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Using data to inform the COVID-19 policy response

In brief

- The COVID-19 pandemic is one of the biggest challenges the world has ever faced. Data can be used to target resources, forecast future needs, or evaluate decisions.
- Data collection should be guided by specific policy questions surrounding how to contain the disease, how to protect the vulnerable, and how to mitigate damage to economies.
- To better serve policymakers, data needs to be displayed in a way that is accessible and easy to interpret, it should also be high-quality, up-to-date, and consistent.
- Where detailed data collection and complex analysis are not viable, simple proxy measures can be used that are suited to the context, capacity, and resources available. This includes merging datasets, the use of administrative data, and predictive modelling.
- To have a better chance of tackling the crisis, it is necessary to have an institutional environment that values data and has the capacity to produce, analyse, and use it. This has benefits beyond the current crisis, presenting a critical juncture to invest in a data-driven approach more generally.

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Introduction

The COVID-19 pandemic is an unprecedented global crisis. From a health perspective, a pandemic of this scale has never been recorded nor managed in developing countries. From an economic perspective, stringent containment measures have caused disruptions to supply chains and demand for goods and services that are extraordinary – and somewhat unpredictable – by nature. For governments to respond effectively, policymakers need quality data on the prevalence of the virus and its various economic impacts. As we detail in this paper, with the right frameworks for collecting and applying data – as well as the political will to adapt policy when new evidence comes to light – even governments with limited capacity can form timely and effective responses to COVID-19.

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In this paper we discuss at least three major classes of decisions that developing country governments have to make around COVID-19 and the types of data infrastructure needed to support them. There are undoubtedly further sets of important decisions – for example, those concerning the health sector, such as hospital admissions rules, purchasing of ventilators, and personal protective equipment – but as economists, this is out of our scope. With that in mind, the focus of this paper is on data options to address the following policy decision areas:

1. **How can data help contain the virus?** The foremost policy concern is to track the spread of virus and formulate the most appropriate containment measures for balancing economic needs with efforts to mitigate transmission. This category includes questions such as: What businesses and borders can stay open and when should they re-open? What rules should be upheld around personal mobility and who should be targeted?
2. **How can data help protect economic vulnerabilities?** Decisions around mitigating the economic impact of the virus are also critical to maintain livelihoods. These include policy decisions within the domain of social protection, mostly around temporary financial or in-kind assistance to those made destitute due to containment measures.
3. **How can data help mitigate the damage to economic markets?** Decisions concerning firms and markets are critical to the restoration of supply chains and the protection of business and employment. This category covers questions such as whether disruptions to agricultural supply chains could impact food security, or whether firms should receive financial aid, and how these are best administered.

Decisions in each of these areas will have varying requirements for data gathering. Some policies will make sense no matter what data say, such as decisions to expand testing, create public awareness, encourage hygiene, and disallow large public meetings. Others could be based largely on existing data, such as decisions for targeting food aid or implementing age-specific lockdowns. Finally, several policies will require prioritising new data collection, such as decisions for identifying and assisting groups without a

safety net made vulnerable by the crisis. The latter will become particularly important as we move into phases of recovery from the devastation caused by lockdown policies. In any case, data can help government decision making (see Box 1 key examples of how data help).

With this in mind, it is important for governments to recognise that the benefits of more data do not always outweigh the costs of collecting it. Governments should always collect data in line with their priority challenges and their capacities to respond, thereby preserving limited resources. An important principle is that any data effort should start with a specific policy question (like those detailed above) before working towards actionable and targeted solutions to answer them.

Using data to inform the COVID-19 policy response

1. Targeting public resources: With better information on citizens and their needs, governments can more effectively target the allocation of scarce public resources.

2. Forecasting future needs: By planning and predicting for a range of best-case, expected, or worst-case scenarios, policymakers can prepare to control the damage when realities come to bear.

3. Evaluating policy decisions: With consistent evaluation and active learning, policymakers can adapt decisions taken and choose the right time to scale initiatives up or down.

But good decisions also require good institutions that can process and interpret data: Capacity is a more important challenge than data or policy for many governments. The best policy ideas in the world cannot be implemented without enough capable people. Similarly, the best data in the world is useless without a dedicated data analytics team turning data into usable information for the public sector. As we discuss in the latter half of this paper, efforts to rapidly scale or repurpose local capacities towards data analysis will be a critical part of the overall COVID-19 response.

The rest of this paper is structured as follows: We first examine how data can be used to address policy questions on containment of the virus, protection of economic vulnerabilities, and mitigation of damage to economic markets. We then discuss institutional reforms to facilitate improved data governance and application to COVID-19. Each section identifies case studies and lessons that can be drawn from experiences of handling virus outbreaks in various developing countries.

Section 1: How can data help contain the virus?

Virus containment is the most critical first-order response to the pandemic. It is composed of two main steps, (i) identification of the transmission of the virus, both in terms of prevalence and transmission chains, and (ii) action to stop the spread. Accurate data can contribute to the implementation of effective policies to contain the pandemic, answering questions on prevalence in specific areas through testing and tracing, and helping to identify the most appropriate strategies, such as isolating positive cases, smart containment, as well as hygiene and social distancing precautions. Once the problem has been identified and the strategy rolled out, data can tell us if the strategy worked, if it should be replicated, or scaled up/scaled down.

How to identify transmission of the virus?

To identify transmission of the virus, policymakers need to know (i) who is carrying the virus, and (ii) how the virus is spreading. Testing, tracing, and isolating (TTI) positive cases is unanimously considered as one of the most effective strategies for doing this and containing the contagion (World Health Organization, 2020). However, this activity is extremely complicated due to some intrinsic characteristics of the virus: For example, its high level of contagiousness (Shaw, 2020), long incubation period (Lauer, et al., 2020), and the presence of asymptomatic cases (Heneghan, Brassey, & Jefferson, 2020). Furthermore, governments' have limited capacity to procure and process diagnostic tests – which might be mitigated through the development of various proxy measures.

"Given that this situation is unlikely to change in the short term, developing countries might benefit from adopting a different approach to testing..."

How many people are carrying the virus?

Only a minority of countries around the world, mostly developed ones, have been able to pursue a strategy of comprehensive and aggressive testing, for two main reasons: (i) Shortages in the supply of diagnostic kits (for both swabs and reagents) forcing governments to ration their use and halt exportations (Akinwotu, 2020) and (ii) a lack of laboratory facilities and experts to perform the COVID-19 tests and interpret results (Giri & Rana, 2020). Even in the absence of these constraints, a long lag between when testing takes place and when results come out could make testing redundant. Given that this situation is unlikely to change in the short term, developing countries might benefit from adopting a different approach to testing, such as carrying out targeted, randomised, or pooled testing.

Intensive testing to confirm positive cases

The collection, dissemination, and use of good/reliable data on testing has been a key part of the global response to the pandemic but there are different approaches to conducting testing, which have varying degrees of applicability depending on the characteristics of the country and government in question.

1. Targeted testing

In cases of limited testing capacity, especially in areas with community transmission, targeted testing can support quick identification of vulnerable patients, clusters of infection, and types of interactions that facilitate the contagion. This approach should prioritise testing for specific categories of people:

- Hospitalised patients and people at risk of becoming severely ill from COVID-19[1] to provide early treatment.
- Health workers to reduce the risk of outbreaks within hospitals.
- Symptomatic individuals in a closed setting (e.g. schools, long-term living facilities) to identify outbreaks and promote containment measures (World Health Organization, 2020).
- Individuals regularly visiting at risk-environments (e.g. wholesale markets) or interacting with many people (i.e. superspreaders) to promptly identify potential clusters of infections.

