



Next time, we **must** do better

**BUILDING CANADIAN CAPACITY
FOR PANDEMIC RESPONSE**



EXECUTIVE SUMMARY

The threat...

DISEASE X

In 2018, Disease X was first listed on the World Health Organization's list of priority pathogens. It represents a pathogen currently unknown to cause human disease which could cause a serious international epidemic.

COVID-19 is the first example of Disease X.

DEATHS IN CANADA FROM 2000

	2001 SARS	2009 H1N1	2020-PRESENT COVID-19	DISEASE X** (20??)
INFECTIONS	438	51,800	4,625,700+	?
DEATHS	44	428	51,800+*	?

*Does not include deaths due to delays in access to medical care for other conditions.

** A pathogen currently unknown to cause human disease that could cause a serious international epidemic. Source: The Canadian Encyclopedia and Government of Canada COVID-19 epidemiology update: Key updates (March 20, 2023)

COSTS OF COVID-19

\$517.4 BILLION
FEDERAL SPENDING

\$17.6 BILLION VACCINE PROCUREMENT

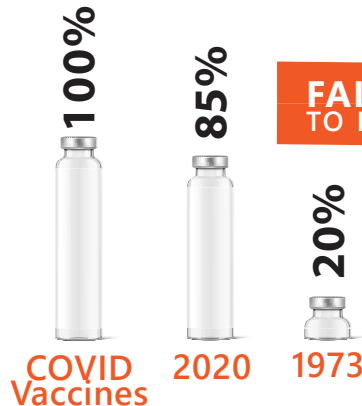
\$51.5 BILLION HEALTH & SAFETY MEASURES

\$450 BILLION FINANCIAL SUPPORT

600,000+
DELAYED SURGERIES

40,000+
EXCESS DEATHS

DEPENDENCY ON IMPORTED VACCINES



VACCINE HOARDING

SCALE OF OUTBREAK
HIGHER MORTALITY RATE
reliance on **other** countries
export restrictions

Our response...

WE MUST IMPROVE OUR BIOSECURITY...

COVID-19 showed how quickly a novel virus can spread and the risk that such spread poses to vulnerable populations, food security and economies when we don't have effective countermeasures. At present there are ten pathogens that have been identified by the World Health Organization ("WHO") as being priorities for research as they pose a significant risk to public health due to their potential to create an epidemic and the lack of countermeasures to control an epidemic. This list includes Disease X, which represents a pathogen currently unknown to cause human disease which could cause a serious international epidemic. COVID-19 was the first example of Disease X.

While we were ultimately successful in controlling the COVID-19 pandemic, it came at a significant financial and social cost. It is imperative that we reduce the risks posed by future pandemics by improving our ability to identify threats, and develop diagnostics, vaccines and therapeutics.

The Government of Canada recognizes that we must be better prepared and has committed \$2 billion to developing biomanufacturing capabilities over a four to seven-year period. Many of the planned investments are in infrastructure to develop capacity. Developing capabilities requires using the infrastructure we have and engaging in ongoing research so our scientists are at the leading edge and have the experience necessary to develop effective countermeasures.

THE ROLE FOR PHILANTHROPY

Philanthropy has an important role to play in complementing the investments that are being made by government and industry in pandemic preparedness. Philanthropic organizations are not tied to demonstrating outcomes over an election cycle or to shareholders with a need to see short-term returns. This means they can be more visionary and are able to invest in areas of research that have longer or uncertain time horizons, which could be difficult for government or industry to justify as the memory of the pandemic fades. Philanthropy can provide seed funding for the initial stages of research that produces the type of results that leads to further investment by government or industry. It can also be leveraged to obtain additional funding from government or industry.

WE HAVE A WORLD LEADER IN INFECTIOUS DISEASE RESEARCH WITH A HISTORY OF SUCCESS

MNP reviewed Canada's pandemic preparedness infrastructure, including recent investments in our biomanufacturing and life sciences. The review found that the Vaccine and Infectious Disease Organization ("VIDO") played an important role in Canada's response to COVID-19 and is well-positioned to play a leading role in making sure we are ready for the next pandemic when it happens.

VIDO is a world leader in infectious disease research and plays an important role in protecting Canada from biosecurity threats. It focuses on understanding how infectious diseases progress and spread; developing novel vaccines for diseases that lack effective control mechanisms; and enhancing vaccine development platforms to speed up the creation and approval of effective vaccines.

Why VIDO?

VIDO'S STRENGTHS INCLUDE

INFRASTRUCTURE. VIDO's state-of-the-art infrastructure has been developed over 45 years in response to the needs of its constituents. Its available infrastructure includes containment level 1 through 4 laboratories. This specialized infrastructure is required to work with various organisms and reduces the risk of unintentional exposure or release of pathogens. VIDO has one of only a few containment level 4 facilities in North America that have the capability of working with large animal models. The ability to work with large animal models is important to accurately predicting vaccine outcomes in humans.

A RESEARCH MODEL THAT FOCUSES ON THE NEEDS OF ITS STAKEHOLDERS. This results in outputs that address specific problems and can be commercialized. Since its inception VIDO has developed eight vaccines that have been commercialized and two that are in the process of being commercialized. This model means that VIDO will be developing the capabilities to respond in a pandemic, while providing important contributions during non-pandemic times and building sustainable funding streams for its activities.

DEVELOPING ANIMAL MODELS NEEDED FOR VACCINE DEVELOPMENT. Prior to entering human clinical trials vaccine candidates are assessed for vaccine safety, immune response, and protection using animal models. VIDO has developed unique expertise in developing animal models for this purpose and has some of the largest facilities in the world to test new medicines.

ABILITY TO ATTRACT AND RETAIN LEADING SCIENTISTS. VIDO's reputation, infrastructure and success means it is attracting leading infectious disease scientists to Canada to assist with our pandemic preparedness.

IT HAS STARTED WORKING. While other organizations are building infrastructure and developing research centres, VIDO's scientists are working on infectious diseases, including priority pathogens. It has the infrastructure to work with any pathogen and is building on its experience developing COVID-19 vaccines to be able to manufacture human vaccines.

FOR VIDO TO PLAY A LEADING ROLE IN PREPARING FOR THE NEXT PANDEMIC REQUIRES INVESTMENT TO ENSURE THAT IT HAS SUSTAINED FUNDING TO ENGAGE IN RESEARCH TO CONTINUE TO DEVELOP ITS CAPABILITIES.

VIDO'S NOTABLE ACHIEVEMENTS INCLUDE:



First Canadian organization to isolate SARS-CoV-2 (i.e., COVID-19).



Awarded \$6 million to develop vaccines that are broadly protective against COVID-19 by the Coalition for Epidemic Preparedness Innovations.



Established itself as an internationally recognized research facility that attracts talent from around the world.



Training over 1,000 highly skilled scientific and technical personnel and providing training to 165 individuals in working safely in containment level 3 environments.



Investment in containment infrastructure to allow researchers to work with all pathogens.



Investment in a vaccine manufacturing facility that meets Good Manufacturing Practice standards and allows it to manufacture both human and animal vaccines.



Development of eight commercially available vaccines for livestock, six of which were world firsts.