Memorandum

CL-C 20-2020

Subject: Response to Further Questions Regarding Universal Testing Proposal

Date: May 20, 2020

To: Board of Health (Regional Council)

From: M. Mustafa Hirji, Medical Officer of Health & Commissioner (Acting)

Subsequent to the presentation entitled "The Need for COVID-19 Testing in Niagara" at the May 12, 2020 Public Health & Social Services Committee, there have been several questions from Councillors seeking additional details and context. To provide consistent information to all Councillors in case of further debate around this item, I have been requested to prepare this memo summarizing those details and context.

The presentation dealt with three interrelated issues:

1. Establishment of a screening laboratory in Niagara
2. Pursuit of a universal screening strategy of testing every Niagara resident every 100 days
3. Undertaking "tracking" of positive results, which I understand to mean case and contact management, including contact tracing

I will address the questions and context around each of these in turn.

1. Establishing a Screening Laboratory in Niagara

Several questions have concerned the **mechanics of testing**, and **how testing is organized** in Niagara and Ontario.

How Testing is Organized in Ontario

Consistent with our federal system of government, public health responsibilities are held by federal, provincial and local public health authorities. With respect to COVID-19 testing, responsibilities break down as follows:

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Federal	• Licensing of tests permitted for use in Canada • National reference laboratory o Calibrates testing across the country
Provincial	• Licensing of laboratories to perform testing • Provincial reference laboratory o Assessment of federally licensed tests for use in licensed provincial laboratories • Organization of a laboratory network to perform public health testing • Setting of provincial testing guidelines
Local	• Working with local health care partners to implement testing guidelines

As can be seen, most responsibility for testing is a provincial responsibility, and local public health has no role in establishment, operation, nor approval of laboratories for COVID-19 testing.

How Testing is Administered

Individual health care practitioners can order testing for COVID-19. Most testing, however, is done within provincially-funded but locally-run assessment centres. This is because of the difficulty of acquiring collection materials and personal protective equipment to do testing. Whichever health care provider is ordering testing will collect a sample and submit it to their local laboratory.

Local laboratories will forward testing to the provincial COVID-19 testing network, if not already part of that network. Upon intake of samples, the provincial agency, Ontario Health, centrally routes testing to where there is capacity to ensure the fastest possible turn-around time for a result. Tests being done for an outbreak or for hospitalized patients are prioritized. Overall, 60% of tests are targeted for completion within 24 hours and 80% within 48 hours.

Positive results must be reported to the local public health agency of the patient for case and contact management. Negative results can be accessed by patients online or through their health care provider.

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Accreditation & Licensing

A couple of questions posed pertain to the **process for accreditation and licensing** of a laboratory. As local public health has no involvement in accreditation or licensing, we do not have knowledge of the details of this process. Accreditation is done by the Ontario Medical Association Quality Management Program—Laboratory Services, and assesses the quality and competence of a laboratory. We believe accreditation is one of the minimum qualifications to apply for licensure. Licensing for COVID-19 testing likely also requires using an approved test and demonstrating sufficient reliability and accuracy of testing on a proficiency panel. The Ministry of Health's Laboratories & Genetics branch handles licensing for COVID-19 testing, on recommendation of the Office of Chief Medical Officer of Health. Those offices would need to be contacted to understand the process further.

As we have no experience with laboratory licensing nor accreditation, we again cannot comment in detail on timelines needed. We assume it would take several months given accreditation timelines elsewhere in the health sector. Licensing has taken 1-2 months for most established laboratories in the COVID-19 testing network.

We similarly can't answer question about staffing needed in detail. A laboratory doing virology would typically require some physicians with speciality training in medical microbiology, as well as lab managers, lab technicians, customer service personnel, and data management staff. As we have no experience operating or establishing a laboratory, we can't comment on numbers that might be needed.

Competing Proposals

As to whether Public Health is aware of **other proposals to develop a laboratory**, Public Health has heard from three other parties interested in engaging in laboratory testing for COVID-19. Public Health has no role in laboratory testing, therefore we have provided contacts at the provincial level for follow-up around their proposal.

It should be noted that given Regional bylaws and policies around neutrality with respect to supporting external businesses, Public Health would never support a private sector proposal absent an open competition, an objective evaluation of competition proposals, and a neutral party's blinded selection of a preferred proposal.

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2. Pursuit of a universal screening strategy

Appropriateness of the South Korea Comparison

Since the proposal highlights South Korea as the model for the testing strategy proposed, it has been asked how appropriate that comparison may be.

South Korea has undoubtedly had significant success in containing their COVID-19 outbreak, and we at Public Health do believe we should be studying them carefully to learn lessons from their success, noting that Niagara has different culture and geography, as well as a different experience with COVID-19, so not all lessons may apply here.

