ACTaccelerator
ACCESS TO COVID-19 TOOLS

An economic investment case & financing requirements

September 2020 – December 2021

ACT now, ACT together to accelerate the end of the COVID-19 crisis

25 September 2020

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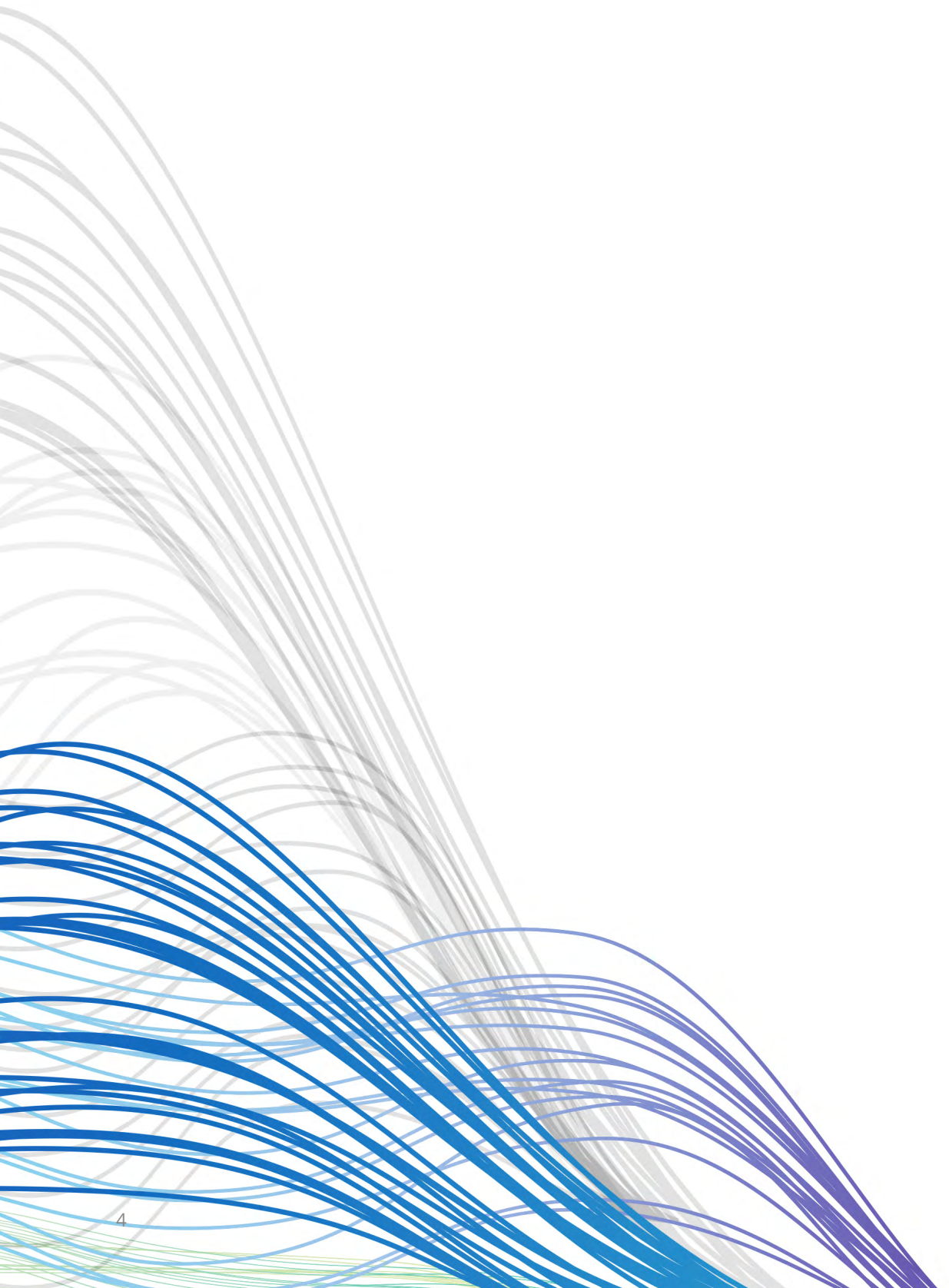

01

PURPOSE OF THIS DOCUMENT

Act now to change the course of the COVID-19 pandemic

This document lays out economic arguments for investing in the Access to COVID-19 Tools Accelerator (ACT-Accelerator). Framed within an overall context that recognizes the broader human health and societal impacts of the COVID-19 crisis, ACT-Accelerator's *Economic Investment Case* argues that investment in ACT-Accelerator is the world's best bet and most viable solution for restarting the global economy. It is intended for governments, multilaterals, civil society, businesses and foundations and all those interested in the work required to change the course of the pandemic.

The global deployment of ACT-Accelerator's comprehensive package of tools will reduce the severity of COVID-19 disease, enabling countries to transition out of the crisis thereby restarting domestic and international economic engines driving our global economy.

ACT-Accelerator *Economic Investment Case* is complimented by ACT-Accelerator's *Status Report & Plan* which outlines the overall goal and vision for ACT-Accelerator, accomplishments to date, and immediate priorities in ACT-Accelerator's critical path. The *Status Report & Plan* also highlight the step change needed to transition this work out of a start-up phase and position it for global impact.

This document focuses on a specific aspect of the economics of COVID-19 to illustrate the considerable economic benefits that could potentially accrue from collectively accelerating the development and deployment of tools that can rapidly reduce the risk of severe COVID-19 disease globally. Additional more comprehensive analyses have been developed by such institutions as the World Bank and IMF and complement this document.[1]

[1] Lancet COVID-19 Commissioners, Task Force Chairs, and Commission Secretariat. Lancet COVID-19 Commission Statement on the occasion of the 75th session of the UN General Assembly. Lancet. 2020;S0140-6736:31927-9. doi: 10.1016/S0140-6736(20)31927-9 (https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31927-9/fulltext).

02

EXECUTIVE SUMMARY

ACT-Accelerator provides an integrated 'end-to-end' global solution that targets the root cause of the crisis – severe COVID-19 disease - to accelerate the end of the pandemic.[2]

Nearly 5,000 lives are lost each day due to COVID-19.[3] In accelerating global and equitable access to tests, treatments and vaccines that can reduce the incidence and severity of COVID-19 cases, the human health toll of COVID-19 will diminish. Reducing the severity of COVID-19 disease will also ensure the safe provision of health care and will ease pressure on hospitals allowing for the redeployment of resources back towards essential non-COVID-19 health services. Fear of the virus will subside and extreme physical distancing measures will no longer be necessary. International mobility, trade and societal and economic activity will be able to fully resume.

The economic rationale for investing in an approach that can accelerate the end of the COVID-19 crisis is clear:

- The global economy is expected to contract by $US 7 trillion in 2020 as a result of the pandemic. ACT-Accelerator's financing gap is $US 35 billion. Fully financing ACT-Accelerator to help shorten the duration of the crisis would pay back this investment in less than 36 hours once global mobility and trade are restored.

- ACT-Accelerator total funding needs represent less than 1% of what G20 governments have already committed to domestic economic stimulus packages. Many countries have made significant investments in domestic R&D and on domestic economic stimulus packages. However, these investments will not on their own address severe COVID-19 disease, the root cause of the crisis and the key to restarting all aspects of their economies.

[2] The purpose of ACT-Accelerator is to provide specific COVID-19 tools; it will leverage local enablers to support their deployment (e.g. human resources, supply chains). In many cases, those enablers will be directly funded through domestic investments with other resources.
[3] Average daily number of deaths due to COVID-19; source: WHO Coronavirus disease (COVID-19) dashboard [online database]. Geneva: World Health Organization; 2020 (https://covid19.who.int/, accessed 24 September 2020).

The lack of an adequately financed global exit strategy is an existential threat to the economic and health security of all nations and people

The good news is that ACT-Accelerator is an up-and-running exit strategy for the world that is already delivering returns. It is the only global investment opportunity that mitigates R&D risks across a portfolio of tests, treatments and vaccines, and delivers a public health strategy explicitly designed to end the crisis everywhere at the same time.[4]

ACT-Accelerator accelerates an exit from the crisis in four concrete and interlinked ways:

1. ACT-Accelerator has a large and diverse R&D portfolio of products. This reduces risk and ensures that countries can access safe and effective tests, treatments and vaccines, without depending on individual product candidates which might fail.

