SOME COMPARATIONS IN METHODS OF PANDEMIC INFLUENZA PREPAREDNESS

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Most infectious disease experts agree that an influenza pandemic will occur at some point [15, 17]. Pandemic influenza] has the potential to pose disease control challenges unmatched by any other natural or intentional infectious disease event. Pandemic influenza viruses have demonstrated their ability to spread worldwide within months, or weeks, and to cause infections in all age groups. There are three essential epidemiological conditions that must be met to generate a pandemic influenza. Fortunately they rarely converge; unfortunately they are impossible to predict, but the requirements are clear.

- ***A new flu virus must emerge from the usual animal reservoirs that produce and harbor such viruses. By definition, most people will not have pre-existing immunity.***
- ***The virus has to actually make humans sick (most do not).***
- ***The virus must be able to spread efficiently between people through coughing, sneezing, or a hand-shake.***
- **For the Southeastern Asian avian influenza A virus (H5N1), transmission from poultry to people has been documented with significant mortality; however, the transmission rate is relatively low and transfer between people isn't clearly established [17]. Health scientists are increasingly concerned that the H5N1 virus is mutating in ways that could lead to efficient person-to-person spread [1]. Effective transmission between humans may cause the virus to spread around the globe and initiate the next influenza pandemic. The Secretary of the U.S. Department of Health and Human Services recently stated that "There is a time in the life of every problem when it is big enough to see and small enough to solve. For influenza preparedness, the time is now" [5].**

The ultimate number of infections, illnesses, and deaths is unpredictable, and could vary tremendously depending on multiple factors. Without adequate planning and preparations, an influenza pandemic in the 21st century has the potential to cause enough illnesses to overwhelm current public health and medical care capacities at all levels, despite the vast improvements made in medical technology during the 20th century. While certain modern trends have provided for increased communication and coordination in response to an infectious disease outbreak, increasing globalization could increase the potential for pandemics to cause more illnesses and deaths than occurred in earlier pandemics:

- ***Globally, human populations are more urbanized, which may allow viruses to be transmitted within populations more easily.***
- ***International travel is more frequent and may allow viruses to spread globally more quickly than in the past.***
- ***In many countries and depending upon the characteristics of the virus and disease, increasing percentages of elderly persons and those with chronic medical conditions or suppressed immune systems may elevate the potential for more complicated illnesses and deaths to occur.***

This combination of factors suggests that the next pandemic may progress rapidly and overwhelm countries and health systems that are not adequately prepared.

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a. Current pandemic influenza preparedness

United States Government agencies are currently developing, testing, or refining their plans in case of pandemic flu. Published plans from the United States and the World Health Organization have primarily focused on detection and disease control through (1) surveillance and early detection (2) community containment strategies (movement restrictions, facility closure, and health care service continuity) that would serve to decrease disease transmission and (3) mass prophylaxis strategies using vaccines and antiviral medication, as available and appropriate. While these aspects are mainstream components in the public health and medical preparedness toolkit, relatively little attention has been paid to identifying and managing psychological and social factors likely to influence human behavior during a pandemic. Mass fatality and economic impacts also need to be addressed from this perspective. All of our health and medical strategies require people to behave in prescribed ways to avoid exposure, prevent infection, or halt disease transmission. Containment measures may also impact religious or cultural rituals surrounding burial and grieving for those who perish. Furthermore, leaders in the public and private sectors must be attuned to the behavioral health of constituents to maintain continuity of business and government operations throughout the pandemic or we will not be able to preserve our ways of life. Therefore, applied behavioral science will play a critical role in the success or failure of these strategies.

In the event of pandemic flu, the public will demand information, reassurance, and guidance about what they can do to protect themselves, their families, and their economic well-being. Experience with quarantine during the 2003 SARS outbreak suggests that local officials will face enormous logistic, economic, ethical, and psychological challenges in implementing community- level containment measures [4].

For example, closure of schools may have to be considered, along with restrictions on public gatherings, revisions to policies on mass transit systems, etc. As individuals congregate or travel, influenza transmission will be difficult to avoid. In the initial phases of the pandemic (i.e., 6-9 months), vaccines are not likely to be available, and antiviral medications, if effective, will be in limited supply. Containment measures may prevent transmission, or at least suppress or slow the spread of a pandemic, allowing time for targeted use of medical interventions.

Management in health
XXV/2/2021; pp. 16-19

b. Adherence to public health interventions and outcome at the population level.

The term tipping point was borrowed from Gladwell [3] as he described social marketing trends, and was selected to represent the potential to either increase or decrease the likelihood of adverse health outcomes. More specifically, use of the label tipping point is meant to identify events, actions, or perceptions that strongly influence psychological reactions or social behaviors at the group or population level. The use of this term allows us to look at factors improving or decreasing the likelihood that sufficient numbers of people adhere to appropriate public health intervention measures, such that disease containment is achieved and health is protected at the population level. Several individual and community level factors impact these tipping points and will influence the psychological or behavioral responses to pandemic influenza.

