

Senate



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CANADA

Canada's Response to the 2009 H1N1 Influenza Pandemic

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Chair

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Deputy Chair

**Standing Senate Committee on
Social Affairs, Science and
Technology**

December 2010

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THE COMMITTEE

The following Senators have participated in the study:

The Honourable Art Eggleton, P.C., Chair of the committee
The Honourable Kelvin K. Ogilvie, Deputy Chair of the committee

and

The Honourable Senators:

David Braley;
Catherine Callbeck;
Andrée Champagne, P.C.;
Jane Cordy;
Jacques Demers;
Lillian Eva Dyck;
Nicole Eaton;
Yonah Martin;
Pana Merchant;
Judith Seidman.

Ex-Officio members of the committee:

The Honourable Senators Marjory LeBreton, P.C. (or Gérald Comeau) and James Cowan (or Claudette Tardif).

Other Senators who have participated from time to time in the study:

The Honourable Senators Dickson, Fairbairn, Kochhar, Lang, Marshall, Poirier and Wallace.

STAFF OF THE COMMITTEE

Odette Madore, Chief, Social, Health and Cultural Affairs Section, Parliamentary Information and Research Service, Library of Parliament;

Sonya Norris, Analyst, Parliamentary Information and Research Service, Library of Parliament;

Molly Shinhat, Communications Officer, Communications Directorate;

Diane McMartin, Administrative Assistant; and

Jessica Richardson, Clerk of the committee.

ORDER OF REFERENCE

Extract from the *Journals of the Senate*, Monday, June 28, 2010:

The Honourable Senator Ogilvie moved, seconded by the Honourable Senator Eggleton, P.C.:

That the Standing Senate Committee on Social Affairs, Science and Technology be authorized to examine and report on Canada's pandemic preparedness;

That in particular the Committee be authorized to examine issues concerning Canada's past pandemic preparedness, lessons learned from the response to the 2009 pandemic virus (H1N1), the roles of all levels of government in pandemic preparedness, and Canada's future pandemic preparedness;

That the Committee's examination include processes and ethical issues related to pandemic preparedness;

That the Committee submit its final report no later than October 31, 2010, and that the Committee retain all powers necessary to publicize findings of the Committee until January 31, 2011.

After debate,

The question being put on the motion, it was adopted.

Extract from the *Journals of the Senate*, Tuesday, September 28, 2010:

The Honourable Senator Eggleton, P.C. moved, seconded by the Honourable Senator Smith, P.C.:

That notwithstanding the order of the Senate adopted on June 28, 2010, the date for the presentation of the final report by the Standing Senate Committee on Social Affairs, Science and Technology on Canada's pandemic preparedness be extended from October 31, 2010 to December 31, 2010 and that the date until which the committee retains powers to allow it to publicize its findings be extended from January 31, 2011 to March 31, 2011.

The question being put on the motion, it was adopted.

Gary W. O'Brien

Clerk of the Senate

GLOSSARY

CEPR – Centre for Emergency Preparedness and Response

CFIA – Canadian Food Inspection Agency

CIHR – Canadian Institutes of Health Research

CMOH – Chief Medical Officer of Health

CPHLN – Canadian Public Health Laboratory Network

CPHO – Chief Public Health Officer

CPIRN – CIHR-PHAC Influenza Research Network

EA – *Emergencies Act*

EMA – *Emergency Management Act*

EOC – Emergency Operations Centre

FNIHB – First Nation and Inuit Health Branch (Health Canada)

F/P/T – Federal/Provincial/Territorial

GSK – GlaxoSmithKline

IDEPB – Infectious Disease and Emergency Preparedness Branch, PHAC

CIRID – Centre for Immunization and Respiratory Infectious Disease, PHAC

IHRs – International Health Regulations

MOU – Memorandum of Understanding

NESS – National Emergency Stockpile System

NML – National Microbiology Laboratory

PIC – Pandemic Influenza Committee

PCC – Pandemic Coordination Committee

PHAC – Public Health Agency of Canada

PHN – Pan-Canadian Public Health Network

POGG – Peace, Order and Good Government

PPHB – Population and Public Health Branch, Health Canada

PWGSC – Public Works and Government Services Canada

SAC – Special F/P/T Advisory Committee on the H1N1 virus

SARS – Severe Acute Respiratory Syndrome

SPP – Security and Prosperity Partnership

WHO – World Health Organization

EXECUTIVE SUMMARY

On June 15, 2010, the Honourable Leona Aglukkaq, Minister of Health, requested that the Standing Senate Committee on Social Affairs, Science and Technology undertake a review of Canada's response to the 2009 H1N1 influenza pandemic. The committee heard from representatives of the federal government, several provincial and territorial governments, healthcare professions, First Nations and Inuit organizations, and the research community as it focussed its review on the federal government's role in the pandemic response. The committee also heard from first responders and front-line workers, and would like to express its appreciation for their hard work and dedication in contributing to community preparedness. This document contains the committee's findings as well as 17 recommendations and is intended to complement other 'lessons learned' exercises in Canada.

Overall, the committee found that the planning that began many years ago and that had been ramped up in recent years proved successful. Canada's response as a result of years of planning effectively reduced the impact of the H1N1 influenza pandemic. However, the committee would like to emphasize the importance of pandemic readiness and the need to maintain a focus on pandemic planning. In this regard it is recommending that the Government of Canada renew the funding for Pandemic Preparedness in Federal Budget 2011.

In addition, several themes emerged with respect to those areas that could be further strengthened. These themes are as follows:

- Roles of the federal, provincial and territorial governments in public health
- Canada's Pandemic Influenza Plan for the Health Sector
- Communications and messaging
- Vaccines and antivirals
- Data collection, surveillance and analysis
- Capacity for public health service delivery
- Collaboration and consultation
- First Nations and Inuit
- Research

In the context of the roles of the various levels of government, the committee is calling for greater use of federal/provincial/territorial agreements as a means to create more uniformity between and among jurisdictions in their respective responses to pandemics. With respect to Canada's Pandemic Influenza Plan, the committee finds that future revisions should be regularly and rigorously tested.

The committee heard considerable testimony expressing concerns and challenges with respect to communication and messaging. In this regard, the committee is calling for the communications annex to Canada's Pandemic Influenza Plan to be updated so as to clarify the roles and

responsibilities of the different levels of government. It is also recommending that the Public Health Agency of Canada consult widely on how best to communicate real-time policy decisions as well as how to harmonize messaging. The committee also recommends that the use of social media and the consultation of health professionals be included as it moves forward with its examination of communication policies. Finally, the committee is calling on the Public Health Agency of Canada to launch public awareness campaigns, including the use of social media, which are aimed at various aspects of public health such as vaccine safety and effectiveness.

The Pandemic vaccine was another issue for which several concerns were raised. In response to these concerns the committee finds that the next ten-year federal/provincial/territorial contract that is to be established in 2011 must include a backup supplier and that the government must take steps to ensure that the backup supplier will add to Canada's ability to ensure access to a safe and sufficient supply of pandemic vaccine. In addition, the committee heard that the packaging chosen for the vaccine, that is the number of doses per vial and the number of vials per box, should be more relevant to the end user. Therefore, the committee recommends that the manufacturer consult the Public Health Agency of Canada prior to making this determination. Finally, the committee is concerned that the logistics of implementing the necessary vaccination programs for expedient inoculation of all Canadians who want to be vaccinated was not fully appreciated. As such, it is recommending that mass vaccination programs be more thoroughly explored and tested.

With respect to data collection, surveillance and analysis, the committee would like to see greater use of electronic resources. As such, it is recommending implementation of electronic public health surveillance applications as well as electronic health records systems. In terms of capacity for public health service delivery, the committee is calling for the Public Health Agency to monitor the scope of practice of paramedics and pharmacists in jurisdictions across Canada in order that they be included wherever possible as a valuable resource during public health emergencies. In addition the committee would like the Public Health Agency of Canada to work with the provinces and territories to encourage greater interconnectivity between the different health care infrastructures, namely acute care, primary care, clinical care and public health care. It notes that these measures will contribute to increased surge capacity in hospitals.

In terms of collaboration and consultation, the committee is calling for broader inclusion of health professionals. It is also recommending that the Public Health Agency of Canada establish formal collaborative arrangements with provincial public health agencies so as to make efficient use of resources and expertise.

The committee would also like to make recommendations specific to First Nations and Inuit populations. While the committee commends the efforts made to ensure that remote communities and on-reserve First Nations received necessary interventions such as antivirals and vaccine, it is concerned about public health infrastructure in general. The committee is calling for Health

Canada's First Nation and Inuit Health Branch, the Public Health Agency of Canada and Indian and Northern Affairs Canada to identify those communities where unhealthy conditions exist, such as poor access to clean water and overcrowding, that make the residents vulnerable to communicable disease and to address these public health concerns. The committee is also calling for improvements to the reporting systems for data collection and surveillance for aboriginal groups. Finally the committee recommends that the federal government enter into discussions with representatives from First Nation and Inuit organizations and communities with the aim to clarify its role in a public health emergency.

The final area of concern identified during this study was that of research. The committee recommends that research be included in the ongoing focus on pandemic preparedness, In this regard the committee recommends that the infrastructure must be maintained for influenza research and is calling on the federal government to provide dedicated and sustained funding in this regard.

The committee commends the Public Health Agency of Canada for its role on the international stage and acknowledges the leadership role that Canada played in collaborating with various jurisdictions as well as providing assistance and certain expertise to those countries that were less well-equipped. The report examines the key areas of concern and includes recommendations to strengthen Canada's pandemic preparedness plan for the future.

1. INTRODUCTION

On June 15, 2010, the Honourable Leona Aglukkaq, Minister of Health, requested that the Standing Senate Committee on Social Affairs, Science and Technology undertake a review of Canada's response to the 2009 influenza H1N1 pandemic. The committee agreed and between September 29 and October 29, 2010 it examined the issue to reveal the lessons learned from this public health challenge with a view to improving Canada's preparedness for future pandemics. Over the course of 9 hearings and one roundtable discussion, the committee heard testimony from representatives of the federal government, several provincial and territorial governments, healthcare professions, First Nations and Inuit organizations, first responders, front-line workers, and the research community. Finally, the committee sought input from other countries as well as from bioethicists and health law experts.

2. CONTEXT

1. Overview of Influenza Pandemics

Influenza is a respiratory illness caused by viruses which can be classified as type A, B or C. Type A influenza viruses can infect both humans and animals and pose the greatest risk for pandemics. Type B influenza viruses affect only humans and have not been associated with any pandemics. Type C influenza viruses can affect humans and animals, are associated with mild illness in humans and are not associated with pandemics.

Influenza is highly contagious, affecting mainly the nose, throat, bronchi and, occasionally, the lungs, and is characterized by sudden onset of high fever, aching muscles, headache and severe malaise, dry cough, sore throat and rhinitis.¹ Some symptoms of influenza are similar to those of the common cold, however, onset of colds is over the course of a few days, and they are rarely associated with fever, chills and fatigue.

As with any communicable disease, influenza can be subject to regional, national or international outbreaks. The World Health Organization (WHO) considers a disease outbreak to be an epidemic when there are more cases of that particular disease than normal in a given geographic area, whereas a pandemic is worldwide epidemic. An influenza pandemic may occur when a new or novel influenza virus appears against which the human population has no immunity, it can be either mild or severe in the illness and deaths that it causes, and the severity of a pandemic can change over the course of that pandemic.²

¹ WHO, "Influenza," <http://www.who.int/topics/influenza/en/> (accessed 1 November 2010).

² WHO, "Pandemic Preparedness", <http://www.who.int/csr/disease/influenza/pandemic/en/> (accessed 1 November 2010)

Influenza pandemics over the last century have ranged in severity and impact and are summarized below.

a. The Spanish Flu: 1918–1919

The 1918 Spanish Flu was caused by a strain of H1N1 influenza virus. The pandemic was quite severe as it is estimated to have, over the course of three waves of this pandemic, infected one third of the global population (approximately 500 million people), resulting in 50-100 million deaths.³ The wide range in estimates is due in part to secondary bacterial infections that seemed to be characteristic in many individuals infected with this strain of flu virus.⁴

b. The Asian Flu: 1957–1958

In February 1957, scientists in Melbourne, London and Washington, DC were alerted to an influenza outbreak in Hong Kong where 250,000 people were infected within a short period of time. By May of that year the virus had spread worldwide. The 1957 pandemic marked the first time that analytical laboratory techniques were available to understand the outbreak as it unfolded. The H2N2 influenza virus responsible for this pandemic replaced the H1N1 virus that had been circulating among the population since the Spanish flu and was subsequently replaced by the virus of the Hong Kong Flu described below.⁵

c. The Hong Kong Flu: 1968–1969

The influenza outbreak known as the Hong Kong Flu also originated in Asia, but was unique in that there were several small epidemics occurring simultaneously scattered geographically and often differing in clinical impact. This may have been due to the partial immunity to a portion of the H3N2 Hong Kong Flu virus. To date, this influenza virus is still present in the human population and continues to pose a risk.⁶

The timing and nature of influenza pandemics is unpredictable but it is a certainty that influenza pandemics will emerge periodically, on average every 30 to 40 years. As such, much effort has been put into preparedness and response planning. Below is an overview of International and Canadian pandemic plans.

³ J. K. Taubenberger, and D. M. Morens, “1918 Influenza: the mother of all pandemics,” *Emerging Infectious Diseases*, 2006, Vol. 12, No. 1, pp. 15–22.

⁴ E. D. Kilbourne, “Influenza Pandemics of the 20th Century,” *Emerging Infectious Diseases*, 2006, Vol. 12, No. 1, pp. 9–14.

⁵ Ibid.

⁶ Ibid.

2. International Preparedness and Response

Pandemic planning and response in Canada is guided by several key international frameworks, regulations, standards and guidelines. These include various WHO agreements as well as other frameworks such as the International Partnership on Avian and Pandemic Influenza, the World Organization for Animal Health, the World Trade Organization, and the North American Free Trade Agreement. The main international obligations and frameworks that guide Canada's response to an influenza pandemic are outlined below.

a. WHO International Health Regulations

Like all participating WHO member states, Canada must meet international health obligations outlined in The International Health Regulations (IHRs), which were first adopted by the Health Assembly in 1969 and most recently updated in May 2005 to reflect in part lessons learned from the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak.⁷ These most recent IHRs came into force on June 15, 2007.

