

# The Indirect Health Effects of COVID-19: Emerging Findings from Kenya, the Philippines, South Africa, and Uganda

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## Abstract

**Background:** COVID-19 has caused significant morbidity and mortality, both directly and indirectly via the disruption to routine health services. Evidence on the indirect health impacts has largely been anecdotal or modeled, and cause/program-specific. We aimed to document the indirect health impacts in four countries with different experiences: Kenya, the Philippines, South Africa, and Uganda.

**Methods:** Using a common framework that encourages a whole-of-health assessment of the indirect health impacts of COVID-19, we used a variety of data sources, including estimates of excess mortality and changes in service utilization and coverage, to analyze the impacts of COVID-19 and its response measures on key health conditions and services.

**Findings:** Each country experienced disruptions to health services, but the disruptions varied in terms of the services, geographic areas, and subpopulations affected, and most importantly, the degree and duration of disruptions experienced.

**Interpretation:** We must continue to routinely and systematically measure the health and socioeconomic impacts of both the virus and the control measures, with short-, medium- and long-term timeframes and with an equity lens to look at how the virus has differentially impacted societal groups.

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## Foreword

On March 11, 2020, the World Health Organization declared COVID-19 a global pandemic. With dire predictions about how the virus could devastate populations and overwhelm health systems, many countries imposed stringent response measures. Yet most of these policy approaches focused narrowly on potential impacts of COVID-19, without sufficient attention to how the pandemic and various responses would have broader indirect impacts across other health needs and health services. While the evidence of disruptions to essential health services was largely anecdotal to begin with, and its health effects mostly modeled, increasingly detailed evidence is beginning to emerge from countries.

Over the past year we partnered with research institutions in Kenya, the Philippines, South Africa, and Uganda to document, from a whole-of-health perspective, what we know about the nature, scale, and scope of the disruptions to essential health services in those countries, and the health effects of such disruptions. This research provides initial insights on the observed near-term indirect health impacts of the pandemic and response measures, relying on the best available data in the months following lockdown measures. However, it is important to recognize the limitations of conducting research during a pandemic and a continuously evolving epidemiological and policy context. We plan to build on these studies as more and better data become available, and as public health responses continue until the pandemic is brought under control.

In this paper, we present findings on the indirect health effects of COVID-19 and its mitigation strategies across the four countries. Each of the four countries experienced disruptions but the disruptions varied in terms of which services, where, who was affected, and most importantly, the degree and duration of the disruptions.

Armed with the kind of evidence in this working paper, national governments and global partners must focus their efforts on the most affected, most cost-effective services, and ensure that any lost generations due to the pandemic are minimized. We hope that the findings from this working paper—and the project as a whole—will contribute to our global knowledge about the ongoing effects of the pandemic, and ways to mitigate them.

However, we are concerned that the research is not moving forward quickly enough when it comes to understanding the best ways of mitigating disruptions to essential health services during the pandemic. Our paper provides an overview of the indirect health effects faced by Kenya, the Philippines, South Africa, and Uganda during the first wave of infections. These countries, along with other low- and middle-income countries, are experiencing a third wave of COVID-19 without the benefit of vaccines. Unfortunately, they are facing this new wave with essentially the same approach to mitigation. That's why it is critical that we capture and share lessons from waves one and two, to help countries ensure that their COVID mitigation strategies disrupt essential healthcare services as little as possible while controlling the virus. It is not too late for action.

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## Introduction

On 11 March 2020, the World Health Organization declared the COVID-19 outbreak a pandemic (WHO, 2020). Several groups modelled the impact of COVID-19, and strategies to slow or halt its spread, on infections and deaths (Walker et al. 2020; Cabore et al. 2020). While their specific predictions varied based on data, policy assumptions, and modeling scenarios, they all painted a grim picture on the number of COVID-19 cases and deaths. For example, modelling from Imperial College London found that, in the absence of any measures to slow the spread of the virus, COVID-19 could claim the lives of 40 million people across 202 countries (Walker et al. 2020). That report and other similar modelling efforts influenced many governments' decisions to implement stringent policies to halt the spread of the disease. By April 2020, over 100 countries had instituted either a full or partial lockdown affecting billions of people for periods of months, and many others restricted movement for some of their citizens; at the time of the writing, some countries are now lifting lockdowns, while others have re-introduced national or local lockdowns.

However, morbidity and mortality from COVID-19 are not the only health impacts to consider when weighing up the impact of this pandemic (nor when assessing prospective policies or the success or failure of mitigation and suppression responses); what's missing from these numbers are the people who will fall ill and die from the many indirect impacts of the COVID-19 response. In low- and middle-income countries (LMICs), where official cause-specific mortality statistics are unavailable or less reliable, social media reports and evidence from health management information system are beginning to hint at the magnitude of indirect health impacts.

Subsequent to the influential COVID-19 modeling papers, several papers that considered the potential impact of the COVID-19 pandemic on HIV, tuberculosis, and malaria, child and maternal health, and immunization, in LMICs were published (see Box 1).

**Box 1. Selection of published modeling efforts to estimate the potential indirect health impact of the pandemic on specific disease areas**

Using the Lives Saved Tool, Johns Hopkins University (Robertson et al. 2020) reported that across 118 low- and middle-income countries, the increase in child and maternal deaths will be devastating. Based on a range of plausible scenarios, the authors estimate that there could be as many as 2,300,000 additional child deaths and 133,000 additional maternal deaths in this first year of the pandemic as a result of unavoidable shocks, health system collapse, or intentional choices made in responding to the pandemic.

A report by the London School of Hygiene & Tropical Medicine (Abbas et al. 2020) found that for every one excess COVID-19 death attributable to infections acquired during routine vaccination clinic visits, there could be up to 549 deaths in children prevented by sustaining routine childhood immunization in Africa.

