

medical staff. The purpose of this study was to define how to keep staff members at a hospital during the avian influenza pandemic phase.

**Methods:** Employees at six hospitals in Kyoto, Osaka, Hyogo Prefecture were surveyed using a self-administered questionnaire regarding ethical issues, working conditions, and their attitude for avian influenza.

**Results:** Of the 1,626 respondents of all staff in hospitals (response rate: 63.4%) including doctors, nurses, pharmacists, radiological technicians, medical technologists, nutritionists, occupational therapists, physiotherapists, clerical workers, and others, 25.0% of them answered that they would carry out their duties without any conditions, 40.4% with some conditions. They thought the personal protective equipments (PPE) had to be prepared, and workers' compensation was essential. The others answered that they will not perform their duties.

**Conclusions:** In order to cope with an avian influenza pandemic, it is not enough to prepare pre-pandemic vaccine and antivirals of the neuraminidase inhibitors (Tamiflu). It is essential to provide medical staff with PPE, workers' compensation, and the safety of the working environment. Additionally, it is essential to protect not only medical staff, but also their family members.

**Keywords:** healthcare; medical staff; pandemic; professionals; safety; working environment

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### Designing Alternate Care Sites for Pandemics and Public Health Emergencies

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**Introduction:** Developing alternative systems to deliver emergency health services during a pandemic or public health emergency is essential to preserving the operation of acute care hospitals and the overall healthcare infrastructure. Alternate care sites that can serve as areas for primary screening and triage or short-term medical treatment can assist in diverting non-acute patients from hospital emergency departments and manage non-life threatening illnesses in a systematic and efficient manner.

**Methods:** In New York State, we developed a model concept of an operational plan for alternate care sites to be used during pandemics and large-scale public health emergencies. Subject matter experts were convened and best-practice methods used to design operational plans, clinical protocols, altered standards of care, and progressive medical care designed to allow the mild to moderately ill patient to be managed, and then, return to their homes for convalescence.

**Results:** More than one year of interagency, comprehensive planning, training, and review was conducted to create a model alternate care site plan. Accomplishments and milestones included: (1) creating stakeholders; (2) engaging community partners; (3) site selection; (4) staffing issues; (5) designing medical protocols and clinical pathways; (6) functional role development; (7) equipment and supplies; (8) site security; (9) communication with the public; (10)

drafting the plan; (11) designing training programs; and (12) exercising the ACS plan.

**Conclusions:** Learning how to create stakeholders at local and regional levels and starting a process of collaborative planning and interagency cooperation is essential in preparing for and operating an alternate care site. Lessons learned and best practices developed in our program will be presented to assist attendees in beginning or continuing the process of planning to operate alternate care sites in their home areas.

**Keywords:** alternate care site; model; New York; pandemic; public health emergencies

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### Planning for Uptake of Vaccine among Healthcare Workers during the Next Influenza Pandemic

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**Introduction:** Healthcare workers in Canada will be the first priority to receive vaccinations during the next influenza pandemic. This can only be an effective infection control strategy if workers actually receive the vaccine. Little is known about how healthcare workers will respond during an influenza pandemic. Despite considerable evidence of efficacy and organizational and legal pressure to adhere to this recommendation, seasonal influenza vaccinations among healthcare workers are drastically below target. This study considers whether current planning for an influenza pandemic affecting Toronto's healthcare workers adequately considers the potential for low numbers of vaccinations.

**Methods:** Pandemic plans of public and non-profit organizations relevant to Toronto's healthcare workers were reviewed for content regarding the need for active promotion of vaccines or strategies to increase vaccinations.

**Results:** The majority of pandemic plans relevant to Toronto contain no references to the promotion of vaccinations among healthcare workers. Some plans are explicit in their assumptions that more healthcare workers will accept vaccines during a pandemic situation than in outbreaks of seasonal influenza. Evidence supporting this assumption is lacking.

**Conclusions:** Pandemic planners should consider and document a range of strategies to increase vaccinations.

**Keywords:** influenza; healthcare workers; pandemic; public health; vaccinations

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### Vaccine Purchasing for an Influenza Pandemic: A Comparative Cost-Benefit Model

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**Introduction:** The next influenza pandemic is expected to spread rapidly, causing worldwide morbidity, mortality, and economic disruption. Effective vaccines are pivotal to thwart the spread of a pandemic virus and to prevent illness and death. However, the global potential vaccine supply is

several billion doses short of the necessary amount. Health authorities worldwide face two main strategies to afford a reasonable chance for utilizing vaccines during a pandemic—pre-emptive stockpiling of vaccines against circulating avian H5N1 strains, or signing an advanced purchase agreement for vaccines with the vaccine manufacturers. Both options are costly and are associated with many unknown influencing factors. We present a mathematical model for the comparison of these two vaccine purchase strategies (advanced purchase agreement vs. pre-pandemic avian H5N1 vaccine stockpiling) in economical terms.

