

## 5. Antivirals and Vaccines

*Production facilities have to be ready to manufacture vaccines and drugs; others should be stockpiled and distributed around the country.*

John M. Barry, The Great Influenza

**Antivirals** (anti-influenza drugs) can be used to treat and prevent influenza, and will be an important disease management strategy during an influenza pandemic – particularly during the early wave(s) when vaccine is not available. We do not yet know how effective antivirals will be against the pandemic strain but, when used to treat seasonal influenza, they have been shown to reduce the length of time people are ill, symptoms and hospitalizations.

Ontario is working with the federal government to develop an antiviral stockpile that will be large enough to treat 25% of the population, as recommended by the World Health Organization. This represents the proportion of the population who will be sick enough to need antiviral treatment. Although antivirals can be used both for treatment and prophylaxis (prevention), Ontario will use its supply primarily for treating people who are ill.

**Vaccine** is the most effective means to prevent disease and death from influenza during a pandemic; however, it will take four to five months after the pandemic strain is identified to develop a vaccine so it will likely not be available for the first wave.

We do not know how effective the vaccine (once developed) will be against the pandemic strain, but vaccines for seasonal influenza usually prevent illness in 70 to 90% of healthy adults.

### 5.1 Objectives

#### Antivirals

1. To ensure the security of the supply of antivirals allotted to the PCCHU from the MOHTLC.
2. To store, distribute, allocate and administer antivirals efficiently and appropriately.
3. To monitor the safety and effectiveness of antivirals as well as any development of resistance to antivirals.

#### Vaccine

1. To ensure the security of vaccine supply allotted to the PCCHU from the MOHLTC.
2. To store, distribute, allocate and administer vaccine supplies efficiently and appropriately.
3. To monitor the safety and effectiveness of vaccine programs.

### 5.2 Antivirals

### **5.2.a. Antiviral Supply**

The federal government is responsible for approving and licensing antivirals. At the current time, two antivirals are licensed for use in Canada for prophylaxis and treatment of influenza A infections: amantadine and oseltamivir (Tamiflu®), a neuraminidase inhibitor (neuraminidase inhibitors are much more expensive than amantadine). When administered within two days (48 hours) of the onset of illness, neuraminidase inhibitors (e.g., oseltamivir) are effective in reducing length of illness, hospitalization and influenza complications. Resistance to amantadine is now well established and can develop when the drug is used for treatment during annual influenza season. The strain of avian influenza responsible for the recent outbreak strain in Asia (H5N1) is resistant to amantadine in laboratories. Another antiviral, zanamivir (Relenza™) is licensed for treatment only – and is the recommended treatment for pregnant and lactating women. A fourth antiviral, rimantadine is not currently licensed in Canada.

Because of amantadine's side effect profile and individual dosing requirement, oseltamivir (Tamiflu®) is the drug of choice for most people during a pandemic. Clinicians may consider other drugs, based on their clinical expertise and judgment. Based on consultation with chief medical officers of health, the Public Health Agency of Canada is now working with the provinces to establish a national antiviral stockpile, with a target of having enough supplies to treat 22% of the population of Canada.

Ontario has committed to maintaining a stockpile large enough to treat up to 25% of the population, and has placed orders to purchase more antivirals (in addition to its share of the national stockpile). The stockpile will consist primarily of oseltamivir, but the MOHLTC is also purchasing a supply of zanamivir to diversify the stockpile and provide appropriate treatment for pregnant and lactating women. The stockpile will be complete in 2009.

The PCCHU is working with the MOHLTC to estimate the demand for antivirals for prophylaxis and treatment. Information on the use of antivirals for prophylaxis for early treatment during a pandemic will be included in the PCCHU public education campaign.

### **5.2.b. Antiviral Storage and Distribution**

To be effective, antivirals must be started within 48 hours of the onset of symptoms; and the earlier they are started, the more effective they are. To provide timely treatment, Ontario must have an effective distribution system for antivirals. The PCCHU will implement the MOHLTC guidelines for distribution of antivirals.

During a pandemic, the Ministry Emergency Operations Centre (MEOC) will be responsible for coordinating the distribution of antivirals across the province, and public health units will be responsible for coordinating the distribution of antivirals among health care organizations at the local level.

Should a pandemic occur before Ontario's stockpile is complete, antivirals for treatment will be distributed according to the available epidemiological evidence (e.g., priority may be given to those likely to develop complications from influenza) and in accordance with the ethical framework for decision-making.

### **5.2.c Use of Antivirals**

Currently there is no evidence that putting large groups of otherwise healthy individuals on antivirals in order to prevent influenza (i.e., prophylaxis) will slow or stop the spread of a pandemic; however, prophylaxis with antivirals may play a key role in maintaining critical services (i.e., preventing infection in and providing reassurance to people caring for individuals with influenza as well as workers in critical industries) until a vaccine becomes available.

