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THE ECONOMICS OF THE COVID-19 PANDEMIC IN POOR COUNTRIES

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<u>ABSTRACT</u>

The COVID-19 pandemic has upended health and living standards around the world. This article provides an interim overview of these effects, with a particular focus on low- and middle-income countries (LMICs). Economists have explained how the pandemic is likely to have differential consequences for LMICs, and demand distinct policy responses, compared to rich countries. We survey the rapidly expanding body of empirical research that documents its many adverse economic and non-economic effects in terms of living standards, education, health, and gender equality, which appear to be unprecedented in depth and scale. We also review research on successful and failed policy responses, including the failure to ensure widespread vaccine coverage in LMICs, which is needed to end the pandemic. We close with a discussion of implications for public policy in LMICs, and for the institutions of international governance, given the likelihood of future pandemics and other major shocks (e.g., climate).

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A data appendix is available at http://www.nber.org/data-appendix/w29339

1. Introduction

While the SARS-CoV-2 coronavirus (COVID-19) pandemic is global in scale, poor and rich countries have experienced the crisis very differently. This article aims to document the COVID-19 pandemic experience of residents of low- and middle-income countries (LMICs), with a principal focus on its economic consequences and associated policy responses. It covers both conceptual issues -- including whether public health and social safety net policy responses should differ in LMICs compared to rich countries -- as well as the emerging empirical facts, such as the adverse effects of the pandemic on living standards, gender equality and other outcomes in LMIC populations.

We aim to be comprehensive but face several important limitations worth flagging. The first and most important limitation relates to timing: we write this article as the pandemic rages and new variants are emerging, changing the virus' transmissibility and lethality. While there has been an explosion of research on COVID-19 across disciplines, which we attempt to distill here, the pandemic remains a fluid situation -- as is the state of research about it -- and there are possibly still many twists and turns ahead regarding how it will play out. As a result, our discussion is necessarily tentative and incomplete.[1] Nonetheless, we see value in summarizing what has been learned to date, both to provide insight to researchers and policymakers today, and as a snapshot of scholarly thinking in the midst of this unprecedented crisis.

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[1] The appendix contains a more complete listing of existing studies, beyond what is directly discussed in this chapter. For further information, note that, together with partners, the Innovations for Poverty Action (IPA) Research for Effective COVID-19 Responses (RECOVR) Tracker maintains an up-to-date list of studies on COVID-19's socioeconomic impacts: https://www.poverty-action.org/recovr.

The article is also simultaneously broader and narrower in scope than many other *Annual Review* contributions. The piece is *broader* in that we dive more deeply into the "gray" research literature -- for instance, from NGO reports and public policy briefs, media opinion pieces, and journalistic accounts in some cases -- than is typical for an academic review. This is a necessity given how rapidly the pandemic situation is changing and how much of the relevant work has not yet been published in standard academic outlets. The article is also *narrower* than we would like: while the pandemic has touched all aspects of our lives, we lack the space to cover all relevant economic and societal issues. In particular, there are multiple important political economy topics -- regarding political stability, democratic transitions, and conflict (Barrett, Chen, and Li 2021), as well as pandemic misinformation -- that we are unable to cover.

Our review of the burgeoning literature on the economics of COVID-19 in LMICs has yielded useful insights and facts. While there is broad agreement among public health experts that widespread vaccination coverage is the best way to end this pandemic, vaccine distribution among LMICs populations remains incredibly limited, over half a year after mass distribution began in the United States, United Kingdom and some other wealthy countries (Tregoning et al. 2021). At the time of writing (August 2021), only 1.2% of people in Sub-Saharan Africa -- the world's poorest region -- have been fully vaccinated. In our opinion, the stark difference in access to lifesaving COVID-19 vaccines between poor and rich countries is not only a moral outrage, but also a strategic error: the virus can mutate and become more virulent as billions of people in

LMICs remain unvaccinated, and those new variants then spread to rich countries, perhaps prolonging the pandemic for years.

Improving vaccination rates will require addressing gaps in supply, of course, but also preparing for last-mile delivery problems and vaccine hesitancy in LMICs (although the recent experience with HIV/AIDS shows these can be tackled, Nachega et al. 2021). Until then, non-pharmaceutical interventions (NPIs) like mask distribution remain a key weapon in the arsenal to stem the spread of COVID-19, and prevent already-weak healthcare systems in LMICs from becoming overwhelmed. That requires large-scale behavioral change that has been a stubbornly difficult challenge in all countries -- poor and rich alike -- and as a result, many LMIC governments have resorted to periodic lockdowns to control the virus. Yet these lockdowns have imposed large-scale economic, social, psychological and even health costs, especially in LMICs with weak distribution systems for economic relief and where large shares of the population work in the informal sector outside of the official government social safety net.

An accumulating body of evidence indicates that the adverse effects of the pandemic -- both in terms of COVID-19 morbidity and mortality itself, and the damage caused by lockdowns -- extend far beyond the immediate economic effects, as bad as they are. There are distributional consequences with disproportionately adverse effects for women, low-income and migrant workers, and other vulnerable groups, and broader effects on other welfare metrics including educational progress, access to healthcare, mental health, and the risk of domestic violence. While speculative, it seems likely that the pandemic's negative economic consequences will persist for years to come.

The article is organized as follows. Section 2 discusses key conceptual issues, with a particular focus on how underlying differences across poor and rich countries may influence both pandemic impacts and the design of appropriate policy responses. Section 3 provides an overview of global patterns of COVID-19 infection and mortality. Section 4 surveys empirical work on pandemic effects on living standards and food security (mainly based on household surveys), as well as national accounts evidence suggesting that the global COVID-19 recession is the largest since World War II. Section 5 extends this discussion to education, health access and mental health, and outcomes among migrant populations and women. Section 6 presents lessons about effective policy, including behavioral insights regarding NPI adoption.

The final section looks forward, both to the hoped-for end of the pandemic and beyond to lessons for future crises. In the context of a global pandemic, it is apparent that policy decisions made in one part of the world affect all others. Given the magnitude of the crisis, we argue that greatly expanded assistance from rich to poor countries would be needed -- both in terms of vaccines and financial resources -- to address the twin health and economic crises in LMICs today. The pandemic has also made it painfully obvious -- if the climate crisis had not already done so -- that current institutions of international governance are not well designed to achieve the collective action needed to provide global public goods, such as effective pandemic preparedness and response.

2. Conceptual issues for Analyzing the Economics of COVID-19 in LMICs

An unusual attribute of COVID-19, relative to other recent viral epidemics like Ebola or Zika, is that this pandemic mainly hit richer countries first. The virus was already

widespread in South Korea, Italy, and then in the United Kingdom and the United States, before its effects were directly felt in any LMIC other than China, where it originated. In fact, migrants returning from richer countries in Europe and East Asia evidently brought the virus into South Asia (Lee et al. 2021; Ahsan et al. 2020). As a result, much early policy analysis centered around the experience of rich countries and the policy strategies they should pursue to contain the virus. An influential Imperial College epidemiological model (Ferguson et al. 2020), calibrated to U.K. data, was the basis for widely-publicized social distancing guidelines (Fink 2020; Boseley 2020), This model predicted that without *flattening the curve* of infections through social distancing and lockdowns, the demand for hospital beds or ventilators could exceed the health system's capacity. An overwhelmed health system unable to provide care for either COVID or other non-COVID medical issues would lead to excess, unnecessary deaths.

This policy discussion on "flattening the curve" captured the attention of major international media (Roberts 2020; The Economist 2020). Even though the data underlying this analysis was most relevant for rich countries in Western Europe and North America, the benefits of social distancing became the dominant policy narrative influencing lockdown decisions everywhere, including in LMICs. Countries like India hurriedly instituted lockdowns, sometimes with harsh unintended consequences on migrants and informal workers stranded in the city without jobs or housing (Barker et al. 2020; Abi-Habib and Yasir 2020; Pandey 2020).

Economics research contributed to this policy discussion in at least three ways. Here we provide a high-level summary of a few contributions; refer to Appendix Table A1 for a more complete list of studies that we do not have room to elaborate on here.

First, economists conducted cost-benefit analyses of social distancing policy by estimating the monetary value of the lives saved from bringing the virus under control, so that this value can be directly compared against the GDP losses from lockdowns. In an early contribution, Greenstone and Nigam (2020) applied the value of statistical life (VSL) methodology on epidemiological projections of life-years saved through social distancing in the US, to estimate that the reduction in mortality is worth $7.9 trillion, which exceeded any reasonable projections of GDP losses from lockdowns. They conclude that aggressive social distancing in rich countries is economically sensible.

A second, related contribution from economists was to model the tradeoffs of implementing alternative *forms* of social distancing to provide guidance to policymakers. Acemoglu et al. (2020) added GDP loss projections and age-specific COVID mortality rates to the workhorse epidemiological Susceptible, Infected and Recovered (SIR) model to argue that targeted lockdowns for vulnerable groups (e.g., the elderly) and curbing contact across age groups can limit mortality while preserving economic output better than blanket lockdowns.

Third, economists also conducted empirical analysis to evaluate the actual effects of NPIs like social distancing on COVID infections. Using event-study designs, Hsiang et

al. (2020) show that imposing social distancing in China, South Korea, Italy, Iran, France and the US slowed COVID spread, averting an estimated 495 million infections.

Isolating the causal effects of COVID response policies is methodologically difficult because the decision to impose mobility restrictions will itself respond to emerging virus threats. Appendix Figure A1 makes clear how lockdowns were made more restrictive in the US, UK, Brazil and New Zealand exactly when COVID fatalities started rising. Figure 1 illustrates the interplay between patterns of COVID fatality rates and the stringency of government policy responses (Hale et al 2021) for a range of LMICs and high-income countries (HICs). It is evident that policy choices have varied widely, even across countries within the same income category. New Zealand, Argentina, and India imposed the strictest possible lockdowns early in the pandemic, but the US, UK and Brazil did not. This allowed New Zealand to crush the virus, which in turn allowed a much quicker reopening once local transmission was eliminated. In contrast, both the virus remained in circulation, and mobility remained depressed for much longer, in response to the half-hearted distancing attempts in the US and UK (Mobarak 2021). Geography and luck also play important roles: Argentina (and Uruguay) experienced a second wave much later despite their strict early lockdowns, possibly due to their proximity to Brazil, where a new variant of the coronavirus emerged. India maintained a low fatality rate for months after its initial lockdown[2] -- with experts struggling to explain its success (Mukherjee 2021) -- only to be hit by a massive spike in fatalities a full year after the pandemic started, again linked to a new virus variant.

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[2] The official COVID-19 mortality statistics in India have been disputed; see Anand, Sandefur, and Subramanian 2021.

In addition to the early economic analysis, parallel discussions in the international news media were also heavily focused on rich countries, where we learned about South Korea's impressive testing and contact tracing strategies (juxtaposed against the failure of the US to implement the same (Parodi et al. 2020; Fisher and Sang-Hun 2020), smartphone-based tracking of virus spread in Israel (Lubell 2020), and the emerging politics around lockdowns, masking, and anti-science attitudes in Europe and North America (Romm 2020). While interesting, this was not the most directly relevant information for LMIC policymakers. If the COVID testing infrastructure is virtually non-existent, sophisticated contact tracing procedures cannot be implemented. In places where mask-wearing makes no political statement, policymakers need to focus on other factors driving behavior change. Lost in that media shuffle were the indigenous frugal innovations that West African and Central American countries had developed when dealing with the Ebola and Zika epidemics (Meriggi and Mobarak 2020). It might have helped for South Asians to learn about these strategies rather than rush to follow UK or US policy guidelines.[3]

There are several reasons why the early economic analysis -- inspired by models and data from rich countries -- was not necessarily applicable to LMICs. First, the epidemiological models were calibrated to demographics and health system capacity data in rich countries, and the model's predictions on the benefits of imposing social distancing may change when applied to LMIC settings. Barnett-Howell, Watson, and Mobarak (2021) formally conducted that exercise and found that the benefits are much

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[3] Post-lockdown reopening guidelines provided by the WHO were framed around test positivity rates, but inadequate testing capacity may similarly limit their applicability in LMICs (Shonchoy et al. 2021).

smaller in LMICs, driven by the large differences in population age structures and health

system capacities across poor and rich countries; for instance, the proportion of elderly

population is six times larger in high-income relative to low-income countries, and

COVID fatality rates an order of magnitude larger for the elderly than for young people.

Second, in rural areas of LMICs with limited health infrastructure -- say, where there are

no ventilators -- "flattening the curve" by delaying infections would not actually prevent

unnecessary deaths because the infection curves in the model remain above the (very

low) health capacity line. Imposing social distancing therefore produces much smaller

gains in terms of deaths averted compared to rich-country settings.[4]

When one converts the lives saved into a monetary value using the VSL methodology

(as in Greenstone and Nigam (2020) and Barnett-Howell, Watson, and Mobarak

(2021)), there is an even larger gap between the benefits generated in rich versus poor

countries, in part as the VSL is estimated to be much higher in the US or UK than it is in

Nigeria or Bangladesh (Viscusi and Masterman 2017). This is not because some lives

are inherently worth more than others, but because the poor and rich would naturally

choose to make different money versus risk tradeoffs in a pandemic situation. Richer

people can more easily afford to stay at home, in that they are more willing to sacrifice

their livelihoods to avoid the risk of contracting COVID. In contrast, a poor day-wage

laborer in Bangladesh may be less inclined to forgo her economic livelihood if staying

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[4] Kim and Loayza (2021) and von Carnap et al. (2020) find smaller marginal gains from suppression than from mitigation measures, and the gains from both mitigation and suppression are again smaller in poor countries compared to rich nations. Alon et al. (2020) argue in favor of age-specific or sector-specific policies (e.g., school closures) over blanket lockdowns in LMICs.

home implies that her children will not have enough to eat that week.[5] This logic explains both why the pandemic and lockdowns impose larger costs on poorer populations within countries, and also why VSL is larger in richer countries. When LMICs with weak social safety nets have to worry about the hunger that emerges due to social distancing, they would not make that same policy choice as rich countries.

Ma et al. (2021) quantify these effects by augmenting an SIR model with macroeconomic indicators on the effects of economic downturns on child mortality. They find that in poor countries lockdowns can lead to 1.76 child deaths per COVID fatality averted, producing a *net increase* in mortality. This echoes an early sharply-worded op-ed warning: "Lockdowns will starve people in low-income countries" (Jamison 2020).

Taken together, these analyses highlight the fact that not only are the benefits of social distancing smaller in LMICs, the costs imposed on society are arguably far larger due to weaknesses in health infrastructure and the social safety net. We present empirical evidence on these adverse consequences in sections 3, 4 and 5.

3. Empirical Overview of Health Patterns during the COVID-19 Pandemic

The virus was first identified in Wuhan, China in late 2019 (hence the "19" in its name). Starting in early 2020, the virus spread globally and by March there were rising infections in countries at all income levels (Figure 2) and all major world regions (Figure

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[5] This is a systemic issue that distinguishes LMICs. Alfaro, Becerra, and Eslava (2020) show that in economies with larger informal sectors, a greater share of the workforce faces unemployment risk during lockdowns. For example, 50% of jobs in Colombia were at risk when COVID prevention measures were instituted but this would drop to 33% if Colombia's employment distribution looked like that of the US.

3).[6] These infection case numbers (Panel A in both figures) and deaths (Panel B) are likely to be underestimates given limited COVID-19 testing capacity (especially early in the pandemic) and misreporting by some governments, issues we return to.

The time pattern of recorded infections was notably different across country income levels. Throughout 2020 and early 2021, recorded cases and deaths per capita were generally higher in high income countries (Figure 2) -- and equivalently in the Organization for Economic Cooperation and Development (OECD) group (Figure 3) -- than in LMICs, echoing Section 2 above, and suggests that certain aspects of demography or economic structure may have partially shielded poor countries, at least early on. These broad patterns are reflected in the experiences of several of the highest population countries in these regions (Appendix Figure A2).

Yet some of these gaps could also reflect more testing and better reporting in HICs (Nkengasong 2020). Over 2020, recorded case and death rates in middle income countries (Figure 2), and in particular in Latin America, Middle East and North Africa, and Eastern Europe and Central Asia (Figure 3) show sharp increases, probably due to both rising actual case rates and improved reporting (Beschel Jr and Yousef 2020), although overall rates remained modest into early 2021 in the world's two poorest regions, South Asia and Sub-Saharan Africa. The rising rates of excess mortality documented in some LMIC regions -- and again in Latin America, Middle East and

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[6] The infection data is collated by Our World in Data (Ritchie et al. 2020), and is from the COVID-19 Data Repository at Johns Hopkins University (Dong, Du, and Gardner 2020). Immunization data is collated by Our World in Data from official reports; and excess mortality data is from the Human Mortality Database Short-term Mortality Fluctuations project (University of California, Berkeley, and Max Planck Institute for Demographic Research, www.mortality.org) and the World Mortality Dataset (Karlinsky and Kobak 2021).

North Africa, and Eastern Europe and Central Asia (Appendix Figure A3) -- during 2020, even when official COVID cases and deaths were relatively flat, suggests pervasive under-reporting.[7]

Following a spike in new cases and deaths in wealthy countries in late 2020 to early 2021, there was a similar lagged rise in LMICs several months later. By early to mid 2021, recorded cases and deaths per capita were higher in several LMIC regions than in the OECD (Figure 3), including in Latin America and South Asia. Several of the world's largest LMICs, including India and Brazil (see Appendix Figure A2) experienced sudden surges of cases and deaths, often linked to the rise of new virus variants that were particularly infectious (including the Delta variant that is spreading rapidly as we write). These surges overwhelmed health care systems and led to thousands of deaths, many of which may have gone unrecorded (Anand, Sandefur, and Subramanian 2021).

The 2021 reversal of pandemic fortune across world regions can be attributed to the rising case rates in all LMIC regions combined with a dramatic decline in COVID-19 cases and deaths in rich countries. The main cause of this drop is the mass deployment of vaccines (Tregoning et al. 2021), beginning in early 2021 (Figures 2 and 3, Panel C). By the end of the period covered in the figures (1 August 2021), vaccination rates had increased dramatically in HICs, including in the US and UK Kingdom (Appendix Figure A2, Panel C), and stood at several times the vaccination rates in LMICs.

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[7] Of course, the pandemic could have also contributed to higher mortality for causes other than direct COVID-19 deaths -- for instance, due to an inability to receive treatment for other health conditions or deteriorating socio-economic conditions (which we return to below) -- so the rise in excess mortality while reported COVID-19 deaths were modest does not definitively prove that cases were under-reported.

In early 2021 (Figure 4, Panel A) and at the time of writing (Panel B), the rates of
COVID-19 vaccination have been consistently highest in the world's wealthiest
countries -- concentrated in Europe, North America, East Asia and Oceania -- and rates
decline monotonically with per capita income (Figure 2, Panel C). The world's poorest
region, Sub-Saharan Africa, has by far the lowest vaccination rate at only 1.2%, with
somewhat higher rates in middle income regions (8.7%), although these greatly lag the
OECD's 41.6% (Figure 3, Panel C). In this matter of literal life and death, wealthy
societies have monopolized access to the new vaccine technology through policy
decisions that fail to support the global COVAX effort to provide vaccines to LMICs,
while simultaneously providing third boosters for their own populations (Mueller and
Robbins 2021).[8]

Together with many other observers, including public health experts (The Lancet
Infectious Diseases 2021; Hassan, Yamey, and Abbasi 2021; Moon, Alonso Ruiz, and
Vieira 2021; McSweeney and Chingono 2021), we believe this is categorically unjust
and an abdication of ethical and humane leadership on the part of the world's richest
societies, including the country that we live in (the United States). At the time of writing,
many of the richest countries have large stocks of unused vaccines, as vaccine
hesitancy has slowed mass distribution efforts, while highly vulnerable populations in
LMICs -- including health care workers and the elderly -- remain largely unvaccinated.
The WHO Director Dr. Tedros Ghebreyesus wrote in January 2021: "I need to be blunt:
the world is on the brink of a catastrophic moral failure – and the price of this failure will

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[8] For detailed data on vaccine procurement by individual countries, blocs (e.g., African Union) and global
agreements such as COVAX, refer to: https://launchandscalefaster.org/covid-19/vaccinepurchases.

be paid with lives and livelihoods in the world's poorest countries" (World Health

Organization 2021b). In the next section, we review the empirical evidence on economic

impacts in LMICs.

