

December 2010

Review of Alberta's Response to the 2009 H1N1 Influenza Pandemic

**As Requested by the Minister of Alberta Health and Wellness and as Mandated by the  
Health Quality Council of Alberta Regulation 130/2006 of the Regional Health Authorities  
Act Section 13**



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The Health Quality Council of Alberta (HQCA) thanks the many staff and physicians of the Government of Alberta, Alberta Health and Wellness, Alberta Health Services and Alberta Emergency Management Agency who gave generously of their time to be interviewed by the HQCA Review Team, who provided numerous documents for this review and who courteously responded to ongoing questions posed by the Review Team. The cooperation and candid and open dialogue allowed for a comprehensive and transparent review of the pandemic planning, preparedness, response and evaluative processes.

Despite the mild nature of the 2009 H1N1 influenza pandemic, 71 Albertans lost their lives as a result of H1N1. The HQCA wishes to recognize those families and friends touched personally by the influenza pandemic and extends its sympathies to them.

This report is for all Albertans to learn from the noteworthy experiences and improve in areas that will enhance the province's response to the next pandemic or other public health emergency.

## Review of Alberta's Response to the 2009 H1N1 Influenza Pandemic

### Executive Summary

The response to the H1N1 pandemic experienced in 2009 was recognized as an opportunity to review Alberta's plans and preparedness and determine what could be improved in a future response to another pandemic or other public health emergency. On February 28, 2010 the Minister of Health and Wellness requested that the Health Quality Council of Alberta (HQCA) conduct a review of the Alberta response to the 2009 H1N1 influenza pandemic consistent with Section 13 of the HQCA Regulation under the *Regional Health Authorities Act*.

The review examined systems to plan, prepare for, implement and evaluate a coordinated provincial response to the 2009 H1N1 influenza pandemic and focused on the activities of Alberta Health and Wellness (AHW), Alberta Health Services (AHS) and Alberta Emergency Management Agency (AEMA). Coordination of activities with other relevant national, provincial and local bodies, pandemic plans and guidance documents was also examined. An AHS internal audit of their response to the pandemic was conducted during the course of the HQCA review and provided to the HQCA to inform them about AHS's H1N1 influenza pandemic planning, preparation, response and evaluation. Areas of success and those that required significant improvement were compared with the pandemic experiences of Saskatchewan and Ontario. The findings and recommendations of the HQCA report will be used to inform and enable improved future planning for a provincial public health emergency, and will be used by the Office of the Auditor General of Alberta to consider what, if any, further work needs to be done for their audit of Alberta's response to the pandemic.

AHS came into formal existence on April 1, 2009 as the provincial health authority, but it had not yet integrated the pandemic plans of the historic nine regional health authorities. Between 1998 and 2008, the Government of Alberta, AHW and the regional health authorities had actively planned for pandemics and each had their own plans in place. Continued pandemic planning had not been a priority for either AHW or the previous health authorities during the transition to the new organizational structure of AHS.

Wave 1 of the H1N1 influenza pandemic lasted from April 19 to July 25, 2009; the pandemic peaked in the week of June 14, 2009. Wave 2 lasted from October 11 to December 5, 2009 and peaked in the week of October 25, 2009. The mild pandemic effects of wave 1 served as an alert for the Government of Alberta, AHW and AHS that there was not a fully integrated pandemic plan in place to sufficiently respond to the emergency.

In the inter-wave period, between wave 1 and 2, AHS developed a strategic pandemic plan and a comprehensive operational plan with guidelines, procedures, training and educational material. Simultaneously, AHW revised its pandemic plan to meet the anticipated needs of a more severe wave 2 and to address the needs of AHS. "Alberta's Plan for Pandemic Influenza" (hereinafter referred to as the Alberta Plan) was finalized November 2009.<sup>1</sup> It was developed by AHW and AEMA and aligned with the Alberta Health Services Pandemic (H1N1) 2009 Response Plan.<sup>2</sup>

Significant milestones in the pandemic planning and response for Alberta are depicted in Figure 1. A more detailed timeline of world and Alberta pandemic events is attached as Appendix I.

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<sup>1</sup> Alberta Health and Wellness. "Alberta's Plan for Pandemic Influenza." *Government of Alberta*. November 2009. [www.health.alberta.ca](http://www.health.alberta.ca)

<sup>2</sup> Alberta Health Services. "Alberta Health Services Pandemic (H1N1) 2009 Response Plan." October 2009. <http://www.albertahealthservices.ca/files/ns-h1n1-plan.pdf>.

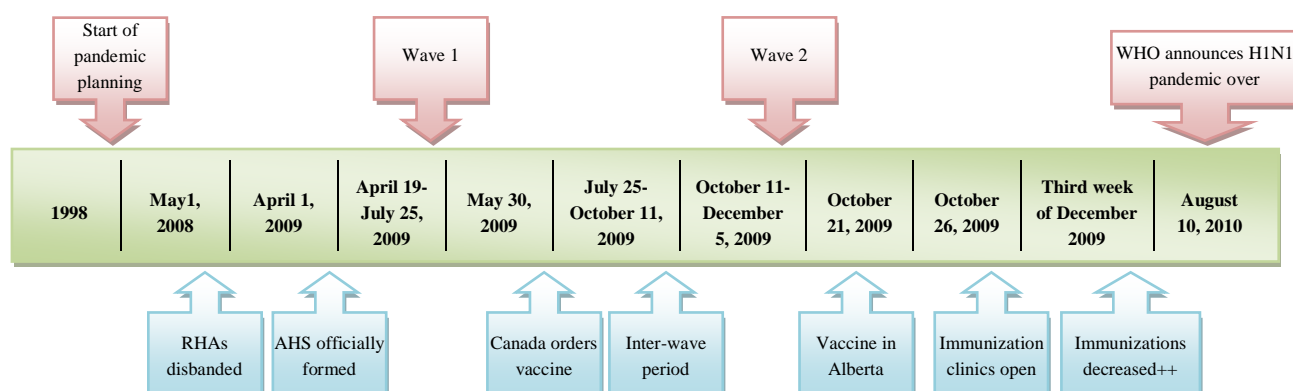


Figure 1. Significant milestones in Alberta's pandemic experience

The review revealed many good outcomes and commendable practices from Alberta's response to the pandemic which should continue in future responses to public health emergencies. They include, but are not limited to the following:

- Frontline staff, management and physicians, AHS, AHW, AEMA and the community rallied together to respond to the public health needs.
- The Chief Medical Officer of Health, AHW, and the Senior Medical Officer of Health, AHS, provided strong leadership for the pandemic response as well as in communication with the public.
- The surveillance groups of AHW and AHS, including the Provincial Laboratory, combined their databases and expertise to create one set of data to guide the pandemic planning and response.
- The Provincial Laboratory in Alberta was the first provincial laboratory in Canada to test for the H1N1 virus.
- 52% of the province's health care workers were immunized; 78% of AHS's workforce was immunized.
- 66% of aboriginals on reserves were immunized.
- A provincial approach to critical care services linked critical care services across the province and was well-positioned to support the care of severely ill influenza patients.
- Influenza Assessment Centres saw 10,000 people with influenza-like symptoms, relieving pressure on emergency departments.
- Implementation of a fee to be paid to physicians for providing telephone consultations with patients.

### Recommendations for Action:

The review identified systemic shortfalls that limited Alberta's ability to respond effectively. This led to the development of the following key recommendations.

1. The Government of Alberta develop and implement a high-level over-arching governance model for public health emergency management response that aligns with and supports the operational command system within AHW, AHS, AEMA and other relevant government ministries. (See 1.3 *Governance and Leadership to Support the Plan*)



2. The Government of Alberta, AHW, AHS and AEMA evaluate the incident command system and determine an optimal operating command system with adequate structure and processes to respond to a public health emergency. Critical elements in the operating command system are the need to:
  - educate and train senior administrative personnel and elected politicians on their authority, role and responsibilities during a pandemic or other public health emergency
  - establish a decision-making authority structure with well-defined processes to quickly move escalating issues to the appropriate authority for decisions
  - establish a process for conflict resolution between and within lead organizations

(See 1.4.5 *Framework to Manage the Pandemic Response – Incident Command System*)
3. The Government of Alberta, AHW, AHS and AEMA collaboratively develop an integrated communication plan for a public health emergency that:
  - determines roles and responsibilities for each organization including the responsibility for lead role(s) for different audiences
  - identifies a primary source of validated information
  - identifies the communication linkages for zones, municipalities, stakeholders and partners
  - facilitates working with, educating and informing the public about their role in a pandemic or other public health emergency
  - engages the media as a partner to develop communication strategies that meet both parties' needs during a public health emergency
  - includes adequate quality checks in the sign off process to ensure the integrity and key messages of the information are maintained
  - considers feedback from their audiences, stakeholders and partners to evaluate the effectiveness of their communication

(See 4.2 *Provincial Communication*)
4. AHW, AHS and AEMA develop quantifiable triggers that would activate an appropriate response to a pandemic or public health emergency. Triggers need to address, at minimum, the activation, escalation or deactivation of procedures such as:
  - opening the agreed upon number and location of emergency operating centre(s)
  - closing, opening or expanding immunization clinics
  - releasing and using antiviral drugs
  - opening Influenza Assessment Centres
  - releasing funds for emergency response expenditures

(See 1.4.2 *Quantifiable Triggers for Activating and Implementing the Pandemic Response*)
5. AHW, AHS and AEMA include measurements of severity in their pandemic plans that could reflect escalating changes in the pandemic and identify responses that consider mild, moderate and severe pandemic impact. (See 1.4.1 *Scalability and Flexibility of the Plan*)

6. AHW, AHS and AEMA articulate the roles and responsibilities of each organization in their respective and collaborative pandemic plans that reflect the legislative mandate and unique expertise of each organization. (See 3.1.2 *Interaction of Lead Organizations and Stakeholders*)
7. AHW, AHS and AEMA collaboratively develop and implement integrated pandemic preparedness exercises that test key elements of the pandemic plans subject to a variety of severity scenarios, and ensure thorough debriefing and evaluation by all three organizations are used to update the pandemic plans. (See 2.0 *Testing the Plan and Preparedness*)
8. AHW, AHS, and where applicable to their mandate AEMA develop a prioritization matrix that will facilitate immunization of the maximum number of defined populations at greatest risk in the shortest time.
  - Decision-making related to immunization strategies needs to be based on facts and supported by public health experts.
  - Determine appropriate placement in the hierarchy of vulnerable populations at greatest risk of developing severe complications.
  - Achieve consensus on the definition of first responders and essential services and their place in the hierarchy.
  - Achieve consensus on placement in the hierarchy of populations such as recipients of children and youth services, students in educational facilities and inmates in correctional services.(See 3.3.3 *Were the Right People Immunized?*)
9. AHW and AHS develop a strategy for electronic documentation of immunization that provides real-time data such as vaccine inventory and wastage and information on numbers and populations immunized. (See 3.3.7 *Immunization Documentation*)
10. AHW and AHS develop a plan for communicating with health professionals to create and disseminate critical clinical guidance documents and information in a timely way during public health emergencies such as the pandemic. (See 4.2.5 *Communication with Health Care Providers*)
11. AHW and AHS collaboratively clarify roles and responsibilities for developing drug policies related to the pandemic and determining how they will be used. (See 3.4.3 *Prevention and Treatment Guidelines*)
12. AHW and AHS examine the benefits of an integrated surveillance system that supports timely information and decision-making and uses a minimum surveillance data set for tracking the pandemic or other public health emergency and system resource capacity. (See 3.2.1.3 *Surveillance Data to Monitor the Pandemic and Determine Human Resource Capacity*)
13. AHW, AHS and the Provincial Laboratory review and update the Provincial Laboratory's business continuity plan to ensure adequate and redundant resources in managing a pandemic. (See 3.2.1.4 *Capacity of Provincial Laboratory to Respond to the Pandemic*)
14. AHW and AHS jointly determine the roles and responsibilities of AHS for health care workers not under the direct jurisdiction of AHS in a public health emergency. (See 3.5.1 *Responsibility for Health Workforce Protection*)
15. AHW, AHS and Alberta Employment and Immigration collaboratively develop a structure and process that:
  - delineates the roles and responsibilities of each organization to address occupational health and safety and infection prevention and control issues
  - uses scientific evidence to change standards when necessary

(See 3.5.3 *Use of Personal Protective Equipment (PPE) including N95 Masks*)

16. AHW, AHS and AEMA develop an evaluation framework and process for immediate and collaborative debriefing after a public health emergency and ensure learnings are incorporated into each organization's pandemic plans. (See 9.2 *Debriefing and Evaluating*)
17. AHW and AHS develop and maintain an ethical framework and strategies to guide operational and clinical decision-making that is understood by the public. (See 5.0 *Ethical Considerations*)
18. AHW and AEMA collaboratively develop deactivation strategies for inclusion in the Alberta Plan for Pandemic Influenza that aligns with AHS's post-pandemic business resumption and recovery plans. (See 7.0 *Deactivation*)

The 2009 H1N1 influenza pandemic served as the ultimate pandemic preparedness exercise for Alberta. When wave 1 of the pandemic began on April 19, 2009, a pandemic plan that reflected the new organizational structure of health service delivery in Alberta was not in place. During wave 1 in Alberta, few people were infected and the virulence appeared to be less severe than anticipated. The Government of Alberta, AHW, AHS and AEMA recognized more work was necessary to prepare for an anticipated, more severe, wave 2. The final pandemic plan was developed after wave 1 and available shortly after the peak of wave 2 of the pandemic.

While this report addresses several areas for how Alberta could have improved its response to the H1N1 pandemic of 2009, many commendable practices were observed. AHW, AHS, AEMA and health care workers joined forces, regardless of their organizational base, to prevent the spread of H1N1 influenza and care for the infected individuals in both wave 1 and 2. Sufficient vaccine, antiviral medication and pandemic supplies were available for the citizens of Alberta. AHW and AHS collaborated to create and use a common surveillance database to guide pandemic planning and response. Collaboration extended to the First Nations and Inuit Health populations resulting in immunization of 66% of aboriginals on reserves. Influenza Assessment Centres treated 10,000 people with influenza like symptoms and were effective in relieving some of the pressure on emergency departments.

There were many lessons learned from the pandemic response. Perhaps the greatest learning was that future pandemic responses must implement plans to ensure the maximum number of people at greatest risk are immunized as a top priority. The need to use the processes and decision-making authority of an agreed-upon incident command system, with appropriate governance oversight, and with clear roles and responsibilities for AHW, AHS and AEMA was another key learning. Integrated pandemic preparedness exercises must be used to test key elements of the pandemic plans using various scenarios with follow up, collaborative debriefing, evaluation and revision of pandemic plans as necessary. Robust information systems must provide good data for decision-making and an integrated communication plan that works with the media and the public to meet needs of varied audiences must be considered in improving future responses.

AHW and AHS initially viewed the pandemic almost exclusively as a "health" issue but there was a need to consider more fully, and earlier, the impact on society as a whole. Should workers of essential services be infected with the H1N1 virus, their absenteeism could significantly and negatively impact industries such as those providing electricity, water and communications. The role and expertise of AEMA in coordinating the planning, testing and emergency response among all government departments and emergency management partners and industry needs to be fully recognized.

Pandemic planning is a requisite part of Alberta's plan to protect its citizens from public health emergencies. Initial debriefing sessions by AHW, AHS and AEMA indicate a strong willingness to consider opportunities for improvement and an enhanced response in the event of the next public health emergency. Implementation of the recommendations in this report will strengthen Alberta's ability to respond to a future pandemic or other public health emergency.

## Introduction

The world had been anticipating the emergence of an influenza pandemic caused by a novel influenza A virus, which occurs about three times a century. The new virus causes disease to which people have no immunity and for which there is no vaccine at the start of the outbreaks. The disease is characterized as a pandemic when it substantially exceeds what is expected and is spread across a large region. Pandemic outbreaks generally occur in two to three waves, each lasting six to eight weeks in a defined area. The influenza pandemics of the last century, the Spanish Influenza of 1918-1919, the Asian Influenza of 1957-1958 and the Hong Kong Influenza of 1968-1969 all illustrated different characteristics and health impacts. An avian, or bird, influenza strain, A:H5N1, had been more recently tracked in its spread from South East Asia to Europe and Africa. Canada was anticipating this avian flu, which was expected to last 12 to 18 months, based on surveillance and known epidemiology.

New strains of influenza vary in the rate of spread, the severity of symptoms produced and the target population most affected. An appropriate response to influenza outbreaks is based on past experiences and evolving knowledge of the new strain of influenza virus. In the majority of the population, people will not have been exposed to the new virus and will have had no immunity to protect them from becoming infected. A rapid and high incidence of infectivity may result in significant numbers of severely ill people, many of whom may require hospitalization or may die. A high rate of absenteeism among the work force may result in social and economic disruption. As available vaccines are not effective against the new strain, a new vaccine must be developed to provide immunity.

In mid-March, 2009, the World Health Organization issued the first reports of a new influenza strain in Mexico. In late April, testing of the Mexico cases confirmed an outbreak of influenza caused by a new virus named the “influenza A/H1N1 ‘swine’ flu”. At the same time the first cases were confirmed in Canada and the United States. In April the World Health Organization released its global influenza preparedness plan,<sup>3</sup> recently updated from the 2005 version, to mitigate illness and spread of the disease.

Canada reported its first case from the influenza virus April 26, 2009;<sup>4</sup> on April 28, 2009 Alberta experienced its first case.<sup>5</sup> A mounting number of cases were emerging around the world and on April 29, 2009 the World Health Organization declared a worldwide pandemic alert. By May 1, 2009 Canada had confirmed 51 cases and the World Health Organization officially renamed the virus H1N1 instead of the “swine flu”. No vaccine was available at this time. On May 6, 2009 a major breakthrough came with the announcement that the National Microbiology Laboratory in Winnipeg had succeeded in decoding the genetic make-up of the H1N1 flu virus.<sup>6</sup> Further research by the World Health Organization Collaborating Centres supported scientists to work on manufacturing a vaccine to prevent H1N1 infection. On June 11, 2009 the World Health Organization officially declared a full pandemic was in effect.

Alberta experienced its first fatality from H1N1 on May 8, 2009 in the midst of wave 1 of the H1N1 influenza, which lasted from April 19 to July 25, 2009; the pandemic peaked in the week of June 14, 2009. Wave 2 lasted from October 11 to December 5, 2009 and peaked in the week of October 25, 2009. The period between wave 1 and 2 will be referred to as the “inter-wave” period for the balance of this report.

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<sup>3</sup> World Health Organization (WHO). "Pandemic influenza preparedness and response: a WHO guidance document" April 2009. <http://www.who.int/csr/disease/influenza/pipguidance2009/en/index.html>.

<sup>4</sup> Public Health Agency of Canada (PHAC). "Government of Canada is Working Closely with Provinces and Territories and International Partners to Address Swine Flu" April 26, 2009. [http://www.phac-aspc.gc.ca/media/nr-rp/2009/2009\\_0426\\_h1n1-eng.php](http://www.phac-aspc.gc.ca/media/nr-rp/2009/2009_0426_h1n1-eng.php).

<sup>5</sup> Alberta Health and Wellness. "Alberta confirms two cases of human swine influenza" *Government of Alberta*. April 28, 2009. <http://alberta.ca/acn/200904/25811ED906071-B361-0CDA-10112E68542A6D75.html>.

<sup>6</sup> Public Health Agency of Canada (PHAC). "Canada's National Microbiology Laboratory in Winnipeg First in World To Decode Genetic Makeup of H1N1 Flu Virus." May 6, 2009. [http://www.phac-aspc.gc.ca/media/nr-rp/2009/2009\\_0506\\_h1n1-eng.php](http://www.phac-aspc.gc.ca/media/nr-rp/2009/2009_0506_h1n1-eng.php).

Severity of a pandemic is based on three components: virulence and transmissibility of the virus, vulnerability of the population (e.g., people with chronic conditions or malnourishment), and the capacity of a country to fight the disease (i.e., whether they have access to antivirals, antibiotics, or vaccines). Alberta based their planning on the Canadian Pandemic Influenza Plan for the Health Sector, Section 3 (available at <http://www.phac-aspc.gc.ca/cpip-pclcpi/ann-g-eng.php>). For a pandemic of mild to moderate severity and in the absence of any interventions (e.g., vaccine, antivirals), of those who are clinically ill:

- 0.4% will be fatal cases (of fatal cases, the majority will also have required hospitalization)
- 1% will be hospitalized and recover
- up to 50% will seek outpatient care

For a severe pandemic and in the absence of any intervention, of those who are clinically ill:

- 2% may be fatal
- up to 10% may be hospitalized and recover

The 1918 Spanish Flu was classified as a severe pandemic where globally about 1 in 50 people died. To put things in perspective, each year seasonal influenza claims roughly 1 person out of every 10,000.

Alberta had planned for a pandemic of moderate severity that was based on the following assumptions:<sup>1</sup>

- The majority of the Alberta population (over 70%) may be infected over the course of the pandemic influenza with 15-35% of the population becoming clinically ill.
- It was estimated that up to 5% of Alberta's population may have been infected during the first wave of H1N1 pandemic influenza in the spring of 2009. The second wave of illness was expected to be more severe than the first.
- Although the rates of severe illness and complications from the H1N1 pandemic influenza were anticipated to be low overall, the number of people infected may be large and may place a heavy burden on the health care system, including acute care hospitals.

The response of the H1N1 pandemic experienced in 2009 was recognized as an opportunity to review Alberta's plans and preparedness and determine what could be improved in a future response to another pandemic or other public health emergency. On February 28, 2010 the Minister of Health and Wellness, the Honorable Gene Zwozdesky, requested that the Health Quality Council of Alberta (HQCA) conduct a review of the Alberta response to the 2009 H1N1 influenza pandemic consistent with Section 13 of the HQCA Regulation under the *Regional Health Authorities Act*. The *Regulation* states that, "On the request of the Minister, the Council shall assess, inquire into or study matters respecting patient safety and health service quality that are referred to it by the Minister."

The review examined systems to plan, prepare for, implement and evaluate a coordinated provincial response to the 2009 H1N1 influenza pandemic and focused on the activities of Alberta Health and Wellness (AHW), Alberta Health Services (AHS) and Alberta Emergency Management Agency (AEMA) (\*hereafter referred to as the "lead organizations"). Coordination of activities with other relevant national, provincial and local bodies, pandemic plans and guidance documents was also examined. The review did not examine the World Health Organization's decisions regarding the public threat of the H1N1 influenza virus and actions necessary to protect the public or other related international responses. The care of individuals infected with the H1N1 influenza virus was examined from a systemic perspective; a review of clinical care on an individual patient basis was not considered.

An AHS internal audit of their response to the pandemic was conducted during the course of the HQCA review and provided to the HQCA to inform them about AHS's H1N1 influenza pandemic planning, preparation, response and evaluation. Highlights of noteworthy success and areas that required significant improvement were compared with

the pandemic experiences of Saskatchewan and Ontario. The findings and recommendations of the HQCA report will be used to inform and enable improved future planning for a provincial public health emergency, and will be used by the Office of the Auditor General of Alberta to consider what, if any, further work needs to be done for their audit of Alberta's response to the pandemic.

The HQCA Review Team, under the direction of executive sponsor, John Cowell, MD, FRCPC, Chief Executive Officer, HQCA, consisted of Project Lead, Linda Poloway, BScPharm, Director, Patient Safety, HQCA and HQCA Review Team members Rinda LaBranche, RN, B.Ed. M.Ed, Patient Safety Lead, HQCA, David Matheson, M. Math, MD, FRCPC, Principal DMMD Consultants Inc., and Arlene Weidner, RN, MSc, CHE. An Expert Advisory group was appointed by the HQCA to provide technical and clinical expertise relevant to pandemic and disaster planning and responsiveness. They were accessed intermittently by the Review Team and Executive Sponsor for advice, comments and suggestions. The group consisted of Dr. Michael Gardam, Director, Infectious Diseases Prevention and Control, Ontario Agency for Health Protection and Promotion (at the time of the review), Medical Director, Infection Prevention and Control, University Health Network, Dr. Perry Kendall, Medical Officer of Health, Ministry of Health, British Columbia, and Major General (retired) Robert Meating. Lead and key ministry contact for this review was Margaret King, BScN, MN, Alberta Health and Wellness, Assistant Deputy Minister, Community and Population Health.

The HQCA Review Team formally commenced work April 21, 2010 and gathered relevant pandemic planning, preparedness, and evaluative information from international, national and provincial sources that included information from the three lead organizations. With the aid of AHW, AHS and AEMA, the HQCA Review Team selected appropriate interviewees as well as a list of stakeholders for interview purposes. Eighty-seven interviews, which included 152 interviewees, were conducted.

## **Purpose and Objectives**

### **Purpose**

The review examined the adequacy and effectiveness of systems to plan, prepare for, implement, deactivate, and evaluate a coordinated provincial response to the H1N1 influenza pandemic by Alberta Health and Wellness (AHW), Alberta Health Services (AHS), Alberta Emergency Management Agency (AEMA) and their stakeholders.

### **Objectives**

The review examined processes, structures and activities to determine whether the following elements, considered necessary for an optimal, coordinated provincial response, were present:

1. An effective plan that engaged AHW, AHS, AEMA and their stakeholders in a collaborative approach to respond to the pandemic and evaluate their experience.
2. Pandemic plans were collaboratively tested using various scenarios of severity of pandemic to verify appropriateness of identified roles and responsibilities of the lead organizations and key stakeholders, logistics, communication and pandemic response practices.
3. Roles and responsibilities of the lead organizations were clearly defined and effectively implemented.
4. Adequate surveillance systems to track the spread and impact of the virus and enable informed decision-making.
5. Adequate vaccine, antiviral drugs, supplies and human resources that were effectively utilized to respond to the pandemic.
6. An effective communication strategy was used to provide accurate, timely and effective information to those who needed it.
7. A collaborative debriefing and evaluation was conducted by the lead organizations immediately after the pandemic response and pandemic plans were updated to reflect the learning.



