

Chapter 3

Section 3.12

Ministry of Health and Long-Term Care

Outbreak Preparedness and Management

Background

The Ministry of Health and Long-Term Care (Ministry), through Order-in-Council, is responsible for formulating emergency plans concerning human health, disease, and epidemics in Ontario. To that end, the Ministry's Public Health Division has a mandate to respond to the immediate threat of infectious-disease outbreaks.

In accordance with the *Health Protection and Promotion Act*, local medical officers of health and local boards of health of public health units are responsible for matters involving public health in their communities. Public health units are funded jointly by the Ministry and municipalities. Yet certain outbreaks of infectious disease require ministry co-ordination and intervention, because of their size, the speed with which they spread, and the limitations on the resources available locally.

After the outbreak of severe acute respiratory syndrome (SARS) in Ontario and other parts of the world in 2003, the College of Family Physicians of Canada, after conducting a survey in 2005, reported that the majority of the public expressed significant concern about all levels of governments' readiness to respond to a future medical emergency.

As well, according to the Ministry and the World Health Organization (WHO), the risk of pandemic influenza is serious, and its impact on society would be much greater than that of SARS. Unlike the seasonal flu, a pandemic influenza is one that can spread easily from person to person and cause serious illness because the population has little immunity to what would be a new virus. On the basis of an internationally recognized model, should another influenza pandemic occur in Ontario, it could result in up to 2 million outpatient hospital visits, 52,000 hospitalizations, and 12,000 deaths. By way of comparison, the 2003 SARS outbreak in Ontario resulted in approximately 300 hospitalizations and 44 deaths, as shown in Figure 1.

Figure 1: Comparison of SARS and Pandemic Influenza Outbreaks in Ontario

Source of data: Ministry of Health and Long-Term Care; Health Canada

	SARS	Influenza Pandemic (Estimated Impact)
# of deaths	44	5,000–12,000
# of hospitalizations	312	22,000–52,000
# of outpatient visits	not available	1–2 million
duration	4 months	at least 8 weeks
spread	contained with little spread into the community	widespread

In its ongoing efforts to ensure that Ontario is prepared in the event of a pandemic, the Ministry spent approximately \$83 million during the 2006/07 fiscal year for outbreak-related expenditures, including procurement and stockpiling of antiviral drugs and personal protective equipment, operating expenses for the Ministry's emergency management unit, and other public health expenditures.

Audit Objective and Scope

The objective of our audit of the outbreak preparedness and management activity in the Ministry of Health and Long-Term Care was to assess whether there were satisfactory systems and procedures to:

- identify and respond to infectious-disease outbreaks of public health significance on a timely basis, in accordance with applicable legislation and international best practices; and
- measure and report on the effectiveness of these activities.

This audit assesses whether the Ministry is prepared to respond to infectious-disease outbreaks of significance to public health, particularly in cases of diseases that are transmitted from person to person in the community, such as SARS, pandemic influenza, and other as-yet unknown infectious diseases capable of widespread transmission among the general public. The scope of our audit excluded epidemics caused deliberately by means, for example, of chemical, biological, and radio-nuclear materials and agents.

The criteria used to meet our audit objectives, which were discussed with, and agreed to, by senior ministry management, pertained to the systems, policies, and procedures that the Ministry should have in place.

Our audit fieldwork included discussions with relevant ministry program staff; a review and analysis of research papers and expert reports on infection control, influenza pandemics, and SARS; a review of management reports and other relevant documentation; and research into comparable practices in other jurisdictions and into WHO guidelines. We also made site visits to the warehouse that stores the province's stockpile of antiviral drugs. We did not rely on any work done by the Ministry's Internal Audit Services Branch because it had not recently done any work in the areas we were examining.

Summary

Since the SARS outbreak in 2003, the Ministry of Health and Long-Term Care (Ministry) had undertaken a number of initiatives to improve the province's readiness to respond to outbreaks of infectious diseases. Such changes included drawing up detailed response plans, stockpiling antiviral drugs and supplies, and creating infection-control networks. Nevertheless, Ontario, like many other jurisdictions, is still not adequately prepared to respond to an outbreak of an infectious disease, especially a large-scale one such as an influenza pandemic. In particular, we noted the following:

- The health-care-sector response plan developed by the Ministry for an influenza pandemic was generally comprehensive in its guidance to the health-care sector. However, the Ministry does not have assurance that all members of the health system knew what to do in planning for and during a pandemic. Although public health units take the lead role in responding to a pandemic, a ministry survey found that over one-third of the public health units had not completed their local pandemic plans. As well, some health-care

stakeholders were unsure as to who should be responsible for stockpiling critical supplies, which was both a provincial and local responsibility.

- The Ministry estimated that during an influenza pandemic, the demand for beds in intensive care units and ventilator-supported beds would exceed the current capacity by 70% and 17% respectively. The Ministry's pandemic plan included a critical-care triage tool, which they informed us was the first such tool ever developed, to help physicians in acute-care settings make the difficult decisions as to who should receive critical care during an influenza pandemic. Despite the recommendation by its designers, this tool had neither been tested nor submitted for public consultation.
- The availability of sites where a significant number of people could be quarantined or isolated for an extended time was limited. The Ministry had no plans to look for other quarantine or isolation sites for future outbreaks, despite its experience in 2003 during the SARS outbreak, when it was not able to find suitable alternative isolation sites. Our research also found that, during the SARS outbreak, other jurisdictions identified holiday camps and other non-hospital sites as being suitable for quarantine purposes.
- In 2006, the Ministry instructed the local public health units to establish up to 750 temporary community-based influenza assessment centres to ensure that hospitals and other primary-care providers are able to focus on providing a range of health services and treating people who are critically ill with influenza or with other illnesses or injuries. According to a 2007 ministry survey, public health units either did not have operational plans for establishing these centres or were

undecided whether to establish them in their communities.

- There were a significant number of staffing vacancies in the Ministry's public health area and in local public health units. Approximately one-third of the public health units were without full-time medical officers of health. In the Ministry, close to 100 Public Health Division and laboratory positions were vacant. Some of these positions were designated as being critical during a human-health emergency.
- The Ministry had recently entered into a three-year contract with a private-sector warehousing firm for short-term storage of its pandemic supplies at four specific locations across Ontario, at a projected cost of \$14 million, until more detailed long-term distribution and warehousing plans could be developed. However, there was no documentation showing the reason for the choice of these locations. There were no warehouses west of Toronto, and the Toronto warehouse, which had almost the same storage capacity as two northern warehouses combined, would have to serve a population about eight times the size of the population served by the northern warehouses. A fourth warehouse is located in eastern Ontario. The potential risk of having all pandemic supplies for southern Ontario stored in one location had not been formally assessed.
- In our 1997 and 2003 audits of Public Health Activity, the Ministry told us it was going to replace its disease-surveillance information system with a new one. However, the new system was not fully implemented until December 2005, by which time the federal government had indicated that it was planning to introduce an even newer system. While the Ministry's epidemiologists have

been using the system data since 2005 to conduct routine surveillance, ministry physicians indicated that they could not use the system to conduct more in-depth disease surveillance because the information contained in it had not been captured in a consistent and timely manner and included duplicated cases. We are concerned that the Ministry will not be able to correct these deficiencies before converting to a newer system and transferring the data from the current system in 2008.

- The Ministry was unable to reach some health-care providers because it had been informed that the contact information held by the College of Physicians and Surgeons of Ontario could be used only in emergencies. Consequently, the Ministry had to purchase this information from an external party, but the information was incomplete.

We also noted that the Ministry had not collected \$17 million from the federal government for its share of the cost of the antiviral stockpile. After we brought this to the Ministry's attention, it began discussions with the federal government to recover the outstanding amount.

We sent this report to the Ministry and invited it to provide responses. We reproduce its overall response below and its responses to individual recommendations following the applicable recommendation.

OVERALL MINISTRY RESPONSE

The Ministry has taken action to build on lessons learned during SARS and from the recommendations from post-SARS reviews. The Auditor General's advice will support further improvements to ministry and health-sector strategies regarding outbreak preparedness and management.