4. **Impacts on Living Standards in Poor Countries**

The COVID-19 pandemic has also been an enormous economic shock: global GDP

declined by approximately 4% in 2020, a recession larger than any decline recorded in

the last six decades (Appendix Figure A4, International Monetary Fund 2020b). As a

point of contrast, global GDP declined by roughly 2% during the Great Recession of

2009 and was largely flat during the 1973-4 Oil Crisis. Although comparable national

series are not readily available, it is likely that the COVID-19 pandemic has caused the

largest global decline since the period of the Great Depression and World War II in the

1930s and 1940s (International Monetary Fund 2020a). In absolute numbers, the

pandemic has increased the number of people living in poverty by nearly 100 million

back to 2015 levels, undoing 5 to 6 years of progress (Gerszon Mahler et al. 2021).

We next discuss a growing literature documenting the evolution of economic conditions

in LMICs since March 2020, utilizing household surveys and other data sources to go

beyond the national statistics that form the basis of Figure A4. Aggregate national

accounts data have recognized deficiencies relative to direct surveying for tracking the

well-being of the poor (Deaton 2003a; 2003b). Household surveys are necessary

because aggregate data can overlook large segments of the population: over a quarter

of economic activity and half of all workers in Africa, Asia, and Latin America are in the

informal sector (Medina and Schneider 2020; ILO 2018), and therefore are not fully

captured in most official statistics. Informality similarly undermines the informativeness

of private sector transactions data such as payroll, credit, or smartphone transfers.

Hence, many approaches national statistical agencies and researchers have used to

document COVID economic patterns in HICs cannot easily be implemented in LMICs.[9]

Egger et al. (2021) is among the first relatively comprehensive analyses of pandemic

living standards in LMICs during 2020. Egger et al. (2021), as well as Bundervoet et al.

(2021) discussed below, rely on original, large-sample household surveys in LMICs.

These research teams adapted existing data collection protocols to deploy phone

surveys, often starting mere weeks after the start of the pandemic. Egger et al (2021)

utilize random sampling to generate statistically representative information about 16

populations in nine countries in Africa, Asia, and Latin America -- namely Bangladesh,

Burkina Faso, Colombia, Ghana, Kenya, Nepal, Philippines, Rwanda, and Sierra Leone

-- that have a combined population of nearly 500 million. The 30,000 surveys collected

cover heterogeneous samples constructed in different ways: seven samples rely on

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[9] Data collection during the pandemic posed a unique set of methodological challenges in LMICs. Economic data is more regularly reported by government agencies in high-income countries, but such administrative records are less frequently collected in LMICs and less reliable when large shares of the economy are in the informal sector. To generate high-frequency signals during the pandemic, Chetty et al. (2020) creatively assemble granular-level records produced by the data systems of US private companies to document spending, revenue, employment rates. A similar data infrastructure does not exist in most LMICs. This is why development economists resorted to phone surveys in LMICs as the primary method of tracking economic conditions during the pandemic. This can be supplemented with smartphone-based data on (say) mobility from Google, Facebook and other sources (Buckee et al. 2020; Ilin et al. 2021; Kraemer et al. 2020), but smartphone penetration is also lower in LMICs, limiting representativeness. The World Bank and their partners in national statistical offices have filled in important gaps in 2020-21 through large-scale phone survey efforts in scores of countries, creating data public goods that have contributed to many of the projects that we survey in the remainder of this section and the next.

random phone digit dialing (RDD)[10], and skew toward wealthier mobile phone owners, while nine are drawn from earlier studies representative of specific subsamples, including formal and informal sector workers, agricultural laborers, small business enterprises, refugees, migrants, and their families.

While their data is unusually timely, it has important limitations. All post–COVID-19 data were collected via telephone interviews to comply with social distancing guidelines. Unfortunately, this places limits on data collection: surveys were short, lasting only 15-30 min with relatively coarse economic measures and rendering some types of measurement infeasible. Some of the surveys compare income reported during pre–COVID baseline surveys to a contemporaneous report (in the phone survey) to determine whether there has been a change in income. Yet others rely on retrospective reports of baseline income, which carry the risk of respondent recall or reporting biases. Finally, the data focus on March to July 2020 and thus are valuable for tracking the initial shock but not the pandemic's extended effects.

With those caveats in mind, Egger et al (2021) documents the widespread nature of economic hardships and the decline in living standards: across the 16 samples, between 8 and 87% of respondents report a drop in income during the crisis period, with a staggering median of 70% It is important to recognize up front that these "pandemic effects" are the combined effects of the virus plus the country-specific policy responses,

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[10] Random digit dialing (RDD) is a type of probability sampling in which the research sample is determined by randomly generating telephone numbers to call. This creates a study sample frame representative of those with a phone. Very poor households may not own phones or live in areas with low connectivity and so may be underrepresented (an issue the authors discuss but we do not focus on here).

and these factors cannot in general be separately identified. The proportions reporting

declines in employment are similarly high, ranging from 5 to 49% (median share 30%).

The adverse economic shock has been compounded by impediments to livelihood: in

most countries, a large share report reduced access to markets (median share 31%),

likely related to the ubiquitous lockdowns.[11] Together, these drops in employment,

income, and access to markets contribute to food insecurity: between 9 and 87% of

respondents were forced to miss or reduce meals (median share 45%). Even in

Colombia -- the richest country in the sample -- large shares of respondents report

drops in income (87%) and employment (49%) and increased food insecurity (59%).

Social support in response to the economic shock has been mixed: the proportion of

respondents who report benefiting from government or NGO crisis support runs the

gamut in the sample from 0 to 49% (median share 11%). However, the high rate of

missed meals and reduced portion sizes suggests that even when these efforts are

present, they have been insufficient. For instance, Rohingya refugees in Bangladesh

report the highest rates of assistance, likely due to preexisting international aid

infrastructure, yet even in this sample 27% of respondents report food insecurity. More

detailed data in one Kenya sample indicate that households also engage in extensive

dissaving, such as selling assets and spending stored cash, to stabilize consumption.[12]

These adverse economic effects vary substantially both across countries and different

subsamples within countries, but perhaps surprisingly Egger et al (2021) find little

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[11] Ceballos, Kanna, and Kramer (2020) similarly find disruption of agricultural market access in India.
[12] Mahmud and Riley (2021) find dissaving in a Ugandan sample though no large-scale asset liquidation.

evidence that this variation is systematic by socioeconomic status (SES). The finding

that even relatively well-off households experienced adverse economic shocks in LMICs

indicates that the rich could not easily "buy" their way out of the crisis, and resonates

with academic and journalistic accounts (Dahir 2020a; Singh and Kumar 2021; Cefalà et

al. 2020). There is similarly no clear pattern across refugee and nonrefugee

populations: reported food insecurity is actually slightly lower among refugees than the

host communities living near Rohingya camps in Bangladesh (perhaps due to greater

presence of humanitarian organizations there), yet on the other hand, food insecurity is

somewhat higher among refugees in Kenya compared with a national sample.[13]

Egger et al (2021) also draw on a subset of samples that feature more detailed panel or

repeated cross-sectional data with richer measures, allowing them to quantify the depth

of economic decline. Firm revenue, a natural measure of overall local economic activity,

was adversely affected: in rural Kenya, average firm profits and revenues fell by 51 and

44%, respectively (both $P < 0.05$ relative to pre-crisis levels; Figure 5, Panel A1). The

analogous decline in Sierra Leone is a similarly large 50% ($P < 0.05$; Panel A2).[14] In the

rural Kenya sample, there is also a decline in per capita consumption expenditures

(Panel B1), with declines in nonfood expenditures of 29% ($P < 0.05$) persisting through

May 2020. Food expenditures in Kenya and Sierra Leone actually rose slightly, by 11%

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[13] A central methodological concern with Egger et al (2021) and the related studies surveyed below is that non-pandemic factors could drive the evolution of outcomes over time, for instance, seasonal variation related to the agricultural cycle. While it is challenging to rule these out, the authors argue that the consistency in outcomes across multiple samples, with a wide range of seasonal patterns, suggests that they are largely documenting crisis impacts. Plus in some cases, they directly document that food insecurity is far higher during the 2020 crisis than in the same season in previous years.

[14] Bishi, Grossman, and Startz (2020) find that 91% of traders in Lagos, Nigeria reported zero revenue during lockdown periods, and that sales rose after re-opening (but did not return to pre-pandemic levels).

(Panel B1) and 6% (Panel B2), respectively, although in Sierra Leone this appears to have been driven by higher food prices (19%, P < 0.05 relative to pre-period; Panel C2) rather than greater quantities consumed. In contrast, Kenyan prices were largely stable or even fell slightly (Panel C1). These data indicate that households appear to be cutting back nonfood consumption in an effort to maintain essential food intake.

Examining food insecurity in greater detail, Egger et al (2021) observe rising rates of missed meals and reduced portions during the crisis in both Kenya (Panel D1) and Sierra Leone (Panel D2), and for both adults and children (P < 0.05 for all effects). The sharp rise in child food insecurity is alarming given the potentially large negative effects of child undernutrition on later life outcomes (Baird et al. 2016; Victora et al. 2008).

A second notable study is Bundervoet et al (2021), which like Egger et al (2021) relies on phone survey samples conducted in the first months of the pandemic and collects similar economic outcomes. This allows for comparability with Egger et al (2021) as well as similar limitations, for instance around the imperfect representativeness of phone survey samples. A major advantage of this impressive World Bank coordinated effort is its use of data from a larger set of countries, 34 in total (with a combined population of 1.4 billion people) from Africa, East Asia and the Pacific, Latin America, Europe and Central Asia, and Middle East and Northern Africa, representing the full range of LMICs.

They document extensive job loss, drops in income and rising food insecurity across this large sample of countries, with magnitudes similar to the median levels in Egger et al (2021): 36% of respondents stopped working in the early pandemic and over 64% of

households reported decreases in income, while food insecurity rose, and they find large adverse effects in all major LMIC regions. Bundervoet et al (2021) also present detailed information on the heterogeneity of impacts across major demographic and socioeconomic groups. A striking finding is the far higher share of women who lost a job at the start of the pandemic (42%) compared to men (at 31%), suggesting that the crisis was highly gendered (which we discuss in the next section). The gradient with respect to SES is more nuanced: workers in non-agricultural self-employment experience particularly large drops, while those working in agriculture -- who are often among the poorest in LMICs -- were somewhat less affected. Similarly, there were large income drops across the respondent educational distribution. Khamis et al. (2021) extend the collection of core economic measures and show there was a substantial but still only partial recovery in income and employment in the latter half of 2020.[15]

While no other studies (to our knowledge) have the extensive cross-country LMIC coverage of Egger et al (2021), Bundervoet et al (2021) and Khamis et al (2021), an emerging literature documents impacts among particular populations; as presented in Appendix Table A2, these study a wide variety of LMIC cases, and examine outcomes ranging from food insecurity to firm outcomes and coping strategies (although despite searching a range of sources, we have almost certainly missed important contributions in this rapidly evolving literature). Together, they echo the central finding of sudden and large declines in LMIC economic activity and living standards during the pandemic.

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[15] Furbush et al. (2021) document a similar time pattern of partial household economic recovery in late 2021 in four Sub-Saharan African countries.

A few examples illustrate, although we point the reader to the appendix for a fuller picture. Mahmud and Riley (2021) collect follow-up phone survey data of an existing sample in rural Uganda during the early months of the pandemic and document adverse economic consequences, including falling household income and food consumption (by 60% and 50%, respectively), a drawing down of savings and declining life satisfaction. Le Nestour and Moscovitz (2020) similarly find that 87% of Senegalese households experienced a drop in income and increased food insecurity in the early pandemic. Malik et al (2020) find that household income and small business sales fell by roughly 90% in Pakistan and microfinance repayment rates plummeted, and both Hamadani et al. (2020) and Rahman and Matin (2020) document similar patterns in Bangladesh.

This body of evidence leaves little doubt that the COVID-19 pandemic has had a massively negative economic impact on households and firms across LMICs since March 2020. Stepping back, one key limitation of the existing evidence is that it focuses mainly on the early pandemic period. It will be valuable for new studies to present data from late 2020 into 2021 (and beyond) for a fuller dynamic picture.[16]

An important open question is the role that government lockdown policies played in driving these adverse outcomes. While critical for containing virus spread, more severe lockdown policies in India have been associated with greater regional declines in GDP, including when measured using night lights (Beyer, Jain, and Sinha 2020), as well as reduced income, food insecurity and mental health outcomes among women based on

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[16] A valuable source for up-to-date LMIC data is the World Bank Household Monitoring Dashboard: https://www.worldbank.org/en/data/interactive/2020/11/11/covid-19-high-frequency-monitoring-dashboard which suggests some improvements in socio-economic conditions in 2021 in many countries.

household surveys (Bau et al. 2021). Yet Meyer et al. (2021) document a large negative impact on the livelihoods of Ethiopian garment workers in mid-2020 due to changes in world demand for their products, despite the fact that there were then few COVID-19 cases in the country and that Ethiopia was pursuing mild lockdown policies (Oqubay 2020), evidence of the truly global nature of the economic shock.

5. Broader Impacts for Households and Society

This section outlines effects beyond the incomes and living standards impacts that were the focus of the previous section, including on (i) education, and both (ii) health access and (iii) mental health. Some are the direct result of the pandemic and others could be consequences of the resulting economic shock, as well as the coping mechanisms that individuals and households took to deal with rapidly declining living conditions. We also place special focus here on how the pandemic has differentially affected (iv) migrants and refugees, and (v) women across all of these dimensions. Some common coping mechanisms that LMIC households adopt to deal with adverse economic shocks have been shown to be differentially disadvantageous to women and girls, including practices of early marriage and reliance on transactional sex (Corno, Hildebrandt, and Voena 2020; Corno and Voena 2016; Jones and Gong 2021; Archibong and Annan 2019). Here we focus on a few studies; for a more thorough (although surely still incomplete) review, refer to Appendix Table A3. We do not cover many important societal outcomes for reasons of space and because they fall beyond the scope of this article.[17]

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[17] An important area that we miss relates to political outcomes, which may themselves have economic consequences. Disease outbreaks have affected politics throughout human history -- as documented in all the ancient religious texts and in debates in the new U.S. republic about the appropriate public health

5.1 Education

The pandemic led to massive drops in school enrollment during 2020 and into 2021 in most countries, and this is likely to have a wide range of adverse consequences for children today, their futures and their societies.[18] Across poor and rich countries, most children had only a few weeks of in-person schooling during the first year of the pandemic (Evans et al. 2021). For children in many LMICs, a lost year of schooling could account for a large proportion of their expected lifetime educational attainment.

We again turn to Bundervoet et al (2021): they find that roughly 30% of children were unable to continue any schooling during the early pandemic. In some countries, like Kenya, entire school years were cancelled (although the Government of Kenya later partially reversed this policy (Dahir 2020b; BBC News 2021; Yusuf 2021)). Bundervoet et al (2021) highlight how these closures are likely to exacerbate social inequalities, as children of low income families, those who have parents with less education and who live in rural areas were all more likely to miss school time. Many remote schooling approaches -- via internet or television, for instance -- are inaccessible for children from marginalized communities (Mueller and Taj 2020; Akmal et al. 2020; UNESCO 2021).

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response to yellow fever (Chernow 2004)-- and the global COVID-19 pandemic is no different. There are ample journalistic accounts and research studies linking the pandemic to the rise of political instability, authoritarianism, conflict, and polarization in countries rich and poor (Kishi 2021; Swanson 2020; Blanc and Brown 2020; Perrigo 2020; Cheeseman 2020; Cheeseman and Smith 2020), and this topic clearly merits detailed examination in a different venue.

[18] The World Bank and UNESCO have detailed global trackers of school closures and education impacts; see https://www.worldbank.org/en/data/interactive/2020/03/24/world-bank-education-and-covid-19 and https://en.unesco.org/covid19/educationresponse#durationschoolclosures.

The initial data indicates that a substantial amount of learning was simply "lost" during the first year of the pandemic, and it remains unclear whether and how these children will be able to catch up. For instance, children in Ethiopia only learned 30-40% as much on average as in a normal school year (Evans et al. 2021; J. Kim et al. 2021), while math knowledge was documented to decline for many students in Kenya (Whizz Education Report 2021) and Pakistan (Crawfurd, Hares, and Minardi 2021), and particularly those from poorer backgrounds. Phone survey data from the Young Lives project indicate that large shares of adolescents in Ethiopia, India, Peru and Vietnam either dropped out of school or chose not to enroll, or had minimal engagement with their teachers if still enrolled (Favara et al. 2021). The pandemic economic shock may also make it more difficult for poor families to pay for school fees in the coming years. It seems unlikely that these losses will be fully reversed for those who dropped out due to the pandemic (Favara et al. 2021; Evans et al. 2021; Dessy et al. 2021).

Azevedo et al (2020) argue that this loss of schooling, learning and ultimately human capital in most LMICs could have major long-run economic consequences. They simulate the macroeconomic effects on future economic growth from the loss of schooling (and associated lower wages) -- building on work like that in Barro (2013), among others, that estimates how aggregate schooling levels affect country economic growth -- and find that losses of a 5 month school shut down in 2020 have a global net present value of US$10 Trillion. Lopez Boo, Behrman, and Vazquez (2020) carry out a related exercise for lost preschool attendance. These studies are based on a partial equilibrium assumption, in other words, assessing the impact of education in a given

society holding constant education in the rest of the world. The COVID-19 pandemic shock is unusual in that it reduced human capital in many if not most societies at the same time. Whether this global drop in learning has effects larger or smaller than those estimated in existing work depends on whether education in one country is a complement or substitute to education in others; to our knowledge, this remains an unsettled question but one with important implications for pandemic recovery.

These exercises remain speculative, but there are reasons to think that they may represent lower bounds on true impacts of school closures, which also halted delivery of the school-based feeding programs that are a main source of nutrition for hundreds of millions of poor children (Borkowski et al. 2021; Achalika Ahuja and Devolla 2021) as well as health programs (e.g., mass deworming) in scores of countries.[19] Staying home from school appears to have contributed to teenage pregnancies and marriage, which could have detrimental long-run effects for many young women's future economic prospects. Beyond school closures, child undernutrition also increased sharply during the pandemic and this will likely have negative long-run economic consequences (Osendarp et al. 2021).

5.2 Health Access

The ability to access health care has been severely disrupted in most countries and especially in LMICs (Krubiner, Keller, and Kaufman 2020; World Health Organization 2021a), due to a combination of supply side and demand side factors. On the demand

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[19] After the temporary halt of a long-standing national primary school deworming program in Kenya in 2020, the government was able to carry out mass treatment in 2021 (Hagemann 2021).

side, most immediately, mobility restrictions and lockdowns (and fear of contracting the virus) have directly hindered many individuals from accessing services. The precipitous drop in living standards discussed in section 4 above limits households' ability to purchase some medical services. Supply side disruptions have also been severe. In some countries, the concentration of resources to deal with COVID infection spikes has drawn staffing away from other essential health services, and has led to the loss of medical staff due to COVID morbidity and mortality (especially before vaccines are widely distributed to health workers, Gholami et al. 2021; Bandyopadhyay et al. 2020). The pandemic fiscal shock has also reduced government health spending in many countries.

The combination of these factors has contributed to delayed or cancelled vaccination drives for other non-COVID illnesses in most countries (Causey et al. 2021; WHO 2020b), with tens of millions of missed doses, and disruption of medical care for other infectious diseases (e.g., tuberculosis, HIV/AIDS, malaria, etc.) and other health conditions (Jain and Dupas 2021) in many LMICs. These disruptions are predicted to lead to substantial increases in the future disease burden (Sherrard-Smith et al. 2020; Nature editors 2020; McQuaid et al. 2020; Weiss et al. 2021), imposing further human costs for years after the pandemic ends. Meta-analysis also shows significant pandemic deterioration in maternal and neonatal health outcomes, as well as increased postnatal depression, with a disproportionate impact in LMICs (Chmielewska et al. 2021). This could compound the costs of schooling disruption and child undernutrition noted above.

