LEARNING FROM COVID-19:

A 23-Nation Comparative Study of COVID-19 Response, with Lessons for the Future of Public Health

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INTRODUCTION

A central puzzle of COVID-19 is why some nations have contained the virus almost completely while others have struggled to prevent multiple waves of community transmission. Equally puzzling is why many nations with evolved resources to combat a pandemic have fared worse than countries with fewer resources. A further paradox is why the virus has produced such different political and economic repercussions in nations with similar systems of government and demographics. In sum, confronted with the same phenomenon -- a pandemic caused by a novel virus -- we need to ask why countries have diverged so significantly. They differ in what they perceived as the most important problem to address, what resources they mobilized to tackle it, how much political buy-in they achieved, and to what extent they ultimately contained the disease and its economic fallout.

- The cumulative confirmed COVID-19 cases per million people in the US was 1,837 times greater than in Taiwan.
- The cumulative confirmed COVID-19 deaths per million people in Italy was 375 times greater than in China.
- The tests per confirmed case in Peru were almost 65 times fewer than in Singapore.
- The UK's cumulative deaths per million (1,113) is more than double South Africa's (515) despite having a GDP per capita over 3 times higher. [3]

To explore how and why these divergences occurred and what we can learn from them, two teams, composed of 78 researchers from 47 research institutions around the world, undertook a cross-national comparison of 23 nations on six continents.[4] Spanning a diverse range of countries, one was focused globally[5] and another specifically on Africa.[6] These comparative studies each draw on interdisciplinary expertise in the social sciences, law, clinical medicine, public health, and Science & Technology Studies (STS).

[3] Note all ratios included utilize data available up to January 4, 2021

[4] See appendix for full country and participant list.

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Australia	India	Singapore
Austria	Indonesia	South Africa
Brazil	Italy	South Korea
China	Japan	Sweden
Egypt	Kenya	Taiwan
Ethiopia	Netherlands	United Kingdom
France	Nigeria	United States
Germany	Peru	

This summary paper, drawing from both underlying studies, offers an early snapshot of a dynamic situation. The pandemic will continue for some time. Nevertheless, the preliminary findings outlined here provide tantalizing insights into why COVID has produced different outcomes in different places, how policymakers can better manage national responses in the months ahead, and what we must do to strengthen national and global systems for future health emergencies.

I. PUZZLES, PARADOXES, AND DIVERGENCES

- **United States:** Despite the impressive US achievements in biomedicine and extensive planning for pandemic preparedness, the US record in addressing the public health crisis of Covid-19 is among the worst in the world, as evidenced by absolute incidence and fatalities, ongoing economic disruption, and extreme political disarray.

- **Germany:** Effective response at the national level kept per capita incidence in Germany lower than in many of its neighbors throughout the multiple waves of transmission that struck Europe. In contrast to the US and Brazil, the German economic response emphasized preserving jobs and economic relationships with the result that stability and social order were largely preserved. Emergency measures were broad and inclusive and did not produce significant controversies around science or policy of the sort seen in many other nations, though some protests did occur.

- **Taiwan:** Quick action by a junior health ministry official who heard of the Wuhan outbreak on Twitter on December 31, 2019 led health authorities to intercept inbound flights from China that same day and helped stop the spread of COVID almost immediately in Taiwan, an island nation. Authorities have to date identified 776 cases of Covid-19 and 7 deaths. Expected GDP growth for 2020 dropped from 2.5% to 1.1%, but it still left Taiwan in the rare position of projecting positive growth for the year.

- **India:** With the second highest number of cases and the third highest number of deaths in the world, India has been hard hit by Covid-19. Yet the absolute numbers do not tell the full story, which would have to account for large regional differences in reported case-fatality rates. A unique element of the Indian response was a sudden and drastic lockdown that drove tens of millions of migrant workers back home to their villages, encountering severe hardships on the road and facing uncertain long-term economic prospects. India's economic recovery may be far more problematic than recovery from the disease, where India, as a major vaccine manufacturer, enjoys technological advantages.

- **Ethiopia:** With support from the Africa-CDC, WHO and UNICEF, national leadership mobilized 40,000 community health workers to screen 40 million people across 11 million households since the pandemic began, and deployed a mobile phone-based platform for data collection and reporting. Today Ethiopia showcases how disease control and prevention in Africa is, in comparison to other places, multilateral, regionally networked, and highly collaborative. 81% of a national sample of Ethiopians approved of their government's response. In a population of 110 million, Ethiopia has 1,909 deaths. At the same time, Ethiopia has an ongoing crisis in its Oromo region where 35% of its population lives. Simmering internal tensions with the Tigrayan leadership in north-western Ethiopia have spilled over into a regional conflict with Eritrea and Sudan, unleashed a refugee crisis on top of a refugee problem, and diverted government's attention away from the immediate crisis and longer-term effects of the Coronavirus pandemic. The Ethiopian economy flatlined during 2020, and the situation is increasingly precarious.

- **Netherlands:** Early in the pandemic the Dutch Prime Minister announced an "intelligent lockdown" aimed at controlling the virus but less so the citizen, who could be trusted to be reasonable and follow expert advice in an appropriate manner. This response contrasted with the total lockdowns of Southern Europe and the no lockdown approach of Sweden. This "intelligent lockdown" worked well initially, but by the second wave of cases in the fall, progress was largely undone, causing the Netherlands to pivot its official response sharply, especially with regard to masks.

- **China:** After disastrous inaction during the first crucial weeks of the outbreak when authorities in Wuhan suppressed information and international health authorities were not permitted in the country, the central Chinese CDC implemented a policy of containment with military precision. The advanced machinery of digitalized state surveillance was mobilized, and millions of citizens were tested and checked daily for fever. Treatment in designated hospitals, combined with partly electronic contact tracing, brought the disease under control, and subsequent small, local outbreaks were successfully suppressed.

- **Brazil:** Taking a cue from the public posture of Donald Trump, President Bolsonaro scoffed at the virus and pushed for a politically infeasible policy of "vertical isolation," seeking to target those most at risk while keeping the economy open. In the ensuing controversies, a publicly trusted health minister was fired for supporting quarantine measures imposed by governors and mayors, but denounced as economically ruinous by Bolsonaro. The next health minister resigned within weeks. Brazil's Covid death toll rose to be second highest in the world.

- **United Kingdom:** Despite having a universal public health system beloved and trusted by its citizenry, the UK's per capita case count remains among the highest in the world and its own Prime Minister was hospitalized with COVID at a moment of immense debate about appropriate containment policies. The government's official source of science advice, the Science Advisory Group for Emergencies (SAGE), was challenged by an unofficial group that dubbed itself Independent SAGE, or "indieSAGE" for short, which became an oppositional voice calling for more stringent public health action than the Tory government pursued.

- **Australia:** In contrast to other federal systems, especially the US, the Australian government pulled together a unified national response to the pandemic. For the first time, the prime minister established a National Cabinet that included the heads of all the states and territories, without regard to party membership, to coordinate a "wartime" response. Strict lockdowns, international and domestic travel restrictions, social distancing, and testing, contact tracing, and isolation kept incidence and mortality (908 deaths) to low levels.

