# Unraveling the immediate and long-term effects of the COVID-19 pandemic on socio economic development in sub-Saharan Africa

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# Contents

## List of Acronyms and terms used in the report

AfCFTA - African Continental Free Trade Area

Africa-10 – Angola, Cabo Verde, Chad, Democratic Republic of Congo, Ethiopia, Kenya, Mali, Mauritius, Nigeria, South Africa

COVID-19 – The severe acute respiratory syndrome coronavirus 2, or Sars-COV2

DRC – Democratic Republic of Congo

EU28 – European Union, composed of 28 countries

FDI – Foreign Direct Investment

GDP – Gross Domestic Product

HDI – Human Development Index

HIV/AIDS – Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome

ICT – Information Communication Technologies

CGE – Computable General Equilibrium

IFs – International Futures model

IHME – Institute for Health Metrics and Evaluation

IMF WEO – IMF World Economic Outlook report

IMF – International Monetary Fund

IOM – International Office for Migration

JHU – Johns Hopkins University

LDC – Least Developed Countries

MER – Market Exchange Rate

No-COVID – A scenario describing a world without COVID-19, following a development pathway prior to the COVID-19 pandemic

OECD – Organisation for Economic Co-operation and Development

PM – Prime Minister

PPP – Purchasing Power Parity

SDG – (United Nations) Sustainable Development Goals

SIR – Susceptible-Infectious Recovered models

UK – United Kingdom

UNCTAD – United Nations Conference on Trade and Development

UNICEF – United Nations Children's Fund

US or USA – United States of America

USD – United States Dollar

WTO – World Trade Organization

## Executive summary

The spread of COVID-19 has been devastating for the millions of people who have been infected by the disease and lost their lives, and the tens of millions of people who have lost their work and livelihoods. Governments and civil society have responded swiftly to the spread of the virus with policies that reduce human interaction and slow the spread of the virus. These policies have had the adverse effect of further reducing labor participation, productivity, and capital utilization, reducing household consumption and increasing poverty across various thresholds, both in absolute and relative terms (Dabalen and Paci 2020; IMF 2020b; OECD 2020a; Roberton et al. 2020; Verity et al. 2020; WTO 2020). Combined, the COVID-19 pandemic has significantly reduced economic growth and altered patterns of international economic interaction. While we are still in the midst of the crisis, there is real concern that the majority of macro-economic effects will not be temporary, and disproportionately shift long-term development pathways in low- and middle-income countries, offsetting some of the gains towards SDG achievement made in the last decades. However, so far little is known about the long-term implications of COVID-19 across individual countries over the next decades, their ability to recover from health and economic shocks, and the country characteristics that shape the post-COVID recovery patterns.

In this report we study the long-term dynamics of COVID-19 at the country-level in Africa through a macro-economic lens. Specifically, we analyze how today's effects on country-level mortality, GDP growth and international monetary flows of trade, aid, foreign direct investment (FDI) and remittances shape long-term patterns of mortality, economic growth and international trade by 2030 and 2050. In addition, we unravel how these macro-economic changes affect socio-economic indicators and human development by quantifying the outcomes for child mortality and poverty over the next decades.

In this report we present a conceptual framework (see Figure 1, below) that conceptualizes the effects of COVID-19 on human development as cascading across three systems. First, COVID-19 directly effects human health systems, changing patterns of mortality and morbidity with differential distribution across countries. Second, these direct health effects are mitigated through government policy and civil society action that reduces human interaction, slowing the spread of the virus and saving lives while also reducing economic activity and changing patterns of production and consumption. Finally, these changing economic effects ripple through the international economic system, changing patterns of trade, FDI, foreign aid and remittances. Some countries may have fewer direct health effects from COVID-19 —a finding particularly relevant for many countries in Africa— but may experience more direct effects from changing patterns of international economic interdependence.

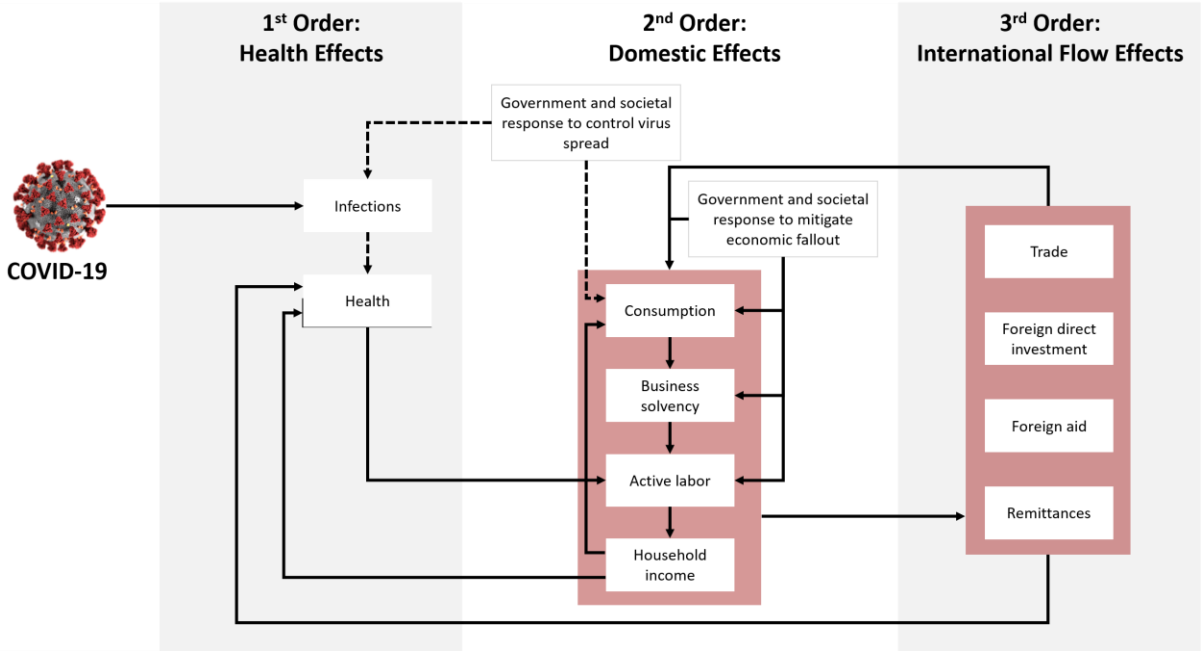


*Figure 1: Conceptual framework outlining the macro-economic effects of COVID-19, through health effects, domestic effects and international flow effects. While the framework outlines the effects as sequential, i.e. moving from left to right, many countries experienced disruption of the international flow effects prior to health and domestic effects. Solid lines depict pre-dominant positive feedback loops, whereas dotted lines depict negative feedback loops. As such increased infections (+) negatively affect health (-) which reduces active labor (-).*

We model these dynamics across 10 countries in sub-Saharan Africa: Angola, Cabo Verde, Chad, Democratic Republic of Congo, Ethiopia, Kenya, Mali, Mauritius, Nigeria and South Africa (referred to as *Africa-10)*. The countries are selected based on regional spread, differences in their domestic economic structure, and their dependency and interconnectedness with the global economic system. We use the International Futures (IFs) model to assess the immediate and long-term consequences of COVID-19 across these first, second and third order effects. We built scenarios with diverging assumptions around the COVID-19 effect on mortality in 2020, and GDP growth and international trade in 2020 and 2021. We compare these scenarios with a *No-COVID* scenario, representing a world in which COVID-19 did not occur.

*In the short-run, we find that:*

The first-order effects of COVID-19 on these countries have been relatively limited, with the exception of South Africa. The limited spread and mortality of COVID-19 could be driven by many factors, including poor levels of testing, policy-makers and citizens with high levels of experience with communicable disease, or particularly unique immunity. More importantly, we also find that the range of uncertainty associated with direct COVID-19 mortality is considerable, with some countries projected to see between 800 and 60,500 deaths based on different approaches to model mortality. While uncertainty around the direct mortality of COVID-19 is large, even the high-end projections have little-to-no effect on long-term country-level development outcomes over the next decades.

Second-order effects—those associated with government policies to both slow the spread of the virus and stimulate economic activity—are the most consequential driver of impaired human development. The reductions in GDP growth range from -2.6% to -10.6% across *Africa-10* countries and are coupled with reductions in household income, reduced government revenues and increases in extreme poverty. In 2020

we project a 4% increase in people in extreme poverty across the *Africa-10* countries, or around 10 million people. The majority of increases in extreme poverty occur in Nigeria, which accounts for about 7 out of 10 people moving into extreme poverty.

COVID-19 reduces international flows of trade, aid remittances and FDI in 2020. FDI inflows experience the strongest reduction in 2020, with reductions in FDI between countries ranging between -35.1% and -72.5%. Oil producers experience the largest drop in FDI (Nigeria, Angola, and to a lesser extent Chad). Reductions in exports range from -5.2% to -17.8% relative to a no-COVID scenario. The reduction in international trade is strongest for the island economies, of Cabo Verde and Mauritius, reducing their trade openness by respectively -7.4% and -8.4% compared to a *No-COVID* scenario.

While there are uniform negative effects of COVID-19 on mortality and GDP projections, the impact on international flows is non-uniform but depends on the country studied as well as the indicator used. International flows are a balance between incoming and outgoing flows. Whilst both incoming and outgoing flows are negatively affected by COVID-19, this does not result in net negative outcomes across countries and across all indicators. Prior to the pandemic, Mauritius had a positive trade balance and was a net sender of remittances. COVID-19 resulted in a reduction of the positive trade balance, but also reduced the negative balance for remittances. On the contrary, prior to the pandemic Nigeria had a negative trade balance and was a net receiver of remittances. COVID-19 resulted in a reduction of the negative trade balance, and a net negative effect on the flow of remittances.

*In the long-run, we find that:*

The economic down-turn identified above will drive an increase in "indirect mortality," or the measure of people who will die through 2030 that would not have had without the COVID-19 pandemic. These people will die mostly from preventable communicable diseases that stem from poor access to food, clean water, sanitation, and income.

Indirect mortality will be dominated by child mortality under five years. The COVID-19 pandemic primarily affects elderly people, with little consequences for direct child mortality in 2020. However, mortality of children under 5 years makes up 80% of the indirect mortality in 2025 and 2030 from COVID-19.

Countries with low levels of government capacity and low government investment in health system prior to COVID-19 will bear the largest burden of indirect mortality. Our analysis projects that for these countries, the indirect mortality burden will be much higher than the direct COVID-19 mortality burden. For many of these countries the increase in indirect mortality exceeds the direct mortality burden.

The economic downturn of the pandemic is relatively persistent across countries, with reductions in GDP relative to a no-COVID scenario still present in 2030 and 2050. However, some countries show recovery, measured as a smaller economic downturn in 2050 compared to the GDP shock in 2020, whereas other countries show increasing economic downturns. For example, GDP in Mauritius is projected to decline by -10.2% in 2020 and by -6.9% in 2050, whereas GDP in Mali is projected to decline by -3.3% in 2020 and by -9.2% in 2050.

Countries with higher levels of government capacity and a smaller reliance on agriculture are showing a stronger recovery, following the economic shock. On the contrary, countries with lower government capacity and higher labor shares in the agricultural sector show continuing worsening economic declines to 2040 and 2050.

The long-term effect of the economic downturn will lead to an erosion of the gains made to human development over the previous decades by increasing mortality, increasing child mortality, and pushing more people into poverty. While this will reduce the number of countries that achieve key Sustainable Development Goals, the trend in continued improvement in human development is expected to continue. The magnitude of the effect on reduced human well-being will be driven by the speed of economic recovery in a post-COVID world, with the most optimistic scenario showing convergence of poverty levels towards a no-COVID world.

Across the first and second order effects, we find that levels of government capacity and economic development are significant drivers of the long-term effect of this pandemic. Countries with fewer resources, poorer infrastructure, and less government capacity today are more vulnerable to prolonged economic downturns, higher levels of indirect mortality, and higher levels of child mortality. Importantly, these long-term effects do not correlate with the immediate economic shock of COVID-19. As such the countries most impacted today, might not be the countries baring the largest share of the long-term effects. For some countries, this result in projected limited loss of human lives and economic loss in 2020, but larger aggravating losses towards 2030 and 2050. The opposite is true for countries with higher levels of government capacity, showing stronger recovery following the economic shock with a stable economic impact over time and a smaller share of indirect mortality.

Patterns of international economic interdependence will experience a long-term shift, as the economic consequences of COVID-19 will negatively affect key trading partners for Africa (Europe, India, US), and have less effect on economic production in China. As a result, the *Africa-10* economies become more reliant on trade with China, at the expense of trade with EU and India. The shift in Intra-African trade is small.

Together the long-term effects of COVID-19 across countries and across indicators are a multiplier on the development challenges these countries face. For many of the countries studied the long-term effects of COVID-19 on increasing child mortality, increasing indirect mortality and economic downturns by 2030 and 2050 might well exceed the extent of the initial shock. Differences in the long-term effects of COVID-19 across countries are explained by levels of government capacity, high agricultural labor share and investments in the health sector prior to COVID-19. For international trade flows, COVID-19 results in a shift towards China, and away from EU and India. Together these findings point to general policy priorities to build towards recovery for economies and populations beyond the pandemic. Many of these policy priorities are not new, rather COVID-19 reinforces the need to focus on these policy priorities. The specific policy measures implemented to reach these policy priorities need to be tailored towards the individual countries. We recommend that policy makers:

- Analyze and understand the effect of COVID-19 to be system-wide and that the response must be multi-dimensional. This requires an analytical framework that does not focus on policies in isolation (health, economic, etc.) but as an integrated whole. Currently, many governments are organized across topical domains and ministries. Integral task forces have been enacted to combat COVID-19, acting across domains and ministries. We suggest that governments maintain a post-pandemic task force, working on economic recovery, sectoral diversification and a broad human development agenda in the immediate aftermath of the pandemic.
- Countries that lack resilience may see more negative long-term effects from COVID-19 than short-term effects. The least resilient countries are defined by indirect mortality exceeding direct mortality, and by economic downturns in 2030 and 2050 exceeding the initial economic shock. Building resilience should be a crucial focus of policy makers to guard against future shocks, be they health, climate, or conflict related. This economic resilience should focus on both short-term

resilience, or the ability to minimize the initial economic shocks, but more importantly should focus on building towards long-term resilience, the ability to recover following an economic shock.

- Invest in children and youth to minimize the indirect economic and health impacts on future generations. On the short term, this involves investing in health infrastructure and WASH infrastructure to minimize the high level of indirect mortality amongst children. In the immediate term, it requires investing in youth education, to minimize the effect of COVID-19 through school closures and education, and to invest in youth employment and jobs.
- Our analysis suggests a couple of key policy priorities for minimizing long-term effects on indirect mortality and economic growth, which include investing in government capacity. Studies on post-crisis recovery have previously highlighted the importance of improving governance and reducing corruption for benefiting direct resilience to and long-term recovery from economic shocks (Caldera-Sanchez et al. 2016). Improving government capacity is multi-dimensional and should be achieved through increasing government revenue through increased capacity of the taxation system, increasing accountability and transparency of governments and reducing corruption, improving the rule of law for individuals and businesses, and increasing regulatory quality regarding the domestic market, trade policies and other international flows.
- Enact policies that minimize the costs and barriers associated with sending and receiving remittances and FDI. Currently, COVID-19 threatens to result in a double-hit to households and business by reducing the domestic economy and by reducing flows of remittances and FDI. Currently, the costs for sending and receiving remittances in sub-Saharan Africa are amongst the highest globally. Government should aim to reduce the cost of sending and receiving remittances and by pushing towards a further digitization of banking and remittance flows.
- Plan for an accelerated shift in economic interdependence to China and away from Europe, India, and the US. African leadership should use this opportunity to increase internal continental trade by increasing export diversification, reducing non-tariff barriers to trade, and accelerating the adoption of the African Continental Free Trade Area. The African Continental Free Trade Area should not only result in a shift in trade between countries, but the opportunity should be leveraged to shift the export profile of countries in Africa towards export diversification and a shift to exporting higher value-add goods and services.

# Introduction

The spread of COVID-19 has affected millions of people who have been infected by the disease and lost their lives or loved ones, and the tens of millions of people who have lost their work and livelihoods. Governments have responded swiftly to the spread of the virus using a range of policies that reduce human interaction and slow the spread of the virus. These policies have been largely successful at flattening the curve, slowing the spread, and saving countless lives from the disease. But they also have the effect of further reducing labor participation, productivity, and capital utilization. Combined, the COVID-19 pandemic has significantly reduced economic growth and altered patterns of international economic interaction. While we are still in the midst of the crisis, there is real concern that this reduction in economic growth will negatively affect development pathways in low- and middle-income countries, partly offsetting gains towards SDG achievement made over the last decades.

Researchers have quantified the COVID-19 effect on country-level GDP growth, international exports, the tourism industry and patterns of global international investment (IMF 2020b; UNCTAD 2020d; WTO 2020). In addition, there is an emerging body of research regarding the consequences of COVID-19 on poverty, child mortality, malnutrition and food security (Akiwumi 2020; Kharas and Hamel 2020; Roberton et al. 2020). A smaller set of studies attempts to understand the potential medium- and long-term consequences on economic activity and indicators of human development beyond the pandemic (Cilliers et al. 2020). This latter body of research can help us understand systemic effects of the COVID-19 pandemic, including the pathways and mechanisms through which COVID-19 might affect country-level resilience in the face of this shock.

This report focuses on the macro-economic effects of COVID-19 for 10 countries in sub-Saharan Africa: Angola, Cabo Verde, Chad, Democratic Republic of Congo, Ethiopia, Kenya, Mali, Mauritius, Nigeria and South Africa (together referred to as *Africa-10)*. The countries were selected based on differences in their domestic economic structure, level of development, interconnectedness with the global economic system and regional distribution. Our analysis focuses on the outcomes of COVID-19 for mortality, domestic economic growth and international economic flows between countries in 2020,2030 and 2050. In addition, we quantify the effect of COVID-19 on poverty and child mortality.

A more complete understanding of both the immediate and longer-term outcomes of COVID-19 on macro-economic development in these countries will assist policy makers in making more informed decisions about the future of development and Sustainable Development Goal achievement within these countries and beyond.

## Structure of the report

This document includes six sections, outlined below.

The **conceptual framework and background literature** section presents a way of thinking about the consequences of the COVID-19 pandemic. We distinguish between three classes that are identified based on their proximity to the virus itself. These groups are:

1) **First Order Effects:** Health effects concerned primarily with direct and indirect mortality associated with the pandemic
2) **Second Order Effects:** Domestic economic effects focusing on key socio-economic indicators related to the wellbeing of a country's economy and its population

3) **Third Order Effects:** International economic effects which explore the positions of countries and patterns of financial exchange within the global economy(This section includes an extensive literature review to further contextualize this conceptual framework in a global development context.)

The **methodology** section introduces the modeling approach taken in this analysis. It specifically focuses on the use of the International Futures (IFs) modeling platform and the key concepts in that model related to this study. While the methodology introduces the general approach, the sections on near-term effects and The Futures introduce how we input COVID-19 effects into IFs and the scenarios used to explore the long-term effects.

The **Pre-COVID *Africa-10*** section analyzes the current level of socio-economic development across the 10 countries in this report. It lays a foundation for understanding the country-level COVID-19 effects by describing the 2019 pre-COVID level of development in these countries, as well as some of the main differences across the countries.

The **Near-term effects of COVID-19** quantifies the immediate effect of COVID-19 on *Africa-10* in 2020. It includes three subsections that draw upon the conceptual framework we outline. This section reviews the country-level characteristics prior to the COVID-19 pandemic both quantitatively and qualitatively.

In **The Future(s)**, we use a scenario approach to quantify the consequences of COVID-19 to 2030 and 2050 for mortality, economic activity and trade. This section starts by introducing sensitivity analysis aimed at framing some of the uncertainty around the most detrimental aspects of the pandemic along with recovery patterns of different countries. Here we focus on the direct and indirect health burdens, macroeconomic consequences and the pandemic's influence on global trade patterns.

The **Main takeaways & policy recommendations section** concludes the report by drawing together the analytical findings and making broad conclusions about their implications for decision-makers both in the *Africa-10* and beyond.

## Conceptual framework and background literature

The conceptual framework that we deploy for this report separates the long-term effect of COVID-19 on socio-economic development into three broad areas. First, we focus on the immediate effects of the pandemic on human health, or so-called "first order" effects. Next, we explore how the response of governments to the pandemic has been to both slow the spread of the virus and save lives, but also reduce human interaction and slow economic activity. We refer to this broad set of effects as "second order". Finally, we explore how patterns of international economic interaction are affected by the spread of COVID-19, and the consequences thereof on the *Africa-10*. This conceptual framework is summarized in Figure 2.

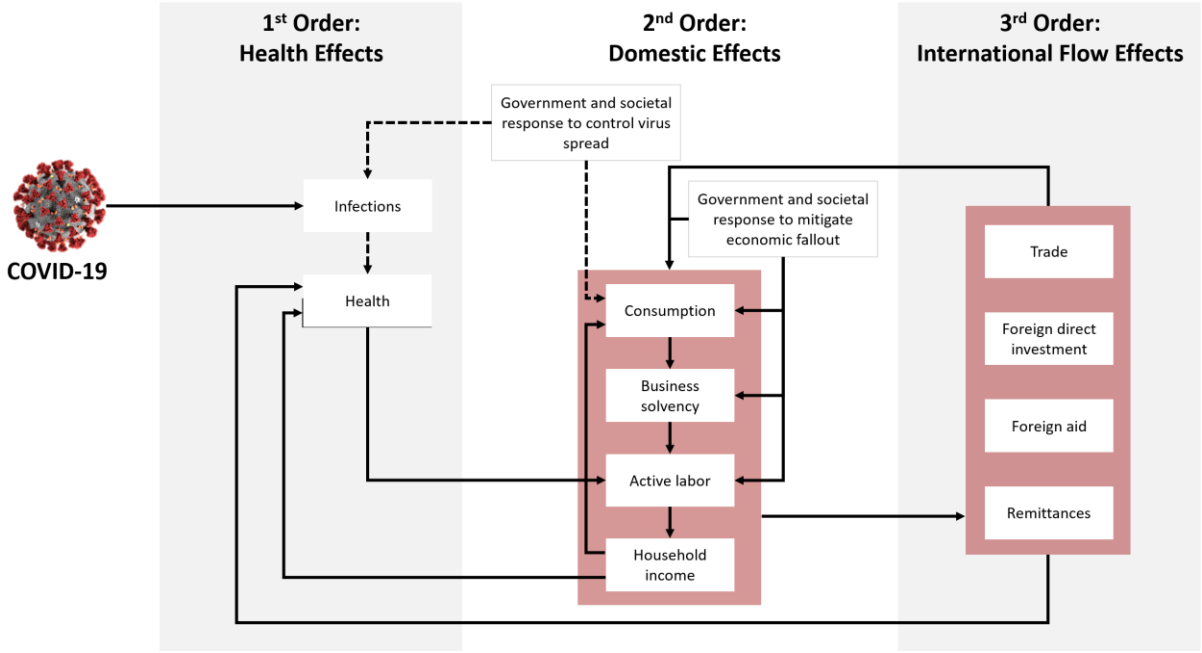


*Figure 2: Conceptual framework outlining the macro-economic pathways of COVID-19 and how it shapes long-term socio-economic development at the country level. The three main pathways are through health effects, domestic effects and international flow effects. While the framework outlines the effects as sequential, i.e. moving from left to right, many countries experienced disruption of the international flow effects prior to health and domestic effects. Solid lines depict predominant positive feedback loops, whereas dotted lines depict negative feedback loops. As such increased infections (+) negatively affect health (-) which reduces active labor (-).*

**First order – health effects**: COVID-19 is first a health crisis causing disease spread, mortality and morbidity. The immediate macro-economic consequence is reduced labor participation and labor productivity, both immediately and in the longer-term due to the effects of mortality on future labor supply. In many African countries, the health effects of COVID-19 have not been as severe as in other parts of the world. A notable exception is South Africa with the highest levels of COVID-19 spread and mortality in sub-Saharan Africa.

**Second order – domestic effects:** Governments and societies have responded swiftly to minimize the spread of the COVID-19 virus and limit first order effects. Efforts to "flatten the curve" have included lock-downs, travel restrictions, and other policies that, in combination with changes in household and firm behavior, led to a range of secondary effects on domestic economies. A second set of policies include those which aim to stimulate domestic economies and mitigate the negative effects of policies that have reduced human interaction. Combined, these set of policies are expected to result in an economic downturn, with both immediate and long-term consequences for socio-economic development.

**Third order – international flow effects:** First and second order effects drive changes at the global level, shifting the flows of trade, foreign aid, remittances and foreign direct investment. For countries highly dependent on the flow of goods and finance across borders, this could be disruptive. The magnitude of this effect will also be shaped by the COVID-19 effect on major trading partners, and the relative level of interdependencies between the *Africa-10* countries and the outside world.