The IHRs seek “to prevent, protect against, control and provide a public health response to the internal spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with internal traffic and trade.” Under the IHRs:

- Canada and participating member states must ensure that the human rights of persons and travellers are protected in the context of a disease outbreak;
- Canada and other participating States must develop specified minimum core public health capacities such as surveillance system(s) and capabilities to address the risk of international spread of a given disease at ports, airports and ground crossings;
- Canada and other participating States must notify the WHO of a public health emergency of international concern within 24 hours of assessment in accordance with the case definition established by WHO, as well as provide follow up information such as case definitions, laboratory results and data on morbidity and mortality; and,
- National and WHO IHR Focal Points are established to facilitate urgent communications between State Parties and the WHO. The Public Health Agency

⁷ WHO, *International Health Regulations (2005)*, http://whqlibdoc.who.int/publications/2008/9789241580410_eng.pdf (accessed 1 November 2010).

of Canada's (PHAC's) Centre for Emergency Response and Preparedness (CEPR) is Canada's national focal point.⁸

The IHRs also provide the mandate for the WHO to collect reports of potentially serious public health risks and to coordinate the necessary international response. In the event of a pandemic, the WHO is responsible for selecting the pandemic vaccine strain and the appropriate time to move from seasonal influenza vaccine production to that of the pandemic vaccine. This is done in collaboration with WHO Collaborating Centres for influenza, national regulatory reference laboratories and other key stakeholders.⁹

b. WHO Pandemic Influenza Preparedness and Response

Pandemic preparedness and response in Canada is also informed by the WHO guidance document, *Pandemic Influenza Preparedness and Response*. This document describes the recommended measures and systems to appropriately respond to an influenza pandemic. It was updated in 2009, in part to align with the most recent IHRs, and is accompanied by several supporting documents focusing on specific aspects and tools for planning, preparedness and response, which can together be used to inform national planning.¹⁰

A key aspect of the guidance document is the emphasis on a “whole-of-society” approach to pandemic planning and preparedness, where all sectors of society should be engaged participants. For example, national governments could lead the overall coordination and communication during a pandemic response, the health sector would provide epidemiological, clinical and virological information and response, and the non-health sector could ensure that economic and social impacts are addressed. Moreover, it is suggested that civil society, families and individuals could work to raise awareness, promote accurate communication of information, and reduce the spread of illness through the uptake of pandemic control measures.¹¹

In addition to defining the various roles and responsibilities related to pandemic preparedness and response, the WHO has introduced a framework to describe the progression or lifecycle of a pandemic (see Table 1). This framework allows for activities of both affected and non-affected regions to be described. It should be noted that this framework does not directly capture the

⁸ Government of Canada, *Public Health Agency of Canada*, <http://www.infosource.gc.ca/inst/ahs/fed04-eng.asp> (accessed 1 November 2010).

⁹ WHO, “Pandemic influenza preparedness and response,” <http://www.who.int/csr/disease/influenza/PIPGuidance09.pdf>, p. 10, (accessed 1 November 2010).

¹⁰ *Ibid.*, p. 9.

¹¹ *Ibid.*, p. 20.

extent of morbidity¹² nor mortality associated with the pandemic, and as such may not completely reflect the virulence or severity of illness associated with the virus.

Table 1 – WHO Pandemic Phase Description, 2009

Phase		Description	Main Actions in Affected Regions
Pandemic Preparedness	1	No animal influenza virus circulating among animals have been reported to cause infection in humans.	Producing, implementing, exercising and harmonizing national pandemic influenza preparedness plans with national emergency preparedness and response plans.
	2	An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is therefore considered a specific potential pandemic threat.	
	3	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks.	
Pandemic response and mitigation	4	Human to human transmission of the virus able to sustain community level outbreaks has been verified.	Rapid containment.
	5	Virus has caused sustained community level outbreaks in two or more countries in one WHO region.	Pandemic response: each country to implement actions as called for in their national plans.
	6	Virus has also caused sustained community level outbreaks in at least one other country in another WHO region.	
Post Peak Period	Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.	Evaluation of response; recovery; preparation for possible second wave.	
Possible New Wave	Level of pandemic influenza activity in most countries with adequate surveillance rising again.	Renewed response.	
Post Pandemic Period	Levels of influenza activity have returned to the levels seen for seasonal influenza in most countries with adequate surveillance.	Evaluation of response; revision of plans; recovery.	

Sources: Table prepared by the Library of Parliament using data obtained from the WHO, *WHO Pandemic Phase Descriptions and Main Actions by Phase*, http://www.who.int/csr/disease/influenza/pandemic_phase_descriptions_and_actions.pdf; and WHO, “Pandemic influenza preparedness and response,” <http://www.who.int/csr/disease/influenza/pipguidance2009/en/index.html> (accessed 20 August 2010).

Within each of the phases of a pandemic, actions taken in pandemic preparedness and response can be focused within the five basic components:¹³

1. Planning and coordination: Providing leadership and coordination of various stakeholders and ensuring that pandemic preparedness is appropriately integrated into national emergency preparedness frameworks. This includes regular revision of plans, coordination of resources and

¹² Morbidity refers to any departure, subjective or objective, from a state of physiological or psychological well-being, whereas the mortality rate captures the frequency of occurrence of death in a defined population during a specified interval of time.

¹³ WHO, “Pandemic Preparedness and Response”, p. 11.

capacities, as well as reviewing lessons learned and sharing experiences with the international community.

2. Situation monitoring and assessment: This entails the collection, interpretation and sharing of information on pandemic risk, and once under way, on pandemic activity. This requires a robust national surveillance system with the capacity to increase monitoring in a rapid and comprehensive manner, while being able to continue longer term surveillance after the peak pandemic period to detect subsequent potential waves.

3. Reducing the spread of disease: Depending on the “social distance” between individuals, families and communities, actions to reduce the spread of disease may include promoting protective behaviours and containment protocols (if necessary).

4. Continuity of health care provision: This includes the preparation and implementation of contingency plans that allow for the health care systems at all levels to continue to provide essential services throughout the pandemic.

5. Communications: Effective communication before and during a pandemic, as well as the provision and exchange of information between the public, partners and key stakeholders allows for well-informed decision making and the use of appropriate subsequent action plans. The World Health Organization Outbreak Communication Guide suggests that communication planning focus on the five principles of planning, trust, transparency, announcing early, and listening.¹⁴ Related activities may include promoting and communicating recommended interventions to reduce risk, and providing updates to the public and key stakeholders on the state of the pandemic.

c. North American Pandemic Plan

In addition to meeting its international obligations and commitments, Canada is an active participant in regional pandemic preparedness and response frameworks in the context of the Security and Prosperity Partnership (SPP) of North America. Given the interdependence of Canada the United States and Mexico, the SPP was launched in March 2005 to provide a flexible means for a dialogue, priority setting, collaboration and action on issues affecting the security, prosperity and quality of life of Canadians, Americans and Mexicans. It addresses issues such as border facilitation, the environment and food and product safety.¹⁵

¹⁴ WHO, “World Health Organization Outbreak Communication Planning Guide,” 2008, http://www.searo.who.int/LinkFiles/CDS_WHO_Outbreak_Comm_Planning_Guide.pdf (accessed 1 November 2010).

¹⁵ Government of Canada, “About SPP,” http://www.spp-psp.gc.ca/eic/site/spp-psp.nsf/eng/h_00003.html (accessed 1 November 2010).

In March 2006, the leaders of Canada, Mexico and the United States met at the SPP summit and committed to the development of a comprehensive, coordinated influenza preparedness plan for North America. The resulting plan known as the North American Plan for Avian and Pandemic Influenza was released in August 2007 and seeks to: detect, contain and control an avian influenza outbreak and prevent transmission to humans; prevent or slow the entry of a novel strain of human influenza to North America; minimize illnesses and deaths; and, sustain infrastructure and mitigate the impact to the economy and the functioning of society.¹⁶

d. The Canadian Pandemic Influenza Plan for the Health Sector

i. Development of the Influenza Pandemic Plan

Since 1988, Canada has had an influenza pandemic plan which has undergone several revisions in light of new evidence, experience and regional and international commitments and obligations. The most recent iteration, The Canadian Pandemic Influenza Plan for the Health Sector¹⁷ (the Plan) was released in 2006 and is the result of a collaborative process led by the Pandemic Influenza Committee (PIC). This committee, which was created in 2001, consisted of representatives from all provinces and territories, and expertise was provided by Chief Medical Officers of Health, epidemiologists, virologists, communicable disease specialists, clinical, public health and laboratory specialists and ethicists. The PHAC's Centre for Infectious Disease Prevention and Control coordinated the development of this edition of the Plan in collaboration with its CEPR, with direction from the PIC.¹⁸

With the establishment of the Pan-Canadian Public Health Network in 2005, PIC was subsumed within its working group structure, reporting to the Communicable Disease Control Expert Group.¹⁹ PIC continued to revise the Annexes of the Canadian Pandemic Influenza Plan for the Health Sector until 2009 and formally ceased to exist at the end of that process.

The Plan undergoes updates and revisions as new information and experience become available. For example, several of the annexes which support some of the specific operational details of the Plan have been updated and included in the current version of the Plan, including Annex B- Influenza Pandemic Planning Considerations in On Reserve First Nations Communities (updated June 2009) and Annex K- Canadian Pandemic Influenza Plan for the Health Sector: Communications Annex (updated October 2009).

¹⁶ Security and Prosperity Partnership of North America, "North American Plan for Avian and Pandemic Influenza," 2007, [http://www.spp-ssp.gc.ca/eic/site/spp-ssp.nsf/vwapi/pandemic-influenza.pdf/\\$FILE/pandemic-influenza.pdf](http://www.spp-ssp.gc.ca/eic/site/spp-ssp.nsf/vwapi/pandemic-influenza.pdf/$FILE/pandemic-influenza.pdf) (accessed 1 November 2010).

¹⁷ Government of Canada, *The Canadian Pandemic Influenza Plan for the Health Sector*, 2006, <http://www.phac-aspc.gc.ca/cpip-pclcpi/pdf-e/cpip-eng.pdf> (accessed 1 November 2010).

¹⁸ Ibid, preface.

¹⁹ Ibid., introduction, p. 6.

ii. Scope of the Plan

The scope of the Plan is national in focus with recognition that operational details need to be established in each jurisdiction's own plan. In addition, the Plan has a health sector focus which includes health emergency responders, health planners, health care workers, public health laboratories, as well as those involved in the manufacture, registration and supply of pharmaceuticals. Moreover, the Plan highlights that the primary intended audiences are the provincial and territorial (P/T) Ministries of Health.

The Plan recognizes that the health sector focus does not fully address emergency response activities and business continuity issues, which would be expected to play an important role in mitigating societal disruption. These aspects were included in the 2004 version of the Plan; however, the 2006 version addresses these issues in Annex L – Federal Emergency Preparedness and Response System. This annex describes the federal system for addressing emergencies and outlines the emergency response plan for the federal Health Portfolio.²⁰ In addition, it acknowledges other relevant planning documents that may intersect with the Plan including the Federal Emergency Response Plan, 2009 which describes the general roles and responsibilities of federal departments in an emergency, as well as the Health Portfolio Emergency Response Plan, 2009, which focuses on the responsibilities specific to the federal health portfolio during an emergency.

iii. Goals and Objectives

The goal of the Plan is primarily to minimize serious illness and overall deaths, and secondarily to minimize the resultant societal disruption among Canadians. Objectives of the Plan are:

- To assist and facilitate appropriate planning and response at all levels of government by: developing, through a federal/provincial/territorial collaborative process, a national Plan that is acceptable and applicable to stakeholders and that clearly identifies roles and responsibilities; developing a Plan that is sufficiently flexible to account for the unknown epidemiology of a pandemic and the needs of different stakeholders; recommending planning considerations for the appropriate prevention, care and treatment during a pandemic; and, recommending planning considerations for appropriate communications, resource management and preventive measures to minimize societal disruption from a health sector perspective,

²⁰ The Health Portfolio includes Health Canada, the Public Health Agency of Canada, the Canadian Institutes of Health Research, the Hazardous Materials Information Review Commission, the Patented Medicine Prices Review Board and Assisted Human Reproduction Canada.

- To provide a Plan that is reviewed on an annual basis to ensure the incorporation of new developments and to ensure consistencies with best practices, and
- To provide an evaluated Plan that is sufficiently clear and comprehensive to ensure operational validities.

iv. Federal, Provincial and Territorial Roles and Responsibilities under the Plan

The roles and responsibilities of the PIC and the federal/provincial/territorial (F/P/T) Ministers of Health with respect to the Plan were detailed in a Working Agreement between Deputy Ministers of Health in March 2001. The Working Agreement is an iterative document that allows for roles and responsibility components to be adapted or added as they are developed. This agreement was drafted prior to the creation of PHAC in September 2004. In general, the F/T/P roles and responsibilities can be described as follows below ²¹

- The federal government, through Public Safety Canada (PS), is responsible for the nationwide coordination of the pandemic influenza response, including surveillance, international liaison and coordination of the vaccine response.
- Joint responsibilities of the F/P/T Ministers of Health include ensuring the distribution of plans to all organizations that may be involved in the pandemic response and liaison with these stakeholders on an ongoing basis. The Ministers of Health may also be involved in planning simulation exercises once plans (national, federal and P/T) are in place. Development of cost estimates and options for decision makers will also be a joint F/P/T responsibility.
- The P/T governments are responsible for mobilizing their contingency plans and resources. Health emergency response commences at the local level and moves up the line to P/T levels and then to the federal level of government.
- Local public health authorities are responsible for planning local responses to an influenza pandemic with direction from both the P/T and federal levels. This involves liaising with local stakeholders (e.g., emergency responders, hospitals, and mortuary services) in advance of a pandemic to facilitate a coordinated response if pandemic influenza strikes a community. It is likely that the local public health authorities, through existing or enhanced surveillance, may be the first ones to detect influenza in their communities. It is essential that the lines of communication in communities and up the line to the P/T and federal levels are clear and established in advance of a pandemic.

²¹ Government of Canada, *The Canadian Pandemic Influenza Plan for the Health Sector*, 2006, Introduction, p. 5.

v. Planning Assumptions

The Plan is based on several key assumptions informed by past experience and current knowledge.

- *Origin:* The next pandemic will first emerge outside of Canada and be present in Canada within 3 months, although it could be sooner given the speed of population mobility.
- *Timing:* The virus could arrive at any time during the year (i.e., not just during flu season), and the first peak of illness could occur within 2–4 months after the virus arrives in Canada, followed by the first peak in mortality (after approximately 1 month). There will likely be two or more waves of illness and each wave may go across Canada in 1–2 months affecting several locations simultaneously.
- *Epidemiology:* The incubation period, method of transmission and period of communicability are based on current understanding of the influenza virus. It is assumed that a pandemic influenza virus will transmit efficiently from person to person allowing for large numbers of individuals to be infected. It is expected that there are specific groups that will be at increased risk for complications or *poor clinical outcomes*.
- *Impact:* Over 70% of the population will be infected, but only 15–35% will become clinically ill – the rest of the population having asymptomatic infection. Mortality is expected to be between 0.4–2% of the population depending on the pathogenicity (or clinical severity) of the pandemic virus.
- *Absenteeism:* During an outbreak, a workplace absenteeism rate of between 20–25% can be expected (as compared to 8% during a normal winter). Rates would be influenced by factors such as the type of work, extent of social interactions, and implementation of measures that encourage infected individuals to stay at home.

3. Roles of the Federal, Provincial and Territorial Governments in Public Health

Public health differs from health care because its focus is on the health of the population as a whole, rather than the health of the individual patient, and because its emphasis is on the prevention of disease rather than clinical care. While no national consensus currently exists regarding the main functions of a public health system, the following six activities could be considered as essential functions: health protection, health surveillance, disease and injury prevention, population health assessment, health promotion and public health emergency

preparedness and response.²² Details regarding each of these specific functions and related programming areas are outlined in Table 3 below.