An HIV modelling report (Jewell et al. 2020), convened by the WHO and UNAIDS, used five models of HIV epidemics to estimate the effect of various potential disruptions to HIV prevention and treatment services on HIV-related deaths and new infections in sub-Saharan Africa over one- and five-year periods. It found that a six-month full interruption of antiretroviral therapy (ART) supply would be expected to lead to excess deaths over a year which are more than the total current annual number of HIV deaths. In sub-Saharan Africa this amounts to possibly over additional 500,000 HIV deaths. Similar disruption would also lead to a doubling in the number of children born with HIV.

The WHO's Global Malaria Program considered nine scenarios for potential disruptions in access to critical malaria interventions in 41 countries (WHO 2020). Under the worst-case scenario, in which all insecticide-treated net campaigns are suspended and there is a 75% reduction in access to effective antimalarial medicines, they reported that excess malaria deaths could approach 400,000, a more than 100 percent increase in the deaths reported in 2018.

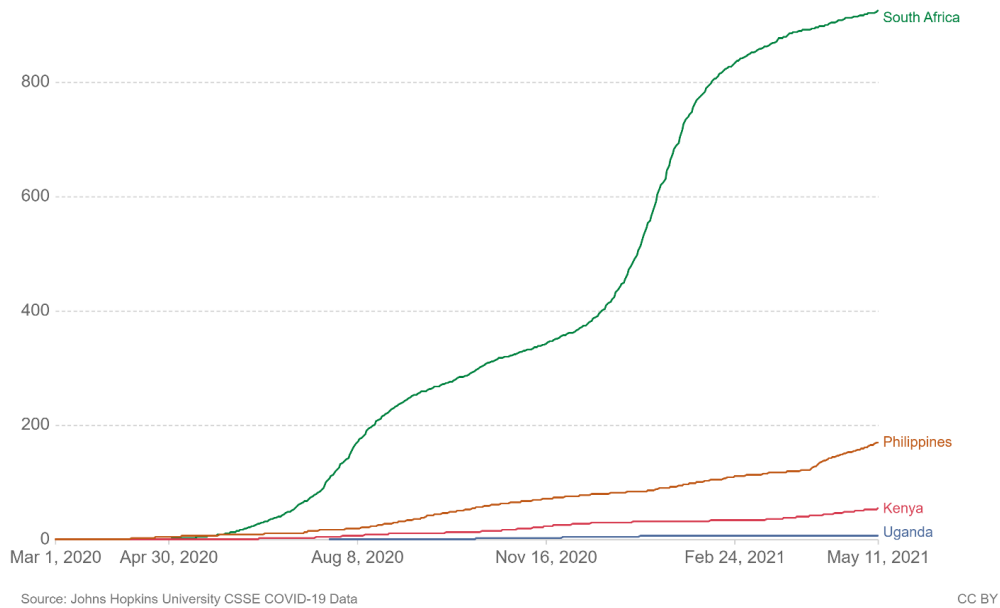
The Stop TB Partnership, in collaboration with the Imperial College, Avenir Health and Johns Hopkins University, estimated that a three-month lockdown and a protracted 10-month restoration could lead to an additional 1.4 million TB deaths during this time between 202–2025 (Cilloni et al. 2020).

While these studies are useful—and we have not listed them all here—they are issue-based, with no attempt to look across the full range of essential health services that are being disrupted. They are also models (and in some cases of ‘worst case scenarios’), not calibrated against real world data, and as a result do not reflect accurately what is happening in countries. Additionally, there has been a conspicuous absence of modeled estimates for non-communicable diseases in LMICs (likely because these diseases do not have a dedicated modeling consortium tasked with estimating the impact and cost-effectiveness of interventions). However, in high-income countries such as the UK, early estimates of the indirect impacts of the policy response are emerging and seem equally devastating: a six month delay in diagnosis for new cancers could match almost half of the life-years lost due to COVID-19 (Sud et al. 2020).

In this paper, we report findings from a multi-country study that used a variety of data sources and analytical methods to estimate the indirect health effects of COVID-19. There continues to be a lively debate about the extent to which the virus itself or the response measures are having the greatest impact on people’s lives and livelihoods. We do not seek to disentangle the damage that is caused by avoidance of health care due to fear of the virus from the damage caused by the response to mitigate the spread of the virus—the damage needs to be mitigated no matter how it is caused. Rather, we aim to provide a sense of the magnitude of the collateral health impacts using a wide range of conditions. We selected a range of countries to reflect experiences in both the African and Asia regions: Kenya, the Philippines, South Africa, and Uganda.

Confirmed COVID-19 deaths (and cases) across Kenya, the Philippines, South Africa, and Uganda as of 10 May 2021 are 2,907 (163,620), 18,562 (1.11 million), 54,825 (1.60 million), 346 (42,384) respectively. Figure 1 controls for population size and shows the cumulative confirmed COVID-19 deaths per million people; it shows that while Kenya and Uganda appear to have successfully controlled the spread of the virus, South Africa has struggled resulting in the highest confirmed rates (and numbers) in sub-Saharan Africa. Similarly, the Philippines has one of the highest rates in the East-Asia Pacific region.

**Figure 1. Cumulative confirmed COVID-19 deaths per million people**



*Note:* Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.