2. It aims to reduce costs by providing efficiencies of scale and purchasing power, guaranteeing supplier markets, improving the bargaining power of purchasers, and reducing prices.

3. It is designed to ensure that the full spectrum of products needed across vaccines, therapeutics, diagnostics, and other essential products (including personal protective equipment and oxygen) is developed and accessible through strengthened health systems[5], reducing the risk of only having some of the tools needed to fight COVID-19.

4. It will help all countries to emerge from the health crisis and restore economic activity together, facilitating a more rapid return of international mobility and trade. Without the equitable access that ACT-Accelerator provides, the COVID-19 crisis may persist and economies in low-and-middle-income countries (LMICs) will struggle to restart. A new study found that under a scenario in which 50 high-income countries (HICs) get the first 2 billion doses of vaccine, transmission continues unabated for a longer period and almost twice as many people die, compared with a scenario of equitable distribution based on countries' populations.[6] Additionally, the global and equitable deployment of these tools should bolster the capacity of all countries to control COVID-19, thus reducing the potential for international spread.[7]

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[4] In parallel with the development of new tools, substantial investments are needed in countries with weak health systems to ensure their full application and impact.
[5] Health systems capacity considerations are not limited to the availability of tools. If there is limited health system infrastructure (beds/power supplies, etc.) and human resources, the integrated package of COVID-19 tools cannot be administered.
[6] Chinazzi M, Davis JT, Dean NE, Mu K, Piontti AP, Xiong X et al. Estimating the effect of cooperative versus uncooperative strategies of COVID-19 vaccine allocation: a modeling study. Boston: Northeastern University; 2020 (https://www.mobs-lab.org/uploads/6/7/8/7/6787877/global_vax.pdf).
[7] In this context, ACT-Accelerator also builds on the commitment made by G20 leaders to the Coronavirus Global Response on 26 March in order to present a united front against the pandemic.

03

BROADER SOCIETAL & ECONOMIC IMPACTS OF COVID-19

COVID-19 has caused a total crisis that places populations at high risk & undermines all Sustainable Development Goals (SDGs)

The pandemic is not slowing down. As of September 2020, 30 million people have been infected, hundreds of thousands of people have died, and despite flattening the curve in some regions of the world, confirmed cases increased by 50% in August 2020 alone.[8]

Longer-term and structural impacts of COVID-19 on global health, education, climate change and the economy threaten to undermine progress and may hamper the development potential of future generations.[9]

Global Health: in addition to the large human health toll directly attributed to COVID-19, essential health services have been disrupted in nearly all countries, threatening to reverse health gains made in maternal and child health, non-communicable diseases, and HIV, tuberculosis and malaria.[10] In early May 2020, a total of 99 countries reported the suspension of immunization campaigns for measles/measles rubella, polio (including for vaccine derived polio virus response activities), meningococcal A, yellow fever, typhoid, cholera and tetanus/diphtheria.[11]

Education: according to the World Bank[12], 1.6 billion students were out of school at the peak of the pandemic in April 2020. In LMICs alone, 24 million children and youth may drop out or not have access to school next year. Lack of education may exacerbate exclusion and inequality – particularly for those without means for accessing alternative education tools (e.g. internet, on-line learning). School closures could translate into $US10 trillion dollars of lost earnings for the global economy because of lower levels of learning, lost months of schooling, and potential school attrition.

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[8] WHO Coronavirus disease (COVID-19) dashboard [online database]. Geneva: World Health Organization; 2020 (https://covid19.who.int/, accessed 24 September 2020).
[9] For more details on these impacts, see: A UN framework for the immediate socio-economic response to COVID-19. New York: United Nations; 2020 (https://unsdg.un.org/resources/un-framework-immediate-socio-economic-response-covid-19, accessed 24 September 2020).
[10] WHO reported that in the period March to June 2020, health services were disrupted in 90% of countries surveyed (n=105) https://www.who.int/news-room/detail/31-08-2020-in-who-global-pulse-survey-90-of-countries-report-disruptions-to-essential-health-services-since-covid-19-pandemic
[11] Impact of COVID-19 on vaccine supplies. In: UNICEF Supply Division [website]. New York: UNICEF; 2020 (https://www.unicef.org/supply/stories/impact-covid-19-vaccine-supplies, accessed 24 September 2020).
[12] COVID-19 could lead to permanent loss in learning and trillions of dollars in lost earnings. Press release 18 June 2020. Washington: The World Bank; 2020 (https://www.worldbank.org/en/news/press-release/2020/06/18/covid-19-could-lead-to-permanent-loss-in-learning-and-trillions-of-dollars-in-lost-earnings).

Climate: investments in the energy transition needed to align with global climate change targets have also been hampered. While greenhouse gas emissions dropped by 5-10% during the crisis, the world is now back to pre-COVID-19 levels. In the face of global economic uncertainty, many companies focus on increasing liquidity – raising debt and cutting capital expenditure (CAPEX). In the energy sector, this resulted in a deferral (to 2021) of $US 50 billion of CAPEX originally planned for deploying renewable energy assets.

Economy: the economic impact of COVID-19 can be seen through its impact on the overall economy, public finances, household poverty, unemployment and development financing. The full extent of the economic shock – which is affecting both the demand and supply of goods and services – remains unknown at present, but initial estimates are dire. The average global decline of GDP (5.2%) masks significant inequalities across countries, with some countries projecting small increases in GDP and others projecting declines as high as 12%.[13] Even countries with a limited number of cases are not 'immune' to the economic shock of this crisis because of global interconnectedness and 'pre-existing' conditions such as low tax revenues, high inflation, high deficits and high levels of debt.

The major drop in government revenues is without precedent in recent history, averaging -1.7% of GDP relative to 2009-2019, with further reductions in both tax and non-tax revenues expected. The average fiscal deficit is expected to soar to 14% of GDP in 2020, 10 percentage points higher than in 2019, and debt levels are projected to skyrocket globally resulting in fiscal tightening for years to come.[14] The IMF also estimates that global public debt is expected to reach an all-time high, exceeding 101% of GDP in 2020-21 – a surge of 19 percentage points from a year ago.[15]

For many Organisation for Economic Co-operation and Development (OECD) countries, upticks in unemployment have been limited by job retention schemes that support up to 50 million workers. Other HICs have seen larger increases in unemployment; LMICs are also expected to be hard hit. In countries with large informal employment sectors, lockdowns have led to joblessness and abrupt income losses for many workers. As many as 71 million people could be pushed into extreme poverty in 2020; 176 million people are predicted to fall below the poverty line due to COVID-19.[16] Progress in reducing the fraction of the world's population living in extreme poverty is at risk, with more than 90% of LMICs projected to register negative per capita income growth in 2020.

In addition to the consequences above, the global pandemic has exacerbated existing humanitarian crises with impacts on food insecurity, poverty, migration and inequality. According to the UN, 130 million people will be pushed back into poverty by 2030 as a result of COVID-19. The underlying humanitarian crises will threaten the social stability of affected regions in the coming months and has the potential to fuel migration and civil unrest.

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[13] OECD Interim economic assessment. Coronavirus: living with uncertainty. Paris: Organisation for Economic Co-operation and Development; 2020 (https://www.oecd-ilibrary.org/economics/oecd-economic-outlook/volume-2020/issue-1_34ffc900-en).
[14] World economic outlook update, April 2020: the great lockdown. Washington DC: International Monetary Fund; 2020 (https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020).
[15] World economic outlook update, June 2020. A crisis like no other, an uncertain recovery. Washington DC: International Monetary Fund; 2020 (https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020).
[16] Projected poverty impacts of COVID-19 (coronavirus). Brief, 08 June 2020. Washington: The World Bank; 2020 (https://www.worldbank.org/en/topic/poverty/brief/projected-poverty-impacts-of-COVID-19).

