Uniting to Solve COVID-19

Gifts aid Yale in responding to crisis
In early March 2020, as the World Health Organization first characterized COVID-19 as a pandemic, Yale marshaled its world-class research scientists and clinicians in an effort to understand and mitigate the novel coronavirus, while simultaneously protecting its campus community and wider educational mission. Giving to support the university’s response—which included funding for critical research, aid to students, and assistance for New Haven—has since contributed to efforts at the state, national, and global levels to safeguard public health.

Yale’s COVID-19 response was enabled by faculty, staff, and students coming together, identifying where they could make a difference, and developing solutions. Campus-wide action was also made possible by generous supporters. Their previous and recent gifts positioned Yale experts to be nimble and tireless while pivoting their work to focus on the challenge at hand.

“The Yale community has faced this ongoing global threat with courage, inventiveness, and strength,” says President Peter Salovey.

“I’ve never been more inspired by our faculty, students, staff, and alumni.”

UNDERSTANDING THE VIRUS AND ITS SPREAD

One of the most striking aspects of the crisis response was the speed with which so many of Yale’s biomedical researchers and epidemiologists shifted their work toward COVID-19. Nathan Grubaugh, assistant professor of epidemiology, for example, used genetic epidemiological methods to track the spread of COVID-19 in the U.S., showing how it moved across the country and providing insights on where to focus prevention efforts.

Other researchers at Yale assessed the structure of the virus in order to determine the best vaccine candidates, probed the fundamental mechanics of COVID-19 and the body’s response to it, and uncovered more accurate, consistent, and safer methods of testing for infection. By late April, more than 200 COVID-19-related studies had been proposed by over 170 researchers.
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Rothberg Family Supports the COVID-19 Response

With a generous gift, Jonathan Rothberg ’91 Ph.D. and Bonnie Gould Rothberg ’94 M.D., ’05 MPH, ’09 Ph.D. supported Yale’s clinical and research response to the COVID-19 emergency. The funds were deployed to meet the urgent needs of the healthcare workers on the frontlines and facilitate research to defeat the virus.

“Our doctors, nurses, first responders, and all of our healthcare workers are saving the lives of people we love. We each need to do everything we can to keep them safe and let them know that we are there for them,” says Jonathan Rothberg.

This research has been supported by fifty-nine donors who contributed over $3 million to the Yale COVID-19 Research Resource Fund and similar funds.

“Our faculty and staff have risen to the occasion, not hesitating to shift their research toward COVID-19 as soon as the threat of this virus became clear,” says Nancy J. Brown ’81, the Jean and David W. Wallace Dean of the Yale School of Medicine. “Because we understood that we needed to be agile and work across boundaries, we mobilized a COVID-19 Response Coordination Team (CoReCT) to facilitate research across the university. Generous donors have supported and enabled this critical research at a time when we did not have the luxury of applying for agency funding.”

SHARING EXPERTISE

Yale’s efforts to address the global pandemic go beyond the biomedical knowledge needed to understand the virus and develop therapies and vaccines. Yale’s data scientists are also disseminating valuable insights. Jeffrey Brock ’92, Faculty of Arts and Sciences dean of science
Ludwig Family Foundation Advances Immunology and Inflammation Science

The School of Medicine is home to leading immunobiologists, and their expertise has been vital to Yale’s COVID-19 response. Recognizing the important role of these scientists, the Ludwig Family Foundation has supported Yale’s COVID-19 Research Resource Fund and five projects aiming to develop COVID-19 vaccines and therapies.

Among the researchers receiving support from the foundation are Akiko Iwasaki, the Waldemar Von Zedtwitz Professor of Immunobiology, and Craig Wilen, an assistant professor of laboratory medicine. Iwasaki is working to uncover how the immune system responds to the COVID-19 virus, and Wilen is studying how the virus infects humans and how human genes mediate infection. By supporting their research and that of other scientists at Yale, the Ludwig Family Foundation is enabling work that will save lives.

and dean of the School of Engineering and Applied Science, spearheaded a series of virtual seminars to discuss how data science can be used to address COVID-19. The series, Hacking Across Science, Technology, and Engineering, or HASTE, was a launchpad for several projects that led to real solutions in short time. One featured project, led by Jordan Peccia, the Thomas E. Golden, Jr. Professor of Chemical and Environmental Engineering, has shown that measuring SARS-CoV-2 RNA levels in wastewater can serve as an early warning system for disease spread in a local population.