5.3 Mental Health and Wellbeing

There have been dramatic increases in anxiety and mental distress in LMICs during the pandemic related to both fear of the disease and consequences of lockdowns, social isolation and economic deprivation (Kumar and Kumar 2020; Rajkumar 2020), including in Bangladesh (Hamadani et al. 2020), Ghana (Boateng et al. 2021), Iran and China (World Health Organization 2020a), and so on. This global phenomenon appears to affect poor and rich countries, children and adults (Porter et al. 2021). As with other dimensions of health, access to mental health services has been severely disrupted (Kola 2020; "The Impact of COVID-19 on Mental, Neurological and Substance Use Services" 2020c), which is particularly troubling given low baseline access in LMICs.

The mental health impacts appear to be particularly pronounced for vulnerable populations, including women. Bau et al (2021) survey Indian women and document increased sadness, depression and hopelessness, with particularly adverse effects for women in areas experiencing stricter lockdowns, as well as those with daughters and in female-headed households (who are often more economically vulnerable).

5.4 Migrants and Refugees

Poor households with migrant members were highly vulnerable during the COVID-19 pandemic because they faced a triple threat: increased exposure to the virus, local economic exposure to the downturn, and susceptibility to economic contraction in destination markets. Of particular concern is the threat posed to forcibly displaced populations, who are disproportionately hosted in LMICs with weakened healthcare systems and safety nets.

The International Labour Organisation (International Labor Organization 2020) estimates tens of millions of migrants were stranded abroad without work during the pandemic. This is a significant problem for LMICs because 192 of the 272 million people who live outside their country of birth come from regions classified as 'less developed' (UNDESA 2019). This not only puts individual migrant households at risk, but can also have significant global macroeconomic consequences: direct remittances to LMICs in 2018 reached nearly US$500 billion, triple the flow of official development assistance. Internal (often rural to urban) migration is even more common in LMICs. Barker et al. (2020) find that both the public health risks of COVID and subsequent economic fallout have been particularly damaging to households that engage in labor migration, and merits special policy focus.

Appropriate policies to deal with the risk of disease spread from migrant mobility are also not necessarily straightforward. For example, Burlig, Sudarshan, and Schlauch (2021) shows that moderately lengthy domestic mobility restrictions *increase* infections once those restrictions are lifted, relative to either shorter or very long restrictions.

5.5 Gender Differences

As noted above, there is evidence that both economic losses and mental health problems have been more pronounced for women than men during the pandemic (Bundervoet et al 2021, Hamadani et al. 2020). In terms of other economic outcomes, Levine et al. (2021) compare male and female-headed households in Sierra Leone, and

find that the pandemic exacerbated pre-existing gaps: female-headed households faced greater food insecurity and were less likely to be informed about COVID-safe behaviors.

Investigators have examined and found evidence for similar gender differences along other dimensions. Women's work in many countries is concentrated in the informal sector and in jobs providing care to others, including health care, and many of these occupations have been particularly hard hit (Staab 2020). For instance, those working in domestic service jobs may not have been allowed to work in person at their employer's residence during lockdown periods. Moreover, informal sector workers may be excluded from government assistance, which may be restricted to those who pay into national social insurance schemes, and the same goes for those who lack national ID cards or mobile phones, all of which are more likely to be female. Those women working in health care professions -- many of which are dominated by females[20] -- were on the pandemic front lines and experienced increased infection risk, overwork and burnout.

Care responsibilities extend far beyond work, and many women bore the brunt of childcare responsibilities during school lockdowns in both poor and rich countries (U.N. Women 2020; Abuya et al. 2020). This can disrupt their economic activities and threaten household livelihoods, especially for those women who worked outside the home pre-pandemic (Cucagna and Romero 2021; Deshpande 2020). Women are also disproportionately responsible for caregiving for ill household members, including those suffering from COVID-19 related morbidity, possibly for extended periods (i.e., due to Long COVID) (U.N. Women 2020; Staab 2020). These care responsibilities often

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[20] 70% of community health workers in Sub-Saharan Africa are female (Staab 2020)

extend to older adolescent girls, impacting their ability to invest in their own schooling and other important life choices (Baird et al. 2021; Amin et al. 2020).

School closures have also been cited as a risk factor for one of the most important and troubling effects of this pandemic, a sharp rise in domestic violence against women and children (Taub 2020), which has been termed the "shadow pandemic". To illustrate with data from LMICs, complaints and reports of intimate partner violence and domestic violence have increased by +0.47 standard deviations in Indian data (Ravindran and Shah 2020), 50% of women report an increase in all forms of violence during lockdown in Bangladesh (Hamadani et al. 2020), and there was a +48% increase in calls to a distress hotline in Peru from March to July 2020 (Agüero 2021); see also Mahmud and Riley (2021) and Peterman and O'Donnell (2020).[21] Children and adolescents have experienced increased exposure to intra-household violence as well (UCSD Center on Gender Equity and Health 2021; Banati, Jones, and Youssef 2020).

There are many possible contributing factors, including: the fact that means of recourse such as shelters and emergency lines have been curtailed due to infection risk (or overstretched due to the rise in distress calls or budget cuts); the deterioration of economic conditions and living standards; changes in living arrangements, including child presence in the home (rather than at school), and "exposure" effects simply due to greater proximity to partners during the day. Regardless of the particular mix of

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[21] In contrast, Hoehn-Velasco, Silverio-Murillo, and Balmori de la Miyar (2020) from Mexico show that in the initial months of lockdown (March to May 2020) alimony lapses, sexual crimes and domestic violence reports decreased by 20% but all crimes rates were back to pre-pandemic levels by four months in.

contributing factors in any setting, the rise in domestic violence during the COVID-19

pandemic is a major crisis and may leave physical and emotional scars for many years.

6. Public Policy Responses

As we write in August 2021, the most important country-level policy response to

COVID-19 -- and the only action that can bring this pandemic to an end -- is to ensure

widespread vaccination coverage in the population. We first discuss the challenges

LMICs have faced in procuring sufficient doses of vaccines. In the absence of

widespread vaccine coverage, countries should implement non-pharmaceutical

interventions like mask-wearing and lockdowns to slow the spread of disease, and

develop robust social safety nets for citizens whose livelihoods are threatened by

lockdowns. We discuss those two categories of public policy response in this section.

Appendix Table A4 contains a more comprehensive listing of studies on these topics.

6.1 Vaccination Coverage

Most LMICs currently fall far short of vaccination coverage goals (see Figure 2, Panel

C). As of August 1, 2021, in South Asia, only 2.3% of Pakistanis and 6.1% of Nepalis

are fully vaccinated, in West Africa, only around 1.3% of Ghanians and fewer than 1%

of Nigerians are, and in the Caribbean, 4.1% of Jamaicans and less than 1% of Haitians

are fully vaccinated (Ritchie et al. 2020). The low vaccination coverage in LMICs is

largely due to supply shortages, and immediate policy action needs to focus on

procurement (Ahuja et al. 2021). LMICs are currently dependent on support from either

high income countries (HICs) or from the COVID-19 Vaccines Global Access (COVAX)

initiative for doses. HICs have chosen to largely focus on the challenges of vaccinating their own citizens, and support to LMICs has been limited: rich countries are storing excess doses, and have begun to administer third booster doses to their own vulnerable citizens, while coverage remains inadequate in LMICs. As noted above, this strategy facilitates the further mutation of SARS-COV2, and propagation of new variants in LMICs followed by re-importation to HICs will likely prolong the global pandemic.

A case study of COVID vaccine access in Bangladesh illustrates the challenges many LMICs currently face to implement efficient campaigns. Bangladesh's inconsistent access to vaccines has led to a disorganized campaign, and eight months after the first batch of vaccine doses arrived in the country, only 2.6% of the population has been fully vaccinated (Ritchie et al. 2020). Bangladesh was successful in procuring the Covishield vaccine -- manufactured by the Serum Institute of India (SII) under license from AstraZeneca -- quite early, and started a nationwide rollout on February 7, 2021. As in other countries, the government prioritized frontline healthcare professionals and those over 55 years old. Without an effective promotion campaign, demand was low and access was extended to those aged 40 and above. SII received advance payment and agreed to provide 30 million doses by June 2021. However, after the first 5 million doses were delivered, India halted all vaccine exports -- due to the rapid spread of the Delta variant there -- and that order remains unmet. Bangladesh has since received smaller donations of Pfizer and Moderna vaccines, and the Chinese Sinopharm vaccine, but overall coverage is low and the campaign has not really begun in earnest in rural areas.

The Bangladesh case also illustrates that even when supply shortages are addressed, LMICs will have to ensure efficient last-mile delivery of vaccines, lower access costs and convenience -- especially in remote rural areas -- and conduct campaigns to address vaccine hesitancy and build confidence in the new technology. Existing economics literature provides guidance on how to boost immunization rates (Banerjee et al. 2021). Solís Arce et al. (2021) show that vaccine hesitancy is generally lower in LMICs than in Russia or the US (though itself variable across sub-Saharan African countries - Africa CDC 2021), and argue that shipping vaccines to LMICs is sensible from the perspective of maximizing coverage to build global herd immunity.

However, while these vaccine supply shortages remain, LMICs will need to minimize the public health and economic damage caused by a continuing epidemic by implementing the programs recommended by public health experts and economists in pursuit of two broad categories of goals: (1) use non-pharmaceutical interventions (NPIs) -- like widespread use of face-masks and proper hygiene practices, dissemination of COVID safety information and protocols, limits on crowding and religious/social gatherings, and social distancing policies -- to slow the spread of disease; and (2) provide economic support to the vulnerable population who are adversely affected by social distancing and lockdown protocols.

6.2 Non-Pharmaceutical Interventions (NPIs)

From early in the pandemic, public health experts and the political leadership in each country were tasked with convincing the general population to follow a new set of

pandemic protocols including NPIs. Large literatures in the social sciences suggest that behavior change is difficult to achieve in a single domain, and ensuring population-level adoption of multiple new practices simultaneously was, unsurprisingly, extremely challenging. Appropriate policy design is important because this affects adherence, as revealed through mobility data (Jamison et al. 2020).

Political leaders played a large role by either providing clear guidance to their constituents and leading by example in some countries, or refusing to do that -- and jeopardizing public health goals -- in others. For example, several African leaders quickly enacted aggressive measures to close airports in March 2020 and restrict mobility to slow the spread of COVID. For instance, Senegal, Rwanda, Mauritius and Liberia began screening and quarantining travelers at the airport, while Ghana and Nigeria banned travel between cities and implemented curfews. Within a week of its first reported case, Kenya shut its schools, banned gatherings, and enforced a mandatory 14-day quarantine for incoming travelers (Mobarak and Mahbub 2020).[22]

In contrast, the US was relatively slow to react and national policy remained indecisive: several high-level US government leaders, including former President Trump ignored basic social distancing and mask guidelines set by their own Centers for Disease Control and Prevention, hosted large political rallies, and even encouraged people to protest against social distancing (Abutaleb et al. 2020). The Brazilian President Bolsonaro systematically downplayed COVID-19 risks, blocked any centrally

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[22] There were also prominent examples of African leaders who were COVID-19 deniers and promoted destructive public health policies, most famously former Tanzanian President John Magufuli, who passed away in early 2021, reportedly of COVID-19 related causes (Dahir 2021).

coordinated response (Anderson 2021, Azjenman et. al 2020), and undermined local leaders implementing lockdowns or mask mandates. The heterogenous political responses were at least partly responsible for the highly variable COVID caseloads and fatalities across countries (Fitzpatrick et al. 2021).

Beyond the macro level reactions from political leaders that can either inspire or deter collective action, there are many micro-level behavior change strategies, information campaigns and nudges that can promote adherence to COVID safety protocols, and many economists have tested innovative interventions to provide relevant guidance to policymakers. For example, Banerjee et al. (2020) (building on Alatas et al. (2019)) show that light-touch messaging interventions involving celebrities can improve disease knowledge, and some self-reported health behaviors (e.g. handwashing, adherence to social distancing) in the short-run. Others including Fitzpatrick et al. (2021), Bahety et al. (2021), and Allen et al. (2021) have found more limited effects.

6.3 Mask-wearing

Much scientific evidence has accumulated during the pandemic that wearing face masks can slow the spread of COVID-19 and save lives. As LMICs wait for vaccinations, masks can act as an important and low-cost line of defense to control the pandemic. Laboratory studies show that masks block particles emitted by infected individuals, and randomized trials in hospitals indicate that surgical masks protect wearers (Howard et al. 2021). Economists have contributed a number of observational studies to this evidence base, showing that: countries with mask mandates or mask-wearing norms have had lower infection rates (Abaluck et al. 2020; Leffler et al.

2020); U.S. states which mandated mask use subsequently experienced declines in case growth rates (Lyu and Wehby 2020); and model simulations indicate that mask mandates reduce the growth of cases (Chernozhukov, Kasahara, and Schrimpf 2021).

Despite this growing evidence base on the benefits and cost-effectiveness of masks, ensuring universal mask-wearing has met with numerous practical, political and even scientific challenges. Since a substantial share of coronavirus transmission stems from asymptomatic or presymptomatic individuals, the science would appear to support a policy of universal mask-wearing rather than mask-wearing among only those with symptoms. Yet mask-wearing has been politicized in some countries.[23] If the decision to wear a mask signals a political affiliation, then achieving universal mask-wearing becomes challenging in politically polarized societies. In January 2021, over 40% of the world's population lived in countries where mask-wearing was mandated in public areas, and another 40% in countries where universal mask norms prevailed (Abaluck et al. 2021). However, the actual ground-truthed data suggests that it has been difficult to ensure persistent mask-wearing in LMICs. In Bangladesh, proper mask use remained very low, at around 10-20%, even after the government formally mandated mask use and threatened to fine those who did not comply (Abaluck and Mobarak 2020). An August 2020 phone survey in rural Kenya finds that while 88% of respondents claim to wear masks in public, direct observation in market centers revealed that only 10% actually did so (Jakubowski et al. 2021).

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[23] For the case of the United States, Bazzi, Fiszbein, and Gebresilasse (2021) attributes some of this resistance to historical factors, such as a culture of "rugged individualism" in some regions.

In LMICs with weak capacities to enforce mandates, a more proactive policy approach

appears necessary to ensure consistent usage. Abaluck et al. (2021) show that a

combination of mask promotion strategies involving free distribution, information

dissemination, community leader engagement and reinforcement via mild social

shaming triples mask usage in rural Bangladesh, effects persist for 10 weeks, and this

significantly reduces symptomatic COVID transmission, especially among the elderly.

This program was subsequently adopted by governments and others in Bangladesh,

Pakistan, India, Uruguay, and Nepal to reach over 100 million people (at the time of

writing), a notable example of how economics research can quickly translate into

large-scale policy impact (Innovations for Poverty Action 2021).

6.4 Social Benefit Transfers

While policies regarding lockdowns and mask mandates have been controversial, there

was broader consensus in many countries on the need to ensure a social safety net for

those suffering from the pandemic-related economic shock, and as a result, many

governments implemented new cash assistance programs or scaled up existing ones.

Between March 20th, 2020 and May 14, 2021, a total of 3,333 social protection

measures -- including social assistance, social insurance, and labor market protection

programs -- were planned or implemented in 222 countries or territories, and cash

transfers have been the primary instrument (Gentilini et al. 2020). There is evidence that

cash transfers can mitigate the adverse economic and mental and physical health

consequences of COVID-19 (Banerjee, Faye, et al. 2020; Brooks et al. 2020).

Effectively implementing cash transfer programs requires policymakers to overcome at

least two key challenges: (1) identifying the individuals or households who most urgently

require assistance, while minimizing inclusion and exclusion errors in targeting; and (2)

transferring funds to targeted beneficiaries safely and efficiently.

Variation in financial infrastructure across countries has proven to be important in the

effectiveness of targeting and delivery of such payments (Berkouwer et al. 2021).

Countries with more advanced digital financial services that allow governments to send

payments directly into mobile or bank accounts can scale up transfers faster (Rutkowski

et al. 2020). However, even Kenya, an African mobile money leader, faced challenges in

implementing a pandemic relief program: Human Rights Watch (2021) "found that only

a small fraction of vulnerable families in Nairobi benefited from the [COVID-19 cash

transfer] program, given cronyism, nepotism and outright favoritism." The urgency of the

pandemic has created unprecedented opportunities for innovations in this area. For

example, Blumenstock (2020) and Aiken et al. (2021) report on big data and machine

learning techniques that helped the Togolese government target the most vulnerable

households for direct cash payments. The systems developed through these

partnerships could be useful for future assistance programs beyond the pandemic.

Other such "COVID innovations" include the high-frequency phone surveys of

statistically representative samples that have been spearheaded by the World Bank to

improve data collection efficiency during the crisis. Such data could also be useful for

building more robust social protection systems going forward. Innovations like the

Kenya COVID tracker, Sierra Leone COVID dashboard, and data dashboards set up in

Bangladesh[24] (in partnership between the government innovation agency and researchers) ensure that new data and insights being generated in response to the COVID-19 pandemic crisis are now quickly reaching the desks of policymakers.

7. Looking Forward

We do not see this section as a conclusion in the traditional sense: we write as the COVID-19 pandemic continues to rage around the world, spreading and changing by the day and with no clear endpoint in sight. Rather we hope to highlight some remaining issues and opportunities, and speculate about how the pandemic's impacts will radiate through low- and middle-income countries in the coming years.

A main empirical finding of this piece is that LMICs have been very hard hit health-wise, economically and socially by the COVID-19 pandemic. The world has experienced the largest global recession in living memory, and the consequences in low resource environments with limited government capacity have been particularly dire. Early hopes that the pandemic would simply pass poor countries by -- due to their younger age profile or perhaps other factors -- have unfortunately proven premature. A second focal fact in the literature is that -- as in richer countries -- socially disadvantaged groups, including women and those who work in-person with their hands (rather than behind a desk or at a computer), have experienced some of the pandemic's worst effects.

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[24] See: Kenya COVID Tracker: https://www.kenyacovidtracker.org/; Sierra Leone COVID Dashboard: https://sl-dashboard.github.io/corona/; Bangladesh Dashboard: https://dashboard.corona.gov.bd/webportal.

There are several lessons from the COVID-19 pandemic that are worth keeping in mind, although it is an open question how well they will apply to the next global crisis. Other global pandemics may occur in the coming decades, and there are also likely to be increasingly frequent climate-related shocks, unfortunately. The COVID-19 pandemic experience indicates that building a more robust social safety net, including the ability for governments to quickly mobilize public assistance to vulnerable households, will be essential for an appropriately rapid and scaled up response next time. One small silver lining of the pandemic is the fact that large-scale social safety net programming has increased dramatically since early 2020 (Gentilini et al. 2020), and innovative delivery approaches have been developed and deployed at scale, including sophisticated targeting methods and low-cost mobile money transfers (Aiken et al. 2021).

At the same time, future crises may be different and this might require learning a whole new set of lessons or pulling distinct policy levers. For instance, in contrast to COVID-19, the next virus that leads to a pandemic (should one occur) might be deadlier for children than it is for adults or the elderly. This would change the public health calculations and appropriate policy response around which types of institutions should be shut, the optimal extent of social distancing, and the like. These caveats and uncertainties apply not only to future pandemics, but even to the likely evolution of this pandemic in the very near future.

The pandemic has also shone a negative light on the current ability of global institutions to address humanity's most important challenges. The coming year will be one in which the bonds of international solidarity will be tested. The epidemiological consensus is that

the only way out of the health crisis is to achieve high levels of vaccination globally (The Lancet Infectious Diseases 2021), and there have been some moves in this direction, including the COVAX programs and vaccine assistance from China, Russia and others (Westcott 2021; Gavi 2020). Yet as we showed above, these efforts have not been up to the challenge and vaccination in the world's poor countries lags far behind.

Related to the classic economic theory of externalities (Samuelson 1954), everyone remains vulnerable as long as it remains the case that large shares of the world's population remain unvaccinated. The pandemic won't be over for anybody until it's over for everybody. The next variant that emerges in a largely unvaccinated society could be more infectious and deadlier than the last. There is thus a very strong economic case for large-scale transfers -- far beyond what we have seen so far -- from the world's rich to poor countries to provide the vaccination and other forms of assistance needed in this critical moment (Sandefur 2021). These are important not just for today but for the future, given the potentially massive adverse long-run consequences of the COVID-19 pandemic for the next generation in LMICs -- for instance, through lost educational opportunities, early and unintended pregnancy, and exposure to domestic violence.