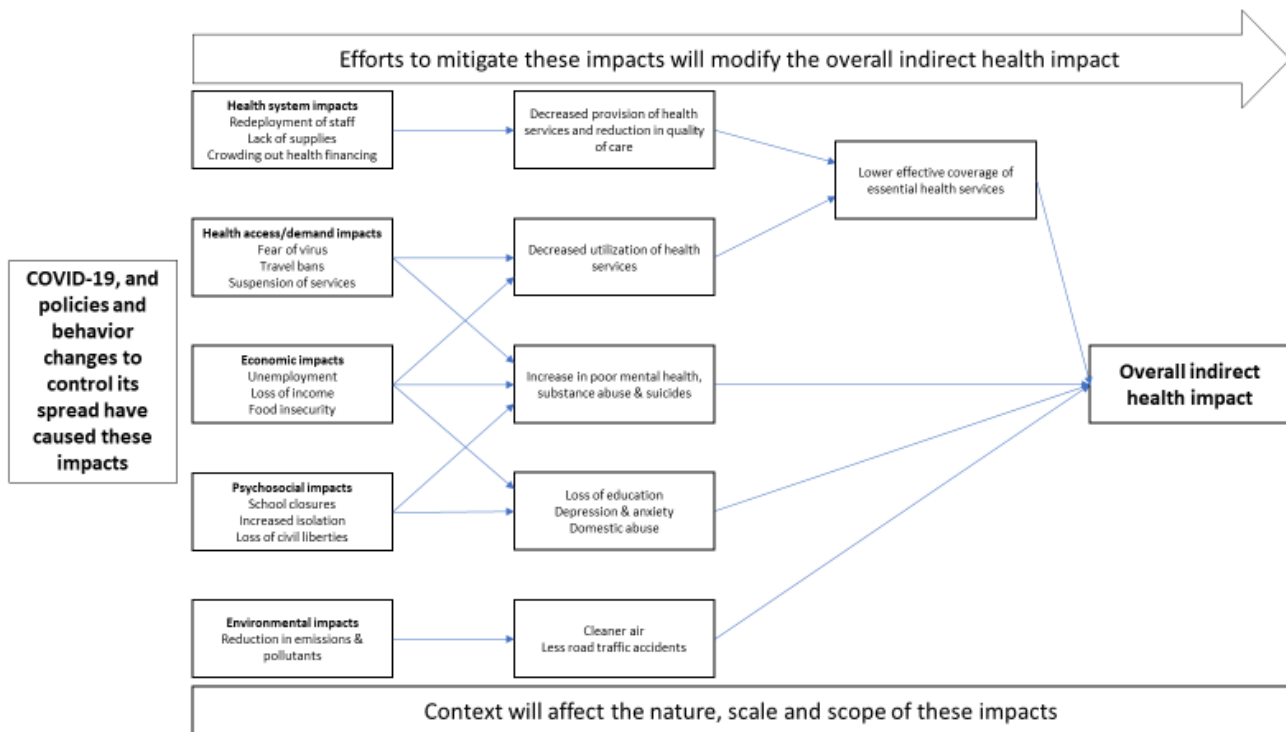


## Methods

### Conceptual framework and scoping review

We know that the impacts of this pandemic are, and will be for many years, profound and multifaceted. During the 2014–2016 West African Ebola virus epidemic, health care utilization was found to have declined by 18.0% during the 2013–16 (Wilhelm and Helleringer 2019). The outbreak also caused a \$2.8 billion loss of GDP in Guinea, Liberia, and Sierra Leone (World Bank 2016). Based on evidence from previous disease outbreaks, we built a conceptual framework organized around four distinct but interrelated indirect impacts: health system, economic, psychosocial, and environmental (see Figure 2). Note that this conceptual framework is a slightly modified version of a previous conceptual framework developed by some of us (Chi et al. 2020).

**Figure 2. Conceptual framework of the indirect impacts of COVID-19 on people's health**



The health system impacts include supply and demand side disruptions that can result in lower utilization of health care and, in some cases, impacts on quality of care. Less health care will result in more ill health and deaths because health services have been suspended, displaced, or inaccessible. In addition to explicit policies to suspend certain services, e.g. polio, yellow fever and measles vaccination and vitamin A supplementation campaigns, other demand and supply factors contribute to the reduction in services, such as changes in care-seeking behavior and health worker absenteeism.

On the demand side, this is linked to the economic impacts—unemployment and poverty will mean that individuals and households (and payers more generally) have fewer resources to purchase health care. Restrictions on travel have had disastrous consequences, e.g. women in labor walking to hospitals and dying because governments have banned travel in private vehicles (Reuters 2020). On the supply side, as health workers, became infected (due to a lack of or inadequate personal protective equipment), and/or some, in particular community health workers, stayed away from work because of safety concerns, there was a reduction in the quantity of services delivered. With less to work with it is also likely that there have been reductions in the quality of care. The consequence of these impacts is that there will be lower effective coverage of essential health services.

The economic impact of the COVID-19 response is already estimated to be unprecedented. Unemployment and inactivity rates have risen dramatically (ILO 2020). Poverty is estimated to increase by up to 500 million people in Africa (World Bank 2020). Remittances, which have become a major source of external financing for African countries, have been adversely affected by the slowdown in developed countries (LSE Business Review 2020). The decline in the volume of remittances has a direct negative impact on the well-being of households since such transfers—unlike other types of transfers—are directly used to cover primary needs such as food, education and healthcare.

Psychosocial impacts triggered by increased isolation are having an adverse impact on mental health, addictive behaviors and suicides (Xiong et al. 2020). Evidence is emerging of increases in domestic abuse including child abuse (Sacco et al. 2020). While many people bristle at the loss of their civil liberties through these lockdowns, of greater concern has been the zealotry with which police have sometimes brutally enforced the measures. Finally, with schools closed, billions of children and adolescents and young adults are losing valuable education. While it may be possible to catch-up and fill these gaps in the future, strong evidence points to the knock-on effects of less education.

Finally, environmental impacts. These would appear to be largely positive, resulting in lives indirectly saved. For example, cleaner air and less pollutants, and fewer road traffic accidents. But when we ask people to “shelter in place” in their homes, what does this mean for deaths due to indoor pollution?

