Technology & Ideas

We Must Start Planning For a Permanent Pandemic

With coronavirus mutations pitted against vaccinations in a global arms race, we may never go back to normal.

By Andreas Kluth
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The arms race of our time. *Photographer: Jack Guez/AFP via Getty Images*

For the past year, an assumption – sometimes explicit, often tacit – has informed almost all our thinking about the pandemic: At some point, it will be over, and then we'll go "back to normal."

This premise is almost certainly wrong. SARS-CoV-2, protean and elusive as it is, may become our permanent enemy, like the flu but worse. And even if it peters out eventually, our lives and routines will by then have changed irreversibly. Going "back" won't be an option; the only way is forward. But to what exactly?

Most epidemics disappear once populations achieve herd immunity and the pathogen has too few vulnerable bodies available as hosts for its self-propagation. This herd protection comes about through the combination of natural immunity in people who've recovered from infection and vaccination of the remaining population.

In the case of SARS-CoV-2, however, recent developments suggest that we may never achieve herd immunity. Even the U.S., which leads most other countries in vaccinations and already had large outbreaks, won't get there. That's the upshot of an analysis by Christopher Murray at the University of Washington and Peter Piot at the London School of Hygiene and Tropical Medicine.

The main reason is the ongoing emergence of new variants that behave almost like new viruses. A clinical vaccine trial in South Africa showed that people in the placebo group who had previously been infected with one strain had no immunity against its mutated descendant and became reinfected. There are similar reports from parts of Brazil that had massive outbreaks and subsequently suffered renewed epidemics.

That leaves only vaccination as a path toward lasting herd immunity. And admittedly, *some* of the shots available today are still *somewhat* effective against *some* of the new variants. But over time they will become powerless against the coming mutations.

Of course, vaccine makers are already feverishly working on making new jabs. In particular, inoculations based on the revolutionary mRNA technology I've previously described can be updated faster than any vaccine in history. But the serum still needs to be made, shipped,

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distributed and jabbed.

And that process can't happen fast enough, nor cover the planet widely enough. Yes, some of us may win a regional round or two against the virus, by vaccinating one particular population – as Israel has done, for instance. But evolution doesn't care where it does its work, and the virus replicates wherever it finds warm and unvaccinated bodies with cells that let it reproduce its RNA. As it copies itself, it makes occasional coding mistakes. And some of those chance errors turn into yet more mutations.

These viral avatars are popping up wherever there's a lot of transmission going on and somebody bothers to look closely. A British, a South African and at least one Brazilian strain have already become notorious, but I've also seen reports of viral cousins and nephews showing up in California, Oregon and elsewhere. If we were to sequence samples in more places, we'd probably find even more relatives.

We should therefore assume that the virus is already mutating fast in the many poor countries that have so far received no jabs at all, even if their youthful populations keep mortality manageable and thus mask the severity of local outbreaks. Last month, Antonio Guterres, the Secretary General of the United Nations, reminded the world that 75% of all shots had been administered in just 10 countries, while 130 others hadn't primed a single syringe.

A pathogen's evolution is neither surprising nor automatically worrisome. One frequent pattern is that bugs over time become more contagious but less virulent. After all, *not* killing your host too efficiently confers an advantage in natural selection. If SARS-CoV-2 goes this route, it'll eventually become just another common cold.

But that's not what it's been doing recently. The variants we know of have become more infectious, but no less lethal. From an epidemiological point of view, that's the worst news.

Consider two alternative evolutionary paths. In one, a virus becomes more severe but not more transmissible. It will cause more disease and death, but the growth is linear. In the other path, a mutating virus becomes neither more nor less virulent but more contagious. It will cause increases in disease and death that are exponential rather than linear. Adam Kucharski at the London School of Hygiene and Tropical Medicine explains the math here.

If this is the evolutionary trajectory of SARS-CoV-2, we're in for seemingly endless cycles of outbreaks and remissions, social restrictions and relaxations, lockdowns and reopenings. At least in rich countries, we will probably get vaccinated a couple of times a year, against the latest variant in circulation, but never fast or comprehensively enough to achieve herd immunity.

I'm not arguing for defeatism here. In the grand sweep of history, Covid-19 is still a relatively mild pandemic. Smallpox killed nine out of 10 Native Americans after the Spanish brought it to the Americas in the 16th century. The Black Death carried off about half of the Mediterranean population when it first came to Europe in the sixth century. Worldwide, the coronavirus has killed fewer than four in 10,000 so far. And with our science and technology, we're armed as our ancestors never were.

But we must also be realistic. Resilience demands that we include this new scenario into our planning. The good news is that we keep getting better at responding. In each lockdown, for example, we damage the economy less than in the previous one. And we may achieve scientific breakthroughs that will eventually make life better. Our Brave New World needn't be dystopian. But it won't look anything like the old world.

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