Yet leaders in the world's rich countries have for the most part opted to direct assistance to poor countries that falls short of the level needed to contain the pandemic. The obvious explanation is that this is due to a short-run political calculus: it is politically challenging for leaders to direct resources abroad when there is a public health crisis at home. Few leaders in wealthy countries have articulated the reality of the global situation to their citizens, explaining the importance of giving all people access to the

new life-saving vaccine technology -- given the epidemiological and economic logic laid out above -- even though doing so is in the best interest of rich country populations.

Thus we draw twin lessons from the COVID-19 pandemic. One is that scientific evidence and rational policy making, combined with genuine international solidarity and compassion, are critical ingredients to any successful response. The second is that the political reality of most rich countries does not allow them to be sufficiently generous to LMICs, even if this inadequate response ends up hurting the rich countries themselves by prolonging the crisis, as appears to currently be the case with COVID-19.

What then is a potential solution to this failure? One obvious way forward would be to establish a more robust system of international taxation, redistribution and policymaking -- perhaps through a strengthened United Nations system -- to overcome collective action problems and achieve an adequate degree of funding for global public goods like pandemic response (as well as for responding to global warming) (Nordhaus 2006). In the absence of a fairer system of global redistribution, the residents of low- and middle-income countries -- the vast majority of the world's people -- remain at the mercy of the world's rich, as the COVID-19 virus rages, hoping that vaccine charity reaches them before it is too late.

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FIGURES AND TABLES:

Figure 1: Government Stringency Index in Response to Covid-19 deaths per million over time

Legend:
- ●— New Deaths per Million
- ●— Stringency Index (Average)
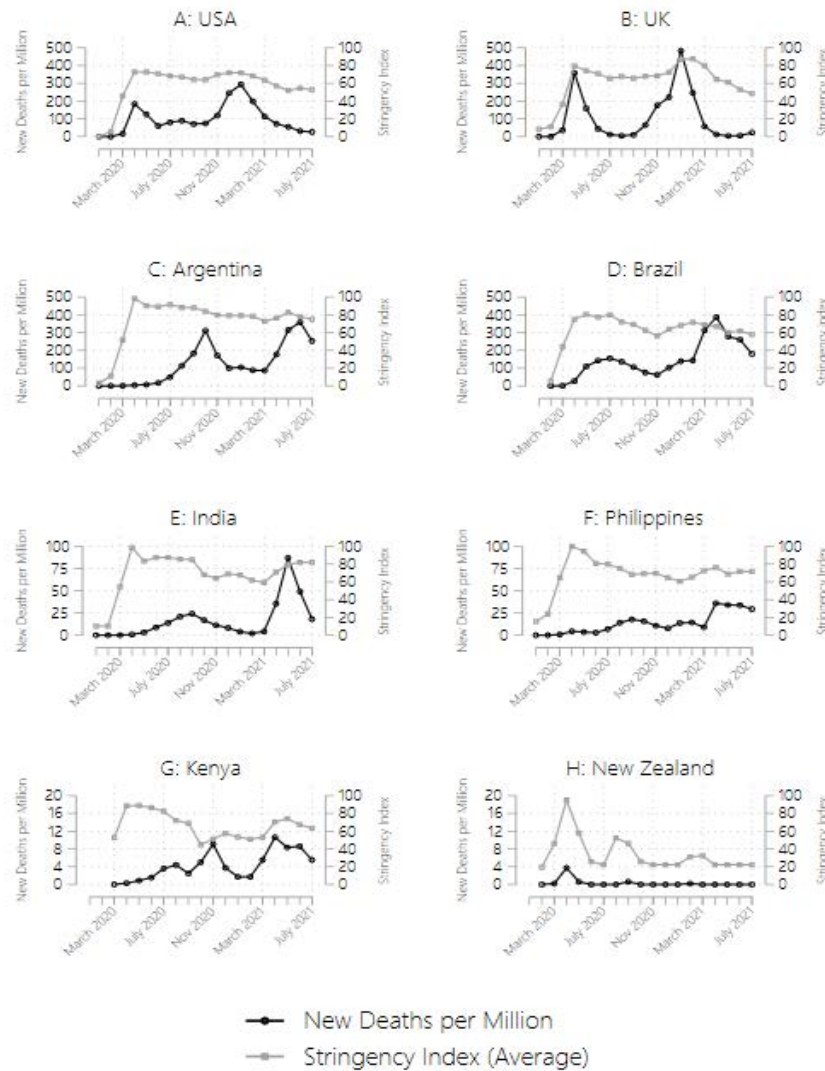
Notes: This figure shows the relationship between deaths and government responses to contain the spread of COVID-19 across the selected countries. The level of government response is measured by the Stringency index constructed by the Oxford Covid-19 Government Response Tracker. It is a composite measure that is based on nine containment and closure policy measures and their respective severity. These indicators include school closures, workplace closures, internal and international travel bans, and stay-at-home orders. The index is then rescaled to be between 0 and 100. If policies vary at the subnational level, the index considers the level of response of the strictest sub-region.

Figure 2: Cases, deaths, vaccination rates by income group (HIC, LMIC+, LIC)
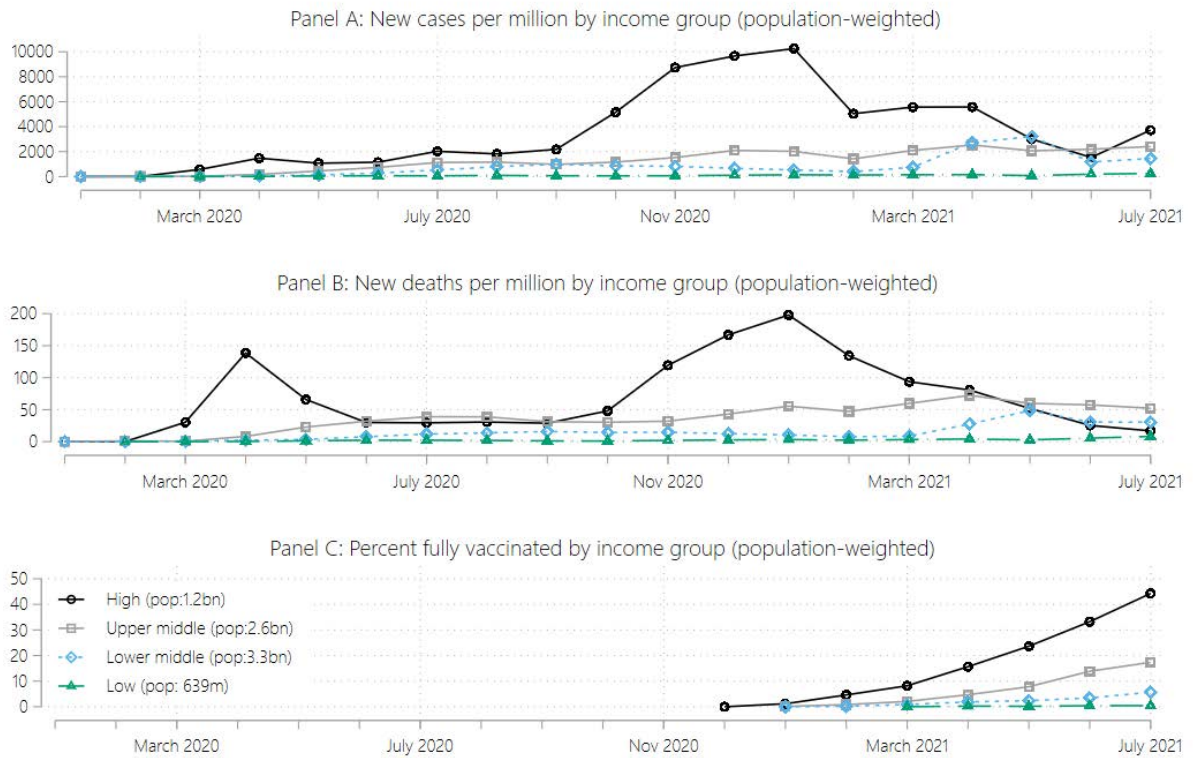
Sources: Official data collated by Our World in Data (Ritchie et al. 2020; Dong, Du, and Gardner 2020) downloaded on Aug 1st, 2021.

Figure 3: Cases, deaths, vaccination rates by OECD and other regions (SSA, SA, EA, MENA, EE, LAC)
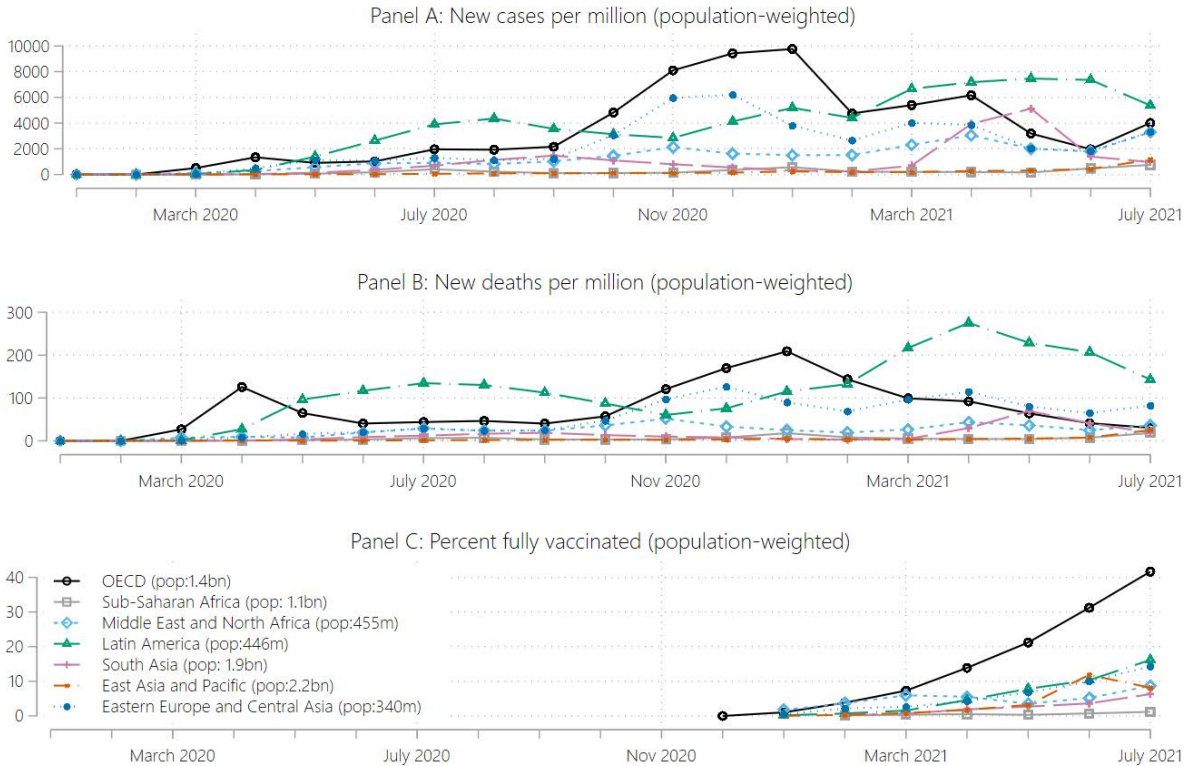
Panel A: New cases per million (population-weighted)

Panel B: New deaths per million (population-weighted)

Panel C: Percent fully vaccinated (population-weighted)

OECD (pop:1.4bn)
Sub-Saharan Africa (pop: 1.1bn)
Middle East and North Africa (pop:455m)
Latin America (pop:446m)
South Asia (pop: 1.9bn)
East Asia and Pacific (pop:2.2bn)
Eastern Europe and Central Asia (pop:340m)

Sources: Official data collated by Our World in Data (Ritchie et al. 2020; Dong, Du, and Gardner 2020) downloaded on Aug 1st, 2021.

Figure 4: Maps of global vaccine coverage by country

Panel A: April 1ˢᵗ, 2021   Panel B: July 31ˢᵗ, 2021

No data 0% 1% 5% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
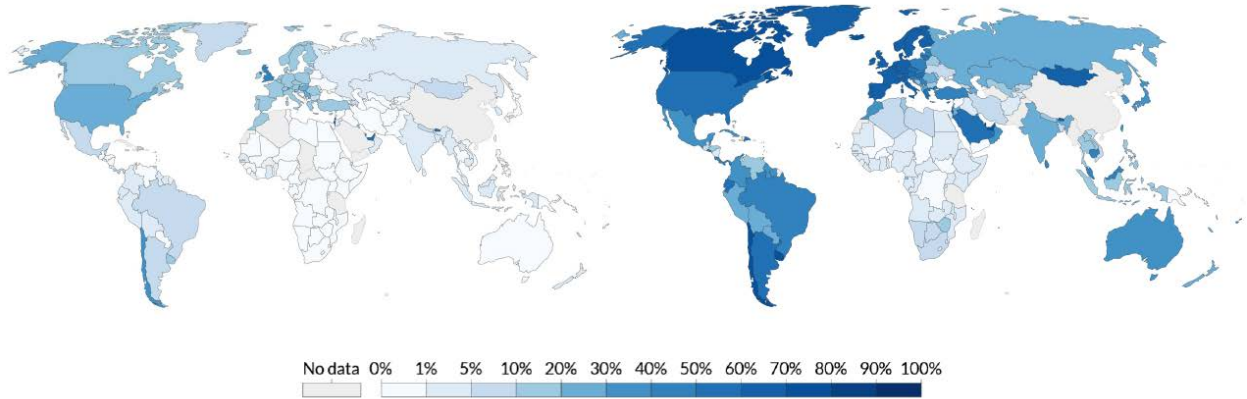
Sources: Official data collated by Our World in Data (Ritchie et al. 2020).

Notes: Share of the total population that received at least one vaccine dose. This may not equal the share that are fully vaccinated if the vaccine requires two doses. This data is only available for countries which report the breakdown of doses administered by first and second doses.

Figure 5: Annual Global GDP growth 1961-2020 (in %)
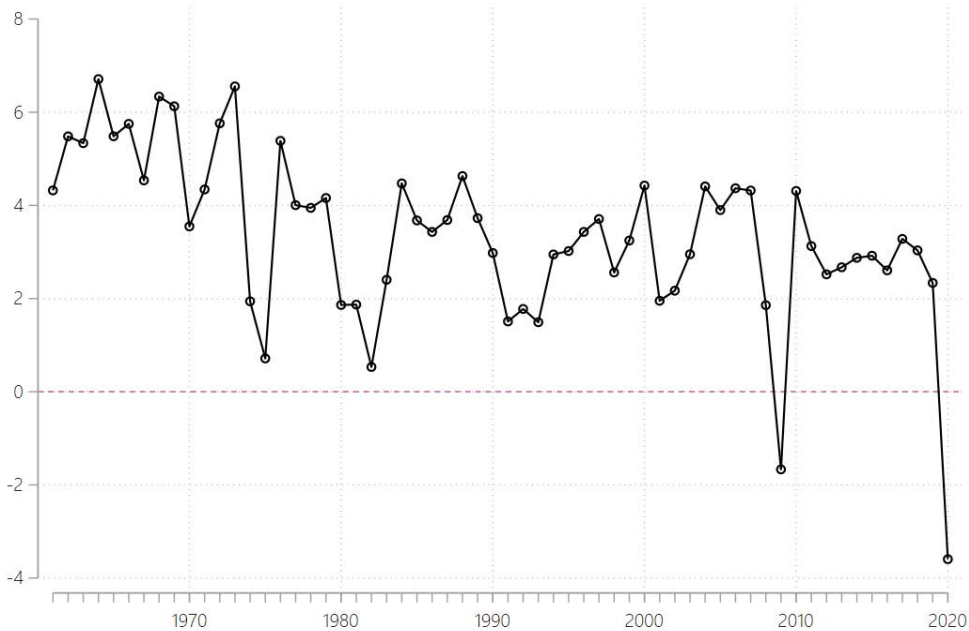
Notes: Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Source: World Bank national accounts data, and OECD National Accounts data files.

Figure 6: Key Economic Indicators Over Time
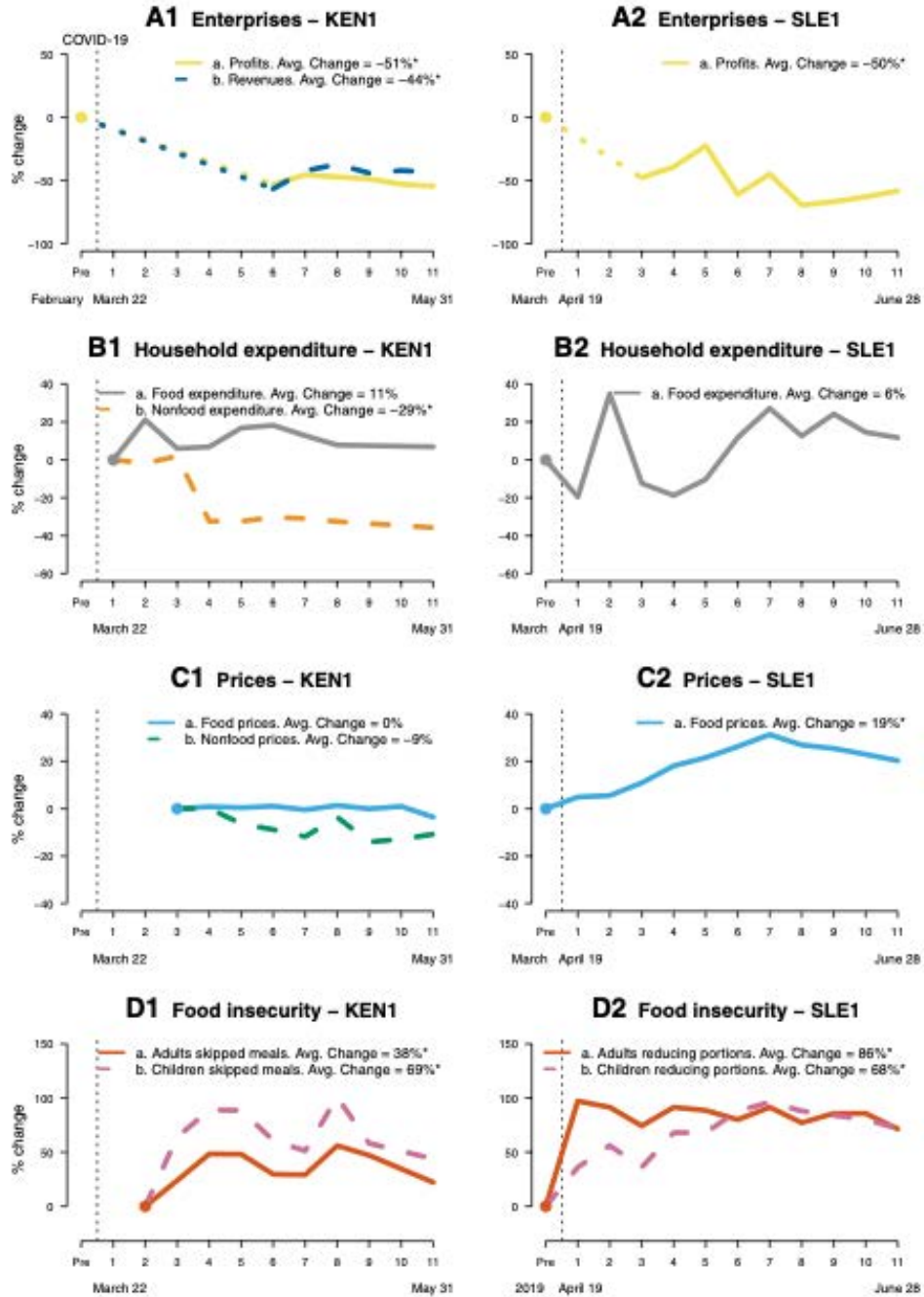
Notes: This figure is replicated from Figure 1 of Egger et al. (2021). It shows the percentage difference from baseline for several indicators in rural Kenya and Sierra Leone during the COVID-19 global pandemic relative to the pre–COVID-19 or early COVID-19 levels. The Kenya sample is representative of all households and enterprises across 653 rural villages in three sub-counties taking part in an unconditional cash transfer program. The Sierra Leone sample is representative of households in 195 rural towns across all 12 districts of Sierra Leone. Surveys in Kenya were conducted in two rounds. During the first round (weeks 1 through 8), 8594 households were interviewed. During the second round

(week 11), 1394 households were surveyed, of which 1123 were interviewed for a second time. Surveys in Sierra Leone were conducted across 2439 households. The pre–COVID-19 levels are from questions that recall data from February (A1) and March (A2 to C2) or from a previous survey conducted in November 2019 (D2). The post–COVID-19 levels are from questions that recall data from the prior 7 days (A to D2 and C to D1), prior 2 weeks (A1), and a combination (prior 7 days for food and prior 2 weeks for nonfood expenditures in B1). The weeks on the horizontal axis refer to the start of the recall period for each observation rather than the period during which the data were collected. The dotted lines in A1 and A2 show the linear trend from the pre-COVID baseline to the first observation for each respective time series. Baseline level for D1 is 1.3 days out of seven for adults and 0.72 for children. Baseline level for D2 is 35% of adults missing any meals in prior 7 days and 25% of children. *$P < 0.05$.