The sequence, character and magnitude of impacts in each country will depend on the severity of the immediate effects as well as country-specific vulnerabilities. For example, countries with high co-morbidities and relatively old population structures might have more severe first order effects. When

considering second order effects, household income prior to COVID-19 will influence the magnitude of the COVID-19 pandemic on increasing poverty levels in a country. Finally, on an international scale, countries particularly dependent on trade flows, tourism or remittances will likely experience more acute effects. Overall, the severity of COVID-19 at the country level the impact on its major trading partners combined with the country-specific vulnerabilities, and economic recovery will shape the medium to long term macro-economic effects of COVID-19.

## Background overview

### First order – health effects

The first-order effects of COVID-19 include disease spread, increased mortality, increased morbidity, reduced labor participation and reduced productivity. Several research groups are quantifying the spread, case count, the mortality and the underlying causes driving mortality related to COVID-19 (Friedman et al. 2020; Johns Hopkins University 2020; Walker et al. 2020). The mortality rate for the overall population based on initial data appears to be between 1.2% and 1.5% (Verity et al. 2020) but the mortality for those over 80 is around 13% (with mortality estimates ranging from 8% to over 30% of measured cases) (Livingston and Bucher 2020; Onder, Rezza, and Brusaferro 2020; Verity et al. 2020). Co-morbidity has played a significant role in the overall mortality of COVID-19, with the presence of certain diseases including heart disease, diabetes, and chronic respiratory disease increasing the likelihood of adverse impacts. There is limited research, however, on the correlation between co-morbidities that are common within parts of Africa such as malaria and HIV/AIDS and COVID-19 severity.

To date, COVID-19 mortality in Africa has been relatively low. The availability of testing and quality of reporting call into question the reliability of current mortality numbers (Katz, Lu, and Sanger-Katz 2020). Lower spread and mortality in Africa may also be due to the fact that the virus appeared in Africa later than in other parts of the world, that government response was relatively strong, that populations were compliant with requirements to wear masks and socially distance, and that immune responses may differ from other continents.

### Second order – domestic economic effects

Governments have responded swiftly and strongly to minimize the spread of the COVID-19 virus and limit the first order health effect and the knock-on effect of the associated economic contractions. We conceptualize second-order effects of the virus to be primarily driven by domestic government policy to (1) slow the spread of the virus as well as (2) mitigate the consequences of reduced economic activity globally. Differential development outcomes should be expected from these policy choices depending on the macro-economic context in which they occur, the degree to which COVID-19 is spreading, the nature of the associated policies and the effectiveness of government action. The first set of policy choices—reducing human interactions to slow the spread of the virus—has notable effects on economic activity, labor participation, and ultimately incomes and household consumption. Together, the economic consequences of COVID-19 and the effects of government-imposed lockdowns are projected to lead to a global recession in 2020 (IMF 2020a; OECD 2020b), with immediate consequences for human development and poverty levels.

Changes in poverty levels will be driven by reductions in economic growth, as well as by the changes in the distribution of household income across income levels. At the global level, for the first time in this century, extreme poverty (the number of individuals below <1.90 USD per day), is projected to rise resulting in over 700 million people in extreme poverty by 2020, or a setback of five years in the global effort to reduce poverty and achieve SDG 1 (World Data Lab 2020). Much less work has been done on the

distributional economic impact of this increase in poverty. Large-scale economic disruptions tend to disproportionately affect those most vulnerable. Those in the informal sector often have no reserves or cushion and survive from hand to mouth. Persons active in the informal sector are also unable to work from home and do not qualify for unemployment benefits, should these be available. In an African context, the high level of informal employment combined with existing poverty levels may magnify the already disproportionate effects of COVID-19 on vulnerable groups.

The second set of policies enacted by governments are those that aim to stimulate domestic economies and mitigate the negative effects of policies that have reduced human interaction. Governments have done this in a variety of ways, but most often these interventions have come in the form of policies that either give cash directly to households and businesses to off-set losses and mitigate social instability or that postpone loan and tax payments. These policies play a key role in countering economic disruption and fostering recovery. However, in the current context of high debt levels amongst a number of African countries, government spending programs contribute to the growth of sovereign debt. This is particularly worrying during the COVID-19 crisis as government revenues will concurrently decline, underlining the importance of measures to stimulate economic growth as soon as practically feasible. For countries with already constrained fiscal and monetary space, inefficient tax systems, and high levels of debt, the growth in sovereign debt will be especially concerning. In emerging economies, government debt is anticipated to rise to around 63% of GDP by 2020, a 10% increase from 2019 levels (IMF 2020b).

### Third order – international flow effects

COVID-19 affects the domestic economy of countries as well as the international system of economic interdependence. The immediate COVID-19 effects are those which directly alter the international flow of people, goods, and money. These manifest through changes in trade, aid, FDI and remittances. The longer-term implications of COVID-19 will manifest both as changes to domestic development along with changing patterns of international relations.

#### *Trade*

Compared to most economic disturbances the global economy has weathered in the past, COVID-19 is unique in that it results in both a supply and demand shock (Novy 2020). Compared to the 2008/2009 financial crisis, trade is expected to take an even harder hit during the unfolding crises as trade shocks will be exacerbated by government restrictions on the movement of people, money and goods across borders. For example, around 80 countries have introduced temporary export restrictions. These restrictions have the potential to seriously disrupt global supply chains and significantly affect import dependent countries that lack the capacity to meet domestic demand (WTO 2020). Certain African countries, for example, have already seen a COVID-19-related shortages in seed supply for important crops like cowpea, groundnut, sorghum, millet and maize (Gakpo 2020).

The effect of COVID-19 on trade is expected to vary across countries and sectors, with the difference driven by import dependencies prior to COVID-19. The anticipated downturn in trade in 2020 is expected to disproportionally affect Least Developed Countries (LDCs) (WTO 2020). This is due to lack of resources within LDCs to support an economic rebound as well as their dependence on revenues from a limited number of exports to a small number of markets. For example, Angola, which was due to graduate from LDC to developing country status in 2021 (UN DESA 2015), has been hit hard by the fall in oil prices to an 18-year low in March 2020. This shock will deepen the recession the country has been in since the 2014-2016 oil crash which halted more than a decade of economic growth (CNBC Africa 2020). Of immediate concern for many African countries, is the trade in medical supplies. Germany, the US, and Switzerland supply 35% of medical products, and China, Germany and the US export 40% of personal protective products. Therefore, disruptions in trade with these countries could influence countries' ability to

effectively combat COVID-19 as well as other diseases. For example, the COVID-19 pandemic threatens to severely threaten the fight against HIV/AIDs in many African countries due to issues with the global supply chains for medicine, as well as domestic distribution due to lockdowns. Both immediate and longer-term AIDS-related deaths are expected to increase as a result (WHO 2020).

The services industry has also been severely affected by the pandemic. For example, tourism, transport, entertainment, hospitality and distribution services have all experienced significant disruptions due to COVID-19. While this is the case across countries, it is acutely felt in a country like Mauritius which is highly dependent on tourism, financial services, manufacturing and food imports. The tourism sector currently accounts for 23-34% of Mauritius' GDP and employs 15% of the population. International travel restrictions, limited air travel and the lockdown of airports has decimated the revenues from tourism, making Mauritius tourism industry one of the hardest hit by COVID-19 (Smit 2020; UNCTAD 2020a).

On a positive note, COVID-19 and efforts to contain it have also fast-tracked digital transformation. Industries in the knowledge economy and ICT sectors have been less affected, and in some cases have even grown during this time. This includes e-commerce and digital logistics solutions. This should result in an increased focus on rolling out ICT infrastructure and skills across Africa. Countries like Kenya, Ethiopia and Nigeria already prioritize the digital economy to diversify from a reliance on agriculture (in Kenya and Ethiopia) and oil (in the case of Nigeria).

COVID-19 has also expanded efforts to improve food self-sufficiency in Africa and elsewhere. However, the reasoning behind these shifts varies from country-to-country. Some countries want to boost their agricultural sector and exports, such as Angola, Ethiopia and Chad (BBC 2020; Maylie 2020; Ravesteyn 2020), partly as a means to diversify away from their dependence on oil exports. Other countries, such as Mauritius, have high agricultural exports, but want to diversify their domestic agricultural production. Currently, Mauritius is a large producer and net exporter of sugar cane, but has high food import dependence on other agricultural products. The COVID-19 pandemic is laying bare some of the vulnerabilities around the global food system and high levels of import dependence, urging Mauritius to diversify domestic production.

### Remittances

Remittances are a significant international financial flow into sub-Saharan Africa. COVID-19 is projected to result in a sharp drop in global remittance flows, with sub-Saharan Africa showing a larger decline compared to the global average (World Bank 2020b). Remittance flows are affected by two simultaneous processes driven by COVID-19: 1) falling demand for migrant labor and lower wages due to domestic lockdowns and economic declines, and 2) reduced ability to send and collect remittance flows through formal channels following economic lockdowns (Asare et al. 2020; IAMTN 2020). The loss of remittances will further exacerbate the domestic economic shock felt by developing countries and is likely to affect progress towards SDG achievement as reduced international remittances may significantly reduce household consumption and increase poverty levels in countries that are particularly dependent (Hong and Knoll 2016).

### Foreign Direct Investment

As a result of the COVID-19 pandemic FDI inflows are expected to decline, with global projections ranging from 30 to 40 percent (OECD 2020c; UNCTAD 2020b), but with sharper drops in African countries (UNCTAD 2020d). Due to the harsh effects of the COVID-19 pandemic on export and commodity-oriented investments, developing economies will be disproportionally affected. Particularly, emerging markets and less developed countries that depend on FDI may experience lasting consequences. Historically, foreign investment has played a crucial role in the construction of infrastructure and promotion of economic

activity, driving long-term structural change. Africa is expected to suffer severe negative consequences as FDI drops, especially in relation to its attempts to diversify and industrialize the overall economy (UNCTAD 2020d). As such, the intended push for economic diversification following trade declines might be hampered by reductions in FDI.

### Foreign Aid

The COVID-19 pandemic has increased the need for foreign aid globally, both to support the direct health response and to minimize the domestic economic impact on vulnerable populations. However, the COVID-19 effect on foreign aid flows is complicated and diverse. At the one hand, humanitarian aid is threatened by reduced financial flows combined with restrictions on providing humanitarian aid. COVID-19 is affecting vulnerable communities throughout the world including those in refugee camps, disaster displacement sites, border crossings and conflict zones (The New Humanitarian 2020). The crisis has stretched aid resources with many humanitarian aid programs halting operations to shift support to COVID-19-specific needs. Health and aid workers have also faced movement restrictions due to lockdowns with many returning to home nations without replacement (The New Humanitarian 2020). In addition, the pandemic may force donor countries to choose between domestic spending needs and aid, increasing demand for aid in recipient countries which have less capacity to combat the spread of infections and mitigate other social and economic damages.

On the other hand, COVID-19 has resulted in additional pledges for foreign aid from some donor countries. Many international organizations have increased their support to countries. For example, the Kenyan government received 60 million USD from the World Bank. The World Bank also provided 47 million USD to support the Democratic Republic of Congo and the U.S. government provided an additional 6 million USD in humanitarian funding to the Democratic Republic of Congo (Ozili 2020). The pandemic may highlight increased demand for different aid packages, particularly in recipient countries struggling with both high spending needs and large deficits.

Combined, the net effect on foreign aid is difficult to decipher. Importantly, aggregate money flows might mask that changes in foreign aid might shift between countries, across populations in countries and operate across different time scales. How foreign aid will be affected by the pandemic will have implications for human development in countries that are currently strongly dependent on foreign aid.

# Methodology

We apply the conceptual framework to assess immediate and long-term COVID-19 effects on macroeconomic development in 10 African countries. This section provides an overview of the general methodological approach. However, particular methodological assumptions, such as the scenarios framework, may be found in other sections of the report.

## Country selection

This report will focus on the macro-economic impact of COVID-19 in sub-Saharan Africa based on a sample of 10 African countries (Table 1). The selected countries aim to capture some level of heterogeneity across African countries in terms of their domestic economy, international relations and the impact of COVID-19 thereon, and represent a significant share of the economic activity in sub-Saharan Africa (67.2% in 2019). Specifically, countries were selected based on the following indicators: regional spread, main economic sectors, and their COVID-19 induced GDP growth.

*Table 1: Overview of the 10 case-study country selection for the assessment of COVID-19 across sub-Saharan Africa. Country selection aims to capture the heterogeneity of sub-Saharan countries on domestic economy, international flows and the impact of COVID-19 thereon using criteria on regional spread, main economic sectors and COVID-impact on GDP growth based on IMF projections. The depicted GDP growth is based on the WEO release of June 2020 (IMF 2020b).*

| | Country | Main economic sectors | GDP Growth | |
|---|---|---|---|---|
| | | | 2020 | 2021 |
| West Africa | Mali | Mining, Agriculture | 1.50% | 4.10% |
| | Nigeria | Hydrocarbons | -5.40% | 2.60% |
| Central Africa | Chad | Hydrocarbons | -0.20% | 6.10% |
| | Democratic Republic of Congo | Mining | -2.20% | 3.50% |
| East Africa | Ethiopia | Agriculture, Tourism | 3.20% | 4.30% |
| | Kenya | Agriculture. Services | 1.00% | 6.10% |
| Southern Africa | Angola | Hydrocarbons | -1.40% | 2.60% |
| | South Africa | Mining, Services | -8.00% | 3.50% |
| Islands | Cabo Verde | Tourism | -4.00% | 5.50% |
| | Mauritius | Tourism, Agriculture | -6.80% | 5.90% |

## Modelling the macro-economic effect of COVID-19 with International Futures

We use the International Futures (IFs) integrated assessment modelling platform to simulate the effect of COVID-19 across domestic systems related to economic production, finance, and human wellbeing, as well as the pandemic's impact on patterns of economic interdependence between countries. IFs models and projects more than 700 variables across human, social and biophysical systems for 186 countries to the year 2050 and beyond. It draws on multiple modelling techniques, expressing relationships within and across key systems related to demographics, health, agriculture, education, economics, infrastructure, energy and governance, with countries interacting through trade, aid, FDI, remittances and migration (Hughes 2019). IFs is a dynamic, recursive model system with single-year time steps, drawing on a vast historical database to identify trends and initialize forecast variables. The IFs model has been used in the academic literature and policy-science interface to explore alternative futures of economic and human development across countries (Cilliers et al. 2020; Hedden et al. 2016; Moyer et al. 2020; Moyer and Bohl 2019; Moyer and Hedden 2020). Scenarios are used to explore a set of alternative futures, based on differentiating assumptions around the consequences of today's events and policy decisions (such as COVID-19) on medium to long-term development across a wide set of indicators and topical domains.

As a near-term shock, COVID-19 presents some unique challenges to long-term forecasting using the IFs model. Recently the model has been adjusted to better represent the health and economic outcomes related to COVID-19, and has been applied to assess the pandemic's long-term effects on key developmental outcomes across multiple scales and issues, including impact assessments at the country and regional levels in Africa (Cilliers et al. 2020). Across all projects, we compare various COVID-19 scenarios with a *No-COVID* counterfactual scenario, which simulates how the world may have progressed in absence of the COVID-19 pandemic. The comparison of these scenarios can help us to explore the ways in which COVID-19 moves countries away from their prior developmental trajectory, both in 2020 through direct representation of shocks as well towards the long-term by leveraging the built-in understanding of longer-term dynamical systems in IFs.

Much of the modeling work exploring the effect of COVID-19 has focused on accurately assessing a sub-domain around mortality, economic growth, poverty, child malnutrition or trade (IHME 2020; Roberton et al. 2020; World Data Lab 2020; WTO 2020). In this report we partly draw on those insights. A systems approach, similar to that adopted by integrated assessment models like IFs, can represent some of these direct effects, and can trace these through indirect linkages between these systems that together drive longer-term indicators of economic and human development. For example, changes in present-day economic growth have consequences for government revenues which partly drive investment in education and health which in turn have consequences for long-term economic growth.

The fact that there remains significant uncertainty regarding the full effects of COVID-19 makes representing the full extent of COVID-19 impacts difficult. For example, there is much uncertainty surrounding COVID-19 direct effects on education and school closures, which may either represent a temporary disruption after which education is resumed or might result in significant school drop-outs with longer-term implications for education levels and economic productivity. In this study we focus on some of the key dynamics and interactions around macro-economic effects but are wary that there is still much to understand about COVID-19, its direct effects and its forward linkages to economic and human development over the next decades.[1]

We specifically focus on representing COVID-19 through first order health effects and through second and third order domestic and international economic effects. Two sub-systems of particular interest in IFs are the health module (Hughes et al. 2011) and the economics module (Hughes 2015). The health module builds on the global burden of disease project (Mathers and Loncar 2006), with projections of 15 disease categories distributed over communicable disease, non-communicable disease and injuries. Projections of morbidity and mortality across 22 age/sex groupings are primarily driven by income, education and technology, and are supplemented by a wide variety of additional variables around topics such as undernutrition, access to safe water and sanitation or indoor air pollution. COVID-19 mortality is represented directly through an increase in a residual category of communicable disease. An important forward linkage of COVID-19 mortality is reduced labor participation and a reduced labor force over the next years.

The economic sub-system represents production, consumption, and trade across agriculture, energy, materials, manufactures, services and information communication technologies (ICT) sectors. Supply and demand are governed by a computable general equilibrium (CGE) -like model, with physical and financial flows between households, firms and governments managed through a social accounting matrix (Hughes and Hossain 2004). COVID-19 is mostly represented as a direct shock to GDP with ramifications for labor, capital stock, capital utilization and productivity in 2020 and beyond. Changes in total economic production are important drivers of many outcomes throughout the system, with direct implications for indicators such as household income and government revenues, and indirect effects on poverty, investments in health and education, and other variables which drive important changes in socio-economic development outcomes.

An additional element of the economic model represents international flows such as trade, foreign aid, remittances and foreign direct investment (FDI). The IFs trade model represents the import demand and export capacity of a country for six capital sectors. These are then reconciled with a pooled estimate of global supply and demand through price equilibration in order to estimate country-level flows of goods and services. IFs then distributes these flows dyadically, using historical patterns and a gravity-based approach,

[1] The IFs tools, and its underlying documentation, is fully open-source and can be implemented by anyone interested in strategically exploring questions around alternative future pathways of economic and human development (https://pardee.du.edu/access-ifs).

resulting in bilateral flows of exports and imports by sector between all 186 countries. This allows our analysis to look at not only COVID-19's country-level trade impact from depressed production and consumption, but also the ways in which it might redirect trade between countries.

Foreign aid donations as a percent of GDP are anchored in historical levels and distributed across recipient countries according to historical patterns and demand. Foreign aid receipt allocations are also initialized by historical data but are driven in part by changes in GDP per capita, with demand diminishing as a percent of GDP with higher levels of per capita income. Recipient countries may eventually graduate to net donors once they reach a given level of per capita GDP. Comprised of both loans and donations, aid represents an important source of revenue for many lesser developed countries but can also contribute to debt. As such, disruptions to aid inflows because of COVID-related shocks may undermine the ability for governments to maintain delivery of public goods and services. Remittances are international flows sent from migrant workers to friends and family living in their home country. In many cases, remittances represent a very important source of income for poor and vulnerable households. In IFs, remittance flows are initialized from data and driven as a function of net migrant stocks (the population of a country that is living abroad minus the foreign born population living within the country) and changes in GDP per capita. FDI also draws on a country level pooled approach, which is based on historical patterns of inflows and driven towards a net-inflow target (as a percent of GDP), resulting in a tendency towards net provider of investment. These flows represent an important source of capital for firms, and directly impact growth prospects of a country.

We update and adjust the IFs model by incorporating COVID-19 effects on mortality, GDP growth and international flows. We describe how we updated the IFs model specifically for each of these components in the section on near-term effects. This results in a single COVID-19 scenario, which we compare to the *No-COVID* world. All COVID-19 effects are implemented for 2020 and 2021, and all results in the near-term effects are only depicted for 2020. We are also interested in the long-term implications of COVID-19 towards 2030. In the section "The Future(s)" we describe 3 scenarios with varying assumptions around COVID-19 effects in 2020, and the recovery in 2021. We compare those scenarios to a *No-COVID* world and quantify the COVID-19 effect in 2030 and 2050. The specific description of the scenario is given in the section "The Future(s)".

## Outcome indicators

We assessed both immediate and long-term effects of COVID-19 on mortality, the overall economy, poverty, international flows and interdependencies. With immediate effects we refer to changes in outcome indicators in 2020 and 2021, i.e. during the pandemic. With long-term outcomes we refer to changes in outcome indicators beyond the pandemic, i.e. from 2022-2050.

We report on indicators related to first, second and third order effects. First, we report on increases in mortality. We make a distinction between direct and indirect mortality. The direct effects of COVID-19 are the spread of the disease and its effect on mortality and morbidity, and as such we refer to mortality from COVID-19 as direct mortality. The indirect mortality effects are those that happen after, considering both government and market responses to the pandemic in the immediate and long-term. These changes in mortality are not a direct consequence of mortality assumptions, but follow from policy changes that shift the structure of macro-economic development beyond the immediate effect of the pandemic. As such we refer to those as indirect mortality. The section on near term effects focuses purely on direct mortality whereas the section on The Future(s) focuses on both direct and indirect mortality. In addition, we break down mortality across disease categories and age, specifically focusing on long-term impacts on child mortality. We report mortality towards 2030.

For indicators on the domestic economy, we primarily focus on changes in economic output over time, measured as GDP in constant 2011 USD. Here we quantify both the immediate effect in 2020 of COVID-19 as well as the long-term changes in GDP to 2050. To assess the long-term economic decline, we specifically focus on a country's resilience to the economic shock, by quantifying an economic recovery ratio. Resilience is the ability for something to return to its original state after experience some form of shock, distortion, or disruption. Here we focus on the economic resilience on the long-term, i.e. the ability to recover from the initial shock. To assess a country's economic resilience, we compare the change in GDP relative to a No-COVID scenario over time with the change in GDP relative to a No-COVID scenario in 2020. With this approach, values above 1 suggest economic recovery relative to the initial shock and values below 1 suggest a worsening of the economic decline over time. Taken together, we can think of resilience as the rate of change of this measure. In the report, we identify countries as resilient if the GDP reduction over time is smaller or equivalent to the initial GDP shock. We measure GDP in constant 2011 USD.

Last, a significant portion of the report focuses on changes in international flows. We quantify the immediate effect of COVID-19 in 2020 on trade, foreign aid, FDI and remittances. These international flows are quantified at the monadic trade level, i.e. representing changes in total flows of a country irrespective of changes in partner countries. We also quantify long-term changes in trade from the *Africa-10* countries at the bilateral level, i.e. quantifying shifts in trade between countries.

## Levels of analysis

We analyze all effects across three levels: 1) the *Africa-10* level intends to highlight general trends and insights that may be applicable more broadly to countries in sub-Saharan Africa; 2) the individual country level highlights similarities and differences in both the immediate and long-term outcomes of the pandemic across indicators and countries and 3) country typologies, which represent subsets of countries in order to explore variation between countries which share certain characteristics such as levels of economic and human development, domestic economic structure, and patterns of international dependence. The country typologies aim to distill initial general patterns of explaining how and why COVID-19 effects differ across countries. These insights help policy makers in thinking about policies to mitigate the COVID-19 effect based on shared country characteristics, and to foster economic recovery following COVID-19. While the results in this report are specific to the *Africa-10* countries, the country typologies also help countries not covered in this report to relate to the insights presented here.

# Pre-COVID: Introducing our 10 case study countries

## Economy and trade

The economic output (measured as GDP at MER in 2011 in billion USD) in 2019 across the *Africa-10* varies widely, from the two largest in sub-Saharan Africa, Nigeria (514 billion USD) and South Africa (462 billion USD), to smaller economies such as Mali (18 billion USD), Chad (15 billion USD) and the island economies of Mauritius (15 billion USD) and Cabo Verde (2 billion USD) (Figure 3). The *Africa-10* together represent 1.5% of world economic output and 67.2% of the economic output of sub-Saharan Africa. Nigeria and South Africa together constitute 1.1% and 49.5% of the economic output for the world and sub-Saharan Africa respectively.

