COVID-19 Rapid Response Impact Initiative | White Paper 11

# Towards Global Pandemic Resilience

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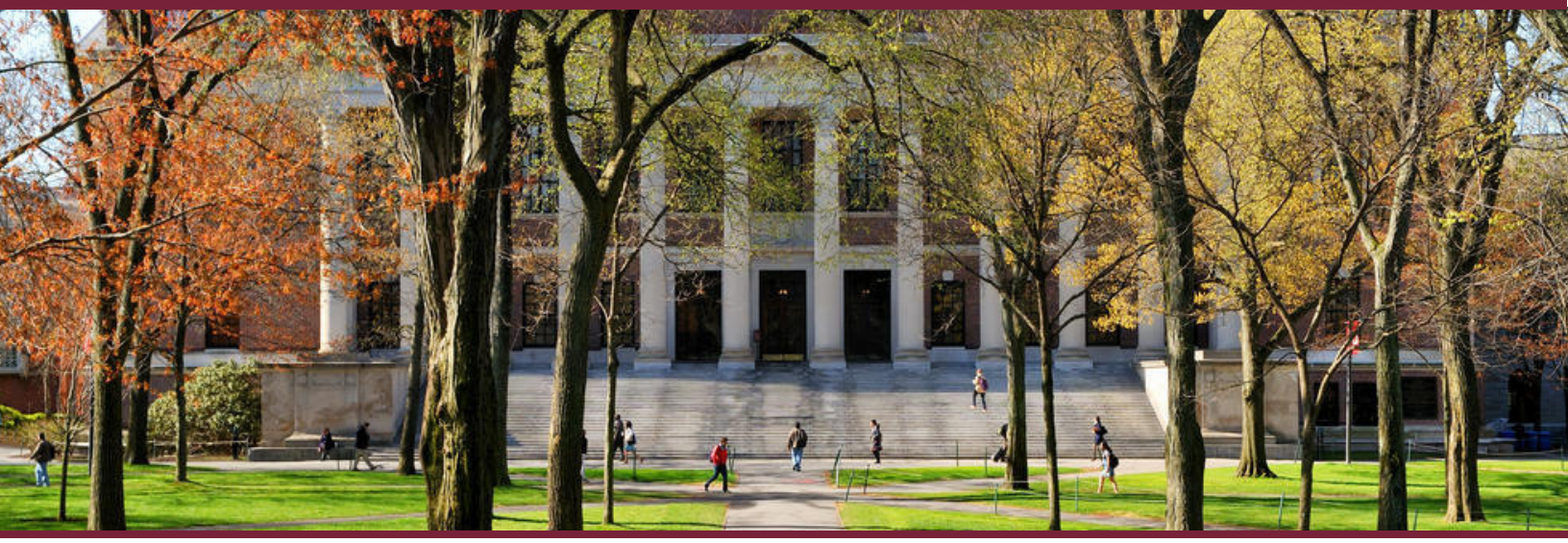


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# Abstract

Across the world, the COVID-19 pandemic has been most devastating to already-vulnerable populations. At the same time, it has brought our interconnectedness into sharp focus. Policies chosen in one jurisdiction affect conditions in others, and even regions isolated from each other are linked through third parties. This calls for harmonization of strategies across countries worldwide. However, regions differ sharply in their levels of medical and public health infrastructure, population density, concentrated poverty, patterns of internal migration, access to communication technologies, ability to bid on global markets, protection of privacy and civil liberties, communal tensions, and institutions of social support. Hence, policy responses also need to be carefully tailored to local conditions. This paper considers varied experiences with tackling the pandemic, with particular focus on three regions -- India, Africa, and Latin America -- that are collectively home to forty percent of the world's population. These regions face several challenges to adopting the testing, tracing, and supported isolation (TTSI) roadmap that we have proposed for the United States. We reflect on alternative policy trajectories that can help us transition back to work and social activity while safeguarding human lives worldwide.

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# Table of Contents

# 01 Introduction

The coronavirus pandemic has made us acutely aware of national and subnational boundaries, and of the benefits and vulnerabilities that arise from our interconnectedness. Policies chosen in one jurisdiction affect conditions in others, and even regions isolated from each other are connected through third parties. The closure of borders can allow some regions to insulate themselves from the policies of others for a while, but isolation cannot be sustained for long. Migration patterns over the past half century have resulted in vast geographic separation even among family members, whose demands for travel are powerful and often urgent. In addition, many industries, tourism and higher education among them, depend critically on human movement across large distances for their survival. As a result, there is an inescapable need for international policy coordination.

Harmonization of strategies across regions does not, however, imply uniformity of approach, only consistency in policies so that measures adopted at one location do not undermine those at another. Effective responses must have both local and global components, and local policies may be very different in the way they constrain and serve their populations. Specifics will depend on medical and public health infrastructure, population density, concentrated poverty, patterns of internal migration, access to communication technologies, ability to bid on global markets for scarce supplies and equipment, traditions governing privacy and civil liberties, communal tensions, and institutions of social support.

This paper considers the varied regional experiences with tackling the pandemic and reflects on the alternative policy trajectories that can help us transition back to a world of work and social activity while safeguarding human lives. We begin by documenting differences in testing and stringency since February 2020, after the World Health Organization labeled the outbreak a “public health emergency of international concern.”[8]

[8] This was done on January 30, 2020, after the WHO Director General returned from meeting with Chinese leaders in Beijing.

## Introduction

These differences form the basis of a discussion on possible transition paths out of a period of unprecedented peacetime restrictions on individuals and organizations. They are also the starting point for a debate on how to simultaneously protect individual rights and further the common good in the face of global shocks such as the current pandemic.

Much of our attention is focused on three regions in the Global South—India, Africa, and Latin America—that collectively hold 40% of the world's population. Cases of COVID-19 in these areas are currently small by international comparison but, according to experts, they could explode in the coming months. At the same time, pockets of acute poverty coupled with limited social support in those regions make it likely that authoritarian lockdowns will lead to large scale suffering, human rights violations, and in some areas, widespread starvation. We discuss how existing institutions and scaled-up social programs could be leveraged in these regions, should cases rise, to allow for containment and transition in the coming months.

# 02 Policy Stringency and Testing: Country Comparisons

The global goal of containing a pandemic can be broken down into many local policies. Even for countries that are geographically, socially, and economically similar, there is more than one route to containment. In fact, for a variety of reasons having to do with different circumstances, ideologies, and priorities, there has been considerable variation across countries in the policies adopted to date.