Vietnam has been following this approach. Initially, it targeted people with a travel history (to limit the number of imported cases), those showing COVID-19 symptoms, and close contacts of confirmed cases. Subsequently, testing was expanded to at-risk environments, like wholesale markets in Hanoi and industrial zones in Ho Chi Minh City (Le, 2020).

2. Randomised testing

This approach consists of the administration of antibody tests[2] on a representative sample of the population to identify the percentage of people that have already contracted COVID-19. It could help reveal the spread of the contagion and the level of immunity,[3] and understand the epidemiological profile. This information might be very useful to inform appropriate containment and testing strategies, as well as the allocation of healthcare resources (de Walque, Friedman, Gatti, & Mattoo, 2020). For example, Togo carried out 5,000 tests on a random basis to generate data on prevalence that could inform decisions on mobility restrictions (Duflo & Banerjee, 2020). It is necessary, however, to ensure that samples are truly representative of the population to provide reliable and useful guidance to policies. Many studies, like the one in Iceland (Gudbjartsson, et al., 2020), have been relying on volunteers, potentially jeopardising the validity, and usefulness, of the evidence generated. The provision of financial incentive to participants might be an option to increase the participation rate (Greenstone, 2020).

1. "Older adults and people of any age who have serious underlying medical conditions might be at higher risk for severe illness from COVID-19" (Centers for Disease Control and Prevention (CDC), U.S. Department of Health & Human Services, 2020).
2. Differently from molecular assays (swabs), that inform whether someone is currently carrying the virus, antibody tests provide information on immune responses, identifying previous infections.
3. While it is confirmed that recovered COVID-19 cases develop antibodies to the virus, it is worth noting that it is unconfirmed whether the presence of antibodies confers immunity, or how long it will last, to subsequent infection.

3. Pooled testing

In Ghana, scientists have overcome resource limitations by grouping individual specimens into pools. When a member of that pool tests positive, the whole pool is tested. Starting at a pool size of five, they gradually increased it to ten as testing became more accurate. The associated savings on test kits have been considerable – for every 200 tests needed, only 50 test kits were used - a saving of up to 75% (Dzansi, 2020). Additionally, it has been proved that using pooled testing could lead to the screening of more specimens (between two and 20 times) than individual testing and could increase the number of true positive infections identified. A public-available calculator can help inform decisions on pooling algorithms (Pilcher, Westreich, & Hudgens, 2020).

Assessing contagion: Monitoring and collecting data

In addition to different approaches to testing, there are other sources of data (primary and secondary) that could provide insights into the prevalence of symptoms. These data sources could be essential to tracking virus prevalence in cases where testing at scale is not feasible.

- **Administrative and secondary data:** COVID-19 may cause severe breathing problems and pneumonia, often reducing the ability to breathe without a ventilator. This means that a large number of patients may potentially overload Intensive Care Units (ICUs). Therefore, monitoring data on ICU admissions, as well as comparing the number of pneumonia cases to historical data, may support a swift identification of clusters of infection. Other data sources to track high prevalence areas could be records of deaths from funeral homes and undertakers, as is being done in Cape Town, as well as analysis of untreated wastewater, as is being tested in several countries (Ahmed, et al., 2020).

- **Primary data:** Household phone surveys and data collection by community health workers can help assess the spread of the virus and provide real-time data on symptoms observed in a specific area (Leape, et al., 2020). The City of Medellin is asking residents to register their symptoms online, incentivising cooperation by using the same platform to provide financial support. Nearly 90% of the residents have submitted their information (The Economist, 2020). Countries with high smartphone penetration can also benefit from insights provided by apps capable of estimating whether someone has COVID-19 based on reported symptoms and individual characteristics, such as age and gender. An app of this kind has been piloted in the United Kingdom (UK) and the United States (US), predicting that 17.42% of participants were likely to have COVID-19 (Menni, et al., 2020).

Data innovation: Tracking and predicting transmission

Finally, advances in technology have offered new and widely available data sources to track and monitor transmission in real-time, where testing capacity may be constrained.

- **Spatial and big data:** Geographic Information Systems (GIS) and big data technology can significantly support policymakers during the implementation of prevention and control measures, providing, among other things, (i) geographic visualisation of the contagion, (ii) spatial tracking of confirmed cases' activities

and movements, (iii) prediction of regional transmission through analysis of population flow, and (iv) spatial segmentation of the risk and prevention level (Zhou, et al., 2020).

The World Bank has developed a methodology that uses spatial data to predict potential clusters of infection, whose prompt identification can help leaders prioritise health and civil resources. A first set of hotspots is identified by combining data on population density with building heights data, and accounting for minimal mobility. This can help assess where people cannot maintain the minimum social distance of two metres. Given that people living in informal settlements need to move to access basic services (e.g. toilet facilities), the location of such services, and mobility around them, are used to identify a second layer of potential hotspots. The methodology – which has been implemented with data from Mumbai, Kinshasa, and Cairo – can be replicated using globally available data (Bhardwaj, et al., 2020).

How is the virus spreading?

Quick identification of COVID-19 cases can help identify hotspots of the virus. However, it may not be possible to prevent transmission without a contact tracing system in place with the objective "to rapidly identify potentially newly infected persons who may have come into contact with existing cases, in order to reduce further onward transmission" (European Centre for Disease Prevention and Control, 2020). Ideally, contact tracing could help identify and quarantine all individuals potentially infected, allowing the rest of the population to carry out a normal social and economic life. However, studies have shown that only a very effective contact tracing system can control the epidemic, especially in cases of faster transmission (Hellewel, et al., 2020). More so, many speculate whether such systems could be effectively implemented, especially in a developing country context.

How can data help put in place measures to contain the spread?

Implementing smart lockdowns

Once the virus is identified, governments need to act. Without a comprehensive ability to trace and isolate all cases, many countries initially turned to a universal shutdown of all activities involving proximity between people. However, economy-wide lockdowns are often not feasible for sustained periods given their impact on job loss, deprivation, and hunger. With a vaccine several months away, and global economies suffering from suppressed demand, developing countries need to find alternative and less costly policy instruments (Haas, Khan, & Khwaja, 2020).

Many countries have been considering or implementing 'smart containment' strategies, where lockdowns are selectively enforced according to differing risk profiles and how they change over time. Combining data on the prevalence of the virus with associated demographics, locations, and critical

Case study 1: Contact tracing in Vietnam

Vietnam took early action against the spread of COVID-19 with a strategy that focused on detection through targeted testing and containment via contact tracing and quarantining. In February 2020, Vietnam developed locally made COVID-19 tests and quickly improved its testing capacity from two testing sites in January, to 120 in May. Given the low number of cases, the country focused on targeted testing to quickly identify potential clusters and limit wider transmission. In cases of domestic transmission, even if just one case, aggressive testing and localised lockdowns were implemented. As a consequence, while testing per capita might appear low, Vietnam has been leading in terms of tests for each confirmed case (966.7 on 29 April 2020).