Detailed Audit Observations

In the case of SARS, the following reports have been commissioned by the federal government and the province of Ontario:

- *Report of the National Advisory Committee on SARS and Public Health* by Dr. David Naylor (released October 2003);
- *Report of the Expert Panel on SARS and Infectious Disease Control* by Dr. David Walker (released April 2004);
- *First Interim Report of the SARS Commission* by Mr. Justice Archie Campbell (released April 2004);
- *Second Interim Report of the SARS Commission* by Mr. Justice Archie Campbell (released April 2005); and
- *Final Report of the SARS Commission* by Mr. Justice Archie Campbell (released December 2006).

We found these reports very useful, in that they provided recommendations and principles for improving the public health system and enhancing preparedness for and responses to outbreaks of infectious diseases.

MINISTRY INITIATIVES TAKEN TO DATE

Our review found that, after the SARS crisis, the Ministry had undertaken a number of emergency preparedness initiatives that were adopted from international best practices or recommended by experts familiar with the Ontario health system, including Dr. Walker and Mr. Justice Campbell. The following are some examples:

- creation of the Provincial Infectious Disease Advisory Committee (which advises on the prevention, surveillance, and control measures necessary for protecting the people of Ontario from infectious diseases);

- creation of Regional Infection Control Networks (to co-ordinate infection prevention and control activities in health-care facilities across Ontario);
- creation of a critical-care triage tool (to help physicians decide during a pandemic who would receive critical care);
- creation of a new public health and protection agency (to provide laboratory and epidemiological services and to translate research and information into practical assistance, tools, and advice for health-care providers in Ontario);
- stockpiling of drugs and pandemic supplies (in anticipation of a period of high demand worldwide); and
- creation of an emergency management unit (to support emergency management activities and develop an emergency response plan).

While having these initiatives under way is an important step toward ensuring readiness, our review showed that, like many other jurisdictions, the Ministry was not yet adequately prepared for a large-scale outbreak such as an influenza pandemic. The following sections describe some of our observations in areas where improvements are needed.

PLANNING AND CO-ORDINATION

Outbreak preparedness is a province-wide effort, largely community-based—it involves many individuals and organizations, including the Ministry, other provincial ministries, the federal government, public health units, health-care providers, non-health organizations and services, and essential workers, to name a few. Figure 2 demonstrates how these many parties are involved in this effort. However, the Ministry is ultimately responsible for ensuring that Ontario is prepared should an outbreak occur.

Our audit focused on the Ministry's responsibilities in the preparation for and management of an

infectious-disease outbreak. Those responsibilities include developing policy; setting strategic directions; ensuring compliance with standards and guidelines; and monitoring, reporting, and overseeing performance. Examples of events involving co-ordination and intervention by the Ministry include the outbreak of SARS in 2003; the salmonella outbreak (as a result of contaminated bean sprouts) in 2005; the rubella (German measles) outbreak in Oxford County in 2005; and the salmonella and *E. coli* outbreak (as a result of contaminated spinach and croutons) in 2006.

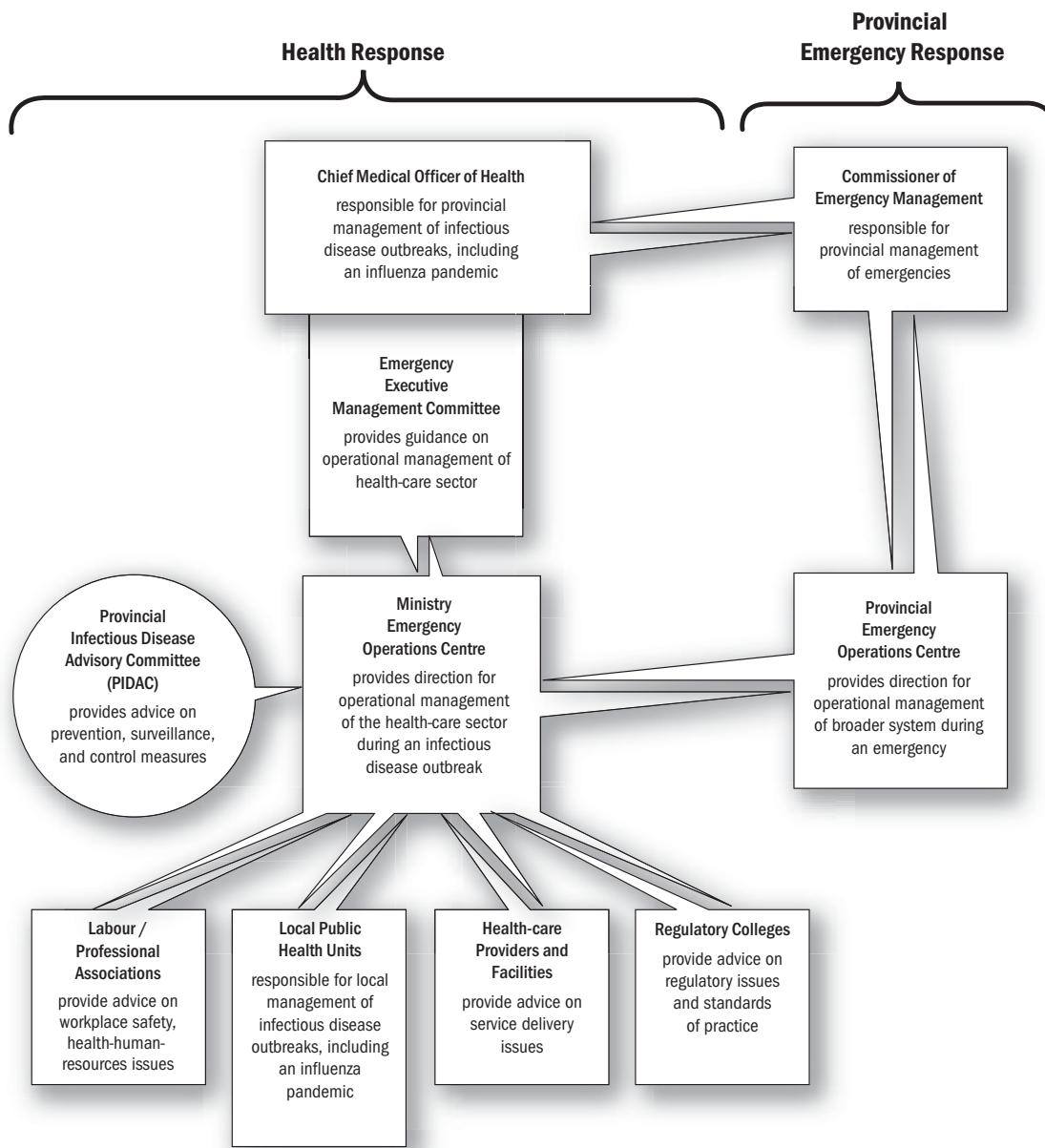
The Public Health Agency of Canada has also pointed out that, to manage an emergency successfully, it is essential to have comprehensive response plans. And in the case of pandemic planning, the responsibilities of every health-care-sector partner must be known and agreed to well in advance.

Response Plan

In accordance with the *Emergency Management and Civil Protection Act*, the Ministry developed a ministry emergency response plan (MERP) for its response to infectious-disease and other health emergencies. The MERP, last updated in July 2005, outlined what the Ministry will do in the event of any emergency that affects the health-care system and the health of Ontarians. It is intended to complement incident-specific plans such as the Ontario Health Plan for an Influenza Pandemic (OHIP), which was introduced in 2004 and has since been updated every year, the latest update having been issued publicly in July 2007 (because our audit fieldwork was completed in June 2007, we reviewed and refer in this report to the preceding version issued in September 2006). This plan, which concentrates on the emergency response actions of the health-care sector, outlines operational practices, frameworks, tools, and measures to guide and support health-care-sector pandemic planning and actions.

Figure 2: Emergency Management: Roles and Relationships

Source of data: Ministry of Health and Long-Term Care



Our review found that MERP needed updating. Although the OHIP was generally comprehensive in its guidance for a health-care-sector response, it had not complied fully with provincial legislation and national guidelines, and it needed to be developed further. Specifically, we noted the following:

- The measures for hazard identification and risk assessment contained in MERP had not

been reviewed in light of the current epidemiology of infectious diseases since 2005. The Ministry uses this assessment to prioritize its planning for infectious diseases and to direct resources and planning efforts. The Ministry told us that it had planned to review the risk assessment in 2006, but that because of other priorities, had been unable to do so.