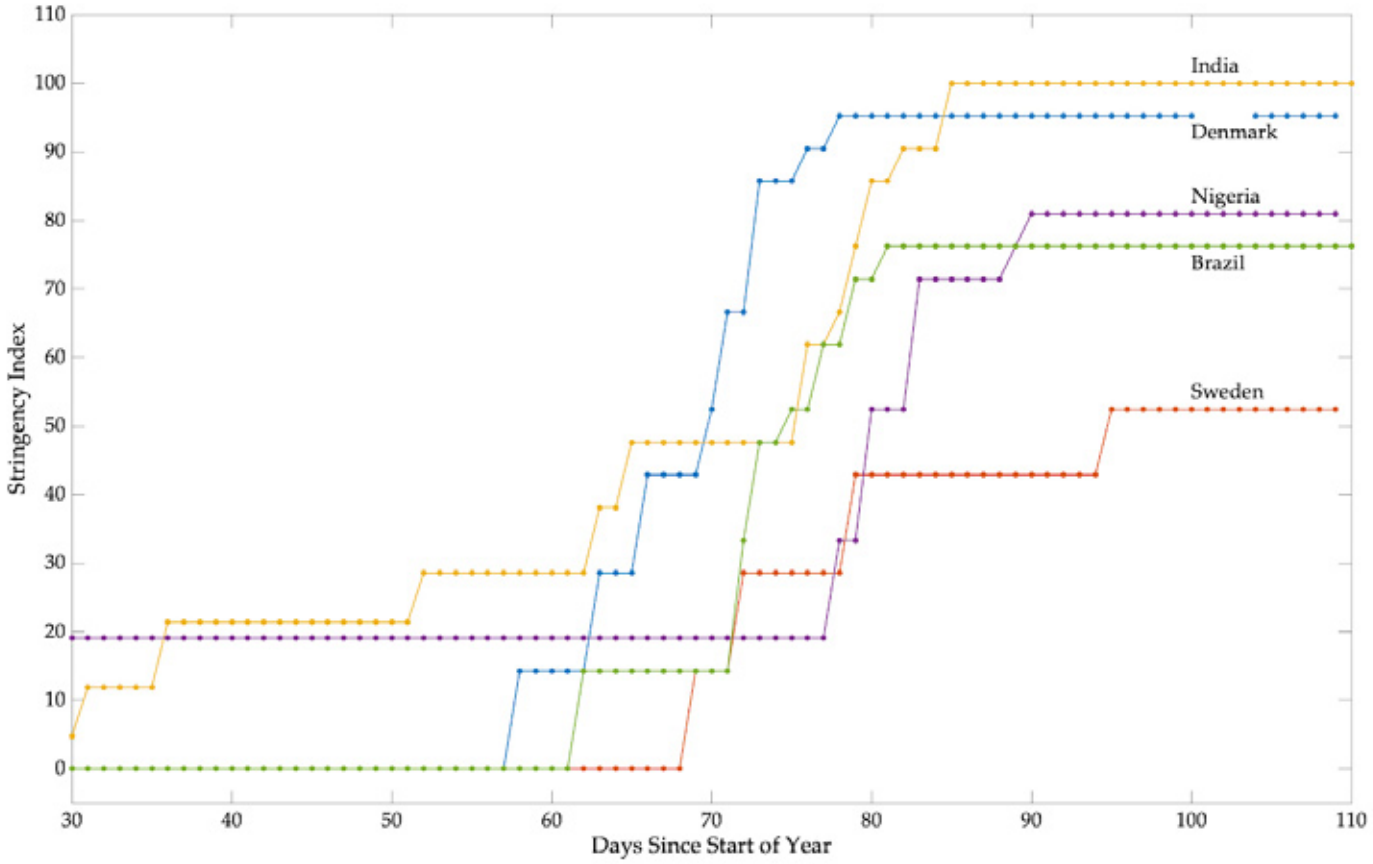


Figure 1. Policy Stringency in Selected Countries

Figure 1 shows the degree of policy stringency in selected countries. Denmark and Sweden have chosen sharply different paths, despite being neighbors with comparable levels of prosperity and state capacity.[9] Denmark started sooner, moved more aggressively, and remains significantly more restrictive

[9] The index of policy stringency is defined as the rescaled sum of seven indicators: closings of schools, workplaces, and public transportation, cancellation of public events, restrictions on internal and international travel, and public information campaigns; see Hale et al. 2020 for data and other details. Data for Denmark is missing for some days.

## Policy Stringency and Testing: Country Comparisons

than Sweden. Large differences also exist between Brazil and India, both large countries in the Global South with considerable inequality, concentrated poverty, and densely populated cities.[10] India started much sooner and became among the most restrictive countries in the world, with curfew-like conditions imposed in most cities and entry denied even to citizens stranded abroad.[11] Stringency in Nigeria is currently close to that in Brazil, though it was even more stringent than India during the earliest phases of the pandemic.

Significant disparities also exist in the measured extent of per-capita testing, although international

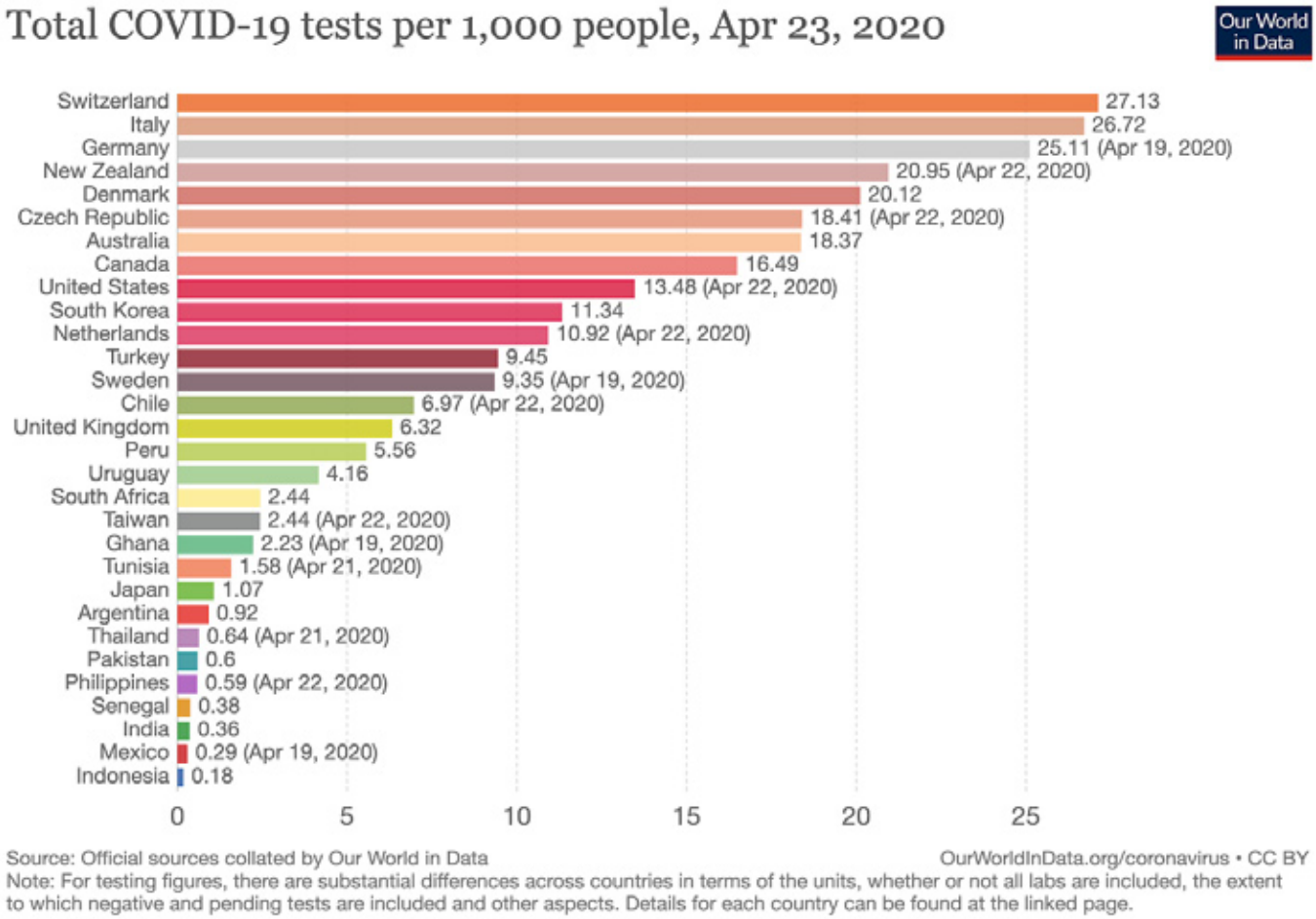


Figure 2: Cumulative Tests Performed Per-capita in Selected Countries

[10] We use the term Global South rather than developing or less developed to describe largely post-colonial low- and middle-income countries, following usage by the United Nations.
[11] See India Bureau of Immigration (accessed April 13, 2020).

## Policy Stringency and Testing: Country Comparisons

comparisons are hard to make in the absence of a uniform reporting criterion. Some countries report number of tests performed, some report number of people tested, some exclude those with results pending, and some report only positive results. Based on the imperfect data available, cumulative per-capita testing levels for a range of countries are shown in Figure 2. Even allowing for inconsistency across countries in reporting criteria, one can see large differences. In general, countries in the Global South are testing at much lower rates relative to their populations, a reflection in part of binding resource constraints. But there is also significant variation unexplained by resources: Chile and Mexico, for instance, have similar levels of GDP per capita, yet Chile has conducted more than 20 times more tests per capita than Mexico.