Contact tracing system in Vietnam

Source: Vietnam Ministry of Health, 2020

The contact tracing (and quarantine) protocol implemented in Vietnam has been based on different levels of tracing, starting with infected cases (F0) and their closest contacts (F1). Once identified, confirmed cases (F0) are isolated in health facilities and all their contacts in the past 14 days (F1) are tracked and tested. Positive F1 cases are isolated at a hospital, while negative ones are quarantined for 14 days in governmental facilities. Close contacts of F1 cases (F2s) are asked to self-isolate at home for 14 days. Differently from most countries around the world, Vietnam's protocol establishes test and quarantine for all individuals that were exposed to the virus, and are at risk of being infected, rather than focusing merely on those showing COVID-19 symptoms (Pollack, et al., 2020). After 100 days (May 1st) since the first case was identified in the country, over 200,000 people were quarantined in Vietnam. Given that a high share of confirmed cases (43%) never showed any symptom, this approach, along with effective communication campaigns and international travel restrictions, might have played a significant role in reducing the spread of the contagion (Pham, et al., 2020).

Thanks to the effectiveness of its detection and containment protocols, Vietnam quickly isolated areas with at least one case of community transmission through targeted lockdowns and managed to trace hundreds of thousands of potential cases, quarantining them before they could spread the virus locally.

indicators of available healthcare capacity can help decide where, what, and who to lock down over various periods of time. This ensures that health objectives are met with minimum damage to the economy and livelihoods.

While the specific design and orientation of the smart containment policy will vary, the key takeaway is that it needs to be proactive, flexible, and

based on accurate evidence. Unlike in normal situations where policies are typically stable over time, smart containment requires governments to design, implement, and monitor policies that differ according to rapidly changing local environments (Das & Sanchez-Paramo, 2020). Policymakers also need to be able to manage negative responses from society. In many regions, once residents became aware of selective lockdown policies, they refuse to undergo testing. Additionally, in certain politically polarised environments, local restrictions may not be well received. As a result, communication with relevant community leaders will be a key determinant of the policy's success (Haas, Khan, & Khwaja, 2020).

Which areas should be targeted?

Most countries have implemented some version of containment by area, limiting lockdowns to places where the virus is most prevalent. For example, in Kenya, lockdowns were limited to major cities with strong connections to other countries, such as Nairobi, Mombasa, and Mandera, using urban density and connectivity to the outside world as a proxy for expected virus prevalence. In other cities, more precise measures have been used, including:

"Combining data on the prevalence of the virus with associated demographics, locations, and critical indicators of available healthcare capacity can help decide where, what, and who to lock down over various periods of time."

- **Data on virus prevalence and healthcare capacity:** In South Africa a graded lockdown was implemented using data on the prevalence of the virus from testing as well as available administrative data on healthcare capacity to determine which 'level' each region or municipality is assigned. In Chile, 'dynamic quarantines' were implemented at the neighbourhood level based on the number of positive test cases. The approach was initially successful, as most cases happened to be concentrated in wealthy, younger neighbourhoods. However, lack of accurate data in poorer and more crowded areas meant officials did not observe the spread into these parts of the city, which led to a significant outbreak over the following months (Barlett, 2020).

- **Apps to track biometrics and travel information:** In China, citizens are required to install the innovative Alipay Health Code App, which tracks their travel and contact history and biometric data (such as body temperature) through their smartphone. Citizens are then assigned a colour code — green, yellow, or red — that indicates their health status (Mozur, Zhong, & Krolik, 2020). Authorities (including police) then use the information to implement highly localised lockdowns. Whilst the data-enabled approach has allowed policymakers to better manage the spread of the virus, sharing of user data has raised surveillance and privacy concerns (Tan, 2020). Furthermore, replicability in developing countries is likely limited due to lower smartphone penetration rates.

Which people should be targeted?

Some countries, such as Colombia and Bolivia, are targeting people randomly – allowing people to leave the house on certain days based on the final digit of their ID numbers (BBC News, 2020). In others, targeting certain groups has been based on evidence of their vulnerability to the virus.

- **Data on population demographics:** Data have shown that targeting specific age groups can be a highly effective way to preserve lives during the pandemic. Recent research in the US finds that the overall virus fatality rate for a given location is directly linked to the age-specific pattern of infections. According to the analysis, in the event that the US infection rate reaches 20%, protecting the elderly could prevent up to 200,000 deaths (Levin, Cochran, & Walsh, 2020). Furthermore, this is likely to be a particularly effective solution in developing countries where more complex solutions are limited by fiscal capacity, a strained healthcare system, and a high percentage of households living hand-to-mouth (Alon, et al., 2020). Turkey has imposed such a solution, where individuals younger than 20 and those over 65 are restricted from going out, while the rest of the population can undertake normal activity (Damon & Tuysuz, 2020).

- **Administrative health data or online survey data on co-morbidities:** These data are helpful in understanding the proportion of the population at risk, with strong evidence suggesting that those with diabetes, heart disease, or chronic lung conditions are more vulnerable to the virus (Sanyaolu, et al., 2020). Those with comorbidities could be targeted with more information on the increased risks they face, encouraging them to remain isolated and at home.

Which economic sectors should be targeted?

Targeting lockdowns by economic sector has been done by a number of countries, often prioritising goods and services deemed to be essential to meet basic human needs, such as food markets, pharmacies, and healthcare. On the other hand, sectors that involve frequent or extended social interaction have been de-prioritised, with devastating effects on the service and hospitality industries, such as restaurants, beauty, entertainment, and tourism. However, the long-term impacts of persistent lockdowns and social distancing on the recovery of the economy also need to be considered. Firms with large fixed costs and limited sources of credit often cannot sustain themselves over the lockdown period. This has wide-reaching impacts on the supply-chain and other complementary goods.

While some cases are clear without data, prioritisation of sectors requires more information on key economic indicators, including the number of jobs, overall revenue and liquidity constraints, fixed costs, contribution to the trade balance, and the level of face-to-face interaction. Some of this can be leveraged through tax and customs data, firm records, as well as official census information, whilst others will require rapid surveys to be deployed, as explored in the section below.

- **Firm-level data and national accounts:** In many countries, export-oriented firms should be a priority sector to support. Export-oriented firms are typically large and absorb a significant component of the labour force. They also bring in foreign currency earnings – which often offsets the import of essentials, like basic food items – and pay higher

wages, which support communities. Finally, they are formal, which means they can be reached by policy, and have data on employment records and relationships with banks. In Bangladesh, supporting export industries (largely the ready-made garment sector) has extended the life of solvent factories by providing liquidity. Salary data from the pre-COVID period enabled the government to match these payments for six months, accruing as a loan to be repaid over 18 months (Woodruff, 2020).

Evaluating the success of policy measures to contain the spread

Targeting virus containment is only as effective as the subsequent containment measures taken, and data can ensure that only measures for which the benefits outweigh the costs are used. Furthermore, even with the most sophisticated information and recommendations, outcomes depend on compliance and enforcement. One example is enforcing social distancing through lockdowns. These measures can be expensive to put in place, not in the least forcing entire sectors of the economy to close down to reduce proximity between people. In all cases, the health benefits must be weighed against the economic and social costs, prioritising the least harmful mitigation strategies.