## **Country case studies**

This cross-country synthesis draws upon four case studies in Kenya, the Philippines, South Africa, and Uganda. The case studies were conducted independently by teams of in-country researchers, but a common approach and framework was adopted to allow this synthesis. The data sources and methods varied from one country to another based on availability and access. Data sources included national health information systems and programmatic data where available (Kenya, Uganda), health insurance claims data (the Philippines), key informant interviews (the Philippines, Kenya), as well as secondary analysis of survey data, literature reviews, (see Table 1). Detailed methodologies for each case study are described in the published reports (Barasa et al. 2021; Bayani and Tan 2021; Smart et al. 2021; Tumwesigye et al. 2021; Ulep et al. 2021).

**Table 1. Data sources**

Country	Data Sources	Methods used
Kenya	Kenya Health Management Information System (KHMIS)	Interrupted time series analysis of routine data systems (KHMIS), qualitative inquiry through key informant interviews with MOH and disease programs
Philippines	National Vital Statistics, Philippine Health Insurance Corporation claims database, Program Data on HIV/AIDS, EPI, NTDs	Analysis of routine data systems and insurance claims database, review of literature and qualitative inquiry with local health system managers and hospital heads
South Africa	National vital statistics and program data from National Institute of Communicable Diseases (NICD), South African Medical Research Council (SAMRC), the National Department of Health (NDOH), Coronavirus Rapid Mobile Survey National Income Dynamic Study (CRAM-NIDS)	Review of official reports from NICD, healthcare synthesis reports and crime statistics
Uganda	District Health Information (DHIS II), Health Management Information System (HMIS) Program data on immunization, HIV, TB and Malaria	Trend analysis of HMIS and DHIS II data, review of documents records and media

Given the variability in the data sources and available indicators, this synthesis does not try to draw any direct comparison between how countries experienced indirect impacts of COVID-19 and their response measures on other areas of health and health care. Rather, we focus on key themes emerging across the various settings to better understand the kinds of indirect health impacts observed and the major sources of disruption to inform: contextualized considerations for future mitigation strategies; persistent evidence gaps and areas for enhanced data collection; potential near and longer-term implications of observed disruptions on priority areas for health.

## **Ethics**

This paper largely relies upon secondary data analysis of public data sets reporting on aggregate indicators with no identifying information. Where data were obtained from other sources, permission was granted by those maintaining data sets and sources reviewed to ensure there was no personal identifying information. To supplement the secondary analysis of public data sets, key informant interviews were conducted in Kenya and the Philippines, for which IRB review was requested and granted exemption by the Single Joint Ethics Review Board of the Philippine Department of Health (SJREB–2020–62).

## **Role of the funding source**

The funders of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

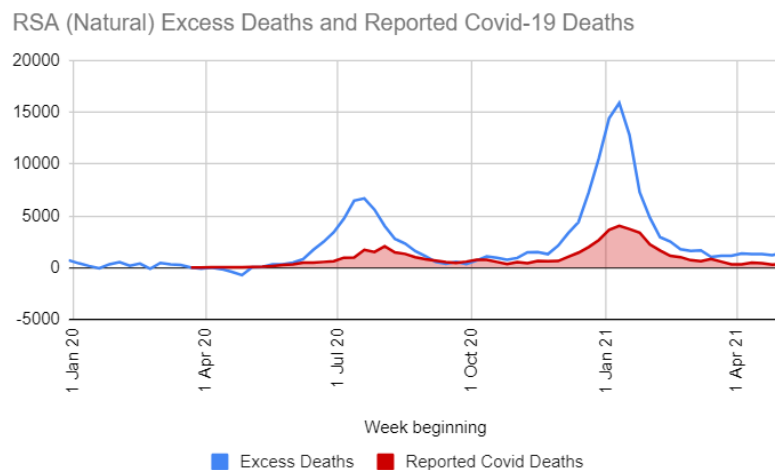
## Results

### Excess mortality

Data on all-cause excess mortality, or the difference between deaths in 2020 from the average of previous years, was available from the Philippines and South Africa. Preliminary mortality statistics from the Philippines as of 16 March 2021 showed deaths due to ischemic heart disease and diabetes in 2020 exceeded their 5-year average (2015–2019) by as much as 21%. Deaths due to intentional self-harm also increased by 25.7% from 2019. In South Africa, a total of 148,599 excess deaths were reported from 3 May 2020–8 May 2021, where only a third can be directly linked to COVID-19 given the reported mortality statistics from the same period (see Box 2).

#### Box 2. Excess deaths and reported COVID-19 deaths in South Africa

The South African Medical Research Council (SAMRC) produce a weekly report estimating excess deaths for the week. Excess deaths are estimated by subtracting expected deaths from the total number of deaths recorded in a week. The expected deaths are based on the average deaths from the same period in 2018 and 2019. For the period 3 May 2020 to 6 March 2021, the SAMRC estimates excess deaths at 146,626. By 8 May 2021, COVID-19 deaths recorded were running at 54,825. There is a close correlation between the number of excess deaths and recorded COVID-19 deaths, with the former peaking before the latter during the first wave on infections. However, excess deaths are considerably higher than COVID-19 deaths, with more than 90,000 not recorded as COVID-19. While the National Health Laboratory Service have reported backlogs in test results, they are not of this scale. Despite efforts, we were unable to obtain causes of death data from official sources. It is critical that both the possibility of missed COVID-19 deaths and non-COVID-19 deaths are considered during this period. Both possibilities point to a potentially large number of deaths outside of hospitals. Despite efforts, we were unable to obtain causes of death data from official sources.



Source: <https://www.samrc.ac.za/reports/report-weekly-deaths-south-africa>

Overall, delays in validation and time-lags in reporting of this vital statistic limited its usefulness in understanding the impact of lockdown on deaths from other causes.