- The OHPIP was not translated into French as required by the *French Language Services Act*. Since the plan was targeted to members of the health-care sector and was available on the Ministry's public website, not having the document in French could pose a health hazard to the community served by francophone health-care workers.
- The amount of detail in the guidelines that the OHPIP provided to various health-care-sector groups varied. For instance, detailed instructions were given to laboratories, public health units, and acute-care services to consider suspending or curtailing their services (with suggestions included) during a large-scale outbreak, such as an influenza pandemic; on the other hand, the directions to other health services providers, such as family physicians, home-care providers, and community mental health centres, were simply to maintain "key" services, which were not defined. Moreover, a chapter on emergency health services relating to ambulance services has yet to be written.
- The OHPIP did not address all areas recommended by the national pandemic plan. The areas not addressed included assessing health-care personnel and facilities capacity, determining liability and insurance for health-care workers and volunteers, assessing the surge capacity of hospitals and non-traditional sites, and maintaining inventories of existing communication systems, including hardware and software.

We also found that the Ministry had not conducted an enactment exercise with its response plan for infectious-disease outbreaks. Rather, it had presented a scenario of an influenza pandemic to a discussion session in February 2006. In contrast, the Ministry had participated in two full-scale enactments with relevant stakeholders for nuclear emergencies in 2005 and 2006. We noted that the WHO recommends that jurisdictions consider carrying out a simulation exercise, preferably one

that focuses on specific aspects of the response plan for an influenza pandemic. We also noted that in Queensland, Australia, a number of live drills were conducted in 2006 to test operational procedures. The Ministry told us that it had no multi-year plan for future enactment exercises for outbreaks of infectious diseases.

Clarification of Roles and Responsibilities

In March 2007, the Ministry issued a document called *Influenza Pandemic Roles and Responsibilities for Ministry of Health and Long-Term Care Divisions—Operations*, which outlined each division's activities at various emergency levels. However, the Ministry was still developing policies and procedures for surveillance during a pandemic, since the responsibilities of ministry personnel, such as physicians and epidemiologists, would differ significantly from their everyday functions. As a result, the Ministry was unable to provide training for these ministry personnel on the procedures they should follow during a pandemic.

We also found that there was a lack of understanding among public health units and health-care providers as to their roles and that of the Ministry in an emergency. We determined that there was a need to clarify the responsibilities of various parties. For example:

- The minutes of a debriefing meeting held after the 2005 salmonella outbreak indicated a need to define clearly the roles of the responsible parties, especially the Ministry and public health units, during a localized outbreak. Given the inter-jurisdictional involvement of different stakeholders, it is crucial that it be clear who is in charge and who should make key decisions.
- A 2006 report of a discussion session on a hypothetical influenza pandemic noted numerous comments to the effect that everyone was working in isolation from one another and that there was a lack of integration among various

organizations such as local health units and health-care providers.

- The Ministry's 2006 community pandemic planning survey found that public health units and health-care provider groups were unclear about their responsibilities in preparing for and managing outbreaks of infectious diseases. For example, a number of public health units and health-care providers were not sure who should be responsible for stockpiling critical supplies; and independent physicians in general wanted the Ministry to give them more direction on pandemic planning in their sector.
- The Ministry's 2007 community pandemic planning survey showed that about 40% of the public health units had not engaged independent practitioners and laboratories in developing their local pandemic plans, and almost all public health units said that there was little or no planning for pandemic preparedness by independent practitioners, home-care services, and mental health organizations.
- A number of public health units requested, via the 2007 survey, that the Ministry develop a curriculum for health-care workers, and according to the Ministry, this was under development.

In their reports, both Dr. Walker and Mr. Justice Campbell recommended that the Ministry ensure that all organizations have a clear understanding of their own and one another's responsibilities. The Ministry told us that it had relied on more than 300 stakeholders and experts representing different parts of the health-care system, with whom it consulted in the development of its pandemic plan, to promote the plan to their respective organizations. However, the Ministry does not have adequate assurance that these organizations have duly educated their members about their roles during a pandemic.

The federal pandemic plan and the WHO both say that a response plan structured by pandemic phase and by key stakeholders or organizations

would facilitate a quick and adequate response, because each party should know what to do, and in what order. We noted that in the OHIPP the Ministry had summarized the planning activities by pandemic phase. However, it had not summarized the specific actions required of each stakeholder. Although the information was in the document, it was spread throughout 485 pages, and stakeholders would have difficulty finding out exactly what their specific responsibilities were. We noted that in British Columbia's pandemic plan, a useful checklist was used to summarize the responsibilities of each provincial health agency by pandemic phase, so that the key stakeholders know what they are responsible for doing and in what order.

Local Pandemic Planning

The Ministry decided that the local medical officers of health of public health units will take the lead in co-ordinating the local health response to a pandemic. As the health lead for influenza pandemic planning at the local level, public health units are required to work with all aspects of the health-care system in planning, such as compiling a health human resource registry and establishing influenza assessment centres (see Influenza Assessment, Treatment, and Referral Centres below).

Our review of the preparedness of public health units indicated the following:

- A number of public health units said that because of inadequate funding, they would not be able to prepare for a pandemic in accordance with ministry requirements. Specifically, although significant resources were needed to meet the level of preparedness required, no specific funding was provided.
- The Ministry's 2007 community pandemic planning survey found that over one-third of the public health units had not drawn up their pandemic plans.
- Our review of pandemic plans from the public health units that had completed them

showed that they included various amounts of detail; one plan simply referred the readers to the OHIPIP without providing additional information specific to local pandemic planning. To help public health units develop local pandemic plans in a consistent and cost-effective manner, the Ministry could develop a template for them to use.

RECOMMENDATION 1

To ensure a consistent and co-ordinated response to infectious-disease outbreaks across the province, the Ministry of Health and Long-Term Care should:

- review both the Ontario Health Plan for an Influenza Pandemic (OHIPIP) and the Ministry Emergency Response Plan regularly to update these documents as necessary;
- translate the OHIPIP into French as required by legislation;
- as recommended by the World Health Organization, periodically conduct simulation exercises to confirm that its response plan on infectious-disease outbreak will work properly;
- clarify the responsibilities of all relevant parties so that all parties understand their responsibilities—for example, by providing a summary or checklist of planning activities by pandemic phase and by organization in the next version of the OHIPIP; and
- develop a template to help public health units complete local pandemic plans.

MINISTRY RESPONSE

The Ministry agrees that emergency plans and supporting documents must be reviewed and updated regularly. Subsequent to the audit, the annual updated Ontario Health Plan for an Influenza Pandemic (OHIPIP) was released in July 2007. The executive summary is translated

into French. Supporting public fact sheets are translated into French and 22 other languages. The caption identifying this document as exempt from the *French Language Services Act* has been added to the 2007 OHIPIP. By fall 2007, the Ministry Emergency Response Plan will be modified to reflect our new organizational structure and the updated Hazard Identification and Risk Assessment.

The Ministry agrees it is important to test emergency plans to ensure relevance. We have:

- conducted and participated in exercises;
- activated plans in response to community events (for example, Legionella outbreak, salmonella outbreak, hospital evacuation, and flooding);
- developed new plans following post-event debriefs:
 - *Public Health Division Outbreak Response Plan* outlining staff mobilization to support local-level outbreak;
 - guidelines, prepared by the Provincial Infectious Disease Advisory Committee (PIDAC), for *Managing an Outbreak of a Novel Infectious Respiratory Disease* (draft 2).

The Ministry will develop an exercise calendar to ensure that outbreak response, including field exercises, is tested regularly.

The Ministry agrees with the importance of all parties understanding their role in an emergency. The Ministry has:

- defined roles and responsibilities in the OHIPIP;
- developed a fact sheet summarizing roles and responsibilities from a front-line health-worker perspective;
- prepared checklists for specific groups within the sector and beyond, including the identification of ministry responsibilities by phase and/or level of activation.

