The Economics of Covid-19 in South Africa: Early Impressions

By Haroon Bhorat, Tim Köhler, Morné Oosthuizen, Ben Stanwix, François Steenkamp and Amy Thornton

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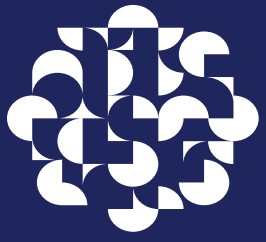

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THE ECONOMICS OF COVID-19 IN SOUTH AFRICA:

Early Impressions

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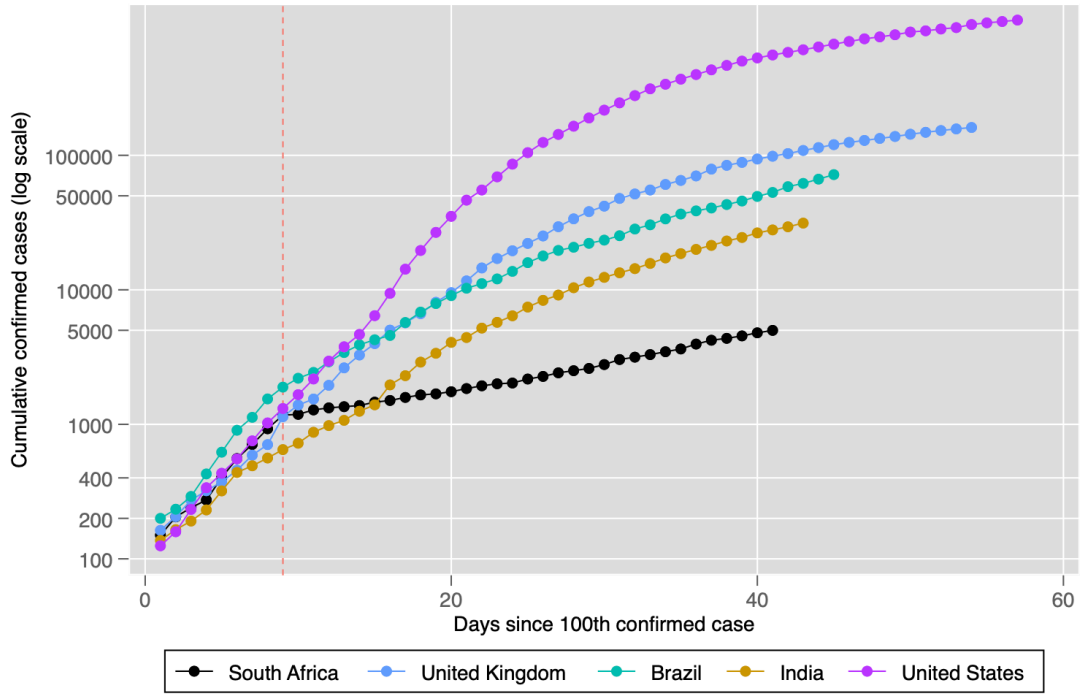
1 Introduction

South Africa's efforts to contain the Covid-19 pandemic have been relatively rapid and comprehensive by international standards. The number of confirmed cases passed 100 – a basic benchmark in the progression of the epidemic – on 18 March 2020. Three days prior to this a National State of Disaster had already been declared, and on 26 March the country was placed under a complete national lockdown for five weeks[1]. The lockdown was extremely stringent, restricting all individuals' mobility to essential travel only, prohibiting the sale of alcohol to take pressure off the public health system, and making no allowance for any non-essential activities outside the home including walking and basic exercise. This essentially brought most economic functions across the country to an immediate halt, apart from a set of essential services including healthcare, security, agriculture, and the transport of selected goods. Following these various interventions, and after an early exponential increase in confirmed cases, the spread of the disease at the time of writing appears to have slowed temporarily. Figure 1 thus shows the number of confirmed cases for South Africa alongside four comparator countries, where the vertical line marks the introduction of the lockdown in South Africa, after which a gradual flattening of the curve is evident.

Figure 1: Trajectory of Cumulative Confirmed Cases



Source: Compiled using data from Our World in Data. Data as of 29 April 2020.
Notes: Vertical line = introduction of national lockdown in South Africa.

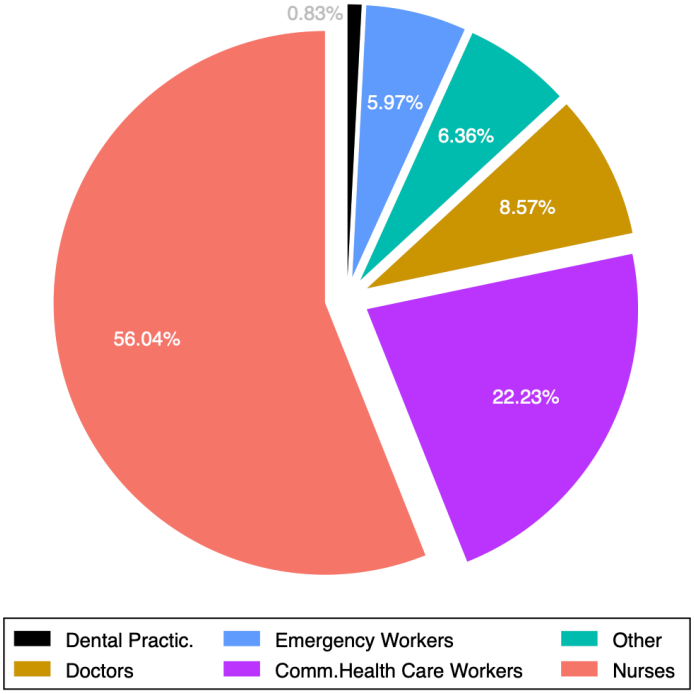
The available evidence appears to confirm that the country's uncompromising lockdown, combined with effective contact tracing for the early cases (mainly Europeans or South

[1] The lockdown was initially set to be three weeks but was subsequently extended for a further two weeks.

Africans returning from Europe), helped prevent uncontrolled local community transmission during these early stages of the pandemic. It is important to note however, that this early effective response will not, according to the available health modelling outcomes, result in a decline in the absolute number of cases. Instead, what the early lockdown has done is to allow the South African government time to prepare for what will inevitably be an exponential rise in Covid-19 infections after the complete lockdown ends. Essentially then, the epidemiological evidence would suggest that in the early stages of the epidemic, some form of a delayed infection curve has been observed in South Africa (Karim, 2020).

In addition to the lockdown measures there has been a proactive health response with some unique features that are linked to programs that currently manage the country's pre-existing disease burden. South Africa remains the global epicentre of HIV epidemic, with 7.7 million HIV-positive individuals and 5.2 million people receiving antiretroviral treatment. In part-response to this, South Africa expanded its base of community health care workers (HCWs) substantially. At present, health systems data indicates that the country has around 28 000 community health workers in the public system. As shown in Figure 2, they comprise just over 20 percent of all public healthcare workers in the country. As the name suggests, these workers operate at the community level and play a crucial role in testing and prevention of HIV (and TB), treatment adherence, as well as more general health promotion. Despite some concerns over proper training and equipment, the early deployment of community health workers to help screen, test, diagnose, isolate, contact trace and treat at the household level for Covid-19 may have also had an impact in limiting the rapid spread of the disease. Going forward it appears that community health care workers will continue to play an important role in combatting the spread of the virus in the country.

Figure 2: Distribution of Public Healthcare Workers, South Africa



Source: NDoH (Forthcoming), Own calculations.

In addition to the unexpected resilience provided by the availability of HCWs, South Africa's testing numbers have been significant. By the end of April overall rates of screening and testing in South Africa had increased rapidly, with per capita testing far above almost all other developing countries. However, despite managing to increase testing to reach approximately 15 000 tests per day, as the strict lockdown ends much more extensive screening, testing, contact tracing and quarantining is required to control the spread of infections.

If the various measures taken to contain the pandemic have bought the country valuable time to prepare for an imminent health crisis, they have also placed extreme economic strain on virtually all South Africans. Many people have been deprived of income and employment, while the production and distribution of goods and services has ceased in most sectors. This has created an unprecedented reduction in both demand and supply that is set to continue even as the intensity and coverage of the lockdown eases.[2] The economic impacts of the lockdown remain uncertain and difficult to measure with any accuracy, but all early predictions suggest they will be both severe and widespread. The effects for those who cannot work, and the people they support, will of course be crippling. In a country with already high levels of poverty and joblessness, anecdotal evidence suggests that many households are already facing alarming levels of economic

[2] The South African government has established a staged system to ease the lockdown based on 5 levels; where level 5 is a complete national lockdown, and level 1 is 'business as usual' with basic hygiene precautions. On 1 May 2020 the country will move to level 4.

distress – marked for example by the growing food insecurity (PLAAS, 2020). Businesses will also be under huge strain as revenue and cash flow dries up and debts mount. The firm-level impacts will certainly vary across sectors, occupations, regions and other key covariates, and as the country moves toward reopening the economy these dynamics will change.

Government gradually introduced measures to mitigate some of the negative economic impacts on individuals, households and businesses. The most important intervention was a stimulus package that was announced by President Cyril Ramaphosa on 21 April – approximately a month after declaring a State of National Disaster. This included substantial additional spending targeted to firms and individuals that amounts to 6.5 percent of GDP. The package does represent a progressive intervention relative to the policy approaches of most other emerging market economies, although a concern is how successfully the relief measures will be implemented by the various government departments that oversee them. The package does however, unambiguously place an increased strain on South Africa's already fragile fiscus, and existing projections are that the budget deficit will double. Together with a predicted growth contraction of around 7 percent, the macroeconomic impact of the pandemic is expected to be severe. At present much about Covid-19 at the country level remains unknown: The full public health, social and economic effects of the pandemic depend on existing interventions, future policy support, the progression of the pandemic, and what medical science can deliver in terms of treatment and vaccines. Yet critical policy decisions will have to be made in the face of this uncertainty. As lockdown measures persist, the economic costs become increasingly unmanageable and policymakers must take decisions on how to resume economic activity.

In this regard a simple framework can assist thinking through the optimal trajectory of South Africa's lockdown policy. The policymaker's goal is to limit the increase in infections while also allowing as much economic activity to resume as possible. In this sense three main components are possible to control:

1. The number of people under lockdown
2. The effectiveness of the lockdown (enforcement)
3. The composition of people allowed to move about (reopening)

Deciding on (1) must be based on where South Africa is on the infection curve, and take into account the gradient of the fatality rate, which differs by age group and underlying frailty, but also evolves over time depending on the capacity of the health system. Deciding on (2) is a function of both explicit policing, which comes with its own risks and costs, and implicit policing, which depends on the strength of social cohesion and personal discipline. Deciding on (3), the composition of those who are phased back into the economy can be informed by existing occupational and industry data. The aim is to maximise the safest number and combination of people who can go back to work, by

identifying those groups in the population where the risk of infection is lowest, against those most important for economic sustainability and survival. We take this up in the second half of the paper.

In the sections that follow we bring together a set of early impressions on the economics of the pandemic in South Africa, focused on several areas that are of key concern. In Section 2 we assess the potential economic impact of the pandemic. This begins by looking at current global economic forecasts, how previous downturns have impacted on the South African economy, and what the existing projections suggest in terms of South Africa's projected GDP growth rates. We then assess the monetary and fiscal responses to the crises, detailing the various relief measures, and the implications for the fiscus. The section ends by reviewing the existing relief plans, with a particular focus on social assistance. Given the dramatic economic impact of a complete lockdown, there are then important questions about how the country shifts toward reopening. In Section 3 we present an analytical instrument that can be used to guide thinking about the length and intensity of lockdowns in South Africa. Here we use detailed occupation and industry data to create measures that examine transmission risk and economic importance by sector, in order to see how the public health and economic concerns can be balanced. This approach is arguably generalisable to other countries. Much of the data used here is time-sensitive, and throughout we have tried to make use of the latest available data at the time of writing. We provide references, which include the relevant dates and important caveats regarding the data where relevant.

2 Covid-19: Assessing the Macroeconomic Impact In South Africa

In this section we consider the negative economic shocks that the pandemic sparked both globally and regionally. We begin by discussing the projected performance of the global economy, noting the importance of these for an open economy such as South Africa. The focus then shifts to South Africa, in the following three areas: Firstly, we outline the macroeconomic mechanisms behind the negative economic shock arising out of the current lockdown regulations. Secondly, we discuss predicted macroeconomic outcomes. Thirdly, we consider the fiscal and monetary policy responses that have emerged, in a bid to deal with the fallout from this shock, and some of the early firm responses.

2.1 The Global Economy

The IMF's most recent global economic growth projections point to a negative output shock from the pandemic that exceeds the impact of the global financial crisis, making this the most severe global recession since the Great Depression (IMF, 2020). As shown in Table 1, below, the IMF predicts the global economy to contract by 3 percent in 2020.[3] The magnitude of this predicted downturn dwarfs the annual downturn from the global financial crisis in 2009, where a contraction in global output of 0.1 percent was observed. Acknowledging that these projections may be revised, it is worth noting that the downturn is expected to be more severe in advanced economies relative to emerging markets and developing economies – with a projected contraction in output of 6.1 and 1 percent, respectively, in 2020.

However, there is a substantial degree of heterogeneity in the expected downturn across the grouping of emerging markets and developing countries. In Asia, for example, aggregate predictions are for radically reduced economic activity, but not negative growth rates. In contrast, other developing country regional groups are all predicted to experience negative growth rates, with the downturns most acute in the emerging and developing parts of Europe (-5.2) and the Latin American and Caribbean (-5.2) region. While negative, the predicted downturn in the Middle East and Central Asian region (-2.8) and among Sub-Saharan African countries (-1.6) is significantly lower on average. While emerging markets are only expected to experience a -1 percent contraction (influenced positively by Asian countries), relative to a global contraction of -3 percent, the forecast for South Africa in 2020 is for a -5.8 percent contraction, significantly higher than these average estimates, and notably similar to Mexico, Brazil and Russia.

[3] This is consistent with a corresponding prediction by the Hong Kong Shanghai Banking Corporation (HSBC), which forecasts a 3.3 percent contraction of the global economy (HSBC, 2020).

Table 1: IMF GDP Growth, Selected Economic Groupings and Countries

	Actual		Projections	
	2009	2019	2020	2021
World Output	-0.1	2.9	-3.0	5.8
Advanced Economies	-3.3	1.7	-6.1	4.5
United states	-2.5	2.3	-5.9	4.7
Euro Area	-4.5	1.2	-7.5	4.7
Japan	-5.4	0.7	-5.2	3.0
United Kingdom	-4.2	1.4	-6.5	4.0
Canada	-2.9	1.6	-6.2	4.2
Other advanced economies	-0.8	1.7	-4.6	4.5
Emerging Market and Developing Economies	2.8	3.7	-1.0	6.6
Emerging and Developing Asia	7.6	5.5	1.0	8.5
China	9.4	6.1	1.2	9.2
India	8.5	4.2	1.9	7.4
Emerging and developing Europe	-5.7	2.1	-5.2	4.2
Russia	-7.8	1.3	-5.5	3.5
Latin America and Caribbean	-2.0	0.1	-5.2	3.4
Brazil	-0.1	1.1	-5.3	2.9
Mexico	-5.3	-0.1	-6.6	3.0
Middle East and Central Asia	1.1	1.2	-2.8	4.0
Sub-Saharan Africa	3.4	3.1	-1.6	4.1
Nigeria	8.4	2.2	-3.4	2.4
South Africa	**1.5**	**0.2**	**-5.8**	**4.0**

Source: Output data for periods 2019, 2020 and 2021 adapted from IMF (2020). Output data for 2009 taken from IMF Data Mapper.

The IMF modelling, notably, expects a relatively fast recovery in the global economy for 2021, with above trend growth rates. In total, the global economy is expected to grow by 5.8 percent in 2021, while advanced economies, and emerging markets and developing economies, are expected to grow by 4.5 and 6.6 percent, respectively.[4] For South Africa, this bounce-back is projected to be weaker than that of other Emerging Market Economies, although notably higher than Brazil, Mexico and Russia. Certainly this predicted recovery is contingent on the effects of the pandemic fading in the second half of 2020. Indeed, the report makes it clear that these forecasts are characterised by extreme uncertainty and depend on a variety of interacting factors, including the trajectory of the pandemic; the intensity and efficacy of containment; the extent of supply disruptions; repercussions of the tightening of global financial markets; shifts in spending patterns; changes in behavioural patterns; confidence effects; and the volatility of commodity prices. Much worse growth outcomes are possible, even likely, if lockdown periods are longer and more stringent, if developing countries are more severely hit,

[4] The HSBC also predict a recovery of the global economy in 2021 – 5.4 percent. The corresponding recoveries for advanced and developing economies are 5.5 and 5.2 percent, respectively.

amidst tightening of financial conditions and the persistence of long-term reductions in employment and production (IMF, 2020).

2.2 The South African Situation: An Economy Under Strain

South Africa entered 2020, and the Covid-19 crisis period, on the back of a weak economic growth record, having experienced a technical recession in the final two quarters of 2019. Growth declined by 0.8 percent in quarter 3 of 2019 and by 1.4 percent in quarter 4 (StatsSA, 2019a; StatsSA, 2019b). Analysis indicates that a confluence of many factors fed into this weak economic performance, including: network industry failures – particularly constraints in electricity supply; low consumer and business confidence; declining consumer spending and fixed investment spending; further deterioration of the financial condition of State-Owned Enterprises (SOEs); policy inertia; and slow implementation of proposed 'structural reforms' (BER, 2020a; National Treasury, 2020a). These weak fundamentals are unlikely to disappear in the near term. Indeed, in some cases these economic fundamentals may worsen, thus adversely affecting the economy's ability to absorb the negative impacts of the lockdown and the pandemic, as well as prevent a quick recovery from the predicted recession.

2.2.1 GDP Growth Projections

In South Africa, as elsewhere, the crisis has imposed a large supply shock on production which has precipitated further adverse demand and supply responses. Lockdowns and workplace closures disrupt supply chains and lower productivity, while purely in terms of the level of infections, can also disrupt labour supply. Lockdown restrictions also cause a significant contraction in consumer demand for both goods and services. Beyond the country's borders, the disruption to production and supply chains and the collapse of commodity prices work to lower domestic exports significantly – while lower domestic demand reduces imports commensurately, or even more so.[5] Together these factors all result in reduced business confidence, investment appetite, and ability of firms to invest over the medium and long term. Significant employment losses (particularly in the private sector), and reductions in real wage growth and real disposable income place further pressure on consumer demand. The latter in turn feeds through to depress firm profitability and encourages the scaling back of operations. In the absence of appropriate fiscal and monetary policy, this cycle repeats itself.