[10] We use the term Global South rather than developing or less developed to describe largely post-colonial low- and middle-income countries, following usage by the United Nations.
[11] See India Bureau of Immigration (accessed April 13, 2020).

# 03 The TTSI Strategy

For the United States, we have advocated a strategy that calls on governments to mobilize and transition to pandemic resilience based on testing, tracing, and supported isolation (TTSI) on a massive scale.[12] While testing on such a scale is expensive, estimates for the United States have shown that these costs are a fraction of what current lockdowns are imposing in terms of shrinking output and rising welfare payments, and more importantly, human lives.

More than thirteen million people in the United States filed initial claims for unemployment insurance over the two-week period ending on April 4, reflecting an economic collapse that is unprecedented in speed and scale. By way of comparison, the largest ever recorded number of initial weekly unemployment claims was below 700,000. There are some who believe that a recovery from this will be equally strong and swift, after a few weeks of social distancing. The Secretary of Labor, for example, has stated that he expects us to "spring back to the strong economic conditions we enjoyed just weeks ago."

This view is untenable. Under current policies, we are likely to see ebbs and flows in COVID-19 infections over a year or more, in concert with the relaxation and tightening of social distancing measures. The economic and social consequences of this would be unimaginably dire. We desperately need an alternative approach.

The TTSI strategy involves the testing of several million individuals per day in the United States, so that the population can be partitioned at any point in time into those assessed to be safe, those who need to be isolated, supported, and treated, and those whose status remains undetermined. Individuals with a

[12] For a comprehensive overview of the proposed strategy, see the Roadmap to Pandemic Resilience developed by Allen et al. 2020. Background white papers have been published by the Safra Center at Harvard University; see especially Allen et al. 2020, Weyl and Sethi 2020, Siddarth and Weyl 2020, and (for a brief overview) Allen, Weyl, and Sethi 2020.

## The TTSI Strategy

recent negative disease test or a serological test indicating immunity can return to work and a more normal life, while those who test positive can be isolated and assisted with care and relief, with finely targeted contact tracing used to identify others at risk. Taiwan and Singapore have been effective in implementing strategies of this kind already.

There will still be severe economic hardship for millions along the way, for which we need a robust social support system. But the TTSI strategy allows for a return to participation in economic and social life for most of us long before the pandemic has been fully contained, and will result in lower mortality and faster economic recovery than strategies that rely primarily on waves of massive and indiscriminate social distancing.

Two key components of the strategy are credible verification of safe status, and contact tracing that includes detection of peripheral or casual interactions. In the United States (as in many other countries) the right to privacy and civil liberties are deeply rooted traditions. Technologies that allow for casual contacts to be traced must therefore embed protections that remove identifying information from location tracking, while still allowing intersections to be traced and individuals at risk to be warned and tested. Furthermore, credible verification of safe status must also be non-discriminatory, reliable, and protective of individual health information and privacy. While these goals are in some tension with each other, they are not irreconcilable, and technologies under development have the capacity to meet privacy and equity concerns, while gathering and distributing the necessary information (Hart et al. 2020).

While this strategy may well be feasible and superior to the available alternatives in the United States, the proposed level of testing is simply infeasible in many countries. Resource constraints and variations in patterns of work and mobility suggest alternative approaches that attach different weights to testing relative to tracking and distancing. We consider region-specific policies below, but begin with some general remarks about policy alternatives.

# 04 Policy Alternatives for the Global South

There are several potential obstacles to a worldwide adoption of a TTSI-type strategy, including resource constraints, access to technology, and potential abuses by state institutions. Several of these are widely relevant and many are not unique to these regions; difficult tradeoffs between public health, civil liberties, political will, affordability, and economic functioning confront societies everywhere. However, the particular confluence of factors present in the geographies we focus on—India, Africa, and Latin America—point to distinct challenges that require context-specific thought and discussion in order to arrive at effective containment and transition programs. We use these regions and countries to illustrate some of the specific challenges that might apply more generally in developing a strategy of global pandemic resilience.

First, we see a range of economic feasibility issues that might arise if governments in low- and middle-income countries adopt a TTSI strategy, starting with the current state of medical and social infrastructure. These governments are confronting the pandemic with fewer available hospital beds, isolation wards, clinics, and medical staff and professionals, as well as limited capacity to carry out the large-scale welfare programs needed during quarantine periods. Infrastructural concerns extend to shelter and housing capacity in cities, last-mile delivery pipelines for essentials, and ability to transport goods and services domestically, as well as the effect that high-density living in urban areas may have on virus spread and on the possibility of self-isolation.

Affordability is also a major feasibility concern. This encompasses both the extent of possible government investment and the proportion of the population that can either work from home or survive with temporary loss of income during lockdown periods. These realities will affect recommendations around instituting, implementing, and lifting lockdowns. For example, recommended testing during and after

lockdown is currently about 1 to 3% of the population per day, which in India comes out to about 20 million tests per day. At Rs. (rupees) 1500 to 4500 rupees per test ($20 to $60), this is a potentially prohibitive expense. This is especially true given that these countries may have reduced ability to compete in global markets for necessary products, from tests to personal protective equipment to ventilators, medicines, and other supplies.

Second, the availability of technology introduces a major constraint on the adoption of the mobilize-and-transition framework. Multiple recommended steps currently rely on personal smartphone ownership. However, many citizens in developing countries do not own smartphones or devices capable of running Bluetooth-based tracing software. While recent years have seen a rise in smartphone ownership, this may be divided along existing class, caste, race, and gender lines. Reliance on this technology for contact tracing may deepen health disparities within the population and expose those without smartphone access to greater risks or longer periods of lockdown. Most developing countries will need to rely on manual contact tracing, given incomplete and unequal access to smartphone technology.

Furthermore, the rise in smartphone penetration has also led to a commensurate rise in misinformation and disinformation in many countries. As clear communication is a key piece of successfully rolling out these programs, particularly in heterogenous, distributed populations, the capacity of trusted authorities to disseminate consistent, clear, and accurate messaging to citizens will be a crucial piece of any successful strategy.

Third, compliance with social distancing and the staged remobilization of the economy will likely also emerge as a significant challenge. We are already seeing the enforcement of lockdowns lead to infringements on citizen privacy and civil liberties, and these issues may proliferate. There is also the danger of unequal and discriminatory enforcement of testing, tracing, and safety certification programs,

particularly in geographies with existing policing disparities and legacies of authoritarian abuses of information. Care will have to be taken to ensure that public health programs do not deepen uneven policing or introduce civil liberty violations across cultural and political contexts. Preserving trust in institutions over time will require iteration on program recommendations and will likely require thoughtful involvement of civil society actors, local governments, and community leaders able to represent diverse communities.

Each of the regions we consider is facing many of these concerns, albeit to different extents and in different forms. Depending on context, the scale of these issues may indicate that successfully implementing a mobilize-and-transition strategy to safeguard citizen health and wellbeing may require significant modification to the existing framework. We next consider region-specific and general needs.

# 05 India

India is a useful starting point, because its federal structure of government has resulted in several alternative approaches to containment and relief across the country. Due to its size and diversity, it may offer lessons for multiple smaller countries in the Global South. Both its fast-expanding economy and its stark economic and social disparities mirror those in countries with fast rising COVID-19 cases such as Brazil and South Africa. Meanwhile, its vast tracts of predominantly agricultural small farmer communities are similar to those seen in Africa. Further, India has a robust medical and scientific community that is actively studying the disease and reflecting on effective policy alternatives in a resource-constrained context. The dangers of recent authoritarian policies have also been well documented by groups of journalists, particularly independent media. Finally, India has a large group of trained information technology professionals who are exploring how mobile networks can be harnessed for contact tracing.