Further opportunities to provide clarity will be pursued as they become available.

The Ministry supports the intent of the recommendation to develop a pandemic-plan template for use by local public health units and will consult with them on how best to accomplish this while acknowledging the significant work already completed locally.

HEALTH-SYSTEM RESOURCES

The goal of the OHPIP is to minimize serious illness, deaths, and social disruption during a health emergency when existing services may need to be deferred and workloads prioritized. The ability of the health-care system to respond to a threat to public health would be affected by the availability and accessibility of response resources. In the OHPIP, the Ministry provided instructions to health-care providers for planning for an influenza pandemic in light of limited resources and increased demand.

Acute Care in Hospitals

The Ministry has estimated that during an influenza pandemic, the demand for intensive-care unit (ICU) beds and ventilator-supported beds would be 70% and 17% over current capacity respectively, and the number of existing ICU and ventilator-supported beds would not be enough to meet the demand for up to five weeks and three weeks respectively. During the SARS outbreak, the need for mechanical ventilation by about 80 infectious patients overwhelmed Ontario's critical-care capacity, but in a pandemic, Ontario could see over 1,000 patients needing ventilator-supported beds.

In the OHPIP, the Ministry offered a number of strategies for managing a surge in demand at acute-care hospitals, namely, mutual-aid agreements between hospitals, deferral of elective surgery, the

use of alternative care areas, and as a last resort, mass emergency care, which involves the use of triage to maximize survival within the population. To guide physicians in acute-care settings in the difficult decisions as to who should receive critical care during an influenza pandemic, the Ministry began developing a triage tool in 2006. This tool, which the Ministry told us was the first one in the world, uses a scoring system and has been incorporated into the OHPIP. For the following reasons, however, this tool may not yet be ready to be used:

- The designers of the triage tool had recommended that it needed public consultation because the criteria that the tool uses might be contentious. For example, being above a specified age is an exclusion criterion. However, the Ministry had no plans to present the triage tool for public consultation.
- The tool had not been tested. According to the designers, since it has never been used, testing is essential so that they can determine whether it is practical and, if necessary, can refine it. They said that the resources needed for effective triage management must be planned, established, and tested before a pandemic.
- Whereas the Ministry had the critical-care triage tool for use in a pandemic, there was no formal plan for responding to other outbreaks of disease with smaller surges in patients needing critical care.

RECOMMENDATION 2

To ensure that access to acute care in an outbreak is fair and equitable to all Ontarians, the Ministry of Health and Long-Term Care should:

- consider the need for public consultation, particularly since its recently developed critical-care triage tool may be the first one developed anywhere in the world;

- work closely with the medical community to test and refine the critical-care triage tool; and
- establish a plan for responding to various levels of surges in patients needing critical care.

MINISTRY RESPONSE

The Ministry agrees with the recommendation for public consultation on the critical-care triage tool and is exploring how best to achieve a meaningful dialogue on this, while building on previous consultation with the critical-care community.

A ministry-funded pilot study was initiated in February 2007 to test the best method of gauging the tool's efficacy and accuracy. Pilot results are expected by March 2008 and will inform next steps.

The Ministry is implementing a Surge Capacity Management Program to provide tools and sharing of best practices. The program's goal is to meet patient needs regardless of the surge's cause. The Champlain Local Health Integration Network is the demonstration region, which will focus on strengthened communication, improved partnerships, and greater access for patients. The demonstration project will be completed in 2007/08; lessons learned and evaluated will inform the province-wide rollout of the program, anticipated in 2008/09.

SARS. Isolation is used for people who are actively ill with an infectious disease.

The former Chief Medical Officer of Health (CMOH) of the Ministry commented in her 2005 annual report that a central inventory of critical resources, such as isolation rooms, is needed in conjunction with a mechanism for managing scarce resources so that they are used efficiently and with regard to system-wide needs and not just those of the individual institution. To that end, the Ministry established a critical-care bed and resource registry that contains information on the inventory of negative-pressure rooms (rooms with low air pressure used for isolating patients with air-borne infectious diseases) and isolation beds across the province. In addition, the Ministry, in February 2007, set up a critical-care information system in nine hospitals that would give decision-makers a real-time snapshot of what critical-care resources were being used in those hospitals. The Ministry expected that this information system would be extended to all remaining hospitals with critical-care beds by March 2008.

The *Health Promotion and Protection Act* states that if the CMOH certifies to the Minister of Health and Long-Term Care that there is an immediate risk of an outbreak of a communicable disease anywhere in Ontario, and if premises are needed as a temporary isolation facility, the Minister "may require the occupier of any premises to deliver possession of all or ... parts of the premises ... to be used as a temporary isolation facility." We noted that during the outbreak of SARS in 2003, an empty unit in a health-care facility was chosen as an isolation site for medical staff who had contracted SARS. Although the administrator of the facility believed that it was not fully equipped, the Ministry could not find another site and had to use that facility. Despite its experience during the SARS outbreak, when it was not able to find suitable alternative isolation sites, the Ministry has not formally identified such sites for future outbreaks.

Isolation and Quarantine

The Ministry has determined that quarantine, which involves separating people from others if they have been exposed to the virus but are not ill, would not be an effective means of containing an influenza pandemic—because of the way the disease is spread—but that it would be effective in containing some other infectious diseases, such as

In addition, our research on the use of facilities in other countries for individuals who do not need to be hospitalized revealed that, at about the same time in Hong Kong, a number of holiday camps were used for that purpose. Although New York State was not significantly affected by SARS in 2003, the State did instruct local health departments to consider using alternative, non-hospital sites—such as schools, dormitories, and hotels—for quarantine. However, we noted that the Ministry has not examined the feasibility of such alternatives.

We are concerned that the availability of sites where a significant number of people could be quarantined or isolated for an extended period is limited.

Transfer of Patients with Infectious Diseases

The WHO recommends that jurisdictions develop mechanisms to co-ordinate patient transport. To that end, the Ministry in 2003 established the Provincial Transfer Authorization Centre to track the movement of patients between health-care facilities. The Centre, whose purpose is to prevent the spread of infectious diseases, instructs facilities receiving patients with infectious diseases to take necessary precautions in preparing to accept these patients.

However, another report by Dr. Walker noted that the Centre was not used during the outbreak of Legionnaires' disease in 2005. The report noted, "More must be done to prepare Ontario for outbreaks where large numbers of people become ill and have to be hospitalized or moved between facilities." As well, we were informed that participation in the Centre's program was strictly voluntary.

Influenza Assessment, Treatment, and Referral Centres

During an influenza pandemic, people in Ontario who develop influenza symptoms must know where to go for diagnosis and treatment. To ensure that hospitals and other primary-care providers can both provide a range of health services and treat people who are critically ill with influenza or who have other life-threatening illnesses or injuries, the health system will establish temporary community-based influenza assessment, treatment, and referral centres (assessment centres). The 2006 OHIP specifies that it is a local responsibility to plan for the establishment of assessment centres. The Ministry recommended that up to 750 of these centres be established by public health units across the province.

Our review of the Ministry's 2007 community pandemic planning survey of public health units and other ministry documents showed that:

- Half of the public health units did not have operational plans to establish assessment centres; the remaining public health units were undecided whether to establish such centres in their communities.
- The Ministry had not yet made decisions about legal issues, licensing and scope-of-practice issues, financial compensation for people who work in these assessment centres, and the division of funding roles and responsibilities between the Ministry and municipalities.

RECOMMENDATION 3

To ease the burden on hospitals during an infectious-disease outbreak, the Ministry of Health and Long-Term Care should:

- ensure that local public health units identify suitable non-hospital quarantine sites for individuals not requiring hospital care and determine if they are properly equipped or

- how they are to be equipped, so that they will be available when they are needed;
- give due consideration to making participation in the Provincial Transfer Authorization Centre compulsory to help prevent the spread of infectious diseases between facilities;
 - resolve the legal, licensing, scope-of-practice, and funding aspects of community-based influenza assessment, treatment, and referral centres, and monitor their establishment by public health units; and
 - make alternative arrangements in advance if it is likely that certain local public health units will not have established the required assessment centres.