04

AN ECONOMIC RATIONALE FOR INVESTING IN ACT-ACCELERATOR

Sectors that depend heavily on international trade and mobility will not recover with existing government stimulus

The COVID-19 health crisis has deep implications for the global economy and is impacting sectors differently depending on their reliance on international trade

The World Bank anticipates that global GDP will contract by 5.2% in 2020, equivalent to $US 7 trillion. While some HICs and upper-middle income countries (UMICs) are seeing signs of a recovery, the sectors driving that recovery largely depend on domestic demand. Economic sectors that depend heavily on foreign markets or international mobility are still facing significant difficulties. International trade, for example, is expected to contract by up to 32%.[17] Revenue losses of $US 3.4 trillion are expected in the global Travel & Tourism sector for 2020.[18] For Transport & Logistics, revenue losses are expected to reach $US 300 billion by end 2020, and losses in the Aerospace sector are expected to reach $US 100 billion.[19]

[17] Trade set to plunge as COVID-19 pandemic upends global economy. Press release, 08 April 2020. Geneva: World Trade Organization; 2020 (https://www.wto.org/english/news_e/pres20_e/pr855_e.htm, accessed 24 September 2020).
[18] Travel & Tourism recovery scenarios 2020 & economic impact from COVID-19. London: World Travel and Tourism Council; 2020 (https://wttc.org/Research/Economic-Impact/Recovery-Scenarios-2020-Economic-Impact-from-COVID-19/moduleId/1450/itemId/92/controller/DownloadRequest/action/QuickDownload, accessed 24 September 2020).
[19] IATA, Oxford Economics, Transport Intelligence, ResearchAndMarket, BCG analysis.

Sectors that depend heavily on international trade and mobility will not recover with existing government stimulus

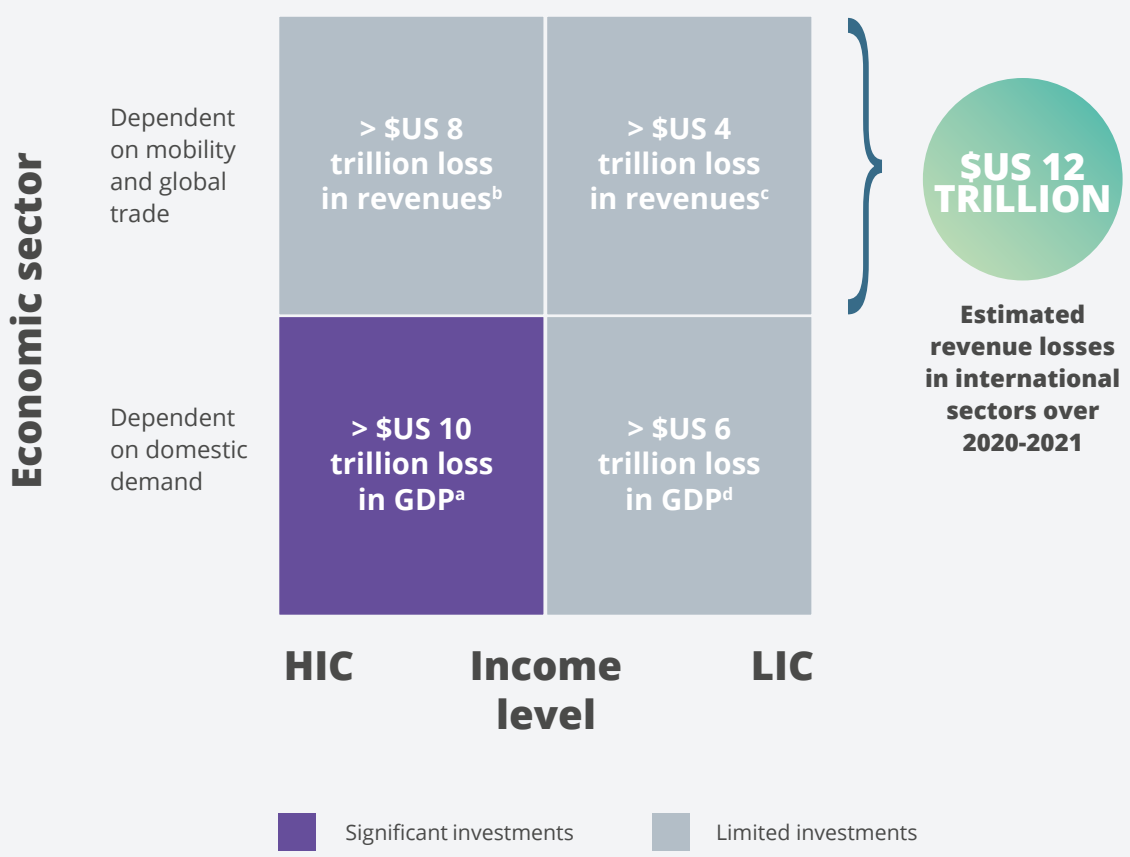

Figure 1

[a] pre-COVID GDP at end of 2021 expected to be $US 152 trillion worldwide. In April, forecasts post-COVID predicted $US 138 trillion. The loss for G20 economies would be ~$US 10 - 13 trillion. Source: IMF, World Bank.
[b] 2020 Travel & Tourism drop by $US 3.7 trillion. Source: WTTC.
[c] International trade is facing contraction that could reach -32%. Source: IMF, WTO, BCG analysis.
[d] $US 3 trillion excluding China. Source: World Bank, WTO, BCG analysis.

The $US 10 trillion G20 domestic stimulus invested to date will not mitigate substantial parts of the economic consequences of COVID-19

1. **Domestic markets in HICs have been sustained with bold economic stimulus packages. G20 countries have already invested $US 10 trillion in their own economies.**[20] These investments were intended either to stimulate domestic demand or protect businesses from immediate bankruptcy. As a result, some national economies have started to bounce back. But this stimulus comes with a future price tag[21] and should be optimized to also address the root cause of the crisis.

2. **Investments made in sectors that rely heavily on international mobility have not fully restarted and will not fully recover until LICs/LMICs restart as well.** Sectors such as Travel & Tourism, Aerospace and Transport & Logistics continue to face losses even in countries with otherwise positive trends. As of 31 August 2020, the activity level of these key sectors is on average two thirds of what it was a year ago.[22]

3. **Restoring international trade will protect the global supply chain.** According to the OECD, developing economies are as engaged in global value chains as developed economies. In 2015, both developed and developing economies had the same rate of global value chain participation - estimated to be 41.4% of their total exports.[23]

4. **Supporting LIC/LMICs and UMICs in shortening the crisis will also restart the engine of global growth.** Emerging Markets contribute to 74% of global growth[24] today and are expected to contribute to 84% by 2023.[25] Only a global approach that simultaneously addresses the pandemic in LIC/LMICs will enable the global economy to fully recover.

We have the moral argument to ensure equitable access to COVID-19 tools. These tools will also allow HICs, UMICs and LMICs to reach full recovery by supporting all economic sectors, protecting the global value chain, and securing long-term global growth

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[20] IMF, National Authorities, Oxford Economics, https://www.csis.org/analysis/breaking-down-g20-covid-19-fiscal-response-june-2020-update
[21] Fiscal monitor [online database]. Washington: International Monetary Fund; 2020 (https://www.imf.org/external/datamapper/datasets/FM, accessed 24 September 2020).
[22] https://wttc.org/Research/Economic-Impact/Recovery-Scenarios-2020-Economic-Impact-from-COVID-19, BCG analysis.
[23] World trade statistical review 2019. Geneva: World Trade Organization; 2019 (https://www.wto.org/english/res_e/statis_e/wts2019_e/wts19_toc_e.htm; accessed 24 September 2020).
[24] 35% excluding China; Source: Global economic prospects [online database]. Washington: The World Bank Group; 2020 (https://databank.worldbank.org/source/global-economic-prospects).
[25] Global economic prospects [online database]. Washington: The World Bank Group; 2020 (https://databank.worldbank.org/source/global-economic-prospects, accessed 24 September 2020).

