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A Global Strategy to Manage the Long-Term Risks of COVID-19

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Prepared by Ruchir Agarwal, Jeremy Farrar, Gita Gopinath, Richard Hatchett, and Peter Sands

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ABSTRACT: The pandemic is not over, and the health and economic losses continue to grow. It is now evident that COVID-19 will be with us for the long term, and there are very different scenarios for how it could evolve, from a mild endemic scenario to a dangerous variant scenario. This realization calls for a new strategy that manages both the uncertainty and the long-term risks of COVID-19. There are four key policy implications of such as strategy. First, we need to achieve equitable access beyond vaccines to encompass a comprehensive toolkit. Second, we must monitor the evolving virus and dynamically upgrade the toolkit. Third, we must transition from the acute response to a sustainable strategy toward COVID-19, balanced and integrated with other health and social priorities. Fourth, we need a unified risk-mitigation approach to future infectious disease threats beyond COVID-19. Infectious diseases with pandemic potential are a threat to global economic and health security. The international community should recognize that its pandemic financing addresses a systemic risk to the global economy, not just the development need of a particular country. Accordingly, it should allocate additional funding to fight pandemics and strengthen health systems both domestically and overseas. This will require about \$15 billion in grants this year and \$10 billion annually after that.

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I. Introduction

We are in the third year of the COVID-19 pandemic, and the health and economic losses continue to grow. More than 6 million people have died according to official estimates (with studies estimating the actual death toll ranging from 16 to 20 million, approximately equal to that of World War I), and the IMF's *World Economic Outlook* (IMF 2022) has projected the cumulative output loss from the pandemic through 2024 to be about \$13.8 trillion (Figure 1). The sharp rise in cases and deaths in some countries in Asia and the resurgence of cases in Europe are a stark reminder that the pandemic is not over.

The global economic recovery continues to be constrained by unequal access to tools to prevent and treat COVID-19 and uneven policy support to address the impact of the pandemic. Several of the challenges the global economy faces, such as supply disruptions, inflation, and persistent uncertainty, also follow from the fact that the world remains in the pandemic's grip. COVID-19 is expected to leave lasting imprints on the economic potential of many countries.

Despite the strong consensus that ending the acute phase of the pandemic is an urgent global priority, there has been insufficient progress toward the global targets set by the ACT Accelerator¹ (ACT-A) and the IMF Pandemic Proposal for the delivery and use of available countermeasures (WHO 2021; Agarwal and Gopinath, 2021a,b). On vaccines, 86 countries did not meet the 40 percent vaccination target by the end of 2021, and disparities in vaccine access and uptake remain significant. Under current trends, over 100 countries are unlikely to meet the 70 percent vaccination target set for mid-2022—and several may never reach it (Figure 2). On tests, the daily target was set at 1 per 1,000 people, and about two in three developing economies continue to test below this target despite the Omicron wave. Meanwhile, high-income countries are testing 80 times more than low-income countries (Figure 3). There are similar gaps in access to oxygen, treatments, and personal protective equipment (PPE). And there is an imbalance across countries when it comes to disease surveillance underpinned by testing and genomic sequencing—an important tool for identifying new virus strains and developing adequate vaccines and treatments. This means we detect variants where we have capabilities to detect them, not necessarily where they are occurring.

Ending the acute phase of this pandemic everywhere remains an essential priority, while we simultaneously evolve our global strategy to manage the long-term risks of COVID-19. Two emerging facts will influence how we inform these goals. First, as we go through the Omicron wave, much if not most of the world population is expected to be either vaccinated or to have been infected, and many will be both vaccinated

¹ The Access to COVID-19 Tools Accelerator (ACT-A) is an international partnership of the world's international health organizations to accelerate development, production, and equitable access to COVID-19 tests, treatments, and vaccines. It was launched in April 2020 in response to a call from G20 leaders.

and convalescent. Both types of exposure offer some protection against severe disease and death, though to a different extent. Second, while vaccinations are highly beneficial, there is growing evidence that vaccines (nor infection-induced immunity) do not represent “silver bullets” against the evolving SARS-CoV2 virus. And unlike diseases such as smallpox, which could be eradicated with widespread vaccination, it is probable that SARS-CoV-2 will never be eradicated and will continue to evolve in human and animal populations. Considering these developments, we propose a central post-Omicron pivot in global priorities (Table 1) to manage both the uncertainty and the long-term risks of COVID-19.

Central Pivot: Recognize that COVID-19 is with us for the long term and that there are very different scenarios for how it could evolve—from a mild endemic scenario to a dangerous variant scenario. Since it may be impossible to entirely eliminate SARS-Cov-2, the virus will probably continue to circulate indefinitely, resulting in periodic outbreaks and endemicity (Morens, Taubenberger, and Fauci 2022). While a likely scenario may be that the combination of vaccination and naturally acquired immunity within a given population renders COVID-19 less of a mortal threat in those vaccinated or previously infected—there remains the risk that a variant simultaneously more transmissible and more virulent than Omicron will emerge. Furthermore, new birth cohorts; people who are or become immunosuppressed by cancer, HIV, or other conditions; and older individuals will be especially exposed to the risks presented by such variants and to waning immunity in general. The overall consequences of these scenarios call for particular actions.

- **Managing uncertainty:** The plasticity of the virus suggests that many more variants are inevitable, and some could be much worse than Omicron. We should manage the risk based on scenarios of how this virus might evolve to become more transmissible and/or more deadly. Such an approach puts a premium on no-regrets moves that deliver benefits across multiple scenarios and continuous monitoring to detect changes in the probability of various scenarios. Moreover, as we have seen in earlier phases of the pandemic, the scenarios (discussed below) may play out differently in different parts of the world—divided by geography, demographics, or access to vaccines, tests, treatments, and PPE. And they may all happen at different times or different places, with ongoing risks to all.
- **Dealing with COVID-19 over the long term:** We need to transition from an emergency response mode to accepting that we are in for a long-term fight, with implications for the funding model, priorities, and deployment of resources over time. Having a long-term strategy in place will help ensure that as the risk of severe illness and death declines, we can shift focus to securing a resilient recovery—including by balancing ongoing COVID-19 commitments against the many other priorities that were put on hold to deal with the global emergency.