As such, current economic growth projections point to South Africa entering a deep recession in 2020. Looking at Table 2, a simple average of the predictions of core forecasts of the economic contraction of GDP in 2020 is expected to be around 7 percent, with lower and upper forecast bounds of 5.8 and 9.5 percent, respectively. This is a

[5] There is already evidence of declining world prices in energy, base metal, precious metal and agricultural commodity prices (IMF, 2020). This is likely to weigh down on export revenues of resource-intensive economies such as South Africa.

substantial revision of pre-Covid 19 growth forecasts, which already pointed to tepid growth in 2020. Furthermore, as in the case of the IMF global forecasts, the expected magnitude of the downturn is substantially larger than what the country experienced in 2009 recession from the global financial crisis – Table 1 (above) shows that South Africa experienced a 1.5 percent growth contraction in 2009.

Table 2: GDP Growth Projections for South Africa, 2020-2021

Source	Date of forecast	GDP growth 2019a	2020f	2021f
Pre-crisis forecast				
Treasury Budget 2020	26-Feb	0.6	0.9	1.3
Current forecasts				
HSBC	2-Apr	0.2	-6.7	4.0
BER	28-Apr	..	-9.5	3.0
SARB	14-Apr	0.2	-6.1	2.2
IMF	15-Apr	0.2	-5.8	4.0
Average		0.3	-7.0	3.3

Source: IMF (2020); HSBC (2020); SARB (2020); BER (2020b); National Treasury (2020a).
Notes: 1. Real GDP growth and employment projections refer to year-on-year percentage changes. 2. For BSA estimates, the range of GDP growth estimates vary according to the severity of the impacts of the crisis. BER estimates take into account the Covid-19 stimulus package.
3. 'a' and 'f' denote actual and forecast, respectively.

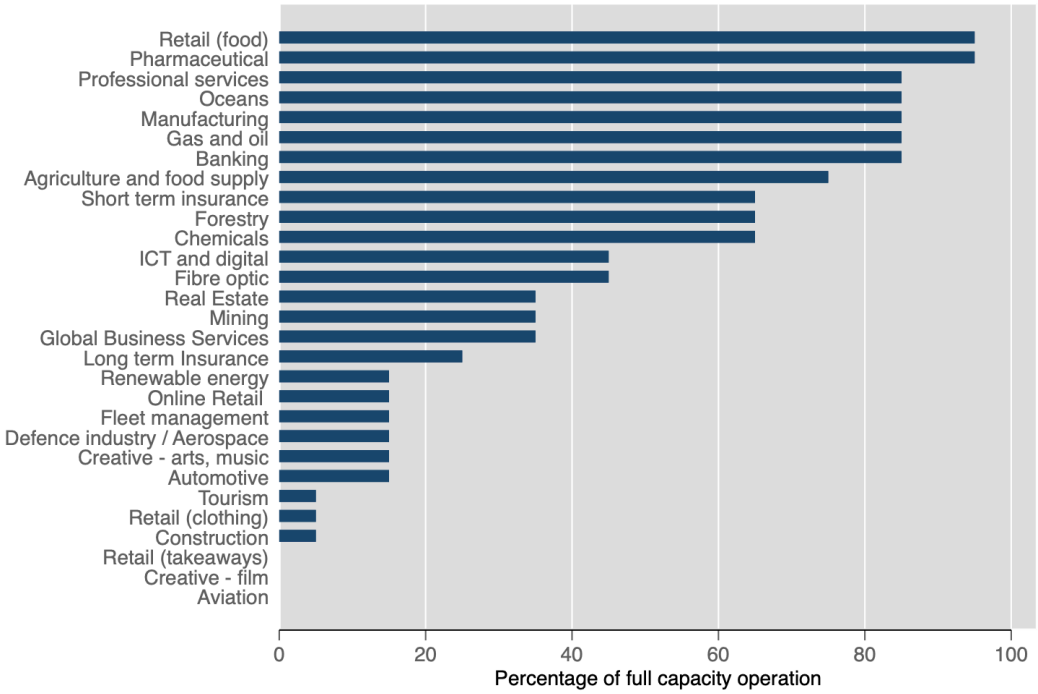
Following the recession, an average of current local forecasts predicts a recovery of 3.8 percent in 2021, which is likely to be protracted over the long-term. The South African Reserve Bank, for example, predicts a 2.2 percent recovery in 2021, increasing to 2.7 percent in 2022 (SARB, 2020). Two important points emerge from this forecast, which are qualitatively consistent with the other reported forecasts. First, it is clear that the Reserve Bank is not anticipating a v-shaped, or rapid, recovery. This is supported by the Bureau for Economic Research (BER) work which alludes to the weak economic fundamentals that precipitated the technical recession toward the end of 2019, stating that these remain, and are thus likely to slow the recovery of the economy (BER, 2020a). Second, and relatedly, at these growth rates, the South African economy will only reach 2019 quarter 4 GDP levels near the end of 2023. After the 2008 financial crisis, pre-crisis GDP levels were reached by 2010 – a swifter recovery than the one predicted in this case. Importantly, these projections will need to be updated as both the evolution of the epidemic evolves, and details of the scale, intensity and length of the lockdowns become clearer.

2.2.2 Firm-Level Impacts by Sector

The negative effects of the current economic shock are of course heterogeneous across sectors. Efforts to contain the spread of the virus, such as the 5-week national lockdown in South Africa, have had the most acute adverse supply effects in sectors that rely on social interactions (e.g. transport, hospitality, entertainment, travel and tourism). A rapid

survey conducted by Genesis Analytics (2020) – an individual-level survey consisting of 483 unique responses completed on 8 April 2020 – reveals some of the early effects of the downturn. The survey's instrument, however, is related to the individual's industry with the aim of gaining rapid insight into the economic impact of different lockdown scenarios, and hence the authors of the survey have been careful not to ascribe statistical representivity of the survey (Genesis Analytics, 2020). As depicted in Figure 3, the results of the survey suggest that no industries were operating at full capacity as of the beginning of April.

Figure 3: Predicted Economic Effects by Sector, 2020



Source: Genesis Analytics Rapid Industry Diagnostic Survey (2020).

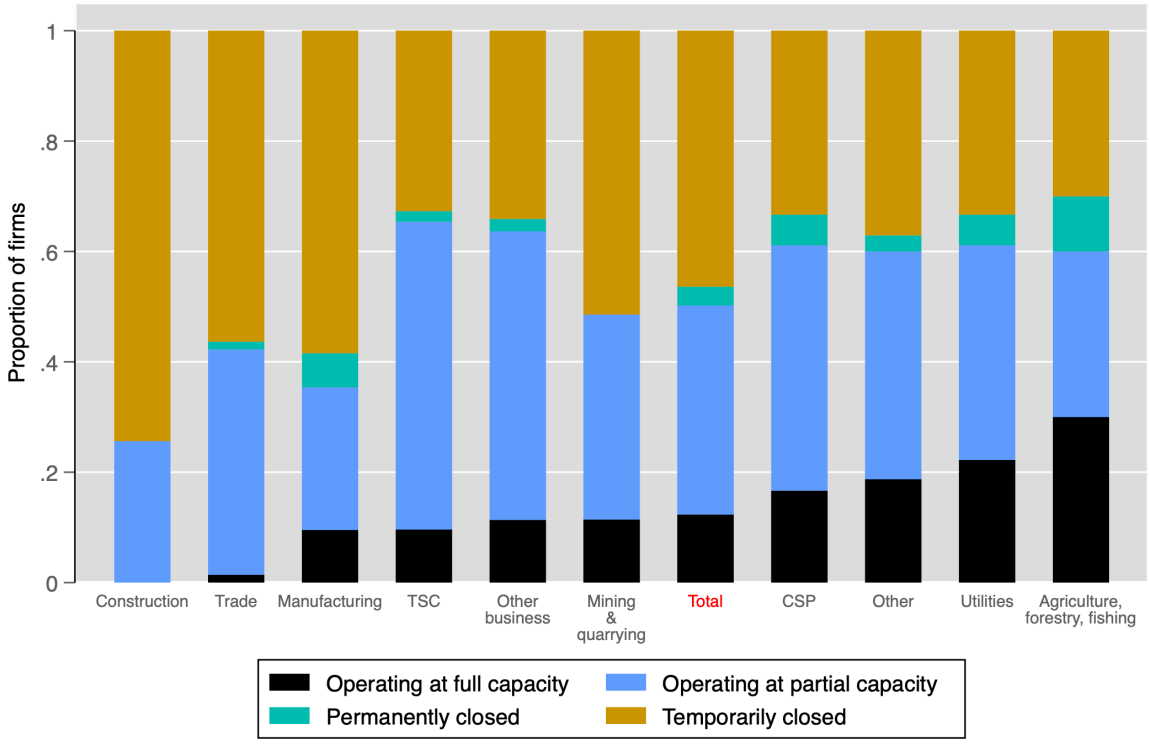
Changes in operational activity are, however, heterogenous. Whereas some firms may still be able to operate partially under the lockdown regulations, several industries seem to be disproportionately experiencing reductions. These sectors include Aviation, Creative (film) and Retail (takeaways), where no firms in the sample reported operating at full capacity, to Retail (food), Pharmaceutical and Banking, where more than four in every five firms reported operated at full capacity.[6]

Statistics South Africa (StatsSA) has recently released data from a firm-level survey also conducted in the beginning of April, which aims to capture various aspects of the impact of the lockdown by focusing on current and expected operations across main industry groups. The survey consists of 707 unique formal sector firms.[7] There are, however, two

[6] The industries listed here are those categorized by Genesis Analytics and do not necessarily align with official industry names as observed by StatsSA or the Standard Industrial Classification (SIC) system.
[7] Formal sector firms refer to those registered for Value Added Tax (VAT).

notable limitations of this survey. First, micro businesses, i.e. those with an annual turnover of less than R2 million, were excluded from the sampling frame. This is unfortunate given that it is plausible to expect that SMMEs will be more adversely impacted by the lockdown regulations relative to larger firms. Second, the survey was not designed to be nationally representative, and is therefore neither weighted nor stratified. Despite this, the data is still very useful in terms of an early insight into the behaviour of firms. Figure 4 uses this data to show the distribution of firms' current operation status by main industry. It is immediately clear that, although a minority of firms are operating at full capacity (12%), most firms are not in this position and no sectors are fully operational. On average, based on the data from the StatsSA survey, around 10 percent of firms were operating at full capacity, 40 percent at partial capacity, 48 percent temporarily closed, and around 2 percent report having already permanently closed.

Figure 4: Firm operation status by main industry.



Source: Business Impact Survey (StatsSA, Own calculations).

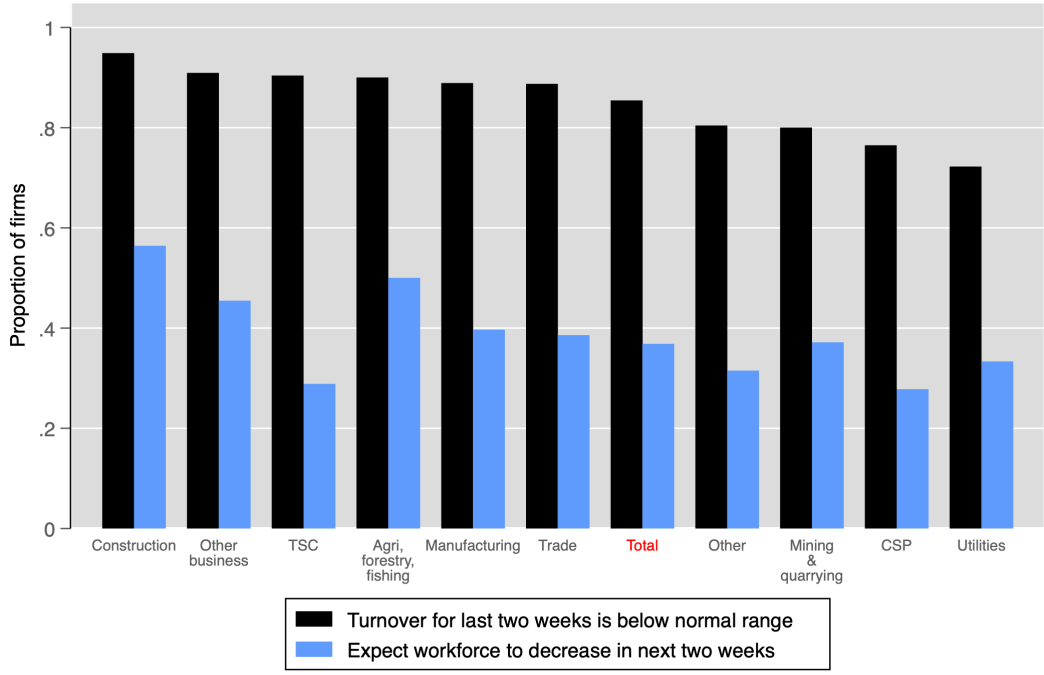
The figure also highlights the heterogeneous impact of the lockdown across different industries. Around one third of firms in Agriculture are operating at full capacity, but not a single construction firm is in this position. Indeed, most firms, across all sectors, are either temporarily closed or operating at partial capacity. On average, two in every five (38%) firms are operating at partial capacity, while 46 percent are temporarily closed. Temporary closures are highest in Construction (74%), Manufacturing (58%), Trade (56%), and Mining and Quarrying (51%). Notably, some firms are already reporting permanent closure, with the largest share of these located in Agriculture (8%) and Manufacturing (4%).

2.2.3 Employment Projections

The negative economic shock resulting from Covid-19 is expected to have substantial adverse employment effects. At this stage, given the high degree of uncertainty, employment projections vary widely. Indeed, these projections are probably even less certain than those for GDP, given the various determinants of labour demand and its heterogeneity across time, and the way that growth-employment elasticities will vary based on sectoral linkages, policy shocks and so forth. Keeping this is mind, projections from the HSBC point to over a million jobs being lost in South Africa in 2020, with the number of unemployed rising toward 8 million individuals, and the unemployment rate increasing from 29.1 percent to approximately 33 percent (HSBC, 2020; StatsSA, 2020). The IMF is predicting a slightly higher increase in the unemployment rate – 35.3 and 34.1 percent in 2020 and 2021, respectively (IMF, 2020). The BER initially predicted negative employment growth of 3.9 percent in 2020 and 1.7 percent in 2021 – roughly equivalent to 640 000 and 270 000 jobs being lost in 2020 and 2021, respectively (BER, 2020a). They have now revised these to project employment losses of more than 1.4 million by 2021 (BER, 2020b). The National Treasury predicts negative employment impacts that range from 690 000 to 1.8 million (National Treasury, 2020b). For comparison, the financial crisis resulted in roughly 1 million jobs being lost in South Africa between 2009 and 2010 after a GDP contraction of 1.5 percent (Verick, 2012). The current predictions of the economic shock from the pandemic range from -5.8 and -9.5 percent. If these are even remotely correct the negative employment shock is likely to be far higher than that experienced during the Great Recession.

Some more detailed information on the ability of firms to cope with crisis can be found in the StatsSA firm survey introduced above. Figure 5, below, uses the data to present information collected on firm turnover and short-term employment expectations, by main industry. Importantly, the survey took place before the country's large stimulus package was announced, and certain relief measures may help to mitigate some of the immediate negative impacts of the lockdown. Nevertheless, at the time of the survey, nearly 40 percent of firms across all industries expected an employment reduction within the next two weeks. Such expectations appear to be significantly higher amongst firms in Construction (56%) and Agriculture, Forestry, and Fishing (50%). Regarding turnover, all industries reported experiencing a reduction in turnover in the two weeks preceding the survey. Across industries, this amounts to more than four in every five firms (85%), and is particularly prevalent in the Construction industry (95%).

Figure 5: Turnover and expected change in workforce by main industry



Source: Business Impact Survey (StatsSA, Own calculations).

The survey also contains data on other measures taken to avoid retrenchments, where nearly half of all firms (48%) indicated that they have either reduced working hours, or laid off staff in the short-term. Just 29 percent of firms are confident that they have adequate financial resources to continue operating throughout the Covid-19 outbreak. This is a concern given that only 31 percent of firms indicated that they can only survive less than one month without any turnover.

2.3 Current Fiscal and Monetary Policy Response

Internationally there is widespread agreement that broad-based stimulus is critical to mitigate the effects of the crisis and bolster expectations of economic recovery (IMF, 2020). In this regard, the South African government announced a relatively large stimulus package, which we discuss in greater detail below. We begin by looking at the various components of the stimulus and where the largest areas of spending are. We then compare it to Covid-spending in a range of other countries. Lastly we examine projections on how this stimulus is likely to impact on South Africa's budget deficit.

2.3.1 Monetary Response

In terms of monetary policy, the South African Reserve Bank (SARB) has instituted a number of policy interventions to stabilise the bond market and ensure liquidity in the financial market. These include: Firstly, reducing the repo rate by 225 basis points at the start of 2020. Due to an ailing economy, the SARB announced a 25 basis point drop in early January. Subsequently, in light of the impending economic crisis, two 100 basis

point reductions have taken place on 19 March and 14 April 2020. The BER is predicting a further 50 basis point reduction in May (BER, 2020b).

Secondly, as a result of liquidity strains appearing in various markets by mid-March, the SARB has implemented a number of measures to address liquidity demands in the economy. These include: Holding repos auctions on a daily rather than weekly basis, and offering repos for longer timeframes than the usual overnight period; adjusting the Standing Facility borrowing and lending rates downwards to improve the supply of liquidity in interbank markets and to discourage cash hoarding by individual banks; and the expansion of SARBs monetary policy portfolio by purchasing government bonds on the secondary market, to stabilise the market and to inject new cash into the financial system (SARB, 2020).

Thirdly, the Reserve Bank has reduced the Liquidity Coverage Ratio from 100 to 80 percent. This move allows banks to hold fewer near-cash assets to cover a liquidity stress scenario in a month, which, in theory, should allow banks to increase lending.

2.3.2 Fiscal Response

After an initial fiscal stimulus package amounting to around R59 billion, or 1.1 percent of GDP, the government subsequently ramped this up to announce a much larger stimulus that allocates R500 billion to Covid relief measures. This intervention recognises that targeted support to households and businesses is vital in order to maintain economic relationships, so that activities can gradually normalise as soon as possible. Table 3 provides a breakdown of the stimulus package according to each line item announced. Firstly, spending is aimed at the fight against the pandemic by providing R20 billion in additional health support. Secondly, R20 billion is allocated to assist municipalities with the provision of basic services, and R50 billion will be given directly to vulnerable households by temporarily increasing government grants and introducing a grant for the unemployed. For those in low-wage formal sector employment, R40 billion is set aside for wage subsidies that will be transferred through the tax system, while an additional R100 billion is due to be spent on job creation and protection. The rest of the spending is aimed at businesses, particularly SMMEs, through credit guarantees, tax relief, and direct support.

