BROOKINGS

Report

Preparing for the next pandemic: Early lessons from COVID-19

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COVID-19 has caused more than 109 million confirmed cases, claimed more than 2.4 million lives, and even brought prosperous nations and well-run healthcare systems to their knees. Few countries have been spared. Even in the economically powerful U.S., the tension between maintaining social freedoms and engaging in efforts of collective defense against the virus has led to politicization (e.g., mask wearing, social distancing and vaccine refusal). Sadly, the U.S. is bearing the heaviest human toll from the virus with 25.4 percent of total confirmed cases and more than 486,000 deaths. Fortunately, even in our darkest hour in the fight against COVID-19 – amid a predictable winter surge – there is a light at the end of the tunnel. Pfizer and Moderna have each produced vaccine breakthroughs with 90 percent or greater efficacy, while Johnson & Johnson seeks approval of a single dose vaccine that may be available over the summer. With over 70 million doses delivered across the country, close to 53 million doses have been administered of which 14 million people have received their second shot, breaking the logistical and supply chain log jam that plagued early vaccine efforts.

Even though pandemic preparedness and biodefense have had ardent and clarion supporters, namely Bill Gates and the first Secretary for Homeland Security Tom Ridge, COVID-19 proved how ill-prepared we were to combat a 100-year pandemic. It is not too early to draw lessons from this lack of preparation and global coordination. Not only will doing so aid current recovery efforts, but it would also increase readiness for the next communicable or vector-borne disease to threaten the world. Below are seven areas of opportunity to learn from our COVID-19 response and improve readiness for future pandemic shocks.

Restore institutional trust

Public health always depends on public trust. This is especially true during a global health emergency in which the first line of defense is public adherence to health directives, including to quarantine, observe social distancing, wear masks, and, eventually, receive a vaccine. It is notable that during the 21st century's pandemics, the most effective remedies borrow from a playbook that is hundreds of years old. Unfortunately, the fight against COVID-19, like past outbreaks and pandemics, has suffered from various perverse, insidious, and conspiratorial setbacks, including the specter of cyber-attacks attempting to thwart the lucrative and geopolitically prized race for a cure or vaccine. Indeed, cyber ne'er-do-wells are also targeting cold supply chains as the mobilization of vaccines gets underway.

The eroding public trust in the Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), World Health Organization (WHO), and pharmaceutical companies more generally has already signaled the need for reform. In the U.S., the CEOs of major pharmaceutical firms, along with industry bodies, have made public pledges that their race for a cure will not succumb to political pressure nor will their companies cut corners on public safety and scientific soundness. Seeing a tension between public interest, shareholder value, and corporate reputation, the private pharmaceutical industry seems to have distanced itself from political interference and emphasized science in their decision making. The same temperament should hold true among political leaders who, in a crisis, must model the behavior they want to see in the public. Such leaders must also provide clear, fact-based information, even if— especially if—it is politically inconvenient.

Fortify early alert frameworks

Some countries, such as Singapore and South Korea, have a comparatively more effective disease outbreak early alert system. This is especially true in Southeast Asia, where people are accustomed to the perennial threat of communicable upper respiratory diseases. Many of these diseases have been identified and mitigated through preventative measures including airport and port of entry screening, temperature checks, and broader social acceptance of wearing masks. Partly due to such measures, countries with crowded urban

environments such as Taiwan or Singapore have fared comparatively well in terms of COVID-19 infections even though social distancing (of six feet or greater) may be impossible in some settings such as public transport. These examples demonstrate that building a system for defense against infectious diseases, especially novel or emerging threats, requires an outermost perimeter that serves as a veritable early alert system. Central components of this early alert system include forward-deployed infectious disease specialists, as well as trusted relationships among scientists and epidemiologists. These specialists know the tell-tale signs that a novel virus is emerging and when to sound the alarm – in short, science and data should guide decision-making in response to potential outbreaks.

Sadly, in the case of COVID-19, many components of such early alert systems have been greatly strained, defunded, and politicized, both at the national and global levels. However, in the fight against a so-called "invisible threat," global solidarity, trust, and real-time threat information sharing are a part of our collective defense. The U.S. is best positioned to lead and refortify these early alert frameworks, beginning with shoring up trust in public health authorities within the country and resourcing them adequately for the global fight against vector-borne and emerging infectious diseases. It was always a matter of time before a new pandemic would occur, and efforts to improve defenses post-COVID-19 should treat the prospect of communicable disease outbreaks like a mathematical certainty.

Threat-based resource allocation

One of the risk management conundrums in pandemic preparedness and biodefense is that the risk feels intangible. Additionally, experts who warn about the specter of contagion are frequently dismissed. Prominent voices from Bill Gates, who sounded a clear alarm at the 2017 Munich Security Conference, to Governor Tom Ridge and Senator Joe Lieberman, who co-chair the bipartisan commission on U.S. biodefense and pandemic preparedness, have largely gone unheeded. COVID-19 must serve as a global wake up call, lest the great human and economic sacrifices are in vain.

