



Our Nation Cannot Afford Pandemic Fatigue: The Urgent Need to Speed Pandemic R&D

As the COVID-19 BA.2 subvariant spreads in the United States (U.S.), there is no way to predict when the next variant or next pandemic will occur. There may be no breathing room between BA.2 and the next variant, or COVID-19 and the next worldwide spread of an infectious disease. R&D can and should be leveraged with greater urgency to speed the end of this pandemic and prevent a similar or even more destructive infectious disease from wreaking havoc on the American people and populations across the world.

The R&D Need: Previous responses to emerging infectious diseases (EIDs) have been pathogen-specific, prioritizing research on a small number of pathogensⁱ deemed to be a significant threat to human health. The reality is, though, that often pathogens of concern are only recognized after an outbreak has occurred. Even the most robust predictive algorithms have failed to adequately predict the introduction and impact of such public health threats as Zika, SARS (2002), and COVID-19.¹⁻³

There is a better way. Years before COVID-19 emerged, prominent researchers were advocating for a strategy in which:

- 1) Research gaps are filled for viral families from which deadly pandemics could emerge; One global study identified over 500,000 animal viruses with potential to spread to humans, the vast majority of which represent viral families we have little to no previous knowledge to build on should they be the origin of the next pandemic.⁴
- 2) This knowledge is used to develop platform technologies that would empower rapidly deployable interventions.

As the unparalleled leader in the R&D arena, the U.S. is positioned to work quickly. Leveraging our public-private sector R&D assets, we can close the gap between where we are today and where we need to be in our ability to minimize the human and fiscal cost of this pandemic and the next one. If we do not out-smart and out-innovate the next threat now, we are leaving ourselves vulnerable to needless deaths and spending going forward. The human and fiscal devastation of future pandemics could dwarf that of COVID-19. We simply do not know. According to a study by the Duke University Global Health Institute:

“...the risk of intense outbreaks is growing rapidly. Based on the increasing rate at which novel pathogens such as SARS-CoV-2 have broken loose in human populations in the past 50 years, the study estimates that the probability of novel disease outbreaks will likely grow three-fold in the next few decades.⁵”

ⁱ Here defined as microorganisms capable of causing disease in humans

To protect our nation and the global community, the U.S. should treat the next pandemic as if it is a certainty and allocate the additional resources needed to fight against it now, with urgency and in parallel with meeting the immediate needs presented by COVID-19.

The sooner we execute this proactive approach, the greater the chance that we save millions of lives and trillions of dollars going forward. In a [January 2022 national survey](#) Research!America commissioned, more than 60% of Republicans, Democrats, and Independents chose this statement: “The COVID-19 pandemic is a disruptive event and requires that the United States assign a higher priority to science and technology” over “Things will get back to normal soon; we don't need increased efforts in science.”

Sooner or later, and sooner is increasingly likely, our nation and the global community will face a new pandemic firestorm. Will we be ready?

Background: Most EIDs are viruses.⁶ Viruses are organized within larger viral families based on shared functional and structural properties, meaning that effective treatments and vaccines against different viruses within the same family are likely to be similar.^{2,3}

A “prototype pathogen” approach would fill research gaps on viral families of pandemic concern, and apply knowledge of prototype, or representative, viral pathogens within each family to the development of vaccines and therapeutic platforms for related viral family members.³ These “plug-and-play” technology platformsⁱⁱ could be customized to specific viruses as they arise — significantly shortening the timeline between outbreak, approval, and use, as well as significantly reducing the associated costs.^{1,3}

Further, use of the prototype approach to identify vaccine and therapeutic platforms effective against related viruses may also empower the development of “universal” vaccines that can offer broad protection against numerous viruses within the same family.² Within the scope of future pandemic preparedness, development of universal vaccines could ensure that populations quickly have some level of blanket, protective immunity against a previously unidentified virus related to a targeted family, buying time to produce more specific treatments and vaccines.

Recent progress has been made toward a vaccine effective against numerous COVID-19 variants.⁷ However further work is needed to develop a universal coronavirus vaccine. A universal vaccine would not only be effective against present and future COVID-19 variants, but also in offering broad protection against future threats from the larger viral family COVID-19 belongs to. As the COVID-19 pandemic is ongoing and its trajectory cannot be predicted. A proposal to outpace COVID-19 and other coronaviruses is of paramount importance.

Sources:

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ⁱⁱ Platforms are flexible technology frameworks that have multiple applications, for example a platform enabling the development of vaccines for different viruses within a viral family