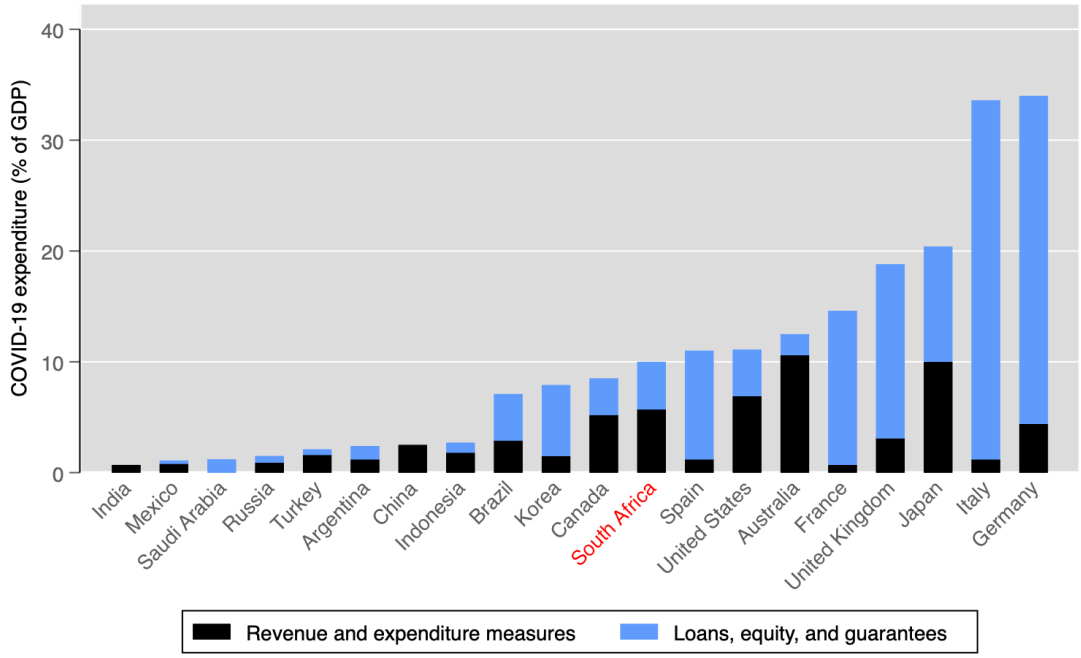
Table 3: Covid-19 Support Package, as announced on 21 April 2020

Intervention	R (bn)	% of Total
Expenditure & Tax Measures		
Additional Health Support	20	3,98
Municipal Assistance (water and sanitation)	20	3,98
Social Assistance (Grants)	50	9,96
Wage Protection (UIF)	40	7,97
Job Protection & Creation	100	19,92
SMME Support	2	0,40
Tax Relief	70	13,94
Loans		
Credit Guarantee Scheme	200	39,84
Total Allocation	**502**	**100,00**
(Less - Reprioritisation & Tax Deferrals)	174	34,66
Total Net Spend	**328**	**65,34**

Source: BER (2020b).

This fiscal stimulus package is currently higher than the Covid-related spending of any other developing countries, and exceeds even the expenditure of some advanced economies. In Figure 6, we plot Covid-19 stimulus packages as a share of GDP for a subset of advanced and developing economies, where for South Africa we rely on data from the National Treasury to differentiate between total expenditure and revenue measures, versus loans, equity and guarantees. Advanced economies, such as the United Kingdom, France, Germany and Japan, have all implemented fiscal stimulus packages with expenditure shares of GDP in excess of 10 percent. South Africa's spending is below this level but exceeds its developing country peers with a stimulus package equivalent to approximately 10 percent of GDP.

Figure 6: Covid-19 Expenditure as a Share of GDP



Source: IMF (2020), BER (2020b), National Treasury (2020c), Own calculations.

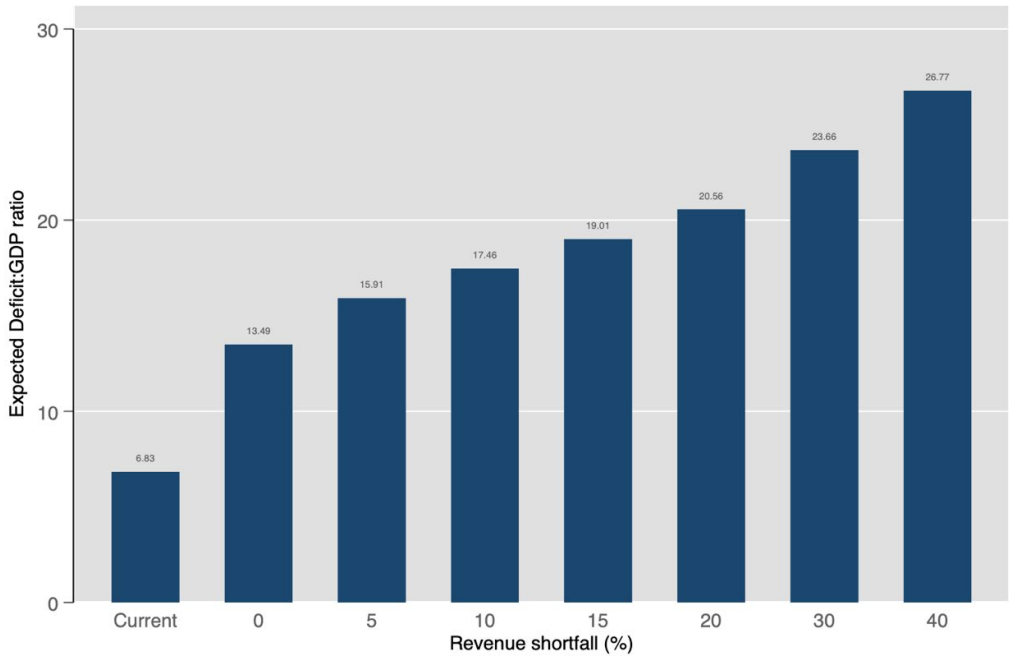
It is, however, important to note that while this stimulus package is much needed and will offer vital relief to households and businesses, it is likely to further drive-up the budget deficit and the debt ratio in South Africa. In addition, there is upward risk to the deficit and debt if stoppages to economic activity persist for longer periods, or the recovery in economic activity is too slow, and fiscal stimulus has to be increased further. It is worth reiterating that the same weak economic fundamentals that resulted in South Africa entering 2020 in a technical recession, are unlikely to abate. Most notably, the supply issues at the country's power utility, Eskom, remain a massive constraint to investment and productivity. As such, there is much potential for this crisis to act as a catalyst for dealing with a number of pressing structural issues hindering long-run growth in South Africa.

The impending deficit and associated debt expansion are serious financial management concerns, addressed in more detail below. At present, the government is forced to operate within this constrained environment. To limit the costs of debt, the stimulus is being funded by a combination of budget reallocations, revenue measures such as tax relief, the loan guarantee scheme with banks, and applications for funding from international financial institutions including the IMF, World Bank, and the BRICS New Development Bank. However, at this stage, many of these details are still being discussed and revised on an almost daily basis, ahead of a revised annual budget.

2.3.3 Public debt and budget deficit projections

The government intervention that has been taken to ameliorate the adverse economic effects of Covid-19 is substantial and necessary. However, as noted above, this counter-cyclical expansionary fiscal approach is likely to put further pressure on an already burdened fiscus. The 2020 Budget shows that South Africa's fiscal position has weakened over the near term, reflecting an expected fiscal deficit of R371 billion, equivalent to 6.8 percent of GDP (up from 6.3%). Prior to the crisis public debt was projected to rise to R3.5 trillion, which is 65.6 percent of GDP (up from 61.6%). In Figure 7 we present various simplified scenarios for possible increases in the country's deficit based on a contraction in GDP of 6 percent (a conservative estimate at present) and a range of potential revenue shortfalls. The first bar (current) shows the level of the deficit if GDP and revenue collection were to remain unchanged. The second bar shows the deficit ratio if GDP contracts but there is no change in revenue collection – the deficit rises to 13.5 percent, which is an increase of 6.7 percentage points. If revenue collection falls by 15 percent, the deficit rises to 19 percent of GDP. Early projections had the budget deficit rising to between 11.1 and 12 percent of GDP, but these were made without taking the R500 billion stimulus package into account, and thus they are likely to be revised upwards (BER, 2020a; HSBC, 2020). Taking the stimulus package into account the BER now predicts a deficit of 16 percent for 2020/21 (BER, 2020b).

Figure 7: Deficit: GDP Projections, by Revenue Shortfall



Source: National Treasury, 2020b and own calculations; Ajam (2020).
Note: '0' represents zero change in GDP and revenue collection; remaining estimates assume a GDP contraction of 6%.

As a result of the pandemic South Africa's budget deficit together with the overall debt burden is expected to deteriorate at an accelerated rate. A deep recession, as is predicted, reduces revenue collection substantially, while spending pressures have intensified in order to fight the pandemic. Further, existing factors driving South Africa's rising budget deficit – spending pressures on wages, SOE bailouts, and higher debt service costs – remain (HSBC, 2020). As a result, overall public debt could rise from a current debt ratio of 62 percent, to around 80 percent in 2021. In addition to this, higher long-term investment yields have increased the cost of borrowing, further crowding out public investment programmes. This reduces reduces investment and capital accumulation even further over the longer term, thus reducing potential growth.

2.4 Government Programs: Coverage, Firm Responses and Social Assistance

The R500 billion stimulus package, outlined above, was announced on 21 April 2020. Prior to this announcement, however, different government agencies and departments introduced a number of other specific interventions. Most of these interventions are targeted at firms, require an application of some kind, and make use of existing budgetary allocations, rendering actual expenditure difficult to quantify at this stage. The focus of this section, however, is threefold: Firstly, to provide an overview of the full list of Covid-19 policy responses in order to assess the extent of coverage and identify possible gaps. Secondly, we examine some early responses by firms to the available assistance using data from the StatsSA Business Survey. Thirdly, we assess the coverage and distributional impact of the R50 billion increase in social grants.

2.4.1 Coverage of Covid-19 Relief Programs

For the purposes of examining the composition of current government relief programs, one can think of the South African economy as being segmented broadly into Firms and Households. Then, within these two segments there are five distinct groups:

Firms/Enterprises:

1. Large firms in the formal sector
2. SMMEs in the formal sector
3. Enterprises in the informal sector

Individuals/Households:

4. Grant recipients and informal workers
5. The unemployed

Based on the segmentation suggested here, we summarise the existing support measures in Table 4, below, to provide an overview of who is covered and who is not.

Table 4: Current government economic relief interventions to combat Covid-19

<table>
<tr><th colspan="2">Formal Sector</th><th rowspan="2">Informal Sector</th><th rowspan="2">Grant Recipients and informal workers</th><th rowspan="2">Unemployed Individuals</th></tr>
<tr><th>Large Firms</th><th>SMMEs</th></tr>
<tr><td colspan="2">Temporary Employee/Employers Relief Scheme (TERS) + Illness Benefit</td><td>Spaza Shop Support Scheme</td><td>Increase in all social grants</td><td>UIF Disaster Benefit Fund (if eligible)</td></tr>
<tr><td colspan="2">The Disaster Management Tax Relief (includes deferrals and relief measures)</td><td rowspan="9"></td><td colspan="2">Covid-19 Social Relief of Distress grant</td></tr>
<tr><td colspan="2">Employment Tax Incentive (wage support)</td></tr>
<tr><td colspan="2">Competition Act exemption to Retail Property industry</td></tr>
<tr><td colspan="2">IDC/DTI Industrial Funding Package</td></tr>
<tr><td colspan="2">Credit Guarantee Scheme</td></tr>
<tr><td>Selected Competition Act exemptions</td><td>Tourism Relief Fund</td></tr>
<tr><td></td><td>SEFA Debt Relief Finance Scheme</td></tr>
<tr><td></td><td>SEFA Business Growth/Resilience Facility</td></tr>
<tr><td></td><td>SEFA Debt Restructuring Facility</td></tr>
<tr><td></td><td>DTIC/NEF Black Business Fund</td></tr>
</table>

Source: Compiled based on statements made and documents released by The Presidency, National Treasury, the South African Revenue Service, the Department of Employment and Labour, and the Department of Small Business Development.

For firms in the formal sector (i.e. those registered with SARS), a variety of relief programs exist. These include tax relief and deferrals, certain regulatory exemptions, wage support for low-wage workers, additional assistance via the UIF, as well as credit and direct relief facilities. For those firms at risk of having to retrench workers, reduce employee hours, or temporarily lay off workers, the Temporary Employee/Employers Relief Scheme (TERS) is a key government program. The TERS aims to prevent

retrenchments and provides wage support assistance by covering a proportion (between 38% and 60%) of firm wage expenses. This overlaps with several other measures with broad coverage: The expansion of the Employment Tax Incentive (ETI) subsidy to cover all workers earning less than R6500 per month[8], as well as PAYE, VAT and other tax relief measures. In addition, the recently announced R200 billion credit guarantee scheme offers government-backed credit from commercial banks to firms with a turnover of less than R300 million. For large firms, the IDC/DTI Industrial Funding Package provides significant funding for firms in specific sectors[9] in the form of short-term loans, a revolving credit facility, and bank guarantees. For SMMEs, an additional range of support programs are accessible that include debt relief, credit, and grant funding. We examine some early data on firm take-up of assistance shortly.

For formal firms then, there are a relatively broad range of interventions that aim to provide assistance through the crisis. Firm size is not a criterion for eligibility in most cases. However, for some interventions funding disproportionately targets registered SMMEs as they are considered less likely to have reserves to weather the crisis. As the table makes clear however, grouping of firms not adequately covered by these measures are those in the informal sector. Approximately one in every five jobs in South Africa is in the informal sector, and while reliable data are scarce, a lower-bound estimate from 2013 suggests that there are at least 1.6 million informal enterprises in South Africa (Fourie and Kerr, 2017). While firms in the informal sector are understandably difficult to reach via existing institutional channels, there appears to be only one intervention geared toward firms in this sector – specifically aimed at retailers – namely, the Spaza Shop Support Scheme.

In an agreement with commercial banks, the Department of Small Business has set up a Spaza Shop Support Scheme to provide relief for qualifying enterprises. This includes assistance in the provision of credit, working capital, business management skills support, and legal compliance support. However, there are implementation challenges involved with this scheme that relate primarily to stringent qualifying requirements, including the provision of various forms of business and banking documentation which most Spaza shops are unlikely to have. The funding is also restricted to South Africans only. For individuals working in the informal sector, who lack registration documentation or small businesses that are foreign-owned, there thus appears to be very little direct support from government.

As noted in Table 3, above, social assistance has been increased significantly. For vulnerable individuals and households the current stimulus package includes

[8] This covers approximately 4.4 million workers (QLFS, 2019; own calculations)
[9] The list of eligible sectors can be found here: https://www.idc.co.za/2020/03/24/idc-interventions-in-response-to-covid-19/.

approximately R50 billion in additional expenditure to be disbursed as grants.[10] This includes a grant 'top-up' for existing beneficiaries that will last for six months. It also includes a new Covid grant targeting unemployed individuals who do not receive any other government assistance, which will also last for 6 months, covering the period May to October 2020. There are currently around 17 million grant beneficiaries in South Africa, and 75 percent of these are children registered for the Child Support Grant (CSG). These individuals are relatively easy to target as they are already registered with the Department of Social Development and receive monthly payments. Under the stimulus package all CSG beneficiaries (13 million children) will receive an additional R300 in May 2020, and thereafter the top-up is limited to R500 per caregiver (7.5 million recipients) from June to October, regardless of how many children a caregiver supports. This policy reduces the spending on this element of social assistance significantly, but it also has distributional implications, which we review below. All other grants will be increased by R250 per month until October.

The Covid-19 Social Relief of Distress grant is new and aims to target unemployed individuals and provide them with R350 per month for six months. Specifically, eligible individuals must meet the following criteria: Over 18 years old; unemployed; not receiving any income or grant; not qualify for or be receiving unemployment insurance; not receiving any student financial aid from the government; and not living in government funded accommodation. In practice, however, it appears that accurate targeting of this grant will be a challenge. The number of unemployed individuals depends on the selected definition, but using StatsSA's definition of expanded (or broad) unemployment the most recent data show that 9.5 million South Africans are classified as unemployed (StatsSA, 2020). It is unclear, for example, how it will be possible to confirm that individuals are unemployed, which opens up access to this grant to informal workers who have lost their income but are not registered or eligible for other forms of government relief. As such the number of eligible individuals may actually be closer to 13 million, and thus the number of actual claimants may be higher than initially expected. In total then, the relief to vulnerable households and individuals does appear to have relatively broad reach and could cover in excess of 26 million people. The spending does, however, appear to be capped at R50 billion, which would cover the existing interventions depending on eligibility and take-up of the Covid-19 grant.

2.4.2 Initial Firm Responses to Available Relief Measures

To get some early indication of how many firms have either applied, or plan to apply, to various government relief schemes listed in Table 4 above, we look at data from the aforementioned StatsSA Business Impact survey, which samples 707 unique firms. As noted above, this sample is not representative and given the timing of the stimulus package announcement, many firms surveyed would not have been aware of all the

[10] Where individuals are recently unemployed and registered with the UIF, they would qualify for increased relief unemployment insurance measures.

available relief measures. Nevertheless, the survey can provide a useful initial indication of firm responses to the government relief measures. Specifically then, in a question about relief measures, firms were asked, "Has your business applied for or plans to apply for financial assistance to fund operations due to the coronavirus (Covid-19) outbreak?". Firms that answered affirmatively to this question were then asked to select among a set of options the kind of assistance for which they had applied or intended to apply – "Which of the following initiatives is your business interested in using, if any?".

Table 5, below, shows the proportion of firms across each sector and whether they have applied or plan to apply for the available forms of assistance. On average, one third (35%) of all the surveyed firms had already applied to the TERS, with application rates in excess of 20 percent for all sectors. More granular detail on this will ideally be available from the UIF administrative data in due course. Perhaps more worryingly, over one in every five firms (21%) reported they do not yet have a plan for how to deal with the crisis.