Table 3 – Essential Functions of Public Health Systems in Canada

Essential Public Health Functions	Overview	Examples of Public Health Interventions and/or Programming
Health Protection	Protection of the public from a variety of hazards, including: carriers of infectious diseases, food, drugs, consumer products, pesticides, improper waste disposal, impure drinking water, dangerous motor vehicles, second-hand smoke etc.	<ul style="list-style-type: none"> ● Regulatory frameworks for the control of infectious disease, such as quarantine legislation. ● Restaurant inspections. ● Water treatment monitoring. ● Air quality monitoring/enforcement.
Health Surveillance	Health surveillance is the epidemiological practice of monitoring data on diseases, health conditions, health factors and cases of illness. Health surveillance allows for the detection of public health threats, enabling earlier responses thereby mitigating the impact of the threat.	<ul style="list-style-type: none"> ● Periodic health surveys. ● Cancer and other disease registries. ● Communicable disease reporting. ● Ongoing analysis of data to identify disease trends or emerging problems. ● Monitoring of adverse reactions to vaccinations.
Disease and Injury Prevention	Many diseases can either be prevented or delayed, while injuries can be avoided.	<ul style="list-style-type: none"> ● Immunizations. ● Investigation and outbreak control. ● Encouraging of healthy behaviours, such as not smoking and physical activity. ● Early detection of cancers. ● Safe roads, etc.
Population Health Assessment	Population health assessment is the ability to understand the health of populations, including the socio-economic factors that underlie health.	<ul style="list-style-type: none"> ● Community health needs assessments. ● Health status and health system report cards. ● Tracking and reporting determinants of health.
Health Promotion	Health promotion involves the development and implementation of public policy and community-based interventions that support healthier and safer behaviours, which in turn contribute to the prevention of disease and injury.	<ul style="list-style-type: none"> ● The creation of physical and social environments that support health (e.g., bike paths). ● Advocacy for health public policies and behaviours.

²² The National Advisory Committee on SARS and Public Health (Health Canada), “Learning from SARS: Renewal of Public Health in Canada,” 2003, p. 46, <http://www.phac-aspc.gc.ca/publicat/sars-sras/pdf/sars-e.pdf>, (accessed 1 November 2010)

Essential Public Health Functions	Overview	Examples of Public Health Interventions and/or Programming
Public Health Emergency Preparedness and Response ²³	Public health systems must be able to respond to public health emergencies involving natural and human induced disasters that have an impact on population health, such as infectious disease outbreaks and/or nuclear attacks.	<ul style="list-style-type: none"> • Participating in pandemic preparedness and response planning.

Source: Table prepared by the Library of Parliament using data obtained from the National Advisory Committee on SARS and Public Health, pp. 45–48; and PHAC, “What We Do,” http://www.phac-aspc.gc.ca/about_apropos/what-eng.php.

a. Public Health: A Shared Authority

The *Constitution Act, 1867*, outlines the division of responsibilities between the federal and provincial governments. Neither “health” nor “public health” was specifically assigned to one level of government.²⁴ This was due to the fact that at the time, the administration of health and public health was still at an early stage, based upon the assumption that health was a private matter and state assistance to improve or protect the health of the citizen was highly exceptional and tolerable only in emergencies such as epidemics.²⁵ Due to this lack of clarity in the constitutional division of powers in relation to health and public health, both levels of government may legislate in these areas. As the Supreme Court of Canada has stated, “Health is not a matter which is subject to specific constitutional assignment but instead is an amorphous topic which can be addressed by valid federal or provincial legislation, depending upon the circumstances of each case on the nature and scope of the health problem in question.”²⁶

b. Constitutional Sources of Provincial Jurisdiction over Public Health

Jurisdiction over public health has therefore been derived from other powers outlined in the Constitution. Section 92(13) of the *Constitution Act, 1867* grants the provinces jurisdiction over “property and civil rights,” which has been interpreted broadly to include public health.²⁷ In addition, further provincial authority over public health is derived from section 92(16), which grants the provinces power over “matters of a local or private nature” of which health and public health is considered a part.²⁸ Moreover, section 92(8) of the Constitution grants provinces

²³ It is important to note that the Public Health Agency of Canada [PHAC] has included preparedness and response to public health emergencies, such as pandemics, as part of its mandate. PHAC, “What We Do” http://www.phac-aspc.gc.ca/about_apropos/what-eng.php.

²⁴ Nola M. Ries, “Legal Foundations of Public Health in Canada,” in *Public Health Law & Policy in Canada*, 2nd ed., ed. Bailey et al., Lexis Nexis Canada Inc., Markham, 2008, p.10.

²⁵ Elaine Gibson, “Public Health Information, Federalism and Politics,” *Health Law Review*, Vol. 16, No. 1, 2007, p. 5.

²⁶ Reis (2008). p. 10

²⁷ Kumanan Wilson, “The Complexities of Multi-level Governance in Public Health,” *Canadian Journal of Public Health*, Vol. 95, No. 6, December 2004, p. 409.

²⁸ Ibid.

jurisdiction over municipalities, which had been responsible for public health interventions prior to Confederation.²⁹

Provinces and territories have exercised jurisdiction over public health by enacting public health legislation that grants powers to public health officials to carry out various functions, including: monitoring the health of residents, providing independent advice to the government on public health issues, and activities related to communicable disease control and health hazard mitigation.³⁰ While public health statutes vary across jurisdictions, some contain specific provisions related to public health emergencies, such as epidemics and disease outbreaks, that enable the Lieutenant Governor in Council to declare a provincial/territorial public health emergency, thereby authorizing the provincial/territorial government to impose measures such as: travel restrictions, orders to provide essential goods and services, including medical assistance and supplies.³¹

c. Constitutional Sources of Federal Jurisdiction over Public Health

The federal government derives its authority over public health, in part, from its power over quarantine under section 91(11) of the Constitution. However, the federal power over quarantine is limited to imposing quarantine on individuals or conveyances entering and leaving the country. Under this authority, the federal government introduced the *Quarantine Act* in 1872, which was replaced by the new *Quarantine Act* in 2005. The Act empowers the federal Minister of Health to designate quarantine stations throughout Canada and appoint quarantine officers to inspect conveyances, such as ships, aircraft and motor vehicles, and to decontaminate them in cases of infestation. In addition, they may also screen individuals and where the officer has reasonable grounds to believe that the person is ill, may carry an infectious or contagious disease or may have been exposed to such a disease, the officer may request a medical examination and, upon refusal, may order the person into detention.³²

In addition to its powers over quarantine, the federal government derives jurisdiction over public health through its criminal law power under section 91(27) of the Constitution. This enables Parliament to enact legislation that protects Canadians from hazards that could be dangerous to public health; this would include legislation pertaining to the safety of food and drugs or to environmental contaminants.³³

Most significantly, the federal government has authority to act in the context of a public health emergency, such as a pandemic, under section 91 of the Constitution, which grants power over

²⁹ Gibson (2007), p. 5.

³⁰ Ries (2008), p. 16.

³¹ Ibid., p. 20.

³² Ibid., p. 13.

³³ Ibid.

“peace, order and good government” (POGG). The POGG power allows Parliament to pass legislation that regulates matters related to national health and welfare.³⁴ It consists of two branches: an emergency branch, which in times of emergency, allows Parliament to enact laws that would normally lie within the jurisdiction of provincial legislatures; and, a national dimensions branch, which allows Parliament to make laws in areas that concern Canada as a whole.³⁵

However the POGG power may only be used to regulate matters in which provinces are either unable to regulate effectively on their own, or the failure of one province to regulate would affect the health and welfare of residents in another province. Moreover, the extent to which the federal government may apply this power without the consent of the provinces remains uncertain and subject to the interpretation of the courts.³⁶

Currently, there are two statutes that grant the federal government authority to prepare for and act in the context of a public health emergency: the *Emergencies Act* (EA) and the *Emergency Management Act* (EMA), both of which are under the purview of the Public Safety Canada. The EMA provides the authority for the federal government to build capacity and develop plans to respond to emergencies. This is interpreted to include public health threats arising from natural disasters, infectious diseases and deliberate acts of bioterrorism. However, the EMA specifies that the federal emergency preparedness plan may only be implemented within a province if the province or local authority within that province has given the federal government consent.³⁷

Meanwhile, the *Emergencies Act*, which replaced the *War Measures Act* in 1988, grants the federal government authority to act if an emergency situation occurs such as a public welfare emergency, which includes a real or imminent emergency caused by a disease “that results or may result in a danger to life or property, social disruption or a breakdown in the flow of essential goods, services or resources, so serious as to be a national emergency.”³⁸ The declaration of an emergency under the EA authorizes the federal government to prohibit travel, establish emergency hospitals, direct persons to provide essential services and make emergency payments. However, under the EA, the federal government must consult with the affected provinces and may not declare an emergency when the effects of the emergency are confined to one province.

³⁴ Wilson (2004), p. 410.

³⁵ Marlisa Tiedemann, *Bill C-5: Public Health Agency of Canada Act*, LS-523E, Parliamentary Information and Research Service, Library of Parliament, Ottawa, 26 April 2006, p. 2, <http://www2.parl.gc.ca/Content/LOP/LegislativeSummaries/39/1/c5-e.pdf>.

³⁶ Wilson (2004), p. 410

³⁷ The EMA is available online from the Department of Justice website at: <http://laws.justice.gc.ca/PDF/Statute/E/E-4.56.pdf> (accessed 2 November, 2010)

³⁸ The EA is available online from the Department of Justice website; <http://laws.justice.gc.ca/PDF/Statute/E/E-4.5.pdf> (accessed 2 November, 2010)

Under the Constitution, the federal government may also involve itself in public health through the use of its spending power, which is inferred from Parliament's jurisdiction over public debt and property (section 91(1)(a)) and its general taxing power (section 91(3)), which enables the federal government to raise funds and spend them in any way that it deems necessary.³⁹ This could include providing federal transfers to the provinces for public health programs and/or entering into legal contracts to develop public health initiatives, such as the purchasing of vaccines or antiviral stockpiles.⁴⁰

In addition to these broad powers related public health, the federal government has responsibilities for certain groups of people under section 91 of the Constitution, including: military, militia, and naval services; First Nations and Inuit; and federal inmates. Under section 95, the federal government also has jurisdiction over immigrants concurrently with the provinces. As such, the federal government is responsible for the provision of certain public health services, such as immunizations, to these groups of people.⁴¹

Finally, the federal government has authority to implement international public health treaties and/or regulations through its power to regulate trade and commerce of an inter-provincial or international nature under section 91(11) of the Constitution.⁴² For example, the federal government is responsible for ensuring that Canada meets its obligations under the WHO's IHRs, which outline a framework for state response to a disease outbreak, including Canada's reporting requirements to the WHO and its obligations to maintain certain capacities for disease surveillance and response.⁴³

d. Limits of Federal and Provincial Powers in Public Health:

i. The Canadian Charter of Rights and Freedoms

All public health legislation in Canada must be consistent with the *Canadian Charter of Rights and Freedoms*⁴⁴ and any statute may be challenged if affected persons believe that their Charter rights have been violated. When any level of government institutes restrictive measures to protect public health, these measures may violate Charter rights to liberty, personal security,

³⁹ Marlisa Tiedemann, *The Federal Role in Health and Health Care*, PRB 08-58E, Parliamentary Information and Research Service, Library of Parliament, Ottawa, 20 October 2008, p. 2, <http://lpintrabp.parl.gc.ca/lopimages2/prbpubs/pdf/bp1000/prb0858-e.pdf>.

⁴⁰ Wilson (2004), p. 410.

⁴¹ Tiedemann (2008), p.3

⁴² Ibid.

⁴³ Barbara von Tigerstrom, "Public Health", in *Canadian Health Law and Policy*, 3rd ed., ed. Jocelyn Downie et al., Lexis Nexis, Markham, July 2007, p. 483.

⁴⁴ *Canadian Charter of Rights and Freedoms*, Part I of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (U.K.), 1982, c. 11.

association with others, freedom from discrimination and right to privacy.⁴⁵ Individuals therefore may seek judicial review of such measures. However, section 1 of the Charter also stipulates that protected individual rights are subject to reasonable limits that can be justified in a free and democratic society.⁴⁶ This means that any government violation of these rights may be justified as long as the government's goal is sufficiently pressing and substantial to warrant restrictions on fundamental liberties. Furthermore, the limits imposed on individual rights must be rationally connected to achieving the government's goal. Finally, the public benefit that is to be gained by the restriction of individual rights must be proportionate to its harmful impact on the individual.

4. Organization of public health delivery in Canada

As the federal and provincial/territorial governments share responsibilities for public health, each level of government has developed its respective structures and institutions to carry out the essential functions of public health systems. This section outlines how public health is organized and delivered at the federal, provincial/territorial and municipal levels of government.

a. Federal

i. Public Health Agency of Canada (PHAC)

The 2003 SARS outbreak illustrated that there was a need to enhance public health preparedness and infrastructure in Canada. Reports evaluating Canada's response to the outbreak found that federal leadership in a public health emergency needed to be strengthened through the establishment of a federal agency specifically responsible for public health and the creation of new mechanisms for improved F/P/T collaboration and coordination in public health.⁴⁷

Prior to the SARS outbreak, the federal government's public health functions were carried out by Health Canada's Population and Public Health Branch (PPHB), which was headquartered in Ottawa with regional offices across the country. Components of PPHB included the Centres for Infectious Disease Prevention and Control, Chronic Disease Prevention and Control, Emergency Preparedness and Response, Surveillance Coordination and Health Human Development. The National Advisory Committee on SARS and Public Health found that this arrangement of public health placed within the context of a larger department meant that there was no specific federal public health focal point.⁴⁸

Additionally, the National Advisory Committee on SARS and Public Health felt that the PPHB was not in a position to address effectively the jurisdictional disputes that arose in the context of

⁴⁵ Nola M. Ries, "Legal Issues in Disease Outbreaks: Judicial Review of Public Health Powers," *Health Law Review*, Vol. 16, No. 1, 2007, p. 12.

⁴⁶ *R. v. Oakes*, [1986], 1 SCR 103

⁴⁷ Tiedemann (2006).

⁴⁸ *Ibid.*

SARS.⁴⁹ For example, the federal government does not have constitutional authority to require that provinces and territories transfer health surveillance information. Consequently, when the federal government did not receive sufficient information from the Government of Ontario, it was unable to inform the WHO of the actual degree of severity of the outbreak, resulting in the WHO imposing a travel advisory on the City of Toronto.⁵⁰

As a result of these recommendations, Parliament passed legislation in 2006 establishing the PHAC and the role of the Chief Public Health Officer, which outlines measures that the Government of Canada may take in area of public health, including health protection and promotion, population health assessment, health surveillance, disease and injury prevention and public health emergency preparedness and response. These public health measures may be accomplished through; collaboration with other public health bodies in order to coordinate federal policies; cooperation and consultation with provincial and territorial governments; and, cooperation with foreign governments and international organizations and other interested parties.⁵¹

The Chief Public Health Officer, whose role was established under this statute, must be a public health professional who also acts as the deputy head of the Agency. The Chief Public Health Officer's main duties include:

- Acting as lead health professional of the Government of Canada in relation to public health;
- Communicating with governments, public health authorities or organizations in the public health field within Canada or internationally;
- Communicating with the public, voluntary organizations in the public health field or the private sector for the purpose of providing information, seeking their views regarding public health issues; and,
- Submitting an annual report to the Minister of Health on the state of public health in Canada.

PHAC is the primary agency within the health portfolio responsible for assisting the Minister of Health in co-ordinating overall national public health activities, including responding to a public health emergency. PHAC carries out its activities through two branches: the Planning and Public Health Integration Branch and the Infectious Disease and Emergency Preparedness Branch (IDEPB). The IDEPB focuses on preventing, eliminating and controlling infectious diseases and maintaining the safety and health security of people both nationally and internationally. It works

⁴⁹ Ibid.

⁵⁰ Nola M. Ries, "Legal Foundations for a National Public Health Agency in Canada," *Canadian Journal of Public Health*, Vol. 96, No. 4, p. 282.