- **Nigeria:** While managing outbreaks of Yellow Fever, Lassafever, Monkeypox, Cholera and Vaccine-Derived Polio Virus, the Nigeria-CDC established 26 additional COVID-19 testing sites and implemented restrictive measures at a subnational level. With a population of over 196 million, Nigeria recorded 1,247 deaths cumulatively by December 27, 2020. While this is certainly an undercount and an alarming rise of second wave cases continues, this outcome is remarkable given that the WHO Joint External Evaluation and 2019 Global Health Security Index found Nigeria's health system to be seriously challenged.

II. FIVE FALLACIES

A year into the Covid-19 pandemic, many are asking which countries did best at managing the crisis and produced the best outcomes. This comparative study shows that, in important respects, these are the wrong questions and, given the scale of the ongoing disruptions, they are being asked prematurely. We identify here five common fallacies

refuted by our study. To learn from this crisis, future policy makers must move beyond these fallacies to develop more robust and resilient responses.

Fallacy 1: A playbook can manage a plague.
Our study shows the opposite:

- Playbooks presume performers will play their prescribed parts.
- A playbook works only if key actors agree it is the right play.
- If politics changes, players may throw out the script and play a different game. For example: Taiwan successfully played the SARS playbook. Germany played the reunification and 2008 financial crisis scripts to manage its economy well. The US administration disregarded the playbook left by Ebola policymakers and played a different game.

Fallacy 2: In an emergency, politics takes a backseat to policy.
Our study shows the opposite:

- Emergencies amplify pre-existing conditions in economic and political systems.
- In polarized societies, crises aggravate divisions such as racial and economic disparities, political hyper-partisanship, and distrust of governing elites (e.g., Brazil, India, South Africa, US).
- In consensual societies, crises reinforce pre-existing solidarity: at least initially, people temporarily set aside differences and support policies for the collective good (e.g., France, Japan, Germany, Netherlands, Singapore).

Fallacy 3: There are clear indicators of success and failure and successful outcomes can be well defined and objectively measured.
Our study shows the opposite:

- Outcome measures are contested and always context dependent.
- Performance measures are often contradictory, and experts disagree about which ones are right or important.
- Which indicators seem salient changes over the course of a crisis.
- How outcomes are perceived depends on which indicators are used.
- Choosing indicators to evaluate policies is therefore a political decision.

Fallacy 4: Science advisors enable policy makers to choose the best policies.
Our study shows the opposite:

- In crisis situations, technical knowledge is subject to interpretation and experts rarely speak with one voice.
- In many countries, conflicting expert advice is the norm not the exception (e.g., Brazil, Netherlands, UK, US).
- Trust in official advice correlates with trust in government (e.g., Germany, Netherlands, Singapore).

Fallacy 5: Distrust in public health advice reflects scientific illiteracy.
Our study shows the opposite:

- Vigorous debates about the "facts" occur between experts, and not only between experts and lay people (e.g., Italy, Netherlands, UK, US).
- Estimates, models, numbers, predictions, and overconfident expert recommendations based on evolving data change rapidly during a crisis (e.g., Ferguson on epidemiology [UK], Fauci on masks [US]).
- Vaccine hesitancy stems in part from cultural experiences with medicine (e.g., exploitation or marginalization).

III. KEY FINDINGS

Cross-national comparison offers a powerful method for identifying and explaining similarities and differences among countries, drawing out the many complexities of COVID-19, as well as understanding the sources of success in controlling the virus and its effects. Findings from this 23-nation comparative study include:

National actions produced divergence. Global institutions such as the World Health Organization (WHO) provided important, if controversial, leadership, augmented in important ways in the case of the African continent by the Africa Centre for Disease Control (Africa-CDC), but national governments and, in certain places, state or provincial authorities, emerged as far and away the most important loci of decision making and policy implementation. As a result, policies were far from uniform as countries with differing institutions, research traditions, cultural commitments, and ways of decision making pursued their own directions.

Networked governance mattered. Controlling COVID entails overcoming challenges in three interlinked systems: public health, the economy, and politics. Problems in any of these domains tend to spill over into the others. Policy makers cannot safely intervene in any of these domains in isolation without consideringthe others. Hence the health crisis intensified serious political problems in some countries, including the difficulty of building public support and legitimacy for policy decisions that turned normal life on its head.

The virus exploited nations' pre-existing conditions. Just as the virus exacerbated pre-existing medical conditions in individual bodies, the pandemic revealed pre-existing weaknesses in the body politic. Wherever there were structural weaknesses in the public health, economic, and political systems when the pandemic began, the difficulties of coping with the virus significantly worsened them (and vice versa). In Italy, pre-existing interparty conflict and lack of policy coordination were partly responsible for the failure to contain the virus at the initial epicenter of the outbreak in Bergamo. In Germany and Sweden, right-wing extremism found new grounds for mobilization in opposition to government policies on issues such as school closings and mask mandates. In France,

where Islamic alienation has long been a threat to the ideal of secularism, or laïcité, highly visible terrorist murders reignited tensions over the meaning of French citizenship, complicating Macron's efforts to invoke a shared conception of Frenchness. And in China, the pandemic provided cover for the central government to clamp down on Hong Kong's pro-democracy movement.

The cohesiveness of responses correlated with a nation's degree of "public health sovereignty." For more than 100 years, modern states have agreed that one of their core imperatives is to protect public health. That goal justified extraordinary grants of power to health officials, such as the power to impose quarantines. Indeed, the public health apparatus in some nations enjoys almost state-like authority, or "public health sovereignty." Yet public health sovereignty differs greatly in degree and kind across the 23 nations, shaping how responses and outcomes play out in each.

Integrating biomedical with social intervention presents unresolved policy challenges. Public health officials in all study countries instituted the same two broad modes of intervention, each based on different forms of technical knowledge. Biomedical interventions externalize the threat, focusing on the virus as a foreign invader that attacks the individual body and the national population. Its entry must be blocked by erecting impenetrable walls, such as personal protective equipment (PPE) or border controls; or it must be defeated after entry through biomedical means, such as medications or vaccination. The second mode brings the problem home to people's behavior. It frames citizens and social practices as a threat that can spread disease within the community and nation. This threat must be controlled through measures such as social distancing in public spaces, limiting the size of gatherings, and locking down the economy and social life. In effect, these two framings underwrite two very different types of measures: those targeting the virus and those targeting social practices. The latter in particular proved far more difficult for policymakers to implement.