Table 5: Self-reported firm Covid-19 financial assistance plans

	Financial assistance plan (%)									
	SMME Debt Relief Scheme	Tax deferral	SMME grant or loan scheme	Accredited finance agreement	SMME Business Growth & Resilience Facility	TERS	Other	Not sure	No plan	Total
CSP	0.00	0.00	0.00	0.00	0.00	33.33	33.33	5.56	27.78	100.00
Construction	7.69	5.13	7.69	0.00	0.00	35.90	20.51	5.13	17.95	100.00
Utilities	0.00	0.00	11.11	0.00	0.00	33.33	16.67	11.11	27.78	100.00
Agriculture, forestry, fishing	0.00	0.00	0.00	10.00	0.00	20.00	20.00	30.00	20.00	100.00
Manufacturing	2.22	3.33	3.89	2.78	0.56	41.11	21.11	10.56	14.44	100.00
Mining and quarrying	5.71	0.00	0.00	0.00	0.00	37.14	20.00	11.43	25.71	100.00
Other	2.50	5.83	1.67	2.50	0.00	30.00	23.75	7.50	26.25	100.00
Other professional business	4.55	9.09	0.00	4.55	0.00	45.45	11.36	4.55	20.45	100.00
Trade	0.00	1.43	1.43	7.14	0.00	42.86	22.86	8.57	15.71	100.00
TSC	5.77	5.77	0.00	1.92	1.92	23.08	21.15	17.31	23.08	100.00
Total	2.83	4.25	2.41	2.83	0.28	35.27	21.67	9.35	21.10	100.00

Source: Business Impact Survey of the Covid-19 pandemic in South Africa (StatsSA) (Own calculations).
Note: 'SMME grant or loan scheme' refers to any other government relief measure other than the Debt Relief Scheme and the Business Growth & Resilience Facility coordinated by the Department of Small Business Development.

Almost all other schemes have extremely low take-up rates. Again, firms not having a plan may be a time-sensitive matter, but it does highlight a possible information problem regarding knowledge and access to the various government measures that may differ

widely across firms. It may be likely, for example, that where firms have access to accounting and auditing services they are much more likely to take advantage of all the available forms of government assistance listed above. Overall then, there are a range of factors which will influence firm decisions going forward, including firms' capabilities to respond to a crisis; CEO and management's skills; the location of the firm; the sector they are in; the government's ability to publicise its various relief programmes; and so on.

2.4.3 Assessing the Social Assistance Interventions

Amidst the early days of the Covid-19 crisis and the stringent lockdown measures instituted by the South African government, there were vocal calls for the immediate expansion of the social assistance scheme – centering specifically on the child support grant (CSG). Research undertaken in support of this campaign showed that a CSG top-up would provide much-needed support to the majority of low-income households in South Africa (Bassier et al., 2020).[11] The subsequent decision by the Department of Social Development to only allocate the top-op to caregivers, from June onwards, was therefore unexpected and has distributional implications at the household level, and consequences for overall costs that are important to unpack. Presumably, this decision was taken partly due to the fact that a new Covid-19 relief grant was also introduced, and that this would provide additional household income. Indeed the Covid-19 grant will in theory reach many of the same households receiving the CSG. In the analysis below, we assess the social assistance increases from a coverage and financial perspective in order to understand the implications of the chosen package. We begin with an overview of grant recipients that shows where they are situated in the South African income distribution. This suggests that allocating relief via the grant system is an effective means to reach poor households, many of which are likely to be hardest hit by the effects of the lockdown. We then look at three different allocation scenarios based on the variations of the chosen package using data from NIDS (2017). The focus here is to examine the distribution of overall social assistance spending, and the costs of the three different social assistance support packages outlined here.

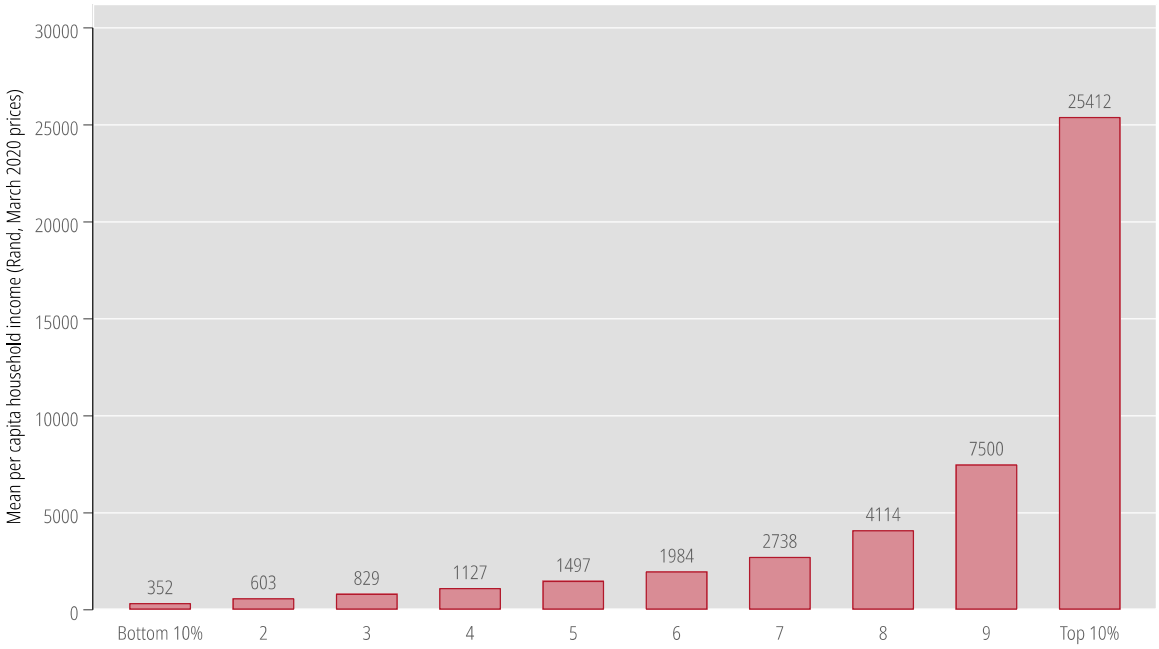
i. Social assistance relief offer of an increase in the CSG, of R500 per beneficiary (i.e. per child) for 6 months (referred to below as the "CSG boost" policy).
ii. Current package: This entails a R300 boost per beneficiary (i.e. child) for the CSG in month 1, followed by a switch to a R500 boost per recipient (i.e. caregiver) in months 2-6; a R250 per beneficiary boost to all other grants for months 1-6; and a R350 Covid-19 grant to non-employed adults aged 18-59 who do not receive other state support, for months 1-6. This is referred to below as the "Grants plus" policy.

[11] See: https://www.dailymaverick.co.za/article/2020-04-05-influential-coalition-urges-president-ramaphosa-to-increase-child-support-grants/

iii. Current package if the Covid-19 grant is excluded (referred to below as the "Grants only" policy).

The need for intervention to support households during the lockdown is clear from Figure 8. In the figure, the population is divided into ten deciles based on per capita household income, and the bars indicate the average real per capita household income within each decile. Thus, while the richest 10 percent of the population reside in households with an average per capita income of R25 412 per month, the poorest 10 percent reside in households with an average income of R352 per capita per month. Indeed, between 70 and 80 percent of the country's population reside in a household where monthly per capita income is less than the minimum wage.

Figure 8: Mean Per Capita Household Income, by Decile (March 2020 Rands)



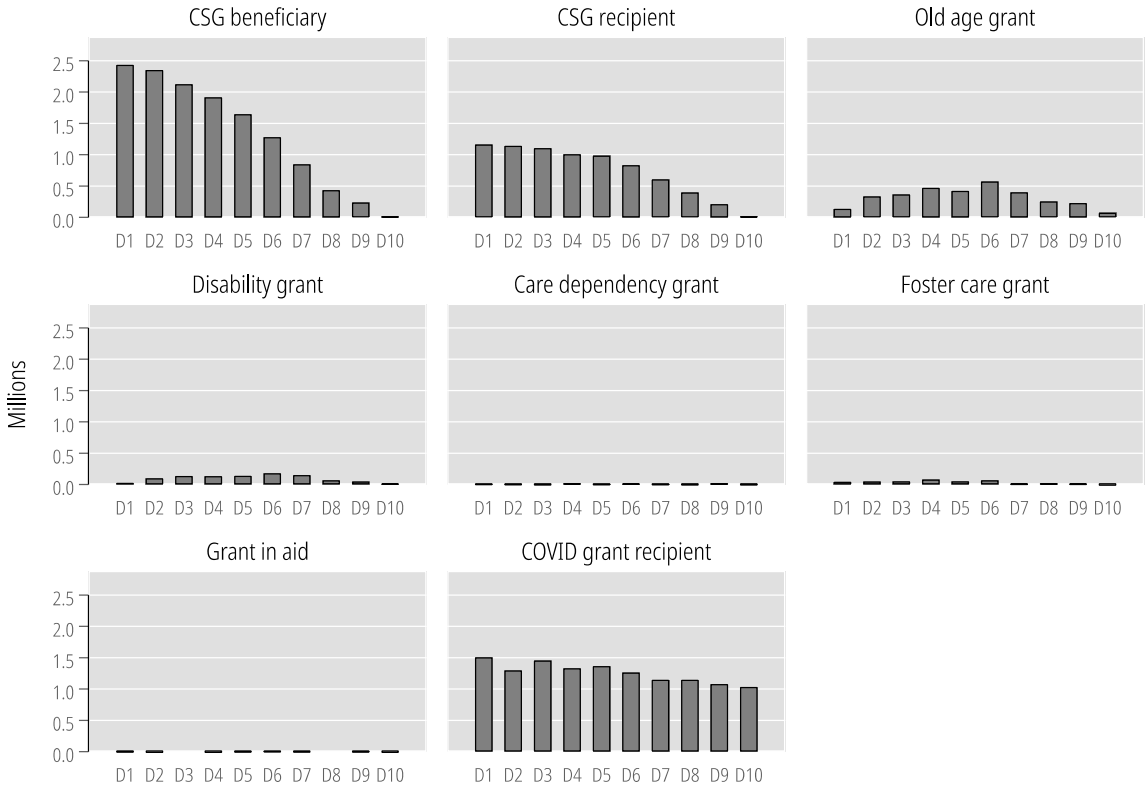
Source: NIDS (2017), own calculations.

It is important to recognise for example, that even the 7th decile household in South Africa yields a mean per capita household income of R2738 per month – well below the national minimum wage.

Figure 9 shows the distribution of all grants across these income deciles, including those eligible for the new Covid-19 grant. The y-axis in each plot measures the number of beneficiaries and the x-axis indicates the ten deciles, with the first decile (D1) representing the poorest 10 percent of the population. Looking first at the distributional coverage of the CSG grant, the number of beneficiaries (13 million in total) account for the vast majority of existing grant beneficiaries in South Africa. Of those receiving the CSG, the majority are clearly in the lower income deciles. It is crucial to note however,

that the per capita income of those in decile 8 is only around R4 100; thus even those in the middle of the distribution would be measured as poor in absolute terms. To the right of this plot is the number of CSG recipients (the adult caregivers who receive the money on behalf of the child), representing fewer individuals and a similar but less progressive allocation across the income distribution.

Figure 9: Distribution of Grants, by Decile



Source: NIDS (2017), own calculations.

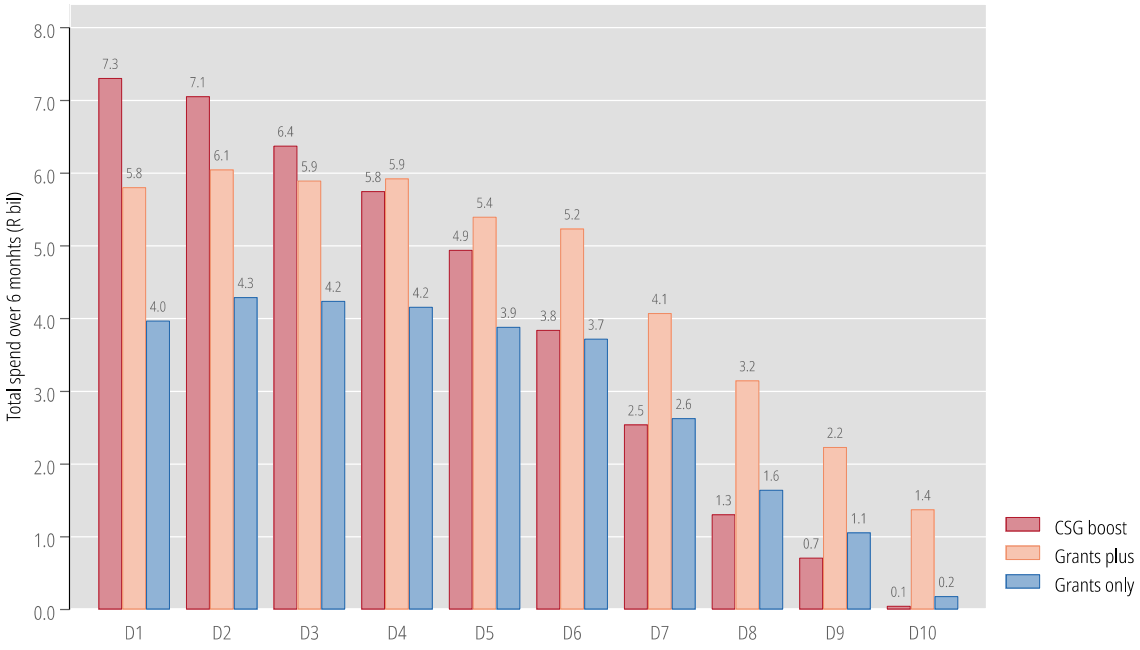
The other conventional grants do not cover a large number of individuals in relative terms, with about 3 million old age grant beneficiaries, and much lower numbers across the other grant types. The distributions of old age grant and disability grant beneficiaries are centered towards the middle of the income distribution; the result of their relatively large size in monetary terms which moves beneficiary households upwards within the post-transfer income distribution compared to their positions in the pre-transfer distribution. The new Covid-19 grant, however, does have considerable coverage and, based on the eligibility criteria noted above and an assumed 60 percent uptake rate, includes over 12 million individuals. As shown in the figure, the distributional impact of the Covid-19 grant is fairly even across income deciles, with over 3 million people eligible for this grant in deciles 8, 9 and 10.

In order to compare the three social assistance scenarios outlined above, we make certain assumptions about the take-up of the new Covid-19 grant.[12] We assume a relatively high take-up rate of the Covid-19 grant: 60 percent of the eligible population claim the grant by the 6th month. We assume a linear increase in take-up rate over time, and an even take-up across the income distribution. However, given the published criteria, take-up rates may in fact be positively correlated with uptake rates. Take-up is randomly allocated to the eligible population. The take-up rate assumptions are admittedly optimistic: achieving a 60 percent take-up rate within 6 months implies the addition of more than 12 million beneficiaries (almost as many as the CSG) to the social assistance system, requiring SASSA to process an average of 2 million successful applications per month.

In Figure 10, we compare the three different scenarios – the CSG boost policy, the Grants plus policy, and the Grants only policy – by looking at the total amount of spending that accrues to different income deciles in each case. In Scenario 1 (the red bars), the CSG boost policy draws on proposals made to government prior to the finalisation of the stimulus package. We model this scenario as an increase in the CSG of R500 per month, given to all 13 million beneficiaries. The total cost of this option is R39.9 billion, and the figure shows that the majority of this spending would go to the poorest households. In Scenario 2 (the orange bars), we model the Grants plus policy, which is the social assistance policy as confirmed by the Department of Social Development and includes the Covid-19 grant. In this case the total cost is R44.9 billion, assuming incremental take-up of the Covid-19 grant to reach 60 percent by month 6. The distributional impacts are slightly less progressive, but the number of additional households reached is higher than in Scenario 1. Finally, in Scenario 3 (the blue bars), we model the Grants only policy. The cost of this option is R29.3 billion, with considerably less in financial transfers reaching the lower deciles, in part due to the old age grant, which has more beneficiaries in the upper deciles.

[12] Given the published criteria, eligibility for the Covid-19 grant within the dataset is: aged 18-59; not in formal employment; not paying UIF deductions; not receiving old age grant, disability grant or grant in aid; and not receiving UIF or Compensation Fund payments.

Figure 10: Total Spending in Each Scenario for 6 Months, by Decile



Source: NIDS (2017), own calculations.
Notes: 1. Calculations assume a take-up rate of 60 percent of the eligible population for the Covid-19 grant by the 6th month, increasing linearly from zero over the period. 2. Uptake rates are assumed to be identical across the income distribution.

In essence, the chosen social assistance policy appears to be less progressive than the original proposal, and it costs more. When assuming even uptake rates across deciles, there are substantial 'losses' for the lower deciles relative to the original proposal of a large increase in the CSG. This is largely driven by the difference in the distribution of CSG beneficiaries (the children) and CSG recipients (their caregivers) across deciles, due to differences in family and household sizes. The benefit of the selected package however is that it reaches additional households that do not have a CSG recipient. The announced intervention is in essence a social assistance package which attempts to target all households, without conditioning on the household or individual being the recipient of a single grant only. Given that the announced package explicitly widens the opportunity to reach vulnerable workers and households across the income distribution who are not necessarily CSG-eligible – most notably those unemployed and those in the informal economy with no access to unemployment insurance – there is an important redistributive, poverty reducing and targeting component of this expenditure which should not be overlooked.

Given that one of the original policy imperatives for the Covid-19 linked social assistance scheme was to utilise the CSG to target informal sector workers, the efficacy of this targeting instrument is key to unpack. Thus, Table 6 explores this targeting of the informal sector through households receiving the CSG in greater detail. For each of the three largest grants in terms of both numbers of beneficiaries and size of the total transfer

to households – the old age grant, the disability grant, and the child support grant – the table presents estimates for each of the deciles and for the country as a whole. The table clearly illustrates the low levels of co-residence of informal workers with old age and disability grant recipients. On average, only 16.0 percent of informal workers are co-resident with a recipient of the old age grant, while just 4.6 percent are co-resident with a recipient of a disability grant. If one assumes that grant income, like other income, is shared amongst household members, it is estimated that just 6.5 percent of an increase in the old age grant would accrue to informal workers. In absolute terms, the majority of this is accounted for by deciles 4 through six, 6 together account for 3.4 percentage points of the 6.5 percent. Additional spending on the old age grant in lower deciles is also less likely to filter through to informal workers: just 2.2 percent of additional spending on the old age grant in decile 1 would accrue to informal workers, compared to 10.6 percent in decile 5 and 11.4 percent in decile 10. The pattern is similar for the disability grant, with just 5.6 percent of additional spending on the disability grant by government reaching informal workers.

