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ECONOMIC VULNERABILITIES TO HEALTH
PANDEMICS: WHICH COUNTRIES ARE
MOST VULNERABLE TO THE IMPACT OF
CORONAVIRUS

Sherillyn Raga and Dirk Willem te Velde

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TABLE OF CONTENTS

Executive summary	_____	
1 Introduction	_____	1
2 Economic forecasts and health pandemics	_____	2
2.1 Economic forecasts	_____	2
2.2 Economic impacts of health pandemics	_____	2
3 The spread of coronavirus and direct observable impacts	_____	3
3.1 Spread of Coronavirus and impacts	_____	3
3.2 Directly observable economic impacts	_____	5
4 Economic vulnerabilities to global health pandemics	_____	6
4.1 Direct impacts	_____	6
4.2 Economic exposure	_____	7
4.3 Economic resilience	_____	7
4.4 Overall vulnerability	_____	8
5 Which countries are most vulnerable to the impact of coronavirus?	_____	8
6 Possible economic impacts on China and other countries	_____	12
6.1 Impacts on China and the world economy	_____	12
6.2 Impacts on low- and middle-income countries	_____	13
7 Policy implications	_____	15
7.1 Health measures to contain the virus in China and other countries	_____	15
7.2 Measures to contain economic impacts in China and other countries	_____	15
8 Conclusions and suggestions	_____	16
References	_____	17
Appendices	_____	18

EXECUTIVE SUMMARY

Shocks such as global health pandemics can affect and significantly alter growth and transformation trajectories including in the poorest countries. While the Severe Acute Respiratory Syndrome (SARS) virus in 2003 had a limited effect on global growth of around 0.1% (around \$50 billion), Coronavirus is different in spread (faster), mortality rates (lower) and measures taken (more and faster). It is too early to tell the impact, but with China's gross domestic product (GDP) share in 2019 (17%) more than four times bigger than in 2003 (4.3%), and the number of confirmed cases already nearly double that of the total of SARS, it seems prudent to expect a larger economic impact this time around. The impact could be equivalent to 1% of Chinese GDP this year and some 0.4% of world GDP. The global costs could be around \$360 billion. There will also be effects in the poorest countries in Asia and Africa. For example, we estimate that sub-Saharan Africa stands to lose \$4 billion in export revenue, even without contracting a single case of Coronavirus.

There is already stark evidence that economic activity in China is slowing down. Cities are under lockdown, travel is restricted, manufacturing plants have ceased production, stock prices of travel related services are down, and many international flights have stopped operating, and some international borders have closed. Global prices of commodities such as oil and copper are down too. A much more integrated China now (compared to 2003) means low- and middle-income countries across the world will see indirect economic impacts even when they may not be affected directly by the spread of the virus.

We develop an index to examine which countries are most vulnerable to virus outbreak and a slowdown in China. We quantify the vulnerability of low- and middle-income countries based on impact channels. Some countries are affected by Coronavirus most directly in terms of direct already visible health impact and direct flight cancellations. These include the Philippines and Vietnam, followed by a range of mainly Asian countries that have recorded cases of infection. Some African countries are also included here: six out of eight African airlines have cancelled flights with China.

We also examine which countries are most exposed to Coronavirus through economic channels, depending on direct links with China (through trade, investment and movement of people) and the wider world more generally. Mongolia, Cambodia and Laos are most exposed, followed by other, mostly Asian, countries (e.g. Myanmar, Philippines and Vietnam). These countries export more than a sixth of their total exports to China and in some cases 90%. Myanmar, Thailand, Mongolia, Cambodia and Vietnam are for more than a fifth dependent on China for tourism revenues. African countries most exposed in this way include Angola, Congo, Sierra Leone, Lesotho and Zambia. For example, for Angola, 60% of its total exports are to China and 10% of tourists are from China.

Countries that are less well placed (i.e. that have less fiscal space or less health spending) to do something about the impact are less resilient and more vulnerable. The least resilient countries in our sample are Ethiopia, Laos, Pakistan, Ghana and Sudan.

Taking these indicators together, we present an overall vulnerability index. Sri Lanka, Philippines and Vietnam, followed by Kazakhstan, Kenya, Cambodia and Nepal, top this index as the most vulnerable countries in economic terms.

Beyond vulnerabilities we also provide estimates of possible impacts. For example, low- and middle-income countries would lose \$4 billion in goods exports (sub-Saharan African \$420 million) as a result of a 1% fall in Chinese demand and \$0.6 billion in tourism exports (sub-Saharan African \$16 million). With trade prices falling (oil prices are down by 20%, copper by 7%), the effects on the value of exports could be significant, as this will affect not just exports to China. We estimate that a 5% decrease over one year (or 20% in this quarter) would lead to losses in the value of

exports from sub-Saharan Africa of \$3.1 billion (there are major gains in South and South East Asia but losses in Central Asia and Europe). Sub-Saharan Africa therefore faces losses in exports of \$4 billion (and this does not account for copper price declines).

A range of policies are being designed to address the crisis. First and foremost, countries need to implement health-related policies to contain the spread of the virus. In economic terms, China has already begun to address the economic consequences of the virus; these effects come on top of the challenge that China is facing in terms of its slowest-paced economic growth in three decades. Other countries need to be aware of the potential fall-out, especially this quarter, but also later, as impacts often have lags. Some countries are much more exposed to China than others, but most if not all are much more exposed than when a health pandemic struck in 2003. There may also be gainers, for example producers that take the place of Chinese production or net importers of commodities whose prices have dropped.

This is a first attempt to assess the vulnerabilities and potential impacts in low and middle income countries. As the spread of the virus unfolds, we are gaining a better understanding of what is happening inside China, whilst obtaining examples of impacts in China and abroad, and obtain more precise estimates of the impacts through trade in goods and services, investment and migration linkages. This paper will need to be updated regularly.

1 INTRODUCTION

Growth and economic transformation pathways are subject to a range of shocks that will affect economies in varying ways. In the past, we have examined the impact of shocks such as financial crises, the eurozone crisis and a slowdown in China.¹ Health emergencies can also have major economic impacts on low- and middle-income countries – and we examine these in this paper.

On 28 January 2020, the World Health Organization (WHO) declared a public health emergency of international concern around Novel Corona Virus 2019, following previous emergencies around H1N1 (2009), Ebola in West Africa (2014), Polio (2014), Zika (2016) and Ebola in Democratic Republic of Congo (2019). At this stage it is difficult to understand the precise impact of the latest virus but it has already claimed the lives of more than 360 people (as of 3 February 2020) and has disrupted travel.

This paper assesses the possible vulnerabilities and impacts in low- and middle-income countries to the effects of this outbreak. Much of the outbreak is currently centred around China, with the affected areas effectively under lock-down. This will affect the Chinese economy and beyond. Many countries in South East Asia and Africa are increasingly dependent on economic links with China for their growth and economic transformation.

Beyond the health-related effects, should countries be concerned about the possible economic impacts? How might they be affected and what are the transmission channels? While some global impacts are emerging already, such as declining stocks, there is less discussion of the effects on individual economies. This paper examines this and assesses the vulnerabilities of countries by considering their exposure and resilience to the economic effects.

The structure of this paper is as follows. Section 2 reviews current economic forecasts and how health pandemics have previously affected the world, with a particular focus on African growth. Section 3 provides details on the direct impacts of the virus on China and elsewhere (currently visible). Section 4 develops a methodology to assess the vulnerabilities of low- and middle-income countries geared towards the Coronavirus outbreak. Section 5 provides the results of data analysis. Section 6 discusses the possible impacts on China and other countries. Section 7 discusses policy measures to contain the virus and the economic impact of the virus. Section 8 concludes and provides recommendations going forward to contain the impact of the crisis.

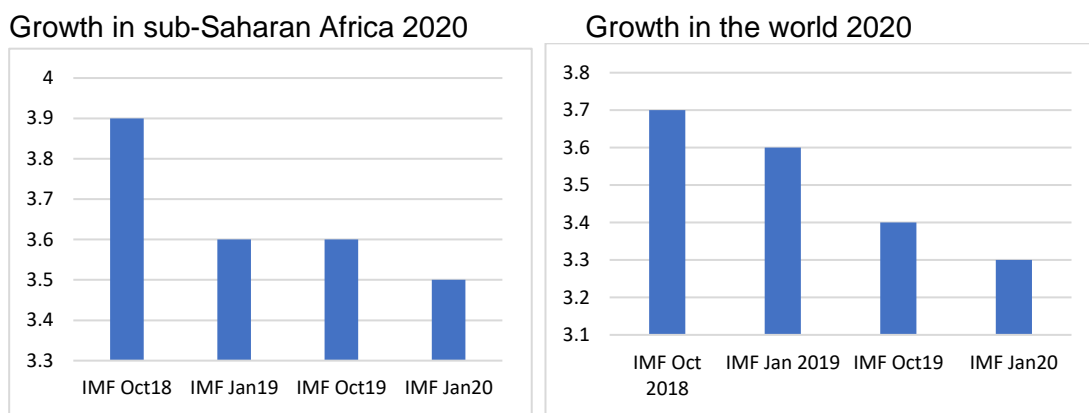
¹ See ODI shockwatch publications: <https://www.odi.org/search/site/shockwatch>

2 ECONOMIC FORECASTS AND HEALTH PANDEMICS

2.1 Economic forecasts

Before this point, growth was already slowing down, with China growing at its slowest pace for almost three decades. In January 2020, the International Monetary Fund (IMF) forecast world growth at 3.3% this year and 3.4% in 2021. For sub-Saharan Africa, the IMF forecast 3.5% growth in 2020 and 2021. These forecasts had already downgraded from previous forecasts (Figure 1). China is forecast to grow at 6.0% in 2020, down from 6.1% in 2019 and 6.6% in 2018. The US–China trade dispute may affect growth by between 0.5% and 1.0%.

Figure 1: IMF forecasts for growth in 2020 in sub-Saharan Africa and in the world



Source: IMF various forecasts including the IMF January 2020 update

2.2 Economic impacts of health pandemics

Previous analyses have covered the impact of Severe Acute Respiratory Syndrome (SARS), Swine Flu, Ebola and Zika. The 2002/03 outbreak of SARS, which killed nearly 800 people of the some 8,000 it infected, cost the world economy around \$40 billion (Lee and McKibbin, 2004). China's gross domestic product (GDP) in 2003 is estimated to have been reduced by about 1%, while Hong Kong's growth rate was lowered by about 2.6%. The economic costs go beyond the direct damages incurred in the affected sectors of disease-inflicted countries and include economic impacts via travel, trade and financial linkages, with both direct and knock-on effects. Flights to the Asian region fell by 45% and Canada lost \$1.2 billion in health and travel-related expenses as a result of the SARS outbreak (Salaam-Blyther, 2011).

The IMF also pointed to limited impacts of SARS, arguing that there was a dip in growth in the months during and immediately after the containment of the epidemic, followed by a rebound. Global growth for the year was just 0.1% lower (Kawanami, 2020). JP Morgan suggested that stock prices fell by some 9% from start to crisis peak but markets rebounded after that (in fact by 30% in three months later). The impacts of the other pandemics were between 2% and 5%. Consumer durables, software, hotels, restaurants and airlines were among the activities hardest hit following the SARS outbreak, whereas energy, food and health care rose rapidly. Some suggested that private car ownership increased rapidly after the outbreak as people shunned public transport.

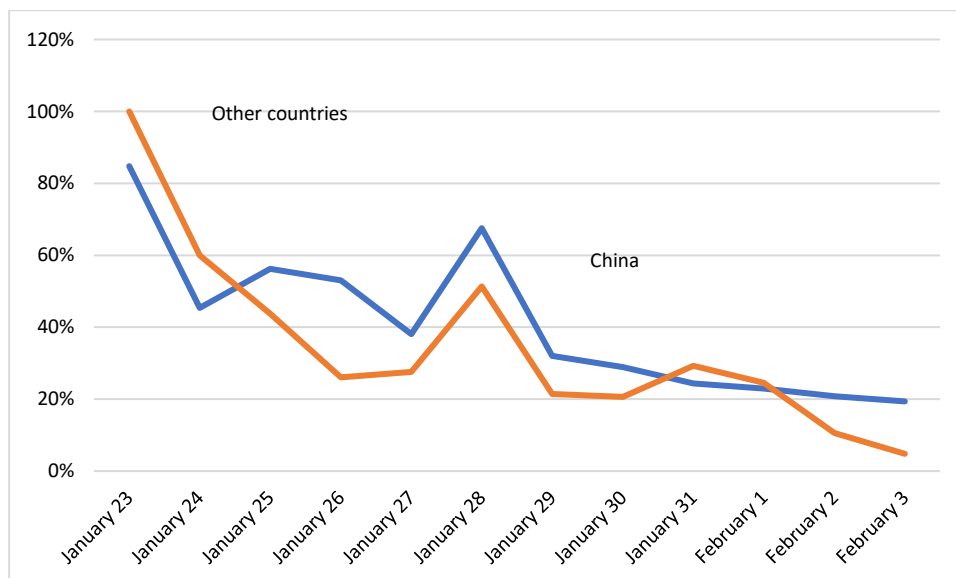
3 THE SPREAD OF CORONAVIRUS AND DIRECT OBSERVABLE IMPACTS

The spread of the Coronavirus is already different from that of SARS as more people have been affected. The impact will also be different as China's share in the world economy is bigger now and economies are more integrated with China.