05

ACT-ACCELERATOR'S VALUE PROPOSITION

ACT-Accelerator is the only 'end-to-end' global solution that aims for equitable access, building on its public health expertise and offering risk mitigation for the investment made

1. ACT-Accelerator mitigates research and development (R&D) risks: a portfolio of investment for each tool

With the largest portfolio of COVID-19 tools in the world,[26] investing in ACT-Accelerator increases the probability of being able to access the "winning candidate" and hedges the risk that countries that have already entered individual bilateral agreements end up with products that are not ultimately viable.

2. Led by public health expert organizations, ACT-Accelerator mitigates operational risks

Investing in ACT-Accelerator limits the operational risk of purchasing and delivering COVID-19 tools as ACT-Accelerator draws on expertise of multilateral and global health institutions, in a working relationship with industry. ACT-Accelerator global health organizations have demonstrated ability to deliver impact on many diseases – AIDS, TB, malaria, polio - working to improve market access, market preparedness and functional supply chains (See Appendix 1 for an overview of ACT-Accelerator Co-conveners and Lead agencies). All ACT-Accelerator conveners are leading players in their respective areas and are uniquely positioned to help new COVID-19 tools reach the people who need them most, in particular in LICs/LMICs. ACT-Accelerator Co-conveners and partners include CEPI, FIND, Gavi, the Global Fund, Wellcome Trust, Unitaid, the World Bank and WHO.

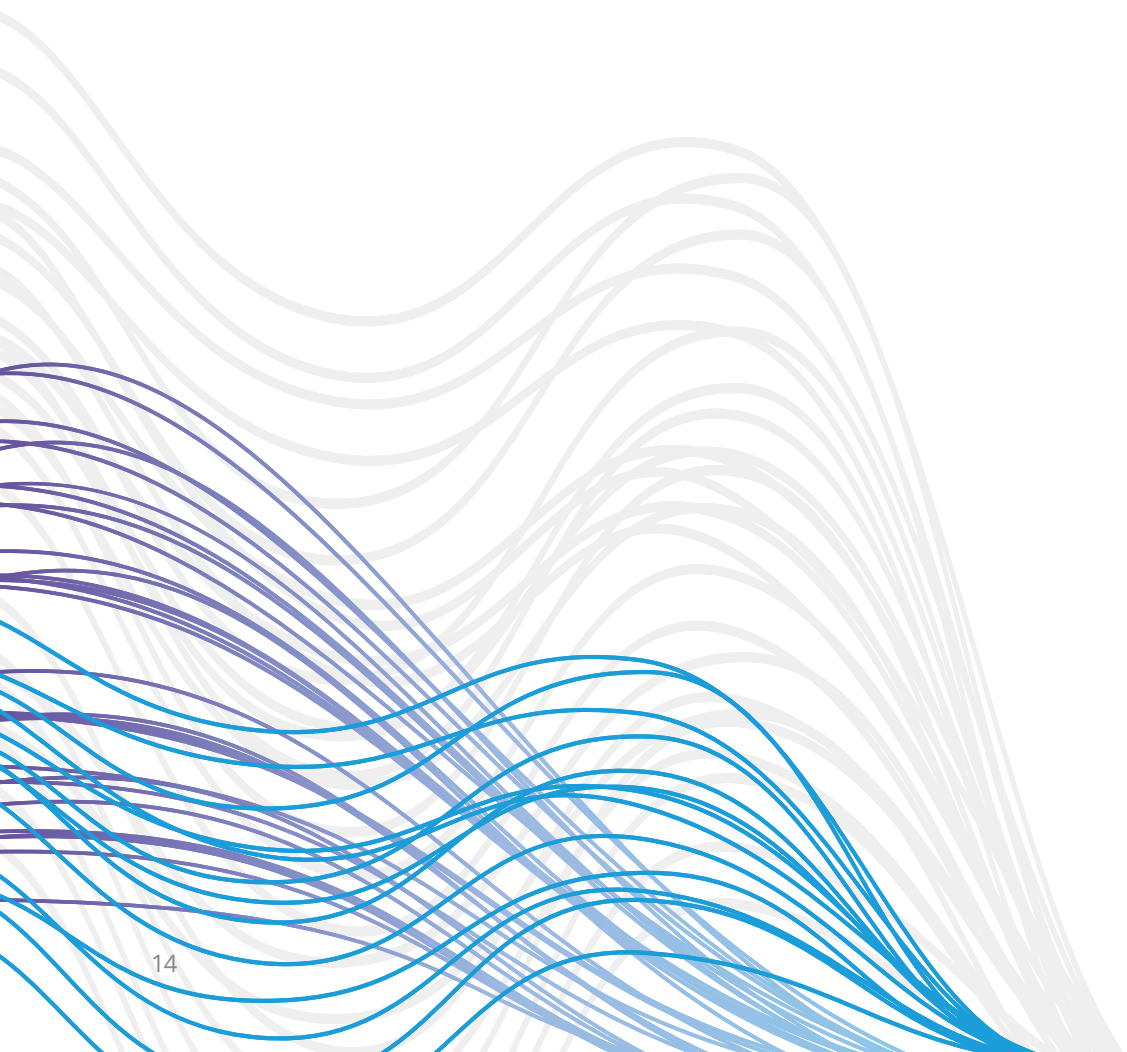
[26] 9 vaccines candidates in Phase 2/3, 200 therapeutic candidates (as of 23 September 2020).

3. ACT-Accelerator offers a comprehensive toolbox to fight COVID-19

ACT-Accelerator is an end-to-end global solution to expedite the end of the COVID-19 pandemic by developing, scaling and enabling equitable global access to tests, treatments and vaccines needed to reduce the incidence and severity of COVID-19 cases (see Figure 2), thereby easing pressure on hospitals and health systems. Reducing the severity of COVID-19 disease would also reduce the fear currently associated with the virus and help to restore overall consumer confidence and mobility. Extreme physical distancing measures and transport restrictions will no longer be necessary, and international mobility, trade and societal and economic activity will be able to fully resume.

4. By explicitly focusing on equitable access, ACT-Accelerator supports the restoration of international mobility & trade

ACT-Accelerator, founded on principles of equitable access, works to ensure that COVID-19 tools will be delivered in the most efficient way to those who need them the most, restarting all economies and protecting international mobility, trade, and economic activity.



Theory of change and public health strategy underpinning ACT-Accelerator's goal to reduce the severity of COVID-19 disease, rapidly ending the acute phase of the pandemic