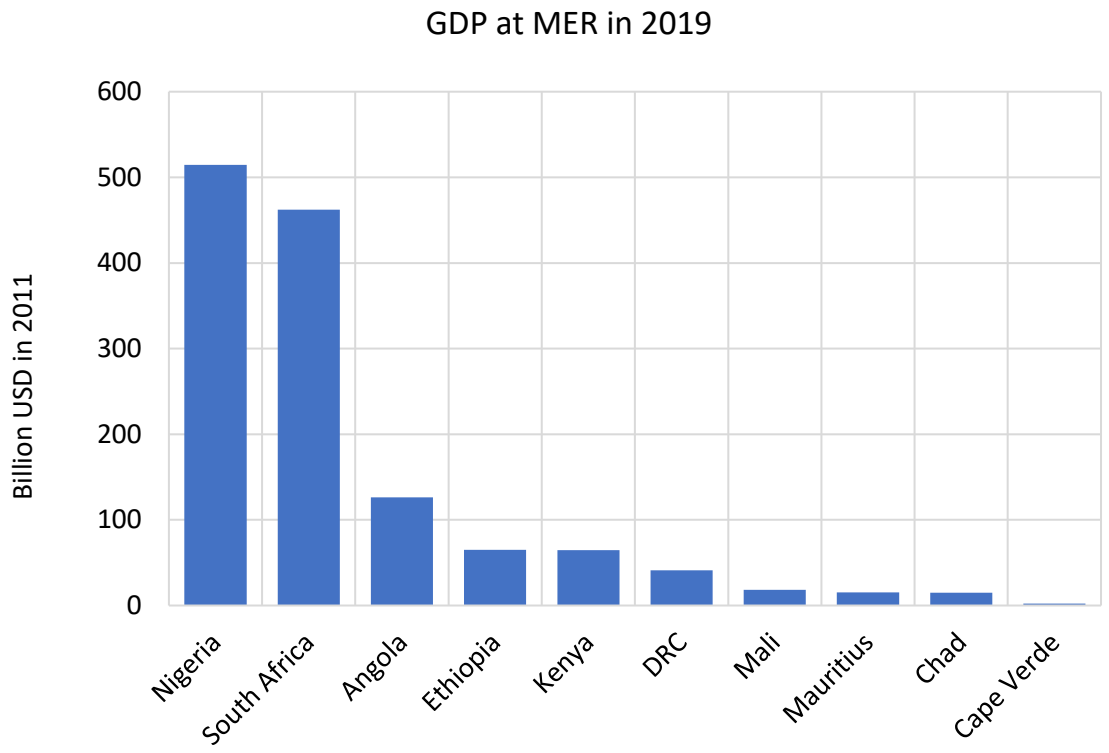


*Figure 3: GDP at MER in 2019 for Africa-10 countries. GDP is measured in billion constant 2011 USD.*

Trade openness, measured as the value of exports and imports relative to overall GDP, also varies significantly across the *Africa-10 (*Table 2), with the island economies being most open, Cabo Verde (108.5%) and Mauritius (96.2%) and Ethiopia (33.9%) and Nigeria (25.5%) being the least open economies. Most countries in the case study are more open to trade than the global average (57%), or sub-Saharan average (52%).

Nearly all the *Africa-10* countries saw a trade deficit, measured as the difference between exports and imports, for 2019: Cabo Verde (-20.3% of GDP), Mali (-18.1%), Ethiopia (-16.6%), Democratic Republic of Congo (-11.1%), Kenya (-10%), Chad (-9.3%), Nigeria (-7.3%), Angola (-3.4%), and South Africa (-0.6%). Only Mauritius had a trade surplus (Mauritius (+9.7%)). Angola, Mauritius and South Africa have smaller trade deficits relative to the sub-Saharan African average of -6.6%.

*Table 2: Summary of trade indicators as a percent of GDP in 2019. Note: total trade represents the sum of exports plus imports and trade balance is estimated as exports minus imports.*

| | Total trade | Trade balance | Exports | Imports |
|---|---|---|---|---|
| | Pct. GDP | Pct. GDP | Pct. GDP | Pct. GDP |
| Africa-10 | 45.4 | -5.3 | 20.1 | 25.3 |
| Angola | 60.0 | -3.4 | 28.3 | 31.7 |
| Cabo Verde | 108.5 | -20.3 | 44.1 | 64.4 |
| Chad | 65.5 | -9.3 | 28.1 | 37.4 |
| Democratic Republic of Congo | 72.5 | -11.1 | 30.7 | 41.8 |
| Ethiopia | 33.9 | -16.6 | 8.6 | 25.3 |
| Kenya | 39.7 | -10.0 | 14.9 | 24.9 |
| Mali | 66.7 | -18.1 | 24.3 | 42.4 |
| Mauritius | 96.2 | 9.7 | 53.0 | 43.3 |
| Nigeria | 25.5 | -7.3 | 9.1 | 16.4 |
| South Africa | 60.1 | -0.6 | 29.7 | 30.3 |

## Population and human development

The *Africa-10* range in population size from the seventh most populous country in the world (Nigeria - 205 million) to Ethiopia (113 million), Democratic Republic of Congo (87 million), South Africa (58 million), Kenya (53 million), Angola (32 million), Mali (20 million), Chad (16 million), Mauritius (1.3 million) and Cabo Verde (0.6 million) (Figure 4). These ten countries represent 7.6% of the world's population and 52.6% of the sub-Saharan population.

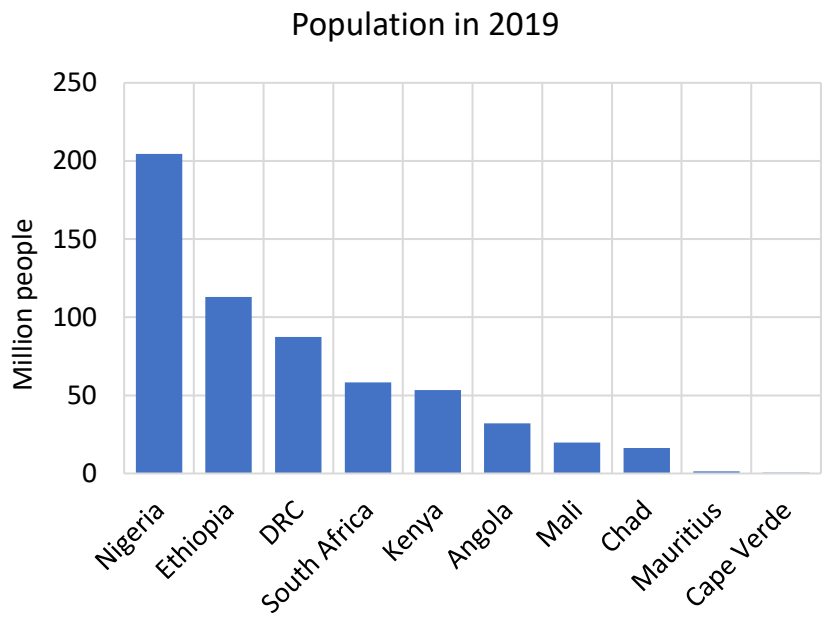


*Figure 4: Population in 2019 of Africa-10 countries in millions of people.*

The Human Development Index (HDI) measures human development across time taking into account health, education, and standard of living from a scale of 0 to 1, with 1 being the highest level of development (Table 3). The 10 countries explored vary considerably in their Human Development Index (HDI) level in 2019 - from a higher level of human development in Mauritius (0.79) and South Africa (0.70), to Cabo Verde (0.68), Nigeria (0.60), Angola (0.59), and Kenya (0.58), to a lower level of human development in Ethiopia (0.48), Democratic Republic of Congo (0.44), Mali (0.45), and Chad (0.43). Angola, Cabo Verde, Kenya, Mauritius, Nigeria, and South Africa exceed the average HDI level for sub-Saharan Africa (0.53), while only Mauritius exceeds the world average HDI level (0.71) for 2019. All other countries – Chad, Democratic Republic of Congo, Ethiopia, and Mali – fall below these averages.

*Table 3: Human Development Index (HDI) for Africa-10 and Africa-10 countries, including variables related to HDI sub-components, including average years of adult education, GDP per capita (at PPP), and life expectancy at birth.*

| | HDI | Adult Education | GDP per capita (PPP) | Life Expectancy |
|---|---|---|---|---|
| | Index 0 to 1 | Years | Thou. USD | Years |
| *Africa 10* | 0.55 | 6.5 | 4.3 | 64.8 |
| Angola | 0.59 | 6.7 | 5.7 | 64 |
| Cabo Verde | 0.68 | 8 | 6.7 | 74.3 |
| Chad | 0.43 | 3.4 | 1.8 | 59.3 |
| Democratic Republic of Congo | 0.45 | 4.5 | 0.9 | 62.5 |
| Ethiopia | 0.49 | 4 | 1.8 | 66.2 |
| Kenya | 0.59 | 6.6 | 3 | 68.5 |
| Mali | 0.46 | 3 | 2.1 | 64.7 |
| Mauritius | 0.79 | 9.5 | 20.6 | 75.2 |
| Nigeria | 0.6 | 8.2 | 5.3 | 64.9 |
| South Africa | 0.7 | 10 | 12.1 | 63 |

## Governance

The level of governance is an important indicator of post-recession recovery (Caldera-Sanchez et al. 2016). Here we use an indicator on government capacity (index 0-1), with higher values indicating higher levels of government capacity (Kaufmann, Kraay, and Mastruzzi 2010). Government capacity is an aggregated indicator based on government effectiveness, largely determined by the level of government revenue, and the level of government transparency (Table 4). Three countries exceed the average world government capacity level (0.46) for 2019, namely Mauritius (0.5), South Africa (0.58), and Cabo Verde (0.51). Kenya and Angola exceed the average government capacity level for sub-Saharan Africa (0.28), scoring 0.33 and 0.37 respectively. Other countries– Mali (0.26), Nigeria (0.21), Ethiopia (0.26), Chad (0.17), and Democratic Republic of Congo (0.22) – fall below both the world and sub-Saharan African average government capacity averages.

*Table 4: A summary of governance-related indicators for Africa-10 countries in 2019. Government capacity is a composite index estimated as the normalized average of government effectiveness and government revenue as a percent of GDP. Governance effectiveness is based off the World Bank's Worldwide Governance Indicators. Government revenue net aid is the total government revenue excluding foreign aid (from the World Bank's World Development Indicators). Government transparency is a measure of corruption, where higher values indicate greater transparency, based off Transparency International's Corruption Perception Index.*

| | Governance capacity | Governance effectiveness | Gov't rev. net aid | Governance transparency |
|---|---|---|---|---|
| | *Index 0-1* | *Index 0-5* | *Pct. of GDP* | *Index 1-10* |
| *Africa-10* | 0.28 | 2 | 19.2 | 3.1 |
| Angola | 0.37 | 1.4 | 24.3 | 1.9 |
| Cabo Verde | 0.51 | 2.7 | 21 | 5.5 |
| Chad | 0.17 | 1 | 6.4 | 2 |
| Democratic Republic of Congo | 0.22 | 0.9 | 10.5 | 2 |
| Ethiopia | 0.26 | 1.9 | 11.3 | 2.7 |
| Kenya | 0.33 | 2.3 | 19.1 | 2.3 |
| Mali | 0.26 | 1.6 | 10.4 | 2.8 |
| Mauritius | 0.5 | 3.6 | 20.7 | 5.3 |
| Nigeria | 0.21 | 1.5 | 7.8 | 2.4 |
| South Africa | 0.58 | 2.8 | 33.1 | 4.2 |

# The near-term effects of COVID-19

## First Order – Health effects

### Setting the stage – Mortality prior to COVID-19

Prior to COVID-19 the mortality rate of communicable diseases across *Africa-10* countries differs significantly (Figure 5*)*. Mauritius has the lowest mortality rate, with most deaths being driven by the elderly population dying from respiratory infections. Communicable diseases deaths occur infrequently here. This stands in stark contrast to South Africa, Democratic Republic of Congo, and Nigeria which have much higher mortality rates from communicable diseases. In South Africa, communicable disease mortality impacts younger populations and is largely driven by AIDS. In Nigeria and Democratic Republic of Congo mortality is driven by diarrhea and to a lesser extent by AIDS and malaria. In Nigeria, the rate of infant mortality from communicable diseases is especially high, compared to the other countries. As such the differences in these countries in communicable disease deaths shows 1) a very different starting point and level of development prior to COVID-19, 2) a very different set of co-morbidities which interplay with COVID-19 and 3) a very different starting point for longer-term economic impacts on mortality and child mortality.

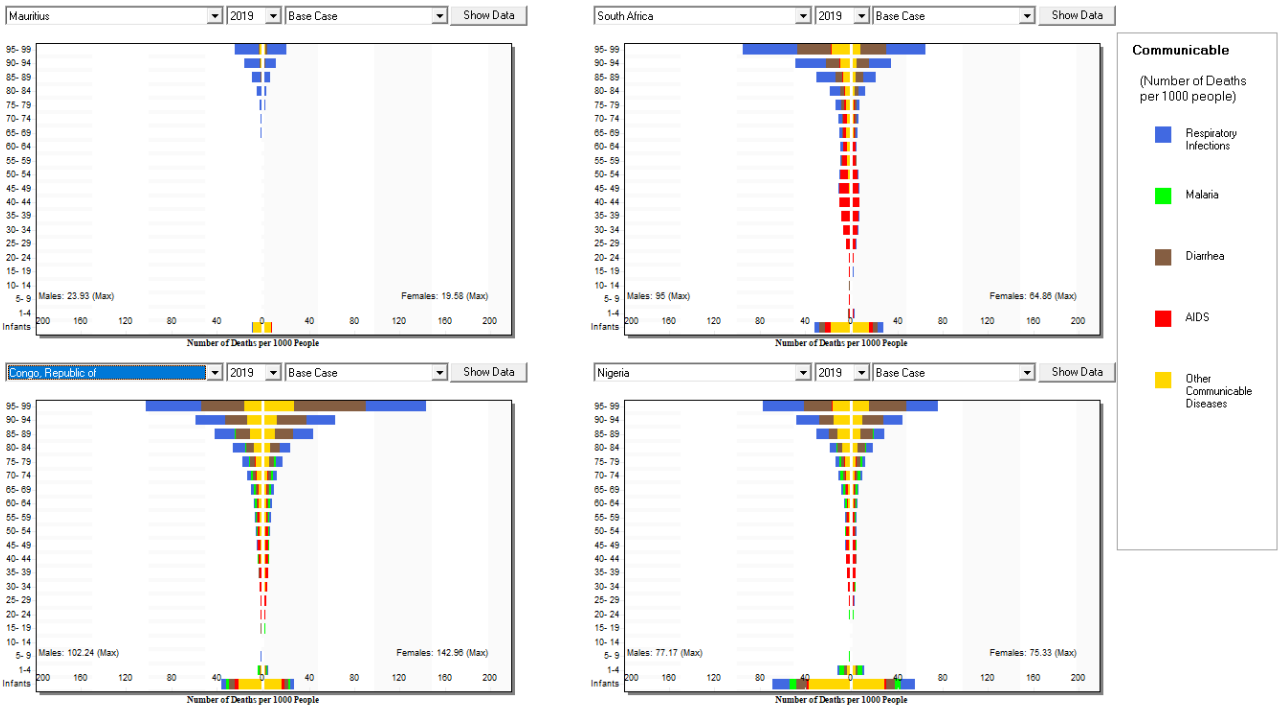


*Figure 5: The distribution of mortality from communicable diseases per age group in 2019 and across four countries (Mauritius, South Africa, Democratic Republic of Congo and Nigeria) from the IFs model.*

## Overview of the country-to-country health effects

Overall, the spread of COVID-19 has not been as severe in Africa as in most other parts of the world. That said, many *Africa-10* countries have had difficulty combatting the influx of COVID-19 patients due to already strained health systems. Additionally, there are concerns regarding the availability and effectiveness of testing and case tracking within these countries. For further information on country-specific health effects of COVID-19, refer to the box below.

Given the rapid developments of COVID-19, any overview of country-level impacts becomes quickly outdated. Nevertheless, understanding how the impact of COVID-19 differs across countries is valuable. The following summarizes key health effects of COVID-19 across the 10 case-study countries.

**Angola -** Coronavirus was first confirmed in Angola in late March 2020. As of November12th, the cumulative number of confirmed cases stood at 13,053 and mortality remained low at 135 (Worldometer 2020). The health care system remains weak and lacks adequate medical workers, medicines, facilities and systems to efficiently test and track infected people. The relatively low infection and death rates are perhaps moderating the health care situation.

**Cape Verde -** The first official case of COVID-19 was confirmed on March 20th, 2020 (Xinhua 2020). As of November12th, the confirmed cases stood at 9,694 and fatalities at 102 (Worldometer 2020). From a health perspective, Cape Verde is seeking to contain the spread of the pandemic and has received assistance from the World Bank through medical equipment and supplies (World Bank 2020d).

**Chad -** The first confirmed case of COVID-19 in Chad was reported on March 19th, 2020. As of November12th, the cumulative confirmed cases stood at 1,538 while deaths were at 100 (Worldometer 2020). Although the Chadian health system is very weak and cannot handle a full breakout of the virus in the country, the pandemic goes beyond the healthcare system. The country's highly rural and young population may help to contain the severity of cases in the country but the recession, aggravated economic hardships and deteriorating security issues might cause challenges for the government (Oxford Analytica 2020).

**DRC -** The first confirmed case of COVID-19 in the DRC was on March 10th, 2020. As of November12th, the country had recorded 11,692 confirmed cases cumulatively and 318 deaths (Worldometer 2020). DRC faces the double burden of the coronavirus pandemic and the Ebola epidemic. Having to deal with two diseases in parallel is putting a strain on the healthcare system, which is already quite weak. DRC's experience with Ebola might allow it to integrate COVID-19 into its response. However, testing challenges and funding for the two diseases remain insufficient (Jerving and Tsongo 2020).

**Ethiopia -** The first confirmed case was on March 13th, 2020. As of November12th, the country had reported 101,248 cases and 1,554 deaths (Worldometer 2020). Depending on the country's COVID-19 trajectory, the country could face serious difficulties in its already strained health system.

**Kenya** - Kenya confirmed its first case of coronavirus on March 15th, 2020. As of November12th, the country had confirmed 66,723 cases and 1,203 deaths (Worldometer 2020).

**Mali** - The first case of COVID-19 in Mali was reported on March 25th, 2020. As of November12th, Mali has reported 3,792 cases and 138 deaths cumulatively (Worldometer 2020). The health care system is inadequate to tackle the virus and the country is struggling to increase spending on emergency health response to COVID-19. Mali is in dire need of vital equipment and support for health structures to effectively respond to the virus.

**Mauritius** - The COVID-19 pandemic was first confirmed in Mauritius March 14-19th, 2020. As of November12th, Mauritius had reported 468 confirmed cases and 10 deaths (Worldometer 2020). So far, the country has managed to contain the virus and is helped by a relatively well-equipped health system (Blin 2020).

**Nigeria** - The first confirmed case of the virus in Nigeria was on February 27th, 2020. As of November12th, Nigeria had recorded 64,728 confirmed cases and 1,162 deaths, cumulatively (Worldometer 2020). The health system remains weak and spending on health remains below 5% of the country's budget. The country is struggling to respond and test for the virus. Additionally, COVID-19 has affected routine healthcare provision (Offiong 2020).

**South Africa** - The first case of COVID-19 was confirmed in South Africa on March 5th, 2020. As of November12th, South Africa has the highest number of reported cases in Africa at 744,732 and 20,076 deaths cumulatively (Worldometer 2020). Although South Africa's health system is the best in Africa, the country is slowly experiencing an overload. Apart from managing the virus, the country is tasked with caring for its large population living with HIV/AIDs who are adversely impacted by the restrictions in place. In fact, there are a large number of unreported COVID-19 deaths in South Africa that would further increase the death toll (Bax 2020).

## COVID-19 mortality in the IFs model

The near-term forecast of COVID-19 mortality has been the focus of a variety of analytic efforts. There is considerable variation and uncertainty associated with these mortality projections (Friedman et al. 2020). Here we do not attempt to project a single-best mortality estimate, but instead choose to focus on the uncertainty associated with the different approaches. Most models share a common dependence on data (Dong, Du, and Gardner 2020; Johns Hopkins University 2020) and are based on Susceptible-Infectious-Recovered (SIR) models (Friedman et al. 2020; Srivastava, Xu, and Prasanna 2020). Some incorporate techniques like machine learning, statistical learning, spatial temporal and time series models (Carnegie Mellon University 2020). There are also models combining multiple techniques. For example, the Institute for Health Metrics and Evaluation (IHME) implements a combination of curve fitting and a mechanistic disease transmission model to predict number of cases and deaths (IHME and Hay 2020).

Taking into consideration the two major factors that increase uncertainty of mortality projections, which are variations in projection methods and limited level of data with potential under-reporting issues, this project uses a mixed approach to represent mortality projections at the country level to the end of 2020 in IFs. Each projection emphasizes a different approach and produces a unique estimate. In all, we create five estimates using our three approaches for each country in *Africa-10*. We utilize three different methods to project mortality outcomes for *Africa-10* countries. First, we take IMHE projections at the end of 2020 (an SIR approach) that takes several key drivers of transmission into account including mobility, mask use, testing and seasonality (Friedman et al. 2020; IHME and Hay 2020). IHME offers three sets of mortality estimates: 1) a more severe scenario where social distancing mandates stop; 2) a current projection that maintains the social distancing mandates; and 3) 95% mask usage in public spaces and mandates reimposed when daily-deaths reach 8 per million.

For a second approach, we divide our assumptions about mortality into spread and severity. We draw differential age-based mortality rates to represent the severity (see Table 5 below). For spread, we make assumptions about COVID-19 prevalence. From literature, the spread of COVID-19 as a share of the population differs significantly. Across states in the US incidence rates vary from 1% to 6.9%. Similarly in Spain, coastal areas have seen prevalence of 3% while areas like Madrid are over 10% (Pollán et al. 2020; Stringhini et al. 2020; Sutton, Cieslak, and Linder 2020; Xu et al. 2020). We use this observed uncertainty band to estimate three different incidence rates of 1%, 3% and 8%.

Curve fitting is the third method applied to *Africa-10* countries. With data of cumulative mortality from JHU (2020), we fit two types of forms to mortality trajectories and use one month of latest recorded data as the benchmark to compare performance between fitted curves. Sigmoid functions and non-decreasing polynomial functions are used to fit curves that are then extrapolated to the end of 2020.

*Table 5: Mortality assumptions by age structure in IFs for COVID-19.*

| | 0 to 9 | 10 to 19 | 20 to 29 | 30 to 39 | 40 to 49 | 50 to 59 | 60 to 69 | 70 to 79 | 80+ |
|---|---|---|---|---|---|---|---|---|---|
| *Deaths as a percent of infections by age* | 0.02% | 0.02% | 0.30% | 0.50% | 0.50% | 1.30% | 4.00% | 12.50% | 22.00% |

The IHME model works well for countries that have good data reporting, but it is generally pessimistic about countries that have surging cases or are experiencing a second wave. For countries that are suffering potential data reporting issues or for places where the outbreak is in a very early stage, approximation through age-specific mortality rates and incidence rates produces reasonable estimates. Extrapolation using curve fitting is good for countries where some data are available and infection cases are sparse or curves have been flattened out for a certain period.

We construct a total of five mortality estimates per country in IFs, to represent the uncertainty associated with mortality estimates. The first three estimates follow the same procedure and are named the *Base, Minor* and *Major* mortality estimates. We used a tiered approach for these three estimates, First, if estimates from the IHME model are available, we use those to represent three scenarios in IFs. Second, for countries that are not modeled by IHME but have data recorded in JHU's database, we use extrapolated values from curve fitting method. Third, the remaining countries are filled using incidence rates. For the different estimates, we used current projection from IHME for *Base* scenario in IFs, universal masks for *Minor* scenario and easing of mandates for *Major* scenario. We use extrapolated values from curve fitting method to represent *Base* scenario. The remaining countries are filled with mortality estimates using 1% to 3% incidence rates for their *Minor, Base* and *Major* scenarios respectively.

In addition, we implemented two extreme estimates, namely *Low* and *High* to represent the best and worst situations. We use current recorded mortality numbers from JHU in the *Low* scenario to indicate the assumption of no further deaths. Countries not recorded in JHU are filled with estimates using 1% incidence rate. On the other hand, for the *High* scenario we use the maximum value across the methods from IHME, curve-fitting and incidence rates to present the worst case. For most countries the *High* scenario is based on the 8% incidence rate.

Last we perform some sanity checks across all scenarios. In the *Base* scenario, if a country's projected value from either IHME model or curve fitting extrapolation exceeds 10-fold of its current recorded mortality numbers, we replace it with the estimated value using 2% incidence rate. Also, we make sure that the ranking across mortality estimates is correct, i.e. values from *Base* scenario are less or equal to those from *Major* scenario.

In addition to the uncertainty of COVID-19 mortality forecasting due to potential under-testing and under-reporting issues and variation of methodologies, model-based projections are also time sensitive. The three mortality projection methods introduced above use data through September 2$^{nd}$, 2020. As such, the resulting country specific ranges of mortality forecast enable us to conduct an uncertainty analysis to assess the impact of different mortality projections (Table 6).

The immediate impact of mortality across countries varies based on the method used. As such, the approach used to estimate mortality strongly affects the mortality estimates in 2020. Uncertainty is especially high in countries such as Ethiopia and Kenya, while uncertainty ranges are much smaller between approaches in for example Chad, Mali and Mauritius. The *High* estimate results in a clear outlier for almost all countries.

