LabCANDx

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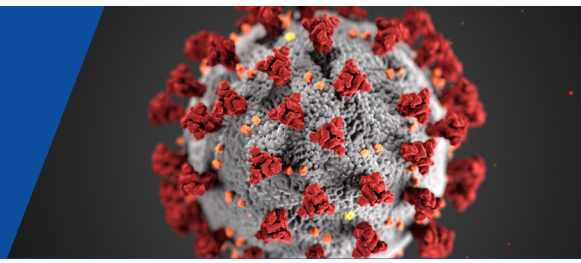
LABORATORY MEDICINE:

Critical to Managing Through the **COVID-19** Global Pandemic and Economic Recovery



COVID-19 (SARS-CoV-2) is a respiratory disease associated with endothelialitis and microthrombosis[1] and is the largest global pandemic since the Spanish Flu in 1918.

- Initial cluster of cases of COVID-19 reported in Wuhan, China in January, 2020.[2]
- First Canadian case of COVID-19 was reported by Health Canada on January 25, 2020.[3]
- Global COVID-19 pandemic was declared by the World Health Organization on March 11, 2020.[2]

Millions of people around the world have been infected with COVID-19, resulting in serious illness and death. Individuals with moderate to severe illness requiring hospitalization have severely stressed the healthcare system.

	Canada	Global
COVID-19 cases	1,202,737†	150,734,026*
COVID-19 related deaths	24,117†	3,170,401*

† Numbers as of April 29, 2021
Sources: https/www.worldometers.info/coronavirus/ and https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html

COVID-19 Timeline

FALL 2019

COVID-19 emerging[4]

WINTER 2020

WHO declares public health emergency[2]

Companies and public labs develop diagnostic tests

SPRING 2020

Pandemic declared[2]

First commercial PCR test developed

SUMMER 2020

First wave subsides[4]

Different testing platforms developed

Building lab-based testing capacity

FALL 2020/WINTER 2021

Second and third wave[4]

Approval of different tests and platforms from various suppliers

Building lab-based and point of care testing capacity

Testing for COVID-19

- Rapid diagnosis of symptomatic patients and identification of asymptomatic infectious individuals could have potentially reduced the scope of the pandemic.
- Initially, no diagnostic tests were available.
- Development of accurate testing methods began in January before the pandemic was declared.
- Highly sensitive tests could have facilitated the earlier detection of influenza and/or COVID-19, permitting appropriate and timely medical management and a reduction in transmission.[5-8]

A number of Canadian laboratory medicine accomplishments over the year since the pandemic was declared are noteworthy:

3 TESTS DEVELOPED — Three types of tests for COVID-19 were developed.

<1 MONTH — The first COVID-19 tests were developed in less than one month.

31M+ TESTS COMPLETED — Over 31,173,221 individual tests have been conducted in Canada.[9]

For more information contact **LabCANDx@gmail.com**

Three categories of COVID-19 tests have been developed

Test Type Category	What is Tested	Primary Purpose	Sampling Methods	Setting	Scalability*
Antigen	Viral proteins	• Presumptive diagnosis • Screening	• Nasal/nasopharyngeal swabs	Point of care	+++
				Central or Hospital Laboratory	+++
PCR or Nucleic Acid	Viral Genetic Material	• Diagnosis • Screening	• Nasal/nasopharyngeal swabs • Saliva sample	Point of care	++
				Central or Hospital Laboratory	+++
Serological (Antibody)	Antibodies to SARS-CoV-2 (COVID-19 Virus)	• Epidemiology	• Blood sample	Point of care	-/+
				Central or Hospital Laboratory	+++

Note: Point of Care means the technology can be used in decentralized settings (i.e. doctors' offices, pharmacies, clinics, schools, workplaces)
***Scalability refers to the capacity to adapt to changes in demand.**

Development of diagnostic tests for COVID-19 delivers on the ***Quadruple Aim***

Improve patient outcomes

- Technological advancements in testing will reduce costs and turnaround times for results.
- von Willebrand factor antigen is a predictive factor for in-hospital mortality in patients with COVID-19 and is believed to drive microthrombosis in COVID-19.[1]
- Early and rapid diagnosis of this disease will help in early management of patients.[10]

Improve health of general population

- The Canadian government identified optimizing diagnostic capacity with lab-based PCR testing and deploying rapid tests for screening to reduce the prevalence of infections and protect Canada's most vulnerable populations.[11]
- More vigorous testing strategies, including screening and more frequent testing, could enable more rapid identification and isolation of COVID-19 infected individuals, leading to better management and control of the pandemic.[13]

Improve healthcare sustainability

- The Canadian government identified optimizing diagnostic capacity with lab-based PCR testing and deploying rapid tests for screening to limit the impact of the disease on the health care system and the economy.[11]
- Expanded testing approaches allow proactive response (including asymptomatic individuals) and would lead to more robust and comprehensive solutions to COVID-19 management and control. [12]

Improve care team well-being

- Health care team well-being is linked to patient experiences.[4]
- Having a selection of tests can give clinicians confidence to select the best test for the patient and allow clinicians to efficiently manage the disease.

Laboratory medicine has developed a toolbox of tests and testing strategies to help manage and control the pandemic and drive economic recovery.

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