Whether the tipping points lead to the success or demise of a public health response will depend upon the capacity and ability of any response system to understand and manipulate the factors. The remainder of this article provides recommendations that should be implemented by public health and emergency management officials, healthcare and business leaders, and other responsible parties **now** to minimize preventable losses and preserve our way of life.

c. Facilitate self-care and appropriate care-seeking.

Throughout each phase of a pandemic, it is important to ensure that those with influenza symptoms and other acute medical problems seek proper care at the appropriate time. It is also worth efforts to instruct and support people with non-urgent health complaints to safely continue with their daily routine and seek alternative care or support for self-care. It is of prime importance that specialized health care resources retain safe environments--accessible to those needing acute care during an influenza pandemic. As such, it will be crucial to ensure that adequate information about when and how to seek treatment is provided to enhance the capacity of individuals and communities to react appropriately. Because pandemic influenza hasn't been experienced recently, expert panelists recommend that knowledge about successful behavioral adaptation be extrapolated from other infectious disease events. For example, in 2003, the Canadian government recommended cancelling certain public gatherings like funerals and nonessential meetings and invoking a voluntary quarantine for potentially-exposed persons to help contain the SARS outbreak. Civic and faith-based leaders may use this preparedness effort to initiate innovative methods for conducting funerals, other rituals involving groups of people, and social support networks (using a variety of communication venues). A major contributor to the successful voluntary quarantine in Canada was a reimbursement strategy for absenteeism from work.

d. Provide accurate, credible information now.

Official guidance should be provided about over-the-counter medicines for pain and symptom relief, alternative remedies, antibiotics, and antiviral medications. Attention should be given to the psychological and social factors that influence the ways in which people respond to such information [2**,** 13, 14, 16,17].

Because a community's cohesion, values and resources will influence its members' ability and proclivity to receive such information**,** knowledge should be gathered about the pre-existing community context [7,12]. Natural leaders in the community who could disseminate and gather information, and educational systems that are already in place should be identified and tasked with a response role during a pandemic. Rapid ethnographic methods could be applied to better inform local leadership about their constituencies and how to leverage information exchange more effectively. A partnership with the public requires active listening; mechanisms need to be created to garner feedback and engage the public to understand how people are trying to appraise their own risk and choices.

In order to reduce public risk, efforts to enhance adaptive functioning and increase compliance with recommendations and restrictions will also be needed. To facilitate these reactions, the public should be informed by multiple channels prior to any widespread transmission that an influenza pandemic is likely to happen and they need to be emotionally prepared. Such preparation includes teaching about expected reactions and improving coping skills to better manage the emotional fall-out from pandemic influenza, such as grief, anxiety, apathy, dysfunction, and volatility. Information should also be provided now to increase awareness about disease transmission, health impact, available treatment, and how individuals can mitigate their own risk level. Instructions about what to do under different circumstances should be distributed to each household. Children's media programming can be created and disseminated on handwashing, self-care, and family care. In addition, "flu kits" (i.e., tissues, games, alcohol-based hand disinfectants, fact sheets, and key information sources) could be made available to promote awareness and compliance.

e. Facilitate coping and recovery.

General support of adaptive behavior in multiple domains is recommended under situations of ongoing stress and threat. Past experience has shown that affiliation needs and community self-reliance are critical components of disaster recovery and resilience [16]. Work group members recommended that in communities with moderate to severe impact from pandemic influenza, virtual neighborhoods be created with communication support (e.g., walkie-talkies, local TV, conference call capabilities, use of faith/community group telephone call-trees or Internet chat rooms or "blogs", etc.). Depending on how widespread the threat is, information- gathering and dissemination for special populations should also be included in planning and response efforts. For instance, information should be sent home with children when schools are closing about what to do with the children while they are home and interim plans for continuity of education and suggestions about ways to remain connected to the school or community-at-large. Faith-based groups or local cultural organizations should be recruited before hand to disseminate information and to organize visitation, social support and care for their members.

Community information sharing networks (such as neighborhood listservs, newsletters, or bulletin boards) should be facilitated, given that people will feel much more

comfortable going to sources of information that cater to their particular background. A community- wide ethnocultural assessment should focus on the best methods to communicate with residents [18]. Whenever possible, local customs should be honored and reinforced. Information materials should be developed in foreign languages, and disseminated through multiple and culturally-appropriate channels [7].

In previous infectious disease outbreaks, it was found that the community generally wants information from people they recognize as authoritative until their family is more highly threatened. Then they may be more likely to turn to leadership they are familiar with (religious, union leaders, mayor). Therefore, State and local advisory councils should be formed, with regular input to and from the national advisory panel mentioned above. The groups should include local cultural leaders and first responders in communities, who can cull information about how people coped, survived, and sustained themselves in times of depopulating disease or severe economic depression. Local leaders should be informed about how to deliver messages to communities, and how to consult with subject matter experts regarding conveying details.

f. Implement appropriate programs and policies.

