Technology and Innovation Solutions Must Lead the Way to COVID-19 Recovery

The COVID-19 pandemic is disrupting the US and world economy with unprecedented speed and scope, drastically altering the daily experiences of millions of Americans. As private and public leaders in the US race to suppress the outbreak and begin reopening the economy, educators, employers, and service providers are seeking new or different ways of doing business to preserve learning, productivity, and well-being.

Aided by US capitalism’s long history of boundary-pushing advancements in science and technology, the US response—ranging from tracking the virus’s spread to shifting commerce to virtual tools and platforms—will draw on rapid adoption, adaptation, or improvement of technologies as well as faster-paced innovation. Under pressure of the public health crisis, many organizations will accelerate technologies in their daily practice, advancing the timeline for cutting-edge business and social services. America is in a strong position to innovate to address this and future pandemics. However, it must also address the spotlight COVID-19 has shone on critical shortcomings with US technology, its accessibility, the regulations governing its application and use, and the privacy and public health trade-offs for policy makers and private sector leaders.

As this report explains, policy makers and business leaders must address these critical shortcomings with new approaches including:

- Funding states and localities so all Americans have access to broadband during lockdowns to access services and distance learning; a “digital divide” that was problematic before the crisis is crucial during social and economic restrictions when even some basic services are provided only remotely;
• Changing regulations—some temporarily, others permanently—to support innovation and experimentation to address the immediate and potential future public health crises, including relaxing restrictions to speed vaccine development, expanding telemedicine, and improving monitoring and tracking of the outbreak;
• Removing unnecessary roadblocks to faster and more effective adoption of digital tools to improve remote work, medicine, and learning capabilities while protecting data privacy; and
• Replacing outdated public-sector IT systems to increase flexibility and reliability in providing relief and serving families and businesses.

After this crisis, technological innovation will remain critical to the nation’s economic strength—ensuring that the US remains globally competitive and achieves prosperity. The US must use this moment as a turning point, not only to address the immediate crisis but to bolster its technology and innovation edge to compete globally and respond to unforeseen challenges and crises in the long term.

COVID-19 IS EXACERBATING THE DIGITAL DIVIDE

Even prior to the COVID-19 crisis, the US faced a significant digital divide, because affordable access to relatively high-speed internet connections is a prerequisite for economic and educational opportunities as well as quality of life improvements like telemedicine. Studies have shown that access to, speed of, and competition in broadband are associated with regional economic growth and lower levels of unemployment.

The degree of access to broadband is a meaningful measure of economic disparity. Research by the Federal Reserve Bank of Kansas City found that little more than half of adults with incomes less than $30,000 have broadband at home, compared with 95 percent of those with incomes above $75,000. Federal Communications Commission data suggest that roughly 25 million Americans live in census blocks with no broadband customers and where internet service providers either do not provide access or could not “without an extraordinary commitment of resources.” Moreover, when measured in practice, research by Microsoft suggests that 163 million people do not use internet at speeds that would qualify as broadband.

As a result, economic and social restrictions aimed at addressing the COVID-19 epidemic will disproportionately disadvantage Americans without reliable broadband access, especially those who may not be able to do their jobs remotely. Although precrisis estimates vary, most find that a minority of Americans could plausibly perform their jobs remotely full time. Workers in the top half of the income distribution were roughly three times more likely to report in surveys that they have an option to work from home. High-speed internet access is not the only determinant, but because employers increasingly want their workforces to be productive remotely, workers without broadband may risk furlough or job loss. And workers currently in jobs that do not allow remote work will likely want such opportunities but will face roadblocks in identifying and securing such work without high-speed internet in their homes.
Similarly, without broadband, students and workers on shutdown cannot access
education and training delivered virtually, whether provided by local schools or more
generally. By the end of March, more than 90 percent of students worldwide had school
closures due to COVID-19. And, as of the middle of April in the US, all 50 states had
formal school closure. While the US has led online education (about 16 percent of higher
education degree students in 2017 enrolled exclusively in online or distance learning),
nearly every US student has been affected by the outbreak.