## Impacts on the health system

We also report observed effects in the health system and health financing, where much of the existing capacity was diverted to directly addressing the virus at the start of the pandemic. In terms of healthcare financing, Kenya reported that local funding was not affected, however, donor funds were re-prioritized for COVID-19. Similarly, disruption in local supply chain was minimal, except for imported goods, which was addressed by leveraging the government's network of development partners. Looking at healthcare infrastructure, it was reported that many facilities were repurposed as COVID-19 hospitals or isolation wards, which led to decreased access by non-COVID-19 patients. Additionally, laboratories had to accommodate increased testing for COVID-19, limiting their capacity for other services.

The most common effect observed in all countries was the diversion of human resources from their usual tasks to do COVID-19-related work. This seemed to be a more serious concern in settings such as the Philippines where an inequitable distribution of health care workers was apparent even before the pandemic (see Box 3). Redeployment of staff to COVID-19 designated facilities and hotspots, as well as task-shifting of personnel to do contact tracing and testing were commonly observed in the country. It was also reported that surveillance and record-keeping were hampered, as the dedicated staff for these purposes were also re-assigned to work on direct patient care. It is important to note that the health system effects largely depended on the baseline structure and organization within these countries. For example, there is much variation on the impacts observed in countries such as Uganda and the Philippines where healthcare delivery and financing are decentralized to districts and municipalities.

### Box 3. Impacts on human resources for health in the Philippines

In the Philippines, local government units are in charge of recruiting health professionals to serve municipalities, which has created persistent inequalities in the distribution of health workforce. While the national average of doctor per 10,000 population was 3.9 in 2017, the majority of these professionals work in urban settings and more developed provinces. Only 10% of the total health care workforce work in rural areas, and despite having established a minimum of one doctor and two nurses per rural health unit (RHU), there are still some municipalities that are doctorless. For instance, the doctor to population ratio of Bangsamoro, MIMAROPA and CARAGA regions is 0.9, 1.9 and 2.1 doctor per 10,000 population (respectively), compared to the National Capital Region which has a doctor to population ratio of 10.6 per 10,000. A similar distribution can be observed for nurses, midwives, medical technologists and other allied health professionals. Given the devolved set-up of the health system, local government units are in charge of recruiting and hiring health professionals to serve municipalities, and often face difficulties in providing sufficient incentives for trained graduates to practice in far-flung areas. As such, the Department of Health implements a deployment program called Doctors-to-the-Barrios (*small town*) (D'TTB), for health professionals to address the HRH gap.

(continued)

**Box 3, continued**

The inequalities in the distribution of health care workers became even more apparent with the COVID-19 pandemic. While more community health care workers or the “Barangay Health Emergency Response Teams” were mobilized to maintain routine services, major task shifting was observed to tackle the pandemic. In municipalities where there is only one doctor in the RHU, they had to take on roles of a medical technologist to do swabbing and sample preparation, while midwives served as nurses and administrative aides were also delegated medical tasks. To support COVID-19 hotspots, the DOH suggested the redeployment of DTTBs, but this decision was met with heavy criticism. In late June of 2020, Cebu City, a highly-urbanized city in the Visayas Region, became a COVID-19 hotspot and hospitals reached peak capacity due to the high number of cases. As a response, the Department of Health called for the reassignment of DTTBs assigned in Visayas to Cebu City to serve in both public and private hospitals. The directive was met with resistance from DTTBs, citing lack of consultation with chief executives. Most of the DTTBs raised that their redeployment was likely to cause gaps in provision of essential care services, oftentimes in poorer and more deprived areas. This concern was discussed with the DOH, which decided to reverse the directive and make the reassignment voluntary.

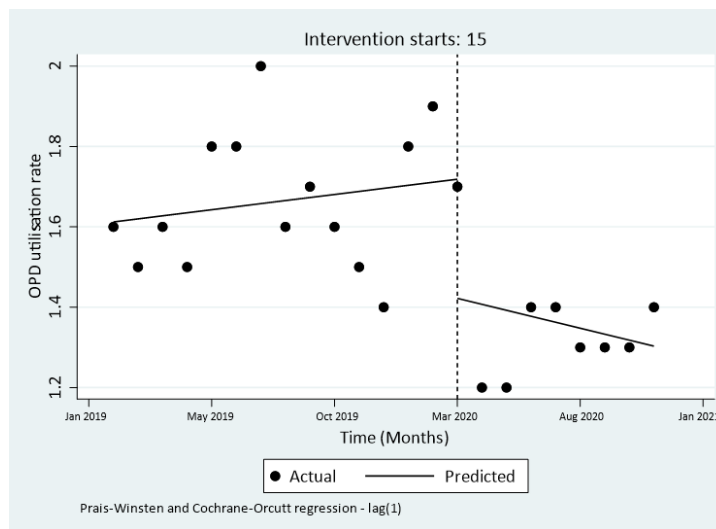
**Impacts on health service utilization**

The effects on service delivery varied greatly by the type of service and at which level it is provided. In South Africa, an overall decline in HIV testing by 46% was observed, with the more populous province of Gauteng seeing the most drastic decline of 82%. Likewise, in Uganda, provision of HIV-related services was also disrupted. Countries also reported disruption to the provision of maintenance medications for chronic conditions and family planning services. However, in both the Philippines and Kenya referral networks were successfully reinforced where community health workers played a more active role in minimizing disruption to routine services. Additionally, in Kenya, 3–6 month supplies of various maintenance medications were stockpiled which served to reduce impact of supply chain disruptions and enable continuity of medicines access. Healthcare workers delivered medicines and vaccines to homes and conducted check-ups for minor conditions. To some extent, this practice also addressed the demand side effects where patients preferred not to seek care in health due to fear of contracting COVID-19. Other means of adapting to restrictions such as use of telemedicine and social media were also utilized, although this was not without problems. Given that primary and preventive care services were more easily deployed to communities, evidence from the countries suggest that there was greater disruption to specialty and facility-based care. (see Boxes 4 & 5) Many elective surgeries were canceled, and hospitals limited the conduct of non-urgent procedures. In settings where hard lockdown measures were implemented, transportation proved to be difficult which severely affected patients with acute conditions such as those with high-risk pregnancies, stroke, or heart attacks that needed emergent care.

