

**REVIEW OF CITY OF TORONTO
PANDEMIC PLANNING AND PREPAREDNESS**

November 16, 2007



Auditor General's Office

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EXECUTIVE SUMMARY – A SNAPSHOT OF THE CITY’S PANDEMIC PLANNING AND PREPAREDNESS AS OF JULY 2007

Many governments and other large organizations throughout the world are developing emergency preparedness plans specific to a pandemic influenza. The Public Health Agency of Canada and the Ontario Ministry of Health and Long-Term Care have developed pandemic influenza plans. The City of Toronto likewise is developing its own plans. The City’s pandemic planning and preparedness efforts must be commensurate with the significant health, economic and social impacts that can potentially be caused by an outbreak of avian influenza, commonly known as “the bird flu”.

The purpose of the audit is to provide a snapshot of what the City has accomplished and what work needs to be completed in preparing for a pandemic emergency

Because the City’s pandemic planning is still in progress, the purpose of the audit is to provide a snapshot of what the City has accomplished and what work remains to be completed in preparing for a pandemic emergency.

The audit was based on the City’s pandemic planning and preparedness effort through July 2007 and consisted of three components:

- A comparison of the City’s planning activities with planning criteria and issues recommended by authoritative bodies;
- A review of a sample of the City’s Continuity of Operations Plans and related documents; and
- A review of other cities’ pandemic planning efforts.

The results of our audit and recommendations have been discussed with the City Manager and the City’s Medical Officer of Health.

The City has three vital responsibilities in the event of a pandemic emergency

In the event of a pandemic emergency, the City has three vital responsibilities:

- Public health - Toronto Public Health is responsible for implementing public health measures to protect human health by preventing and controlling the spread of the disease;
- Continuity of operations - the City’s divisions, agencies, boards, and commissions are responsible for maintaining critical City services such as policing, public transportation, ambulance services, garbage collection, and drinking water treatment; and

EXECUTIVE SUMMARY – A SNAPSHOT OF THE CITY’S PANDEMIC PLANNING AND PREPAREDNESS AS OF JULY 2007

- Employee health and support – the City is responsible for the health and safety of its employees and has an obligation to assist them through a pandemic emergency.

Existing structure governing the City’s emergency management program

The framework, accountability, and organizational structure of the City’s emergency management program are governed by provincial and municipal legislative requirements. Under the existing governance structure, the Toronto Emergency Management Program Committee, currently chaired by the Mayor, is mandated to oversee the City’s emergency management program including pandemic planning and preparedness.

In order to ensure that Council is aware of activities relating to emergency management and emerging issues, consideration be given to providing periodic updates through the Executive Committee onto City Council.

To provide corporate leadership and coordination in pandemic planning and preparedness, the City Manager in 2007 established a Pandemic Influenza Steering Committee. Given the oversight responsibility of the Toronto Emergency Management Program Committee, a regular reporting relationship should also be established such that the Pandemic Influenza Steering Committee reports periodically to the Toronto Emergency Management Program Committee.

Certain public health planning activities remain outstanding but some of them are reliant on other levels of government

Since 2001 Toronto Public Health has devoted a considerable amount of resources to pandemic planning. To date many of the planned activities have been completed, but a number of important issues remain outstanding, some of which are dependent upon federal or provincial guidance.

Pandemic public health planning can be further enhanced by setting short-term objectives and timelines

An advantage in the City’s pandemic public health planning is its well defined accountability framework and related roles and responsibilities. Toronto Public Health reports planning progress on a regular basis to the Board of Health. The Communicable Disease Control Unit within Toronto Public Health is responsible for all pandemic related public health planning activities. More importantly, the critical planning issues and required actions are outlined in the Provincial and Federal pandemic planning guidelines. Given the existing planning framework, Toronto Public Health can further enhance pandemic planning and preparedness by setting short-term objectives and timelines for completion.

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Planning for City continuity of operations is more complex

In comparison with public health planning, continuity of operations planning is more complex. Responsibilities for planning are spread among all City divisions, agencies, boards, and commissions with the Office of Emergency Management undertaking a coordinating role. In addition, a specific guideline on how a local government should prepare for continuity of critical functions during a pandemic emergency does not exist.

A corporate lead in pandemic related continuity of operations has been established and funding has been allotted

As of July 2007, the City has completed the initial planning phases in which staff have identified critical City services, and alternate strategies needed to sustain critical services during a pandemic emergency. Furthermore, a Pandemic Influenza Steering Committee has been established to provide corporate coordination and leadership, and City Council has approved a reserve fund allocation of \$5 million for pandemic preparedness.

The City should now progress to the next stage where the preparedness actions are implemented. Going forward the City will be faced with a number of challenges in implementing the preparedness actions. Examples are:

City will be faced with a number of challenges in implementing preparedness actions to sustain critical services during a pandemic emergency

- Certain proposed actions to sustain critical services during a pandemic emergency appear to have been developed without considering all possible options. For instance, options such as asking legislative bodies for special emergency provisions or recruiting retirees or volunteers should be considered in planning for sustaining ambulance services during a pandemic emergency;
- The proposed actions to sustain critical services must be viable should a pandemic occur. For instance, the option to allow staff to work off site may not be viable unless the City invests significant funds to purchase additional equipment and to make arrangements to house and staff the additional equipment;
- Many preparedness actions have financial implications such as stockpiling operational supplies, adding pressure to an already limited City budget; and

EXECUTIVE SUMMARY – A SNAPSHOT OF THE CITY’S PANDEMIC PLANNING AND PREPAREDNESS AS OF JULY 2007

- Not all preparedness actions require immediate implementation; some may be more effective (e.g., certain types of training) or economical (e.g., supplies with short shelf life) if implemented when the risk of the outbreak increases.

The City can benefit from an enhanced coordinated corporate process in planning and implementing preparedness actions

To overcome these and other challenges, going forward to the next preparedness phase, the City needs to establish a coordinated approach and process whereby preparedness strategies are reviewed, prioritized, planned, and monitored at the corporate level. A number of our recommendations relate to the need for an enhanced corporate process.

In addition, to facilitate timely and adequate corporate responses in the event of a pandemic emergency, the City needs to develop a corporate pandemic plan integrating critical elements in the individual divisional Continuity of Operations plans.

Pandemic planning assumptions for employee support need to be reviewed

The City is responsible for the health and safety of its employees and has the obligation to assist them through a pandemic emergency. As of July 2007, management has drafted a pandemic specific human resource response plan and has begun discussions with employee unions. To ensure pandemic related employee support issues are adequately considered and addressed, a review of the City’s current planning assumptions and preparedness effort is recommended.

When all three areas of planning and preparedness are considered, the City has undertaken a significant amount of planning, but some of the key actions such as stockpiling personal protective equipment and essential operational supplies have not been implemented as of July 2007.

We appreciate that the substantial degree of uncertainty surrounding a possible pandemic influenza makes planning for a pandemic emergency a complex and difficult task. As the City’s planning and preparedness are still ongoing and evolving, we believe by pointing out certain challenges and gaps in the process we can help improve its effectiveness and efficiency. With adequate planning and preparedness, the City will be in a better position to minimize illnesses and possible deaths, as well as mitigate the social and economic disruptions that can be expected during such an emergency.

1.0 BACKGROUND

What is a Pandemic Influenza?

Seasonal influenza, or “flu”, is a respiratory illness that is caused by the influenza virus. The virus constantly undergoes minor changes from year to year necessitating a new blend of influenza vaccine every year. Most people recover from an influenza infection within one or two weeks, largely because of immunity from previous infections by similar strains of the virus.

A specific type of influenza virus, however, from time to time will undergo a radical change in its structure. The result can be a completely new strain of influenza virus to which people have no immunity. The illness can therefore be much more severe than the seasonal flu, and if the virus also has the ability to spread quickly and effectively between people, the disease can lead to a worldwide emergency. This is called a pandemic.

History of Pandemic Influenza

In the past century, the world has experienced three pandemics each caused by a different strain of influenza virus:

- 1918 - 1919 : the ‘Spanish’ flu
- 1957 - 1958 : the ‘Asian’ flu, and
- 1968 - 1969 : the ‘Hong Kong’ flu

The most severe was the 1918 pandemic when 40-50 million deaths were reported worldwide. The world population at the time was 1.75 billion; today it has grown to over 6 billion. In the United States alone, it is estimated that 25 per cent of the population was infected and over 650,000 people died during the 1918 pandemic.

Currently public health experts are concerned about a particular strain of avian influenza virus, type A/H5N1, also known as the “bird flu”, which has caused the death so far of hundreds of millions of wild and domestic fowl on three continents. As of September 10, 2007, 328 people in twelve countries are known to have contracted the H5N1 virus, and 200 have died. While the human death toll from H5N1 so far is comparatively small, public health experts warn that if the virus mutates and becomes transmissible from human to human, it has the potential for causing an unprecedented worldwide public health emergency.

Why plan and prepare for a pandemic influenza?

In light of the significant health, economic and social impacts that can potentially be caused by an outbreak of avian influenza, governments and large institutions throughout the world are developing emergency preparedness plans specific to a pandemic

1.0 BACKGROUND

influenza. Both the Public Health Agency of Canada and the Ontario Ministry of Health and Long-Term Care have developed and updated their pandemic influenza plans. Many cities in the world have developed detailed pandemic preparedness plans. The City of Toronto, as the sixth largest municipal government in North America, must plan and prepare for a pandemic, building on the lessons learned from SARS and other communicable disease outbreaks.

Why we conducted this review

While staff of the Auditor General's Office do not possess expertise in public health or emergency management, we can contribute by undertaking an independent and objective assessment of the planning and preparedness process.

The Toronto Auditor General's Office included an audit of the City's pandemic planning and preparedness in the 2007 work plan and the Terms of Reference was presented to the Audit Committee in April 2007.

Purpose of the audit

Because the City's pandemic planning is still in progress, the purpose of the audit was to provide a snapshot of what the City has accomplished and what work remains to be completed in preparing for a pandemic emergency. The focus of the audit was on identifying challenges and gaps in the planning and preparedness process, and recommending steps to improve the process. By providing comments and recommendations at an early stage we can help the City better prepare for a pandemic emergency.

"To the extent possible, how prepared is the City for a potentially severe pandemic?"

The overall question the audit attempts to answer is:

"To the extent possible, how prepared is the City for a potentially severe pandemic?"

We are cognizant that this should only be answered within the context of what the City can realistically achieve as a municipal government in pandemic planning, in particular considering the City's current fiscal constraints and the need for provincial and federal guidance and coordination. We also recognize the substantial degree of uncertainty surrounding a possible pandemic influenza, in terms of timing, size of population affected, and severity of illness.

1.0 BACKGROUND

How we conducted this review

Specific audit objectives were to determine:

- (1) adequacy of the corporate governance and coordination of pandemic planning and related initiatives;
- (2) compliance with legislative standards for emergency planning and management; and
- (3) completeness and comprehensiveness of the City's pandemic influenza plan, continuity of operations plans, and related policies and procedures.

Our audit covers planning activities through to July 2007 and includes three main components:

- (1) A comparison with recommended planning criteria and activities

We compared the City's planning activities to planning criteria and activities recommended by authoritative bodies. Among a number of pandemic preparedness guidelines issued by major government agencies in the U.S. and Canada, we selected the following two guidelines because of their comprehensiveness and relevance to the City:

- For public health planning : *"The Canadian Pandemic Influenza Plan for the Health Sector"* from the Public Health Agency of Canada; and
- For continuity of critical functions and workforce : *"Pandemic Influenza, Preparedness, Response, and Recovery - Guide for Critical Infrastructure and Key Resources"* from the U.S. Department of Homeland Security.

As these are generic tools designed to be adapted by a wide range of sectors, some of the criteria and recommended activities may not be relevant to the City. We therefore asked City staff responsible for pandemic planning to review and help identify the criteria that are relevant and important to the City.

Based on staff input and our own assessment, a modified list of planning issues and criteria tailored for the City was developed for each of the following areas of responsibility:

1.0 BACKGROUND

- public health planning;
- continuity of operations; and
- employee health and support.

These criteria are presented in Exhibit A, B and C attached to this report respectively along with “activities undertaken” and “work to be completed”.

***How we
conducted this
review
(continued)***

- (2) A review of City Continuity of Operations Plans and related documents

To identify issues in the planning and implementation process, we also reviewed a sample of the City’s Continuity of Operations Plans submitted by its divisions, agencies, boards, and commissions.