Below we discuss four policy implications of this central pivot. Implications 1 and 2 flow from the uncertainty about scenarios; Implications 3 and 4 flow from the recognition that we are dealing with COVID-19 for the long term.

Policy Implication 1: Broaden the effort to achieve equitable access beyond vaccines to encompass a comprehensive toolkit. While vaccines remain a critical tool, a broader toolkit provides greater resilience across multiple scenarios of viral evolution. So far, the donor response has been heavily weighted toward vaccines, with over 70 percent of the grant financing raised so far being for the development, procurement, and delivery of vaccines, with much more limited funds available for tests, treatments, and strengthening health systems. From a risk-management perspective, we need to ensure that each country has access to a comprehensive COVID-19 toolkit of vaccines, tests, treatments, and PPE. Demand for vaccines will likely soon reach a saturation point, making this more comprehensive approach even more important. While there is growing evidence that natural immunity on its own is less effective than either vaccination or natural immunity augmented by vaccination, the global response should not treat vaccines as a silver bullet. Each tool is imperfect by itself, with varying durability, but each offers different types of protection. Deploying a comprehensive toolkit—including the new antivirals—will provide multiple lines of defense, reducing the risk of hospitalization, economic disruptions, and a fear-driven response every time cases surge or a new variant emerges. Many of the capacities required for a more comprehensive approach—oxygen, PPE, enhanced diagnostic capacity, and so on—will be of value not just for COVID-19 but also for many other health risks and diseases. On vaccinations, the focus should primarily be on fully vaccinating the most clinically vulnerable populations (in accordance with WHO’s Prioritization roadmap, WHO 2022a).

Policy Implication 2: Monitor the evolving virus and dynamically upgrade the toolkit. To enable a dynamic response to the evolution of the virus, the toolkit should be continuously updated via investments in surveillance, R&D, manufacturing, and health systems. The extraordinary speed with which Omicron spread around the world (a few weeks) should be a reminder that once a new variant emerges, the world will have little time to react. Continued investments in surveillance, R&D, manufacturing, and health systems make it possible to focus more safely and confidently on securing a resilient economic recovery with a stable return to economic, social, and school lives.

Policy Implication 3: Transition from an acute response to a sustainable strategy toward COVID-19, balanced and integrated with other health and social priorities. It is time to bring the different priorities together. The global response has thus far rightly focused on ensuring that each country can make COVID-19 tools available to its citizens. But despite the obvious and enormous global returns to accelerating the end of the pandemic (Agarwal and Gopinath 2021a), the international community has failed to generate sufficient and timely funding. The ACT Accelerator continues to face significant financing constraints, with

about \$15 billion in grant needs still unmet. And the supplies of tools have been highly episodic, impeding in-country delivery. With growing absorptive capacity constraints and vaccine hesitancy, over 100 countries are not on track to meet the 70 percent vaccination target by mid-2022. Africa Centers for Disease Control and Prevention (CDC) has called for a pause in vaccine donations until at least the second half of this year. For better or worse, as demand for vaccination reaches a saturation point (due to subsiding infection rates, vaccine hesitancy, or other reasons), many countries will deprioritize COVID-19 immunization campaigns. Considering that we are operating with finite resources and that fighting COVID-19 is now a multiyear endeavor, we must gradually shift to a more balanced and demand-driven global response as we prepare for the end of the acute phase of the pandemic. As and when severe cases decline, there is a need to balance further investment on COVID-19 against addressing other health priorities, particularly those whose mortality and incidence have increased as a knock-on impact of the pandemic (for example, tuberculosis, malaria) (Heuschen and others 2021). These inherently difficult trade-offs will depend on individual country factors, such as disease burden, demography, and, ultimately, resource availability.

Policy Implication 4: Adopt a unified approach to reduce global risks posed by infectious disease.

As we transition to fighting COVID-19 over the longer term, we must in parallel shift our approach to thinking about future threats. The conversation on the immediate global response to COVID-19 has become somewhat detached from the need to scale up pandemic preparedness and response capabilities more generally and from the broader global health agenda. Further mutation of the SARS-CoV-2 virus remains a key risk for the world, with coronaviruses (both SARS-CoV-2 and other emerging and reemerging sarbecoviruses) now retaining pandemic potential going forward. An unknown number of animal coronaviruses, of unknown transmissibility and lethality, could emerge in the foreseeable future (Morens, Taubenberger, and Fauci 2022). From this perspective, many of the actions to fight COVID-19 (especially if, as seems likely, it is to stay with us forever) will also help reduce the risk of further mutations of the virus, reduce the risk of future pandemics, and enhance our abilities to deal with other pressing health issues.

As investments against HIV, TB and malaria helped lay the foundations for many low and middle income countries' responses to COVID-19, so investments to defeat COVID-19, alongside ongoing investments to combat these earlier pandemics, will help such countries reinforce their capacities to prevent, detect and respond to future threats (Sands 2020). Yet thus far the benefits to pandemic preparedness from such disease-specific investments have been largely of the nature of serendipitous by-products rather than being intentional consequences. By being more purposeful about leveraging the synergies between investments to fight existing diseases and investments to counter new threats, we can maximize the extent to which investments to prepare for future pandemics pay dividends even in the absence of such unpredictable events. Otherwise, we face the risk that these investments in preparedness will not be sustained.

Many of the investments required for preparedness will pay such dividends: enhanced genomic and epidemiological surveillance capabilities, for example, will provide early detection and warning for pandemic threats but also enhance efforts to tackle tuberculosis, HIV, malaria; help prevent the spread of antimicrobial resistance; and contribute to the management of regionally important infections (dengue, yellow fever, enteric and other respiratory infections) and noninfectious diseases. Such investments and those in R&D and distributed manufacturing will not be sustainable for the long term unless they have a function and are maintained between outbreaks.

Some required investments, however, may not yield such obvious or immediate dividends. Confronted with low-yield but necessary investments, the donor community should recognize that its pandemic financing addresses a systemic risk to global economic and health security, and not just the development needs of particular countries or regions. The international community should therefore allocate additional funding for fighting pandemics and strengthening health systems both domestically and overseas. These budgetary resources should be drawn from pools beyond the confines of official development assistance and constrained and overstretched health budgets.