## Methodology

The following steps were taken in conducting the review of Alberta's response to the 2009 H1N1 pandemic:

1. Review Team was selected to ensure collective expertise and experience in pandemic and/or disaster planning and implementation of response, quality and safety, systems thinking, and relevant clinical knowledge in infectious diseases and infection prevention and control.
2. Preparation and information gathering.
  - a. Review of relevant documentation including but not limited to:
    - Pandemic plans from each of the lead organizations.
    - The Canadian Pandemic Influenza Plan for the Health Sector and related national strategies and guidance documents.
    - Operational plans to support the pandemic plans from each of the lead organizations.
    - Evidence of testing the pandemic response implementation.
    - Surveillance data of H1N1 influenza virus and/or analysis of surveillance data conducted by AHW and AHS.
    - Documentation of vaccine use and wastage.
    - Documentation related to stockpiled inventories including storage and distribution.
    - Relevant committee, working groups and taskforce minutes and meeting notes.
    - Communication plan and communiqués.
    - Media excerpts.
    - Debriefing and/or evaluation of pandemic responses, including communication by all leading organizations.
    - Documentation of immunization rates, hospitalization due to H1N1 influenza and deaths due to H1N1 influenza from lead organizations, Saskatchewan and Ontario.
  - b. Gathering of information on national and provincial legislation, standards, guidelines and leading practices in pandemic/disaster/public health emergency planning and implementation.
3. Interviewing of individuals and scheduling of focus groups.

Note: The HQCA Review Team planned to conduct focus group to seek the public's perceptions on their experience with the Alberta pandemic. An alternative to focus groups was provided by AHW; the Review Team was invited to submit questions for a public survey (See 4.2.8.1 *Rapid Response Public Survey*). Some questions submitted were accepted; those suggested but not included in the survey inquired about the preferred media for communication as well as perspectives on the public's greatest concerns and areas of satisfaction about the pandemic.
4. Analysis of information gathered through documentation and interviews.
5. Development of draft observations, evaluation of processes to identify elements that worked well and development of recommendations to improve future pandemic processes.



6. Development and presentation of preliminary findings to Alberta Health and Wellness, Alberta Health Services and Alberta Emergency Management Agency.
7. Development of draft report by Review Team and Executive Sponsor, HQCA.
8. Presentation of draft report to Alberta Health and Wellness, Alberta Health Services and Alberta Emergency Management Agency for validation of facts.
9. Collaborative review of feedback by Review Team and Alberta Health and Wellness, Alberta Health Services and Alberta Emergency Management Agency.
10. Revision of report by Review Team and Executive Sponsor, HQCA.
11. Presentation of final report to AHW Assistant Deputy Minister, Community and Population Health.

## Findings and Recommendations

The review of the pandemic planning, preparedness, response and evaluation by Alberta Health and Wellness (AHW), Alberta Health Services (AHS) and Alberta Emergency Management Agency (AEMA) revealed commendable practices as well as several opportunities for improvement. This report describes those noteworthy practices that should continue in future responses to public health emergencies; the report focuses in more detail on how those areas which require improvement may be enhanced.

### 1.0 Planning for the Pandemic

#### 1.1 Who Are the Players?

##### 1.1.1 Federal

The Government of Canada managed international aspects of the pandemic response and development, updating and evaluation of the Canadian pandemic plan through the Public Health Agency of Canada.

The Public Health Agency of Canada, the main Government of Canada agency responsible for public health in Canada, provided nationwide coordination for the pandemic influenza response. It also monitored the spread of the disease in Canada, provided information links to the World Health Organization and other nations, and obtained and distributed pandemic vaccine to the provinces and territories.

The Public Health Agency of Canada is supported by a number of pandemic committees with representation from federal, provincial and territorial governments to aid in coordination of a national pandemic response. Alberta was represented on many of these committees, often at the leadership level.

Health Canada is Canada's regulatory authority responsible for ensuring the safety, efficacy, effectiveness and quality of all drugs, including vaccines, for use in Canada.<sup>1</sup> The First Nations and Inuit Health Branch, of Health Canada, supports the delivery of public health and health promotion services on-reserve and in Inuit communities.

##### 1.1.2 Provincial

Alberta's pandemic plan required the input, support and collaboration of the Government of Alberta, AHW, AHS and AEMA. The Government of Alberta is responsible for maintaining the safety of its citizens. AHW, within the Government of Alberta, develops and implements policy that impacts and governs health care provision. Prior to April 1, 2009 this was done through nine regional health authorities and three provincial boards. In May 2008 AHW announced that they would be replaced with one organization known as AHS. The legal entity of AHS was in place by April 1, 2009. The AEMA is the legislated provincial authority in Alberta responsible for emergency management acting for all Government of Alberta departments and which provides coordination and communication for operational management of non-health sectors.

The three lead organizations were positioned to provide policy and legislation that supported the pandemic response, offer protection from and treatment of the H1N1 influenza and provide coordination of all ministries, essential services and industry to ensure business continuity and public order.

Understanding the roles of each lead organization was instrumental in measuring the effectiveness of Alberta's combined response and is described below.

Alberta Health and Wellness:

- Leads the health sector response by developing provincial legislation, policy and guidelines and establishing a provincial pandemic plan.
- Supports coordination among AHS and other health organizations.
- Leads provincial communications and communicates government health policy.
- Procures and supplies antiviral medications and vaccine for distribution across the province.
- Collects data on the spread of the disease in Alberta and shares this information with the Public Health Agency of Canada.
- Takes action to resolve any health related issues that may arise.<sup>7</sup>

Alberta Health Services:

- Provides services to meet the health needs of Albertans.
- Provides information to AHW on the number of cases, hospitalizations and deaths from influenza.
- Delivers antiviral medications and vaccines to Albertans.
- Sets up alternative care sites for the delivery of health care (if necessary).
- Provides guidance and information to other service providers and Albertans.<sup>1</sup>
- Communicates about health service delivery in the province.

The Alberta Emergency Management Agency:

- Coordinates planning and emergency management among all Alberta government departments and emergency management partners (e.g., municipalities and AHS) and stakeholders (e.g., business and industry).
- Facilitates the requisite governmental and non-governmental support required to manage the emergency once it begins.
- Supports the municipal response to emergencies by:
  - communicating with municipalities
  - coordinating the non-health Government of Alberta provincial response
  - monitoring the effect of pandemic influenza on essential services
  - coordinating federal assistance programs
- Provides coordination and communication for operational management of non-health sectors.<sup>1</sup>

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<sup>7</sup> Alberta Health and Wellness. "Alberta's Plan for Pandemic Influenza - A Summary." *Government of Alberta*. October 2009.  
<http://www.health.alberta.ca/documents/APIP-Summary-Oct-2009.pdf>.

## **1.2 How was the Pandemic Plan for Alberta Developed?**

For the past decade, Alberta actively planned for pandemic influenza in conjunction with its federal, provincial and territorial partners to achieve a coordinated national response. National-level work resulted in the Canadian Pandemic Influenza Plan for the Health Sector 2008, a number of national strategies and guidance documents as well as funding agreements.

When AHS came into formal existence on April 1, 2009 as the provincial health authority and a new pandemic plan had not yet been developed. Between 1998 and 2008, the Government of Alberta, AHW and the regional health authorities had actively planned for pandemics and each had their own plans, which AHW reviewed and identified any risks that needed to be addressed. During May 2008 to April 2009, the phase during which the regional health authorities and provincial boards transitioned to the AHS structure, the development of a pandemic plan for the one health delivery organization did not appear to be a priority given the other challenges AHS was facing. The start of wave 1 of the pandemic (April 19, 2009) coincided with the beginning of the new legal entity of AHS. There was no firm organizational structure within AHS or clear leadership structure for public health, infection prevention and control, acute care, or continuing care. Throughout the summer of 2009 and during the inter-wave period of the pandemic, roles and responsibilities were emerging, an organizational structure was forming and relationships were being created.

During wave 1 of the pandemic, AHS responded by utilizing the pandemic plans of the historical regional health authorities. AHW used the Alberta Pandemic Influenza Plan of April 2008; AEMA's January 2008 Alberta Pandemic Influenza Operations Plan provided the non-health component of provincial planning. After wave 1, the focus turned to revising the plans to reflect the known epidemiology of the H1N1 pandemic, incorporate lessons learned from wave 1 and reflect the creation of a single health authority for service delivery in the province. AHS developed a Pandemic Steering Committee to oversee the development of a strategic pandemic plan and a comprehensive operational plan with numerous guidelines, procedures, training and educational material.

The structure within AHW to develop the pandemic plan and its operational guidelines had a longer history, was multi-faceted and involved various groups in the pre-H1N1 planning, wave 1 response and inter-wave planning phases. An Alberta Pandemic Influenza Working Group was formed in 2005 and existed until wave 1 of the 2009 pandemic. This provincial planning group provided the planning structure for the regional health authorities and a number of the Government of Alberta stakeholders. It reported through the AHW executive structure and provided updates to the Deputy Ministers Committee on Pandemic Influenza created in 2005. During wave 1 the AHW Public Health Emergency Coordination Group was responsible for guiding and coordinating the provincial health response to the pandemic, working in partnership with AHS. In the inter-wave planning, an Alberta's Health System Pandemic Preparedness Project Charter was created to provide a formal framework for an AHW led pandemic preparedness project. Interfaces were established with the AHS project structure and federal, provincial, territorial and Government of Alberta governance structures. See Appendix II for details of the organizational structure. During wave 2 the AHW Public Health Emergency Coordination Group resumed responsibility for coordinating the pandemic.

A summary of Alberta's Plan for Pandemic Influenza (hereinafter referred to as the Alberta Plan) was released October 2009 with the detailed plan completed November 2009. The Alberta Plan was to "guide and support the pandemic planning and response of the Government of Alberta, the health sector, the municipalities and other key stakeholders".<sup>1</sup> It identified AHW as the lead agency within the Government of Alberta and aligned with the Canadian Pandemic Influenza Plan for the Health Sector 2008 as well as the AHS pandemic response plan.

The Alberta Plan included the following goals:<sup>1</sup>

- Control the spread of disease and reduce morbidity and mortality by promoting appropriate prevention measures and providing access to care and treatment.
- Mitigate societal disruption in Alberta by ensuring the continuity of essential services.
- Minimize adverse economic impact.
- Demonstrate an efficient and effective use of public resources during a response.
- Expedite business resumption and organizational recovery within the health sector.

### 1.3 Governance and Leadership to Support the Plan

In May 2009, during the end of wave 1, AHW sought external consultation from Acton Consulting to determine the best governance model for pandemic planning and response. The July 2009 Acton report<sup>8</sup> recommended development of a Pandemic Deputy Ministers Committee reporting to a Pandemic Cabinet Committee that ultimately reported to Cabinet. The Pandemic Cabinet Committee was to have had representation from four ministries (Health and Wellness, Municipal Affairs, Treasury Board and Justice and Attorney General). Its mandate was to “make decisions that protect life and property, maintain continuity of the Government of Alberta and disseminate decisions to all ministries, agencies, individuals.” Although the Deputy Ministers’ Committee on Pandemic Influenza was created, terms of reference were never developed. There was no evidence that the Pandemic Cabinet Committee was formally convened despite endorsement of the proposal at the September 15, 2009 Deputy Ministers’ Committee on Pandemic Influenza. Representation of this model appears in the Alberta Plan<sup>1</sup> (see *Figure 2 below*).

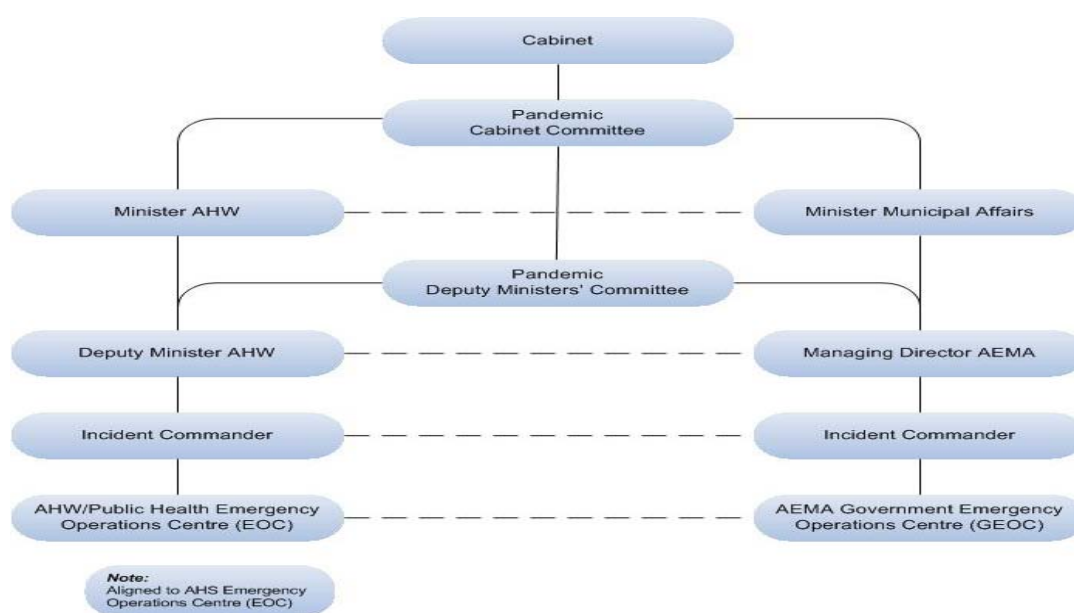


Figure 2. Governance structure for pandemic response<sup>1</sup>

<sup>8</sup>Acton Consulting. "Government of Alberta Pandemic Response Governance Framework Draft Report." Edmonton, AB: Alberta Health and Wellness, July 8, 2009.

Terms of reference for an AHW/AHS Joint Pandemic (H1N1) 2009 Governance Committee were developed July 16, 2009 and a first meeting held September 4, 2009. AEMA was not a standing member of the AHW/AHS Joint Pandemic Governance Committee but was to be included by invitation. Important decisions were made in the absence of, and therefore outside of, an integrated governance structure.

*It is recommended that:*

***The Government of Alberta develop and implement a high-level over-arching governance model for public health emergency management response that aligns with and supports the operational command system within AHW, AHS, AEMA and other relevant government ministries.***

### **1.3.1 AEMA Reporting Relationship**

According to the governance model in Figure 2, AEMA was to have reported through the Pandemic Deputy Ministers Committee and the Minister of Municipal Affairs during the pandemic response. The current reporting structure for AEMA does not mirror that in the Alberta Plan. AEMA has requested a governance review to make recommendations on the ideal reporting relationship. The HQCA review supports AEMA's request for a governance review to determine the most effective structure that will enable AEMA to best meet its mandate.

## **1.4 Structures and Processes to Activate and Implement the Plan**

### **1.4.1 Scalability and Flexibility of the Plan**

The decision to activate a pandemic response by the World Health Organization is based on the speed and geographic spread of viral influenza but does not cover severity. There was somewhat of a 'disconnect' as national and provincial jurisdictions were directed to plan for a moderate to severe strain of virus. The literature of post-pandemic reviews suggests plans should include measurements of severity that could reflect escalating changes in the pandemic:

*"Canada's pandemic preparedness plans lacked a severity index (sometimes referred to as a risk matrix) which could have helped guide decision-making by provincial and local authorities. A severity index tool would have helped local planners determine the extent of mitigation measures to put in place to slow down the progression of the pandemic."*<sup>9</sup>

The pandemic plans of AHW and AHS, which addressed planning for a moderate pandemic, lacked a severity index for responding to the pandemic. Although both plans indicated that they were flexible and adaptable, they did not specifically illustrate the way they could be adapted to respond to a more severe or mild pandemic. A May 2006 briefing note from the AEMA to the Deputy Minister, Executive Council following May 2006 pandemic exercises recommended that three levels of response be incorporated into pandemic plans that

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<sup>9</sup> "CSA Standards Roundtable on Health care and Emergency Service Sector Preparedness. Voices from the H1N1 Influenza Pandemic Front Lines: A White Paper About How Canada Could Do Better Next Time." June 8, 2010.  
<http://www.csa.ca/cm?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1241708779869&ssbinary=true>.

reflected minor, moderate and maximum impact scenarios. The briefing note further recommended that all departments conduct exercises to test the response at each level of impact. These recommendations align with leading practices in preparing for general emergencies by emergency management personnel.<sup>10</sup>

*It is recommended that:*

***AHW, AHS and AEMA include measurements of severity in their pandemic plans that could reflect escalating changes in the pandemic and identify responses that consider mild, moderate and severe pandemic impact.***

#### **1.4.2 Quantifiable Triggers for Activating and Implementing the Pandemic Response**

It is acknowledged that there will always be unknowns in the specific characteristics of the virus during an influenza pandemic and flexibility for public health responses must be allowed. Identification of “triggers – events or milestones in the epidemic or pandemic process that signal a qualitative change in the situation”<sup>9</sup> would support a planned response to escalating elements of a pandemic. Both subjective and objective criteria should be developed to trigger various phases of a pandemic response.

The AHW Alberta Pandemic (H1N1) 2009 Planning Task Force Workplan identified lack of quantifiable triggers in their current pandemic planning and targeted September 15, 2009 for development of such triggers. However, triggers were not developed in time to respond to wave 2 of the pandemic.

AHS had developed triggers that included thresholds for activation of the Influenza Assessment Centres (See 3.6.3 *Influenza Assessment Centres*), activation of the Emergency Medical Service Flu Response Units (See 3.6.6 *Other Resources for Enhanced Surge Capacity*), and relocation of patients when the intensive care units reached maximum capacity (See 3.6.1 *Critical Care Services*). Development of additional criteria to trigger other elements of pandemic response is required.

No triggers were found in the pandemic documentation of AEMA.

*It is recommended that:*

***AHW, AHS and AEMA develop quantifiable triggers that would activate an appropriate response to a pandemic or public health emergency. Triggers need to address, at minimum, the activation, escalation or deactivation of procedures such as:***

- *opening the agreed upon number and location of emergency operating centre(s)*
- *closing, opening or expanding immunization clinics*
- *releasing and using antiviral drugs*
- *opening Influenza Assessment Centres*
- *releasing funds for emergency response expenditures*

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<sup>10</sup> Consultation by Expert Advisor, Major General (retired) Robert Meating, May 2009.



#### **1.4.3 Application of Emergency Measures of Public Health Act**

The Alberta Public Health Act<sup>11</sup> provides for access to emergency measures when a public health emergency is declared. Under authority of the Public Health Act, the Chief Medical Officer of Health, on behalf of the Minister, monitors the health of Albertans and can “make recommendations to the Minister and regional health authorities on measures to protect and promote the health of the public and to prevent disease and injury”.<sup>11</sup> Evoking the “State of public health emergency” provisions in the Public Health Act is an extraordinary measure and used as a last resort when other measures do not adequately protect the public.

Alberta did not declare a public health emergency in response to the pandemic. This was appropriate and consistent with the action of other provinces. The Review Team was told that some personnel in AHW and AHS were under the impression that AEMA would become activated only on declaration of a public health emergency or evidence of social and business disruption. This may have contributed to the late engagement of AEMA in wave 2 of the pandemic response.

On January 20, 2010 the government was required to declare a public health emergency under the Fiscal Responsibility Act<sup>12</sup> to access funding for non-budgeted costs such as vaccine, supplies and antiviral drugs.

#### **1.4.4 Readiness of Pandemic Plans Pre-Wave 1 and Wave 2**

The majority of operational planning and establishment of roles and responsibilities were not in place before wave 1. The mild pandemic effects of wave 1 alerted the Government of Alberta and AHW that there was not a fully integrated pandemic plan in place to sufficiently respond to the emergency. AHS did not have time to develop their own plan and relied on those developed by the historical regional health authorities. While it is recognized that knowledge of the virus was evolving, some infrastructure issues and critical policies should have been in place before wave 1 and definitely before wave 2 which started October 11, 2009.

The following were addressed in the inter-wave period of the pandemic:

- a. Development of governance structure for pandemic planning at Government of Alberta.
  - The Pandemic Cabinet Committee was approved September 15, 2009 but there is no evidence it was ever convened.
  - The AHW/AHS Joint Pandemic (H1N1) 2009 Governance Committee was established September 4, 2009.
- b. Policy on use of antiviral drugs and involvement of community pharmacies. (Policy was issued October 19, 2009.)

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<sup>11</sup>"Province of Alberta: Public Health Act, Revised Statutes of Alberta 2000, Chapter P-37." April 1, 2010.  
[http://www.qp.alberta.ca/574.cfm?page=P37.cfm&leg\\_type=Acts&isbncln=978779733873](http://www.qp.alberta.ca/574.cfm?page=P37.cfm&leg_type=Acts&isbncln=978779733873)

<sup>12</sup> "Province of Alberta: Fiscal Responsibility Act, Statutes of Alberta, 2009. Chapter F-15.1." June 4, 2009.  
<http://www.qp.alberta.ca/documents/Acts/F15P1.pdf>.



- c. Directive, specific guidelines and clinical algorithms to physicians regarding the use of stockpiled antivirals. (Letter to physicians was dated October 21, 2009.)
- d. Plan and policies for distribution and administration of vaccine. (Policy was issued October 27, 2009 followed by a revised policy November 20, 2009.)
- e. Identification of essential services across all ministries. (Final list of essential services was available November 2009.)

Appendix I provides a timeline of pandemic events and context to the development of the critical elements noted above.

#### **1.4.5 Framework to Manage the Pandemic Response – Incident Command System**

The incident command system is a management framework that consists of standard emergency management hierarchies and procedures to respond to any type of emergency and organizes the personnel, facilities, equipment, communications and funds required. The system is recognized internationally. The pandemic plans of AHW and AHS identified the incident command system as their emergency management framework to execute the pandemic plan from within the emergency operation centres. “AHW, AEMA and AHS have established emergency management structures including emergency operations centres, which use the generally accepted Incident Command System (ICS), which is also called the Incident Management System (IMS), to foster decision-making and alignment.”<sup>1</sup> The plan to use the incident command system was consistent with emergency response practices. However, it appears there could have been a better understanding of the system as well as the roles and responsibilities of individuals outside the emergency operations centres.

*It is recommended that:*

*The Government of Alberta, AHW, AHS and AEMA evaluate the incident command system and determine an optimal operating command system with adequate structure and processes to respond to a public health emergency. Critical elements in the operating command system are the need to:*

- *educate and train senior administrative personnel and elected politicians on their authority, role and responsibilities during a pandemic or other public health emergency*
- *establish a decision-making authority structure with well-defined processes to quickly move escalating issues to the appropriate authority for decisions*
- *establish a process for conflict resolution between and within lead organizations*

#### **1.4.6 Emergency Operations Centres**

Multiple emergency operations centres were activated as the operational hubs for the incident command system in waves 1 and 2 of the pandemic. (Note: AHW launched its Emergency Operations Centre, AEMA launched the Government Emergency Operations Centre while AHS activated its Emergency Coordination Centre and five zone Emergency Operations Centres. The term emergency operations centres will be used to refer to all the operational centres of the incident command system.)

In wave 1, AHW and AHS co-located their emergency operations centre in Edmonton at AHW as AHS was not sufficiently organized to have a separate emergency operations centre. In wave 2 AHW set up its own emergency operations centre in Edmonton.

In wave 2, the AHS emergency operations centre was established in Calgary to oversee operational issues. The AHW and AHS emergency operations centres communicated regularly with one another several times each day but the HQCA Review Team was told difficulties in effective communication still existed.

The AEMA Government Emergency Operations Centre had been established in Edmonton to “coordinate the provincial government's response to major emergencies and disasters”.<sup>1</sup> It was partially activated by AEMA during wave 2 with the understanding that AHW would likely set up their emergency operations centre within the Government Emergency Operations Centre. However, AHW did not use the Government Emergency Operations Centre for several reasons, the most significant being loss of proximity to decision-makers within the Ministry of Health and Wellness and access to staff and other AHW resources. The Government Emergency Operations Centre was deactivated November 27, 2009.

Liaison officers provided the connection between AHW, AHS and the Government Emergency Operations Centre and facilitated an integrated approach to discussions and decision-making. This was achieved by the AHW, AHS and AEMA liaison positions in the AHW and AHS emergency operating centres. AEMA acknowledged the need to better educate and train their liaison officers to function effectively.

During wave 1, pandemic operations at the local level were managed using the previous regional health authority structures and pandemic plans. In wave 2, the five zones of AHS – North, Edmonton, Central, Calgary and South – established zone emergency operation centres to implement the operational decisions from the AHS emergency operations centre. Prior to the creation of the AHS, pandemic planning occurred within the regional health authorities. The newly created zones did not have time to develop relationships within and between themselves or with AHS. While AHS attempted to ensure a consistent, province wide approach to the pandemic, the zones were concerned about addressing the needs of their own local populations. The two approaches did not always align and consistent feedback from the zones indicated that AHS did not recognize some of the nuances of the zones and that a “one size fits all” would not always work. For example, AHS directed that only the first dose of a prescription for an antiviral drug be given to patients in the emergency department with the expectation that the balance of the prescription would be filled in the community. However, access to pharmacies on evenings and weekends in small, rural communities is often not available and this directive would have caused an interruption in the antiviral therapy.

AHW, AHS and AEMA, in consultation with municipalities and AHS zones, are strongly encouraged to collaboratively determine the optimal number and location of emergency operations centres with clear direction for roles, responsibilities and authority for decision-making.