As the proposal points to South Korea's testing strategy, it is instructive to look at it.

The [South Korea (Republic of Korea) Centre for Disease Control](#) explains their testing eligibility as follows:

> ○ In accordance with the case definitions provided for in these guidelines, patients classified as suspected cases and Patients Under Investigation (PUI) may get tested.
>
> ○ There is no need to get tested out of simple anxiety. We ask that you trust the expert advice of your physicians.

Suspected Cases	A person who develops a fever or respiratory symptoms (coughing, difficulty breathing, etc.) within 14 days of coming into contact with a confirmed patient
Patients Under Investigation	① A person who is suspected of having the COVID-19 virus as per doctor's diagnosis of pneumonia of unknown causes.
	② A person who develops a fever (37.5℃ and above) or respiratory symptoms (coughing, difficulty breathing, etc.) within 14 days of travelling overseas

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Suspected Cases	A person who develops a fever or respiratory symptoms (coughing, difficulty breathing, etc.) within 14 days of coming into contact with a confirmed patient
	③ A person with an epidemiologic link to a collective outbreak of COVID-19 in Korea and develops a fever (37.5℃ and above) or respiratory symptoms (coughing, difficulty breathing, etc.) within 14 days.
Source: Response Guidelines for Coronavirus-19 (edition 7-4), Central Disease Control Headquarters, as of April 3, 2020	

As can be seen, South Korea's testing eligibility is significantly more restrictive than our testing eligibility in Niagara, where anyone with a single mild symptom that is plausibly due to COVID-19 should be tested.

If we look at the correlation of cases of COVID-19 per capita against testing per capita (figure 1, next page), we see that more testing does not correlate to fewer cases. In fact, less testing correlates to fewer cases. This implies that case volume drive a need to do more testing (as more people get ill and need to be tested) rather than testing driving some way of stopping cases.

It is a mistake to attribute the success of South Korea in managing COVID-19 to testing. That narrative reflects a US-centric perspective where the US failed to roll-out adequate testing, and continues to struggle to test all persons who are ill and need testing.

The true lesson of South Korea is that the challenge posed by COVID-19 is complex, and there is no simple single solution like universal testing that will lead to it being contained. South Korea's success has had to do with early action on a large suite of measures: restrictions on border crossings, strong voluntary physical distancing, preventing anyone with mild illness from working, well-resourcing the public health system, a coordinated hospital sector, intense government surveillance of people's movement, universal masking in public, early roll-out of testing, strong capacity for case management and contact tracing, and heavy fines for those who violate public health advice. It is an intense area of study currently to understand which of these measures had the most impact in South Korea so that they can be adopted in Canada as well.
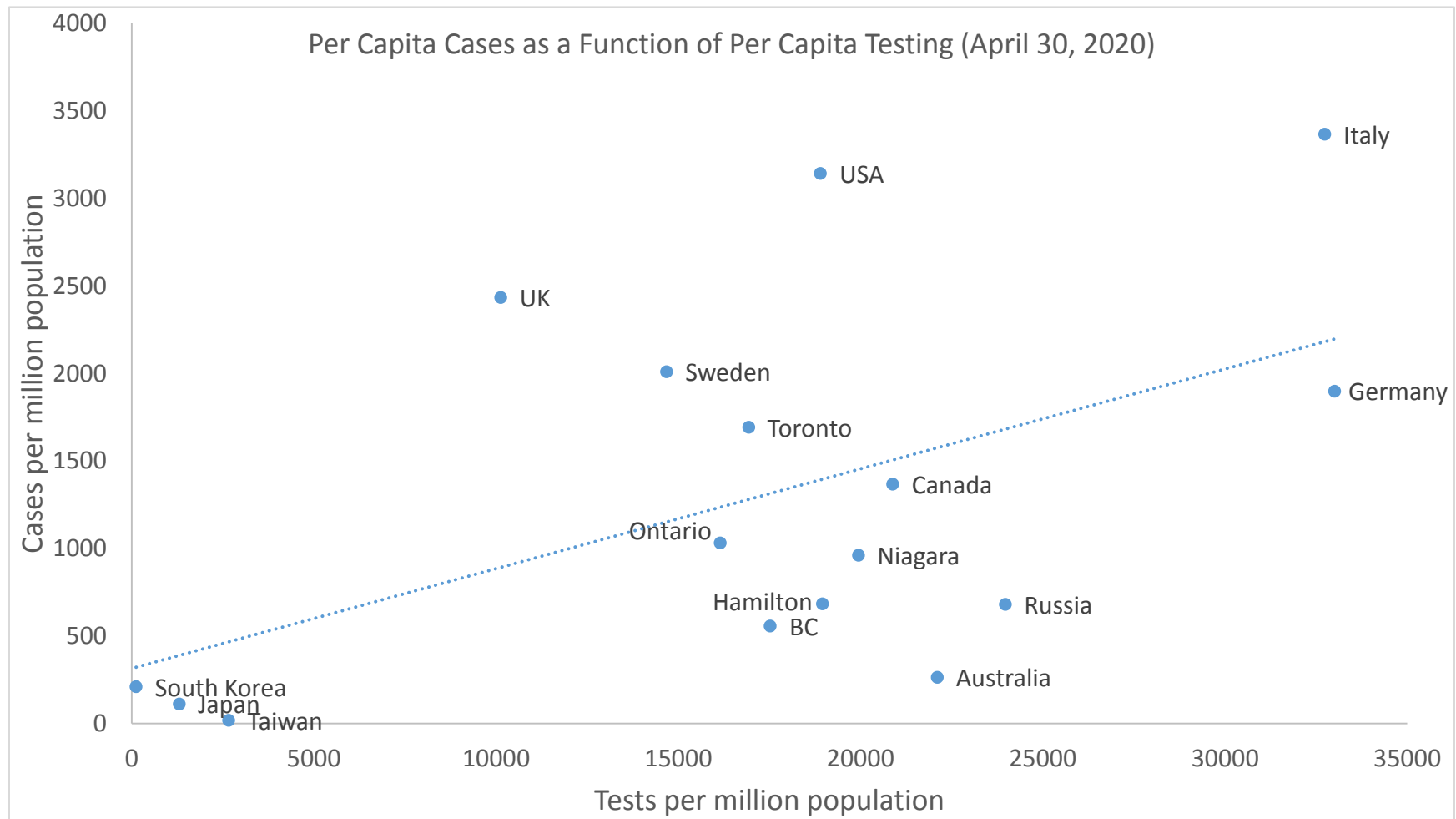
Per Capita Cases as a Function of Per Capita Testing (April 30, 2020)