- (3) A review of other cities’ planning reports and status

We reviewed a number of pandemic planning documents prepared by other cities and interviewed staff responsible for planning. The purpose of the benchmarking exercise was to add a “realistic” perspective to our audit answering the first part of the audit question “*To what extent can a city prepare itself for a pandemic emergency?*”

For public health planning, the benchmarked cities and their respective documents reviewed include:

- Regional Pandemic Influenza Response Plan by Vancouver Coastal Health, Version 0.2, October 2006; and
- Pandemic Influenza Preparedness and Response Plan by the New York City Department of Health and Mental Hygiene, July 2006.

For city wide coordinating planning, the benchmarked cities and their respective documents reviewed include:

- Ottawa’s Interagency Influenza Pandemic Plan sponsored by Ottawa Public Health, October 2005;
- London (U.K.) Regional Resilience Flu Pandemic Response Plan - Special arrangements for dealing with pandemic influenza in London, overseen by the London Regional Resilience Forum, January 2007; and

1.0 BACKGROUND

- GLA (Greater London Authority) Group Pandemic Flu Response Plan by Greater London Authority, July 2006.

We conducted this audit in accordance with generally accepted government auditing standards

We conducted this audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

How pandemic planning is related to WHO alert phases

The World Health Organization (WHO) uses a series of six phases of pandemic alert (Table 1) as a system to inform the global community of the seriousness of the threat and of the need to launch progressively more intense preparedness activities. As of August 2007, the WHO alert phase was at Phase Three in the Pandemic Alert Period, indicating occurrences of human infections but no human-to-human spread, or at most rare instances of spread through close contacts.

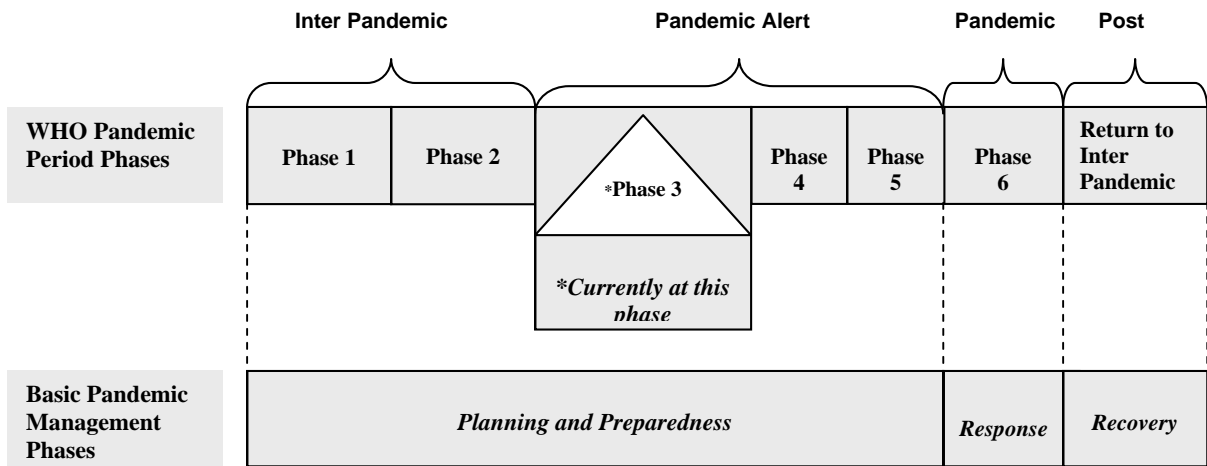
Period	Phase	Brief Description
Interpandemic Period	Phase 1	No new influenza virus subtypes have been detected in humans
	Phase 2	No new influenza virus subtypes have been detected in humans but a circulating animal influenza virus subtype poses a substantial risk of human disease
Pandemic Alert Period	Phase 3	Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.
	Phase 4	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.
	Phase 5	Large cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).
Pandemic Period	Phase 6	Increased and sustained transmission in general population.
Post Pandemic Period		Return to interpandemic period

Source: World Health Organization, 2005

1.0 BACKGROUND

The time to plan and prepare is before the pandemic occurs. Figure 1 below shows how the four basic pandemic management phases: planning, preparedness, response, and recovery should correspond to the WHO alert system. This review focuses on the first two pandemic management phases - planning and preparedness.

Figure 1 : World Health Organization (WHO) Pandemic Periods and Phases Corresponding with Basic Pandemic Management Phases



1.0 BACKGROUND

Health Impact Assumptions

While it is impossible to predict the exact impact on human health before a pandemic occurs, the development of any pandemic plan must be based on certain health assumptions for the plan to be useful. These health assumptions are provided by a number of leading public health agencies such as the WHO and the U.S. Centers for Disease Control and Prevention (CDC).

One of the major health assumptions is the unusually high infection and mortality rates associated with the avian influenza. Other health assumptions that will have direct impacts on business operations include:

- About 30 per cent of the overall population will develop the illness, and about 20 per cent of working adults will become ill;
- At the height of a severe pandemic, total absenteeism from work resulting from illness, the need to care for ill family members, and fear of infection, may reach 40 per cent; and
- Unlike other types of emergencies, the pandemic is likely to last for several months with multiple waves of epidemics of illness, each lasting 6 to 8 weeks in affected communities.

Planning must also factor in the potential side effects and impacts from specific pandemic containment strategies, including isolation, quarantine, social distancing, closing places of assembly, restrictions in transportation and movement at the border, and voluntary closure of all non-essential businesses. Any of these measures would disrupt daily life and business and have significant economic side effects and social consequences.

Detailed audit findings and recommendations are provided in the remainder of the report in the following order:

- Accountability and Legal Framework;
- Public Health Planning;
- Continuity of Operations Planning and Preparedness;
- Employee Health and Support; and
- Recommendations Relating to All Pandemic Planning and Preparedness Activities.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.1 Accountability and Legal Framework

2.1 Accountability and Legal Framework

Legislative Requirements

A potential global outbreak of pandemic influenza is one of many risks monitored by the City's emergency management program. The framework, accountability, and organizational structure of the City's emergency management program are governed by provincial and municipal legislative requirements including:

- The Ontario Emergency Management and Civil Protection Act (R.S.O. 1990);
- Ontario Regulation 380/40 made under the Act; and
- Toronto Municipal Code Chapter 59 "Emergency Planning".

The Ontario Emergency Management and Civil Protection Act requires every municipality to develop and implement an emergency management program consisting of:

- (a) an emergency plan;
- (b) training programs and exercises for employees and other persons;
- (c) public education on risks to public safety and on public preparedness for emergencies; and
- (d) any other element required by the standards.

In May 2004, City Council adopted the Toronto Emergency Management Program including the City of Toronto Emergency Plan. The City's Emergency Management Program is reviewed annually by Emergency Management Ontario, the Ministry of Community Safety and Correctional Services, and was certified to be in compliance with the Essential Level Emergency Management Program.

Because of the importance of emergency management in the City, the Toronto Mayor chairs the Toronto Emergency Management Program Committee

In compliance with Ontario Regulation 380/40 made under the Act, the City has established a Toronto Emergency Management Program Committee (TEMPC). Because of the importance of emergency management in the City, the Toronto Mayor assumed the Chair of TEMPC in 2004. The Committee is composed of senior City officials and staff involved in emergency management. In 2004 it was extended to include external private and public sector representatives such as the Insurance Bureau of Canada and the Ontario Health Association as support members to TEMPC. A number of initiatives have been undertaken by TEMPC since 2004 including establishment of operational

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.1 Accountability and Legal Framework

linkages with federal and provincial agencies, as well as proposing amendments to the Ontario Emergency Management and Civil Protection Act to address the unique and complex emergency management issues faced by the City.

The City's Municipal Code further assigns responsibility for developing the Toronto emergency plan and emergency management program, as well as responsibility for coordinating implementation of the emergency plan, to TEMPC. The Committee therefore has the oversight role in all emergency management activities, including planning and preparedness for a pandemic influenza.

Given the legislative requirements, our review noted that the linkage between the Committee's oversight responsibility and pandemic planning and preparedness can be strengthened. To provide corporate leadership and coordination in pandemic planning and preparedness, the City Manager in 2007 established a Pandemic Influenza Steering Committee. This Steering Committee is composed of internal management staff and representatives of employee unions and association.

A Terms of Reference defining the specific roles and authority of the Steering Committee has not been developed as of July 2007. In light of the significance of this Committee, its lines of authority and roles should be formally defined and recognized.

Figure 2 illustrates the current corporate structure governing pandemic public health planning and continuity of operations planning. The oversight structure for pandemic public health planning has been clearly established in which Toronto Public Health provides monthly verbal updates and quarterly written reports to the Board of Health. In comparison, the City's effort on continuity of operations planning is relatively new and as a result its oversight structure is not as clearly defined.

Reporting Relationship should be strengthened

While pandemic planning has regularly appeared on the TEMPC meeting agenda, to date no formal relationship has been established for the Pandemic Influenza Steering Committee to report to TEMPC. A regular reporting relationship should be established given the legislative responsibilities of TEMPC in emergency management.

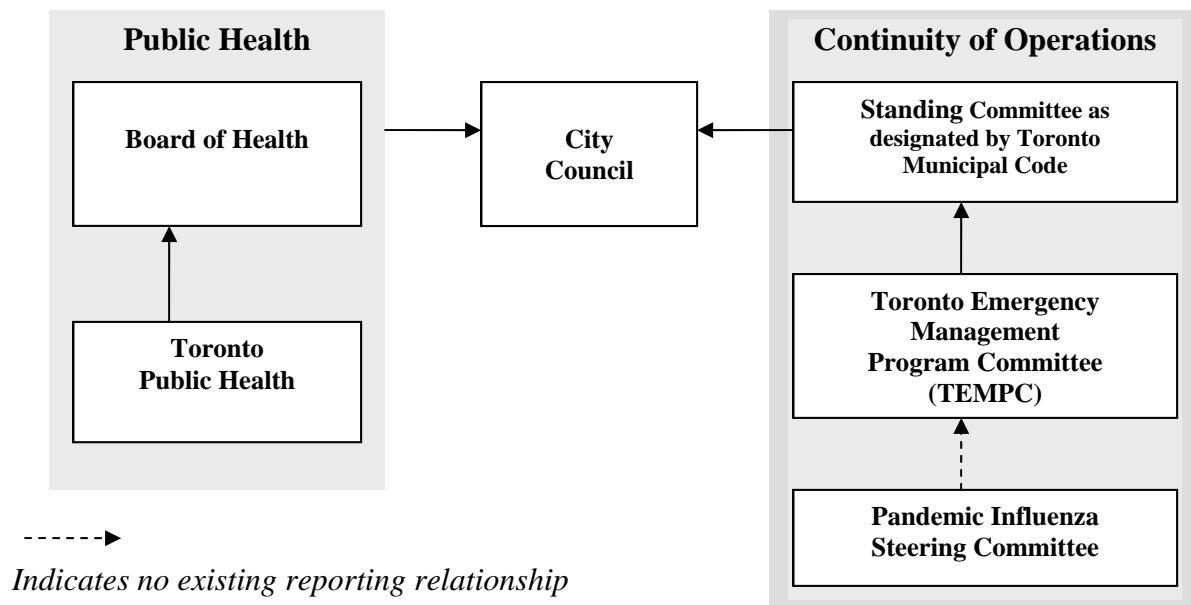
2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.1 Accountability and Legal Framework

Recommendation:

1. The City Manager define in writing the lines of authority and roles of the Pandemic Influenza Steering Committee, and establish a regular reporting relationship for the Steering Committee to report to the Toronto Emergency Management Program Committee on pandemic planning and preparedness.

Figure 2 : City of Toronto Existing Accountability Structure for Pandemic Influenza Planning & Preparedness



Formalizing the Executive Committee's roles in emergency management

The Toronto Municipal Code also sets forth reporting relationships in emergency management requiring that TEMPC report to the former Community Services Committee or its successor. The former Community Services Committee in turn reported to City Council on all matters relating to the planning and coordination of responses to emergencies.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.1 Accountability and Legal Framework

In late 2006, the City restructured its Standing Committees and eliminated the former Community Services Committee. Under the new governance structure the Executive Committee replaced the former Community Services Committee in emergency management. An amendment to the Toronto Municipal Code has not been made as of July 2007 to reflect this change.

Recommendation:

2. **The City Manager amend the Toronto Municipal Code Chapter 59 “Emergency Planning” to reflect the replacement of the former Community Services Committee with the Executive Committee.**

Reporting Emergency Planning Progress to City Council

Ontario Regulation 380/04 outlines responsibilities of the emergency management program committee as:

- (a) advising the council on the development and implementation of the municipality’s emergency management program; and
- (b) conducting an annual review of the municipality’s emergency management program and shall make recommendations to the council for its revision if necessary.