*Table 6: COVID-19 projected deaths under 5 different scenario assumptions for the 10-case study countries. Most estimates are based on projections from the IHME models and JHU recorded mortality by September 2nd.*

| | Low | Minor | Base | Major | High |
|---|---|---|---|---|---|
| Angola | 110 | 153 | 230 | 230 | 13,420 |
| Cabo Verde | 41 | 41 | 84 | 444 | 742 |
| Chad | 80 | 77 | 82 | 82 | 6,720 |
| Democratic Republic of Congo | 300 | 296 | 373 | 373 | 40,400 |
| Ethiopia | 800 | 3,647 | 15,070 | 29,780 | 60,500 |
| Kenya | 590 | 664 | 1,957 | 4,248 | 25,640 |
| Mali | 130 | 128 | 128 | 128 | 8,400 |
| Mauritius | 10 | 11 | 11 | 11 | 1,938 |
| Nigeria | 1,100 | 1,067 | 1,341 | 1,341 | 100,000 |
| South Africa | 14,550 | 17,110 | 19,120 | 19,120 | 48,460 |

## Second order – domestic economy effects

### Setting the stage: economic development prior to COVID-19

The *Africa-10* represent a wide range of developmental levels and histories. Since 1980, average GDP per capita (at PPP) has grown by only 400 USD (Figure 6). Between 1980 and 2000, the region experienced twice as many years of negative per capita growth as positive. These lost decades were primarily driven by larger economies like Angola, Democratic Republic of Congo, and South Africa which all struggled with conflict and social instability as well as Nigeria, which struggled to recover from falling energy prices. Several countries have enjoyed strong and consistent economic growth. In 1980, Mauritius's GDP per capita was half that of South Africa. Today it has nearly doubled. Between 1992 and 2008, Cabo Verde averaged over eight percent annual growth in GDP per capita (PPP). Recently, Nigeria averaged nearly five percent annual per capita GDP growth between 2002 and 2012.

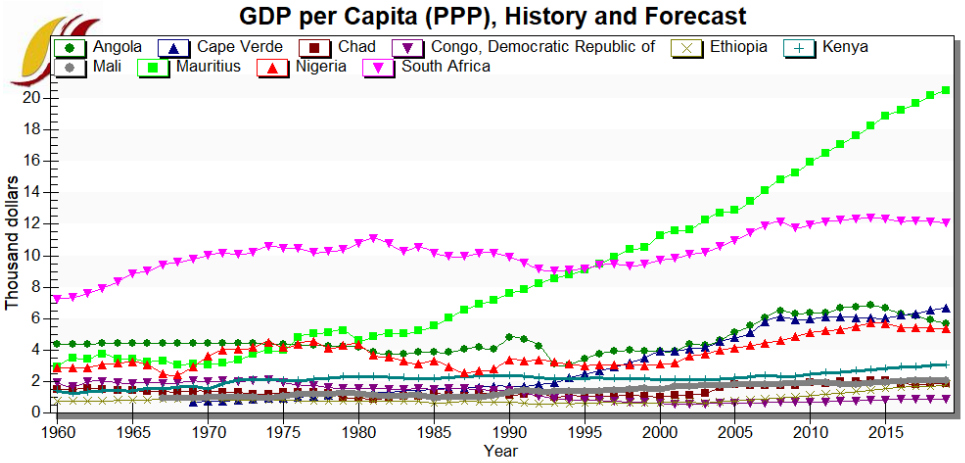


*Figure 6: GDP per capita over time at purchasing power parity.*

Today, four countries in *Africa-10* are classified as low-income economies (Chad, Democratic Republic of Congo, Ethiopia, and Mali), four as lower-middle income economies (Angola, Cabo Verde, Kenya, and

Nigeria), one as an upper-middle income economy (South Africa), and one as high income (Mauritius). These country classifications loosely correspond to economic structure. While all countries have a large services sector, low and lower-middle income economies are also largely dependent on the agricultural sector. Angola, and to a lesser extent Nigeria, also rely on energy as an important sector of their economies. Manufacturing plays an important role in South Africa (22 percent of GDP), which accounts for roughly 50 percent of *Africa-10*'s manufacturing production, as well as Democratic Republic of Congo (22 percent of GDP), Mali (18 percent of GDP), and Mauritius (16 percent of GDP) (Table 7).

*Table 7: Value add by sector as a percent of GDP in 2019. Note: Letters in parentheses next to country names correspond to current World Bank Income Group classifications for low (L), lower-middle (LM), upper-middle (UM), and high (H) income economies.*

| | Agr. | Ene. | ICT | Man. | Mat. | Serv. |
|---|---|---|---|---|---|---|
| Angola (L) | 12.2 | 15.8 | 5.8 | 14.1 | 2.1 | 50 |
| Cabo Verde (LM) | 11.4 | 2.2 | 6.5 | 10.6 | 0.8 | 68.6 |
| Chad (L) | 43.8 | 5.4 | 2.5 | 6.2 | 1.3 | 40.7 |
| Democratic Republic of Congo (L) | 30.2 | 1.8 | 2.9 | 21.7 | 11.9 | 31.5 |
| Ethiopia (L) | 33.3 | 3.2 | 4.5 | 9.1 | 0.9 | 49 |
| Kenya (LM) | 29.5 | 1.4 | 5.2 | 12.4 | 2.2 | 49.3 |
| Mali (L) | 31.9 | 2.1 | 4.2 | 17.7 | 1.3 | 42.8 |
| Mauritius (H) | 3.7 | 0.1 | 9 | 16.4 | 0.7 | 70.1 |
| Nigeria (LM) | 22.2 | 8.6 | 5 | 9.4 | 0.5 | 54.4 |
| South Africa (UM) | 2.1 | 5.8 | 5.6 | 21.9 | 5.6 | 59 |

## Varying impacts of COVID-19 on the domestic economy of countries

Governments around the world, and across the *Africa-10*, have adopted strategies to 1) limit the spread of the COVID-19 virus and 2) implement economic aid and stimulus packages in order to limit economic fallout related to COVID-19 and the containment measures employed to keep populations safe. Second order effects have been measured through indicators on the overall impact on the economy through GDP reductions, or the development of indicators that describe the stringency of the lockdowns or the extent of economic stimulus packages (Hale et al. 2020; IMF 2020b). While helpful in understanding differences across countries, these aggregate indicators often miss specific impacts at the country level that are relevant to contextualize the COVID-19 domestic economic impact.

The *Africa-10* have generally responded swiftly to the COVID-19 pandemic, with most closing borders, suspending travel and closing non-essential businesses and schools for a period of time. This has resulted in significant economic consequences with large declines in GDP and growth in unemployment anticipated in 2020. Specific domestic sectors including tourism, various services, agriculture and transport are expected to be particularly hard-hit by COVID-19 restrictions. Government response to limit the economic consequences has varied by country with many countries lacking sufficient resources to implement adequate relief programs. Countries with large informal economies have seen a disproportionate impact as informal workers may be more affected by regulations to limit COVID-19 spread and are also more difficult to target with economic relief programs. There is also concern that relief programs will expand sovereign debt to unsustainable levels in certain countries. For further information on near-term country-specific domestic economic impacts of COVID-19, refer to the box below.

Given the rapid developments of COVID-19, any overview of country-level impacts becomes quickly outdated. Nevertheless, understanding how the impact of COVID-19 differs across countries is valuable. The following summarizes key domestic economy effects of COVID-19 across the 10 case-study countries.

**Angola –** After coronavirus was first confirmed in Angola in late March 2020, the government's first response was the closing of all borders, airports and ports from passengers for 15 days. This was followed by closure of all schools. Angola has generally had a rapid response effort through its National Contingency Plan to help contain the virus although it has come at a cost. Over 70% of Angola's population works in the informal economy which has been deeply affected by the health and safety regulations put in place by the government to contain the spread of the virus. The plight of the population has been worsened by the lack of social safety nets (Columbo 2020).

**Cape Verde –** On March 17th, the PM of Cape Verde issued a suspension of passenger flights from the US, Brazil, Senegal, Nigeria, Portugal and all other European countries affected by the pandemic (Government of Cabo Verde 2020). On March 28th, a set of measures were instated to contain the virus. The measures taken to contain the virus in Cape Verde have led to an economic crisis which has resulted in job losses estimated at 20,000 (about 20% unemployment rate) as of the beginning of July 2020. The country also experienced a labor supply shock due to the operation of only essential services being allowed which in turn reduced economic productivity. The country's lockdown is estimated to have resulted in a 6.3% loss of GDP (LUSA 2020). The sectors most affected are tourism and the service industry.

**Chad –** After the first case of COVID-19 was confirmed in March 2020 the government suspended all passenger flights into the country as a preventative measure (Olatunji 2020). Chad's economy has so far been hard hit by the economic and social fallout from the COVID-19 pandemic. Measures to contain the pandemic have affected livelihoods, disrupted supply chains and limited access to food for a country already struggling to feed its people (WFP 2020b).

**DRC –** In response to the first confirmed case in March 2020, schools, bars, restaurants and places of worship were closed soon after. On 19 March, flight suspensions were introduced and on March 24th, a state of emergency was imposed and borders were closed (France 24 2020). The restrictions around movement within DRC have impacted the domestic economy. The largely informal economy has taken the biggest hit from lockdown measures.

**Ethiopia** - The national government responded to the COVID-19 crisis by declaring a five-month state of emergency but allowed economic activity to carry on (Embassy of the Federal Democratic Republic of Ethiopia 2020). COVID-19 poses challenges to Ethiopia's economic and social reforms. The pandemic threatens to slow economic growth (expected to face a 2.9% decrease in economic growth due to COVID-19 (UNICEF 2020) , increase risk of high debt and default in payment, high inflation, rising unemployment and increased risk of COVID-19 transmission for displaced people in the country (UN Country Team in Ethiopia 2020). Businesses in the country have already reported substantial decrease in demand for their products and services. The patterns in business vary by industry and type of business (Madden 2020). Additionally, Ethiopia is one of the Eastern African countries that was struggling with the locust invasion well before the pandemic. This means greater food insecurity for Ethiopians in the face of the pandemic.

**Kenya** – Government responses in Kenya were targeted and although preventative measures were put into place, the country did not go into a full national lockdown. International flights were suspended on

March 25th although cargo vessels were allowed into the country. A curfew was also introduced (Kenyatta 2020). Job and income loss have occurred across various sectors with a significant reduction in business hours due to curfews. Additionally, delays at borders due to testing taking place have been reported resulting in loss of profits for businesses. Kenya also faces challenges associated with the locust invasion in East Africa and is faced with an imminent threat of food insecurity (Owino 2020). Although challenges abound, Kenya is one of the African countries supporting a shift to the digital economy with digital financial services already helping many towards financial inclusion (Allmen et al. 2020).

**Mali** – In response to COVID-19 in Mali, flights from affected countries were suspended, schools closed and large public gatherings prohibited. The country instituted a curfew as its response to containing the virus (Le Républicain 2020) . The Malian economy is expected to grow at only 0.9% compared to earlier projections of 5%, and inflation is expected to reach up to 4.9%. Restrictive measures to contain the spread of the virus are already affecting the service industry and the agricultural sector. The impact of COVID-19 has also increased food insecurity.

**Mauritius** – After the first COVID-19 case in Mauritius was confirmed mid-March, schools were closed on March 18th. Travel restrictions, a national confinement (March 20th) and a curfew were also instituted as a response to the virus. Although the country has managed to contain the virus and its healthcare system is estimated to be better equipped than the UK (with 3.4 beds per 1000 compared to UK's 2.8 per 1000 (Blin 2020), the economic ramifications have been great. Mauritius is heavily exposed to global dynamics and has faced the combined threat of an essentially devastated tourism sector (Smit 2020), capital flight from its financial sector, a reduced demand for textiles and clothing from Europe and USA, and concerns about its food security (Gopaldas 2020).

**Nigeria** - On March 18th, Nigeria instituted a travel ban on 13 countries with high cases of coronavirus. Other internal measures on public gathering, closure of schools and other regional lockdowns and curfews soon followed. Before the pandemic, Nigeria was already grappling with low oil prices and limited fiscal space. The impact of measures to curb the virus has caused a rise in unemployment and disruption of economic activity to sectors in food production, agriculture, mining, trade, transportation, accommodation and recreational facilities in the country. The virus has particularly magnified challenges faced by people engaged in the informal economy which accounts for almost 65% of GDP (Adeniji 2020). As a result, household consumption has fallen. Additionally, business investments have been affected with many firms holding off on long-term investment decisions (Onyekwena and Ekeruche 2020).

**South Africa** – South Africa closed schools, prohibited public gatherings, closed its borders to international travel and instituted a lockdown during the course of March 2020. South Africa's economy was expected to shrink in 2020 but with COVID-19 the economy is forecast to be adversely impacted by the pandemic with the IMF expecting a contraction of -8%. So far, unemployment has soared to over 30% according to Stats SA (BusinessTech 2020). Employment losses have been recorded in the manufacturing, utilities, transport, trade, accommodation and tourism sectors. This has exacerbated poverty and inequality in the already most unequal country in the world.

For 2020 IFs projections of economic growth rates for all countries use estimates from the IMF's June 2020 World Economic Outlook. Compared with a *No-COVID* scenario, these differences will have far reaching impacts on many other domestic economic outcomes such as household income, consumption, and

government revenues, as well as influence levels of global trade and trade patterns. According to IMF projections, the largest reductions in GDP growth compared to *No-COVID* scenario estimates occur in the two islands economies of Mauritius (-10.6%) and Cabo Verde (-9.0%), whereas Angola (-2.6%) and Mali (-3.5%) experience the smallest changes in GDP growth. Though all countries show a decline in GDP growth, Kenya (1%), Mali (1.5%), and Ethiopia (3.2%) are still projected to have positive GDP growth compared to 2019. This contraction is reflected in household consumption and government expenditure patterns as well (Table 8), and will have further implications, most proximately in terms of impact on poverty, public goods and service provision.

*Table 8: Key macroeconomic estimates in 2020 for No-COVID (NC) and COVID intervention. GDP growth projections for 2020 in the COVID intervention are from the June 2020 WEO from IMF (2020b). 2020 GDP growth for a No-COVID scenario are from the 2019 IMF WEO (IMF 2019). Household consumption, government expenditures and extreme poverty estimates for both scenarios are from the IFs model.*

| | Annual GDP Growth | | GDP at MER | | Household Con. | | Government Expend. | | Extreme Poverty | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *percent* | | *billion USD* | | *billion USD* | | *billion USD* | | *million pop.* | |
| | NC | COVID | NC | COVID | NC | COVID | NC | COVID | NC | COVID |
| Angola | 1.2 | -1.4 | 127.9 | 124.6 | 78.1 | 77.8 | 34.5 | 33.8 | 15.3 | 15.3 |
| Cabo Verde | 5 | -4 | 2.5 | 2.2 | 1.7 | 1.6 | 0.9 | 0.8 | 0 | 0 |
| Chad | 5.4 | -0.2 | 15.6 | 14.8 | 11.2 | 10.6 | 3.3 | 3 | 6.3 | 6.6 |
| Democratic Republic of Congo | 3.9 | -2.2 | 42.8 | 40.3 | 30.7 | 30.1 | 6.3 | 5.4 | 66.7 | 67.4 |
| Ethiopia | 7.2 | 3.2 | 69.9 | 67.3 | 40.9 | 40.3 | 12.5 | 11.1 | 34.1 | 34.9 |
| Kenya | 6 | 1 | 68.4 | 65.1 | 49.7 | 49.1 | 20.6 | 19 | 16.3 | 16.6 |
| Mali | 5 | 1.5 | 19.3 | 18.6 | 15 | 14.8 | 4 | 3.4 | 9.3 | 9.6 |
| Mauritius | 3.8 | -6.8 | 15.9 | 14.3 | 8 | 7.8 | 2.9 | 2.5 | 0 | 0 |
| Nigeria | 2.5 | -5.4 | 527.3 | 486.6 | 425.8 | 393.3 | 59 | 53.8 | 113 | 120.1 |
| South Africa | 1.1 | -8 | 467.4 | 425.3 | 311.9 | 283.4 | 240.6 | 233.6 | 9.9 | 10.7 |

With reduced consumption, COVID-19 threatens to reverse several years of progress made in the fight to eliminate extreme poverty. As a group, *Africa-10* are expected to see roughly 10 million people pushed into extreme poverty in 2020, or a four percent increase in the number of people living on less than 1.90 USD per day relative to a *No-COVID* scenario. Because of the country's size, Nigerians are projected to make up 7 out of 10 of the people in this unfortunate position, however, Cabo Verde, Mauritius, and South Africa also see over a 6 percent increase in extreme poverty relative to a *No-COVID* scenario.

## Third order – international flow effects

### Setting the stage: International patterns of trade prior to COVID-19

Patterns of trade are best understood by understanding a country's dependence on international trade for the full economy and at the sectoral level. We provide an overview of the country-level dependencies on international trade based on historical data series and projections from the IFs model. In 2019, there are large differences between countries with respect to their dependency on trade. The two island economies, Cabo Verde and Mauritius, have a high reliance on international trade with trade values in 2019 being close to 100% of GDP. The countries in Eastern Africa as well as Nigeria are far less dependent on trade, with

trade as share of GDP between 25.5% to 39.7% for respectively Nigeria and Kenya (Table 9). As a group, *Africa-10* countries have net trade deficits in 2019. The two countries with the lowest trade deficits are South Africa and Mauritius with nearly equivalent imports and exports. In contrast the largest deficit between imports and exports are in Cabo Verde, Ethiopia, and Mali.

There are significant differences in trade across sectors (Table 10*)*. In Cabo Verde agriculture imports account for more than 10% of its GDP. For exports, all countries except South Africa primarily depend on one or two sectors of the economy. Angola and Nigeria heavily rely on energy exports, mainly oil. The combined downturn in oil exports coupled with lower oil prices will affect these countries strongly. On the other hand, oil importing countries, such as Mauritius, might benefit from lower oil prices. Cabo Verde and Mauritius mostly rely on the services sectors, driven by tourism, whereas Democratic Republic of Congo exports mainly stem from the material sectors. Manufacturing is the largest export sector in South Africa, but its export profile is more diversified than any of the other countries. A reliance on a single sector could make countries particularly vulnerable to disruptions following economic crises.

*Table 9: Overview of GDP and trade in 2019 for the 10 countries. Projections come from the IFs forecast values for 2019*

| | **GDP (2019)** | **Trade (2019)** | | **Imports (2019)** | | **Exports (2019)** | |
|---|---|---|---|---|---|---|---|
| | *billion USD* | *billion USD* | *% of GDP* | *billion USD* | *% of GDP* | *billion USD* | *% of GDP* |
| Angola | 126.4 | 75.8 | 60.0 | 40.0 | 31.7 | 35.8 | 28.3 |
| Cabo Verde | 2.34 | 2.5 | 108.5 | 1.5 | 64.4 | 1.0 | 44.1 |
| Chad | 14.78 | 9.7 | 65.5 | 5.5 | 37.4 | 4.2 | 28.1 |
| Democratic Republic of Congo | 41.2 | 29.9 | 72.5 | 17.2 | 41.8 | 12.7 | 30.7 |
| Ethiopia | 65.19 | 22.1 | 33.9 | 16.5 | 25.3 | 5.6 | 8.6 |
| Kenya | 64.49 | 25.6 | 39.7 | 16.0 | 24.9 | 9.6 | 14.9 |
| Mali | 18.36 | 12.3 | 66.7 | 7.8 | 42.4 | 4.5 | 24.3 |
| Mauritius | 15.33 | 14.8 | 96.2 | 6.6 | 43.3 | 8.1 | 53.0 |
| Nigeria | 514.4 | 131.1 | 25.5 | 84.2 | 16.4 | 46.9 | 9.1 |
| South Africa | 462.3 | 277.6 | 60.1 | 140.1 | 30.3 | 137.5 | 29.7 |

Across the *Africa-10*, the dominant trading partners are China, India, USA and European countries (Figure 7). China is the dominant trading partner for Angola, Democratic Republic of Congo, Ethiopia, South Africa and Nigeria. Cabo Verde and Mauritius are somewhat more focused towards European countries. Kenya (with India), Chad (with USA) and Mali (with Senegal) have different main trading partners. The dependency of countries on a single dominant trade partner varies. For example, the trade between the USA and Chad accounts for 24.2% of total trade volume for Chad, whereas countries such as Kenya, South Africa, Mali and Nigeria have a more even share of trade across the main trading partners.

*Table 10: Imports and exports at the sectoral level for 2019 in % of total GDP.*

| | Agr | | Ene | | Mat | | Man | | ICT | | Ser | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | imp | exp | imp | exp | imp | exp | imp | exp | imp | exp | imp | exp |
| Angola | 6.2 | 0.0 | 1.2 | 18.5 | 0.1 | 0.8 | 9.7 | 7.0 | 0.8 | 1.5 | 13.6 | 0.6 |
| Cabo Verde | 10.5 | 3.8 | 0.3 | 0.4 | 0.3 | 0.0 | 31.1 | 3.9 | 2.6 | 0.2 | 19.5 | 35.8 |
| Chad | 1.8 | 0.0 | 0.0 | 0.8 | 0.4 | 0.2 | 32.8 | 25.2 | 0.8 | 1.1 | 1.6 | 0.7 |
| DRC | 7.9 | 0.1 | 2.1 | 0.5 | 0.3 | 14.7 | 21.3 | 13.6 | 0.7 | 0.8 | 9.5 | 1.1 |
| Ethiopia | 4.0 | 2.7 | 2.4 | 0.0 | 0.2 | 0.0 | 12.8 | 0.4 | 1.2 | 0.0 | 4.7 | 5.4 |
| Kenya | 5.3 | 3.9 | 2.6 | 0.0 | 0.2 | 0.6 | 12.1 | 3.5 | 1.0 | 0.1 | 3.6 | 6.8 |
| Mali | 6.0 | 0.3 | 1.1 | 0.3 | 0.2 | 0.2 | 20.2 | 20.0 | 1.4 | 0.0 | 13.4 | 3.4 |
| Mauritius | 7.8 | 5.9 | 3.7 | 0.0 | 0.3 | 0.1 | 17.1 | 15.3 | 4.1 | 7.6 | 10.2 | 23.9 |
| Nigeria | 3.7 | 0.1 | 0.7 | 6.2 | 0.1 | 0.0 | 7.3 | 2.1 | 0.4 | 0.0 | 4.2 | 0.6 |
| South Africa | 2.0 | 1.6 | 2.0 | 3.4 | 0.5 | 6.2 | 20.3 | 13.8 | 2.6 | 0.4 | 2.8 | 4.3 |

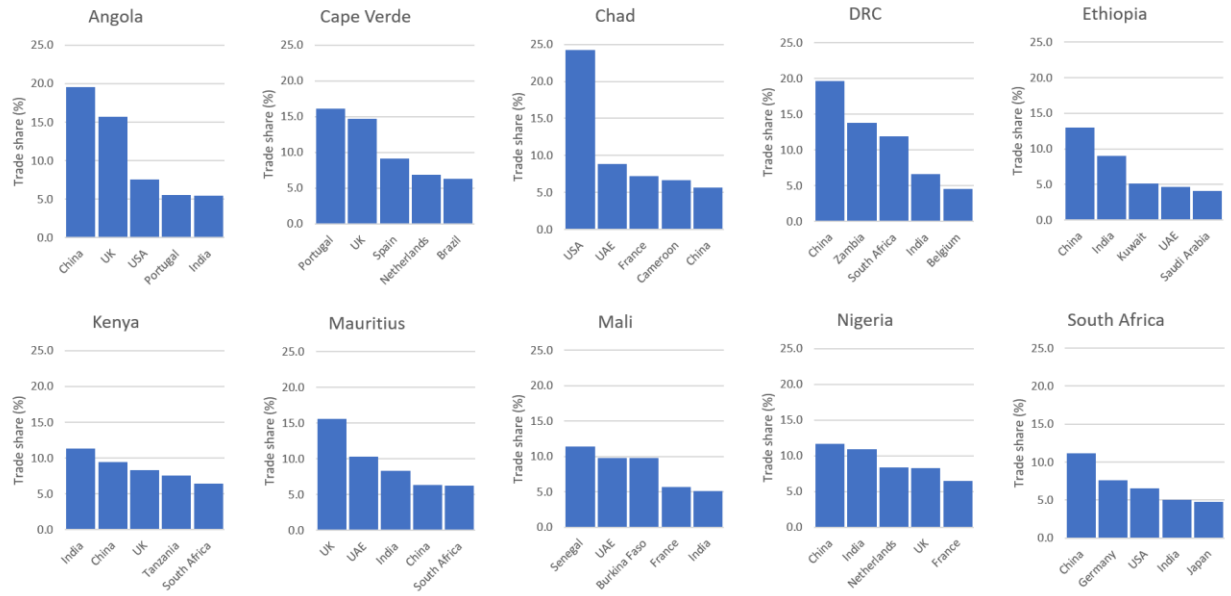


*Figure 7: Bilateral trade share between the Africa-10 countries and their top 5 major trading partners. The trade share is calculated as the percentage of trade (import + exports) with a specific country, relative to the total trade with all countries. These values are for 2019.*

Mali and Democratic Republic of Congo have high shares of intra-African trade, with 38.5% and 41.3% occurring within the continent (Table 11). The two largest oil producers, Angola and Nigeria, have the lowest shares of intra-African trade, 6.5% and 8.0% respectively. The imports in Chad (25.2%) are highly dependent on other African countries whereas only 7.7% of the exports from Chad are to other African nations. On the other hand, Kenya (39.1%) and South Africa (30.4%) have a much higher share of exports going to other African nations making them important trading partners for other African nations. Overall trade with other African nations (16.5%) is an important component of total trade for the *Africa-10* countries, but the main dependencies remain on trade with non-African partners such as China, India, Europe, and to a lesser extent the USA.