Online learning will challenge students who have less reliable internet connections and
devices. Surveys suggest that roughly one-third of families with school-age children
at home and annual incomes below $30,000 lack broadband. Even households with
internet access may not have enough devices for all their students and workers. The push
to remote learning already leaves some students behind. For example, the Los Angeles
Unified School District—serving more than 600,000 students—reports that one-third of
its high school students do not regularly participate in its online offerings, and 13 percent
had no connection with teachers online during the first three weeks of distance learning.

A lack of high-speed internet has costs beyond employment and education. For example,
telemedicine potentially can provide health services to rural Americans far from doctors’
ofices. However, a 2019 study found that less than 40 percent of Americans who live at
least a 70-minute drive from the nearest primary care physician have internet speeds and
equipment to support telemedicine. With the COVID-19 outbreak, access to many other
critical services has moved almost entirely online. But, as with telemedicine, those on the
wrong side of the digital divide can lose all access.

For example, the New York City Mayor’s Office estimated that 1.5 million residents
had neither a home broadband connection nor a mobile internet connection at the
beginning of 2020. Those New Yorkers are not likely helped during the pandemic by
telemedicine options.

In financial services, roughly 60 percent of internet users use online banking, which
provides an alternative when bank branches are temporarily closing or offering reduced
hours and a way to avoid travel to ATMs. Low-income families without internet access
are about 11 percentage points more likely to be unbanked—lacking a checking or
savings account—than otherwise similar low-income families, which will pose additional
challenges during economic and social restrictions.

Additionally, much of the relief the federal government has enacted to support families
and small businesses economically harmed by the crisis overwhelmingly relies on digital
means—including applications that can be accessed or completed online—to help deliver
it quickly. And, with 70 percent of Americans reporting that they have looked online for
information about COVID-19, communicating public health and social service information
to Americans without access to broadband poses an additional challenge.
Recognizing the importance of addressing the digital divide to avoid disparate economic, educational, and health crisis outcomes, many individual cities, school districts, and businesses have tried to increase access to high-speed internet and digital devices, particularly for disadvantaged students, despite the restrictions related to the pandemic. For example, some school districts in South Carolina are deploying Wi-Fi-enabled buses to create mobile hot spots, allowing students without home internet access to get online. However, overall, current aid is too patchwork, and students in the districts with the most resources could benefit while students in poorer or more rural districts are left behind. Additionally, much less is being done to close the digital divide for adults, and many public libraries and other “anchor institutions” that help Americans without home access are closed. These adults could go without internet connections while out of work, working reduced hours, or earning reduced income, when connectivity could help them access training, services, or economic opportunities.

POLICY MAKERS AND BUSINESS LEADERS SHOULD SUPPORT UNIVERSAL ACCESS TO BROADBAND DURING RESTRICTED ECONOMIC AND SOCIAL ACTIVITY AND TAKE LESSONS LEARNED INTO ACCOUNT FOR THE FUTURE

Though the US must resolve disparate access to high-speed internet in the future, policy makers and business leaders should seek immediate improvements while the nation faces restricted social and economic activity that could stretch through, or recur in some fashion during, the next school year. More far-reaching improvements in access that will take longer to deploy should be included in future-oriented infrastructure legislation.

For students, proposals to expand computer lending programs, retrofit the school bus fleet with Wi-Fi connectivity, or create lending libraries for individual Wi-Fi hot spots that could go to students without home connections all have merit. But policy makers should balance federal funding and oversight with state and local flexibility to pursue solutions that expeditiously suit each community and to continue to work with private companies that are stepping in to help address shortages of laptops and tablets and access to Wi-Fi, among other needs.

As districts prepare for any COVID-19 disruptions in the fall, they should learn from and adopt the most successful current distance learning approaches relevant to their needs. Federal funding should allow states and localities to invest in hardware and connectivity solutions that best match those strategies. At the same time, the federal government should connect states and school districts pursuing similar strategies to negotiate together for the lowest prices and quickest equipment in volume by the fall.

But efforts should not be limited to students. The historic numbers of Americans who could remain out of work while economic and social restrictions remain in place will need to connect to search for jobs and training.
REGULATORS SHOULD FOSTER INNOVATION IN THE COVID-19 RESPONSE

As outlined by the Committee for Economic Development of The Conference Board in *Smart Regulation in a Post-COVID-19 Economy*, all levels of government are rapidly reevaluating longstanding regulations to respond to the COVID-19 outbreak. Risks to safety and privacy must be reweighed against uncertain potential benefit from innovative interventions against the virus.