According to the Regulation, TEMPC is responsible for reporting to City Council on the progress of emergency management activities and emerging issues. While there have been a number of staff reports to various Committees on emergency planning and response issues, TEMPC has not submitted reports to City Council through the former Community Services Committee or the current Executive Committee since 2004. In light of the City’s recent pandemic planning for continuity of operations, TEMPC should consider providing City Council with updates on pandemic and other emergency management planning efforts.

Recommendation:

3. **The Toronto Emergency Management Program Committee consider providing periodic reports on the progress of emergency management activities and/or emerging issues to City Council.**

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.1 Accountability and Legal Framework

The City's Emergency Plan was initially approved by City Council in May 2004 and subsequently revised in 2005. The Plan lists 15 Operational Support Functions, including areas such as Notifications, Emergency Operations Centre Operations, Donation and Volunteer Management, Mass Care, and Psychosocial Response and Recovery.

*Emergency Plan
Operational
Support Functions
need to be
completed with
written
authorization*

As of July 2007, most operational support functions have been developed but four were still under development. Since they are considered internal documents and not included in the body of the Emergency Plan, they were not presented to City Council for approval in 2004. Nor are they subject to annual review by Emergency Management Ontario.

The completion of all operational support functions would aid planning for specific emergencies including a pandemic influenza. While the purpose of operational support functions are to provide general operational concepts and agency responsibilities, these generic documents could be used as a basis for developing emergency procedures geared for specific disaster threats.

In addition, most operational support functions do not include evidence of agreement by City divisions and external agencies involved. As each support function could involve multiple City divisions and external organizations as supporting agencies, a critical step in developing the support functions is to seek cooperation and agreement from all contributing parties. When a consensus is reached, a formal sign-off from all parties should be carried out and included in the final document. Any subsequent reviews or revisions to procedures or responsibilities should be dated and certified by the person performing the review or revision.

According to the Emergency Plan, the Office of Emergency Management is responsible for coordinating the overall planning and review of the Plan and related support functions. The primary support function divisions or units are responsible for taking the lead in preparing and maintaining their specific operational support functions.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.1 Accountability and Legal Framework

Recommendation:

- 4. The City Manager ensure that the operational support functions listed in the City of Toronto Emergency Plan are finalized and authorized by responsible agencies before December 2008.**

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.2 Public Health Planning

2.2 Public Health Planning

Roles and Responsibilities

Toronto Public Health is the lead for pandemic planning activities related to public health measures.

Currently seven full-time equivalent staff within the Communicable Disease Control Unit are assigned to pandemic planning. In response to the Board of Health's request, Toronto Public Health has been reporting pandemic planning progress on a regular basis to the Board since 2006.

Health Canada pandemic planning criteria

The Canadian Pandemic Influenza Plan for the Health Sector issued by the Public Health Agency of Canada includes the following seven critical planning components:

- (a) Surveillance;
- (b) Antivirals;
- (c) Vaccine programs;
- (d) Health services emergency planning and response;
- (e) Public health measures for pandemic influenza (including Incident Management System);
- (f) Communications/education; and
- (g) Plan for post-pandemic evaluation.

Specific planning activities are provided within each component. We reviewed these planning activities with Toronto Public Health staff to identify those within the City's public health mandate.

While we primarily used checklists from the Public Health Agency of Canada, the components and recommended activities in the checklists are similar to those in the Ontario Health Plan for an Influenza Pandemic, issued July 2007, by the Ontario Ministry of Health and Long-Term Care.

Key achievements

Exhibit A presents a summary of the public health planning criteria and issues, work undertaken, and work to be completed or issues to be addressed.

Toronto Public Health began its pandemic planning in December 2002. Planning activities were temporarily interrupted in 2003 during the SARS outbreak. In late 2002 Toronto Public Health established a steering committee consisting of internal and external stakeholders to develop a pandemic influenza plan. The first version of the Toronto Pandemic Influenza Plan and the associated staff report were adopted by the Board of Health in November 2005 and by City Council in April 2006.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.2 Public Health Planning

An advantage in the City's pandemic public health planning is its well defined accountability framework and related roles and responsibilities. Toronto Public Health reports planning progress on a regular basis to the Board of Health. The Communicable Disease Control Unit within Toronto Public Health is responsible for all pandemic related public health planning activities. More importantly, the critical planning issues and required actions are outlined in the Provincial and Federal pandemic planning guidelines.

To date a considerable amount of work has been completed. These include:

- Establishment of a public health pandemic influenza steering committee;
- Identification of sites for mass vaccine clinics;
- Development of vaccine storage capacities; and
- Development of an operational plan for community flu centres.

Work remains to be completed

Despite a significant amount of planning effort, Toronto Public Health is still faced with a number of outstanding issues, some of which are dependent upon federal or provincial guidance. The following section highlights the key issues that need to be addressed:

(1) Community Flu Assessment and Treatment Centres

Ontario government has stockpiled antiviral drugs to treat up to 25 per cent of the population

According to public health experts, when a pandemic occurs, it will take four to five months to develop a vaccine. During this early period of a pandemic, antiviral drugs (i.e., medical treatment for influenza) are an important public health measure to treat and prevent the disease. In its latest Health Plan for an Influenza Pandemic (July 2007), the Ontario government indicates that it has stockpiled antiviral drugs to treat up to 25 per cent of the population.

In December 2006, Toronto Public Health received a correspondence from the Ministry of Health and Long-Term Care recommending that Toronto Public Health take the lead in planning for the implementation of influenza assessment, treatment, and referral centres (also called community flu centres) in the City.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.2 Public Health Planning

Toronto Public Health has developed an operational plan for community flu centres addressing issues such as criteria for opening the centres, client flow patterns, and management structures for the centres. Other details such as identifying potential site locations, determining and purchasing equipment and supplies for the centres, and developing a staffing model, are being developed.

Toronto Public Health is awaiting federal and provincial guidance on issues associated with operating community flu centres and stockpiling antiviral medication

Toronto Public Health is awaiting federal and provincial guidance on a number of issues associated with operating the community flu centres. These include liability and life insurance for people temporarily assigned to work at the community flu centres, scope of authorized practice, budget, and mechanisms for distributing the antiviral medications for early treatment.

Since the use of antiviral drugs as prophylaxis (preventing healthy people from contracting the disease) is being reviewed at the national level, a provincial policy on this matter has not been issued. As a result, Toronto Public Health has not stockpiled any antiviral medication for use as prophylaxis. The need for clear provincial guideline on this matter has been voiced by the City through a letter from the City Mayor to the Premier of Ontario in July 2006, and a letter from the Chair of Toronto Board of Health to the Minister of Health and Long-Term Care in April 2007.

(2) Mass Vaccine Clinics

Provincial guidance is needed to address issues associated with using non-licensed volunteers to administer influenza vaccine

When a pandemic influenza vaccine is developed, the province is responsible for providing a supply of vaccine to each municipal public health unit, which in turn is responsible for organizing mass vaccination clinics for the public.

In view of the size of Toronto's population, multiple clinics would be required across the City. Toronto Public Health is currently determining staffing resources for these clinics, including eliciting help from volunteers and retired health workers to work at the vaccination clinics.

Provincial guidance is needed to address issues associated with using non-licensed volunteers to administer the influenza vaccine, including legal authority, scope of authorized practice, insurance coverage, and potential liability. These issues should be dealt with in advance so that volunteers and retirees can be quickly accessible when needed.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.2 Public Health Planning

In addition, Toronto Public Health needs to develop plans to ensure the safety and security of vaccine and related supplies during storage and transportation. Coordination of vaccine distribution with bordering jurisdictions could be a potential issue for the City if the supply of vaccine is limited.

(3) Coordination of Health Services Emergency Planning

The coordinating role for local health services presents challenges and issues to Toronto Public Health

In normal circumstances, hospitals and long-term care facilities are not within the jurisdiction of Toronto Public Health. To prepare for a pandemic influenza, the Ministry of Health and Long-Term Care has assigned public health units the responsibility for coordinating local health services. These responsibilities include assessing the capacity of local health services and helping them identify additional or alternative resources.

In May 2007, Toronto Public Health conducted a survey of the state of pandemic preparedness among health service providers such as hospitals and long-term care facilities. The survey showed that these facilities are facing challenges such as lack of policy guidelines, coordination, and dedicated human resources. Following the survey, Toronto Public Health hosted a meeting with health service representatives to explore coordination opportunities.

The recently appointed coordinating role for local health services presents a new set of challenges and issues to Toronto Public Health. Many of the issues would need to be addressed jointly by Toronto Public Health, the Ministry of Health and Long-Term Care, and local health sector representatives. Examples of the issues are:

- stockpiling extra health care supplies;
- developing mechanisms for coordinating patient transport; and
- assessing health care facility capacity and health care personnel capacity.

Benchmarking results

For public health planning, we have reviewed planning reports and activities conducted by the New York City Department of Health and Mental Hygiene and Vancouver Coastal Health. We also spoke to the chair and coordinator of the Vancouver Coastal Health Pandemic Planning Steering Committee.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.2 Public Health Planning

New York City Pandemic Response Plan contains many strengths

New York City Department of Health and Mental Hygiene

Because of significant differences in organizational size and structure, a direct comparison between Toronto Public Health and the New York City Department of Health and Mental Hygiene on their pandemic planning efforts would not be meaningful. Instead we highlight some of the strengths in the New York City's pandemic plan for information.

The New York City Department of Health and Mental Hygiene has developed a comprehensive Pandemic Influenza Preparedness and Response Plan. It focuses on three key requirements: early detection, prevention, and health care delivery. The strengths of the New York plan include:

- A robust surveillance system capable of alerting the Department at the earliest spread of a disease;
- An electronic messaging system accessible to all New York licensed health professionals registered with the City, and any company with an employee health program;
- All hospitals have conducted pandemic “tabletop” exercises;
- Communications systems with nearly 70 acute care hospitals; and
- Hospital staff have received mental health preparedness and risk communication training.

Vancouver Coastal Health

Being another Canadian City and governed by the same set of federal pandemic planning guidelines, Vancouver Coastal Health represents a more comparable choice for benchmarking than New York City. However, Vancouver Coastal Health has a major advantage over Toronto Public Health in that they are a regional government agency with direct authority over laboratories, hospitals, and long-term care facilities within the region. It is important to note that despite being assigned the temporary coordinating role, Toronto Public Health has no jurisdiction over the City's health care sectors.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.2 Public Health Planning

Vancouver Coastal Health has completed many of the critical public health planning and preparedness activities, some of which are currently being developed in Toronto

Based on our review of Vancouver's Regional Pandemic Influenza Response Plan and information provided by its staff, Vancouver Coastal Health has completed many of the critical public health planning and preparedness activities. Some of these are currently being developed in Toronto. For example:

- In surveillance, Vancouver already has in place physician, hospital emergency room, and border surveillance, to name a few. They have also compiled a complete and updated list of physician email addresses and fax numbers for broadcasting alerts.
- In preparing for mass vaccination clinics, Vancouver Coastal Health has contracted private security to ensure the safety and security of vaccine and supplies during storage and transportation. They have also developed a list of potential personnel who can be deployed to work at clinics when needed.
- In health service emergency planning and response, Vancouver Coastal Health has up-to-date information concerning health care personnel, health care facilities and their capacity. Staff are confident that the existing provincial acute care bed management system will work well during a pandemic.
- In operational preparedness, Vancouver Coastal Health has assigned response functions to specific staff members, and has provided training to management personnel to perform these functions.
- In aftercare and recovery, Vancouver Coastal Health has developed aftercare and recovery plans and guidelines.
- In post-pandemic evaluation, they have developed procedures and forms to collect information for a post-pandemic evaluation.

Exhibit D provides a comparative summary between Toronto Public Health and Vancouver Coastal Health in pandemic planning.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.2 Public Health Planning

Toronto Public Health should strive for completing the critical planning and preparedness activities in a timely manner

How Toronto compares with Vancouver in pandemic public health planning

Based on a review of the Vancouver Regional Pandemic Influenza Response Plan and information provided by related staff, it would appear that Vancouver Coastal Region has successfully implemented many planning and preparedness actions related to a potential pandemic. We recognize that certain planning actions and issues are more challenging to Toronto Public Health operating with limited authority over the health service sector. Nonetheless, Vancouver Coastal Health has indicated that most of the critical public health planning criteria are achievable. Toronto Public Health should strive to complete the critical planning and preparedness activities in a timely manner. Development of short-term objectives and completion timelines will help Toronto Public Health monitor progress.