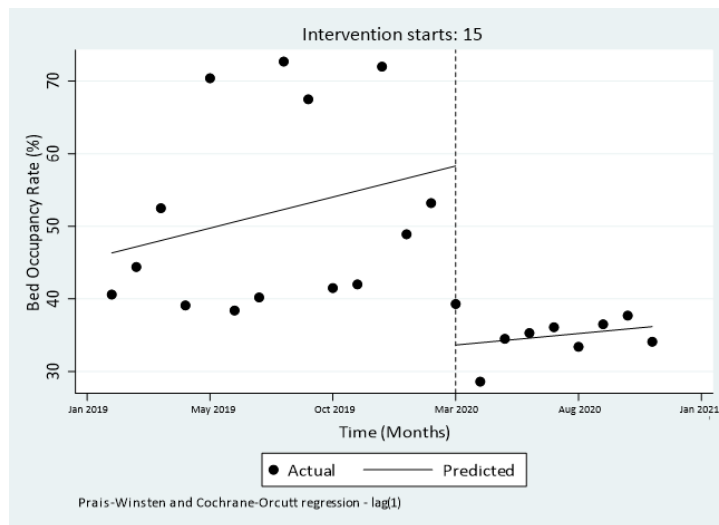
**Box 4. Interrupted time series findings of selected service utilization and coverage indicators in Kenya**

Employing interrupted time series (ITS) analysis to quantitatively evaluate the impact of COVID-19 on the level and trend of selected utilization and coverage indicators, we showed that the outpatient utilization rate reduced in March 2020, and continued to reduce in the months after March 2020, even though all these changes in the OPD utilization rate (before, during and after March 2020) were statistically insignificant. On the other hand, the bed occupancy rate significantly declined by 24.67% during March 2020. Further, no significant change was observed post-intervention for the bed occupancy rate.

**Trend in monthly OPD utilization rate in Kenya from January 2019 to November 2020 (where 0 = January 2019, and 15 = March 2020)**



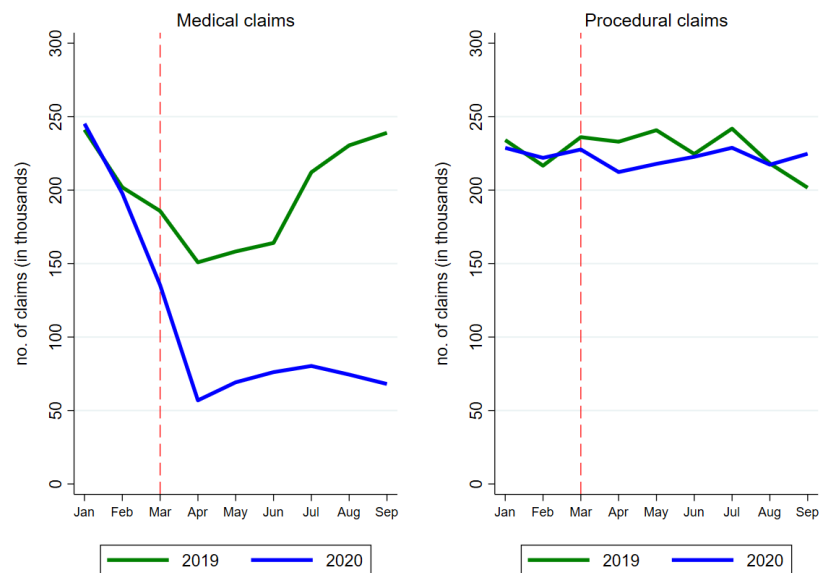
**Trend in monthly Bed Occupancy Rate in Kenya Jan 2019 to November 2020**



### Box 5. Analysis of claims data from the Philippine’s national social health insurance

The trend of social insurance claims of twelve high-burden diseases (e.g., acute gastroenteritis, asthma, chronic kidney disease, chronic obstructive pulmonary disease, cancer, dengue, diabetes, hypertension, ischemic heart disease, pneumonia, stroke, and tuberculosis) and the five most common procedures (e.g., chemotherapy, vaginal delivery, cataract surgery, hemodialysis, and cesarean section) from January 2018 to September 2020 were examined to assess the impact of the pandemic on utilization of essential healthcare services. From March to September 2020, seasonally-adjusted social insurance claims for high-burden diseases declined by almost 60% compared to the previous year. In contrast, no significant change in insurance claims for procedures at least on aggregate. However, across hospital ownership, a 30% decline was observed in publicly-owned end referral hospitals with modest growth in lower-level hospitals.

