Can the Health-Care System Meet the Challenge of Pandemic Flu? Planning, Ethical, and Workforce Considerations

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SYNOPSIS

The federal pandemic influenza plan predicts that 30% of the population could be infected. The impact of this pandemic would quickly overwhelm the public health and health-care delivery systems in the U.S. and throughout the world. Surge capacity for staffing, availability of drugs and supplies, and alternate means to provide care must be included in detailed plans that are tested and drilled ahead of time. Accurate information on the disease must be made available to health-care staff and the public to reduce fear. Spokespersons must provide clear, consistent messages about the disease, including actions to be taken to contain its spread and treat the afflicted. Home care will be especially important, as hospitals will be quickly overwhelmed. Staff must be prepared ahead of time to assure their ability and willingness to report to work, and public health must plan ahead to adequately confront ethical issues that will arise concerning the availability of treatment resources. The entire community must work together to meet the challenges posed by an epidemic. Identification and resolution of these challenges and issues are essential to achieve adequate public health preparedness.

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The federal pandemic influenza plan and public health experts predict that should the H5N1 influenza virus mutate in such a way that human-to-human transmission can easily occur, approximately 30% of the U.S. population could develop the disease.[1] An influenza pandemic of some type could occur in the next few years. It may be H5N1 or some other subtype, which could translate into approximately 90 million cases nationwide.

Depending on the severity of the pandemic—whether it is moderate like the 1957 and 1968 strains, or severe like the 1918 strain—the federal plan projects the following: 45 million people in need of outpatient care; between 1 million and 10 million people in need of hospitalization; 130,000 to 1.5 million people in need of intensive care; 65,000 to 750,000 patients requiring mechanical ventilation; and deaths numbering from 200,000 to 2 million. In recent flu seasons, it has been reported that hospital emergency departments have reached their limits and that there is little room for a surge in patients in either emergency rooms or inpatient beds.[2,3]

A grim picture is predicted of a significant surge in the need for additional health-care resources, which our nation currently lacks. It is expected that there would be serious shortages of health-care facilities, equipment, pharmaceuticals, and personnel. The public health system and hospitals will be quickly overrun if even some of the estimated number of people become sick. It is important to realize that victims of this disease will, by default, need to be cared for in home-care settings, and we must plan accordingly.

THE ARRIVAL OF A PANDEMIC

The H5N1 influenza virus carries significant morbidity and mortality in humans once infection occurs but, so far, it has not been efficient in spreading from birds to humans or from person to person. However, it is prudent to assume that the virus could mutate in such a way that its transmission to or among humans becomes easier. Therefore, the threat to the public's health may not be determined by the virus's genetic makeup as we see it today, but rather it is dependent upon the right twist that will make it more infectious among humans and thus more easily spread. It is important to note that no proven and approved vaccine to prevent H5N1 as yet exists and does not appear to be close to development and production. Antiviral drugs can be considered for treatment of infected individuals and possibly for chemoprophylaxis in selected groups, but the evidence base for the effectiveness of such usage is weak, and they do not confer lasting immunity.[4]

Avian influenza could arrive in the U.S. by any number of means. Wild birds or smuggled exotic pet birds could serve as carriers, or people infected elsewhere in the world could travel to the U.S. with it.[5,6] Researchers are trying to determine how the virus spreads so easily among birds but infrequently to and among humans. Genetic analysis has revealed that another strain of the virus found in American pigs in 1997 contained gene segments from human, pig, and bird flu viruses.[7] Genetic changes allow the virus to jump species and, as it does this, it can undergo further genetic changes. If a deadly strain becomes highly infectious among humans, it is important to remember that each month, millions of people travel to and from the U.S. via airlines, ships, trains, automobiles, and even on foot.[8] The world today is closely connected. If avian influenza spreads abroad, we must assume that it will also spread to the U.S.