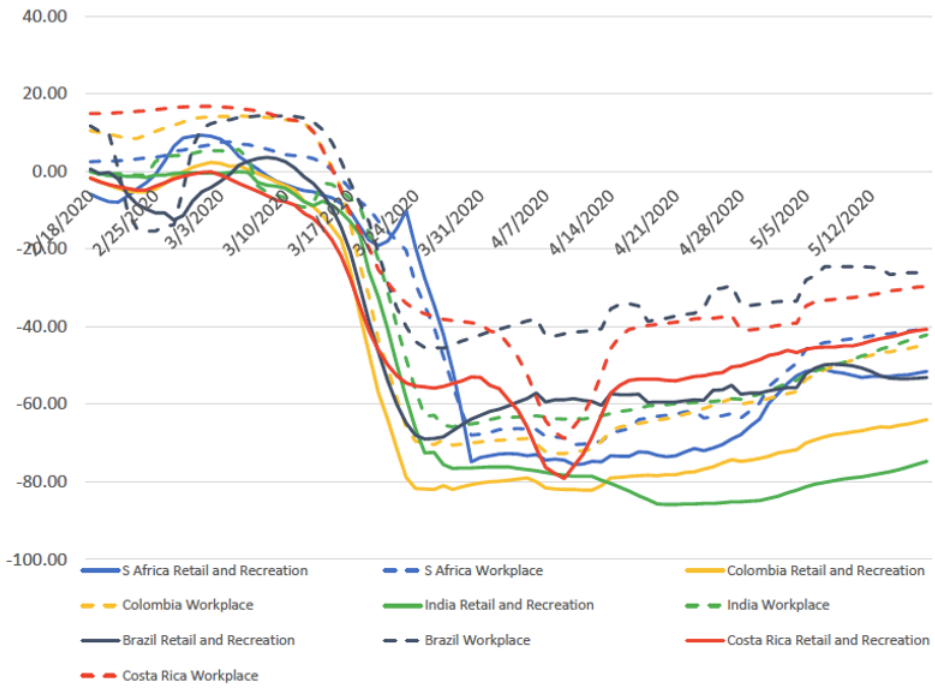
Are restrictions on movement being observed?

Apart from the more sophisticated surveillance methodology used in China and South Korea, which is unlikely to be feasible in many developing countries, other methods can also be used, including:

- **Leveraging private telecommunications data:** To measure whether social distancing and restrictions on movement are being adhered to, the European Commission has been working with private telecommunication companies to share aggregate location data on their users. The data is being used to track the impact of confinement measures on the intensity of cases, as well as forecast the spread of the virus (Lomas, 2020).

- **Leveraging Google maps location data:** Similarly, Google has developed COVID-19 Community Mobility Reports, providing granular location and movement data (see 'Google Mobility Trends', below). The data can be used to track the prevalence of travel, as well as the most frequented destinations, informing where stricter enforcement may be necessary, as well as where increased services – such as more public transport or sanitation – may be required (Fitzpratick, J, & DeSalvo, 2020). Some of the results from emerging countries are shown in Figure 2 below.

Figure 2: Google Mobility Trends for select emerging economies



Source: Hevia & Neumeyer, 2020.

Section 2: How can data help protect vulnerabilities?

The perceived trade-off between lives and livelihoods is creating immense policy challenges. Some key policy decisions that are being or will need to be taken include (i) how to rapidly reach out to the poor and (ii) how to assess the extent of vulnerabilities and target the newly vulnerable. As mentioned, most containment strategies for COVID-19 rely on some form of lockdown, which invariably creates additional groups of vulnerable households, often not covered by existing social protection programmes given they would not have needed such assistance before. To target support for such households, up-to-date data and analysis are pivotal (Leape, et al., 2020). However, gaps in critical information to support policy decisions around protecting vulnerabilities remain (Callen & Glaeser, 2020). Some data solutions are discussed below.

"To provide an instant response, governments may start with what they already know to target those in need..."

Rapidly reaching out to the vulnerable

Across a large number of countries, social protection in the form of cash based social assistance remains the main tool to reach the poor (Parekh & Bandiera, 2020). However, in many developing countries, the poor are often left behind as social protection programmes are inadequately equipped to recognise the newly vulnerable. To provide an instant response, governments may start with what they already know to target those in need before new information is made available: Existing datasets, including administrative data, can be used to map out vulnerabilities and rapidly expand coverage, without being overly selective. Some ways to meet the most basic needs and quickly reach out to the most vulnerable are mentioned below:

- **Use existing social registries:** Where existing social registries or databases exist, quick assessments can be made to scale-up social protection interventions, as is done in many countries. For example, Bangladesh has increased its coverage by 163% (Gentilini, et al., 2020). Colombia's social registry helped identify three million new households eligible to receive payments due to COVID-19 (Soon-Shiong, Qhotsokoane, & Phillips, 2020). However, in most developing countries social registries are either incomplete or out-of-date.

- **Make targeting less restrictive:** Governments can move away from relying on restrictive means-tested poverty-targeting – which is based on assets, household composition, and socio-economic profile (all difficult to collect) – towards other parameters, such as national identity numbers, names, addresses, and mobile numbers, to become more inclusive. This information can be used for both universal transfers and to determine eligibility. For example, based on proof of address, a potential beneficiary can be verified via a machine learning algorithm trained to differentiate a poor locality from a rich one (discussed below).

- **Using sector/industry wide databases:** Vulnerable populations can also be identified through other databases, such as government tax registries,

records of people employed in vulnerable industries (such as tourism and hospitality), transportation and construction, or those who have accessed public services such as health, schooling, and hospitals (Vaziralli, 2020). For example, the Jan-Dahn ecosystem in India, which assigns a digital identification document (ID) to a mobile bank account for those eligible for a financial inclusion scheme, was used to immediately make welfare payments to around 200 million low-income account holders for three months (Kejriwal, 2020).

Assessing the extent of vulnerabilities and targeting the newly vulnerable

This requires understanding the economic impact of COVID-19 on the vulnerable. There is active learning in methods to gather reliable data on impact as more information becomes available (Vaziralli, 2020). Complex data solutions can help measure the extent of vulnerabilities and inform targeting and the size of benefits (primarily cash transfers, which seem to be the most common form of social assistance currently being rolled out across many countries) (Soon-Shiong, Qhotsokoane, & Phillips, 2020).

- **Using alternative ways/proxies to measure income:** Instead of measuring income changes via a survey, other indicators, such as changes in mobile money transaction activity, as done in Kenya, can be a cheaper, more reliable alternative to identifying those experiencing loss of income or to predict poverty (Logan, 2020). This may also entail fewer reporting biases.

- **Modelling data to make predictions:** Predictive models and machine learning models can be used to make projections about vulnerabilities (Tsivanidis, 2020). Josh Blumenstock (Berkeley) and Mushfiq Mobarak (Yale), along with their team, are using changes in Call Detail Records (CDRs) to forecast changes in income through machine learning in Bangladesh, Togo, and Nigeria. Formal partnerships between the telecom industry and researchers can sustain efforts to merge survey data with CDRs to train algorithms.

At the same time, policymakers may also need to reach out to those that existing social protection programmes were not originally designed to reach (such as informal workers and non-resident citizens). An adverse income shock distinct from the baseline wealth/asset score used as a basis to enrol an individual into existing social protection programmes may imply the exclusion of certain groups altogether (Shaikh, 2020). In Pakistan, where over 70% of those employed in non-farm activities are informal, social protection programmes cover less than 20% of the population (Asian Development Bank, 2019). Identifying and supporting such groups should be a priority. It may be worthwhile to develop smart sustainable ways to track such individuals and suggest changes to social protection programmes accordingly.

- **Combining or merging datasets:**

- Data sources such as cellphone detail records (CDRs) can provide invaluable information to target smart lockdowns and relief efforts. The World Bank is creating a dashboard for policymakers by compiling CDR data from various sources across several countries (Tsivanidis, 2020).
- As performed in Jordan, merging data from telephone panel surveys with CDRs can measure the impact of lockdown policies on informal workers and refugees and inform decisions around the allocation and size of benefits (Tsivanidis, 2020).
- The identification of potential beneficiaries can also be achieved using spatial data and merging it with existing datasets. Pakistani researchers, led by Rashid Memon (LUMS), are geotagging 2.4 million households based on electricity consumption. They are acquiring electricity bills from the main electricity supply company in the city, and then predicting/estimating consumption, to geo-spatially target social assistance.