### **1.5 Ensuring Business Continuity and Essential Services if Pandemic Plan is Activated**

A business continuity plan is the process by which an organization makes advance arrangements to respond to events so critical business functions continue during a crisis or emergency. Business

continuity plans are activated during, or immediately after an emergency or disruption and ensure the rapid and cost effective recovery of essential services”.<sup>13</sup>

At the time of the pandemic, AHW had a well-developed business continuity plan but there was reluctance to activate it according to the AHW-commissioned report, “After Action Review of Alberta Health & Wellness Response to H1N1 Influenza”.<sup>14</sup> The report, which examined AHW’s response to wave 1 of the pandemic, recommended “that the decision to begin activation of AHW’s business continuity plans be made very early during a public health crisis to better reflect altered priorities and reassign key staff to assist with response activities”. This recommendation was only partially implemented by AHW. Key staff were reassigned to pandemic response activities but many of the staff continued to work at their regular jobs after their pandemic-related tasks for the day were completed.

Prior to the formation of AHS, business continuity plans were available in some of the regional health authorities and varied in nature. As a new organization, AHS had not yet developed a business continuity plan; however, elements to support continuing business processes existed. AHS Contracts, Procurement and Supply Management ensured that suppliers and contracted freight carriers had adequate business continuity plans to provide a reliable source of pandemic supplies. AHS stockpiled pandemic supplies to ensure supplies were available should there be a disruption in supply chains. AHS developed agreements with various professional regulatory bodies to contact inactive members of their colleges should additional health practitioners have been required.

Clinicians require guidance for their role in business continuity planning. The Public Health Agency of Canada suggests that the following basic tasks of business continuity planning would apply to clinicians:<sup>6</sup>

- conduct a business impact analysis identifying critical services, impacts of disruption and critical dependencies
- develop a business continuity plan that would mitigate the risks identified by the disruptions
- complete response preparation and readiness procedures such as stockpiling critical supplies and providing staff training
- conduct quality assurance procedures such as exercises and continuous evaluation

Unique aspects for clinicians in preparing for a pandemic would include adequate procedures, training and supplies to ensure infection prevention and control. Creation of alternative options for patients with less urgent needs would allow for treatment of the more severely ill in a timely manner; e.g., instituting telephone-based prescription renewals, not normally allowed, may be a useful strategy in the clinician’s business continuity plan. AHS Emergency / Disaster Management recently forwarded a proposed AHS Business Continuity Management Governance Policy and Framework to AHS Risk Management for review and consideration that includes many of these elements for clinicians’ business continuity planning.

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<sup>13</sup> Alberta Municipal Affairs and Housing. "Business Continuity Guide." *Alberta Emergency Management Agency*. March 2007. [http://www.aema.alberta.ca/documents/bcp\\_guide\\_March\\_2007.pdf](http://www.aema.alberta.ca/documents/bcp_guide_March_2007.pdf).

<sup>14</sup> Lawson, S. Linc Group Corporation. “After –Action Review of Alberta Health and Wellness Response to H1N1 Influenza”, July 10, 2009.

The Government of Alberta established a Cross Government Coordination Team to coordinate the allocation of resources and services within their business continuity plan to support the continued provision of the Government of Alberta's essential services. AEMA had a lead role in assembling a list of essential services. In November 2009 AEMA reported that the majority of Government of Alberta essential services had sufficient staff to operate the service and backup capacity in place with the exception of six services. Tabletop pandemic planning exercises with the ministries in the fall of 2009 concluded they were well resourced to carry on essential services based on the influenza information available.

The definition of essential services was interpreted differently by various municipalities and an agreed upon definition and description is still outstanding. Nonetheless, AEMA provided AHS with a list of essential services personnel for a large number of municipalities but a comprehensive list of essential services for all municipalities that includes identification of essential staff positions was not available and is still required.

Interviews by the Review Team indicated that at least three essential services experienced high absenteeism and were concerned about their ability to sustain services. During wave 2, Lethbridge water treatment staff experienced a 30% absentee rate; ATCO Gas absentee rate was greater than 30%. The Calgary police service experienced a 33% increase in absenteeism. There was firm agreement by municipal representatives interviewed that their ability to provide essential services would have been challenged had the pandemic been more severe.

## **2.0 Testing the Plan and Preparedness**

Emergency response plans must be tested, evaluated and updated from lessons learned in the testing exercise.<sup>10</sup> In the past, the historic regional health authorities, AHW and AEMA independently tested their own pandemic plans. Exercises conducted by AHW included testing roles, logistics, technical setup and configuration of floor plans for the emergency operations centre. AEMA conducted exercises to test strategic decision-making, internal and external communication, essential services and the impact of a manpower shortage. The regional health authorities conducted training and exercises with their municipalities that included contingency planning, ethics, planning and response and communications and frequently included AEMA field officers.

Limited testing of the roles and responsibilities between AHW and regional health authorities may have contributed to the lack of clarity regarding the roles of AHW and AHS (made up of the former regional health authorities) during the pandemic. Based on interviews, it was learned that the AHW pandemic plan exercises had been exclusive of AEMA; no documentation to support collaborative preparedness exercises was available.

AEMA conducted government-wide exercises with various personnel from the ministries that included AHW and the communications departments of various ministries. AEMA's documented assessment of the exercises concluded that while there was broad testing throughout government, there was still a need for improved collaboration across government.

Each organization tested elements of their plan but there was little evidence that all three organizations collaboratively tested all the elements of the plans, debriefed, evaluated and updated their plans to reflect the learning. Lack of full collaboration was noted in the "After-Action Review of Alberta Health & Wellness Response to H1N1 Influenza" of July 10, 2009;<sup>14</sup> the report stated that (AHW) should "engage their counterparts across the Government of Alberta (e.g., AEMA, CHR [Corporate Human Resources], Alberta Employment and Immigration, Alberta Education, Alberta Agriculture and Rural Development) to

establish strong working relationships for emergency response and solidify response plans and procedures during public health emergencies”. This recommendation was partially implemented with the creation of stakeholder working groups that included organizations such as Post-Secondary Education, Vulnerable Populations, Schools, Municipalities, Corrections, Children and Youth Services Committee and Aboriginals.

AEMA has substantial expertise and operational experience in emergency planning and management and was well-positioned to take the lead on planning and implementing Government of Alberta preparedness exercises for pandemic and public health emergencies collaboratively with AHS. To do this requires dedicated resources. Similarly, AHW and AHS require resources dedicated to pandemic and public health emergency preparedness planning and testing of pandemic plans.

***It is recommended that:***

***AHW, AHS and AEMA collaboratively develop and implement integrated pandemic preparedness exercises that test key elements of the pandemic plans subject to a variety of severity scenarios, and ensure thorough debriefing and evaluation by all three organizations are used to update the pandemic plans.***

### **3.0 Implementing the Plan**

#### **3.1 People and Structures to Implement the Plan**

##### **3.1.1 Leadership**

Throughout waves 1 and 2 of the pandemic, strong collaborative leadership was shown by the Medical Officers of Health responsible for the promotion and protection of the health of Albertans under the authority of the Public Health Act. The Chief Medical Officer of Health of AHW and the Senior Medical Officer of Health of AHS, along with a network of provincial Medical Officers of Health, developed and provided direction on public health issues necessary to mitigate risk of infection from the H1N1 influenza virus. They liaised with AHS and other health care providers to support treatment of infected individuals and gave the public regular, frequent and succinct updates on the evolution of the pandemic to instill public trust and confidence through joint press conferences. Press conferences also allowed the media to engage in dialogue with AHW and AHS leaders.

The Chief Medical Officer of Health and Senior Medical Officer of Health further proposed and supported the establishment of a joint (AHW and AHS) surveillance group that produced one data set for the province.

Following the transition from the regional health authority structure to that of AHS, formal and informal leaders within AHS emerged across the spectrum of frontline staff to various levels of management. New relationships required to achieve the necessary pandemic response were forged during the course of the pandemic.

Leadership arose among stakeholders and included examples from Alberta Education, Edmonton School District and the University of Calgary. Alberta Education provided a grant for school districts to hire an expert in pandemic planning who facilitated the improvement and standardization of plans. The University of Calgary’s plan for managing students in residence was used by other universities.

The First Nations and Inuit Health showed significant leadership in achieving an immunization rate of 66% of the population of 65,000 aboriginals living on reserves. Using usual processes, local community leaders helped communicate changing circumstances and details regarding the H1N1 influenza and the immunization process. With the support of pharmacists, the First Nations and Inuit Health public health staff were the first in the province to organize repackaging of the 500 dose vaccine format into smaller package sizes more appropriate for distribution to small clinics. Together with AHW they pre-positioned antiviral drugs in the First Nations and Inuit Health communities. Videoconferencing was used to provide simultaneous education sessions to all clinical staff and First Nations leadership. First Nations and Inuit Health public health personnel travelled to First Nations and Inuit Health communities to provide immunization at sites previously used for seasonal immunization. An enhanced process for mass immunization was implemented in each First Nations community, building on existing routine seasonal influenza immunization processes. In addition, a roster of regional public health nurses was available to assist First Nations communities in their immunization and/or influenza-like-illness assessment services response to augment existing community-based staff.

### 3.1.2 Interaction of Lead Organizations and Stakeholders

While the AHW pandemic plan identifies the policy and legislative role of AHW and the health delivery responsibilities of AHS, in reality there were several instances where the distinction was not clear. This lack of clarity observed by the HQCA Review Team was substantiated by the debriefing documents of both organizations and the interviews conducted.

AHW activities crossed into AHS operations as they related primarily to clinical decision-making and vaccine and antiviral drug strategies. For example:

- Alberta's Influenza Immunization Program Policy of November 20, 2009<sup>15</sup> provides significant direction on operational and clinical issues such as monitoring the patient after an immunization, patient record management of AHS and safe storage and transportation of vaccine.
- AHW followed the Public Health Agency of Canada (PHAC) guidelines and did not support the use of antiviral drugs to prevent infection by H1N1. The guidelines state that the antiviral drugs were only to be used in patients with severe symptoms or who were at high risk of developing complications from the influenza. AHS did not agree with the PHAC guidelines and felt they should have been able to use their clinical judgment to treat patients. Ultimately there was agreement between AHW and AHS that individual physician clinical judgment remains paramount around the use of antivirals.

The pandemic was initially viewed by AHS and AHW almost exclusively as a "health" issue but both organizations needed to examine the downstream, non-health implications. Should workers of essential services be infected with the H1N1 virus, their absenteeism could have significantly and negatively impacted industries such as those providing electricity, water and communications. The role of AEMA in coordinating the non-health planning and

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<sup>15</sup>Alberta Health and Wellness. "Alberta's Influenza Immunization Program Policy." Government of Alberta, November 20, 2009.



emergency management among all government departments and emergency management partners and industry needed to be fully recognized.

AEMA was not part of the initial activation of the pandemic. They were officially engaged November 1, 2009 to address a crowd control crisis at an immunization patient clinic well after the activation of the emergency operations centres of AHW and AHS. The AHW pandemic plan of November 2009<sup>1</sup> states that AEMA's involvement was not dependent on a severity trigger or declaration of an emergency. However, the role of AEMA stated in the summary version of the Alberta Plan of October 2009<sup>7</sup> is that it "supports Alberta Health and Wellness as needed and leads the provincial response regarding the non-health consequences of a pandemic". AEMA's lack of meaningful engagement was based, at least in part, on the perception by AHW and AHS that AEMA should not be involved in the pandemic response until the severity was escalated and business and societal disruption was evident.

AEMA has substantial planning expertise and operational experience in emergency management from the tactical to strategic levels. AEMA is also versed in the incident command system and has demonstrated continuous learning from preparedness exercises that incorporates learnings into a dynamic preparedness plan. It is acknowledged that AHW was the lead agency for the pandemic; nonetheless, the combined expertise of AHW, AHS and AEMA should be considered in optimizing Alberta's response to a pandemic or other public health emergency.

*It is recommended that:*

*AHW, AHS and AEMA articulate the roles and responsibilities of each organization in their respective and collaborative pandemic plans that reflect the legislative mandate and unique expertise of each organization.*

### **3.1.3 Interaction with Municipalities and Industry**

Municipalities are responsible for ensuring the continuity of essential services to support their residents. The Emergency Management Act<sup>16</sup> allows municipalities to declare public emergencies in their jurisdiction. Municipalities, in their critical role of responding to emergencies, work in conjunction with the mandate of AHS to provide health care services.

AEMA has a close relationship with municipalities and is responsible for communicating with them, monitoring the effect of the pandemic on their essential services and facilitating federal assistance programs, and monitoring the need for support among families of victims. AEMA also assists municipalities with developing consequence management plans for health emergencies and other hazards.

Prior to the formation of AHS, the main links to municipalities were with the regional health authorities. With the establishment of AHS, five zones replaced the regional health authorities. The new zones had minimal time to develop a relationship with the municipalities. The municipalities tended to defer to the AEMA field officers, to get information.

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<sup>16</sup> "Province of Alberta: Emergency Management Act, Revised Statutes of Alberta 2000 Chapter E-6.8." October 1, 2009.

AHS determined the number, location and hours of operation of immunization clinics. However, municipalities should be engaged in selecting clinic sites to improve communications and ensure their expertise and experiences are used to optimize mass immunization strategies.

Some immunization centres were at facilities (e.g., churches) donated by business owners. The 2009 AHW policy on immunization required AHS establish contracts with the municipalities and the business owners to formalize the use of their facilities for AHS public health purposes. The Review Team was told that rather than deal with the intricacies of what was perceived to be a complicated legal contract, some business owners retracted their support to use their properties as public immunization clinics. AHS was then required to find alternative sites.

AEMA is also the main organization charged with communicating with industries, particularly those providing essential services such as water, transportation, security/protection services and communication during an emergency. AHW, through AEMA, had a responsibility to communicate with industries regarding the status of the pandemic and to gather surveillance information such as absenteeism. There was some communication to provincial business leaders late in the course of the pandemic from AHW; AEMA was not part of that communication loop. The need to address roles and responsibilities of municipalities and communication with municipalities is made in section 1.4.4 Emergency Operations Centres and section 4.0 Communication.

### **3.1.4 Interaction with Stakeholders**

Key stakeholders were identified largely through seven sector groups established in partnership with key Government of Alberta ministries and AHS. Each ministry was responsible for maintaining contact with its individual stakeholder groups before, during and after a pandemic for two purposes:

- To keep the provincial government aware of stresses and shortages in the private sector.<sup>1</sup>
- To provide information on preparedness, response and the impact of a pandemic to the stakeholders so that they can plan appropriately and avoid negative impact on their business and/or population.<sup>1</sup>

Committees for Post-Secondary Education, Vulnerable Populations, Schools, Municipalities, Corrections, Children and Youth Services and Aboriginal populations were convened as sector groups with their own terms of reference reporting to AHS and AHW. The Committees were to coordinate roles and responsibilities and identify risks and mitigation strategies for the stakeholder group during the H1N1 pandemic. The ability to organize the sector working groups quickly and support them in their pandemic response was commendable. Notwithstanding limited resources from AHW and AHS to do the work, the quality of support was very satisfactory and appreciated by the sectoral groups.

Details of stakeholders' experience are below:

#### **Aboriginal Populations**

The "First Nations Emergency Operations Plan" provided a detailed operational plan for responding to the pandemic. AEMA had been instrumental in facilitating pandemic



preparedness training and exercises and two First Nations AEMA Emergency Management Officers work exclusively with Alberta First Nations communities. 99% of communities participated in a pandemic tabletop exercise September 29 to October 1, 2009. Most Metis settlements, however, do not have emergency management plans.

First Nations Inuit Health's response during the pandemic is covered in this report in section 3.1.1 *Leadership*.

Of the lessons learned, more training for assessment of influenza-like illness was identified. Further, a communication plan to prioritize and address the large number of requests for information is required, at the regional level, for an improved response by the First Nations and Inuit Health population. Much more work is required to address the needs of Metis settlements as there are no structures or processes that relate to pandemic or public health emergency planning for this population.

### **Children and Youth Services**

During the pandemic, the focus for the Department of Children and Youth Services was to ensure day care facilities and family day homes were adequately prepared to minimize the risk of spread of H1N1 influenza and manage the situation if children in their care became infected. Information was developed by the Department of Children and Youth Services and distributed to day care centres, family day homes and child care program field officers. Although most information was received in a timely fashion, some documents were slow to receive approval for final dissemination.

### **Correctional Services**

Regional (Alberta, Saskatchewan and Manitoba) and provincial Correctional Services began planning for some aspects of a pandemic in 2007. In Alberta, stockpiling of antivirals, medications, medical supplies and personal protective equipment such as gowns and masks began at this time. A pandemic plan for the Alberta Solicitor General and Public Security department was developed in the spring of 2009.

The closed environment housing 3,000 offenders in custody was recognized by the Solicitor General and Public Security as a risk for the spread of communicable diseases such as the H1N1 influenza. However, clear agreement was not reached by the Government of Alberta, AHW and AHS that the inmates should be treated as a high-risk population during the 2009 pandemic. The Review Team was told by regional and provincial Correctional Services that inmates and staff were not offered the vaccine early in the immunization campaign when community based high-risk groups were eligible. This occurred to avoid an anticipated negative reaction from the public if the vaccine became available at the corrections sites prior to the public having access. In Alberta, inmates were able to be immunized when the vaccine was available to the general public on November 23, 2009. Corrections staff were originally not considered as first responders. After intervention from the Ministry they were added to the first responder group. There is concern, from Correctional Services, that this inclusion was specific to this event and they would recommend that the definition of first responders is revised to include correctional staff.

Although the Alberta Solicitor General and Public Security department did not experience significant absenteeism during the pandemic, they had proactively negotiated with other ministries to help manage their operations in the event they would need to augment their

staffing if absentee rates escalated. The department expected that a business continuity framework would have supported the development of linkages within government to support one another; however, that was not the experience of the department and creation of memorandums of understanding with two other ministries were necessary.

### **Advanced Education and Technology**

The Department of Advanced Education and Technology oversees adult learning, apprenticeship and industry training, and technology for the 26 post-secondary institutions and 250 private vocational schools in the province. It expects all institutions to have plans in place and to be ready to respond to various types of emergencies.

After wave 1, in May 2009, the University of Alberta hosted a conference for post-secondary institutions to provide information about the H1N1 influenza and the more severe wave 2 anticipated for the fall of 2009. AHS and a number of post-secondary institutions formed a working group to coordinate planning for wave 2. By late September, institutions were sharing best practices for pandemic planning. A template for a pandemic plan was not available and would have been welcomed. A guidance document on developing a pandemic plan was created by the Department of Advanced Education and Technology and issued to academic institutions in October 2009. Post secondary institutions worked hard in the inter-wave period to prepare for the pandemic through regular teleconferencing; the larger institutions provided leadership in sharing guidelines and advice. Nonetheless, development of pandemic plans and levels of preparedness varied across the institutions and left room for improvement.

Lessons learned included the following:

- There is no oversight for the preparedness of post-secondary institutions for pandemic or other emergency planning. This was referenced in the Report of the Auditor General of Alberta, April 2010: “We recommend that the Department of Advanced Education and Technology (through the Campus Alberta Strategic Directions Committee) work with post-secondary institutions to identify best practices and develop guidance for them to implement effective enterprise risk management systems.”<sup>17</sup>
- A single, credible source of information about the pandemic was not available until the AHS website was available.
- Essential services were not well classified in Advanced Education.
- Given that influenza can affect animals, pandemic planning and policies need to address animal research.

### **Alberta Education**

Alberta Education is responsible for developing education policy and regulations as well as setting curriculum and standards for approximately 660,000 school-age children in Alberta. Representatives from Alberta Education and three school districts were interviewed by the Review Team.

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<sup>17</sup> "Report of the Auditor General of Alberta." [http://www.oag.ab.ca/?V\\_DOC\\_ID=936](http://www.oag.ab.ca/?V_DOC_ID=936), April 2010.

Pandemic plans had been developed in Alberta schools since 2007 with the assistance of the AHW Deputy Chief Medical Officer of Health. School districts recognized further planning was required. Alberta Education provided consultative support, through a conditional grant agreement in cooperation with the Alberta School Boards Association, to provide on-site guidance and direction to school authorities regarding their specific pandemic plans. In addition, Alberta Education developed a “*Pandemic Guide for Alberta School Authorities*” that was designed to assist them to anticipate specific issues that affect the operation of schools and school authorities during a pandemic. During the inter-wave period, AHS created a stakeholder group for additional planning support.

Alberta Education and the Alberta Teachers Association developed an educational video and series of commonly asked questions that addressed general information about the H1N1 influenza as well as safety concerns of staff exposed to children who may have been infected. Other information from Alberta Education and AHS was valued by the school districts but the Review Team was told that the information was sometimes available later than desired. Pandemic responsiveness varied among the schools.

Some schools had absenteeism rates of approximately 30% with isolated reports of 40% absenteeism among staff. Over 50% of the schools had an H1N1 outbreak; however no schools were closed during the pandemic. The current rate of 10% absenteeism that must be reported to public health officials appears too low as many schools’ usual absentee rate is approximately 10%. Children attending school with influenza-like symptoms was a challenge for some schools and the need for policy to manage this was identified during the interviews.

### **Vulnerable Populations**

AHW and AHS created the Pandemic Influenza Planning Committee – Vulnerable Populations to bring together stakeholders of various vulnerable populations for the purpose of pandemic planning. The role of the committee was to coordinate roles and responsibilities as well as identify risks and mitigation strategies for Alberta’s vulnerable and disadvantaged populations who required some assistance but were not currently receiving services from AHS. Populations in this sector included the homeless, seniors, persons with developmental disabilities, special needs, addictions and mental health issues. Due to the broad scope, jurisdiction for this group crosses a number of ministries within the Government of Alberta and departments within AHS. AHS developed a template for pandemic planning with and for these vulnerable populations.

The pandemic plans created in 2009 worked well for seniors; the only section that required substantial change was that dealing with use of personal protective equipment and supplies. Although health care staff at inner city agencies is limited, staffing of the immunization clinics worked well due to health care providers volunteering to work additional shifts and sharing of staff among various shelters and inner city programs. However, immunization clinics in the Edmonton inner city area closed October 31, 2009 (as did all other AHS immunization clinics) and did not open again until November 18, 2009 (other AHS clinics opened November 5, 2009).

Lessons learned:

- A significant challenge was defining who should be in the vulnerable population group and whether some of the sectors within the population should be recognized as an independent group (e.g., seniors).
- People within vulnerable population groups are generally at higher risk for complications if they become infected with a pandemic influenza virus. Re-examination of this group for appropriate ranking of risk is necessary.
- There was inconsistency in the provision of immunization for sectors within the vulnerable populations as well as their caregivers. Unique challenges of the population present barriers for them to attend mass immunization clinics. Review of the barriers and needs of this group are necessary for more consistent delivery of immunization.

## **3.2 Processes to Implement the Plan**

### **3.2.1 Surveillance**

#### **3.2.1.1 Collaborative Approach to Surveillance**

The surveillance groups of AHW and AHS (which included the AHS Provincial Laboratory) combined their databases and expertise during wave 1 to create one set of data to guide the pandemic planning and response. Through work with the National Microbiology Laboratory in Winnipeg, the Provincial Laboratory in Alberta was the first provincial laboratory in Canada to test for the H1N1 virus.

Although there were challenges in getting the required surveillance data, the vast majority of the data provided by the surveillance group was deemed to be excellent and timely and supported AHW and AHS decision-making in the emergency response centres.

AHS and AHW generated a comprehensive report entitled “Pandemic (H1N1) 2009: the Alberta Situation”,<sup>18</sup> which provided information and surveillance data on the burden of the disease, Alberta's response, impact on the health care system, prevention and treatment with antivirals and vaccines, as well as surveillance status and surveillance needs in Alberta. Findings from this report will provide guidance for future pandemic planning.

#### **3.2.1.2 Interprovincial Comparability of Surveillance Elements and Pandemic Outcomes**

The Public Health Agency of Canada created standard definitions of surveillance for reporting but not all provinces and territories were able to apply the definitions; therefore, true interprovincial comparability was not possible. Consequently comparing Alberta's immunization rates and rates of H1N1- associated deaths with other provinces is difficult. Figure 3 depicts immunization rates across Canada.

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<sup>18</sup>Alberta Health Services. "Pandemic (H1N1) 2009: The Alberta Situation." Government of Alberta, April 9, 2010.

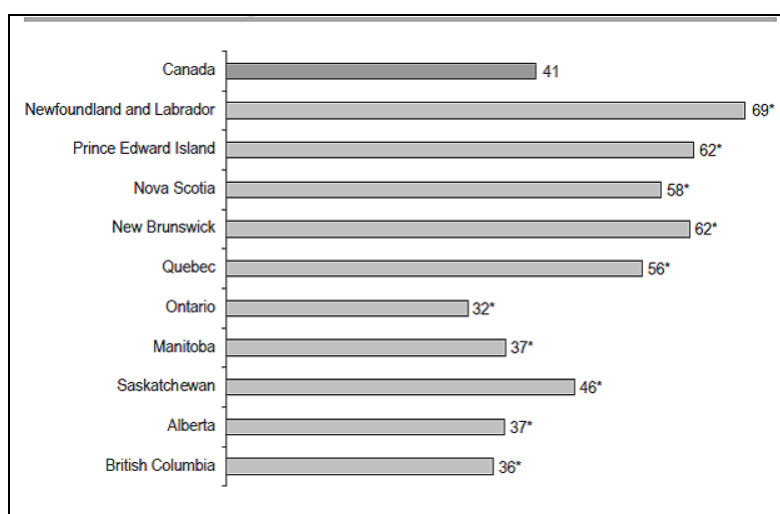


Figure 3. Percentage vaccinated by province, household population aged 12 or older<sup>19</sup>

Deaths in Alberta were classified as those where the H1N1 virus was present but not necessarily the cause of death. The death rate in Alberta, not adjusted for age or risk factors, was 1.9 per 100,000 population. Comparative death rates are provided in Figure 4. All provinces used the same definition of death rate where H1N1 was present but it is not known if testing for the presence of H1N1 in each death was done universally. Hence, Alberta's higher than average death rate should be interpreted with caution. Currently public health officials in Alberta are further examining the information to help explain Alberta's H1N1 death rate.