Table 6. Ability of the Grants System to Reach Informal Workers, 2017

DECILE	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	TOTAL
Population ('000s)	5 653	5 669	5 639	5 659	5 655	5 640	5 652	5 653	5 666	5 637	56 522
Old age grant											
Recipients ('000s)	137	334	368	472	425	574	402	257	230	75	3 274
Benefiting household population (incl. recipients) ('000s)	1 147	2 272	1 875	1 999	1 736	1 520	1 201	773	617	137	13 278
Co-resident informal workers ('000s)	25	69	99	124	184	148	93	65	44	16	865
Non-co-resident informal workers ('000s)	308	300	392	456	585	583	569	709	395	250	4 547
Co-residence rate of informal workers (%)	7.5	18.6	20.1	21.3	23.9	20.3	14.0	8.3	10.0	5.9	16.0
Recipients in informal worker households ('000s)	24	62	93	119	158	153	84	58	45	16	813
Additional OAG spend accruing to informal workers (%)	0.2	0.5	0.7	0.9	1.4	1.1	0.7	0.5	0.3	0.1	6.5
Decile-specific add. OAG spend accruing to inf. workers (%)	2.2	3.0	5.3	6.2	10.6	9.8	7.7	8.4	7.1	11.4	6.5
Additional OAG spend accruing to informal worker HHs (%)	17.8	18.6	25.3	25.2	37.1	26.7	20.8	22.8	19.6	21.9	24.8
Disability Grant											
Recipients ('000s)	29	101	137	136	140	181	152	70	48	14	1 008
Benefiting household population (incl. recipients) ('000s)	214	685	753	699	565	491	553	256	134	39	4 389
Co-resident informal workers ('000s)	2	16	39	31	32	46	38	27	15	0	247
Non-co-resident informal workers ('000s)	331	353	451	549	738	685	624	746	423	265	5 165
Co-residence rate of informal workers (%)	0.6	4.4	8.0	5.3	4.1	6.3	5.7	3.5	3.5	0.0	4.6
Recipients in informal worker households ('000s)	2	13	27	27	29	45	40	24	14	0	220
Additional DG spend accruing to informal workers (%)	0.0	0.4	0.9	0.7	0.7	1.0	0.9	0.6	0.4	0.0	5.6
Decile-specific add. DG spend accruing to inf. workers (%)	1.0	2.4	5.2	4.4	5.6	9.3	6.8	10.7	11.5	0.0	5.6
Additional DG spend accruing to informal worker HHs (%)	7.2	12.4	19.6	19.8	20.6	25.2	26.2	33.8	28.9	0.0	21.8
Child Support Grant											
Recipients ('000s)	2 436	2 352	2 127	1 918	1 649	1 282	848	437	238	17	13 305
Benefiting household population (incl. recipients) ('000s)	5 216	5 177	4 924	4 556	4 275	3 528	2 552	1 476	880	73	32 658
Co-resident informal workers ('000s)	239	277	375	358	514	359	230	128	58	7	2 544
Non-co-resident informal workers ('000s)	94	92	116	222	255	373	432	646	380	258	2 868
Co-residence rate of informal workers (%)	71.7	75.0	76.4	61.7	66.8	49.0	34.7	16.5	13.3	2.7	47.0
Recipients in informal worker households ('000s)	473	694	775	692	779	541	252	129	68	6	4 410
Additional CSG spend accruing to informal workers (%)	0.7	0.8	1.1	1.1	1.6	1.1	0.7	0.4	0.2	0.0	7.8
Decile-specific add. CSG spend accruing to inf. workers (%)	4.6	5.3	7.6	7.8	12.0	10.2	9.0	8.7	6.6	9.8	7.8
Additional CSG spend accruing to informal worker HHs (%)	19.4	29.5	36.5	36.1	47.3	42.2	29.7	29.4	28.7	37.6	33.1

Source: NIDS (2017), own calculations.

Table 7. Ability of the Grants System to Reach Other Vulnerable Categories of Workers, 2017

Decile	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	Total
Population ('000s)	**5 653**	**5 669**	**5 639**	**5 659**	**5 655**	**5 640**	**5 652**	**5 653**	**5 666**	**5 637**	**56 522**
Covered by OAG (%)	20.3	40.1	33.3	35.3	30.7	26.9	21.3	13.7	10.9	2.4	23.5
Covered by DSG (%)	3.8	12.1	13.4	12.3	10.0	8.7	9.8	4.5	2.4	0.7	7.8
Covered by CSG (%)	92.3	91.3	87.3	80.5	75.6	62.6	45.2	26.1	15.5	1.3	57.8
Covered by any grant (%)	93.7	93.2	91.6	89.0	84.5	76.5	60.1	35.3	26.1	4.2	65.4
Covered by Covid-19 grant (month 6) (%)	83.3	83.5	78.7	72.5	68.6	60.5	56.6	47.9	46.3	36.0	63.4
Covered by any grant, incl. Covid-19 grant (%)	98.1	98.6	97.6	96.7	93.9	92.3	82.4	67.1	58.4	39.1	82.4
Workers in Private Households ('000s)	**40**	**41**	**104**	**89**	**108**	**104**	**108**	**136**	**56**	**3**	**789**
Covered by OAG (%)	12.8	8.1	17.6	14.9	17.7	20.7	6.2	9.6	5.0	29.8	13.2
Covered by DSG (%)	0.0	0.7	5.7	3.0	8.2	3.9	4.8	0.0	0.0	0.0	3.4
Covered by CSG (%)	89.8	91.5	84.9	86.6	68.0	69.4	57.4	28.2	42.1	57.0	64.6
Covered by any grant (%)	89.8	91.5	85.7	88.5	72.1	78.4	61.0	33.3	48.2	57.0	68.5
Covered by Covid-19 grant (month 6) (%)	79.5	90.4	84.4	68.1	69.0	65.7	45.4	50.7	46.2	29.8	64.0
Covered by any grant, incl. Covid-19 grant (%)	92.6	100.0	95.6	97.9	85.7	89.3	74.1	76.0	65.2	57.0	85.1
Workers in Agriculture, Forestry, Fishing ('000s)	**27**	**30**	**90**	**117**	**106**	**142**	**153**	**218**	**48**	**37**	**968**
Covered by OAG (%)	10.4	23.6	15.8	18.8	19.5	13.3	9.0	2.7	0.0	0.0	10.9
Covered by DSG (%)	0.0	7.2	6.4	12.2	2.6	5.8	7.0	0.0	3.8	0.0	4.7
Covered by CSG (%)	100.0	93.2	78.2	59.8	67.0	60.0	21.1	16.1	12.0	1.4	43.9
Covered by any grant (%)	100.0	93.2	78.2	69.3	72.5	65.2	27.8	17.4	15.8	1.4	48.0
Covered by Covid-19 grant (month 6) (%)	94.2	87.0	81.6	69.1	54.3	52.7	45.5	18.1	29.0	22.2	48.5
Covered by any grant, incl. Covid-19 grant (%)	100.0	100.0	91.4	86.6	85.0	84.9	60.3	33.1	29.6	22.2	65.9
Workers in Elementary Occupations ('000s)	**126**	**148**	**294**	**368**	**362**	**369**	**466**	**530**	**282**	**28**	**2 973**
Covered by OAG (%)	13.6	13.5	20.7	24.0	19.4	15.6	7.1	6.2	8.2	2.9	13.6
Covered by DSG (%)	3.6	5.6	8.0	10.6	5.3	4.5	6.8	0.9	2.3	2.0	5.2
Covered by CSG (%)	94.1	92.6	82.5	80.2	74.5	68.8	42.5	21.6	9.7	10.1	55.8
Covered by any grant (%)	94.1	93.5	84.7	84.3	78.9	74.9	49.4	25.6	17.0	12.1	60.4
Covered by Covid-19 grant (month 6) (%)	86.1	85.2	80.8	70.1	65.6	54.3	43.7	27.0	15.0	19.2	52.5
Covered by any grant, incl. Covid-19 grant (%)	97.3	99.2	94.4	94.0	88.0	88.0	70.6	43.2	27.7	23.8	73.3

Source: NIDS (2017), own calculations.

Notes: Assumes a take-up rate of 60 percent of the eligible population for the Covid-19 grant. Uptake rates are assumed to be identical across the income distribution.

For the child support grant, the picture is considerably more favourable. Nationally, 47.0 percent of informal workers are co-resident with a child receiving the child support grant, with co-residence rates in the bottom five deciles ranging between 60 and 80 percent. In other words, nearly half of any additional spending on the child support grant is expected to accrue to households that include informal workers. Again assuming equal sharing of grant income within households, it is estimated that 7.8 percent of additional spending on the child support grant will accrue to informal workers themselves, with the bulk of this attributable to the mid to lower deciles. Put differently, for every R100 of additional spending on the CSG, an estimated R7.80 will accrue to informal workers themselves, while R33.10 will accrue to informal worker households. For the old age grant, these values are R6.50 and R24.80; and for the disability grant, they are R5.60 and R21.80.

Informality is just one way of defining labour market vulnerability, and there are various categories of workers that one might be concerned about within the context of the Covid-19 pandemic. Table 7, above, explores the ability of the grants system to reach three other types of vulnerable workers: workers in private households (i.e. domestic workers); workers in Agriculture, Forestry and Fishing; and workers in elementary occupations. The table presents coverage rates of each of these groups of workers for the old age, disability and child support grants, for the Covid-19 grant (as modelled earlier), and for a combination of any of the grants and the Covid-19 grant. The CSG coverage rate speaks to Scenario 1 (the CSG boost); while coverage of any grant including the Covid-19 grant speaks to Scenario 2 (the Grants plus policy), and coverage of any grant speaks to Scenario 3 (the Grants only policy).

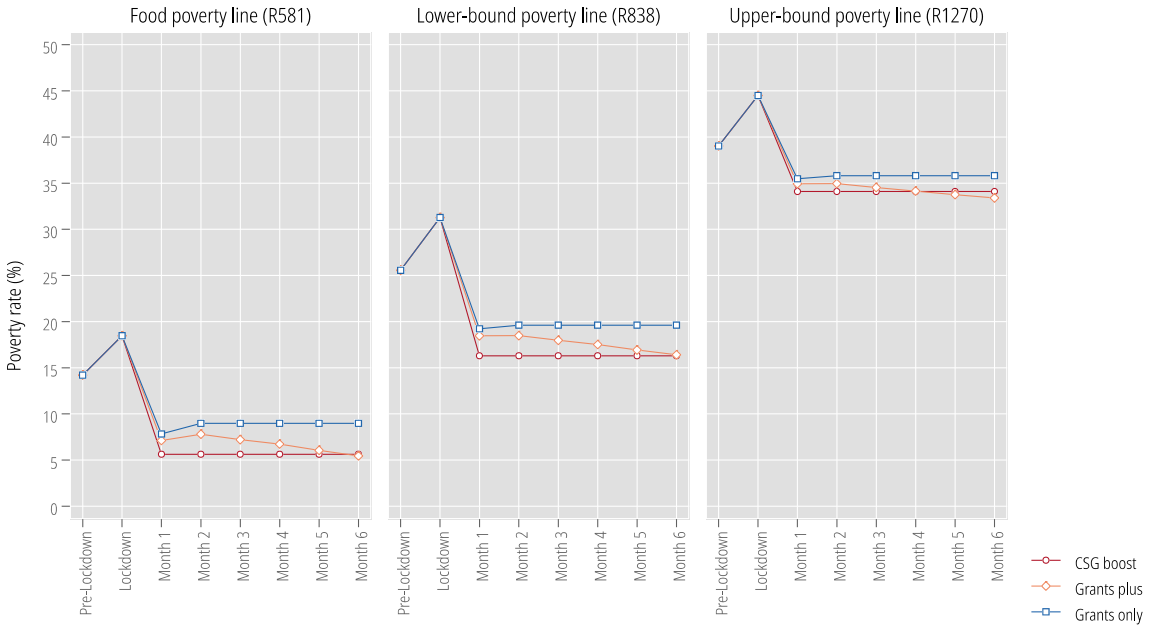
Of the three groups of workers, old age grant coverage rates are highest for those in elementary occupations (13.6 percent) and those working in private households (13.2 percent). Disability grant coverage rates are around five percent for workers in elementary occupations and those in Agriculture, Forestry and Fishing, and slightly lower for workers in private households. In contrast, nearly two-thirds (64.6 percent) of workers in private households and more than half (55.8 percent) of workers in elementary occupations are covered by the child support grant; for those in Agriculture, Forestry and Fishing the coverage rate is 43.9 percent. Coverage rates for all grants (including those grants not shown in the table) are over 90 percent in the bottom two deciles across all three types of workers. However, they drop off steeply for workers in Agriculture, Forestry and Fishing between deciles 6 and 7, and between deciles 6 and 8 for workers in private households and in elementary occupations.

The eligibility criteria for the Covid-19 grant mean, though, that coverage rates are less progressive: they are high, but lower than those for any grant, in the bottom three or four deciles. Further, for workers in Agriculture, Forestry and Fishing, coverage rates of the Covid-19 grant are substantially higher than those for any grant in the top two deciles. It is, though, clear that the Covid-19 grant brings a large number of previously unreached

households into the system, as illustrated by the large increase in coverage rates in the middle deciles in particular. For example, the Covid-19 grant raises national coverage of social assistance in decile 6 from 76.5 percent to 92.3 percent, with coverage rates in the same decile rising by 10.9 percentage points for workers in private households, 19.7 percentage points for workers in Agriculture, Forestry and Fishing, and 13.1 percentage points for workers in elementary occupations. Thus, while the Covid-19 grant is less progressive, it provides support to substantial numbers of vulnerable workers who are otherwise uncovered by the social assistance system.

In Figure 11, below, we use the results from the scenarios above to examine the differential impacts on poverty over the 6-month relief period. This examines the impact of the additional grant income after an assumed decrease in informal income of 75 percent. We use three different official poverty lines, deflated to March 2020 prices, to measure the impact in each scenario: the food poverty line (R581), the lower-bound poverty line (R838) and the upper-bound poverty line (R1270). For each poverty line we look at the impact on the national poverty rate from month 1 to month 6.

Figure 11: Poverty Impact in Each Scenario, Month 1 to 6



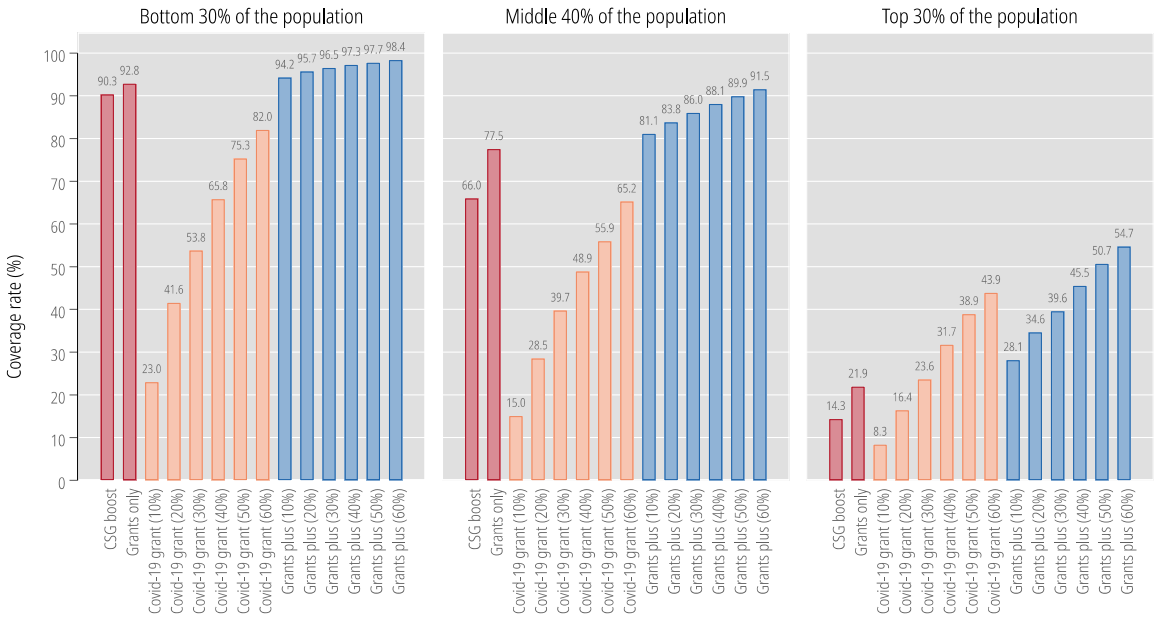
Source: NIDS (2017), own calculations.

The results can be summarised as follows: poverty impacts are generally weaker in Scenarios 2 and 3, i.e. the Grants plus policy and the Grants only policy. Put differently, the direct impact on poverty of Scenario 1 (the CSG boost policy) has a larger poverty-reducing impact at all three poverty lines. However, as the take-up levels of the Covid-19

grant increase it eventually has the strongest poverty reducing impact. That is, as take-up of the Covid-19 grant approaches 60 percent, Scenario 2 (the selected policy) leads to the largest reduction in poverty.

If we consider then the distribution in terms of three groups – the poorest 30 percent of the population, the middle 40 percent of the population, and the top 30 percent of the population – it is possible to estimate coverage rates and resource flows implied by the various policy options, and for varying degrees of uptake of the Covid-19 grant. Figure 12 presents coverage rates for the CSG boost, the Grants only, and various possible Grants plus policies, while Figure 13 presents the total transfer over six months in terms of each of the policy options. Figure 14 details the share of the total transfer under each policy option that accrues to each of the three income groups.

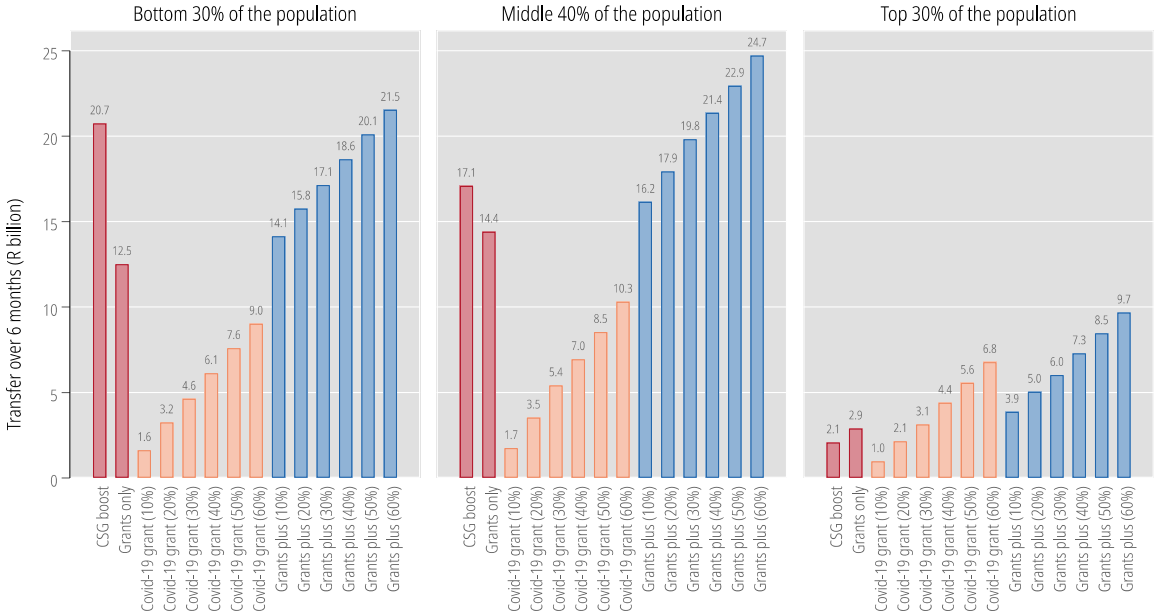
Figure 12: Coverage Rates at the Bottom, Middle and Top of the Income Distribution



Source: NIDS (2017), own calculations.