Figure 7: Evolution in number of countries/territories and social protection measures

APPENDIX MATERIAL:

Figure A1: Stay-at-home orders by country over time
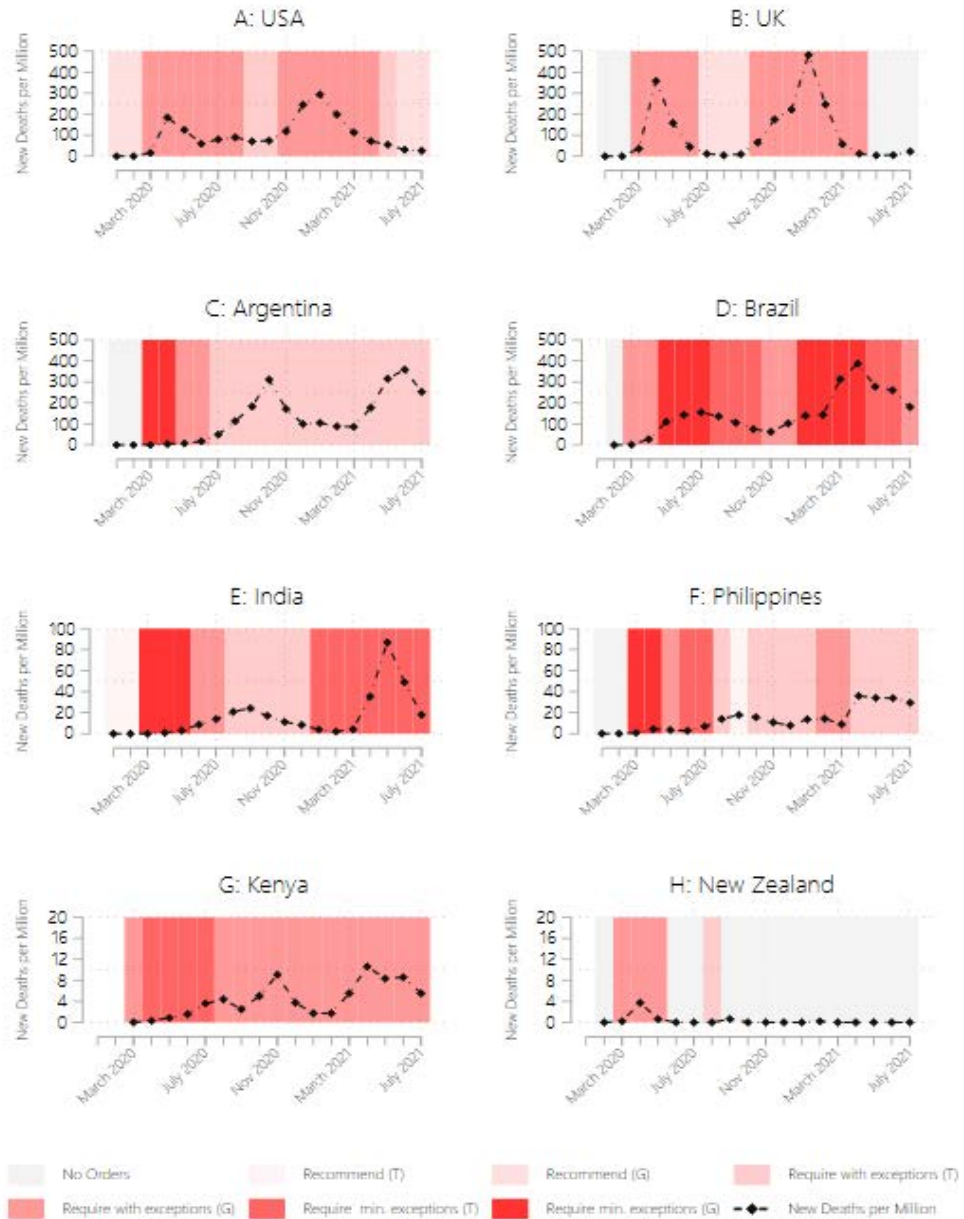
Notes: Categories are split by geographic scope. 'T' are targeted measures and 'G' are national-level measures. 'With exceptions' includes daily exercise, grocery shopping, and essential trips. 'Minimal exceptions' mean only once a week or only one person can leave at a time. This data comes from the Oxford Covid-19 Government Response Tracker.

Figure A2: Cases, deaths, vaccination rates for selected countries
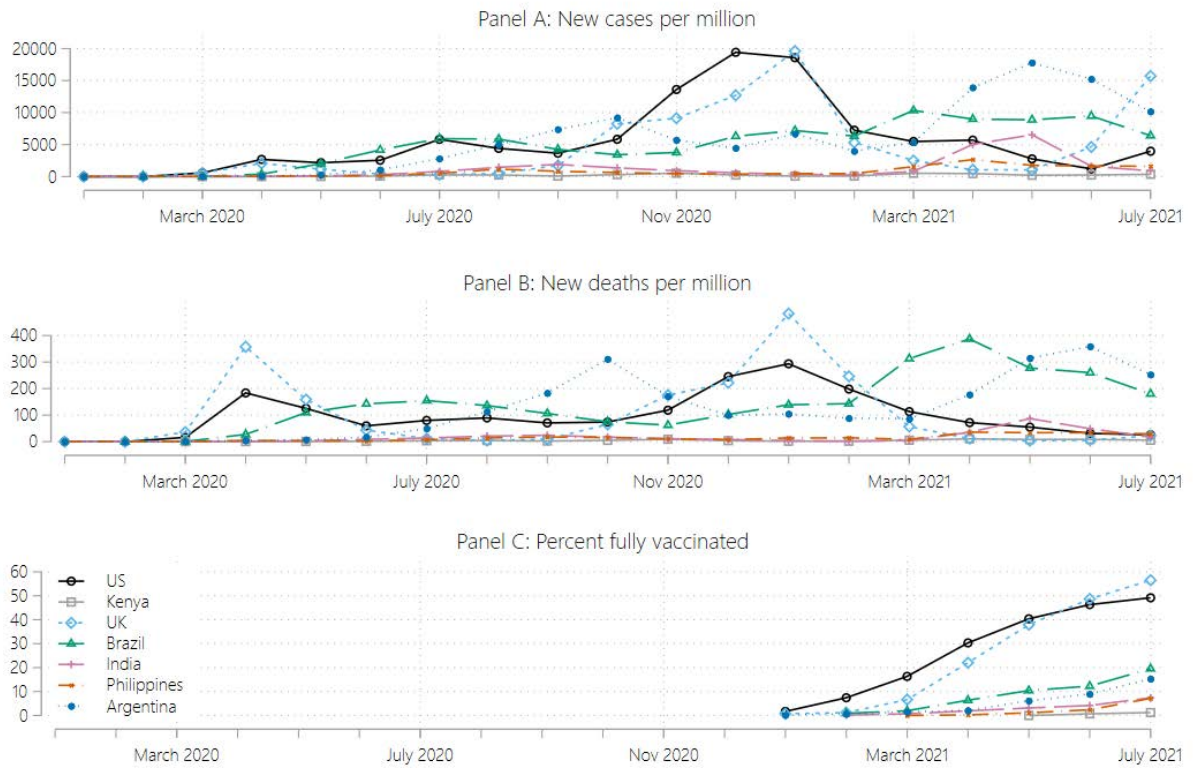
Figure A3: Excess deaths by region
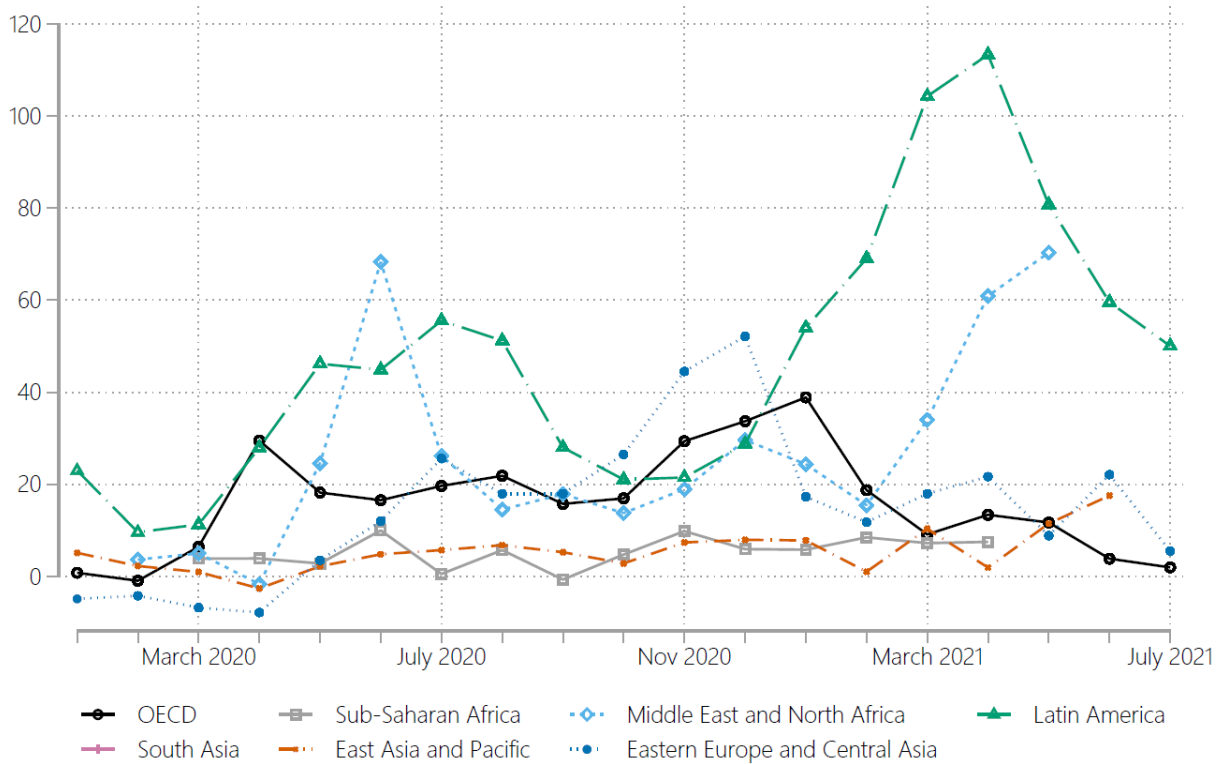
Sources: Our World in Data (Ritchie et al. 2020) based on mortality data from the Human Mortality Database (HMD) Short-term Mortality Fluctuations project and the World Mortality Dataset (WMD), downloaded on Aug 1st, 2021.

Notes: Excess mortality is defined as the percentage difference between the number of weekly or monthly deaths in 2020–2021 and the average number of deaths in the same period over the years 2015–2019 (though for a small minority of countries only data from 2016 or 2017 to 2019 are available).

Excess mortality contains missing data for many countries. In particular, there is no available information for any of the countries in the South Asia group. The countries included in the averages pictured for the other regions are given below in parentheses: OECD (Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, United Kingdom, and United States), Sub-Saharan Africa (Mauritius, and Seychelles), Middle East and North Africa (Egypt, Lebanon, Oman, Qatar, Tunisia), Latin America (Bolivia, Brazil, Cuba, Ecuador, El Salvador, Guatemala, Jamaica, Nicaragua, Panama, Paraguay, Peru, Uruguay), East Asia and Pacific (Hong Kong, Macao, Mongolia, Philippines, Singapore, Taiwan, and Thailand) and Eastern Europe and Central Asia (Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Gibraltar, Kazakhstan, Kosovo, Kyrgyzstan, Liechtenstein, Malta, Moldova, Monaco, Montenegro, North Macedonia, Romania, Russia, San Marino, Serbia, Ukraine, Uzbekistan).

Appendix Table A1: Conceptual Issues for Analyzing the Economics of COVID-19

	Panel A: COVID-19 Response Policies for Low and Middle Income Countries			
	Study	**Countries/Regional Scope**	**Sample/Methodology**	**Summary***
1.	Economic Loss from COVID-19 Fatalities Across Countries: A VSL Approach (Kim and Loayza, 2021)	202 countries classified by income group	Susceptible-Exposed-Infected-Recovered (SEIR) model adjusting for country-specific healthcare capacity (number of hospital beds per 1,000)	Mitigation strategies show significant economic gains, but marginal gains decrease when moving from mitigation to suppression. Lower income countries gain less in moving from no intervention to mitigation and still less in moving from mitigation to suppression than higher-income countries do.
2.	The Benefits and Costs of Social Distancing in High- and Low-Income Countries (Barnett-Howell et al, 2020)	178 countries, aggregated by income classification	Susceptible-Exposed-Infected-Recovered (SEIR) model	Social distancing policies deliver less value in lower-income countries that have younger populations. Trade-offs are more pronounced for poorer people who are less able to make economic sacrifices.
3.	The Intergenerational Mortality Tradeoff of COVID-19 Lockdown Policies (Ma et al, 2020)	85 countries	SIR macro model augmented with different ages and elasticity of child mortality to aggregate income	Lockdown-triggered reduction in labor supply and consumption, meant to lower COVID-19 mortality, can be counterproductive in LMICs, as economic contractions increase overall child mortality.
4.	A Novel Index-Based Decision Support Toolkit for Safe Reopening Following a Generalized Lockdown in Low and Middle-Income Countries (Shonchoy et al, 2021)	24 countries	Susceptible-Infected-Recovered-Mortality (SIRM)	Re-opening strategies differ between HIC and LMIC.
5.	EMEs and COVID-19 (Alfaro et al, 2020)	Colombia, USA	Modelling framework to quantify job and income losses from accounting identities and data for US and Colombia, depending on different economic organizational structures	Characteristics of jobs (informality, sectoral distribution, lack of labor protections) in LMICs increases risk of labor income and job losses as a result of lockdowns, and social distancing policies. Workers are exposed to demand shocks and have limited ability to telework.
6.	The Macroeconomics of Pandemics in Developing Countries: An Application to Uganda (von Carnap et al, 2020)	Uganda	Extension of Susceptible-Infected-Recovered (SIR) model to incorporate economic decision-making (working and consuming exposes agents to contagion risk, and so when infection levels rise, they reduce economic activity)	Optimal containment is less restrictive in Uganda than in the US because of differences in demography, comorbidfities, and health systems, lower income.
7.	How Should Policy Responses to the COVID-19 Pandemic Differ in the Developing World? (Alon et al., 2020)	N/A	Susceptible-Infected-Critical-Recovered (SICR) model incorporating contact matrices measuring the number of contacts between individuals of different ages in different locations, calibrating for the US and for a representative developing economy	Blanket lockdowns are less effective in developing countries, saving fewer lives per unit of lost GDP. Age-specific policies are more effective since they focus scarve public funds on childing those who are most at risk. School closures are more effective at saving lives in developing countries.

	Panel B: COVID-Response Policies for High Income Countries			
	Study	**Countries/Regional Scope**	**Sample/Methodology**	**Summary***
1.	The Effect of Large-Scale Anti-Contagion Policies on the COVID-19 Pandemics (Hsiang et al., 2020)	China, South Korea, Italy, Iran, France, and the USA	Reduced-form econometric methods	Anti-contagion policies prevented or delayed on the order of 61 million confirmed cases, corresponding to averting approximately 495 million total infections.
2.	Does Social Distancing Matter? (Greenstone and Nigam, 2020)	UK, USA	Individual-based Simulation Model and Value of Statistical Life (VSL)	Moderate social distancing is projected to reduce fatalities by 1.76 million which would produce economic benefits worth $7.9 trillion.
3.	Impact of Non-Pharmaceutical Interventions (NPIs) to Reduce COVID-19 Mortality and Healthcare Demand (Ferguson et al., 2020)	UK, USA	Microsimulation Modelling	Suppression will minimally require a combination of social distancing of the entire population, home isolation of cases and household quarantine of their family members. May need to be supplemented by school and university closures. Will need to be maintained until a vaccine becomes available since they predict that transmission will rebound if interventions are relaxed.
4.	Optimal Targeted Lockdowns in a Multi-Group SIR Model (Acemoglu et al., 2020)	N/A	Multi-group SIR model	Optimal policies differentially targeting risk/age groups significantly outperform optimal uniform policies and most of the gains can be realized by having stricter lockdown policies on the oldest group.

*Summary may directly reference authors' own words in abstract and paper.