*Table 11: Percent of trade from intra-African trade relative to the total trade of a country. The values are calculated as the % of exports to other African countries, relative to total exports. Similarly, trade is calculated as the sum of exports and imports intra-African relative to the total value of exports and imports.*

| | % from Intra-African trade | | |
|---|---|---|---|
| | **Exports** | **Imports** | **Trade** |
| Africa-10 | 23.7 | 10.8 | 16.5 |
| Angola | 3.3 | 9.4 | 6.5 |
| Cabo Verde | 9.7 | 7.0 | 8.1 |
| Chad | 7.7 | 25.2 | 17.7 |
| Democratic Republic of Congo | 39.8 | 42.5 | 41.3 |
| Ethiopia | 21.5 | 14.4 | 16.2 |
| Kenya | 39.1 | 21.0 | 27.7 |
| Mali | 41.1 | 37.0 | 38.5 |
| Mauritius | 24.5 | 13.5 | 19.6 |
| Nigeria | 12.2 | 5.6 | 8.0 |
| South Africa | 30.4 | 6.8 | 18.5 |

## Impacts of COVID-19 on international trade across countries

When considering the impacts of COVID-19 on international flows for the *Africa-10*, those most reliant on foreign trade, tourism and/or remittances have experienced the most significant effects of changing patterns of economic interdependence. For countries dependent on imports, shortages of essential goods are becoming a greater risk while countries that are dependent on exports are experiencing notable declines in revenues. Countries that rely on oil exports have been particularly impacted by the decline in oil prices as well as by an overall decline in trade. Remittances, which constitute a significant part of many of the *Africa-10* international flows have declined due to overall declines in economic activity and travel and movement restrictions. Many *Africa-10* countries are seeking external support because of these changing patterns of economic interdependence. To date, half of the *Africa-10* have requested or been approved for support from the World Bank or IMF and many will seek additional assistance in the form of aid. For further information on country-specific international flows during COVID-19, refer to the box below.

Given the rapid developments of COVID-19, any overview of country-level impacts becomes quickly outdated. Nevertheless, understanding how the impact of COVID-19 differs across countries is valuable. The following summarizes key domestic international flow effects of COVID-19 across the 10 case-study countries.

**Angola** - Angola is starting to feel the impact of third order effects. The country runs the risk of shortages of essential goods which are largely imported. Apart from the economic crunch, border closures have slowed down the speed of the supply chain. Additionally, as oil accounts for about 90% of Angola's exports, low oil prices leave Angola incapable of independently managing the pandemic (Columbo 2020). FDI inflows into Angola had already declined to below US$0.5 billion in 2019 and they are expected to contract further amid the double shock of the coronavirus pandemic and low oil prices (UNCTAD 2020c).

With regard to remittances, it is expected that these will decline owing to the negative economic impact of the pandemic on workers who can no longer send money home as well as the fact that Angola falls in the Southern Africa region which is the most expensive corridor in terms of remittance costs (World Bank 2020b).

**Cape Verde -** As a country dependent on tourism, services and remittances Cape Verde is determined to reduce the impact of the coronavirus pandemic. Remittances specifically account for 12.1% of GDP and disruption in flows has a serious impact on livelihoods in Cape Verde (WFP 2020a). The country has reopened its borders to international travel and is working with international bodies to come up with prevention and mitigation measures to alleviate the negative impacts of the virus.

**Chad -** Chad's petroleum industry dominates economic activity, accounting for about 60% of export revenues. These revenues are hindered by the current low oil prices in the international market (Export Entreprises 2020). Additionally, the landlocked country whose low-income economy is now challenged by the coronavirus faces the combined threat of declining remittances especially for its poor rural population that owes its lifeline to the Chadian diaspora and the money they send home (IOM 2020).

**DRC -** Due to the pandemic, the DRC and the surrounding region is expected to experience a decline in remittance flows of up to 23.1%, to $37 billion U.S. in 2020, with a recovery of 4% expected in the year 2021 (World Bank 2020b). Much of the remittances are sent informally and travel/movement restrictions hamper such flows to recipients. FDI is expected to slow down with major projects like the Inga III facing financing challenges on top of the concerns raised about the eco-impact of such projects.

World Bank approved $47 million in financing from the International Development Board Association to fund the DRC's COVID-19 response (World Bank 2020a). DRC's trade which is highly dependent on commodities including minerals has also been highly affected due to the disruption in global supply chains.

**Ethiopia** - Ethiopia has seen a drop in demand for exports and operation of its key service industry, aviation, which has caused loss of revenue for the country. Although the major carrier has resumed flights, the services offered are not optimal and thus recovery will be slow. Additionally, in Ethiopia, private individual transfers in the form of remittances cover more than a third of what Ethiopia imports. By March of 2020, the country had seen a 17% decline in private individual transfers. Compared to the same period last year, and this is attributed to the impact of the pandemic. This reduction is expected to have significant impact on household consumption. The urban poor and unskilled labor are likely to be the most impacted (Beyene and Gebrewolde 2020). Ethiopia has so far received financing from the World Bank and IMF to mitigate the impact of the pandemic on the country's ongoing reform agenda (World Bank 2020c).

**Kenya** - In Kenya, not all supply chains were disrupted due to COVID-19. The country recorded a marked decline in its trade deficit with significant improvement (given the circumstances) in exports in the first quarter of the year (Mveyange and Mold 2020). However, the region has experienced a worrying scale of disruption to trade and this may signal a disturbing upcoming trend for Kenya. Declines in remittances have also resulted in many families struggling to buy food and pay rent (Adow 2020). IMF has disbursed US$739 million to Kenya to aid in the COVID-19 pandemic.

**Mali** - From an international perspective, COVID-19 is disrupting the supply chain of commodities like dried mangos. Additionally, the pandemic threatens to cause a cotton crisis. The guaranteed price, for

example, has been revised downward due to COVID-19 to account for global price fluctuations (Koné et al. 2020). Mali has so far received financial support from the World Bank (US$25.8 million) and IMF (US$200 million) to address its budgetary gaps and shortfall in cash flows for COVID-19 response.

**Mauritius** - Mauritius has now been blacklisted as a tax haven by the EU posing financial risk that exacerbates other divestments and outflows related to COVID-19. This risks further deteriorating FDI, on top of reductions following COVID-19. Mauritius is also affected by its inability to import food owing to a growing climate of nationalism in which countries are restricting food exports to protect domestic food security (Gopaldas 2020).

**Nigeria** - Border closures have resulted in a decline in exports as well as an overall decline in markets for exports due to a fall in global demand (Ekeruche and Onyekwena 2020). Nigeria receives the largest amount of remittances within the sub-Saharan African region. Remittances are expected to decline by around 20% in Nigeria due to the COVID-19 crisis (Odutola 2020). The total direct remittance inflow into Nigeria has declined considerably, falling by 50% from US$2.04 billion to US$1.01 billion between January and February 2020 (Centre for the Study of the Economies of Africa 2020). FDI is expected to drop in Nigeria by 48.5% in 2020/2021 (Anadolu Agency 2020; UNCTAD 2020c). Despite the projected slow-down in FDI, Nigerian economists are optimistic towards local investments and the opportunities presented by COVID-19 to not only increase domestic investor activity but also to diversify the economy away from petroleum (Ventures Africa 2020). Nigeria has so far received US$3.4 billion in emergency funding towards COVID-19.

Several international organizations have provided estimates of the impact of COVID-19 on trade. For 2020, WTO projects a decrease in trade volume between 13% and 32%, depending on the scenario and the approach, whereas UNCTAD projects a 20% reduction in trade (UNCTAD 2020b). These studies look at the impact of global trade across all countries. Whereas much uncertainty remains about trade impacts beyond 2020, two initial insights can be drawn from studies so far: 1) restrictions on international travel and trade following COVID-19 are mostly impacting countries with more liberal trade policies prior to the pandemic and 2) trade policies which are currently implemented as a response to the pandemic tend to be "sticky policies", i.e. they tend to be implemented for a period longer than the pandemic per se (Benz, Gonzales, and Mourougane 2020; Novy 2020). Although these insights do not yet tell about long-term impacts, they start to shape a discussion on how current COVID-19 impacts as well as changes in policy will shape the future beyond the pandemic.

Drawing upon previous research, a COVID-19 trade-shock was imposed on IFs (WTO 2020). For 2020, WTO finds a global elasticity of trade to GDP of 1.8%. We use this elasticity at the global level, and uniform across sectors in IFs, on both imports and exports to capture the COVID-19 impact on international trade flows. Importantly, while much discussion has centered around sectoral differences in trade impact, we are currently not aware of estimates across all countries on sector specific trade-shocks. Therefore, we can only implement a similar trade shock across all sectors into the IFs model.

*Table 12: Changes in exports and trade openness following the implementation of a COVID-19 trade shock in the IFs model. The numbers on export depict the change in in absolute value, as well as the relative change. The change in trade openness for Cabo Verde is calculated as the difference in Trade Openness between a No-COVID (110.9) and a COVID-19 (103.5) intervention, equivalent to -7.4.*

| | Change in Exports | | Change in trade openness |
|---|---|---|---|
| | *Billion USD* | *% change* | *% of GDP* |
| Angola | -1.9 | -5.2 | -1.2 |
| Cabo Verde | -0.2 | -14.3 | -7.4 |
| Chad | -0.4 | -9.7 | -2.8 |
| Democratic Republic of Congo | -1.4 | -10.4 | -4.1 |
| Ethiopia | -0.4 | -6.8 | -1.1 |
| Kenya | -0.9 | -8.5 | -1.4 |
| Mali | -0.3 | -6.1 | -1.7 |
| Mauritius | -1.6 | -17.8 | -8.4 |
| Nigeria | -6.7 | -14.6 | -1.3 |
| South Africa | -22.2 | -16.1 | -4.7 |

Both export and imports decrease in 2020 because of COVID-19. In absolute terms, exports from South Africa decrease by the largest amount (22.2 billion USD), followed by Nigeria, with a 6.7 billion USD reduction in exports (Table 12). Prior to COVID-19 trade openness was highest in Mauritius and Cabo Verde. As a result, the impact on trade openness is highest for the two island economies, with a 8.4 percent point reduction in Mauritius and a 7.4 percent point reduction in Cabo Verde.

### Setting the stage: International patterns of foreign aid, remittances and FDI prior to COVID-19

We discuss the other international flows besides trade jointly. FDI is largest for Nigeria, Angola and South Africa (Table 13). Relative to total GDP, FDI is most important for the economies of Cabo Verde (8.8%), Democratic Republic of Congo (4.6%) and Mali (3.4%). While data on bilateral FDI are limited, data from 2012 suggest that many countries received the most FDI inflows from China, with Ethiopia, Mali, Democratic Republic of Congo and Chad receiving over 90% of their FDI inflows from that country alone. Angola, Mauritius and South Africa primarily received FDI inflows from European countries.

In terms of foreign aid, the largest receivers are Nigeria (7.2 billion USD), Ethiopia (3.9 billion USD) and Democratic Republic of Congo (3.1 billion USD). As a share of GDP, Mali (10.6%) and Chad (.6%) have the largest dependence on foreign aid. The US is the most important aid partner for 8 of the 10 countries analyzed here. Only Mauritius and Cabo Verde are more dependent on France and Portugal. The dependence on a single partner country for foreign aid also differs across the countries. Mauritius receives 81.1% of its total aid from France. Similarly, Nigeria receives 52.1% of its foreign aid from the US. The Democratic Republic of Congo only receives around 29.5% of its total aid from the US, and Belgium, the UK and France all contribute over 10% of foreign aid.

Remittances are an important addition to household income. The relative importance of remittances for individual countries, however, varies. In absolute amounts the largest receiver of remittances is Nigeria (25.2 billion USD). Relative to GDP, remittances are the most important for Cabo Verde (10.0%) and Mali (5.7%). Other countries have very limited remittances flows, and remittances are either close to zero or make up less than 1% of GDP, such as in Angola and Chad.

*Table 13: : Inflows of remittances, FDI, and foreign aid in 2019, both in absolute value and as a % of GDP*

| | | Remittances, FDI and foreign aid | |
|---|---|---|---|
| | | *Billion USD* | *% of GDP* |
| Remittances Received | Angola | 0.0 | 0.0 |
| | Cabo Verde | 0.2 | 10.0 |
| | Chad | 0.0 | 0.0 |
| | Democratic Republic of Congo | 1.1 | 2.7 |
| | Ethiopia | 1.8 | 2.7 |
| | Kenya | 2.3 | 3.5 |
| | Mali | 1.0 | 5.7 |
| | Mauritius | 0.2 | 1.0 |
| | Nigeria | 25.2 | 4.9 |
| | South Africa | 0.7 | 0.2 |
| FDI Inflows | Angola | 2.9 | 2.3 |
| | Cabo Verde | 0.2 | 8.8 |
| | Chad | 0.4 | 2.7 |
| | Democratic Republic of Congo | 1.9 | 4.6 |
| | Ethiopia | 1.7 | 2.6 |
| | Kenya | 1.0 | 1.6 |
| | Mali | 0.6 | 3.4 |
| | Mauritius | 0.4 | 2.9 |
| | Nigeria | 8.9 | 1.7 |
| | South Africa | 7.1 | 1.5 |
| Aid Received | Angola | 1.6 | 1.3 |
| | Cabo Verde | 0.2 | 7.9 |
| | Chad | 1.3 | 8.6 |
| | Democratic Republic of Congo | 3.1 | 7.5 |
| | Ethiopia | 3.9 | 6.0 |
| | Kenya | 2.4 | 3.8 |
| | Mali | 1.9 | 10.6 |
| | Mauritius | 0.1 | 0.4 |
| | Nigeria | 7.2 | 1.4 |
| | South Africa | 2.6 | 0.6 |

## Impacts of COVID-19 on international flows across countries

COVID-19 is projected to result in drops in FDI, remittances and foreign aid. FDI is expected to show the most pronounced decline. This is in line with projections from other groups, projecting larger drops in FDI globally (30-40%) and in African countries (25-45%) relative to drops in remittances globally (20%)

and in African countries (23.1%) (OECD 2020c; UNCTAD 2020b; World Bank 2020b). Projections on the reduction in foreign aid are largely absent making comparisons difficult.

While the relative order of magnitude aligns with other projections, there are some differences between the magnitude of the drop projected in IFs and other projections. IFs project a drop in remittances of 7.5% for the *Africa-10.* Although a different set of countries this is considerably lower than the 23.1% projected by others. However, an update to previous analysis now projects a 7% drop in remittances, much more in line with projections from IFs (World Bank and KNOMAD 2020b). These updated projections highlight the considerable uncertainty surrounding COVID-19 effects on remittances. Projections of FDI reductions are at the high end with a projected drop of 59.5%, whilst others project a drop ranging between 25% to 45%. There are also similarities between the projections. Oil producers, with a large energy sector are expected to be hardest hit by the drop in FDI (UNCTAD 2020d). Similarly, in IFs we observe that the countries with the largest energy sectors (Nigeria, Angola, South Africa and Chad) are the countries experiencing the largest drop in FDI, of on average -67.1%. This is in stark contrast to countries with smaller energy sectors only experiencing a drop of -42.2%. Second, there is a large uncertainty associated with any COVID-19 projections for the year 2020. For example, projections of COVID-19 impact on FDI were adjusted downwards to -30%-40% from a previous projection of -5% to -15% (UNCTAD 2020b). This underscores the high uncertainties associated with projecting COVID-19 impacts in 2020.

### COVID-19: relative impact across international flows

Importantly, whereas the impact of COVID-19 on first and second order effects is negative across all countries, this is not necessarily the case for international flows. COVID-19 negatively affects incoming and outgoing international flows. However, the net effect on balance of trade, aid, remittances and FDI is not necessarily negative across indicators and across countries (Figure 8). Figure 8 depicts the relative contribution of trade balance, remittance balance, foreign aid balance and FDI balance to the total change in international flows. Values above zero actually indicate an improvement in the balance of that indicator. For example, changes in exports and imports in Cabo Verde following COVID-19 result in an improvement of the trade balance. In addition, the length of the bars indicates the relative importance of a drop in that specific international flow for a country. As an example, total changes in international flows in Angola are dominated by changes in FDI, whereas remittances are much more important in Nigeria.

There are some important uniform effects in this graph. Across all countries, reductions in FDI negatively affect international flows and are relatively important compared to drops in other international flows. As such policies aimed at lowering barriers for FDI within these countries is likely to be beneficial across *Africa-10*.

Foreign aid is also an important contributor to total drops in international flows, especially so for Chad, Democratic Republic of Congo, Ethiopia, Kenya and Mali. The international community should try to uphold foreign aid for these countries, to limit the economic impact. But this observation does not hold for all countries. On the contrary, COVID-19 is projected to result in an increase in foreign aid in South Africa. Foreign aid is a function of GDP per capita, previously received foreign aid and importantly a threshold value on GDP per capita after which foreign aid significantly drops. COVID-19 is expected to push South Africa below this threshold value, significantly increasing foreign aid for the country. This is partly a model artefact, but also relates to the significant economic downturn in South Africa combined with its economic central role for sub-Saharan Africa, increasing the significance of providing aid to South Africa from many partner countries.

The impact on trade balance and remittances are dependent on the conditions of a country in 2019. Mauritius is the only country with a positive trade balance in 2019, and COVID-19 is projected to result in a reduction.

On the contrary, countries such as Cabo Verde, Ethiopia, Kenya and Democratic Republic of Congo have a negative trade balance in 2019, and simultaneous reductions in exports and imports actually reduce that negative trade balance prior to a *No-COVID* scenario. For remittances roughly the same dynamics hold. Mauritius as well as South Africa are net senders of remittances, and as such a simultaneous reduction results in a positive impact on the remittance balance. On the contrary, Nigeria, Cabo Verde, Kenya and Mali are net remittance recipients and COVID-19 is expected to negatively affect remittance flows for these countries. Currently, costs of sending remittances are highest in countries in sub-Saharan Africa. Countries which prior to the pandemic relied on remittance inflows could enact policies aimed at reducing these costs (World Bank and KNOMAD 2020a).

These results highlight the complexity in analyzing the impact of COVID-19 across international flows. Estimated effects depend on the country, the type of international flow and the indicator used to describe this flow. Whilst these results might suggest some general macro-economic positive impacts, the reality is far more complex. For remittances, the households sending remittances abroad are not necessarily the same households receiving remittances. As such, net aggregated positive effects on remittance flows might result in additional differences between incomes of households. Similarly, net changes in trade do not necessarily distribute evenly across sectors, and can still lay bare import dependencies on crucial agricultural or medical products. Nonetheless, our results provide an important insight into how COVID-19 effects differ across countries, how policy makers might respond to these across countries, and especially on long-term macro-economic consequences for mortality, economic growth and international trade specific to these countries.

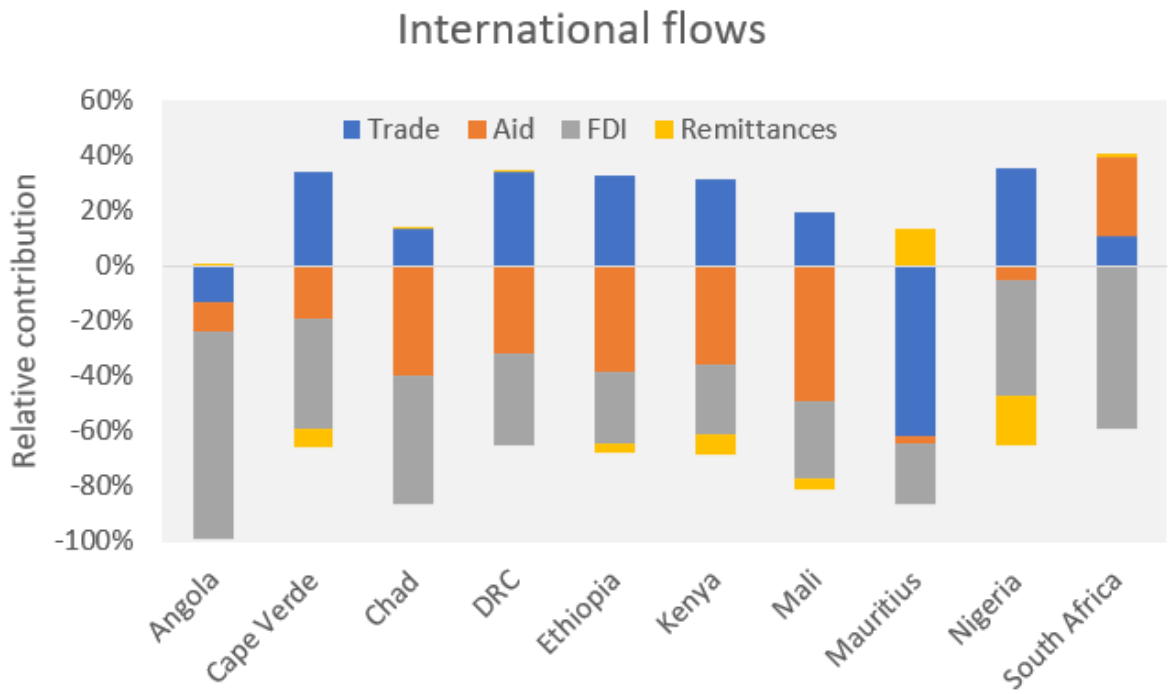


*Figure 8: Relative change in international flows between countries in 2020. The differences depicted are between a scenario with and without COVID-19. The larger the relative contribution, the larger the specific contribution of that international flow to the total change. All results are depicted as a net effect, i.e. the combined effect of COVID-19 on exports and imports (trade). Positive effects suggest that COVID-19 might reduce outgoing flows more than incoming flows, compared to a No-COVID world.*

## Exploring long-term effects of COVID-19 in IFs

We use scenarios to frame uncertainty around the impacts of COVID-19 in 2020 and 2021 on mortality, GDP and trade, and to explore how these assumptions affect long-term development by 2030 and 2050. Table 14 provides an overview of the four different scenarios used in this study. First, there is a *No-COVID* scenario describing a world without COVID-19, with no additional mortality, no COVID-19 trade-shock and IMF growth projections for 2020 and 2021 prior to the pandemic.

We then develop a set of three COVID-19 scenarios around diverging assumptions on mortality in 2020, the GDP shock and rebound in 2020 and 2021 and the COVID-19 trade shock. The *COVID-19 base* is the scenario which follows current projections on mortality, GDP and trade from other institutes (Table 14). In a previous section, we showed the high uncertainty around mortality projections in 2020. However, while direct mortality at the country level is highly uncertain, this has little consequences for long-term macro-economic development. In Appendix 1 we compare scenarios with diverging mortality assumptions coupled with similar GDP and trade assumptions and quantify the variation in mortality, GDP, poverty and levels of international flows by 2050. Overall the long-term, forward impacts of varying rates of mortality are limited. For the *COVID-19 base* scenario we select the mortality projections from the *Base* mortality estimate, closely resembling the IHME current mortality projection. In addition, we use the IMF June 2020 WEO GDP growth rates and the WTO COVID-19 trade elasticities. All scenario assumptions are implemented across all countries globally, to not only represent the domestic effects of COVID-19 in the *Africa-10* countries but also the consequences for international flows between countries.

We developed two additional scenarios, 1) *Relief & Rebound* describing a world in which the COVID-19 impacts in 2020 are less severe than anticipated in the *COVID-19 base*, and the economic recovery in 2021 is stronger *and 2) Global Suffering* describing a world in which the COVID-19 impacts in 2020 are more severe than anticipated, and the economic rebound in 2021 is smaller. Specifically, in the *Relief & Rebound* we use the minor mortality estimates, largely based on IHME projections around strict virus containment, and an upward adjustment in GDP growth of +1.5% in both 2020 and 2021 compared to the *COVID-19 base*. The *Global Suffering* scenario uses the major mortality estimates, largely based on IHME projections with limited virus containment, and a downward adjustment of GDP growth by -1.5% in both 2020 and 2021. The trade elasticities remain the same across scenarios, but changes in GDP growth rates drive changes in trade across scenarios. After 2021 the scenario interventions cease, and all indicators are calculated endogenously in IFs.

We quantify the effect of COVID-19 across the scenarios for mortality to 2030, for economic growth to 2050 and for trade to 2050. Importantly in the international trade section most results focus on a comparison of the *No-COVID* to the *COVID-19 base* scenario.