The central government of India has taken significant steps to combat COVID-19, instituting a three-week, full-country lockdown starting on March 25 (announced just a day earlier). However, there were no restrictions of any kind before the second week of March: school and university closures began around mid-March, as did more intensive screening of passengers on incoming flights. After the lockdown announcement, only essential services were allowed to operate. The lockdown has now been extended until May 3, although after April 20th some restrictions will be relaxed to allow agricultural harvesting and the sale of grain. States will be allowed to operationalize the relaxed rules and these plans are likely to be announced in the coming days.

The lockdown restricts the movement of all 1.3 billion of India's citizens, with transport services suspended, factories closed, and economic movement of all kinds halted across the country. This does seem to have had an effect on curtailing the spread of the virus, with the number of total cases still fairly low, although these numbers may be distorted by lack of testing. However, the lockdown has also

## India

highlighted existing material disparities within the population, as well as the inadequacy of existing public health and welfare programs. The coercive nature of the lockdown has caused great economic and emotional hardship to migrant laborers who have either not been able to return home or have done so at great risk. Community kitchens are mostly managed by non-government organizations (NGOs) and individual initiatives, and millions of migrant and informal workers have been left without income, food, and shelter. Millions more have lost their livelihoods.

In contrast with the case of Kerala (discussed below), relief has been minimal in most of the country. Rs. 500 (about $6.50 at current exchange rates) has been deposited into individual's bank accounts, some additional food grains have been provided to those entitled to them, and cooking gas allowances have been increased. Shelters have been established in some states. In the face of dire economic need, many have flouted the curfew and walked hundreds of miles to return to their villages. The change in the demographics of rural India has been dramatic in some areas. An urgent first step required to restore some measure of safety for these populations is creating systems for a safe and supported return home to villages.

As has been pointed out by Ray et al. (2020), India's population is particularly vulnerable to a generalized lockdown—making the human impact of shutdown and quarantine policies distinctly different from similar steps taken in the Global North. As the country faces its biggest economic slump in decades, the government must take care to ensure that its pandemic containment policies do not lead to widespread suffering. We are already seeing a stark tradeoff between lives lost due to COVID-19 and lives lost due to the various responses leveraged by the state, with both counts likely to grow sharply in coming weeks. A clear-eyed, compassionate, and comprehensive response that adapts suggested best practices to the specifics of the Indian context is needed.

## India

There are several feasibility constraints specific to India that arise in implementing any variant of the TTSI strategy for pandemic containment. The first is outlined above: the long periods of lockdown that may be required to build up medical, testing, and tracing capacity may simply be impossible to sustain for many Indian citizens. This is particularly true in the case of informal workers, daily wage workers, contractual laborers, and self-employed workers, who make up a plurality of the Indian workforce (Ray et al. 2020). The nature of the lockdown meant the suspension of India's largest social insurance scheme, the MNREGS, which provides 100 days of work per year to upwards of 70 million rural Indians (as of 2018). Several states announced that they will continue to pay workers during the lockdown, with Kerala and Karnataka notably promising to pay workers for the next two months. MNREGS has also been suggested as a mechanism through which relief could be provided to newly unemployed workers, through a massive expansion of current work guarantees. However, no such proposals have currently been approved by the central government, which pays a large share of the cost of the scheme.

On the testing front, India is undersupplied, with the government finding it difficult to compete in global markets for testing kits and local manufacturing of these kits just getting underway. The country is also under-resourced in terms of its ability to administer tests and deliver care to those who have tested positive. Last-mile delivery to rural areas is an issue even during regular economic functioning, and this has been exacerbated by the closing of roads, railways, and factories. Also, many of these areas are not serviced by clinics or hospitals, and many currently operating private hospitals are not accredited, with practitioners and staff unable to procure personal protective equipment and other medical supplies. Realistically, ramping up to testing to 1 to 2% of the population per day may take months, not weeks, and may not be feasible even then. Many states are identifying hotspots and restricting movement in and out of them. Others are recommending random testing, acknowledging that kits are limited and expensive and that many samples may need to be pooled. Faculty at the Indian Statistical Institute have proposed a model for sample-based testing and transition that accounts for these resource constraints.

## India

There are, however, large parts of the country with no confirmed cases. An alternative strategy to population-level testing may be to let economic activity continue in these areas, and in areas where hospital capacity is well above the estimated number of cases. The country is already moving towards these types of transition measures, and may adopt a red, yellow, and green classification of cities and other areas to determine the stringency of measures needed for containment. This avenue of thinking seems to be a positive one, especially if done in concert with precise manual contact tracing, which we will explore below.

As India evolves in its approach to containing the pandemic, other implementation issues have emerged. A bulk of these are around the various technology-mediated aspects of the control strategy. Before delving into these, it is important to note that tech-mediated programs may leave out a large majority of the population—only about one-third of Indians currently own a smartphone. Also, smartphone usage is gendered, with men being 28% more likely to own a smartphone than women.

Currently, contact tracing applications have been rolled out by both state and national governments, with immunity certification technology soon on the way. The central government contact tracing application, Aarogya Setu, uses a Bluetooth-based tracing protocol based on the Singapore model and claims to protect user privacy and security. However, upon inspection, these claims do not seem to hold and privacy advocates have criticized the application for collecting a stream of GPS data, storing sensitive user information, sharing information with unknown actors, and retaining data for extended periods of time.

There has also been a move in the direction of quarantine enforcement technology across the country. For example, the Karnataka government is tracking quarantined individuals with GPS and threatening police action unless they submit hourly selfies to prove that they have remained indoors. There have

## India

also been concerning instances of Indian state and local governments publicizing individually identifiable medical data, encouraging harmfully biased interpretations of virus spread, and allowing police brutality to proliferate in the interest of lockdown enforcement.

All this points to the dangers of implementing large-scale tracking and certification protocols in the country. The rise of COVID-19 coincided with anti-Muslim riots in Delhi and large-scale protests around the country, specifically around new requirements for citizenship documentation and fast-tracking of applications for non-Muslim refugees. In response, increasingly authoritarian and illiberal government actions have proliferated in recent months. Religiously motivated harassment has been exacerbated by the pandemic, as Muslim communities have been blamed for being carriers of the coronavirus and have been the target of disinformation campaigns by fringe groups as well as by well-known public figures. In addition, well-documented police and institutional bias against religious minorities, as well as against Dalit and Adivasi communities, will likely stand in the way of equal enforcement of any tracing and certification programs.[13]

Thus, there are a wide range of emergent implementation concerns in adapting the TTSI model to the Indian context. However, a return to work for most citizens is a necessity, not a luxury (Ray et al. 2020), and will likely happen regardless of policy, as most workers have few other options. This shifts the focus of a successful containment model from population-level testing and immunity certification to large-scale investments in public health and social support, at least for the immediate future. Of course, contact tracing will still be a crucial piece of lifting lockdowns and ensuring citizen health.

A possible solution to both the privacy concerns and the lack of smartphone penetration in implementing

[13] Dalit and Adivasi communities are referred to as scheduled castes and scheduled tribes respectively in Indian census documents and data sets.

tracing is through massively scaling manual contact tracing capabilities, which can mitigate privacy risks (Hart et al. 2020) as well as provide desperately needed jobs. Further, massive funding of relief, through direct cash transfers, use of existing ration shop networks, and guaranteed work programs, is required. Funds will be better spent on providing food, shelter, livelihood opportunities, and medical care rather than on quarantine enforcement for 1.3 billion citizens along the lines of what has been enacted.

When immunity certification programs are considered, extreme care will need to be taken to ensure privacy-preserving implementation and equal, non-discriminatory enforcement. The dangers that are already visible with current tracing and quarantine enforcement programs will likely be magnified if an immunity certification program is put in place. One way to mitigate these risks is by involving NGOs and citizen advocacy organizations throughout the implementation process. Already, NGOs in India are shouldering much of the burden of citizen needs—of the more than 8 million people provided meals in the last few weeks, 37% of them were fed by NGOs. Those groups will need funding and support if this is to continue. More intentionally and actively involving civil society groups in the rollout of certification programs is one way to mitigate the dangers of enforcement biases and discriminatory policies.