	Targeting the Virus	Targeting Social Practices
Metaphoric frame	Virus as foreign invader	Citizens and social practices as domestic threat
Typical Measures	Border controls, Personal protective equipment, Isolating vulnerable individuals, Herd immunity, Miracle drugs, Vaccines	Social distancing in public, Limiting private gatherings, Mask mandates, Domestic travel restrictions, Lockdowns of economies & social life, School closings, Combating vaccine hesitancy
Sources of expertise	Clinical medicine, virology, cellular biology, genomics	Epidemiology, mathematical modeling, social science
Imagined mechanism of action	Technical fix, "silver bullet" solutions defeating virus	Citizen compliance limiting spread
Intrusiveness	Low	High

Policy leaders consistently misjudged the implementation and effects of social interventions. A key finding of this study is that policy makers need to negotiate the implementation of social interventions in relation to salient features of their specific political contexts. This is important as measures targeting social practices involve imposing restrictions on personal and group behavior that disrupt the lives of much of the population. These measures are likely to generate substantial controversy. Political subjects are not simply biomedical entities but also, as many states have discovered, citizens with interests, rights, and ways of imagining their relationship with the state independent of the strictures of public health controls.

Economic responses aimed at preserving jobs rather than simply stimulating markets and providing relief initially performed best. Economic policies in different countries focused on achieving different objectives based on divergent understandings of the work/life relationship. Some measures aimed first and foremost to provide short-term cash relief to individuals, whereas others addressed structural issues by stimulating markets, while others sought to preserve relationships, such as between employers and employees or

landlords and tenants. Some countries explicitly included vulnerable groups like artists and gig workers, while others ignored them (e.g., the large informal sector in India received little explicit attention). At least in the short term, money spent maintaining solidarity and sustaining the social and economic fabric lessened anxiety and boosted public confidence more than those focused only on short-term spending relief for individuals.

IV. CLASSIFYING COUNTRIES: CONTROL, CONSENSUS, CHAOS

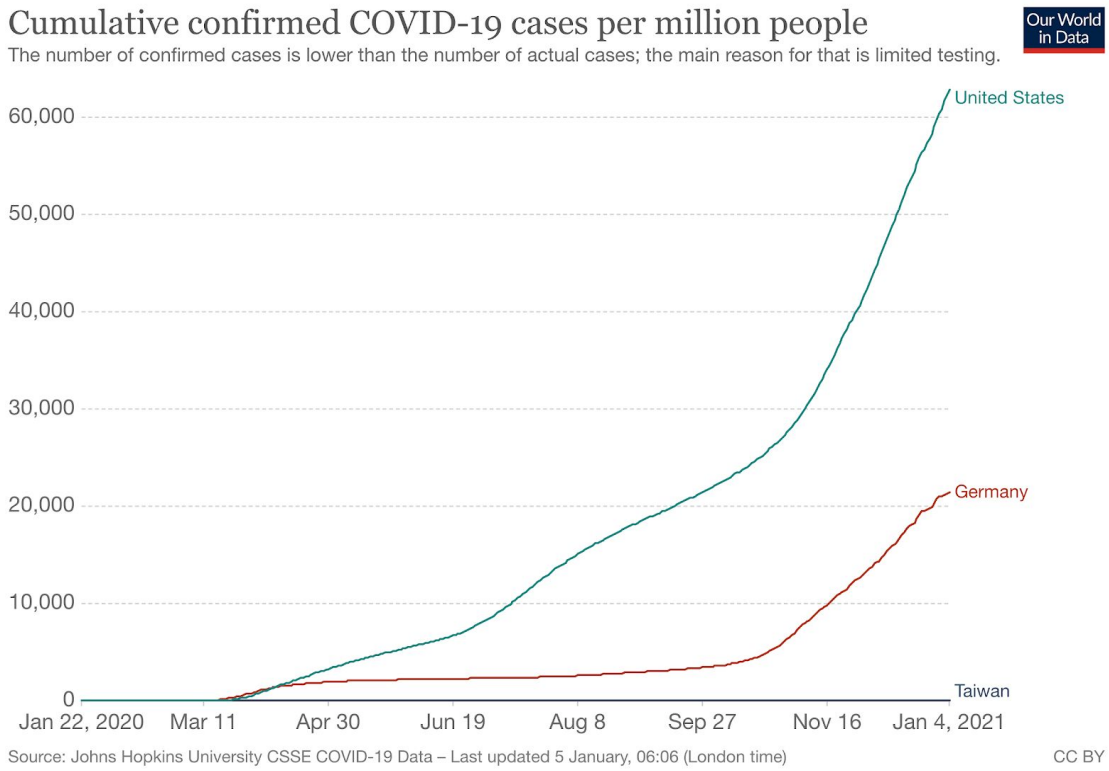
How have the efforts to manage the three intersecting systems comprising pandemic policy – public health, economy, and politics – played out around the world?

Analyzing the responses of the 23-study countries to date reveals three broad and dramatically different patterns, connecting policies and outcomes across the health, economic, and political systems. Some countries have achieved a coherent response and significant degree of control over the situation in all or most of the three systems. Notably, this category includes democratic as well as authoritarian states. Some countries achieved basic policy consensus about how to proceed, although ongoing health concerns entail significant economic hardship. In still a third group of countries, policy chaos prevailed, with extensive conflict over policy goals and measures in all three systems. This classification is schematic, and a country's overall experience of the pandemic will not completely conform to these ideal types. For example, South Africa exemplifies a hybrid with elements of all three types. The situation is rapidly evolving, so any country's place in this schema may change. Nevertheless, classifying countries into these three categories provides a useful, high-altitude comparison of the patterns of national experience.

Table 2 sketches the differences between control countries, consensus countries, and chaos countries, using Taiwan, Germany, and the United States as exemplars of each.

	Control (Taiwan)	Consensus (Germany)	Chaos (United States)
Health	• Uncontested public health sovereignty • Learning from SARS	• Negotiated public health sovereignty • National research & advisory system • Corporatist medicine	• Contested public health sovereignty • Competing political and biomedical subject
Economy	• Minimal intervention • No lockdown • Effects mainly from networked economy	• System stabilization • Job protection • Learning from 2008 & Eurozone crisis	• Market stimulus • Money into pocketbooks of the unemployed • Controversial bailouts
Politics	• Statist approach • High public approval of Covid response • Victory for VP in mayoral election	• Corporatist approach • Committed to risk aversion and stability	• Pluralist with high polarization • Distrust in expertise • Conflict between center and states

Figure 1: Cumulative confirmed COVID-19 cases per million people in the United States, Germany, and Taiwan.[7]



Control Countries

Taiwan provides a good example of a control country in which a statist policy response, dominated by public health expertise, was able to achieve control in all three arenas. Learning from its experience with SARS conditioned Taiwan's response. Public health sovereignty was largely uncontested, and a command-and-control model was instituted. After the first case was confirmed on Jan 21, 2020, the government gradually introduced border control, contact tracing, and mask rationing policies. Social distancing guidelines were added in April. As of the beginning of December, Taiwan had identified 776 cases of Covid-19 and 7 deaths. Taiwan's economic response involved relatively minimal intervention. Although the government did not lockdown the economy, some sectors such as the travel and hotel industries experienced a downturn. Expected GDP growth for 2020 dropped from 2.5% to 1.1%, but it still left Taiwan in the rare position of projecting positive growth for the year. The government enjoyed high public approval for its response. The

[7] Published online at OurWorldInData.org. Retrieved January 05, 2021 from: 'https://ourworldindata.org/coronavirus-data-explorer'. [Online Resource]. Underlying source: John Hopkins University CSSE COVID-19 Data.

vice-premier, who was known for his work with the Taiwanese CDC, ran for mayor of Kaohsiung city and won handily.