Appendix Table A2: Impacts on Living Standards in Poor Countries

Panel A: Multi-Country Studies

	Study	Countries/Regional Scope	Sample/Methodology	Themes	Summary
1.	Falling Living Standards During the COVID-19 Crisis: Quantitative Evidence from Nine Developing Countries (Egger et al., 2021)	Bangladesh, Nepal, Philippines, Burkina Faso, Ghana, Kenya, Sierra Leone, Rwanda, Colombia.	Phone surveys of samples drawn via RDD and from pre-existing studies. The total sample consists of rural and urban households, formal and informal sector workers, agricultural laborers, small business enterprises, refugees, and migrants. (~30,000 respondents)	Income	Steep declines in income: Median share of 70% of respondents across samples reported a drop in income.
				Employment	Decline in employment: Median share of 30% of respondents across samples who lost their jobs at the time of interview.
				Access to Markets	Reduced access to markets: Median share of 31% of respondents across samples faced difficulty purchasing food because of mobility restrictions.
				Food Security	Steep decline in food consumption: Median share of 45% of respondents across samples either skipped meals or reduced portion size or quality.
2.	The Short Term Impacts of COVID-19 on Households in Developing Countries: Overview Based on a Harmonized Dataset of High-Frequency Surveys (Bundervoet et al, 2021)	Burkina Faso, Bolivia, Chile, Colombia, Costa Rica, Djibouti, Dominican Republic, Ecuador, Ethiopia, Gabon, Ghana, Guatemala, Honduras, Croatia, Indonesia, Kenya, Cambodia, Lao PDR, Madagascar, Mexico, Myanmar, Mongolia, Malawi, Nigeria, Peru, Papua New Guinea, Paraguay, Romania, El Salvador, South Sudan, Uganda, Uzbekistan, Vietnam, Zambia.	Phone surveys of samples drawn via RDD and from pre-existing nationally representative surveys. The total sample consists of rural and urban households, and formal and informal sector workers. (~46,000 respondents)	Income	Steep declines in income: 64% of households reported a decrease in total income.
				Employment	Decline in employment: 35.6% of respondents stopped working, either temporarily or permanently.
				Food Security	Higher for those economically affected: 8 percentage points more likely to miss a meal if the respondent has lost their job, and 8 percentage points higher for households who experienced a drop in income.
3.	The Early Labor Market Impacts of Covid-19 in Developing Countries: Evidence from High-Frequency Phone Surveys (Khamis, 2021A, Follow-Up Khamis, 2021B)	Burkina Faso, Bolivia, Bulgaria, Chile, Colombia, Costa Rica, Djibouti, Dominican Republic, Ecuador, Ethiopia, Gabon, Ghana, Guatemala, Honduras, Croatia, Indonesia, Kenya, Cambodia, Lao PDR, Madagascar, Mexico, Myanmar, Mongolia, Malawi, Nigeria, Peru, Papua New Guinea, Paraguay, Romania, El Salvador, Solomon Islands, South Sudan, Tajikistan, Tunisia, Uganda, Uzbekistan, Vietnam, Zambia, Zimbabwe.	Phone surveys of samples drawn via RDD and from pre-existing nationally representative surveys. The total sample consists of rural and urban households, and formal and informal sector workers.	Income	Steep decline with modest recovery: Between April and July 2020, an average of 20% of employees experienced income loss. This share declined by around 25 percentage points since the early phase of the crisis but remain high.
				Employment	Large decline with substantial recovery: Between April and July 2020, an average of 34% of workers stopped working. Between the second and third quarters of 2020, the average employment rate increased by 10 percentage points. There is little evidence of a continues large recovery in employment between the third and final quarters of 2020, with only a 2 percentage point increase during the last two quarters of the year. The share of employment in the commerce sector increased by 0.8 percentage points and 1.2 percentage points in mining, manufacturing, public utilities and construction
4.	Socioeconomic Impacts of Covid-19 in Low-Income Countries (Josephson Et Al., 2021; Follow-Up Furbush Et Al., 2021)	Ethiopia, Malawi, Nigeria, and Uganda	Phone surveys of a sample drawn from a pre-existing nationally representative samples as part of the LSMS-ISA survey (10,865 households).	Income	Large reduction in income with a modest recovery over time: In the months immediately following COVID-19 restrictions 77% of the population reported a loss in monthly income. Since those times, fewer households have reported a loss of income since the previous month of the survey. Non-farm enterprise revenue saw a steep decline in the first few months in all four countries, but have made a modest recovery relative to the month previous.
				Food security	High food insecurity with modest decline over time: In the early months, food insecurity was high in Malawi and Nigeria where the prevalence was more than 60% of the adult population. For Uganda and Ethiopia food insecurity was relatively lower at 40%. However, the prevalence of food insecurity declined across all four countries over time.
5.	Young lives, interrupted: Short-term effects of the COVID-19 pandemic on adolescents in low- and middle income countries (Favara et al., 2021)	India, Ethiopia, Peru, and Vietnam	Phone surveys of a sample from a pre-existing survey called the Young Lives Survey (YLS). The total sample consists of young people from two cohorts aged 19 and 25. (~10,000 respondents)	Income	Large reduction in income: Between 60-94% of households in the four countries experienced a fall in income or a rise in expenses
				Employment	Higher employment: In the four countries, between 13 and 33 percent of adolescents who were not working before the pandemic were working.
				Food Security	Higher food insecurity: In three of the four countries, around 13-16% of respondents reported that their household had run out of food since the pandemic began at least once. In Vietnam, this was around 4%.
6.	Did COVID-19 Market Disruptions Disrupt Food Security? Evidence from Households in Rural Liberia And Malawi (Aggarwal et al, 2020)	Liberia, Malawi	Phone surveys of a sample drawn from a pre-existing study. The sample consists of rural households and market vendors. (~1,200 households and ~2,100 market vendors)	Income	Large decline in income- 42-52% reduced monthly profit among food vendors.
				Food Prices	Mixed depending on agricultural season: Increase of 4-9% for all food items and 12-20% for staples in Liberia. Large declines in prices of food in Malawi likely due to the harvest coinciding with lockdown
				Access to Markets	Severe disruption in market access: 98% of food vendors reported that they are closed or reduced business hours in Liberia, and 25% in Malawi.
				Food Security	No effects on worsened food security across the two countries from market disruptions.
7.	Unmasking the Impact of COVID-19 on Businesses: Firm Level Evidence from Across the World (Apedo-Amah et al, 2021)	Global (~51 countries)	Phone surveys of businesses (100,000 businesses)	Income	Decreases in sales: Globally, the pandemic has had a persistent negative impact on sales.
				Employment	Reduction in hours: Globally, the employment adjustment has mostly been a reduction in hours and increased leave of absenses. A smaller share of firms laied off their workers.

	Panel B: Single Country Studies				
	Study	**Countries/Regional Scope**	**Sample/Methodology**	**Themes**	**Summary**
1.	Livelihoods, Coping, and Support During Covid-19 Crisis (Rahman and Matin, 2020)	Bangladesh	Phone surveys of urban slum dwellers and rural poor drawn from census data and a nationally-representative survey	Income	Drop in income: Income shocks led to a decline in income across groups. Vulnerable non-poop and non-poor categories suffered a drop of 67% and 65% respectively.
				Food security	Lower food expenditure: Expenditures for food are lower but much smaller than the corresponding drop in income.
				Savings and Debt	Higher use of savings and borrowing: 67% of urban respondents and 83% of rural respondents relied on savings. However more urban slum dwellers relied on borrowing to meet needs. Very few respondents sold assets to meet there needs.
2.	Immediate Impact of Stay-at-Home Orders to Control Covid-19 Transmission on Socioeconomic Conditions, Food Insecurity, Mental Health, and Intimate Partner Violence in Bangladeshi Women and Their Families: An Interrupted Time Series (Hamadani et al, 2020)	Bangladesh	Phone surveys of a sample drawn from a pre-existing study. The total sample consists of mothers of children enrolled in an iron supplementation program. (2,424 mothers)	Income	Family income fell: Median monthly family income fell from US $212 to $59 during lockdown. Proportion of families earning less than $1.90 per day rose by 47.1 percentage points.
				Employment	Reduction in work: 96% of mothers reported a reduction in paid work for the family
				Food Security	Moderate to severe food insecurity: The number of families experiencing any level of food insecurity increased by 51.7%
3.	Food Consumption and Food Security During the COVID-19 Pandemic in Addis Ababa (Hirvonen et al., 2021)	Ethiopia	Phone surveys of a sample drawn from a pre-existing study. The total sample consists of urban households. (~600 respondents)	Income	Reduction in income: In the May, June, and July surveys, over 50% of respondents states their household incomes are lower or much lower than usual. Poorer households are more likley to report income losses than richer households.
				Employment	Reduced employment: Job losses were high, but mostly voluntary where the employee terminated their contract.
				Food Security	No change in food security: Food consumption and household dietary diversity were at the same levels, or even slightly higher by August 2020 compared to the same time the previous year.
4.	The Market-Reach of Pandemics: Evidence from Female Workers in Ethiopia's Ready-Made Garment Industry (Meyer et al, 2021)	Ethiopia (Hawassa Industrial Park)	Phone surveys of a sample drawn from an electronic personnel dataset of RMG production workers and applicants. The sample consists of female RMG workers. (3,896 workers)	Employment	Large drop in employment: 41% of respondents employed in January 2020 were put on leave or terminated by April to July 2020. 91% of those not currently working do not have other employment, although 41% of them have tried to find a job or start a business. The majority of respondents no longer working have relocated to a rural area (43% of those on paid leave) - important coping mechanisms as those who left report lower levels of food insecurity and a lower percentage of them report any food expenditures at all
5.	Short-term impacts of COVID-19 on food security and nutrition in rural Guatemala: Phone-based farm household survey evidence (Ceballos et al, 2020)	Guatemala	Phone surveys of a sample drawn from a pre-existing study. The total sample consists of rural agricultural households. (1,428 households)	Income	Large reduction in income: About 80% of households report a decrease in income. Almost two- thirds of households reported a fall in income from both agricultural-related and non-agricultural-related activities. For non-agricultural activities, more people report a large decrease. Households receive significantly less remittances-- 94% report a decrease in the amount received and a 97% decrease in frequency .
				Market access	Higher difficulty accessing markets: 78% of sampled communities were closed or had restricted access. 90% of households indicate a decrease in food availability, and the majority of households report an increase in prices across all food groups.
				Food security	High food insecurity: 91% of households report having eating less than they thought they should. 20% report having not eaten despite feeling hungry. Dietary diversity also decreased, mainly driven by reduuced diversity in animal proteins. Dietary diversity for children increased.
				Savings and Debt	High share of dissaving and selling assets: About one-third use savings to cope with the crisis. 30% report selling assets. Borrowing from friends and family dropped.
6.	Impacts of a National Lockdown on Smallholder Farmers' Income and Food Security: Empirical Evidence from Two States in India (Ceballos et al., 2020)	India (Haryana and Odisha)	Phone surveys of a sample drawn from a pre-existing study. The total sample consists of rural agricultural households. (1,515 farmers)	Income	Costs and prices changed: 41% of farmers in Haryana reported having spend more on harvest than usual, including higher labor and machinery costs. In Odisha, 36% of farmers reported selling at prices lower than usual.
				Access to Markets	More difficulty accessing markets: 61-74% of farmers could not sell their harvest immediately upon harvest, and had to store it to sell or consume in the future.
				Food security	Difficulty accessing food: In the period after the lockdown 25% of farmers in Haryana reported that they had difficulty accessing different kinds of food due to unavailability in the market or increased prices.
				Savings and Debt	Higher debt: In one state, 14% of farmers were more likely to take out a loan to finance the shortfall in agricultural income
7.	Economic Impacts of COVID-19 Lockdowns: An Examination of Recoveries in Jordan (Cefalà et al., 2020)	Jordan	Phone surveys of a sample drawn using RDD. The total sample consists of refugees, and low and high wage workers (4,000 respondents)	Income	Large decline in earnings: Wage earnings decreased by 42% of pre-pandemic baseline levels on average during lockdowns. After lockdowns eased, earnings still remained 19% below their baseline. Low wage workers saw a larger decline in earnings compared to high wage service workers.
				Employment	Decrease in employment: Unemployment of adult population increased from 7% to 16% during lockdown. Highly educated and high wage service workers saw relatively larger reductions in hours worked during lockdown.
				Access to Markets	Decline in access to markets: About hald of workers faced some dfifficulty buying food suring lockdown.
				Food security	Decline in food consumption: 10% of working respondents skipped meals or reducted portions.
8.	The Short-Term Economic Effects of COVID-19 on Low-Income Households in Rural Kenya: An Analysis Using Weekly Financial	Kenya	Phone surveys of a sample drawn from a pre-existing study. The total sample consists of low-income rural households with either a woman who is pregnant or a	Income	Sharp drop in income: Household income decreased by up to a third in the five weeks after the first lockdown was implemented. In particular income drop work, as well as gifts and remittances received decreased sharply.
				Food security	No change in food consumption: Food expenditures were stable over the 5 week period.

#	Study	Countries/Regional Scope	Sample/Methodology	Themes	Summary
	Household Data (Janssens et al., 2020)		woman who is pregnant or a mother of a child below 4 years old. (328 respondents)	Savings and Debt	Deposited less and loaned less: Households withdrew less money from accounts, and deposited less savings. Credit and loan supply dropped, as well as loan repayments, gifts, and Harambee contributions.
9.	How COVID-19 Has Affected Lagos Traders: Findings from High-Frequency Phone Surveys (Bishi et al, 2020)	Nigeria	Phone surveys of a sample drawn from a sample of a pre-existing survey. The sample consists of wholesale and retail traders in Lagos, Nigeria. (765 respondents)	Business Revenue	Severe drop in revenue: 91% of traders reported zero revenue during lockdown measures. Sales rose substantially after re-opening but did not return to pre-pandemic levels.
10.	Impacts of COVID-19 on Food Security: Panel Data Evidence from Nigeria (Amare et al., 2020)	Nigeria	Phone surveys of a sample drawn from a pre-existing nationally representative survey. (1,950 households)	Employment	Reduced employment: Participation in non-farm business activities reduced by 11 percentage points. There is a smaller impact on wage-related activities and farming activities.
				Food Security	Significant increase in food insecurity: lockdowns increased households' experience with food insecurity by 13 percentage points.
11.	COVID-19 and the Future of Microfinance: Evidence and Insights from Pakistan (Malik et al., 2020)	Pakistan	Phone surveys of a sample drawn from a general population of microfinance borrowers with outstanding loans, and a population of 'graduated' borrowers. The sample consisted of microenterprise owners and microfinance loan officers. (1,000 microenterprise owners, 200 loan officers)	Income	Huge decline in income: Week-on-week business sales and household income fell 88-91% after the lockdown. Informal sector workers were particilarly hit hard.
				Savings and Debt	Severe drop in repayment rates: 70% of regular borrowers reported that they could not meet the required payment on their microfinance loans.
12.	Phone Survey on the COVID Crisis in Senegal (Le Nestour et al., 2020)	Senegal	Phone surveys of a sample drawn via RDD. (1,023 respondents)	Income	Large decline in income: 86.8% of respondents reported a loss of income. This is more pronounced in rural areas and among people living below the povert line.
				Food Security	Less meals: Over a third of respondents report limiting the size of their meals four to seven days a week.
13.	Age, Employment and Labour Force Participation Outcomes in COVID-era South Africa (Espi et al, 2021)	South Africa	Phone surveys with a sample of households drawn from a pre-existing nationally representative survey (5,862 respondents)	Employment	High churn over time: The employment-to-population ratio in March 2021 is nearly identical to how it was in February 20202, before lockdown policies. However, there has been a lot of churn between these two time periods with 23% of those employed in February 2020 are employed a year later, and 30% of those without employment finding employment by March 2021. The youth experienced the largest recovery in eployment-to-population ratio between February 2020 and March 2021 compared to older adults. The industries that experienced the highest recovery were community, social and personal services, and wholesale and retail trade.
14.	Household Response to an Extreme Shock: Evidence on the Immediate Impact of the COVID-19 Lockdown on Economic Outcomes and Well-Being in Rural Uganda (Mahmud and Riley, 2021)	Uganda	Phone surveys of a sample drawn from a pre-existing study. The sample consists of rural households. (1,277 households)	Income	Large decline in household income: 60% on household non-farm income both enterprise and labor.
				Food Security	Large decrease in food expenditure: 40% reduction per adult equivalent
				Savings and Debt	Households use up nearly 50% of their savings and borrow more
				Labor Supply	Increase total household labor supply to enterprises and labor outside of the household.

Panel C: Data and measurement methods during COVID-19

#	Study	Countries/Regional Scope	Sample/Methodology	Themes	Summary
1.	The Short-Term Impacts of COVID-19 on Households in Developing Countries (Bundervoet et al, 2021)	34 countries	Representative samples from phone surveys in 34 countries	Phone/household surveys	Use of high-frequency phone surveys in 34 countries to study economic and social effects of pandemic, by focusing on inequities within LMICs
2.	Rapid Food and Income Security Assessment: How Are BRAC International Volunteers and Programme Participants Coping with COVID-19 (BRAC report, 2020)	Afghanistan, Myanmar, Nepal, Tanzania, Liberia, Sierra Leone, Uganda and the Philippines	BRAC phone surveys with BRAC volunteers and participants (1019 respondents)	Phone/household surveys	Phone surveys within BRAC structure to understand effects of COVID virus among most vulnerable: focusing on rapid response to changes in income and food security, and current and future coping mechanisms
3.	Falling Living Standards During the COVID-19 Crisis: Quantitative Evidence from Nine Developing Countries (Egger et al, 2021)	Bangladesh, Burkina Faso, Colombia, Ghana, Kenya, Rwanda, Nepal, Philippines and Sierra Leone	Random digit dialing + random samples from pre-existing studies: to create representative random samples	Phone/household surveys	Move towards phone survey for real-time tracking of the economic effects of the pandemic in 9 countries, due to lack of frequency with household surveys and increased precision not found in aggregate data
4.	Household Response to an Extreme Shock (Mahmud and Riley, 2020)	Uganda	Representative random sample from in-person survey pre-pandemic (1217 rural households)	Phone/household surveys	Use of phone surveys to follow up on in-person survey to study well-being and economic effects of the lockdown for rural households
5.	Public Mobility Data Enables COVID-19 Forecasting and Management at Local and Global Scales (Illin et al, 2021)	China, France, Italy, South Korea, and the United States (local and regional data); 80 other countries (national data)	N/A	Tech companies and mobility data	Publicly available mobility data (FB, Google, Baidu) measuring adherence to NPIs are integrated in an epidemiological model to forecast COVID-19 cases and help assist public officials
6.	European Mobile Operators Share Data for Coronavirus Fight (Reuters, March 2020)	EU countries	N/A	Tech companies and mobility data	European mobile carriers are sharing data with EU politicians to monitor people's movements and compliance with national and local lockdowns, prompting concerns on privacy
7.	Aggregated Mobility Data Could Help Fight COVID-19 (Buckee et al, 2020)	N/A	N/A	Tech companies and mobility data	Population-level (aggregated) mobility data could be used in order to refine COVID response policies, especially interventions and messaging meant to encourage social distancing, as it provides real-time information about movement patterns at a granular level.
8.	How Did COVID-19 and Stabilization Policies Affect Spending and Employment? (Chetty et al, 2020)	USA	N/A	Private sector data	Use of private sector data to analyze effect of COVID and of US COVID policy response (PPP, stimulus checks, etc.) on spending and employment for low-wage and high-wage workers in the US
9.	Precision for COVID - Vulnerability Index (SurgoVentures)	African Countries	N/A	Mismeasurement of real effect of pandemic	Combining large-scale surveys (DHS, etc.) and other sources (published papers, etc.) in order to establish more granular data - at the subnational level - and and look at the social, health, and economic effects of COVID within different African countries
10.	COVID-19 is a Developing Country Pandemic (Gill and Schellekens, 2021)	LMICs	N/A	Mismeasurement of real effect of pandemic	Using excess mortality data (compared to official statsitics), analysis finds that LMICs might have been more affected than HIC countries - due to comorbidities and higher infection prevalence

11.	Three New Estimates of India's All Cause Excess Mortality During the COVID-19 Pandemic (Anand et al, 2021)	India	N/A	Mismeasurement of real effect of pandemic	Contrasting official statistics to other sources (local admin data, IFR (infection fatality rate) and household surveys) finds 3.5 to 5m extra deaths from the pandemic in India, highlighting the underestimation of the true effect of pandemic in LMICs

* Summary may directly reference authors' own words in abstract and paper.