During a HASTE seminar, Nicholas Christakis ’84, Sterling Professor of Social and Natural Science, shared his COVID-19 risk-tracking app, Hunala, which he developed with Amin Karbasi, assistant professor of electrical engineering and computer science. Hunala is an anonymous and private method for tracking infection much like map apps track traffic, and it informs an individual of their risk of contracting COVID-19.

“HASTE has been a truly interdisciplinary, collaborative effort that has accelerated our identification of challenges and coordinated our efforts to find solutions,” says Brock. “The researchers who have come together through these seminars have established entirely new research networks that will last well beyond our current crisis.”

Coordinating research is essential in a crisis, and so is disseminating information as it is gathered. The School of Public Health held weekly live discussions about the state of the pandemic and new findings, and YSM launched a website to share research information, data, and patient care strategies. At the medical school, Dean Brown also convened regular workshops featuring Yale healthcare professionals, researchers, and leaders working to mitigate the spread of the virus and develop our understanding of COVID-19. Meanwhile, Yale’s faculty members appeared in numerous newspapers, magazines, websites, and TV segments to share their knowledge.

“Accurate information is vital during this critical time,” says Sten Vermund, dean of the School of Public Health, “and our faculty members have worked tirelessly to make sure the general public, public health officials, and policy makers have clear, evidence-based guidance.”
While ramping up its research efforts, Yale also set a high priority on ensuring the health and safety of students, staff, faculty, and healthcare workers. Students, on spring break at the time, were asked to remain off campus, staff began working remotely, and faculty were tasked with shifting their courses online. While these measures ushered in entirely new working and learning environments, they were essential for keeping the Yale community safe.

Any Yale College student receiving financial aid was provided funds to travel home, and those remaining on campus were safely housed. Yale donors contributed to these essential efforts and helped to minimize educational disruption by giving generously to two funds: The Yale College Safety Net already existed as a year-round resource to help low-income students with urgent needs; this spring, it helped subsidize student travel home. In addition, Yale launched the President’s Emergency Fund for Students, which aided graduate and professional school students, as well as undergraduates.

At the same time, Yale professors developed online experiences for courses already in progress. The Poorvu Center for Teaching and Learning was an integral part of this exceptional effort. Endowed by a gift from William ’56 and Lia Poorvu in 2018, the center helped faculty members maintain rigorous instruction and serves as an example of how gifts made before the pandemic strengthened Yale and enabled agility throughout the crisis.

“Our students rapidly adapted to the shift from in-person to online instruction, and I am impressed with their dedication and resilience,” says Marvin Chun, dean of Yale College. Tamar Gendler ’87, dean of the Faculty of Arts and Sciences, adds, “Our faculty members have shown remarkable flexibility and commitment to their craft of teaching. I am proud of our entire community.”

While many of the university’s staff and faculty members were able to continue their work remotely, that was not the case for the 1,400 clinical faculty members at Yale School of Medicine (YSM) who serve as frontline healthcare providers at Yale New Haven Hospital. Early on,
Students and faculty adapted to virtual classes.

like doctors and nurses across the country, Yale’s clinicians were faced with shortages of personal protective equipment.

As the needs of these workers became clear, the community mobilized. Individuals donated respirators and masks to the university, and Yale engineers developed an apparatus to test mask quality and ensure adequate protection. Later, as Yale’s healthcare workers faced ventilator shortages, Yale engineers designed methods for splitting ventilators to extend their use; to address a reduced supply of testing swabs, they 3D-printed more. Much of this work was made possible by the resources available at the Center for Engineering Innovation and Design (CEID) and by collaborations formed through the Coalition for Health Innovation in Medical Emergencies (CHIME), established by CEID staff members at the start of the COVID-19 crisis.