Once the virus is able to spread easily among humans, a deadly influenza pandemic could appear. In recent years, we have experienced unimaginable disasters, but if avian influenza becomes pandemic in humans, it will be unlike the events of 9/11 or Hurricane Katrina. In response to both of those disasters, surge capacity was provided by communities across the country that sent personnel and materials. A pandemic is different. It may reach almost everywhere, and there may be no community outside its reach that can be counted on to provide spare health-care personnel or critically needed medical equipment, such as ventilators.

In the U.S., our emergency plans are usually prepared to deal largely with the destruction of property or a single major event. Unlike a hurricane, earthquake, or bomb, however, a pandemic would leave facilities and equipment not destroyed but abandoned, as the people needed to run them would be either unable to go to work or may refuse to do so. A pandemic could also be prolonged and return in waves, the timing and duration of which are very hard to predict.

IMPACT OF A PANDEMIC ON THE HEALTH-CARE SYSTEM

One estimate from the New York City Department of Health and Mental Hygiene stated that in the first wave of a pandemic, 67% of intensive care unit (ICU) beds in the city hospitals would be filled with flu victims.[9] However, on a daily basis in New York City (and the rest of the nation), there are rarely any unoccupied ICU beds. Where will the displaced ICU patients go? Some have suggested that additional or portable ICU beds be added to the system now. However, this solution would be both costly and impractical.

Nurses and doctors may be able to work extended shifts for a day or two, some ICU patients may be moved to other units, and some medical or surgical procedures could be postponed. But most cases that require ICU care, such as strokes and heart attacks, would not wait. We need to determine now how these everyday emergencies will be triaged, where they will go for treatment, and how to assure that the staff will come to work to care for them. A useful and practical protocol offering a real solution to the problems of providing care to all in the face of a pandemic is possible and must be planned for at the local level now.

One solution is to plan for influenza care to be given in the home setting. Some health professionals have suggested that during an influenza epidemic, care can be provided in public settings such as high school gymnasiums, churches, or convention centers. However, there is no level of care that can be provided in these settings that cannot be given in the home. Home care is delivered by a variety of organizations—nonprofit, corporate, and locally owned small proprietorships—that are not normally included in health-care emergency planning. Because much of the treatment in a flu epidemic will take place at home, efforts must be made ahead of time to include home-care agencies and other community resources, such as pharmacies and the Veterans Administration, in the plan. Home-care nurses' and managers' experience and guidance must be sought and included in the development of surge capacity in the community itself.

Placing large numbers of infected people in one congested setting, which will probably have inadequate facilities for personal hygiene and sanitation, could serve to promote its spread and provide marginal care at best. The ill would be more likely to receive better care at home, having food prepared for them by family members, use of their own lavatory, and a comfortable bed to convalesce in (rather than lying on a cot). Moving or collecting people in such centralized facilities is likely to spread the disease more readily than keeping them at home. Even for the approximately 29 million people in the U.S. who live alone (26% of all households), it would be preferable to remain at home, whether ill or quarantined, and receive support from visiting friends, family, home-care personnel, or a combination thereof.[10]

For home care to work, it will require the integration of home care into pandemic flu plans. A means of diagnosing and then providing treatment for those who develop life-threatening sequelae to a case of the flu must be established. This plan is an entirely new concept and the American health-care system will need some prodding for this plan to be accomplished.

To create the surge capacity necessary to care for people at home, public health department pandemic flu planning must be linked with input from organized home-care agencies and community-level volunteer organizations such as the Medical Reserve Corps. To date, these groups rarely have been included in influenza epidemic preparedness planning. During a large-scale epidemic, the job of public health will be challenging because it will be called upon to organize and direct the delivery of acute care in the community-based home-care setting on a monumental scale.