Figure 3. Total medical and procedural claims (seasonally adjusted), in thousands



### Broader Impacts on health and wellbeing

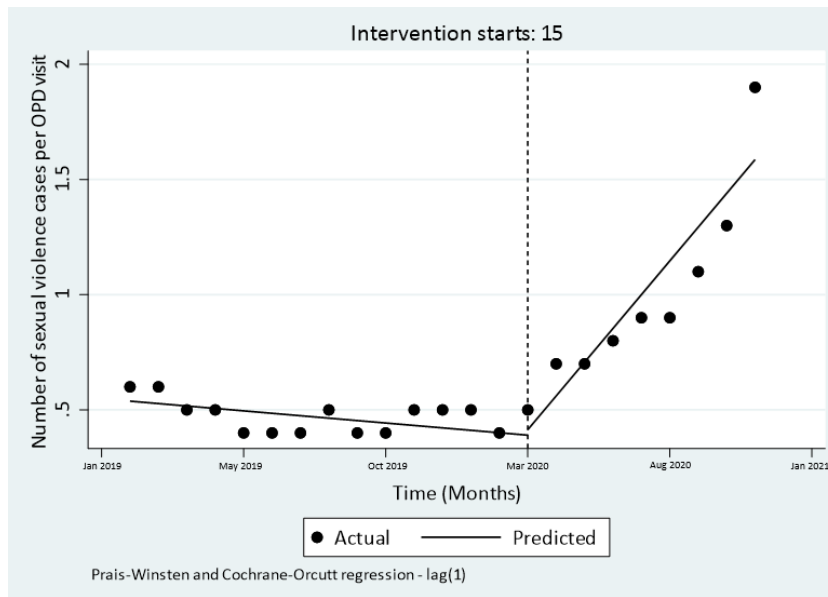
Beyond the ways in which disruptions to the health sector create collateral health effects, there are broader ways in which the pandemic and various response measures impact health and wellbeing. All countries reported a decline in GDP and increase in unemployment rates (IMF 2020), which will likely have a negative impact on nutrition and health in the future. Early reports from surveys in the Philippines and South Africa show higher levels of hunger and malnutrition and the effects in actual morbidity and mortality will likely be observed in the longer-term (SWS 2020; Stats SA 2020). The social effects also cannot be ignored. Countries reported an increase in documented cases of gender-based and domestic violence (see Box 6). Additionally, the number of deaths from self-harm has increased in Kenya, Uganda and the Philippines.



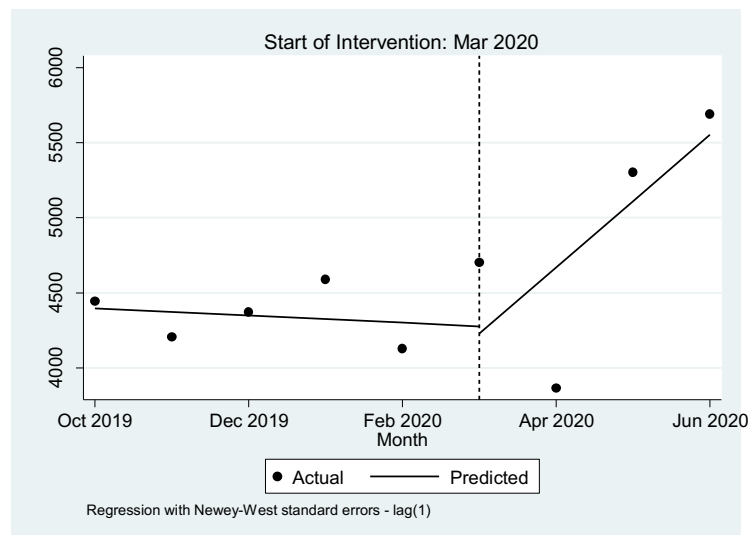
**Box 6. Interrupted time series of monthly number of sexual violence cases per 1000 outpatient visits in Kenya**

COVID-19 movement restrictions and working from home directives have led to extended stays at home. These, in addition to social and economic strain due to COVID-19, have led to increased household conflicts and domestic violence. Interrupted time series analysis of data from the Kenya HIS on the number of sexual violence cases reported shows that there was a statistically significant increasing trend in cases from April 2020.

**Figure 4. Interrupted time series analysis, trend in the number of sexual violence cases per outpatient department visits in Kenya from January 2019 to November 2020 (where 0 = January 2019, and 15 = March 2020)**



**Figure 5. Interrupted time series analysis, trend in the number of sexual violence cases in Uganda from October 2019 to June 2020 (where 0 = January 2019, and 15 = March 2020)**



## **Discussion**

When the World Health Organization declared COVID-19 a global pandemic a year ago, many countries focused on limiting cases and deaths from COVID-19 without sufficient attention to the broader indirect impacts of the pandemic and various response measures across other health needs. While the evidence of disruptions to essential health services was largely anecdotal to begin with, and its health effects mostly modeled, increasingly detailed evidence is beginning to emerge from countries.

The research reported here was conducted between August and November. In normal circumstances, routine lags between when research is carried out and when it is published may not matter—but conducting research during a pandemic, in a continuously evolving epidemiological and policy context, imposes limitations. It will take time to fully unpack and understand the role of various factors at play that affect access, utilization and quality, with corresponding effects on health outcomes in the near- and longer-term.

### **Experiences varied across and within countries**

Over a year ago, COVID-19 was declared an emergency, yet the pandemic continues to rage in LMICs. As countries across the world continue to respond to the evolving COVID-19 threat, policies must be responsive to the broader population needs concerning health and wellbeing. This will require better understanding the nature and magnitude of indirect impacts of various response measures on various health conditions, the health system, and a number of social determinants of disease and premature death. While it is too early to know the full extent and duration of these impacts, and there are various challenges in accessing needed data, this study provides early insights into the nature, scale and scope of the indirect health effects of the COVID-19 outbreak and mitigation strategies using reported data from a diverse group of countries in Africa and Asia. While most studies have focused to date on modelled effects of the pandemic, our country experiences provide a first glimpse of the short-term, observed effects on the health systems, spanning a range of disease areas, programs and service outputs.