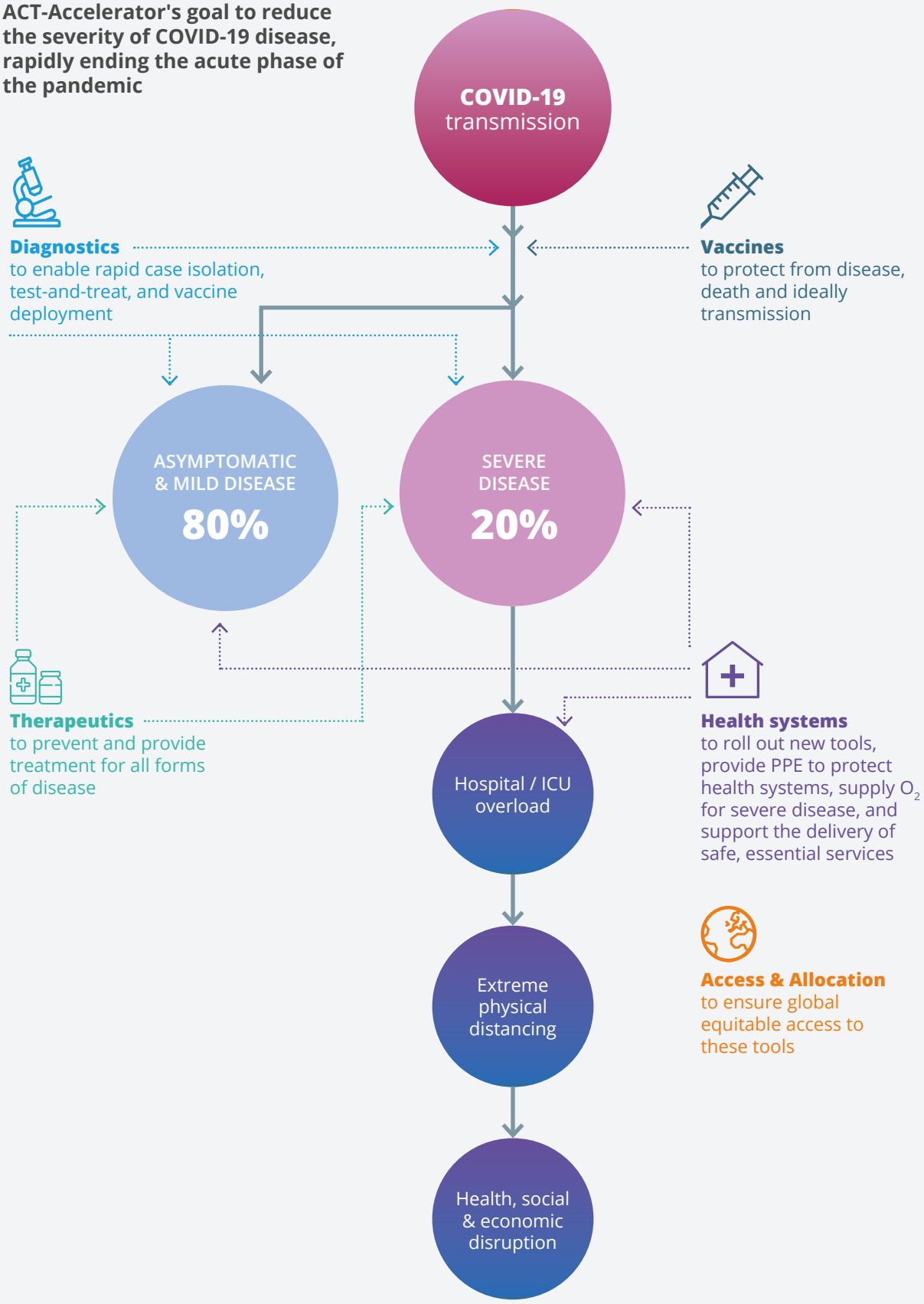


Figure 2

06

ACT-ACCELERATOR FINANCING REQUIREMENTS

ACT-Accelerator's $US 38 billion budget pales in comparison to the economic impact of COVID-19. The investment required to fully fund ACT-Accelerator would be paid back in 36 hours of economic recovery

- The total ask for ACT-Accelerator is 10% of what the global economy is losing every month in 2020[27]
- The total ask for ACT-Accelerator represents less than 1% of the total stimulus packages committed by G20 countries to date
- ACT-Accelerator's ask is equivalent to a one-week loss of Travel & Tourism alone for G20 countries[28]

ACT-Accelerator requires an additional $US 35 billion to deliver its full promise

This section provides a consolidated overview of the investment needs across the Diagnostics, Therapeutics and Vaccines Pillars and Health Systems Connector that comprise ACT-Accelerator. (See Appendix 2 for more detailed assumptions underpinning these funding requirements).

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[27] IMF evaluation: US$ 375 billion per month. Global economic prospects [online database]. Washington: The World Bank Group; 2020 (https://databank.worldbank.org/source/global-economic-prospects, accessed 24 September 2020).
[28] Recovery scenarios 2020 & economic impact from COVID-19 [website]. London: World Travel & Tourism Council; 2020 (https://wttc.org/Research/Economic-Impact/Recovery-Scenarios-2020-Economic-Impact-from-COVID-19, accessed 24 September 2020).

Table 1: ACT-Accelerator funding requirements by Pillar – as of 21 September 2020

In $US billion, rounded	Total ask[29]	Immediate ask not funded	Total pledged	Financing gap
Vaccines Pillar	16	7	2	14
Therapeutics Pillar	7	4	0.3	7
Diagnostics Pillar	6	2	0.3	6
Health Systems Connector[30]	9	2	0.1	9
TOTAL	**38**	**15**	**3**	**35**

The Pillar and Health Systems Connector budgets reflected above have been developed by the co-convening agencies and are detailed in their respective plans and investment cases.[31] The totals have been calculated over a 12-month period for the Therapeutics and Diagnostics Pillars and for the Health Systems Connector, and 18 months for the Vaccines Pillar.

The 'immediate asks' represent the critical investments required by end of 2020 to meet ACT-Accelerator targets.

Since the launch of ACT-Accelerator on 24 April 2020, many governments, philanthropic organizations, companies and individuals have signaled their commitment and made financial pledges to end COVID-19 through investments in ACT-Accelerator partnerships. To date, these pledges have translated into $US 2.6 billion in financing for the Vaccines, Therapeutics and Diagnostics Pillars and the Health Systems Connector. These contributions represent 7% of the $US 38 billion needed for ACT-Accelerator.

[29] Cost estimates for the Health Systems Connector were not included in the previous release of the investment case.
[30] The costs for the Health Systems Connector include costs for two critical tools not included in the other Pillars: PPE and oxygen. It does not cover all enabling Health Systems costs and is complementary to other funding needs such as SPRP and GHRP.
[31] See https://www.who.int/initiatives/act-accelerator for a link to the June 2020 ACT-Accelerator consolidated investment case as well as links to the Pillar-specific investment cases (updates in process).

07
APPENDICES

Appendix 1 – Pillar Co-Conveners & Leads

ACT-Accelerator draws on the expertise of multilateral and global health institutions, as well as close engagement with industry and innovators and manufacturers. Among these organizations, ACT-Accelerator conveners bring world-class knowledge and know-how in R&D, manufacturing, market shaping, procurement and delivery.

CEPI (Coalition for Epidemic Preparedness Innovations) and Gavi, the Vaccine Alliance, are co-conveners of the Vaccines Pillar. **CEPI** was launched after the Ebola crisis in West Africa, as the result of consensus that a coordinated, international, and intergovernmental plan was needed to develop and deploy new vaccines to prevent future epidemics. Its mission is to stimulate and accelerate the development of vaccines against emerging infectious diseases and enable equitable access to these vaccines for people during outbreaks. The unique innovation ecosystem (public, private, philanthropic, civil society organization partnerships) that CEPI can leverage makes it the right leader for vaccine development. CEPI was able to react very quickly to respond to the COVID-19 outbreak at the end of January 2020. Within two weeks of the publication of the SARS-CoV-2 sequence, CEPI was able to leverage and support several of its research partners to pivot and start developing vaccines against the virus. In the last 20 years, **GAVI, the Vaccine Alliance**, has helped vaccinate 820 million people through routine immunization and one billion through campaigns to deal with outbreaks and boost immunization rates, rolled out 496 new vaccines in the poorest 73 countries and established global vaccine stockpiles against major health threats, such as Ebola. On vaccine delivery, Gavi will use the strength of the full Alliance and their collective experience to help Gavi-supported countries (and others if so needed) prepare for vaccine introduction and provide support for the operational costs of vaccine introduction.

The Wellcome Trust and Unitaid are co-conveners for the Therapeutics Pillar. **Wellcome Trust** is an independent foundation that exists to improve health by helping great ideas to thrive. Wellcome supports researchers, takes on big health challenges, campaigns for better science, and helps everyone get involved with science and health research. In March 2020, Wellcome co-founded the COVID-19 Therapeutics Accelerator with the Bill & Melinda Gates Foundation and Mastercard. The Therapeutics Accelerator is an initiative to coordinate research, remove barriers to drug development and scale up treatments to address the pandemic. **Unitaid**, a partnership hosted by WHO, invests in innovations to prevent, diagnose and treat diseases including HIV and coinfections and comorbidities, tuberculosis, and malaria more quickly, affordably and effectively. Unitaid's work also ensures access to critical health products women and children, making it a world-class downstream convener for Therapeutics.

FIND and the Global Fund are co-conveners for the Diagnostics Pillar. **FIND**, a global diagnostics alliance, has over 17 years of deep technical and practical experience in the definition of needs, development of fit-for-purpose products, generation of evidence for regulators and policymakers, analysis of market dynamics, the introduction of new products, and strengthening of laboratory systems. FIND has been instrumental in the development of 24 new diagnostic tools. Over 50 million FIND-supported products have been provided to LMICs in the last 5 years. The Global Fund mobilizes and invests more than $US 4 billion a year to support programs to fight HIV/AIDS, tuberculosis and malaria, and to strengthen systems for health. The **Global Fund** partnership operates across more than 100 countries and has invested over $US 45 billion over the past 19 years, saving some 38 million lives. It has a proven record in strengthening procurement and delivery systems.