ETHICAL CONSIDERATIONS

The health-care system will experience critical shortages of pharmaceuticals of all types to treat secondary infections and complications. The supply of ventilators needed and the staff to maintain them is inadequate by any measure. If H5N1 strikes, the number of respirators that may be needed could not be stockpiled ahead of time. The number needed could be enormous. It is possible that people will die if the availability of these resources is insufficient when they are needed. People can accept the idea of death when there is no known cure for a disease, but how many people have experienced the death of a loved one because a drug or medical supply simply "ran out?" If pandemic influenza occurs, and we do not adequately prepare in our communities ahead of time, many of us will have this unnecessary and unfortunate experience.

With blood products and live organs, we have learned to collect and distribute life-giving goods in a rational and equitable fashion even though the supply is inadequate. We should be prepared to do the same, if necessary, for rationed drugs and ventilators. We need to set in motion a process to create a rational means of doing this, ahead of time, for shortages of critically needed drugs, ventilators, and other supplies. Otherwise, the equipment and supplies that can be found will become rare commodities and acquire enormous cash value. The demand for medical necessities could become an ugly scramble among different communities, hospitals, patients, and doctors' consciences.

We must inventory existing supplies, develop a tracking and distribution system, and assess projected needs, manufacturing capacity, and finances. These are not biological goods like blood and organs with a limited useful lifespan; we can manufacture them at will. While production is limited now, industry can expand just as in wartime if given direction, time, and revenue. However, without a formal process involving discussion and community-wide decision-making to plan a response in the midst of a pandemic, it is difficult to estimate

which drugs and equipment should be stockpiled. Loss of life because of an inadequate inventory of drugs or ventilators would be tragic. In the eyes of the survivors of the deceased, and perhaps in the eyes of juries of their peers, it may be considered an act of neglect for which compensation is due.

For those health-care workers who come to work to provide care for victims during an influenza epidemic, unfamiliar ethical decisions will surely confront them. For instance, they may have two patients in need of ventilators but only one ventilator, or 10 patients in need but only eight ventilators. They may have to choose between those who will or will not receive care. Given two patients but only enough time or resources to care for one, should the provider give care to the one with the greater ability to pay? It would seem an inhuman choice to make, but it is not always possible to ignore the financial aspects of providing care.

These are difficult ethical issues, but they are issues that health-care providers, community members, ethicists, and public health leaders must address now. It is possible to have a dialogue in our society and deliver education to health-care workers now on how to recognize ethical dilemmas, encourage discussion of the issues, and decide how to reconcile rationing to provide the best care to the most people during such a situation. This dialogue will provide health-care providers with a framework for dealing with ethical issues when the need arises.

THE HEALTH-CARE WORKFORCE RESPONSE

America's health-care system is only as strong as its workforce. The impact of avian influenza would challenge workforce behavior in unaccustomed ways. In a survey of more than 6,400 health-care workers in 47 facilities in the New York metropolitan region, only 48.4% said they would be willing to report to work during an outbreak of Severe Acute Respiratory Syndrome (SARS).[11] The most frequently cited reason for unwillingness to report to work was fear for personal or family safety.

Health-care workers will become infected early in the pandemic in great numbers and will need to care first for themselves and second for family members. When health-care workers perceive themselves to be at greater risk for becoming ill or injured in a crisis, they will be less likely to report to work during the event. A new strain of deadly influenza could be similarly feared and/or misunderstood. With half of the health-care workforce self-reporting that they may not show up for work during a major infectious disease outbreak, the ability to even have an effective surge capacity system is questionable. Hospital ICU beds and ventilators are not useful if there are not adequate numbers and types of health-care personnel to provide care to the patients who are in these beds on the ventilators.

Steps must be taken ahead of time to educate health-care workers regarding selection and use of personal protective equipment, immunization programs, when vaccine becomes available for first responders, availability of prophylactic medications, and assurances that the fears and concerns they have will be addressed. Health-care workers want to be heard before they are in the midst of a crisis. If health-care managers and agencies take steps now to deal with these issues, they will have a prepared workforce that is more likely to serve during an epidemic. It is necessary that these discussions take place prior to the event and help prepare workers for the unforeseen. Hopefully, these discussions will include not only health-care workers, but also the media, clergy, and community decision-makers. These people together will serve as a coalition to promote a thoroughly integrated local plan—something that has rarely occurred in the past.