In terms of coverage, either of the grant options – the CSG boost or Grants only policies – have more than 90 percent coverage for the bottom 30 percent of the population, with the Covid-19 grant only increasing coverage marginally. For the middle 40 percent of the population, the increase in coverage as a result of the Covid-19 grant is larger: between 3.6 percentage points and 14.0 percentage points higher than the Grants only option, depending on uptake, and 15.1 percentage points to 25.5 percentage points higher than the CSG boost option. For the top 30 percent of the population, however, the Covid-19 grant drives coverage rates, particularly at higher uptake rates. Importantly, it is only at very high take-up rates (from around 55 percent) for the Covid-19 grant that the bottom 30 percent of the population receive transfers equivalent to the CSG boost policy.

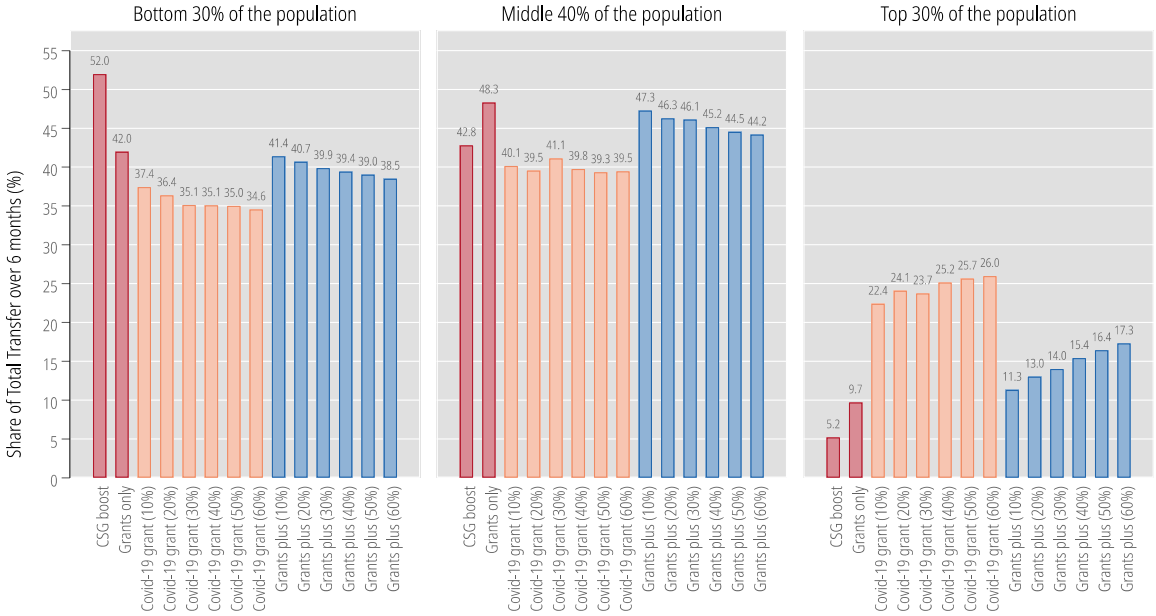
Figure 13: Total Transfers over Six Months to the Bottom, Middle and Top of the Income Distribution



Source: NIDS (2017), own calculations.

The impact in terms of transfers is a shift from the bottom 30 percent of the population to the middle 40 percent and top 30 percent. The CSG boost sees the distribution of transfers strongly skewed towards the bottom 30 percent of the population, while a Grants only policy sees nearly half of the resources transferred to the middle 40 percent of the population. Even assuming no variation in take-up rates across the income distribution, transfers are much more strongly distributed towards the top 30 percent of the population. This shift in the distribution of resources is clearly illustrated in Figure 14. If one takes the view that resources transferred through these policies to the top 30 percent of the population are leakages, roughly one-quarter of the spending on the Covid-19 grants are leakages, as is around 15 percent of the spending in terms of the Grants plus policy.

Figure 14: Share of Total Transfers for each Policy over Six Months to the Bottom, Middle and Top of the Income Distribution



Source: NIDS (2017), own calculations.

To conclude, these results clearly indicate that while the CSG boost policy delivers resources progressively with a strong focus on the bottom five deciles, the addition of the Covid-19 grant has the potential to bring a large group of otherwise uncovered households into the system. Thus, the Grants plus policy delivers large increases in coverage rates in the middle of the distribution, as well as large increases in resource allocations to deciles 6 through 10. In addition, the Covid-19 grant is able to reach additional households who would not be reached through the existing grants. Critically, though, this comes at a cost to households at the bottom of the income distribution: the poorest 30 percent of the population see a R3 billion decline in total resources allocated to them over the six-month period when comparing the CSG boost to the Grants plus policy. In contrast, the top seven deciles see increased support.

The Grants plus policy, based on our assumptions, is R5 billion more expensive than the CSG boost. Effectively the Grants plus policy implies a redistribution of the benefits of the CSG boost policy amongst the population within deciles 1 through 5, and a straight gain for each of the top five deciles. On the other hand, even households in decile 7 would not be considered well off, and therefore at least part of this redistribution is to households that would be vulnerable to poverty; of which many fall outside of the reach of the pre-Covid suite of social grants. This is critical in the context of the way in which social assistance can re-order the income distribution. While a strictly progressive intervention may ensure that all resources flow to the poorest households, in the context of the lockdown this may simply result in households in the middle deciles to drift down the

income distribution to be replaced by otherwise poorer households that have been able to access government support.

3 Planning the Post-Lockdown Transition

All available evidence suggests that the lockdown will have deleterious economic effects in South Africa. As we describe above, the South African government has introduced various support measures to partially mitigate these effects, but is in no position to provide further economic stimulus. Instead, it appears increasingly critical that the economy be reopened if the country is to avoid an even more damaging Covid-induced recession. However, reopening presents policymakers with the difficult task of trying to balance economic and public health priorities.

The health risks will evolve according to a range of complex interactions that are very difficult to predict at present. Indeed we can think of the overall planning exercise as essentially comprised of two key factors that determine an analysis of how the virus will impact the economy:

1. The Stage of Epidemic (E_t)
2. The Frequency, Length and Intensity of Lockdowns (L_t)

In the first case, continuously updated actuarial and epidemiological modelling is required to determine E_t, in order to assess where on the epidemic curve we are, and what the predicted evolution of the epidemic is. This is of course not straighforward and involves a dynamic set of covariates. In the second case, L_t is determined by government policy on the length of a lockdown, if it will be repeated, which sectors are affected, and also how lockdowns may be sequenced. These are questions that can be more reliably informed using available data, and are the focus of this section.

Whilst E_t and L_t are the focus of ongoing work, an attempt will be made here to try and provide some analytical guidance on how rules around the sequencing of lockdowns may be more accurately and objectively measured and applied. In order to develop this analytical framework, we proceed in the following manner. Firstly, we know that transmission risk increases with physical interaction, and we formulate an index that tries to measure this for different occupations, based on the estimated levels of physical interaction required in each case. Secondly, this index is then used to understand how levels of physical interaction differ by sector. Cross-referencing our index with work by Kerr and Thornton (2020) allows us to assess where people are more likely to be able to work from home, as well as to measure the level of how reliant on physical interaction various sectors of critical economic importance are – where economic importance is measured by GDP contribution and total employment levels. Finally, we use the above results to create a framework around which criteria for different phases of a lockdown can be created. We note here that these criteria are based on the measurable features in our index, discussed below, and that there are certainly a range of other important elements relevant to the economic decisions about lockdown decisions for which we do not have measurable data.

3.1 Measuring Physical Distance in Economic Activity

To measure the extent of physical interaction across the South African economy, we build an index that allows us to assign scores to different occupations, which we explain in more detail below. These scores are then aggregated across sectors. We focus primarily at the sectoral level because South Africa has many sector-based bodies that could be used to facilitate a phasing in of economic activity based on this approach, but also because this can be sensibly cross-referenced with which sectors are the most important economically, in terms of GDP and employment.

3.1.1 Data and Estimation Procedure

We identify a full list of South African occupations using four-digit level occupation codes in the 2003 South African Standard Classification of Occupations (SASCO 2003). We then use data from the Occupational Information Network (O*NET), an American survey of detailed occupational information collected by the Bureau of Labour Statistics, to identify information on the level of physical interaction in each occupation. These data are based on detailed labour market questionnaires that are used to build a detailed database of occupation descriptions and classifications.[13] We select key occupational features available in O*NET that relate to physical interaction, similar to work done by Avdiu and Nayyar (2020) and Lu (2020). Specifically, we use data on the extent of Physical Proximity and Face-to-Face Discussions in a given occupation. The definitions of these components are described in Table 6, below, and examples include whether you share an office, and how frequently you are speaking to other workers in a face-to-face manner.

These occupational codes are then linked at the four-digit level to each occupation identified in the Post-Apartheid Labour Market Series (PALMS) version of the Quarterly Labour Force Surveys. We use data for 2018 and the first two quarters of 2019. Thus, for each occupation in the PALMS we can measure the typical level of physical proximity and the average importance of face-to-face discussions. In addition, we want to account for the fact that commuting to and from work also carries risks. We therefore make use of data from Statistics South Africa's latest Time Use Survey to identify how many people use public transport to commute to work across each occupation category. Detail on this variable is also contained in Table 8. This variable is then also merged in the PALMS data for each occupation.

We note that the data come from a pre-pandemic world of work, and we should expect some difference between the level of physical interaction indicated here and the actual level once pandemic protocols are in place, that enforce social distancing and limit the numbers of staff in workplaces, for example. Our estimates, therefore, can be seen in

[13] See https://www.onetcenter.org/questionnaires.html for more details.

some sense as an 'upper bound' of physical interaction given that there is no measure of how possible it may be to reduce physical interaction at the workplace. Since we know Covid-19 is spread through air and touch, the more people interacting physically with each other the higher the risk of contracting and spreading the virus. We therefore build an index measuring the quantum of physical interaction required for a given occupation both while at work and while commuting to work.

Table 8. Defining the components of the Physical Interaction Index

Component	Definition	Scoring	Source
Physical proximity	1. I don't work near other people (beyond 100 ft.) 2. I work with others but not closely (e.g., private office) 3. Slightly close (e.g., shared office) 4. Moderately close (at arm's length) 5. Very close (near touching)	O*NET spreads 100 points across five levels per occupation. Our approach multiplies points by their category level and sums to get a score. We sum points in categories 3-5 only to reach a score out of 500 (the maximum feasible score). We rescale this to vary [0;1]	O*NET
Face-to-face discussions	1. Never 2. Once a year or more but not every month 3. Once a month or more but not every week 4. Once a week or more but not every day 5. Every day	O*NET spreads 100 points across five levels per occupation. Our approach multiplies points by their category level and sums to get a score. We sum points in categories 4-5 only to reach a score out of 500 (the maximum feasible score). We rescale this to vary [0;1]	O*NET
Public transport	Ever used any type of public transport to travel to work on a given day where public is defined as bus, taxi, train and other transport and private transport is defined as walking, cycling, or private vehicle	Share per occupation. Varies [0,1]	StatsSA Time Use Survey, 2010

This Physical Interaction Index, PX_i, is made up of three components: the level of 'physical proximity', P_i; the level of 'face-to-face discussion' in a given occupation, F_i ; and the extent to which people in particular occupations rely on public transport, T_i. The measures are combined as follows:

$$PX_i = (⅓*P_i) + (⅓*F_i) + (⅓*T_i) \quad (1)$$

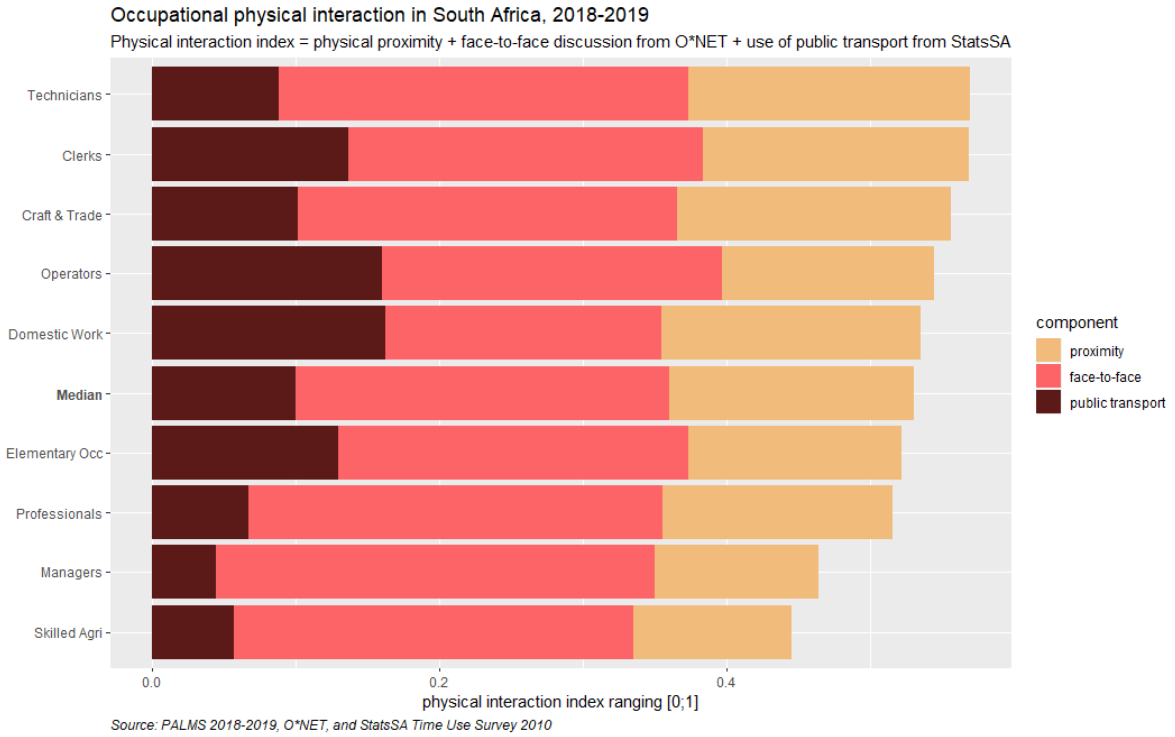
where PX_i = [0,1]. Once we have index values for all occupations in the PALMS data we then aggregate this occupational information to get sector-level estimates. [14] Our weighting decision here is based on a common approach in the poverty and labour market literature (See, for example: Alkire & Foster, 2011; Bhorat et al., 2020a).

[14] See Bhorat et al. (2020b) for a more detailed discussion of this index.

3.1.2 Measuring Physical Interaction in the South African Economy

Before reviewing the sectoral aggregates in more detail, we provide an introduction to the PX_i by reviewing the scores assigned to broad occupational categories in Figure 15. Looking at the aggregated occupation scores reveals relatively high levels of physical interaction across these broad categories. The lower bound of the Index here is 0.45 for Skilled Agricultural Workers, and the upper bound is 0.62 for those working in Services occupations. As we would expect, people working in service occupations have more physical interaction than most other job types, and the bars are coloured to show the contribution of each component in the Index. This allows us to see that in Services occupations, for example, physical proximity to others is a relatively dominant occupational feature. For other groups, such as Domestic Workers and Agricultural Workers, the use of public transport accounts for a large amount of physical interaction.

Figure 15: Physical Interaction Index by Occupation, South Africa



*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), own calculations.*

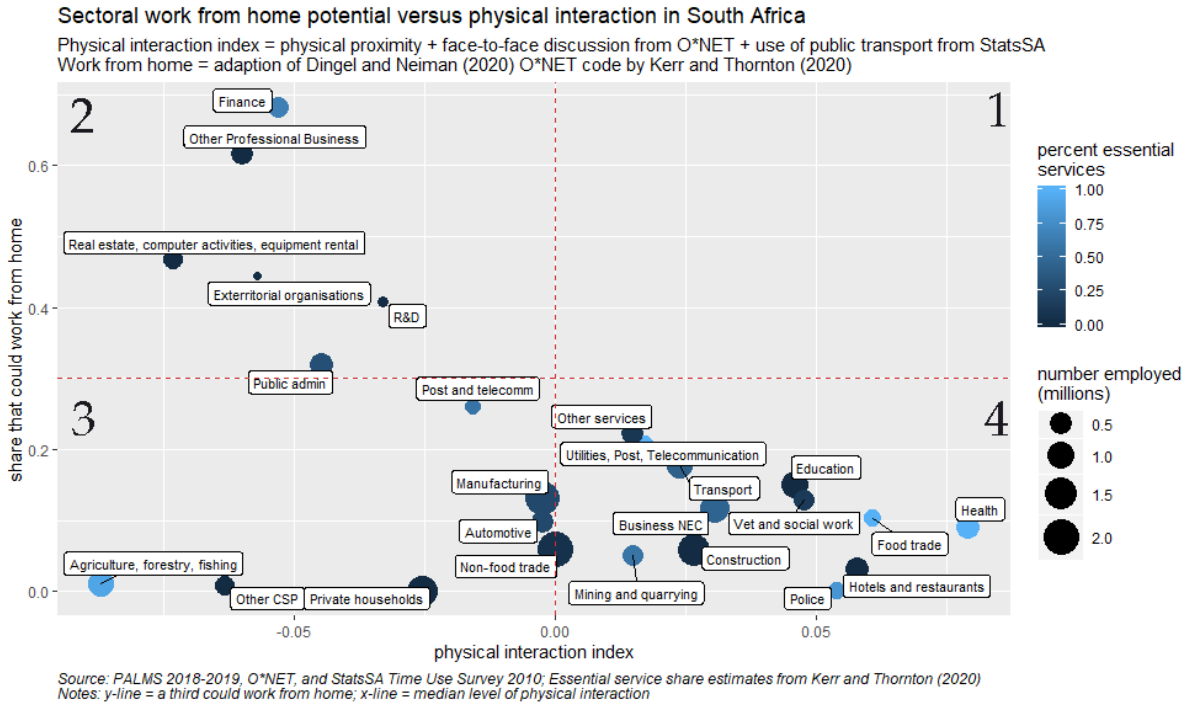
In South Africa, public transport also has a distinct wage bias, where workers in low-wage occupations or sectors are more likely to use public transport. The difference, for example, between the relative contribution of public transport to overall scores among professionals and managers as compared to domestic or agricultural workers, is clear – reflecting the skills-biased nature of public transport usage in South Africa. The figure shows that at the median, physical interaction in South African occupations is primarily due to face-to-face contact, followed by physical proximity, and then interactions based on taking public transport.

