Pandemic Influenza:  
When Mother Nature Calls,  
Will We be Prepared to Answer?

ABSTRACT
Pandemic outbreaks of human influenza are a reality of nature and have occurred periodically throughout history. Since we know the next outbreak is an eventuality, developed nations have ample opportunity to prepare. The H5N1 virus currently infecting birds in several parts of the world should prompt healthcare leaders to develop effective, integrated plans for responding to a pandemic. The iterative cycle of preparedness outlines five key steps: (1) capabilities-based planning, (2) equipping, (3) training and educating, (4) exercising and evaluating and (5) identifying and incorporating lessons learned. This paper focuses on the strategic aspects of effective pandemic preparedness and the cyclical architecture that links them. It also describes concrete steps healthcare leaders can take not only to prepare their organizations for a pandemic, but also to participate in broader planning activities to ensure that preparedness is a community investment.

The threat of a pandemic is unfortunately quite real. Pandemics are a reality of life and occur periodically as a matter of nature. Though the pandemic of 1918 is widely regarded as the one of the worst epidemics in human history (Barry 2005), there have been several less-severe pandemics since then. Much has been written about the H5N1
type-A influenza virus currently affecting birds in some parts of the world. At present, there is no evidence of sustained human-to-human transmission of the virus. However, public health officials have noted striking genetic and morphological similarities between the H5N1 virus and that which led to the 1918 pandemic. It is because of those concerns—and the reality that another pandemic will eventually occur—that healthcare leaders would do well to assess not only their organizations’ levels of preparedness but, in fact, the very framework by which they undertake pandemic preparedness efforts.

In November 2005, President George W. Bush unveiled the United States’ National Strategy for Pandemic Influenza at the National Institutes of Health, in Baltimore, Maryland (The White House 2005). In doing so, the president outlined three pillars of the Strategy: (1) preparedness and communication, (2) surveillance and detection and (3) response and containment. Preparedness is the bedrock upon which surveillance, detection, response and containment rest. Accordingly, this paper focuses on the strategic aspects of effective pandemic preparedness and the cyclical architecture that links them.

**Defining the Challenge**

A pandemic is much more than simply a public health or medical event. A pandemic will certainly have significant health and medical consequences that could overwhelm local resources and capacity. It will just as certainly have profound economic consequences, raise border security issues and potentially affect the sustained operation of critical infrastructures. For these reasons, it is insufficient to plan for a pandemic on the basis of medical or public health consequences alone; pandemic planning must incorporate the full spectrum of preparedness activities. Moreover, it is not enough merely to have a local plan or to rely on the government to respond to a pandemic. Rather, effective pandemic plans must leverage the totality of community, state (or provincial) and national resources in a carefully integrated manner, and they must be tested, evaluated and continually refined. Developing and maintaining such plans require significant investments of time and a deliberate commitment to the process of capability-driven preparedness.

**The Cycle of Preparedness and Its Application to Pandemic Planning**

Successful contingency planning for a pandemic requires a disciplined approach to the iterative cycle of preparedness. This cycle includes (1) capabilities-based planning, (2) equipping, (3) training and educating, (4) exercising and evaluating and (5) identifying and incorporating lessons learned. A discussion of each within the context of pandemic influenza follows.

**Capabilities-Based Planning**

In resource-constrained environments, it is critically important for leaders to use risk-based requirements to drive their preparedness investments. Too often, procurement activities focus on the latest technology or trendiest resource. It is more important, however, to focus on the capability that a given resource (or collection of resources) will provide. In order to plan for a pandemic, jurisdictions should identify the specific capabilities required to execute successfully their response plans. These capabilities will be acquired by systematically expressing desired outcomes and accomplishing the tasks required to produce those outcomes.

The first step in capabilities-based planning is the recognition of a need for holistic contingency plans. Well before a pandemic occurs, individuals, communities, private-sector organizations and governments at all
levels must develop comprehensive plans for managing a pandemic that reflect the individual needs of communities. Recognizing that a pandemic will rapidly escape the health sector, incident management plans should incorporate a broad view of the resources and capabilities required to respond, and they should provide sufficient latitude to ensure that the response is scalable, flexible and adaptable as the pandemic unfolds.

To begin the planning process, organizations should determine the specific capabilities they require to respond successfully to a pandemic. These capabilities will be directly dependent upon individual areas of responsibility: a healthcare organization will require different capabilities than, for example, a water treatment facility. While the continued operation of each is critical to a community’s ability to withstand a pandemic, each has very different responsibilities during the response. Different communities also possess different types and quantities of resources, and effective, capabilities-based planning should include provisions for mutual aid agreements by which neighbouring communities might share resources during a pandemic.

The planning process should also include consideration of pandemic-specific policies, procedures, mutual aid requirements and strategies for gaining and maintaining situational awareness. Leaders should think prospectively about the types of information they will require to sustain operations during a pandemic, and they should begin working immediately to establish communication channels to ensure they receive such information.

**Equipping and Identifying Resource Requirements**

A robust planning process should drive the development of requirements for supplies, materiel, personnel and other resources. Those requirements should in turn inform the procurement of such equipment and resources. It is similarly necessary to identify repositories for storage and have in place robust logistics systems to organize, maintain and rapidly deploy necessary equipment and supplies in response to an emerging threat. To the extent that equipment guidelines and standards exist, jurisdictions should use them to ensure that the materiel they purchase is interoperable with that of other providers or responders.