Reflecting this discussion, we take a look at COVID-19 scenarios and long-term risks and provide additional background on the four policy implications.

II. COVID-19 Scenarios and Long-Term Risks

COVID-19 is now expected to stay with us for many years as a recurring disease. This requires a global strategy to manage its long-term risks while ensuring we can urgently end the acute phase of the pandemic. After the Omicron wave, much of the world population is expected to be either vaccinated or have experienced at least one infection. There is considerable uncertainty about what comes after that, with the path of the health shock depending on the virulence of the virus. Will vaccines and/or prior infection provide long-lasting protection against severe illness and death? Or will future variants again be associated with severe disease and high mortality? A possible future post-Omicron scenario is one marked by broad-based immunity and a marked reduction in severe disease and death. If that happens, the world can gradually focus less on the health shock and prioritize returning the economy to something resembling its pre-pandemic state. However, a clear takeaway from the pandemic is that SARS-CoV-2 has the capacity to surprise us, and there remains a significant if unquantifiable risk of a much more severe variant taking over the world and causing millions of additional deaths and trillions of additional economic losses. Given the uncertainties, a scenario-based risk-management perspective is needed.

We foresee at least four possible scenarios in the post-Omicron world (Table 2). These scenarios are based on the scenarios developed by Jeremy Farrar (2022) in early 2022 and broadly aligned with scenarios developed by the WHO (2022c).²

- A. **“Mild” Endemic Scenario (Scenario A):** Future vaccines or repeated infections elicit long-lasting and broad protection against severe disease, and the spread of future variants has a limited impact on the functioning of health care systems. In this scenario, the world can gradually focus less on the health shock and prioritize restoring the economy.
- B. **“Injurious” Endemic Scenario (Scenario B):** Vaccines and/or prior infections provide long-lasting and broad immunity, but there is potential for future variants that manifest high transmission or high severity of disease and mortality. In this scenario, a fraction of the population that has not developed immunity (including new birth cohorts; people who are immunosuppressed by cancer, HIV, or other conditions; or older individuals) will remain exposed to the risk of severe disease. Ensuring equitable access to antivirals (which can now significantly lower mortality risk) will be important in this scenario. However, the clinical pathway for administering these treatments requires early detection of the virus, thereby making it important to also scale up testing capacity.
- C. **“Disruptive” Endemic Scenario (Scenario C):** Vaccines and/or prior infections provide only temporary immunity, but all future variants have low disease severity. In this scenario, the global rollout of all tools will remain important. While the future risk of hospitalization for individuals might be low, the economy may be vulnerable to periodic disruptions to in-person schooling and work caused by high rates of transmission. Thus, it will be important to have strengthened public health measures in place (such as rapid testing) to ensure minimal disruption of daily life. Further, if immunity is not durable, regular boosters may be necessary, *increasing* the importance of regional manufacturing capacity to ensure equitable access to vaccines (a worthwhile investment with high social returns across all scenarios, but especially in Scenarios C and D).
- D. **“Dangerous Variant” Scenario (Scenario D):** Vaccines and/or prior infections provide only temporary immunity, and there is potential for future variants to be highly transmissible and/or more deadly. Within this scenario, there is also a possibility of a second pandemic emerging while we remain exposed to the risks of COVID-19. Overall, in this scenario, the global rollout of all tools will remain important. More

² The WHO’s ‘Strategic Preparedness, Readiness and Response Plan to End the Global COVID-19 Emergency in 2022’ (WHO, 2022c), released in End-March, envisions *three* planning scenarios. In their ‘base case’, the severity of the virus is significantly reduced as the virus evolves, but periodic spikes in transmission may occur if waning immunity is significant (broadly corresponding to our Scenario B). In their ‘best case’, future variants are significantly less severe and protection against severe disease is maintained (broadly corresponding to our Scenario A). In their ‘worst case’ a more virulent and transmissible variant emerges against which vaccines are less effective (broadly corresponding to our Scenario D).

accelerated scaling up of R&D investments, strengthened genomic surveillance to detect new variants early, and enhanced in-country health systems to rapidly deliver medical tools will be critical priorities. Further, the regional manufacturing and distribution capacity (and public acceptance/education) will need to be optimized for speed such that the world can have a rapid and agile response to novel threats due to mutations.

One fundamental question is whether these scenarios unfold at a global level or whether people face different scenarios depending on where they live. The scenarios may play out differently in different parts of the world—divided by geography, demographics, patterns of population immunity, and access to and effectiveness of medical countermeasures and health care systems. It will also depend on the durability of protection provided by existing vaccines and the level of coverage—especially among the elderly and clinically vulnerable population. And the four scenarios may all emerge at different times or in different places, with ongoing risks to all.

Further, as the scenarios illustrate, the global priorities may shift depending on the path of the virus going forward. Given the many unknowns today about which of these scenarios will materialize, the global priorities should be designed such that actions today will help secure lives and livelihoods in all possible future scenarios.

III. A Comprehensive and Dynamic Toolkit (Policy Implications 1 and 2)

Post-Omicron, a comprehensive response is needed given the various scenarios (Figure 4). The logic of this “comprehensive” and “dynamic” approach is as follows. The more the variants evade vaccines from an infection perspective, the greater the importance of other transmission reduction measures, such as testing-based behavioral actions and PPE. Treatments, including oxygen, are particularly important for the unvaccinated high-risk population and if new variants undermine vaccine protection against severe disease (or vaccine protection wanes over time). Given the plasticity of the virus and the explosive speed with which new variants spread, disease surveillance—underpinned by testing and gene sequencing—is vital in helping us understand which scenario we are in, in time to do something about it. Based on this logic, we can derive the following three priorities, which yield benefits in all possible scenarios, albeit to varying degrees:

1. Support countries to develop a comprehensive toolkit: While vaccines remain a critical tool, we need to move beyond an approach that is overly dependent on vaccines to one that includes testing, genomic surveillance, and therapeutics. The refreshed ACT Accelerator budget of \$23.4 billion (with about \$15

billion in grants), which outlines a financing need for vaccines, diagnostics, treatments, and health systems, is a good starting point. It will be important to see the ACT Accelerator budget as a dynamic tool, which can be updated depending on the evolution of the virus (as outlined above). Financing the strengthening of health systems is likely to become more important to reduce the risk of mutations, prevent the excess mortality that occurs when infections overwhelm health systems, and prepare for future pandemics. Many of the infectious disease outbreaks with multi-country impact have originated and had the greatest impact in countries with weak public health systems and with limited capacity to detect and suppress outbreaks.