Learning from effective strategies already being practiced within the country is also crucial. In particular, lessons can be learned from the Communist-run state of Kerala, which has been successfully flattening its coronavirus curve. The state instituted a program of aggressive testing and manual contact tracing, building heatmaps to identify possible hotspots and hiring more than 30,000 health workers to assist in the effort. In addition, the government has funded walk-in testing facilities, built thousands of shelters for migrant workers and others left without homes, and has distributed millions of cooked meals to those in need. Subsidized meals (at INR 20, or less than 30 US cents) are available to all, and free meals are available to the poor simply by calling a helpline number for food. There is a well-established network

of women's groups throughout the state, many under the banner of the NGO Kudumbashree and other grassroots community organizations, which manage kitchens and direct a large team of volunteers in delivering food.

The Kerala government has also focused on clear, consistent, and practical messaging to its citizens, in sharp contrast with the wave of misinformation that has plagued much of the rest of the country during this crisis. Each evening the state issues a new press release and Kerala's chief minister addresses the state's population, apprising them of the current developments on the disease and relief measures. In contrast, the Indian prime minister has addressed the nation only a few times since the crisis hit. This combination of massive investment in public health, manual contact tracing, and provision of social and economic support to vulnerable populations is paying off—the state has seen only two deaths so far and the growth rate of new cases is slowing.

Kerala's experience may provide useful lessons for the Global South because it thus far has managed to control the epidemic without population-level testing—fewer than 17,000 people have been tested out of a population of 33 million—and instead with robust welfare, health, and manual contact tracing programs. Kerala has been investing in public health at higher rates than other states for decades, which certainly has contributed to these successes, as have long-term government priorities that have led to high literacy, lower inequality, and strong ties to the community and to grassroots groups. Nonetheless, this model points a way forward for India and for the Global South, not only in combating the current pandemic but also in being ready for the next one.

# 06 Africa

Africa is currently the least affected continent in the world from COVID-19, both in terms of the number of cases and the case fatality rate, with over 13,000 cases confirmed as of April 18 (WHO). But many countries, like Niger, Mali, and Cote d'Ivoire, are seeing relatively rapid increases in new cases (currently at 627, 190, and 688 respectively as of April 18, 2020), doubling every five to seven days. Although the average numbers of cases in Africa are nowhere near the rest of peer regions in North America and Europe, the increased growth in cases is a concern in a region where health financing and the corresponding quality of health infrastructure is relatively low.

Additional challenges include a large poor population, an unemployment rate of 23% as of 2014 (Afrobarometer), and limited access to water and sanitation infrastructure. Just 60% of households report having access to piped water and only 30% to sewage systems in a 2014 survey of over 50,000 respondents in 36 African countries, which clearly constrains risk-mitigating measures like handwashing. The most pressing concern for African governments currently is figuring out efficient ways to mobilize existing resources to reduce infection and mortality rates, while boosting access to health services and employment. Without massive intervention, including testing, social distancing measures, health financing, and economic stimulus, the spread of the virus in Africa could have catastrophic consequences. Modelers at Imperial College London and researchers at the United Nations Economic Commission for Africa (UNECA) have estimated that African countries could see a death toll from COVID-19 between 300,000 and 3.3 million people, depending on the intensity and effectiveness of mitigating measures.

Mitigation can be a daunting task, and governments will need to battle on various fronts: tackling the spread of the pandemic while easing the effects of the negative income shock and recession on individuals and households. However, African countries have had recent experience with tackling epidemics, including the meningitis epidemics that frequented sub-Saharan Africa (Archibong and Annan 2017;

## Africa

Archibong, Annan and Ekhator-Mobayode 2020) and the Ebola epidemic from 2014 to 2016. Many countries, including Nigeria and Ghana, have had success in tackling these epidemics and there are many lessons to be learned from their efforts. Recent research has also shown that targeted financial resources, focused on shoring up health systems, can reverse the medium- to long-term negative effects of epidemics, through a combination of domestic and intergovernmental efforts focused on increasing health financing (Archibong, Annan and Ekhator-Mobayode 2020).

Increasing health financing is imperative in a region where health spending was just 5.6% of GDP as of 2016 compared to 10% for the world, by World Bank estimates. Government spending on health per capita in Africa is low, at 1.3% of GDP compared to 7.4% for the world (Archibong, Annan and Ekhator-Mobayode 2020). Out-of-pocket health care expenditures are also high—at 36% of overall health spending compared to the world average of 19% in 2016. A large component of health expenditure in Africa comes from external sources such as the World Bank, which provides up to 20% of health spending in the region. This is much higher than in India (0.64%) and Latin America and the Caribbean (0.38%) (World Bank). Efforts to mitigate the health and economic effects of COVID-19 will therefore require economic stimulus from both domestic and intergovernmental sources (Archibong, Annan and Ekhator-Mobayode 2020).

Africa has a majority informal worker sector, comprising 71% of the workforce. This includes a significant population of daily wage earners who are not recorded in formal employment and depend on day-to-day market activities for consumption. This is a significant challenge to governments looking to implement prolonged social distancing. As a result, African countries will need to increase testing and contact tracing significantly to avoid the catastrophic projections of the Imperial College and UNECA models.

## Africa

With the goal of minimizing the negative impacts of the COVID-19 pandemic on health systems, social services, and economic activities, development institutions such as the World Bank and IFC are currently providing financial assistance that could meet the short- and long-term resource needs and provide improved response systems in the region. Strategies include suspension of debt payments to the International Development Association (IDA) for least developed countries, which will be crucial in helping poorer countries cope with the increased costs from the pandemic. Funds from these sources will support the private sector and target critical health activities such as laboratory and essential medical equipment and supplies, such as test kits and personal protection equipment (PPE). Within countries, some governments (e.g., Ghana) have established COVID-19 pandemic funds that are meant to fight COVID-19; these funds have been attracting donations from domestic banks and other organizations. If these resources are well utilized, this strategy could facilitate massive testing and detection of COVID-19 cases.

However, given the varying and sometimes weak institutional arrangements across the region and their likely impacts on these resources, we cannot conclude that massive testing will be achievable. In part, this might explain why Ghana and Senegal, with good institutional rankings in the region, show modest per-capita testing for COVID-19 (see Figure 2). An additional challenge for testing is that African countries are net importers of medical and pharmaceutical products; eliminating tariffs and reducing costs on crucial testing and medical supplies will play an important part in boosting testing in African countries. Countries like South Africa are working to increase the number of tests available to their population with the country; as of April 7, they have conducted over 70,000 tests, though significant further increases in testing will need to occur given a population of over 57 million at risk in the country.

Countries in the region are rapidly piloting user-friendly mobile technologies aimed at contact tracing, including WhatsApp chatbots (e.g., South Africa, Nigeria), the COVID-19 Triage Tool (e.g., Nigeria),

and the COVID19 Tracker Apps (e.g., Ghana). The COVID-19 Triage Tool is a free online tool that allows individual users to self-assess their coronavirus risk category based on their symptoms and their exposure history. Users are offered remote medical advice or linked to a nearby healthcare facility based on their answers to the tool's questions. Similarly, the COVID19 Tracker App is a digital tool designed for both self-assessment and contact tracing. These tools facilitate detection and tracing of those at risk, and also reduce the overall demand on the limited health and disease control facilities. If these technologies properly preserve privacy and are widely adopted, then massive contact tracing using app-based methods could be promising. But given the relatively low trust in public institutions (Afrobarometer), large scale adoption will be limited in the absence of significant involvement by local and more highly trusted community organizations and leaders.

Learning from workable strategies in this region and elsewhere is key. Some governments have implemented a mixed approach that combines (1) testing and contact tracing mobile technologies achievable at the subpopulation level; (2) welfare programs (e.g., free water, electricity, and food for the very poor; discussed below); and (3) enhanced manual contact tracing, drawing on previously unemployed public health experts and other frontline health workers. An example is Ghana, which has yielded modest per-capita testing for COVID-19 cases and death rates. This approach is congruent with the Kerala model outlined above.