Recommendation

- 5. Toronto Public Health develop timelines for completion of specific pandemic planning and preparedness activities, monitor the completion of these activities, and report progress to the Board of Health.**

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

2.3 Continuity of Operations Planning and Preparedness

Roles and Responsibilities

The City is responsible for providing a wide range of services, many of which are critical services such as policing, public transportation, ambulance services, garbage collection, and drinking water treatment. Continuity of operations planning and preparedness for a pandemic emergency involves all City divisions, agencies, boards, and commissions.

The City's planning for continuity of operations was formally launched in February 2006 and was coordinated by the Office of Emergency Management, Technical Services. Currently two full-time equivalent staff members in the Office of Emergency Management are assigned to pandemic planning, and a significant amount of the Manager's time is devoted to pandemic planning.

Critical issues and actions

The "Pandemic Influenza, Preparedness, Response, and Recovery - Guide for Critical Infrastructure and Key Resources", issued by the US Department of Homeland Security, provides a checklist of issues and actions for each of the four emergency management phases: Planning, Preparedness, Response, and Recovery. This audit focuses on the first two, Planning and Preparedness phases.

Although the Homeland Security Guide is intended for business sectors, most business continuity criteria would apply to the City, which will be required to continue to provide a minimum level of critical municipal services during any emergency. Nonetheless, we asked City staff responsible for emergency management and policy development to review criteria in the Planning and Preparedness checklists for relevance to the City. Minor modifications were made based on staff input.

The issues contained in the Planning and Preparedness Checklists relate to:

- governance;
- consultation;
- defining and prioritizing critical services and potential impacts from service disruptions;
- prioritizing and implementing actions to sustain critical functions;
- sustaining critical workers;
- maintaining critical supply chains;

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

- sharing information and collaboration with other levels of government and agencies;
- maintaining communication;
- cost tracking;
- developing and testing trigger points; and
- on-going planning and adjustment to actions.

Exhibit B consists of two separate lists: one for planning and another for preparedness. Each list contains three columns outlining planning/preparedness criteria and issues, work undertaken, and work to be completed.

Difference between planning and preparedness

Among the issues contained in the two Planning and Preparedness checklists, many of them may appear to be similar. The terms “planning” and “preparedness” are often used synonymously and in some cases they represent a continuum of activities. However, they differ from each other in that the planning phase sets out a “road map” of actions while the preparedness phase is when the preparatory actions take place. For example, a need for cross training staff is identified in the planning phase; this should be followed by actual training to staff in the preparedness phase. Only when the actual preparedness action has been implemented can the City claim to be approaching “prepared”.

Key Achievements

The following sections outline some of the key achievements by the City in its continuity of operations planning for a pandemic emergency:

(1) Development of a Continuity of Operations Plan by each City Division, Agency, Board, and Commission

In April 2006, City Council adopted the report “Pandemic Influenza Plan for the City of Toronto” and related recommendations from the Medical Officer of Health. The report recommended that the City Manager ensure all City divisions, agencies, boards, and commissions have a service continuity plan for pandemic influenza by July 2006.

To date, all City divisions, agencies, boards and commissions, have developed their continuity of operations plans

The City’s Office of Emergency Management was responsible for developing and coordinating the continuity of operations planning process. Phase 1 and Phase 2 of the process were introduced respectively in February and April 2006. The process directed each City division, agency, board, and commission to identify key functions, assess impacts of disruption due to various levels of staff absenteeism, and identify alternative

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

operating strategies to cope with the impacts. To date, all City divisions, agencies, boards, and commissions have developed their respective continuity of operations plans.

(2) Establishment of a Pandemic Lead and a Reserve Fund Allocation for Pandemic Preparedness

A Pandemic Influenza Steering Committee was established to provide corporate leadership and a \$5 million reserve fund was approved for pandemic preparedness

To provide corporate coordination and leadership in pandemic planning, the City Manager established a Pandemic Influenza Steering Committee in 2007. The Committee is chaired by the City Manager and includes senior staff and employee union and association representatives. A Pandemic Influenza Core Planning Group was created to oversee pandemic related corporate issues and to provide support to the Steering Committee. Members of the Core Planning Group also formed sub-committees to work on specific pandemic related issues such as volunteer management, stockpiling and human resources policies. Furthermore, in mid-2007 City Council approved \$5 million within the Emergency Planning Reserve Fund for pandemic preparedness.

(3) Corporate Pandemic Exercise

City Mayor and staff participated in a pandemic exercise in 2006

On October 12, 2006, the Office of Emergency Management and Toronto Public Health led a one-day, “table-top”, simulation exercise of the City’s response to a pandemic influenza emergency. Members of the Toronto Emergency Management Program Committee and representatives of City divisions, agencies, boards and commissions participated in the exercise. It highlighted areas that were well planned and at the same time identified gaps in the planning process requiring further work. Participants’ comments were collected during and after the exercise and analysed to formulate “lessons learned”. The three key areas requiring further work, as identified by the participants, were:

- human resource and labour relations policies for a pandemic emergency;
- pre-emptive materials management stockpiling; and
- appropriate personal protective equipment policy.

Various actions have been undertaken to address issues raised by the participants. Another exercise is being planned for the end of 2007.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

As of July 2007, City has completed the planning phase

As of July 2007, the City has completed the initial phases of continuity of operations planning, and has begun working on the preparedness phase where the proposed preparedness actions and resource requirements, such as cross-training staff and stockpiling essential supplies, are implemented.

City will be faced with a number of challenges in implementing preparedness actions

Going forward to the next preparedness phase, the City will be faced with a number of challenges in implementing preparedness actions. These challenges include:

(a) Ensuring the Proposed Actions to Sustain Critical City Functions Represent the Best Options

Certain proposed actions to sustain critical services appear to have been developed without considering all available options

In reviewing a sample of divisional continuity plans, we noted that certain proposed actions to sustain critical functions appear to have been developed without considering all available options. Citing restrictions by union agreement and legislation as barriers to exploring other options, management of Emergency Medical Services indicated no possible alternate option to cope with high absenteeism rate among paramedics during a severe pandemic emergency. The resulting impact, according to management, could be significant delays in response time and adverse health impacts up to and including deaths.

While we are not familiar with the specific lines of service provided by divisions, we would expect that a thorough exploration of alternate options would include asking legislative bodies for special emergency provisions or recruiting retirees or volunteers. Some of these options are currently being explored by Toronto Public Health in organizing an emergency staffing model for mass vaccine clinics. Furthermore, a number of current planning efforts at the corporate level may provide additional options to pandemic staffing strategies. These include development of an inventory of skill sets by job classification, development of a volunteer management program, as well as on-going discussions with employee unions. The latest Ontario Health Plan for an Influenza Pandemic (July 2007) also suggested a number of preparedness actions to sustain land ambulance services at local level. These actions should be considered by Toronto Emergency Medical Services, and staff informed that they are now considering these additional options.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

In planning for a pandemic, staff must explore all possible options

In the event of a severe pandemic influenza, no amount of planning or preparation could avoid high rates of illness and death. Nonetheless, in planning for a pandemic, staff should explore all possible options. A detailed review of the proposed staffing strategies for critical City services should be undertaken to ensure that they represent the best options.

(b) Ensuring the Proposed Options are Viable

Certain alternate strategies may not be viable during a severe pandemic

Prior to and during a pandemic emergency, some City employees may not be willing or able to commute to work for various reasons. Given today's remote technology access, management has proposed that arrangements can be made to allow employees to work off site during a pandemic emergency. However, an internal assessment by the City's Information Technology Division indicated that even with a 5 per cent increase in remote access usage, the City would need to invest significant funds to purchase additional equipment, and to make arrangements to staff and house the additional equipment. To date no decision has been made about the purchase of additional equipment to increase remote access capacity, nor has any budget been established for this purpose. In its current state, the proposed remote access work strategy will therefore not be viable in a pandemic emergency.

Recommendation:

- 6. The City Manager undertake a detailed review of the proposed actions to sustain critical City functions in a pandemic emergency to ensure that the proposed actions represent the most effective and appropriate options. Such a review should include, but not be limited to, an examination of the viability, effectiveness, and resource requirements of the proposed preparedness actions.**

(c) Aligning Preparedness Actions with Pandemic Alert Phases

It is unlikely the City can implement all proposed preparedness actions at once

Many pandemic preparedness actions have financial implications such as stockpiling supplies. Other strategies would require considerable staff resources such as cross-training staff, or making prior arrangements with internal or external groups (e.g., employee unions, volunteer sectors). It is unlikely the City can implement all proposed preparedness actions at once. The

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

alternate strategies and related resource requirements should therefore be reviewed and prioritized based on a number of factors such as risk, impact, costs, and feasibility.

Not all preparedness actions require immediate implementation

Equally important is that not all preparedness actions require immediate implementation. For example, certain types of staff training may be more effective if provided when the WHO disease alertness escalates to the next phase(s), or critical supplies with short shelf-life should be purchased when the risk of pandemic increases to a certain level.

The City needs to ensure the proposed preparedness actions are prioritized, planned and staged progressively with the increasing threat of the disease.

Recommendation:

- 7. The City Manager take necessary steps to ensure a coordinated corporate process to prioritize and implement the proposed preparatory actions to sustain critical City services in a pandemic emergency.**

(d) Developing a Corporate Policy on Stockpiling

To prepare for a pandemic influenza, the City needs to make decisions on stockpiling personal protective equipment and essential operational supplies such as chemical disinfectants for drinking water treatment, and fuel for vehicle operation.

The focus of City pandemic planning has been on stockpiling infection control supplies and personal protective equipment

As of July 2007, the focus of City pandemic planning has been on stockpiling infection control supplies and personal protective equipment. A Stockpiling Sub-committee has been established and is developing a corporate purchasing and warehousing strategy for pandemic related supplies.

According to an internal survey in May/June 2007, certain City divisions have not stockpiled any personal protective equipment while others have stocked supplies sufficient for six months or longer. For instance, Toronto Emergency Medical Services has stocked various types of personal protective equipment sufficient for six months. Toronto Fire Services has also purchased a large quantity of personal protective equipment (gowns and surgical masks) sufficient for several years of usage. In comparison, other divisions reported they have not purchased any supply of personal protective equipment as of May 2007.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

Some City divisions overstocked personal protective equipment while others did not stock any

It would appear that, in the absence of a clear corporate direction following the completion of the Continuity of Operations phases in 2006, certain divisions have purchased additional supplies of personal protective equipment while others have not taken any action. Staff indicated that the overstocked items will be re-distributed to divisions that have not purchased the items.

In mid-2007 the Pandemic Influenza Steering Committee adopted in principle interim recommendations by the City Medical Officer of Health. The recommendations pertain to allocations of specific infection control supplies and personal protective equipment to all City staff and employees providing care to persons ill with influenza as part of their work.

A corporate policy and plan on pandemic related stockpiling are needed

Stockpiling personal protective equipment and essential operational supplies poses additional pressure on an already limited City budget. Procurement decisions in relation to pandemic planning should be determined at the corporate level after prioritizing and aligning purchase requirements with the disease alert phases. Factors such as shelf-life, storage and transportation, and supply chain uncertainty, should be considered in formulating a corporate procurement policy and plan.

The need for a corporate strategy on pandemic related procurement issues was echoed by senior City staff attending the 2006 pandemic tabletop exercise. Comments from attendees after the exercise pointed to the importance of identifying and purchasing critical operational materials before the pandemic strikes, or risk leaving no time to replenish supply or no stock available during the emergency.

Recommendation:

- 8. The City Manager take necessary steps to develop a corporate procurement policy and plan for infection control supplies, personal protective equipment, and critical operational supplies, in preparation for a pandemic emergency. Such steps should include, but not be limited to, a review, prioritization, and alignment of purchasing requirements with the World Health Organization pandemic alert phases.**

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

City needs to complete its corporate pandemic response plan and corporate communications strategy

Following the completion of individual Continuity of Operations Plans by City divisions, agencies, boards, and commissions, the City needs to develop a corporate pandemic response plan and a corporate communications strategy. These documents are being prepared by the Office of Emergency Management and Strategic Communications Division respectively. Both the corporate pandemic response plan and the corporate communications strategy are essential in managing a pandemic emergency and their timely completion is important.

The corporate pandemic response plan should establish authorities, triggers, and procedures for activating and terminating the City's response and recovery plans based on the WHO pandemic alert phases, the Canadian Pandemic Phases, or disease surveillance results at the local level. The "trigger points" define when certain actions should be initiated. For example, the City's corporate pandemic plan should outline the points at which non-critical City services will be reduced or suspended, or the points when the City will activate prior arrangements to transfer staff to other duties or distribute personal protective equipment. The corporate communications strategy should detail the different communication messages to employees and residents of Toronto at respective stages of the pandemic.