⁵¹ The *Public Health Agency of Canada Act* is available online from the Department of Justice website at: <http://laws.justice.gc.ca/PDF/Statute/P/P-29.5.pdf> (accessed 2 November, 2010)

in partnership with other federal government agencies, provinces and territories, as well as other national and international partners. Representatives from IDEPB work in conjunction with the Pan-Canadian Health Network (see below) to develop and update the Canadian Pandemic Influenza Plan for the Health Sector.

IDEPB is made up of four program centres and two laboratories. Those that play key roles in federal pandemic preparedness and response include the National Microbiology Laboratory (NML), the Centre for Immunization and Respiratory Infectious Disease (CIRID) and the CEPR. NML's key activities include: surveillance for infectious diseases; reference microbiology and quality assurance; preparedness and response to biological threats; and applied and fundamental research. With respect to the two centres involved in pandemic preparedness, CIRID focuses on strengthening Canada's ability to manage and respond to emerging and re-emerging infectious disease and respiratory infections, including pandemic influenza, while CEPR is Canada's central coordinating point for public health security issues. CEPR's main responsibilities include:

- developing national emergency response plans for PHAC and Health Canada;
- monitoring outbreaks and global disease events;
- assessing public health risks during emergencies;
- ensuring that Canada's health and emergency policies are in line with threats to public health security;
- developing federal public health rules for laboratory safety and security, and quarantine; and
- acting as the primary federal health authority on bioterrorism, emergency health services and emergency response.⁵²

ii. The Pan-Canadian Public Health Network

In order to foster greater F/P/T collaboration in public health, Canada's F/P/T Ministers of Health established the Pan-Canadian Public Health Network (PHN) in 2005. The mandate of the PHN includes: information sharing; providing policy and technical advice to F/P/T Deputy Ministers of Health on public health matters, including pandemic planning and preparedness; and, providing support to jurisdictions during public health emergencies and/or crises. It is governed by a 17-member Council that includes representatives from federal, provincial and territorial governments. It is co-chaired by an appointed provincial/territorial representative and the federal Chief Public Health Officer. The Council reports on behalf of the Network to the F/P/T Deputy Ministers of Health and then onto the Council of Ministers.

⁵² PHAC, Centre for Emergency Preparedness and Response, <http://www.phac-aspc.gc.ca/cepr-cmiu/index-eng.php> (accessed 2 November, 2010)

The work of the PHN is carried out by six expert working groups made up of academics, scientists, public servants and members of non-governmental organizations, who work in the following areas: communicable disease control, emergency preparedness and response, Canadian public health laboratories, surveillance and information, chronic disease and injury prevention and control and health promotion.⁵³

iii. Health Canada

While most of the federal responsibilities for public health have been transferred to PHAC, Health Canada maintains certain key functions related to public health and public health emergency preparedness and response. In particular, Health Canada has some responsibility for health protection of First Nations and Inuit populations. However, the jurisdictional framework in this regard is complex and has a direct impact on the type and scope of health services provided to Aboriginal groups. Aboriginal-specific federal programs are only available to First Nations residing on reserve and in some cases to the Inuit in northern territories.

The federal government maintains that the provision of health care to First Nations on reserve is a matter of custom and policy rather than a treaty right. The First Nations and Inuit Health Branch of Health Canada provides public health services and non-insured health benefits for First Nations communities and Inuit.

In addition, Health Canada is responsible for the health protection of federal public service workers and federal emergency responders. Health Canada is also responsible for the approval and safety monitoring of anti-viral drugs and vaccines necessary to address public health threats, such as a pandemic. Finally, Health Canada shares certain public health functions with PHAC, including the administration of the Quarantine Act, where Health Canada is responsible for its administration and enforcement relating to conveyances of goods and cargo and other services, while PHAC is responsible for its enforcement in relation to international travellers. Health Canada and PHAC work together to engage and coordinate public health efforts among domestic and international health partners.⁵⁴

iv. Public Safety Canada

Public Safety Canada is responsible for the coordination of a whole-of-government response to an emergency. Under the *Emergency Management Act*, Public Safety Canada has developed a Federal Emergency Response Plan that is an “all-hazards” response plan, which is designed to respond to any type of emergency, such as a nuclear attack or an influenza pandemic. In the context of a public health emergency, PHAC is designated the primary or lead department, while

⁵³ Pan-Canadian Public Health Network, *About the Network: The Pan-Canadian Public Health Network: An Overview*, http://www.phn-rsp.ca/About_e.html.

⁵⁴ From: Government of Canada, “Health Portfolio Emergency Response Plan,” September 2009.

Public Safety Canada provides support to PHAC by coordinating the overall federal public health and emergency response effort, as well as ensuring the maintenance of critical infrastructure and services.⁵⁵

b. Provincial/Territorial

Primary legislative authority for public health activities in Canada remains at the P/T level of government. As such, each province or territory has established a Chief Medical Officer of Health (CMOH) or equivalent. The CMOH advises the provincial/territorial government on public health matters and may also be the director of the health department, or public health department of the provincial/territorial government. Public health policy development, programs, and funding allocations are the responsibility of either a health department, or a department designated specifically for public health such as the British Columbia Centre for Disease Control. In addition, provincial/territorial departments of health/public health are also responsible for the development and implementation of pandemic contingency plans and guidelines, including: surveillance, prevention, treatment and control.⁵⁶

c. Municipal/regional

Responsibility for the actual delivery of most public health services remains at the local or regional level, including planning the local response to an influenza pandemic. Yet it is important to note that local/regional governments must deliver these services in accordance with provincial/territorial public health statutes and regulations, as well as other policies, directives and conditions for funding. Moreover, in the context of a national pandemic, local public health responses must also be coordinated with federal responses.

In Canada, four governance patterns exist for the delivery of public health services at the local level. The most common model is the Regional Health Authority/District, where locally elected or appointed boards are responsible for the provision of health services within a defined geographical area. In this model, the delivery of public health services is combined with the delivery of other health services. This model is the most common pattern in the western provinces, as well as the Maritimes. Another model of Regional/District boards also consists of locally elected or appointed boards, but these boards are only responsible for public health. The model is most common in Newfoundland. The third pattern consists of municipal or county boards that are appointed by municipalities and the provinces to carry out public health functions, as well as other community services. This model remains in Ontario. Finally, in Prince Edward Island services are delivered at the provincial level. Each of these local or regional

⁵⁵ Government of Canada, *Federal Emergency Response Plan*, December 2009, p. 1, <http://www.publicsafety.gc.ca/prg/em/fl/ferp-eng.pdf>.

⁵⁶ This section is drawn from: The National Advisory Committee on SARS and Public Health (Health Canada), "Learning from SARS: Renewal of Public Health in Canada," 2003, p. 50.

public health units are supported by a medical officer of health, a licensed physician with post-graduate training in public health.⁵⁷

5. The 2009 Influenza H1N1 Pandemic

A new strain of influenza virus was identified in April 2009 as type A H1N1. The new virus spread rapidly in several countries and on June 11, 2009 the WHO announced that the H1N1 outbreak had met the criteria to be considered a pandemic. In Canada, the first reported cases of patients displaying symptoms of H1N1 were confirmed on April 23, 2009. By June 11, 2009, H1N1 had spread in to all provinces and territories. On August 10, 2010, the WHO declared the end of the H1N1 pandemic.

Canada experienced two distinct waves of pandemic H1N1 in 2009, the first wave was in the spring and second wave was in the fall, peaking in early June 2009 and early November 2009, respectively. The first wave was substantially larger than the second wave and resulted in a 4-5 fold increase in hospitalizations and deaths.

A total of 40,185 laboratory-confirmed cases of H1N1 were reported to the PHAC during the pandemic.⁵⁸ Of this total, 8,678 cases were hospitalized, of whom 1,473 (16.9%) cases were admitted to the intensive care unit. Some 60% of those admitted to intensive care required ventilation. Overall, 428 (4.9%) Canadians died with H1N1, a mortality rate of approximately 1.3 per 100,000population.⁵⁹

The 2009 H1N1 pandemic marked the first pandemic of the 21st century as well as the first pandemic to be tackled not only with a vaccine but also antiviral medication. It was also the first opportunity for the global community to use the pandemic influenza preparedness and response plans that had been created and updated over the past two decades.

⁵⁷ Ibid., pp. 49-50.

⁵⁸ It should be noted that the number of confirmed cases reported is likely underestimated since not all cases were confirmed by laboratory analysis.

⁵⁹ All statistics provided are from PHAC's *Fluwatch* surveillance program.

3. COMMITTEE FINDINGS

The following summary of the witness testimony is arranged to reflect those areas in which concerns were raised. These areas are:

- Roles of the federal, provincial and territorial governments in public health;
- Canada's Pandemic Influenza Plan for the Health Sector;
- Communications and messaging;
- Vaccines and antivirals;
- Data collection, surveillance and analysis;
- Capacity for public health service delivery;
- Collaboration and consultation;
- First Nations and Inuit; and,
- Research.

1. Roles and Responsibilities of the Federal, Provincial and Territorial (F/P/T) Governments in Public Health

Throughout its hearings the committee heard that there has been substantial improvement in the public health realm, specifically since the 2003 SARS outbreak and the subsequent creation of the Public Health Agency of Canada (PHAC). As stated earlier, public health is a shared responsibility in Canada and both the federal and provincial/territorial levels of government have legislation in this regard. Their respective roles depend on the circumstances, scope and nature of the issue. Witnesses agreed in general that the division of roles among the different levels of government was reasonable and was not itself in dispute.

While PHAC officials indicated that the federal government took a leadership role in disease surveillance, antiviral and vaccine programs, infection prevention measures, collection of clinical care guidelines, public health communication, research, and laboratory testing during the H1N1 pandemic, some witnesses stated that the federal government should have been more emphatic about its leadership role. That is, some front-line workers felt that the shared responsibility for public health should come under explicit federal leadership. Witnesses proposed different mechanisms by which a uniform national approach could be achieved. These ranged from further nurturing the current approach of consulting with provinces and territories, to establishing mutual agreements among the jurisdictions, to harmonizing legislation between the provinces and territories, to utilizing the peace, order and good government head of power granted under the Constitution. However, it was pointed out that the goal of a pandemic response should be to have a uniform national response.

Federal government officials described the unprecedented level of cooperation between jurisdictions but emphasized that the provision of health services is a provincial responsibility.

Provincial officials expressed overall satisfaction with the level of cooperation between governments as well but felt that determination of how to implement decisions within their jurisdiction should be left to them. As such, the committee was told, consultation and collaboration with the provinces and territories was the preferable route to achieving uniformity across the country. In this respect the committee heard about federal/provincial/territorial Memoranda of Understanding (F/P/T MOUs). These are the F/P/T MOUs on: the Sharing of Information During a Public Health Emergency, the Provision of Mutual Aid in Relation to Health Resources During an Emergency Affecting the Health of the Public and, Roles and Responsibilities in Pandemic Influenza Preparedness and Responses – 2009 H1N1 Outbreak. These agreements describe the general intention of the parties but are not legally binding.

The committee heard from health law experts and bioethicists that provinces and territories should harmonize their public health legislation, particularly statutes relating to pandemic or other public health emergencies. It was pointed out that there are inconsistencies between some provincial/territorial plans and Canadian law which can be potentially damaging to the efficiency, effectiveness, and legitimacy of the responses, as well as to public trust in the system. It was proposed that this could be accomplished, as it has been in other areas, through the Uniform Law Conference of Canada, while still respecting jurisdictional realities. These witnesses also called attention to the report of the National Advisory Committee on SARS and Public Health which also made recommendations about harmonization of legislative frameworks for public health emergencies.⁶⁰ The committee heard that the F/P/T governments need to engage health law and health policy experts in a thorough review of constitutional powers, federal, provincial and territorial legislation, as well as Canadian common law. This would permit a determination of the legal status of the measures found to be necessary to meet the public health goal that is in the interests of all Canadians.

Finally, the committee heard that a public health emergency, such as an influenza pandemic, may warrant the use of the Peace, Order and Good Government (POGG) head of power. It was suggested that now is the time to sort out the relationship of pandemic to emergency powers and to communicate this to the provinces and territories. A discussion on this difficult issue at a time when there is no imminent public health threat would help to avoid inaction and confusion at a time of crisis. Most witnesses agreed that a cooperative and collaborative approach with the provinces and territories is preferable. However, under the POGG, a legislative back up plan would be available if needed.

In regard to federal leadership, the committee clearly heard that the Minister of Health is the lead minister in emergencies involving health events and that PHAC assumes the primary role. According to Public Safety Canada, this operating structure worked well during the H1N1

⁶⁰ David Naylor, The report of the National Advisory Committee on SARS and Public Health, “Learning from SARS: Renewal of Public Health in Canada,” October 2003.

pandemic. Committee members were made aware of the federal health portfolio's response structure and procedures for federal staff. The Health Portfolio's Emergency Response Plan is a requirement of the *Emergency Management Act*. This plan operationalizes the joint response of those departments and agencies involved to any emergency and the committee was told that it had been tested a number of times prior to the H1N1 outbreak. The committee members visited the Emergency Operations Centre (EOC), managed and maintained by PHAC, and were told how rapid and on-going response is coordinated through this centre. It was told that the EOC was activated in the earliest days of the H1N1 detection, before it became an international concern, and remained active 24 hours a day, 7 days a week for most of the declared pandemic period.

2. Canada's Pandemic Influenza Plan for the Health Sector

Overall witnesses acknowledged that Canada's preparedness and response was satisfactory. Canada's Chief Public Health Officer (CPHO), Dr. David Butler-Jones, emphasized that Canada's Pandemic Influenza Plan (the Plan) allowed Canada to: create, approve, produce and distribute vaccine to the H1N1 virus; achieve high vaccination rates; access to stockpiles of antiviral treatments; target vulnerable populations; and, launch national public awareness and advertising campaigns. He stated, "Canadians, together with their communities, institutions and governments, responded effectively, as did those around the world. Our collective response could not have happened had it not been for years of planning and the Government of Canada's investment in this planning effort."⁶¹

As such, the committee was told the impact of the 2009 H1N1 was reduced, although it also heard that it is very difficult to measure how much the Plan reduced the burden of the influenza. Many witnesses emphasized that Canada was a leader in many facets of its response to the pandemic from identification of the H1N1 virus, to vaccine production and delivery, to information-sharing on the global stage. Although it was pointed out that the Plan assumed a 'moderately severe pandemic, allowing a certain degree of scalability up or down, government officials recognized that the flexibility of the Plan was not sufficient. Government officials, both federal and provincial/territorial, as well as front-line workers suggested that a revised Plan should reflect the reality that influenza pandemics have exhibited different levels of severity in the past, and that the Plan should be sufficiently flexible such that it can be scalable and adaptable to this, as well as responsive to emerging scientific knowledge and to the severity of the virus changing during the pandemic. It was suggested that a scalable pandemic plan would outline activities that are responsive in real-time to observations on the ground, rather than a potential worst case scenario. In this regard, committee members heard that Saskatchewan had accelerated its revision of the provincial pandemic plan to encompass a range of clinical severity

⁶¹ Standing Senate Committee on Social Affairs, Science and Technology, Evidence, 29 September, 2010, No. 012, 3rd Session of the 40th Parliament.

and to make risk assessment a key in determining the appropriate response rather than having a proscriptive response.