Appendix Table A3: Broader Impacts for Households and Society

Panel A: Education

	Study	Countries/Regional Scope	Sample/Methodology	Summary*
1.	COVID-19: Missing More Than a Classroom. The Impact of School Closures on Children's Nutrition (Borkowski et al, 2021)	Global	UNICEF report	School closures have led to the collapse of school feeding programs. These programs have played a large role in supporting childhood nutrition (providing up to 15% of daily family income), and catching up early growth failures. The 39bn in-school meals missed worldwide as a result of the pandemic will have dire consequences on children's health, cognitive development, education (test scores) and earnings potential in the long run. The economic crisis triggered by the pandemic will also worsen childhood food insecurity with adverse effects on nutritional outcomes (increase in stunting, wasting, morbidity, especially in SSA and South Asia due to malnutrition but also in obesity due to reduced physical activity).
2.	Simulating the Potential Impacts of COVID-19 School Closures on Schooling and Learning Outcomes: A Set of Global Estimates (Azevedo et al, 2020)	Global	Simulations considering 3, 5, and 7 months of school closures	COVID-19 could result in a loss of between 0.3 and 0.9 years of schooling. Close to 7 million students from primary up to secondary education could drop out due to the income shock of the pandemic alone. Students from the current cohort could, on average, face a reduction of $355, $872, or $1,408 in yearly earnings.
3.	It's Been a Year Since Schools Started to Close Due to COVID-19 (Evans et al, 2021)	LMICs	Evidence from phone surveys, UNESCO's global monitoring of school closures and CGD's COVID Education Policy Tracker	Across SSA, MENA, EAP and LAC, children have missed 57%, 75%, 46% and 78% of their schooling in 2020 respectively. In some of the poorest countries in Eastern and Central Africa, that amounts to nearly 10-16% of their lifetime expected education. School closures have also meant that students, especially marginalized ones, have experienced lower levels of learning, even with access to distance education; many students are at risk of permanently dropping out, leading to potentially long-term adverse consequences in terms of human capital accumulation and earnings.
4.	Economic Costs of Preprimary Program Reductions due to COVID-19 Pandemic (Lopez Boo et al, 2020)	140 countries	Simulations considering different per-child program cost depending on income groups and 3, 6 or 12 months of preprimary school closures	COVID-19 could result in large losses for children currently in preschools due to cuts in program participation in pre primary. For a median 6-month cut in participation, losses are highest for upper middle income countries (3.38% of GDP), similar for high-income (2.94% f GDP) and lower-middle income countries (2.66% of GDP) and smaller for low-income countries (0.89% of GDP) highlighting large aggregate losses in terms of lifetime earnings.
5.	The Short Term Impacts of COVID-19 on Households in Developing Countries: Overview Based on a Harmonized Data Set of High-frequency Surveys (Bundervoet et al, 2021)	Burkina Faso, Bolivia, Chile, Colombia, Costa Rica, Djibouti, Dominican Republic, Ecuador, Ethiopia, Gabon, Ghana, Guatemala, Honduras, Croatia, Indonesia, Kenya, Cambodia, Lao PDR, Madagascar, Mexico, Myanmar, Mongolia, Malawi, Nigeria, Peru, Papua New Guinea, Paraguay, Romania, El Salvador, South Sudan, Uganda, Uzbekistan, VIetnam, Zambia.	Phone surveys drawn via RDD and pre-existing nationally representative surveys. The total sample consists of rural and urban households, and formal and informal sector workers. (~46,000 respondents)	Over 30% of children were unable to continue learning activities during school closures. Disruptions were higher for children in low-income countries, and within countries they were higher for children in lower-income households with lower-educated parents in rural areas.
6.	Impact of COVID-19 on Children's Education in Africa (HRW report, 2020)	Burkina Faso, Cameroon, DRC, Kenya, Madagascar, Morocco, Nigeria, South Africa and Zambia	Qualitative interviews with students, parents, teachers and education officials (57 remote interviews)	Lockdown has meant that many children especially vulnerable have received no education at all; even for those attending remote schooling, interactions with teachers or instructions have been scarce in some contexts. Children also report learning less (fewer topics or less content) through remote schooling.
7.	Young Lives, Interrupted: Short-term Effects of the COVID-19 Pandemic on Adolescents in Low- and Middle Income Countries (Favara et al, 2021)	Ethiopia, India (Andhra Pradesh and Telangana), Peru and Vietnam	Phone survey to participants of a longitudinal cohort study of a geographically diverse, poverty-focused sample, also reaching those without mobile phones or internet access (8988 individuals)	All countries experienced disruptions in education. In Peru, 16% of those engaged in formal education before the pandemic had dropped out or did not enrol again. In Vietnam, 8% dropped out, and in Ethiopia and India the rate is lower. Those in India and Ethiopia, only 40% and 10% of students engage in learning activities with their teachers respectively (both in-person or virtual classes).
8.	Socioeconomic Impacts of COVID-19 in Low-Income Countries (Josephson et al, 2021)	Ethiopia, Malawi, Nigeria, and Uganda	Phone surveys of a sample drawn from a pre-existing nationally representative samples as part of the LSMS-ISA survey (10,865 households).	Following school closures, the incidence of school-aged children who were previously attending school engaging in any learning activity fell to an estimated 46%. Student-teacher contact dropped from 96% during pre-COVID times to 17% among households with school-aged children.
9.	Remote-learning, Time-Use, and Mental Health of Ecuadorian High-School Students during the COVID-19 Quarantine (Asanov et al, 2020)	Ecuador	Phone Surveys with a random sample from pre-existing sample of high-school students (1552 students)	Between 59 and 74% of students have access to a computer/tablet and/or internet at home, and a vast majority (59% and 92% resp.) have access to the radio and the television, with some variation with SES levels. Disadvantaged groups with reduced or no access to internet are less likely to participate in telelearning, and spending less time on average on schooling. There is also some difference in engagement with online schooling, with less wealthy students and younger students spending less time studying compared to richer students, spending more time on work or leisure (boys), on household tasks (girls).
10.	Learning Inequalities Widen Following COVID-19 School Closures in Ethiopia (RISE Programme)	Ethiopia	Sample from Young Lives Survey, and retesting of some students (~2645 students)	COVID has exacerbated schooling inequalities, leading to a widening learning gap between rural and urban students as a result of school closures. The gap is even larger conditional on pre-primary participation, showing that rural children or poorest children without pre-primary education are left behind. However, the gender gap has remained the same and not been affected by school closures.
11.	Measuring the Impact of COVID-19 on Learning in Rural Kenya (Whizz Education Report, 2021)	Kenya	Sample of students in rural Kenya, who participated in NGO project (Project iMlango) and had a reliable Maths Age in March 2020, reassessed between October and March 2021 (~965 students from 88 schools)	Between March 2020 and late 2020/early 2021, as a result of school closures, rural students experienced significant learning loss (53% of students saw a decline in their Maths Age, already behind by 3-4 years compared to international peers). The average loss is 1.1 years. The remaining students (47%) saw a small gain in their math learning, by 0.68 years, which is comparable to the annual rates of learning, suggesting that even students who were least affected by COVID were barely able to catch up to their baseline levels of learning (prior to any tutoring intervention by the NGO). There is some heterogeneity: with lower grade students, female students or students from 'hardship' (rural schools facing more difficult conditions) and rural schools exhibited higher learning loss.
12.	COVID-19 and Children's School Resilience: Evidence from Nigeria (Dessy et al 2021)	Nigeria	Phone surveys with school-age individuals (aged 5 to 18) from subsample of households from the Nigeria COVID-19 national longitudinal monthly phone survey, also interviewed in person in 2019, and interviewed before school closures and after school reopening (4006 individuals)	Lockdown measures reduce school attendance by 7pp, for children age 5 to 19 and the effect increases with age (5pp for children 5 to 11; 9pp for children 12-18 and 11pp for children 15 to 18, past the age of compulsory schooling): suggesting long term effects of lockdown on schooling outcomes and labor market outcomes. No difference in gender on the effect of lockdowns on school attendance, except when interacting gender and geopolitical zone, showing disproportionate effects on girls' attendance, aged 12-18, in the North West, where education attainment is the poorest for girls. Suggestive evidence that lockdown measures can increase risk of child marriage in areas where child marriage is prevalent.

	Study	Countries/Regional Scope	Sample/Methodology	Summary*
13.	New Data on Learning Loss in Pakistan (Crawfurd et al, 2021)	Pakistan	Phone surveys with a sample of households whose children are enrolled into a large private school network (~1528 households)	Increase in time spent studying between June and September 2020 (coinciding with 1st peak), with slightly larger increase for girls than boys who spent more time working outside the home. Math assessment suggests lost learning (fewer correct answers) for boys only, with a 10pp drop in the percentage of boys who can correctly substract or divide, compared to expected levels of learning from grade to grade prior to the pandemic. Learning losses are even more pronounced among poorest children. Data reveals limited engagement with distance learning: teleschool program launched by the govt is mostl followed by richer families (86% more likely). Upon school reopening, 86% of children re-enrolled, with lower re-enrollment rates for girls.
14.	COVID-19 in Pakistan: A Phone Survey to Assess Education, Economic, and Health-Related Outcomes (Akmal et al, 2020)	Pakistan	Phone surveys with a sample of households whose children are enrolled into a large private school network (~1211 households)	As of June 2020, 66% of households are not using technology for learning - even among households with access to TV and mobile, with richer households much more likely (+55%) to engage in distance learning via technology. 2/3 of households report helping children at home, with strong differences by SES (more educated and wealthier families being more likely to do so). Limited differences in studying time between income groups, but some differences based on gender, with girls more likely to engage in household chores and boys more likely to work outside the home.
15.	What Happened to Senegalese Students after the COVID-19 School Closure? (Mbaye et al, 2021)	Senegal	Face-to-face surveys with households and students (984 households and 182 schools)	By May 2021, most students were back in school: there was no increase in dropout rates compared to 2018 but +81% increase in grade retention due to the months of closure. Poorer students were more likely to be held back a grade, with financial consequences on families, whereas as a result of fear of worse performance from their children, richer families were more likely to invest in tutoring (+1.3pp) and private education (+3.2pp at the secondary level and +1.4pp at the primary level). Poorest students were financially affected by the closures, as 60% of them declared one household had to stop working because of them, compared to 37 percent.
16.	The Impact of COVID-19 in Education: Synthesis Report (Spaull et al, 2021)	South Africa	Phone surveys with a sample of households drawn from a pre-existing nationally representative survey (5,862 respondents)	500,000 children have dropped out of school during the pandemic. This has tripled from 230,000 pre-pandemic to approximately 750,000 as of May 2021. The highest rates were found amongst the poorest households, those in rural areas, and those with high caregiver worry about learners returning to school. Average school attendance for 7-17 year olds have dropped 4 percentage points from pre-pandemic times. Results from projects indicate that between March 2020 and June 2021, most primary school learners in South Africa have lost nearly a full year of learning relative to the 2019 cohort.

Panel B: Health Access

	Study	Countries/Regional Scope	Sample/Methodology	Summary*
1.	Estimating Global and Regional Disruptions to Routine Childhood Vaccine Coverage during the COVID-19 Pandemic in 2020: A Modelling Study (Causey et al, 2021)	Global	Modelling combined with administrative and reports from immunization systems, mobility data	Compared to expected dose delivery, there was lower (estimated) vaccine coverage in 2020 for DPT and measles vaccines, leading to 30m and 27m children missing doses of vaccines for DPT and measles respectively between Jan to December 2020. This corresponds to about 9m children not being routinely vaccinated for each of these diseases, across the whole world, with most missed doses in April, and in the most severe impact in MENA, South Asia and Latin America.
2.	The Impact of the COVID-19 Pandemic on Maternal and Perinatal Health: A Scoping Review (Kotlar et al, 2020)	Global	Scoping review of 95 publications	Some evidence that pregnant people are at higher risk of adverse outcomes when infected with COVID-19. Also, more likely to suffer more from the non-medical impacts of COVID-19: deteriorated mental health, lower access to antenatal care (with potentially worse birth outcomes in LMICs); disruption of health services affecting delivery and early infant health outcomes; etc.
3.	COVID-19 and Healthcare Workers: A Systematic Review and Meta-analysis (Gholami et al, 2021)	Global	Meta-analysis of 28 studies (119,883 patients)	Half (51.7%) of health care workers tested positive for COVID-19, with higher share of hospitalizations (15.1%) and a total mortality of 1.5%, highlighting the high infection risk by COVID-19 for healthcare workers in the first 6 months of the pandemic.
4.	Infection and Mortality of Healthcare Workers Worldwide from COVID-19: A Systematic Review (Bandyopadhyay et al, 2020)	Global	Systematic review including 594 records	Healthcare workers as of early May 2020 represented 4% of the number of patients with COVID-19, and 0.5% of the COVID-19 deaths worldwide. Women (72% of healthcare worker infections) and nurses (39%) were more likely to get infected, whereas doctors (51%) were the largest group who died from COVID-19.
5.	Lives and Livelihoods: Estimates of the Global Mortality and Poverty Effects of the COVID-19 Pandemic (Decerf et al, 2020)	150 countries	Estimation of welfare costs using pre-pandemic and COVID pandemic mortality data, income distribution and poverty distribution datasets and GDP growth estimates	Effects of the pandemic and pandemic policies has led to massive welfare costs: based on growth estimates for 2020, the pandemic could cause 68m additional poverty years (years of life spent in poverty), and 4.3m yers of life lost. The substantial costs of the pandemic in terms of poverty are concentrated in poorer countries.
6.	The COVID-19 Crisis Will Exacerbate Maternal and Child Undernutrition and Child Mortality in Low- and Middle-Income Countries (Osendarp et al, 2021)	118 countries (LMICs)	Modelling (the MIRAGRODEP computable general equilibrium model, Lives Saved Tool (LiST) and Optima Nutrition model) based on different scenarios of predicted declines in GNI during 2020-2022	Accounting for elasticity of wasting to national income, as well as the additional effect of service disruptions to the health sector on nutritional outcomes, the moderate scenario (in terms of GNI declines) estimates an increase of 9.3m in the number of children under 5 with wasting (with 2/3th of them in South Asia); an increase of 2.6m children with stunting in 2022 (most of them will be in SSA) as well as increased child mortality as a result of child wasting and declines in nutritional intervention coverage. Additional child stunting and mortality suggest substantial future productivity losses of $29.7bn dollars under the moderate scenario, these represent 0.2% of current GNI in the sample countries. Similar, increases in cases of anemia during pregnancy would incur $79m dollars in productivity losses between 2020-2022.
7.	Pulse Survey on Continuity of Essential Health Services during the COVID-19 Pandemic: Interim Report, 27 August 2020 (World Health Organization, 2020)	105 countries (LMIC and non-LMIC)	Key-informant surveys of 105 Ministry of Health Officials	Disruptions in essential services are geographically widespread across the globe. Almost every country (90%) experienced a disruption to some extent, with greater disruptions being reported in low- and middle-income than in high-income countries. The most frequently disrupted services included routine immunization services – outreach services (70%) and facility-based services (61%) – noncommunicable disease diagnosis and treatment (69%), family planning and contraception (68%), treatment for mental health disorders (61%), antenatal care (56%) and cancer diagnosis and treatment (55%).
8.	Indirect Effects of the COVID-19 Pandemic on Malaria Intervention Coverage, Morbidity, and Mortality in Africa: A Geospatial Modelling Analysis (Weiss et al., 2021)	African Countries	Mathematical model of COVID-19 and malaria	COVID-19-related disruption to malaria control in Africa could almost double malaria mortality in 2020, and potentially lead to even greater increases in subsequent years.
9.	The Potential Public Health Consequences of COVID-19 on Malaria in Africa (Sherrard-Smith et al, 2020)	Sub-Saharan African Countries	Mathematical model of COVID-19 and malaria	If activities are halted, the malaria burden in 2020 could be more than double that of 2019. In Nigeria alone, reducing case management for 6 months and delaying long-lasting insecticidal nets campaigns could result in 81,000 (44,000–119,000) additional deaths
10.	Effects of the COVID-19 Pandemic on Maternal and Perinatal Outcomes: A Systematic Review and Meta-analysis (Chmielewska et al, 2021)	17 countries (LMIC: Brazil, Botswana, China, India, Mexico, Nepal, Turkey and non-LMIC)	Meta-analysis	Significant increase in stillbirths and maternal deaths during versus before the pandemic; a higher incidence of post-natal depression during versus before the pandemic; and an increase in surgically managed ectopic pregnancies.

		Burkina Faso, Colombia, Ghana, Kenya, Rwanda, Sierra Leone*	Phone surveys drawn via RDD and from pre-existing studies. The total sample consists of rural and urban households, formal and informal sector workers, agricultural laborers, small business enterprises, refugees, and migrants. (~30, 000 respondents)	
11.	Falling Living Standards During the COVID-19 Crisis: Quantitative Evidence from Nine Developing Countries (Egger et al., 2021)	*Healthseeking behavior module only collected in these countries but study covers 9 countries (Bangladesh, Nepal, Philippines, Burkina Faso, Ghana, Kenya, Sierra Leone, Rwanda, Colombia)		Across the 5 African countries: between 11-20% of the respondents (6% in Sierra Leone) report a delayed or reduced access to healthcare, whereas 44% of the sample reports the same situation in Colombia.
12.	The Potential Impact of COVID-19-related Disruption on Tuberculosis Burden (McQuaid et al 2020)	China, India, South Africa	Mathematical model of tuberculosis with an age-specific contact matrix calibrated to data from the 3 countries	Models find that COVID-19 restrictions could lead to an increase of over 20,000 tuberculosis deaths.
13.	Intersecting Vulnerabilities: The Impacts of COVID-19 on the Psycho-emotional Lives of Young People in Low and Middle-Income Countries (Banati, Jones and Youssef, 2020)	Cote d'Ivoire, Ethiopia, Lebanon	Qualitative phone and in-person interviews of adolescents sampled from pre-existing panel study (Rural/Urban; refugee camps; with disabilities; married; in education/out-of-education) (568 adolescents)	Concerns about infection were a major deterrent to health-seeking behaviour, especially for sexual and reproductive healthcare (Cote d'Ivoire/Ethiopia). In Ethiopia, married girls not seeking antenatal care opting for home births with potentially adverse birth events and mortality increases
14.	The Effects of India's COVID-19 Lockdown on Critical non-COVID Health Care & Outcomes (Jain & Dupas 2021)	India (Rajasthan)	2.110 patients taken from 3.183 dialysis patients under insurance: disproportionately male (69%), 46 yrs old on average, under dialsysis under insurance for 11.5 months, 5 visits/month Of the 1392 patients alive at the time fo the first survey, 1177 completed a follow-on survey	62% of households report disruption of dialysis care during lockdown; 42% report being unable to reach the hospital due to travel barriers. Effects on care-seeking were worse for lower caste, poorer patients and those living far away from a dialysis hospital. Mortality in May 2020 is 4.37%, a 1.7pp increase (63% increase) relative to the 2.67% mortality in March 2020, pre-lockdown; mortality declines in June & July but never to March levels - excess mortality appears driven by lockdown related disruptions to care.

Panel C: Mental Health and Wellbeing

	Study	Countries/Regional Scope	Sample/Methodology	Summary*
1.	COVID-19 and Mental Health: A Review of the Existing Literature (Rajkumar, 2020)	Global	Narrative review of 28 articles	The COVID-19 outbreak seems to have worsened psychological health. Across all studies, the pandemic and its response have led to the emergence of symptoms of anxiety, depression, and self-reported stress. Sleep also seems to have worsened. This mental health impact of the pandemic seems to be especially pronounced among vulnerable populations (health care workers, migrant workers, pregnant women, etc.)
2.	Impact of the COVID-19 Pandemic on Anxiety and Depression Symptoms of Young People in the Global South: Evidence from a Four-Country Cohort Study (Porter et al, 2021)	Ethiopia, India (Andhra Pradesh and Telangana), Peru and Vietnam	Phone survey to participants of a longitudinal cohort study of a geographically diverse, poverty-focused sample, also reaching those without mobile phones or internet access (8988 individuals)	Rates of mild anxiety and mild depression were higher in Peru (32% and 41% resp.) and Ethiopia (18% and 15% resp.), mirroring higher COVID-19 mortality rates in these countries, and lowest in Vietnam. In all countries except Ethiopia, women had higher rates of anxiety and depression than men. Across all countries, there was no consistent pattern in differential rates of mental health distress by urban/rural, or wealth tercile, or internet access. Further analysis shows positive association between (at least) mild anxiety and perception of risk with respect to being infected with COVID-19, leaving the house at least 1 day a week (only in India), economic adversity (even among those who did not have to reduce food consumption), increasing the odds of mild anxiety. Increased domestic responsibilites, in India, Peru and Vietnam, as well as changes in employment status substantially increased odds of anxiety, in Ethiopia.
3.	COVID-19-related Knowledge, Attitudes, and Practices Among Adolescent Girls in Bangladesh (Amin et al, 2020)	Bangladesh	Phone Surveys; Sample from pre-existing survey in UNFPA districts and random sample (480 girls) from existing program targeting 2200 adolescent girls at risk of child marriage in 5 high child marriage districts (Bogura, Jamalpur, Sherpur, Kushtia and Chapainawabganj) (960 girls)	75% of the sample of adolescent girls reports feeling sometimes or mostly depressed during the lockdown period.
4.	Immediate Impact of Stay-At-Home Orders to Control COVID-19 Transmission on Socioeconomic Conditions, Food Insecurity, Mental Health, and Intimate Partner Violence in Bangladeshi Women and their Families: An Interrupted Time Series (Hamadani et al, 2020)	Bangladesh	Phone Surveys; Random sample of mothers of children enrolled in previously enrolled in an iron supplementation RCT (2,424 mothers)	Deterioration of mothers' mental health symptoms: increase of reports during lockdown of symptoms of depression compared to period before lockdown; anxiety during lockdown was high, with 25.7% of respondents reported a score consistent with mild anxiety and 12.2% moderate anxiety. 68.8% report change in anxiety symptoms with lockdown (increase of anxiety for 98.9% of those who reported a change).
5.	Remote-learning, Time-Use, and Mental Health of Ecuadorian High-School Students during the COVID-19 Quarantine (Asanov et al, 2020)	Ecuador	Phone Surveys with a random sample from pre-existing sample of high-school students (1552 students)	There is some suggestive evidence that depression rates have increased as a result of the pandemic (no baseline score collected), with higher depression levels reported by female and indigenous students. Closure of schools and isolation are two main problems; 16% have mental health scores that indicate depression.
6.	The Market-Reach of Pandemics: Evidence from Female Workers in Ethiopia's Ready-Made Garment Industry (Meyer et al, 2021)	Ethiopia	Phone surveys (random digit dialing) of a random sample from existing electronic personnel dataset sample of female Hawassa Industrial Park workers (3896 respondents)	24% of respondents screen positive as depression of the depression scale, although there are no signficant differences by employment status.
7.	Prevalence and Changes in Boredom, Anxiety and Well-being Among Ghanaians During the COVID-19 Pandemic: A Population-based Study (Boateng et al, 2021)	Ghana	Web-based survey restricted to adults 18 and above and resident in Ghana recruited on social media (811 participants)	Despite limited spread of the infection at the time of the survey, participants were concerned about the spread of COVID. As a result of the pandemic, the proportion of people with better well-being (based on mental well-being scale) dropped from 64% to 39%, while the likelihood of reporting boredom symptoms increased from 30% to 43%. Analysis shows a significant increase in bordeom scores, in generalized anxiety disorders and a decrease in well-being, compared to the period before the pandemic (self-reported).
8.	Women's Well-Being During a Pandemic and its Containment (Bau et al, 2021)	India (Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh, and Maharastra)	Pre-existing surveys with sample drawn from nationally representative voter rolls, and CHW registers of lactating mothers and rural households (1545 households, incl. 573 women for the female survey)	Lockdown policies worsen women's mental health: moving from 0 to average containment policies leads to a 13-14pp (+39-40%) increase in the likelihood that feelings of depression have worsened and a 20pp (+73%) increase in the likelihood that feelings of tiredness have increased, with effects increasing in magnitude with the level of containment. Similar effects from containment are found for anxiety (+13pp or +45%), feelings of safety (non-significant decrease).