Province or Territory	Deaths reported per 100,000 population
British Columbia	1.26
<b>Alberta</b>	<b>1.93</b>
Saskatchewan	1.46
Manitoba	0.9
Ontario	0.98
Quebec	1.38
New Brunswick	1.07
Nova Scotia	0.75
Prince Edward Island	0
Newfoundland	3.54
Yukon Territory	8.9
Northwest Territory	2.3
Nunavut	3.11
Canada	1.26

Figure 4. Death rates from H1N1 influenza per 100,000 population<sup>20</sup>

<sup>19</sup> Gilmour, G, and N Hofman. "H1N1 Vaccination." Statistics Canada, Catalogue no. 82-003-XPE, Health Reports, Vol 21, no. 4, December 2010.

AHW and AHS are encouraged to work with the federal, provincial and territorial pandemic group and the Public Health Agency of Canada to develop standard , minimum elements of surveillance that use standard definitions to facilitate consistent and comparable surveillance data and outcomes measures across Canada.

### **3.2.1.3 Surveillance Data to Monitor the Pandemic and Determine Human Resource Capacity**

Standard surveillance data elements had not been defined, tracked and shared with the three lead organizations during the H1N1 pandemic. Not all schools reported on absenteeism. Absenteeism in the other ministries of the Government of Alberta that supported essential services was not available consistently or in a timely manner. In the health system, zone absenteeism reports were received daily but did not provide real-time information on staff absence and the capacity of the system to cope with the shortage.

AHS required real-time information on the number and type of available hospital beds and critical equipment to support the treatment of acute care patients. Provincial data on bed utilization in real time was not available even though many facilities had excellent information relevant to their specific site. Information was readily accessible on the total number, type and location of ventilators (equipment used to assist breathing of patients with severe respiratory problems as a result of H1N1 infection).

Surveillance information was largely developed through manual input of data in the AHW and AHS surveillance departments. Similarly, all immunization data was collected manually and electronically entered into a database that was forwarded for surveillance purposes. Transcription of data introduced the potential for data errors. Robust supportive surveillance technology was not available to provide real-time data for decision-makers.

Public health and acute care surveillance databases were separate and used different data elements, making it challenging for AHS and AHW to extract relevant data from both systems to produce information useful for monitoring the pandemic. AHS and AHW has considered the value of one integrated surveillance system and this warrants further review.

***It is recommended that:***

***AHW and AHS examine the benefits of an integrated surveillance system that supports timely information and decision-making and uses a minimum surveillance data set for tracking the pandemic or other public health emergency and system resource capacity.***

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<sup>20</sup> "The H1N1 Pandemic - How Ontario Fared: A Report by Ontario's Chief Medical Officer of Health." June 2010.  
[http://www.health.gov.on.ca/en/public/publications/ministry\\_reports/cmoh\\_h1n1/cmoh\\_h1n1\\_20100602.pdf](http://www.health.gov.on.ca/en/public/publications/ministry_reports/cmoh_h1n1/cmoh_h1n1_20100602.pdf).

### 3.2.1.4 Capacity of Provincial Laboratory to Respond to the Pandemic

During the inter-wave period, the Provincial Laboratory had appropriately integrated many of the previous regional health authority laboratory plans for pandemic into one provincial AHS plan. The plan identified tests that would be discontinued temporarily should the pandemic-related workload demand become excessive. The Provincial Laboratory experienced a tenfold increase in the workload at the height of the pandemic and was unable to immediately hire more staff for the additional technical workload due to lack of availability of such human resources and the AHS vacancy management program. Senior laboratory leaders attempted to fill the gap but also continued to do work relevant to their current positions. Significant risk of burnout occurred among all staff towards the end of the pandemic. The Provincial Laboratory has recognized the lack of a sustainable human resource plan and is working on better delegation of roles and infrastructure support.

*It is recommended that:*

***AHW, AHS and the Provincial Laboratory review and update the Provincial Laboratory's business continuity plan to ensure adequate and redundant resources in managing a pandemic.***

## 3.3 Vaccines and Immunization

Immunization is a major strategy for managing communicable diseases. It is used with preventive strategies like hand washing and therapeutic strategies like antiviral therapies to minimize morbidity and mortality. As soon as the nature of the virus is known, plans are implemented to manufacture the vaccine, ensure it passes regulatory safety tests and distribute it for administration.

Canada opted to use an adjuvanted vaccine to minimize the amount of antigen (virus) that would be required in each dose; the adjuvant increases the immune response using smaller amounts (25%) of antigen. On May 30, 2009 the Public Health Agency of Canada placed an order with GlaxoSmithKline for adjuvanted vaccine and added an order for unadjuvanted vaccine August 20, 2009; unadjuvanted vaccine was ordered for young children and pregnant women due to the lack of safety data using adjuvanted vaccine in this population. See Appendix I for details of vaccine orders and supply.

2009 was the first year for coverage for immunization for all Albertans six months of age and older at no charge. Mass immunization clinics were selected as the preferred method for immunizing as many people as possible in the shortest timeframe. The clinics were smaller in number than those used for seasonal influenza campaigns but some sites could accommodate more people. Experience with seasonal influenza immunization showed up to 50% of immunizations are frequently completed in the first week and attendance at immunization clinics drops significantly after that. This experience supported ramping up capacity of the immunization clinics at the outset with sufficient staff to support high demand.

Many opportunities for improvement about the immunization campaign are identified further in this report; however, a number of successes cannot be overlooked:

- Canada was fortunate to have had a Canadian manufacturer as a reliable source of vaccine, which eliminated delays in trans-border distribution.



- Vaccine arrived sooner than the expected delivery date of November, 2009 and was available to the public October 26, 2009.
- 37% of the total population was immunized for H1N1 influenza compared to 21.7% for seasonal influenza in 2008-2009.
- 52% of the province's health care workers were immunized.
- 66% of aboriginals on reserves were immunized.

### **3.3.1 Policy Development**

Policies for pandemic immunization and the use of antiviral drugs during the pandemic were not in place until after the beginning of wave 2. This presented a number of operational issues for AHS. The policy indicated that AHS was required to establish contractual agreements with external providers such as pharmacists and family practitioners to aid in the immunization of the general public. Time required by AHS legal counsel to review the policy and develop contracts with providers for immunization was significant and underestimated by AHW. Several weeks were required for AHS to obtain legal counsel input and develop memorandums of understanding before AHS could implement the policy. Ensuring time for legal review of all new policies was a primary learning for both AHW and AHS.

Furthermore, the policy did not fully align with the expectations in the draft developed by a working group of pharmacists, the Alberta College of Pharmacists, the Pharmacists Association of Alberta, AHW and other relevant players. Time required to come to a common understanding of the expectations of the policy delayed the engagement of pharmacists and physicians to assist in administering the vaccine.

Input from working groups is often solicited by AHW to provide perspective on operational issues impacted by the policy. AHW is encouraged to continue to collaborate with service delivery organizations during policy development and ensure the final policy reflects an understanding of operational issues required to implement it.

### **3.3.2 Immunization Campaign Roll Out**

The operational guide of the AHS pandemic plan identified priority immunization of the high-risk groups as the preferred strategy.<sup>21</sup> High-risk groups were those who would be more at risk of experiencing severe symptoms if infected. AHW concurred with this strategy. This strategy was also consistent with the Public Health Agency of Canada's framework for the immunization process as represented in the "Guidance on H1N1 Vaccine Sequencing"<sup>22</sup> document issued September 16, 2009. The high-risk populations identified by Public Health Agency of Canada are listed below:

- persons with chronic conditions under the age of 65
- pregnant women

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<sup>21</sup> Alberta Health Services: Emergency/ Disaster Preparedness, Public and Population Health. "Alberta Health Services Pandemic Influenza Operational Guide." Calgary, Alberta, March 2010.

<sup>22</sup> Public Health Agency of Canada (PHAC). "Guidance on H1N1 Vaccine Sequencing." September 16, 2009. <http://www.phac-aspc.gc.ca/alerte-alerte/h1n1/vacc/pdf/vacc-eng.pdf>.



- children 6 months to less than 5 years of age
- persons residing in remote and isolated settings or communities
- health care workers (all health care system workers involved with the pandemic response or delivery of essential health services)
- households contacts and care providers of:
  - infants less than 6 months of age
  - persons who are immunocompromised
- populations otherwise identified as high risk

AHW and AHS public health experts had agreed that high-risk groups should be vaccinated as a priority; however, as there was adequate vaccine supply, a decision was made at a high level to encourage high-risk groups to be immunized but anyone seeking vaccination would be accommodated. Mass immunization clinics opened on October 26, 2009 to all Albertans.<sup>23</sup>

Based on the Federal Government's contract with GlaxoSmithKline, the Government of Alberta and AHS felt confident that there would be sufficient vaccine for all citizens. The Review Team was consistently told that public uptake for the vaccine was anticipated to be about 35% based on a public survey of 3,000 Albertans.

The Rapid Response Public Survey,<sup>24</sup> used to determine public uptake showed 44% of adult Albertans and 57% of children aged six months to 17 years were expected to request immunization with the H1N1 vaccine. This was considerably higher than the previous year's immunization rate of about 21%. This information could have been a useful indicator that crowds at the immunization clinics would be larger. Secondly, the manufacturer committed to supply Canada with its full order of vaccine by January 2010 to be delivered in phases<sup>25</sup> versus one large quantity delivered at the start of the immunization campaign.

Figure 5 shows a timeline of events related to the H1N1 vaccine and the immunization campaign.

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<sup>23</sup> Predy, G AHS Senior Medical Officer of Health. Toronto Globe and Mail.

<http://www.theglobeandmail.com/news/technology/science/provincial-h1n1-vaccination-clinic-plans/article1334191>, October 22, 2009.

<sup>24</sup> Alberta Health and Wellness: Surveillance and Assessment. "Rapid Response Public Survey." Edmonton, Alberta: Government, August 2009.

<sup>25</sup> Raymond, B. (2010, August 9). Centre for Immunization and Respiratory Infectious Disease, Infectious Disease Prevention and Control Branch. *Personal communication with PHAC, Chief, Pandemic Preparedness (Technical Section), Pandemic Preparedness Division, Alberta's Response to the Pandemic - request for information*. Ottawa, ON.

Date (2009)	Event
May 30	Canada orders 48.375 million doses (0.5 mL) of H1N1 adjuvanted vaccine; at this time it was thought that 2 doses were required for an immune response
August 20	Canada orders 1.8 million doses of unadjuvanted vaccine for pregnant women and young children
October 19	604,000 doses of vaccine arrive in Alberta
October 21	Vaccine is approved for use in Canada
October 22	Mass immunizations clinics are open to AHS staff (including AHS emergency medical services personnel)
October 26	Mass immunization clinics are open to the general public
October 26	An otherwise healthy 13 year old from Ontario dies due to H1N1 influenza
October 29	Alberta learns that supply of adjuvanted vaccine will decline due to recent change in production by manufacturer to produce unadjuvanted vaccine
October 31	323,036 Albertans are immunized leaving 280,984 doses available if no wastage occurred.
October 31	Mass immunization clinics are closed at 1600 h
November 5	Mass immunization clinics reopen to high risk groups that are phased in over several weeks
November 17	Non-AHS emergency medical services personnel are eligible for immunization
November 23	Essential services* personnel and first responders** and the general public are eligible for immunization
December 4	Alberta received its last shipment of 551,500 doses of vaccine.
April 30, 2010	1,197,074 (0.5 mL) doses were administered from a supply of 2,216,000 doses of adjuvanted and unadjuvanted vaccine leaving 1,018,926 doses unused <sup>26</sup>

Figure 5. Timelines relevant to vaccine availability and immunization

\*Essential services include police, public works, utilities, public transportation, social services, provincial corrections, and any others as designated by a municipality considered as essential for business continuity purposes. (Source: Alberta Pandemic Influenza Plan May 13, 2008 Revised.)

Critical essential services require resumption within 24 hours, vital essential services require resumption in less than 48 to 72 hours, and necessary essential services must be resumed within 10 days to 2 weeks. If those services identified as critical were not available, there could be loss of life, infrastructure destruction, loss of confidence and government and significant loss of revenue. (Source: Business Continuity for Pandemic Plan, Business Continuity for Pandemic Planning Committee, Feb/March 2007.)

<sup>26</sup>Alberta Health and Wellness (AHW). "Weekly Vaccine/ AEFI Summary Report: For week ending April 30, 2010." Government of Alberta.

\*\*First responders include practitioners from fire services, emergency medical services, integrated services, and police services. First responders may be included in the essential services group. (Source: Alberta Emergency Plan 2008, Alberta Emergency Management Agency.)

Shortly after the immunization clinics opened on October 26, 2009, the public learned that a previously healthy adolescent boy in Ontario died of H1N1 influenza. That event received considerable media attention and may have contributed to the population's sense of urgency to be immunized. Long lineups were common at most immunization clinics and difficulties in crowd control occurred at some sites. These issues were a focal point in the media. A central theme that emerged during the review, and as communicated to the HQCA Review Team during the interviews with AHW and AHS, was that the pandemic was not an emergency. Rather, the challenge was managing the immunization clinics.

On October 29, 2009, four days into the immunization campaign, the province learned the supply of adjuvanted vaccine would decline temporarily. The manufacturer had shifted production to the unadjuvanted vaccine on October 1, 2009 and was now manufacturing the adjuvanted vaccine again. Quality and safety checks would delay release of adjuvanted vaccine. Although there was consensus from all interviewed in Alberta, Ontario and Saskatchewan that the abrupt drop in vaccine production came as a surprise, communication with the Public Health Agency of Canada<sup>25</sup> indicated the provinces and territories were kept aware of vaccine production schedules and other issues through weekly updates to the Federal/Provincial/Territorial Scientific Advisory Committee, Federal/Provincial/Territorial Deputy Minister meetings and Federal/Provincial/Territorial Vaccine Supply Working Group. The Public Health Agency of Canada felt the provinces should have been aware that a drop in production was expected. The reason for the disconnect between the Public Health Agency of Canada and the provinces is unknown.

As the available volume of vaccine distributed to the immunization clinics was tracked manually, an accurate estimate of vaccine supply at the clinics was not known in real time. There was also concern that there may be a short-term interruption of vaccine supply. In addition, continuing strong demand for immunization by all Albertans was resulting in long queues at the immunization clinics. Public health experts at AHW and AHS recommended a one-day closure of the clinics to allow time to refocus the immunization program onto high-risk groups only. A high-level decision was made to close the immunization clinics on October 31, 2009. They reopened November 5, 2009, restricting immunization to high-risk groups only. Additional high-risk groups were added every few days until November 23, 2009 when the clinics were once again open to the general public.

Retrospective examination of the residual vaccine in Alberta as of October 31, 2009 showed 280,964 doses of vaccine were still available in the province assuming no wastage.<sup>27</sup> It is estimated that at peak immunization rates of 60,000 doses per day as seen the previous week and allowing for up to 10% wastage, sufficient doses were available to allow the clinics to remain open for a further three to four days without any new supply of vaccine. The decision to close the clinics and keep them closed until November 5, 2009 was unique in Canada and was not based on accurate vaccine inventory data.

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<sup>27</sup> Alberta Health and Wellness. "Weekly Immunization Coverage Reporting Form for H1N1 Influenza Vaccine." Edmonton, Alberta, For week ending October 31, 2009.

Immunization rates dropped sharply in the first week after the clinics reopened and momentum was not regained until the end of the week of November 27, 2009. By the third week of December 2009, few people were seeking immunization. At the end of the immunization campaign, 1,018,926<sup>27</sup> doses of vaccine remained unused.

Examination of the closure of the immunization clinics and the impact on the immunization of Albertans, especially those in high-risk groups reveals several opportunities for improvement. It is understandable that AHS and AHW needed to regroup to gain control of the long queues at the immunization clinics. However, the Review Team found no evidence-based decision-making for keeping the clinics closed for four days until November 5, 2009. Running short of vaccine was only a potential and a risk/benefit evaluation of that scenario was not provided to the Review Team. Specific strategies to facilitate maximal immunization of the high-risk groups in the event of a vaccine shortage were also not included as part of the pandemic plan. The Review Team was told by public health personnel that past experiences shows maximal rates of immunization occur in the first week of immunization campaigns and that momentum usually falls off rapidly after that. This information was conveyed to AHS Executive during the planning of the mass immunization clinics but additional resources to accommodate a large public response during the first week were delayed.

In hindsight, both AHW and AHS agreed that those at high risk should have been immunized first and that capacity at clinics should have been ramped up in the first week of immunization.

A recommendation to improve immunization of Albertans, especially high-risk populations, is included in section 3.3

### 3.3.3 Were the Right People Immunized?

The Government of Alberta, AHW, summary report for immunization<sup>26</sup> reported the following immunization rates for high risk groups:

Target Group	Estimated percentage immunized
Under 65 at high risk	31%
6 months to 4 years	51%
Health care workers	52%
Pregnant women	35%
Aboriginals on reserve	66%

Figure 6. Immunization rates of high risk groups in Alberta

Although the categories are not identical, Canadian immunization rates for high-risk groups are represented below:

Target Group	Estimated percentage immunized
High risk for complications	54.8%
Children (age 5 or younger)	44%
Health care workers (age 15-75)	65.9%
Pregnant women (age 15 – 49)	47.2%

Figure 7. Immunization rates of high-risk groups in Canada, excluding territories<sup>26</sup>

In all but the category of children under the age of 5, Alberta's immunization rates for high-risk groups were less than the Canadian average.

In the first week, 150,303 or 45%, of the 325,000 doses of vaccine were administered to individuals from high-risk groups.<sup>25</sup> Approximately 55% of those immunized in the first week were not part of the high-risk categories.

The rationale for immunizing high-risk groups first is supported by both the Public Health Agency of Canada<sup>22</sup> and the World Health Organization.<sup>28</sup> Health care workers were to be immunized early to prevent an infected health care worker from spreading the infection to already ill patients or public in the ambulatory care setting and to minimize the absenteeism rate of health care workers required to care for patients.<sup>19</sup> Immunization clinics for AHS staff were open beginning October 22, 2009.

During a pandemic response, it is critical to have an understanding of which individuals are considered as first responders and essential services and whether they comprise part of the high-risk group. Government, AHS, industry and municipalities need to agree on a definition of who is included in essential services, what those services are and what is required to ensure continuity. AEMA was responsible for working with municipalities and government to develop a list of essential services. During the 2009 pandemic response, consensus on a definition and creation of a comprehensive list for both municipalities and government remained outstanding.

Albertans who work in industries that provide essential services such as water and electricity were not eligible for immunization until the clinics were open to the general public November 23, 2009. The societal implications of the pandemic have been discussed in section 3.1.2, *Interaction of Lead Organizations and Stakeholders*.

Agreement on the definitions and descriptions of first responders and where they fit into the high-risk groups was not clear during the immunization campaign. First responders commonly included emergency medical services personnel, police and firefighters.<sup>13</sup> Emergency medical service personnel who were also AHS staff or contracted service providers to AHS could receive immunization at AHS staff clinics open October 22, 2009. Special arrangements for other first responders to receive immunizations were made on November 17, 2009. No data is available on the total number of first responders immunized.

<sup>28</sup> World Health Organization (WHO). "WHO recommendations on pandemic (H1N1) 2009 vaccines: Pandemic (H1N1) 2009 briefing note 2." July 13, 2009. [http://www.who.int/csr/disease/swineflu/notes/h1n1\\_vaccine\\_20090713/en/index.html](http://www.who.int/csr/disease/swineflu/notes/h1n1_vaccine_20090713/en/index.html).

AHW and AHS need to collectively define first responders and determine their placement in a risk category for immunization.

If infected, individuals living in close quarters such as care centres, group homes, correctional facilities and homeless shelters were also at high risk of spreading the disease. The homeless received the vaccine in the early stages of the immunization campaign. Immunization in correctional facilities for inmates and staff did not occur until November 23, 2009 when the vaccine was available to the general public. Immunization of inmates and staff needs to be re-examined to determine their placement in the appropriate risk category for immunization.

School-age children were not listed in the high-risk populations for the H1N1 pandemic as per the Public Health Agency of Canada guidelines<sup>22</sup> although children are excellent vectors for disease transmission. Had vaccine been available well before the pandemic peaked in Alberta, literature supported immunization of children first.<sup>29</sup> However, that was not the case so healthy children were appropriately approved for immunization November 21, 2009.

Seventy-one Albertans who had the H1N1 influenza died. Of the 71 deaths, 96% had high-risk factors such as chronic lung disease, chronic heart disease, obesity, asthma and diabetes. 31% of high risk groups less than 65 years of age were immunized. There were no deaths of pregnant women although they did comprise 12% of the hospitalized cases.

Were the right people immunized? There is agreement by AHW and AHS that Alberta could have likely done better if it had immunized the high-risk groups first. A recent study<sup>30</sup> using a computer simulation model based on the H1N1 experience supports immunizing high-risk individuals first and shows beneficial effects with respect to patient mortality and health care costs.

***It is recommended that:***

***AHW, AHS, and where applicable to their mandate AEMA develop a prioritization matrix that will facilitate immunization of the maximum number of defined populations at greatest risk in the shortest time.***

- ***Decision-making related to immunization strategies needs to be based on facts and supported by public health experts.***
- ***Determine appropriate placement in the hierarchy of vulnerable populations at greatest risk of developing severe complications.***
- ***Achieve consensus on the definition of first responders and essential services and their place in the hierarchy.***
- ***Achieve consensus on placement in the hierarchy of populations such as recipients of children and youth services, students in educational facilities and inmates in correctional services.***

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<sup>29</sup> Loeb, Russell M, M Moss, and L et al. "Effect of Influenza Vaccination of Children on Infection Rates in Hutterite Communities: A Randomized Trial." JAMA. 2010;303(10):943-950. March 10, 2010. <http://jama.ama-assn.org/cgi/content/full/303/10/943>.

<sup>30</sup> Lee, Bruce Y, et al. "A computer simulation of vaccine prioritization, allocation, and rationing during the 2009 H1N1 influenza pandemic." Contents list available at ScienceDirect, April 28 2010: 4875-4879.

### 3.3.4 Immunization in Pregnant Women and Young Children

Recommendations for immunization of pregnant women and young children from the Public Health Agency of Canada<sup>31, 32</sup> and World Health Organization<sup>33</sup> were confusing, changed during the fall of 2009 and were, on occasion, contradictory.

It is acknowledged that knowledge about the new vaccine was evolving. Nonetheless, the untimely and ambiguous recommendations for dosing in pregnant women and young children from national and international sources put Alberta in a vulnerable position where credibility of its public health decision-makers was jeopardized because of issues beyond their control. Perhaps more importantly, it is not known what relationship this ambiguity of information had with the relatively low immunization rates of pregnant women who are considered to be in one of the highest risk categories.

### 3.3.5 Vaccine Labelling and Packaging

It was known by the provinces and territories in early September 2009 that the vaccine would be packaged in a box housing 50 vials of adjuvant and 50 vials of antigen. The adjuvant was to have been added to the vial of antigen to provide 10 doses of 0.5 mL each. This package size was commonly referred to as a shoebox of 500 doses. Recognizing this package size was too large for many immunization clinics, Health Canada allowed repackaging of vaccine into smaller portions as of October 20, 2009.<sup>34</sup> Permission to repack was provided before the mass immunization clinics opened October 26, 2009; however no repackaging was done until mid-to late November, 2009. This delayed engagement of physicians and pharmacists who were able to provide immunizations but required smaller packages of vaccine to minimize wastage. Physicians received repackaged vaccine the week of November 24, 2009 while pharmacists did not get vaccine until December 10, 2009. AHS should consider a strategy for future repackaging of large sizes of vaccine to provide reasonable volumes for distribution.

According to AHW, discussion has occurred among federal/provincial/territorial pandemic planning groups about the need for their input on vaccine contract negotiations to address packaging and labelling requirements for vaccine. AHW is encouraged to pursue this action.

### 3.3.6 Use of Appropriate Resources to Maximize Immunization

Public health nurses have traditionally administered vaccines in Alberta. Administering vaccines is also within the scope of practice of physicians, pharmacists and paramedics. Historically, family practitioners in community-based medical offices provided approximately 30% of the seasonal influenza immunizations. For the H1N1 pandemic,

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<sup>31</sup> Public Health Agency of Canada. "Pregnant Women - Which H1N1 Flu Vaccine is Right For You?" October 30, 2009. <http://www.phac-aspc.gc.ca/alert-alerte/h1n1/vacc/pregvacc-grossvacc-bck-eng.php> (accessed October 7, 2010).

<sup>32</sup> Public Health Agency of Canada. "H1N1 Flu Vaccine: Dosing Recommendations." November 13, 2009. <http://www.phac-aspc.gc.ca/alert-alerte/h1n1/vacc/recommendation-recommandation-eng.php> (accessed October 7, 2010).

<sup>33</sup> World Health Organization. "Experts advise WHO on pandemic vaccine policies and strategies." *Pandemic (H1N1) 2009 briefing note 14*. October 30, 2009. [http://www.who.int/csr/disease/swineflu/notes/briefing\\_20091030/en](http://www.who.int/csr/disease/swineflu/notes/briefing_20091030/en) (accessed October 7, 2010).

<sup>34</sup> Health Canada. "Permission to Deliver Arepanrix H1N1 (AS03-adjuvanted H1N1 pandemic influenza vaccine) prior to the Authorization for Sale; Guidance on Redistribution and Re-packaging." Ottawa, Ontario, October 20, 2009.



AHW and AHS did not engage these resources early as they were concerned about a vaccine shortage after learning October 29 that the supply of vaccine would decline temporarily. They felt distributing the 500 dose package sizes to physicians and pharmacists who would not have used the full amount could have depleted the total vaccine available.

