

case scenario were modeled. The benefits were adjusted to an annual probability of a pandemic as low as 1%, and the relevant cost-benefit ratio was calculated. The impact of vaccination on disease spread was assessed according to a systematic review of published dynamic models.

Results: The model showed that a advanced purchase agreement was cost-saving, with a cost:benefit ratio of 1.81:3.65 in the base-case scenario, depending, among other factors, on the assumed R0 in the underlying mathematical models. The ratio proved relatively robust in extensive sensitivity analyses.

Conclusions: The risk of a severe pandemic caused by a highly pathogenic influenza virus remains. An advance purchase agreement for future vaccine supply is a cost-saving strategy and should be pursued. The practical aspects of this strategy will be discussed.

Keywords: cost-benefit; H1N1; influenza; pandemic; vaccine
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Development of Crisis Care Guidelines for Critical Care Management and the Allocation of Scarce Resources during the H1N1 Pandemic

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Introduction: The H1N1 pandemic has raised concerns about potential limited resources during peak surges. These limited resources may include respiratory care equipment (e.g., ventilator), sub-specialist access, critical care/intensive care unit (ICU) bed capacity, and surgical access. Many emergency preparedness coordinators have developed plans to allocate scarce resources, including a triage system with inclusion and exclusion criteria. However, in order to provide equal and equitable care, this triage system must be applied evenly across the healthcare spectrum. In Northern California, a guideline to provide equal and ethical care across a diverse region during the H1N1 pandemic was developed. This guideline includes regional and healthcare triggers, the local facility trigger, suggested beside guidance, and the development of a facility and regional triage team. In this presentation, the development of this guideline will be discussed including examples, test cases, and drill data to show its success and limitations. Detailed portions of the guideline will be distributed and discussed.

Objectives:

1. Understand the broad development of crisis-care guidelines for H1N1 pandemic management, including the allocation of scarce resources;
2. Discuss and develop a triage model for the allocation of scarce resources; and
3. Discuss the ethical and policy issues regarding crisis care during a pandemic.

Keywords: critical care; H1N1; guidelines, preparedness; resources; triage

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Do Standard Operating Procedures for Pandemic Influenza Impact on Emergency Preparedness?

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Introduction: Standard operating procedures (SOPs) are the basis of preparedness for biological threats. This study investigated the relationship between the quality of the SOPs for the management of pandemic influenza to the level of performance in an H5N1 drill.

Methods: The SOPs for of all general hospitals in Israel for managing pandemic influenza were evaluated using a tool developed for this purpose. Results were compared to the levels of performance measured in an avian influenza drill.

Results: The reliability of the two scales was high (SOP evaluation = 0.741 and drill assessment = 0.739). The overall correlation between the SOP score and drill assessment was strong ($r = 0.737$; $p < 0.000$). Performance in the avian flu drill correlated significantly with the SOP evaluation in: (1) protection of staff and patients ($r = 0.591$, $p = 0.002$); (2) manpower control ($r = 0.8750$; $p = 0.000$); (3) infrastructure and minimizing overload ($r = 0.932$; $p = 0.000$). Results of two stepwise regressions: (1) using the SOP scores to predict performance on the drill; and (2) using the drill scores to predict the SOPs ratings resulted in the emergence of two significant models.

Discussion: A correlation was found between the SOPs for pandemic flu and the performance on the Avian flu drill, mainly in relation to elements that were unfamiliar to the staff or in areas which were perceived by the staff as posing a risk to their well-being. High quality SOPs have a strong correlation with the performance of the hospital in an avian flu drill; therefore, it is recommended to invest effort in developing high quality SOPs in order to promote the preparedness for pandemic flu.

Keywords: avian flu; drills; pandemic influenza; performance; preparedness; standard operating procedures

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Biosurveillance for Pandemic Influenza: US Experience with the H1N1 Outbreak, April–June, 2009

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Introduction: Making good decisions under crisis conditions is dependent on understanding the types of decisions

needed during the crisis, the information needed to make those decisions, and timely availability of that critical information. In April, 2009, the United States experienced a late-season outbreak of a novel H1N1 influenza virus that led to a full-scale national response. An in-process-review of the performance of biosurveillance efforts at the Centers for Disease Control and Prevention (CDC) was conducted for the first three months of the response.

