
BEYOND COVID-19: PLANNING FOR THE FUTURE

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History has demonstrated that, even with the ability to control many diseases by vaccination or antimicrobial therapy we will continue to experience new or re-emerging diseases. Over the last 30 years there have been 30 new emerged or reemerged diseases, both viral (such as Ebola) and bacterial (such as E.coli). We can expect more epidemics as severe or even more severe in the future. Thus, we must plan ahead and be well prepared to respond quickly.

To do so Canada needs to ensure that we have the infrastructure and people to respond quickly so as to reduce the economic and societal costs. Part of this response is to ensure that our physicians are well trained in the concept of one-health, which links human and veterinary medicine within an environmental context. In the middle of the 20th century, universities had Schools of Public Health that placed Medical and Veterinary doctors in the same environments. The ambition was to train physicians in the concept of one-health , which links human and veterinary medicine. Beginning in the 60's these Schools began to be dismantled. Pandemics illustrate the importance of recognizing these links and fortunately some universities are slowly returning to this concept: a trend that should be encouraged as a one-health focus will be critical.

Fortunately, the Canada Foundation for Innovation (CFI), in partnership with other funders such as Provincial governments, has provided significant resources to establish a number of unique and well equipped facilities across the country that are able to respond quickly. One example is the Vaccine and Infectious Disease Organization (VIDO-InterVac), currently Canada's largest Level 3 biocontainment facility and amongst the best in the world, which was the first laboratory to isolate the COVID-19 virus from a Canadian patient. Since,over 70% of new emerging diseases are zoonotic – transmitted between animals and humans, having such a facility is critical to study the diseases in natural animal models (one health focus) before initiating human clinical trials of new vaccines and therapeutics. Canada must continue to support such facilities to ensure the resources are available to respond to new outbreaks.

Institutes like VIDO-InterVac , interact extensively with other researchers and biopharmaceutical companies to rapidly advance our knowledge of the disease processes and potential treatments (both vaccines and antivirals). In addition to strong research institutes in Universities we also need strong support for our federal government facilities, such as the National Institute for Microbiology (NML) , a Public Health Agency of Canada (PHAC) laboratory facility in Winnipeg where a strong fundamental research culture is linked to a diagnostic mandate. Now we need to expand this culture and mandate to the activities of the National Center for Foreign Animal Disease (NCFAD) division of the Canada Food Inspection Agency (CFIA) from focusing mainly on diagnostics to expand and embrace a similar focus that the NML is doing. Their co-location in the same building in Winnipeg also fosters collaboration between both institutes to link the animal and human domains required for addressing these zoonotic diseases (one health concept). We have seen some nationalism in the current pandemic with some countries threatened to limit exports of needed supplies to other countries. Thus, Canada needs to continue to

support GMP licensed facilities such as the Ottawa Hospital Biotherapeutics Manufacturing center, the Alberta Cell Therapy Manufacturing (ACTM) center as well as the National Research Council facility in Montreal. Currently it is not possible to know whether nucleic acid, inactivated, subunit or vectored vaccines will be the best for any specific disease it is critical to test various types. Since each facility can only produce one type of vaccine at a time it is critical that we have different ones that can develop and test different configurations of the vaccine. Furthermore, unfortunately, even with the best facilities one cannot immediately produce the quantities needed to vaccinate the entire Canadian population in the face of a pandemic. Therefore, we must plan on how we decide who will get the vaccine first: will it be health care workers, essential service providers, elderly etc.? These are the questions that must be addressed as we plan for the future.

Finally, we need to support the Canadian Center for Vaccinology clinical trials unit in Halifax where these new vaccines can be tested in humans. Support must continue, indeed be enhanced, in all areas to ensure our ability to respond in the future and train the next generation of researchers, clinicians and managers to be part of the rapid responders.