- **Encourage self-enrolment:** A long term measure can be to create systems whereby informal workers self-enrol into a programme by providing relevant information and perhaps paying a small fee or spending time filling in a form. New techniques can also be used to enrol beneficiaries by accessing alternative/passive data sources.

- **Use real time data for rapid diagnostic:** Real time and high frequency data can keep targeting on track and instantly identify those falling into poverty. High frequency phone surveys in rural western Kenya are tracking economic activity to determine the impact of cash transfers on household resilience. This real time information is then uploaded to a dashboard to simplify its visualisation.[4]

Focusing on what lies ahead

COVID-19 has exposed gaps in social protection systems, such as their lack of ability to cater to the newly poor or vulnerable. A few major policy issues that decision-makers will need to continue to address include: (i) How to identify and target those who have been pushed into poverty; (ii) how to assess the duration and extent to which such people might need assistance; (iii) how social protection transfers have impacted beneficiaries and if they have correctly identified those most in need.

"COVID-19 has exposed gaps in social protection systems..."

In order to make social protection programmes more responsive to future shocks and become dynamic in terms of identification, targeting, and outreach, effective systems will need to be put in place to collate administrative (including big data phone and satellite records), spatial, and primary data (such as poverty surveys). A good starting point can be to expand the base of potential beneficiaries, allowing the system to expand in case of a shock and contract thereafter.

4. See the Kenya COVID-19 Economic Tracker: https://www.kenyacovidtracker.org/timeseries.html

Section 3: How can data help mitigate damage to economic markets?

In a fast-evolving situation with an unprecedented impact on economic activity, governments will need to learn quickly, and at scale: (i) How to track market conditions, and (ii) how to target policies for market support. The most important markets that will need protection are markets for food and other necessities, followed by markets that support large sources of firm activity and employment. Governments will need to leverage all available data options, including pre-existing administrative sources and more passive third-party sources.

How can data help track the conditions of food markets and food supply?

Monitoring the food sector is a first order priority in a context where supply is at risk of disruption and income streams of consumers are likely to have fallen. Data to track food prices, production, and distribution are vital indicators of market conditions, and much of these data may already exist. Where it does not, it points to an essential place for governments to build data capacity.

- **Markets and prices:** Price levels in local markets offer an important summary statistic for problems in food supply chains. Supply shocks will show up as either price spikes or stock outs. Monitoring food prices at a high frequency in markets across locations within a given country, combined with data on income streams of households, allows policymakers to identify and respond to the main areas of food vulnerability. However, it is important to recognise that food prices may be extremely volatile and therefore tricky to measure. Moreover, prices themselves are not necessarily the measure of interest, but rather people's access to food itself. Data on prices is important as a key measure of food accessibility, but measures of actual consumption, such as daily caloric intake, will also be critical for forming an accurate picture.

- **Production:** Lockdowns and other containment strategies could likely disrupt activities at the farm level. For example, successive rounds of panel surveys (April and July 2020) conducted in Bangladesh showed that most daily labourers in agriculture were unable to work during the lockdown (BRAC Institute of Governance and Development, 2020). With global value chain disruptions, agricultural inputs may also be lacking. Tracking activity at the farm-level and using administrative records on imported inputs could therefore prove essential for policymakers to track current market conditions and forecast how potential difficulties could impact food supply chains downstream with a few weeks lag.

- **Food distribution:** COVID-19 is also likely to impact trading relationships and the distribution of food items. Many low-income countries, particularly in sub-Saharan Africa, are reliant on food imports. Disruptions to global value chains could severely impact their ability

to access food, particularly so for landlocked countries, which could be affected by disruptions in border countries. The overall impacts to distribution may be difficult to predict in advance, so tracking disruptions in real-time is vital, with customs data offering an important source to monitor food imports.

Some policymakers have recommended that governments set up response units with data rooms to gather all these data sources and deploy them to manage food availability, accessibility, and affordability (Pais, Jayaram, & van Wamelen, 2020). Kenya has established one such food-security or agricultural response unit as a centralised strategic and planning hub in the backdrop of COVID-19. It proactively gathers pricing and availability data on about ten food commodities at a subnational level on a weekly basis through a digital tool and maintains dashboards on trends to identify any "hotspots" where interventions are required.

Some of the ways that these response units can be made robust include: Monitoring food availability and pricing on a subnational level, enabling governments to be proactive in identifying "hotspots" of shortages or hoarding, and intervening where necessary. Further, these units can develop and implement guidelines and policies, track ongoing indicators to ensure continuity of the agricultural and food system, and provide targeted support where necessary. This could include guidance on how to prioritise food imports and agricultural inputs at ports and for inland distribution, as well as engagement at the regional level to ensure ongoing trade. Looking forward to the next harvesting and planting seasons, the availability and distribution of agricultural inputs can be tracked, and the safety of critical value-chain actors (such as seed inspectors, extension agents, and traders) ensured.

Even as economies open, the ongoing threats of pests, climate change, and isolated security events mean that food systems in the developing world might continue to face ongoing crises. Governments can draw on the lessons of COVID-19 to build longer-term capability to proactively manage and diminish such threats through setting up agile 'Food Crisis Response Units' that proactively monitor and mitigate risks in the agricultural and food value chain, leveraging the data room mentioned above. This is analogous to the pandemic health response units that many countries have set up.

"Even as economies open, the ongoing threats of pests, climate change, and isolated security events mean that food systems in the developing world might continue to face ongoing crises."

The Agricultural Policy Support Unit (APSU) of Bangladesh's Ministry of Agriculture was jointly established by USAID and the International Food Policy Research Institute (IFPRI) in 2012 to strengthen the Ministry's in-house technical capacity. APSU does this by providing timely policy recommendations in response to short-term challenges; carrying out in-depth analyses to help produce policy options that will address medium- and long-term challenges; and monitoring and evaluating policy implementation and outcomes. Similarly, there exists the Food Planning and Monitoring Unit (FPMU) within the Ministry of Food that is responsible for monitoring the food security situation in Bangladesh and the implementation of related policies. Upgrades and customisations to combat the current crisis can go a long way to make

these units more effective in delivering on their respective mandates.

How can data help target support to food markets and food supply?

Through robust resource units, governments become equipped to channel targeted support to value-chain players in the form of (but not limited to) working-capital and tax-rebate support to ease financial burdens during a time when credit is likely to be constrained. Governments could also consider earmarking logistics subsidies for food distribution to high-cost regions, providing targeted input subsidies to more stressed value chains, or even stimulating local production through government offtake for buffer stocks.

These units would be instrumental in monitoring food security across the country and providing support to vulnerable households, including offering cash transfers or food vouchers. However, owing to the protracted nature of the COVID-19 crisis, it is imperative to engage across ministries — including the ministry of agriculture, water, economic development, trade, and the interior — in gathering information, ensuring fit-for-purpose initiatives, and driving rapid data-driven decision making on a daily basis. Government will also need to engage actively with private-sector players as well as development partners, multilateral institutions, and international agencies to bring about successful mitigation and the creation of more resilient food systems.