3.1 Spread of Coronavirus and impacts

The spread of the 2019- Coronavirus appears faster than that of, for example, SARS, as the total number has already surpassed the number of SARS cases. However, the mortality rates are much lower, reportedly in the 2–3% range, but higher than the 0.4% mortality rate that applies to seasonal flu according to some.² The increase in the number of cases is at around 20–30% at present (Figure 2).

Figure 2: Daily change (% d-o-d) in confirmed cases of Novel Coronavirus (2019-CoV)



Source: WHO Situation Reports and own calculations

There has also been a spread of the virus to other countries, especially to those neighbouring China (see Table 1). There are now more than 20,000 confirmed cases.

² There is a large literature on mortality rates and these statements are general, based on general observations, and subject to improvement as better research and observations become available. In fact, given the infection lags and the total number of people actually infected versus those who have sought medical treatment and been laboratory confirmed, the mortality rate may actually drop to about 0.4% (using confirmed deaths of 362 as of today and a Wuhan-alone estimated infection total of 75,000 from Lancet models). What is missing from news reports are morbidity issues – short, mid- (say to 6 month), to long (+ 0.5 years). It is still too early to know how many individuals might be affected by permanent lung damage or other organ damage that will impact their wellbeing and ability to work, as well as family medical costs down the road. Ideally, when looking at impacts in general, we need to introduce a time component.

Table 1: Total confirmed cases of Novel Coronavirus (2019 – Coronavirus)

	4 February 2020
China	20,485
Japan	20
Thailand	19
Singapore	18
Hong Kong	17
South Korea	15
Australia	12
Germany	12
US	11
Macau	10
Malaysia	10
Taiwan	10
France	6
Vietnam	6
UAE	5
Canada	4
Italy	2
Russia	2
Philippines	2
India	2
UK	2
Nepal	1
Cambodia	1
Spain	1
Finland	1
Sweden	1
Sri Lanka	1
Total	20,679

Source: John Hopkins as of 4 February 2020³

Africa countries have not yet been affected in terms of infected cases although there are several cases under investigation. However, WHO announced it would be scaling up preparedness in Africa, particularly in 13 top priority countries: Algeria, Angola, Côte d'Ivoire, Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Mauritius, Nigeria, South Africa, Tanzania, Uganda and Zambia (Sawhani, 2020). There is a large amount of travel between China and Africa; hubs such as Addis Ababa, Cairo and Nairobi are at particular risk owing to the large number of Chinese travellers that pass through these airports.

Countries including Côte d'Ivoire, Mauritius and Mozambique are taking measures to quarantine and check Chinese travellers. African carriers that have cancelled flights to China include RwandAir, Kenya Airways, Royal Air Maroc, EgyptAir, Air Madagascar and Air Mauritius; Air Tanzania has postponed its maiden flight to China. Notably, Ethiopian Airlines and Air Algérie have not yet banned airline access.

Other countries such as Australia, New Zealand, Singapore, the US and Vietnam are among countries that have denied entry to foreign nationals who have recently been in China. The border between China and Russia has closed.

³ <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

3.2 Directly observable economic impacts

While it will take time before the measured impacts become visible (which is why we examine vulnerabilities in Sections 4 and 5 and possible impacts in Section 6), a number of directly visible impacts on stock prices and commodities are already visible. Airlines are banning flights and their stock prices are declining. The global travel insurance industry is already concerned: more than a dozen airlines, including British Airways, American Airlines and Cathay Pacific, have cancelled some or all of their flights to and from mainland China. These airlines will need to offer refunds or rebook on to different flights.⁴

When markets opened after Chinese New Year they finished down by 6% on 26 January 2020. Many factories have closed indefinitely, some indefinitely, which is not what happened under SARS in 2003. Nissan and Apple have closed down some subsidiaries in affected areas. The stock market price of China Southern Airlines fell by 7% and that of Luckin Coffee by 10%; Macau gambling activity also fell.⁵ Apple shut down all of its 42 retail stores. There may also be supply chain effect on sectors such as electronics. On 3 February stock market prices fell by another 8%.⁶

Transport sectors will be affected in a major way. This will reduce the demand for fuel. Oil prices have already declined, from \$68 per barrel (Brent crude) to \$58 at end of January and \$54 on 3 February 2020, with most of the decline over the past two weeks. A reduction in oil demand of 20% is expected (Durdan, 2020). Oil prices may stay lower than would otherwise have been the case (note that geopolitical tensions can have major effects on oil prices).

Other commodity prices are also affected. On 3 February, copper prices immediately fell by the daily limit of 7% to 44,780 yuan a tonne on the Shanghai Futures Exchange. This was the lowest since November 2016, before the price ended down 6.5% at 45,040 a tonne (Hobson, 2020).

Some sectors are gaining, such as medical supply factories in Zhejiang, which reopened after Chinese New Year, with production of facemasks soaring; production capacity in one factory reached its largest daily output of 40,000 masks. China's online delivery and e-commerce was already booming before the virus and continues to (as long as delivery agents keep working).

4 <https://www.ft.com/content/59e3ee90-437d-11ea-abea-0c7a29cd66fe>

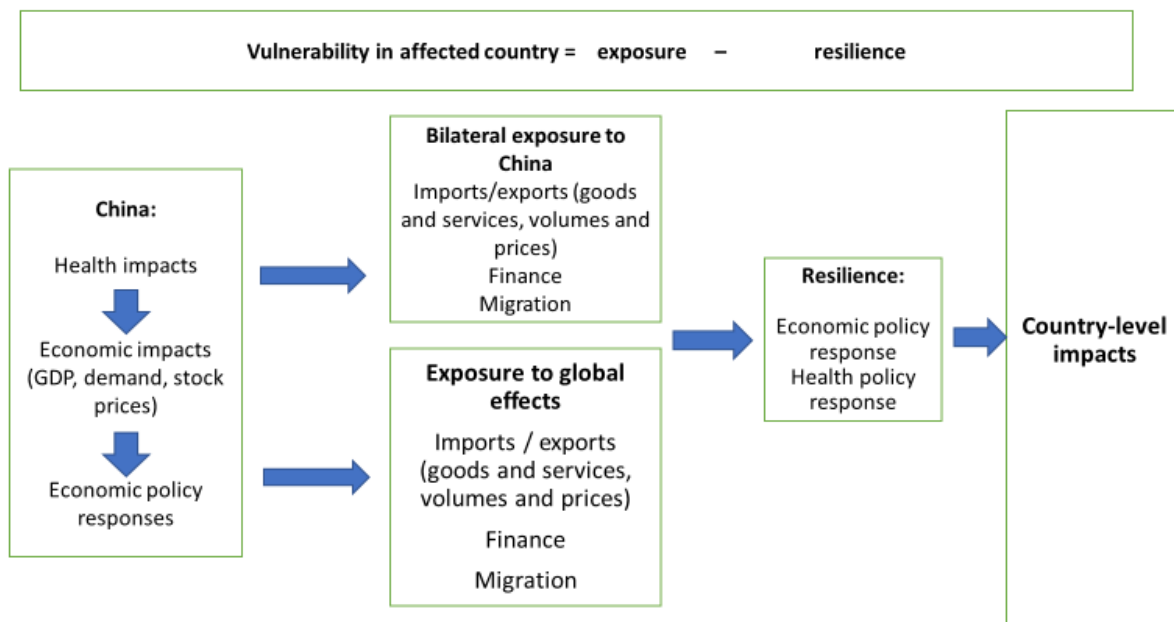
5 <https://www.ft.com/content/72164340-443c-11ea-a43a-c4b328d9061c>

6 <https://www.ft.com/content/14867176-461e-11ea-aeb3-955839e06441>

4 ECONOMIC VULNERABILITIES TO GLOBAL HEALTH PANDEMICS

We define economic vulnerability to global health pandemics at country level as the combination of direct impacts and economic exposure (divided into exposure directly to China, where the virus emanated; and indirectly through openness to the world) minus resilience to the shock (economic and health governance), which is the ability to act on the shock. Figure 3 shows these channels. For example, we expect the virus to lower Chinese economic activities, which will lower demand for imports from countries that are directly exporting to China and may also lower the price paid (and hence the value of exports); in addition, there may be indirect, third country effects. It may be that not all impacts are negative: weaker commodity prices globally may have positive impacts on the welfare of net commodity importers. Some traded products will be affected more; for example, tourism, transport and hotels and restaurants will be affected most.

Figure 3: Economic vulnerability to the global health pandemic emerging in China



4.1 Direct impacts

Countries will be affected immediately through health impacts, including deaths and weaker health, but some will recover. The human costs can be high; so far, the mortality rate has been much lower than in SARS but total deaths are likely to outpace the SARS total.⁷ These will have immediate impacts and will determine the magnitude of the shock as well. There will be immediate effects at the source of health impact. Currently the impact is visible in China, as discussed above.

The immediate impact will be greater in countries that also have direct health impacts and have measures in place that directly limit travel to and from China. But also, the greater the economic impact in China, the greater the impact on other countries. And the greater the health impact in other countries, the greater the economic impact in those countries (other things being equal). However, the main economic impacts will be through indirect economic channels.

⁷ Of course, there are many other health impacts from more common diseases such as malaria and pneumonia.

We use the following indicators as indicators of the direct and immediate impact of Coronavirus:

1. number of reported confirmed cases of Coronavirus
2. reported reduction, cancellation and suspension of flights following the Coronavirus outbreak
3. travel ban to and from China and/or entry restrictions against Chinese (as of 3 February 2020).

4.2 Economic exposure

A major slowdown in China will affect other countries depending on their exposure to China. Countries will be affected differently depending on whether and how they are exposed directly to the economic shock in China and more generally through third country effects. Direct exposure to economic shocks in China can be measured through

1. exports of goods to China/total country export goods (%)
2. import of goods from China/total country import goods (%)
3. total trade (exports+imports) with China/country's total trade to the world (%)
4. total trade with China/GDP (%)
5. China outward foreign direct investment (FDI) stock in countries/GDP (%)
6. Chinese tourist arrivals/total tourist arrivals in country.

The more a country trades, and receives investment, tourists and migrants from China, the more the country will be affected.

A country may also be exposed to China even if does not trade with China but when it trades with a third country that does trade with China. This means that a country that is more open to trade (including tourism) and investment in general will be affected more.

1. exports of goods and services/GDP (%)
2. FDI inflows/GDP (%)
3. personal remittances received/GDP (%)
4. migrants/population (%)
5. international tourism receipts/total exports (%).

4.3 Economic resilience

Economic resilience is the ability of a country to do something about a shock, either directly (health related) or in economic terms, such as the ability to use fiscal or monetary stimuli. It could also include governance, and here we include health governance.

Thus we measure economic resilience as:

1. fiscal balance/GDP (%)
2. current account balance/GDP (%)
3. foreign currency reserves in months of imports
4. external debt/GDP (%)
5. expenditure on health/GDP (%)
6. health care access and quality index.