Recommendation:

- 9. The City Manager set a timeline for completion of the corporate pandemic response plan and the corporate pandemic communications strategy, and ensure that both documents contain essential details facilitating a timely and effective City response to the World Health Organization's pandemic alert phases.**

Benchmarking results

For city-wide pandemic planning and coordination, we reviewed planning documents from the London Resilience Forum and the Greater London Authority Group (U.K.), as well as the City of Ottawa. The many differences between the City of Toronto and these two cities must be taken into account in reviewing their respective progress in pandemic planning. For information, we provided examples of work completed and work to be completed as reported by the two benchmarked cities.

A summary of benchmarking results for city-wide pandemic planning and coordination is provided in Exhibit E.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

All three cities (Toronto, London U.K, and Ottawa) reported completion of the continuity of operations planning and have identified critical services to be maintained in the event of a pandemic emergency. Each of the three cities, however, has work to be completed such as:

- prioritizing and implementing the proposed actions and staffing strategies for Toronto;
- determining training and information technology requirements for London; and
- proposing actions and strategies to sustain the critical services for Ottawa.

Toronto has established a \$5 million reserve fund for pandemic preparedness

With respect to stockpiling critical supplies, Toronto has established a \$5 million reserve fund for pandemic preparedness, and has initiated planning for stockpiling personal protective equipment and other infection control supplies for employees. The Greater London Authority reported that they have procured a supply of anti-viral drug Tamiflu to be used by its employees when needed. It has also developed strategies for assessment and distribution of the anti-viral drug through telephone call centers and distribution hubs. Policy and guidance on non-drug intervention were still being developed. The City of Ottawa has not yet developed a stockpiling policy or budget for personal protective equipment or other critical supplies.

The Greater London Authority has procured a supply of anti-viral drug Tamiflu to be used by its employees when needed

Regarding the development of a city-wide coordinated pandemic plan, both the London Regional Resilience Forum and the City of Ottawa have completed their plans. Toronto is currently developing a corporate pandemic response plan.

The first version of the London Regional Resilience Flu Pandemic Response Plan was approved in 2006 and its second version in January 2007. The Plan summarizes key plans and procedures, gives an overview of the regional response to a pandemic emergency, and outlines roles and responsibilities of agencies. A unique feature of the regional plan is its “action chart” approach detailing phase-by-phase actions and outputs for organizations within the London Resilience Partnership. The actions are organized based on the World Health Organization alert phases and the UK four-level alert structure for a pandemic influenza.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.3 Continuity of Operations Planning and Preparedness

Toronto is currently developing a corporate pandemic response plan

The Ottawa Interagency Influenza Pandemic Plan was completed in 2005. The Plan applies a function-based approach, detailing who does what for various pandemic response functions such as Overall Coordination, Quarantine and Isolation, Psychological Support, and Volunteer Services.

Both the London regional response plan and the Ottawa interagency plan contain unique features that may be modeled by Toronto in developing its corporate pandemic response plan.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.4 Employee Health and Support

2.4 Employee Health and Support

Roles and Responsibilities

The City is responsible for the health and safety of its employees and has an obligation to assist them through a pandemic emergency. In addition, research has shown that in a crisis situation employees tend to rely more heavily on their employers for advice and direction.

This area is currently led by the City's Human Resources Division which is responsible for developing a pandemic specific human resources policy, as well as other strategies to support City workers during the emergency.

Planning Criteria and Issues

Three planning issues in the US Homeland Security "Pandemic Influenza, Preparedness, Response, and Recovery - Guide for Critical Infrastructure and Key Resources" relate to employee health and support:

- Assess and propose pandemic response policies and actions to initially protect and sustain all business workers, family members, customers, clients, and the public, and then more specifically for the business' essential workers;
- Whenever possible and with appropriate privacy protections, identify and assess issues for supporting worker family care; and
- Implement internal surveillance and detection for greater than normal numbers of workers with flu-like symptoms.

Staff indicated that not all of the suggested planning and preparedness issues from the US Homeland Security Guide are relevant and practical to the City. Certain modifications to the planning issues have been made incorporating staff input. Exhibit C provides a summary of the planning criteria and issues, work undertaken, and work to be completed in relation to employee health and support.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.4 Employee Health and Support

City has an interim recommendation for personal protective equipment and has drafted a human resource response plan for pandemic influenza

The City has initiated actions to protect its employees in the event of a pandemic emergency. The Pandemic Steering Committee has adopted in principle an interim recommendation for personal protective equipment for use by City employees during a pandemic emergency. The City Manager has also established an emergency planning reserve fund of \$5 million for procurement of personal protective equipment and other pandemic related supplies.

A human resource response plan has been drafted by the City Human Resources Division addressing issues such as hiring, pay policies, employee absence support, and alternate work arrangements during a pandemic emergency. The policy has been reviewed by senior management, and staff have initiated discussions with City unions. Staff also reported that specific human resource procedures are being drafted and will be finalized once a policy agreement has been reached with employee unions.

With regard to identifying and assessing issues for supporting worker family care, the US Homeland Security Guide suggests a number of supporting actions. These include:

- Develop pandemic education and information sharing processes targeted for worker families;
- Assess the number of workers with school-age children or other dependents at home;
- Review the number of workers and families who rely solely on public transportation;
- Consider availability of social and community services support;
- Plan for grief counselling and psychiatric care;
- Account for language issues and barriers, and
- Identify other special family support needs.

During and after a pandemic, the City could experience a higher than normal demand for employee assistance and counselling services

A number of these supporting actions are being addressed by the City. For instance, the City has an existing Employee Assistance Program which provides counselling services to all City employees on matters such as bereavement, trauma or financial concerns. During and after a pandemic emergency, the City could experience a higher than normal demand for employee assistance and counselling services. Staff are currently working on arrangements to expand existing service capacity when needed.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.4 Employee Health and Support

Regarding the other worker family support actions suggested by the US Homeland Security Guide, City management decided that certain of them will not be considered at this point. For example, staff reported that no action is planned to identify the number of City workers and families relying solely on public transportation. Staff explained that they would not be addressing this risk as “*we are advised that the public transportation system is deemed a priority service and will continue to operate during a pandemic influenza emergency.*” Staff also indicated that the cost of surveying workers on their use of public transportation will not justify the minimal benefits derived from this activity.

Planning assumptions and strategies for employee health and support should be reviewed

In our opinion, it is possible that in the event of a severe pandemic, public transportation services may be reduced or cancelled. This will also have serious repercussions on the City’s ability to maintain its critical services because some critical workers might not have alternative transportation means. It is nonetheless management’s prerogative to decide what issues and preparedness actions they will pursue in preparing for a pandemic emergency. The decision should be based on sound information and rationale.

Recommendation:

- 10. The City Manager undertake a review of the City’s Human Resources related pandemic planning assumptions and preparedness actions to ensure they are adequate and sufficient. Such a review should include, but not be limited to, an examination of Human Resources related pandemic planning issues and criteria, a review of other cities’ employee support actions in preparation for a pandemic, and consultation with employee unions and management association.**

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.5 Recommendations Relating to All Pandemic Planning and Preparedness Activities

2.5 Recommendations Relating to All Pandemic Planning and Preparedness Activities

The following two recommendations relate to all pandemic planning and preparedness activities.

A corporate process to report and track pandemic related costs is needed

Tracking and reporting costs associated with pandemic preparedness

A corporate process to report and track pandemic related costs has not been developed. These costs should be systematically tracked by divisions and monitored at the corporate level. Without an adequate cost tracking and monitoring process, the City cannot ensure that its limited resources are allocated according to priorities, or to monitor overall spending associated with pandemic planning and preparedness. A cost tracking and reporting process, encompassing internal controls and accountability mechanisms, needs to be developed and implemented.

Recommendation:

- 11. The City Manager take necessary steps to develop and implement a process to systematically track and monitor costs associated with pandemic preparedness.**

Specific corporate goals, objectives and completion timelines for pandemic preparedness need to be developed

Establishing timelines for completion and performance measures

The City needs to establish specific corporate goals and performance measures for related pandemic preparedness efforts. A corporate implementation plan outlining overall goals and specific tasks, targeted completion timelines, as well as assignment of responsibilities, can aid the City in gauging its progress and enabling more effective oversight and accountability. The plan should be reviewed and, if necessary, revised periodically to incorporate the latest disease development information and policy recommendations from other levels of government.

2.0 DETAILED AUDIT RESULTS AND RECOMMENDATIONS

2.5 Recommendations Relating to All Pandemic Planning and Preparedness Activities

Recommendation:

- 12. The City Manager develop a corporate pandemic implementation plan outlining goals, specific short-term objectives and targeted timelines, as well as assignment of responsibilities.**

3.0 CONCLUSION

Much work has been undertaken but still more could and should be done to better prepare the City for a potential pandemic

We began our review by asking the question “to the extent possible, how prepared is the City for a potentially severe pandemic?” At the conclusion of our review, it became evident to us that much work has been undertaken but still more could and should be done by the City to better prepare itself for a potential pandemic. As the City’s planning and preparedness is still on-going and evolving, we hope by pointing out certain challenges and gaps in the process we can help improve its effectiveness and efficiency. With adequate planning and preparedness, the City will be in a better position to minimize illnesses and deaths, as well as mitigate the social and economic disruptions expected during such an emergency.

EXHIBIT A

Summary of Toronto Public Health Pandemic Planning and Preparedness as of July 31, 2007

The following table provides a summary of public health activities that have been undertaken by Toronto Public Health as of July 2007 in relation to the pandemic planning and preparedness components contained in the *Canadian Pandemic Influenza Plan for the Health Sector* issued by the Public Health Agency of Canada. Remaining work to be completed or issues to be addressed are listed in the last column of the summary table.

	Critical Planning Component¹	Action initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Planning Component	Work to be completed or issue to be addressed
1	Surveillance	Yes	<ul style="list-style-type: none"> - Toronto Public Health (TPH) posts on its website a weekly summary of global events of interest to pandemic surveillance - Obtained commitment from two School Boards to provide student absenteeism data. Implementing student absenteeism pilot project for the 2007/08 school year - Working with Toronto Police Service to collect employee absenteeism data - Obtained a reasonably updated list of physician fax numbers for sending mass alert 	<ul style="list-style-type: none"> - Develop a system to capture and analyze police absenteeism data - Work on expanding mass alert capacity to include physician email addresses
2	Antivirals/ Community Flu Assessment Centers	Yes	<ul style="list-style-type: none"> - The City Medical Officer of Health has recommended stockpiling antiviral medications for use as prophylaxis by City employees providing care to persons who are ill or suspected of being ill with influenza. However, stockpiling of antiviral medications has not taken place as the use of antiviral medications for prophylaxis is still being debated and reviewed at the national level. - An operational plan has been developed by TPH addressing issues such as the functions of the community flu centers, the criteria for opening the centers, client flow patterns, and management structures for the centers. As well, various 	<ul style="list-style-type: none"> - Identify potential site locations for assessment and treatment centers - Estimate quantity of equipment and supplies for the community flu centers, purchase the equipment and supplies, and identify storage locations - Develop a staffing model and identify sources of personnel - Draft an educational pamphlet for self-care for people who visit the assessment centers - Identify funding resources for antiviral assessment centers before provincial reimbursement <p>Awaiting Federal or Provincial guidance:</p>

¹ Based on the Pandemic Planning Checklist included in the *Canadian Pandemic Influenza Plan for the Health Sector*, the Public Health Agency of Canada, 2004

