Technology & Ideas

Why Science Won't Ace Its Covid-19 Test

In normal times, the decentralization of research works remarkably well. In a crisis, the usual process is inadequate.

By Ariel Procaccia
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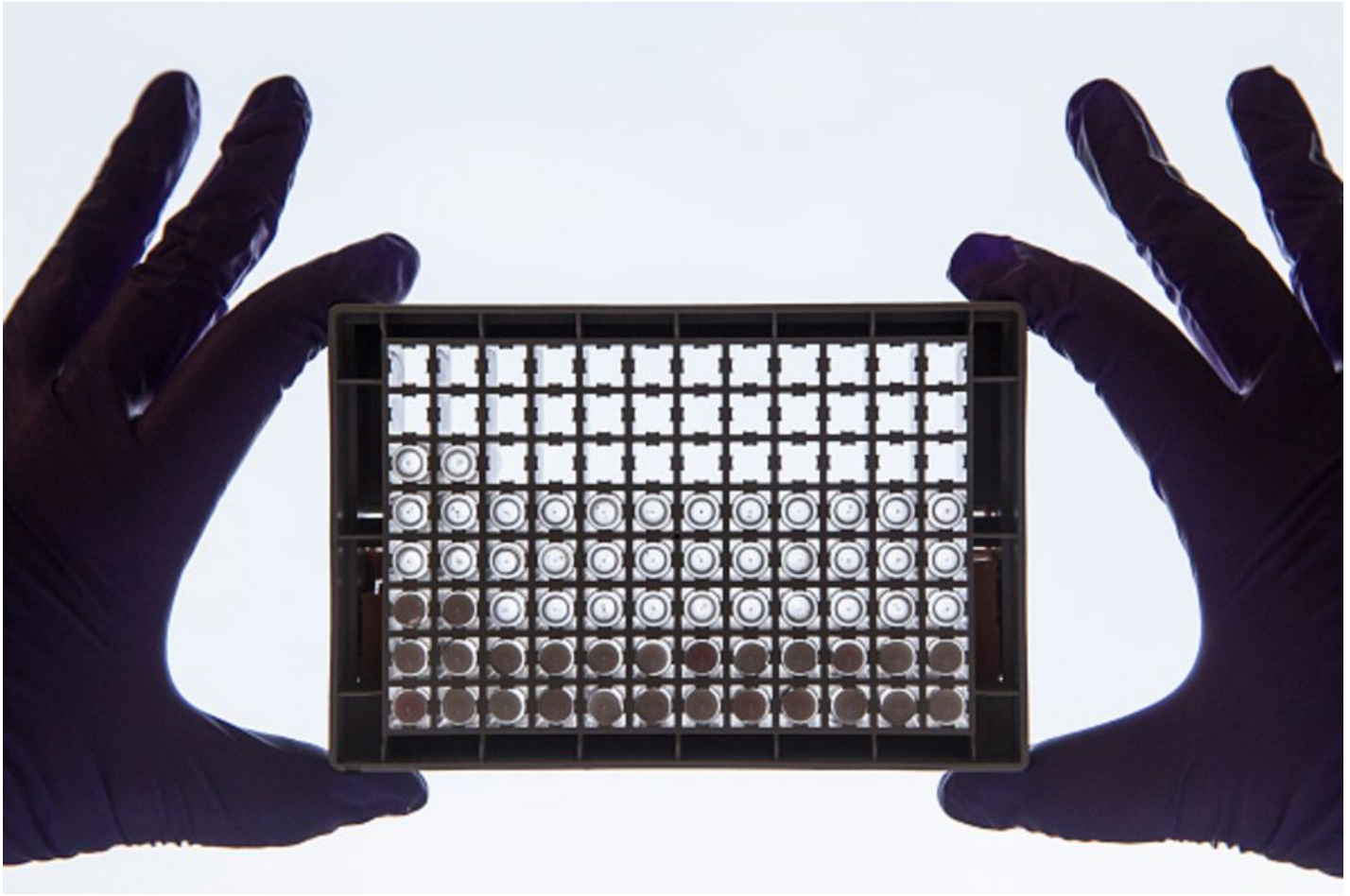

The coordination is missing. *Photographer: Dan Kitwood/Getty Images Europe*

A New York Times article published earlier this month proclaimed that, according to scientists, "never before have so many of the world's researchers focused so urgently on a single topic." It went on to describe the race to develop a coronavirus vaccine and drugs for treating it, involving global collaborations of medical researchers. Epidemiologists are also laboring tirelessly to save us from the virus by modeling its spread and directing mitigation efforts. Meanwhile, some macroeconomists are working overtime to save us from the epidemiologists.

But that hardly accounts for most of the world's researchers, who specialize in disciplines as alphabetically diverse as aerobiology and zoopathology. In the U.S. alone there are likely hundreds of thousands of scientists and engineers who have the desire and knowledge to contribute to the fight against the coronavirus. And those of us working in academia continue to command the resources and professional autonomy needed to refocus our work, despite having decamped from proverbial ivory towers to dingy basements.

So why haven't we seen a dramatic shift in academic research priorities across all disciplines? One reason may be lack of coordination.

Under normal circumstances, science works remarkably well as a decentralized process, where researchers identify problems they're passionate about, study them with very little oversight, and then hope to convince their peers that their work is inspiring, profound or useful. Good research projects are deliberative and careful, often taking years from conception to publication.

In a crisis, however, the usual scientific process is inadequate. When it comes to dealing with the coronavirus, time is of the essence, and the relevance of a project is determined by its potential to save lives, aid mitigation efforts, or alleviate the epidemic's damage to society.

Scientists need an up-to-date, detailed understanding of the situation on the ground in order to pinpoint feasible problems whose solutions truly matter. This understanding, in turn, can only arise from a system for large-scale coordination and information sharing between the scientific community and those managing the response to the pandemic at all levels – which doesn't exist (at least in the U.S.).

It would be a mistake to dismiss the absence of such a system as yet another way in which we were woefully unprepared for a pandemic. Admittedly, until a few months ago pandemics were roughly in the same category as sharknadoes from the public's perspective: Most people who feared these potential catastrophes were film critics. But coordination and information-sharing are also required if scientists are to effectively respond to more familiar disasters like earthquakes, hurricanes, floods, wildfires and oil spills.

This exact point is one of the key conclusions of a prescient report, "Science During Crisis," which was published last year by the American Academy of Arts and Sciences. "At the onset of a crisis," the authors wrote, "a central curated clearinghouse developed in advance should be activated to collect, disseminate, and coordinate relevant scientific information." The report makes a number of sensible and equally unimplemented recommendations, but I believe this is the one that would have made the biggest difference (and can still make a difference in the future).

To be sure, despite the difficulties there already are plenty of valuable contributions from scientists and engineers across many disciplines. To ease the shortage of medical devices, economists from Boston College and MIT put forward a clever triage protocol, and engineers from the University of California, Berkeley, are designing kits that convert sleep apnea devices into ventilators. As another example, several apps created by computer scientists and mathematicians anonymously trace users' exposure to the coronavirus. Applications of artificial intelligence are somewhat less sporadic; in fact, a new public-private consortium plans to invest $367 million in harnessing AI against the virus.

But the scale of these timely initiatives is still tiny relative to grand scientific endeavors like the Apollo program, which has made numerous cameos in commentary about the pandemic. Even in the longer term I expect we won't be seeing the epic mobilization of scientists that perhaps would have been possible with better preparation and coordination. That doesn't mean scientists won't play a key role in defeating the coronavirus. The goal shouldn't be to land on the moon, but merely to land on our feet.

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