4.4 Overall vulnerability

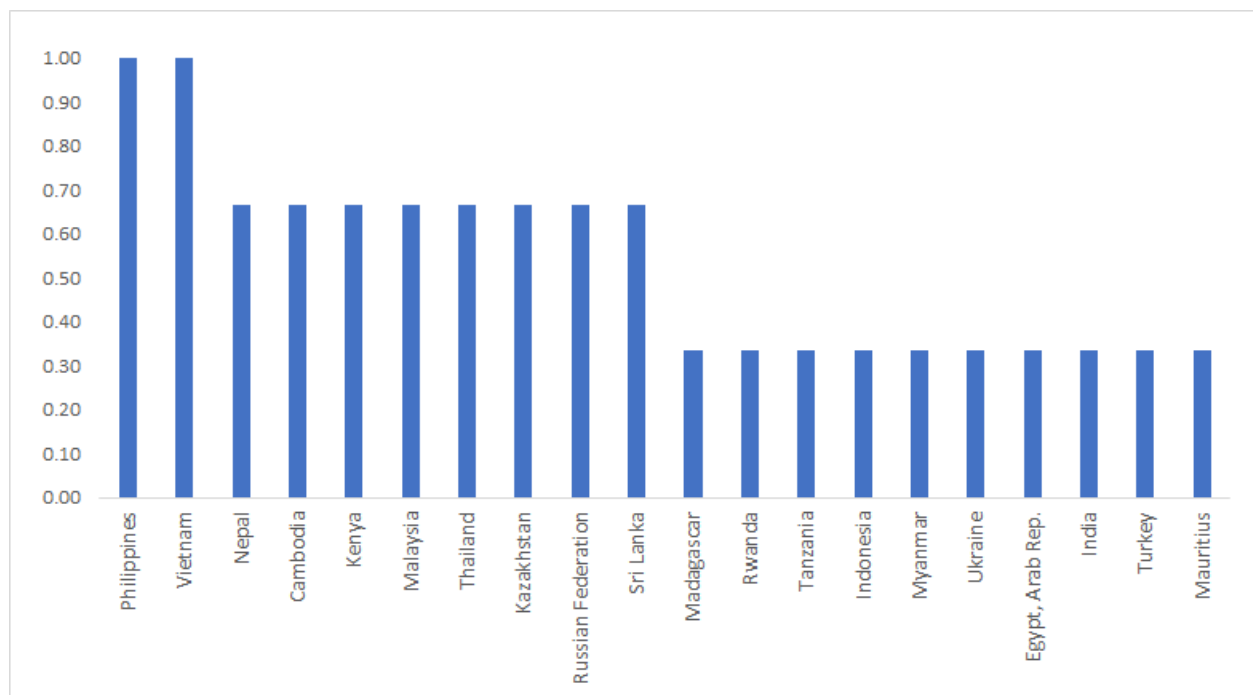
The overall vulnerability of a country to the economic shock that has emerged as a result of Coronavirus in China can be described as a combination of exposure (direct health impact, direct exposure to China through trade, finance and migration linkages and indirect exposure to China) and resilience (ability to contain the virus and to do something about the potential effects).

5 WHICH COUNTRIES ARE MOST VULNERABLE TO THE IMPACT OF CORONAVIRUS?

This section quantifies the vulnerability of low- and middle-income countries to Coronavirus based on the impact channels developed in Section 4.

We first examine which countries are most directly affected by Coronavirus in terms of direct health impacts visible and direct flight cancellations. These impacts are already visible now and are likely to suggest greater economic impacts later. Figure 4 shows that the Philippines and Vietnam are the most affected, followed by a range of mainly Asian countries that have recorded infected cases. Some African countries are also included by virtue of having cancelled flights. (Other routes are also being cancelled; for example, Russia and Kyrgyzstan have closed land borders.)

Figure 4: Which countries are directly affected by health impacts or flight cancellations?



Source: Own elaboration

Notes: Index 1 is calculated based on 3 indicators: 1) reported confirmed cases of Coronavirus; 2) reported reduction, suspension and cancellation of flights following the Coronavirus outbreak; and 3) imposed travel ban to and from China and entry restrictions against Chinese. A high risk is tagged in the presence of the indicator in countries. Each indicator is given an equal weight of 0.33, with the highest possible index score of 1. Refer to raw data and sources in Appendices 1 and 2.

We then examine which countries are most exposed to Coronavirus through economic channels (see Figure 5). As explained above, this consists of direct links with China and the wider world

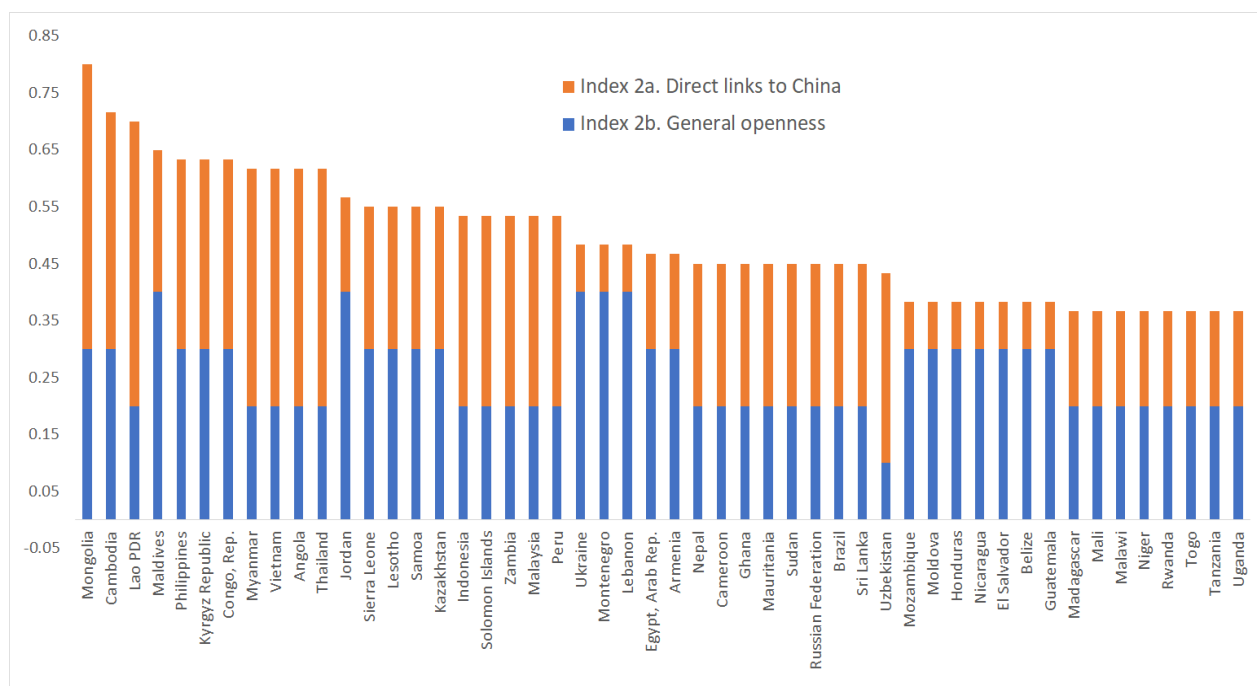
more generally. This clearly shows that Mongolia, Cambodia and Laos, followed by other, mostly Asian, countries (e.g. Myanmar, the Philippines and Vietnam), are the most affected. African countries follow, including Angola, Republic of Congo, Sierra Leone, Lesotho and Zambia. This is because these countries have more intense trade and investment relationships with China.

Figure 6 shows that five countries are least well placed to do something about the crisis (Ethiopia, Laos, Pakistan, Ghana and Sudan). This is because they have fewer reserves or fiscal resources to counter the effects of the virus and because their health systems do not provide sufficient quality and access.

Figure 7 brings together Figures 4–6 and presents an overall vulnerability index. This is calculated based on the aggregation of indices 1, 2 and 3, with the highest possible score of 3. It uses 20 indicators for the direct economic impact of the Coronavirus outbreak, the direct and indirect exposure to China and the economic resilience of 97 countries, of which 18 are low-income countries, 37 are lower-middle-income countries and 42 are middle-upper-income countries. Raw data and sources are available from Appendices 1 and 2.

Vietnam, Sri Lanka and Philippines, followed by Kazakhstan, Cambodia, Kenya, Malaysia and Nepal, are the most vulnerable to Coronavirus because they are most exposed to China and least well placed to address the impacts.

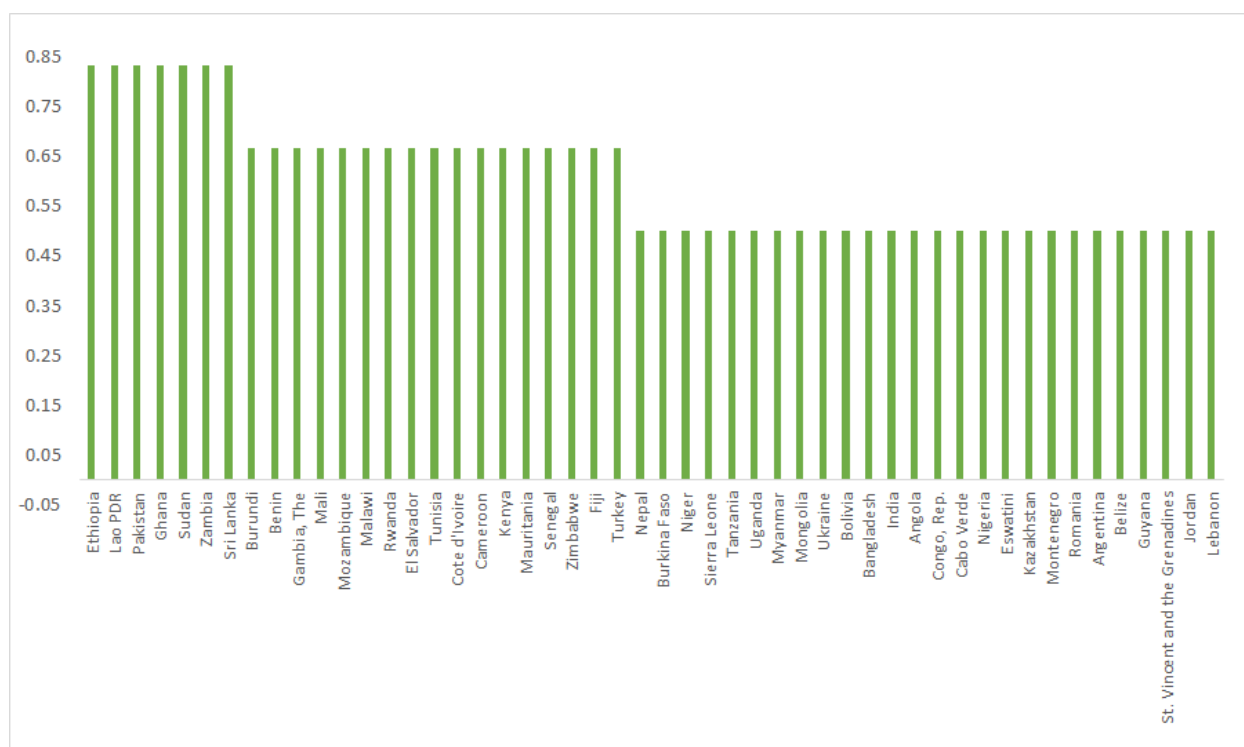
Figure 5: Countries with the greatest exposure to a China slowdown directly or indirectly



Source: Own elaboration

Notes: The calculation of sub-index 2a is based on the following six indicators: export of goods to China/total country export goods (%); import of goods from China/total country import goods (%); total trade (exports+imports) with China/country's total trade with the world (%); total trade with China/GDP (%); China outward FDI stock in country/GDP (%); and Chinese tourist arrivals/total tourist arrivals in country. A high risk is tagged if an indicator exceeds 10%. Each indicator is given an equal weight of 0.17, with the highest possible sub-index score of 1. Meanwhile, sub-index 2b is calculated based on five indicators: exports of goods and services/GDP (%); FDI inflows/GDP (%); personal remittances received/GDP (%); migrants/population (%); international tourism receipts/total exports (%). Each indicator is given an equal weight of 0.20 with the highest possible sub-index score of 1. Index 2 is an aggregate of indices 2a and 2b, with the sub-indices given equal weight of 0.50. Refer to raw data and sources in Appendices 1 and 2.