*Table 14: Overview of scenario assumptions for the different COVID-19 scenarios used in this study. The scenarios differ in their assumptions around mortality, GDP growth and trade.*

| | Mortality | GDP growth | Trade |
|---|---|---|---|
| *No-COVID* | No COVID-19 mortality | Pre-COVID IMF growth rates | No COVID-19 shock to trade |
| *COVID-19 base* | Mortality in 2020 is based on *Base* mortality projection, largely following IHME current projection | Growth rates for 2020 and 2021 from IMF WEO of June 2020 | WTO GDP-to-trade elasticity of 1.8 in 2020; and 1.64 in 2021 |
| *Relief & Rebound* | Mortality in 2020 is adjusted downwards based on the *Minor* mortality largely following an IHME scenario with stricter virus control | IMF growth rates are increased by +1.5% in 2020 and 2021 | Same assumption as COVID-19 base, but different effect due to changes in GDP |
| *Global Suffering* | Mortality in 2020 is adjusted upwards based on the *Major* mortality estimate, largely following IHME scenario with looser virus control | IMF growth rates are decreased by -1.5% in 2020 and 2021 | Same assumption as COVID-19 base, but different effect due to changes in GDP |

## First Order Effects: Direct and indirect mortality

COVID-19 is expected to result in increased indirect mortality to 2030 following the economic decline, far surpassing the initial 2020 COVID-19 direct mortality (Figure 9). In 2020, direct mortality from COVID-19 for the *Africa-10* ranges between 23,000 deaths in the *Relief & Rebound scenario* to 56,000 in the *Global Suffering scenario.* Towards 2030, indirect mortality is expected to range between just over 82,000 (*Relief & Rebound*) to over 247,000 (*Global Suffering*). The more significant the economic decline following the COVID-19 pandemic, the greater the increase in indirect mortality in absolute numbers and rate relative to the direct mortality counts from COVID-19.

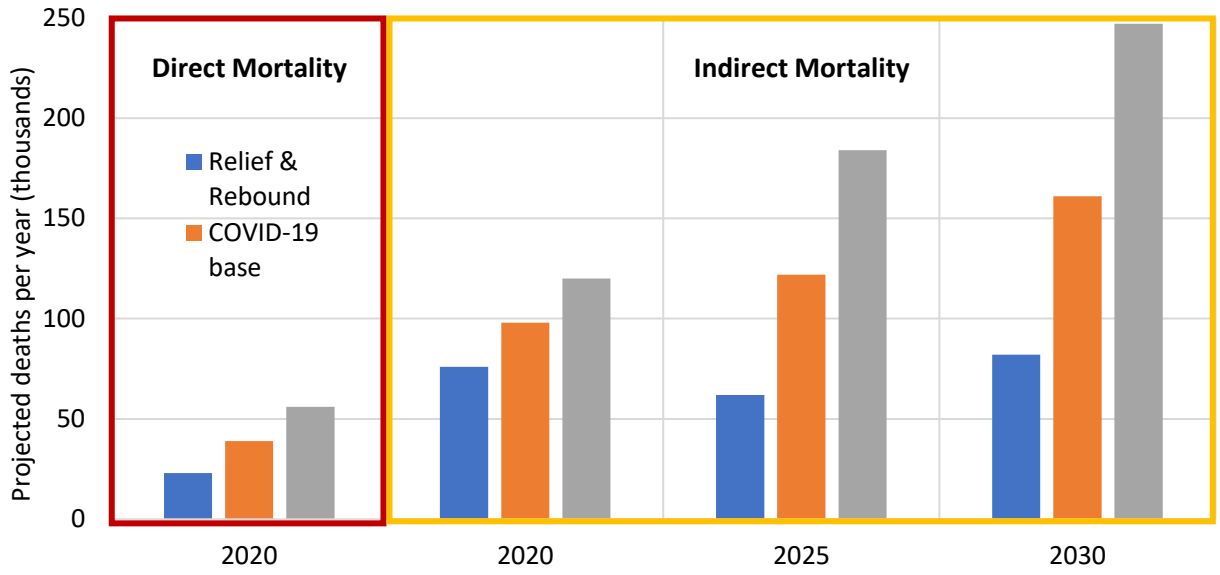


*Figure 9: Direct and indirect mortality for the Africa-10 countries following the COVID-19 pandemic across the three scenarios. Mortality projections are relative to a No-COVID scenario.*

There is considerable country-to-country variation in the relative importance of direct and indirect mortality (Figure 10). For each country we calculated the mortality ratio, the relative increase between the mortality in a COVID-19 scenario (*COVID-19 base)* and *No-COVID* mortality in 2020, 2025 and 2030. For all countries the mortality ratio is above 1 by 2030, indicating that all countries suffer from increased indirect mortality. However, there are some important and remarkable differences. Cabo Verde and South Africa are primarily affected by direct COVID-19 mortality, with declining mortality ratios over time. The opposite is true for many other countries, most notably Nigeria and Mali, for which the indirect mortality by far exceeds the direct mortality from COVID-19. Without sustained economic growth and government action these countries are projected to suffer significant increases in indirect mortality, following the economic decline.

The majority of indirect COVID-19 deaths are children under five years, encompassing around 80% of indirect COVID-19 mortality by 2025 and 2030. In 2020, child mortality under five years accounts for less than 1% of total direct COVID-19 mortality. On the contrary, across all scenario's child mortality accounts for 82% of indirect mortality by 2030. These increases in indirect child mortality are driven by increases in preventable communicable diseases. By 2030, in the *Relief & Rebound* scenario increased mortality occurs as a consequence of diarrhea (+4.0%), malaria (+5.4%) and respiratory infections (4.0%). In the *Global Suffering* scenario, a larger economic downturn further drives increased mortality due to diarrhea (+12.7%), malaria (15.8%) and respiratory infections (+12.0%). Over time, young children might present the largest share of COVID-19 related mortality.

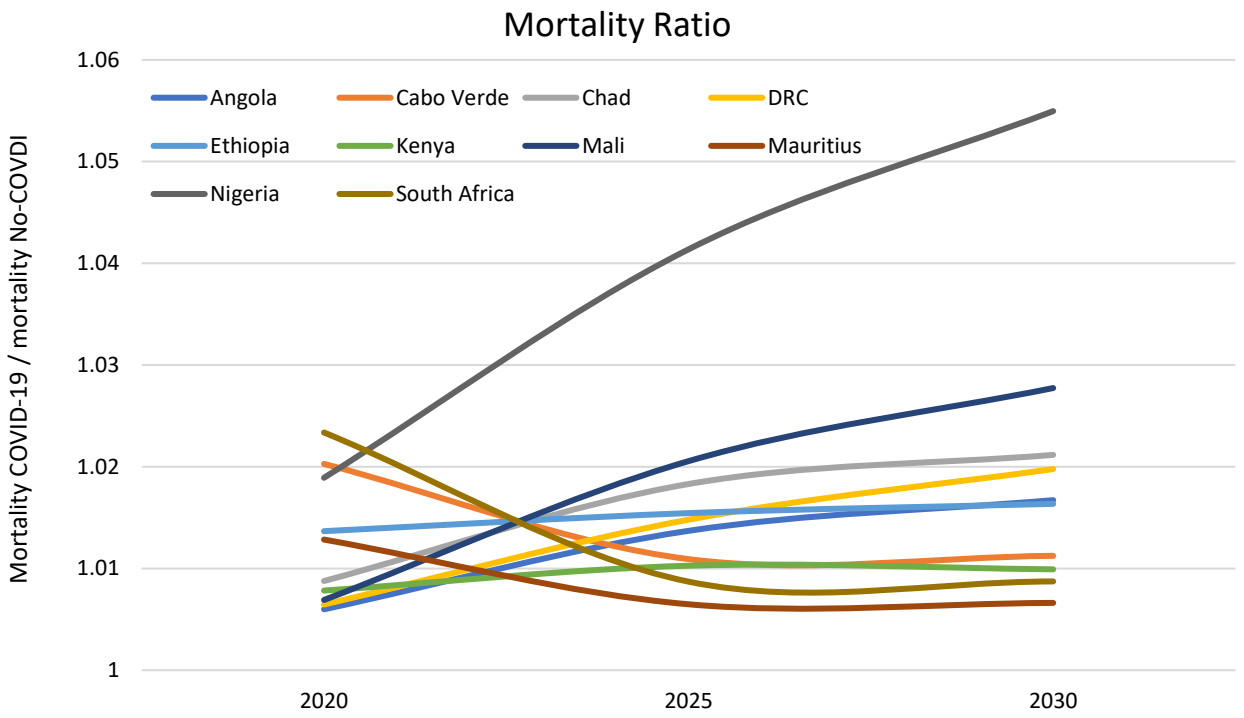


*Figure 10: Mortality ratio for the Africa-10 countries in 2020, 2025 and 2030. The mortality is calculated as the increase in mortality between a COVID-19 base scenario and a No-COVID scenario. Here we depict the results for the COVID-19 base. The mortality ratio is calculated for 2020, 2025 and 2030. The dotted lines are not data points but are intended to describe the direction of trend of the individual countries.*

The study of post-crises recovery suggest that the quality of government institutions helps in 1) minimizing the economic shock and 2) furthering economic growth post-recession. As such, better government institutions around lower levels of corruption, higher government effectiveness and higher levels of political stability could be an important indicator of post-COVID recovery. Here we use a government capacity (0-1) which an aggregate index measuring the quality of government institutions across these domains. We identify two different country set, countries with a government capacity below 0.3 and countries with a government capacity above 0.3.

The burden of increasing indirect COVID-19 mortality primarily falls to countries with low government capacity. (Figure 11). These countries have much high levels of indirect mortality, coupled with relative low levels of direct mortality. On the contrary, countries with higher government capacity have higher levels of direct mortality, coupled with a lower level of indirect mortality. Thus, countries with low government capacity might be less resilient, and will experience the biggest hit of COVID-19 on mortality numbers not today, but over the next decade. This increased mortality primarily consist of children mortality under 5 years.

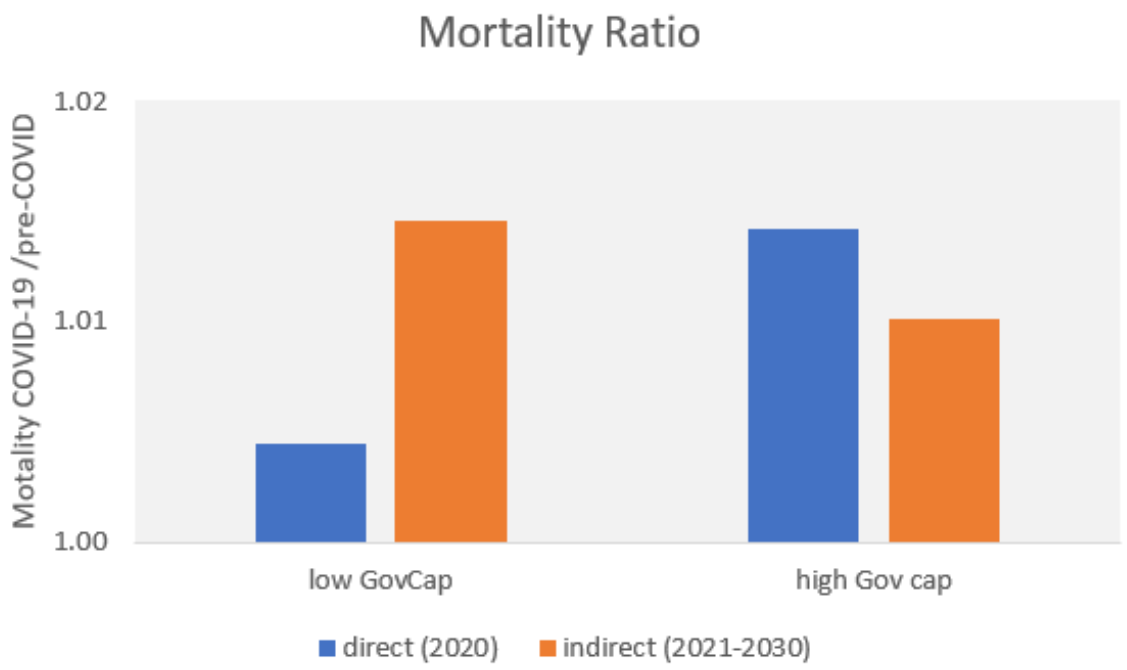


*Figure 11: Direct and indirect mortality in countries with low and high government capacity. We distributed the countries into two groups, countries with a government capacity below 0.3 and countries with a government capacity above this value.*

Related to both government capacity and mortality following the COVID-19 pandemic are government expenditures on the health system. Based on the sample, we divided countries into two groups, one with investment below 2% of GDP in the health sector prior to COVID-19 and second a group with investments above 2% in the health sector.

Indirect mortality in countries with low levels of government investments in health is even more pronounced (Figure 12). Initially, these countries are lucky with relative low levels of increased direct COVID-19 mortality. However, this relief is temporary as these countries experience an increase in indirect mortality.

Together, these results highlight an important pattern. For many countries the COVID-19 mortality isn't over after the pandemic. On the contrary for many countries indirect mortality driven by the economic downturn by far will exceed direct COVID-19 mortality over the next decade. This indirect mortality disproportionally falls to children, and countries with low levels of government capacity and investment in the health system prior to the pandemic. Thus, COVID-19 might result in increased mortality and especially increased child mortality for many African countries over the next decade.

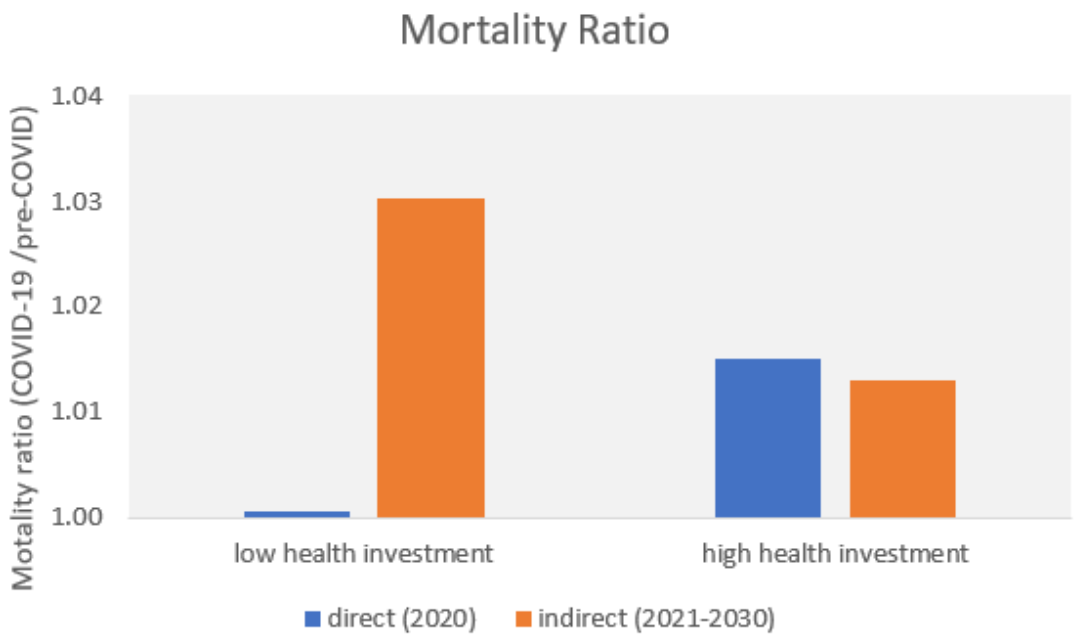


*Figure 12: Direct and indirect mortality on countries with low and high government capacity. We distributed the countries into two groups, countries with a government capacity below 0.3 and countries with a government capacity above this value.*

## Second Order: Domestic Patterns of Development

Model results for GDP in 2020 and 2021 follow IMF World Economic Outlook projections. On average for the *Africa-10*, the GDP growth in 2020 is -3.3% in *Relief & Rebound*, -4.8% in *COVID-19 base* and -6.3% in *Global Suffering* (Figure 13). From 2021 onwards GDP growth is positive. In 2021, both the *COVID-19 base* (+3.3%) and the *Relief & Rebound* (+4.8%) model an economic rebound, with higher GDP growth than a *No-COVID* scenario (+2.7%). However, this rebound is short-lived, and by 2022, all scenarios are projected to have a GDP growth slightly below a *No-COVID* scenario.

The negative GDP growth in 2020 results in a drop in GDP of 77.8 billion USD in *Relief & Rebound* ranging to 117.5 billion USD in the *Global Suffering* scenario relative to a *No-COVID* scenario (Figure 14). The projected drop in GDP is larger than the size of the Kenyan economy (64.5 billion USD) prior to COVID-19. Whereas GDP growth rebounds, absolute GDP remains below a *No-COVID* scenario. In 2021 the projected GDP across *Africa-10* in a *No-COVID* scenario is 1,393 billion USD, with *Relief & Rebound* showing a slight recovery (-77.8 in 2020 versus -52.5 in 2021), *COVID-19 base* showing a stabilization (-97.6 in 2020 to -92.2 in 2021) and *Global Suffering* showing a worsening economic impact (-117.5 in 2020 versus -131.3 in 2021). The most optimistic *Relief & Rebound* scenario reaches 2019 GDP-levels by 2021, whereas the *COVID-19 base* and the *Global Suffering* take respectively an additional one to two additional years to reach 2019 GDP-levels again.

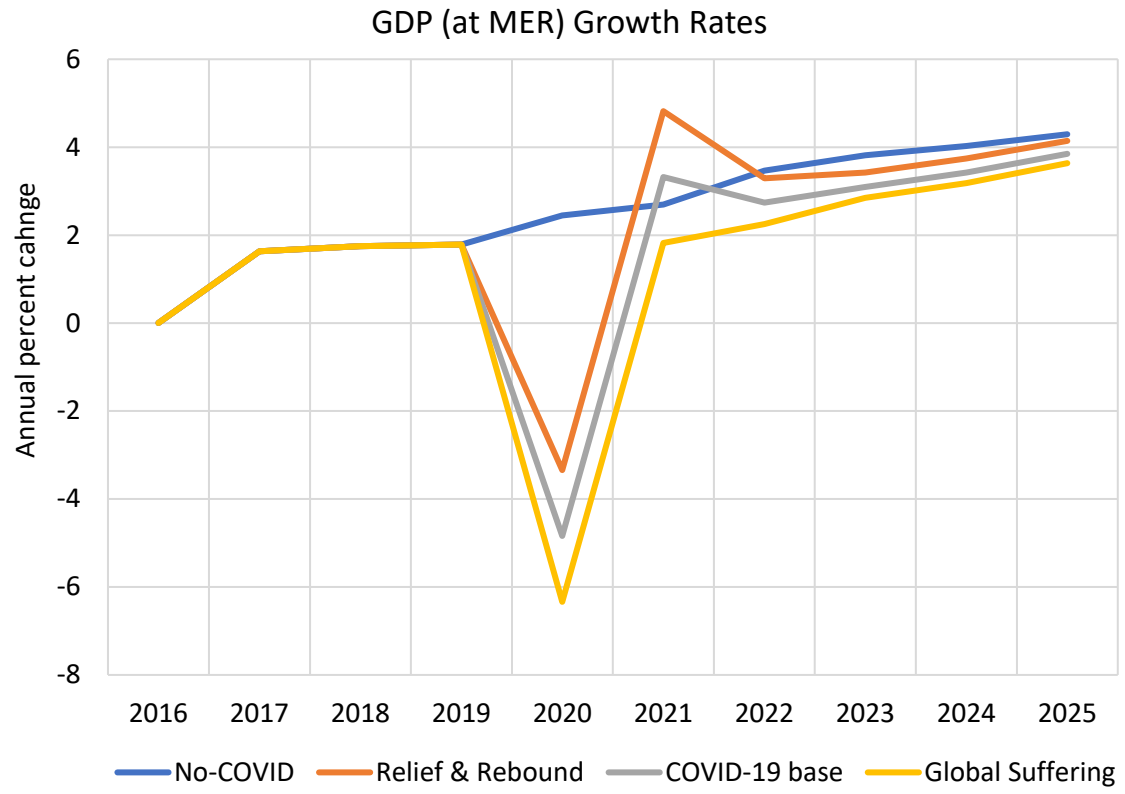


*Figure 13: GDP growth rates across scenarios to 2025. GDP growth rates for 2015-2021 are based on IMF growth rates.*

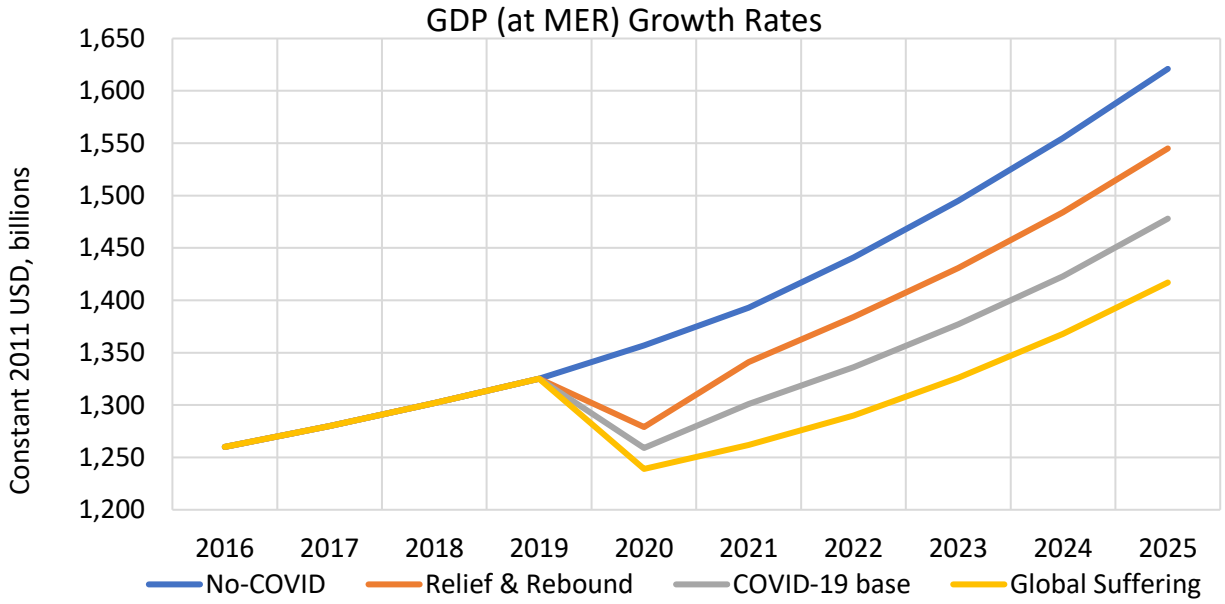


*Figure 14: GDP at MER across scenarios towards 2025 in 2011 constant USD.*

The reductions in GDP of the initial COVID-19 shock continue to 2030 and 2050. However, there are differences in the economic recovery following the pandemic (Table 15). We calculated the percent reduction in GDP in 2020, 2030 and 2050 between the three COVID-19 scenarios and the *No-COVID* scenario. In the *COVID-19 base* scenario all countries show reductions in GDP in 2020, 2030 and 2050 compared to a pre-COVID scenario. In other words, no country is capable of fully recovering from the COVID-19 pandemic economic shock with GDP reductions projected towards 2050.