2. Expand production of antivirals and ensure equitable access: The world now has access to effective oral antivirals that can significantly reduce the risk of hospitalization and death—if administered early. However, global production is expected to remain very limited in 2022, with most developing economies having no or very limited access to them in the near term. For example, Paxlovid has been shown to be 89 percent effective in preventing hospitalization, albeit on a small sample. Despite efforts to expand its production, only 120 million courses are expected to be available in 2022, of which 30 million are expected in the first half of the year. It seems likely that only a limited volume would be available to developing countries. But even if 10 million were secured for these countries, about \$2 billion would be required to procure and deploy this volume (with adequate testing), which is currently not available. Generics are not expected until 2023. Substantial support will be required to expand the production of these lifesaving tools and create a pathway for equitable access. In addition, providing a comprehensive toolkit will be critical to enable countries to implement “test and treat” pathways that support diagnosis, prioritization and treatment with antivirals in the time frame required to maximize benefits. Many low-income countries will need to scale up their testing significantly. These actions will be particularly helpful if Scenarios B or D materialize, that is, if future variants cause severe disease. Further, global coordination will be needed to ensure that these drugs are not used as monotherapies, to minimize the risk of drug resistance.
3. Invest in R&D and genomic surveillance: The COVID-19 pandemic has been one of the greatest challenges faced by modern science. Yet the global scientific community responded with unprecedented scale, developing vaccines, tests, and treatments at record speed—saving uncountable lives (Agarwal and Gaule 2022). We must continue upgrading our toolkit to handle new SARS-CoV-2 variants, novel coronaviruses, and other threats through R&D investments (including by developing a universal vaccine against coronaviruses and improved antiviral drugs) to handle new SARS-CoV-2 variants, novel coronaviruses, and other threats. Similarly, there is a need for enhanced genomic surveillance capabilities, especially in developing economies. The heroic and rapid efforts by the scientific teams in Botswana and South Africa to detect and sequence the Omicron variant—which

alerted the world to its threat faster than for any previous variant of concern—demonstrate the value of such investment and the critical need to expand surveillance capabilities in developing economies. These actions will also be particularly helpful if Scenarios B or D materialize; that is, if we encounter highly virulent future variants.

IV. A Balanced and Integrated Global Response (Policy Implication 3)

Even before the Omicron wave, many developing economies faced a trade-off between allocating scarce resources to COVID-19 vaccination campaigns and other pressing health priorities. After the Omicron wave, as seropositivity rates increase due to natural infection, several countries are considering deprioritizing vaccination—implying that the vaccination target will get increasingly out of reach in many countries that currently have low coverage. We see at least four main reasons for limited progress toward global targets for COVID-19 tools:

- **Lack of financing:** Meeting the targets requires up-front financing. So far, the global response has raised only about \$18.7 billion in grant form for the ACT Accelerator. The IMF Pandemic Proposal (Agarwal and Gopinath 2021a) identified a grant need of \$35 billion, so a gap of about \$15 billion remains. The US Global COVID-19 Summit was a significant leap forward in getting the world to embrace the global targets in line with the IMF Pandemic Proposal and the ACT Accelerator, but there is significant scope for progress on raising funds for a timely global response.
- **In-country delivery barriers:** On vaccines, in 2021 the biggest obstacle was getting sufficient and predictable supply to COVAX and the African Vaccine Acquisition Trust (AVAT)—including companies prioritizing advanced economies, cross-border trade restrictions that affected the relevant supply chains and also restricted exports, and insufficient funding.³ Now, increasingly, in-country delivery challenges, possibly coupled with weak public demand, have become a critical barrier to reaching the global vaccination target. COVAX offers free vaccines to 91 Advance Market Commitment (AMC) countries as a contribution toward the 70 percent goal. But over half of the countries have deferred or refused delivery of free vaccines despite low vaccine coverage. The typical reasons for deferral or refusal were absorptive capacity or lack of demand. The latest COVAX allocation (Round 14) offered 420 million doses to AMC countries, but only 100 million doses were accepted—signifying the presence of serious in-country delivery barriers. COVAX deliveries continue to be unequal across countries, with countries

³ COVAX is a global initiative aimed at offering equitable access to COVID-19 vaccines. African Union Member States have access to vaccines procured through the African Vaccine Acquisition Trust (AVAT).

with greater absorptive capacity receiving larger allocations. Until recently, high-level attention has focused primarily on raising funds to procure vaccine supplies, but not enough on the strategic oversight needed to get shots in arms. Overcoming these barriers requires more reliable long-term supply forecasts to enable countries to plan and prepare mass vaccination programs, and flexible financing to rapidly support in-country efforts to get shots in arms and strengthen health systems (including public trust and mitigating impact on other programs). Similar in-country delivery barriers and health system challenges are also preventing equitable access to tests and treatments (although for these tools the primary binding constraint remains financing, far more than for vaccines).

- **Unpredictable supplies and inefficiencies in regulatory processes:** The crisis has shone a bright light on the multiple barriers to implementing a swift and flexible response to an infectious disease threat. The in-country delivery barriers (discussed above) are exacerbated by the interplay of (1) episodic supplies and wave-driven demand and (2) inefficiencies in global and local regulatory authorities, guidance, and processes. Episodic and unpredictable supply of vaccines has been a significant disincentive to planning and preparing a mass vaccination program—as it was simply not worth the effort for many countries, given that they often had no idea if or when vaccines or other tools were coming. And regulatory authorities have struggled to provide timely and clear guidance on the use of tools to enable a swift and flexible response to the pandemic.
- **Unbalanced response:** Needed tests, therapeutics, and supportive care (including medical oxygen) are vastly under-resourced across many regions. For example, funding for diagnostics through the ACT Accelerator has only been a fraction of what would be required to attain this level.