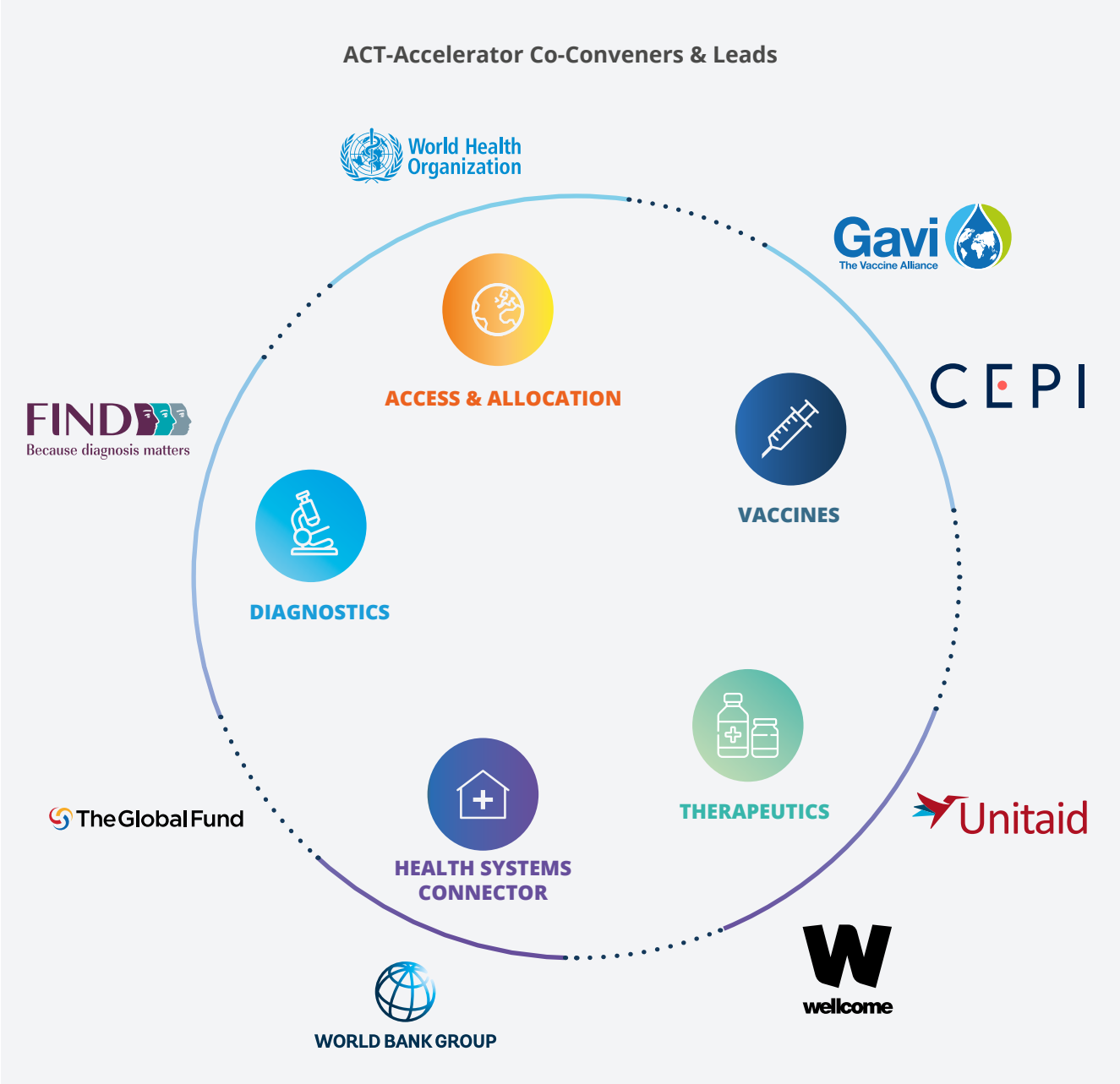

Figure 3

The World Bank, the Global Fund and WHO are co-conveners for the Health Systems Connector. **The World Bank** works to help nations build healthier, more equitable societies and to improve fiscal performance and country competitiveness. Over the last decade, the International Development Association (IDA) has provided $US 13.5 billion to fund essential health interventions for 770 million people, and immunizations for 330 million children. The World Bank closely works with donors, development partners, governments, and the private sector, and can provide unique expertise in health systems strengthening. The World Bank has mounted the largest, broadest and fasted financing platform for supporting countries in the emergency COVID-19 health response, including through its Global Health Multi-Phase Approach program, approving $7.6 billion for 111 countries within 3 months, as part of its $160 billion broad commitment to addressing the global pandemic over the next 15 months. WHO is the leading and directing authority for global health within the UN and international health and development system. **WHO** is leading ACT-Accelerator's work on global access and allocation and regulatory processes (including WHO prequalification). WHO also provides normative, policy and technical guidance for the development of Pillar-specific deliverables (e.g. clinical use guidelines for each of ACT-Accelerator products). WHO also hosts the ACT-Accelerator Hub which is facilitating and coordinating work across the Pillars and Health Systems Connector.

Appendix 2 – Key assumptions for Pillar's investment cases

As uncertainties in ACT-Accelerator product pipeline are addressed, and as more epidemiological data becomes available, the assumptions that underpin ACT-Accelerator investment needs will be refreshed and the requirements updated.

These needs have been developed through Pillar-specific scenarios and assumptions, using the structural hypotheses that are aligned across all Pillars, which include:

- Baseline populations and projections
- Geographic scope for procurement and for in-country delivery
- Epidemiology of the pandemic and across population groups
- Interdependent assumptions

Vaccines Pillar

A total of **$US 15.9 billion** is needed for the work of ACT-Accelerator's Vaccines Pillar. This need has been estimated based on a set of assumptions and covers an 18-month period.

ACT-Accelerator's Vaccines pillar (COVAX), co-convened by CEPI (Coalition for Epidemic Preparedness Innovations) and Gavi, the Vaccine Alliance, working with WHO, aims to end the acute phase of the COVID-19 pandemic and protect the world's population by accelerating global, fair and equitable access to COVID-19 vaccines. COVAX is the only truly global effort to ensure that people in all corners of the world will get access to COVID-19 vaccines once they are available – regardless of their wealth.

COVAX will achieve this by acting as a platform that supports and accelerates research, development and manufacturing of a wide range of COVID-19 vaccine candidates, and the rapid scale-up and deployment of safe and effective COVID-19 vaccine(s). All participating economies, regardless of income levels, will have equal access to these vaccines. The initial aim is to deliver at least 2 billion doses by the end of 2021 to end the acute phase of the pandemic by focusing on priority groups around the world.

COVAX aims to accelerate access to vaccines for self-financing economies and for funded participants, at the same time. The funded participants are 92 low income economies that would otherwise be unable to afford these vaccines and will be supported through an Advanced Market Commitment (AMC). Through purchasing together, self-financing and AMC-supported countries are both benefitting from the greater collective bargaining power. COVAX maximizes the chances of success through its broad, actively managed global portfolio of vaccines. CEPI is currently supporting 4 different vaccine technology platforms across 9 different candidates and is exploring adding more candidates. In addition, the COVAX Facility will be able to procure any appropriate vaccine candidates, including those outside of the CEPI portfolio. For economies that may already have their own deals with vaccine manufacturers, COVAX serves as an invaluable insurance policy to protect their citizens. Firstly, COVAX provides direct protection by increasing economies' chances of securing safe and efficacious vaccine doses, as not all candidates will ultimately be successful. Secondly, as self-financing economies procure vaccines through the COVAX Facility, these economies will also indirectly protect their citizens by reducing the chances of resurgence by ensuring a successful Facility which means that the rest of the world gets access to doses too.

A total of $US 15.9 billion is urgently needed for COVAX to achieve its objectives, alongside a commitment from fully self-financing economies to procure doses through the COVAX Facility. This need has been estimated based on a set of assumptions reflecting the latest developments in the vaccines landscape and therefore the potential supply of vaccines against the widespread demand and considers an 18-month time period (mid-2020 to end-2021) to end the acute phase of the pandemic.