Standards related to test production and processing, the credentialing of out-of-state health care workers, telemedicine, and the production and use of ventilators have already been relaxed or changed at the federal and state levels. The US Department of Health and Human Services has accelerated its normal processes in the development of vaccines and serological treatments for COVID-19. The Centers for Medicare and Medicaid Services has temporarily relaxed standards for what counts as a hospital bed and what kinds of services can be delivered at home to stretch existing capacity and quarantine infected patients. At the request of governors, some medical schools are permitting early graduation to increase the supply of physicians.

Educators have similarly reassessed and adjusted regulations to leverage technology-assisted options during open-ended school closures. For instance, federal authorities have changed professional development requirements to help schools prepare and train staff and redeploy federal funds to support distance learning. In higher education, admission standards, graduation requirements, and exam proctoring have been altered to accommodate restricted movement and closed campuses.

Some regulations could potentially support or hinder creative, technology-enabled approaches to the epidemic. For example, 3-D printing could potentially address a supply shortage of critical but simple health care equipment parts. Regulators must still ensure necessary levels of quality and sterility but may need to alter standards to match available options and risks.

Drones and autonomous vehicles could potentially reduce public health risks while increasing deliveries. Already, in Florida, a Mayo Clinic processing center has used autonomous shuttles to deliver COVID-19 tests while limiting human exposure. However, tapping those technologies on a wide scale would require federal and state regulators to waive or adjust regulations to approve experimentation.

US government consideration of tracking smartphone owners to contain the spread of COVID-19 illustrates the tension between the health response and risks to privacy. Similarly, the rapid adoption of video-conferencing software for use in health care and distance working and learning has suggested privacy and data security vulnerabilities especially for patients or young students that may outweigh the benefits. Greater transparency on precise data used could increase public buy-in for such difficult trade-offs. Disclosures could also draw a road map for restoring privacy protections when the crisis is over.
State and federal regulators should also consider temporary approvals based on approvals of other trusted regulators through “reciprocal approval” or “mutual recognition.” For example, eighteen states have recognized out-of-state medical licenses during declared emergencies. Many states also formed compacts that confer reciprocal recognition for some health care disciplines to practice in all participating states. Federal regulators should also consider conditional, temporary approvals for products or drugs that have received rigorous approvals overseas and could address the pandemic. Such presumptive approvals could save scarce time and research resources otherwise spent in duplicative trials.

The crisis shows that the US needs more innovation at every level of health care. Narrowly, in the short term, the federal government should leverage the power of markets and competition to act as a broker for critical information and breakthroughs to drive innovation as a public good. For instance, the US could incentivize innovation through COVID-19-related prize competitions and make successful breakthroughs rapidly and widely available. Also, the US could purchase patents for promising drugs or treatments to share critical research and learning with all scientists and researchers on COVID-19.

The need to review and modernize regulations in light of the pandemic is not just about stripping out rules and incentives that may impede innovation. The US must also improve regulations that could help incentivize some critical manufacturing to remain on-shore, reduce obvious vulnerabilities in global supply chains, and create a well-managed national stockpile and domestic just-in-time surge capacity for necessary supplies including pharmaceuticals like the vaccine for this virus.

**PUBLIC-SECTOR STRUGGLES WITH TECHNOLOGY UNDERCUT THE COVID-19 RESPONSE**

Years of inefficient or neglected public investment in technology have eroded the flexibility and capacity of public health and benefit systems to respond to a crisis. Notably, resources to generate and disseminate data are deficient.

The Government Accountability Office has long highlighted security risks and unnecessary costs in aged, legacy federal IT systems. State systems are likely even worse. A 2018 study by the Center for Digital Government found that roughly a third of 250 business-critical state IT systems reviewed were at least seventeen years old and “currently unable to meet user demands.”