Several witnesses suggested that Canada did not take the opportunity of the seasonal influenza to improve upon the Plan and make the necessary preparations. The committee was told that an ongoing evaluation of seasonal flu would help to build the necessary infrastructure and provide the means to rehearse certain aspects of pandemic preparedness. The Minister of Health, the Honourable Leona Aglukkaq, stated that the H1N1 pandemic was the first real test of the Plan. Several witnesses suggested that more, and regular, trial exercises should have been implemented prior to the appearance of the H1N1 virus in 2009 and should include all parties down to the local level, including the health care providers. Such exercises may have been successful in highlighting some of the concerns that are discussed below in the areas of communications and messaging, vaccines and antivirals, surveillance, data collection and analysis, capacity, collaboration, research, and First Nations and Inuit populations.

Similarly, Public Safety Canada highlighted that some of the federal agencies and departments had not yet tested their own influenza pandemic plans prior to the H1N1 pandemic. In summer 2009, Public Safety Canada instructed departments and agencies that their plans needed to be exercised. A follow up on this prior to the second wave indicated that 70% had complied and by the time the second wave had passed, 90% of departments and agencies had complied with the testing requirement.

In addition, in the event of a pandemic, as was the case with H1N1, Public Safety Canada works with the federal departments and agencies responsible for critical infrastructure to produce daily reports of pandemic impact. The committee heard that fortunately in the case of this past pandemic, there were no impacts on critical infrastructure. Public Safety Canada also works on a number of emergency management initiatives in collaboration with senior officials from the provinces and territories. Finally, the department launched, in 2006, a private sector pandemic working group comprised of representatives from the ten critical infrastructure sectors. The purpose of the working group is to ensure a consistent approach to pandemic influenza planning and preparedness.

A number of witnesses suggested that there should have been development of national clinical guidelines. The committee heard that at the outset of the H1N1 pandemic there was a perception by some that PHAC would be providing leadership in the guidance on clinical care. The committee was told that a Clinical Care and Antiviral Task Group was established within the Public Health Network structure; however, its mandate had been unclear. Eventually its mandate was determined to be one of providing a forum to facilitate and support the development of clinical guidelines through consultation with national organizations. Due to the delay in establishing the role of this group, the committee was told that most jurisdictions developed their own guidelines.

Another criticism of the Plan pertained to its scope. The current Plan focuses on the health sector, although annexes to the Plan provide information for a broader scope. That is, Annex L-The Federal Emergency Preparedness and Response System, and Annex O-The Role of Emergency Social Services in Planning for Pandemic Preparedness in Canada, provide preparedness information for services outside those of health care provision. In this respect, the committee heard that for specifics that fall outside of the public health context, Public Safety Canada is responsible under the *Emergency Management Act* to ensure that each of the federal departments and agencies has developed and implemented its own emergency preparedness plan.

The committee also heard from the Canadian Food Inspection Agency (CFIA), which is part of the Agricultural Portfolio, and heard about its role in the H1N1 pandemic. CFIA indicated that it works closely with other members of the Agricultural Portfolio on emerging animal health issues as well as with the Department of Foreign Affairs and International Trade on the economic implications from border closures to Canadian animal and animal products. In this regard, CFIA has pursued a Memorandum of Understanding with the United States and Mexico to promote consistent responses in the three countries to minimize confusion in the marketplace.

Some witnesses referred to the Pandemic Preparedness budget of 2006 which set aside \$1 billion over five years. This included \$400 million in contingency funding and \$600 million to be distributed among PHAC (\$367 million), Health Canada (\$16.5 million), CFIA (\$195 million) and the Canadian Institutes of Health Research (CIHR) (\$21.5 million). The committee was told that this funding will expire in March 2011 and heard that it should be renewed so that Canada can maintain capacity and infrastructure, effectively consult and update the Plan, and retain and build upon our research accomplishments. The Minister of Health stated in her testimony to the committee that a similar approach would be taken to replenish the resources needed to implement a pandemic plan.

The committee heard that a robust public health infrastructure would improve Canada's capacity to respond to public health outbreaks. It was emphasized by health officials that there needs to be more attention paid to public health in order to build public trust in the system. In turn, public trust would ensure more public confidence in pandemic response in times of public health outbreaks. It was also pointed out that harmonization of public health practices and consequently of pandemic plans, such that there is little or no variation across jurisdictions, would result in greater public trust and confidence.

3. Communications and Messaging

Several witnesses commended the federal government, particularly PHAC and Dr. Butler-Jones, on the unprecedented communications effort it made during the H1N1 pandemic. Comparisons were again drawn to the SARS crisis and how much improved the communications were between the F/P/T governments. The committee heard that it was unique for a Deputy Head, the Chief Public Health Officer Dr. Butler-Jones, and not a Minister, to be the visible official during

an emergency. All witnesses who commented on this agreed that the CPHO was the right lead for communicating to Canadians on the H1N1 situation and that he performed the task very well.

Despite the fact that communications was handled much better than it was during SARS and that our CPHO was complimented on his performance by many witnesses, communications and messaging were the most frequently criticized issues during the study. This issue is vast and includes the federal government's communication and messaging to the Canadian public, their communication with the P/T governments, their role, if any, in the messaging available to Canadians via different media, and the responsibility for two-way communications, whether possible or helpful.

Overall, the federal government's messages to the Canadian public were viewed as very consistent and successful. Successful messages included updates on the status of the pandemic early on and promotion of measures to reduce the spread of illness such as coughing and sneezing into the arm, hand washing and the use of hand sanitizer. The committee heard from some witnesses however, that in some instances the messages delivered by PHAC were confusing and an example of this was on the subject of vaccine safety. Canada's primary H1N1 vaccine was an adjuvanted formulation. As the safety data on this type of vaccine did not include pregnant women, assurances could not be given in this respect. This was not to say, however, that there was any indication that it was unsafe. Because of the lack of safety data for adjuvanted vaccine use in pregnant women, Canada also ordered some unadjuvanted vaccine, which is what the seasonal influenza vaccine has traditionally been. Some witnesses described the messages explaining the adjuvanted versus the unadjuvanted vaccine as confusing and unclear.

Messaging about vaccine availability was also cited as being confusing. PHAC's message to Canadians was that enough vaccine would be made available so that all who wished to be immunized would be. However, they were also told that only certain groups would get priority. Canadians wondered why there was a need to prioritize if there would be enough vaccine for all. Witnesses suggested that this was easily explainable as not all vaccine would be available on day one, but stated that the government's message on this was not clear.

The committee was told that the confusing message could have been avoided with more effective communications strategies. It heard that communication with the public should have included clear explanations about the capacity to produce vaccine and deliver it through vaccination clinics and that these limitations dictate that the most vulnerable should get priority. The committee heard that the science firmly supported PHAC's recommendations but they were not successful in relaying that information. It was told that the level of public trust in the federal government, and in particular PHAC, is directly affected by the success of their communications.

Communication and messaging as it filtered down through the levels of government to the local level and the role played by the media were also issues of great interest to many of the witnesses. Annex K of the Plan relates to communications and it provides the framework for consistent and

coordinated public communications for PHAC, Health Canada and the P/T governments. Although the committee heard from PHAC that the communication networks were tested ahead of time, the annex only provides guidance. As one witness put it, “Many voices, one message”. Several witnesses questioned whether this can truly be achieved in a free and democratic society. Overall, federal and provincial/territorial witnesses were pleased with the level of cooperation between governments; however, some expressed the need to harmonize communication. In this respect, the committee heard that the F/P/T communications officials teleconferenced daily with a view to providing clear and consistent messages.

As messaging extended down from the provincial and territorial level to the local level, health care professionals indicated that their information was coming from multiple sources. The committee heard that while this did not necessarily mean that the messages were inconsistent, they indicated that health care professionals were too busy to sort through all of this information in order to determine the central message. In this regard the committee heard that better linkages should be established with the primary and acute care systems. Witnesses described how the public health system has established links within provinces, between provinces and with the federal government due to the nature of the work they do. This has not historically been the case within the primary or acute care communities but it is essential to appreciate that these systems become vital in a public health emergency. In this regard, the committee heard that these linkages should include two-way communication by embedding primary care expertise into public health planning.

Much of the concern about conflicting messaging was in reference to opposing viewpoints expressed in the media. It was generally agreed that this cannot be controlled but the impact could be minimized. One way to minimize the impact is to increase the level of trust in public officials, preferably prior to the onset of a public health concern. It was suggested that the public would be more liable to have confidence in messages delivered by credible public officials with whom public trust has already been established and will be less likely to give credence to ‘talking heads’.

Another way to minimize the impact of contradictory messages from those who may not be experts is to have established linkages with the media, again during times when there is not a public health threat. The committee heard that there is willingness among the mainstream media to be helpful as they have an interest in educating the public and, as such, there should have been partnerships developed with key trusted opinion leaders and the media. As well, PHAC indicated that it attempted to counter misinformation that was circulating on the internet with a team of media relation officers under its “Detect and Correct” system. The committee commends PHAC for this effort. PHAC indicated that in future it would ramp up this effort in order to respond more aggressively.

Consistency of messaging becomes more complex when we consider new media. Several witnesses commented on the challenge of addressing the misinformation that circulated on the internet. This included established websites, Facebook, Twitter and blogs. The committee was told that this cannot be controlled but the information coming from government can be. It was also suggested that partnering with opinion leaders, respected and trusted by the public, could be one way of minimizing the impact of misinformation. It also heard that governments must also embrace the social media and develop ways of using them in an appropriate and proportionate way so as to stay focussed on the overall public health threat.

The committee also heard about less conventional means of communicating that the government may wish to consider. The vaccine manufacturer suggested that it could be a facilitator of communications between the public and the private sector. The pharmacies conveyed that they are ideally positioned to provide information on vaccine and antiviral use, as well as general information on infectious illness like influenza and the non-medical interventions including personal hygiene and social distancing. The committee heard that this means of communicating to the public would be effective as the level of trust for pharmacists is already high.

The issue of communicating best practices was raised throughout the study. As officials stated, regardless of the planning that occurs, there will always be lessons learned during a pandemic or other public health emergency. In this respect, several witnesses spoke of the need to create a mechanism whereby best practices can be made available to other jurisdictions. Some noted the example of mass vaccination programs where jurisdictions experienced different levels of success. It was suggested that if there was a central point where best practices could be posted and accessed, some of the difficulties encountered may have been avoidable and that this type of informal information sharing may have helped to save time and resources when both of these are scarce.

4. Vaccines and Antivirals

a. Vaccines

Considerable discussion centred on vaccines over the course of this study and included testimony with respect to: the F/P/T contract; regulatory approval; packaging; distribution, programs and coverage; and, prioritization.

i. F/P/T Contract

The committee heard from Public Works and Government Services Canada (PWGSC), which runs the F/P/T Group Purchasing Program for drugs and vaccines. The Program, which was launched in 1973, allows all jurisdictions to benefit from cost savings achieved through economies of scale as it purchases influenza vaccine on behalf of all provinces and territories as well as the six federal departments for which there is federal authority for health care, namely;

the military, Royal Canadian Mounted Police, First Nations on-reserve, veterans, federal inmates and refugees.

The committee heard that, in 2000, as part of pandemic planning that Canada had initiated in 1998, requests for proposals were posted seeking a domestic pandemic vaccine supplier. At that time PWGSC learned that only one company was interested in establishing sufficient capacity to produce enough vaccine to immunize the entire Canadian population in the event of an influenza pandemic. In 2001, a ten year contract was awarded to ID Biochemical which required that the company supply 100% of Canada's influenza vaccine requirements in the event of a pandemic. The contract also granted the company 50% of Canada's seasonal influenza vaccine requirements, in order to ensure that the company would retain sufficient capacity to fulfill pandemic requirements. In addition, Canada would have priority, meaning that the company, which is now owned by GlaxoSmithKline, would have to fulfil Canada's quota before supplying any other purchasers. As GlaxoSmithKline retains 25% of the remaining 50% of seasonal influenza vaccine supply, GSK is under contract to deliver 75% of Canada's seasonal influenza vaccine as well as 100% of its pandemic influenza vaccine. The committee heard that over the course of this ten year contract, the company was paid a 'pandemic readiness fee' but was not told its value. PWGSC clarified that the seasonal influenza vaccine is paid for entirely by the provinces and territories while the cost of the pandemic vaccine is shared between the federal and P/T governments 60:40 respectively.

The committee heard that securing a domestic supplier that would provide priority access to vaccine for Canada was essential for our success in obtaining sufficient vaccine for all Canadians. Witnesses revealed that some countries that had not secured their own domestic supply were still waiting for vaccine in January 2010. The committee was told that the order was made eight years ago but that the number of doses requested, 50.4 million, was made in summer 2009. This order was based on 75% uptake and two doses per person. As information became available indicating that only one dose was required, this order was reduced. Government witnesses emphasized that the price that had been negotiated was very favourable and that Canada paid much less than other Western nations. Witnesses also emphasized that some of the cost of purchasing the H1N1 vaccine will be recouped in seasonal influenza vaccine programs. The committee heard that seven eighths of the cost of the H1N1 vaccine was the adjuvant, to which the antigen had to be mixed. This unused adjuvant component has been retained for future use.

The current ten-year contract expires in 2011. In preparation for the next contract, PWGSC indicated that an industry consultation was held in March 2010. This was attended by six suppliers, although only one supplier currently has the facilities to produce the vaccine domestically. In April 2010, two requests for proposals were issued. These correspond somewhat to the current influenza contracts with the added change of having a backup supplier of pandemic vaccine. There is no requirement for the backup supplier to be domestic. Another difference that

the committee was told of is that there will be greater consultation and collaboration with the provinces in the next contract. Of the six suppliers who attended the industry consultation, three suppliers have responded to the two requests. This is an ongoing process.

ii. Regulatory Approval

Health Canada is responsible for assessing the safety, quality and efficacy of drugs in Canada, including vaccines, and issuing approval to market those drugs in Canada. The H1N1 vaccine posed an additional challenge for issuing that approval in that it differed from the seasonal influenza vaccine as it contained an adjuvant, a substance included in the vaccine formulation that increased the effectiveness of the vaccine. As such, in general a smaller dose of adjuvanted vaccine is needed to elicit an immune response. The committee heard how Health Canada was able to expedite approval of the vaccine without compromising safety. Health Canada officials discussed their success in being able to approve the vaccine, Arepanrix™, as it was being produced. This was due to the high level of planning and collaboration with international counterparts, particularly the United States, the European Union and Australia, so that Canada had access to global data. In this way, Canada was able to approve the adjuvanted H1N1 vaccine using data that was being collected and assessed in real-time.

iii. Packaging

Several witnesses commented on the packaging of the H1N1 vaccine. The decision on how to package the vaccine was made by the manufacturer, GSK, in order to accelerate getting vaccine distributed, and was made under the assumption that vaccine would be provided almost exclusively in mass vaccination clinics. The vaccine was packaged in boxes of 50x10 millilitre vials, for a total of 500 doses. These vials required further mixing at the point of delivery where the 10ml vial would each have to be mixed with the H1N1 antigen. Once mixed, the vial had a limited shelf life of 24 hours.

Witnesses indicated that this packaging was problematic for a number of reasons. First, boxes of 500 vaccine doses were unsuitable for physician offices. Several witnesses expressed frustration that such large packaging was chosen and questioned why it was assumed that the vaccine would not be delivered through doctors' offices.

Second, witnesses pointed out that those physicians who did wish to order vaccine were required to go through a pre-qualification process in order to be eligible, including the need for a type of fridge not previously required for vaccine storage. This pre-qualification requirement further slowed down the process of vaccine delivery to the public.