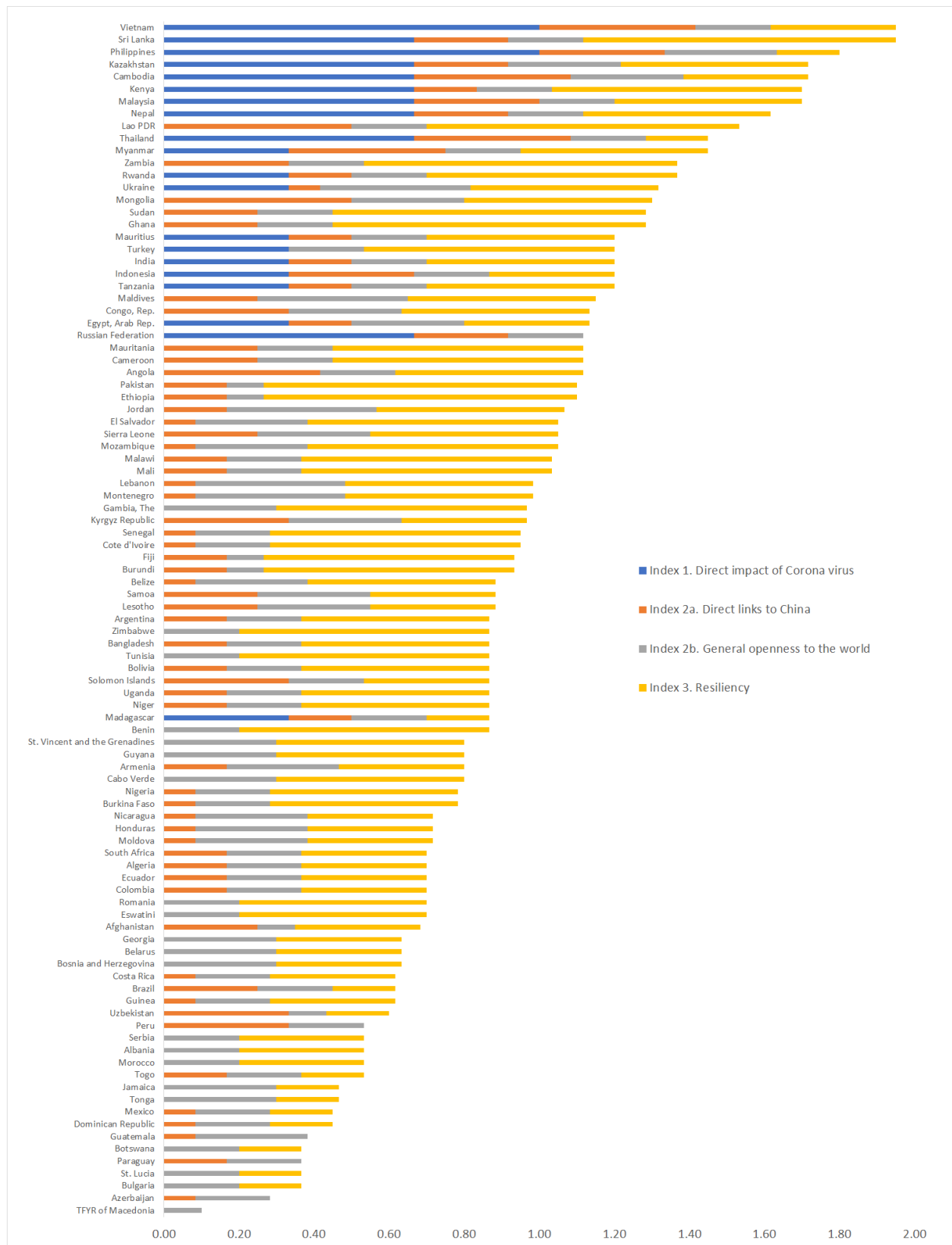
Figure 6: Which countries are least resilient (i.e. may confront challenges to doing something about the impacts)



Source: Own elaboration

Notes: Index 3 is calculated based on six indicators, which are tagged to be at high risk if these exceed a certain threshold: fiscal balance/GDP (%) that is less than -2%; current account balance/GDP (%) that is less than -3%; foreign currency reserves at less than 3 months worth of import cover; external debt/GDP (%) that exceeds 50%; expenditure on health/GDP (%) that is less than 5%; and health care access and quality index score that is less than 50. Each indicator is given an equal weight of 0.17, with the highest possible sub-index score of 1. Meanwhile, sub-index 2b is calculated based on five indicators: exports of goods and services/GDP (%); FDI inflows/GDP (%); personal remittances received/GDP (%); migrants/population (%); international tourism receipts/total exports (%). Each indicator is given an equal weight of 0.16, with the highest possible index score of 1. A higher index score indicates a weaker resiliency. Refer to raw data and sources in Appendices 1 and 2.

Figure 7: Which countries are most exposed to a China slowdown directly or indirectly



Source: Own elaboration

6 POSSIBLE ECONOMIC IMPACTS ON CHINA AND OTHER COUNTRIES

Beyond computing vulnerabilities to the global pandemic and the economic slowdown in China, we also discuss estimated impacts. We focus first on the impact on China and the world economy and then provide some new estimates of possible impacts on low- and middle-income countries. We recognise that the use of more sophisticated modelling could help make these estimations more precise; this will need to be done at a later stage.

6.1 Impacts on China and the world economy

A number of organisations and individuals have estimated the possible impact on China and the world economy. Assuming the epidemic is under control by early April, Shang-Jin Wei (former Chief Economist of the Asian Development Bank) suggests the effects on Chinese GDP growth rate in 2020 are likely to be small, perhaps leading to a decline in the order of 0.1 percentage point. He suggests the effects in the first quarter of 2020 will be big, perhaps lowering growth by 1 percentage point on an annualised basis, but this will be substantially offset by above-trend growth during the rest of the year. This will affect US and EU growth by 0.02 percentage points and Australia by 0.04 percentage points. He argues it is too early to panic from an economic point of view. However, much will depend on whether the virus can be contained and what measures are needed to do so. So far, measures appear to be stricter and faster than under SARS.

Analysts at Nomura believe Chinese GDP could fall by an annualised 2% this quarter. This would be a hit worth \$62 billion this quarter, affecting migrants working in particular (He, 2020). Many of China's 290 million migrant workers travel from rural areas to the cities to take construction and manufacturing jobs or low quality services jobs. This will now be difficult especially for the 10 million migrant workers from Hubei province.

Xu Gao, Chief Economist at Bank of China International (China), argues that the epidemic may drag down year-on-year GDP growth for the first quarter by about 1 percentage point and cost full-year growth around 0.2 percentage points, contingent on effective policy measures to combat the epidemic (Li, 2020).

Goldman Sachs suggests world growth will be lower by some 0.3% if the infection rates do not peak until the second quarter of 2020.⁸ The IMF suggests that SARS had limited impacts in part because China represented only 4% of the world economy in 2003, not 18% as it does now. A more than four-fold increase in the share of China may lead to a global impact that is closer to 0.4% now. This would amount to some \$360–400 billion. As the virus is different, as are the responses to the crisis, the impacts will also be different this time. Exactly how the effects will differ remains to be seen; more analysis is required.

The China of 2003 and that of 2020 are very different, and not just in size. China is much more integrated now into regional and global economic systems. While China is the largest recipient of FDI among developing economies, its outward direct investments were small before the mid-2000s but grew fast afterwards, until they exceeded inward direct investment in 2015. The share of Chinese tourists has also more than doubled and is now close to 10%. In 2003, there was no high-speed railway connecting provinces.

8 <https://www.ft.com/content/eb6a7d40-4691-11ea-ae2-9ddbdc86190d>

6.2 Impacts on low- and middle-income countries

A range of studies suggest a growth shock in China will have significant spillover effects. In 1990, a one percentage point decline in growth used to affect growth in other countries by only 0.06%; this had risen to some 0.25% in 2015 (Furceri et al., 2016). The impact will be greater in Asia and Africa than in Europe or Latin America. Drummond and Liu find that a 1 percentage point decline in Chinese GDP lowers sub-Saharan African export growth by 0.6%.

We estimate the impacts of a slowdown on the value of bilateral trade in goods and services (for data sources see Appendix 1) by assuming that a 1% slowdown in the Chinese economy will lower the demand for goods and services by 1% (income elasticity of 1) and tourism services by 2% (income elasticity of 2). Exports of goods and tourism services would fall by \$5 billion in low- and middle-income countries and about \$0.5 billion in sub-Saharan Africa.

Table 2: Loss in exports of goods (\$ billion) to China if Chinese growth falls by 1%

Country income status	All regions	Sub-Saharan Africa	Middle East and North Africa	East Asia Pacific	South Asia	Latin America and Caribbean	Europe and Central Asia
Low-	0.01	0.01	0.00		0.00	-	-
Lower-middle-	1.43	0.32	0.01	0.86	0.19	0.01	0.04
Upper-middle-	2.47	0.09	0.10	0.65	0.00	0.95	0.68
Low- and middle-	3.91	0.42	0.11	1.50	0.19	0.95	0.73

Table 3: Loss in tourism receipts (\$ billion) from China if Chinese growth falls by 1%

Country income status	All regions	Sub-Saharan Africa	Middle East and North Africa	East Asia Pacific	South Asia	Latin America and Caribbean	Europe and Central Asia
Low-	0.006	0.004	0.000	-	0.002	-	0.000
Lower-middle-	0.177	0.008	0.002	0.158	0.009	0.000	0.000
Upper-middle-	0.440	0.004	0.001	0.376	0.026	0.007	0.025
Low- and middle-	0.623	0.016	0.003	0.535	0.036	0.007	0.025

There is a further effect through commodity prices. As we noticed previously, copper prices are down by 7% and oil prices are down by 20% since the outbreak of Coronavirus started. This will lower the value of exports of much of Africa, as countries such as Angola, Nigeria and Zambia are major trade exporters. The impacts can be large, as the value of exports to other destinations will also be lower through lower global commodity prices. At the same time, there will be gainers for net commodity/oil importers when commodity prices decrease. This needs more detailed attention and specific analysis of specific commodities.

Table 4 shows the losses in the value of net oil exports of a decline in oil prices. We assume the decline is 5% over the year (which is equivalent to 20% this quarter alone). There are negative impacts on sub-Saharan African worth \$3 billion but there are gains for net oil-importing regions such as South Asia and South East Asia. Central Asian countries are also losers.

Table 4 Loss in the value of net oil exports (\$ billion) following a 5% decline in oil prices

Country income status	All regions	Sub-Saharan Africa	Middle East and North Africa	East Asia Pacific	South Asia	Latin America and Caribbean	Europe and Central Asia
Low-	-0.52	-0.43	0.08		-0.16		
Lower-middle-	-7.00	3.98	-0.85	-0.50	-8.91	-0.11	-0.61
Upper-middle-	0.91	-0.50	4.93	-16.30	-0.17	-0.18	13.13
Low- and middle-	-6.61	3.05	4.16	-16.80	-9.25	-0.29	12.52

7 POLICY IMPLICATIONS

Countries are beginning to be concerned about the economic impact of both the virus and the measures (e.g. flights cancellations) taken to address its spread. This section scopes initial policy reactions and will need to be updated the further we are into the outbreak.

7.1 Health measures to contain the virus in China and other countries

After an initial period of lack of information, China has now taken drastic measures trying to contain the virus. Cities are under lock-down and travel is heavily restricted. The country has built two new hospitals in little over a week. Other countries are supporting some of these actions. For example, a South African manufacturer has donated masks to China. Several countries have evacuated their nationals. Many countries are developing a vaccine for the virus.

Are low-income or African countries prepared for the health impacts? Airlines are cutting flights to China but not all of them (e.g. Ethiopian Airlines). A Center for Global Development blog suggests that none of the African countries are prepared to respond to such outbreaks (Glassman, 2020). Low-income countries may be worse prepared to address the health impacts because of (i) poor health and nutrition at the outset and poor quality of health care; (ii) resource constraints; (iii) low influenza vaccination rates; and (iv) vulnerable supply chains.

7.2 Measures to contain economic impacts in China and other countries

Short-term economic measures to stabilise markets include fiscal, monetary and financial measures. For example, China is planning a liquidity boost of some \$173 billion. China has also reduced its one and two week repo rates by 10 basis points.

Some countries fear losing access to Chinese markets. For example, Cambodia and Ethiopia have both announced that they will keep flights going. This strategy carries a risk in terms of health impacts at this stage compared with for the countries that have banned flights. It may, on the other hand, avoid the worst of the economic slowdown (e.g. through impacts on tourism). The Cambodian prime minister has said that cancelling flights to and from China is out of the question as it will 'kill the hospitality and service industry in Cambodia' (Ng, 2020).

Other countries need to monitor the impacts. As China has begun to play a major role in their economies (through, for example, the Belt and Road initiative), shocks will also be felt harder now compared with previous shocks.

There could also be temporary winners in economic terms. China will produce less this quarter. Those countries to take its place may gain temporarily. Wuhan/China plays a major role in some of the largest supply chains, such as that of electronics.