A breakdown of the $US 15.9 billion total cost for COVAX is shown below with its main areas of application:

Research and development ($US 2.4 billion total, of which $US 1.5 billion is needed by the end of 2020):

Support and invest in a broad and balanced portfolio, including a range of vaccine technologies and geographical development locations to maximize the likelihood of rapid delivery of safe, effective and globally accessible vaccines against COVID-19. In order to rapidly get to 2 billion doses before the end of 2021, investment in 12-15 vaccine candidates will be needed to ensure there are 3-5 vaccines that can be scaled to this unprecedented level at speed.

- Ensure the most promising vaccine candidates get support and funding ($US 2.1 billion) for research and clinical trials to accelerate development of efficacious and safe vaccines to licensure

- Conduct a global vaccine solidarity trial ($US 300 million)

Manufacturing and upfront payments for Advance Purchase Agreements (APA) ($US 5.7 billion total, of which $US 5.4 billion is needed by the end of 2020):

- Invest in technology transfer, scale-up/out ($US 0.8 billion) and manufacturing reservation fees ($US 1.1 billion) to increase global manufacturing capacity and diversify geographic manufacturing locations

- Execute upfront payments on APAs with manufacturers ($US 3.8 billion) to purchase raw materials and build inventory at scale pre-approval, to secure the necessary and timely supply of vaccine doses for the COVAX Facility

Procurement ($US 6.3 billion total, of which $US 2.0 billion is needed by the end of 2020 + commitment from self-financing countries to procure doses through the COVAX Facility):

- Procure doses for low-income countries, with 100 million doses reserved for an emergency stockpile, including to support humanitarian needs

- Ensure global, fair and equitable allocation of the available doses to self-financing and funded participants at the same rate, proportional to their total population

Delivery at-scale for the COVAX 92 low income economies (initial estimate of $US 1.5 billion, contingent on timing and characteristics of vaccine and needs of countries, of which $US 500 million is needed by the end of 2020):

- Ensure country readiness and equitable delivery of vaccines for low-income countries[32]

- Provide global and regional technical support, oversight and coordination as well as mobilize expertise for planning, implementation and monitoring of COVAX and ensuring COVAX vaccine safety

- Support post-licensure or post-authorization safety studies

Therapeutics Pillar

A total of **$US 7.2 billion** is needed for the work of ACT-Accelerator's Therapeutics Pillar. This need has been estimated based on a set of assumptions reflecting the latest developments in the therapeutics landscape and considers a 12-month time period (mid-2020 to mid-2021).

The breakdown of the $US 7.2 billion ask is shown below with its main areas of application:

Research and development ($US 2 billion total ask, of which $US 1 billion is needed by the end of 2020):

Funding for R&D will be leveraged in order to support the rapid assessment of potential treatment candidates, coordination of clinical trials, and selection of promising treatments for development at scale.

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[32] As well as countries included in the COVAX Facility Advanced Market Commitment

Example areas for R&D funding in the case of the total ask ($US 2 billion) include:

- $US 500 million to fund Phase 3 and licensure for ~15 promising repurposed drugs; $US 1.5 billion to fund Phase 2, Phase 3, and licensure to produce 2 new antibody and 2 new antiviral treatments

Example areas for R&D funding in the case of the immediate ask ($US 1 billion) include:

- Flexibility to fund repurposed therapeutics as well as a portion of trials for new antibody or antiviral treatments (as possible within a 6-month timeframe)

Furthermore, funding will be used for potential additional clinical trials, e.g., to assess candidate efficacy across multiple use cases (and symptom severities) as well as to optimize dosing / formulations to maximize health impact and cost effectiveness.

Manufacturing scale-up ($US 0.6 billion total ask, of which $US 0.3 billion is needed by the end of 2020):

Funding for manufacturing scale-up will be used to finance the facilitation of market entry and supply at scale, including regulations, production capacity, pricing, and the development of tools and interventions adapted for promising treatment candidates (e.g. for monoclonal antibodies and novel antivirals).

As part of this, funds will support the preparation and initiation of supply capacity-related interventions such as advance purchases, capacity reservations, and volume guarantees in order to secure potentially scarce manufacturing capacity for LMICs.

Example areas for manufacturing scale-up funding in the case of the total ask ($US 0.6 billion) include:

- Capacity reservations and volume guarantees for two monoclonal antibodies and two novel antiviral candidates

Procurement & delivery ($US 4.6 billion total ask, of which $US 2.5 billion is needed by the end of 2020):

Funding for procurement & delivery will be used to ensure access to up to 245 million treatment courses for LMICs countries based on expected demand and policy guidance. Furthermore, funds will support preparing and ensuring equitable distribution of treatments while providing access to treatments for the most marginalized communities.

The number of treatment courses to be procured and delivered assume an LMIC population of 5 billion (excluding China) and assume that treatments will cover a wide range of use cases – pre-exposure prophylaxis (PrEP), post-exposure prophylaxis (PEP), mild, moderate, severe, and critical.

Additionally, overall need for treatments is assuming a scenario in which 20% of people are infected with COVID-19 in the next 12 months, with 40% of infected showing COVID-19 symptoms (leading to an infected symptomatic rate of 8%). Of the infected symptomatic cases:

- 40% are assumed to be mild
- 40% are assumed to be moderate
- 15% are assumed to be severe (e.g. requiring oxygen)
- 5% are assumed to be critical (e.g. requiring mechanical ventilation)

To reflect limited availability of manufacturing capacity and other constraints in the ability to receive treatments, funding requirements further assume that 40% of potential need can be met through supply across PrEP, mild, moderate, severe, and critical treatment candidates.

Diagnostics Pillar

A total of **$US 6 billion** is needed for the work of ACT-Accelerator's Diagnostics Pillar. This need has been estimated based on a set of assumptions and considers a 12-month period (mid-2020 to mid-2021). Of the $US 6 billion total, $US 5 billion will be dedicated to procurement, the remaining $US 1 billion being dedicated to research and development (R&D), market shaping interventions (Market Readiness) and country implementation (Country Preparedness) activities.

The immediate ask needed by the end of 2020 is $US 2 billion, $US 1.3 billion of which will be invested in the procurement of tests, the remaining $US 0.7 billion to be distributed among activities in R&D, Market Readiness and Country Preparedness.[33]

The breakdown of the $US 6 billion need is shown below with its main associated assumptions.

The immediate priority is to focus on developing, scaling up manufacturing capacity (including expanding local production), and securing volumes of 2 to 3 affordable, well-performing antigen RDTs for LMICs with companion digital apps.

R&D ($US 0.3 billion, immediate ask): accelerate the development of high performing, affordable antigen RDTs, and create robust digital, data, and analytics solutions.

Market Readiness ($US 0.1 billion, immediate ask): implement market shaping interventions to accelerate implementation including assessment of product performance, validation of use-cases, support for manufacturing and commercialization, price negotiation, and regulatory support.

[33] The total ask for R&D and Market Readiness should be jointly considered given the interdependencies among both sets of activities.

Further down the line, the development and manufacturing scale-up (including expanding local production) of one to two affordable, well-performing point-of-care molecular tests will also be key to bring diagnostics closer to communities, including decentralized settings ($US 0.1 billion).

Supply ($US 5 billion, $US 1.3 billion of which is needed by end of 2020): procure and deploy 500 million tests by mid-2021 to LMICs, 85 million of which will be deployed by end 2020 to cover immediate needs.

The 500 million tests target assumes an LMIC population of 5 billion (excluding China) and assumes that 75% of tests required will be RDTs (375 million) and 25% will be molecular tests (125 million). The testing use cases considered to reach that target volume of tests are the following, assuming a test mix of 85% RDT and 15% molecular tests for patient triage.