Now, with timely service delivery critical, many federal and state systems have fallen short. In one particularly glaring instance, Florida’s executive director of its Department of Economic Opportunity apologized for the “fiasco” of its Unemployment Insurance (UI) enrollment website, which a local newspaper described as “essentially broken” and “dogged by longstanding glitches” that led the state to revert to mail-in applications. But Florida was only one of many states where call centers and benefit systems were reportedly overwhelmed by high demand.
Outdated state systems constrained the design of federally expanded UI benefits, resulting in wage replacement levels less well-targeted to workers’ previous earnings.\textsuperscript{42} Computer system crashes at the Small Business Administration slowed lending and economic relief programs targeted to small businesses.\textsuperscript{43} Internal Revenue Service call centers have reportedly been unresponsive or unavailable, and relief payments targeted to nearly all Americans could take months to reach those without up-to-date direct deposit information on file with the IRS.\textsuperscript{44}

With delays in securing benefits and relief, or concerns that relief will not be available, businesses and individuals are reluctant to shelter in place and prioritize public health. Trust in government erodes precisely when government must communicate convincingly on behavior needed to safeguard public health. Inability to adjust benefit systems to handle new claimants and changes in law constrains the effectiveness of program design and the speed of delivery of aid.

At a time when policy makers should be focused on innovative ways to address the crisis, they are constrained by flaws in public systems and will struggle merely to upgrade systems to handle status quo approaches under the pressure of a pandemic.

Congress has tried to modernize federal systems, and efforts have included funding for administration of state UI systems in legislation in March, but more must be done. The federal government should help states to replace aging legacy benefit systems, and support procurement best practices and securing private-sector management expertise. While states should have flexibility to contract for replacement systems that suit their needs, they should know what has worked well in other states. With sharp state revenue shortfalls, the “moral hazard” of federal investment in state systems will likely never be lower, and more responsive, reliable, and flexible systems could pay both quick and lasting dividends in the current crisis and beyond.\textsuperscript{45}

Better and faster data gathering would also be invaluable in decision making and service delivery.\textsuperscript{46} Congress should explore technology investments to increase the timeliness and accuracy of reporting to state vital statistics agencies. Policy makers should better leverage the federal government’s data collection resources to aid researchers, health workers, policy makers, and entrepreneurs trying to suppress the epidemic and improve data sharing among federal agencies.\textsuperscript{47} The US needs infrastructure for quickly tracking and sharing testing results within and among states while maintaining privacy protections.\textsuperscript{48} For example, FDA publication of its vaccine trial data in real time could inform the work of other health researchers.\textsuperscript{49}

Finally, some researchers have suggested the federal government launch a new, pandemic-specific daily survey using a blend of public- and private-sector methods.\textsuperscript{50} While expensive, the price could be well justified by better and more timely data, which could be shared widely. Statistically, even a 1 percent better response would significantly improve decisions for public health and economic recovery. The Census Bureau announced plans to launch a new, much-needed 90-day “Household Pulse Survey” that would collect information on COVID-19 impacts related to employment status, food security, housing security, education disruptions, and physical and mental well-being beginning in late April.\textsuperscript{51}
POWERING AMERICA’S INNOVATION AND TECHNOLOGY EDGE

The US has benefited enormously from its long-running leadership in technology and innovation—the product of strong public, private, and academic partnerships, world class education, entrepreneurial opportunity, unmatched support for foundational science and defense-motivated research and development, and openness to immigration. The US edge continues, but is feared to be eroding. The technology-related challenges in the US response to the COVID-19 pandemic suggest new concerns about the state of US technology policy making.

The continuing immense digital divide suggests that the US has not recognized the fundamental importance of access to high-speed internet for modern education, commerce, and living. The consequences in the COVID-19 crisis are painful for the economy and for the disadvantaged.

A 2007 National Academies of Sciences report concluded that an “open, dynamic market is the source of US competitive strength in a range of industries.” However, the COVID-19 crisis has surfaced numerous examples of regulations that hinder new technologies, even in normal times. Thus, the US needs smart regulation and must consistently update regulations for changes in facts and circumstances. However, although the crisis has motivated reevaluation of existing regulations in extraordinary circumstances, fresh thinking will be needed to strike the right balance among innovation, personal freedom, privacy, health and safety, cybersecurity, and property rights in the years ahead.

Finally, failure to maintain technological modernization for critical systems has hampered the crisis response, with potentially significant consequences for Americans’ health and economic well-being. This is an unfortunate indication of a failure of the public sector to invest in technology more generally.