Those who have been most affected and/or stigmatized will need emotional support, social protection policies and possibly treatment for adverse mental health. If federal policies allow this, a federal crisis counseling mechanism should support front-line community teams. For pain issues, hospice and faith communities are well equipped to advise individual and group strategies and should be incorporated into community responses. Where appropriate, procedures should be put in place to identify people at risk of severe social, psychological or functional impairment and formal mental health treatment should be provided for those most affected, with provisions for online or telemedicine based on evidence-based or approved treatments [7]. If there are traffic restrictions, the main way to exchange communications will be by using telephone lines (telephone and Internet) or two-way radio waves. Screening or triage may require self-assessment based on awareness and education.

Direct dialing arrangements should be incorporated into any automated screening or educational process. Alternative technologies can be used for more remote areas or to help strengthen healthcare in the event of staff shortages or the closure of units. Municipal planning organizations (MPOs) and government councils (COGs) may be key to integrating efforts in different sectors (e.g., training and protective equipment for private business and public settings to facilitate food or medicine delivery during crises) in order to improve community relations and possibly community cohesion before the pandemic [10]. Previous crisis counseling programs declaring disasters can provide lessons learned on how to spread cultural messages [8, 9].

g. Maximize performance and resilience.

Team cohesion and morale are also essential to combat fear, helplessness, dysfunction, and burnout in healthcare workers. Prior research has demonstrated that some of the most important barriers to workforce participation among nurses are concerns about family; that is primarily the need for communication with family. Basic stress control begins with reasonable work/rest cycles along with the addition of mobile stress management teams. Front-line stress control teams can be formed to help alleviate provider stress, and rest and recuperation sites set up with food resources, music/relaxation tapes and movies, and circulating mental health workers. Specific family support is advised so that healthcare workers' families can exchange information regularly. Responders may also need assistance in changing their expectations about their capabilities. Maintaining a critical workforce for health care is a professional guild and facility management issue that needs to be addressed through a comprehensive worker protection program – including appropriate infection control practices that encompass engineering design, administrative rotation and patient cohorting, and proper use of personal protective gear.

Other responder populations will need special guidance and inclusion in response plans, including law enforcement, drug and alcohol rehabilitation facilities, faith-based organizations, nursing homes and prisons, visiting nurses, hospice agencies, managed health companies, social service providers (psychologists, social workers, psychiatric nurses, school counselors, employee assistance programs). Information should be disseminated through multiple mechanisms/channels: including professional organizations and multidisciplinary tabletop workshops. CEOs of large businesses ought to be recruited to create resources for preparedness funding, distribution, and service delivery for basic needs.

At the federal level, policy recommendations need to be shaped regarding equitable acceptance of patients in hospitals during a pandemic influenza. Policy should be backed by specific guidance for the local resources available. Federal, state, and local plans need to be formulated on how to protect lower-income individuals and families, and small businesses. State and local authorities in the medical, public and mental health, social service, urban planners, and emergency management sectors should collaborate to put plans in place for community preparedness. A template for stress control and emotional support during pandemic influenza should be created, as well as federal assistance with accessing compensation or insurance (e.g., federal guidelines may be needed to ensure that individuals can maintain insurance coverage for health care services delivered during a pandemic; federal guidelines may also be needed to ensure employers can continue to receive salary or wages while complying with voluntary quarantine).

As part of the planning for an influenza pandemic, cross-cutting databases and coordinated analysis should be set up within communities to determine resource availability, community impact and needs, and to monitor compliance (adherence) with health directives and effectiveness of disease control measures. Pandemic influenza exercises need to address the behavioral issues likely to challenge the scenario, with guidance provided in the lessons phase to give leaders and responders a sense of control and provide policy parameters to address potential chaos.

Management in health
XXV/2/2021; pp. 16-19

National oversight should be given to states and communities engaging in different scenarios, and answering key resource and logistics questions. Appropriate anticipation of the behavioral dimensions requires exercising all aspects of quarantine and isolation from voluntary and home-based, to the workplace, health care setting, and mass transit.

h. Develop policies for handling non-compliance.

In advance of the pandemic, procedures for handling people who are oppositional to movement restrictions need to be agreed upon and enforceable. Issues involving civil liberties, resource allocation, and economics need to be addressed in the planning stages. The World Health Organization recommends that governments determine who will get anti-influenza drugs and vaccines; whether hospitals will be open only to influenza victims, and whether international borders should be closed to travelers from influenza-infected countries. States should be mandated to perform exercises to test their plans, including anticipated behavioral challenges, and report results about corrective actions needed.

CONCLUSIONS

This article has been prepared to raise awareness and stimulate guidance regarding behavioral countermeasures which will be a critical component of public health preparation for pandemic influenza. Because of the complexity of issues likely to arise given this international threat, we need to strengthen our public health approach by incorporating psychological and behavioral countermeasures. It is hoped that these countermeasures will help shape the public's adaptive and risk-reducing behaviors and reduce social and emotional deterioration in the advent of pandemic influenza. Measures to support key personnel demonstrate an organizational commitment to the well-being of its workforce and may help counter a sense of helplessness and chaos that often accompanies disaster settings. This will only be possible with proper planning, coordination, collaboration, policy commitment and economic support at federal, state, and local levels now, before a pandemic is declared.

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