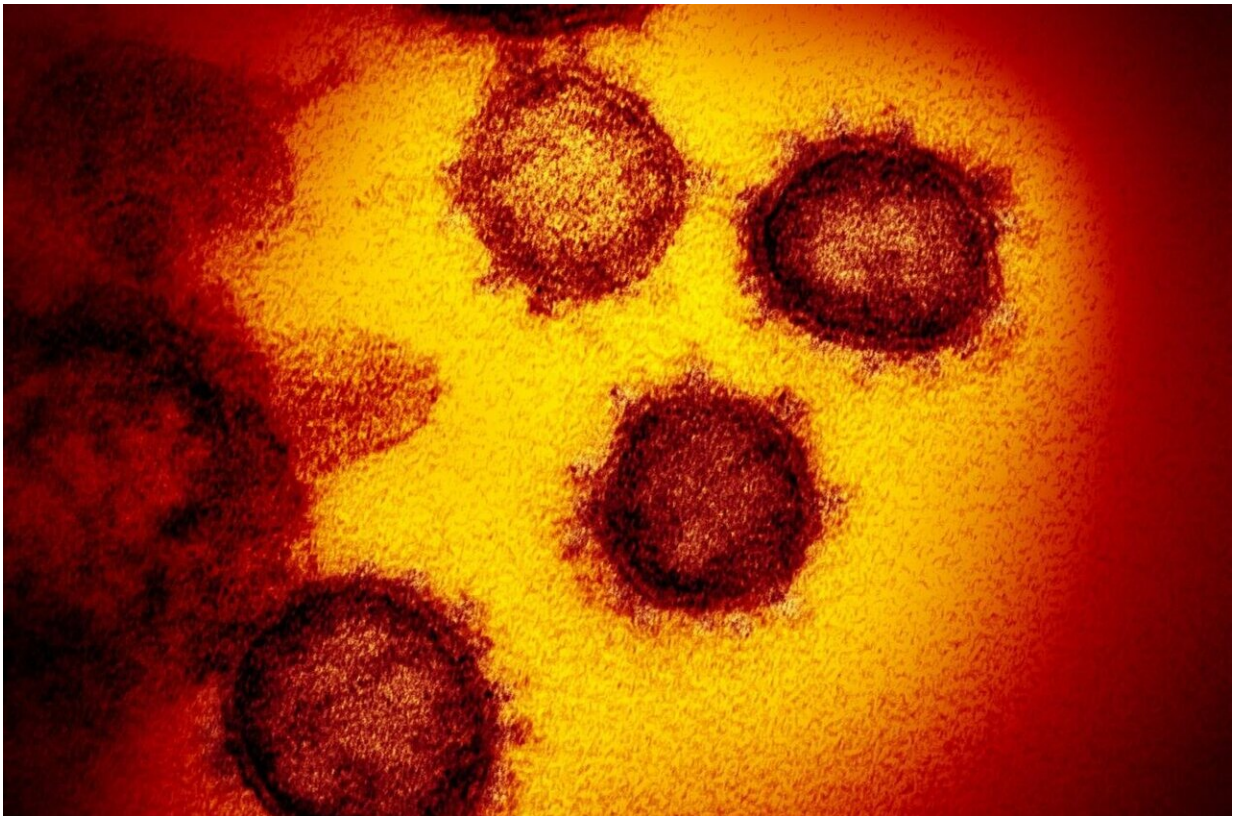


# 'Investing to rebuild science' critical due to profound impact of COVID-19 pandemic

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Transmission electron microscope image of SARS-CoV-2, the virus that causes COVID-19, emerging from human cells. Credit: NIAID

Scientific research was sharply curtailed across the globe when the COVID-19 pandemic began in early 2020, restricting access to

laboratories, shuttering core facilities and ceasing many clinical trials. Volunteer leaders and experts with the American Heart Association describe the ripple-effect of the pandemic on current and future cardiovascular and stroke research in a new American Heart Association Presidential Advisory, "Impact of the COVID-19 Pandemic on Cardiovascular Science: Anticipating Problems and Potential Solutions," published today in the Association's flagship journal *Circulation*. Further, they urge targeted support for early career investigators, women and people from underrepresented racial and ethnic groups in science; call for increased support and federal funding to ensure that the research enterprise can recover; and affirm the value of continued expansion of digital innovations that have changed and enhanced clinical trial design and conduct.

"Over the last 18 months of the COVID-19 pandemic, we've seen remarkable scientific successes in the face of tremendous challenge. However, research laboratories everywhere have faced daily impediments that began with laboratory shut downs, followed by the need to social distance, illness, supply chain limitations, and many other obstacles that have hit every phase and every type of research," said Chair of the presidential advisory writing group Elizabeth M. McNally M.D., Ph.D., FAHA, chair of the Association's Basic Cardiovascular Sciences Council and professor and director of the Center for Genetic Medicine at Northwestern University's Feinberg School Medicine in Chicago. "The pandemic has illustrated why [science](#) matters, and we must re-invest in the scientific infrastructure to rebuild science—so we are ready for the next challenges that come our way."

Pandemic-related shelter-in-place orders in the U.S. and internationally resulted in nearly all research laboratories closing for several months in 2020. When laboratories re-opened, the return was far from normal operations with the need to work in limited shifts in order to reduce on-site personnel. Additionally, clinical studies and trials were halted to

protect patient safety. Supply chains for research materials and equipment remain disrupted, and impediments to hiring research staff combined with modified or restricted training and education have hindered clinicians and scientists. Funding sources have not been available to address the costs required to re-establish research programs impacted by these challenges.