Disruptions to the health system, as well as social, economic and environmental factors were observed, although at different intensities, with some pillars of the health system being more resilient than others. Access to reliable and timely data proved to be a challenge throughout this endeavor, which is both a limitation and a finding in itself. Most of the data presented were based on what was available and accessible to country partners, which varied in type, quality and level of granularity making a comparative analysis infeasible (although, we have highlighted several instances where two or more countries had data for the same metric or indicator).

## **The linkage between health service disruptions and adverse health outcomes**

A major challenge for understanding the extent of the indirect health impact is the lag in the reporting of the health effects caused by the disruptions to essential health services. Fortunately, urgent care appears so far to have been spared the deep and long-lasting disruptions seen by elective and preventive care. For the latter care, increased morbidity and mortality arising from missed vaccinations and screening at the primary level, and delayed diagnoses of chronic conditions, are likely to be reported in months or even years to come. Similarly, health consequences related to the economic impacts of COVID-19 will continue in the future, as will major shocks to the health system for countries that lost significant numbers of their health workforce to COVID-19. This underscores the importance of systematically tracking a variety of indicators on service utilization and health outcomes over various time horizons, including collecting mortality data that distinguishes between confirmed and suspected COVID-19 deaths and other cause mortality, to comprehensively assess the indirect health impacts of the COVID-19 crisis. Currently, in most LMICs, the data are limited by low completeness and lack of timely reporting and data processing. Hence our collective reliance on models.

We therefore encourage more efforts to model these impacts on disease and death—with ongoing tracking to see what manifests over time—to provide a more complete picture of the pandemic’s health effects. Data emerging from countries that implemented moderate restrictions such as Kenya (curfews and movement restrictions only in hotspots) are only seeing minimal disruptions to many essential health services in the short term, which suggest the possibility that long-term impacts could be averted. And even in countries where stronger restrictions were implemented, and services such as vaccinations were seriously disrupted, good data systems may make it possible to track who was missed and target catch-up services to mitigate serious health consequences, as was the case in Pakistan, where electronic immunization records enabled reaching children who missed routine immunizations. Learning from innovations in service delivery or implementation of dedicated policies (e.g., vaccination catch-up campaigns, telemedicine or changes in medication dispensary practices) that helped countries alleviate the impact of COVID-19 on essential services should be the focus of future research.

## **So, what do we really know?**

The majority of these findings are hypothesis-generating rather than firm, generalizable conclusions, as these are preliminary observations based on real-world, on-the-ground experiences of the countries. The pandemic has led to a reduction in the volume of both critical and non-critical care, due to a myriad of supply and demand side factors mentioned. However, at present, it is difficult to disentangle the extent to which these are due to patient-level or health system factors. One main drawback is its limited generalizability to other settings due to the inherent differences in baseline country context and health system organization, severity of COVID-19 outbreak, stringency of policy response, among others. While we are unable to ascertain the relationship between the severity of the indirect impact and strictness of control measures based on the current available data, these still provide

useful insights on areas that require closer inspection. More research is required to examine the relationship between country characteristics before the COVID-19 pandemic and COVID-19 outcomes, indirect health effects, economic indicators (e.g. real GDP forecast for 2020, job losses/unemployment), and government responses. Similarly, it would be interesting to examine the relationship between government responses and COVID-19 outcomes, indirect health effects, and economic indicators.

Findings from this study can help countries plan not only for future pandemics but also to inform subsequent COVID-19 policy responses to dampen the unintended consequences caused by strict lockdowns. As and when countries move to relax containment measures, subsequent efforts to investigate indirect health impacts, with the aim of reducing the chance of these turning into additional morbidity and mortality, should be prioritized. Recognizing the most vulnerable populations and program areas that were disproportionately affected should also be used as guidance for priority-setting and resource allocation. Given the challenges of capturing timely data for this purpose, we shed light on the issues surrounding the need for stronger and more resilient health information systems which are now deemed as an essential component to making evidence-informed response strategies.

It will take much more time to fully unpack and understand the role of various factors at play which affect access and utilization, with corresponding effects on health outcomes in the near- and longer-term. Nevertheless, we believe this research provides important insights that can still inform how countries approach the easing of restrictions and also how they might plan for future COVID-19 outbreaks as many countries wait to vaccinate their people, or new pandemics. Furthermore, we plan to build on these studies as more and better data become available, and as public health responses continue until the pandemic is brought under control.

## **Recommendations**

National governments and their global partners must

1. **Identify and prioritize the most affected, most cost-effective services**, and ensure that ongoing response and recovery activities include minimizing the impacts of foregone essential health services. As part of this, governments should explore the most successful adaptations and needed catchup activities as well as the additional resources needed to resume progress to achieve country and global health goals.
2. **Invest in stronger routine systems to collect, manage, and analyze health data.** These health information systems are always critical, but in a time of crisis, generating local data and evidence can support countries in producing timely estimates of disruptions and indirect health impacts to tailor response measures and recovery efforts accordingly. Local data should include facility-level data but could also involve collecting information at the community level, leveraging opportunities through community health workers and other methods.

3. **Commission and use models with a whole-of-health perspective rather than disease specific approaches.** Modeling will continue to be a critical tool to understand the ultimate health effects of disruptions to health services, as well as the health effects of the economic, psychosocial, and environmental impacts of the pandemic. But future modeling must look beyond the disease and death caused by COVID-19, or the indirect disease and deaths felt by specific programs, and move toward a whole-of-health perspective. Governments should also urge modelers to periodically revisit their data and assumptions in light of new information and evidence—such as in this paper and the accompanying country reports—to update their priors, and recognize efforts to mitigate some of the predicted collateral damage. A failure to do so means that old—and potentially harmful—estimates continue to be used to set policies.
4. **Encourage researchers to adopt a whole-of-health perspective, and a mixed methods approach** to better understand not just *what* the effects are to utilization of a range of essential health services, but *why* and *how* we might see different patterns emerge.

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