Overall, the insufficient progress toward targets and the substantial global spread of the virus as a result of the Omicron wave raise a question: Are the global targets still relevant? The answer to this depends on the evolution of the virus and the pandemic, as discussed above. If the “mild endemic scenario” (Scenario A) materializes worldwide, the targets are less likely to be a useful guide. By contrast, if the world or parts of the world find themselves in the other severe scenarios (albeit perhaps with a lower probability of materializing), then access to a full array of countermeasures will remain critical. On vaccinations, the focus should primarily be on fully vaccinating the most clinically vulnerable populations (in accordance with WHO’s Prioritization roadmap, WHO 2022a). Further, considering the uncertainty—and when the risk subsides—over time we will need to gradually shift from a supply-driven global response to a demand-driven and balanced response guided by competing health priorities at the national level (Boum, Bebell, and Bisseeck 2021).

There are many hidden scars of the pandemic that need addressing. The pandemic has exacerbated within-country inequality—especially in emerging markets and developing economies. Vulnerable households often face a disproportionate burden when health and economic shocks occur. About 65–75 million additional people are estimated to be in extreme poverty in 2021 compared with pre-pandemic projections, principally as a result of the pandemic (IMF, 2021). Employment and participation in labor markets are still below their pre-pandemic levels, with emerging market and developing economies hit harder than advanced economies, on average. In several countries, the youth face the prospect of graduating in a weak labor market due to the pandemic.

Further, the pandemic has disrupted schooling worldwide and brought many education systems to a halt. Nearly one in four people in the world are school age, and schools were closed for millions worldwide. Closures have been twice as long in developing economies as in advanced economies. There is also an emerging health crisis beyond COVID-19. In rich countries, we are seeing waiting lists for various medical procedures (for example, surgeries) extended, and delayed diagnosis of conditions such as cancer. In poorer countries, the knock-on impact on other infectious diseases (which may kill more in these countries than COVID-19) has reversed years of progress and led to hundreds of thousands of additional deaths. The longer the pandemic lasts, the greater the knock-on impact and the harder it will be to reverse the long-term hysteresis effects on health.

Together, such economic, human capital, and health effects may have consequences for decades through learning losses, productivity and employment impact, and longer-lasting divergence across countries in health and well-being outcomes. Therefore, as we exit the global emergency, the goal of ensuring equitable access to the comprehensive COVID-19 toolkit must be balanced against the other competing health priorities and the goal of preventing long-term scarring from the pandemic. This will require greater country engagement and ownership and support for countries to customize the toolkit based on their national priorities. These actions are in line with the comprehensive but context-adaptable strategy using the complete toolkit we have described. We also need greater macro-fiscal attention in managing uncertainty (IMF 2016) and increased efficiency of health spending, given limited policy space in several countries.

V. A Unified Approach to Reduce Global Risks (Policy Implication 4)

As we transition to fight COVID-19 over the longer term, the world also needs a broader shift in the principles guiding these actions and the global response to fighting future threats. We see at least four areas that need a refreshed approach.

One, the donor community should recognize that its pandemic financing addresses a *systemic risk to the international economy*, not just the development needs of a country. Donor financing reduces the risk of new variants that disrupt lives and livelihoods everywhere. In this sense, it should be seen differently from development aid. Donor countries and the international community should therefore allocate additional funding for fighting pandemics and health system strengthening both domestically and overseas. These budgetary resources should go beyond the confines of official development assistance.

Two, we must recognize that when it comes to addressing the pandemic, doing too little too late is way worse than doing too much too early. The *time value of action* during pandemics is enormous. Accessing resources even one week earlier can save lives (see Agarwal and Gopinath, forthcoming; Agarwal and Reed, forthcoming). Thus, for the remainder of this pandemic and in future pandemics, taking a systemic risk approach can also help avoid a situation in which perfectionism and lack of global coordination stand in the way of a strong and rapid global response.

Three, we need a *unified approach to fight pandemics* that emphasizes complementarities between investments to fight specific diseases and systems to address broader health threats. Currently, the discussions about ending the COVID-19 pandemic are only partially-linked with those about future pandemic preparedness and response, and even less so with those about other infectious disease priorities. There is a need for more investments in systems, platforms, and capacities on a multi-pathogen basis versus investments specific to a particular disease. Most preparedness investments are in the first category; many response investments are necessarily in the second. Further mutation of the SARS-CoV-2 virus remains a key risk for the world, with coronaviruses (both SARS-CoV-2 and others) now retaining pandemic potential going forward. From this perspective, many of the actions outlined above will also help reduce the risk of further virus mutations and of future pandemics. Moreover, we should be intentional in ensuring that the investments in technologies, people, kits, and equipment strengthen our capability to counter infectious disease threats beyond COVID-19, including antimicrobial resistance, HIV, tuberculosis, malaria, and potential future pathogens (Sands 2020). Therefore, financing action to help end the COVID-19 pandemic has spending multipliers and spillovers on the pandemic preparedness agenda (and more broadly on the universal health coverage agenda) that the Indonesia G20 and German G7 Presidencies and other multilateral initiatives have prioritized.

Four, we must strengthen global collaboration and systems for a faster and better response. Preventing future pandemics is a global choice. While the threat of disease outbreaks will remain with us, we can mitigate or even eliminate their pandemic potential by strengthening our global architecture. Action is needed in five areas: (1) stronger multilateral institutions with high-level political support to coordinate the global response to health shocks; (2) rapid and adequate financing windows for global public goods

that are activated at the onset of pandemics; (3) diversified regional manufacturing capacity for vaccines, tests, and drugs (optimized for speed and agility) with arrangements to share technology and know-how; (4) increased investment in disease surveillance at global, regional and national levels, in the resilience and sustainability of national public health systems, and in R&D to prepare for and enable more rapid delivery of medical countermeasures (for example, the goal of making safe and effective vaccines against any virus in 100 days) (Seville et al. 2022; G7 2021); and (5) improved regulatory frameworks to allow speedy delivery of existing and novel tools worldwide. We also need to better understand the environmental drivers of SARS-CoV-2 and other pathogens, given the strong interlinkages between health and the environment (as emphasized by the One Health work program).