Third, some jurisdictions chose to re-package the large boxes before sending them on to final destinations. In addition to the time required to physically re-package the product there were also

regulatory hurdles to solve as the packaging of vaccines is regulated under the Food and Drug Regulations. As such, there were further delays resulted in delivering vaccine to the end users.

iv. Distribution, Programs and Coverage

Witnesses were pleased overall with Canada's performance in supplying vaccine across the country and they stressed that the H1N1 pandemic marked the largest single vaccination program in Canadian history. Witnesses from GSK testified that within 20 weeks, despite some production problems, they were able to develop a vaccine and begin mass production. They indicated that the seasonal influenza vaccine typically takes seven months.

The committee was told that although Canada was not the first country to have a vaccine available, it was among the first eight. It also heard that China was the first country to have a vaccine at week 39 but was only able to obtain a small amount of vaccine relative to its population, whereas Canada had sufficient vaccine to immunize anyone who wished it. Government officials also pointed out that Canada was able to complete the vaccine programs faster than other countries, with the exception of Australia.

Witnesses expressed some concerns about the distribution of vaccine. This concern related to the unpredictability for jurisdictions of knowing how much vaccine was going to be received for distribution. Although all jurisdictions were aware of distribution projections, frequently production challenges meant that the amount delivered to jurisdictions was altered with short notice. Representatives from Ontario expressed frustration that supply never matched up with demand. Federal government officials explained that production disruptions are unavoidable but suggested the communications involved could have been improved. The committee also heard the concern that the normal, well-established distribution chains should have been utilized. Federal government officials indicated that, in fact, they had been, but they acknowledged that individual jurisdictions could use whatever supply mechanism worked best for them. The committee heard from British Columbia's Provincial Health Officer that his province did rely on the standard supply chain but that Nova Scotia changed the way it distributed the vaccine as it felt that its traditional distribution to doctors' offices would have been too time consuming.

Witnesses also discussed the difficulties encountered regionally in implementing mass vaccination clinics. Some witnesses acknowledged that the Plan did not foresee the difficulties in trying to vaccinate a significant proportion of the population in a very short timeframe. Others pointed out that this was further complicated by the second wave of the pandemic appearing earlier than what is normally observed for influenza.

Canada also performed well in terms of overall uptake of vaccine. While the coverage rate varied considerably across the country, several witnesses stated that Canada, as a whole, realized a coverage rate of more than 40%, and that this was second only to Sweden, which achieved coverage of 70%. Members were told that the United States, which had started sooner than

Canada, experienced several production difficulties, had limited supply and realized about a 20% coverage rate, Australia about 25%, Japan around 12% and only 7% in the United Kingdom. Within Canada, witnesses indicated that coverage rates varied with a trend towards higher coverage rates in the east and the highest rates in the northern, remote communities. Rates that were quoted by witnesses were B.C. 41%, Saskatchewan 50%, Ontario 38%, Newfoundland 80% and health care workers reached a coverage rate of 66%.

v. Prioritization

Several witnesses stated that much of the confused messaging related to vaccine prioritization. In September 2009, PHAC issued, in accordance with WHO guidelines, a list that proposed a prioritization of groups for vaccination. PHAC testified that this list had been developed collaboratively with the provinces and territories. The list was developed because although sufficient vaccine would become available to immunize all those who wished to receive the vaccine, it would not be available at the same time. Indeed, even if it could be made available all at once, it would not be possible to vaccinate everyone at once. As such, the prioritization list identified those most at risk for complications from the H1N1 influenza. The committee heard that the list was only considered a guideline and that jurisdictions could implement it as was considered best for their circumstances. The first priority group was identified by PHAC as; persons under 65 years old with chronic conditions, pregnant women and children six months to five years, individuals living in rural and remote settings, health care providers involved in pandemic response as well as those delivering essential services and, those in contact with infants less than six months old or immunocompromised persons. The second priority group included essentially everyone else, including first responders.

The committee heard from several first responders (i.e., fire fighters) and front-line workers (i.e., teachers) that they should have been included earlier in the prioritization list. In this regard, it was told that the two goals of the Plan conflict. These goals are to minimize illness and mortality due to the pandemic while also minimizing social disruption. As such, one of these had to be chosen over the other and the decision was made to focus on minimizing illness and death of those most vulnerable to the H1N1 virus and those who care for them.

Witnesses criticized the manner by which this was communicated as well as the fact that they were merely guidelines and that jurisdictions could, and did, deviate from them. The committee heard that PHAC could have done a better job of explaining the prioritization and emphasizing that jurisdictional and regional concerns would dictate whether there would be variation from one area to the next within Canada.

Witnesses pointed out that the prioritization was justifiable in terms of being evidence based but was difficult to implement on the ground. Health care providers questioned how to enforce this list as individuals identified on the list do not live in isolation but rather as families and as communities. The committee was asked whether it is ethical or moral to only immunize the

pregnant woman who presents at the clinic with her husband and children who may not be considered priorities.

b. Antivirals

Witnesses spoke of the important contribution that antivirals make to pandemic preparedness since vaccine will not be available during the first wave of a pandemic, at least with the today's technologies. As such, antivirals become the first line of defence when prevention measures such as hand washing, social distancing, etc., have failed. PWGSC explained that the F/P/T Group Purchasing Program for drugs and vaccines coordinates two stockpile systems in Canada. One is the National Emergency Stockpile System (NESS), which is federally owned and funded. The NESS provides a rapid response to support the efforts of provinces and territories when facing an influenza pandemic. The second is a provincially and territorially funded and administered supply of antivirals.

The committee heard that the NESS was accessed during the H1N1 pandemic and that its use increased significantly between the first and second waves resulting in a reduction in complications, hospitalizations and death. Roche Canada, the manufacturer of Tamiflu, one of the antivirals included in the stockpile, indicated that about 500,000 treatment doses were prescribed in Canada between May and December 2009. Roche indicated that it worked closely with PHAC as well as the Canadian Pharmacists Association to ensure that up to date information was available at all times.

Dr. Butler-Jones indicated that clinical guidelines on the use of antivirals for H1N1 evolved over time. He stated that the conventional wisdom had been at the outset of the pandemic that antivirals would only be effective if administered within 48 hours of the onset of symptoms. However, it was later determined that they should be administered even after that time period, despite perhaps having a diminished effectiveness.

The committee heard that preparedness in terms of large scale distribution and use of antivirals was not tested during the H1N1 outbreak, nor prior to it. It was suggested that details for deploying interventions other than vaccines, such as the distribution of antiviral stockpiles need to be thoroughly tested. Concern was also raised pertaining to the shelf life of antivirals and the need to keep the stockpile up to date. Finally, with respect to antiviral resistance, members heard that this was being monitored but that it would not be possible to consistently test all patient samples for resistance but rather to pursue those who did not respond well to antiviral treatment.

5. Data Collection, Surveillance and Analysis

Canada's CPHO suggested that Canada has one of the best surveillance systems in the world in terms of tracking data such as hospitalizations, intensive care admissions and mortality rate, but he stated that this is not generated in real time. That in fact, much of the data is collected after the

fact. He clarified that there is one stream of data that must be collected in real time in order to help officials and health providers manage the situation and a second stream of data that is only required for later reflection. Testimony heard throughout the course of this study referred more to data collection, surveillance and analysis required in real time in order to respond to and manage this public health emergency.

The committee was advised that while Health Canada is responsible for approving vaccines, PHAC is responsible for monitoring adverse events associated with their use. PHAC maintains an adverse event database which it monitors closely. Witnesses indicated that concerns about adverse events would be communicated back through the PHN. The committee heard concern that this system is a passive one which only collects adverse event reports that have been submitted by health care professionals, the manufacturer, and in some cases the public. It heard that this system could be made more pro-active if it could be linked with electronic medical records that could specifically request information on adverse events.

Concern was expressed by several witnesses, particularly public health representatives, that Canada was not adequately prepared in the areas of data collection, surveillance and analysis. With respect to analysis of patient samples to generate data on the H1N1 virus, witnesses spoke of the Canadian Public Health Laboratory Network (CPHLN) which is Canada's national association of public health laboratory professionals and was described as a unified voice for federal and provincial member laboratories while providing a forum for public health laboratory leaders to share knowledge. The CPHLN allowed for smooth communication between the National Microbiology Laboratory (NML) and the provincial public health laboratories. Several witnesses agreed that Canada's public health laboratories performed well during the pandemic in analyzing samples. They stated that there was a close working relationship between federal and provincial public health laboratories which ensured a cohesive and strong national response. Witnesses from the CPHLN revealed that within days of the H1N1 strain being discovered, the NML developed and shipped H1N1 diagnostic tools to provincial public health laboratories thereby quickly decentralizing laboratory testing in Canada. The provincial public health laboratories also had access to the laboratory preparedness guidelines that the Pandemic Influenza Laboratory Preparedness Network, a subgroup of CPHLN, had developed for the Plan.

However, members heard that this was not the case when it came to surveillance. Several witnesses emphasized the importance of robust surveillance systems and suggested that without reliable surveillance, effective response to any public health threat is difficult. The committee was told that insufficient resources are currently dedicated to this component of pandemic response. Some witnesses suggested that surveillance issues were not given adequate weight. They testified that members of the Surveillance, Epidemiology and Laboratory Task Group, which advised the Pandemic Coordinating Committee within the PHN, felt as though, in their efforts to analyze data in real time and provide background to support decisions made at higher levels, their advice and recommendations were underappreciated.

The committee heard that, prior to the pandemic, PHAC's surveillance group consisted of only four people; a medical specialist, a senior epidemiologist, a junior epidemiologist and a virologist. During the pandemic, this number increased slightly. It was suggested that this is inadequate. The committee was informed about the challenges faced when trying to respond to developments in real time given resource restrictions and complex communication networks. Committee members were told that there is a need to establish, as well as rehearse a national process for rapidly generating, appraising, incorporating and communicating new evidence during a crisis in real time. They heard that Canada lacks sufficient epidemiologists and methodologists to interpret and appraise the data rapidly. Further, the committee was told that the rapid response required in a crisis requires a nimble, well-rehearsed system, for which the infrastructure must already exist and be properly resourced. In addition, that part of this infrastructure should include improved linkages between the epidemiological or analysis, side and the laboratory, or data generating and collection side.

In terms of surveillance, which was described as critical in underpinning every aspect of controlling influenza, witnesses indicated that there has been improvement since SARS but that more needs to be done. For example, while some provinces, such as Quebec, have implemented registries to track vaccination rates, others, such as British Columbia, do not. Committee members heard that concerns about surveillance extend to poor monitoring among swine populations. For example, the committee heard that there is a span of ten years for which there is no data on circulating swine viruses.

Committee members also heard about a partnership that PHAC entered into with Rx Canada shortly after the H1N1 outbreak had been detected, to augment Canada's surveillance capacity. Rx Canada, a pharmacy sponsored organization, implemented a pharmacy surveillance system that would track the sales of prescription antivirals as well as over the counter influenza medication. The organization indicated that within one week of entering into the agreement with PHAC, over 2,500 pharmacies in all provinces began supplying Rx Canada with daily prescription data for antiviral medication as well as daily sales information for products used in the early treatment of influenza symptoms, such as cough and cold medications. Data was supplied through a central data hub called Rx Gateway. This system, the committee was told, was able to detect the surge in influenza-like symptoms weeks before PHAC's FluWatch surveillance system. Rx Canada stated that funding for the existing contract ends in November 2010 and suggested that their surveillance system should be recognized as an essential component of the pandemic surveillance system and should be funded on a permanent basis.

Many witnesses stressed the urgent need for electronic systems to assist in data collection and surveillance activities. Some discussed the public health surveillance IT application called Panorama that is currently under development. British Columbia's Ministry of Health is managing the project and every province and territory is collaborating on its application and design. When complete, members were told, public health officials from across Canada will be

better equipped to manage information during infectious disease outbreaks. Disappointment was expressed that this system had not been more developed at the outset of the H1N1 pandemic and many witnesses urged the development of the pan-Canadian electronic surveillance system. Other witnesses discussed electronic health records in primary care and how these may have facilitated surveillance and communications.

6. Capacity for Public Health Service Delivery

The committee heard that Canada's ability to face a public health crisis had improved since SARS and how the years of planning since that time allowed Canada to perform well in several respects during the H1N1 pandemic. Nevertheless, despite the mild severity associated with the H1N1 pandemic, many witnesses testified that Canada's resources were pushed to their limit. Federal and provincial officials, as well as public health representatives, felt that had the pandemic been any more severe Canada would not have been able to keep up. Many of the concerns that were raised in this regard came back to the observation by some witnesses mentioned earlier that there needs to be more focus on public health generally. This would bring about the needed changes to the public health infrastructure that would in turn increase our capacity to respond to public health emergencies. Some public health witnesses suggested that the seasonal influenza provides the opportunity to build upon the public health infrastructure. Health care professionals pointed out that the failure to build a robust public health infrastructure meant that public health units pulled in resources from other programs resulting in critical services being delayed, suspended or cancelled.

One area that was discussed as a means of enhancing surge capacity had to do with the sharing of health human resources between jurisdictions. Health professionals were concerned that labour mobility issues need to be addressed. In this respect the committee was told about the F/P/T MOU on the Provision of Mutual Aid in Relation to Health Resources During an Emergency Affecting the Health of the Public. This includes an agreement on the movement of health providers from one jurisdiction to another when requested.

The committee heard that innovative approaches need to be considered in order to increase surge capacity. Witnesses suggested that greater use could be made of health care providers outside of those traditionally called upon during health emergencies. Paramedics suggested that they are an untapped resource as they feel they could provide service in public safety, emergency management and preparedness, mitigation, response and recovery during a pandemic. The committee was told that greater use could have been made of paramedics, particularly in the area of vaccination clinics. The committee also heard that expanding the scopes of practice of some health professionals would help to address the strain on human resources. The Canadian Pharmacists Association representative discussed how some jurisdictions expanded their scope of practice to include immunization authority and issuing prescriptions for antivirals. He indicated that most provinces intend to implement legislation giving pharmacists prescriptive

authority. Another idea promoted during the study was to make use of health professionals who have retired, although the committee was cautioned that individuals would still have to be licensed where required by the jurisdiction. It was also emphasized that these options for addressing surge capacity are subject to provincial or territorial authority.

The committee heard from provincial officials that jurisdictions implemented certain strategies in an effort to reduce the strain on the health system. For example, British Columbia implemented a new fee structure which allowed physician's to be compensated for taking calls at their offices from people concerned that they were affected by H1N1. This approach reduced the number of potentially infectious people presenting at doctors' offices for advice. As the crisis passed, the province removed this fee. This approach compares to the practice implemented in the United Kingdom. The committee was told that concerned citizens in the United Kingdom had access to a central phone number where they could receive assessment as well as be prescribed antivirals if necessary.

PHAC officials emphasized that the response plan allowed them to pull human resources from across different areas of the Agency. However, PHAC also stated that operation of the Emergency Operations Centre 24 hours a day, seven days a week for several weeks put PHAC at risk of exhausting its human resources. As one federal official emphasized, it was a marathon, not a sprint.

7. Collaboration and Consultation

PHAC officials discussed international collaboration and described it as unprecedented. Representatives from Mexico described the close relationship they enjoyed with the NML. They related the chain of events that transpired during April 2009 when the NML received samples from Mexico for typing and the resultant realization that a novel influenza virus was the subject of an outbreak in that country. Committee members also heard that PHAC sent specialists to Mexico to set up and teach their public health laboratory personnel to process and test samples there.