No remuneration agreement or immunization policy for pharmacists was available until November 20, 2009. 157 pharmacists provided provincially funded H1N1 vaccine. Despite the late engagement by pharmacists, results from a survey the Alberta College of Pharmacists conducted with its members<sup>35</sup> indicated 88% of respondents were very likely or somewhat likely to participate in a mass immunization program in the future.

AHS requested vaccine for administration by paramedics August 19, 2009. Correspondence from the Alberta College of Paramedics October 27, 2009 confirmed it was within the scope of paramedic practice to administer vaccine. It was not until November 26, 2009 that AHW and AHS released a protocol for administration of H1N1 influenza by paramedics. The Review Team could not identify the reason for the delay in supporting paramedics to administer vaccine.

Nursing and medical students were also able to administer vaccines but the review did not reveal why these students were not engaged in immunization.

AHW and AHS are strongly encouraged to engage resources such as general practice physicians, pharmacists, emergency medical service personnel and appropriate medical professionals in mass immunization campaigns when surge capacity is required.

### **3.3.7 Immunization Documentation**

All immunization data – demographics of the patient, identification of high-risk category, lot number of vaccine, date and information of the immunizing personnel – was manually collected on an AHS form (see Appendix III). Each day specific data from this form was collected for immunization statistics and entered into a database using additional transcription staff. The number of people immunized daily was manually calculated and sent to AHW. This process was laborious and prone to transcription errors. As well, information on real-time inventory of remaining doses of vaccine was not available to support important decision-making such as the closure of the mass immunization clinics on October 31, 2009.

*It is recommended that:*

*AHW and AHS develop a strategy for electronic documentation of immunization that provides real-time data such as vaccine inventory and wastage and information on numbers and populations immunized.*

### **3.3.8 Models for Scheduling Staff at Immunization Clinics**

The staffing model created by AHS to provide adequate staff coverage in the immunization clinics was based on a seven minute window required to immunize one person. Calculated time for immunization per person increased significantly in the second and subsequent

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<sup>35</sup> Alberta College of Pharmacists. "Pharmacists' Participation in 2009-2010 Alberta Influenza Immunization Program." Edmonton: Alberta College of Pharmacists, 2010.



weeks as fewer people presented for immunization at the clinics. AHS was challenged to relocate staff appropriately with changes to priority groups for immunization and no firm determinants of the number who would come for immunization on any given day. At times, staffing did not align with demand. An excess of staff at some clinics became the attention of the media and contributed to negative publicity about the pandemic response.

The debriefing AHS conducted in January 2010<sup>36</sup> voiced a need for a more effective staffing model. AHS is strongly encouraged to develop a model to guide staffing for mass immunization clinics that uses the experience from the H1N1 2009 influenza pandemic and considers various scenarios such as huge demand at the outset, fluctuating uptake by the public and varying quantities of vaccine.

### **3.3.9 Selection and Maintenance of Sites for Mass Immunization**

Public health had historically selected facilities for immunization of seasonal influenza that targeted seniors and individuals at risk for complications if infected with influenza. The dynamics of the mass immunization clinics for H1N1 immunization did not mirror that of the seasonal influenza campaigns. A broad spectrum of age groups and large crowds were common and assistance was required to manage the crowds.

AHS Protective Services indicated they could have added value to the selection of immunization clinics by examining security and safety for the public, access to parking, access to comfort measures, crowd control and traffic flow through. According to them, some immunization clinics were less than ideal and presented a potential safety hazard to the public. AEMA also had experience and resources to effectively conduct a risk assessment and select the most appropriate site for mass immunization clinics. They were not engaged in assessing the sites for immunization clinics.

Due to the unanticipated high demand for immunization in the first week, the Review Team was told the Department of Municipal Affairs directed AEMA to work with municipal emergency management personnel to establish additional immunization clinics. AHS had previously identified one of those additional immunization clinics and it was already being activated at the time of the AEMA request. The redundancy in selecting and activating immunization clinics and lack of clarity of who was responsible for selecting them was confusing and frustrating for those involved.

AEMA was requested to provide assistance to the mass immunization clinics for crowd control and management of the lineups of people waiting to be vaccinated. AEMA responded with strategies for line management. Although AEMA did not traditionally provide crowd control services, they contracted security forces for this purpose. The experience provided mixed results (i.e., some of the contract security were well versed in crowd control and were able to perform satisfactorily while others lacked the necessary skills and training).

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<sup>36</sup> Alberta Health Services. "Pandemic (H1N1) 2009 Post Incident Summary." Population and Public Health, March 1, 2009.

It is suggested that AHS, in collaboration with their Protective Services department and AEMA, develop a strategy for selection of appropriate immunization clinic sites, line management and control of crowds.

### **3.3.10 Wastage of Vaccine**

AHW was unable to provide information on vaccine wastage as AHS staff were not required to document and collect that data during the immunization campaign. It is standard procedure in the use of vaccines to document wastage. The HQCA Review Team was told by AHW that the wastage with seasonal vaccine was usually 2-5%.

AHW estimated a wastage range of 10 to 20% in the first week alone, which would equate to 32,000 to 64,000 doses. While staff encountered some difficulty in reconstituting and withdrawing the correct number of doses in the first few days, that number appears high given public health's experience in manipulating reconstituted medication and using vaccine.

When the high risk groups were determined, AHS staff endeavoured to follow the guidance given regarding eligibility for vaccine. Staff were put in a difficult position and had to use their discretion in terms of using up reconstituted vaccine at the end of the day to avoid wastage, as the vaccine has a shelf life of only 24 hours once reconstituted. If vaccine was administered to a person not identified as high risk, staff received criticism because it was perceived as queue jumping. Staff working in rural and remote communities would have to drive long distances, often after hours, to return reconstituted vaccine to storage. As a result decisions were made that it was better to discard the vaccine than to compromise staff safety.

Alberta received 2,216,000 doses where one dose equals 0.5 mL of vaccine.<sup>26</sup> At the end of the campaign, 1,018,926 doses remained unused.

The AHW immunization policy<sup>15</sup> is silent on methods for safe disposal of the vaccine as a biological agent and it was not known how the vaccine was discarded. The policy should include requirements for discarding unused vaccine. Furthermore, AHS needs to develop a strategy to accurately measure and document wastage of vaccine used in all pandemic immunization campaigns.

## **3.4 Antiviral Drugs**

Antiviral medications work by reducing the ability of many viruses to reproduce in the body. If they are taken within 48 hours of first symptoms, they can limit the severity of illness. The drugs also can prevent infection during a pandemic if the course of therapy begins before or promptly after close contact with an infected person. Two specific drugs, oseltamivir phosphate (Tamiflu®) and zanamivir (Relenza®), are currently approved for use in Canada and were used in Alberta during the pandemic.

### **3.4.1 Supply and Documentation**

Over the past years AHS and AHW have worked to ensure an ample supply of antiviral drugs for use in a pandemic. Three sources of antiviral drugs were combined to provide coverage for approximately 26.2% of the population in Alberta in the case of a moderate pandemic; AHW and AHS each purchased antivirals for their own stockpile and had access

to the federally-owned stockpile. Given that the model for stockpiling antiviral drugs was developed several years ago, AHW should update it to accommodate varying population demographics and severity of disease.

Quantities of antiviral drugs were prepositioned in aboriginal communities as well as provincial and federal correctional facilities to ensure quick access when required.

Although guidelines for treatment of the H1N1 influenza of April 28, 2009 contained some information on the use of antiviral drugs,<sup>37</sup> a directive and detailed guidance on using antiviral medications for the general population came late in the process, just before the peak of wave 2. The "Antiviral Dispensing Policy for Pharmacists / Community Pharmacies during the Pandemic (H1N1) 2009 Response"<sup>38</sup> was issued October 19, 2009. The Chief Medical Officer of Health approved the release of the antiviral stockpile and provided guidelines for antiviral use to all physicians on October 21, 2009.<sup>39</sup> Before that, access to the AHW stockpile was only by request directly to the Chief Medical Officer of Health. Access to the AHW stockpile ended on April 30, 2010 and unused AHW stockpiled antivirals distributed to pharmacies were to be returned to AHW.

AHS arranged for stockpiled oseltamivir (Tamiflu®) to be distributed to pharmacies using a single drug wholesaler. This provided seamless and familiar access of the antiviral for community pharmacies and is viewed as a leading practice in Canada. AHW limited the public access of zanamivir (Relenza®) to AHS facilities to reserve its use for oseltamivir-resistant cases. This meant that patients requiring zanamivir could obtain it only by visiting already busy emergency departments. The need to restrict access to zanamivir should be re-examined using education for the prescribers and adequate controls within community pharmacies.

AHW was responsible for monitoring distribution and dispensing of all antivirals and relied on weekly reports from AHS that were a mixture of manual and electronic documentation. AHS reported that the process of tracking and communicating the distribution and dispensing of antiviral medication was cumbersome and complex. AHW is strongly encouraged to develop a robust electronic tracking system for stockpiled antiviral drugs in a pandemic that captures and differentiates use by the general public and any other relevant groups such as health care workers.

The AHW antiviral policy for pharmacy did not provide guidance on responsibility for stock rotation and return of expired goods and should be updated with that information. About 10% of all stockpile antiviral drugs were used but a significant amount of the supply is nearing the end of its shelf life at the time of writing this report. Further guidance on stockpiling and restocking antivirals will be completed by AHW in conjunction with the Public Health Agency of Canada and a federal/provincial/territorial group of experts.

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<sup>37</sup> "Guidelines for Human Swine Influenza A (H1N1)." Correspondence from AHW Chief Medical Officer to all Alberta (physician) members, April 28, 2009.

<sup>38</sup> Alberta Health and Wellness. "Antiviral Dispensing Policy for Pharmacists/Community Pharmacies during the Pandemic (H1N1) 2009 Response." Government of Alberta, October 19, 2009.

<sup>39</sup> Alberta Health and Wellness. "Influenza Antiviral Prescribing Guidelines for Pandemic (H1N1) 2009 and Availability Through Community Pharmacies." Government of Alberta, October 21, 2009.

### 3.4.2 Prescribing

Through collaboration between AHS, AHW and the College and Association of Registered Nurses, the Minister of Health and Wellness issued a directive granting registered nurses in the Influenza Assessment Centres temporary prescribing privileges for the antiviral drug oseltamivir (Tamiflu®). According to an AHS survey<sup>40</sup> conducted with personnel who worked in the Influenza Assessment Centres, only 17.1 % of the RNs prescribed oseltamivir but all respondents felt the Minister's directive had a positive impact on supporting Albertans to receive prompt access to antiviral medications.

### 3.4.3 Prevention and Treatment Guidelines

The AHW followed the Public Health Agency of Canada guidelines<sup>41</sup> for use of antiviral drugs that stated they were reserved for individuals with severe illness as a result of H1N1 or who were in one of the high-risk groups. The antivirals were not to be used in individuals with mild symptoms or to prevent infection in individuals who were likely to be exposed to the virus. The direction for use of the antiviral drugs allowed prescribers to use clinical judgment,<sup>42</sup> leaving some flexibility in prescribing.

The Public Health Agency of Canada guidelines on antiviral drug use have been criticized by the CSA Standards Roundtable<sup>9</sup> which stated “Nearly all major pandemic plans outside Canada consider the prophylactic use of antivirals ... to protect health care workers and first responders. The goal is to contain outbreaks by reducing the early transmission of a new and virulent strain. The existing Public Health Agency of Canada Plan does not address pre-exposure prophylaxis for health care workers and first responders, no matter how severe the influenza pandemic.”

While both AHW and Public Health Agency of Canada did not recommend commencement of therapy after 48 hours of onset of influenza-like symptoms, AHW did recognize and support using antivirals past the 48-hour limit in isolated severe and critical cases.<sup>43</sup> This benefit had been demonstrated in Winnipeg intensive care unit patients where improved morbidity and mortality correlated with antiviral use<sup>44</sup> and many provinces, including Alberta, implemented similar protocols. Of the 241 AHS patients who were positive for H1N1 and admitted to an intensive care unit, 206 received antivirals, 18 were not given antivirals and there is no information available for 17 of the cases.<sup>45</sup>

AHW's position on use of antivirals did not align with that of AHS. AHS physicians and senior leaders supported the use of antivirals in people with clear risk factors for severe illness who presented with or without influenza symptoms. AHS also supported use of antivirals in staff who showed any influenza-like symptoms to prevent more severe illness

<sup>40</sup> Alberta Health Services. "Draft Staff Survey Report for Influenza Assessment Centres (IACs)." January 2010.

<sup>41</sup> Public Health Agency of Canada. "Pan-Canadian public health network council report and policy recommendations on the use of antivirals for prophylaxis during an influenza pandemic." June 2007. <http://www.phac-aspc.gc.ca/publicat/2008/prapip-uappi/03-eng.php>.

<sup>42</sup> Alberta Health and Wellness. "Clinical Decision-Making Tool Pandemic (H1N1) 2009 Influenza." Government of Alberta, November 5, 2009.

<sup>43</sup> Alberta Health and Wellness. "Clinical Decision-Making Tool Pandemic (H1N1) 2009 Influenza." Government of Alberta, October 21, 2009.

<sup>44</sup> Zarynchanski, Ryan. "Lessons from the H1N1 Pandemic." Banff, Alberta: Presented at Canadian Society of Hospital Pharmacists, Western Branches Seminar, March 21, 2010.

<sup>45</sup> AHW Surveillance Personnel email message to HQCA Review Team. Alberta, May 19, 2010.

and reduce the number of sick days. Prevention of illness with use of antivirals in staff families was similarly supported by AHS.

Rationale for the conservative use of the antiviral drugs was based on concern of resistance emerging from widespread use. At the time of the pandemic, only a handful of pandemic viruses resistant to oseltamivir had been detected worldwide, despite the administration of many millions of treatment courses of antiviral drugs. The December 2, 2009 WHO briefing note number 18,<sup>46</sup> identified 96 documented cases of oseltamivir resistance in H1N1 viruses, around one-third of which were in severely immunosuppressed or immunocompromised patients where virus replication can persist for prolonged periods of time. While the need for continuing vigilance on emerging resistance is recognized, decisions for use of antivirals must be made on available evidence.

*It is recommended that:*

***AHW and AHS collaboratively clarify roles and responsibilities for developing drug policies related to the pandemic and determining how they will be used.***

#### **3.4.4 Dispensing**

Patients who were prescribed antivirals within the clinical guidelines received the medication at no cost from the AHW stockpile. Prescriptions not covered by the clinical guidelines were the responsibility of the patient and were accessed from pharmacy-owned stock. Pharmacies were reimbursed for their dispensing fee through Alberta Blue Cross. More than 46,000 antiviral prescriptions were provided to Albertans. Dispensing by pharmacists served as one of the best surveillance markers for incidence of H1N1.<sup>18</sup>

### **3.5 Health Workforce Utilization and Protection**

The AHS pandemic plan recognized the health care workforce is critical in a pandemic and it is imperative to support their health and well-being. To reduce “H1N1 related disease and work related fatigue and stress”, their “goal (was) to have effective human resource planning to ensure the optimal number, mix and distribution of health care workers (were) available to sustain the health system”.<sup>2</sup>

The Alberta’s Plan for Pandemic Influenza indicated the “AHW emergency operations centre monitors the health workforce capacity across the province.”

#### **3.5.1 Responsibility for Health Workforce Protection**

The Alberta Plan states that “although health care workers are employees or contractors of AHS or other health-care organizations, there is an expectation that AHS is as self-sufficient as possible”.<sup>1</sup> The plan specifies that “during a pandemic (based on authorities provided to the Minister of Health and Wellness under the Public Health Act), AHS is required to provide adequate human resource distribution to other organizations (e.g., continuing care, First Nations and Inuit Health, etc.)”. The implications of this requirement were not clear and it was not known if AHS was aware of this requirement prior to the pandemic response.

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<sup>46</sup> World Health Organization (WHO). “Oseltamivir resistance in immunocompromised hospital patients.” December 2, 2009. [http://www.who.int/csr/disease/swineflu/notes/briefing\\_20091202/en/index.html](http://www.who.int/csr/disease/swineflu/notes/briefing_20091202/en/index.html).

Regardless, as the pandemic response widened, AHS's responsibility for the 90,000 health care employees in its facilities increased to an estimated 208,000 health care workers in the entire province.

It was not clear to AHS if being responsible for other health care providers such as community physicians, physician office staff and long-term care staff employed by private providers included provision of personal protection equipment and supplies, education of staff on infection prevention control practices, ensuring compliance to occupational health and safety standards and ensuring access to early immunization. Funding from AHW to support these services was not available during the pandemic.

***It is recommended that:***

***AHW and AHS jointly determine the roles and responsibilities of AHS for health care workers not under the direct jurisdiction of AHS in a public health emergency.***

### **3.5.2 Human Resource Management**

The positive response of staff, physicians and managers/administrators to step up to the plate at the time of need was a strong theme presented by interviewees. The review recognized countless individuals from AHS and AHW volunteered many hours beyond their regular hours of work to address the events of the pandemic.

Not all required positions could be managed with volunteerism and paid overtime. A challenge for AHS was that the new organization did not yet have a robust human resource management system that could be used to match the clinical skills of each individual available for deployment with vacancy needs. People with nursing backgrounds were deployed to priority services such as the immunization clinics, but sometimes without consideration for the areas they were being pulled from. For example, staff reduction of people with nursing backgrounds in the AHS Patient Concerns Department stretched that department's ability to deal with public and patient concerns.

Staff was uncertain about when to return to work if they had influenza-like illness symptoms. While the AHS directives indicated they were to remain home for seven days after the onset of symptoms, staff would have preferred to come back sooner if they knew they did not have H1N1 influenza. However laboratory testing for H1N1 was restricted to hospitalized patients and staff at home with influenza-like illness had little choice but to remain away from work for the requisite seven days.

The compilation of the AHS Pandemic H1N1 (2009) Human Resource Manual November 12, 2009 provided significant guidance to staff. It was not released until all sections were completed, delaying the final distribution. In hindsight, AHS acknowledged they should have released components of the manual as they were available. AHS has committed to updating this manual regularly and is considering expanding the applicability of the human resource requirements beyond pandemic to other broader public health emergencies.

Union groups were cooperative and supportive throughout the pandemic response. They provided input into parts of the AHS Human Resource Manual and vetted work done for



occupational health and safety. The United Nurses of Alberta worked with AHS to develop a joint document addressing human resource needs and requirements.<sup>47</sup> There were no grievances filed during the pandemic response.

### **3.5.3 Use of Personal Protective Equipment including N95 Masks**

The use of personal protective equipment, especially respiratory barriers like masks that can filter out infectious particles, is an important stop gap early in a pandemic.

Direction and guidance on the use of personal protective equipment and practices from national as well as federal/provincial/territorial groups was slow to arrive to health care decision-makers. Therefore, there was also a delay in Alberta to communicate clear direction. The delay led health and non-health staff to access information from a variety of sources which were not entirely congruent on the choice of personal protective equipment. Once AHW and AHS websites were established, they became the primary source of information for health care workers.

Within AHS, the roles of infection prevention control and occupational health and safety and the corresponding responsibility for personal protective equipment standards were not clear. AHS infection prevention and control resources recommended surgical masks as sufficient protection against droplet transmission of H1N1 whereas AHS Workplace Health and Safety followed the occupational health and safety legislated requirements in the Alberta Employment and Immigration document "Best Practice Guideline for Workplace Health and Safety during Pandemic Influenza".<sup>48</sup> The latter recommended N95 masks that filter 95% of particles in an aerosolized form. Surgical masks are not designed to protect the wearer from inhaling aerosolized particles. They will trap some particles but are much less effective than the N95 mask. AHW supported a Public Health Agency of Canada guideline requiring the use of surgical masks.

AHS was bound by law to use Alberta Employment and Immigration directives and accepted the N95 mask as the standard where there was aerosol generating procedures or where staff had close contact (within two meters) with a vigorously coughing individual who was unwilling to wear a mask. This late acceptance of Alberta Employment and Immigration's directive indicates this organization should have been involved earlier in the provincial pandemic planning.

The United Nurses of Alberta endorsed the position of the US Center for Disease Control where N95 masks were required at all times.

The change in personal protective equipment requirements to use the N95 masks created confusion among the staff who had been previously informed that surgical masks were adequate. Fit testing of the N95 masks had to be done for every staff member. As surgical masks were still appropriate in certain circumstances, staff had to be educated about the

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<sup>47</sup> Alberta Health Services: Emergency/ Disaster Preparedness, Public and Population Health. "Alberta Health Services Pandemic Influenza Operational Guide (Annex 17: AHS and UNA Joint Statement: Responsiveness in a Pandemic Situation)." Calgary, Alberta, March 2010.

<sup>48</sup> Work Safe Alberta. "Best Practice Guideline for Workplace Health & Safety During Pandemic Influenza: Including employment standards rights and obligations." 2009. [http://www.employment.alberta.ca/documents/WH/WH-PUB\\_bp002.pdf](http://www.employment.alberta.ca/documents/WH/WH-PUB_bp002.pdf).

point of care assessment decision matrix used to determine the type of respiratory protection each individual patient required.

To add to the logistical challenges, AHW expected AHS to provide personal protective equipment and education on their use for the 120,000 health care workers who were not AHS employees as per the directive to in the Alberta Plan. . AHS's stretched resources could not consistently provide education to the community of non-AHS health care workers.

AHS had stockpiled sufficient surgical masks but their supply of N95 masks was limited due to a global shortage. AHW participated in a federal/provincial/territorial procurement initiative to obtain a surge capacity of N95 masks for provincial use. Fit testing of the N95 masks was specific to the brand. Use of a non-standard brand in the South zone necessitated repeat fit testing of a limited number of health care workers to align with the different brand.

The attention on the N95 masks resulted in a of loss of focus on other important personal protective equipment measures such as gowns, eye protection, gloves, processes and procedures, work flow, hand washing, immunization and other factors.

The use of N95 masks versus surgical masks was still not resolved at the time of writing this report and it is important, that in the near future, AHS, AHW and Alberta Employment and Immigration collaboratively develop a process to select a respiratory barrier to aerosolized droplets of a specific virus using scientific information.

***It is recommended that:***

***AHW, AHS and Alberta Employment and Immigration collaboratively develop a structure and process that:***

- ***delineates the roles and responsibilities of each organization to address occupational health and safety and infection prevention and control issues.***
- ***uses scientific evidence to change standards when necessary.***

### **3.5.4 Immunization with H1N1 Vaccine**

Designated staff immunization clinics were established largely within AHS health care facilities as soon as the vaccine was available. Staff clinics opened October 22, 2009. Staff in contracted-service facilities were required to travel to AHS facilities to receive their immunization.

Initially all health care workers were eligible for immunization and did not require identification to receive their immunization. When the mass immunization clinics were closed October 31, 2009, staff immunization clinics closed as well and reopened November 5, 2009 with a prioritization for immunization eligibility. Categories of high, medium and low priority were established but the definitions were not clearly understood by all staff and the HQCA Review Team was told that many felt they were applied incorrectly.

Immunization rates were 78% for AHS staff and 52% for all health care workers in the province. The numbers may not be accurate as it was known that non-staff members received immunizations at staff clinics.



### **3.6 Surge Capacity**

For organizations to effectively respond to emergencies, they must have the ability to assess needs and expand their services to care for an increase in patients that exceeds normal operating capacity. This ability is called surge capacity. Managing surge capacity requires an incident management structure, including an effective communication system.

Plans for surge capacity should include short-term needs as well as long-standing demands on the system. These plans should anticipate that prolonged response to the pandemic may reduce the capacity to provide regular services.

Over approximately the last two decades cost reductions in health care have resulted in lean staffing levels with limited resilience to take on significant additional capacity. At the time of the pandemic, AHS had implemented a vacancy management program that limited hiring new staff.

#### **3.6.1 Critical Care Services**

A provincial approach to critical care services had been established and continuously improved well before any documented cases of H1N1 influenza in Alberta. The AHS Critical Care Network linked critical care services across the province, including intensive care units in Covenant Health (Catholic provider of health care in Alberta) and was well-positioned to support the care of severely ill influenza patients. Telemedicine was used to connect geographically disparate sites for consultation.

Critical care prepared extensively for redeployment. A skills profile for redeployment requirements was created and matched with their staff. Contingency plans were in place to recall staff who had worked in intensive care units in the past. Staff returning to the intensive care unit were offered education and additional training that was monitored by senior critical care staff. Staff were described as exceptional and did a phenomenal job meeting the high demands of intensive care both individually and on a collective basis.

A plan to increase intensive care unit capacity and accommodate more patients included overflowing intensive care unit beds into the operating room if the number of pandemic cases had become more critical. This plan did not have to be activated.

AHS had purchased additional ventilators in advance, recognizing the need for this critical equipment in treating patients infected with the H1N1 virus and experiencing respiratory complications. AHW arranged to access ventilators from the national stockpile but these ventilators did not meet some of the requirements of caring for intensive care unit patients. To assist intensive care unit patients in hospitals without necessary ventilators, AHS sent both ventilators and respiratory technicians to operate the ventilators to the other hospitals. From a patient perspective, this relocation of equipment and staff to the site requiring the resources is much preferred to transferring the patient to a hospital with specialized services. AHS indicated this leading practice will likely continue in the future.

Despite their readiness, the HQCA Review Team was told the lack of surge capacity in the health care system severely taxed Alberta's critical care systems.

#### **3.6.2 Emergency Department Services**

Prior to wave 2, AHW developed a plan for emergency department services. The HQCA Review Team was told by several zone leaders that the plan did not adequately consider the

needs of rural emergency departments and its patient populations and was not adaptable to physical layouts of all emergency departments. In most cases, the plan enabled staff to respond to the significant increase in patient load. Additional staff were deployed to meet increased demand and new staff were subject to a standardized orientation and education.