MINISTRY RESPONSE

The Ministry agrees with the importance of providing infection-prevention and -control services in a local-level outbreak. We have enhanced isolation resources through:

- funding 112 additional infection-control practitioners in acute-care hospitals;
- creating 180 communicable disease positions in local health units;
- creating 13 Regional Infection Control Networks;
- developing on an ongoing basis infection-control guidelines in hospital construction and renovations planning and design.

The Ministry agrees that:

- guidelines for local quarantine facilities will be developed;
- mandatory participation in the Provincial Transfer Authorization Centre will be evaluated;
- legal, licensing, scope-of-practice, and funding issues related to a significant outbreak will be addressed. Documented

decisions regarding scope-of-practice and funding are included in the 2007 OHPIP.

As of May 2007, 60% of public health units were working on development of local assessment, treatment, and referral centres. The Ministry continues to monitor their progress.

Human Resources in Public Health

The staff of local public health units and in the Ministry's Public Health Division are essential for delivering programs and services, responding to emergencies or periods of increased need, and assisting other health-care providers. We noted that there was a significant number of staff vacancies in the Ministry's public health area as well as in public health units that are partly funded by the Ministry. For example:

- In our *2003 Annual Report*, we noted that eight local public health units did not have a full-time medical officer of health (MOH) as required by the *Health Protection and Promotion Act*. The situation has worsened since then. According to the Ministry, as of December 2006, approximately one-third of the public health units were without a full-time MOH. Half of these units had not had a full-time MOH for over five years, and one unit had not had one for almost 12 years. We noted that the Ontario Medical Association had warned in November 2005 that the lack of MOHs was putting the province's health in serious peril: "There is a danger that the current critical mass of medical officers of health is insufficient to be viable and sustainable. The foundation has been so eroded over time that, if not protected and fortified, it will disintegrate and seriously imperil the province's health."
- There were approximately 40 vacancies in the Ministry's public health laboratories.

For example, the Ministry had not been able to recruit a qualified microbiologist to provide medical and clinical assistance and advice during disease outbreaks. For the last three years, this position had been filled on a rotational basis by a variety of medical microbiologists.

- There were over 50 vacancies in the Ministry's Public Health Division. The staff in those positions are needed to meet ongoing needs in various areas. Some of these positions were described as being critical during human health emergencies. For instance, seven senior medical consultants were designated as critical in the Ministry's continuity-of-operations plan, but at the time of the audit, the Ministry employed only five. Moreover, there had been no physician manager for communicable disease for two years.
- The Ministry's emergency operations centre, which will become the "central command centre" during an outbreak, was once backed up by 50 ministry staff to support public health staff. These individuals volunteered in 2004 and were informally committed to the operation for one year. The Ministry did not keep a current roster of backup support staff who could supplement existing resources. We were informed that in an emergency, the staff for the operations centre will be recruited as needed.

Human Resources in the Health-care Sector

During an infectious-disease outbreak, health-care workers will be called upon, not only to treat patients affected by the outbreak, but also to maintain other ongoing health-care services. According to the Ministry, in a pandemic, as many as 25% of health-care workers may be absent from work, either because they are sick or because they have care-giving responsibilities at home.

In 2003, after the SARS outbreak, a survey conducted by the Ontario Nurses Association (ONA) found that 20% of respondents either declined or refused to work as a result of the SARS outbreak. And Dr. Walker commented in his report on Legionnaires' disease that early in the outbreak, one hospital reported that a large number of health-care workers refused to come to work.

In his report on SARS, Dr. Walker recommended that the Ministry, together with professional associations and regulatory colleges, establish provincial registries to provide rapid deployment of health-care personnel; such registries should be tested and evaluated within 12 months of being set up. Similarly, the Canadian pandemic plan recommended that the provinces estimate both the number of health-care workers by type and workplace and the number of medical personnel who are inactive (because, for example, they are retired). In December 2005, the Ministry developed a database of over 1,000 health-care professionals, including nurses, physicians, respiratory therapists, and paramedics, who expressed a willingness to volunteer their services during a health emergency. However, we noted that the Ministry had not been maintaining this database since that time.

Part of the Ministry's strategy for a pandemic is to recruit health-care retirees and other volunteers who, before a pandemic, would fill out a Ministry competence questionnaire that would allow local pandemic planners to identify areas of expertise, so that these people could help health-care professionals and other service providers during an outbreak. The Ministry did not monitor to what extent the competence questionnaire had been used, and it explained that such resources are best understood at the local level and therefore should be organized locally. We are concerned that without proper monitoring of local planning, the province may not be able to provide adequate health-care professional staff to respond adequately to an infectious-disease outbreak.

RECOMMENDATION 4

To enhance the availability of human resources during an infectious-disease outbreak, the Ministry of Health and Long-Term Care should:

- take effective measures to fill the large number of vacancies of medical officers of health in the public health units and of other positions in the Ministry's Public Health Division and public health laboratories;
- in conjunction with professional associations and regulatory colleges, maintain up-to-date registries of volunteer health-care providers who would be available to assist during outbreaks; and
- monitor the success of local public health units in recruiting health-care retirees and other volunteers who could help in an outbreak situation.

MINISTRY RESPONSE

The Ministry accepts the need to fill ongoing vacancies among Medical Officers of Health, within the Public Health Laboratory system and within the Public Health Division. In addition, plans for health-human-resources needs in an emergency must be in place. The Ministry created HealthForce Ontario in May 2006; developed a health-human-resources (HHR) pandemic plan to assist with anticipated HHR needs; and is making a proposal to regulatory colleges on how their members can volunteer in any emergency, from which it anticipates a formal agreement in winter 2007/08.

The Ministry will modify its next quarterly survey of public health units to capture local human-resource-strategy information.

MEDICAL INTERVENTIONS

To help prepare for an influenza pandemic, the federal government co-ordinated the purchase of vaccines and antiviral drugs and contributed to the funding. The Ministry supplements those preparations by buying and distributing vaccines, antiviral drugs, certain personal protective equipment, and clinical supplies.

Vaccines

The primary public health intervention during a pandemic is vaccination. However, vaccine production requires the seed virus and therefore cannot begin until the pandemic virus is already infecting humans. A pandemic vaccine, therefore, may not be available until four to six months after the first case of pandemic influenza is identified. Canada is one of the few countries in the world that has the capacity to manufacture pandemic vaccines. In 2001, the federal government entered into a 10-year contract for an influenza vaccine with a manufacturer in Quebec.

Since a vaccine is in limited supply in the first phases of the pandemic, prioritization within the population is necessary. The federal government will designate priority groups on the basis of the epidemiological data on the virus once it emerges, and each province will follow the federal recommendations for the priority groups. The federal pandemic plan suggested that each province develop more refined estimates of priority groups ahead of the pandemic.

Our audit showed that the Ministry had not sufficiently planned and managed delivery and administration of the vaccines to the public. For example:

- The Ministry had not completed the enumeration and mapping of the priority groups.
- Security arrangements for transporting vaccines from the Quebec manufacturer to the Quebec-Ontario border and after they arrive in Ontario have not been made. The Ministry

had not yet decided if the risk of theft or loss is to be borne by the manufacturer or by the Ministry itself after the stock leaves the manufacturer.

- The Ministry told us that the pandemic vaccines would be stored at the government pharmacy because the pharmacy had proved proficient in the annual vaccine distribution for the seasonal flu vaccine program. However, the Ministry had not analyzed the effect of a pandemic upon the warehousing and distribution capabilities of the government pharmacy.
- Although the administration of the vaccine to the local population will be a municipal responsibility, the Ministry had not addressed the foreseeable risk that there might be a general breakdown of public order at dispensing sites during the mass vaccinations. Furthermore, syringes and needles with which to administer the vaccines had not yet been obtained because the federal government was partnering with the province to procure these supplies. The Ministry told us that the federal government hoped to have a contract for these supplies by 2008.
- According to the WHO, the pandemic influenza vaccine might require two doses, administered months apart, to be fully effective. The Ministry had no system for managing immunization schedules or for planning, delivering, and tracking immunization sessions or adverse reactions. The Ministry told us that it was in the process of requesting funding for such a system.