With respect to collaboration and consultation within Canada, the committee learned about the PHN, which was created in 2005, and the committee structure within it supporting all of its functions. The committee was told that the PHN structure was led by the Special F/P/T Advisory Committee (SAC) on the H1N1 virus, which was specifically created within the existing PHN structure in response to the pandemic. It was composed of the members of the Public Health Network Council which heads up the PHN, and the Chief Medical Officers of Health from the provinces and territories. Next in PHN's structure was the Pandemic Coordination Committee (PCC).

These two committees were supported by the work of issue specific task groups, including clinical care and antivirals, vaccines, communications, etc., as well as a number of expert groups,

such as the emergency preparedness and response expert group, and the CPHLN. Together these groups supplied recommendations and advice to the executive SAC and managerial PCC. The PHN was described to committee members as having successfully allowed for an unprecedented level of consultation and collaboration between the federal government and the provincial and territorial governments. It was described by PHAC as providing the structure for facilitating a coherent national response during H1N1.

The committee was told that the collaboration encouraged by the structure of the PHN extended to professional organizations who were also involved in offering their help. For example, the CPHO indicated that clinicians, public health specialists, intensive care personnel, etc., were brought together in spring 2009 to discuss treatment options in order to improve clinical outcomes during the second wave. Some witnesses suggested that the consultation be extended to include health care professionals on the PHN. It was pointed out that policy decisions made during an emergency that may be evidence-based, may not be possible to implement on the ground. They further suggested that, had they been consulted at the level of the PHN, policies could have been altered to be more practical. The committee also heard that stakeholder groups were not actively involved in the tabletop exercises but rather were put to the side in an observation capacity. It was pointed out that in order to effectively test the Plan, it must be tested right down to the ground level where it is operationalized.

Several witnesses spoke about the frequency of contact between governments, whether at the Ministerial, Deputy Ministerial, official or expert level through the various committees and expert groups of the PHN. While some witnesses who were on SAC described this communication as being two-way, indicating that federal officials made themselves available if requests were made of them to meet via teleconference, others suggested that broader access to members of the committee was difficult.

The committee heard from federal and provincial public health officials that a formalized collaboration between the provincial public health agencies would help to increase Canada's capacity to respond to public health emergencies. The committee heard that the public health agencies of British Columbia, Ontario and Quebec each had their own strengths which, if properly integrated within a collaborative public health effort, could be more effectively utilized across the country. Other previously discussed issues should be reiterated here in the context of collaboration. These include the MOUs described earlier, the relationships with the provincial public health laboratories, and creation of stronger links with other health care systems, such as acute care.

8. First Nations and Inuit

Federal, provincial and territorial officials, as well as representatives from First Nation and Inuit organizations, appeared at committee to discuss the H1N1 response. Health Canada officials described pandemic planning for, and their response to, on-reserve First Nations communities.

The committee heard about the collaboration between Health Canada's First Nation and Inuit Health Branch (FNIHB), PHAC and First Nations representatives to harmonize activities described in the Plan. It was told that 80% of First Nations communities had pandemic plans in place prior to the appearance of H1N1. With the appearance of the novel virus, the federal government worked with on-reserve First Nation communities to increase the number of communities with pandemic plans and assisted in the testing of the plans. In this regard, committee members were told about Annex B to the Plan, Influenza Planning Considerations in On-Reserve First Nations Communities.

Overall, federal government officials stated that response efforts to H1N1 were quite successful. They spoke of the vulnerability of the Aboriginal population to H1N1 and that the virus appeared very early on in these communities. They described the first wave of the pandemic as being severe and in terms of Aboriginal people making up a disproportionate amount of the hospitalizations, intensive care admissions and deaths. Witnesses discussed the important role played by antivirals during the first wave of the pandemic. Due to the severity of illness in on-reserve First Nation communities, Health Canada's non-insured health benefits program took initiative early on to cover the cost of prescription antivirals. In response to lessons learned from the severe impact of H1N1 in northern Manitoba during the first wave, FNIHB worked to pre-position antivirals in all of the remote and isolated on-reserve First Nations Communities.

The committee heard from Aboriginal organizations that future revisions of the Plan should include increased consultation with Aboriginal peoples. It was indicated that no formal mechanism exists currently for direct consultation with First Nations, Inuit or Métis within the PHN. However, Health Canada pointed out that First Nations considerations were brought up and integrated at all planning stages and that FNIHB was a member of SAC as well as all task groups within PHN, and was a co-chair on the Remote and Isolated Communities task group. The committee heard that Aboriginal peoples need a forum where they can come together and discuss health related issues. Such a forum could be used in collaboration towards planning for an upcoming pandemic. Many witnesses felt that work in this area needs to be expanded and that any updates to Annex B of the plan should be done in consultation with First Nations groups.

One of the areas of focus pertained to the federal versus the provincial/territorial roles and responsibilities in health. The committee heard that the division of roles and responsibilities between Canada's federal, provincial and territorial governments has not been clearly articulated. As a result, jurisdictional disputes regarding funding as well as delays in decision making for the provision of services were encountered during the 2009 pandemic. According to the federal government, on-reserve First Nations communities received funding through regional Health Canada offices. Witnesses felt that Chiefs should be given more authority in determining fund allocation in the best interest of their communities.

While there was agreement that the federal government is responsible for the provision of health care services in on-reserve First Nation communities, the committee heard disagreement regarding the role of the federal government in regards to health programs in Inuit communities. Inuit representatives suggested that the Plan should include a section specifically focused on the Inuit and developed in consultation with them. They felt that, in its current form, the plan does not address the unique needs of Inuit communities. The committee heard that the need for an Inuit-specific annex to the Plan was brought to the attention of provincial and territorial leaders by the Minister of Health last year and was rejected. The committee was told that the Inuit live in the provinces and territories and that their health care is delivered by those governments. Although the Plan does include Annex B for remote and isolated communities, some witnesses indicated that the annex is not culturally appropriate. In addition, witnesses suggested that it was developed too late. Specifically, members heard that health authorities in the Northwest Territories and Nunavut could not use it.

Vaccination programs were described as very successful, where higher coverage rates were reached than for the general Canadian population. Identified as a vulnerable population on the vaccine prioritization list, Health Canada witnesses described how mass vaccination clinics were held in rural and remote communities as early as October 26, 2009, achieving overall coverage rates of 64% in on-reserve First Nations communities. They observed that the severe illness and mortality witnessed during the first wave was not repeated during the second. In fact, no deaths were reported. Some representatives from Aboriginal organizations pointed out that these observations pertained only to on-reserve First Nations and that 60% of the aboriginal population live in urban centres. With respect to the prioritization list for the vaccine as well as service delivery, the committee heard that guidelines for these communities must be culturally sensitive.

Several witnesses suggested that the social determinants of health must be addressed in Canada's on-reserve First Nations and Inuit communities in order to improve overall public health issues. Specifically, several witnesses emphasized that overcrowding, poor housing conditions, lack of access to clean water, underlying chronic health issues and poor socio-economic status all contributed to increasing the spread and severity of the pandemic in these communities. In addition, witnesses expressed a need to improve public health infrastructure. The committee was told that public health resources were stretched to capacity during the pandemic and the infrastructure in these vulnerable communities would have been incapable of handling the second wave had it been as severe as the first one.

9. Research

PHAC officials indicated that the need to establish better research capacity to respond to public health concerns was acknowledged following SARS. As such, a research network had been established prior to the appearance of the H1N1 virus. In this respect, the committee heard about the Pandemic Preparedness Strategic Research Initiative which established the CIHR-PHAC

Influenza Research Network (CPIRN). The CPIRN was described as having encouraged scientists, who are naturally competitive, to work together for a common good. In addition to funding several research protocols over the years, the CPIRN also held meetings which served to inform the research community and the stakeholders to work in coordination in order to respond effectively to public health challenges.

Several areas of research were discussed during the study. CIHR described its involvement in funding clinical trials to assess the safety and efficacy of the H1N1 vaccine, strategies for deploying mass vaccination programs, improvement of vaccine coverage, etc. In addition, the committee heard that there are many aspects of seasonal influenza that are not well understood and that this should be an area of focus. Several witnesses commented on the need to develop and approve vaccines produced through new technologies. Witnesses talked about cell-based and DNA-based vaccine technologies that have the potential to replace or supplement the traditional egg-based vaccine technology. Committee members heard that these technologies may someday result in faster vaccine production. The committee heard that more research is required in this area to further perfect the technologies as well as to determine how to scale up production to the levels required for commercial purposes. It was also suggested that work being done in the area of HIV vaccine development may prove helpful in the development of vaccines to other viruses including influenza.

The possibility of stockpiling vaccines was also mentioned and this is an area that has received research funding in Canada in the past. The committee heard about the need to invest in the development of more rapid tests for the detection of influenza virus. Members heard that the sensitivity of the available test is poor and that it often does not detect the virus. Tests with greater sensitivity would improve the confidence of health care providers who must decide whether or not to prescribe antivirals. Witnesses emphasized that clinical research requires approval of the research protocol, including ethical approval from a research ethics board. Often clinical trials are scattered across the country, with approvals being required at every centre involved in the trial. Witnesses suggested that if the approval process could be centralized with the pre-approval of protocols, time won't be wasted during a pandemic. In terms of rapid response, the committee was told that while federal departments and agencies have rapid response mechanisms, research does not. However, PHAC officials testified that it would be nearly impossible to establish a rapid response research team that could be deployed across the country.

The committee learned that the CPIRN was funded with the \$21.5 million granted to CIHR under the pandemic preparedness funding supplied in the 2006 federal budget described earlier, which sunsets in March 2011. This research allocation was further matched with \$24.2 million in public and private funds. Witnesses suggested that Canada's ability to rapidly and efficiently respond to infectious agents would be threatened if this funding is not renewed. The committee heard that dedicated funding is necessary if Canada is to remain a leader in pandemic

preparedness. Further it was told that Canada will lose the researchers who have become experts in this field to other areas of research or to other countries if the funding is not sustained and dedicated. PHAC officials agreed that research infrastructure needs to be maintained.

4. RECOMMENDATIONS

1. Roles and Responsibilities of the Federal, Provincial and Territorial Governments in Public Health

The committee agrees that there should be greater uniformity across the provinces and territories when responding to public health issues. The committee would like to see more accomplished through federal/provincial/territorial discussions and Memoranda of Understanding (MOU) as opposed to relying on legislation. The committee sees the work done on establishing Memoranda of Understanding (MOUs) between the federal and provincial/territorial governments as a positive step in achieving a truly national approach to public health. The committee would like to see the MOUs on information sharing and mutual aid finalized as well as more MOUs developed. The committee also notes that these agreements should be made enforceable wherever possible.

RECOMMENDATION 1

The committee therefore recommends that the Public Health Agency of Canada finalize the current Memoranda of Understanding, expand the number of issues addressed through this mechanism and work toward making them legally binding.

2. The Canadian Pandemic Influenza Plan for the Health Sector

Public health officials (and health care professionals) concur that Canada has improved measurably from its response to SARS in 2003. The Canadian Pandemic Influenza Plan for the Health Sector (the Plan) was collaboratively developed with the provinces and territories. The Plan was originally released in 2006 and is regularly updated. The scope of the Plan is national in focus with recognition that operational details need to be established in each jurisdiction's own pandemic plan. The Plan sets out the roles and responsibilities of the various levels of government for both preparedness and response activities.

However, there is general agreement that there is more room for improvement. As governments conduct their lessons learned exercises and report on their respective performances during the H1N1 pandemic, the committee is of the opinion that revision of the Plan should not result in a plan for the last pandemic, as some witnesses pointed out. That while it is imperative that we learn lessons from H1N1, all pandemics are unique. Further, the committee agrees with the testimony from several witnesses that the Plan must be regularly and rigorously tested.

RECOMMENDATION 2

The committee therefore recommends that the Public Health Agency of Canada, in collaboration with the provinces and territories:

- **Revise the Canadian Pandemic Influenza Plan for the Health Sector to make it scalable to mild, moderate and severe pandemics as well as responsive and flexible as new information becomes available;**
- **Implement regular and rigorous testing of the revised Canadian Pandemic Influenza Plan for the Health Sector; and,**
- **Promote the active participation of all stakeholders.**

The committee agrees with witnesses who stressed the importance of maintaining a focus on pandemic planning. Members feel that in doing so, not only will Canada's ability to respond to other public health threats be augmented, but that the country's public health infrastructure will also benefit. The committee would like to emphasize that the timing of the next pandemic is not predictable and could arrive at any time. As such, pandemic preparedness should always be on the government's agenda and the committee urges it to renew pandemic preparedness funding.

RECOMMENDATION 3

The committee therefore recommends that the Government of Canada includes renewed funding for pandemic preparedness planning in its 2011 Budget.

3. Communications and Messaging

The committee is concerned that communications and messaging did not receive enough attention in the pandemic planning process, for example it notes that Annex K to the Plan on communications has not been updated since October 2006. Jurisdictional challenges must be resolved prior to the next public health emergency. In this regard some provincial officials suggested that roles and responsibilities of the federal, provincial and territorial governments need to be clarified. The committee would like to emphasize that there is a clear need to act as uniformly as possible across Canada since influenza, and other infectious illnesses, are blind to borders. The committee understands the challenges posed when trying to deliver consistent messaging when the science is evolving and there remain many unknowns but would like to emphasize that in order to build and maintain public trust there needs to be effective communication and consistent, harmonized messaging. The committee would like to reiterate a particularly meaningful sentiment expressed during its study, "Many voices, one message."

The committee acknowledges that despite considerable efforts by all levels of government to deliver harmonized messages, the public became confused from conflicting messages that

originated from non-official sources. While conflicting messages were frequently in the main media, the new social media proved to be a particular concern. Finally, the committee would like to see the federal government take a more active role in public awareness campaigns about public health issues during inter-pandemic periods. It agrees with witnesses who emphasized a need to focus on public health in general and sees this as a means to increase overall trust in Canada's public health system.

RECOMMENDATION 4

The committee therefore recommends that the Public Health Agency of Canada:

- **Ensure that Annex K on communications is updated when the Canadian Pandemic Influenza Plan for the Health Sector is revised;**
- **Collaborate with the provincial and territorial governments to clarify roles and responsibilities in regard to communications;**
- **Study ways of communicating real-time policy decisions and ensuring harmonized messaging and in doing so, consult widely across Canada;**
- **Develop and evaluate social media as another means of helping the public better manage their health , as it studies ways of ensuring harmonized messages; and,**
- **launch aggressive public health campaigns that involve social media, which include, but are not limited to public health measures and vaccine safety and effectiveness. .**

The committee agrees that the messaging issued by the federal government during a pandemic should include information that clearly separates the geographic spread of the virus from its severity. It agrees with those witnesses who were concerned that a pandemic was only defined in terms of its geographic spread and suggests that, should Canada have to invoke its Plan again in the future, Canadians be kept informed of the virus' severity.

RECOMMENDATION 5

The committee therefore recommends that the Public Health Agency of Canada's pandemic planning, with respect to communications, include specific requirements to define the pandemic in terms of severity of disease, not only the geographic spread, with the acknowledgement that this information can change depending on the evolving science.

The committee commends the open and transparent communication that existed during the H1N1 pandemic between the federal, provincial and territorial governments and agrees that there has been considerable improvement since SARS. It acknowledges that not only was there good communication from the Public Health Agency of Canada to the provincial and territorial governments but that the Public Health Agency of Canada was responsive to requests from

provincial and territorial governments for information. However, the committee agrees with those witnesses who suggested that communications could be strengthened with external partners, including hospitals and clinicians. It agrees that this level of communication would be even more crucial in a more severe pandemic.

