EDITORIAL

Cautious optimism

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The first half of 2020 has seen extraordinary accomplishments in science. The international scientific community has described the genomic sequence of the virus that causes coronavirus disease 2019 (COVID-19) and structures of its important proteins, elucidated principal aspects of the immune response, identified neutralizing antibodies that can serve as therapeutics, and developed promising vaccines. There is much more to learn about COVID-19 and its cause, but the achievements so far are remarkable. So why doesn't this progress feel like the triumph that it is?

Public health guidance is ignored, reopening businesses happens too fast, people fight over wearing masks, and the forces that undermine confidence in vaccines proceed unimpeded. Scientists who burn the midnight oil in academia, government, and industry to decipher COVID-19 are confronted with political leaders who downplay and criticize their tireless efforts. Many are immigrants who hear that they aren't welcome in the United States. President Trump and his allies are sticking their fingers in the eyes of the very people who can lead the world out of this calamity.

> **"With no strategy, a vaccine is the government's best way out of the pandemic crisis."**

There are many reasons to be optimistic about getting a vaccine against the COVID-19 pathogen, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), in record time. Monkey studies of candidate vaccines have shown immune responses that appear linked to protection, and 25 of these have entered human clinical trials. And the U.S. federal government has gambled approximately $6 billion on pharmaceutical companies to produce vaccines in large quantities in the hope that they will perform well in large clinical trials and merit approval by the Food and Drug Administration.

Science also offers reasons to be cautious. We can't know for sure that a vaccine is safe over the long term until we have had more time to observe volunteers in clinical trials. Monkeys don't develop severe disease from SARS-CoV-2, limiting the model's predictive powers. Two doses of the vaccine may be required, which creates a logistical challenge. We won't know whether billions of doses of the vaccine can be produced and distributed until we actually attempt to do so.

But the political and social impediments create even more reason for caution. Despite his recent, hollow backtracking, President Donald Trump has mostly embraced the dogma of the antivaccine movement and cheered on the antimask crowd. Part of the administration's strategy is to undermine Dr. Anthony Fauci, the foremost authority on infectious disease in the United States, which might lead to vulnerable people refusing to get the vaccine that their health and lives may depend on. Even folks who are not against vaccines will have questions about the safety of a vaccine to SARS-CoV-2 given how muddled the messaging has been. It doesn't help that the White House calls the vaccine effort "Operation Warp Speed," which hardly reflects the great care that is being taken to produce a safe and effective vaccine.

The logistical impediments seem most daunting of all. Deciding which vaccines get support from Operation Warp Speed, what signals are required for approval, and who gets the vaccine if it is in limited supply would be challenging under any circumstances. Now a committee assembled by the U.S. National Academies of Sciences, Engineering, and Medicine has been convened to sort through these issues. There is also the Advisory Committee on Immunization Practices that advises the U.S. Centers for Disease Control and Prevention (CDC). Meanwhile, the U.S. National Institutes of Health has organized Accelerating COVID-19 Therapeutic Interventions and Vaccines. How do these committees and agencies interact to make decisions?

Having botched the distribution of diagnostic tests to get ahead of the pandemic, disemboweled the CDC, trampled on its own experts, stoked conspiracy theories about wearing masks and the origins of the virus, pushed an unproven treatment that proved worthless, stepped on the independence of the NIH, and audaciously attacked Fauci, the Trump administration does not inspire confidence in its ability to make sound public health decisions. With no strategy, a vaccine is the government's best way out of the pandemic crisis.

It's not too late to get it right. We need clear decision-making by experts, articulated crisply and without interference. This is not a time for leading with the gut, building up false hope, or making speculative bets. It's time to let the data do the talking.

Science is doing its part. Over to you, Mr. President.

–H. Holden Thorp

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