Antiviral Drugs

According to the federal government, antivirals, or anti-influenza drugs, are the only specific medical intervention that targets influenza and that may be available during the initial pandemic response.

Neuraminidase inhibitors, a type of antiviral drug, are known to slow down the spread of the disease during the first wave of the pandemic. These drugs reduce the duration and severity of the symptoms and reduce complications and the use of antibiotics.

The WHO recommends that each jurisdiction stockpile enough antiviral drugs to treat its population. Several doses per person are required in a treatment course. In Ontario, the stockpiling of a quantity sufficient to treat 25% of its population, which is a national guideline, was nearly complete as of March 31, 2007. The total value of the antiviral drugs on hand amounted to \$73 million. The Public Health Agency of Canada is responsible for reimbursing Ontario for part of the stock under a cost-sharing arrangement.

According to the manufacturers, the antiviral drugs have a shelf life of five years and are most effective if administered within 48 hours of the beginning of symptoms. The Ontario antivirals stockpile is stored in a single location. An efficient distribution system is therefore necessary, given the large number of persons with symptoms that is expected at the beginning of an outbreak.

With regard to the management of the antiviral stockpile, our audit revealed that:

- The Ministry had not developed guidelines for such elements of delivery and administration of antivirals as security, transportation, and monitoring of drug distribution.
- Five million doses of an antiviral drug in the pandemic stockpile will expire in 2009. The federal government's pandemic plan says that the stability of antiviral drugs may extend beyond the current stated expiry date, but because the Ministry did not monitor the storage temperature in the warehouse (the storage temperature recommended by the manufacturers is between 15°C and 30°C), it may not be able to take advantage of the potential longer shelf life of these drugs.

- The inventory system used for the antiviral stock was almost 20 years old, and it could not provide real-time inventory or itemized inventory information. This will make it difficult to keep track of inventory levels during a pandemic.
- Storing antiviral drugs in a single location could pose a security risk in the event of a natural disaster or civil disturbance, and could make distribution difficult.

We also noted that as of March 31, 2007, the Ministry had not collected \$17 million from the federal government for its share of the cost of the antiviral stockpile. After we brought this to the Ministry's attention, the Ministry began discussions with the federal government to recover the outstanding amount.

Personal Protective Equipment and Medical Supplies

During an outbreak, health-care workers and patients would need additional protective equipment and medical supplies to protect themselves from the virus. The 2003 Ontario Nurses Association survey, mentioned earlier in this report, found that more than half of the respondents had concerns about the adequacy of protection they had been given.

Medical supplies such as masks, gloves, gowns, and hand sanitizers are mostly made outside Canada, in places where the influenza pandemic may originate and where border closure is a possibility during a global epidemic. The Ministry had therefore, in early 2007, contracted with a number of vendors to provide a four-week supply of such equipment and supplies for health-care workers who are in contact with patients with infectious diseases. As of March 31, 2007, the Ministry had obtained more than 60% of the required quantities and planned to have all items stockpiled by March 2008.

The Ministry told us that it had stockpiled a limited number of N95 respirators, which may be needed instead of surgical masks to provide health-care workers with adequate protection, but that funding for additional quantities had not been approved at the time of our audit.

Instructions Provided to the Health-care Sector on Local Stockpiling

The Ministry stated in its pandemic plan that health-care providers are responsible for obtaining their own four-week stock of personal protective equipment, so that collectively, the province will have enough supplies for eight weeks, which is the estimated length of the first wave of an influenza pandemic.

The Ministry gave quantity formulas in the OHIP so that the broader health-care sector would know what quantities of supplies to buy. We noted two areas in the instructions given to the broader health-care sector for local stockpiling that warrant revision:

- The supply of some personal protective equipment, such as masks for patients and gowns for non-clinical staff, would not last for the estimated eight weeks of a pandemic, because the Ministry had not instructed the local health-care sector to buy these supplies.
- The Ministry did not inform the broader health-care sector that it could buy its stocks at the government-negotiated rate once the provincial stockpile was complete. Health-care providers who were in the process of building their local stockpiles or had already done so may have bought their supplies at a higher price.

Status of Stockpiling in Local Communities

Despite the Ministry's indication in its pandemic plan that health-care providers were responsible for obtaining their own four-week stockpiles of

personal protective equipment, as of January 2007, a significant number of health-care providers had not completed their personal stockpiles. This was evident in the results of the Ministry's 2007 community pandemic planning survey. In that survey, each public health unit was asked:

- to respond ("yes" or "no") as to whether it had its four-week stockpile of critical supplies for its site; and
- to roughly quantify, for each type of health-care provider in its catchment area (for example, long-term-care homes, Community Care Access Centres, hospitals, and independent health practitioners), how many individual facilities/practitioners had completed the four-week stockpile.

Half of the public health units did not have four-week stockpiles for their sites. In addition, many public health units reported that over half of the facilities and practitioners in a particular category of health-care provider did not have four-week stockpiles. Figure 3 shows the percentage of public health units that reported that more than half of the facilities and practitioners of a particular

Figure 3: Percentage of Public Health Units Reporting Incomplete Stockpiles of Personal Protective Equipment, January 2007

Source of data: Ministry of Health and Long-Term Care

Type of Health-care Provider	% of Units Reporting >50% of Providers without Required Stockpiles
long-term-care homes	80
Community Care Access Centres	63
hospitals	60
independent practitioners	49
home care	49
mental health	49
laboratories	40
community health centres	37
emergency medical services	34

category of health-care provider did not have the required four-week stockpiles.

We also noted in this regard that, as early as November 2005, an OHPIP steering committee had recommended that the Ministry circulate a communiqué to health-care facilities emphasizing their responsibility under the OHPIP to develop a four-week stockpile of personal protective equipment and direct patient-care supplies. However, the Ministry did not do so.

On its own initiative, in mid-2006, the Ministry distributed some 15,000 emergency infection-control kits containing enough supplies for non-hospital health-care providers (for example, physicians, midwives, and community health centres) for the first seven to 10 days of an outbreak of a droplet-spread illness (an illness spread by contaminated air in close proximity to the source, such as that resulting from sneezing or coughing). However, we noted that about 600 kits were undeliverable because of out-of-date or incomplete addresses or because they had been refused by the recipients. In addition, the OHPIP did not contain guidelines for helping independent practitioners decide how much to stockpile. Accordingly, this group of health-care providers might not have enough personal protective equipment to protect themselves and their patients during a pandemic.

Storage and Distribution

In February 2007, the Ministry entered into a three-year agreement with a private-sector warehousing firm, at a projected cost of almost \$14 million, for short-term storage of the provincial stock of personal protective equipment at four locations across Ontario, until more detailed long-term distribution and warehousing plans could be developed. Our audit showed the following:

- The Ministry did not have documentation for its analysis of the alternative ways to

meet its storage needs, such as using surplus government properties, as required by Management Board procurement directives.

- The Ministry did not have a documented analysis to justify the storage size specified for each storage location. For example, the combined size of two northern Ontario storage locations was about the same as the storage location for the Greater Toronto Area (GTA). Moreover, there are no storage locations west of the GTA. The population in the GTA and southwest Ontario is approximately eight times as great as that of northern Ontario, which is served by the two northern warehouses. A fourth warehouse is located in eastern Ontario.
- The Ministry had not decided which municipalities would be served by which of the four locations and did not have a rationale for using those four locations.
- The Ministry had yet to make plans for distribution, reordering, transportation, and security for its current stock of pandemic personal protective equipment. For example, it had not formally assessed the risk of having all pandemic supplies for southern Ontario being stored in and distributed from one location.

During our audit, the Ministry engaged an external consultant to advise on meeting future storage and distribution requirements. The Ministry was reviewing the consultant's recommendations at the completion of our audit.

RECOMMENDATION 5

To ensure that vaccines, antiviral drugs, medical supplies, and personal protective equipment for health-care workers can be made available in sufficient quantities and on a timely basis, the Ministry of Health and Long-Term Care should:

- store, distribute, monitor, and administer antivirals, vaccines, and personal protective

equipment so that they are accessible to people when needed; and

- emphasize to the broader health-care sector the importance of local stockpiling of personal protective equipment.