The general design and layout of an emergency department presented challenges to provide adequate infection control. Patient areas are generally separated by curtains rather than walls and isolation of infected patients who could transmit the illness by sneezing or coughing was a major concern. There were a sufficient number of N95 masks available to all emergency department personnel for their protection against infection by aerosolized droplets.

Patient flow in the emergency department was facilitated by expansion of inpatient capacity in acute and long-term care. Pediatric cases seen in the emergency nearly doubled in volume at the tertiary sites, which aligned with the national findings.

While most emergency departments were staffed with skilled triage personnel, a triage tool specific to the H1N1 influenza had not been developed. AHS has since drafted a pandemic triage tool and implementation plan.<sup>49</sup> The Emergency/Disaster Preparedness, Public and Population Health division of AHS expressed hope that this triage tool will be given due consideration, revised as necessary and implemented as soon as possible.

Without a common system, it was a challenge to communicate staffing changes and schedules. Large volumes of information were available from AHS but the HQCA Review Team was told by several zones this information did not reach their emergency departments in a timely manner.

AHS public advisories strongly encouraged the public to first seek help from Health Link, an AHS-operated telephone advice and health information service. However, wait times with Health Link were often lengthy as a result of their seven fold increase in workload<sup>17</sup> and some people opted to go to the emergency department anticipating a shorter wait. This added to the burden of emergency departments.

Despite the numerous challenges presented to the emergency department, staff were highly commended for overcoming these challenges in providing service to the public. No comments are provided on the clinical care of the patients seen in the emergency department as individual patient care was beyond the scope of this review.

### **3.6.3 Influenza Assessment Centres**

Creation of Influenza Assessment Centres to assess people experiencing influenza-like illness had been addressed in the AHS pandemic plan<sup>2</sup> and referenced in the AHW pandemic plan.<sup>1</sup> High patient volumes in emergency departments prompted the opening of Influenza Assessment Centres in Medicine Hat, Lethbridge, Edmonton and Calgary and several smaller centres in rural areas. Influenza Assessment Centres saw 10,000 people, relieving some of the pressure on emergency departments.

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<sup>49</sup> Alberta Health Services: Emergency/ Disaster Preparedness, Public and Population Health. "Alberta Health Services Pandemic Influenza Operational Guide (Appendix G: Prioritized Care Framework)." Calgary, Alberta, March 2010.

Organizers anticipated the public would migrate to facilities where they traditionally received care. Locating the Influenza Assessment Centre close to acute care facilities would minimize the travel time for the public and provide proximity to treatment of emergency situations that might arise. Calgary, Medicine Hat and Red Deer struggled to find appropriate space within a short time. The Influenza Assessment Centres in rural areas were often created as an extension of the hospital emergency department, usually in an ambulatory care area.

Staffing for the Influenza Assessment Centres was organized within significantly short timelines. A delay in opening the Influenza Assessment Centres, followed by a very short notice of their activation, resulted in some staff shortages as they had made other commitments during the hiatus. Conversely AHS intended to close one Influenza Assessment Centre later in the pandemic because of low patient volumes and planned to reassign staff to areas of higher need. However, because the operation of the first response units was suspended in the area and the impact of that suspension was unknown, the operations of the Influenza Assessment Centre were extended..

Staff often commenced work with minimal orientation. The findings of this review align with the Influenza Assessment Centre survey<sup>40</sup> results, which identified the need for adequate orientation, education and training for new staff.

#### 3.6.4 Immunization Clinics

Section 3.3.8 *Models for Scheduling Staff at Immunization Clinics* commented on the need to ensure sufficient human resource capacity to accept a large volume of public seeking immunization in the first week clinics are open.

Despite support from the highest level of operational command within AHS, staff redeployed to the immunization clinics frequently maintained a dual role in performing their day-to-day functions. AHS and AHW need to develop a strategy for relieving staff of their regular duties or changing expectations when deployed to new positions for the pandemic.

The AHS survey of staff who worked in the immunization clinics reported 46% of respondents were satisfied with their job during the immunization campaign but no respondents reported being very satisfied.<sup>50</sup> Comments on ways to improve staffing included the need to establish more appropriate staffing levels in response to volume demands and the need to align and promote the use of the right skill sets and numbers of staff for the required functions.<sup>47</sup>

#### 3.6.5 Health Link – Health Information Services

AHS Health Link, a 24-hour-a-day, 7-day-a-week nurse telephone advice and health information service accessed through a 1-800 number, played a vital role in responding to calls for information and/or direction during the course of the pandemic. It was estimated call volumes would increase four-fold. In fact, the volume increased seven-fold within a short period of time. During the first wave, there were 1,548 calls about cough and/or influenza-like illness referred to medical care. It was estimated that approximately 13,000

<sup>50</sup> Alberta Health Services. "Pandemic (H1N1) 2009 Immunization Campaign Survey Report." July 9, 2010.

cough and/or influenza-like illness calls were referred to medical care during the second wave. During both waves 1 and 2, it was estimated that 27,500 cough and/or influenza-like illness calls were not of an emergent nature and callers were judged, by Health Link personnel, to be capable of managing their illness at home.<sup>18</sup>

Due to the evolving nature of the influenza, the pathology of the virus and preferred treatment modalities, Health Link's guidelines and protocols required regular updates. Despite this, staff incorporated the new information into their responses in a timely fashion. Additional staff was necessary to respond to the significant increase in call volume but the vacancy management system within AHS delayed the hiring process. There was insufficient time to orient all new staff to the electronic data entry system and a paper-based system had to be implemented to accommodate the expanded work force.

### **3.6.6 Other Resources for Enhanced Surge Capacity**

The use of physicians, pharmacists and emergency medical services personnel for immunization purposes was discussed in section 3.3.6 Use of Appropriate Resources to Maximize Immunization. These resources could have been used to boost surge capacity.

To prepare for a potential staff shortage, the regulatory bodies of medicine and nursing and pharmacy cooperated with AHW to contact retired and/or inactive members willing to return to work. The College & Association of Registered Nurses of Alberta prepared to reactivate licensure of registered nurses who retired or were otherwise inactive. Recall of inactive pharmacists and physicians was not necessary.

AHS implemented their Flu Response Units, which were operated by AHS emergency medical services, to respond to influenza-like illness calls to reduce the strain on regular service ambulances. Each unit was stocked with personal protective equipment, assessment kits, communication equipment and one driver. The Flu Response Units used a card system that assisted dispatch staff in identifying the severity of illness of suspected influenza patients who called for help and supported appropriate utilization of scarce emergency medical services, hospital, and community health care resources. While the Flu Response Units worked well, the emergency medical services personnel identified that the card system often underestimated the severity of influenza and needed to be revised.

During seasonal influenza campaigns, large organizations had historically received vaccine for their staff. Although several employers requested vaccine, it was not provided and employees were required to attend mass immunization clinics.

AHW, AHS and AEMA staff are commended on their dedicated service and long hours of work during the pandemic. The Review Team was told, however, that the workload of AHW staff in the emergency operations centre was unsustainable and staff were close to burnout at the end of the pandemic. Similarly, AEMA staff communicated similar concerns of sustainability within their workforce. Surge capacity for pandemic response within AHW and AEMA needs to be reviewed for adequacy over a sustained period of time.

## **4.0 Communication**

*“There was terror afoot in 1918, real terror. The media and public officials helped create that terror – not by exaggerating the disease but by minimizing it, by trying to reassure. The fear, not the disease, threatened to break the society apart. So the final lesson, a simple one yet one most difficult to execute, is that those*

*who occupy positions of authority must lessen the panic that can alienate all within a society. Those in authority must retain the public's trust.”*<sup>51</sup>

*“Rapid, accurate communication is vital in a crisis, but this seemed to be the first casualty in the 2009 H1N1 pandemic. We saw the same problem with SARS in 2003. Clearly this is a common problem in a rapidly changing infectious disease situation, which means we have to find a way to operate within this ‘new normal’ –which should include an integrated communications structure amongst federal/provincial/territorial levels.”*<sup>9</sup>

Many interviewees identified the communication of emerging and changing information to multiple audiences with varying needs as the number one challenge in responding to the pandemic.

## **4.1 Federal Communication**

### **4.1.1 Information from the Public Health Agency of Canada (PHAC)**

The role of the Public Health Agency of Canada as a national coordinator for the pandemic influenza response is described in section 1.1.1 *Federal Players*.

A common sentiment expressed to the HQCA Review Team was that the clinical guidelines originating from Public Health Agency of Canada were not timely and lengthy compared to the concise and clear information physicians and other health care providers require. Medical Officers of Health in the zones particularly expressed extreme challenges and frustrations with the timeliness of decisions from Public Health Agency of Canada. Multiple versions of the widely distributed Public Health Agency of Canada guidelines were an added problem. Clinicians told the Review Team they frequently found they were not all working from the most recent version. The physician co-lead for AHS Acute/Community Operations Section provided a valuable service by distilling the Public Health Agency of Canada documents into shorter ones.

## **4.2 Provincial Communication**

### **4.2.1 Responsibility for Communication**

AHS and AHW have separate communications departments. In the Government of Alberta, the Public Affairs Bureau provides communications support to government ministries and helps inform Albertans about government programs and policies. The Public Affairs Bureau also coordinates communications for cross-government initiatives and during public emergencies and reviews messages for release to the public to ensure they are congruent with departmental and governmental policy. Members from the Public Affairs Bureau reside in various government departments.

The AHS Department of Communications is responsible for media relations, organizational engagement, operational communications and government relations. In the AHW pandemic plan and the AHS operational plan, the roles and responsibilities for communication were articulated. However, the following areas require clarification:

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<sup>51</sup> Barry, J M. "The Great Influenza. As cited in Regional Health Authorities Provincial Communications Council Interregional Pandemic Influenza Communications Planning Project, Tailoring Draft p. 12 (Annex 24.1 AHS Operational Plan)." February, 2007.

- Who is responsible for communicating what type of information with stakeholders and partners?
- AHW, AEMA and AHS differ in their views regarding responsibility for communicating with the municipalities although AHW currently identifies AEMA and AHS as holding this responsibility.
- Both AHW and AHS claim responsibility for providing self-help information to the public and introducing public health containment measures as necessary. AEMA is also identified in the AHW pandemic plan as having responsibility to “work with AHS to provide information and advice to the public”.<sup>1</sup>

Both AHS and AHW communications departments were required to provide information to the public, internal staff, physicians, contracted providers, stakeholders, the media and in many cases, politicians. Multiple audiences with differing expectations about the role of communications and message deliverables made it challenging for communication departments to provide a product that satisfied everyone. Multiple interviews conducted by the Review Team revealed dissatisfaction with several of the final communication products.

#### **4.2.2 Communication from and between the AHS, AHW and Zone Emergency Operations Centres**

One of the major roles of the AHS Emergency Coordination Centre and the AHW Emergency Operations Centre was to ensure timely and accurate communication to all players and stakeholders. Favourable feedback was made on the usefulness of the regular morning and afternoon teleconferences between the two emergency operations centres. However, the HQCA Review Team was told in multiple interviews that communication of information in a timely manner to meet the clinical needs of those directly involved in the pandemic response did not always receive top priority while messaging through the media seemed to be a constant focus.

A significant number of interviewees felt AHW and AHS struggled to find a satisfactory balance between providing accurate and timely public service announcements and the desire to ensure positive public perception of the management of the pandemic. The HQCA Review Team heard repeatedly that edits to information prepared by clinical personnel sometimes changed the intended message.

Information recipients were overwhelmed with the volume of communication and concerned that vital information may have been overlooked in the attempts to sift through all the information on a regular basis especially within tight timelines. Staff in the zone emergency operations centres did not feel they required all the information they received but recognized that AHS’s provincial approach to communicate with multiple audiences with different requirements resulted in more information sent to all.

Time for approval of all public messages was frequently viewed as excessively lengthy by the zones. For example, during the pandemic the South zone required a communiqué to advise the public to attend the Influenza Assessment Centre for any minor influenza-like symptoms to decrease the burden on emergency departments. Provincial review and approval of the communiqué resulted in a further delay of five days before the public were advised of the correct venue for assessment of their symptoms. In the meantime, the public continued to seek treatment for influenza-like symptoms at emergency departments.

To date, evaluation of the effectiveness of communication from the Government of Alberta and AHS has not included solicited feedback from the many recipients of that communication. The Public Affairs Bureau and Communication Departments of AHW and AHS are strongly encouraged to solicit feedback from a wide range of their audiences, including the public, to help evaluate the effectiveness of their communication.

#### **4.2.3 Communication with Municipalities and Stakeholders**

Emergency management personnel from several municipalities and schools conveyed that it was difficult to get information they requested from the Government of Alberta, AHS or AEMA in the early part of the pandemic response. Municipal emergency management groups and the University of Calgary were not able to access hand washing posters from AHS. Advanced Education cited a delay in approval of guidelines by AHS. Translation of educational documents into French by Alberta Education was slow. Lack of effective communication may have been attributed to the lack of clarity around responsibility for communicating with municipalities and stakeholders identified in section 4.2.1 *Responsibility for Communication*.

#### **4.2.4 Frequently Changing Messages about Immunization Clinics**

Some of the most difficult communication challenges related to the ongoing changes of the mass immunization clinics. The HQCA Review Team was told that the hardest thing to deal with was the decision to open the immunization clinics to all Albertans when AHW and AHS had planned for a rollout of vaccine to priority groups first. Clinics had not been staffed for the crowds that responded to the invitation that communicated “no one would be turned away”. The preferred message that could have been sent to communicate that immunization would be rolled out in phases could have been, as suggested by some interviewees, “Do not worry; we will get to you”.

Changes in clinic times and locations and limited advertisement of hours of operation caused a major disruption for nurses and the public. Although the AHS website had clinic locations in real time, not all Albertans used the internet-based website as their primary source of information. Newspaper ads could not keep pace with the change of information that was often obtained after the ads went to press.

The 15 to 30 age group had the lowest immunization rates. Important messages about the H1N1 influenza may have been better communicated using media familiar to them. AHS acknowledged the need to consider use of social media to a greater extent in future public health communiqués.

Messages about the reopening of the clinic to high-risk groups caused confusion for both public and staff. Strict compliance to immunizing only the high-risk group identified was not always feasible in rural areas where the public, including individuals who may not have been eligible for immunization, travelled long distances to the clinics and/or when a family with mixed eligibilities presented to the clinics. AHS staff were often required to make difficult judgment calls on who should get immunized each day when scrutiny on queue jumping of eligible people was high.



#### 4.2.5 Communication with Health Care Providers

As the science about H1N1 emerged, treatments, guidelines and policy documents needed to change accordingly. Health care providers accessed multiple sources of information. The Center for Disease Control, Public Health Agency of Canada and the World Health Organization all provided insight and direction but sometimes contained conflicting information. Health professionals were actively seeking one credible source for guidelines on critical clinical issues.

Communication systems for health care in the province were evolving at the time of the pandemic. During the inter-wave period, AHS established a call centre in Calgary staffed weekdays and available as a single point of contact for staff and physicians. The centre staff included personnel with expertise in human resources, public health, communications, health workforce safety and infection prevention and control. AHS staff newsletters were disseminated and two provincial town hall meetings were held for staff during wave 2. Prior to wave 2, information for staff and physicians from the historical regional health authority intranet websites was added to the external AHS website. Discussion is underway about one website for AHW and AHS or separate websites that are linked. It has been noted that separate websites may be of benefit by accentuating the division of roles and responsibilities of AHW and AHS. Additionally, linkages to the AEMA website should also be considered.

It was not readily apparent which organization was responsible for communicating with all physicians across the province at a time of crisis or emergency. The College of Physicians and Surgeons, AHS and AHW all had a role communicating with physicians. One of the main challenges was selecting the optimal medium. Electronic messages to physicians had to be channelled through the College of Physicians and Surgeons but the College seamlessly facilitated e-mail access to more than 90% of its members. Information was alternatively faxed to medical clinics but without assurance that the one facsimile sent to one clinic was received by multiple physicians in that clinic. The best medium for communicating with physicians still needs to be identified.

Pharmacists commented in the Alberta College of Pharmacists survey<sup>35</sup> that information about the immunization processes was untimely, conflicting, unclear and fragmented.

AHW and AHS are strongly encouraged to work with the health professions to determine their communication needs and the medium that most consistently reaches the maximum number of its members during a public health emergency.

***It is recommended that:***

***AHW and AHS develop a plan for communicating with health professionals to create and disseminate critical clinical guidance documents and information in a timely way during public health emergencies such as the pandemic.***

#### 4.2.6 Relationship with the Media

A strong and trusting relationship with the media is critical in public health emergencies such as the pandemic. As discussed in the CSA Report<sup>9</sup> on pandemic preparedness, “participants also saw the media and social media as valuable allies in effective communications and saw a need to set the foundation for a non-adversarial relationship by educating key producers, editors, reporters and bloggers about the need for informed and



responsible reporting during a potentially serious pandemic. Such dialogue is also a way to better understand what the media need to know to carry out their duties so that information feeds this back into the overall communications plan.”

A common theme heard by the HQCA Review Team was a concern about negative responses by the media to AHW and AHS decisions. As a result, dealing with the media became a significant issue and challenge affecting the communication and clinical staff responsible for messaging. The favourable news releases presented jointly by the AHW Chief Medical Officer of Health and the AHS Senior Medical Officer of Health have been described in section 3.1.1 *Leadership*. AHW held several other news conferences from the beginning of wave 1 to just before the end of wave 2. The AHW emergency operations centre held a daily media scrum that provided current information. It was felt that fuller disclosure of the issues to the media would have revealed the challenges of the organizations responsible for public safety in the province and could have contributed to a better understanding and empathy by the media.

#### **4.2.7 The Role of the Public in Communication**

The public received many messages from both AHW and AHS on preventive strategies to minimize the spread of H1N1. However, the messages became more complex and sometimes hard to understand when knowledge on the topic was not clear (e.g., use of the unadjuvanted vaccine in pregnant women). Educating the public on how quickly information can change in a situation where the science is emerging is necessary but may not be easy. The public have been conditioned to expect immediate answers to health-related questions from health care providers and likely have even a lower tolerance for the time to develop sound policies governing health care. Pandemics will always have a degree of unknown information and there is a need to better prepare the public for the uncertainties. Education of the public requires a two-way dialogue, first learning what the public needs and wants in times of crisis and then finding a mechanism for more timely and rapid dialogue.

*It is recommended that:*

*The Government of Alberta, AHW, AHS and AEMA collaboratively develop an integrated communication plan for a public health emergency that:*

- *determines roles and responsibilities for each organization including the responsibility for lead role(s) for different audiences*
- *identifies a primary source of validated information*
- *identifies the communication linkages for zones, municipalities, stakeholders and partners*
- *facilitates working with, educating and informing the public about their role in a pandemic or other public health emergency*
- *engages the media as a partner to develop communication strategies that meet both parties' needs during a public health emergency*

- *includes adequate quality checks in the sign off process to ensure the integrity and key messages of the information are maintained*
- *considers feedback from their audiences, stakeholders and partners to evaluate the effectiveness of their communication*

#### 4.2.8 Public Consultation

##### 4.2.8.1 Rapid Response Public Survey

A Rapid Response Public Survey,<sup>24</sup> developed, coordinated and analyzed by working groups from both AHS and AHW, was conducted between September 5, 2009 and October 13, 2009 to obtain information to help guide pandemic planning and response. The survey provided information on the public's intention to receive the H1N1 vaccine, knowledge and beliefs about the H1N1 influenza and their seasonal influenza immunization history. A sample size of approximately 3,000 Alberta adults from around the province was selected using a random digit dialing protocol.

According to the Rapid Response Public Survey, 44% of adults and 57% of children intended be immunized while about a third of the adults did not intend be immunized. These results were similar to other surveys conducted in Canada around the same time period. The final results showed 37% of Albertans were immunized for the H1N1 influenza.

During the spring of 2010, a follow-up Rapid Response Public Survey,<sup>52</sup> was developed to better understand Albertans' intentions to be immunized during the next influenza season and to learn about their experiences with the pandemic H1N1 influenza. A target of 3,000 Albertans was set. Preliminary results were available from survey responses of 1,212 participants at the end of August.

The preliminary survey results revealed a significant uptake of preventive strategies for H1N1 influenza and other communicable diseases. Almost everyone recalled hearing or seeing public health messages suggesting ways to protect themselves from influenza. These included hand washing, coughing into your sleeve, staying at home when sick and getting immunized. Close to 70% of Alberta adults reported they increased the amount that they washed their hands during the H1N1 outbreak and approximately 90% reported they continue to wash their hands at the same frequency or more than during the outbreak.

The questions in the survey about the effectiveness of messages advising the public of when and where to go for immunizations lacked the specificity required to provide meaningful information. Similarly, responses to preferred methods of receiving information simply list the various media used. As responses were not quantified or prioritized, they provide no insight into the most preferred medium.

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<sup>52</sup> Alberta Health and Wellness: Surveillance and Assessment. "Rapid Response Public Survey Pilot." Edmonton, Alberta: Government of Alberta, June 14, 2010.

#### 4.2.8.2 Patient Concerns reported to AHS

The AHS Patient Concerns Department welcomed suggestions from patients and families to improve health services, concerns about their care or services or compliments about their experience. 988 complaints and comments were lodged from October 27, 2009 to November 5, 2009;<sup>53</sup> daily summaries of concerns, commendations and suggestions were forwarded to the AHS senior executive team.

Many of the concerns related to access, wait times, queues and crowding at the immunization clinics, understanding high-risk group eligibility, and inconsistent messaging. However, there were also many comments were about the kindness of staff, staff's attempts to explain situations and appreciation for how hard the staff was working.

## 5.0 Ethical Considerations

"Many critical ethical questions arise in pandemic influenza planning, preparedness and response. These include: Who will get priority access to medications, vaccines and intensive care unit beds, given the potential shortage of these essential resources? In the face of a pandemic, what obligations do health care workers have to work notwithstanding risks to their own health and the health of their families? How can surveillance, isolation, quarantine and social-distancing measures be undertaken in a way that respects ethical norms?"<sup>54</sup>

"Clinical ethics provides a process of considering and evaluating choices for action when people face unfamiliar, difficult and complex circumstances and when they ask 'What is the right thing to do?'"<sup>55</sup>

An ethics framework uses an application of principles or value sets rather than providing a prescribed set of policies to help guide clinical and operational decision-making.

AHS, AHW and the Provincial Health Ethics Network collaborated on the development of an ethics framework based on work begun by Covenant Health and the former Capital Health Region. The framework was subject to several revisions but at the time of the pandemic, it was not implemented. AHS anticipated the ethical operational challenges that could surface as influenza infection progressed and stretched health care resources and consequently developed a Pandemic Ethics Framework. The Framework was part of their pandemic plan and was developed to "help guide clinical and operational decision-making in preparing for, responding to, and recovering from Pandemic (H1N1) 2009".<sup>2</sup> The framework was approved for utilization during wave 2 but, at the time of the HQCA Review, had not yet been subject to a public consultation process although that was planned for the near future. Personnel interviewed as part of this review did not speak to the value of the Pandemic Ethics Framework. AHS was also in the process of completing a Prioritization Framework<sup>2</sup> to inform and expedite decisions necessary when the functional capacity of the health system is reduced significantly and unable to provide all the care that it normally delivers.

<sup>53</sup> Alberta Health Services. "Complaints." Edmonton, Alberta, October 27, 2009 to November 5, 2009.

<sup>54</sup> World Health Organization. "Ethical considerations in developing a public health response to pandemic influenza." 2007. [http://www.who.int/csr/resources/publications/WHO\\_CDS\\_EPR\\_GIP\\_2007\\_2c.pdf](http://www.who.int/csr/resources/publications/WHO_CDS_EPR_GIP_2007_2c.pdf).

<sup>55</sup> Alberta Health Services: Covenant Health. "Clinical Ethics and Pandemic Influenza." October 22, 2009. <http://www.albertahealthservices.ca/files/ns-clinical-ethics-and-pandemic-influenza.pdf>.

An AHS Rapid Response Clinical Ethics Consultation Service was developed to provide resources for difficult decision-making but it was not accessed during the pandemic response. Instead, individuals sought out those familiar to them who would likely be of help during an ethic dilemma or were referred to an individual ethicist. Most questions were potential rather than real ethical dilemmas. Because of the mild nature of the pandemic, provision of scarce products (e.g., vaccine, antiviral drugs) or select services with scarce resources (e.g., admission to intensive care unit beds) was not a major issue. It was agreed by multiple interviewees, however, that a robust ethical framework and mechanisms to support staff would have been necessary had the pandemic been more severe.

***It is recommended that:***

***AHW and AHS develop and maintain an ethical framework and strategies to guide operational and clinical decision-making that is understood by the public.***

## **6.0 Culture**

Culture, typically referred to as “the way we do things around here” shapes the responses of individuals as well as those of the organization. Leaders of an organization play a pivotal role in shaping the culture. A new chief executive officer for AHS assumed the position in March 23, 2009. AHS was a new organization as of April 1, 2009 and acknowledged they had not yet developed a culture despite the presence of many in leadership positions who were familiar from the previous regional health organization.

As difficult as it was for the new organization to respond in a coordinated manner to the pandemic, there was consensus among the interviewees that the pandemic induced accelerated bonding among a multitude of AHS staff, management and physicians. The common objective of caring for patients impacted by the H1N1 influenza minimized barriers, that may have existed under normal circumstances, requiring individuals from different settings, work habits and culture to perform a common function. The continuation of some practices established during the pandemic is encouraging and commendable.