	Critical Planning Component ¹	Action initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Planning Component	Work to be completed or issue to be addressed
			<p>security issues associated with operations of the centers have been identified. TPH continues to work with health care sector partners to further develop the Plan.</p>	<ul style="list-style-type: none"> - Plan for liability, disability and life insurance for people temporarily assigned to work at the community flu centers - Issues related to staffing, scope of practice, equipment, supplies, and budget remain unresolved. - Mechanisms for the distribution of antiviral medications for early treatment
3	Vaccine Programs	Yes	<ul style="list-style-type: none"> - Schools have been identified as sites for mass vaccination clinics - The Toronto District School Board has agreed on a memorandum of understanding for using school sites - Developed vaccine storage capability - Continue to enhance annual influenza vaccination coverage for the general population - Made an arrangement with TPH Information Technology to develop a data management system specific for the pandemic influenza vaccine program when needed 	<ul style="list-style-type: none"> - Develop staffing resource for the mass vaccination clinics - Develop plans for ensuring safety and security of vaccine and supplies during storage and transportation - Coordinate vaccine distribution with bordering jurisdictions could be a potential issue if the supply of vaccine is limited <p>Awaiting Federal or Provincial guidance:</p> <ul style="list-style-type: none"> - Depending on the availability of vaccine, additional staff may be required to operationalize the clinics - Appropriate legal authorities to allow for non-licensed volunteers to administer influenza vaccine; scope of authorized practice; liability issues of using volunteers and retirees
4	Health Services Emergency Planning and Response	Yes	<ul style="list-style-type: none"> - TPH worked with the hospital partners in the development of acute care facility pandemic influenza planning guidelines. - TPH held four community agency meetings in June 2006 for pandemic planning - TPH provided pandemic influenza education at medical rounds, hospital meetings, community health centers, long term care home education days and information meetings, homeless shelters, and other facilities. - In May 2007, TPH conducted a survey on the state of pandemic preparedness among health services providers. The survey showed that health sector 	<ul style="list-style-type: none"> - Continue the lead role in health sector coordination and address issues identified - Some of the additional issues to be addressed by the Ministry of Health and Long-Term Care, TPH, and local health sector representatives are: <ul style="list-style-type: none"> • Stockpiling extra health care supplies such as personal protective equipment and disinfectants in health care facilities • Develop detailed regional and facility-level plans specifying what types of care to be

	Critical Planning Component¹	Action initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Planning Component	Work to be completed or issue to be addressed
			<p>partners are facing challenges such as lack of policy guidelines, coordination, and dedicated human resources.</p> <ul style="list-style-type: none"> - Following the survey, TPH hosted a meeting with health care sector representatives to explore how coordination can be enhanced across the sector. Additional meetings are being planned. - TPH is part of the planning team for a health sector “table top” pandemic influenza exercise scheduled for the end of 2007 	<p>delivered at different health care settings and the triage across sites</p> <ul style="list-style-type: none"> • Assess health care facility capacity and health care personnel capacity • Coordinate clinical care and health services plans with bordering jurisdictions to avoid migration to centres of perceived enhanced services • Develop aftercare and recovery plans and guidelines
5	Public Health Measures for Pandemic Influenza	Yes	<ul style="list-style-type: none"> - TPH participates in the provincial public health measures working group - Public health measures during a pandemic, including case and contact management and school closures, have been published in the Ontario Health Plan for an Influenza Pandemic 	None
6	Incident Management system	Yes	<ul style="list-style-type: none"> - TPH has developed a Pandemic Influenza Incident Management System (IMS) which outlines the organizational structure and functions in responding to a pandemic influenza - The Divisional Management Team has received a technical briefing and participated in a table top exercise for IMS - Technical briefings were also held for all TPH physicians and Communicable Disease Control management staff - A staffing model has been identified for the pandemic influenza IMS model 	<ul style="list-style-type: none"> - City Human Resources is to obtain Union agreement with the staffing model - Provide training for management personnel for their roles in pandemic influenza IMS
7	Communi-cations	Yes	<ul style="list-style-type: none"> - The Toronto Pandemic Influenza Plan outlines public health communication plan and activities. Specific communication strategies have been developed for each of the WHO pandemic alert phases - Developed hotline capability that can be activated in responding to a pandemic - Provided pandemic influenza training to all TPH staff in 2006 - Training modules have been developed for “just in time” training of TPH staff and others during a pandemic 	<ul style="list-style-type: none"> - The Pandemic influenza website will be redesigned to make it more accessible and user friendly, including a web portal for health care professionals - Further education initiatives on basic infection control, e.g. the Sleeve Sneeze campaign - Posters will be distributed to additional sites including emergency shelters, drop-ins and community health centers - Disseminate multilingual infection control signs

	Critical Planning Component¹	Action initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Planning Component	Work to be completed or issue to be addressed
			<ul style="list-style-type: none"> - Collaboratively with Occupational Health and Safety staff, pandemic influenza information sessions are being offered to all City Health and Safety representatives - TPH has also provided information sessions to various community groups, business and financial sectors, colleges, universities, and school boards - Other recent public education activities included: <ul style="list-style-type: none"> (a) Three posters and two fact sheets on infection control have been posted on the TPH website and translated into 14 languages. The posters have been distributed to schools, child care centers, hospitals and long-term care facilities. (b) A community information campaign was held in 2006 to promote respiratory etiquette, including advertisements in newspaper and public places. 	
8	Plan for post-pandemic evaluation	No	<ul style="list-style-type: none"> - To evaluate the impact and effectiveness of the planning and response activities, the Canadian Pandemic Influenza Plan for the Health Sector highlights the need to identify what information needs to be collected and how this can be done. This has not been addressed by Toronto Public Health in its current pandemic planning and preparedness which is focusing on response activities. 	<ul style="list-style-type: none"> - Determine what information to be collected and how this will be done to facilitate post pandemic evaluation in surveillance, antiviral, and disease impact

EXHIBIT B

**Summary of Toronto Pandemic Related Continuity of Operations
Planning and Preparedness
as of July 31, 2007**

The following table provides a summary of continuity of operations activities that have been undertaken by the City of Toronto as of July 2007 in relation to the planning and preparedness components adapted from the US Department of Homeland Security “Pandemic Influenza, Preparedness, Response, and Recovery – Guide for Critical Infrastructure and Key Resources”. Remaining work to be completed or issues to be addressed are listed in the last column of the summary table.

Planning Phase

	Critical Actions and Issues²	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
1	Identify and empower an overall lead pandemic coordinator and/or team	Yes	<ul style="list-style-type: none"> - A Pandemic Influenza Steering Committee was established in early 2007. The Committee is chaired by the City Manager and includes senior management staff as well as union and association representatives. - A Pandemic Influenza Core Planning Group was created in May 2007 to oversee pandemic related corporate issues and to provide support to the Steering Committee. 	<ul style="list-style-type: none"> - The Steering Committee and the Core Planning Group will continue to meet in 2007/2008 to examine and make decisions on pandemic related issues.
2	Seek input and support from internal and external stakeholders such as employees, supply chain businesses and insurers, and, when appropriate, the public.	Yes	<ul style="list-style-type: none"> - Toronto Public Health has sought input from key stakeholders in the health, emergency planning, social service, volunteer, community, and business sectors. - Office of Emergency Management has had informal discussions with multiple external groups. - Human Resources has initiated discussions with employee unions regarding labour measures in a pandemic emergency. 	<ul style="list-style-type: none"> - Finalize an agreement with unions pertaining to labour measures in a pandemic emergency. - Where appropriate, include other sectors such as financial institutions and insurers in future consultation process.

² Adapted with staff input from “Pandemic Influenza, Preparedness, Response, and Recovery, Guide for Critical Infrastructure and Key Resources”, U.S. Department of Homeland Security, 2006

	Critical Actions and Issues²	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
3	Identify and prioritize critical functions and potential impacts arising from disruptions to critical services, and prioritize workers, supplies, equipment, and supports	Yes	<ul style="list-style-type: none"> - In preparing for divisional Continuity of Operations Plans, each City division, agency, board, and commission was asked in 2006 to identify their critical functions and activities, impacts from disruptions, and staff and resources required to sustain the critical functions. - The large number of identified critical functions were reviewed and prioritized at the Cluster level. - The City Manager or Deputy City Managers reviewed and approved a summary of priority critical services to be maintained by City divisions during a pandemic emergency. 	<ul style="list-style-type: none"> - Results of the divisional plans need to be consolidated and integrated into a corporate response plan which is being drafted by the Office of Emergency Management - The divisional plans should be reviewed and updated periodically
4	Identify and propose actions to protect and sustain essential functions, workers, supplies, equipment, and system supports	Yes	<ul style="list-style-type: none"> - In its Continuity of Operations Plan, each City division, agency, board, and commission was asked to propose options and alternative strategies to cope with the possible interruptions to provision of essential services. 	<ul style="list-style-type: none"> - City staff are currently reviewing the proposed actions and strategies from divisions, agencies, boards, and commissions.
5	Develop a plan to transfer authority and responsibility for essential functions from the primary operating staff to other employees or facilities for an extended period	Yes	<ul style="list-style-type: none"> - Divisions, agencies, boards, and commissions in their Divisional Continuity of Operations Plans, where needed, have identified transferring responsibility for essential functions as strategies to cope with shortages of staff or other resources. 	None
6	Develop formal protocols for delegations of authority and orders of succession	Yes	<ul style="list-style-type: none"> - Some of the divisional continuity of operations plans have outlined delegations of authority to alternate positions in an emergency situation 	<ul style="list-style-type: none"> - All divisions, agencies, boards, and commissions providing priority critical services should have a formal protocol for delegations of authority in a pandemic emergency
7	Prioritize City personnel for receipt of vaccines and antiviral medications, and for receipt of other types of medical countermeasures and personal protective equipment to sustain critical functions	Yes	<ul style="list-style-type: none"> - In early 2007 the City's Medical Officer of Health has recommended allocation of specific infection control supplies to all City staff and to employees caring for persons ill with influenza in the event of a pandemic emergency 	<ul style="list-style-type: none"> - Based on the identified priority critical functions and MOH recommendations, a plan needs to be developed outlining the types and number of City personnel for receipt of vaccines and antiviral medications and

	Critical Actions and Issues²	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
			<ul style="list-style-type: none"> - Divisions have been asked to provide estimated number of staff who provide direct care to others. - The City's Continuity of Operations planning process has identified the prioritized critical functions and in turn have identified the personnel who will be responsible for providing these functions. 	other infection control supplies during a pandemic in order to sustain the provision of critical city services.
8	Identify and prioritize critical interdependencies along the entire supply chain	Yes	<ul style="list-style-type: none"> - In preparing for the Divisional Continuity of Operations Plans for essential services, staff were asked to identify supply chain issues and propose strategies to cope with the potential disruptions. - A stockpiling subcommittee has been established to review preliminary stockpiling requirements from divisions, and to prepare a corporate strategy. 	- A consolidated list of supply chain issues and proposed coping strategies is being developed by staff.
9	Liaise and collaborate with other levels of government, community agencies and other sectors	Yes	<ul style="list-style-type: none"> - City staff have working relationships with federal and provincial emergency planning groups, community agencies, and other government and private associations. 	- Where appropriate, expand coordination with business sectors such as financial institutes and insurers in pandemic planning.
10	Develop a communication plan for pandemic emergency	Yes	<ul style="list-style-type: none"> - Strategic Communications is developing specific communications strategies and messages as part of the corporate Communications Plan. 	- Need to develop and finalize a corporate communications plan for a pandemic emergency.
11	Identify, document, coordinate and test "trigger points" and resultant actions	Yes	<ul style="list-style-type: none"> - Staff has begun working on identifying "tipping points" for initiating communication messages and for activating changes to City operations in a pandemic emergency. 	- Need to establish authorities, triggers, and procedures for activating and terminating the City's response and recovery plans.
12	Develop actions to identify and track all pandemic specific resource costs to facilitate decision making	No	<ul style="list-style-type: none"> - The City has not established a system to identify and track pandemic related costs and resource requirements other than spending within a reserve fund for stockpiling personal protective equipment. 	- Need to develop practical cost estimates and a tracking system to help prioritize and allocate limited city resources.

	Critical Actions and Issues²	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
13	Identify and monitor milestones and timelines for implementation	No	- City has not identified at the corporate level targeted timelines for implementing pandemic planning and preparedness activities.	- Progress in planning for continuity of city operations should be periodically reported to City Council, such as the case with Toronto Public Health in reporting pandemic related public health measures.