The MOHTLC has removed the priority groups from the 2006 Ontario Health Pandemic Influenza Plan (OHPIP). They are in the process of developing a provincial policy on the use of antivirals for prophylaxis based on the national policy (currently under development) and in accordance with the ethical framework for decision-making. This will help ensure a consistent approach to using antivirals for prophylaxis across all provinces and territories, which will lead to stronger public confidence and morale.

With regard to antivirals for treatment, the MOHTLC is committed to providing treatment for individuals who become ill during an influenza pandemic and will maintain an antiviral stockpile large enough to treat 25% of the population.

### **5.2.d Monitoring Adverse Effects**

Based on national recommendations, the MOHTLC will develop a mechanism to monitor adverse effects from antivirals as well as the development of antiviral resistance.

The PCCHU will monitor and track:

- Antiviral distribution and uptake
- The development of antiviral resistance in the pandemic strain; and
- Adverse reactions to antiviral drugs used.

## **5.3 Vaccine**

### **5.3.a Immunization Strategies**

As directed by the MOHTLC, the PCCHU has offered free influenza immunization to anyone in the Peterborough County and City over the age of six months with no contraindications to influenza immunization since the fall of 2000. The program, known as the Universal Influenza Immunization Program (UIIP), provides approximately five to six million doses of trivalent influenza vaccine a year.

The PCCHU will continue to actively promote annual universal influenza immunization, particularly with groups identified by the National Advisory Committee on Immunization (NACI) as being at high risk of complications from influenza. Annual influenza immunization will reduce the morbidity, mortality and demands on the health care system from seasonal influenza strains.

The PCCHU will also promote pneumococcal vaccination of NACI “high-risk” groups during the interpandemic period to reduce the incidence and severity of secondary bacterial pneumonia in people with influenza.

### **5.3.b Vaccine Supply**

The federal government is responsible for vaccine procurement and supply, including developing the domestic infrastructure, maintaining a standby supply of fertilized hens’ eggs ready to convert into vaccines, phasing in new technologies, and ensuring security of supply (i.e., via a pandemic contract). In case of a pandemic, the domestic supplier (IDBiomedical) guarantees to manufacture eight million (+/- 10%) monovalent doses, per month, for a period of four months. This will start within four to five months after the receipt of the pandemic seed strain for Canada.

In October 2001, Ontario signed a Memorandum of Understanding to participate in the Canadian influenza vaccine procurement and supply process. That agreement runs until March 2011. To immunize the entire province, Ontario would require 24 million monovalent doses (based on two doses per person, over approximately four months).

### **5.3.c. Access to Vaccine**

Each year, the National Advisory Committee on Immunization (NACI) makes recommendations (published in the Canada Communicable Disease Report) on priority groups for influenza immunization (i.e., persons who are most at risk for influenza, those who could spread influenza to persons at greatest risk). In the event of a pandemic, the Pandemic Influenza Committee, which includes representation from NACI, will make recommendations to federal/ provincial/ territorial governments on priority groups for immunization based on the epidemiology of the pandemic strain. Ontario’s goal is to obtain enough vaccine for the entire population but, during the early stages of a pandemic, vaccine will be in short supply. In this situation, the province will follow the national recommendations for priority groups for influenza immunization, adapting them as required to meet provincial needs. It will also use the ethical framework to guide the decision-making process.

The PCCHU will distribute vaccine to residents of the City and County as directed by the MOHLTC.

### **5.3.d. Distribution and Administration**

Ontario has a vaccine distribution system in place to support its Universal Influenza Immunization Program. A similar system will be used to distribute vaccine during a pandemic, with some changes. In the current system, vaccine is shipped directly to the PCCHU. The PCCHU then distributes the

vaccine to physician offices, workplace clinics, and a variety of other settings where immunization services are provided. During a pandemic, Ontario will use primarily a “Pull” strategy to ensure best use of available resources. The PCCHU will receive influenza vaccine from the MOHLTC and will organize mass vaccination clinics and people will attend these clinics to be immunized. Other vaccines (e.g., pneumococcal) will continue to be administered through current channels.

The PCCHU has adapted the MOHLTC Emergency Mass Vaccination/Prophylaxis Plan and developed Annex A: Mass Vaccination Plan for Peterborough County and City.

### **5.3.e. Monitoring Adverse Events**

The federal government maintains an adverse event following immunization (AEFI) surveillance system through the CIDPC. In Ontario, adverse events associated with influenza vaccination are reportable under the Health Protection and Promotion Act. The PCCHU enters all vaccine adverse events in the Integrated Public Health Information System (iPHIS). The information is electronically transmitted to the MOHLTC.