Methods: Four types of engagement were held to collect information regarding systems, methods, and tools for bio-surveillance: (1) a one-hour meeting with senior Agency response leaders; (2) a series of in-person interviews with CDC subject-matter experts; (3) a focus group with CDC responders; and (4) a focus group with a convenience sample of state and local public health epidemiology practitioners.

Results: Seasonal surveillance systems were the most central to regular reporting and were flexible to the time and volume demands primarily because of the dedication of public health professionals at local, state, and federal levels. Staff-intensive manual collection and reporting efforts degraded as the volume increased. Familiarity with data was important to inclusion in reports. Many critical information requirements were filled from investigation; timeliness and exchange of this information and sharing improved with ability to have federal staff in the field. Quality staff, quality relationships, and effective partnerships were central to effective information sharing domestically and internationally.

Conclusions: Overall, the information exchange was deemed to have been timely and effective. The clarity of critical information requirements was central to the adaptability and efficiency of biosurveillance efforts. The success of information exchange was more a result of the expertise, dedication, and adaptability of staff than the technology. Efforts are underway to increase the coverage and automation of surveillance for the fall.

Keywords: biosurveillance; exchange; expertise; information; response; US

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“Orange Flame” Project: An Integrative Approach to Building Capacity for an Unusual Biological Event

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Preparedness for an unusual biological event (UBE) comprises capacity and capability (know-how and integrative response). Traditional methods for preparing the healthcare system for a biological event fail to achieve real capability for a UBE, as they disregard the unknown agent. Furthermore, they ignore many inherent uncertainties present following event detection.

The most problematic response time to a UBE are the first 48 hours following the event: the greatest uncertainties are definitive agent identification, the scope of the event, and its origin. No governmental directives are expected at this time.

We have developed a model—and a system to implement it—to prepare all responders, mainly on a regional level, to identify and react to a UBE in an integrative and

generic way. Consequently, this model transforms them to a *modus operandi* of an outbreak while the command and control is moved to a national level.

Necessary components of this model are:

1. Setting a generic national doctrine for an unknown agent, by default, a contagious airborne transmissible disease. This doctrine is translated by each agency and institution—civilian or military—to relevant standing orders;
2. Setting a date for a drill—defining an annual timeline for a structured process of planning and training culminating in regional, two-days drills for all participants;
3. Integrating national medical assets, non-medical actors, and decision-makers in the process;
4. A single, multi-organizational, small group that prepares the various agencies, plans and executes the drill, and implements the lessons learned into the doctrine and standard operating procedures; and
5. Peer review of the trainees by veterans of previous drills.

Three “Orange Flame” drills succeeded in building regional capability for UBE, which also serves well for pandemic preparedness.

Keywords: biological event; capacity building; Orange Flame; preparedness

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Methods of Training and Programs to Enhance Preparedness

Disaster Preparedness 101: Preparing Nursing Students for Action

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Introduction: As a result of recent disasters and emerging threats, it is imperative that nurse educators provide students with the foundations to be able to respond to a disaster situation equipped with the tools for action. The purpose of this presentation is to describe the lessons learned from a partnership between a school of nursing and a rural, federally-qualified community health center. Nursing students gained first-hand experience performing a risk assessment—developing, implementing, and evaluating the agencies’ ability to manage a large, multi-victim disaster simulation exercise. In addition, this immersion method emphasized the interface relations and collaboration needed between emergency agencies and academic health partners.

Methods: The immersion method of teaching the concepts of disaster nursing was applied while partnering with a rural, federally-qualified, community health center and a group of community health students. This immersion allowed the students to work with the agency to plan, implement, and evaluate surge capacity. In planning and implementing the disaster exercise, students partnered with local agencies to enhance the reality of the exercise. Following the disaster exercise, students conducted a series of focus groups aimed at identifying the agencies’ strengths and opportunities for improvement in the event of a disaster; these were shared with the agency.