Preparedness Phase

	Critical Actions and Issues³	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
1	Incorporate disaster phases and continuity of operations scenarios for the pandemic periods. Prioritize and implement actions based on a full understanding and integration of requirements across each pandemic period and disaster phase	No	<ul style="list-style-type: none"> - A defined process to identify and prioritize preparedness actions and recourse requirements has not been developed 	<ul style="list-style-type: none"> - The proposed coping strategies and resource requirements to sustain priority critical functions need to be prioritized and aligned with each pandemic phase such that more intense preparedness actions are implemented progressively with the increasing threat of the disease
2	Sustain critical functions and workers	Yes	<ul style="list-style-type: none"> - A number of initiatives have been undertaken to sustain workers responsible for critical functions during a pandemic emergency. These include: <ul style="list-style-type: none"> (a) developing an inventory of skill sets to facilitate transfer of duties when needed; (b) developing a volunteer management program; and (c) discussing with employee unions on pandemic related labour issues. 	<ul style="list-style-type: none"> - Continue to work on other strategies to enhance the City's ability to sustain essential functions and workers, including consideration of using alternative workers, IT infrastructure to support large-scale telecommuting, and worker transportation issues.
3	Secure essential supplies, material, equipment and support systems. Issues to be addressed include stockpiling essential priority reserves for the initial 6-8 week wave, reviewing equipment maintenance and repair schedules, addressing 2 nd /3 rd order effects such as "who supplies the suppliers"	Yes	<ul style="list-style-type: none"> - The supply and material requirements identified in Divisional Continuity of Operations Plans are being reviewed by the Stockpiling Subcommittee. - Some divisions have stockpiled essential supplies for varying periods of time. 	<ul style="list-style-type: none"> - Procurement of supply and material for priority critical services should be determined at the corporate level after reviewing all requirements and setting priorities for different pandemic phases. - The Stockpiling Subcommittee is developing strategies for stockpiling and logistics issues, as well as critical supply chain considerations.

³ Adapted with staff input from "Pandemic Influenza, Preparedness, Response, and Recovery, Guide for Critical Infrastructure and Key Resources", U.S. Department of Homeland Security, 2006

	Critical Actions and Issues³	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
4	Ensure other interdependent systems such as sub-contractors, external suppliers, deliverers and other connected systems are equally well prepared	No	- Some of the interdependent issues might have been identified in Divisional Continuity of Operations Plans but this area has not been directly addressed.	- City's Purchasing Division is consulting Legal on the issue.
5	Monitor and coordinate changes in trigger and breaking points	No	- Trigger points are being developed as part of the Corporate Pandemic Plan.	- This issue is still at the planning stage.
6	Manage risk communications and public relations to ensure an open, consistent two-way information flow with suppliers, customers, employees, and the public	Yes	- Pandemic information is available on City website and there are various communication channels for the public to contact City staff.	- A pandemic specific corporate communication strategy and plan needs to be developed and implemented.
7	Share and compare best practices with other cities and government agencies	Yes	- City staff participated in federal and provincial emergency response exercises. - Emergency preparedness information is routinely shared with Greater Toronto Area counterparts.	On-going activity
8	Implement and test preparedness exercise, education, and training program	Yes	- A City-wide emergency exercise involving divisional heads and emergency staff was conducted in October 2006. - Pandemic information sessions were provided to City's health and safety representatives in 2007.	- A corporate direction and plan for providing pandemic training to staff needs to be developed. - An emergency exercise is being planned for the end of 2007
9	Refine costs and resources	No	- Currently costs and resources associated with pandemic preparedness are not systematically identified or tracked.	- This activity is still at the planning stage.
10	Rapidly and effectively adjust actions based upon changes in the operational environment and disease development	Yes	- Lessons learned from the 2006 emergency response exercise have been considered in developing Human Resources policy for a pandemic emergency. - Pandemic planning and preparedness actions are continuously evaluated and adjusted dependent on latest disease information and changes to guidelines from provincial and federal government.	- This is an on-going responsibility of Toronto Public Health, City divisions, agencies, boards, and commissions, and the Pandemic Influenza Steering Committee.

EXHIBIT C

Summary of Toronto Pandemic Related Employee Health and Support Planning and Preparedness as of July 31, 2007

The following table provides a summary of employee health and support activities that have been undertaken by the City of Toronto as of July 2007 in relation to planning and preparedness components adapted from the US Department of Homeland Security “Pandemic Influenza, Preparedness, Response, and Recovery – Guide for Critical Infrastructure and Key Resources”. Remaining work to be completed or issues to be addressed are listed in the last column of the summary table.

	Critical Actions and Issues⁴	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
1	Assess and propose pandemic response policies and actions to initially protect and sustain all City workers, and their family members	Yes	<ul style="list-style-type: none"> - The City’s Medical Officer of Health (MOH) has recommended the supply of personal protective equipment for use by City employees during a pandemic emergency. The interim recommendation has been adopted in principle by the Pandemic Influenza Steering Committee. - The City Manager in 2007 established a reserve fund for purchase of personal protective equipment - A human resource emergency response plan has been drafted addressing issues such as hiring, pay policies, employee absence support, and alternate work arrangements. The policy has been reviewed by senior management, and staff have begun discussions with City unions. 	<ul style="list-style-type: none"> - Follow-up actions on interim MOH recommendation on supply of personal protective equipment - Finalization of the human recourse pandemic response policy is pending an agreement with City unions - Specific human resource procedures will be finalized once the pandemic influenza policies are finalized - Managers will be trained on the specific pandemic policies and procedures at the appropriate trigger point prior to a pandemic emergency

⁴ Adapted with staff input from “Pandemic Influenza, Preparedness, Response, and Recovery, Guide for Critical Infrastructure and Key Resources”, U.S. Department of Homeland Security, 2006

	Critical Actions and Issues⁴	Action Initiated	Activities undertaken to date (as of July 31, 2007) in relation to the Critical Actions and Issues	Work to be completed or issue to be addressed
2	Whenever possible and with appropriate privacy protections, identify and assess issues for supporting worker family care. Under such extreme conditions, a worker's family becomes an essential supporting or risk element for the worker and the City.	Yes	<ul style="list-style-type: none"> - The City has an existing public service employee assistance program providing counselling services to all city employees and eligible family members on matters such as bereavement, trauma, or financial concerns 	<ul style="list-style-type: none"> - Human Resources staff are arranging additional contracts with professional counsellors in anticipation of increased demand for employee assistance services during and after a pandemic
3	Implement internal surveillance and detection for greater than normal numbers of workers with flu-like symptoms	Yes	<ul style="list-style-type: none"> - City's existing payroll system tracks on a bi-weekly basis staff absenteeism due to illness and the data can be retrieved and reviewed when necessary - Toronto Public Health is working with Toronto Police to put in place a surveillance system 	<ul style="list-style-type: none"> - Management will review the feasibility and viability of implementing an internal disease surveillance system

EXHIBIT D

**Summary of Benchmarking Results for
Pandemic Public Health Planning
as of July 31, 2007**

	Comparison Area	Toronto Public Health (TPH)	Vancouver Coastal Health (VCH)⁵
1	Population Size	2.6 million	1.2 million
2	Unique Pandemic Planning Challenges/Advantages	<ul style="list-style-type: none"> - TPH is a local health agency with no direct jurisdiction over laboratories, hospitals, or long-term care facilities. This presents TPH additional challenges in coordinating pandemic planning among local health care providers. - Toronto's comparatively compacted, mostly urban, geography aids health emergency planning and response in some aspects. 	<ul style="list-style-type: none"> - VCH has jurisdiction over laboratories, hospitals, public health, long-term care homes and other local health care providers. This makes coordinating pandemic planning relatively easier. - VCH covers a geographic area, including large rural areas, about five to six times larger than Toronto (58,560 km² which includes 17 municipalities and 16 First Nations). This poses additional planning challenges, particularly in planning for antiviral assessment centers and mass vaccination clinics.
3	Planning Starting Time and Pandemic Plan Release Time	<ul style="list-style-type: none"> - TPH started pandemic planning in 2001 but was sidetracked when SARS broke out in 2003. Planning was resumed in 2004. - TPH Released the first version of Toronto Pandemic Influenza Plan in November 2005. 	<ul style="list-style-type: none"> - VCH started pandemic planning in 1998, the year the City experienced a very severe flu season. - VCH accelerated its pandemic planning efforts in 2003.

⁵ Based on Vancouver Coastal Health Regional Pandemic Influenza Response Plan (October 2006) and information obtained from a conference call with Vancouver Coastal Health Pandemic Planning Steering Committee Chair and Coordinator, July 16, 2007. Summary table information was also reviewed for accuracy by Vancouver Coastal Health Staff.

	Comparison Area	Toronto Public Health (TPH)	Vancouver Coastal Health (VCH) ⁵
			- VCH released the first version of VCH Regional Pandemic Influenza Response Plan in spring 2005.
4	Surveillance	<ul style="list-style-type: none"> - TPH is developing surveillance systems for: <ul style="list-style-type: none"> ▪ Sentinel physician ▪ workplace absenteeism with Toronto Police Service ▪ school absenteeism surveillance with Toronto Catholic School Boards and Toronto District School Boards - TPH has obtained an updated list of physician fax numbers for sending mass alert. TPH is working to obtain physician email addresses. 	<ul style="list-style-type: none"> - VCH has implemented the following planned surveillance systems: <ul style="list-style-type: none"> ▪ Sentinel physician surveillance ▪ hospital emergency room surveillance ▪ border surveillance ▪ rapid viral testing ▪ laboratory surveillance ▪ workplace absenteeism surveillance ▪ school absenteeism surveillance - VCH has an updated list of physician email addresses and fax numbers for sending out mass information alerts.
5	Mass Vaccination Clinics (MVC)	<ul style="list-style-type: none"> - Current seasonal influenza vaccination covers about 40%. TPH is exploring ways to enhance the seasonal flu and Pneumococcal vaccination coverage. - TPH has identified Mass Vaccination Clinic (MVC) sites and acquired vaccine storage capability. - TPH made an arrangement with TPH Information Technology to develop a vaccine data management system when needed. <p>Issues to be addressed:</p> <ul style="list-style-type: none"> - TPH has yet to develop: <ul style="list-style-type: none"> ▪ plans for the safety and security of vaccine and supplies during storage and 	<ul style="list-style-type: none"> - Current seasonal flu vaccination coverage not available. VCH is working to enhance the seasonal flu and Pneumococcal vaccination coverage through awareness education. - VCH has identified Mass Vaccination Clinic (MVC) sites and is now acquiring vaccine storage capability. - VCH is waiting for a vaccine record-keeping system to be developed by the Public Health Agency of Canada - Centre for Emergency Preparedness and Response - VCH has contracted private security to ensure the safety and security of vaccine and supplies during storage and transportation.

	Comparison Area	Toronto Public Health (TPH)	Vancouver Coastal Health (VCH) ⁵
		<ul style="list-style-type: none"> transportation; and ▪ staffing resource for the mass vaccination clinics. - TPH is waiting for the Ontario Ministry of Health and Long-Term Care to work out the details of using volunteers, retired health care workers and medical students. - TPH should consider the need for coordinating vaccine distribution plans with bordering jurisdictions in case the supply of vaccines is limited. 	<ul style="list-style-type: none"> - VCH has a list of potential MVC immunizers, including an updated list of retired health care workers. Issues to be addressed: - VCH is also waiting for province of BC to work out the nuances of licensure for volunteers, retired health care workers and medical students. - VCH has yet to coordinate proposed vaccine distribution plans with bordering jurisdictions in case the supply of vaccines is limited.
6	Antivirals Assessments, Treatment and Referral Centers (i.e., Community Flu Centers)	<ul style="list-style-type: none"> - Work in this area did not start until spring 2007. - TPH has developed an operational plan and identified various security issues associated with operation of the centers. - Issues to be addressed: <ul style="list-style-type: none"> ▪ Identifying potential site locations; ▪ Estimating quantity of equipment and supplies and purchasing equipment and supplies; ▪ Developing a detailed staffing model and identifying sources of personnel; ▪ Developing an educational pamphlet for self-care for people who visit the assessment centers; ▪ Identifying funding resources before provincial reimbursement; 	<ul style="list-style-type: none"> - VCH has been planning for triage centers since the beginning of its pandemic planning. - VCH has developed patient assessment and screening protocols and will test them through tabletop exercises in September 2007. - VCH has developed a self-care guide. - VCH has estimated the quantities of equipment and supplies. - VCH plans to rent spaces adjacent to large hospitals as flu centers and to staff the centers with physicians and nurses working in the nearby hospitals with existing liability and life insurance coverage.