COMMUNICATION

Communication is essential when preparing for an influenza pandemic and any other public health disaster. Besides planning for effective communication within the health-care and government sectors, public health agencies must assure that there are excellent communication links into the community. During a pandemic, actions taken willingly by the public in response to accurate, scientific information will reduce contagion and suffering. Clear, trusted, and coordinated communication with the public will be essential to avoid unnecessary risk of infection, confusion, anger, and the overwhelming demand for health care. It will also increase the likelihood that the public will follow the directions of the local public health officer.

Because people naturally seek information from multiple sources in a crisis, we must strive to ensure that inconsistent information and advice does not lead to individuals taking the wrong action or no action at all. Providing information to the public about any disaster or epidemic is tricky because the scene constantly changes. Factually correct health education messages about the disease should be coordinated and delivered by spokespersons who are trained and willing to be open and honest. In a crisis, spokespersons, when put in front of a television camera, often have said, "All is well. Remain calm. We have the situation

under control." The public does not respond well to messages giving a false impression of a situation, and this type of message will lead the public to distrust information from the government.

The Centers for Disease Control and Prevention's own training material, "Crisis and Emergency Risk Communication: By Leaders, For Leaders,"[12] is grounded in the excellent, but often overlooked, research on crisis and risk communication. It can be used to help public spokespersons make more effective statements during a crisis about what is known, what is not known, what processes are underway to determine what is happening, and some actions that the public can take to protect its health. This information may not sound like sufficiently vigorous intellectual thinking, but at the stage when a pandemic is still only theoretical, it is useful for physicians and scientists to debate the chance of a deadly new strain of the flu virus emerging.

However, there is a difference between having a discussion about what to do about a possible risk in the future and talking publicly about a threat that is here today. During a crisis, when people feel threatened, they should hear consistent messages about what to do from multiple expert and trusted sources. Inconsistent messages, even when factually correct, can lead to public mistrust of all the messages.

Individuals and communities must receive practical information on how to protect themselves. The dissemination of information is sometimes left to community leaders, who may not be part of the formal governance and media structure. Connections among community leaders and organizations and public health authorities must be built before a crisis occurs. In that way, the public can be prepared to digest the latest information on the nature of the disease and how to prepare for and combat it, if and when it occurs.

CONCLUSION

Finally, we must confront the fatalism that a discussion such as this one on pandemics can breed. Inaction when thinking about this threat is a common psychological response to potential threats, such as a flu pandemic.[13] If we believe an event could have a catastrophic impact, but a low probability of occurring, a basic cost-effectiveness calculation may lead us to conclude that it is a waste of resources to prepare for it. However, an influenza pandemic should not be regarded cynically like the Y2K bug or smallpox. Those two threats linger in the recent memory of many in the political, public health, and health-care arenas as miscalculated or politically manipulated threats that created a lot of work and worry but never materialized. However, influenza pandemics have certainly occurred before, and a strain of H5N1 or another highly pathogenic influenza virus with pandemic potential is likely to occur.

Further, we emphasize that pandemic influenza planning is an activity that has broad application within the larger context of overall public health emergency preparedness that should prove to be valuable regardless of whether a flu pandemic ever occurs. The multidisciplinary outreach sessions, planning meetings, educational programs, tabletop exercises, and evaluation activities foster appreciation for the role that each sector plays during public health disasters. Effective public health planning and response requires input and cooperation among community organizations, businesses, law enforcement, emergency management, and medical services, as well as hospitals and public health agencies, to name a few.

A large-scale influenza pandemic would pose challenges and issues that, while complex, can nonetheless be prepared for. Identification of these issues is the first step in the process of planning for adequate preparation, which will help assure that the health of the public is protected to the fullest extent possible.

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