

The amazing benefits of COVID-19

Richard Béliveau

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The COVID-19 pandemic is without a doubt one of the main health tragedies to have affected the world's population over the past century. In the longer term, however, this crisis will have had the positive impact of having accelerated the development of mRNA vaccines and thus revolutionized our future approach to all infectious diseases.

DISCOVERY CATALISTS

Infectious diseases have always been the main challenges that human civilizations have had to face. Plague, smallpox, syphilis, tuberculosis, measles, malaria, cholera, influenza, AIDS (and many others) are all infections that have prematurely claimed countless lives in human history, and the COVID-19 pandemic that is currently raging is only the most recent demonstration of the devastation that some of these microbes can cause.

It is the desire to fight these diseases and save human lives that is behind some of the greatest discoveries in the history of science. We need only think of the vaccine against smallpox, developed by Edward Jenner in 1796, the identification of the first antibiotic (penicillin) by Alexander Fleming in 1928 or, more recently, the explosion of knowledge on the function of the immune system caused by the search for cures for AIDS.

The overall impact of these discoveries on society has been nothing short of enormous, since it is the reduction in mortality linked to infectious diseases that is the main factor responsible for the extraordinary increase in life expectancy observed during the last century.

VACCINE REVOLUTION

Even if the COVID-19 pandemic is not yet over, we can already anticipate that this ordeal will also have positive effects in the longer term, in particular with regard to the development of vaccines. It was this crisis that made it possible to test the new messenger RNA-based vaccine technology for the first time, with quite spectacular results that exceeded expectations, both in terms of speed of development and clinical efficacy.

Recall that it took only 66 days after the release of the coronavirus sequence, in 2020, for NIH scientists to begin recruiting people into a Phase 1 clinical trial of Moderna's COVID vaccine.

More than 10 billion doses of mRNA vaccines have already been administered since that time. By way of comparison, the most rapidly developed vaccine to date (mumps vaccine) required two years of work before even starting a clinical evaluation.

This accelerated development of mRNA vaccines therefore provides a marked advantage for rapidly dealing with an infectious disease and therefore represents a real revolution in our fight against these diseases.

These vaccines have fundamentally changed the threat posed by COVID, as almost all people who have received three doses are protected against serious illness and death, even in the face of these new variants.



ANTICIPATING FUTURE PANDEMICS

The versatility of the mRNA platform also makes it possible to consider the development of vaccines against other pathogens. Moderna is currently working on vaccines against other viruses such as HIV, Zika and EBV (recently identified as a multiple sclerosis trigger) and plans to increase its efforts to target the 15 pathogens identified as the greatest public health risks by WHO and CEPI (Coalition for Epidemic Preparedness Innovations).

These include the chikungunya virus, Crimean-Congo hemorrhagic fever, dengue fever, Ebola, malaria, and even tuberculosis.

The strategy behind this approach is to develop these vaccines to the stage of clinical trials so that they can be quickly evaluated in phase 3 (the last stage before marketing) in the event of an emerging epidemic. The few months that are thus saved can be extremely important, especially in the presence of a highly contagious infectious agent.

It is therefore possible that one of the most important legacies of the COVID-19 pandemic was to redefine our response strategy to the presence of an infectious agent, using mRNA technology to rapidly produce vaccines specific to these pathogens. As the old saying goes, misfortune is good for something.