In comparing the health care structure in Alberta with other provinces, it was clear that the AHS structure presented many advantages and eliminated barriers presented by multiple jurisdictions for health care delivery. However, the growth of a provincial culture for health service delivery is still evolving within AHS. Just as the culture of the individual health care facilities took time to blend into a regional culture within the regional health authority framework, the newly formed zones will require time to establish their place within AHS. Recognition of the nuances of zonal and rural needs will need to be considered in developing the provincial culture.

One event during the pandemic had a major ripple effect on AHS staff and other decision-makers across the province. On October 30, 2009 the Calgary Flames hockey team received H1N1 vaccine at a special immunization clinic. Two AHS staff members were later terminated for their role in what was perceived as facilitation of queue jumping by the Calgary Flames. The impact was a palpable change in decision-making by AHS staff; a risk aversion position became a common response to many requests. Staff clearly indicated giving no answer was safer than giving the wrong answer and their actions were driven by fear of repercussion, including job loss. Risk of perceptions of queue jumping and impact on the immunizing personnel’s job security also drove the decision to waste vaccine at day’s end in a mass immunization clinic rather than giving it to members of the public at the clinic who did not fit the eligibility criteria. The HQCA Review Team was not able to learn of any facts pertaining to the firing of the AHS staff as a result of the Calgary Flames’ immunization. Nonetheless, the risk averse actions resulting from that event are not compatible with a just and trusting culture that is an essential part of a safe health care environment.

By being open to the learnings emerging from the experience and subsequent reviews of the pandemic, AHW, AHS and AEMA have an opportunity to enhance their separate and collective performance, enhance their public perception and develop a positive culture. A desire to work collaboratively to that end has been demonstrated by all three organizations. An excerpt from the AHS website as of August 10, 2010 illustrates its recognition of positive actions on the culture of the organization. To achieve a change in culture, it supports “taking a provincial perspective on issues, ensuring good ideas developed in one part of the province are shared across the province, and ... exemplify every day, the four AHS values of respect, accountability, transparency and engagement”. The article concludes by saying, “creating and embedding this culture will be a critical task for all leaders and staff in the organization”.

## **7.0 Deactivation**

Ideally, just as a pandemic plan should identify quantifiable triggers for activating the plan, similar indicators should be present to herald its deactivation. This section would address timelines and processes to demobilize activities initiated for the pandemic response and facilitate the organization to resume normal business practices.

Review of both the AHW pandemic plan<sup>1</sup> and the AHS pandemic plan<sup>2</sup> did not reveal plans for deactivation. The AHW Emergency Operations Centre Standard Operating Procedures document of October 2009 included a section on deactivation that listed a few criteria and some general procedures for deactivation but did not include the detail required to deactivate in a systematic fashion. Active planning for deactivation was documented by AHS beginning November 25, 2009 and a comprehensive “Business Recovery and Resumption Task Summary”<sup>56</sup> was finalized for deactivation processes as of April 7, 2010. The plan adequately addressed the following:

- a. Decommissioning of the infrastructure of:
  - emergency operation centres at the provincial and zone levels
  - Influenza Assessment Centres
  - mass immunization clinics
- b. Assessment and ongoing management of pandemic stockpiles and emergency equipment.
- c. Reversal of directives, policies and processes as needed.
- d. Transition of staff previously deployed to pandemic positions back to their primary roles.
- e. Retention of all documentation to support a provincial review of the pandemic response.
- f. Provision of forums to debrief and record lessons learned as well as recommendations for improvement.
- g. Compliance with regular organizational policy and business requirements.

The AHS Office of Emergency / Disaster Management, under the direction of the Vice-President, Population and Public Health and the Senior Medical Officer of Health, was responsible for the development and oversight of business resumption and recovery processes within AHS.

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<sup>56</sup>Alberta Health Services. "Pandemic (H1N1) 2009 Business Recovery and Resumption Task Summary." April 7, 2010.

*It is recommended that:*

***AHW and AEMA collaboratively develop deactivation strategies for inclusion in the Alberta Plan for Pandemic Influenza that aligns with AHS's post-pandemic business resumption and recovery plans.***

## **8.0 Financial Implications**

The H1N1 pandemic response costs, including funding for Alberta Health Services, physician compensation, vaccines dispensed and write-down of expired vaccines totaled \$84.834 million; AHS's portion was \$58.7 million. Neither AHW nor AHS had approved budget for the pandemic but collectively projected costs that were \$64.032 million greater than actual.<sup>57</sup> 1,018,926 doses of vaccine of 0.5 mL were not used by the end of the campaign period and were wasted at a cost of \$4.678 million.<sup>57</sup>

It has been previously stated in this report that on January 20, 2010 that the Fiscal Responsibility Act<sup>12</sup> was evoked to cover extraordinary expenses incurred in 2009 - 2010 that were associated with the response to the pandemic H1N1 influenza.

AHS reported that cost capture was confusing, guidelines for use of pandemic functional centres were unclear, designated signing authority changed in the midst of the pandemic with poor communication of same, and it was difficult to access true costs in a timely manner. Personnel responsible for making decisions with financial implications did not always have appropriate delegation of authority for approved budgets and release of funds required additional time.

The AHS Internal Audit<sup>58</sup> revealed the following additional information (as excerpted from their report):

- "Variations were noted between the H1N1 response costs reported to AHW and the final financial reports. This is because the original reported cost was based on the cost incurred during the two-year period while the final cost pertained to the H1N1 second wave."
- "The process to capture the cost was not consistent throughout the pandemic. Initially, the plan was to capture only the incremental costs of H1N1; however, at a later stage, it was decided to capture the full cost of the pandemic."
- "The guidelines for capturing and tracking costs were not communicated to financial staff in a timely manner and were not consistent and clear resulting in confusion."
- "There would be a variance of \$77.92 million between budgeted and actual costs after considering the above. We did not find evidence of a formal variance analysis conducted between the forecasted and actual response costs."

*Recommendations from AHS Internal Audit:*

AHS Finance should ensure that a clear and consistent process for capturing and tracking cost is established and implemented for future pandemics.

Population and Public Health in coordination with AHS Finance should ensure that an effective process for monitoring of future pandemic costs are implemented which includes a complete budget variance analysis on a periodic basis.

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<sup>57</sup> Alberta Health and Wellness. *H1N1 Pandemic Response Costs*. Received by HQCA Review Team October 6, 2010.

<sup>58</sup> Alberta Health Services: Internal Audit Services. "Draft/Confidential Internal Audit of pandemic (H1N1) 2009 Influenza Preparedness." July 2010.

## 9.0 Evaluation

### 9.1 Positive Experience

*“Although (AHS) staff were tired and relieved to see the public health impact of H1N1 disappear, in other ways, many “mourned” when the pandemic was over. For the first two years within AHS, the focus has been on structural change and budget alignment. During the pandemic, the focus of the organization and its staff shifted totally to patient care. People were reminded that our core business is patient care and population health, and they were energized by contributing to it in a time of great need and uncertainty.”<sup>59</sup>*

For AHS the pandemic experience could be described as, “it was the worst of times; it was the best of times”. Despite being newly formed as the provincial health authority to deliver health care service, frontline staff, management and physicians rallied to respond to the public health needs. The pandemic had created an urgency to act and new relationships developed and, at least in some cases, are being sustained today. Accelerated bonding and understanding of how various disciplines could complement one another occurred; staff and management supported one another to provide the best service they were capable of. Staff volunteered for additional shifts, accommodated their personal needs to respond to changing demands of the system, and went beyond their regular duties to care for Albertans.

The HQCA Review Team was told that the profile of public health and understanding of its role had been elevated by the pandemic experience. Historically, within the health care system, public health has struggled for recognition within the shadow of acute care services. The impact on population health that exceeded the boundaries of acute care was evident during the pandemic response.

According to the Public Health Act, Section 14(1),<sup>11</sup> during any public health emergency such as a pandemic, the Chief Medical Officer of Health has a singularly critical leadership role in managing the emergency. Although a public health emergency was not declared, the Chief Medical Officer of Health executed his responsibilities as necessary to protect and promote the health of the public and to prevent disease and injury. The Chief Medical Officer of Health served as a liaison between the Government and AHS, monitored activities of the AHS and gave directions to AHS to protect the public’s health.

The Chief Medical Officer of Health worked with other Medical Officers of Health throughout Alberta as well as public health emergencies. The Chief Medical Officer of Health, the Senior Medical Officer of Health from AHS and the AHS Medical Officers of Health engaged in a network of working relationships linking AHW and AHS to address clinical and operational matters as well as policy considerations. This network was well utilized during the pandemic response to provide direction and leadership for the pandemic response.

Although the pandemic elevated the role of public health in AHS, does its organizational structure support a continued public health voice at the executive table for decisions that impact the health of Alberta’s population? While the Chief Medical Officer of Health position reports to the highest level of authority for health in the Government of Alberta, i.e., the Minister of Health and Wellness, the Senior Medical Officer of Health reports to the AHS Executive Medical Vice President, who in turn

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<sup>59</sup> Interview with AHS senior executive, June 8, 2010. Permission to use quote received September 28, 2010



reports to the Chief Executive Officer. The Senior Medical Officer of Health is not part of the AHS executive team. Given the strategic influence of public health on the health of the population in the entire province, AHS may wish to examine its organizational structure to determine whether public health representation is provided at a sufficiently senior level given the strategic importance of public health.

## 9.2 Debriefing and Evaluating

Collaborative debriefing of emergency response procedures within one month of the event followed by thorough evaluation and updating of emergency response plans by the lead agencies is critical to improved responses for the future.<sup>10</sup> Although there were several illustrations of debriefing by individual organizations, there was no collaborative debriefing and evaluation conducted by the three lead organizations. Nonetheless, individual debriefings by AHW, AHS and AEMA yielded significant learnings.

Draft minutes of the Deputy Ministers' Committee on Pandemic Influenza of December 15, 2009 reveal a roundtable discussion of lessons learned in wave 2 by attendees that included AHW and AEMA personnel who had key roles in pandemic planning and response. Comments on planning and response, immunization program, Government of Alberta essential services and other employee matters, communications and information sharing, and industry engagement were documented. Several of the comments about areas for improvement mirrored the findings in this report.

Led by an external consultant hired by AHW, the post wave 1 findings of 16 after-action reviews held with more than 70 AHW staff informed AHW of several improvements necessary to provide a satisfactory response to wave 2 of the pandemic.<sup>14</sup> In addition to AHW staff, AEMA, Public Affairs Bureau, Alberta Employment and Immigration, Agriculture, First Nations and Inuit Health Branch, Alberta Education and Corporate Human Resources also participated; unfortunately AHS was "unable to attend...due to the short timelines".<sup>14</sup> While many of the recommendations from the report were incorporated into AHW's response to wave 2, the report was not shared with the other ministries until January 27, 2010. It has not been shared to date with AHS or AEMA despite recommendations impacting all three lead organizations and the other ministries.

AEMA conducted a debrief of wave 1 in June 2009 with multiple ministries of the Government of Alberta, including AHW, that were directly or indirectly involved with the pandemic.

A debrief of wave 2 examining the actions of the AHW emergency operations centre was presented March 12, 2010<sup>60</sup> by the Alberta Pandemic Planning Task Force. Participants included AHW staff who filled positions in the AHW emergency operations centre, liaison officers for AHS and AEMA and a representative from First Nations and Inuit Health.

AHS conducted an extensive debriefing with 650 members of staff and external stakeholders in 43 debriefing sessions held between December 1 and December 21, 2009. The summary, presented in the Pandemic (H1N1) 2009 Post Incident Summary, March 2010<sup>36</sup> reflects observations, experiences and factual occurrences of administrative and clinical support staff, nurses, managers, physicians, executives and union groups. The report contains numerous recommendations for consideration by senior management and is a rich source of information for continuous improvement. The AHS

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<sup>60</sup> Alberta Health and Wellness. "AHW Emergency Operations Centre (EOC) Activation for Pandemic (H1N1) 2009, Debrief for Wave 2, Sept-Dec 2009." March 12, 2010.



recommendations generally align with those of this review but contain additional recommendations aimed at specific operations not within purview of this review.

AHS also conducted an online survey<sup>40</sup> for staff working in the Influenza Assessment Centres as part of its systemic evaluation of the Influenza Assessment Centres; 257 of the 650 staff participated in the survey ending January 14, 2010. In addition, AHS conducted an evaluation<sup>47</sup> between March 17, 2010 and March 31, 2010 of those staff who worked or supported the immunization clinics. The online survey consisted of questions related to key aspects of the immunization campaign with a number of zone specific questions.

All AHS debriefings described above provided feedback on processes, structures and actions that worked well and those that required improvement. Common elements among all debriefings included a need for clear understanding of roles and responsibilities that included training and education of these roles and enhanced communication strategies.

AEMA conducted a short debrief of the Government Emergency Operations Centre November 27, 2009; no required improvements were noted.

*It is recommended that:*

*AHW, AHS and AEMA develop an evaluation framework and process for immediate and collaborative debriefing after a public health emergency and ensure learnings are incorporated into each organization's pandemic plans.*

## **10.0 Alignment with the AHS Internal Audit**

AHS had requested that internal audit assess the adequacy and effectiveness of the design, development and implementation of the AHS Pandemic H1N1 Influenza Preparedness and Response. A draft audit was provided to the HQCA August 19, 2010 with a final version provided on October 11, 2010.

The findings of the AHS Internal Audit generally aligned with those of the HQCA review. The HQCA review was broader in scope with more findings while the AHS Internal Audit delved deeper into AHS financial considerations. The internal audit identified lack of direction for vaccine wastage. The HQCA validated this finding.

## **11.0 Comparison with Pandemic Experiences in Saskatchewan, Ontario, and other Jurisdictions**

Highlights of Alberta's commendable practices and those areas requiring improvement were compared with the H1N1 pandemic experience of Saskatchewan and Ontario. The comparison was based on limited interviews with key personnel who had leading roles in pandemic planning, preparedness and response in Saskatchewan and Ontario and documentation provided by the interviewees as well as that which was researched by the HQCA Review Team. While Ontario's health structure differs from that of Alberta, Ontario had experienced SARS (severe acute respiratory syndrome) and it was expected that the learnings from that experience might have impacted how Ontario responded to the H1N1 pandemic.

### **11.1 Pandemic Planning and Public Health Structures**

Ontario's structure for public health and government pandemic planning differs significantly from that of Alberta. Public health in Ontario is delivered at the local level, by health units, each with a board of health and medical officer of health. At the provincial level, public health responsibility and oversight is shared among the Chief Medical Officer of Health, Ontario Agency for Health

Protection and Promotion, the Ministry of Health and Long-Term Care, and the Ministry of Health Promotion.

The government funded Ontario Agency for Health Protection and Promotion (the Agency) is an arm's-length government organization dedicated to protecting and promoting the health of all Ontarians.<sup>61</sup> Through its scientific and technical expertise, the Agency provides information and assists health providers, public health and partner ministries to make informed decisions about health emergency preparedness as well as infection prevention and control, surveillance and epidemiology, health promotion, chronic disease and injury prevention, environmental and occupational health. The Agency is also responsible for the operation of public health laboratory services. The Agency supplements and supports the Chief Medical Officer of Health and the province in emergency planning and response and provides scientific and technical expertise. During a public health emergency the Agency's division of Emergency Management Support constitutes a Scientific Response Team which provides scientific and technical support to the Incident Commander at the Ministry Emergency Operations Centre (MEOC) who is accountable to the Chief Medical Officer of Health.<sup>62</sup>

The Emergency Management Branch resides within the Ministry of Health and Long-Term Care to plan, coordinate, and lead, through establishing the MEOC, the response to a public health emergency. The Emergency Management Branch has worked with health system stakeholders/partners to develop the Ontario Health Plan for an Influenza Pandemic, which is updated annually. In addition to the Agency the most notable difference is that Ontario has a permanent structure within government dedicated exclusively to planning and leading a response to a public health emergency. Ongoing improvements in the emergency processes are facilitated by dedicated personnel with unique skills and expertise in emergency management. Within AHW, there is an emergency response structure within the Health Protection Branch to provide consultation on emergency planning or management. The unit is not entirely dedicated to public health emergencies but is more of an all hazards approach (advocated by the Public Health Council of Canada) that can be augmented to fulfill a public health emergency event. The clinical advisory group is identified in the emergency management structure, answering to the incident commander. Staff within Alberta Health and Wellness fulfill the roles required as part of the emergency management structure and are trained and participate in exercises to test response plans at least once per year. In comparison, the Ministry in Alberta does not have as many resources as Ontario dedicated to emergency management.

Ontario also has a provincial emergency management agency analogous to the AEMA. Emergency Management Ontario monitors compliance and supports ministries and municipalities in their emergency preparedness and response activities as identified in the Ontario Emergency Management and Civil Protection Act.

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<sup>61</sup> Ontario Agency for Health Protection and Promotion. "About Us." <http://www.oahpp.ca/about/board-of-directors.html> (accessed September 13, 2010).

<sup>62</sup> Personal communication with Dr. B. Schwartz, Appointed Director of Emergency Management Support for the Ontario Agency for Health Protection and Promotion (OAHPP) effective January 1, 2009. *Interview with HQCA Review Team* (September 7, 2010).

## 11.2 Roles and Responsibilities

One of Saskatchewan's identified successes was their early integration of the non-health ministries with a clear separation and understanding of roles and responsibilities into their pandemic response structure.<sup>63</sup> The government pandemic response was co-chaired by the health minister and a minister from the non-health ministries (e.g. education, municipal affairs).

Ontario also has clearly outlined roles and responsibilities in emergency management described in its Ministry of Health Emergency Operations Plan. As well, Ontario has developed the internal Provincial Coordinating Plan for an Influenza Pandemic to outline roles and responsibilities between provincial ministries.

## 11.3 Surge Capacity

Public Health in Alberta had a good relationship with acute care and intensive care services but the same could not be said of the situation in Saskatchewan where it was a struggle for the government to engage acute care.<sup>63</sup> Acute care did not see the pandemic as an issue that would impact them during the planning phases. Population Health was the lead in planning and response in the Ministry of Health in Saskatchewan. As a result, acute care was not so integrally involved in the early stages.<sup>64</sup> The need to proactively involve acute care in future pandemic planning was one of Saskatchewan's biggest learnings.

Ontario implemented a variety of strategies to support surge capacity in the health system including:<sup>62</sup>

- Flu Assessment Centres at the local level to support surge in primary care assessment for influenza patients.
- Guidelines in the Ontario Health Plan for an Influenza Pandemic to support business continuity planning and surge capacity management by local health organizations.
- Modifying primary care funding models to enable physicians to see more patients and to use telephone consultations methods.
- Purchasing additional ventilators and training staff to address anticipated surge in intensive care units during wave 2 through partnership between the Emergency Management Branch and the Critical Care Secretariat of the Ministry of Health and Long-Term Care.

Noteworthy was Ontario's approach to triage where a "See and Treat" section of the emergency department was reserved for patients with more minor symptoms and who did not require invasive treatment or diagnostics to be assessed by nursing personnel. The system alleviated the strain on emergency physician care.<sup>65</sup>

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<sup>63</sup> Personal communication with Dr. M. McKinnon, Chief Medical Officer of Health, Saskatchewan Health. *Interview by HQCA Review Team* (September 8, 2010).

<sup>64</sup> Information provided by Dr. Saqib Shahab, Deputy Chief Medical Health Officer, Population Health Branch, Saskatchewan Ministry of Health. (December 2010).

<sup>65</sup> Ontario Hospital Association. "Pandemic H1N1: Lessons Learned...and Still to be Learned Ontario Hospital Association Conference." February 25, 2010.

#### 11.4 Vaccines and Immunization

British Columbia (BC), Saskatchewan and Ontario all began vaccinating their high risk populations before opening the immunization to all their citizens.

In Saskatchewan, health care workers, pregnant women, women four weeks post partum and people living in remote and isolated communities were vaccinated first. When faced with the vaccine shortage, Saskatchewan was planning to begin immunizing the chronic disease population and recognized that they would likely not have enough vaccine for this group. It made a decision to immunize children in grade seven and lower, followed by children aged 12 and older. This decision was influenced by significant school absenteeism in some schools, limited supply of vaccine, increased morbidity and hospitalization in children (based on data from the United States), concern expressed by the Saskatchewan community regarding the wellbeing of children, anticipation of more vaccine within a week and ability to open public clinics at that time.<sup>64</sup>

Saskatchewan did not utilize full mass immunization clinics in all sites. Mass immunization clinics were established in large urban centres. In smaller urban and rural sites clinics were established in locations and communities where the population eligible for immunization resided and where seasonal influenza immunization had been historically offered. Health care workers were immunized in hospitals or public health offices within the institutional setting, pregnant women were required to go to local public health offices, children were immunized in the schools and remote communities had vaccine delivered to them.

Saskatchewan identified immunization rates in all high risk groups: 63% of children under the age of five, 69% in 5-9 year olds and 69% of First Nations and Inuit Health population were immunized.

In Ontario immunization was available during the week of October 26, 2009 to all the high-priority groups identified in the Public Health Agency of Canada's document "Guidance on H1N1 Vaccine Sequencing"<sup>22</sup> except for "populations otherwise identified as high risk" as listed in the document (emergency medical services personnel who provided direct patient care were included among health care workers as a high priority group). Vaccine for remote northern communities was made available as soon as the vaccine was available through a partnership among the federal and provincial governments and local leadership. By November 10, 2009 first responders, frontline correctional institution workers and residents of long term care facilities aged 65 and over were eligible for immunization. First responders were defined as emergency services personnel, police and firefighters who responded to 911 calls. This distinction of first responders is noteworthy as Alberta was challenged with identifying first responders satisfactorily in a timely manner. The immunization clinics were open to the general public of Ontario November 19, 2009.

Based on a Statistics Canada report, "Canadian Community Health Survey: H1N1 vaccinations", the immunization rates for the three provinces being compared, based on doses administered, are: Alberta 37%, Saskatchewan 46%, and Ontario 32%. The national average was 41%.<sup>66</sup>

Immunization in correctional facilities for both the high risk population of inmates and correction services staff did not occur until November 23, 2009 when the vaccine was available to the general public in Saskatchewan.<sup>63</sup>

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<sup>66</sup> Statistics Canada. "Canadian Community Health Survey: H1N1 vaccinations." July 19, 2010. <http://www.statcan.gc.ca/daily-quotidien/100719/dq100719b-eng.htm>.

Ontario contracted out repackaging of the vaccine where pharmacists were on site; repackaging was conducted on a large scale operation for the province.

In Saskatchewan as there was an effective public health vaccination system in place and as physicians were engaged in providing care, the need to engage primary care physicians was limited.<sup>64</sup> Physicians in Ontario received vaccine the week of November 2, 2009,<sup>62</sup> about two weeks sooner than physicians in Alberta. As well, the United Kingdom's review of their response to the pandemic<sup>67</sup> indicates that they undertook time-consuming and complex negotiation for general practitioners to administer the vaccine during the pandemic rather than prior to the pandemic.

Saskatchewan utilized an electronic data entry system that provided real-time information about vaccine inventory, compared to the manual tracking system used by Alberta. (see 3.3.7 *Immunization Documentation*).

### **11.5 Antiviral Drugs**

Provision of prescribing privileges for Alberta nurses for the antiviral drug oseltamivir (Tamiflu®) was identified as a leading practice in Canada. Saskatchewan had plans to follow suit but no policy or directive was created.

### **11.6 Protection of Health Workforce**

Saskatchewan reported problems with decision-making, procurement and fit testing education around N95 respirators (masks) similar to those experienced in Alberta.<sup>63</sup>

Ontario noted that its decision to use N95 respirators for the care of influenza-like illness patients was in contrast to some other provinces and not uniformly supported by the scientific experts, but was based on the precautionary principle, which states that action to reduce risk need not await scientific certainty.<sup>68</sup> There were some logistical problems with getting all health care providers fit tested, particularly office-based physicians and their staff.

### **11.7 Communication**

In Alberta, the AHW Chief Medical Officer of Health and the AHS Senior Medical Officer of Health engaged in open dialogue with the press. In Ontario, press conferences were held by the Chief Medical Officer of Health, the Chief Executive Officer of the Ontario Agency for Health Protection and Promotion and the Assistant Deputy Minister of the Public Health Division within the Ministry of Health and Long-Term Care to respond to questions from the media. This process was continued in the second wave.<sup>69</sup> Saskatchewan spoke of a very effective relationship with the media where the latter actively solicited public feedback from Saskatchewan Health on a regular basis.<sup>63</sup>

The initial lack of timely communication from the Public Health Agency of Canada (PHAC) has been identified as an issue in Ontario and Saskatchewan.<sup>62, 63</sup> Specifically for Saskatchewan, it was the timely decision on key points within guidelines. In addition, although data was being collected, it

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<sup>67</sup> Hine, Deirdre. "The 2009 Influenza Pandemic: An independent review of the UK response to the influenza pandemic 2009." July 2010.

<sup>68</sup> Campbell, A. "The SARS Commission - Spring of Fear Final Report." December 2006.

[http://www.health.gov.on.ca/english/public/pub/ministry\\_reports/campbell06/campbell06.html](http://www.health.gov.on.ca/english/public/pub/ministry_reports/campbell06/campbell06.html).

<sup>69</sup> Consultation from Allison J. Stuart, Assistant Deputy Minister, Public Health Division, Ontario Ministry of Health and Long-Term Care. (December 2010).

needed rapid analysis and interpretation. For example, the severity of the situation in Manitoba did not come through PHAC but through First Nations and Inuit Health. Information regarding what was occurring outside of Canada was also lacking early in the campaign.<sup>64</sup>

In examining how other provinces approached communicating with physicians a model from BC was notable. A collaborative approach with the British Columbia Medical Association, the BC College of Physicians and Surgeons, the BC Ministry of Health Services and the BC Health Authorities created a voluntary list serve for physicians. Participants received regular notification of pandemic information with a clear identification of new information and opportunity to access additional information through a link to a web site that was easy to navigate. Physicians had the choice of accessing more information if they desired it. Ontario also implemented a broad-based communications strategy with health care providers through the regular distribution of “Important Health Notices”. These information summaries were well received. Frontline providers also recommended greater coordination among levels of government in terms of streamlining the common information.