	Study	Countries/Regional Scope	Sample/Methodology	Summary*
9.	Impact of the Lockdown on the Indian Village Economy (Cefala et al 2020)	India (Tamil Nadu, primarily Chennai)	Male Migrant daily-wage laborers working in construction recruited in Chennai but mostly from villages & towns in Tamil Nadu and their wives	45% of male participants reported feeling very scared or terrified about this situation. Drop in mental health status for both men (4 pp) and women (2.9 pp). Stigma with travel - 63% believe that migrants would be treated as ill by people around them if they traveled back to their native villages.
10.	The COVID-19 Pandemic, Hunger, and Depressed Mood Among South Africans (Hunt et al., 2021)	South Africa	Phone surveys with a sample of households drawn from a pre-existing nationally representative survey (5,862 respondents)	The risk of screening positive for depression increased from 24% to 29% in mid-end of 2020. This is an increase compared to pre-pandemic risk of depression screening, which was 21%. The risk persists at 29% through to May 2021.
11.	Household Response to an Extreme Shock: Evidence on the Immediate Impact of the COVID-19 Lockdown on Economic Outcomes and Well-being in Rural Uganda (Mahmud and Riley, 2021)	Uganda	Phone survey of randomly selected representative sample of rural households in Uganda (1075 households)	Decrease in respondent well-being: high prevalence of mild to moderate depression (53% of respondents) at follow-up (just before lockdown began - early to mid March) and lower satisfaction with quality of life (-1 point), with a decrease of 25% during the lockdown.

Panel D: Migrants and Refugees

	Study	Countries/Regional Scope	Sample/Methodology	Summary*
1.	COVID-19 Crisis Through a Migration Lens (World Bank, 2020)	Global	N/A	Migrant workers are more vulnerable to job and income loss, and unemployment risks; less able to move across sectors. Internal migrants' limited access to basic services and social safety nets make them more vulnerable to infection and economic crisis under lockdown restrictions as their movements can seed infections and they cannot migrate to smooth consumption.
2.	COVID-19 and the Displaced (Refugees International, 2020)	Global	N/A	Living conditions of refugees/internally displaced people(density, limited access to basic services esp. intensive care and to reliable info; disruption to humanitarian chains and lack of attention from broader world) makes them even more vulnerable to the spread of the disease.
3.	Falling Living Standards During the COVID-19 Crisis: Quantitative Evidence from Nine Developing Countries (Egger et al., 2021)	Bangladesh, Burkina Faso, Colombia, Ghana, Kenya, Rwanda, Nepal, Philippines and Sierra Leone	Phone surveys of samples drawn via RDD and from pre-existing studies. The total sample consists of rural and urban households, formal and informal sector workers, agricultural laborers, small business enterprises, refugees, and migrants. (~30,000 respondents)	No evidence of differential impacts of the pandemic among refugees and non-refugee populations in Bangladesh and in Kenya.
4.	Migration and the Labour Market Impacts of COVID-19 (Barker et al., 2020)	Bangladesh, Nepal	Phone surveys of representative samples of migrant and non-migrant households linked to prior studies.	Migrant households report 25% greater declines in earnings and fourfold greater prevalence of food security since March. This is attributed to lower migration rates, less remittances, isolation in origin communities, and greater health risks.
5.	The Impact of Domestic Travel Bans on COVID-19 is Nonlinear in Their Duration (Burlig et al, 2021)	Indonesia, Philippines, South Africa, Kenya and China	Susceptible-Exposed-Infected-Recovered (SEIR) model	Moderately lengthy domestic mobility restrictions substantially increase infections once restrictions are lifted (but do not if restriction is short or very long).
6.	Prevalence of COVID-19 Symptoms, Risk Factors, and Health Behaviors in Host and Refugee Communities in Cox's Bazar (Lopez-Pena et al, 2020)	Bangladesh	Phone survey drawn from a household panel representative of Rohingya refugees and host population (909 households)	The higher prevalence of COVID symptoms among refugees is likely due to worse living conditions at baseline, but refugees seem more likely to attend social and religious gatherings (less adherence to social distancing). Controlling for baseline characteristics, households with return migrants are also more likely to be report COVID symptoms.
7.	COVID-19 Lockdown and Migrant Workers: Survey of Vocational Trainees from Bihar and Jharkhand (Chakravorty et al. 2020)	India (Bihar and Jharkhand)	Phone survey with 2,259 youth from Bihar & Jharkhand in June & Jul 2020; all trainees of a previous 3-6 residential skills training program	45% of the interstate migrants returned ot their home state and 44% of intrastate migrants returned home after the COVID-19 lockdown in India. 32% of respondents with a salaried job in the pre-lockdown period had lost their job. Of those who were in employment, only 31% had received support from employers, mainly through food supplies. 51% of interstate migrants received government assistance (financial aid, & food supplies) and 31% did not receive support from any source. Average anxiety levels were higher than in pre-lockdown (44 vs. 37 on a scale of 100). Willingness to re-migrate was susbtantially lower among former female migrants (34% vs. 68% for men).

Panel E: Gender Differences

	Study	Countries/Regional Scope	Sample	Summary*
1.	Pandemics and Violence against Women and Children (Peterman et al, 2020)	Global	N/A	A network of pathways (such as quarantine, social isolation or economic security) links pandemics to increased domestic violence for women and children. This requires a gender-sensitive pandemic response due to gendered consequences of the pandemic.
2.	Women and Men in the Informal Economy (ILO report, 2018)	LMICs	ILO surveys	In low and lower-middle countries, women are more likely to be informal workers. Women in LMICs are also more often engaged in vulnerable informal work, as family or domestic workers, where they have a lower labor income and are exposed to "higher decent work deficits".
3.	COVID-19: What Does This Mean for Gender (IGC, 2020)	LMICs	UN Women surveys	Due to women's occupations in more informal and low-paid sectors (food service for example), they might bear a disproportionate impact of the economic crisis.
4.	COVID-19 Sends the Care Economic Deeper into Crisis Mode (Staab, 2020)	LMICs	N/A	Women are more likely to be in client-facing sectors (they form the majority of health care workers in many LMICs; they are also involved in food service; carework), thus they might be more directly exposed to the virus.
5.	COVID-19 and Girls' Education (Mendez-Acosta and Evans, 2020)	LMICs	N/A	School closures along with health and economic crises can make girls less likely to return to school long-term, and more likely to engage in negative coping strategies to counteract loss of HH income (early marriages, transactional sex, etc.) or suffer from disruption of health services (early pregnancy).
6.	Child Marriage: the Unspoken Consequence of COVID-19 (Effoum and Revacarren, 2020)	LMICs	N/A	School closures put girls at an increased risk for child marriage and an overall increase in gender-based violence.
7.	COVID-19: Reducing the Risk of Infection Might Increase the Risk of Intimate Partner Violence (van Gelder et al, 2020)	N/A	N/A	Quarantine is effective in controlling spread of COVID but might increase risk of IPV towards women by fostering isolation and limiting access to support.
8.	Whose Time to Care? (UN Women, 2020)	Afghanistan, Albania, Azerbaijan, Bangladesh, Belarus, Bosnia and Herzegovina, Cambodia, Chile, Cote d'Ivoire, Egypt, Ethiopia, Georgia, Guinea, Indonesia, Iraq, Jordan, Lebanon, Libya, Kazakhstan, Kenya, Kosovo, Kyrgyzstan, Maldives, Mexico, Republic of Moldova, Morocco, Nepal, North Macedonia, Palestine, Pakistan, Philippines, Senegal, Serbia, Thailand, Tunisia, Turkey, Samoa, Uzbekistan, Vietnam, Yemen, Croatia.	Web-based and Phone surveys; sampling strategies and sample size vary by country	Both men and women report increased domestic responsibilities: an increase in time spent on chores (60% of women and 54% of men) and an increase in the intensity of unpaid domestic work (i.e. performing at least tree domestic activities) (28% of women, and 16% of men). Men and women report spending more time on unpaid care work in similar proportions (51% and 56% respectively) - in particular, spending more time assisting elderly, sick or disabled adults (21% and 20%). However, women's care burden has increased even more, as 33% report increasing time spent on at least 3 care activities, compared to 26% of men.

9.	The Gendered Impacts of COVID-19 on Labor Markets in Latin America and the Caribbean (Cucagna and Romero, 2021)	Argentina, Brazil, Bolivia, Colombia, Costa Rica, Chile, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Peru, and Paragua	High-Frequency Phone Surveys - Random Digit Dialing; Nationally representative sample of individuals 18 and above with access to a phone: formal and informal workers; women and men (13,152 individuals)	56% of women workers lost their jobs temporarily or permanently by May 2020 (+44% compared to men workers). Employment remained unchanged even after individuals started going back to work (by August 2020); in all countries, women are more likely than men to face job losses: most female-intensive sectors observed the most job losses (56% of losses concentrated in trade, personal services, education, and hospitality, employing 60% of women before the pandemic). Caregiving was a factor in women remaining unemployment as the pandemic persisted (a child in school age results in a 6pp decrease in likelihood of retaining a job for women but not for men, by August 2020 but not in May 2020). No sign of recovery among female workers by August 2020, only for lower-quality jobs; distribution of women across job type also moving towards more self-employment (+5pp) and less paid employees (-8pp)
10.	Adolescent Well-Being in the Time of COVID-19 (Baird et al, 2020)	Bangladesh; Ethiopia; Jordan	Phone surveys; Census-style listing to create sample of rural and urban adolescents aged 12-21 years from pre-existing panel study, oversampling marginalized adolescents, i.e adolescents in refugee camp settings, with disabilities or who experienced child marriage (~6,000 adolescents)	Pressure to marry has increased for adolescents in rural areas; but in urban areas, economic fallout acted as a protective factor (42% of the urban sample in Bangladesh reports that the pressure to marry has decreased). Older girls face substantial demands on their time due to domestic and care work responsibilities - which limits their time for leisure and study.
11.	The Short Term Impacts of COVID-19 on Households in Developing Countries: Overview Based on a Harmonized Data Set of High-frequency Surveys (Bundervoet et al, 2021)	Burkina Faso, Bolivia, Chile, Colombia, Costa Rica, Djibouti, Dominican Republic, Ecuador, Ethiopia, Gabon, Ghana, Guatemala, Honduras, Croatia, Indonesia, Kenya, Cambodia, Lao PDR, Madagascar, Mexico, Myanmar, Mongolia, Malawi, Nigeria, Peru, Papua New Guinea, Paraguay, Romania, El Salvador, South Sudan, Uganda, Uzbekistan, Vietnam, Zambia.	Phone surveys drawn via RDD and pre-existing nationally representative surveys. The total sample consists of rural and urban households, and formal and informal sector workers. (~46, 000 respondents)	Women were 9pp more likely to lose their job (42%, compared to 31% of men); women also more likely to report reductions in total household income in the aftermath of the pandemic.
12.	Intersecting Vulnerabilities: The Impacts of COVID-19 on the Psycho-emotional Lives of Young People in Low and Middle-Income Countries (Banati, Jones and Youssef, 2020)	Cote d'Ivoire, Ethiopia, Lebanon	Qualitative phone and in-person interviews of adolescents sampled from pre-existing panel study (Rural/Urban; refugee camps; with disabilities; married; in education/out-of-education) (568 adolescents)	Girls (but not boys) report increased exposure to intra-household tensions and violence in all 3 countries (psychological and physical violence in Cote d'Ivoire; intra-family tentions and problems in Lebanon); married girls report increased tensions and IPV in Lebanon and in Ethiopia. Ethiopian adolescents report increased pressure to marry with school closures - coinciding with traditional wedding season.
13.	Immediate Impact of Stay-At-Home Orders to Control COVID-19 Transmission on Socioeconomic Conditions, Food Insecurity, Mental Health, and Intimate Partner Violence in Bangladeshi Women and their Families: An Interrupted Time Series (Hamadani et al, 2020)	Bangladesh	Phone Surveys; Random sample of mothers of children enrolled in previously enrolled in an iron supplementation RCT (2,424 mothers)	Increase in emotional violence and physical violence during the lockdown (reported by 20% and 6.5% respectively); lower prevalence of sexual violence but reports of increase since the lockdown for 51% of those affected (6.5%).
14.	COVID-19-related Knowledge, Attitudes, and Practices Among Adolescent Girls in Bangladesh (Amin et al, 2020)	Bangladesh	Phone Surveys; Sample from pre-existing survey in UNFPA districts and random sample (480 girls) from existing program targeting 2200 adolescent girls at risk of child marriage in 5 high child marriage districts (Bogura, Jamalpur, Sherpur, Kushtia and Chapainawabganj) (960 girls)	18% of the adolescent girls reported facing any form of violence in the past 2 weeks. Married and older adolescents report higher levels of household violence (35% for married girls compared to 16% for unmarried girls) Adolescent girls report increased domestic responsibilities under lockdown: they reported increased caretaking for ill family members (63% for girls aged 16 and above and 46% for younger girls) and 22% of adolescent girls reported an increase in household chores during lockdown.
15.	The Short- and Long-Term Impacts of the COVID-19 Pandemic on Family Farms in China – Evidence From a Survey of 2 324 Farms (Du et al, 2020)	China	Online surveys of family farms (2324 family crop farms)	No difference in terms of short-term (immediate shock caused by anti-pandemic policies) impact of the lockdown/pandemic on family farms by age, gender, education but female owners received more shocks to resource allocations than male owners. However, long-term impact (effects on long-term production plans) of the pandemic was differential by education and gender, as male-owned family farms are more diversified and larger, thus better able to adjust in the face of risk such as COVID-19.
16.	Unintended Consequences of Lockdowns: COVID-19 and the Shadow Pandemic (Ravindran and Shah, 2020)	India	Administrative (NCW on district-month level complaints from January 2018–May 2020) and survey datasets (NHFS from 2015-2016 and Google data) (577 districts out of 640)	Increase in domestic violence complaints by 0.47 sd (+131%), in cybercrime complaints by 0.7sd (+184%) concentrated in districtis with high intensity of lockdowns ("red zone districts") compared to districts with low intensity of lockdowns in May 2020. Districts with medium intensity of lockdowns saw smaller increases in cybercrime (0.12sd, +31%). Overall, decrease in number of rape and sexual assault complaints by 0.4-0.6sd in April and May 2020. Long term effects of lockdowns show number of domestic violencecomplaints continue to increase till July 2020, and decreases slightly between Aug and Feb 21 (although it is still above pre-lockdown levels). Cybercrime, rape and sexual assault complaints reach pre-lockdown levels by November 2020.
17.	Experiences Among Adults and Adolescents during the COVID-19 Pandemic from Four Locations Across Kenya (Abuya et al, 2020)	Kenya	Phone Surveys; Samples of urban households from ongoing survey cohorts in 5 Nairobi informal settlements (~1750 adults)	Women more likely to experience violence (3pp) or tension (5pp) in their homes; 7% (5%) of women (men) report more fear than their partner will harm them. Women are 13pp, 37pp and 31pp more likely to report doing more cooking, cleaning and childcare respectively, compared to men.
18.	Falling Living Standards During the COVID-19 Crisis: Quantitative Evidence from Nine Developing Countries (Egger et al., 2021)	Kenya* *Domestic violence module only collected in Kenya but study covers 9 countries (Bangladesh, Nepal, Philippines, Burkina Faso, Ghana, Kenya, Sierra Leone, Rwanda, Colombia)	Phone surveys drawn via RDD and from pre-existing studies. The total sample consists of rural and urban households, formal and informal sector workers, agricultural laborers, small business enterprises, refugees, and migrants. (~30, 000 respondents)	Increase in violence against women by 4% (0.3pp) and against children by 13% (2.6 pp), during the crisis period (although these increases are not statistically significant).
19.	The Great Crime Recovery: Crimes Against Women During, and After, the COVID-19 Lockdown in Mexico (Hoehn-Velasco et al 2021)	Mexico	Municipal level crime incidents throughout Mexico in 2019 and 2020; Data comes from National public Security System; data comprises all municipalities in Mexico, including 2457 municipalities Over Jan - Oct for 2019 & 2020	Lapses in alimony, sexual crimes and domestic violence follow a U-shaped trend: decrease during lockdown to a minimum and then begin to return to pre-COVID19 levels. During the stay-at-home period (March to May 2020), overall crimes against women declined by 20%, domestic violence fell by 20%, lapses in alimony by 59% and sexual crimes by 28%. After 4 months, all crimes were back to pre-pandemic levels. Femicides remain constant through the pandemic.

20.	Families under Confinement: COVID-19 and Domestic Violence (Silverio-Murillo et al, 2020)	Mexico (Mexico City)	Domestic violence call-center calls and official police reports in Mexico City	Calls for psychological violence and physical domestic violence increased by 17% and 7% respectively, whereas police reports of domestic violence decreased by 22%: COVID-19 lockdown most likely prevented reporting of domestic violence even when violence continued or increased. Domestic violence reports return to baseline levels by December 2020.
21.	COVID-19 and the Rise of Intimate Partner Violence (Agüero, 2021)	Peru	Number of calls to the helpline Linea 100 by state from January 2007 to July 2020, adjusted by population size	High prevalence of domestic violence prior to COVID (60%) but increase in incidence of calls (+48%) after lockdown was imposed in Mid-March until July, with effects increasing over time between April and July. Findings robust to baseline characteristics, found in all states.
22.	The Gendered Effects of the COVID-19 Crisis and Ongoing Lockdown in South Africa: Evidence from NIDS-CRAM Waves 1 - 5 (Casale and Shepherd, 2021)	South Africa	Phone surveys with a sample of households drawn from a pre-existing nationally representative survey (5,862 respondents)	Relative to men, women were more likely to lose their jobs during the initial lockdown phase, and their recovery was slower as lockdowns eased. Women were less likely than men to benefit from government income support during the lockdown. Women cited childcare responsibilities as a constraint to their labor market activities more than men. By March 2021, men's employment and working hours returned to pre-COVID levels, while women's employment and working hours remained below the February 2020 baseline figures. Gender gaps in time spent on childcare and income support persist.
23.	Household Response to an Extreme Shock: Evidence on the Immediate Impact of the COVID-19 Lockdown on Economic Outcomes and Well-being in Rural Uganda (Mahmud and Riley, 2021)	Uganda	Phone survey of randomly selected representative sample of rural households in Uganda (1075 households)	Respondents report an increase in perception of violence (# times a man acts violent towards his wife): +0.6 violent acts a month after the lockdown. 30% increase in likelihood of major argument with partner.

* Summary may directly reference authors' own words in abstract and paper.