VI. Financing

For the financing gaps, we rely on the ongoing work on identifying financing needs. Regarding existing financing gaps for COVID-19, we rely on the consolidated financing framework for the ACT Accelerator. This framework was developed by the ACT Accelerator Facilitation Council Financial and Resource Mobilization Working Group to clarify sources of financing that could fund the ACT Accelerator budget between October 2021 and September 2022 (including based on inputs from the authors' respective institutions). When the framework was released in February 2022 (WHO, 2022b), it identified an urgent grant financing need of \$16.8 billion to meet the global COVID-19 targets. In addition, \$6.8 billion was identified as part of a larger investment (beyond ACT Accelerator agencies) to support countries' local delivery of COVID-19 tools. As of mid-March 2022, the grant financing gap stood at about \$15 billion.

Separately, the G7 Pandemic Preparedness Partnership, the *Report of the Independent Panel for Pandemic Preparedness and Response*, and the World Bank and World Health Organization report for the G20 Joint Finance and Health Task Force (G20 2021; G7 2021; IPPP 2021; WB-WHO, 2022) have focused on identifying financing needs to address future pandemics. The WB-WHO report estimates the total annual financing need for a future pandemic preparedness and response (PPR) system to be \$31 billion, consistent with the estimate of the G20 High-Level Independent Panel (HLIP). However, considering current and expected domestic and international financing for the PPR, the report estimates the *additional* international financing required to fund a fit-for-purpose PPR architecture at about \$10 billion.

Thus, reflecting the existing financing framework initiatives, we suggest that the international community make an *additional* \$15 billion in grant financing available in 2022 (primarily geared toward fighting COVID-19 in line with the ACT Accelerator financing framework) and \$10 billion annually going forward to support PPR activities (in line with the WB-WHO and HLIP reports). There is a strong case for these funds to be made available as grant financing—given that ending the pandemic in a timely manner remains a global

public good—and to ensure that developing economies can undertake necessary measures without being saddled with large debt burdens (Agarwal and Gopinath 2021a).

The allocation of these funds should be guided by two criteria. First, as discussed under Policy Implications (1) and (2), the ACT Accelerator budget should be used as a *dynamic tool*, which can be updated according to the evolution of the virus. Financing the strengthening of health systems is therefore likely to gain importance going forward. Second, as discussed under Policy Implication (4), financing actions to help end the COVID-19 pandemic carry spending multipliers and spillovers on the pandemic preparedness agenda. Coordination of the various fundraising efforts and identification of areas of complementarity are therefore essential.

Beyond these financing needs, there are additional domestic financing needs, which should be supported by concessional financing from multilateral development banks. For example, the World Bank's COVID health operations have already provided about \$15 billion in financing for COVID-19 tools (of which about \$6.5 billion is in IDA financing, of which a third is on grant terms). Going forward, there are various initiatives being considered, including the possibility of creating a new financial intermediary facility. At the same time, existing institutions and financing channels, including CEPI, Global Fund, Gavi, and the WHO, will continue to play an important role—especially given the high levels of complexity and fragmentation already apparent in global health. Maximizing the synergies between investments for preparedness and investments to fight existing diseases is vital to optimizing the impact of every dollar. Moreover, strengthened the procurement capabilities, streamlined regulatory approvals, and improved coordination will be essential at national, regional, and global levels.

The IMF also has a role to play in helping countries meet their financing needs—supporting their own efforts to open up fiscal space and potentially acting as a third-resort line of finance (Agarwal and Gopinath 2021a). Further, in 2021 the IMF's Executive Board approved a historic Special Drawing Right (SDR) allocation of \$650 billion, which has made available substantial financial resources to all countries in these difficult times. Beyond that, the IMF is also exploring options to channel SDRs from countries with strong external positions to support global public policy goals through a Resilience and Sustainability Trust (RST). The RST's central objective is to provide affordable long-term financing to support countries as they tackle structural challenges, including climate change and pandemic preparedness (Pazarbasioglu and Ramakrishnan 2022).

VII. Closing Thoughts

Even before COVID-19, major pandemics and epidemics such as plague, cholera, flu, severe acute respiratory syndrome coronavirus (SARS-CoV), and Middle East respiratory syndrome coronavirus, had hit humanity hard (Piret and Boivin 2021). And as societies evolve, so will infectious diseases, with an expected rise in the frequency of epidemics and pandemics in coming decades (Marani and others 2021).

One of the dangerous legacies of the COVID-19 pandemic, exacerbated by the consequences of Russia's invasion of Ukraine, is weakened capacity in developing countries to invest in their people (including in health) combined with lower appetite for grant support for development as countries prioritize their economies. This means the fundamental problem of weak health systems in developing countries and under-investment in global health threats will remain — unless securing resilience is recognized as a common goal and its financing is taken up as a global priority.

There are large welfare gains from avoiding a pandemic like the Spanish Flu or COVID-19, estimated to be about 10 percent of a single year's consumption (Martin and Pindyck 2021; Barro 2009), thus warranting greater policy attention to address the systemic threat from pandemics. Ending the acute phase of this pandemic everywhere is crucial, as is adopting a global strategy to manage the long-term risks of COVID-19 and future infectious disease threats. We are all in this fight together, and collectively we can and must do better to fight the health problems facing humanity.