Several African countries are taking the lessons learned from previous epidemics (like the 2014 to 2016 Ebola outbreak) to heart and are acting to mobilize resources, focusing on providing PPE and food to poor, marginalized, and at-risk communities, and enforcing social distancing through temporal curfews and information campaigns. Countries like Nigeria successfully tackled the Ebola epidemic by implementing critical rapid diagnosis and containment strategies, including rigorous contact tracing and isolation for infected people. Increasing community engagement by leveraging relatively higher trust for

local community leaders in affected West African countries, and paying attention to gender differences in leadership and access to information in local communities were crucial parts in reducing transmission of the virus. Contact tracing and regular temperature checks over Ebola's 21-day incubation period for exposed people and immediate isolation for infected parties were also important, effective strategies to reduce the spread of Ebola. Given health infrastructure deficits in these countries, working with international organizations on health financing and the development of a vaccine also proved essential (Cordelia et al. 2017).

Many African countries are applying similar strategies to COVID-19. In Nigeria, the Nigerian CDC (NCDC) has been working with federal, state, and local governments to enact a number of policies aimed at limiting the spread of COVID-19 and mitigating the effects of economic shocks on poor households. The initiatives include travel bans, shutdowns of schools and church gatherings, and temporary (two to three weeks, depending on the state) lockdowns in some states. There have also been large-scale contact tracing initiatives through local governments and community health networks, as well as information awareness campaigns in public spaces to encourage social distancing and the use of Internet-based contract tracing, or ICT, such as the NCDC's official WhatsApp account, a free service to provide centralized, accurate information on COVID-19. Relief programs have been widespread, including food aid and a stimulus package from the federal governments to hardest hit states like Lagos, as well as a suspension of loan repayment obligations for certain loans and enforced curfews in affected areas. Other strategies include increased sanitation efforts, as sanitation crews work nonstop to clean gutters, and mandating temperature checks and hand sanitizer use before entering stores in Lagos state.

The use of a combination of ICT and local community networks for contact tracing and to enforce social distancing has proved effective in the past in a country where electricity shortages and access to ICT

are an issue, and the Nigerian CDC has worked nonstop to spread information about social distancing and to combat misinformation. An economic stimulus and targeted health financing will be necessary both to limit the spread of the virus through increased testing capability and treatment and to reduce the negative consumption and employment effects of the pandemic on African citizens. A more centralized application of policies presented above might be needed for effective COVID-19 mitigation.

Governments will also need to think creatively about using existing resources to respond to the pandemic. For example, given Africa's history of relatively higher spending on education than on health, more people have access to schools (~90%) than to health clinics (60%). At the same time, many of these schools lack access to the functional sanitation and water needed to limit the spread of the virus. For example, in Nigeria, 55% of schools had no access to functional sanitation and 68% had no access to functional water as of 2012 (Archibong, Modi and Sherpa 2015). Policies like increasing spending and boosting access to sanitation and water at public schools would provide a double dividend: improving school infrastructure, and improving access to sanitation and water that would limit the spread of the virus and help flatten the epidemic curve. The challenges to governments are many, with financing looming large among them, but concerted efforts at mobilizing domestic resources, along with economic stimulus in the form of intergovernmental health aid, are proven ways to mitigate the negative effects of these epidemics now and in the coming months (Archibong, Annan and Ekhator-Mobayode 2020).

Massive testing will be a challenge given the state of health financing and limited supply of health infrastructure and healthcare workers in many areas and governments will need to think through creative ways to facilitate testing—for example, using schools as access points and using mobile testing facilities, among others, to increase testing. Tracking negative and positive tests will also be an important challenge to figure out how to transition into a post-COVID economy.

## Africa

Targeting resources to informal sector workers, as is currently being explored in Ghana, is critical. Some of the useful, practical strategies currently being implemented by the Ghanaian government include direct distribution of free water to households, cutting 50% of the electricity bill (and 100% for very poor and vulnerable populations), tax holidays for health workers and a 50% pay raise for health personnel over April to June 2020 to address shortages in the supply of healthcare workers, free transportation for health personnel, among others, and using mobile payments to distribute funds to a large informal-worker population with high mobile phone access. Free food provided to poor households is also another initiative to mitigate the effects of social distancing strategies.

Another potentially resilient strategy, given the large informal-worker sector in African countries, entails alternating lockdowns with enforceable work permits in rotation. For instance, traders are partitioned and assigned color cards to work on designated color days via a shift system: “red days versus gold days versus green days.” The Ghanaian government, through local metropolitan assemblies, implemented this approach in lockdown communities to minimize the negative income shock from the lockdowns while increasing compliance with social distancing. After a period of selective lockdown in the at-risk communities, Ghana domestically lifted the lockdown initiatives while emphasizing social distancing and maintaining existing COVID-19 welfare programs. The lockdown period was necessary to mobilize resources to conduct enough testing and contact tracing to determine infection rates and to evaluate areas for health investments and COVID-19 mitigation strategies going forward. Other countries in Africa are likely to follow with similar initiatives. At the higher level, an African coalition to address porous border issues and stop border movements that may spread the disease is also an important strategy to enforce social distancing measures across the region.

# 07 Latin America

The idea of a single Latin American context belies the tremendous heterogeneity in responses and resources in the region. Some presidents, like those in Argentina and Peru, have taken fast and decisive actions to impose lockdowns and provide social assistance. Others—associated with populism on both the right (Brazil) and the left (Mexico)—have denied the severity of the virus and the magnitude of the threat. Countries also entered the pandemic with divergent fiscal and state endowments. While Peru and Chile have accumulated reserves to spend countercyclically, others like Ecuador and Venezuela started from precarious economic positions already forcing cuts to public health systems. Investments in universal health coverage and social assistance bureaucracies, as in Colombia and Brazil, will provide human and informational resources to leverage in an effective response.

Despite these differences, there are some common challenges and potential creative solutions that could allow Latin American governments to mobilize and transition to pandemic resilience. In comparison with the discussions on India and the African region, some very broad features are worth bearing in mind. The first is that Latin America is, generally speaking, a highly urbanized region with service-based and often informal economies—more than 80% of the population lives in urban areas, 60% work in services, and 55% are in the informal economy. Dense urban populations complicate effective social distancing but can ease the logistics of testing and contact-tracing. Second, it is a middle-income region, with immense income and regional inequalities. Some countries and subunits can respond like advanced industrial democracies, and others look like the poorer parts of the developing world. Even within urban areas, vast inequalities create stark contrasts in which some middle-class groups can rely on delivery apps and working from home, while others struggle to find their daily supply of food and are compelled to continue in the informal economy.

## Latin America

Pockets of bureaucratic excellence exist in many countries. Harnessing the more capable and resourced parts of the state and private sector will be critical to an effective and equitable response. Third, most Latin American democracies have strong presidential systems and authoritarian legacies in which directives are issued regularly by decree. Centralized power can ease coordination challenges, but also poses additional risks of militarized or corrupt abuses of power and weaker legislatures, courts, and control institutions to hold presidents accountable. We now turn to how these general features affect the current response and next steps towards the mobilize-and-transition plan.

Thus far, most Latin American governments have responded quickly to the pandemic with stay-at-home orders and advisories intended to decelerate the pandemic or "flatten the curve." Twelve of twenty-six countries in the region have total lockdown orders, while the rest have partial lockdowns in place. The distrust of scientific expertise among populist presidents has prevented decisive national lockdowns in some countries. Notably, presidents like Andrés Manuel López Obrador in Mexico, Daniel Ortega in Nicaragua, and Jair Bolsonaro in Brazil flouted medical advice, kissing supporters and denying the threat posed by the virus. Many state and local governments have moved more aggressively than resistant national leaders to impose stay-at-home orders. The decentralization of political authority in the 1980s and 1990s in many countries has given mayors and governors the fiscal and political powers needed to implement divergent policies in response to the pandemic.