Other control countries with somewhat similar stories include China, Singapore, and South Korea.

Consensus Countries

Germany nicely illustrates how a country with a corporatist political system achieved a relatively strong consensus in support of an active, social democratic response to the challenges of the pandemic. Germany delegated public health policy to established scientific authorities and grounded public debate in general appeals to rationality and social solidarity. Compared to other countries, there was little controversy about the strength of the scientific evidence, whether it should be the guiding principle for policy, or the role and composition of expert bodies, all of which were familiar, long institutionalized entities. On the economic front, Germany swiftly mobilized extensive relief measures to maintain economic and social stability by preserving employment and sustaining the relationships that undergird the economy. Controversy about public health and economic policy measures, on the whole, remained limited, though it did intensify in the fall, when, in the face of a second wave, Germany instituted a "lockdown light" over protests against new Covid-19 restrictions inclusive of a new mobilization on the far right.

Other consensus countries displaying similar response patterns include Australia, Austria, France, Japan, the Netherlands, and Sweden.

Chaos Countries

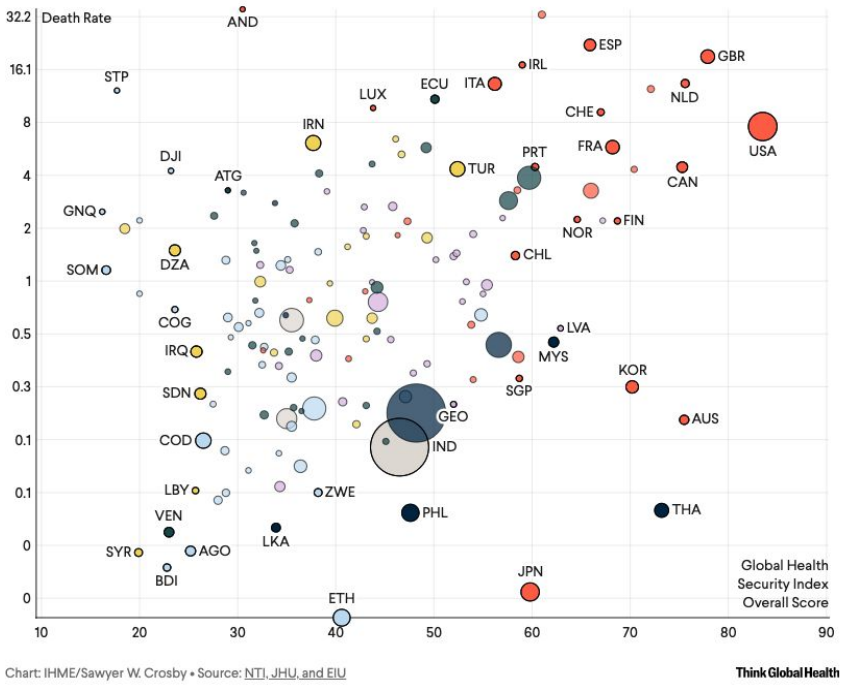
The United States is the leading example of a country in which policy chaos was the prevailing pattern. In a pluralist polity marked by polarization and hyper-partisanship, disputes developed at multiple levels of government: between the national government and states, between states and municipalities, and between the House and the Senate. Public health sovereignty was bitterly contested. Most conflict fell out along party lines, with Democrats seeking to protect the health of the biomedical subject with severe restrictions on movement and Republicans claimingto preserve the liberty of the political subject by keeping the economy open and letting individuals choose for themselves how much risk to bear. An initial consensus that the pandemic demanded a massive response led to passage of a stimulus package, but the goals of this program – to stimulate demand and provide relief to the unemployed – differed from those of the social democracies of Europe. Ongoing debate about a second stimulus package began in the summer and continued till late December when Democrats and Republicans reluctantly reached an unsatisfying compromise that the president even more reluctantly signed.

Other chaos countries displaying similar patterns of political division and inaction or incoherent action include Brazil, India, Italy, and the UK.

V. "EPISTEMIC AUTHORITY" AND THE 21st CENTURY SOCIAL COMPACT

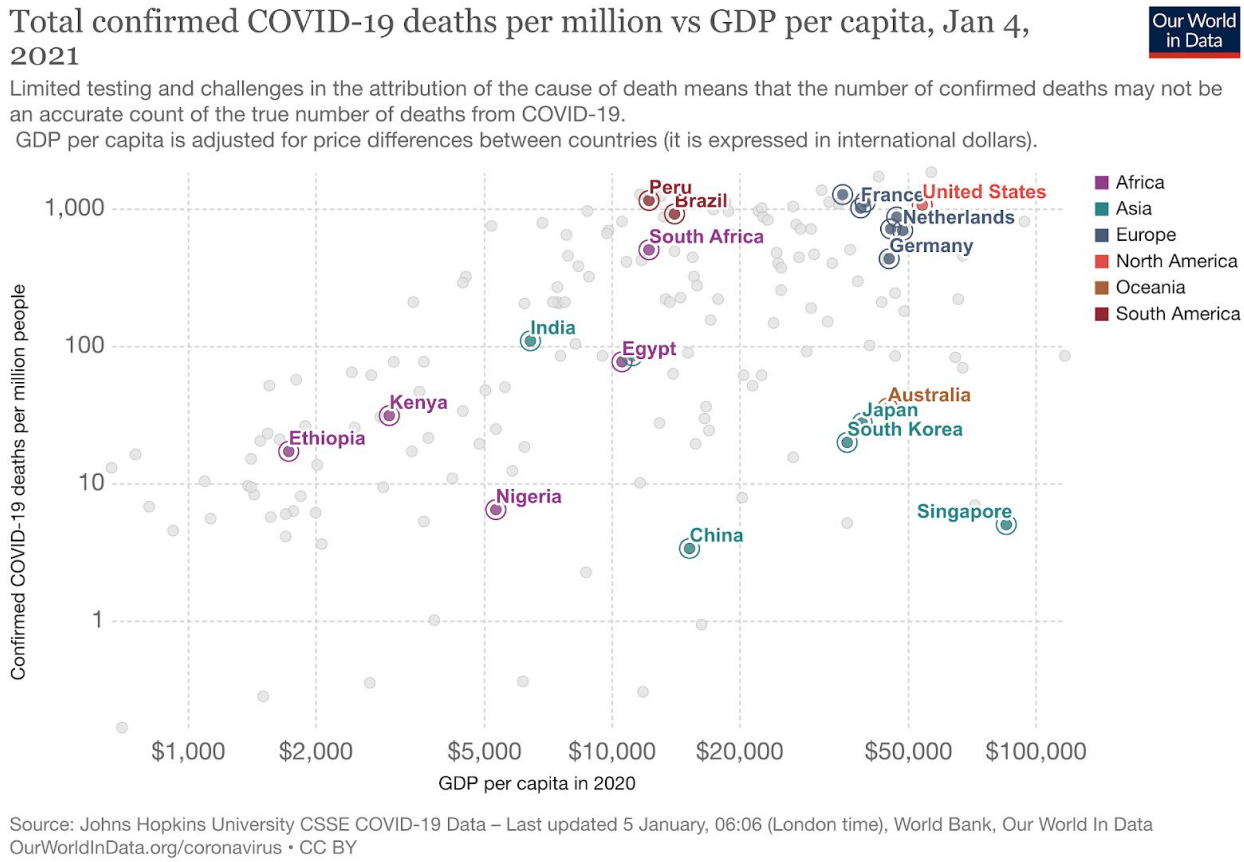
What accounts for the wide discrepancies in the efficacy of responses to the pandemic across the categories of control, consensus, and chaos countries? Differences in GDP per capita is not the explanation, given the divergent experiences of wealthy countries such as Germany, Japan, and the United States. Small island nations like New Zealand may find it easier to reduce coupling to global flows, but size and distance do not begin to explain the observed outcomes across our study. Nor can pre-pandemic assessments of preparedness or national scientific capacity account for these differences, as every country on earth had access to the same expert findings on the coronavirus, and countries ranked highest on the Global Health Security Index underperformed. Poor countries were not necessarily knowledge-poor, though they may have lacked other forms of institutional capacity. More revealing than these factors are the structure and strength of each nation's social compact and its role in framing how the response unfolded.

