

Pandemic Influenza

Section 10: Laboratory Services



10. Laboratory Services

Currently, the Provincial Public Health Laboratory (PHL) is the only facility in the province that has the capability to provide influenza testing. The lab supports both public health surveillance and clinical diagnostic services. The PHL has the capacity to meet routine annual demands, and has developed additional capacity to meet the anticipated increased demands during the different phases of the pandemic.

As the provincial reference centre, the PHL will play a central and critical role in the surveillance of the emergence of the pandemic strain in the province, its early detection in the communities at large, and typing and further characterization of the pandemic virus strain. The provincial Laboratory is a partner within the National Laboratory Network and will maintain activities that are consistent with the Canadian Pandemic Plan.

10.1 Objectives of the Public Health Laboratory Services

The objectives include:

- Provide support to the hospital labs for their surveillance activities
- Detect the arrival and progression of the virus in the province
- Monitor virus strain drift and antiviral resistance
- Support clinical diagnostic practice

10.2 Interpandemic Period

During the interpandemic period, as part of the routine provincial influenza surveillance program, specimens are collected from suspect cases across the province and positive findings are reported to the hospital lab, Regional Medical Officer of Health and the Chief Medical Officer of Health (CMOH). Results are also reported to the Canadian Virus Reporting Program. Representative influenza isolates are forwarded to the National Microbiology Laboratory (NML) promptly for further characterization, and the information disseminated.

10.3 Pandemic Alert Period

During this period the PHL will increase the stock of essential reagents and supplies to meet the anticipated increased demand for testing during this time. Technologists will be cross-trained to create a built-in redundancy to ensure uninterrupted service. The PHL will provide guidelines on specimen collection, handling, submission, and bio-safety. The PHL will also establish a fan-out plan for laboratory information including emergency contact lists for hospital labs, MOHs and CMOH.

10.4 Pandemic Period

Depending on the extent and severity of the pandemic, the demand for influenza testing will far exceed the PHL capacity. It will be necessary to curtail some of the routine laboratory services provided by the PHL. It will also be necessary to limit testing of influenza specimens once the spread of the pandemic strain within the province is established. The PHL will use the services of the NML and other satellite reference centres established as part of the national laboratory pandemic preparedness plan.

10.5 Post-Pandemic Period

The PHL will review and analyse its response to the pandemic, replenish supplies and return to the interpandemic phase for surveillance and other laboratory services.

Table 10.1 – Laboratory Service Roles and Responsibilities by Pandemic Phase

| Laboratory Services Laboratory Services – Interpandemic Period | | |
|---|---|---|
| Phase 1 - No new influenza subtypes have been detected in humans. A new influenza virus subtype may be present in animals, but the risk for human infection is low | | |
| Phase 2 – New influenza subtype in animals posing a substantial risk of human disease | | |
| National | Provincial | Regional |
| <ul style="list-style-type: none">• Routine surveillance activities including strain characterization• Develop and update national guidelines for lab testing methodologies and issues relating to bio-safety, reagent stockpile, etc• Provide proficiency testing programs• Provide training in new testing methodologies | <ul style="list-style-type: none">• Routine diagnostic and surveillance activities• Develop a list of services that can be reduced or curtailed during a pandemic• Provide guidelines on specimen collection, handling, submission, and bio-safety.• Participate in national and international proficiency testing programs.• Increase the inventory of supplies and reagents to meet projected testing demands | <ul style="list-style-type: none">• Maintain specimen collection supplies for annual flu season• Develop a list of services that can be reduced or curtailed during a pandemic• Apply PHL guidelines on specimen collection and submission including bio-safety |

Table 10.1 – Continued.

| Laboratory Services Pandemic Alert Period | | |
|---|--|---|
| Phase 3 – New influenza subtype identified in at least one human case. No human transmission or rare cases of spread through very close contact only | | |
| National | Provincial | Regional |
| <ul style="list-style-type: none"> • Continue activities of previous phase(s) • Increased surveillance to ensure prompt detection of pandemic strain in Canada • Provide confirmation and strain characterization reference services • Provide proficiency testing programs to provincial labs • Ensure provincial labs have the capacity for rapid detection of pandemic strain | <ul style="list-style-type: none"> • Continue activities of previous phase(s) • Increased surveillance to ensure early detection of new virus entry in the province • Submit to NML isolates from flu cases, cases with severe respiratory illness and cases with a link to avian influenza • Assess projected needs for human resources, diagnostic supplies and reagents for scaled up activity • Participate in international and national proficiency testing | <ul style="list-style-type: none"> • Continue activities of previous phase(s) • Review and update pandemic plan as necessary • Obtain additional specimen collection and transport supplies • Submit specimens to the PHL in accordance with guidelines |

| Laboratory Services Pandemic Alert Period | | |
|--|--|--|
| Phase 4 – Localized small clusters of limited human-to-human transmission Phase 5 – Localized larger clusters of human-to-human transmission | | |
| National | Provincial | Regional |
| <ul style="list-style-type: none"> • Continue activities of previous phase(s) • Scale up testing and strain characterization services to meet increased demand • Develop and assess rapid testing methodologies to identify pandemic strain and make appropriate recommendations • Monitor anti-viral resistance and emergence of variants • Review and recommend appropriate bio-safety guidelines | <ul style="list-style-type: none"> • Continue activities of previous phase(s) • Scale up to manage increased numbers of specimens • Review inventory • Ensure all hospital labs have up-to-date information and necessary supplies for increased testing • Implement selective testing • Review, update and distribute plan as necessary including bio-safety guidelines | <ul style="list-style-type: none"> • Continue activities of previous phase(s) • Ensure information on selective testing, screening protocols and bio-safety guidelines are current |

Table 10.1 – Continued.

| Laboratory Services Pandemic Period Phase 6 – Increased and sustained transmission in general population | | |
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| National | Provincial | Regional |
| <ul style="list-style-type: none">• Continue activities of previous phase(s)• Conduct surveillance activities to track the trends of the pandemic in different regions of Canada | <ul style="list-style-type: none">• Continue activities of previous phase(s)• Initiate recommended testing methods• Redirect resources to accommodate increased demand for influenza testing, with suspension of other routine services• Review inventory and restrict influenza testing when appropriate• Assess laboratory capacity and resources and resume routine testing where possible• Forward representative pandemic strains to the NML to monitor antiviral resistance and antigenic changes | <ul style="list-style-type: none">• Continue activities of previous phase(s)• Assess laboratory capacity and resources and resume routine testing where possible |
| Laboratory Services Post-Pandemic Period Recovery | | |
| National | Provincial | Regional |
| <ul style="list-style-type: none">• Review activities; compile and analyze data and report• Evaluate response• Debrief with relevant partners• Revise pandemic plans based on review, evaluation and analysis• Return to Phase 1 | <ul style="list-style-type: none">• Review activities; compile and analyze data and report• Evaluate response• Debrief with relevant partners• Revise pandemic plans based on review, evaluation and analysis• Return to Phase 1 | <ul style="list-style-type: none">• Review activities; compile and analyze data and report• Evaluate response• Debrief with relevant partners• Revise pandemic plans based on review, evaluation and analysis• Return to Phase 1 |