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►► COVID-19: We Have a Vaccine, Now Comes the Hard Part

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One can safely assume that most, if not all people, will agree that 2020 has certainly been a difficult year. As of December 7, 2020, the world has reported almost 67 million cases of COVID-19, including more than 1.5 million deaths¹. That represents a death rate of about 2.3 per cent of cases and an infection rate of a little less than 1 per cent of the world's population of 7.8 billion. Actual case loads may be much higher, since not all countries report with the same accuracy and not all cases are identified as many individuals remain asymptomatic even when infected with the virus.

Recent news provides a ray of hope in the arrival of approved vaccines that appear to be effective in preventing COVID-19 infections and/or in reducing the severity of symptoms in those who are infected. These vaccines encourage hope that both infection rates and death rates can be reduced in the fairly near future.

Pfizer and BioNTech have received approval for their vaccine and have begun distributing it in Great Britain. Both AstraZeneca/Oxford University and Moderna appear to have approvals for their vaccines on the near horizon. Other vaccines are also in development and/or testing phases and may also prove to be effective against the pandemic².

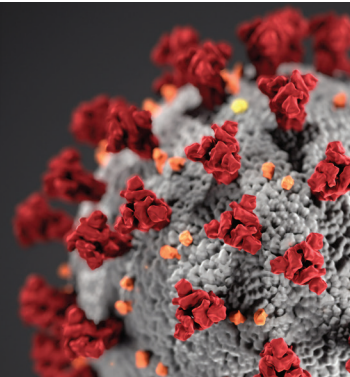
Although the emergence of effective vaccines may generate optimism of an end to the pandemic, there are still great challenges for governments and for society.

►► Production Capacity

Pfizer has reported that it has capacity to produce up to 1.3 billion doses of its vaccine in 2021³. AstraZeneca has capacity to produce up to 2 billion doses per year, including its capacity through the Serum

COVID-19 SERIES: FROM CRISIS TO RECOVERY

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Institute in India⁴. Moderna has reported total production capacity of 400 million doses per year in Switzerland and the United States⁵. That brings the combined annual production capacity of the three most imminent vaccines to 3.7 billion doses per year.

While that may seem impressive, it must be remembered that these vaccines have been administered in double doses in their trial phases. Therefore, suggesting that 3.7 billion doses will be available in 2021, if all goes well, will provide vaccinations for about 1.85 billion people in the world, or not quite 24 per cent of the world's population. At that rate, it would take up to 4 years to vaccinate all the world's population.

▶▶ Distribution Requirements

These vaccines will require various demanding logistical treatments in their distribution. Pfizer's vaccine needs to be stored at -70 degrees Celsius⁶. The other vaccines do not require as extreme conditions, but still require exacting conditions for their storage, distribution and administration to remain effective.

▶▶ The Challenges Ahead

For all the hope these vaccines provide, there remain a number of challenges for governments and society. While COVID-19 has tested our resilience as a species, the road ahead may challenge our resilience as a society.

There will not be enough vaccine to go around, at least for the time being. If we can only vaccinate 24 per cent of the population, we must decide what part of the population should get the vaccine first. The situation raises important moral considerations.

▶▶ International Issues

From an international perspective, it is most likely that wealthy countries will get the lion's share of the vaccine in the early stages. But some have suggested that, if the vaccines were sent to poorer countries, they would avoid twice as many deaths as they would in richer countries⁷.

On the other hand, it might be noted that poorer countries may have limited capacity to meet the stringent storage requirements of the current vaccine candidates and more limited public health delivery infrastructure, factors that could reduce the effectiveness of vaccination efforts concentrated there. And, some might note, the lower productive capacity of poor countries may reduce the positive economic impact of vaccination and a return to normal, at least relative to the same vaccination effort in richer, more productive countries.

▶▶ Canadian Issues

Canada has arranged for delivery of 20 million of the Pfizer vaccine and another 40 million of the Moderna vaccine in 2021⁸. That brings our capacity to vaccinate to 60 million doses (or about 30 million people) in 2021. This represents about 80 per cent of our estimated population.

Estimates of the requirements for coverage of vaccines to result in herd immunity range from 70 per cent to 95 per cent⁹. Given there are some who cannot receive vaccines, including the very young and likely those who have compromised immune systems, achievement of herd immunity requires a very high vaccination rate for the rest of the population.

There remain a number of other difficult issues to face.

▶▶ How Much Where?

Not all this vaccine will arrive at once, we will have to decide who gets the vaccinations first and the order for subsequent distributions.

While the federal government has arranged for the vaccines to be delivered, it is a provincial/territorial responsibility to deliver health care and public health initiatives, including immunizations and vaccinations. The distribution from the national pool of vaccines will have to be allocated to the provinces and territories according to some set of priorities.