Figure 2: Global Health Security Index Scores vs COVID-19 Death Rates. Chart produced by IHME/Sawyer W. Crosby. [8]



[8]Crosby, S., 2021. All Bets Are Off For Measuring Pandemic Preparedness | Think Global Health. [online] Council on Foreign Relations. Accessed 5 January 2021 <https://www.thinkglobalhealth.org/article/all-bets-are-measuring-pandemic-preparedness> Underlying Source: NTI, JHU, and EIU

Figure 3: Total confirmed COVID-19 deaths per million vs GDP per capita, Jan 4, 2021
[9]



The social compact refers to prevailing understandings of the proper relationships among citizens and between citizens and the state. These understandings may be formally codified in law, built into institutions and routine practices, or grounded in unwritten social norms. Regardless of their form, these understandings address basic constitutional questions. What are the fundamental obligations of the state to its citizens? How is authority to make decisions delegated and to whom? What are the rights, obligations, and proper roles of citizens? To justify decisions that constrain the polity, what forms of public reasoning, including kinds of argumentation and evidence, are required? Since citizens will never completely agree on the nature of the good or the allocation of power and resources, how does the polity reach binding settlements to achieve justice without irreparably fracturing the social order?

[9] Figure 3: Total confirmed COVID-19 deaths per million vs GDP per capita, Jan 4, 2021. Published online at OurWorldInData.org. Retrieved January 05, 2021 from: https://ourworldindata.org/grapher/total-confirmed-deaths-of-covid-19-per-million-people-vs-gdp-per-capita . [Online Resource] Underlying source: John Hopkins University CSSE COVID-19 Data.

Constitutional scholars have long focused on the delegation of political authority. In the 21st century, scholars from the field of Science Technology Studies (STS) have argued that this familiar form of delegation must be supplemented by explicit recognition of the delegation of what is termed "epistemic authority": Who is granted the authority to provide the knowledge and evidence used to make public decisions? While all modern nations rely heavily on technical expertise, the ways in which expertise is mobilized differ markedly. For example, nation states have their own ways of determining which sources of expertise to draw on when experts disagree, a common occurrence in fast-moving, high-uncertainty situations. Societies also establish the limits of delegation to experts: for example, in allocating authority for decisions about health and medicine between physician and patient or between public health officials and the citizen. In the 21st century, the routine and expected ways that a polity makes such determinations is crucially part of the social compact. The differing responses to COVID must be seen through this lens.

The State and the Citizen

Singapore, the Netherlands, the US, and Egypt provide useful contrasts in how people imagine proper relations between the state and the citizen. In Singapore, the relationship between the state and the residents of the country is paternalistic in a manner that emphasizes social welfare. Massive public health programs – stabilized through public education, incentives, and fines – along with generous income support were established in order to keep everyday life and the economic sphere running as close to pre-pandemic times as possible. These policies were adopted through Singapore's signature top-down style, without public consultation, and sometimes even in the face of public caution regarding particular policies.

The Netherlands represents a stark contrast to this vision of citizen-state relations. As the pandemic accelerated in the Netherlands in March, Prime Minister Mark Rutte announced the "intelligent lockdown" described earlier in this paper that prioritized a devolution to individual judgement over strict protocols. The immediate result of this invocation of the Dutch citizen as able to make contextual decisions was little use of masks, widespread compliance with social distancing, a drop in cases, and increased support for the government. In the longer term, however, under the pressure of pandemic fatigue, the Netherlands experienced a second wave and some say a less intelligent lockdown, though a new law enacted through parliamentary initiative ensured that future emergency measures would be democratically accountable.

The polarized politics of the US exacerbated two competing, and partisan, visions of the relationship of the American citizen to the state. One vision emphasized the state's benevolence and its role in safeguarding the health and wellbeing of all citizens, expressing a communitarian vision of biomedical subjects jointly committed to protecting society. The

other envisioned a nation of autonomous, if atomized, individuals, stressing the importance of preserving citizens' liberty against overly intrusive government. In the context of these diametrically opposed visions, none of the nation's leaders attempted to build a unified polity, and two opposing camps of citizens maintained a bitter struggle about the right response to the pandemic from March 2020 through the end of this year.

In Egypt governance is still dominated, despite the Arab Spring, by the military with its associated chain-of-command structure for executing policies. The healthcare system is pluralistic, consisting of an underfunded public health sector and a private sector of practising physicians. 60% of healthcare expenditure is out of pocket. In terms of access to healthcare, citizenship means one thing for those without resources, quite another for those with. In this Egypt joins South Africa and other countries with its class-bifurcated system of health citizenship. Egypt tends to suppress rather than manage protest. It is modernising its healthcare system but lacks an effective system of resolving conflicts with healthcare professionals and workers.

Mobilizing Expertise

In responding to the pandemic, the ways in which countries mobilized expertise and delegated authority differed considerably. Even among wealthy democracies that share many similarities, such as Germany, France, and the UK, instructive differences are found. The German pattern of delegating epistemic authority to established institutions such as the Robert Koch Institute was not followed in neighboring France, although it was in Sweden. The Macron government established a new presidentially-authorized Covid-19 conseil scientifique, which included ten medical scientists with expertise in public health, two social scientists, and the president of ATD Fourth World. Controversies arose about the conseil scientifique, including questions whether its proximity to the presidency constrained its capacity to generate independent opinions and whether too many members were versed in epidemiology as opposed to other scientific disciplines.

The UK followed yet a third pattern, with a source of contrarian expertise taking shape. The government's official source of science advice, the Science Advisory Group for Emergencies (SAGE), was challenged by an unofficial group that dubbed itself Independent SAGE, or "indieSAGE" for short. Led by the former Chief Scientific Adviser, Sir David King, IndieSAGE commanded considerable media attention, becoming a loud, and some say confusing, oppositional voice calling for more stringent public health action than the Tory government pursued.