Figure 1. Per capita cases as a funciton of per capita tests on April 30, 2020. This graph shows that better outbreak control (fewer cases) correlates with less testing, not more testing. Niagara's position to the right of the trendline means Niagara is testing on avareage disproportinately more than its case count would expect. Sources: Ontario Ministry of Health, OurWorldinData.org, ICES, COVID-19 Laboratory Testing in Ontario

What is an Adequate Level of Testing?

As figure 1 illustrates, there is likely not a certain level of testing per capita that should be the threshold, but that it is highly dependant on the local context of the outbreak. With more circulation of infection and more cases, there needs to be more testing per capita.

Likely the best marker of whether testing is adequate is not going to be a single statistic. Rather it will be whether health care providers and public health organizations are able to test everyone they consider to need testing.

Since late March, health care providers and Public Health have experienced no barriers in sending people for testing. Since early April, Public Health has been recommending that anyone with any mild symptoms should get tested, and there have been no challenges in getting all those people tested. In particular, Niagara's assessment centres are currently operating at a fraction of their capacity with ability to perform much more testing. Currently the limiting factor to testing is the number of people reporting symptoms and needing testing. This implies there is currently adequate testing.

Public Health's Perspective on Universal Testing

The consensus of public health officials around the world is that universal testing, while perhaps superficially attractive, is an ineffective and likely harmful public health strategy. There are a few reasons for this:

1. **False positives**. Medical testing has some uncertainty and there are no perfect tests. When one has suspicion of illness (e.g. because of symptoms) one can be reasonably confident that a patient who tests positive has illness. When testing large numbers of people with no suspicions of illness (i.e. low probability), one can expect false positives. For example, a test that is 99.5% accurate would generate 25 false positives a day in Niagara. This would distort local understanding of COVID-19 in the community, distract contact tracing efforts, and force 25 people and their many contacts to suffer through being isolated and living with the anxiety that they may have COVID-19.

   False positives are not a theoretical risk. The mass surveillance testing of long term care homes recently completed in Ontario yielded 10 false positive cases in Hamilton that needed to be publicly retracted after further investigation. Investigations are currently underway in Niagara around several possible false positive results from this mass testing as well.

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2. **Point in Time Measure**. A test is a point in time measure. Someone can have a test done one day and test negative, and become ill a day later. Indeed, we have seen examples of people who are sampled for testing and are asymptomatic, and before that test result even comes back (and comes back as negative) they develop symptoms. When re-tested, they are now positive. Testing every 100 days, as proposed, will leave 100 days in between when people may become ill—approximately 15 generations of illness can occur in that time.
For a better known example, The White House now has 3 confirmed cases of COVID-19 despite all employees being tested regularly.

3. **Burden on Health Care Capacity**. Test samples must be collected by a health care provider, after a health assessment by the provider that it is safe to test a person. Results must also be communicated by health care providers. Having front-line health care providers do universal testing will pull them away from providing front line care in our hospitals and long term care homes which are under stress.