A COVID-19 resilient food system is likely to be one that has stable supply chains, infection safe logistics, extended social safety nets, adequate credit facilities, and innovative labour management tools, alongside appropriate farm mechanisation efforts. In addition, COVID-19 safe farm operation protocols, digital extension services, circular nutrient flows, enhanced storage facilities, and innovative marketing mechanisms are needed, along with effective international trade management policies and institutions. Given that the actions required to implement monitoring of a food systems health and undertake corrective measures are complex and interconnected, creation of an adequately funded institutional mechanism to coordinate monitoring and mitigation measures could be beneficial.

How can data help track the conditions of firms and employment?

One of the biggest challenges to leveraging data on firms and employment in developing countries, is that the majority of the urban labour force works in the informal sector, with the largest share being self-employed (International Labour Organisation, 2018). Governments generally lack the data needed to track the conditions of these workers and markets, and even if they did, the kind of support they need is likely to be better provided through individual social assistance, as opposed to relief targeted at the firm-level (Parekh & Bandiera, 2020).

For the informal sector, governments can use data on the functioning of

other economic markets, such as the supply and prices for food and other essentials, as described in the previous sub-section, to act as useful proxies for economic conditions. Governments should also consider leveraging new surveys that can be implemented rapidly to identify worker vulnerabilities and needs for relief packages. Such surveys can also be implemented across the formal sectors. Finally, for tracking the activity of larger formal firms, and especially those involved in exports, governments may be able to make use of readily available administrative data such as value added tax (VAT), electricity, and customs data:

- **Rapid surveys:** New surveying can help measure the economic impact of the COVID-19 pandemic on businesses, self-employed individuals, workers, and farmers in developing countries. The International Growth Centre (IGC) provides a current example of this, collecting data in partnership with Innovations for Poverty Action (IPA) and a range of other organisations across 32 countries. Data is collected through phone surveys by researchers using a survey module that is designed to be standardised and flexible so that it can be implemented across a range of formal and informal businesses to track economic activity across various country contexts.

- **VAT data:** Most countries now have electronic VAT records that allow governments to track transactions along value chains. For the formal sector, such data allow policymakers to identify firms and sectors most affected by the crisis. Combined with historical data from the same source, this information provides a good estimate of the level of economic activity and disruption to trading relationships.

- **Electricity consumption data:** Electricity is a key input in manufacturing processes. Monitoring consumption data in real time and by geographic area, and comparing it to pre-COVID-19 activity levels, may also provide a way to monitor economic impacts similar to how such data can be used to predict impact on individual or household level economic conditions/ vulnerabilities.

- **International trade disruptions and customs data:** Border transactions are recorded in real time by customs agents. This can be used to track economic activity and to project the impact of lower imports through the input-output matrix to get a sense of the magnitude of the effect on the entire economy.

Case study 2: How the IGC is using data to track economic conditions

Researchers across the world are generating datasets to track economic activity during COVID-19. Below we detail two examples from IGC Country Programmes where data is being used to track economic conditions:

Ghana: IGC researchers are currently undertaking weekly surveys (online and by phone) of both households and firms to track trends in key economic indicators such as unemployment, prices, and production (Lagakos et al., 2020). Data are then being used to inform the Ministry of Finance and the Economic Management Team at the Office of the President on the kinds of policies that are best placed to address damage to firms and employment.

Uganda: Various IGC researchers are using administrative data to estimate the impacts of COVID-19 on firms and employment. One project has combined transaction level customs data with other administrative sources, such as VAT and tax records, to assess the impacts of reduced imports on output and employment as well as the implications for overall government revenue (IGCa, forthcoming). Other work explores how firms' electricity use varied before and after the COVID-related lockdown restrictions (IGCb, forthcoming), helping the government recognise the magnitude of the shock.

Sierra Leone: IGC researchers have implemented phone surveys to track the availability and prices of essential commodities such as rice, cassava, gari, bonga fish, and palm oil, as well as other commodities (Meriggi, et al., 2020). The data is updated regularly in an online visual dashboard, so that anybody can consult it live. The results also form part of weekly bulletins sent to government ministries to assist the design of appropriate, targeted responses. This case study is expanded on below.

How can data help target support to firms and employment?

COVID-19 has had a wide-range of health and economic implications for the business environment – whether through finding ways to ensure staff safety and limiting the spread of the virus during business operations, or restricting the economic impact of enforced shutdowns, supply chain disruptions, demand reductions, and a changing financial landscape. Many businesses have had to adopt new policies and procedures, for example to accommodate working from home, grant sick leave, and support vulnerable groups, among others. At the same time, they have faced profitability damage on their financial statements, reductions in working capital, and increased threats of bankruptcy.

- **Using data to ensure staff safety:** Data can be used to identify health risks in certain industries and, where necessary, to help formulate guidelines or target support for workers that are particularly vulnerable. This includes survey data on the working conditions of businesses as well as administrative and spatial data to identify the locations of vulnerable groups or dense sectors of economic activity. Many of these guidelines

(e.g. improved hygiene practices) make sense regardless of the data, but such information can also offer insights on the best policy approaches to ensure compliance. In Sierra Leone, data from the Ebola crisis have shown that many businesses were not enforcing preventative behaviours because they lacked trust in the government. Today, public officials are using respected local leaders to disseminate public health messages and improve compliance with COVID-19 guidelines (Options International, 2020).

- **Using data to support business continuity:** The quality of business data will be crucial for governments in choosing where and how to target economic support programmes. Many countries, including the UK, US, Nepal, and South Africa, have instituted loan policies to preserve business solvency, but even in high-capacity countries, these programmes have proved challenging to effectively target and maintain. In developing countries, policymakers have the added challenge of informality. They may need alternatives to administrative and readily available survey data to target support to workers. Data on transactions, production, and trade among large businesses can help determine which sectors to support, when to do so, and how – for example, whether key sectors should be offered loans on the condition of retaining workers. In the informal sector, early warning systems to signal pending food crises can help ensure that food supplies are maintained and help answer questions, such as whether problems in food supply may necessitate a switch from cash-based transfers to food-based transfers to the poor.

Case study 3: Using data on Nigeria's informal sector to target support

Researchers from the IGC have recently collected data to identify the impacts of COVID-19 on Nigeria's informal sector. The data derives from the Lagos Trader Survey (LTS), which is a panel survey of 1,179 wholesale and retail traders in Lagos who buy and sell consumer goods such as clothing, electronics, toiletries, and homewares. Traders were randomly sampled from a census of 53,000 shops in commercial areas of Lagos State, and have been followed since 2015.

To update the dataset to respond to COVID-19, researchers have created two rounds of phone surveys from a sample of 765 traders within the LTS. These surveys were conducted between 18 April and 11 June 2020. All traders in the sample operate from permanent physical premises. The typical trader is male (73%), 42 years old, and has been in business for 14 years. As of 2017, traders had 1.3 shops and 1.2 paid and unpaid workers on average. In February 2020, before the pandemic hit Nigeria, their average weekly revenue was just under NGN 400,000 (approximately USD 1,030). Two-thirds of them imported goods from outside Nigeria in 2019.

Evidence from surveys shows that traders had virtually zero revenue during the month-long lockdown in Nigeria's Lagos State. Since Lagos partially re-opened in early May 2020, most traders have returned to their markets, and sales have had a larger rebound than employment. Compliance with public health measures has been high, as is evident from the use of mask and wide availability of handwashing stations in markets.