In contrast to the tumult in the UK's scientific advising, the Africa-CDC played a unique continent-wide role providing pandemic-relevant expertise and resources to countries that needed it. It made available information-sharing platforms with daily updates on COVID-19 epidemiology, policies and other technical support materials, as well as webinars and online

education and training sessions. With international partners like Resolve to Save Lives, which co-led the Partnership for Evidence-Based Response to COVID-19 (PERC), it published materials on the effectiveness of public health and social measures.

Mobilizing expertise under uncertain conditions presents special difficulties because, as in politics, opinions are divided and science is often competitive. Though expert consultation processes differ in each country, those that offered transparency and judgment, admitting uncertainty but drawing well-reasoned conclusions, fared better than those that offered dueling facts. In the US, New York State, under Andrew Cuomo's leadership, epitomized a more compelling blend of transparency and judgment than the federal government, which allowed expertise to become overtly politicized. It should be noted, however, that the most successful "control" countries invited very little public discussion of the evidence base for their policies, relying almost entirely on the judgement of epidemiologists and prior experience with containing infectious disease.

VI. WHO DID WELL AND WHY?

Which countries have succeeded and which have failed in their efforts to control the coronavirus crisis? This study of 23-nations cannot provide definitive answers along all of the axes of comparison, but broad conclusions can be drawn about national performance in the first year of the COVID emergency. If success implies generally positive performance in all three systems -- health, economics, and politics -- then control countries performed best and chaos countries worst in the short term, but it would be premature to draw up a balance sheet of the full costs and benefits of each type of approach now.

In health, various measures are in wide use and cross-national performance varies depending on which ones are selected: absolute incidence and mortality, case-fatality rates, excess deaths, numbers of tests and vaccinations, hospital and ICU overload, surges, or distributive effects of disease on demographic groups, including especially vulnerable populations such as the elderly, migrant workers, or racial and ethnic minorities.

In economics, the biggest questions relate to the speed and shape of the recovery and its distributive effects, partly captured in questions about the recovery's shape: will it be a V or a K, for example, the latter reflecting increased inequality and discrepant outcomes across categories of race, gender, and class?

In the political arena, answers are least certain. In Japan, for example, health impacts have been relatively light, the economic recovery slow, but public satisfaction low. India has high disease incidence, relatively high total morbidity and mortality, and massive economic damage to vulnerable populations, but support for the government is still surprisingly strong.

How policy connects to politics is the most significant variable so far affecting control of COVID. A repeatable finding from across the 23-nations is that the virus found and revealed "pre-existing conditions," structural weaknesses in each system that obstructed effective policy response: (i) weak or decentralized public health infrastructure; (ii) economic inequality; (iii) political alienation and partisanship, polarized divisions, and lack of trust in government. Countries that performed relatively well (i) centralized their information-processing channels, (ii) enacted timely and effective measures to protect economic relations in equitable ways, and (iii) successfully called upon a shared conception of citizenship to secure people's trust in those measures.

Solidarity Matters. The coronavirus crisis demanded not merely policy from above, but also acquiescence, vertically compelled or horizontally enforced, from almost all citizens in order to make the policy mandates work. In turn, especially in consensus countries, citizen compliance depended on public perceptions that action was justified and reasonable. Countries with traditions of acting in concert against social problems and countries with histories of deference to public authorities fared better on compliance than countries lacking either or both. For example, Prime Minister Rutte's "intelligent lockdown" in the Netherlands specifically appealed to reasonable citizens. Germany similarly called on citizens to do the right thing, with Angela Merkel invoking the sacrifices of World War II to rally her country behind a severe Christmas lockdown. In Britain, too, memories of wartime solidarity (invoked by Queen Elizabeth in an April 2020 speech) reconciled people to a regime of "shared sacrifice" and caused scandal when high-level officials such as Dominic Cummings violated the common rules.

In contrast, the US case illustrates how a polarized (rather than shared) conception of citizenship contributed to a chaotic crisis response. One version of citizenship, paralleling in many ways Europe's social democratic societies, accepted social restrictions because of almost unquestioning deference to public health authorities. Another version, however, distrusts government and prizes individual risk-taking. Holders of this latter vision, actively aided and abetted by Trump's aggressive social media messaging, took to the streets and to the courts to fight public health mandates and won some notable victories. It remains to be seen whether President-elect Biden's calls for national unity can overcome these rifts.

VII. DOING PUBLIC HEALTH DIFFERENTLY

Broad lessons are emerging from the 23-nation study about how public health policies must change to produce better integrated global responses across highly divergent health, economic, and political systems. These include:

Leaders Must Better Integrate Two Modalities of Public Health Interventions. Public health measures followed two broad modalities relying on different forms of scientific expertise: first, attempts to target the virus itself in its interactions with human bodies, drawing

mainly on molecular biology and clinical medicine; and second, drawing on epidemiological expertise, attempts to control human behavior likely to spread the disease. Responses worked best when these measures – biological and social – operated in tandem, yet precisely because solidarity is such a crucial factor in adherence to non-pharmaceutical interventions, attempts to integrate them can pose extreme challenges to leaders in countries with weak or contested public health regimes.

Evidence Base for Biomedical Measures Must be Strengthened. The failures of biological interventions are clearest in the cases of border shutdowns and policies to build herd immunity. Except in China and tightly controlled island nations like Taiwan and Singapore, attempts to stop the virus at national borders failed for multiple reasons. In the US, the ban on travel from China was incomplete and failed to address influxes from Europe. By contrast, China's containment policy kept even Chinese citizens from returning home in violation of the national ban on cross-border travel. Inadequate knowledge of transmission paths played a role in other countries as well. A former French health minister admitted under parliamentary questioning that initial models had not taken note of direct flights from Wuhan to France. Other knowledge gaps that compromised early biological containment included questions about how readily the virus spread through airborne transmission, whether asymptomatic carriers such as schoolchildren could infect others, and how long an infected person remained contagious. Public health authorities must reckon with these failures and build a better evidence base for action under uncertainty going forward.

Evidence Base for Social Measures Must be Substantially Strengthened. Non-Pharmaceutical Interventions, while undoubtedly powerful ways to stop transmission, are also among the least tested and understood measures in public health. More learning is needed on how to deploy them effectively in different national contexts. Countries that simultaneously implemented controls on the virus and on social practices generally fared better. Examples include Australia, China, Germany, Singapore, South Korea, and Taiwan – although most have experienced second waves necessitating further painful restraints on economic and social activity. The evidence required for more fine-grained evaluation of these hybrid approaches is still accumulating and further study of them must be one of the most important research agendas coming out of the pandemic. Crucially, this study of social measures must integrate sociological, anthropological, political, and behavioral expertise, disciplines that have not historically worked centrally with public health experts or medical authorities.