3.1.3 Physical Interaction and the Ability to Work from Home

An important measure that will influence how many people are able to work during a complete or partial lockdown is the extent to which working from home is possible. This carries very low risk from a health perspective, and we would expect physical interaction in the workplace to be negatively related to the ability to work from home. Some early work has already been done on this issue. Dingel and Neiman (2020) use O*NET to classify whether occupations can work from home or not for the United States. Kerr and Thornton (2020) adapt this for the South African context and also use the gazetted list of essential services to classify industries as being essential or not, at the three-digit industry code level. They estimate that under a complete lockdown, approximately 63 percent of South Africans would not be able to work at all, with the remainder either working from home, working in some partial capacity, or being employed in essential service sectors. In Figure 16, we cross-reference our Index with their estimates for the ability to work from home, for 25 sector categories. The bubbles are weighted by their employment share and coloured by the share of essential workers in that sectoral category. We plot the data around the median for the Physical Interaction Index. As predicted, we find a negative correlation between the ability to work from home and physical interaction in the workplace.

The plot is divided into quadrants based on the level of remote work that is possible, and the level of physical interaction. The vertical line measures median physical interaction according to our Index, while the horizontal line marks the point at which at least a third of people can work from home (i.e. in sectors above the horizontal line, more than one third of people can work from home). Looking at the Index scores on the x-axis, it is clear that the health sector, representing over 640 000 workers in the bottom right-hand corner, has the highest level of physical interaction of 0.08. It also has a very high share of essential workers (light blue). Food trade, and hotels and restaurants – collectively consisting of nearly 800 000 workers – also rank highly on the Index with a similar score of about 0.06. By contrast, sectors in the bottom left of the figure have low average levels of physical interaction.

Figure 16: Physical Interaction and Ability to Work from Home in South Africa, by Sector



*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), own calculations; Essential service and work from home share estimates from Kerr and Thornton (2020).*
Notes: y-line = one third could work from home; x-line = median level of physical interaction; numbers 1-4 label the different quadrants.

The y-axis provides information on the average ability of workers in each sector to work from home. Clearly the sectors grouped in the bottom right hand corner of the figure contain very few jobs that can easily be done from home. These sectors include Health work (only 9% of jobs can be done from home), Policing (close to 0%), Education (15%), Transport (18%), Mining (5%), Food Trade (10%), and Vetinary and Social Work (13%). In the top left of the figure the finance sector and some other service sectors have a low level of physical interaction and the highest share of workers who could work from home. This suggests that working from home would be a feasible strategy for these groups that is likely to have limited barriers and low transmission risks. In the middle of the figure are sectors such as manufacturing, the automotive trade sector, and non-food trade – collectively representing nearly 2.5 million workers – that all have median levels of physical interaction, but very low shares of these sectors could work from home. Here, more detailed information may be required to make decisions about reopening, and workplace protocols would be critical.

Table 9, below, summarises the four quadrants as presented in the preceding figure with a focus on total employment, taking account of employment that is classified as essential or non-essential in each sector. The table provides an indication of employment changes should certain industries of varying degrees of physical interaction and work-from-home feasibility be phased back to work. The majority of employment in the South African

economy is categorised in quadrant 4 (58.6% of total employment). This suggests that nearly three in every five workers (or nearly 9.8 million) are based in industries where a low proportion of jobs can be done from home but have high scores of physical interaction. A third of employees (5.5 million) are based in quadrant 3, i.e. industries characterised by low physical interaction and a low proportion of jobs that can be done from home.

Table 9 Employment by Quadrant

Quadrant:	1	2	3	4	Total
Description	High % work from home, high physical interaction	High % work from home, low physical interaction	Low % work from home, low physical interaction	Low % work from home, high physical interaction	NA
Number of industries	0	5	7	13	25
Industries	None	Exterritorial organisations; real estate, computer activities, equipment rental; R&D; Other Professional Business	Private households; Agriculture, forestry, fishing; Manufacturing; Automotive; Public admin; Other CSP; Post and telecommunications	Mining and quarrying; Utilities; Post and Telecommunications; Construction; Non-food trade; Hotels and restaurants; Transport; Health; Other services; Education; Business NEC; Food trade; Vet and social work; Police	All
Employment	0	1 346 885	5 568 256	9 789 314	16 704 455
Essential employment	0	290 039	1 573 936	2 557 416	4 421 391
Non-essential employment	0	1 056 846	3 994 320	7 231 898	12 283 064
Non-essential:essential employment ratio	NA	3.64	2.54	2.83	2.78
Employment as % of total employment	NA	8.06	33.33	58.60	100
Non-essential employment as % of total non-essential employment	NA	8.60	32.52	58.88	100
Non-essential employment as % of quadrant employment	NA	78.47	71.73	73.88	73.53

*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), own calculations; Essential service and work from home share estimates from Kerr and Thornton (2020).*
Note: quadrants distinguished by the median value of the physical interaction index and the proportion of workers who can feasibly work from home, as in the preceding figures.

The remainder of the country's workforce (1.3 million) are in industries characterised by low physical interaction and a high proportion of jobs that can be done from home – quadrant 2.

The table also shows, building on work by Kerr and Thornton (2020), that nearly three in every 4 workers (73.5%) do not work in essential services, and that all quadrants exhibit a greater absolute number of non-essential workers relative to essential workers. Across quadrants, the non-essential:essential employment ratios suggest that non-essential employment ranges from being 2.5 to 3.6 times larger than essential employment. Most non-essential employment (58.9% or nearly 7.3 million workers) can be found in quadrant 4, followed by quadrant 3 (32.5% or nearly 4 million workers).

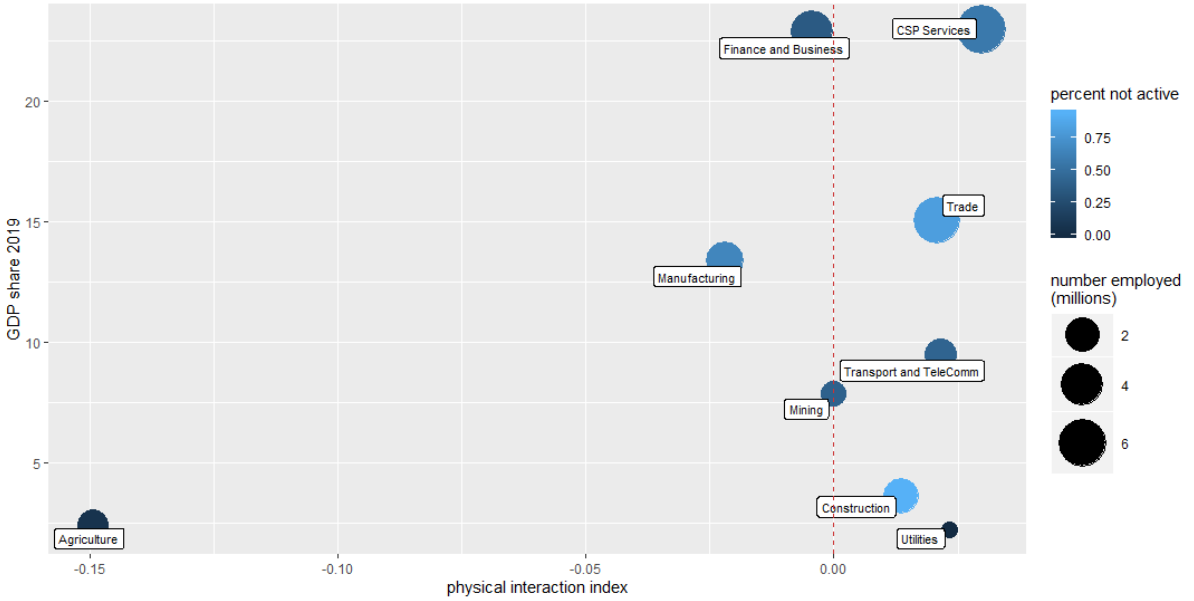
3.1.4 Physical Interaction and Economic Importance

We can also use the Index, PX_i, to identify the relationship between physical interaction and the economic importance of each sector – where this is measured through GDP by sector contribution. Figure 17 and Figure 18 plot PX_i against the share of GDP by main industry classification, both including and excluding the agricultural sector, respectively. The figures also take account of employment levels, where each bubble is weighted by the number of people employed in that sector, and coloured according to how economically active they are in the current lockdown based on occupations that have been classified by Kerr and Thornton (2020) as either essential or able to work from home.

The figures reveal that the two service sectors (Financial and Business Services, and CSP) are the most important sectors in terms of both contribution to GDP and, together with Trade, account for a large proportion of total employment. At the same time it is clear from Figure 18 that while financial services has the lowest index score of all non-agricultural sectors, CSP has a very high relative index score.

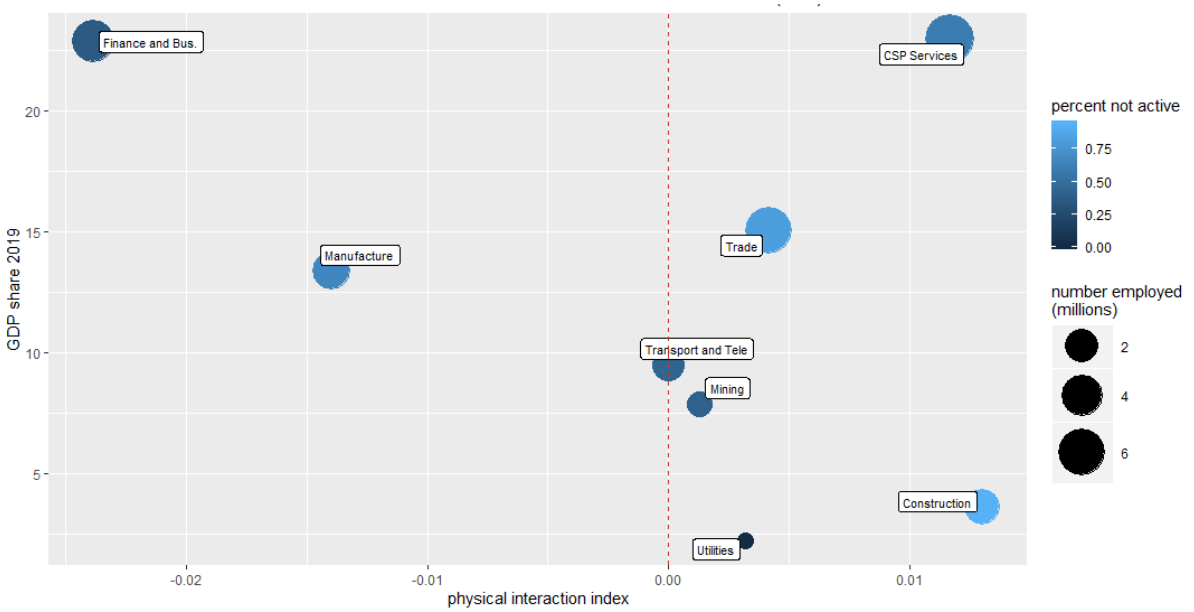
Trade and manufacturing also account for large shares of GDP and employment, however, in both cases the figures show that these sectors are largely non-operational during the lockdown, either because workers in this sector cannot work from home or because they have not been classified as essential. A large proportion of those in the CSP sector are also unable to work during the lockdown, and as the figure shows, many of these jobs do involve relatively high levels of physical interaction. Getting a large proportion of workers in sectors such as CSP services and trade back to work will be a challenge given the high levels of physical interaction as measured here, but it is clear that this is an economic priority. Construction, with lower GDP and employment contributions, will have been badly impacted given that almost no economic activity has been taking place during the lockdown. Notably, this sector does have a slightly lower Index score; and there may be considerable variation in transmission within the sector based on firm type, work environment, and other covariates. Agriculture has remained largely operational, with one of the highest proportions of active workers, being largely free to continue business under lockdown regulations.

Figure 17: Physical Interaction and GDP by Sector Contribution



*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), own calculations, 'percent not active' estimates from Kerr and Thornton (2020).*
Notes: x-line = median level of physical interaction.

Figure 18: Physical Interaction by Sectoral GDP, excluding Agriculture



*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), Kerr and Thornton (2020), own calculations.*
Notes: x-line = median level of physical interaction.

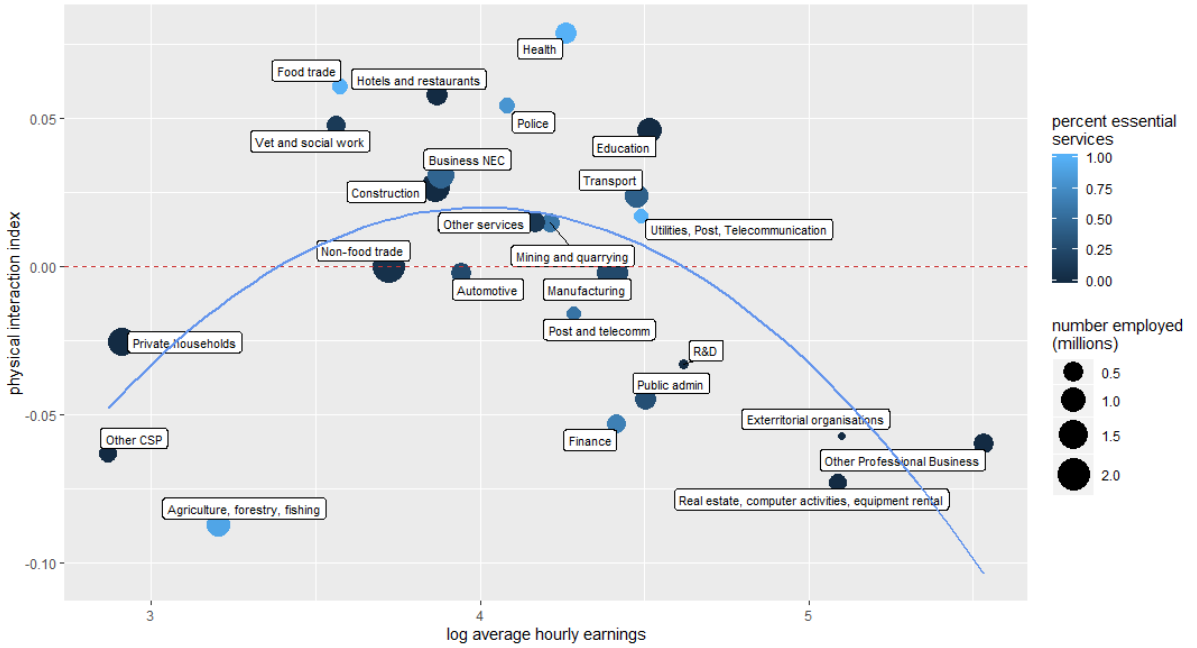
Overall then, these figures provide a very clear picture of the relationship between physical interaction and GDP contributions by sector, particularly when Agriculture is excluded. In essence the data allude to the fact that, apart from the CSP sector, high GDP contribution sectors are associated with lower levels of physical interaction requirements. This means that the higher value-added parts of the economy could potentially be brought back into operation more quickly. However, high GDP contribution

levels are not always positively associated with total employment contribution levels. Indeed, those sectors with Index scores that are below the median account for 48 percent of GDP but only 22 percent of total employment. The biggest GDP contributions here are due to Finance (23% of GDP) and Manufacturing (13% of GDP). Sectors with Index scores that are above the median account for 43.95 percent of GDP, and approximately 75 percent of total employment. In terms of GDP, Services (23% of GDP) and Trade (15% of GDP) make up the major contributing sectors. Finally, Mining and Quarrying is measured at the median Index score, and this sector accounts for 8 percent of GDP but less than 2 percent of total employment. Ultimately, whilst a lockdown metric based, for example, on the Physical Interaction Index may bring high GDP-share sectors into activity sooner, this will indirectly hold back a disproportionate share of the economy's workers.

A more disaggregated sectoral picture is useful to examine the above relationships suggested here. We turn to this in section 3.1.5, shortly. It may be useful though to first examine briefly the relationship between Index scores and wage levels, in order to gauge the extent to which lockdowns may impact on workers differentiated by wage levels. Kerr and Thornton (2020) for example, estimated that amongst the poorest half of earners in South Africa, only 28 percent can feasibly work from home (or are regarded as essential service workers), in contrast to 61 percent of the richest 10 percent. This is in line with the findings of Adams-Prassl et al. (2020) who show that workers in occupations in which just a small share of tasks can be done from home in the United States (US) and United Kingdom (UK), are more likely to experience income and employment loss.

To investigate this, we use wage data from the PALMS (2019) and compute real hourly wages for each sector. Figure 19 presents this sectoral-level relationship between wages and the degree of physical interaction in the workplace as measured by our Index. We also fit a line to show the aggregate relationship. The figure is suggestive of a clear non-linear relationship: higher wages are associated with higher levels of workplace physical interaction, but only up to a certain wage level (approximately R100 per hour), after which the Index score falls. Put differently, we see an inverted U-shaped relationship between wages and Index score, essentially showing that high-and low-wage workers (in sectors such as Professional Business Services and Agriculture, respectively) yield relatively low physical interaction scores. Most of the high Index scores are confined to the rump of mid-level occupations in sectors such as Trade, Education and Manufacturing, and this is where most jobs are found. Those sectors at the bottom left of the figure account for 15 percent of total employment; those at the bottom right make up 13 percent of total employment; and those in the middle of the inverted-U account for the remaining 72 percent of total employment.

Figure 19: Physical Interaction and Wages, by Sector

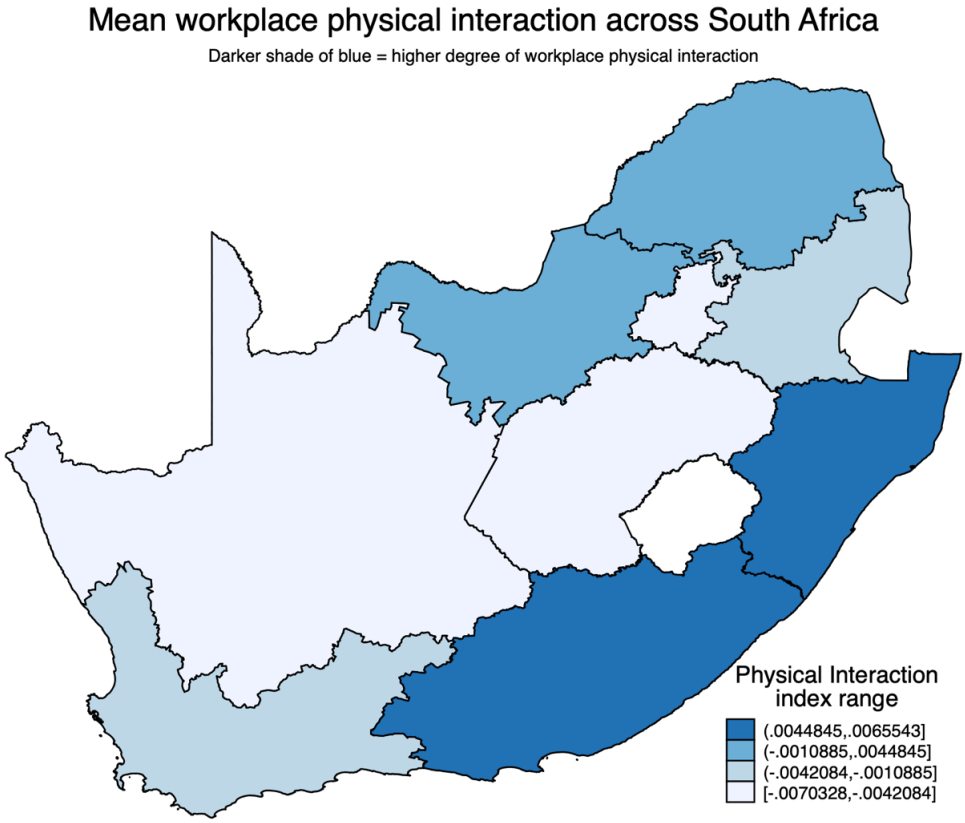


*Source: PALMS (2017-19), O*NET and StatsSA Time Use Survey (2010), own calculations; Essential service share estimates from Kerr and Thornton (2020).*
Notes: y-line = median level of physical interaction; blue line = predicted physical interaction index score based off a linear regression of the physical interaction index on a 1st and 2nd order polynomial of the logarithm of mean real hourly wage.