Fair allocations could be based on each jurisdiction being allotted vaccine according to its share of the national population. Alternatively, each jurisdiction could be allotted vaccine based on its case load, with those communities experiencing the worst infection rates receiving the greater share of vaccine. Or, vaccines could be allocated based on which jurisdictions have the best infrastructure for storing and administering public health initiatives.

Each of these approaches is fair, but each has its problems. The first approach ensures equality of distribution, but may not ensure equality of effectiveness, and may leave heavily infected jurisdictions wanting. The second approach addresses the disparity of infection rates but may not be as effective and may be perceived as rewarding jurisdictions that have not taken adequate steps to control the virus in the past year. The third approach may yield effective distribution, but may be perceived as rewarding wealthy jurisdictions that have advanced infrastructure and ignoring the infection rates of other jurisdictions.

▶▶ From Whom?

Within each jurisdiction, there will need to be a decision about which groups or individuals receive the first and subsequent vaccinations.

Many have suggested that health care workers should be high on the priority list. This could make sense because those working in the health care field may suffer the greatest risk of exposure, and would also be very important to the successful administration of vaccines and treatment of those affected in the meantime.

Of course, one would have to consider what constitutes "health care workers". Front line doctors, nurses and nurse practitioners may be obvious choices. But, we will also have to decide where hospital maintenance staff, office workers, cleaning staff, security personnel, orderlies, ward aids and Emergency Medical Technicians rank on the priority list.

Some have advised that the elderly, being most susceptible to the worst effects of COVID-19 should also be high on the priority list for

vaccination. It must be remembered, however, that the elderly are the least likely to infect others, since their social contacts are more limited than is the case for younger, working people with families. Some might also argue that the elderly are, of course, more likely to die from other causes, raising the spectre that vaccines administered to the elderly are more likely to be “wasted” in terms of health outcomes.

There have been suggestions that “essential workers” need to be first in line for vaccines. From an economic sense or a convenience sense, this approach might make some sense. There is no universal definition of an “essential worker”, however. One might include those who maintain our water supplies, civic employees, for example. Or, those involved in the food chain might be essential, from farmers and food processors to wholesalers and retail clerks. Some might consider communication workers to be essential, especially in today’s high-tech world.

Some have included teachers on the list of essential workers, as they affect the learning of young people and may also have contact with more people than average workers, increasing both their probability of exposure and their likelihood of infecting others. Others might argue that a delay in educating may not have a lasting effect on all students’ learning.

Others have suggested that people in congregate living arrangements, especially those who have few options such as those confined to care homes, should be high on the priority list for vaccines as they have less capacity to limit their exposure to others who may be infected. This logic might well be extended to others in similar circumstances, but are residents in prisons and in faith-based communal arrangements as likely to be as sympathetically viewed. Some might also argue that isolated communities, especially those that are self-sufficient should be able to retain their isolation and, therefore, can wait for later vaccination.

The same arguments could be made in favour of or against early vaccination in other isolated communities, either in the far north or in First Nations communities living on reserve land. In both cases, their isolation can be a protection against infection and a recipe for high rates of community transmission if viral infections appear. On the other hand, the isolation of these communities would make the distribution of vaccines more resource intensive and could jeopardize the effectiveness of initial vaccination attempts simply by depleting resources available to serve larger numbers of more accessible populations.

Some have suggested that the housing situation, occupational limitations and higher co-morbidity issues of many minority groups makes them more susceptible to the spread of disease and, therefore, they should also be high on the list of vaccination candidates¹⁰.

►► How to Pick?

All of these are valid suggestions for assigning priority in a vaccination program. The great problem arises when one considers that each protocol for assigning priority, while clear, understandable and rational, is, by definition, mutually exclusive of any other

protocol that could be adopted. At least in the beginning, every person vaccinated for COVID-19 is matched by another person not vaccinated. While any definition of “fair” is understandable, the adoption of any one definition is the rejection of many other equally understandable definitions of “fair”.

Whatever the availability of vaccines, it is still quite clear that it will be a long time before the entire population, or a large enough proportion to qualify for herd immunity, is provided immunity to COVID-19. In the last three years of annual vaccination programs for the influenza virus, the Canadian public health system has only managed to vaccinate about 40 per cent of the adult population¹¹, a long way from the 70 to 90 per cent level required for herd immunity. The COVID-19 vaccination process also adds a considerable complication by requiring two shots appropriately spaced in time as this will undoubtedly complicate and slow down the vaccination process relative to the one-shot influenza vaccine program.

Many of us will have to wait our turn in any priority list. The wait may test our patience as the requirement of a double dose will mean that, at any point in time, it will be required to have a reserve of doses awaiting the second shot sitting apparently “unused” in warehouses.