A. Symptomatic:

- Triage and confirmation of symptomatic severe cases
- Triage and confirmation of symptomatic mild cases

B. Asymptomatic:

- Triage of asymptomatic at-risk cases (including healthcare worker screening)
- Surveillance of asymptomatic cases (it is assumed that only antibody RDTs are used)

The $US 5 billion total need assumes all-inclusive test prices (covering test, delivery to central warehouse, customs etc.) for RDTs ranging $US 4 - 5 per test and for molecular tests ranging $US 25 - 30 per test.

The $US 1.3 billion immediate need would allow for procurement of up to 85 million tests by the end of 2020, based on an initial mix of 50% RDTs and 50% molecular tests.

Country Preparedness ($US 0.6 billion, $US 0.3 billion of which needed by end of 2020): strengthen health systems and build country capacity and preparedness for rapid and effective RDT implementation based on WHO guidance.
For the total need, it is assumed that to drive policies and uptake in integrated testing strategies in 50+ countries, two main activities will be needed:

- Strengthen laboratories in those countries: $US 0.4 billion
- Develop innovative and integrated delivery models to support country policies and uptake for effective test, trace, isolate strategies: $US 0.15 billion

It is also assumed that $US 0.05 billion will be required to effectively train 10,000 healthcare workers.

Health Systems Connector

A total of **$US 9 billion** is needed for the Health Systems Connector. This amount is to fund two critical tools in the COVID-19 response that are currently not covered by the investment cases of the other pillars: PPE and oxygen, and a set of enablers for essential services. Both PPE and oxygen are mandatory requirements for successfully protecting health workers. The estimated ask of $US 9 billion includes all LMICs countries, excluding China over a 12-month period and assumes a COVID-19 attack rate of 20%.[34]

Health Systems needs facing COVID-19 are much broader and include enablers such as health workforce; data systems; public financial management; community responses and engagement, among others. They are essential to the delivery of any effective COVID-19 response and an estimated $US 500 million and will be required for strengthening them. This is in the budgetary requirements for the investment case. Health system strengthening efforts are country specific, and the support that will be brought to bear through the Health Systems Connector will be implemented on a country-by-country basis. The adequate resourcing of those enablers is critical, through domestic, bilateral and multilateral financing.

Estimates of the amounts needed solely for PPE and oxygen are based on the WHO's costing model used to estimate a price tag for the response in LMICs.[35] For PPE, the assumptions are in line with latest WHO guidance, which recommends the full package of PPE per day for health workers projected to be in direct contact with persons with COVID-19. "Rational use" is not accounted for in the model, and we assume that all PPEs meet grading standards for quality. The model also does not currently account for healthcare workers who perform aerosol-generating procedures who will require additional PPE such as respirators (N95, FFP2 or FFP3 standard, or equivalent). Un-costed elements include point-of-use training and enforcement as well as the cost of waste and disposal of PPE. The estimate does not account for investments in electricity grids and pipes to make oxygen functional.

The number of health workers needed is estimated from WHO's Health Workforce Estimator tool, and the overall costing tool accounts for constraints on the health worker and hospital bed supply.[36] For oxygen, the resource needs estimate is calculated from the total need of severe and critical COVID-19 patients only, not taking into account the constraints of shortage of health workers and lack of hospital beds at country level which will require additional investments for the oxygen to be used. Included are the costs of procuring and delivering portable oxygen concentrators, cylinders and pressure swing adsorption (PSA) plants with some limited operating costs and considering system constraints including the number of hospital beds and the number of health workers.

The calculation of commodities leads to a $US 15.8 billion need (including $US 500 million for innovation, Training, Policy, Guidance and Management Systems). Our assumption is that $US 6.8 billion will be covered by domestic resources, using the same assumptions as the Therapeutics Pillar, namely that the share assumed to be covered by domestic financing would be 80% for UMICs, 40% for LMICs and 0% for LICs.

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[34] A high end assumption
[35] Edejer TT, Hanssen O, Mirelman A, Verboom P, Lolong G, Watson OJ, et al. Projected health-care resource needs for an effective response to COVID-19 in 73 low-income and middle-income countries: a modelling study. Lancet Glob Health. 2020;S2214-109X(20)30383-1. doi: 10.1016/S2214-109X(20)30383-1 (https://www.sciencedirect.com/science/article/pii/S2214109X20303831, accessed 24 September 2020).
[36] Coronvirus disease (COVID-19) technical guidance: Essential resource planning [website]. Geneva; World Health Organization; 2020 (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/covid-19-critical-items, accessed 24 September 2020).

Table 2: For further information on specific funding requirements by pillar, workstream and agency, please contact the relevant co-convener and/or lead agency as follows:

Pillar	Co-leads	Workstream	Workstream leads (facilitate multi-agency investments)
Vaccines	CEPI, Gavi, WHO	Development & manufacturing	CEPI, Gavi
		Policy & allocation	WHO
		Procurement & delivery at scale	Gavi
Therapeutics	Wellcome, Unitaid, WHO	Rapid evidence assessment	Wellcome
		Market preparedness	Unitaid
		Adequate deployment in all countries	Global Fund
Diagnostics	FIND, Global Fund, WHO	R&D of tests and tools	FIND
		Market Readiness	FIND
		Supply	Global Fund
		Country Preparedness	FIND
Health Systems Connector	Global Fund, World Bank, WHO	Protecting front line workers	Global Fund, UNICEF
		Clinical care	WHO
		Integrated data management	WHO, Government of France
		Financing	World Bank
		Community-led response	Global Fund, UNICEF
		Private sector	World Bank
		Key elements of supply chain	Gavi, Global Fund, UNICEF
Access & Allocation	WHO	Allocation framework & mechanism	WHO

The ask for the Health Systems Connector focuses on specific tools and only includes strengthening efforts for critical health systems enablers (policies, regulation, financing, human resources, infrastructure including cold chain, private sector, data and communities etc), which is estimated at $US 500 million as outlined in the joint HSS connector document "ACTA HSS connector vision: a roadmap". Considerable work has been done in the Health Systems Connector to develop these enablers which need a globally coordinated, bottom-up approach to support countries to access and deliver tools. Beyond these health systems enablers, other needs of the health systems at country level will also need to be addressed, particularly the shortage and incentivization of human resources. We must acknowledge that the delivery of the tools will depend on parallel national health systems (policies, regulation, financing, human resources, infrastructure including cold chain, private sector, data and communities etc).

Appendix 3 – ACT-Accelerator accountability

When ACT-Accelerator was launched, a number of donors came together to form a Facilitation Group. This arrangement is transitioning on 10 September to a Facilitation Council, composed of government members that represent regional and economic cooperation groups, founding donors of ACT-Accelerator, and market shapers, with non-government partners and civil society and industry representatives as invitees.

The Council will provide the Pillars with support and guidance on key strategic, policy, and financial issues to ensure delivery, financing, and equitable access. The Council will also communicate progress of ACT-Accelerator Pillars and the Health Systems Connector to a broad range of interested stakeholders.

An ACT-Accelerator Hub which is hosted by WHO, supports the Council and enables the work of the partners in each pillar, recognizing the interlinked nature of treatment, testing and vaccination, and the critical role of health systems. Formal governance of the work of the pillars is provided by the Boards and governing bodies of the partner organizations that lead the work of each Pillar.

Donors have full oversight on the allocation of their pledges. Co-conveners are accountable for the workplans and investment needs of each Pillar. Grant management and financial reporting to donors is managed by the receiving entity.

08

ACRONYMS USED IN THIS DOCUMENT

Ab	Antibody-detecting
Ag	Antigen-detecting
CEPI	Coalition for Epidemic Preparedness Innovations
FIND	The Foundation for Innovative New Diagnostics
GAVI	Global Alliance for Vaccines and Immunization
GHRP	Global Humanitarian Response Plan
HICs	High-Income Countries
IMF	International Monetary Fund
LICs	Low-Income Countries
LMICs	Low- and Middle-Income Countries
NPIs	Non-Pharmaceutical Interventions
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PPE	Personal protective equipment
PQ	Prequalification
RDT	Rapid Diagnostic Test
SPRP	COVID-19 Strategic Preparedness and Response Plan
WHO	World Health Organization

Gavi
The Vaccine Alliance

CEPI

World Health
Organization

wellcome

BILL & MELINDA
GATES foundation

FIND
Because diagnosis matters

The Global Fund

Unitaid