Traders closed their shops during the lockdown. Upon easing the lockdown, market regulations have been largely followed. Traders are experiencing major problems with low demand, difficulty restocking, lack of cash on hand, and limited transportation. Most are raising their prices to cope, but few are taking out loans. There is widespread interest in expanding the use of electronic payment methods and e-commerce, and exploring new suppliers, products, and delivery modes. Supply chain failures are likely to be an ongoing problem. Almost half of the traders report that they have not yet restocked at all in 2020, and very few have succeeded in importing.

Section 4: Practicalities of implementing a data-driven approach in a crisis

In view of the pressing needs emerging from the COVID-19 crisis and limited public resources, data collection efforts by the government must be informed by an understanding of the priority problems and supported by actionable and targeted solutions – allowing governments to do more with less. The examples above illustrate how data can inform decision making on some key policy concerns surrounding the COVID-19 crisis. However, the extent to which meaningful conclusions can be drawn depends largely on the availability and quality of the data collated. Furthermore, simply gathering existing data and collecting new data will not solve the problem: It needs to feed into the decision-making process to have impact. This depends on the standards defined by the ecosystem – the institutional and regulatory structures within which data collection and analysis takes place, and the capacity of the stakeholders to understand, present, and make use of the data.

Effectively accessing and using available data

Since this is a fast-moving crisis, with little precedent, high-frequency data is key. Governments need to learn quickly and at scale – but running large surveys remains a challenge. Hence, leveraging pre-existing data sources (such as administrative data) passive data collection methods (such as adaptive large-scale survey methods and partnerships with the private sector to harness 'big data' collected through mobile records) will remain valuable.

- **Easy and affordable new data collection**

  Rapid surveys conducted via online forms or over the phone are a low-cost and efficient way of gathering information from households and businesses. As explored above, the city of Medellin requested residents to register their symptoms online, resulting in information on 90% of the residents (The Economist, 2020). The case study of Sierra Leone below provides another example, where phone surveys were used to gather information on the economic and social impacts of the crisis.

  Policymakers have also successfully used surveys of government staff (as an easily accessible source of information) to gather accurate data. In Chhattisgarh for example, the government and researchers collaborated on a food availability survey across 20 districts, from 10 April to 18 April (Barboni, et al., 2020). Researching the effectiveness of the public distribution system (PDS), the survey was administered by the Department of Food, Civil Supplies, and Consumer Protection in Chhattisgarh, and was completed by panchayat-level department secretaries, accountants, and officers. Similarly, researchers in Afghanistan used survey data collected from a sample of ministerial employees in the education sector to provide insights into the impact of hygienic practices on virus transmission (Callen, 2020).

Digital data rooms, as seen in Kenya, could complement resource units to go beyond the tracking and forecasting of production based on food stocks and yield forecasts that are currently captured in many ministries of agriculture. It could thereby track trade flows, food pricing at the retail level, and availability at food shops in urban and rural areas. It could also bring together multiple sources of data, including surveys of retail shops from consumer goods or e-commerce players, trade data from commodity traders, and stock data from processors. While the case for this kind of data room is a strong one for COVID-19 response, it could be designed to persist as a long-term solution, providing accessible and accurate data to different actors. Governments could use the opportunity provided by the current crisis to create this much-needed resource.

- **Optimising the use of existing data sources**

  Many policies can be based purely on existing data or on easy to access administrative data (e.g., age-specific lockdowns or the targeting of food aid to regions). Business activity can be tracked with many types of administrative data: For example, electronic VAT records that allow governments to track transactions along value chains and identify the firms and sectors most affected by the crisis. Electricity consumption data also proxies business activity as it is a key input in manufacturing processes. Monitoring consumption data in real time and by geographic area and comparing it to the activity pre-COVID-19 also provides a monitoring tool of economic activity.

  However, existing secondary data may not be beneficial unless it can be combined with primary data to ensure it is accurate and representative. Certain policy questions can only be answered by combining new sources with other data such as geography, demographic trends, and vulnerable population/informal sector estimates. We should therefore consider the power of merging several data sets to respond to different policy questions, as highlighted throughout this brief (understanding supply chains, targeting subsides, identifying beneficiaries etc). This is being done by the IGC Ghana team, who are collaborating with government, private sector firms, and researchers to combine data on consumable prices, electricity data, and port and trade activity, while collecting new data via online surveys on employment and income, and via the phone on firms.

  One challenge that governments are likely to come across is in sharing and accessing data from various counterparts. Even within government departments, this process can be burdensome, let alone between the private and public sector, or between different spheres of government. The four key requirements for effective data sharing are that the data should be (i) standardised, (ii) digitised, (iii) anonymised, and (iv) be accompanied by robust metadata. Leveraging the critical juncture of the COVID-19 crisis presents an opportunity to formalise these data partnerships and invest in a long-term approach to more open data sharing. In the near term, experienced data intermediaries in local

universities or development organisations may be able to assist with securely collating information from various stakeholders.

Skills and human resource capacity

In most governments globally, it is not policy but capacity to implement policy that constrains progress. This is the same for data: Without a dedicated analytics unit to compile and analyse data, even the best data strategy will have limited use. However, given the urgency to respond, there is little time or money to invest in additional capacity around data science, analytics, and engineering given these are expensive skill sets to acquire. Instead, governments should:

"In most governments globally, it is not policy but capacity to implement policy that constrains progress."

- **Repurpose existing resources:** Usually departments – such as the treasury departments, tax agencies, and statistical bureaus – already employ people with strong data analysis skills, who could be repurposed to focus on COVID-19 data initiatives. For example, in the City of Cape Town employees from an in-house call centre were repurposed to help develop a dashboard using data from funeral homes and undertakers to track excess deaths.

- **Leverage external expertise:** A second option is to leverage the assistance of outside experts from development partners, research institutions, or private consultancies, to help set-up data analysis teams and provide external feedback on performance and decisions. However, given their input is naturally limited and temporary, external experts must be used to complement and build local capacity over time. Case study 4 below shows what the IGC are doing in this regard in Sierra Leone.

Overall, driving a data-oriented approach requires strong leadership from the government, who would need to convince its staff and citizens of the importance of such an approach in an environment of crisis and constrained resources. Their role will also extend beyond data analysis, into management and coordination with multiple stakeholders, monitoring data governance and standards, and ensuring there is clear policy relevance for the information being generated. In the longer-term, crises like these offer critical junctures to reform policy, and may be an opportunity to encourage investment in a data-driven approach more generally.

Data quality and usage

There are multiple ways of measuring and ensuring the quality of the data being collected. A good regulatory structure includes data standards and institutional arrangements that keep checks in place, especially when data collection is rapid and in real time – a situation which may lead to a high potential for error and help create an ecosystem that supports a data-driven approach.

- **Ensuring consistency in data**

A common data governance problem is the different calculations and standards used to report on COVID-19, which may lead to varying conclusions drawn from the same data. Definitions and calculations used for common concepts – such as 'confirmed cases' and 'active cases' – must be standardised across governments and regions. Data must also be collected in a consistent manner, across different departments and levels of government, and in compliance with established standards such as per the World Health Organisation (WHO).

Consistency of data across countries is important to ensure cross country comparisons and draw insights, even where new data is being collected. The IGC and IPA have launched a standardised survey across several countries that aims to collect comparable data on the impact of COVID-19 on the economic activity of firms, farmers, and workers in low- and middle-income countries.

- **Data visualisation and clarity**

Another vital aspect of data for policy-making is to make it insightful by illustrating and representing it to policymakers and the public in a meaningful way – such that it is able to guide policy decisions. All communication and knowledge products developed should be tailored to policymaker needs, keeping in mind their capacity to use this data and thus encourage ownership and traction. A collaborative and consultative process can help develop policy traction.

