HFAM Update on COVID Testing – May 13, 2020

- All our testing to date has involved PCR methods, as of today we have only one approved validated serological test for COVID IgG that was approved by Health Canada on May 12, 2020
- The primary objective for testing (given that there are no effective treatments currently) is to detect COVID cases early in the course of illness where PH case and contact management can hopefully have their greatest containment impacts, but this requires shortening to a maximum several key time periods: (i) the time from symptom onset to testing; (ii) test turn-around time and reporting of results; and (iii) time to PH contact of positive reported cases
- The bulk of testing in Hamilton is being done via Regional PH Lab and HRLMP (Hamilton Regional Laboratory Medicine Program), but dozens of other labs assisting with the provincial COVID PCR testing network, not all of them with publicly available performance metrics, namely sensitivity, specificity and positive/negative predictive values
- PCR detects COVID RNA gene sequences, can be quantitated as a measure of viral load but can't assess infectiousness
- The US CDC last week reported further data on viral infectiousness that is estimated to be zero nine days after symptom onset, even though PCR positivity can persist for days if not weeks

What about False positives and negatives?

- PCR false negative results are a concern, especially related to timing of testing in relationship to the incubation period as well as the adequacy of samples via different testing methods; false positive results due to reagent contamination have been a recent local experience, as well as an inescapable fact where the specificity of PCR testing is estimated to be less than 100%

Where is the testing currently happening?

- We have multiple venues for testing within Hamilton, especially our assessment centers, hospitals, LTC outbreak and mass testing, EMS mobile testing and shelters/homeless population testing outreach initiatives

Who is being tested now?

- In Hamilton's early pandemic response our first phase of testing was limited to high priority groups with classic COVID symptoms; it served us well initially during times of lab capacity concerns, but was focused on returned travellers, COVID cases/contacts, hospitals and those with more severe illness
- The opening of the Hamilton east and west assessment centers was fundamental to access to testing and our evolving understanding of the local COVID epidemiology
- However, we were likely underestimating to a significant extent the true degree of community transmission not linked to travel or confirmed COVID cases
- In the latter part of April we expanded the testing criteria to a broader range of COVID symptoms and group eligible for testing, with access being further expedited by opening the drive-through testing facility, improving on our understanding of the local epidemiology but reducing but not eliminating concerns with under-detection of all cases across the community
- The recent weeks of mass testing in LTC facilities have placed huge demands on the local PH and regional/provincial lab systems, have slowed at times markedly turn-around times and have not

resulted in important, actionable PH findings, e.g. LTC outbreaks having to be declared where one or two asymptomatic positive staff are found, where there is no evidence of resident transmission and the facility is already fully compliant with all IP&C measures

Where are we now, where are we going?

- We hope there are no further mass testing demands, especially in retirement homes, as this would be another massive, time- and resource-consuming effort of uncertain benefit
- We need to allow our regional and provincial PH lab systems to calm and re-calibrate and await the next provincial guidance as to testing priorities, which will hopefully emphasize testing all who are symptomatic as quickly as possible
- We need to focus on our existing testing infrastructure and further broaden access to all with appropriate symptoms, re-doubling our efforts to ensure timely access, quick turn-around times and timely, comprehensive PH case and contact follow-up
- We need to plan for increased access to testing, especially through physician offices and commercial lab specimen collection centers, something that can hopefully be expedited by emerging data on acceptability and performance of deep nasal vs. NP swabbing and the IPAC measures to ensure specimen collection does not pose untoward health and safety risks
- We need to advocate for reducing the required period of isolation from 14 to 10 days and seriously examine how were are supporting individuals and families who are required to self-isolate
- All of this will improve upon our case detection and containment efforts, our epidemiologic intelligence especially within the broader community and our ability to detect and respond to early evidence of a pandemic wave 2
- We need to be mindful that there are no easy ways to carry out community-wide surveillance using PCR technologies, especially trying to identify as many asymptomatic cases as is possible, due to limitations in the sensitivity/specificity of the tests, acceptability of the testing methods and the requirement for self-isolation for all positives
- However, there may be ways to use carefully planned cluster sampling to understand emerging epidemiology, especially as we move out of wave one into an inter-wave period and try and identify early the expected wave two
- Serological testing, especially if this is done with careful definition of the sampling frame, adequate local numbers and serial vs. one-time sampling efforts, will vastly improve upon our understanding of COVID epidemiology, especially the prevalence, demographics and duration of immunity, but we're not there yet
- Serological testing will unlikely be an aid to diagnosis of acute infection

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