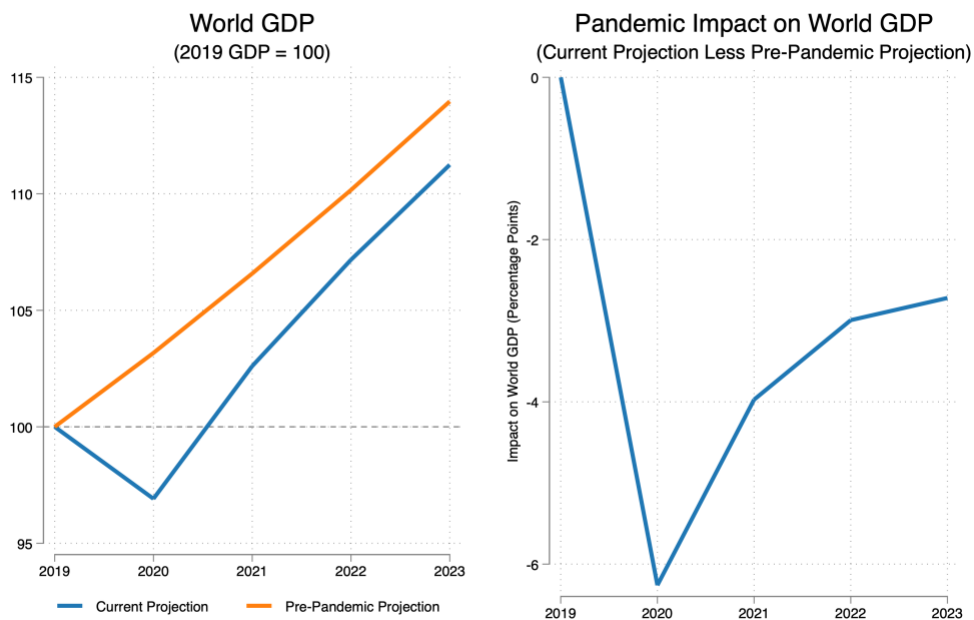
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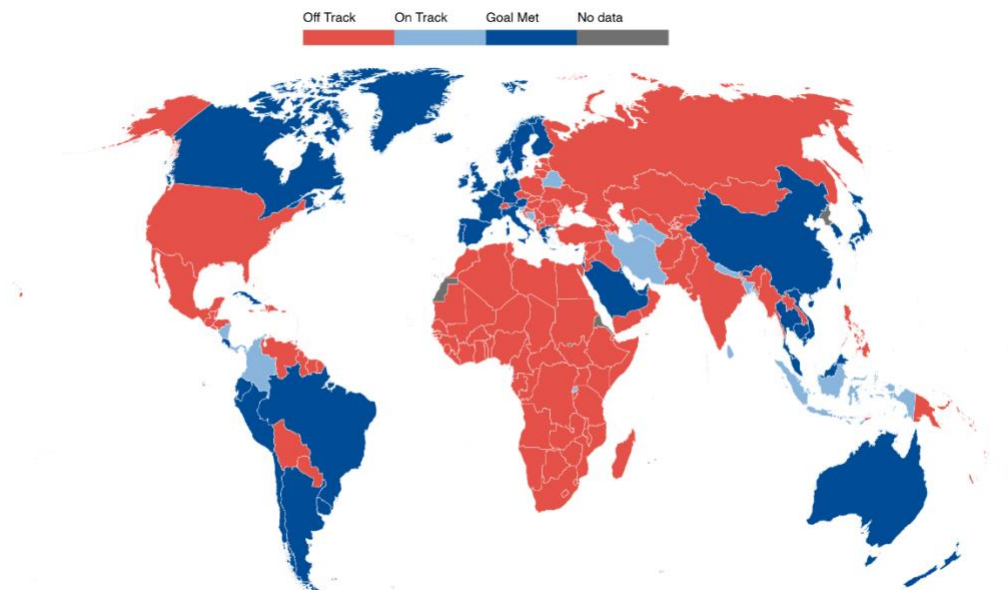
FIGURES

Figure 1: Pandemic Impact on World GDP



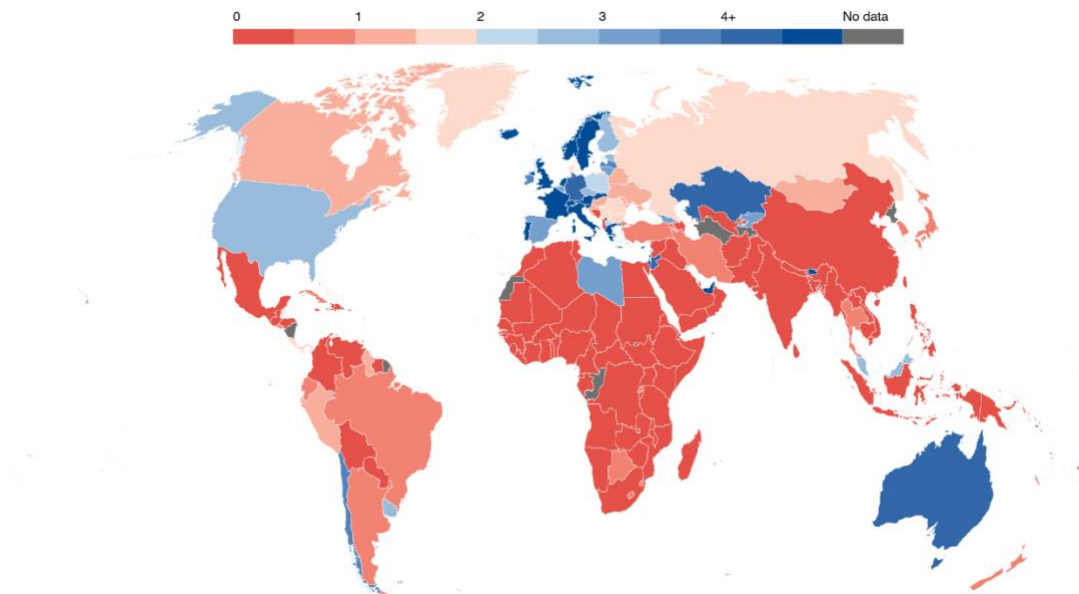
Source: IMF staff calculations based on World Economic Outlook vintage data.

Figure 2: More Than 100 Countries Not on Track to Meet the Mid-2022 Vaccination Target of 70 Percent