**Methods:** We modeled each strategy's cost, impact on reduction in morbidity and mortality compared with a non-intervention, base-case scenario, adjusted the benefits to an annual probability of a pandemic as low as 1%, and calculated the relevant cost-benefit ratio. The impact of vaccination on disease spread was assessed according to a systematic review of published dynamic models.

**Results:** The model showed advanced purchase agreement to be cost saving, with a cost-benefit ratio of 1.81–3.65, depending on the assumed R0. The ratio proved relatively robust in extensive sensitivity analyses. Stockpiling H5N1 vaccine was not cost-saving, with a cost:benefit ratio of 0.25.

**Conclusions:** Current signing of an advance purchase agreement for future (pandemic phase) vaccine supply is a cost-saving strategy and should be pursued.

**Keywords:** avian flu; cost-benefit analysis; influenza; pandemic; vaccine

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### Do Emergency Medicine Department Healthcare Professionals Feel Ready to Face Pandemics?

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**Introduction:** Much is said about new epidemics for the following reasons: globalization, re-presentation of “past” diseases, etc. An avian influenza pandemic is considered inevitable: 90–100% of infected birds die; as of 16 December 2008, 391 humans were infected (247 deaths; 63.17%). New vaccines with unknown protection rates are prepared. It is predicted that a small percentage of the world's population can be vaccinated. Planning for a pandemic is paramount. Emergency medicine departments (EMDs) can be threatened by infectious diseases.

**Objectives:** To assess how risk perception may affect attendance pattern/willingness to work during pandemics; to suggest means reducing absentee impact through meeting healthcare professionals' (HCP) needs/perceptions. Healthcare providers were asked to suggest methods to better cope with pandemics and assess how they feel about information/training and protective means during pandemics.

**Methods:** An anonymous questionnaire was distributed to EMD personnel (physicians, registered nurses, ward clerks) who would be called to respond during epidemics/pandemics.

**Results:** The overall response rate was 68.9% (110 participants). The suggestions offered to improve work during pandemics were: 43% had no suggestions; 46% said courses/drills, specific protocols, adequate protective means; 8% mentioned epidemics managed by dedicated personnel/facil-

ities; 2% said “pay-for-risk”; and 1% mentioned personnel enhancement during epidemics. The results for the means of gaining information include: 34%, specific epidemics' management training; 29%, generic workshops/courses; 14%, board-written information; 14%, participation in risk assessment prior-to-crisis; 5%, up-to-date information through displays/screens; 3%, Web-acquired information; and 1%, other. The EMDs' protective means of safety results were: 21%, safe; 26%, slightly safe; 27%, don't know, 26%, unsafe.

**Conclusions:** A lack of concern about pandemics (to build-up); active participation in training/information acquisition helps people feel that they are “part of the system”; timely information, protocols, periodic training/drills, adequate means of protection, and planning beforehand are paramount.

**Keywords:** avian flu; emergency medicine department; healthcare professionals; pandemic; readiness

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### “Recovery”: The Forgotten Stage of Pandemic Planning

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**Introduction:** In recent years, pandemic planning has attracted much energy and international interest. There are international peak agency plans, national plans, regional plans, and organizational operational plans. These plans may be holistic or focus on specific needs and interests, for instance, general practice perspectives, business recovery, etc. As a component in preparing for the delivery of a unit on disaster recovery in a Graduate Certificate in Emergency Preparedness and Disaster Health program, a range of these plans were reviewed. The outcome is surprising and unsettling.

**Methods:** A review of selected international pandemic plans, including those of the World Health Organization (WHO), New Zealand, and Australian State and Territory was performed and the “recovery” or “post-pandemic period” component was identified.

**Results:** The review is difficult to quantify because of the different nature and structure of the various plans. Compared to the preparedness and response phases, little content relating to “recovery” exists in the plans reviewed. The WHO Global Influenza Preparedness Plan on the post-pandemic period refers back to the pre-pandemic phase with no specific consideration of recovery issues. The New Zealand Pandemic Plan only includes three pages of a 196-page document on “recovery”, but includes a framework and refers to business continuity.

The Victorian state plan defines recovery as—“recovery commences when the first response measures are taken. The plan aims to provide the necessary support and stimulus to help the Victorian community return to normal living as quickly as possible”. Victorian recovery arrangements include reference to: (1) material and financial assistance; (2) psychosocial and community recovery; (3) economic recovery; and (4) ongoing recovery.

**Conclusions:** The basis of this apparent deficiency in pandemic planning remains unclear. Hopefully, as these plans