Global attention has begun to focus on impacts. In a statement, the World Bank Group has stated that it is 'monitoring the wider economic and social impacts of this crisis. We support China's efforts to respond including its efforts to maintain resilience in its economy. We recognize that it is the poorest countries and most vulnerable populations that are often hardest hit by global disruptions like these' (World Bank, 2020).

8 CONCLUSIONS AND SUGGESTIONS

This paper has examined the economic vulnerability of countries to the recent outbreak of Coronavirus. We argue that, while the SARS virus in 2003 had a limited effect on global growth of around 0.1%, or \$50–100 billion, Coronavirus is different in spread (faster), mortality rates (lower) and measures taken (more and faster). It is too early to tell the impact, but it seems prudent to expect a larger economic of at least around \$360 billion this time.

The main contribution of this paper lies in its development of an index to examine which countries are most vulnerable to virus outbreak and an economic slowdown in China. We quantify the vulnerability of low- and middle-income countries based on impact channels. Some countries are affected by Coronavirus most directly in terms of an already visible direct health impact and direct flight cancellations. These include the Philippines and Vietnam, followed by a range of mainly Asian countries that have recorded infected cases. Some African countries are also included as they have cancelled flights.

Meanwhile, countries most exposed to Coronavirus through economic channels include Mongolia, Cambodia and Laos, followed by other, mostly Asian, countries (e.g. Myanmar, Philippines and Vietnam). African countries most exposed in this way include Angola, Republic of Congo, Sierra Leone, Lesotho and Zambia. The least resilient countries in our sample are Ethiopia, Laos, Pakistan, Ghana and Sudan.

Taking these indicators together, we present an overall vulnerability index. Sri Lanka, the Philippines and Vietnam, followed by Kazakhstan, Kenya, Cambodia and Nepal, top this index as the most vulnerable countries in economic terms.

To address the impacts, countries need to implement a range of health-related policies to contain the spread of the virus. In addition, in economic terms, China has already begun to address economic weaknesses. Other countries need to be aware of the potential fall-out, especially this quarter. Some countries are much more exposed to China than others, but most, if not all, are much more exposed than when a health pandemic struck in 2003.

REFERENCES

Anderson, D., Canales Kriljenko, J.I., Drummond, P., Espaillet, P. and Muir, D. (2015) *Spillovers from China onto sub-Saharan Africa: insights from the Flexible System of Global Models (FSGM)*. Working Paper WP/15/221. Washington DC: IMF

Durden, T. (2020) 'Oil crashes into bear market as Chinese oil demand said to plummet 20% due to coronavirus "demand shock"', ZeroHedge, 2 February, <https://www.zerohedge.com/energy/oil-crashes-bear-market-chinese-oil-demand-said-plummet-20-due-coronavirus-demand-shock>

Financial Times, various articles referenced directly.

Furceri, D., Tovar Jalles, J. and Zdzienicka, A. (2016) 'China spillovers: new evidence from time-varying estimates'. Spillover Note 7. Washington DC: IMF

Glassman, A. (2020) 'Coronavirus and low-income countries: ready to respond?', CGD Blog, 31 January, <https://www.cgdev.org/blog/coronavirus-and-low-income-countries-ready-respond>

He, L. (2020) 'The coronavirus could cost China's economy \$60 billion this quarter. Beijing will have to act fast to avert a bigger hit,' CNN Business, 31 January, <https://edition.cnn.com/2020/01/31/economy/china-economy-coronavirus/index.html>

Hobson, P. (2020) 'Metals-shanghai copper plunges to 3-year low as Chinese markets reopen', Reuters, 3 February, <https://uk.reuters.com/article/global-metals/metals-shanghai-copper-plunges-to-3-year-as-chinese-markets-reopen-idukl8n2a33bd>

Kawanami, T. (2020) 'Coronavirus risks dampening global growth: IMF chief', Nikkei Asian Review, 2 February, <https://asia.nikkei.com/Spotlight/Coronavirus-outbreak/Coronavirus-risks-dampening-global-growth-IMF-chief>

Lee, J.W. and McKibbin, W.J. (2004) 'Estimating the global economic costs of SARS', in S. Knobler et al. *Institute of Medicine (US) Forum on Microbial Threats: Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary*. Washington DC: National Academies Press

Ng, K. (2020) 'Coronavirus: Cambodia refuses to evacuate citizens from China as "we need to share their happiness and pain"', Independent, 2 February, <https://www.independent.co.uk/news/world/asia/coronavirus-cambodia-china-evacuation-hun-sen-a9312616.html>

Salaam-Blyther, T. (2011) *U. S. and international responses to the global spread of Avian Flu: issues for Congress*. Washington DC: DIANE Publishing

Sawlani, S. (2020) 'How prepared is Africa for an outbreak of deadly coronavirus?' Al Jazeera, 1 February <https://www.aljazeera.com/news/2020/02/prepared-africa-outbreak-deadly-coronavirus-200201082717976.html>

Wei, S.J. (2020) 'Will the coronavirus cause a major growth slowdown in China?' Project Syndicate, 27 January, <https://www.project-syndicate.org/commentary/china-coronavirus-three-factors-limit-economic-impact-by-shang-jin-wei-2020-01>

World Bank (2020) 'Statement on the novel coronavirus in China—February 3, 2020'. <https://www.worldbank.org/en/news/statement/2020/02/03/statement-on-the-novel-coronavirus-in-china-february-3-2020>

APPENDICES

Appendix 1. Data used in constructing the indicators

Country	Income level	Region	Index 1: Direct economic impact of the virus		
			Confirmed cases of Corona Virus outside mainland China as of 2 Feb 2020	Reported reduction, cancellation, and suspension of flights of key air carriers to/from China	Government imposed travel ban and/or entry or visa restrictions
			Risk threshold (T): At least 1 reported confirmed case	T: At least 1 report	T: At least 1 report
Vietnam	LMIC	East Asia & Pacific	7	Cancelled flights	Travel ban
Sri Lanka	UMIC	South Asia	1	0	Halted visa
Philippines	LMIC	East Asia & Pacific	2	Cancelled flights	Travel ban,
Cambodia	LMIC	East Asia & Pacific	1	Cancelled flights	0
Kazakhstan	UMIC	Europe & Central Asia	0	Cancelled flights	Travel ban,
Kenya	LMIC	Sub-Saharan Africa	0	Cancelled flights	0
Malaysia	UMIC	East Asia & Pacific	8	0	Halted visa
Nepal	LIC	South Asia	1	Reduced flights	0
Lao PDR	LMIC	East Asia & Pacific	0	0	0
Myanmar	LMIC	East Asia & Pacific	0	Cancelled flights	0
Thailand	UMIC	East Asia & Pacific	19	Cancelled flights	0
Zambia	LMIC	Sub-Saharan Africa	0	0	0
Rwanda	LIC	Sub-Saharan Africa	0	Cancelled flights	0
Ukraine	LMIC	Europe & Central Asia	0	Cancelled flights	0
Mongolia	LMIC	East Asia & Pacific	0	0	0
Ghana	LMIC	Sub-Saharan Africa	0	0	0
Sudan	LMIC	Sub-Saharan Africa	0	0	0
Tanzania	LIC	Sub-Saharan Africa	0	Cancelled planned	0
Indonesia	LMIC	East Asia & Pacific	0	Cancelled flights	0
India	LMIC	South Asia	2	Reduced flights	0
Turkey	UMIC	Europe & Central Asia	0	Reduced flights	0
Mauritius	UMIC	Sub-Saharan Africa	0	Cancelled flights	0
Maldives	UMIC	South Asia	0	0	0
Egypt, Arab Rep.	LMIC	Middle East & North Africa	0	Cancelled flights	0
Congo, Rep.	LMIC	Sub-Saharan Africa	0	0	0
Angola	LMIC	Sub-Saharan Africa	0	0	0
Cameroon	LMIC	Sub-Saharan Africa	0	0	0
Mauritania	LMIC	Sub-Saharan Africa	0	0	0
Russian	UMIC	Europe & Central Asia	2	Cancelled flights	0
Ethiopia	LIC	Sub-Saharan Africa	0	0	0
Pakistan	LMIC	South Asia	0	0	0
Jordan	UMIC	Middle East & North Africa	0	0	0
Mozambique	LIC	Sub-Saharan Africa	0	0	0
Sierra Leone	LIC	Sub-Saharan Africa	0	0	0
El Salvador	LMIC	Latin America & Caribbean	0	0	0
Mali	LIC	Sub-Saharan Africa	0	0	0
Malawi	LIC	Sub-Saharan Africa	0	0	0
Montenegro	UMIC	Europe & Central Asia	0	0	0
Lebanon	UMIC	Middle East & North Africa	0	0	0
Gambia, The	LIC	Sub-Saharan Africa	0	0	0
Kyrgyz Republic	LMIC	Europe & Central Asia	0	0	0
Cote d'Ivoire	LMIC	Sub-Saharan Africa	0	0	0
Senegal	LMIC	Sub-Saharan Africa	0	0	0
Burundi	LIC	Sub-Saharan Africa	0	0	0
Fiji	UMIC	East Asia & Pacific	0	0	0
Lesotho	LMIC	Sub-Saharan Africa	0	0	0
Samoa	UMIC	East Asia & Pacific	0	0	0
Belize	UMIC	Latin America & Caribbean	0	0	0
Benin	LIC	Sub-Saharan Africa	0	0	0
Madagascar	LIC	Sub-Saharan Africa	0	Cancelled flights	0

Country	Income level	Region	Index 1: Direct economic impact of the virus		
			Confirmed cases of Corona Virus outside mainland China as of 2 Feb 2020	Reported reduction, cancellation, and suspension of flights of key air carriers to/from China	Government imposed travel ban and/or entry or visa restrictions
			Risk threshold (T): At least 1 reported confirmed case	T: At least 1 report	T: At least 1 report
Niger	LIC	Sub-Saharan Africa	0	0	0
Uganda	LIC	Sub-Saharan Africa	0	0	0
Solomon Islands	LMIC	East Asia & Pacific	0	0	0
Bolivia	LMIC	Latin America & Caribbean	0	0	0
Tunisia	LMIC	Middle East & North Africa	0	0	0
Bangladesh	LMIC	South Asia	0	0	0
Zimbabwe	LMIC	Sub-Saharan Africa	0	0	0
Argentina	UMIC	Latin America & Caribbean	0	0	0
Cabo Verde	LMIC	Sub-Saharan Africa	0	0	0
Armenia	UMIC	Europe & Central Asia	0	0	0
Guyana	UMIC	Latin America & Caribbean	0	0	0
St. Vincent and the Grenadines	UMIC	Latin America & Caribbean	0	0	0
Burkina Faso	LIC	Sub-Saharan Africa	0	0	0
Nigeria	LMIC	Sub-Saharan Africa	0	0	0
Moldova	LMIC	Europe & Central Asia	0	0	0
Honduras	LMIC	Latin America & Caribbean	0	0	0
Nicaragua	LMIC	Latin America & Caribbean	0	0	0
Eswatini	LMIC	Sub-Saharan Africa	0	0	0
Romania	UMIC	Europe & Central Asia	0	0	0
Colombia	UMIC	Latin America & Caribbean	0	0	0
Ecuador	UMIC	Latin America & Caribbean	0	0	0
Algeria	UMIC	Middle East & North Africa	0	0	0
South Africa	UMIC	Sub-Saharan Africa	0	0	0
Afghanistan	LIC	South Asia	0	0	0
Bosnia and Herzegovina	UMIC	Europe & Central Asia	0	0	0
Belarus	UMIC	Europe & Central Asia	0	0	0
Georgia	UMIC	Europe & Central Asia	0	0	0
Guinea	LIC	Sub-Saharan Africa	0	0	0
Brazil	UMIC	Latin America & Caribbean	0	0	0
Costa Rica	UMIC	Latin America & Caribbean	0	0	0
Uzbekistan	LMIC	Europe & Central Asia	0	0	0
Togo	LIC	Sub-Saharan Africa	0	0	0
Morocco	LMIC	Middle East & North Africa	0	0	0
Albania	UMIC	Europe & Central Asia	0	0	0
Serbia	UMIC	Europe & Central Asia	0	0	0
Peru	UMIC	Latin America & Caribbean	0	0	0
Tonga	UMIC	East Asia & Pacific	0	0	0
Jamaica	UMIC	Latin America & Caribbean	0	0	0
Dominican Republic	UMIC	Latin America & Caribbean	0	0	0
Mexico	UMIC	Latin America & Caribbean	0	0	0
Guatemala	UMIC	Latin America & Caribbean	0	0	0
Bulgaria	UMIC	Europe & Central Asia	0	0	0
St. Lucia	UMIC	Latin America & Caribbean	0	0	0
Paraguay	UMIC	Latin America & Caribbean	0	0	0
Botswana	UMIC	Sub-Saharan Africa	0	0	0
Azerbaijan	UMIC	Europe & Central Asia	0	0	0
TFYR of North Macedonia	UMIC	Europe & Central Asia	0	0	0