## 12.0 Comparison of HQCA Findings and Recommendations with Other Pandemic Reviews

The recommendations made in this report were compared with the following reviews of pandemic experiences in different jurisdictions and are depicted in Appendix IV. The external reviews examined were:

- a. "CSA Standards Roundtable on Healthcare and Emergency Service Sector Preparedness. Voices from the H1N1 Influenza Pandemic Front Lines: A White Paper About How Canada Could Do Better Next Time." June 8, 2010.<sup>9</sup>
- b. "The H1N1 Pandemic - How Ontario Fared: A Report by Ontario's Chief Medical Officer of Health." (2010, June).<sup>20</sup>
- c. "Lessons from the frontlines: A collaborative report on H1N1 from Canadian Medical Association, The College of Family Physicians of Canada and National Specialty Society of Community Medicine", July 2010.<sup>70</sup>
- d. "The 2009 Influenza Pandemic – An independent review of the UK response to the 2009 influenza pandemic", July 2010 (UK).<sup>67</sup>
- e. "Assessing Policy Barriers to Effective Public Health Response to the H1N2 Influenza Pandemic: Project Report to the Centers for Disease Control and Prevention." Association of State and Territorial Health Officials (ASTHO). Logan Circle Policy Group LLC.<sup>71</sup>
- f. "WHO recommendations on pandemic (H1N1) 2009 vaccines: Pandemic (H1N1) 2009 briefing note 2." July 13, 2009.<sup>28</sup>
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<sup>70</sup> "Lessons from the frontlines: A collaborative report on H1N1 from Canadian Medical Association, The College of Family Physicians of Canada, National Specialty Society of Community Medicine." July 2010.

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## Conclusion

The mild H1N1 influenza pandemic served as the ultimate pandemic preparedness exercise for Alberta. This review revealed many positive outcomes and commendable practices that should be continued but also identified many areas for improvement that will need to be addressed in planning for the next public health emergency.

The pandemic presented an urgency to act and AHW, AHS, AEMA and health care workers joined forces, regardless of their organizational base, to prevent the spread of H1N1 influenza and care for the infected individuals in both wave 1 and 2. In the end, sufficient vaccine, antiviral medication and pandemic supplies were available for the citizens of Alberta. AHW and AHS collaborated to create and use a common surveillance database to guide pandemic planning and response. Collaboration extended to the First Nations and Inuit Health populations resulting in immunization of 66% of aboriginals on reserves. Influenza assessment centres treated 10,000 people with influenza like symptoms and were effective in relieving some of the pressure on emergency departments.

In order to prepare Alberta and safeguard the public in the event of a future pandemic or other public health emergency, Alberta needs to make several significant changes. Most noteworthy is that future pandemic responses must implement plans to ensure the maximum number of people at greatest risk are immunized as a priority. Should vaccine shortages occur, decisions for alternate immunization strategies must be based on facts and supported by input of public health experts. An effective governance model for public health emergency management that utilizes an agreed upon operational command system must be implemented. AHW, AHS and AEMA require a clear understanding and application of their roles and responsibilities and should update their pandemic plan, to include both subjective and objective criteria to develop quantifiable triggers that would activate or escalate various phases of a pandemic response. The plan must be tested using different severity scenarios and learnings incorporated in further versions of the plan. Information systems must provide robust data that support timely decision making. A strategic, integrated communication plan is also critical.

Pandemic planning should be a requisite part of Alberta's plan to protect its citizens from public health emergencies. Alberta must remain vigilant to keep pandemic planning, testing and evaluation of the plan an ongoing priority.

In the aftermath of the pandemic, Dr. Margaret Chan, Director General, World Health Organization, was quoted as saying "We want to know what went wrong and, ideally, why. We want to know what can be done better and, ideally how."<sup>73</sup> The HQCA review of Alberta's response to the 2009 H1N1 influenza pandemic attempts to provide Alberta-based answers to these questions to assist in ongoing development of Alberta's public health emergency plans.

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<sup>72</sup>"WHO recommendations for post-pandemic period: Pandemic (H1N1) 2009 briefing note 23 - August 10, 2010."  
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## Appendix I

### Pandemic Timeline

May 2008	March 2009	April 19 – July 25, 2009 WAVE 1 of H1N1 Influenza			August – September 2009	October 11 – December 5, 2009 WAVE 2 of H1N1 Influenza			January – April 2010
<b>May 1</b> – AHW announces abolishment of 9 RHAs and 3 Provincial Health Boards and creation of AHS	<b>Mid-March</b> - WHO issues first reports of new influenza strain in Mexico	<b>April 1</b> – AHS officially replaces RHAs and Boards  <b>Late April</b> - New virus named "Influenza A/H1N1 'swine' flu"  <b>Late April</b> -First case of H1N1 confirmed in the United States  <b>April</b> – WHO releases its global influenza preparedness plan  <b>April 26</b> - Canada reports first case of H1N1 influenza  <b>April 28</b> - Alberta experienced its first case of H1N1 influenza  <b>April 29</b> - WHO declares a worldwide pandemic alert	<b>May 6</b> – National laboratory in Winnipeg decodes the genetic make-up of the H1N1 flu virus  <b>May 8</b> – First fatality in Alberta from H1N1  <b>May 26</b> – First meeting of DM Pandemic Committee  <b>May 30</b> – Canada orders adjuvanted vaccine from GSK	<b>June 11</b> – WHO announces activation of full pandemic response  <b>June 14</b> – Peak of wave 1 of pandemic  <b>June 15, 19, 26</b> – AHW debriefs wave 1 experience	<b>August 20</b> – Canada orders unadjuvanted vaccine from GSK <b>September 4</b> – First meeting of AHS/AHW Joint Pandemic (H1N1) 2009 Governance Committee endorsed at Deputy Minister's Committee on Pandemic Influenza; however, never fully convened <b>September 16</b> – Public Health Agency of Canada's (PHAC's) releases Guidance on H1N1 Vaccine Sequencing	<b>October</b> – AHW releases Alberta's Plan for Pandemic Influenza – A Summary <b>October</b> – AHS releases Pandemic (H1N1) Response Plan <b>October 19</b> – AHW Issues Policy on use of antiviral drugs, involvement of community pharmacies <b>October 21</b> – AHW issues guidelines to physicians for use of antivirals <b>October 22</b> – AHS EOC activated <b>October 25</b> – Peak of wave 2 of pandemic <b>October 26</b> – AHW EOC activated Previously healthy 13 year old Ontario boy dies due to H1N1 influenza Mass immunization clinics opened in Alberta <b>October 29</b> – Province learns that the supply of adjuvanted vaccine would decline <b>October 30</b> – Calgary Flames hockey team receives H1N1 vaccine at a special immunization <b>October 31</b> – End of first week of immunization; approximately 325,000 doses administered (45% of those immunized were high risk) <b>October 31</b> – Clinics were closed. 280,964 doses of vaccine were still available (with no wastage)	<b>November</b> – AHW releases Alberta's Plan for Pandemic Influenza <b>November</b> – AEMA get engaged in pandemic response <b>November 4</b> – News released of first AHS employee terminated for their role in Calgary Flames immunization <b>November 5</b> – Clinics re-open, restricting immunization to high risk groups <b>November 6</b> – News released of second AHS employee terminated for their role in Calgary Flames immunization <b>November 20</b> – AHW issues Alberta's Influenza Immunization Program Policy <b>November 23</b> – Clinics open to the general public Essential services personnel, general public eligible for immunization <b>November 24</b> – Physicians receive repackaged H1N1 vaccine for immunization for their patients <b>November 25</b> – Planning for deactivation commenced by AHS <b>November 26</b> – Protocol for administration of H1N1 influenza by paramedics released by AHW and AHS <b>November 27</b> – AEMA conducts debrief of pandemic response	<b>December 10</b> – Pharmacies receive provincially funded vaccine  <b>Third week of December</b> - Immunization campaign unofficially over with 1,073,954 doses left ( no wastage)  <b>December 1-21</b> - AHS debriefing with 650 staff members in 43 debriefing sessions	<b>January 14</b> - AHS conducts on-line survey for staff working in the IACs  <b>January 20</b> – Fiscal Responsibility Act enacted in legislature; pandemic H1N1 influenza declared a public emergency for release of funds  <b>March 17-31</b> – AHS conducts evaluation of staff who worked or supported the immunization clinics  <b>April 7</b> – AHS Business Recovery and Resumption Task Summary finalized for deactivation processes

AEMA = Alberta Emergency Management Agency  
AHS = Alberta Health Services

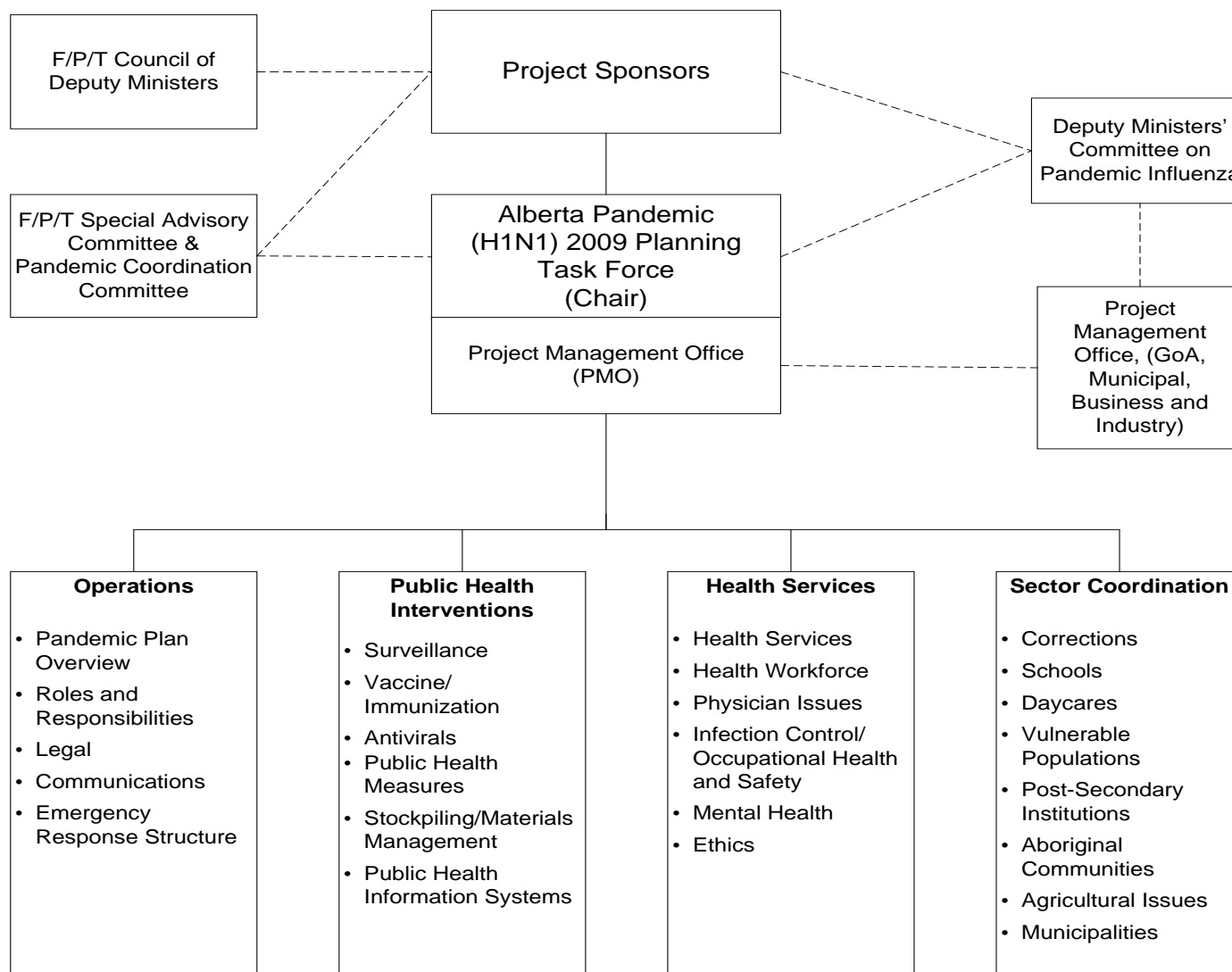
AHW = Alberta Health and Wellness  
EOC = Emergency Operations Centre

IACs = Influenza Assessment Centres  
RHA = Regional Health Authority

GSK = GlaxoSmithKline  
WHO = World Health Organization


## Appendix II

### Alberta's Health System Pandemic Preparedness Organizational Structure





## Appendix III

 <b>Alberta Health Services</b>		<b>Pandemic (H1N1) 2009 Immunization Record</b>		Site/Clinic Location	
Client Last Name		First Name		Middle Name	
Personal Health Number		Date of Birth YYYY      MMM      DD		Gender	Aboriginal (optional)
Alberta Address		City	Province	Postal Code	<input type="checkbox"/> Male <input type="checkbox"/> Yes <input type="checkbox"/> Female <input type="checkbox"/> No
Phone (home)		Phone (other)		Status	
Out of Province Address (if applicable, and specify province)				<input type="checkbox"/> New to Alberta <input type="checkbox"/> Visitor	
<input type="checkbox"/> <b>Informed Consent</b>					
Completed by Health Care Professional	<b>Code</b>		<b>Age</b>		
	46	Pregnant woman	<input type="checkbox"/> 6 months up to and including 4 years of age		
	03	Health care worker <input type="checkbox"/> AHS employee	<input type="checkbox"/> 5 years up to and including 9 years of age		
	01	High risk	<input type="checkbox"/> 10 years up to and including 18 years of age		
	39	Household contacts	<input type="checkbox"/> 19 years up to and including 64 years of age		
	02	65 years of age and older	<input type="checkbox"/> 65 years of age and older		
	59	Healthy			
	<b>Vaccine</b>				
	<input type="checkbox"/> Arepanrix™ H1N1 (GSK)	Antigen Lot Number Adjuvant Lot Number	Dosage <input type="checkbox"/> 0.25 mL I.M. <input type="checkbox"/> 0.5 mL I.M.	Site <b>Arm</b> <input type="checkbox"/> Left <b>Leg</b> <input type="checkbox"/> Left <input type="checkbox"/> Right <input type="checkbox"/> Right	
	<input type="checkbox"/> Non-adjuvanted H1N1 (GSK)	Lot Number Date Vaccine Given (yyyy-mm-dd)	Dose <input type="checkbox"/> 1 of 1 <input type="checkbox"/> 1 of 2 <input type="checkbox"/> 2 of 2	Next dose due on or after	
Immunizer's Name/Designation (please print)			Immunizer's Signature		

09548(2009-10)

White - Chart      Pink - Client copy

## **Directions for Use of NCR Pandemic (H1N1) 2009 Immunization Record**

- PRINT in the boxes that have open areas for collection of information.
- Place a √ or X in the tick box that applies.

**Date of Birth:** Print as shown on the Alberta Health Care card; YYYY = 4 digit year, MMM = 3 letter month, DD = 2 digit date; (e.g., Oct 3, 1939 is to be recorded as 1939 Oct 03).

**Aboriginal (optional):**

- This information **can not** be collected actively, meaning the client **can not** be asked if they are aboriginal.
- The information can be collected passively; this means it is okay to check the box if the client volunteers the information, or if the client is filling in the demographic section, the client can choose to make a selection.

**Out of Province Address:** Complete this section **ONLY** for temporary residents, e.g., persons attending school in Alberta or persons working temporarily in Alberta.

**Status:** Complete this section **ONLY** if the client does not have a Provincial Health Care or Unique Lifetime Identifier (ULI) number. This is required for electronic data entry purposes only.

- New to Alberta: person is resident of Alberta but has not applied or received their provincial health care number.
- Visitor: includes out of province students and temporary workers only.

**Informed Consent:** Standard for informed consent (refer to local protocol) has been met, and fit to immunize assessment has been completed.

**Code:** This section identifies vaccine reason codes listed in order of priority.

- Place a √ or X in one tick box **ONLY**. If the client matches more than one reason code, chose the one that appears first on the list.
- For definition of reason codes, refer to document on Pandemic (H1N1) 2009 Influenza Vaccine Reporting Requirements and Coding Explanations.

**Age:** Place a √ or X in the age appropriate tick box.

**Vaccine:** Place a √ or X in the tick box next to the name of the vaccine given.

- If Arepanrix™ is administered, the lot number for both the antigen and adjuvant are to be recorded as they appear on their respective vials.
- If the nonadjuvanted product is used, the lot number on the antigen vial is to be recorded.

**Date Vaccine Given:** Record in the same format as the Date of Birth, e.g., YYYY / MMM / DD.

**Dose:**

- Dose 1 of 1:
- Use for all persons 10 years of age and older who require only one dose of vaccine.
- Dose 1 of 2 and 2 of 2:
  - Use **ONLY** for children 6 months of age up to and including 9 years of age. There will be no dose 2 of 2 in the first 3 weeks of the campaign.

**Immunizer's Name/Designation:** Please **PRINT** name and designation clearly (e.g., I. Nurse, RN).

## Appendix IV

### Comparison of HQCA recommendations to those made by national and international organizations

Several reviews were completed by provincial, national and international organizations to assess the effectiveness of their pandemic planning and associated responses. Recommendations made by the HQCA review were compared to recommendations from six of these external reviews. Seven of the 17 HQCA recommendations aligned with at least one recommendation from the other external reviews. The seven reports reviewed were the following:

1. “CSA Standards Roundtable on Health care & Emergency Service Sector Pandemic Preparedness”, June 8, 2010<sup>9</sup>
2. “The H1N1 Pandemic – How Ontario Fared: A Report by Ontario’s Chief Medical Officer of Health”, June 2010<sup>20</sup>
3. “Lessons from the frontlines: A collaborative report on H1N1 from Canadian Medical Association, The College of Family Physicians of Canada and National Specialty Society of Community Medicine”, July 2010<sup>70</sup>
4. “The 2009 Influenza Pandemic – An independent review of the UK response to the 2009 influenza pandemic”, July 2010 (UK)<sup>67</sup>
5. “Assessing Policy Barriers to Effective Public Health Response in the H1N1 Influenza Pandemic”, June 2010<sup>71</sup>
6. “WHO Pandemic (H1N1) 2009 briefing note 2”, July 13, 2009<sup>28</sup>
7. “WHO Pandemic (H1N1) 2009 briefing note 23”, August 10, 2010<sup>72</sup>

The Canadian Medical Association recommendations were not included in the table below as they focused on a pan-Canadian response; however, their recommendations did address planning and preparedness, roles and responsibilities, surveillance and communication.

**Table 1**

HQCA Recommendations	External Recommendations
<p>The Government of Alberta, AHW, AHS and AEMA evaluate the incident command system and determine an optimal operating command system with adequate structure and processes to respond to a public health emergency. Critical elements in the operating command system are the need to:</p> <ul style="list-style-type: none"> <li>▪ educate and train senior administrative personnel and elected politicians on their authority, role and responsibilities during a pandemic or other public health emergency</li> <li>▪ establish a decision-making authority structure with well-defined processes to quickly move escalating issues to the appropriate authority for decisions</li> <li>▪ establish a process for conflict resolution between and within lead organizations</li> </ul>	<p>Incorporate a severity index into the harmonized plan to help guide front-line decisions about prevention and treatment.<sup>9</sup></p> <p>Incorporate implementation triggers (events or milestones in the epidemic or pandemic process that signal a qualitative change in the situation) into the harmonized plan.<sup>9</sup></p> <p>A useful plan should incorporate “triggers” which activate those parts of the plan related to vaccination (i.e., when to start vaccinating) and which groups should be given priority.<sup>9</sup></p> <p>Recognize that health care workers and first responders will be sensitive to the anxieties caused by a new and/or potentially dangerous pandemic strain and require clear guidelines for pre-and post exposure prophylaxis use of antivirals – including the identification of “triggers” which would activate the deployment of antiviral stockpiles for protective use in both circumstances.<sup>9</sup></p> <p>The four Chief Medical Officers should jointly commission further work to support key decision-making early in a pandemic by January 2011. This should consider the practicalities of developing methods to measure the severity of a pandemic in its early stages. In particular, further exploration of population-based surveillance, such as serology, should be considered.<sup>67</sup></p>

HQCA Recommendations	External Recommendations
	<p>The Department of Health, working with others through the revision of the National Framework, should explore a more flexible, evidence-based approach to triggering actions during a pandemic that the current WHO phases and UK alert levels. In particular, this work should ensure that clear guidance is set out to enable the rapid adjustment of the prophylaxis policy as more is learned about the nature of the virus. Work to revise the national Framework should be concluded no later than March 2011.<sup>67</sup></p> <p>The Department of Health and the devolved administrations should agree (on) triggers responsive to the capacity of primary care in the activation and stand-down of the National Pandemic Flu Service at both national and regional levels. These triggers should be set out in the revised national Framework and published no later than March 2001.<sup>67</sup></p> <p>CDC and the states need to define what is meant by a “shortage” of N95/PPE and its use as a trigger for releasing stockpiles and implementing protocols to deal with shortage conditions.<sup>71</sup></p>
<p>AHW, AHS and AEMA articulate the roles and responsibilities of each organization in their respective and collaborative pandemic plans that reflect the legislative mandate and unique expertise of each organization.</p>	<p>We also need to extend our chain of command to the local level. The Chief Medical Officer of Health must have the authority to direct public health units in real time as he or she sees fit.<sup>20</sup></p>
<p>AHW, AHS and AEMA collaboratively develop and implement integrated pandemic preparedness exercises that test key elements of the pandemic plans subject to a variety of severity scenarios, and ensure thorough debriefing and evaluation by all three organizations are used to update the pandemic plans.</p>	<p>Federal, state and local governments should conduct a joint evaluation of epidemiologic and surveillance systems used during the H1N1 response to determine what worked well and what should be improved. As part of this process, it should be determined what data elements were necessary and eliminate (those) that were not useful in order to streamline data acquisition and analysis during a public health emergency.<sup>71</sup></p> <p>Develop national standards for the use and reporting of data from syndromic surveillance systems.<sup>71</sup> Federal, state, and local governments and stakeholders should move toward greater nationwide consistency in the reporting of data.<sup>71</sup></p> <p>More research is needed to produce national standards (e.g., case definition, which other elements should be reported) for syndromic surveillance. Funding is needed for states to implement those standards with laboratory capability.<sup>71</sup></p>
<p>AHW, AHS, and where applicable to their mandate AEMA develop a prioritization matrix that will facilitate immunization of the maximum number of defined populations at greatest risk in the shortest time.</p> <ul style="list-style-type: none"> <li>▪ Decision-making related to immunization strategies needs to be based on facts and supported by public health experts.</li> <li>▪ Determine appropriate placement in the hierarchy of vulnerable populations at greatest risk of developing severe complications.</li> <li>▪ Achieve consensus on the definition of first responders and essential services and their place in the hierarchy.</li> <li>▪ Achieve consensus on placement in the hierarchy of populations such as recipients of children and youth services, students in educational facilities and inmates in correctional services.</li> </ul>	<p>Decisions about who should be on the priority list for vaccination against a potentially dangerous new strain of influenza must be established as soon as possible.<sup>9</sup></p> <p>Vaccination remains important as a means of reducing the morbidity and mortality caused by influenza viruses. WHO strongly recommends vaccination of high-risk individuals in countries where influenza vaccines are available.<sup>72</sup></p>

HQCA Recommendations	External Recommendations
AHW and AHS collaboratively clarify roles and responsibilities for developing drug policies related to the pandemic and determining how they will be used.	Groups at increased risk of severe illness from the pandemic H1N1 virus included young children, pregnant women, and people with underlying respiratory or other chronic conditions, including asthma and diabetes. Patients who have severe or deteriorating influenza should be treated as soon as possible with oseltamivir. Patients who are at higher risk of severe or complicated influenza should be treated with oseltamivir or zanamivir as soon as possible. <sup>72</sup>
<p>The Government of Alberta, AHW, AHS and AEMA collaboratively develop an integrated communication plan for a public health emergency that:</p> <ul style="list-style-type: none"> <li>determines roles and responsibilities for each organization including the responsibility for lead role(s) for different audiences</li> <li>identifies a primary source of validated information</li> <li>identifies the communication linkages for zones, municipalities, stakeholders and partners</li> <li>facilitates working with, educating and informing the public about their role in a pandemic or other public health emergency</li> <li>engages the media as a partner to develop communication strategies that meet both parties' needs during a public health emergency</li> <li>includes adequate quality checks in the sign off process to ensure the integrity and key messages of the information are maintained</li> <li>considers feedback from their audiences, stakeholders and partners to evaluate the effectiveness of their communication</li> </ul>	<p>Establish one recognized source / body for information.<sup>9</sup></p> <p>Enlist the media and social media as valuable allies. Educate key producers, editors, reporters and bloggers about the need for informed and responsible reporting during a potentially serious pandemic. Find out what they need to carry out their duties and loop this back into the communications plan.<sup>9</sup></p>
AHW, AHS and AEMA develop an evaluation framework and process for immediate and collaborative debriefing after a public health emergency and ensure learnings are incorporated into each organization's pandemic plans.	<p>The Department of Health should commission an independent evaluation of the National Pandemic Flu Service, covering value for money, risk analysis and any potential for wider application.<sup>67</sup></p> <p>A careful review should be conducted to evaluate how implementing a clear UCS/ICS structure could have improved the H1N1 response at all levels.<sup>71</sup></p>

The Canadian Medical Association recommendations were not included in the table below as they focused on a pan-Canadian response; however, their recommendations did address planning and preparedness, roles and responsibilities, surveillance and communication.

## Table 2

Promoting and improving patient safety and health service quality across Alberta