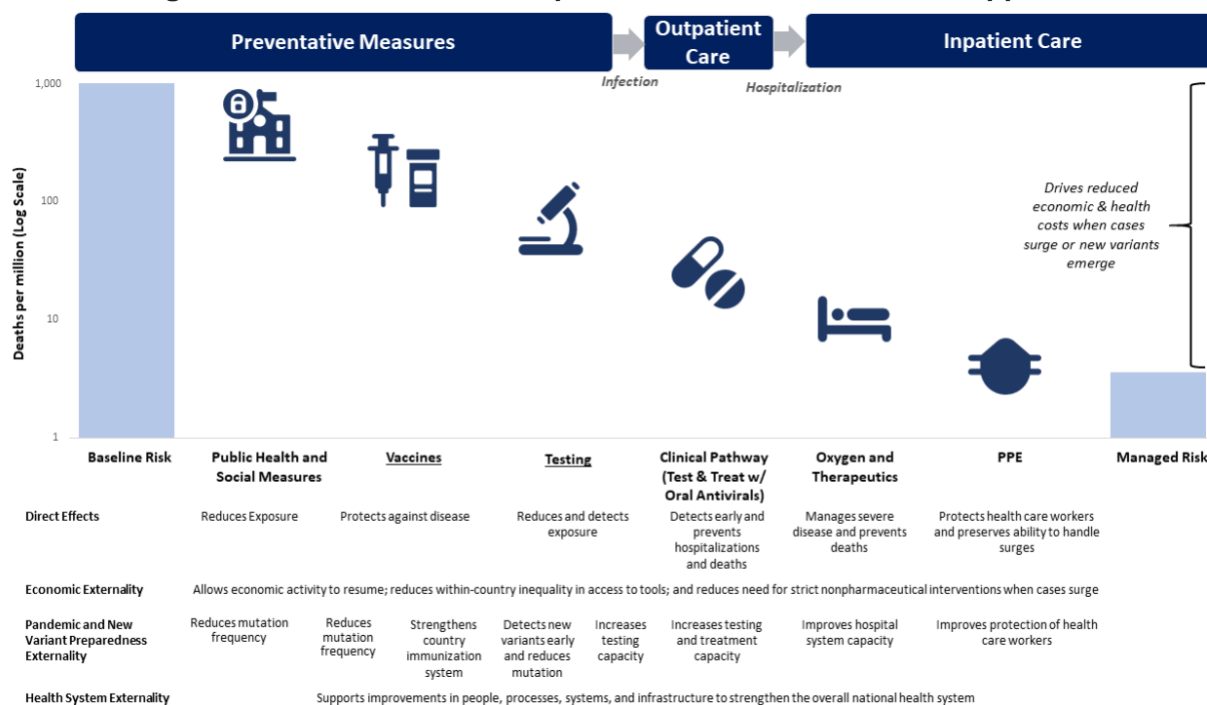
Source: IMF-WHO Vaccine Tracker based on COVID-19 Vaccine Delivery Partnership Information Hub, WHO, updated March 30, 2022

Figure 3: Testing Rates Remain Low and Unequal Worldwide
Average Daily Tests (per 1000 people)



Source: FIND, Our World in Data, updated March 30, 2022
 Note: Country borders or names do not necessarily reflect the IMF's official position.

Figure 4: Illustration of a Comprehensive COVID-19 Toolkit Approach



Source: Authors.

TABLES

Table 1: Summary of the Central Pivot and Its Implications

Central Pivot	Policy Implications	Priorities	Financing
Recognize that COVID-19 is with us for the long term and that there are very different scenarios for how it could evolve	#1. Broaden the effort to achieve equitable access beyond vaccines to encompass a comprehensive toolkit	(1) Support countries to develop a toolkit with vaccines, tests, treatments, and PPE (2) Expand production of antivirals and ensure equitable access	In 2022: <ul style="list-style-type: none"> • \$15 billion in grants in line with the ACT-Accelerator Financing framework • Use the ACT-A budget as a dynamic tool • Identify complementarities across fundraising efforts • Complementary financing from MDBs and domestic sources supported by enhanced revenue mobilization
	#2. Monitor the evolving virus and dynamically upgrade the toolkit	(3) Invest in R&D, genomic surveillance, and health systems	
	#3. Transition from acute response to a sustainable strategy toward COVID-19, balanced and integrated with other health and social priorities	(1) As cases decline, need to consider protracted impact on other health issues and disease burden (e.g., cancer, TB, HIV, malaria, mental health, etc.) that have lost ground (2) Create customized plans for each country in line with national priorities	
Thus, need to:			
-Manage Uncertainty			
-Deal with COVID-19 for the Long Term	#4. Adopt a unified approach to reduce global risks posed by infectious disease	(1) stronger multilateral institutions with high-level political support to coordinate the global response to health shocks (2) rapid and adequate financing windows for global public goods that are activated at the onset of pandemics (3) diversified regional manufacturing capacity for vaccines, tests, and drugs (optimized for speed and agility) with arrangements to share technology and know-how (4) Investments in disease surveillance, national public health systems, and R&D to enable rapid delivery of medical countermeasures (5) improved regulatory frameworks to allow existing and novel tools to be delivered at speed worldwide	Beyond 2022: <ul style="list-style-type: none"> • About \$10 billion in grants annually for PPR architecture • In line with the WHO-WB G20 Report and the HLIP Report

Source: Authors.

Table 2: Four Possible Post-Omicron Scenarios and Priorities

Four Possible Post-Omicron Scenarios and Priorities (both ex-ante and ex-post)

	All Future Variants with Low Severity of Disease	Potential for Future Variants with High Severity of Disease
Long-Lasting and Broad Protection from Prior Infection/Vaccination	<p>“Mild” Endemic Scenario with Greater Focus on Restoring Livelihoods</p> <ul style="list-style-type: none"> Global rollout of tools guided by country preferences (continuous boosting not needed) Prioritize returning economic, schooling, and life to “normal” 	<p>“Injurious” Endemic Scenario with Managed Risk to Avoid Deaths</p> <ul style="list-style-type: none"> Focus global toolkit on “test to treat” strategy and increase vaccination and booster coverage Prioritize pathway for equitable access to antivirals that significantly reduce mortality risk
Temporary Protection from Prior Infection/Vaccination	<p>“Disruptive” Endemic Scenario with Managed Risk to Avoid School/Work Closures</p> <ul style="list-style-type: none"> Global rollout of all tools (vaccines, tests, treatments, PPE) still important; need boosters Prioritize avoiding school closures and work disruptions when cases surge, and managing potential risks from “Long COVID” Create regional diversified manufacturing capacity for tools to ensure equitable access 	<p>“Dangerous Variant” Scenario with Greater Focus on R&D, Surveillance, and Systems</p> <ul style="list-style-type: none"> Global rollout of all tools (vaccines, tests, treatments, PPE) still important; need boosters Prioritize R&D investments, strengthening genomic surveillance and in-country health systems Create regional diversified manufacturing capacity that is optimized for speed and agility Distinction between “fighting COVID” and “pandemic preparedness” blurred

Source: Authors.



PUBLICATIONS

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