While we wait, COVID-19 will still be among us. Thousands will still contract the virus and, if the past is any indication, about 2.5 per cent of those people will die from the disease. The 415,000 cases and 12,665 deaths experienced in Canada in 2020 (as of December 7) can only be expected to be dwarfed by the 2021 experience, when more than 20 per cent of the 2020 caseload has been discovered in just the past 2 weeks—an infection rate much higher than the previous ten and a half months of the year¹².

Businesses, strained by falling sales and rising costs, will continue to disappear. In some cases, their experience in 2020 has already sounded their death knell but, as leases come up for renewal and machinery becomes in need of replacement, they will not be able to justify the renewed commitment and they will close forever. Even an immediate end to the pandemic may not prevent their demise, but a slow, protracted movement towards normal will ascertain their departure.

It is important also to remember that it is not clear that vaccination will guarantee protection. For a very small proportion of those vaccinated, the vaccines have not worked. There simply has not been enough time since the vaccines were developed to learn how long they will provide protection for those who are vaccinated. If those inoculated are protected for many years it is possible that the majority of the population can be vaccinated before we have to start at the beginning of the list again. But if protection only lasts for months, we may never get through all the population before we have to start again, and COVID-19 may not be so easily vanquished.

Some may choose not to be vaccinated, jeopardizing the effectiveness of vaccination as a route to herd immunity. The more who abstain, the greater that jeopardy.

The consequences of any selected protocol for allocating and administering vaccines is significant for individuals, especially those left low on the priority list. While it is very important that we develop a consensus on the protocol because we have to choose one, it will

be very important that we remain open-minded and accepting and that we remember the real lesson of the pandemic.

▶▶ The COVID-19 Lesson

The most glaring lesson we should take for the experience of the pandemic is that none of us is safe until all of us are safe. If COVID-19 exists anywhere it potentially exists everywhere. So, it is not nearly as important where or to whom the vaccines are initially allotted because it matters only where and to whom the vaccines are last allotted. Even those who are vaccinated are not guaranteed safety from the virus until the virus has been eliminated entirely.

We must have the debate about where to start the process but we must accept the outcome of that debate, reach a consensus, and move as swiftly as possible towards the true objective of the program, the protection of the entire population, not the protection of individuals within that population. This is what “public health” is about.

▶▶ A Modest Proposal

In that regard, I would like to suggest we immediately implement the “Greedy Bastard” program to keep our focus on the true aims of an immunization program.

Everyone is welcome to suggest their idea of a “fair” distribution protocol. Any rational protocol has merit to be considered. But anyone who insists that their preferred priority list is inherently superior to any other or that any priority list that is agreed to or selected is inferior to that which they suggested is, by definition, a “Greedy Bastard” and should be summarily dismissed as such.

Other examples of “Greedy Bastard” (GB) behaviour include:

- any individual or group that argues they or their ilk should be assigned a higher priority for vaccination;
- anyone who claims that someone has suffered or died because they did not receive the vaccine in time unless they also acknowledge someone else who did receive the vaccine and was saved from suffering or death;
- any political party that dares to aggrandize themselves by drawing attention to any individual or group that has been assigned a low priority on the vaccination list unless they can identify who they would have moved down the list; and,
- any government that dares to claim its people have been disadvantaged by the allocation process unless they identify what other group or region should have a lower allocation.

Any person or group refusing the vaccine when their turn comes up without a legitimate medical reason to do so, is a “GB”. They need to be told that we are not vaccinating them to protect their health—we are

vaccinating them to protect everyone else’s health and, yes, we have a right to do that. While they wait, they should also wear a mask and practice social distancing and limited contact, for the same reason.

Anyone who has been vaccinated and does not recognize the enormous social responsibility that comes with that privilege is a “GB”. They must be expected to contribute in place of those who have not yet been vaccinated. They must continue to social distance and follow all social health protocols to help the rest of us make it through this while we wait.

If Canada pulls off the greatest vaccination program in its history and COVID-19 is vanquished here and we do not then take steps to ensure the safety of the rest of the world, we are all “GBs”. If COVID-19 exists anywhere, it exists everywhere.

We must guard against the “GBs”. They cannot be allowed to set us against one another or distract us from surviving as a society. It is not enough to ignore them. The danger they pose is too great to ignore. Each of us must react openly and strongly and speak out against their divisive actions and they must be publicly condemned.

▶▶ The Challenge Ahead

The development of vaccines against COVID-19 may have been a brilliant scientific accomplishment. Never have we identified a serious health threat of this proportion and found the means to defeat it in such short order.

The real challenge ahead, however is not one of science as much as it is one of ethics. We must be prepared to match our professed beliefs in the service of others with action that puts others first—for the good of us all.

▶▶ References

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