HELPING NEIGHBORS

The Yale community extends into New Haven, and the wellbeing of campus neighbors has been a key focus of the university’s COVID-19

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How Can Data Science Help in a Crisis?

In numerous areas, Yale researchers have applied data science, machine learning, and mathematical models to inform decision-making and prevent illness:

• Understanding how social distancing guidelines affect human movement
• Designing methods to control COVID-19 outbreaks in confined spaces
• Optimizing vaccine distribution
• Understanding how changes in COVID-19 testing practices affect estimates of viral transmission
• Estimating the early death toll of COVID-19 in the United States
• Adapting machine learning algorithms to identify symptoms of COVID-19 in clinical notes
• Creating a visual model of COVID-19 transmission in correctional facilities
• Calculating the impact pandemic interventions have on virus transmission
Training the Future Frontline

Like the rest of Yale, the School of Nursing (YSN) pivoted rapidly to online education when the campus had to close in the spring. What made that especially difficult for the school’s educators and students was that clinical sites also suspended student experiences. Furthermore, nurses have been on the front lines of the changes in care affecting COVID-19 and non-COVID patients alike. YSN faculty formed research groups to explore impacts of telehealth, end-of-life care, maternal health, and clinical education models in this new era. After hearing about the unique challenges and opportunities faced by the school, Tom ‘83 and Wendy ‘83 Naratil were moved to help with a gift that assists the school in addressing the needs that have arisen as a result of COVID-19.

“As first responders and leaders who are the largest sector of healthcare workers, nurses are essential at all times to the wellbeing of the entire population,” says Tom Naratil. “The pandemic has highlighted the need to invest in nursing education to make it more affordable so that the world has the strong and diverse nursing workforce required to provide proper healthcare to all,” adds Wendy Naratil.

“The Naratils’ gift has helped the School of Nursing faculty and students during a time of great need, and its flexibility has allowed us to be agile in our COVID-19 response,” says Ann Kurth ‘90 MSN, dean of the School of Nursing. “I’m greatly appreciative of their advocacy, vision, and generosity.”

response. In March, President Salovey established the Yale Community for New Haven Fund, to which Yale contributed an initial $1 million and pledged to match every dollar donated by university faculty members, students, and staff. In consultation with United Way of Greater New Haven and the Community Foundation for Greater New Haven, Yale distributes funds raised to area nonprofits. In its first round of disbursements, the fund helped New Haven’s Coordinated Food Assistance Network deliver food to those in need; provided laptops to New Haven public schools and Gateway Community College; supported Food for the Frontlines; aided the Connecticut Center for Arts and Technology in granting rapid emergency financial support to New Haven families; and supported the Grace Chapel Church’s shelter for women.

Yale researchers also partnered with New Haven officials, streamlining the unemployment insurance process, pinpointing ways to stem the impact of the recession, advising on economic policies, and more. Forrest Crawford, associate professor of biostatistics, developed models to inform Connecticut’s reopening decisions, and Zack Cooper, associate professor of public health, and Steven Berry, the Jeffrey Talpins Faculty Director of the Tobin Center for Economic Policy, continue to advise state and federal officials on COVID-19 policies. Prior to the COVID-19 crisis, the Tobin Center received a $500,000 donation to support its health policy research, much of which has been led by Cooper, another example of how donors’ earlier support enabled our researchers to rapidly address the crisis.

ONE YALE, ONE WORLD

Over the past several months, the Yale community has supported its neighbors, developed innovations to overcome widespread challenges, and unearthed new discoveries about COVID-19. This incredible work has been made possible by the ingenuity, creativity, and tenacity of our faculty, the unflinching drive of our researchers and staff, and the deep generosity of the Yale community. The crisis is not yet solved, but what is clear is that Yale’s students, faculty, staff, alumni, and parents will continue to support each other, their communities, and the world.