Hopefully, the aftermath of COVID-19—which may still be some ways off as the U.S. grapples with a growing third wave and the appearance of mutating variations, which may blunt the effectiveness of vaccines—will recalibrate resource allocation to match the global threat environment. Even in the lead up to the COVID-19 pandemic, U.S. resource allocation for combating infectious diseases and developing biodefense was woefully inadequate. In 2014, the U.S. allocated $6 billion in Federal funding to civilian biodefense, mostly in a diffused manner across a range of research and development programs. Similarly, despite the threat of novel infectious diseases making the "magic leap" and the ever-present specter of bioterrorism or lab-borne threats from malicious actors, this low defensive posture is largely the same around the world.

Comparatively speaking, as a share of global defense spending, the security industrial complex does not allocate nearly enough threat-based resources to mitigating pandemic risk, in the form of money, attention, or human capital. In aviation risk management, there is a process of capturing near misses. By this measure, when it comes to emerging zoonotic risks, scientists have identified 200 zoonoses and seen six registered as a Public Health Emergency of International Concern under the WHO's emergency classification. Of these, three have been coronaviruses, suggesting that it was only a matter of time before one reached pandemic proportions. Considering the amount of money spent in shoring up the U.S. economy and providing direct relief to citizens (more than $5.7 trillion in economic interventions thus far), pre-investing in infectious disease prevention and meaningful ways of breaking the chain of transmission are clearly a better investment than ex-post efforts to deal with a novel zoonotic health crisis.

Science in the war room

There is an adage in management circles that if you do not measure something, you cannot manage it. In fighting the spread of COVID-19, data and science should be the most critical elements of decision making. Unfortunately, the void of reliable real-time information has been a global challenge during the COVID-19 crisis. This has been particularly true in the U.S., where different states have each pursued varying degrees of transparency, accuracy, accountability, and, critically, methodologies, with regards to reporting infection and casualty rates. In some instances, low-levels of technological

processes like the limits of Excel spreadsheets or the specter of keystroke errors, have created misreporting and miscalculation on the number of confirmed cases, as well as the prevalence of community spread.

Another major challenge in the race for a vaccine has been the early, often erroneous signals surrounding the effectiveness of treatments and experimental drugs or vaccines. The world has embarked on nothing short of a vaccine space race to find an effective cure for COVID-19, with some countries, such as Russia, claiming victory early on even though clinical trials have been either scant or could not support efficacy and safety with data. Sadly, even in the face of a global threat, the tendency of economic nationalism and retrenchment stands in the way of global collaboration and solidarity in the race for a vaccine and its global availability. This is true for the vital task of building the type of integrated supply chains that are needed for the provision of lifesaving N95 masks and medical equipment, as well as the high-functioning cold supply chains required to distribute vaccines at global scale. Unless there is great coordination on cold supply chain management, likely led by the logistics prowess of the U.S., the advent of a vaccine may be a Hail Mary pass for many countries wherein poor countries that comprise the largest share of the world's population may pay the heaviest price of vaccine nationalism.

Privacy preserving technology

Although we have many technological tools that could help control a public health crisis, those tools are only beneficial if the technologies are both trusted and readily deployable. The general lack of reliable, real-time threat information sharing, contact tracing, and community prevalence data during this pandemic has meant people and public health authorities have either been flying blind in the fight against COVID-19 or are relying on backward-looking reporting of confirmed cases. This type of reporting has been particularly plagued with issues: persistent testing bottlenecks, false positive tests, the asymptomatic nature of many cases, and lags in reporting testing outcomes have all presented challenges in mounting an effective and trusted response. The gap in population-scale technologies to facilitate open information sharing, including self-

reporting COVID-19 symptoms in a privacy preserving way, is a clear national and global vulnerability. The lack of ubiquitous, trusted technologies in the hands of U.S. citizens confounded real-time risk-reward decision making at the household level.

Playing whack-a-mole with the moving target of a COVID-19 resurgence (including the specter of rapidly evolving variants) without a reliable national COVID-19 dashboard has hampered containment, mitigation, and public health information sharing. In the absence of reliable, real-time data on community prevalence of COVID-19, the assumption is that everyone is a potential threat, which is what makes the "nuclear" lockdown option necessary despite its economically detrimental effects, especially on the most vulnerable people and sectors. Herein lies the difference between risk and uncertainty: risk is measurable, uncertainty is not, which is why the latter is a driver of panic, paralysis, and fear. These are the very conditions that have gripped many parts of the country, as U.S. households have contended with the type of life-or-death decision making usually reserved for battlefields or hospitals.

Indeed, as vaccines are gradually approved, notwithstanding the deleterious effects of vaccine nationalism, containing COVID-19 will require the largest vaccination campaign in U.S. history. As with yellow fever vaccination cards required at ports of entry in a number of countries, the prospect of health passports being upgraded from risk-prone analog cards, which may be lost or forged, is another opportunity to leverage technology. Here, too, the advent of privacy preserving technology in the form of portable e-health passports can provide individual protections and community health assurances as we overcome our trepidations to return to normal. Five major airlines are adopting their own e-health passport as a potential precondition for boarding, along with rapid testing to augment potentially porous airport screening or traveler-provided assurances on pre-travel health. Until population-scale clearances are provided, restoring trust and business as usual may see two populations being served: one group that can provide high-assurance on COVID-19 immunity may be allowed to resume a semblance of normal activities, while the other may struggle with restrictions until the chain of transmission is broken.