*Table 15: GDP impact by country, 2020, 2030, and 2050, measured as the percent change in GDP between a No-COVID and the three COVID-19 scenarios*

| | Relief & Rebound | | | COVID-19 base | | | Global Suffering | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2020 | 2030 | 2050 | 2020 | 2030 | 2050 | 2020 | 2030 | 2050 |
| Angola | -1.1 | 0.1 | 3.2 | -2.6 | -4.5 | -0.7 | -4.1 | -8.7 | -4.5 |
| Cabo Verde | -7.1 | -6.6 | -6.6 | -8.5 | -11.3 | -11.8 | -10.0 | -15.5 | -12.2 |
| Chad | -3.9 | -0.2 | -0.3 | -5.3 | -5.0 | -6.5 | -6.7 | -9.5 | -12.3 |
| Democratic Republic of Congo | -4.4 | -2.3 | -0.6 | -5.9 | -6.8 | -5.1 | -7.3 | -11.5 | -10.1 |
| Ethiopia | -2.3 | -4.2 | -6.5 | -3.7 | -8.3 | -11.9 | -5.1 | -12.3 | -17.4 |
| Kenya | -3.3 | -0.5 | -0.9 | -4.7 | -5.7 | -7.6 | -6.1 | -10.5 | -14.3 |
| Mali | -1.9 | -0.6 | -2.2 | -3.3 | -5.6 | -9.2 | -4.8 | -10.7 | -16.3 |
| Mauritius | -8.8 | -2.6 | -3.2 | -10.2 | -6.3 | -6.9 | -11.7 | -9.9 | -10.5 |
| Nigeria | -6.2 | -8.2 | -7.9 | -7.7 | -13.4 | -14.2 | -9.2 | -18.7 | -20.9 |
| South Africa | -7.5 | -5.0 | -6.9 | -9.0 | -9.0 | -11.2 | -10.5 | -12.2 | -14.8 |

There are important differences in the direction of the prolonged economic reduction in 2030 and 2050, with some countries showing a partial recovery (GDP decline 2030/50 < GDP decline in 2020) and other countries showing a further deterioration over time (GDP decline 2020 > GDP decline in 2030/50). First, across all scenarios Mauritius is the only country showing partial recovery following the pandemic. In the *COVID-19 base*, Mauritius recovers from a GDP reduction in 2020 of -10.2% to a reduction of -6.9% in 2050. Angola also shows partial recovery following COVID-19, but this finding depends on the magnitude of the COVID-19 shock and differs per scenario. In the *Global Suffering* Angola does not show recovery in the decades following the pandemic. As such, only Mauritius shows economic recovery and long-term resilience across all scenarios irrespective of the 2020 GDP-shock

A second group of countries show a relative worsening of the GDP effect over time. For these countries the initial COVID-19 economic impact results in a downward pressure resulting in worsening economic conditions over time relative to their *No-COVID* trajectory. This group consists of Ethiopia, Mali and Nigeria. For Nigeria, the COVID-19 initial GDP reduction of -7.2% is almost doubled by 2050 to -14.2%. For Ethiopia and Mali, the GDP reduction more than doubles over time, with the initial reduction in Ethiopia worsening from -3.7% to -11.9% in 2050 and Mali worsening from -3.3% to -9.2% in 2050. Last, there is a group of countries which either show some slight recovery or deterioration over time. This includes Cabo Verde, Chad, Democratic Republic of Congo, Kenya and South Africa. Except for Democratic Republic of Congo, all these countries show worsening GDP reductions over time in the *COVID-19 base* scenario, with the largest effect in Cabo Verde (-8.5% in 2020 and -11.8% in 2050).

To this point we have demonstrated differences in recovery patterns following the economic shock across *Africa-10* countries, but have not yet explained why these recovery patterns differ. Similar to the results on direct vs indirect mortality there is a wide array of interconnected indicators at play that explain the economic recovery of a country. Here we highlight a few key indicators and country typologies that explain these differences. We use the outcomes of the *COVID-19 base* scenario to calculate differences between country groupings. To control for the initial GDP reduction of the pandemic we calculate a recovery ratio, the GDP reduction in 2020 relative to the GDP reduction over time. As such a recovery ratio of 1, is a country with an equivalent drop in GDP in 2030 as in 2020. Countries with a recovery ratio above 1 are capable of partly recovering from the economic shock, whereas countries with a recovery ratio below 1 suffer from increasing economic declines over time.

Countries with high government capacity have a stronger long-term resilience to the COVID-19 economic shock (Figure 15). Similar to the analysis on mortality, we aggregated the ten countries into two groups: countries with a low government capacity below 0.3 and countries with a high government capacity above 0.3. The countries with a high government capacity, show a stronger immediate rebound in 2021 and 2022, and a stabilization of the economic shock towards 2050 (-0.0% reduction in GDP). On the contrary countries with a lower government capacity show a smaller immediate rebound in 2021 and 2022. More importantly, these countries show increasing economic declines to 2040, resulting in an on average additional reduction of around 5%. These results highlight the importance of government capacity. In general, countries with higher government capacity are more resilient to the economic shock following the pandemic. On the contrary countries with lower government capacity suffer similar initial losses, but then receive a second hit by worsening economic declines over the next decades.

Agricultural based economies have less economic recovery following the COVID-19 economic recession (Figure 16). Countries with high levels of the population working in the agriculture sector (>40%) are less resilient to the COVID-19 economic, with continued economic declines to 2050. On the contrary countries with much smaller labor shares in the agricultural sector show recovery following the COVID-19 pandemic with on average across these countries an economic recovery ratio remaining above 1 to 2050. The economic decline following the COVID-19 pandemic slows the transition from a more agricultural focused economy, towards a more diversified domestic economic structure with higher labor in sectors with higher value add to the economy (services, ICT). The biggest offset is experienced by countries with currently the highest labor share in agriculture. As such, COVID-19 postpones this shift in economic structure across these countries and results in an economic decline still apparent in 2030 and 2050.

The previous analysis on country groupings and indirect mortality, or economic recovery pinpoints broad determinants and policy strategies on the importance of investments in health, the level of government capacity and the agricultural labor share in an economy. However, one should be wary of not oversimplifying this finding to individual countries. Whilst economic recovery across country groups might be explained by the level of government capacity, this finding is unlikely to hold for each country individually. On the contrary translating these findings into country-level policy requires understanding of the specific economic, development and policy context of each of these countries. Nonetheless, our analysis shows the importance of health investment, government capacity and agricultural labor in explaining differences in recovery patterns (both economic and indirect mortality) across countries, and more generally highlights that countries with lower levels of economic development, human development and governance are likely to experience the strongest long-term negative effects of COVID-19.

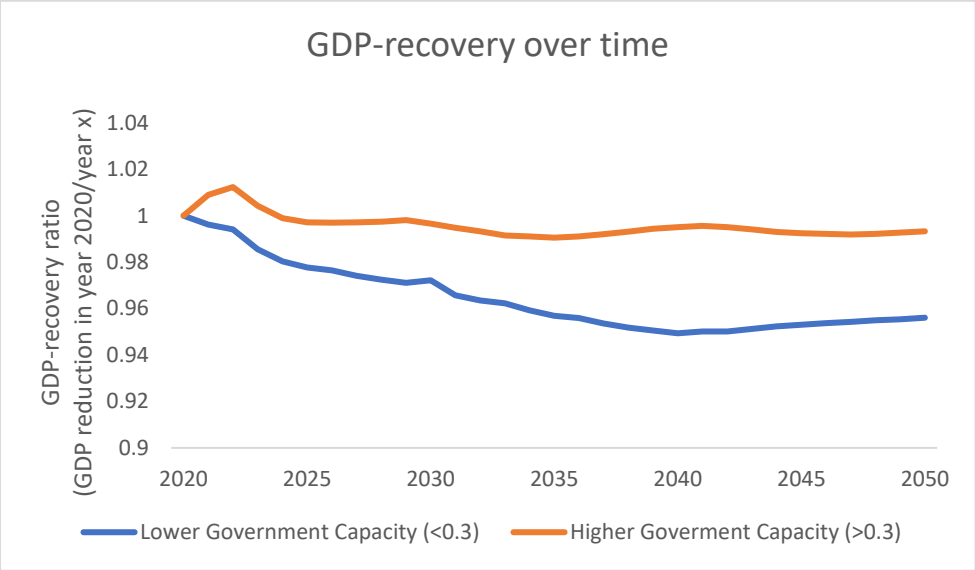


*Figure 15: GDP effect over time by level of government capacity. The GDP effect is calculated as the difference in GDP between the COVID-19 base and a No-COVID scenario, and then normalized relative to the initial 2020 GDP reduction. Values above 1 indicate a partial recovery, whereas values below 1 suggest a worsening economic impact over time*

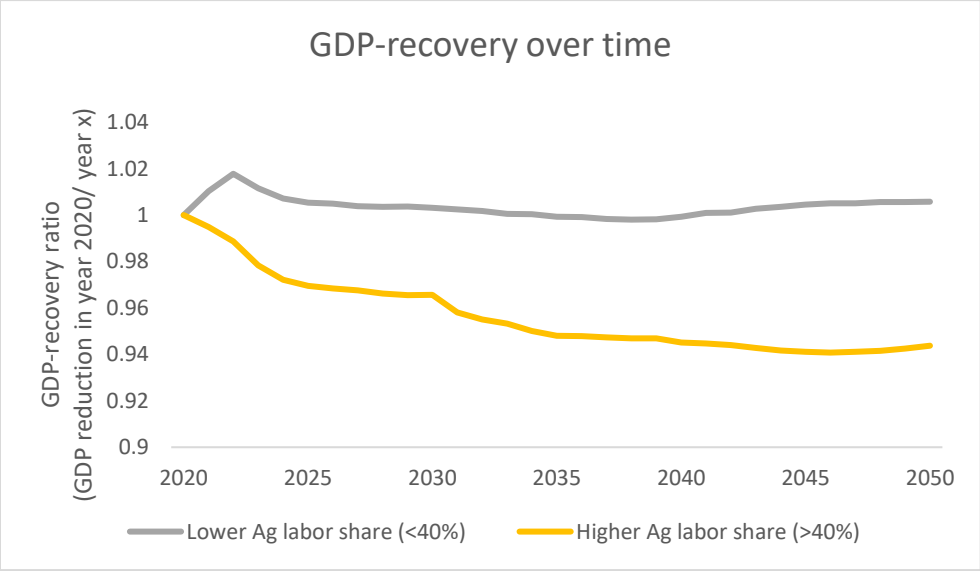


*Figure 16: GDP effect over time by share of agricultural labor. The GDP effect is calculated as the difference in GDP between the COVID-19 base and a No-COVID scenario, and then normalized relative to the initial 2020 GDP reduction. Values above 1 indicate a partial recovery, whereas values below 1 suggest a worsening economic impact over time.*

The COVID-19 economic shock directly reduces household income and increases poverty levels across the *Africa-10*, but also increases poverty levels towards 2050 (Figure 17). In a *No-COVID* scenario, poverty across the *Africa-10* countries drops from 45.0% of the population in 2019 to 17.7% in 2050. In 2020, COVID-19 increases poverty levels by an additional 1-2% of the population, to 46.3% in the *Relief & Rebound* scenario and 47.0% in the *Global Suffering* scenario. The increase in poverty levels across all

scenarios is persistent, with COVID-19 scenarios having higher poverty levels by 2050 than a *No-COVID* scenario. However, in the most optimistic scenario poverty converges with an additional 0.6% of the population living in extreme poverty by 2050, relative to the initial increase of 1.4% in 2020. On the contrary, the *Global Suffering* scenario shows a diverging trend with an additional 2.9% of the population living in extreme poverty by 2050, relative to a 2.1% increase in 2020.

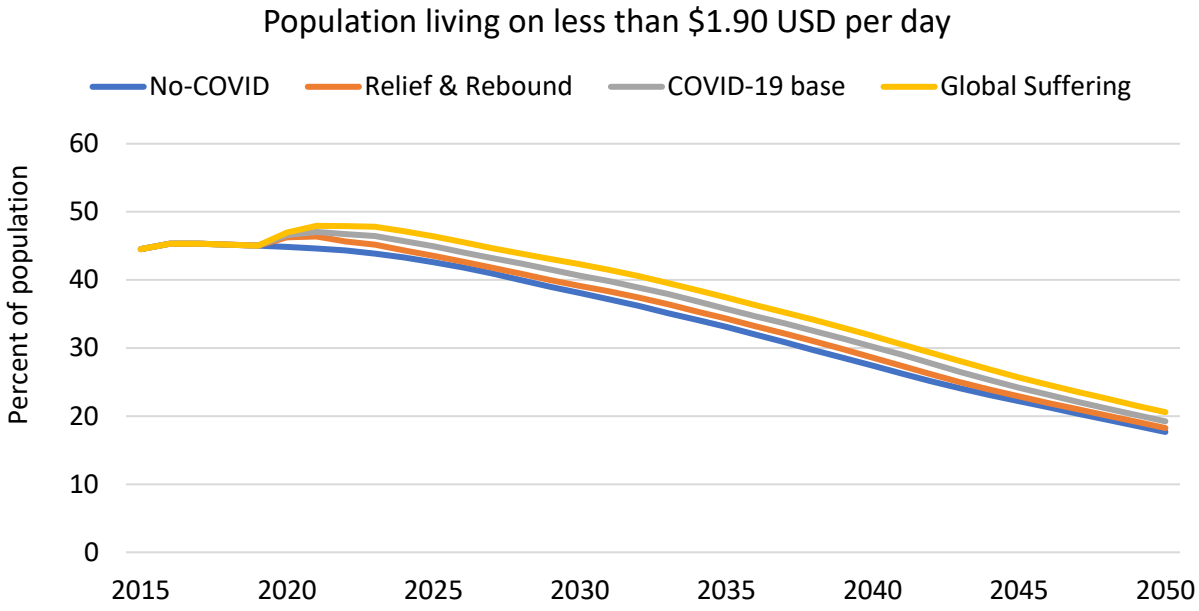


*Figure 17: Percent of the population in extreme poverty by scenario over time.*

## Third-order: Shifting patterns of international trade

Historically, global economic shocks have resulted in significant changes to the profile of integration in terms of redistributing the prominence of a country in the global economy and rewiring trade networks (Gomez, Torgler, and Ortega 2013). The new position that (African) countries find themselves within the global economy will depend on the macro-economic impacts to their domestic economy (second-order) as well as that of their key trade partners (Figure 18). Importantly, though COVID-19 is a global shock, the effect across countries is uneven and bilateral trade patterns are likely to gravitate towards large economies that are well positioned to capture a larger share of global trade. This repositioning will likely depend on 1)the relative domestic economic shock from COVID-19, 2) the relative economic shock of trade partners from COVID-19 and 3) the domestic economic structure, and the international connectivity of countries prior to COVID-19. This holds true for African countries which are expected to become more aligned with countries that have weathered or recovered well from COVID-19, and away from the major players that struggled more with the pandemic and as a result lost ground in the global economy.

### Trade shocks over the short-, medium-, and long-run.

In the short-run, trade shocks arise from the economic impact of COVID-19 though depressed consumption leading to lower import demand, as well as from anemic export capacity as a result of slower rates of production due to pandemic-control measures, supply chain disruptions, and lower levels of investment (foreign and domestic). In addition, countries will incur demand-side shocks due to the economic contraction of a country's key trade partners for the same reasons.

Given the swift recovery of household consumption and production (IFs projects that household consumption and GDP for *Africa-10* will return to pre-COVID 2020 estimates in roughly three years), longer-term changes in aggregate trade and trade patterns will be increasingly dominated by the recovery of their traditional trade partners.

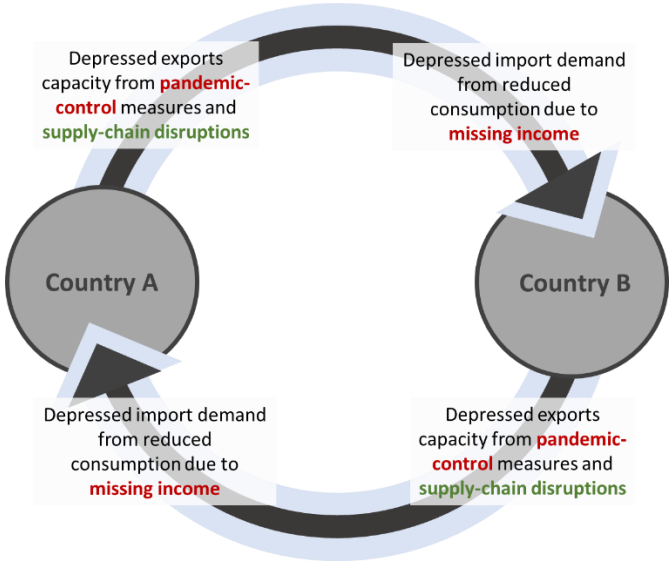


*Figure 18: Conceptual framework highlighting the effect of COVID-19 on bilateral trade between two countries.*

Figure 19 shows *Africa-10*'s top trade partners in 2019, ranked according to their trade as a percent of total trade. In 2019, these countries represented nearly 60 percent of total *Africa-10* trade. While trade with China

represented nearly twice that of the next largest trade partner (India), the country still only accounts for just over 12 percent of total regional trade (ranging from nearly 20 percent in Angola and Democratic Republic of Congo to just over 5 percent in Mali). In 2019, nearly all countries had a greater trade dependence with Europe, ranging from Cabo Verde with nearly 60 percent of total trade occurring with EU28, to Ethiopia with nearly 20 percent. Democratic Republic of Congo is the only country where trade with China (19 percent of total trade) surpasses trade with the EU28 (14 percent).

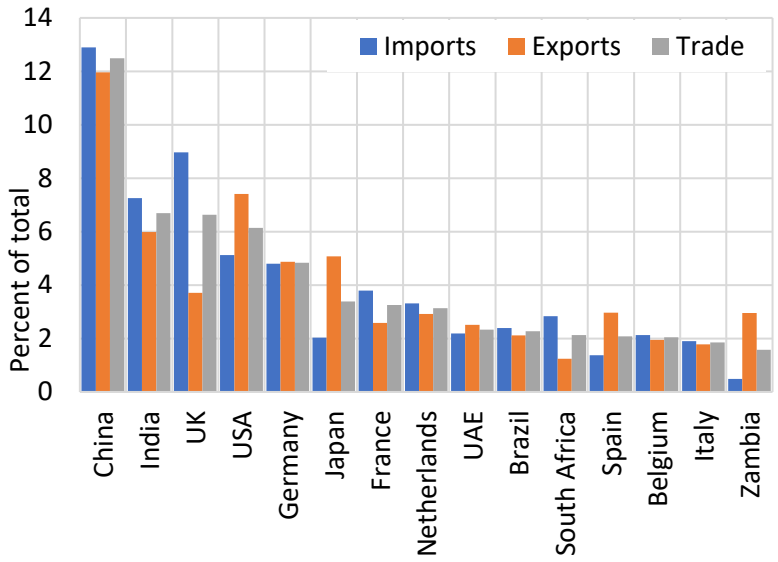


*Figure 19: Top trade partners for the 10 African case study countries in 2019, pre-COVID.*

While no country has been left untouched by the pandemic, the economic impact is expected to be unevenly distributed. Unfortunately, among *Africa-10*'s top trade partners are some of the countries projected to be most severely economically impacted by the pandemic. India, UK, USA, France, and Spain all are expected to experience a reduction of between 17 and 26 percent in both exports and imports in 2020 relative to a *No-COVID* scenario.

Many of these countries are also expected to struggle with a longer recovery period. Table 16 summarizes the recovery of select trade partners by estimating the number of years required to return to pre-COVID estimates of GDP and trade in 2020, alongside the share of *Africa-10's* total trade in 2019. It highlights the finding that Europe is expected to have a much slower recovery than many other, particularly developing, economies.

*Table 16: Recovery of trade partners in terms of GDP and trade levels. Recovery is estimated as the years required to return to the 2019 values of GDP and trade.*

| | Share of *Africa-10* trade in 2019 | Years to reach 2019 levels of | |
|---|---|---|---|
| | | GDP | Trade |
| China | 12.5 | 1 | 2 |
| India | 6.7 | 2 | 2 |
| UK | 6.6 | 9 | 11 |
| USA | 6.1 | 6 | 5 |
| Germany | 4.8 | 5 | 6 |
| Japan | 3.4 | 8 | 6 |
| France | 3.3 | 11 | 14 |
| Netherlands | 3.1 | 10 | 14 |
| UAE | 2.3 | 3 | 2 |
| Brazil | 2.3 | 13 | 18 |
| South Africa | 2.1 | 8 | 10 |
| Spain | 2.1 | 20 | 19 |
| Belgium | 2.1 | 4 | 9 |
| Italy | 1.8 | 13 | 16 |
| Zambia | 1.6 | 3 | 3 |

Recovery patterns will be somewhat determined by growth potentials linked to longer-run dynamics such as their current product sophistication profile (higher levels of growth are often available to economies starting from lower value-added production bases) and demographics (Europe is an older and aging population with low – sometimes negative – contributions to growth from labor whereas India's labor force is still rapidly growing). Generally, this translates to trade partners in Europe experiencing a much slower recovery than those in Asia or Africa.

This uneven distribution of recovery means that the larger economies that are relatively less effected or that are able to better manage recovery, will be better positioned to carve off a larger portion of global trade by filling unmet import demand and absorbing surplus export capacity. Of *Africa-10's* largest trade partners, China, Japan, and to a lesser extent UAE, are the only countries positioned to capture larger shares of global trade. Europe, India, USA, and South Africa are all expected to recover from the pandemic with less of a global presence than they would have enjoyed otherwise. Figure 20 illustrates this shift away from the US and Europe and towards China, where colors indicate the absolute change in global trade shares. Relative to a *No-COVID* scenario, China absorbs roughly 0.7 percentage points more of global trade, at the expense of 0.3 percentage points from the US, and over 1 percentage points from Europe (top). Smaller countries and regions have a less noticeable change in their global presence. However, relative to a pre-COVID scenario, the *Africa-10* countries experience roughly a 3 percent increase in global trade shares, with some southern African countries experiencing a slight reduction in global trade shares (only South Africa experiencing a drop (between -0.6 and -1.6 percent) (bottom).

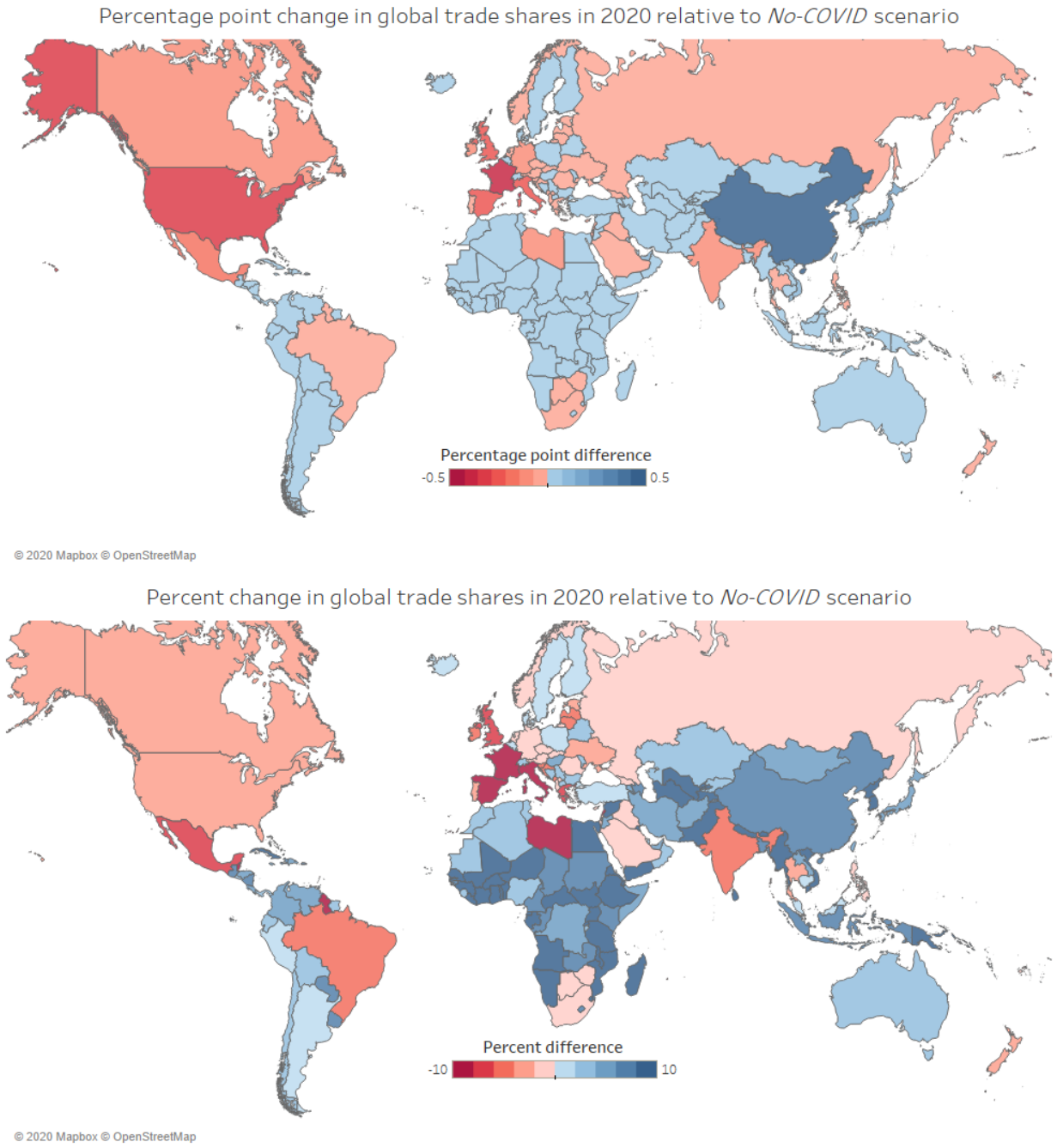


*Figure 20: Top: Percentage point change in global trade share following COVID-19. all countries. Bottom: Percent change in global trade share following COVID-19.*

As China and other large economies that manage stronger recoveries begin to play a more central role in global trade, their relationships with *Africa-10* countries are also expected to strengthen. Figure 21 illustrates a shifting of *Africa-10* trade towards China and away from EU28.