Public Health Authorities, and especially the WHO, Must Move Beyond a "One Size Fits All Approach." At a minimum, this study indicates that the field of public health has undertheorized, in sociological and political terms, the actual world into which its guidance flows. All 23 countries involved in this study have confronted the problem of persuading publics to accept unpopular restrictive measures. With the global rise of "Covid fatigue,"

and Northern nations facing a winter surge in cases, the need for such messaging has become even more acute than in the earliest days of the crisis. The price of this misreading of the world can be steep if good policies are short-circuited by public rejection, whether in the context of flattening the curve or vaccine hesitancy. It is tempting for expert bodies to resort to univocal policy messages, often expecting science's institutional authority to compel public compliance. This study shows why such monotonic messaging is not adequate to the task.

- **Hard Truth #1:** Trust in science as an institution is not equivalent to trust in public health expertise. Unlike scientific research, public health systems wield enormous regulatory power over people. Public health mandates during a pandemic range from compulsory testing and vaccination, to reporting requirements, restraints on movement, quarantines, and even restrictions on who can be treated for disease (e.g., through triage). This study demonstrates that trust in a nation's public health system is contingent on the specifics of each country's institutional arrangements. For example, in the UK, almost universal support for the National Health Service (NHS) led to episodes of public thanksgiving – opportunistically joined in by Boris Johnson following his successful treatment for Covid-19 – and reinforced the sense of an imagined national community and spirit of shared sacrifice that secured public compliance during the early months of the pandemic. In the US, by contrast, a century-long history of constitutional arguments against public health intrusions resurfaced in a proliferation of Covid-related lawsuits. This burst of litigation attests to the ongoing tension between the power of the public health regime and claims of individual liberty. When publics appear to be rejecting the assertions of public health authorities, it is important to query and address the sources of distrust.

- **Hard Truth #2:** Distrust of public health expertise is often attributed to lack of scientific literacy or to active disinformation strategies, but deeper factors are at work and must be addressed. The Trump White House stance against mask-wearing and in support of untested treatments for Covid-19 has been portrayed by some as "anti-science." This study shows, however, that culturally specific reasons for distrust—such as opposition to communitarian solutions among rugged individualists—exist and should be identified and addressed to secure compliance with responsible public health regimes. Sensitivity to culture and history is necessary in every country. A record of medical neglect and research misconduct, for instance, has left Black Americans and Africans deeply suspicious of public health claims and increases the likelihood of vaccine hesitancy among racial minorities. In the Netherlands, a self-aware citizenry, confident of its capacity to make reasoned health choices, challenged the reasonableness of the government's mask mandate. In the UK, a sensitivity to the interpretive flexibility of science led to the formation of a unique alternative body to the official Scientific Advisory Group for Emergencies (SAGE). In India, the rising tide of Hindu nationalism fed rumors of a

Muslim-induced "coronajihad" while also intensifying Muslim distrust of government policies. Rhetorics of persuasion vary across countries and do not translate well across political cultures. It follows then that public health messaging needs to address the specificities and contingencies that underlie particular national and subnational orientations toward public health. This point has significant implications for pandemic response in the emerging post-Covid world order.

- **Hard Truth #3:** A universal "Playbook" is not the answer. Both the Bush and Obama administrations, for example, left their successors thoughtful playbooks for how to address a pandemic. The fact that these playbooks were not followed underlines a basic weakness of this policy approach. To be effective, a playbook demands players who are willing to perform the play and respectful audiences who understand and accept the need for the play to be performed. Both were lacking in the US case. This study indicates that a pandemic requires a far deeper appreciation of how the efficacy of clinical and behavioral public health guidance intersects with politics. As the Covid-19 crisis repeatedly demonstrated, the spread of a pandemic contains twists and turns that no one could have predicted and that converted what might have remained a self-contained outbreak in China into a raging phenomenon that sickened 77 million people and claimed at least 1.7 million lives in 2020.

- **Hard Truth #4:** Resilience is more important than pre-planned public health guidance. Pandemic response strategies would do well to borrow from learning in other disaster contexts, including hurricanes and floods, that have underscored the need to develop resilient systems. In the coronavirus crisis, the systems that performed well, even exceptionally, are the ones primed into preparedness by earlier crises, not necessarily of the pandemic kind, and equipped with redundancies and shock-absorbing mechanisms. The European Union was able to muster the economic expertise gained in trying to manage the 2008 financial crisis and the Eurozone crisis. And as Angela Merkel herself noted in a (for her) unusually emotional pre-Christmas speech, German citizens had learned solidarity and sacrifice the hard way in World War II, but those attitudes were there to be activated in the face of this altogether different crisis. Adaptability proved key. Pre-scripted routines were quickly outrun by events.

- **Hard Truth #5:** Continuous monitoring, evaluation and learning is called for. We have learned that a pandemic caused by respiratory virus like SARS-COV-2 is not a once-off affair. It comes in cycles, waves and surges, and brings at every turn surprises and challenges that have to be met with refreshed strategies, more finely calibrated local responses, and where possible, bespoke emergency funding. South Africa is a painful illustration of why a static approach fails. The strict lockdown to the initial outbreak in cities successfully flattened the curve. But not enough preparation was done to cope with a second wave outbreak in peri-urban and more

rural areas that have less health-care resources, where testing has not scaled to track and stay ahead of the epidemiological trends. Sufficient funds should ideally be available as a war chest for such emergencies, but as in the current context, it remains a global challenge how to ensure such funding for poorer countries. Matching-fund financial vehicles are one possible way to enhance preparedness and response capabilities.

VIII. AGENCY LEADERS HAVE TODAY

One of the great surprises about COVID is how many nations with so few standing resources to combat a health emergency were able to control COVID far better than others who ostensibly had more tools at hand. This finding highlights the crucial role of leaders in transcending structural problems -- in this study's terminology, their own nations' "pre-existing conditions." Suggestions for how all leaders can better manage COVID in challenging circumstances include:

Leadership Matters. Leadership, what it means and why it matters, varies by context and purpose. This 23-nation study suggests that decisive early leadership in countries that had few standing resources to combat COVID-19 helped achieve outcomes that exceed other nations with far more tools at the ready. The five African countries that are part of this study illustrate the value of rapid immediate recognition of the problem at the highest levels of government, even when information is imperfect, to allow swift mobilization of response machinery. South Africa started its public information campaign the same day as its first registered case. Kenya's response was immediate and swift. Ethiopia started its information campaign, closed its schools and ordered a stay-at-home 3 days after registering its first case. These actions helped avert early levels of COVID transmission in Africa that could have been catastrophic, showcasing the difference that agile leadership can make. On the other hand, India's decisive lockdown precipitated a humanitarian crisis, and decisiveness in countries like China and Singapore reinforced practices of authoritarian control.

Leaders Must Understand Which Kind of War They Are Fighting. Decision makers – from heads of state to physicians on the front lines of treating Covid-19 – often refer to the challenge of responding to the pandemic as a war. But as Clausewitz wrote in his classic guide to military strategy, "The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish . . . the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its true nature." This study demonstrates that the "war" against the Covid-19 pandemic poses simultaneous challenges in three coupled systems: public health, the economy, and politics. It further suggests that leaders confront these coupled systems from nations that broadly fit into different typologies -- control, consensus, and chaos. We hope this broad schematization can help leaders better understand the trade-offs involved

in their particular contexts. We note as well that recognizing problems and acting decisively, especially in top down mode, is not guaranteed to produce wise or durable policies. War on a virus, after all, can easily slip into war against entire populations or subgroups, as we learn from the stigmatization of Covid-19 in countries as disparate as India, Japan, and the US.