RECOMMENDATION 6

The committee therefore recommends that the Public Health Agency of Canada encourage its provincial and territorial counterparts to:

- **explore ways in which they can strengthen two-way communications with health providers; and,**
- **establish communications network for all health care providers through collaboration with their representative national associations.**

4. Vaccines and Antivirals

The committee is pleased with the manner in which Canada secured a long term contract for domestically produced pandemic influenza vaccine. It agrees that a domestic supply was necessary in order to ensure a secure supply for Canadians. It also agrees that the next contract must also include a backup supplier, given the difficulties that can be encountered during production. The committee notes the potential risk involved of having a non-domestic supplier of vaccine in that Canada may not have priority. Although the committee would prefer to see a domestic backup supplier, members understand that this may not be possible.

RECOMMENDATION 7

The committee therefore recommends that the Government of Canada explore ways of ensuring that a backup supplier will add to Canada's ability to ensure vaccine supply in the event of a future influenza pandemic.

The committee heard from several witnesses, including federal government officials, that the 500 dose packaging chosen for the H1N1 vaccine was too large. It is concerned that this decision was taken solely by the supplier and questions why so little consultation was done in this regard. It agrees that the end-user must be considered when deciding on packaging format.

RECOMMENDATION 8

The committee therefore recommends that the Government of Canada, in collaboration with the provinces and territories, ensure that the next F/P/T contract for pandemic influenza vaccine, that is to be signed in 2011, includes a requirement that the supplier consult with the Public Health Agency of

Canada when deciding on packaging formats and that the contract list the type and amount of consultation required.

The committee noted that the full scope of implementing mass vaccination clinics across the country was not fully appreciated. It questions how the different levels of government could have dedicated so many resources in pandemic planning, where it was recognized that a vaccine was a main focus, without having properly tested this aspect.

RECOMMENDATION 9

The committee therefore recommends that the Government of Canada work with the provinces and territories to thoroughly test the logistics of implementing mass vaccination clinics, whether at community centres, schools, businesses, etc., particularly in a limited timeframe, with a view to determining the limits of this practice.

5. Data Collection, Surveillance and Analysis

The committee agrees that Canada needs to have the infrastructure to support a pan-Canadian electronic public health surveillance system, while acknowledging the jurisdiction challenges that such a system faces. It is encouraged by the efforts so far but would like to see all parties to continue in their efforts as such a system would be beneficial to the public health system in general and not just helpful in times of public health outbreaks. The committee suggests that, if properly done, electronic systems have the potential to greatly enhance surveillance, epidemiological and analytical capacity as well as the ability to do science and evaluation in real-time. As one component of this, the committee sees value in the system used during the H1N1 pandemic known as RxGateway which tracked prescription antiviral and over the counter influenza medication sales and suggests that the Public Health Agency of Canada determine what ongoing surveillance could be provided by such a system. Similarly, the committee is encouraged about the creation of system known as Panorama and urges its further development and implementation. The committee also agrees that the implementation of electronic health record systems, an initiative led by Canada Health Infoway, needs to be accelerated as it would facilitate the functions of data collection and surveillance.

RECOMMENDATION 10

The committee therefore recommends that the Public Health Agency of Canada work with its provincial and territorial counterparts to fully develop and implement the public health surveillance IT application known as Panorama and that; Canada Health Infoway Inc. increase efforts to implement electronic health record systems across Canada.

6. Capacity

The committee was told that the Public Health Agency of Canada contacted the paramedics to request assistance during the pandemic. The committee commends the Agency for having taken this initiative and suggests that this resource should be further accessed in times of a public health emergency. Similarly, the committee considers the contribution that can be made by pharmacists was not fully realized during the H1N1 pandemic.

RECOMMENDATION 11

The committee therefore recommends that the Public Health Agency of Canada monitor the status of the scope of practice of pharmacists and paramedics across Canada with a view to ensuring that they be included as a health care resource for prescribing antivirals and providing vaccinations during future influenza pandemics.

The committee agrees with witnesses who suggested that addressing surge capacity in the public health system is difficult but must be undertaken in order prepare for future pandemics.

RECOMMENDATION 12

The committee therefore recommends that the Public Health Agency of Canada work with its provincial and territorial counterparts to urge them to establish linkages between health care systems in their respective jurisdictions, such as public, acute, clinical and primary care, with a view to improving the surge capacity of the public health system, including within hospitals, in times of emergency.

7. Collaboration and Consultation

The committee commends PHAC and the PHN for the considerable amount of collaboration and consultation that occurred during the H1N1 pandemic. Canada's role on the global stage was impressive and the efforts made to include and engage all necessary stakeholders within Canada were laudable. While the committee is sympathetic to those front line workers and first responders who expressed a desire to be included in consultations, it agrees that this should be more of a provincial and territorial priority and that the PHN structure is appropriate but that more attention may need to be paid to who the task groups consult as they prepare advice for the Special Advisory Committee. In addition, it agrees that more ground level stakeholders, particularly the health care providers and first responders should be included in the tabletop exercises that test the Canadian Pandemic Influenza Plan for the Health Sector, and that their role should be more participatory.

RECOMMENDATION 13

The committee therefore recommends that the Public Health Agency of Canada:

- **Consider the composition of the task groups within the Public Health Network structure with a view to including more health professionals;**
- **Ensure that health professionals be actively involved in the tabletop exercises that test the Canadian Pandemic Influenza Plan for the Health Sector; and,**
- **Recognize the importance of community preparedness, including clinics and major tertiary care hospitals and the valuable contribution by first responders.**

Finally, the committee agrees that a formalized collaboration between the provincial public health agencies would help to increase Canada's capacity to respond to public health emergencies.

RECOMMENDATION 14

The committee therefore recommends that the Public Health Agency of Canada strive to include in its revised Canadian Pandemic Influenza Plan for the Health Sector a formal collaboration between itself and provincial public health agencies in order to maximize resources and expertise in future pandemics.

8. First Nations and Inuit

The committee would like to express its concern at the lack of progress in addressing the status of the social determinants of health in on-reserve First Nation and Inuit communities. The committee agrees with those witnesses who emphasized that the overcrowding, lack of access to clean water, etc., make these communities more vulnerable to public health outbreaks. The committee is of the view that there needs to be greater attention paid overall to public health, as recommended above.

RECOMMENDATION 15

The committee therefore recommends that Health Canada's First Nations and Inuit Health Branch work collaboratively with Indian and Northern Affairs Canada as well as the Public Health Agency of Canada to identify and address the conditions particular to on-reserve First Nations and Inuit communities such as overcrowding and poor access to clean water that make

them vulnerable to communicable diseases, including pandemic influenza, and that this collaboration include measures to improve the public health infrastructure.

The committee notes that concerns pertaining to data collection, surveillance and analysis, as well as the need for a centralized collection of best practices, as described earlier in this report, were also specifically discussed in the context of all aboriginal groups. The committee agrees that these issues should be reviewed in the context of the aboriginal population.

RECOMMENDATION 16

The committee therefore recommends that Health Canada and the Public Health Agency of Canada consider including, in future revisions of the Canadian Pandemic Influenza Plan for the Health Sector, appropriate parameters and improved reporting systems for surveillance, data collection and analysis, as well as a centralized collection of best practices for aboriginal groups.

Finally, the committee is concerned by the apparent confusion over the roles and responsibilities of the federal government as they pertain to health services and public health programs for on-reserve First Nation and Inuit people. It sees a need for the federal government, in collaboration with its provincial and territorial counterparts, to engage First Nation and Inuit organizations in an open and transparent discussion in this regard. The committee notes that the concerns it heard regarding aboriginal representation on the PHN, as well as updating the Canadian Pandemic Influenza Plan for the Health Sector, including Annex B and maintaining a focus on the need for cultural sensitivity, can also be addressed in this forum.

RECOMMENDATION 17

The committee therefore recommends that Health Canada's First Nations and Inuit Health Branch and the Public Health Agency of Canada initiate discussions with provincial and territorial governments and representatives from First Nation and Inuit organizations and communities with a view to clarifying the federal government's role in a public health emergency.

9. Research

The committee agrees that research capacity must be maintained if Canada is to remain a leader in pandemic preparedness and response. It understands that an overall focus on public health and the research required to support this focus will also improve Canada's ability to respond future influenza pandemics.

RECOMMENDATION 18

The committee therefore recommends that the Government of Canada ensure that future federal pandemic preparedness and response budgets provide dedicated and sustained funding for research.

5. CONCLUSION

The committee congratulates everyone involved in responding to the 2009 H1N1 influenza pandemic. Overall, the planning that started many years ago and that had been ramped up in recent years proved successful. Canada's response as a result of years of planning effectively reduced the impact of this novel influenza virus. Input from international counterparts, particularly Mexico and the United Kingdom, emphasized Canada's leadership role during the pandemic. However, Canada, and the world, was fortunate that the pandemic was not more severe and it is possible that Canada's current pandemic plan and the country's public health infrastructure would not have been able to optimally address a harsher influenza pandemic. Canada needs to remain vigilant, learn from experiences of the H1N1 pandemic and continue to strengthen not only its plan but its public health systems.

APPENDIX A

WITNESSES

Wednesday, September 29, 2010	
Public Health Agency of Canada	Dr. David Butler-Jones, Chief Public Health Officer
BC Centre for Disease Control	Dr. Danuta Skowronski, Epidemiology Lead for Influenza and Emerging Respiratory Pathogens
Mount Sinai Hospital	Dr. Donald E. Low, Microbiologist-in-Chief
As an individual	Dr. Susan Tamblyn, Public Health Consultant
Thursday, September 30, 2010	
Health Canada	Dr. Paul Gully, Senior Medical Advisor
Public Safety Canada	Daniel Lavoie, Associate Assistant Deputy Minister, Emergency Management and National Security Branch
Canadian Food Inspection Agency	Paul Mayers, Associate Vice-President, Programs Catherine Airth, Associate Vice-President, Operations
Public Health Agency of Canada	Dr. Theresa Tam, Director General, Centre for Emergency Preparedness and Response
Wednesday, October 6, 2010	
Public Works and Government Services Canada	Francine Brisebois, Senior Director, Commercial and Consumer Products Directorate Henry Kreker, Manager, Influenza Vaccine Project Tom Ring, Assistant Deputy Minister, Acquisitions Branch
Health Canada	Elwyn Griffiths, Director General, Biologics and Genetic Therapies Directorate Meena Ballantyne, Assistant Deputy Minister, Health Products and Food Branch
Public Health Agency of Canada	Dr. Barbara Law, Chief Vaccine Safety, Centre for Immunization and Respiratory Infectious Diseases Dr. John Spika, Director General, Centre for immunization and respiratory infectious disease
Canadian Pharmacists Association	Jeff Poston, Executive Director

	Janet Cooper, Senior Director, Membership and Professional Affairs
GlaxoSmithKline Canada	Paul Lucas, President and CEO
Roche Canada	Jim Hall, Vice-President, Urgent Care Anne-Marie Hayes, Business Manager, Government, Urgent Care
Rx Canada	Wendy Nelson, President and CEO Jeff Aramini, Senior Consulting Epidemiologist
Thursday, October 7, 2010	
Public Health Agency of Canada	Frank Plummer, Scientific Director General, National Microbiology Laboratory
Institute of Epidemiological Diagnosis and Reference	Celia Alpuche, Deputy Director General
As an individual	Associate Professor, Department of Microbiology and Immunology, University of Alberta
Monday, October 18, 2010	
Health Canada	Glenda Yeates, Deputy Minister
Public Health Agency of Canada	Dr. Gregory Taylor, Director General, Office of the Public Health Practice Dr. John Spika, Director General, Centre for Immunization and Respiratory Infectious Diseases
Ministry of Health and Long-Term Care, Province of Ontario	Allison Stuart, Assistant Deputy Minister, Public Health Division
Province of Ontario	Dr. Arlene King, Chief Medical Officer of Health
Province of British Columbia	Dr. Perry Kendall, Provincial Health Officer
Province of Nova Scotia	Duff Montgomerie, Deputy Minister, Health Promotion and Protection
Province of Saskatchewan	Dr. Moira McKinnon, Chief Medical Health Officer
Thursday, October 21, 2010	
Health Canada	Shelagh Jane Woods, Director General, Primary Health and Public Health Directorate, First Nations and Inuit Health Branch

	Dr. Paul Gully, Senior Medical Advisor
Aboriginal Nurses Association of Canada	Rosella Kinoshameg, President
Assembly of First Nations	Angus Toulouse, Regional Chief
Assembly of Manitoba Chiefs	Ron Evans, Grand Chief
Government of Nunavut	Dr. Isaac Sobol, Chief Medical Officer of Health
Indigenous Physicians Association of Canada	Dr. Darlene Kitty, Board Member
Inuit Tapiriit Kanatami	Mary Simon, President Elizabeth Ford, Director, Health and Social Development
Friday, October 22, 2010	
Canadian Public Health Association	Dr. Isra Levy, Member Debra Lynkowski, Chief Executive Officer
Canadian Standards Association	Suzanne Kiraly, Executive Vice-President, Government Relations
Canadian Association of Fire Chiefs	Robert Simonds, President
Canadian Healthcare Association	Pamela Fralick, President and CEO
Canadian Nurses Association	Claire Betker, Member, Board of Directors Joyce Douglas, Nurse Consultant
Paramedic Association of Canada	Greg Furlong, Director
Canadian Medical Association	Dr. Jeffrey Turnbull, President Dr. Maura Ricketts, Director, Office of Public Health
RiskAnalytica	Paul Smetanin, President and Chief Executive Officer
Ontario Power Generation Inc.	Gian Di Giambattista, Director, Emergency Management and Business Continuity
Canadian Teachers' Federation	Mary-Lou Donnelly, President Myles Ellis, Director of Economic and Member Services
Federation of Canadian Municipalities	Claude Dauphin, Third Vice-President Alain Normand, Member, Pandemic Preparedness Working Group

The Conference Board of Canada	John Neily, Director, National Security and Public Safety
Wednesday, October 27, 2010	
As an individual	Bhagirath Singh, Director, Centre for Human Immunology, University of Western Ontario Françoise Baylis, Professor, Department of Bioethics, Dalhousie University Dr. Ross Upshur, Director, University of Toronto Joint Centre for Bioethics
Thursday, October 28, 2010	
Department of Health, United Kingdom	David Harper, Director General of Health Improvement and Protection
Ministry of Health, Mexico	Dr. Mauricio Hernandez-Avila, Deputy Minister of Prevention and Health Promotion Dr. Hugo Lopez Gatell Ramirez, Director General of Epidemiology
Friday, October 29, 2010	
Health Canada	The Honourable Leona Aglukkaq, P.C., M.P, Minister Glenda Yeates, Deputy Minister Meena Ballantyne, Assistant Deputy Minister, Health Products and Food Branch Dr. Paul Gully, Senior Medical Advisor
Public Health Agency of Canada	Dr. David Butler-Jones, Chief Public Health Officer Elaine Chatigny, Director General, Communications Dr. Frank Plummer, Scientific Director General, National Microbiology Laboratory
Canadian Medical Association	Dr. Maura Ricketts, Director, Office of Public Health
Canadian Standards Association	Suzanne Kiraly, Executive Vice-President, Government Relations
Province of British Columbia	Dr. Perry Kendall, Provincial Health Officer
As an individual	Dr. Todd Hatchette, Associate Professor, Department of Pathology, Dalhousie University