Closed schools meant children were home, and working from home created additional challenges for researchers and clinicians. The international health crisis also required many clinician-scientists to shift into different professional roles including providing COVID-19 care at their hospitals. Many of these issues disproportionately affected early career researchers, women, and scientists from underrepresented racial and ethnic groups in medicine.

"Scientists who are parents of young children have especially struggled because, for most researchers, it is simply not possible to do research from home since the home is not a laboratory," said McNally. "The impact has been greatest on trainees and early career scientists, and on any researcher who is less well-resourced or from an under-resourced racial or ethnic group, or a member of communities disproportionately impacted by COVID-19 infection and serious illness. It takes years of training to be a scientist and clinician, so losing these individuals from the workforce is costly and potentially unrecoverable. We are calling for increased federal investment to stabilize the scientific research workforce."

Many research efforts also moved to focus specifically on COVID-19 therapies, vaccines and population science, away from research on other diseases and health conditions (as of May 21, 2021, approximately 80% of non-COVID trials on ClinicalTrials.gov had been stopped or interrupted) . This critical shift resulted in rapid development of COVID-19 treatment protocols and COVID-19 vaccines, fueled

unprecedented collaboration among institutions and organizations to share data, and created a dynamic and robust collective effort to solve the greatest global public health crisis. Advances in integration and analysis of vast data sources related to the study of COVID-19 will have a long-lasting impact on research, from [clinical trials](#) to observational and population health studies.

The writing group cautions there is much more work to be done to rebuild the scientific research community. They call for broad support and increased funding to regain some of what has been lost as a result of the pandemic. To rebuild a strong foundation—to "build back science better," the writing group urges:

- increased federal investment in research funding;
- support for scientists who are at risk—those who are caregivers or from underrepresented groups in science—and compensation for institutions with programs for these researchers;
- permanently changing grant and publication review processes to include "Impact of COVID-19" in progress reports;
- incorporating and creating new opportunities for collaborative science, through technology;
- increasing flexibility and resources in professional and institutional settings;
- reimagining scientific meetings to include virtual and online options, as well as networking opportunities; and
- a long-term commitment to increase funding for education in science, technology, engineering and mathematics to improve scientific and statistical literacy and, thus, help to make our society more resilient to future health care crises and challenges.

"We are at risk of losing a generation of scientists, which may potentially set back progress on discovering treatments for diseases," said Vice Chair of the advisory writing group Mitchell S.V. Elkind,

M.D., M.S., FAHA, immediate past president of the Association and professor of neurology and epidemiology at Columbia University in New York City. "We have to act quickly to direct resources to this problem before these consequences become irreversible. And we must ensure these resources and efforts are spread equitably throughout society to ensure that all segments of society may benefit."

The pandemic also increased public engagement in science and medicine. Biomedical science was in the media spotlight, topics related to science and COVID-19 were politicized and misinformation created barriers to pandemic public health efforts. Yet, a large international survey of people in the U.S., Canada, Brazil, Russia and across Europe and Asia conducted during the pandemic found that an average of 82% of people considered government investment in [scientific research](#) as worthwhile. A year later into the pandemic, most people believed that science would provide solutions to the pandemic, and almost 80% believed that science broadly has the ability to improve lives and provide for a better future for society.

In addition to these challenges, there were notable successes—such as an accelerated implementation of telemedicine, with more digital and remote processes to access care. Telemedicine will likely have an enduring impact on clinical trial design and conduct going forward, with benefits such as potentially increased geographic diversity of study participants; increased enrollment of women, underrepresented racial and [ethnic groups](#), and rural participants; and streamlining testing. The pandemic also provided unique opportunities to expand research at multiple locations remotely through digital technologies, to increase data sharing and to shift communication with research participants and researchers through video conferencing.

As the largest nonprofit, nongovernmental funder of cardiovascular and cerebrovascular research in the U.S., the American Heart Association

recognized early in the pandemic the need to change course. Since March 2020, the Association has:

- funded \$2.5 million in novel research on COVID-19;
- created a large, national registry of health records for patients hospitalized with COVID-19—the Get With the Guidelines [COVID-19 CVD Registry](#);
- provided enhanced flexibility and up to \$3 million in supplemental funding for recipients of AHA research grants;
- reviewed nearly 4,000 manuscripts focused on COVID-19 research in the Association's 13 peer-reviewed scientific journals;
- disseminated more than 50 oral presentations on COVID-19 research at the Association's premier scientific meetings; and
- established a collection of resources for health care systems, clinicians, patients and the public.

In addition, the AHA is participating with other nonprofit funders in a novel mechanism that will provide funding for early career researchers with caregiving responsibilities.

"It is essential to remember that—despite the horrors of the pandemic—there have also been many scientific and clinical successes," said Elkind. "Chief among these was the rapid approval, production and deployment of vaccines for SARS-CoV-2. None of these successes would have been possible without the sustained financial commitment of the federal government and non-profit organizations such as the American Heart Association over many decades prior to this crisis. Investments in science and scientists and clinicians are investments that will pay off many times over in the future—and ensure we are ready for the next pandemic or scientific challenges. The American Heart Association, with its partners, intends to lead the way."

**More information:** Impact of the COVID-19 Pandemic on Cardiovascular Science: Anticipating Problems and Potential Solutions: A Presidential Advisory From the American Heart Association, *Circulation* (2021). [www.ahajournals.org/doi/10.1161...  
CIR.0000000000001027](http://www.ahajournals.org/doi/10.1161/CIR.0000000000001027)

Provided by American Heart Association

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