With respect to a pandemic, resource requirements might range from the seemingly ordinary (e.g., stockpiling several hundred thousand courses of antiviral medication) to the more complex (e.g., developing plans to convert hotels into mass care facilities). Vaccines or antiviral medications provide excellent examples of the difference between simply identifying a resource and articulating the capability requirement that the resource fulfills. In other words, it is insufficient to purchase antiviral medications without also considering the policies, procedures and plans for their storage, distribution or use. The desired capability is mass chemoprophylaxis; the pills themselves are but one element of the overall resource requirements to fulfill the capability. Equally important are policy decisions to waive physical examinations prior to dispensing medication; distribution plans to ensure that all affected citizens receive adequate supplies in a timely fashion; and follow-up procedures to monitor compliance, prevent misuse and institute safeguards against black markets and price gouging.

**Training and Education**

Having identified the personnel, equipment, supplies and other resources necessary to manage a pandemic, jurisdictions should undertake rigorous training and educational processes to ensure each responder is well versed in his or her specific role, understands the associated responsibilities and is prepared...
to interact effectively with peers. This training should include detailed discussion about incident management structures (i.e., define who is in charge) and specific roles and responsibilities of those charged with coordinating the response.

The adage “practice makes perfect” is never as apropos as when used in the context of preparedness planning. A pandemic is an atypical scenario when compared to most incidents for which hospitals, healthcare organizations and even entire nations prepare. Emergency management planning has historically focused on incidents with concrete beginnings and endings, and for which a temporary surge is required. A pandemic will be different. The next pandemic will likely last for 18 months or longer, result in as much as 40% employee absenteeism and disrupt normal supply chains. Whereas most natural disasters result in focused mutual aid support to an affected area, the widespread nature of a pandemic would likely result in simultaneous government support across an entire nation, thereby diffusing the usual concentration of assistance. In order to overcome such challenges, it is critical that training and education efforts reinforce the unusual circumstances that a pandemic would present, and that curricula include specific strategies for dealing with them.

**Exercise and Evaluation**

Tabletop and field-level exercises present invaluable opportunities to test capabilities and improve the efficiency of contingency plans. Whether conducted as tabletop exercises or as actual field-level events, exercises also allow leaders to assess critically their existing policies, procedures, plans and assumptions to determine gaps and initiate remediation planning. In general, exercises should be multidisciplinary and multi-jurisdictional to ensure that all sectors are engaged and have the opportunity to test their own plans within the context of an overall community response. This is particularly true of pandemic exercises given the inextricable links between sector-specific plans and the overall incident management plan.

Exercises should be structured such that prioritized capabilities are tested and evaluated by predetermined standards and objectives. To the degree possible, leaders should gather and analyze quantitative data to determine the presence or absence of competencies required to fulfill each capability. Immediately upon the conclusion of an exercise, all participants should be involved in an initial after-action or “hot wash” process to capture the major lessons learned and discuss obvious opportunities for improvement. Soon after, a more detailed written report should summarize and categorize all relevant findings and recommendations for change.

In the context of pandemic planning, leaders should exercise each of the capabilities required to sustain a community during an outbreak. Such exercises should be both sector specific and community wide. For example, hospitals and healthcare organizations should exercise plans to care for large numbers of patients, implement respiratory isolation and distribute medical countermeasures. At the same time, other organizations should designate essential employees and test telework programs and ensure that their information technology infrastructures are sufficient to support at least 40% of these key employees as they work remotely.

**Incorporation of Lessons Learned**

One of the most crucial aspects of any preparedness process is the identification and application of lessons learned. Having identified opportunities for improvement, organizations and jurisdictions should move quickly to implement corrective action plans and close gaps in plans, policies, procedures, equipment...
or supply caches or training and education curricula. Once such corrective actions have been identified and implemented, the preparedness cycle should begin anew, thus providing an iterative, unending process of planning, equipping, training, exercising and evaluating and incorporating additional lessons learned.

Because of the emerging nature of most pandemics, it is quite likely that the Western world will have the benefit of observing other countries’ experience and adopting best practices as determined by those countries’ responses. Similarly, recent events such as the 2003 SARS outbreak provide invaluable opportunities to evaluate existing policies, procedures and plans against real-world events. What began in Asia quickly spread to other parts of the world, allowing public health officials to share information about effective mitigation strategies and more rapidly contain the disease.

In many ways, a pandemic influenza would mirror the effects of a large-scale bioterrorism incident: the health effects, while profound, would be rapidly outpaced by myriad social and geopolitical effects, including decisions about border closures, transportation restrictions and economic consequences. To this end, planning and preparedness for a pandemic enhance overall preparedness for bio-defence. Conversely, lessons from previous bio-defence preparedness efforts could be leveraged to enhance pandemic planning. Such interrelationships underscore the nature of capability-based planning: preparedness for one scenario applies to many other scenarios when requirements are based on developing and improving capabilities, not merely stock-piling supplies and equipment or activating a stagnant response plan.

**Conclusion**

Public health officials should recognize that all levels of government and all sectors of society have specific – yet highly complementary – roles to play in preparing for, responding to and recovering from a pandemic. It is neither sufficient simply to rely on governments to develop the plan for pandemic, nor acceptable to think that “others” are responsible for community planning. In the healthcare arena, large, academic medical centres and teaching hospitals have historically led our local or regional preparedness and planning activities. Such a model will not work for pandemic planning. Responding successfully to a pandemic will require the careful coordination of all sectors of society. Private practitioners, group practices, allied providers and others who have not traditionally been engaged in disaster planning will find themselves on the front lines during a pandemic. It is thus imperative that they be involved early – and often – in the preparedness process.

We cannot predict with certainty when the next pandemic will occur. History suggests it will not be long. As with most public health practices, we would do well to heed this lead-time bias to engage in thoughtful, capabilities-based planning and to use the iterative preparedness cycle to refine and improve our plans. Our citizens expect nothing less of us. After all, we cannot begin the planning process when we reach for the last ventilator in the supply closet.

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**References**