As in India, one of the largest challenges in Latin America comes from social distancing in urban environments built around the informal sector and multigenerational households. Latin American cities are sprawling, with denser neighborhoods concentrated on the urban periphery where the poor historically invaded land or purchased cheap rural land to build their houses. Most neighborhoods now have access to electricity, clean water, and sanitation, easing some of the sanitary issues posed in countries like India. But residents remain in close proximity. Grandparents also often live with younger family

members, increasing the contagion among more vulnerable, older populations.

Low-income workers with informal labor contracts often have no way to stop working, since they have no access to social security benefits or unemployment insurance. Savings rates are low in Latin America compared with other regions, and only the top income groups have savings to draw on in an emergency (Inter-American Development Bank 2016). Existing unemployment programs generally don't cover the half of the workforce in the informal sector. Some countries, like Argentina, Peru, and El Salvador, have announced emergency social-assistance packages that extend to those who rely on informal income to make quarantine possible (Blofield, Hoffmann, and Llanos 2020). Other countries are expanding poverty and conditional cash transfer programs to provide some immediate income to cover the basic needs of workers while in lockdowns. However, the sustainability and reach of these programs pose challenges. Most programs are intended to prevent deprivation during a short-term lockdown. They also exclude the 1.6 million Venezuelan refugees who find themselves with few options for work and strained humanitarian aid programs.

The social strains generated by the lockdown are substantial and growing. As in other parts of the world, reports of domestic violence have increased. Several countries have pioneered special hotlines to help confront the additional gender violence as quarantines and unemployment stress domestic relations.

In many Latin American countries, decreased compliance has or might be met with counterproductive coercive sanctions. For instance, faced with perceived disobedience, the interim president of Bolivia, Jeanine Áñez, deployed the military and instated prison sentences of up to ten years for those who violated the quarantine, raising serious human rights concerns. El Salvador has detained more than 1,200 people in overcrowded conditions for violating a mandatory home quarantine, leading to a supreme court case banning detentions. Criminalization and police detentions will do little in a public health emergency.

## Latin America

Economic programs and clear communication strategies that allow low-income workers to continue social distancing are critical to ongoing compliance. Trust in others and in governments will also be key for the success of these measures.

The low levels of trust of Latin American citizens towards their neighbors and their governments, local or national, are well documented. According to the latest measurements available from the Latinbarometer, only 14.2% of respondents felt that they could trust the majority of people and only 5.7% had "a lot of trust" in government, with another 16.6% maintaining they had "some trust" in government. Trust in others, and in government, could be key to generating the minimum conditions for solidarity among neighbors in moments of need. This is particularly relevant with respect to the social control and peer pressure needed to sustain lockdown measures, and as well as for a level of compliance on the measures that local and national authorities impose on their citizens.

Using data from the COVID-19 Community Mobility Reports, we analyzed the change in reporting at residential locations from baseline for countries with data provided. Overall, there are signs of successful self-isolation, although the increase in residential location varies from country to country. The increase in confinement seems lower on average (around 20%) for countries reporting lower trust in others, whereas those in groups with higher trust oscillate around levels of 30% and even 40%. A contrasting case is Mexico, where the current president continues to invite people to go out in the streets and waited weeks before closing schools and other institutions.

Trust is a key lubricant for social and economic life, as well as for state functioning. It is an essential ingredient for the successful implementation of measures to control the spread of the virus, for the functioning of programs that provide food and other basic needs to the poorest, and for the eventual rollout of more selective restrictions on circulation in public spaces as countries transition to reopening their economies.

## Latin America

The next step for Latin American governments is to increase testing, especially among essential sectors, while collective social distancing is still in force. Yet governments lack the ability to test even essential workers, let alone adopt a more universal testing approach. Most Latin American countries (with exceptions in some smaller, higher capacity countries like Chile, Panama, and Costa Rica) have conducted fewer than 1,000 tests per million residents. Nine of the countries with the lowest reported testing rates in the world (of those reporting) are in Latin America. The region as a whole has administered a total 368,726 tests to date, with only a dozen countries reporting. Scaling up to testing as much as 6% of the region's population per day, or roughly 37 million people, will take time, resources, and political buy-in that doesn't yet exist in most countries.

That said, Latin American countries have some advantages in ramping up testing. The concentration of the population in a few cities worsens contagion but makes it easier to implement more comprehensive sampling and testing approaches among asymptomatic and random groups. The logistical costs are far lower, with fewer last-mile delivery challenges, than in areas with longer distances to cover.

How will Latin America acquire massive numbers of tests? Most Latin American countries have limited domestic industry to repurpose for the production of the necessary tests. Countries with larger domestic pharmaceutical and industrial production, such as Brazil, Mexico, and Colombia, will need to work with manufacturers to mobilize production of as many tests and equipment as possible. Coordination with the business community may be easier given the concentration of economic and production capacity in the hands of a small number of largely family-led firms that often control multiple pieces in key supply and logistics chains (Schneider 2013).

However, even if large firms are brought on board to increase domestic production, more than likely Latin American governments will need to buy tests internationally, and they are arriving late and under-resourced to global competition to procure tests on international markets. Some see

## Latin America

China as the region's best hope to supply tests, taking advantage of China's desire to exert soft power in the region (Blofield, Hoffmann, and Llanos 2020). Another possibility is to form a consortium that could organize production internationally and negotiate a quota of tests for each participant, perhaps with an agreement to open bilateral trade between the participating members.

Concerns about corruption in the procurement process may hamper the investment in necessary tests and medical equipment. Almost every president in the region (save Uruguay) has deployed special emergency powers to respond to COVID-19. Emergency procedures generally allow the government to make expedited purchases outside of competitive bidding procedures or anti-corruption reviews. Expanded executive powers permit flexible, rapid procurement. But they also open the door to corruption, the selection of contractors for political gain, and advance payments that lead contractors to disappear without delivering the promised goods. Many of these problems emerged in recent corruption scandals around infrastructure projects (often built using emergency powers) and disaster responses in past decades. It will be critical to ensure that control or audit agencies accompany these processes so that procurement is done as quickly and transparently as possible in emergency conditions. Another possibility is to work through international agencies like the UNDP with clear procurement rules to negotiate massive testing and medical equipment acquisition, or through a consortium to standardize prices and reduce competition among developing countries for the same resources.

Even if tests can be purchased at scale, their distribution and processing will pose the next challenge. The distribution of tests could be done through the mobilization of existing bureaucracies, and particularly furloughed public-sector workers. Mexico City, for instance, has deployed city workers in protective gear to distribute packages of simple medical supplies requested through a hotline. Brigades of retrained public workers could be deployed throughout neighborhoods to bring tests closer to residents.

A more creative solution is to repurpose existing equipment to create mobile testing labs, at least in urban areas. Governments could purchase existing informal buses, vans, and even food carts to retrofit as mobile testing labs that could be deployed throughout urban areas. This would provide capital to informal workers who should not be using their equipment during stay-in-place orders. It also would provide a way to reach the urban periphery and reduce travel to testing facilities. Creative thinking on nimble, mobile testing strategies will be critical to creating equal access to testing across the population.

Processing the tests may pose an even greater challenge than administering them. For the region's wealth, Latin America invests little in research and development, and lacks the laboratory infrastructure to process millions of tests. Universities and hospitals will need to put every lab to use to process tests. Regional universities, in particular, will need to be relied on to process tests rapidly in secondary cities and more rural areas.

As testing capacity expands, Latin American governments also will need to implement contact tracing. While almost all Latin American residents now have cell phones (ECLAC 2018) and more than two-thirds use smartphones, far less have Bluetooth technology to enable more sophisticated contact tracing methods. Income, race, and region all sharply influence access to smartphones and Bluetooth technology. Most Latin American governments will need to pursue manual tracing for close contacts and supplement this process with Bluetooth-based applications that can alert people to possible exposure in public spaces. As the India section notes, Kerala provides a model of hiring and training large numbers of manual contact tracers. Experience building crime heat maps could be deployed to use the data from contact tracers and Bluetooth-based apps to build and disseminate maps of hot spots. Some countries, like Chile, Peru, and Colombia, do have budding technology scenes that could build more decentralized civic-tech approaches to contact tracing to complement manual efforts.