The relationship between wages and physical interaction is thus slightly more nuanced than a simple linear one. Very low wage sectors have relatively low levels of physical interaction. At the same time, a group of high wage sectors also have Index scores that are below the median. Together these two groups account for just under 30 percent of total employment. The majority of sub-sectors, however, are in the middle to lower end of the wage distribution: they have mid-to-high Index scores and account for the majority of total employment.

In addition to questions about GDP, employment and wages, a further issue relates to geography and transmission. Specifically, how does workplace physical interaction vary geographically in South Africa? This is a pertinent question, given that, as announced by President Ramaphosa in his address on 23 April, the country's graded lockdown alert system may vary by municipality, district or province. By making use of Environmental Systems Research Institute (ESRI) shape files, Figure 20 presents the mean scores of our workplace Physical Interaction Index across provinces. Whilst much more detailed regional work would need to be done, the estimates below provide an early indication of how the Physical Interaction Index varies by province.

Figure 20: Geographic Distribution of Workplace Physical Interaction



*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), own calculations.*

It is immediately clear for example, that the degree of physical interaction, and therefore the possibility of transmission risk, is not homogenous across South Africa. The highest scores are in the Eastern Cape and KwaZulu-Natal, and the lowest in Gauteng, Free State, and the Northern Cape. Of course, degrees of physical interaction will vary considerably within provinces, districts and municipalities, as well as between and within different occupations and industries as we suggest above. This then calls for ongoing work into the geographic distribution of physical interaction, and a more detailed multivariate approach that examines index levels across a range of relevant economic and geographic covariates.

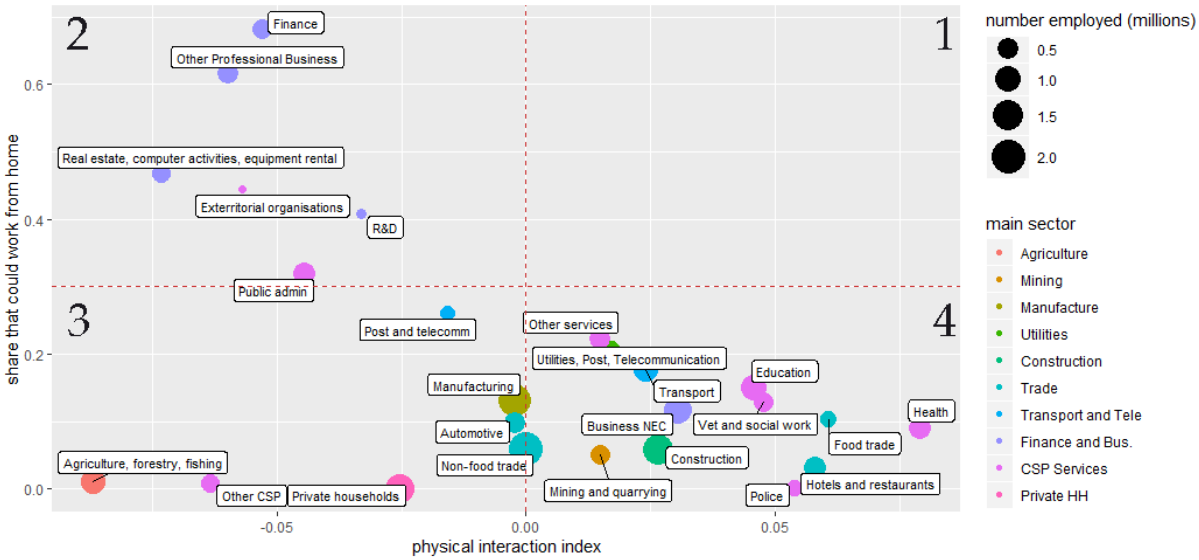
3.1.5 Physical Interaction and the Ability to Work from Home Revisited

We show above that as expected, the extent of physical interaction across sectors and the ability to work from home are negatively correlated (with some notable exceptions). Based on the above, it would be important to determine the intersection between those who are able to work from home and the degree of physical interaction for a disaggregated set of subsectors, but connecting these to the broad sector categories and their relative economic importance.

This is shown in Figure 21 below, where we recreate Figure 16 (*Physical Interaction and Ability to Work from Home*) based on the 25 sub-sector categories – but in this case each of the sub-sectors are linked back to their main sector codes. This provides a more disaggregated sectoral picture regarding the ability of people to work from home in each category, but connects directly to the level of economic importance of each sector. The bubbles are again weighted by employment numbers. The figure is now able to show, for example, that when CSP services (an economically critical sector) is divided into sub-categories there is important variation in the level of physical interaction.

As before, quadrant 2 represents sectors that have low physical interaction and high work-from-home potential, meaning work context here already poses low risk of transmission but also that work can easily be adapted to further reduce risk by working from home. Quadrant 3 captures sectors where physical interaction and risk of transmission is low, but it is difficult or impossible to adapt work conditions in these sectors to work from home. The sectors facing the greatest challenges then fall into quadrant 4. Here, physical interaction is high but it is also very difficult to adapt to remote work to mitigate transmission risk.

Figure 21: Sectoral work from home potential versus physical interaction, by main sector



*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), own calculations; Work from home share estimates from Kerr and Thornton (2020).*
Notes: y-line = one third could work from home; x-line = median level of physical interaction; numbers 1-4 label the different quadrants.

Sectors below the horizontal line (33% can work from home) are worst affected by the lockdown because economic activity has largely been paused. This includes, for example, manufacturing, hotels and restaurants, and non-food trade. The Agriculture and Health sectors also cannot work remotely, but these sectors are mainly made up of essential workers who are exempt from lockdown restrictions on economic activity. In quadrant 2, banking, finance and other professional services can easily adapt to working from home, and thus workers in these sectors will find it easier to continue economic activity.

Clearly there is an inverse relationship across the sub-sectors plotted here, where higher index scores are associated with lower shares of workers who could work from home. There are also a few outlying sectors that have low shares of tasks that can be done from home, but also low Index scores. This includes Agriculture, domestic workers in private households, and other CSP (such as street sweepers, for example). The sectors where physical interaction is highest include human health care, education, veterinary and social work, other services[15], construction, hotels and restaurants. Building on the conclusions of Kerr and Thornton (2020), the figure offers some key insights as to which sub sectors can function during lockdown conditions, and suggests a set of sectors that are considered relatively low risk on our Index and could be reopened as the lockdown eases.

3.1.6 A Guide to Reopening Based on PX_i

Regardless of the lockdown level, Figure 21 suggests that those sectors above the horizonal line should continue to work from home as much as possible while infection risks remain a concern. Those in quadrant 3 are the least risky, and based on our Index should be the first to be phased back to work; given their inability to carry out economic activity without being present at the workplace. This fortunately includes the entire primary sector – Agriculture, Manufacturing, and Mining – as well as domestic workers who are some of the most vulnerable workers in the labour market. Allowing all those in quadrant 2 and 3 to immediately go back to work would cover approximately 5.5 million people – or around 35 percent of total employment.

There are other sectors, however, with higher Index scores that pose more of a challenge. We previously identified CSP services, the Finance and Business Services sector, and Trade, as the three most important sectors in terms of employment and economic value – but noted that on aggregate, they had high Index scores. In Figure 21, when we disaggregate the large sectors into sub-categories, it is clear that about half of those employed in the Financial and Business Sector are in fact located in sub-sectors that have good potential to work from home. In addition, more than a fifth of the only subsector above the horizontal line – Business NEC (Not Elsewhere Classified) – are in fact already active in various essential services. Altogether then, the prospects are relatively good for the Financial and Business Services sector to return to economic activity, compared to other sectors.

CSP services and Trade are more concerning since these sectors mostly occupy quadrant 4, where transmission risk is high due to higher levels of physical interaction and the feasibility of remote work is low. Within this quadrant, there are some exceptional cases.

[15] Activities of social and membership organisations (like trade unions), and other sporting, recreational and cultural organisations including news agencies.

Health, utilities, food trade, public admin and police are all largely classified as essential, so they can be removed from the phase-in sequence decision since they are already operational. Education also needs to be considered separately, since bringing education back on stream also means bringing children back to schools. The Education sector is responsible for employing about 1.7 million people; 75 percent of whom though are employed in the public sector.

For the remaining sub-sectors in quadrant 4, where they are not essential, re-opening should probably happen more gradually, more carefully, and under strict social distancing protocols. These sub-sectors are: the automotive sectors, non-food trade, other services (including membership organisations, sports, recreational and news organisations), transport, veterinary and social work, and construction. Protocols will need to be sector-specific: for example, staff rotation to reduce the number of staff on a site at one time in construction, and a pivot towards delivery instead of point-of-sale contact in the tradable sectors. The exact timing of when to induce each phase should be based on up-to-date information about the infection curve trajectory.

Based on the quadrant approach in Figure 21, we use Table 10 to provide a summary of each sub-sector, and outline three broad 'phases' of returning to work, where the sequencing would go from A to C.[16] The table categorises the 25 sub-sectors plotted above into their relevant phases, which link the quadrants in Figure 21, and then shows what proportion of total employment is accounted for in each case. Employment is also then shown as a proportion of essential workers in each sub-sector to account for those who would be working regardless of lockdown conditions.

The table is useful in highlighting employment coverage in relation to physical interaction as measured by our Index, where the numbers are instructive. Under any circumstances, using the measure developed by Kerr and Thornton (2020), we have around 2.8 million people working in services classified as essential, which accounts for 17 percent of total employment in South Africa. The dominant sub-sectors here are Agriculture, Health, Public Administration and police, along with food trade and other smaller components. Here no reopening decisions need to be made.

[16] We do not account here for the various complex linkages between sectors, including value chains etc. that may fall into different quadrants and thus prevent certain operations from going ahead without these attendant industries also being operational.

Table 10. Phases and conditions of return to work per sector

Phase	Phase description	Sector	Employment	Employment as % of total phase employment	Employment as % of total employment
A (quadrant 2)	Work from home	Finance, Other professional business	969 781	72.00	5.86
		Real estate, computer activities, and equipment rental	341 712	25.37	2.06
		R&D	26 937	2.00	0.16
		Extraterritorial organisations	8 456	0.63	0.05
		Total	**1 039 886**	**100**	**8,13**
B (quadrant 3)	Can't work from home, but have low physical interaction at workplace	Other CSP	346 706	8.21	2.09
		Private households	1 304 427	30.88	7.88
		Manufacturing	1 820 527	43.09	11.00
		Mining and quarrying[17] (50%)	207 758	4.92	1.26
		Automotive	545 101	12.90	3.29
		Total	**4 224 519**	**100**	**25,52**
C (quadrant 4)	Can't work from home, but have high physical interaction at workplace	Other services	552 035	6.76	3.33
		Transport	860 779	10.55	5.20
		Business NEC	1 262 465	15.47	7.63
		Vet and social work	412 791	5.06	2.49
		Education	947 477	11.61	5.72
		Hotels and restaurants	598 387	7.33	3.61
		Non-food trade	2 074 154	25.41	12.53
		Construction	1 453 362	17.81	8.78
		Total	**8 161 450**	**100**	**49,29**
Already operational essential services	NA	Agriculture	791 147	28.05	4.78
		Health	640 802	22.72	3.87
		Food trade	199 225	7.06	1.20
		Utilities, Post, Telecommunications	152 840	5.42	0.92
		Mining and quarrying (remaining 50%)	207 758	7.37	1.26
		Public administration and police	828 868	29.39	5.01
		Total	**2 820 640**	**100**	**17,04**
		Overall Total	**16 246 495**	**-**	**100**

*Source: PALMS (2018-19), O*NET and StatsSA Time Use Survey (2010), own calculations; Essential service share estimates from Kerr and Thornton (2020).*

Based on our assessment then, among those sectors where work has been either partially or fully suspended as a result of lockdown restrictions, the least risky grouping is in Phase A, or quadrant 2 as per Figure 21. These sectors are likely to be able to work from home, and in all probability have been functioning in some form during the full lockdown already. Our estimates suggest that just over 1 million people (8% of total employment)

[17] The Mining sector has already negotiated a partial return to work.

would be in this category, primarily made up of financial sector operations. Next, in Phase B (quadrant 3) are those in sub-sectors where they are unlikely to be able to work from home but their levels of workplace and commuting physical interaction are low. They comprise 25 percent of total employment (4.2 million people), and include work in manufacturing, domestic work, and the automotive industries. Finally, there are those in Phase C, quadrant 4, whose jobs cannot be done from home and also have relatively high Index scores. This group is in the majority, accounting for 50 percent of all employed South Africans. In some cases certain sub-sectors in this group have been operating at low levels (for example certain transport industries), but in most cases these economic activities were restricted under the complete (level 5) lockdown rules. This group of over 8 million people is made up of those working in Transport, Business Services, Education, Non-Food Trade, Construction, Hotels and Restaurants, Social Work and other service sector activities.

Based on the information in the above table then, we can propose a basic set of decision rules relating to easing the lockdown restrictions. The rules we propose operate sequentially and consist of the following:

1. First open sectors with less physical interaction at work.
2. Allow sectors to open if they can work from home.
3. Lastly open up sectors that can neither work from home but which are economically important, with carefully devised workplace protocols.

The feasibility of following a set of clear guidelines for reopening also depends on the capacity of the government to enforce the rules in place; not simply from a general policing perspective but from a more specialised health and safety point of view. Here there are a range of questions about the existing capabilities to do so, and how the penalties for noncompliance will be structured. Indeed a firm-specific approach may be far more suitable than a sector or sub-sector specific approach. There are at present around 1,300 labour inspectors, and only a small percentage of these are Occupational Health and Safety inspectors, who would presumably be responsible for such enforcement (DoL, 2019). Certainly then, in addition to the complex public health and economic decisions around how to transition through the various stages of lockdown, there are a set of associated concerns around enforcement that are not easily solved.

4 Conclusion

This paper has presented a set of early economic reflections on the Covid-19 crisis in South Africa, examining the projected impacts of the pandemic, policy responses, and a data-based approach that could inform decisions around lockdown guidelines as economic activity gradually resumes. Compared to other emerging market economies, the South African health-related and economic responses have been rapid and comprehensive. The national lockdown restrictions in South Africa appear strict – limiting people to their homes for 5 weeks, and prohibiting, for example, walking outside, the purchase of both alcohol and cigarettes, and any local travel for non-essential or emergency purposes. In addition, the redeployment of community healthcare workers to screen, test and educate communities about the virus, as well as the use of the country's far-reaching social assistance architechture to support vulnerable families, are two somewhat unique features of the crisis response. As a result of these and other measures taken to contain the spread of the virus, the curve of the epidemic in South Africa has flattened temporarily, and bought valuable time for the healthcare system to prepare for it to rise as restrictions are lifted.

The lockdown has, however, had devestating economic effects which have yet to be fully realised and understood. Many vulnerable households have been left without income to buy basic necessities, including food, while many businesses will struggle to survive the crisis, and unemployment is set to increase rapidly. Work by Kerr and Thornton (2020) estimates that taking into account essential services and those who have some ability to work from home, approximately two-thirds of South Africans have not been able to work during the five-week lockdown. As a result of this sudden standstill, and a global slowdown, current economic forecasts suggest large decreases in economic growth for 2020 – currently a GDP contraction of 7 percent is projected for South Africa. To mitigate the negative economic shock experienced by households and businesses, a substantial stimulus package of R500 billion was announced by President Ramaphosa, containing additional government spending that amounts to 6.5 percent of GDP. Again, this is progressive in relation to comparator countries. In South Africa's current economic situation this fiscal expansion puts upward pressure on the budget deficit, which is at present expected to double – a conservative estimate suggests it will reach around 12 percent of GDP. This level will also depend on the extent to which the crisis reduces government revenue.

A stimulus package partly made up of R50billion is being spent on direct support to vulnerable households using the existing social grant infrastructure, as well as introducing a new Covid-19 grant to cover those who are unemployed. These grants will last for six months, from May to October, and we show that overall they are able to reach the majority of poor households. The increase in the CSG delivers an income boost that has a strong focus on the bottom five deciles, while the addition of the Covid-19 grant has

the potential to cover a large group of otherwise uncovered households into the system. Critically, the addition of the Covid-19 grant instead of a larger increase in the CSG, comes at a cost to households at the bottom of the income distribution: the poorest 30 percent of the population see a R3 billion decline in total resources allocated to them over the six-month period, while the top seven deciles see increased support. However, even households in decile 7 should not be considered well off, and thus at least part of this redistribution is to households that would be vulnerable to poverty; of which many fall outside of the reach of the pre-existing suite of social grants. This is critical in the context of the way in which social assistance can re-order the income distribution.

Given that the country is in no fiscal position to provide additional stimulus, it is crucial that as much economic activity resumes as soon as possible. But this economic imperative must be balanced with the public health requirements of curbing the spread of infections, which is informed by where South Africa is on the curve of the epidemic. Policy decisions regarding economic activity, however, can be at least partially informed by existing data on how infection risk differs across job types, and how people commute to their jobs. To do this, we build an Index of Physical Interaction for different occupations that is then aggregated across sectors and sub-sectors. Using this Index we are able to do the following: We show the proportion of jobs that can be done from home across each sector, where working from home poses little or no risk, and thus supports reopening these sectors. We examine the level of physical interaction across sectors taking account of economic importance – where economic importance is measured by GDP contribution and total employment levels. We then use these results to create a framework around which criteria for different phases of a lockdown can be created.

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