Leaders Must Act with Carefully Calibrated Decisiveness. Any leadership primer stresses decisiveness, but decisiveness must be smart, compassionate, and consistent in fighting a disease. Building a strong sense of national unity and shared purpose enhances the capacity to avert the worst outcomes. Countries whose leaders fomented division and followed partisan agendas, as in Brazil, India and the US, fared poorly compared to other countries. Implementing policies without attention to people's social needs may be effective with regard to short-run health outcomes but is almost certain to produce political backlash later.

Leaders Must Learn from Disaster. Previous experiences with disasters of whatever form (e.g., pandemics, financial crises, extreme weather, etc.) offer valuable lessons, both for leaders and for the societies that experienced them. Where solidarity is needed, leaders should apply lessons from what worked in prior crises. Thus, SARS and MERS provided effective lessons in East Asia and elsewhere, Ebola, Marburg, AIDS, TB and Polio similarly catalyzed higher levels of surveillance and capacity in many places in Africa , while the 2008 financial crisis offered lessons in stabilizing the economy in Europe.

Leaders Can Find Opportunity in Crisis. At the 67th session of the WHO Regional Committee for Eastern Mediterranean, Egypt's Health and Population Minister Hala Zayed championed free vaccine provision for low-income and affordable prices for middle-income countries. She led the signing of early agreements for China's Sinopharm, Russia's Sputnik V as well as the Pfizer and Oxford/AstraZenetica vaccines. Egypt has organic vaccine acquisition and manufacturing capability as well as commercial relationships with vaccine producers in countries like India, potentially setting it on course to become a vaccine hub for the Middle-East and Africa.

Leaders Must Consider the Post-Pandemic World. Lockdowns are like moratoria. They put systems to sleep, but they do not produce recipes for reawakening to a better future. Leaders should design social interventions with better understanding of how to reactivate life on even surer footing after a pandemic. Reactivation offers opportunities to address structural problems and build societal resilience. In this respect, countries that have thought ahead about reducing inequality and other challenges after the pandemic will find themselves ahead of the curve.

IX. FRAMEWORKS FOR PREPAREDNESS GLOBALLY

The pandemic has been one of the most globally disruptive events of the past century, joining the 1918 flu and both world wars as historic inflection points. It has caused and will continue to cause human suffering on an unimaginable scale. This disruption nevertheless opens the door to previously unthinkable policy change. We are entering a "policy window" for reform within nations and the international system. It is crucial that we use this window not only to do more, but also to reframe and refashion how we conceive of public health and how to protect it. The following observations from the 23-nation study highlight important new global realities that we must grapple with in this window of policy reform.

Networked Governance: Turn of the century revolutions in information and communication, coupled with the fall of the Iron Curtain, have led to a world in which the top-down model of command-and-control government increasingly has yielded to a more networked vision of governance, calling for public-private collaborations and drawing on social media and big data on unprecedented scales. Institutions of the new globalism, such as a reconceptualized WHO, will need to consider how to adapt to a regime of networked governance, which offers greater possibility to better realize human health and wellbeing.

A New Globalism: The development of the Pfizer BioNTech Covid-19 vaccine illustrates contemporary challenges of medical production and delivery that have strained the capacity of existing global institutions. On the one hand, an invention by scientists of Turkish origin trained in Germany, with roots in experimental U.S. DARPA programs, then developed by an American company led by international executives, and first approved for use in Britain, illustrates the overwhelming opportunities for beneficial innovation in a networked world. On the other, the concurrent rise of "vaccine nationalism" with rich countries preemptively acquiring large stockpiles, exemplifies the ethical dilemmas and pitfalls of global pharma. New frameworks for realizing global public health must seek to transcend national divisions to draw upon and fully realize global strengths.

A New Multilateralism: In contrast to many other regions battling COVID-19, Africa has exemplified a more multilateral approach to pandemic response. As early as February, the African Union brought together ministers from its 55 member states to create a proactive and unified response to COVID-19, resulting in the adoption of the Africa Joint Continental Strategy for COVID-19. Led by the Africa CDC, the African Task Force for Coronavirus was formed to coordinate surveillance, infection prevention and control in health-care facilities, clinical management of infected individuals, laboratory diagnosis, risk communication, and community engagement. While most of the world failed to cooperate effectively during COVID, Africa shows a way towards more effective multilateral cooperation in crisis with the Africa-CDC in a unique continent-wide health governance structure layered between the UN agencies and individual countries.

Standardization: The worldwide Covid-19 response was hampered by disparate national and subnational systems of counting and recording illness and death statistics. Rectifying

this problem will require significant coordination of a sort that only global institutions are in a position to provide. However, such coordination demands that these institutions be seen as legitimate and not captive to the interests of their major funders. Standards, moreover, function within a moral economy, and the political and social dimensions of standard-setting will need to remain front and center. The future legitimacy of globalism depends on new funding and governance models in a time when wealth is being ever more concentrated in fewer countries and still fewer hands.

A Global Social Compact: For a global governance regime to achieve even minimal standards of political legitimacy, democratic buy-in must be secured. This will demand new approaches to international deliberation, in forums and with discourses that have yet to be developed. This study makes it abundantly clear that – on this axis in particular – monotonic principles such as "follow the science" or "nudge people to make rational choices" will not do the job. Nor will individual national approaches absent global coordination be effective at containing a future health emergency. A new vision of global cooperation in the face of global threats is urgently needed.

* * *

In his December, 2020 address to the United Nations General Assembly, World Health Organization Director-General Dr. Tedros Adhanom Gebreyesus observed that:

> "A vaccine will help to end the pandemic. But it will not address the vulnerabilities that lie at its root. There is no vaccine for poverty. There is no vaccine for hunger. There is no vaccine for inequality. There is no vaccine for climate change."

The initial findings, conclusions, and recommendations of this ongoing study of how 23 countries have attempted to govern through excruciating circumstances underscore the sentiment expressed by the Director-General. A vaccine will help nations end the suffering of their people under COVID. But so much more work must be done to ensure we can meet the aftershocks of this continuing calamity and any future ones with better tools and stronger underlying systems. That work begins anew, with these initial findings as a contribution to national and global efforts now underway.

APPENDIX I: COUNTRIES STUDIED AND AFFILIATED RESEARCHERS

"Epidemic/Pandemic Response in Africa: Studies of COVID-19 in Egypt, Nigeria, Ethiopia, Kenya and South Africa"

Countries

Egypt	Kenya	South Africa
Ethiopia	Nigeria	

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"Comparative COVID-19 Response: Crisis, Knowledge, Politics"

Countries

Australia	India	Singapore
Austria	Indonesia	South Korea
Brazil	Italy	Sweden
China	Japan	Taiwan
France	Netherlands	United Kingdom
Germany	Peru	United States

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