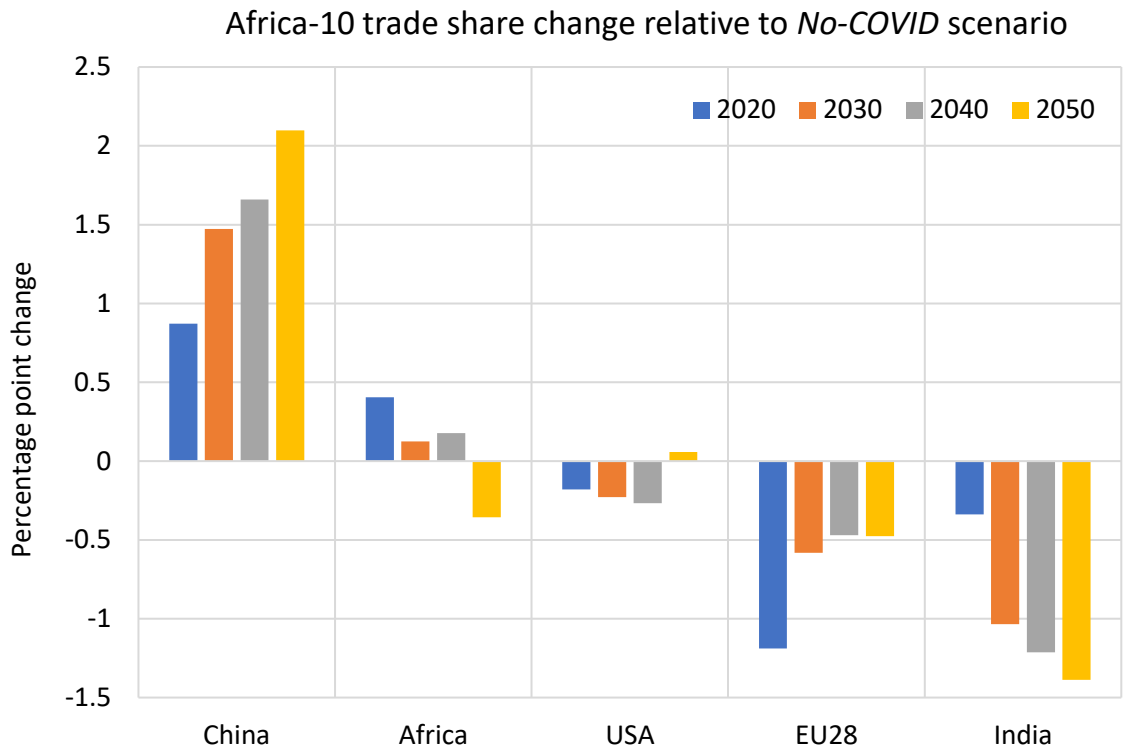


*Figure 21: Long term changes in the relative share of trade between the Africa 10 countries and their major trading partners.*

There are some country-level differences in how these long-term shifts play out (Figure 22). All countries show a relative increase in trade with China, compared to the USA, India or the EU28. Even more so, all countries also show a decline in relative trade with EU28 and India.[2] The shift in trade patterns with the USA is smaller, given the relatively smaller dependency on trade with the USA. An exception is Chad which sees an initial decline in trade with the USA, followed by a relative larger share in 2050. For the specific countries, Angola, Democratic Republic of Congo, Ethiopia, Nigeria, South Africa all grow closer to China than other regions. Whereas Cabo Verde, Chad, Kenya, Mali, and Mauritius experience a greater relative increase in in intra-African trade.

[2] While India is expected to make a swift recovery to pre-COVID (2019) levels, the country's foregone growth and trade relative to a *No-COVID* scenario is one of the largest among *Africa-10's* top trade partners.

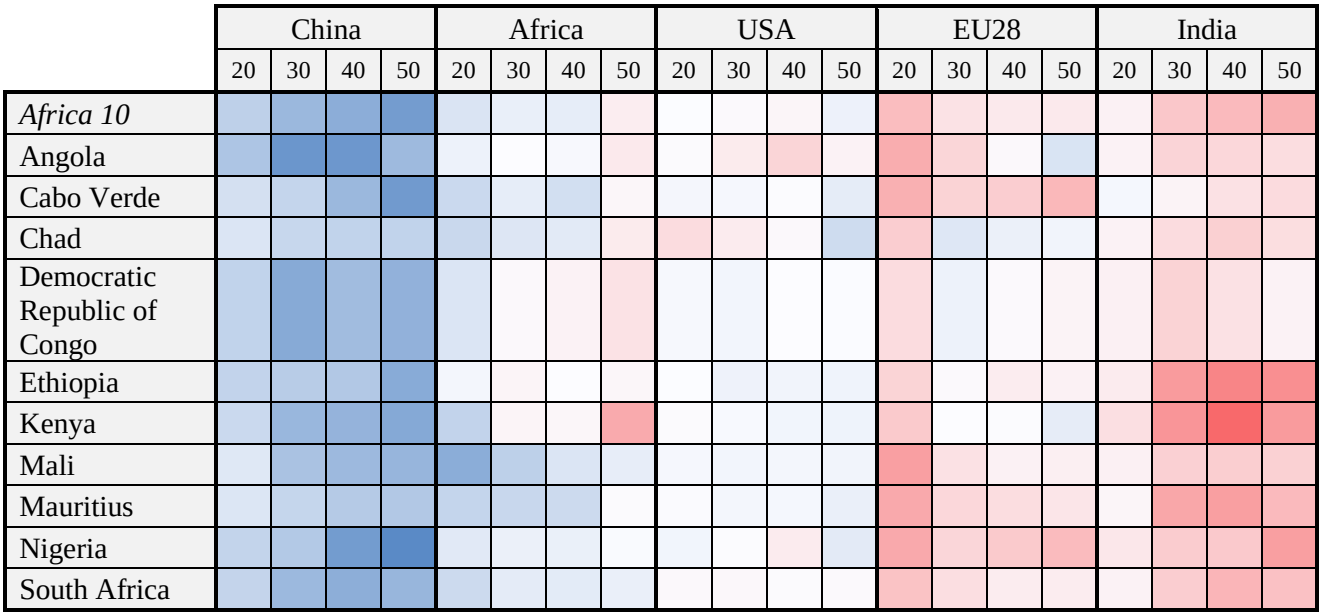


*Figure 22: Relative shifts in trade balance between the 10 African countries and some of the major trading partners in 2020 (20), 2030 (30), 2040 (40), and 2050 (50). Dark blue means a strong increase in relative trade compared to a No-COVID scenario. Dark red means a strong decrease in trade relative to a No-COVID scenario. For reference, the largest positive change (Nigeria-China in 2050) represents a 2.6 percentage point shift, and the largest negative change (Kenya-India in 2040) represents a 2.5 percentage point shift.*

## Main takeaways

**COVID-19 has shifted from a health and economic crises to a system-wide crisis, with potentially long-lasting effects on country level domestic development and on international trade relations**

COVID-19 started as a health crisis in China, quickly followed by a global economic crisis. However, this analysis shows that COVID-19 is changing the broad macro-economic and human development trajectories of countries today, and with knock-on long-term effects exacerbating existing vulnerabilities within countries.

The effects of COVID-19 on macro-economic development move far beyond mortality in 2020 and largely flow from the reductions in GDP in Africa and its trading partners. We show that COVID-19 reduces international flows of trade, foreign aid, remittances and FDI, drives up poverty in 2020 and to 2050, increases mortality over the next decade mostly from communicable diseases, increases child mortality, and drives a shift in trade patterns with increasing trade with China and decreasing trade with the EU and India.

Whilst COVID-19's effect on human lives and the economy is negative, the changes to international flows are much more complex. We show how COVID-19 has immediate and diverging effects on trade balances at the country level, measured as the difference between exports and imports relative to GDP. Prior to COVID-19 most of the *Africa-10* had negative trade balances (higher imports than exports). The effect of this pandemic has been to simultaneously reduce exports and imports leading to almost no net change in

the trade balance across all 10 countries. In contrast to trade, COVID-19 significantly reduces FDI to all *Africa-10* members but with disproportionate reductions in the FDI of oil producing countries.

Beyond the reach of the analysis presented here, the work done by others has highlighted the wider implications of COVID-19 on government finances, child mortality, socio-economic development and risks to internal conflict, as well as the disproportionate effects of COVID-19 on all these indicators across different African countries (Moyer and Kaplan 2020; OECD 2020a; Roberton et al. 2020; Spiegel, Schwank, and Obaidy 2020). This will further complicate a response to the COVID-19 pandemic. For example, government finances are being negatively affected, with many countries concerned about rising debt-to-GDP ratios, which in some cases are projected to reach 100%. In South Africa, for instance, average annual growth rates of as high as 4-5% will be required to stabilize debt-to-GDP without draconian cut-backs on government spending. The COVID-19 pandemic has pushed this stabilization increasingly out-of-reach, with a forecasted -5% growth for 2020 across the *Africa-10* countries. For oil-dependent countries like Nigeria, Angola and Chad, the March-April drop in oil price to USD 9 devastated government revenues, on top of lockdown interventions affecting non-oil revenues, and the projected drop in FDI. Loans and other interventions to stimulate the economy in the face of these challenges are accelerating negative debt-to-GDP ratios in these countries too.

In conflict-affected and fragile states, there are fears that tensions could escalate in the wake of the pandemic given reductions in government revenues to deliver various services such as health, education and security. Among the *Africa-10*, Mali and Chad are expected to be worst affected, facing a multi-year, multi-dimensional crisis involving terrorism and rising domestic political tension. The effect of the pandemic on top of these pressures could push political and social order to a tipping point (Moyer and Kaplan 2020).

Our analysis shows that even after the health crisis has been controlled by limiting virus spread and eventually the distribution of a vaccine, the impacts of the pandemic will be far from over, with long-term increases in disease prevalence and mortality across countries, long-term changes to economic structures, shifts in patterns of international trade and wide, predominantly negative implications for government investment and human progress in areas such as education, health, poverty eradication and child mortality. This wide array of immediate and long-term effects requires governments to think much more creatively on how to respond to COVID-19 across all domains. As such, neither a vaccine nor a specific set of orthodox government measures will be a panacea for addressing the system-wide implications of COVID-19. If anything, COVID-19 emphasized the need for a comprehensive review of Africa's recent efforts at economic transformation. In particular, the continent needs much more determined efforts at using modern technology to leapfrog and rapidly implement initiatives such as trade integration.

***COVID-19 is a multiplier on country level vulnerabilities and development challenges, with long-term increases in mortality and reductions in economic growth affecting the most vulnerable countries.***

The immediate effects of COVID-19 in 2020 and 2021 are country-specific and not directly related to pre-COVID economic and human development. The two island nations (Cabo Verde and Mauritius), for example, are among the countries with relatively higher GDP per capita (Mauritius rank: 1; Cabo Verde rank: 3, out of the *Africa-10* countries) and HDI (Mauritius rank: 1; Cabo Verde rank: 2), but are amongst the countries hit hardest in GDP reduction, and most affected by reductions in international flows.

However, in the long-term, the combined COVID-19 shocks are a multiplier on the development challenges that countries faced prior to COVID-19. We show that COVID-19 risks persistent increases in mortality to 2030 and continued, sometimes worsening, economic effects to 2040 and 2050. We show that indirect mortality in 2030, as a consequence of the economic downturn, exceeds direct mortality from COVID-19. This increase in indirect mortality is driven primarily by preventable communicable diseases. By 2030, in

the most optimistic *Relief & Rebound* scenario, increased mortality occurs as a consequence of diarrhea (+4.0%), malaria (+5.4%) and respiratory infections (+4.0%). In the more pessimistic *Global Suffering* scenario, a stronger economic downturn further drives increased mortality due to diarrhea (+12.7%), malaria (+15.8%) and respiratory infections (+12.0%). In addition, mortality of children under 5 years presents over 80% of indirect mortality. Thus, without policy actions COVID-19 threatens to significantly increase child mortality over the next decade.

There are however important differences in the long-term impact across countries, primarily driven by economic, governance and health infrastructure prior to COVID-19. Importantly, we show that the initial COVID-19 shock is not correlated to the long-term socio-economic outcomes. Instead there are important country typologies that drive the long-term outcomes. For countries with low government capacity and low government investment in health systems, the direct mortality from COVID-19 is projected to be small relative to the indirect mortality. The same holds for the economic recovery. Countries with low government capacity and a high labor share in agriculture are projected to face deteriorating economic growth to 2040 and 2050, whereas countries with higher government capacity and lower shares of agricultural labor are not facing continued economic declines. These differences across countries highlight the importance of country-specific vulnerabilities as well as the readiness and capacities of a country to respond to and recover from the combined health and economic effects of COVID-19.

Our analysis highlights some country level vulnerabilities to and recovery from COVID-19. As future global crises, such as climate change including land degradation, desertification and others disproportionately impact African states, much should be done to build country resilience, both in terms of economic and human development. Lessons from post-recession recovery as well as the 2008/9 financial crisis, show that building higher institutional and government capacity over the long-term is key for building resilient economies while also driving short-term economic growth (Sánchez, Rasmussen, and Röhn 2015). Our analysis also underscores the importance of increasing governance capacity for post-COVID recovery and to act to shift the long-term outcomes of COVID-19.

In addition, our analysis highlights the importance of health systems and the disease burden across countries. Improving health systems is crucial for the immediate response to the pandemic but also to minimize the long-term increases in indirect mortality through communicable diseases. This is especially crucial for minimizing projected increases in child mortality. These investment in the health system should be coupled with investment in infrastructure, most notably to improve access to safe water and sanitation.

However, the need to further build government capacity, invest in health systems and infrastructure comes at a time in which government finances are in peril**.** Our analysis shows that countries with low levels of development prior to COVID-19 are prone to suffer the strongest and longest persistent effects of COVID-19 on human lives and economic recovery. As such, there is an emerging relation between the level of development and long-term resilience to the COVID-19 economic shock. We define long-term resilience as the capacity of a country to recover following the COVID-19 shock. Recovery is measured in a broad sense, through excess mortality, economic size, levels of international dependence and extreme poverty. These challenges come at a time in which COVID-19 is projected to reduce government revenues and decrease foreign aid in countries such as Chad, DRC, Ethiopia, Kenya and Mali. The international community should increase efforts to support countries that have poor levels of structural resilience and government capacity to weather the initial COVID-19 shock and recover beyond the pandemic. Additional foreign aid, debt forgiveness, debt restructuring, and other measures taken by the international community should be provided to countries most vulnerable to economic down-turns associated with COVID-19 to minimize the effect on long-term economic and human development.

***COVID-19 results in the acceleration of existing patterns of trade dependency, with a notable increase in the dominance of China, coupled with a reduction in trade dependency with Europe, the USA and India***

Prior to COVID-19, the major trading partners for the *Africa-10* countries were China, India, the EU28, and USA, with intra-African trade representing a lower share of total trade. COVID-19 has affected the economies of these countries in very different ways, with the greatest GDP declines in Europe and India.

In the medium to long-run, this results in a restructuring of global trade networks. Compared to a *No-COVID* scenario, COVID-19 results in an increased shift of the share of bilateral international trade primarily towards China. In contrast, the trade share with India and EU28 declines.

This trend holds for almost all *Africa-10* countries, but there are important country level variations. For example, both Cabo Verde and Kenya, show a shift towards trade with China, but for Cabo Verde this shift mostly comes at the expense of trade with the EU28, whereas for Kenya this shift mostly comes at the expense of trade with India. In the medium-run share of intra-African trade increases in Mali, the country in 2019 with the highest dependency on intra-African trade of the *Africa-10* countries. Chad had a higher dependency on US trade prior to COVID-19, and as such is the only country showing a shift towards trade with the US by 2050.

Slow shifts in trade patterns between international partners have limited effects on human development and should initially be understood as a political consideration. However, countries with significant sectoral dependence on one external partner that may be further consolidating could experience more acute developmental vulnerabilities that are difficult to model using macro-level tools like IFs. We argue that African nations should focus on strategic policy decisions around managed interdependence with the rest of the world.

COVID-19 has laid bare some of the economic vulnerabilities associated with relying on international trade for essential commodities, food in particular. As part of the project we conducted an expert elicitation with country-level experts on the immediate to long-term effects of COVID-19 for their country. During the expert elicitation, many countries were considering moving to increased self-sufficiency (especially when it comes to food supply), coupled with a growing awareness of the unintended risks of globalization and reliance on global supply chains. For example, a number of African countries have seen a COVID-19-related shortage in seed supply for important crops like cowpea, groundnut, sorghum, millet and maize (Gakpo 2020). In Mauritius, sugar barons are shifting from sugar (one of the biggest global cash crops) to other agricultural crops. Overall, Mauritius is a country highly reliant on the global economy for its tourism, financial services and textile sectors. In the case of the country's tourism sector, for instance, recovery to 2019 levels is expected to take 4-5 years and involve significant and deep restructuring, including a pivot to new regional markets and new business models (for example targeting retirees to spend extended periods on the island vs. short stays). These examples from the expert elicitation highlight the strategic considerations countries are making on the type of interdependencies they want to have with trading partners. However, there are also benefits to globalization. As such, strategic decisions on which goods, products and services countries want to be self-sufficient in versus not are crucial.

Similarly, *Africa-10* countries should be strategic about the level of dependence on other nations. Over-reliance on trade, foreign aid, debt, remittances and FDI from a single source presents both economic and political risks. As such, diversification is not only a question of products and sectors but also a question of the reliance and alliances these countries undertake with specific trading partners. This is challenging as the relative effects of future global economic recessions might not follow the same patterns as COVID-19.

While our analysis shows shifts in trade patterns over time, the analysis does not suggest a move away from globalization towards a more regionalized focus. COVID-19 has laid bare some of the risk associated with long supply chains and import dependencies on certain countries and products. Boosting intra-African trade has been a policy ambition prior to COVID-19. To support intra-African trade, countries are setting up the African Continental Free Trade Area (AfCFTA). AfCFTA aims to increase intra-African trade, but also shift exporting goods away from raw commodities towards higher value-add products in industry and services. The COVID-19 pandemic has delayed AfCFTA's implementation, but the combined initiative of the Africa Medical Supplies Platform to jointly supply medicine and medical supplies across countries shows the continued commitment to intra-African collaboration and integration. In the medium to long-term, however, we may well see a greater prioritization of the agreement, as African governments seek to counteract the downturn. Such coordination could take advantage of the unmet demand for goods and services to establish stronger trade relations among African economies. The results presented here do not yet account for a potential increase in intra-African trade following AfCFTA ratification and implementation. However, previous analysis disagree on the extent to which AfCFTA will improve the level of economic and human development in African countries (Kabandula et al. 2020; Moyer et al. 2020; World Bank Group 2020). Nonetheless, intra-African trade and the development of associated regional value-chains will, together with other policies, assist African economies in improving the value-add of exports and knowledge transmission. and is likely to shift the relative interdependencies between African economies and the rest of the world.

## Discussion & conclusion

The analysis presented in this report quantifies selected immediate to long-term outcomes of COVID-19 across a set of macro-economic indicators for 10 African countries. It provides insights into the relative magnitude and duration of COVID-19 on mortality, domestic economic development and international dependencies. Here we focus on some of the main limitations in this analysis.

Most fundamentally, limitations flow from the reality that the COVID-19 epidemic is ongoing as of this writing. There are many uncertainties related to the magnitudes of mortality and of immediate and short-term economic impacts globally and in almost all countries. As we have seen in this study, and barring an unexpected surge in mortality above current projections and scenarios, the more important uncertainty with respect to most longer-term implications lies in the pattern of pandemic-period GDP and its economic impact in the mid-range period of recovery (Friedman et al. 2020; IMF 2020b). Alternative scenarios in this report have allowed exploration of the longer-term outcomes of this uncertainty, but the analytical limitation remains.

There are other important, often derivative, and mostly longer-term uncertainties falling into at least three categories. The first category consists of the fiscal and monetary implications of pandemic-period decisions. Unemployment, economic closures, and combinations of governmental revenue shortfalls with increased expenditure pressures are leading in a great many countries to substantially increased household, firm, and government indebtedness, often coupled with monetary policy loosening. These behaviors will have future implications for government spending and performance with respect to transfer payments and direct spending on education, health, infrastructure, and other public goods. In Africa, the relationship between poverty levels, transfer payments and public spending is pronounced. Thus, spending reductions coupled with governmental searches for additional revenues will affect patterns of future household incomes, their inequality, and broad human development, therefore also affecting the future of poverty. Until the scenarios explored here can be updated with more complete first-order economic effects of the pandemic and augmented with information about changed fiscal and monetary situations and policy choices post-pandemic, the uncertainty will have unknown implications for analytical conclusions. It seems more likely

than not that addition of these factors to analysis will worsen projections of negative socio-economic fall-out from COVID-19.

The second category of uncertainties includes many elements of economic restructuring. The IFs system already translates changes in expected levels of GDP per capita and trade patterns across sectors into changes in sectoral labor demand, including the relative shares of skilled and unskilled labor demand. This analysis has not, however, explored and elaborated the implications of first-order economic effects on total labor demand, its breakdown into formal and informal components, and the interaction of such changes with educational and skill composition of the labor force (related to societal attention to and spending on education and health as noted above). Nor has the study elaborated the potential outcomes of the pandemic for changing patterns of long-term economic productivity, with potentially differential implications for sectors including manufacturing, services, and information/communications. Further, the COVID-19 crisis has been coupled with a reduction in global oil prices that will play out in complicated ways in the longer term for countries such as Angola and Nigeria (Ekeruche and Onyekwena 2020). Many of these economic restructuring elements will affect income distribution, and forecasts of it are therefore not as well-developed and understood in this analysis as desired.

The third category of uncertainties involves a variety of changes in sociopolitical behavior. Perhaps the most important of these is the potential for increased societal instability, conflict and disruptive regime shifts. This increase would seem more likely than a decrease, considering the global instability that followed World War I and the flu epidemic of the era. The epidemic is unfolding in the face of an already unstable situation in some of the *Africa-10* countries (Moyer and Kaplan 2020; UNHCR 2020). More generally, this analysis has also not tried to address the potential for more or less capable governance. Less dramatic perhaps, but still important, immediate sociopolitical changes such as school closures, with limited opportunities for remote learning in many African countries, is resulting in many children currently being deprived of education. While early warnings therefore suggest broad negative effects of COVID-19 on education, there is uncertainty whether COVID-19 will result in permanent reductions in educational attainment or merely a delay in it (and perhaps even some technological enhancement of educational systems and their future performance). Similarly, shifts of attention within health systems to the pandemic cannot help but detract from attention to other critical diseases including HIV/AIDS, malaria, and tuberculosis (WHO 2020). Further, there has been a necessary but costly shift of broader government attention from other challenges, including the locust outbreak in eastern Africa (Mveyange and Mold 2020).

Despite all of these uncertainties and analytical limitations, the basic take-aways and policy prescriptions presented in this report appear likely to prove sound. COVID-19 will have considerable longer-term effects. Even while it may accelerate some positive changes, it is highly probable that the predominant effect will be negative, diminishing the rate of future economic and human development. There will, of course, be further shocks affecting that development, not least those associated with climate change. Ideally, COVID-19 could and should be a strong call to action to deliberately work towards alternative futures by implementing a broad and inclusive economic and human development agenda and by building resilient countries with resilient populations.

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# Appendix 1 – Long -term effects of COVID-19 mortality on economic and human development

There is a great deal of uncertainty involved in projecting direct COVID-19 mortality. The Institute for Health Metrics and Evaluation (IHME) projections of global COVID-19 deaths currently range from 1.8 million to 3.7 million, as of October 14 2020 (IHME 2020). In order to isolate and frame the uncertainty related to the short-, medium- and long-run impacts of these mortality estimates, we have constructed three scenarios, which differ only in their assumptions of direct COVID-19 mortality. In the low mortality scenario (*Low*) there are 32.6 thousand fewer deaths than in the high mortality scenario (*High*). Case fatality rate assumptions by age are the same across both scenarios (Table 17).

Table 17 below summarizes the impact that the mortality assumptions of these two scenarios has on GDP (MER), GDP per capita (at PPP), extreme poverty and trade openness in 2020, 2030, and 2050. The results suggest a very minimal effect, with less than a 1 percent difference between scenarios for every indicator over time. This insight should assuage some concern regarding the validity of results discussed in this report given the significant uncertainty related to mortality projections.

*Table 17: Summary of changes in indicators for UNDP 10 countries between Low & High mortality scenario*

| Indicator | Scenario | 2020 | 2030 | 2050 |
|---|---|---|---|---|
| **GDP at MER** *billion constant 2011 USD* | Low | 1,259 | 1,853 | 6,905 |
| | High | 1,259 | 1,835 | 6,842 |
| **GDP per capita at PPP** *constant 2011 USD* | Low | 3,997 | 4,555 | 8,616 |
| | High | 3,998 | 4,523 | 8,568 |
| **Extreme poverty** *percent of population* | Low | 47.5 | 40.6 | 19.4 |
| | High | 47.3 | 40.9 | 19.5 |
| **Total Trade** *percent of GDP* | Low | 42.8 | 44.8 | 39.8 |
| | High | 42.8 | 45.0 | 40.1 |