It should also ensure that it recovers the money owed to it by the federal government for its share of the cost of the national antiviral stockpile.

MINISTRY RESPONSE

The Ministry supports this recommendation. The Ministry initiated work in spring 2007 to determine how best to deliver pharmaceuticals and other supplies from geographically dispersed sites to the local level for inclusion in the 2008 OHPIP. Also, in its August 2007 release, the newsletter *Pandemic Planner* reinforced the need for local stockpiles.

Negotiations are under way with the federal government to recover funds owed to Ontario.

SITUATION MONITORING AND ASSESSMENT

The reporting and monitoring of infectious diseases are integral to the detection and analysis of outbreaks. While the Ministry monitors disease situations both in the province and in other provinces and countries, its primary means of surveillance is to monitor and analyze disease and outbreak data in the integrated Public Health Information System (iPHIS). Under the *Health Protection and Promotion Act*, physicians and institutions such as laboratories, long-term-care homes, and hospitals are responsible for reporting certain diseases and outbreaks to local public health units. The public health units enter the data into iPHIS so that the Ministry can analyze and identify unusual and unexpected cases of infectious disease. The analysis is then provided

to the public health units to guide their activities and follow-up.

Public Health Information System

In both our *1997 Annual Report* and our *2003 Annual Report*, we noted there were deficiencies in the then public health information system. The Ministry replied that it was planning to replace that system with an improved one. However, the new system was not fully implemented until December 2005. This new system, iPHIS, was originally developed by another Canadian jurisdiction and made available by the federal government to all provinces in 2001. The Ministry spent \$25 million on its implementation.

By the time Ontario implemented iPHIS, the technology was 15 years old. The federal government stated that it would no longer provide technical support for the system after 2008 and that a newer system would be made available to all provinces and territories in that year. The Ministry told us that it was proceeding to acquire this newer system, at an estimated cost of \$60 million, pending funding approval.

Our audit found not only that iPHIS implementation was delayed, but also that once it was operating, ministry staff noted significant quality problems with the system due to “unrealistic, externally driven timelines that did not allow adequate time for the required deliverables and complexity of the project,” and that the proposed quality assurance plan had been scaled back. In addition, the ministry staff responsible for conducting disease and outbreak surveillance for the province told us that they could not rely on iPHIS data because it was inconsistent and incomplete. Our review of the system showed that:

- The Ministry recognized that there was a two-to-three-week delay from the time local public health units received the first case reports to the time the cases were entered in iPHIS.

Ministry epidemiologists have been using iPHIS data to conduct routine surveillance since the implementation of iPHIS in 2005; however, ministry physicians responsible for more in-depth surveillance activities informed us that their ability to conduct disease and outbreak surveillance was adversely affected by the delays. We noted that the local health units require standards for timely entry. The Ministry told us that it was developing such standards.

- Although the public health laboratory information system would have more timely information, ministry staff told us that they could not obtain it electronically because the laboratory information system was not linked to the Ministry’s disease surveillance system. Accordingly, they had to rely on public health laboratories or local public health unit officials to alert them by phone if there were cases or outbreaks of diseases in the community. The Ministry told us that it was in the process of acquiring a system that would connect the laboratory information system to iPHIS and that this system would be complete by the end of 2009. It also confirmed that if iPHIS is replaced by a newer system, the technology being developed will be transferable to the newer system.
- The Ministry did not provide detailed specifications to public health units to tell them what information should be entered in iPHIS for provincial surveillance purposes. Inconsistencies in data entry could make the Ministry less able to identify occurrences of diseases and rates of infection and to take suitable action. The Ministry planned to develop and release five disease-specific user guides by 2008. It informed us that it had recently issued two of these guides to public health units for feedback. However, public health units indicated that certain parts of these guides were

inadequate and had to be amended by them to meet their needs.

We also noted that there were incomplete or inaccurate data in the information system. Specifically, the system contained many duplicate records dating back to the conversion from the former system. In the Toronto public health unit alone, there were as many as 40,000 duplicate client records. The Ministry maintained that its responsibility extended only to identifying possible duplicates for the public health units to investigate and resolve. We are concerned that if the Ministry converts to a new surveillance system in 2008, inaccurate data could result in inaccurate epidemiological analysis that could compromise decision-making during a crisis.

Our analysis, including a review of a federal study, also showed that there may be significant under-reporting of diseases by physicians. According to this study, released in September 2006, some physicians are not aware of the requirement to report, or do not know which diseases are reportable, and how or to whom to report; some think that they do not receive enough compensation for reporting; and some believe that no useful action is taken on notifications. The Ministry told us that it would consider conducting an awareness program for physicians to increase reporting once the list of reportable diseases is amended and approved.

Surveillance Activities during Large-scale Outbreaks

During a large-scale outbreak of an infectious disease, such as an influenza pandemic, surveillance activities, like other health-care services, may be affected. For instance, the reporting of diseases in iPHIS may need to be modified because of limited resources and system limitations, yet without compromising surveillance of other diseases in the province. iPHIS had not been tested in a pandemic scenario. The Ministry informed us that policies

and procedures for surveillance during a pandemic were being developed and that staff would be trained later in 2007.

RECOMMENDATION 6

To allow efficient and effective disease surveillance at the provincial level so that the extent and seriousness of any outbreaks can be analyzed and the most appropriate action can be taken, the Ministry of Health and Long-Term Care should:

- expedite its setting of standards for the timely reporting of diseases and for the completeness and integrity of disease data that public health units enter in the integrated Public Health Information System; and
- make plans to ensure that any new surveillance system is implemented only after proper quality assurance—such as improving the accuracy and completeness of the disease data in the existing system before conversion—and after sufficient consultation with and training for users.

MINISTRY RESPONSE

The Ministry supports the recommendations and notes:

- Standards have been developed with extensive consultation for timely reporting and data completeness and integrity, which build upon previous guidance to health units. These standards are supported by ministry user guides and data-cleaning initiatives.
- Timeliness of case entry into the integrated Public Health Information System has significantly improved since system implementation.
- Data quality assurance and user training are integrated into the new Panorama surveillance program.

PREVENTION AND REDUCTION OF TRANSMISSION

Provincial Infectious Disease Advisory Committee

The SARS outbreak illustrated the importance of basic infection control in health-care facilities. In response to Dr. Walker's report on SARS, the Ministry formed the Provincial Infectious Disease Advisory Committee (PIDAC) in 2004. PIDAC is a source of expert advice on infectious diseases for Ontario. Membership in the committee includes experts from relevant fields in the health-care sector, including infection control, medical biology, public health, epidemiology, and occupational health and safety. During a disease outbreak, PIDAC representatives may act as advisers to the provincial Chief Medical Officer of Health (CMOH) on communication materials distributed to the health-care system. On an ongoing basis, PIDAC advises the CMOH on prevention, surveillance, and control measures necessary to protect the people of Ontario from infectious diseases.

The Ministry told us that PIDAC, in developing its guidelines and best practices, would review current documents and research on relevant topics. By the first quarter of 2007, in addition to having participated in a number of infection-control initiatives, PIDAC had produced four best-practice manuals in the following areas:

- cleaning, disinfection, and sterilization;
- prevention and control of *Clostridium difficile*;
- prevention of febrile respiratory illness; and
- infection prevention and control of resistant *Staphylococcus aureus* and *Enterococci*.

To fully reap the benefits of this initiative, the full responsibilities of PIDAC should be determined. The Ministry told us that a memorandum of understanding with PIDAC was under development to help clarify its role in a health emergency.

Infection Control in the Health-care Sector

Also in response to Dr. Walker's report on SARS, the Ministry had funded and established 13 Regional Infection Control Networks (RICNs), and one more was expected to be established by the end of 2007. These networks, whose boundaries correspond to those of the Local Health Integration Networks, include infection-control professionals (ICPs) from all fields of health care who enhance infection-control practices by co-ordinating prevention activities and promoting the standardization of infection control in health-care facilities across their region and the province.