4. **Supply Shortages**. During the three weeks in March when Ontario struggled to do testing, it was because of global shortages of materials for testing, given that the entire world is competing for those same materials. Fortunately, Ontario now has sufficient materials to conduct needed testing. However, if such materials are expended on universal testing, Ontario and Niagara might soon experience shortages again. That would put us in a situation similar to the US where minimal needed testing can no longer be done.

5. **False Sense of Security**. Some evidence shows that persons who are tested when asymptomatic generate a false sense of security, and are at higher risk of illness thereafter. We've recently seen the US Vice-President not wear a mask while touring a hospital, justifying it because he has tested negative.
In Niagara, about a dozen persons have been tested when asymptomatic, and then later developed infection. On average, they became infected 6.5 days later. That implies a false sense of security and heightened risk-taking immediately after testing negative.

Frequency of Universal Testing

Regarding questions around doing tests every 100 days, as noted above, likely much infection will be missed between tests.

Some research has been done on the frequency of testing needed for a universal testing strategy to be viable to control COVID-19, in particular by a Canadian research

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group[1]. They concluded that testing of the entire population would need to occur every 36 to 48 hours. If testing of the entire population occurred less frequently than every 48 hours, we would experience a large, out-of-control outbreak that overwhelms the health care system, unless other aggressive measures including physical distancing and limiting economic and social life are instituted.

Logistics of Testing All of Niagara in 100 Days

Questions have pertained to how realistic or possible it is to do such widespread testing. Unfortunately, it is difficult to comment without a detailed proposal.

The proposal and discussion at PHSSC outlines testing 5,000 per day at 50 sites which would require 100 test per site, or a test every 5–7.5 minutes. It should be remembered that likely not all persons can be tested this quickly. While physical well clients can be tested in that timeline (e.g. current drive through testing options in Niagara), those with more complex medical situations require a longer appointment. As well, testing is not just a matter of collecting a sample, but also putting on appropriate protective equipment, doing a health and risk assessment, completing a laboratory requisition, compiling everything into a biohazards safe package for distribution to the lab, carefully removing and disposing of protective equipment that may not be contaminated, and disinfecting the space before the next patient (not needed for drive-through options). Likely multiple providers would be needed per site to facilitate that rate of testing. However, that rate is certainly possible if enough health care providers and enough suitable locations could be found.

3. Undertaking Case & Contact Management

How Contact Tracing Works

Contact tracing is a part of contact management, specifically the part of identifying and finding contacts. Fulsome contact management also involves a risk assessment of the contacts, providing health protection advice based on that risk-assessment, supporting contacts in following public health advice (e.g. if someone must isolate, enabling them to get groceries and necessary means of living; potentially helping them find a safe way to isolate from family members), and providing general health advice around the illness of relevance.

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[1] L. Humphrey,E.W. Thommes, R. Fields, N. Hakim, A. Chit, M.G. Cojocarua. "A path out of COVID-19 quarantine: an analysis of policy scenarios". Pre-print. as granted medRxiv a license to display the preprint in perpetuity. medRxiv preprint doi: https://doi.org/10.1101/2020.04.23.20077503. April 29, 2020.

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Contact tracing is closely tied to case management in that when interviewing a new case as part of case management, after determining what the infectious period was based on the clinical course of illness, a detailed review is undertaken to understand whereabouts and contacts during that infectious period. Professionals doing contact management must use many interview techniques to help jog memories and ensure completeness of information collected. As well, sharing all the details and intimate contacts during a period of time to an unknown person over the phone requires building a high level of trust and ensuring a person believes their privacy will be absolutely protected.

Once contacts are identified, a preliminary risk assessment is completed, and then the contact is reached. Through interview with the contact and understanding the interaction between them and the case or the potentially contaminated environment, the risk assessment is updated, and advice provided accordingly. For those at relatively higher risk, Public Health follows the client daily to ensure the person does not become ill, and to provide ongoing support during a time when people may feel great anxiety about the risk of illness and/or struggle through some hardships, for example, if they are isolated.

Which Professionals do Contact Tracing

Contact tracing is a competency of Public Health Nurses, Public Health Inspectors, and occasionally epidemiologists, though the latter cannot usually do the broader linked activities of case management and contact management. Qualifications for these roles are outlined in *Revised Regulations of Ontario 1990, Reg. 566: Qualifications of Boards of Health Staff* and Ministry of Health protocol *Qualifications for Public Health Professionals Protocol, 2018*. Qualifications exceed those of a registered nurse or inspectors in other fields.

Obviously, given the surge of public health activity with respect to COVID-19, virtually all Public Health Nurses and Public Health Inspectors have been employed. Registered nurses who are eligible to become Public Health Nurses are also in high demand given interest by public health, hospitals, long term care, and other health care institutions.

Respectfully submitted and signed by

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