But the COVID-19 epidemic should be a spur that drives the adoption and adaptation of innovation across sectors and accelerates new technologies and practices worldwide. The response to the epidemic and the planning it motivates will increase the use and further development of technologies in areas like work environment, internet connectivity, virtual communities, global supply chains, surveillance technology, and payment systems. Opportunities for innovation in each of these areas, and many more besides, will necessarily follow from private-sector leadership but must be encouraged by public policy and public-private partnership.

This pandemic is one of the sharpest social and economic disruptions in the nation’s history and may beget further disruption. But, as innovation in technology accelerates, the US must be the country that generates and captures the economic opportunities from that disruption—preserving global leadership and allowing all Americans to achieve and share in the prosperity generated by that success—if the nation is to sustain capitalism for another generation.

The COVID-19 outbreak should drive the US to pursue the evidence-based policies that will position American businesses and workers to thrive during sustained technological innovation and unforeseen challenges. CED research will clearly define success in this environment, with reasoned solutions in the nation’s interest to meet the specific, critical policy challenges for the US to remain the world’s economic leader.
In just the last two weeks of March, more than 10 million Americans filed claims for unemployment insurance benefits after being furloughed or losing employment. On one survey, 46 percent of respondents reported having lost work, wages, and income due to the crisis by late March; on another, nearly three-quarters of Americans reported a reduction in their families’ incomes. One analysis estimated that daily economic output in the US fell by almost 30 percent over the course of the month. By early April, nearly all states had either ordered or recommended closure of public schools, and twelve states had moved to close schools for the remainder of the academic year. See: “Jobs Report Shows Shape of Things to Come,” The Conference Board, April 3, 2020; “Public Viewpoint: COVID-19 Work and Education Survey, Results from March 25-26, 2020,” Strada, April 2020; Lauren Feder and Christine Zhang, “Income of 73% in US Hit by Outbreak — FT-Peterson Poll,” Financial Times, April 7, 2020; “Map: Coronavirus and School Closures,” Education Week, April 5, 2020.


Jeremy Hegle and Jennifer Wilding, “Disconnected: Seven Lessons on Fixing the Digital Divide,” Federal Reserve Bank of Kansas City, 2019. Unless otherwise noted, for purposes of this issue brief, broadband means an internet connection with download speeds of at least 25 megabits per second.


45 Under normal circumstances, states might view federal assistance as free money, use it to displace their own efforts, and in effect spend those fungible dollars on other priorities. Under the current budgetary stringency, states have no such flexibility, and funds for system modernization will be purely additive for that purpose.
50 For example, see: Abigail Wozniak, “Tracking COVID-19 Symptoms and Impact in Real Time: A Survey-Based Surveillance System,” accessed on April 7, 2020.
55 While total US spending on R&D as a share of GDP is at its highest levels since the National Science Foundation began tracking data, federal funding of R&D has averaged only 0.7 percent of GDP since 2000—a full percentage point lower than the average from the 1960s. Additionally, the federal government remains the principal funder of basic research in the US, responsible for roughly 42 percent of all dollars spent in 2018, but federal investment in basic research as a share of GDP has declined to its lowest level since the early 1960s. See: “National Patterns of R&D Resources: 2017–18 Data Update,” National Science Foundation, National Center for Science and Engineering Statistics, January 8, 2020.
SUSTAINING CAPITALISM
Achieving prosperity for all Americans could not be more urgent. Although the United States remains the most prosperous nation on earth, millions of our citizens are losing faith in the American dream of upward mobility, and in American-style capitalism itself. This crisis of confidence has widened the divide afflicting American politics and cries out for reasoned solutions in the nation’s interest to provide prosperity for all Americans and make capitalism sustainable for generations to come. In 1942, the founders of the Committee for Economic Development (CED), our nation’s leading CEOs, took on the immense challenge of creating a rules-based post-war economic order. Their leadership and selfless efforts helped give the United States and the world the Marshall Plan, the Bretton Woods Agreement, and the Employment Act of 1946. The challenges to our economic principles and democratic institutions now are equally important. So, in the spirit of its founding, CED, the public policy center of The Conference Board, will release a series of 2020 Solutions Briefs. These briefs will address today’s critical issues, including health care, the future of work, education, technology and innovation, regulation, China and trade, infrastructure, inequality, and taxation.