Our examination of infection control in the health-care sector found that:

- The Ministry had no data on the amount of infection-prevention and -control resources, including materials and human resources, that were available to each RICN.
- The standard ICP-to-bed ratio in long-term-care facilities is 1:250, which is a 1980 national standard. The Ministry had not conducted any formal survey of the actual ICP-to-bed ratio in long-term-care facilities.
- For acute-care hospitals, the standard ICP-to-bed ratio is 1:115. The Ministry had met this target after funding 112 additional ICPs between 2004 and 2007. However, we noted that while the aggregate ICP-to-bed ratio for this sector met the requirement, approximately 40% of the hospitals still had too few ICPs, even after additional ICPs were funded.
- There were no standards that indicated the number of ICPs needed to support other health-care services, such as public health, community mental health, and home care.
- Until November 2006, there was no ministry requirement for ICPs employed in RICNs to have been certified in infection control within three years of being hired. The Ministry informed us that, at the time of our audit, 30% of ICPs in the acute-care sector had passed the certification examination.

- The Ministry was in the process of designing and conducting education sessions for health-care providers across the broader health-care sector. To date, three “core-competencies” modules relating to infection control had been developed and offered to acute-care professional staff. Similar modules were at various stages of development for staff in non-acute-care and public health sectors.

According to standards established by the Ministry in 1997, public health units were to produce their own infectious-disease policy and procedure manuals. The Ministry acknowledged that because of this arrangement, there was no consistency in contact precautions, preventive use of drugs, and outbreak management of infectious diseases. To that end, the Ministry proposed in the 2007 Public Health Standards to develop infectious-disease protocols that could include instructions on the data elements required, surveillance, and the public health management of infectious diseases of public health importance. Standardization at the provincial level would not just harmonize the application of these procedures and be more efficient than having each public health unit make improvements on its own, but would also encourage implementation and help the province assess compliance. The standardization protocols were expected to be complete by the end of 2007.

Public Health Measures

Public health measures such as closing of schools, closing of day care centres, and cancellation of large social gatherings may be taken during outbreaks if the epidemiology of the disease suggests that such measures will be effective. The Ministry told us that it began working with public health units in April 2007 to determine criteria for implementing those public health measures. The Ministry planned to include these criteria in the next release of the OHPIP by the end of 2007.

RECOMMENDATION 7

To help minimize the public’s exposure during a disease outbreak, the Ministry of Health and Long-Term Care should:

- collect and analyze data on the sufficiency of infection-control resources in all health-care settings;
- establish standards for the infection-control resources required in all health-care settings and follow up to ensure that these standards are being complied with; and
- finalize the protocols for surveillance and management of infectious diseases at the public health units.

MINISTRY RESPONSE

The Ministry supports the recommendations to buttress health-sector infection prevention and control. The Ministry:

- solicited technical advice from PIDAC on infection-control resources in non-acute settings;
- is developing 49 core competencies for infection prevention and control to be in place, with local training, by spring 2008;
- is developing audits to ensure ongoing compliance; and
- has drafted overarching *Ontario Public Health Standards* and expects to complete supporting protocols, including Infectious Disease Prevention and Control, in winter 2007.

COMMUNICATION

Keeping the public and health-care providers informed is paramount in an outbreak of an infectious disease. The Ministry told us that it had either planned or taken a number of measures to facilitate the efficient sharing of information during an emergency. For instance:

- A public-notification project undertaken by the government, similar to the Amber Alert system for missing children, was under way.
- The government had negotiated with major broadcast networks to run ministry-produced television advertisements on 24 hours' notice.
- The capacity of the Ministry's public inquiry line can be increased to 10 times its normal capacity within 24 hours.
- A 24-hour information cycle that outlined when and with whom the Ministry would communicate had been established.
- The Ministry had decided that the Chief Medical Officer of Health was most likely to be the Ministry's spokesperson during an infectious-disease outbreak.

The Ministry acknowledged that it must still test its public communication strategy with the other members of the health system and the media, and formalize an information-sharing agreement between Ontario and other levels of government.

On-call Services

The Ministry provides a number of on-call services, operated from various parts of the Ministry, to public health units and health-care organizations 24 hours a day, seven days a week. The Ministry acknowledged that there were fragmentation, potential for duplication, and inefficiencies in communication since these various on-call services had been developed piecemeal over a number of years and in response to the needs of the moment. In an attempt to move toward a more streamlined and uniform on-call system, the Ministry had engaged a consultant to review the existing on-call services and suggest options for improvement. In January 2007, the external consultant reported a number of problems in the current arrangement, including:

- the use of many different phone numbers, whereas other provinces, such as British Columbia, Alberta, and Manitoba, each had a single call number;

- lack of monitoring of response time;
- lack of clarity among members of the health system regarding the role of the call centre; and
- a shortage of physicians with whom to share on-call responsibility.

In addition to the consultant's observations, our review showed that, for one of the on-call services, the physician on-call service—where physicians employed by the Ministry give public health advice to callers after hours, often in emergencies—the number of ministry staff available fell from eight in 2006 to four in the first quarter of 2007. Also, ministry staff had to rely on materials they had gathered from external sources and information manuals from other jurisdictions because the Ministry had not written any procedure manuals for them to refer to.

In February 2007, the Ministry established a steering committee to provide supervision and advice in the redesign and implementation of a new public health call system. We will review the status of this matter in our follow-up review in two years' time.

Important Health Notices

The Ministry uses Important Health Notices (IHNs) to communicate with the health-care community about emerging events and issues of public health importance. The Ministry's goal is to be able, in the event of a health emergency, to transmit 34,000 IHNs in two hours, through a web-based application, by electronic mail, and by fax. Between December 2003 and March 2007, the Ministry issued 26 IHNs to alert health-care stakeholders. The subject of the IHNs depends on the situation, and they are assembled by subject experts when the need arises.

We noted that the Ministry was unable to obtain physician contact information from the College of Physicians and Surgeons of Ontario, since this information would only be provided in "urgent and

compelling” health emergencies. Instead, it was required to purchase physician contact information from a private-sector vendor. The purchased list contained 800 fewer physicians than the number active in December 2005. Furthermore, over 5,000 physician records in the purchased list did not have a fax or email address, and therefore those doctors could not receive an IHN.

The Ministry told us that improvements to the notice distribution system were under way and were expected to be complete by 2008. Among other improvements, the Ministry will be able to monitor how many people have read the message, and the channels of communication will be expanded to include text messaging, voice mail messages, and pager alerting.

RECOMMENDATION 8

To help ensure timely and coherent information-sharing at various stages of a disease outbreak, the Ministry of Health and Long-Term Care should test its public communication strategy with all members of the health-care system and the media.

MINISTRY RESPONSE

The Ministry supports the recommendation concerning a communications exercise involving the health sector and beyond. Ministry communication protocols were exercised internally in February 2007. Plans exist to similarly engage the health sector by the end of 2007.

PERFORMANCE REPORTING

Dr. Walker recommended that the province should issue an annual performance report for public health in Ontario. This report would discuss human resources, information technology, infections acquired in health facilities, compliance with mandatory programs and services, the health of the

population, and the “central epidemiological capacity of the public health system.”

In accordance with the *Health Promotion and Protection Act*, the province’s Chief Medical Officer of Health (CMOH) issues and tables in the Legislature an independent annual report on the state of public health. The last report tabled was for 2005. As the CMOH’s annual report is of a different nature than the one recommended by Dr. Walker, the Ministry told us that a separate report was needed for performance reporting. However, the Ministry had not collected data on the areas that Dr. Walker suggested in his report and had not established a target date for developing these indicators. We noted that some other jurisdictions set benchmarks and measure their outbreak preparedness and management activities in areas of professional development, communications materials, and research studies.

RECOMMENDATION 9

To help enhance its ability to report publicly on outbreak preparedness and management in a transparent and timely manner, the Ministry of Health and Long-Term Care should:

- collect data and establish reasonable benchmarks for relevant performance measures of outbreak preparedness and management activities; and
- report regularly to the public on these performance indicators.

MINISTRY RESPONSE

The Ministry supports the recommendation concerning performance indicators. Updating *Ontario Public Health Standards*, developing supporting protocols (both discussed in previous responses), and establishing a performance-management framework are the first steps in achieving regular public reporting on outbreak preparedness and response.