Country	Income level	Region	Index 2a. Direct economic links with China					
			Export goods to China/total country export goods	Import goods from China/total country import goods	Total trade (imports+ exports) with China/ country's total trade to the world	Total trade with China in % of GDP	China outward FDI stock in % of GDP	Chinese tourist arrivals in % of total tourist arrivals
			T: > 10%	T: > 10%	T: > 10%	T: > 10%	T: > 10%	T: > 10%
Vietnam	LMIC	East Asia & Pacific	16.45	27.45	21.93	42.62	2.25	31.02
Sri Lanka	UMIC	South Asia	3.64	19.65	14.07	5.23	0.83	12.70
Philippines	LMIC	East Asia & Pacific	12.89	19.63	17.14	9.45	0.26	14.63
Cambodia	LMIC	East Asia & Pacific	6.05	36.79	23.00	25.75	24.56	21.61
Kazakhstan	UMIC	Europe & Central Asia	10.32	16.00	12.34	6.76	4.64	1.23
Kenya	LMIC	Sub-Saharan Africa	1.94	21.07	16.57	4.28	1.96	0.00
Malaysia	UMIC	East Asia & Pacific	13.91	19.93	16.73	21.68	1.54	8.79
Nepal	LIC	South Asia	3.01	12.63	11.97	5.12	0.90	11.13
Lao PDR	LMIC	East Asia & Pacific	36.12	18.24	25.96	11.80	38.99	19.62
Myanmar	LMIC	East Asia & Pacific	33.35	32.17	32.72	17.16	9.00	28.95
Thailand	UMIC	East Asia & Pacific	11.95	20.31	16.08	15.86	1.18	27.55
Zambia	LMIC	Sub-Saharan Africa	14.45	13.64	14.04	9.72	11.46	2.45
Rwanda	LIC	Sub-Saharan Africa	1.18	21.24	17.52	4.48	1.09	0.62
Ukraine	LMIC	Europe & Central Asia	4.65	13.30	9.38	7.50	0.06	0.21
Mongolia	LMIC	East Asia & Pacific	92.78	33.51	65.76	65.14	31.71	30.38
Ghana	LMIC	Sub-Saharan Africa	11.88	19.13	14.85	6.57	2.67	0.00
Sudan	LMIC	Sub-Saharan Africa	17.32	22.00	20.63	6.52	2.62	0.00
Tanzania	LIC	Sub-Saharan Africa	3.94	20.70	15.67	3.37	2.41	2.27
Indonesia	LMIC	East Asia & Pacific	15.05	24.14	19.70	7.11	1.04	14.91
India	LMIC	South Asia	5.08	14.63	11.36	3.93	0.18	1.59
Turkey	UMIC	Europe & Central Asia	1.73	9.29	6.04	3.06	0.15	0.65
Mauritius	UMIC	Sub-Saharan Africa	1.73	16.51	12.67	6.83	7.25	5.44
Maldives	UMIC	South Asia	0.15	16.49	15.55	9.17	1.39	22.05
Egypt, Arab Rep.	LMIC	Middle East & North Africa	3.54	14.22	11.38	5.03	0.35	0.00
Congo, Rep.	LMIC	Sub-Saharan Africa	33.89	6.49	24.07	34.23	12.61	0.00
Angola	LMIC	Sub-Saharan Africa	58.92	14.11	45.36	23.14	1.85	10.58
Cameroon	LMIC	Sub-Saharan Africa	12.09	17.22	15.24	7.36	1.21	0.00
Mauritania	LMIC	Sub-Saharan Africa	35.10	4.60	15.61	17.47	4.79	0.00
Russian Federation	UMIC	Europe & Central Asia	12.41	21.74	15.65	6.53	0.88	6.06
Ethiopia	LIC	Sub-Saharan Africa	2.87	31.88	29.76	8.66	2.61	4.86
Pakistan	LMIC	South Asia	7.52	24.17	19.49	5.16	1.88	0.00
Jordan	UMIC	Middle East & North Africa	1.59	13.62	10.68	6.79	0.16	0.61
Mozambique	LIC	Sub-Saharan Africa	5.81	11.78	9.19	7.65	6.94	0.00
Sierra Leone	LIC	Sub-Saharan Africa	21.22	16.78	17.03	5.19	4.94	2.96
El Salvador	LMIC	Latin America & Caribbean	1.45	14.02	9.84	6.69	0.00	0.22
Mali	LIC	Sub-Saharan Africa	0.97	15.22	10.87	4.41	2.57	2.02
Malawi	LIC	Sub-Saharan Africa	4.70	14.68	12.11	6.67	4.67	0.00
Montenegro	UMIC	Europe & Central Asia	3.56	10.07	9.20	5.84	0.81	1.25
Lebanon	UMIC	Middle East & North Africa	0.75	10.26	9.03	3.67	0.00	0.42
Gambia, The	LIC	Sub-Saharan Africa	5.19	6.66	8.21	3.13	0.36	0.00
Kyrgyz Republic	LMIC	Europe & Central Asia	3.34	36.70	28.11	24.76	16.87	0.76
Cote d'Ivoire	LMIC	Sub-Saharan Africa	1.51	14.96	7.98	4.23	0.80	0.00
Senegal	LMIC	Sub-Saharan Africa	3.18	11.10	8.65	4.30	1.02	0.00
Burundi	LIC	Sub-Saharan Africa	3.37	12.97	11.36	3.15	0.30	0.00
Fiji	UMIC	East Asia & Pacific	4.68	16.32	14.30	8.52	2.92	5.79
Lesotho	LMIC	Sub-Saharan Africa	0.00	14.84	11.19	11.45	0.24	0.69
Samoa	UMIC	East Asia & Pacific	1.21	11.89	10.69	5.07	74.62	1.82
Belize	UMIC	Latin America & Caribbean	0.08	12.01	9.97	5.98	0.04	0.00
Benin	LIC	Sub-Saharan Africa	5.73	7.77	7.36	2.11	0.82	3.67
Madagascar	LIC	Sub-Saharan Africa	4.54	20.18	13.44	7.98	6.68	1.21
Niger	LIC	Sub-Saharan Africa	5.34	16.17	12.57	4.61	8.18	0.00
Uganda	LIC	Sub-Saharan Africa	1.04	17.60	12.39	4.33	2.18	1.20
Solomon Islands	LMIC	East Asia & Pacific	66.96	14.87	40.17	34.09	0.00	4.73
Bolivia	LMIC	Latin America & Caribbean	5.11	20.66	13.32	6.24	1.09	0.00
Tunisia	LMIC	Middle East & North Africa	0.22	8.98	5.40	4.73	0.04	0.25
Bangladesh	LMIC	South Asia	2.25	21.53	13.87	5.31	0.13	0.00

Country	Income level	Region	Index 2a. Direct economic links with China					
			Export goods to China/total country export goods	Import goods from China/total country import goods	Total trade (imports+ exports) with China/ country's total trade to the world	Total trade with China in % of GDP	China outward FDI stock in countries in % of GDP	Chinese tourist arrivals in % of total tourist arrivals
			T: > 10%	T: > 10%	T: > 10%	T: > 10%	T: > 10%	T: > 10%
Zimbabwe	LMIC	Sub-Saharan Africa	0.89	5.71	3.82	1.87	7.99	0.00
Argentina	UMIC	Latin America & Caribbean	6.84	18.46	12.82	3.13	0.24	0.89
Cabo Verde	LMIC	Sub-Saharan Africa	0.62	5.80	5.36	2.41	0.83	0.00
Armenia	UMIC	Europe & Central Asia	4.48	13.65	10.81	6.10	0.26	0.38
Guyana	UMIC	Latin America & Caribbean	1.49	5.50	4.43	6.20	3.07	0.00
St. Vincent and the Grenadines	UMIC	Latin America & Caribbean	0.00	6.77	5.23	2.42	5.41	0.00
Burkina Faso	LIC	Sub-Saharan Africa	0.40	12.65	7.34	3.94	0.00	1.29
Nigeria	LMIC	Sub-Saharan Africa	1.67	19.41	8.91	2.36	0.76	11.01
Moldova	LMIC	Europe & Central Asia	0.75	10.43	8.08	5.43	0.04	0.81
Honduras	LMIC	Latin America & Caribbean	0.75	15.05	9.82	5.77	0.01	0.00
Nicaragua	LMIC	Latin America & Caribbean	1.35	13.24	8.42	7.94	0.02	0.04
Eswatini	LMIC	Sub-Saharan Africa	0.03	6.58	3.12	2.39	0.00	0.29
Romania	UMIC	Europe & Central Asia	1.10	5.32	3.42	2.54	0.15	0.33
Colombia	UMIC	Latin America & Caribbean	9.70	20.58	15.69	4.41	0.11	0.35
Ecuador	UMIC	Latin America & Caribbean	6.92	18.91	13.10	5.39	0.99	1.87
Algeria	UMIC	Middle East & North Africa	1.97	18.06	11.09	5.38	1.10	1.63
South Africa	UMIC	Sub-Saharan Africa	9.14	18.51	13.79	6.96	2.14	0.94
Afghanistan	LIC	South Asia	3.25	15.74	14.42	12.17	1.99	0.00
Bosnia and Herzegovina	UMIC	Europe & Central Asia	0.31	6.95	4.41	4.12	0.02	3.44
Belarus	UMIC	Europe & Central Asia	1.41	7.84	4.84	5.85	1.00	0.03
Georgia	UMIC	Europe & Central Asia	8.19	9.13	8.95	6.27	3.77	0.28
Guinea	LIC	Sub-Saharan Africa	1.77	14.93	9.35	3.95	0.74	8.34
Brazil	UMIC	Latin America & Caribbean	26.76	19.98	23.91	5.30	0.16	0.93
Costa Rica	UMIC	Latin America & Caribbean	1.77	13.71	8.88	4.08	0.04	0.46
Uzbekistan	LMIC	Europe & Central Asia	19.90	20.46	20.24	11.21	1.63	0.56
Togo	LIC	Sub-Saharan Africa	2.04	19.63	14.68	6.87	2.35	1.04
Morocco	LMIC	Middle East & North Africa	0.92	9.83	6.59	4.48	0.29	0.95
Albania	UMIC	Africa	1.83	8.39	6.25	3.66	0.04	0.23
Serbia	UMIC	Europe & Central Asia	0.48	8.37	5.01	4.47	0.39	0.00
Peru	UMIC	Latin America & Caribbean	27.64	23.33	25.60	10.34	0.39	0.78
Tonga	UMIC	Caribbean	0.14	7.52	7.39	3.69	2.03	2.56
Jamaica	UMIC	East Asia & Pacific	1.44	6.27	5.42	2.59	7.54	0.17
Dominican Republic	UMIC	Latin America & Caribbean	0.97	13.20	9.39	3.33	0.00	0.04
Mexico	UMIC	Latin America & Caribbean	1.60	17.99	9.91	7.42	0.08	0.36
Guatemala	UMIC	Latin America & Caribbean	0.55	10.72	6.91	2.69	0.00	0.00
Bulgaria	UMIC	Europe & Central Asia	2.67	4.10	3.43	3.77	0.43	0.32
St. Lucia	UMIC	Latin America & Caribbean	1.29	2.22	2.06	0.91	0.26	0.00
Paraguay	UMIC	Latin America & Caribbean	0.29	28.23	16.94	9.06	0.12	0.04
Botswana	UMIC	Sub-Saharan Africa	0.00	1.78	0.86	0.59	1.71	0.15
Azerbaijan	UMIC	Europe & Central Asia	0.58	10.44	4.24	2.79	0.07	0.42
TFYR of Macedonia	UMIC	Europe & Central Asia	0.94	5.78	3.69	4.64	0.02	0.00