Mass casualty surge capacity

There is a fundamental tension between public health emergencies—and their resulting need for collective defense against a pandemic—and privatized healthcare. The definition of a moral hazard is risk-taking behavior without bearing the consequences of the risk. The vulnerability of an unequal and ill-prepared U.S. public health system, where more than 26 million people are functionally out of the system (as uninsured or poorly covered), has been laid bare during the COVID-19 pandemic. Not only did the material scarcity of life-saving equipment like ventilators and personal protective equipment (PPE) – among other essential supplies – imperil frontline healthcare workers, but it also often consigned those with treatable conditions to their death.

There is a clear need for improved universally accessible emergency healthcare surge capacity to respond to mass casualty events. The national healthcare emergency perimeter should reach 100 percent of the U.S. population, particularly when combating the spread of an infectious disease or responding to a wide-scale bio-hazard event or other mass casualty threat. The medical and emergency management professionals on the frontlines, meanwhile, should never experience a shortfall of predictably necessary and life-saving supplies. Sending healthcare professionals to fight COVID-19 with ill-fitting, reused, or patchwork PPE, is tantamount to sending soldiers into battle without body armor or weapons. In keeping with this combat analogy, the nation's healthcare and emergency response system must also draw lessons learned from the COVID-19 response and formulate tabletop exercises and preparedness drills that treat mass casualty events, communicable diseases, and bio-threats as ever present, rather than as so-called black swans or statistically rare events.

Public-private accelerator

If and when the world sounds the all clear on COVID-19 and the global economy returns to a new normal, a generational debt of gratitude will be owed to scientists and medical professionals. The pandemic, like prior global crises, has blurred the lines between public and private resources. In many countries, including the U.S., governmental powers usually reserved for times of war were used to compel the private sector's balance sheet to make a

down payment on the greater good. While some firms responded to this call to action affirmatively and on their own volition, others will be compelled by the Defense Production Act, not realizing that shielding their balance sheet amid total economic collapse would be a reputation tarnishing Pyrrhic victory. This is especially true considering the scale of the taxpayer backstop that has been deployed in the U.S. in an unprecedented mobilization of the government's financial wherewithal to stave off massive layoffs, business closures, and economic ruin.

In all, the economic response to COVID-19 has tipped already perilous U.S. debt-to-GDP rates to stratospheric heights not seen since World War II. With national debt projected to be greater than the size of the U.S. economy, the down payment on COVID-19 response and recovery will require generational commitments to ensure national resilience in the face of future threats. A public-private approach to catalyzing national and global resilience to large-scale emerging threats such as climate change, pandemic preparedness, and biodefense, among others, would be a more effective use of resources than addressing a catastrophic event without a plan. Operation Warp Speed, the nom de guerre for the U.S. race for a cure, has mobilized what is ostensibly the fastest pursuit of a safe vaccine in history and has also shown the benefits of purposeful societal collaboration. The U.S. is not alone in this quest. If this type of innovation accelerator were not a zero-sum proposition for each country but rather a globally shared and pre-funded capability immune from corporate intellectual property restrictions and national interests, the potential for broad societal benefits would be unprecedented.

Conclusion

The dreadful human, economic and sociopolitical toll of the COVID-19 pandemic hearkens to a war time effort. Rather than combating this disease in global solidarity, many countries and regions have opted to go it alone, ignoring the reality that against a threat unseen like a novel zoonotic disease, porous national borders that depend on the arteries of trade, integration, and globalization, will offer little defense. Some of the capabilities established in response to COVID-19 should remain in place, including and especially reinforced early alert frameworks that can serve as a proverbial tripwire that a novel virus, vector-borne disease or other bio threat has surfaced. These early alert systems are a

global tripwire framework that all countries must contribute to and believe in. Similarly, once the tendencies of vaccine and resource nationalism are overcome, countries must realize that in the face of pandemic and other global threats, we are in effect as strong as the weakest link. U.S. leadership in strengthening the chain of pandemic resilience will be a vital catalyst to ensuring the world is prepared for the next one and that the costly lessons from COVID-19 prepare future generations.

Science coupled with focused public spending or guaranteed demand for billions of vaccines has produced multiple breakthroughs in record time compared to the typical 12 to 18 months it takes to develop a new vaccine. This rapid vaccine development capability should not be disbanded once COVID-19 is contained, especially as many developing countries will rely on coordinated international assistance to contain domestic outbreaks and prevent mutations from leaping over national borders. COVID-19 bears many similarities to other global threats, such as climate change, severe income inequality and societal polarization. Like COVID-19, responding to these threats will require a societal approach, tradeoffs across the public and private lines and trusted public leadership that people will follow.

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