## Latin America

A challenge involves how to implement a tracing system with smart technology and civil society involvement rather than repression or corruption. The precise composition of contact tracing bureaucracies will depend on the country and area. As part of decentralizing processes, many Latin American countries created local health councils (Falleti and Cunial 2018) that could be mobilized to varying degrees. The need for civil society involvement is particularly acute in countries with large Black and indigenous communities, where there are significant concerns about intercultural medicine and the misuse of personal information. Collaborative strategies will be particularly tricky in the many areas of Latin America controlled by gangs and armed actors who have used the pandemic to further assert their control of local territory and social behavior.

To implement testing programs, countries will need to draw on existing state bureaucracies with the highest levels of trust and territorial coverage. In some countries, this might actually come from electoral authorities accustomed to managing databases of citizens and administering elections. For instance, Peru has compulsory voting and national electoral authorities are accustomed to mobilizing workers to run elections throughout the country, imposing small fines on those who don't vote, and hiring and training short-term employees to administer election procedures. In other countries, like Bolivia and Venezuela, political distrust of electoral authorities may reduce their effectiveness to administer certificate programs or work with sensitive health data.

Another option is to leverage existing social programs to link solidarity payments to testing and provide additional support for individuals who receive positive tests, as well as for their contacts who must isolate. Some conditional cash transfers have vast coverage and non-discretionary administrative mechanisms, like Bolsa Familia in Brazil, Progresa/Oportunidades in Mexico or Familias en Acción in Colombia. More than 30 cash transfer programs reach a total of 130 million people—about 20% of the population in Latin America (Cecchini and Atuesta 2017). These programs have already been

designed to provide cash payments conditional on behaviors, such as sending children to school or having regular health check-ups. It's possible to link the receipt of cash transfers to compliance with requirements to be tested or have a temperature taken. Additional solidarity payments and housing arrangements could be provided for those who tested positive and their contacts. Social workers also could conduct ex post facto random checks for compliance. Of course, as with conditional cash transfer programs in general, there are ethical and political challenges to denying benefits to those who don't comply with requirements, and concerns about providing differential payments and treatment to those who have and don't have the virus.

Such schemes may work in urban areas, but a great challenge for the region includes the vast gaps in terms of access to social and physical infrastructure for indigenous and Afro-descendent populations in more rural areas. About 20% of Latin American land is held collectively by indigenous and Afro-descendent groups. These groups lag behind in terms of access to education and health, and geographical distances will make it harder to reach them with assistance programs and testing strategies. Further, exposure to viruses, which has historically marked the history of these groups, is a major existential risk for the already diminishing indigenous groups, particularly in the Amazon.

In all of this, the coordination challenges will be substantial. Decentralized governance means that central and local governments need to articulate their responses, while bringing in civil society and communal actors. An effective response also will be far more likely if governments can coordinate as a region and internationally to negotiate access to tests and medical supplies.

# 08 Conclusions

Across the world, COVID-19 has been most devastating to already-vulnerable populations, exacerbating existing material inequalities within and between countries and regions. The issues outlined in this paper are by no means unique to the Global South, as countries around the world have struggled to mobilize resources and infrastructure to combat the pandemic, and to avoid deepening existing health, enforcement, and trust disparities. A global response must prioritize the most vulnerable among us and be sensitive to context-specific needs and capabilities. To this end, we have outlined the challenges and possibilities of adapting the testing, tracing, and supported isolation strategy to India, Africa, and Latin America, in the hope of highlighting broader considerations in developing a global strategy of pandemic resilience.

Despite the incredible diversity both within and among these regions, they share several major features, in particular, the significantly higher human costs of extended lockdowns. However, in many cases, alternatives are also more difficult to implement. Financial constraints limit testing, and regions face the tandem concerns of minimal local production and a reduced ability to compete in international markets for supplies. Limited access to smartphones may prevent wide adoption of technology-augmented tracing. Further, densely populated cities and limited medical capacity and infrastructure make it difficult to contain contagion once it is present and, while urbanization reduces last-mile problems to an extent, small rural populations remain particularly vulnerable.

We are providing several specific recommendations in response to these challenges in support of lifting lockdowns as soon as is safe, given their human cost. First, governments must massively invest in manual contact tracing. Large-scale manual tracing can supplement or replace technology-augmented tracing, and precise tracing can reduce the number of tests needed by a factor of ten or more (Siddarth et al. 2020). Hiring manual tracers can also provide a path to employment for the millions of unemployed

## Conclusions

workers currently struggling. As these programs are rolled out, tracing and testing should be overseen and administered in collaboration with region-specific, trusted entities to the extent possible. Networks of community organizations and health workers, supported by local and state governments and other institutions such as universities and schools, should be the front line of contact. Adherence and adoption to testing and tracing protocols should be monitored and enforced, as much as possible, by health and social assistance entities rather than by police and security forces. Of course, decentralized responsibility can result in uneven implementation, so consistent national standards, leadership, and communication will also be necessary for a successful response.

Second, during the current lockdown periods and as these lockdowns extend, relief programs must be expanded to account for the massive need for food, water, and shelter. Temporary shelters and kitchens can be built in conjunction with testing and hospital facilities. Further, existing unemployment and relief programs must be expanded to cover the informal sector, as well as other at-risk groups such as indigenous populations, migrant workers, and refugees. However, such expanded relief programs may be unsustainable for long periods of time. Thus, as testing and tracing ramp up, general, countrywide lockdowns should be replaced with region-specific and targeted quarantines to allow a phased and supported return to work and to life. Such policies are currently being considered in India and have already been adapted in parts of West Africa.

The federal structure of many of these regions also allows us to use cross-state experiences to point to potentially useful strategies that may be portable across the Global South. As described, the southern state of Kerala, where the first Indian case was detected and where new infections are now reduced to single digits, offers hope to similar economies as they battle the pandemic. Vietnam also provides a compelling model that has operated on similar strategies, focusing efforts on providing community-led, large-scale resources and relief, as well as precise manual contact tracing and supported quarantine

## Conclusions

to reduce the spread. Long-term investments in public health, education, infrastructure, and community-based welfare programs, evident in both Kerala and Vietnam, have massively contributed to the ability of these regions to successful respond to COVID-19, pointing to these robust governance practices as the best defenses against not only this pandemic, but against crises of all kinds.

In addition to these within-country best practices, current regional and international organizations must also play a significant role, particularly given the resource constraints in some regions. For example, in the attempt to ramp up testing, many low- and middle-income countries will need to compete on international markets. Rather than drive up prices by competing against each other, countries in the Global South may consider forming a consortium to negotiate as a bloc with producers. Each country then could receive a quota of the total tests produced. Existing development organizations, like the UNDP, might be suited to coordinate such a negotiating bloc.

The International Monetary Fund and World Bank also will be critical to making it possible for countries to finance widespread emergency relief, testing, and health programs. Many countries are now facing triple crises caused by the confluence of a health crisis, a financial crisis, and the collapse of global commodity prices. While priority for funds could be established for countries investing in social assistance, testing, and contact tracing, conditionalities have tended to impose a single appropriate policy while disregarding the local and national conditions that might affect the precise ways public health responses are implemented. In planning for an efficient and effective international response, colonial-era narratives regarding the ability of these countries to self-govern and know what is best for their own citizens must be upended, sidestepping issues we have previously seen of international involvement and assistance deepening existing divides in the Global South. We recommend a model of international cooperation that prioritizes the needs and voices of the most vulnerable, and works as much as possible through existing, democratic, and domestic structures.

## Conclusions

The problem of global pandemic resilience will not be solved one region at a time; it is essential that we adopt a holistic approach. Viruses cannot be easily contained within national borders or social boundaries, and neither should our analysis of their effects. A coherent global strategy must take into account significant differences in local conditions and be flexible enough to accommodate these. But it must also recognize that failure itself is contagious and that the success of each region contributes to the success of all.

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