Country	Income level	Region	Index 2b. General economic openness				
			FDI inflows, in % of GDP	Exports of goods and services in % of GDP	Personal remittances received in % of GDP	Migrants in % of population	International tourism, receipts in % of total exports
			T: > 10%	T: > 10%	T: > 10%	T: > 10%	T: > 10%
Vietnam	LMIC	East Asia & Pacific	6.32	105.83	6.50	0.08	3.90
Sri Lanka	UMIC	South Asia	1.81	22.78	7.92	0.19	26.63
Philippines	LMIC	East Asia & Pacific	2.96	31.68	10.22	0.21	9.64
Cambodia	LMIC	East Asia & Pacific	12.64	61.60	5.84	0.47	25.41
Kazakhstan	UMIC	Europe & Central Asia	0.12	37.53	0.34	20.12	3.70
Kenya	LMIC	Sub-Saharan Africa	1.85	13.18	3.09	2.35	14.98
Malaysia	UMIC	East Asia & Pacific	2.39	68.76	0.47	8.29	8.20
Nepal	LIC	South Asia	0.55	8.93	27.77	1.82	29.29
Lao PDR	LMIC	East Asia & Pacific	7.35	33.21	1.33	0.33	13.58
Myanmar	LMIC	East Asia & Pacific	1.81	19.96	3.99	0.14	16.69
Thailand	UMIC	East Asia & Pacific	2.62	66.82	1.48	5.76	20.40
Zambia	LMIC	Sub-Saharan Africa	1.53	37.42	0.40	0.79	7.19
Rwanda	LIC	Sub-Saharan Africa	3.21	17.37	2.74	3.80	31.11
Ukraine	LMIC	Europe & Central Asia	1.89	45.21	11.23	10.79	3.71
Mongolia	LMIC	East Asia & Pacific	14.94	58.66	3.37	0.60	6.79
Ghana	LMIC	Sub-Saharan Africa	4.56	35.26	5.80	1.46	4.50
Sudan	LMIC	Sub-Saharan Africa	2.78	10.25	1.04	1.25	17.50
Tanzania	LIC	Sub-Saharan Africa	1.90	15.14	0.74	0.49	27.33
Indonesia	LMIC	East Asia & Pacific	1.92	20.97	1.08	0.13	7.27
India	LMIC	South Asia	1.55	19.74	2.90	0.40	5.70
Turkey	UMIC	Europe & Central Asia	1.69	29.53	0.15	3.77	15.17
Mauritius	UMIC	Sub-Saharan Africa	2.61	40.66	1.72	2.25	37.19
Maldives	UMIC	South Asia	10.36	69.09	0.08	25.87	86.95
Egypt, Arab Rep.	LMIC	Middle East & North Africa	2.71	18.91	10.17	0.54	20.14
Congo, Rep.	LMIC	Sub-Saharan Africa	38.29	98.89	0.09	8.51	0.93
Angola	LMIC	Sub-Saharan Africa	-5.42	29.00	0.00	0.43	2.48
Cameroon	LMIC	Sub-Saharan Africa	1.81	19.31	0.89	1.64	8.30
Mauritania	LMIC	Sub-Saharan Africa	1.35	45.09		3.40	1.27
Russian Federation	UMIC	Europe & Central Asia	0.53	30.74	0.52	8.12	3.65
Ethiopia	LIC	Sub-Saharan Africa	3.92	8.37	0.49	1.08	37.71
Pakistan	LMIC	South Asia	0.75	8.79	6.74	1.92	3.03
Jordan	UMIC	Middle East & North Africa	2.25	35.64	10.58	40.98	38.81
Mozambique	LIC	Sub-Saharan Africa	18.20	47.76	2.01	0.80	3.05
Sierra Leone	LIC	Sub-Saharan Africa	14.66	17.47	1.25	1.41	4.39
El Salvador	LMIC	Latin America & Caribbean	1.64	28.91	20.68	0.69	16.98
Mali	LIC	Sub-Saharan Africa	2.13	23.60	5.15	2.06	5.91
Malawi	LIC	Sub-Saharan Africa	1.44	29.16	0.63	1.25	3.32
Montenegro	UMIC	Europe & Central Asia	8.82	42.88	10.70	13.19	54.76
Lebanon	UMIC	Middle East & North Africa	5.08	23.34	12.72	34.15	42.70
Gambia, The	LIC	Sub-Saharan Africa	1.79	21.85	15.00	9.67	43.84
Kyrgyz Republic	LMIC	Europe & Central Asia	0.58	32.73	33.22	3.44	18.65
Cote d'Ivoire	LMIC	Sub-Saharan Africa	2.12	29.80	0.84	9.58	4.05
Senegal	LMIC	Sub-Saharan Africa	2.61	21.85	9.17	1.74	11.19
Burundi	LIC	Sub-Saharan Africa	0.03	7.76	1.19	2.57	1.11
Fiji	UMIC	East Asia & Pacific	6.16		5.14	1.54	48.19
Lesotho	LMIC	Sub-Saharan Africa	1.45	43.83	15.72	0.31	2.17
Samoa	UMIC	East Asia & Pacific	2.04	32.58	17.25	2.55	60.71
Belize	UMIC	Latin America & Caribbean	6.39	57.70	4.94	14.99	41.10
Benin	LIC	Sub-Saharan Africa	2.00	35.38	3.55	2.26	6.06
Madagascar	LIC	Sub-Saharan Africa	4.42	28.68	3.07	0.13	20.85
Niger	LIC	Sub-Saharan Africa	4.95	15.74	3.04	0.95	6.83
Uganda	LIC	Sub-Saharan Africa	4.87	19.51	4.48	1.92	18.47
Solomon Islands	LMIC	East Asia & Pacific	0.86	45.07	1.39	0.44	13.00
Bolivia	LMIC	Latin America & Caribbean	0.63	25.99	3.45	1.33	9.63
Tunisia	LMIC	Middle East & North Africa	2.48	48.92	4.77	0.50	10.13
Bangladesh	LMIC	South Asia	1.07	14.80	5.68	0.88	0.88
Zimbabwe	LMIC	Sub-Saharan Africa	2.40	22.92	5.99	2.56	3.35
Argentina	UMIC	Latin America & Caribbean	2.28	14.28	0.10	4.81	7.51

Country	Income level	Region	Index 2b. General economic openness				
			FDI inflows, in % of GDP	Exports of goods and services in % of GDP	Personal remittances received in % of GDP	Migrants in % of population	International tourism, receipts in % of total exports
			T: > 10%	T: > 10%	T: > 10%	T: > 10%	T: > 10%
Cabo Verde	LMIC	Sub-Saharan Africa	5.16	48.78	12.24	2.87	57.32
Armenia	UMIC	Europe & Central Asia	2.04	37.81	11.97	6.34	26.44
Guyana	UMIC	Latin America & Caribbean	12.76	35.47	7.36	2.01	6.21
St. Vincent and the Grenadines	UMIC	Latin America & Caribbean	12.38	34.92	5.14	4.18	73.84
Burkina Faso	LIC	Sub-Saharan Africa	3.40	30.79	3.10	3.89	5.26
Nigeria	LMIC	Sub-Saharan Africa	0.50	15.49	6.12	0.66	5.13
Moldova	LMIC	Europe & Central Asia	2.03	29.29	16.06	3.51	14.07
Honduras	LMIC	Latin America & Caribbean	5.68	41.78	19.93	0.35	9.71
Nicaragua	LMIC	Latin America & Caribbean	2.74	41.98	11.47	0.66	14.75
Eswatini	LMIC	Sub-Saharan Africa	0.54	40.50	3.30	2.45	0.69
Romania	UMIC	Europe & Central Asia	2.87	41.64	2.03	1.16	3.41
Colombia	UMIC	Latin America & Caribbean	3.43	15.93	1.92	0.28	12.03
Ecuador	UMIC	Latin America & Caribbean	1.30	22.82	2.80	2.40	7.63
Algeria	UMIC	Middle East & North Africa	0.87	25.62	1.11	0.61	0.46
South Africa	UMIC	Sub-Saharan Africa	1.48	29.91	0.25	5.77	9.38
Afghanistan	LIC	South Asia	0.72	5.90	1.99	1.18	1.64
Bosnia and Herzegovina	UMIC	Europe & Central Asia	2.41	40.59	10.50	0.91	12.04
Belarus	UMIC	Europe & Central Asia	2.47	70.20	2.01	11.40	3.10
Georgia	UMIC	Europe & Central Asia	6.73	50.56	11.56	4.22	39.30
Guinea	LIC	Sub-Saharan Africa	3.23	37.60	0.26	1.81	0.36
Brazil	UMIC	Latin America & Caribbean	4.73	14.81	0.16	0.34	2.45
Costa Rica	UMIC	Latin America & Caribbean	4.60	33.75	0.89	8.77	19.60
Uzbekistan	LMIC	Europe & Central Asia	1.24	29.11	3.03	3.92	
Togo	LIC	Sub-Saharan Africa	1.90	31.32	8.44	3.79	14.14
Morocco	LMIC	Middle East & North Africa	3.07	38.73	5.87	0.26	23.40
Albania	UMIC	Africa	7.99	31.68	9.66	1.99	49.45
Serbia	UMIC	Europe & Central Asia	8.12	50.78	8.55	9.12	7.80
Peru	UMIC	Latin America & Caribbean	2.92	25.38	1.45	0.29	8.72
Tonga	UMIC	East Asia & Pacific	3.34	22.30	40.70	5.40	47.57
Jamaica	UMIC	Latin America & Caribbean	4.93	37.96	15.92	0.83	57.68
Dominican Republic	UMIC	Latin America & Caribbean	3.21	23.55	7.96	3.95	37.80
Mexico	UMIC	Latin America & Caribbean	3.02	39.29	2.91	0.94	5.14
Guatemala	UMIC	Latin America & Caribbean	1.35	18.12	12.10	0.47	11.22
Bulgaria	UMIC	Europe & Central Asia	3.96	66.94	3.68	1.43	11.73
St. Lucia	UMIC	Latin America & Caribbean	7.03	36.01	1.67	6.90	74.42
Paraguay	UMIC	Latin America & Caribbean	1.25	36.01	1.69	2.36	2.83
Botswana	UMIC	Caribbean	1.23	39.36	0.17	7.10	10.23
Azerbaijan	UMIC	Sub-Saharan Africa	2.99	54.29	2.61	2.71	16.20
TFYR of Macedonia	UMIC	Europe & Central Asia	5.32	60.34	2.72	6.29	