	Comparison Area	Toronto Public Health (TPH)	Vancouver Coastal Health (VCH) ⁵
		<ul style="list-style-type: none"> ▪ Identifying storage locations for the equipment and supplies; and ▪ Waiting for Ontario guidance on liability, disability and life insurance for physicians as well as other people temporarily assigned to work at the centers. 	<ul style="list-style-type: none"> - Issues to be addressed: <ul style="list-style-type: none"> ▪ Leasing space; ▪ Stockpiling equipment and supplies; ▪ Identifying specific staff; ▪ Condensing self-care pamphlet; and ▪ Waiting for B.C. guidance on licensure issues.
7	Health services emergency planning and response	<ul style="list-style-type: none"> - Ontario licensing bodies need to work out liability, insurance, and temporary licensing issues for active and retired health care workers and volunteers. <p><u>Coordinating Local Health Care Pandemic Planning Efforts</u></p> <ul style="list-style-type: none"> - In June 2007 TPH hosted a meeting with health care sector representatives who identified four key pandemic planning issues. Having been assigned the responsibility for coordinating local health sector planning, TPH will play a lead coordinating role in addressing these key issues: <ul style="list-style-type: none"> • Need for enhanced communication between the health care system and the City Emergency Operations Center and TPH; • Need for identifying smaller geographic areas to allow for more localized health care system pandemic planning; • Need for enhanced coordination within the health care system to address issues relating to capacity, patient transfer and treatment location; and • Need for broadening the scope of treatment at flu centers such that certain 	<ul style="list-style-type: none"> - B.C. licensing bodies need to work out liability, insurance, and temporary licensing issues for active and retired health care workers and volunteers. <p><u>Coordinating Local Health Care Pandemic Planning Efforts</u></p> <ul style="list-style-type: none"> - All local health care sectors share the VCH Regional Pandemic Plan. VCH is working on developing local level pandemic plans for Health Service Delivery Areas.

	Comparison Area	Toronto Public Health (TPH)	Vancouver Coastal Health (VCH) ⁵
		<p>population groups (e.g., pregnant women, immuno-compromised individuals, and homeless) can be treated at the centres.</p> <ul style="list-style-type: none"> - TPH needs to work with local health sectors to assess health care personnel, health care facilities and equipments capacity. - TPH will need to work with the Ontario Ministry of Health and Long-Term Care to coordinate patient transport, and tracking and managing hospital beds. - TPH should consider the need for coordinating clinical care and health services with neighbouring jurisdictions to avoid migration to centres of perceived enhanced services. 	<ul style="list-style-type: none"> - VCH has up-to-date information on health care personnel, health care facilities and their capacity. - VCH is confident that B.C. existing provincial acute care bed management system will work well during a pandemic. This system includes a 24/7 toll free call center and an internet based bed registry of hospitals throughout the province. As well, VCH will not need as much patient transport when triage centers are planned to be adjacent to hospitals. - VCH does not need to coordinate with neighbouring jurisdictions because: <ul style="list-style-type: none"> ▪ Most physicians have privilege with hospitals. Thirty per cent of patients who see VCH physicians are from outside VCH jurisdiction. ▪ Three large hospitals (Vancouver General, St. Paul's, and Children's and Women's) have province-wide mandates
8	Personal Protective Equipment (PPE) Recommendation and Stockpiling	TPH has made PPE recommendations.	VCH has made PPE recommendations and has stockpiled several thousand surgical masks and about 100,000 N95 respirators centrally. VCH has identified the trigger point for distributing the PPE stockpiles to VCH Health Service Delivery Areas.

	Comparison Area	Toronto Public Health (TPH)	Vancouver Coastal Health (VCH)⁵
9	Operational Preparedness	<ul style="list-style-type: none"> - TPH is confirming specific roles identified in TPH's Incident Management System. - TPH has yet to train management personnel for specific roles. - TPH has approximately 1600 union positions and needs to undergo a consultation and negotiation process with union representatives 	<ul style="list-style-type: none"> - VCH have already confirmed roles identified in its Incident Command System. - VCH has trained management personnel for specific roles. - Meetings and an oral agreement with unions at provincial level have taken place. VCH is waiting for written agreement.
10	Public Health Measures	TPH is waiting for provincial guidance on public health measures based on the epidemiology of a particular virus strain.	VCH is waiting for provincial guidance on public health measures based on the epidemiology of a particular virus strain.
11	Communications/ Public Education	<ul style="list-style-type: none"> - TPH has developed an intranet site for pandemic influenza - TPH has developed hotline capability that can be activated in responding to a pandemic. - TPH has provided pandemic influenza training to all TPH staff. - Working with Occupational Health and Safety staff, TPH has offered information sessions to all City Health and Safety representatives, and various community groups and agencies. - TPH has distributed posters and fact sheets to schools, day nurseries, hospitals and long term care homes as well as posted the information online. The information materials have been translated into 14 languages. 	<ul style="list-style-type: none"> - VCH has developed pandemic website which provides links to a series of planning checklists - VCH has developed and posted on-line a self-care guide for pandemic and provided algorithms at the end of the document to guide patients on when to seek further care. - VCH has provided numerous educational/consulting sessions to a variety of groups both within and outside of VCH - VCH has provided detailed information to the general public on pandemic preparedness and how to look after persons infected with the flu

	Comparison Area	Toronto Public Health (TPH)	Vancouver Coastal Health (VCH)⁵
		- TPH conducted a community information campaign in 2006 to promote respiratory etiquette.	- VCH has created and posted on-line hand-washing and hand sanitizer posters as well as a "Cover your cough" poster
12	Psychosocial Support	TPH is developing plans for providing psychosocial support during pandemic.	Two VCH emergency management coordinators are members of the Provincial Psychosocial Workgroup. VCH will incorporate provincial psychosocial plans when it is done.
13	Aftercare and Recovery Plans and Guidelines	TPH has yet to develop aftercare and recovery plans and guidelines.	VCH has already developed aftercare and recovery plans and guidelines.
14	Information needed to facilitate post-pandemic evaluation on pandemic preparedness	To facilitate post-pandemic evaluation in surveillance, antiviral, and disease impact, TPH needs to determine what information to be collected and how this will be done.	Procedures and forms are in place to collect information needed to facilitate post-pandemic evaluation on vaccine, surveillance, antivirals and disease impact.

EXHIBIT E

**Summary of Benchmarking Results for Pandemic
City-Wide Coordinating Plan
as of July 31, 2007**

	Area of Comparison	Toronto	London⁶	Ottawa⁷
1	Population Size	- 2.6 million	- 7.5 million	- 840,000
2	Pandemic Planning Starting Time	- Started at the end of 2005 in response to Toronto Public Health recommendation.	- Started pandemic planning in 2005 as required by the request by UK Cabinet Office.	- Initiated pandemic planning shortly after the release of the Canada Pandemic Influenza Plan in February 2004.
3	Pandemic Planning Organizational Structure	<ul style="list-style-type: none"> - Established Pandemic Steering Committee and Pandemic Core Planning Group in 2007. - Started pandemic specific Continuity of Operations planning at the end of 2005 with the Office of Emergency Management as the coordinator. 	<p>Made use of existing emergency planning organizational structures:</p> <ul style="list-style-type: none"> ▪ London Regional Resilience Forum to act as an overarching steering group ▪ Infectious Diseases Working Group to provide guidance of business continuity and resilience planning ▪ Local Resilience Forum 	<ul style="list-style-type: none"> - Established the Interagency Pandemic Steering Committee in the fall of 2004. - Established a Pandemic Clinical Care Committee to engage the clinical care provider groups and a Pandemic Community Preparedness Committee to work with the community to prepare for a pandemic.

⁶ London: Based on London Regional Resilience Flu Pandemic Response Plan (January 2007) and Greater London Authority Group Pandemic Flu Response Plan (July 2006)

⁷ Ottawa: Based on Ottawa's Interagency Influenza Pandemic Plan (Oct 2005) and interview with the Manager of Ottawa Office of Emergency Management in August 2007 who also reviewed the Ottawa specific information in the summary table to ensure accuracy.

	Area of Comparison	Toronto	London ⁶	Ottawa ⁷
			<p>to enable collaboration between boroughs and regional levels</p> <ul style="list-style-type: none"> ▪ Influenza Pandemic Committee to manage and coordinate local planning, response and recovery. 	<ul style="list-style-type: none"> - Utilized the Emergency Management Program Working Group (established in 2002) to create links between pandemic preparedness and emergency preparedness in general.
4	Planning Personnel	Two staff from the Emergency Management Office.	Number of planning personnel not available from published documents.	Established an Emergency Management Program Working Group for planning of all emergency risks. The Working Group consists of 2 full-time employees and one representative from each of the twelve branches/departments who act as long-term emergency planning representatives and report indirectly to the Director of OEM.
5	Planning Approach	Undertook a pandemic-specific business continuity planning and corporate response planning.	Undertook a business continuity planning and pandemic specific regional inter-agency resilience planning.	Undertook an all-hazard business continuity planning and a pandemic specific City-wide Inter-Agency Response Plan.
6	Status of Continuity of Operations Planning	<ul style="list-style-type: none"> - Received divisional inputs in identifying critical services as well as impact on the critical services. - Received divisional proposals on how to sustain critical services. 	<ul style="list-style-type: none"> - Each Greater London Authority (GLA) Group member has developed business continuity plans that identify key services to be maintained in the event of a serious disruption to services, such as a flu pandemic 	<ul style="list-style-type: none"> - Organized three case studies with multiple agencies on pandemic preparedness, response and recovery between November 2004 and January 2005. - Identified critical services and the impact on those critical services.

	Area of Comparison	Toronto	London ⁶	Ottawa ⁷
			<ul style="list-style-type: none"> - The continuity plans have been reviewed and updated as necessary. 	<ul style="list-style-type: none"> - Placed the balance of the business continuity planning on-hold until the 2008 budget cycle to request more planning resource.
7	Critical Continuity of Operations Planning Components to be Completed	<p>Examples of work to be completed:</p> <ul style="list-style-type: none"> - Complete a pandemic specific corporate response plan and corporate communication strategies; and - Review, prioritize and implement proposed actions and staffing strategies to sustain critical services. 	<p>Examples of work to be completed:</p> <ul style="list-style-type: none"> - Determine training requirements and provide training to occupational health staff and distribution staff; - Develop policy and guidance on non-drug interventions (mask, absence and sickness); - Determine Information Technology (IT) systems requirements and start to implement systems solution; - Develop confidentiality agreements for staff who will have access to personal assessment data; and - Clarify legal issues including medical indemnity and insurance. 	<p>Examples of work to be completed:</p> <ul style="list-style-type: none"> - Propose actions and strategies to sustain critical services; - Identify supply chain issues and propose actions; - Identify staffing strategies to allow for planned surveillance of infected population; and - Update IT infrastructure to allow employees to work from home on a large-scale.

	Area of Comparison	Toronto	London⁶	Ottawa⁷
8	Stockpiling	<ul style="list-style-type: none"> - Initiated actions on stockpiling personal protective equipment (PPE) and infectious control supply. - Identified \$5 million reserve fund for stockpiling materials and supplies for a pandemic. - Compiled quantities of PPE stockpiled by certain City divisions. - Issues to be addressed: warehousing options, whether to stockpile division specific supplies, centralized or de-centralized decision making on stockpiling, additional stockpiling budget, communications to divisions. 	<ul style="list-style-type: none"> - Has procured 100,000 packs of anti-viral drug Tamiflu as an emergency stock available for GLA Group staff to maintain key public services in the event of a pandemic influenza. The drug is stored in a secure warehouse in London. - Has developed strategies for assessment and distribution of the anti-viral drugs through telephone call centers and hubs. - Information on stockpiling other supplies not available 	<ul style="list-style-type: none"> - Initiated planning on stockpiling personal protective equipment (PPE). - Has yet to identify PPE stockpiling quantities and budget. - Has yet to centralize individual branch PPE stockpiling. - Will address Branch-specific critical supply stockpiling when business continuity planning resumes in 2008.
9	Pandemic Specific HR Policies	<ul style="list-style-type: none"> - Drafted pandemic specific HR policy framework. - Initiated discussions with employee unions and association. - Has yet to develop detailed and actionable HR procedures based on the policy framework 	Information not available	<ul style="list-style-type: none"> - Identified the need for a human resource pandemic response policy. - Has yet to initiate work on HR policy.

	Area of Comparison	Toronto	London ⁶	Ottawa ⁷
10	City-Wide Pandemic Influenza Coordinating Plan	<ul style="list-style-type: none"> - Has yet to complete the Corporate Response Plan. 	<ul style="list-style-type: none"> - Released first version in 2006 and 2nd version in January 2007. - The regional response plan summarizes key plans and procedures which would be activated in a pandemic emergency, gives an overview of the response, and outlines roles and responsibilities of agencies. <p>The Plan applied an “action chart” approach detailing phase-by-phase actions and outputs for organizations within the London Resilience Partnership. The actions are organized based on World Health Organization’s (WHO) 6 phase model and the UK’s 4 level alert structure for pandemic influenza.</p>	<ul style="list-style-type: none"> - Completed and released first version in September 2005 and is currently at version 1.1 - Applied a function based approach detailing who does what in various pandemic response functions, including Overall Coordination, Quarantine and Isolation, Volunteer Services, Emergency Supplies, Communications and Media, Public Education, and Psychological Support.