One way to do this is to develop reporting formats or visuals to display data using dashboards. The IGC country team in Sierra Leone has developed a survey module focused at a sample of ~4500 households and businesses (with a 50% response rate) to be rolled out at high frequency based on the actual requirements of policymakers (Leape, et al., 2020). An accessible dashboard provides a range of data visualisations to a wide range of stakeholders. The IGC Ghana team is also working towards providing weekly monitoring reports to the government based on survey data combined with electricity data.

Case study 4: Tracking the consequences of COVID-19 in Sierra Leone

To get timely, credible, and low-cost data on the impact that COVID-19 and associated restriction measures had in Sierra Leone, the IGC in partnership with a consortium of international researchers worked closely with the Government of Sierra Leone to design and roll out a phone survey aiming to: (i) Evaluate the economic and social impact of the crisis, (ii) track the impact over the next six months, and (iii) assess the effectiveness of implemented strategies. The idea was to inform policy decisions on containment strategies and economic support to households and firms.

Researchers sampled respondents from 195 locations within Sierra Leone, representative of the entire population, to be interviewed every month for six months. The data collected covered a broad spectrum of themes, including (i) economic indicators, (ii) food security, (iii) COVID-19 knowledge and behaviours, (iv) health seeking behaviours, and (v) migration. These were identified as the most appropriate to inform and guide the Government of Sierra Leone in the implementation of its Quick Action Economic Response Programme (QAERP).

To make data more accessible to stakeholders and policymakers, the researchers developed a dashboard to ensure data visualisation through graphs and maps populated with real time data. Additionally, they draft weekly bulletins summarising the main findings. The data is being used directly by the technical working group in the government, as well as other development partners, such as the International Monetary Fund (IMF) and World Bank, to make critical decisions.

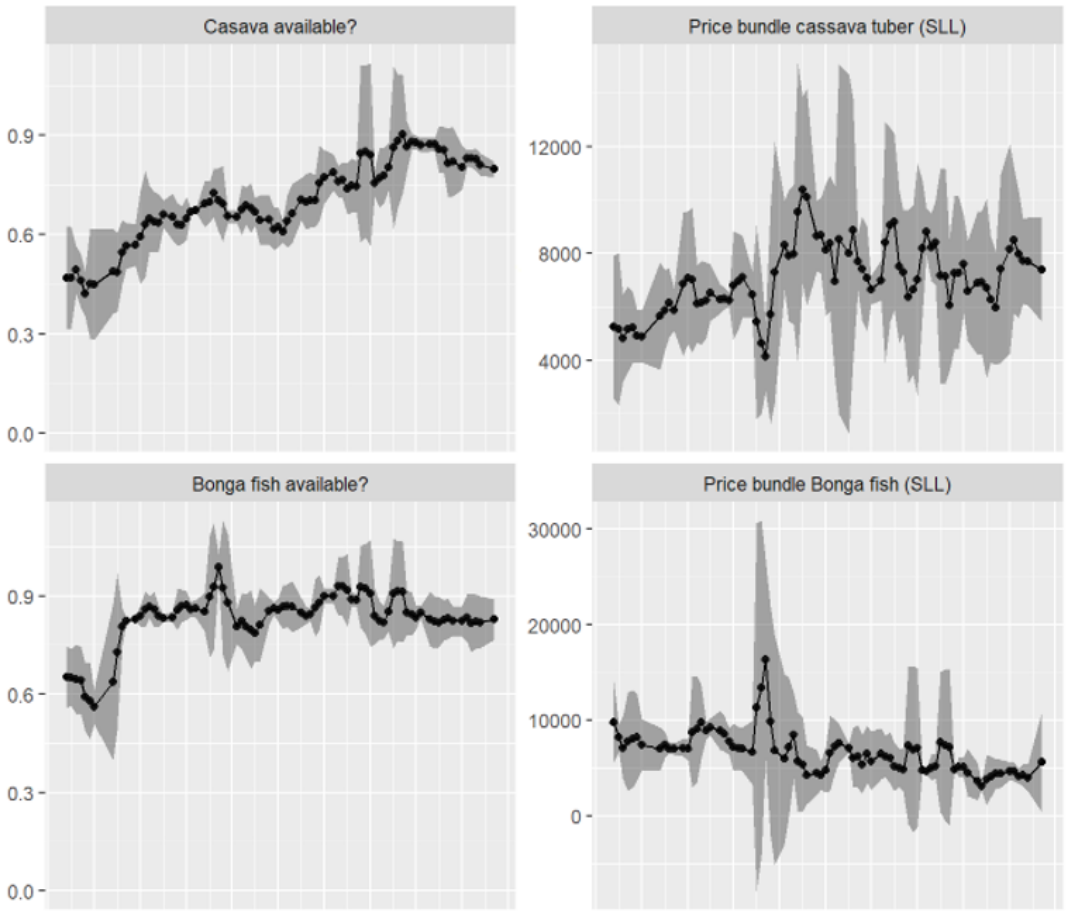
After five weeks of data collection, the researchers identified three main aspects that Sierra Leone's policy response should prioritise (Meriggi, et al., 2020):

- The need for policy measures to support both businesses and households. The data shows that businesses are working shorter hours, and 80% are experiencing difficulties in accessing customers and suppliers. This has resulted in weekly profits that are 50% lower than before the lockdown. At the same time, more respondents are skipping meals. Without support, people have been using savings or borrowing from others in their network to cope.

- The importance of targeting information campaigns on COVID-19 to reach the least informed demographic groups, given that the data shows women to be less informed.

- The importance of ramping up communication efforts to ensure adherence to social distancing and good hygiene and social practices, as the data reflects reduced compliance over time.

National aggregates



Note: Example data on key commodities tracked by the IGC's Sierra Leone dashboard

Policy recommendations

To effectively overcome this unprecedented global crisis, policymakers need good quality data on the prevalence of the virus and its various economic impacts. As we detail in this paper, with the right frameworks for collecting and applying data – as well as the political will to adapt policy when new evidence comes to light – even governments with limited capacity can form timely and effective responses to COVID-19. The following recommendations can help guide an effective data-driven response.

- Data collection should be guided by specific policy questions, including:
  - Virus containment: How many people are infected with the virus? How is it spreading? Which areas, people, or sectors should be contained?
  - Protecting vulnerabilities: How can the poor be rapidly reached? How to assess the extent of vulnerabilities? How to target the newly vulnerable?
  - Mitigating damage to economic markets: What is the state of food supply? How are firms and employment changing? How can support be targeted to firms and food markets?

- To better serve policymakers, data needs to be displayed in a way that is accessible and easy to interpret. It should also be high-quality, up-to-date, and consistent.

- Where detailed data collection and complex analysis is not viable, simple proxy measures can be used that are suited to the context, capacity, and resources. This includes merging datasets to uncover new information, predictive modelling, administrative data, or surveying government staff as an easily accessible sample.

- Setting up response units and digital data rooms are useful ways to gather and coordinate a wide range of data sources and deploy them to answer specific policy questions. Further, these units can develop and implement guidelines and policies, track ongoing indicators, and provide targeted support where necessary.

- While capacity can initially be leveraged from departments with existing skill sets, or from external experts, to have a better chance of tackling the crisis it is necessary to have an institutional environment that values data and that has capacity to produce, analyse, and use it. This has benefits beyond the current crisis, presenting a critical juncture to invest in a data-driven approach more generally.

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