Country	Income level	Region	Index 3. Economic (and health sector) resiliency					
			Fiscal balance in % of GDP	Current account balance in % of GDP	Foreign currency reserves in months of imports	External debt in % of GDP	Expenditure on health in % of GDP	Healthcare access and quality index score
			T: <-2%	T: <-3%	T: <3 months	T: >50%	T: <5%	T: <50
Vietnam	LMIC	East Asia & Pacific	-4.35	2.41	2.53	44%	5.66	60
Sri Lanka	UMIC	South Asia	-5.27	-3.16	2.82	59%	3.89	71
Philippines	LMIC	East Asia & Pacific	-1.55	-2.64	6.88	24%	4.39	51
Cambodia	LMIC	East Asia & Pacific	-0.83	-12.19	7.03	62%	6.08	39
Kazakhstan	UMIC	Europe & Central Asia	2.68	-0.16	5.24	87%	3.53	69
Kenya	LMIC	Sub-Saharan Africa	-7.36	-6.37	4.35	36%	4.55	39
Malaysia	UMIC	East Asia & Pacific	-3.59	2.12	4.92	69%	3.80	68
Nepal	LIC	South Asia	-6.65	-9.55	6.61	19%	6.29	40
Lao PDR	LMIC	East Asia & Pacific	-4.42	-7.97	1.47	87%	2.36	37
Myanmar	LMIC	East Asia & Pacific	-2.63	-3.00	3.10	21%	5.09	42
Thailand	UMIC	East Asia & Pacific	-0.25	6.41	7.78	34%	3.71	69
Zambia	LMIC	Sub-Saharan Africa	-8.25	-1.28	1.77	72%	4.48	29
Rwanda	LIC	Sub-Saharan Africa	-2.61	-7.85	4.29	58%	6.76	36
Ukraine	LMIC	Europe & Central Asia	-2.15	-3.34	3.16	88%	6.73	75
Mongolia	LMIC	East Asia & Pacific	2.62	-14.56	4.21	225%	3.81	53
Ghana	LMIC	Sub-Saharan Africa	-6.97	-3.12	2.72	36%	4.45	39
Sudan	LMIC	Sub-Saharan Africa	-7.66	-11.45	0.19	53%	5.66	46
Tanzania	LIC	Sub-Saharan Africa	-1.88	-3.26	5.55	32%	4.14	34
Indonesia	LMIC	East Asia & Pacific	-1.75	-2.98	5.66	35%	3.12	44
India	LMIC	South Asia	-6.40	-2.41	6.90	19%	3.66	41
Turkey	UMIC	Europe & Central Asia	-3.08	-3.50	4.33	58%	4.31	74
Mauritius	UMIC	Sub-Saharan Africa	-2.23	-5.73	5.31	79%	5.75	69
Maldives	UMIC	South Asia	-4.55	-26.06	1.88	44%	10.61	70
Egypt, Arab Rep.	LMIC	Middle East & North Africa	-9.41	-2.51	5.95	39%	4.64	58
Congo, Rep.	LMIC	Sub-Saharan Africa	6.60		1.11	46%	4.63	34
Angola	LMIC	Sub-Saharan Africa	2.19	7.00	5.41	52%	2.88	33
Cameroon	LMIC	Sub-Saharan Africa	-2.49	-3.64	4.43	30%	4.69	32
Mauritania	LMIC	Sub-Saharan Africa	3.32	-18.58	3.30	95%	4.24	41
Russian Federa	UMIC	Europe & Central Asia		6.84	12.85	27%	5.27	75
Ethiopia	LIC	Sub-Saharan Africa	-3.03	-5.47	2.35	33%	3.97	28
Pakistan	LMIC	South Asia	-6.42	-6.10	1.92	29%	2.75	38
Jordan	UMIC	Middle East & North Africa	-4.75	-6.75	8.19	76%	5.47	70
Mozambique	LIC	Sub-Saharan Africa	-5.20	-30.58	3.53	103%	5.07	30
Sierra Leone	LIC	Sub-Saharan Africa	-5.78	-15.82	3.47	42%	16.53	31
El Salvador	LMIC	Latin America & Caribbean	-2.53	-4.77	2.98	67%	6.96	63
Mali	LIC	Sub-Saharan Africa	-4.71	-7.89	4.20	29%	3.82	35
Malawi	LIC	Sub-Saharan Africa	-5.51	-20.19	2.92	32%	9.83	32
Montenegro	UMIC	Europe & Central Asia	-6.30	-17.13	3.64	143%	7.64	81
Lebanon	UMIC	Middle East & North Africa	-11.01	-21.97	17.30	140%	8.02	86
Gambia, The	LIC	Sub-Saharan Africa	-6.20	-4.82	3.59	42%	4.43	36
Kyrgyz Republic	LMIC	Europe & Central Asia	-1.31	-8.88	4.48	100%	6.63	61
Cote d'Ivoire	LMIC	Sub-Saharan Africa	-3.95	-2.75	4.30	36%	4.40	27
Senegal	LMIC	Sub-Saharan Africa	-3.62	-7.22	3.80	52%	5.51	31
Burundi	LIC	Sub-Saharan Africa	-8.61	-11.94	0.89	19%	6.19	27
Fiji	UMIC	East Asia & Pacific	-5.52	-8.49	3.23	15%	3.46	48
Lesotho	LMIC	Sub-Saharan Africa	-5.15	-0.15	3.42	33%	8.08	32
Samoa	UMIC	East Asia & Pacific	0.07	2.49	4.34	52%	5.53	48
Belize	UMIC	Latin America & Caribbean	-0.98	-8.28	2.68	74%	6.12	56
Benin	LIC	Sub-Saharan Africa	-2.97	-10.00	4.30	36%	3.86	31
Madagascar	LIC	Sub-Saharan Africa	-1.52	0.58	3.94	27%	6.00	30
Niger	LIC	Sub-Saharan Africa	-4.15	-15.66	4.30	35%	6.23	28
Uganda	LIC	Sub-Saharan Africa	-4.16	-9.34	4.11	45%	6.17	31
Solomon Islands	LMIC	East Asia & Pacific	0.65	-3.62	9.21	28%	5.17	32
Bolivia	LMIC	Latin America & Caribbean	-8.14	-4.94	7.78	33%	6.86	49
Tunisia	LMIC	Middle East & North Africa	-4.56	-11.11	2.60	87%	6.95	69
Bangladesh	LMIC	South Asia	-4.64	-2.77	5.65	19%	2.37	48
Zimbabwe	LMIC	Sub-Saharan Africa	-4.46	-1.35	0.51	40%	9.41	31
Argentina	UMIC	Latin America & Caribbean	-5.23	-5.29	7.13	54%	7.55	68

Country	Income level	Region	Index 3. Economic (and health sector) resiliency					
			Fiscal balance in % of GDP	Current account balance in % of GDP	Foreign currency reserves in months of imports	External debt in % of GDP	Expenditure on health in % of GDP	Healthcare access and quality index score
			T: <-2%	T: <-3%	T: <3 months	T: >50%	T: <5%	T: <50
Cabo Verde	LMIC	Sub-Saharan Africa	-2.82	-4.78	5.11	88%	5.24	55
Armenia	UMIC	Europe & Central Asia	-1.83	-9.37	3.67	89%	9.93	71
Guyana	UMIC	Latin America & Caribbean	-3.54	-27.63	1.96	41%	4.24	50
St. Vinc. & Gren	UMIC	Latin America & Caribbean	-2.03	-12.22	4.37	40%	3.56	57
Burkina Faso	LIC	Sub-Saharan Africa	-4.99	-7.25	4.30	23%	6.75	30
Nigeria	LMIC	Sub-Saharan Africa	-4.52	1.34	5.79	12%	3.65	42
Moldova	LMIC	Europe & Central Asia	-1.06	-10.59	5.26	64%	8.98	67
Honduras	LMIC	Latin America & Caribbean	0.20	-5.27	4.19	40%	8.40	47
Nicaragua	LMIC	Latin America & Caribbean	-3.08	0.63	3.81	89%	8.75	61
Eswatini	LMIC	Sub-Saharan Africa	-10.46	1.92	2.12	11%	7.70	40
Romania	UMIC	Europe & Central Asia	-2.84	-4.57	4.27	47%	4.98	78
Colombia	UMIC	Latin America & Caribbean	-2.70	-3.94	7.11	41%	5.91	68
Ecuador	UMIC	Latin America & Caribbean	-1.20	-1.37	0.90	42%	8.39	62
Algeria	UMIC	Middle East & North Africa	-4.81	-13.18	19.36	3%	6.65	63
South Africa	UMIC	Sub-Saharan Africa	-4.42	-3.63	4.84	49%	8.11	50
Afghanistan	LIC	South Asia	1.53	-18.87	12.19	13%	10.20	26
Bosnia & Herz	UMIC	Europe & Central Asia	1.73	-3.72	6.73	78%	9.23	72
Belarus	UMIC	Europe & Central Asia	2.41	-0.06	1.92	65%	6.32	79
Georgia	UMIC	Europe & Central Asia	-0.89	-6.78	3.10	97%	8.44	67
Guinea	LIC	Sub-Saharan Africa	-1.07	-1.75	3.31	16%	5.48	26
Brazil	UMIC	Latin America & Caribbean	-7.23	-2.22	13.64	30%	11.77	64
Costa Rica	UMIC	Latin America & Caribbean	-6.03	-3.10	3.83	46%	7.56	74
Uzbekistan	LMIC	Europe & Central Asia	2.24	-7.12	12.94	35%	6.34	63
Togo	LIC	Sub-Saharan Africa	-0.78	-2.01		33%	6.62	32
Morocco	LMIC	Middle East & North Africa	-3.72	-5.47	5.04	42%	5.84	58
Albania	UMIC	Europe & Central Asia	-1.63	-6.69	6.37	67%	6.70	75
Serbia	UMIC	Europe & Central Asia	0.81	-5.20	4.65	68%	9.14	77
Peru	UMIC	Latin America & Caribbean	-1.99	-1.62	11.09	30%	5.14	64
Tonga	UMIC	Caribbean	-0.77	-6.36	7.96	42%	5.26	50
Jamaica	UMIC	Latin America & Caribbean	1.18	-1.83	4.76	104%	6.07	62
Dominican Re	UMIC	Latin America & Caribbean	-2.30	-1.36	3.31	40%	6.16	61
Mexico	UMIC	Latin America & Caribbean	-2.20	-1.80	3.86	37%	5.47	66
Guatemala	UMIC	Latin America & Caribbean	-1.76	0.85	6.26	28%	5.82	51
Bulgaria	UMIC	Europe & Central Asia	0.13	5.36	7.85	61%	8.23	77
St. Lucia	UMIC	Latin America & Caribbean	-1.43	5.35	2.96	32%	5.31	63
Paraguay	UMIC	Latin America & Caribbean	-1.31	0.02	6.03	39%	8.02	57
Botswana	UMIC	Sub-Saharan Africa	-3.05	1.85	9.02	9%	5.46	52
Azerbaijan	UMIC	Europe & Central Asia	5.61	12.89	3.67	35%	6.89	66
TFYR of Macedonia	UMIC	Europe & Central Asia	-1.76	-0.20	3.97	69%	6.34	75

Appendix 2. Data sources

Indicator	Data	Period covered	Sources
Confirmed cases of Corona Virus outside mainland China	Number of cases of 2019-Coronavirus	As of 2 February 2020	World Health Organization (2020, February 2) 'Novel Coronavirus (2019-Coronavirus) Situation Report – 13'
Reported reduction, cancellation, and suspension of flights of key air carriers to/from China	At least one reported case of flight reduction, cancellations and suspension of flights to/from China	As of 2 February 2020	Online news articles from Business Insider , Reuters , South China Morning post , Visaguide.world
Reported travel restrictions following the Coronavirus outbreak	Reported government-imposed travel ban, entry and transit restrictions and halted visa issuance	As of 2 February 2020	
Export goods to China/total country export goods	Export goods to China	2018 or latest available data	World Integrated Trade Solution (WITS)
	Total export goods to the world		
Import goods to China/total country import goods	Import goods from China		
	Total import goods from the world		
Total trade (imports+exports) with China/ country's total trade to the world	Export goods to China, import goods to China, total export goods to the world, total import goods to the world		
Total trade with China in % of GDP	Total trade	2018 or latest available data	WITS
	GDP, current prices	2018 IMF estimates	International Monetary Fund, World Economic Outlook (IMF WEO) database, October 2019
China outward FDI stock in countries in % of GDP	China outward FDI stock	2017	2017 Statistical Bulletin of China's Outward Foreign Direct Investment, National Bureau of Statistics, Ministry of Commerce of the People's Republic of China
	GDP, current prices	2017 actual/ IMF estimates	(IMF WEO) database, October 2019
Chinese tourist arrivals in % of total tourist arrivals	Trips abroad by Chinese resident visitors to countries of destination (basis: arrivals in destination countries)	2017	World Tourism Organization (2019), Data on Outbound Tourism
	International tourism, number of arrivals in countries	2017	World Development Indicators (WDI)
FDI inflows, in % of GDP	FDI, net inflows in % of GDP	2018 or latest available data	WDI
Exports of goods and services in % of GDP		2018 or latest available data	WDI
Personal remittances received in % of GDP		2018 or latest available data	WDI
Migrants in % of population		2015	WDI
International tourism, receipts in % of total exports		2017 or latest available data	WDI
Fiscal balance in % of GDP	General government net lending/borrowing	2018 actual/IMF estimates	IMF WEO database, October 2019

Indicator	Data	Period covered	Sources
Current account balance (% of GDP)		2018 or latest available data	WDI
Foreign currency reserves in months of imports	Foreign currency reserves in months of imports for Benin, Burkina Faso, Mali, Cote d'Ivoire, Senegal, Niger	Latest IMF article IV or country programme review reports	IMF article IV or country programme review reports for Benin , Burkina Faso , Mali , Cote d'Ivoire , Senegal and Niger
	Foreign currency reserves in months of imports for all other countries	2018 or latest available data	WDI
External debt in % of GDP	External debt stocks, total (DOD, current US\$) for all countries except Malaysia	2018	WDI
	GDP (current US\$) for all countries except Malaysia	2018	WDI
	Malaysia' s external debt in % of GDP	2017	2019 IMF Article IV report for Malaysia
Current health expenditure (% of GDP)		2016	WDI
Healthcare access and quality index score	The index comprise of personal and health care access and quality based on 32 causes from which death should not occur in the presence of effective care to approximate personal health-care access and quality by location and over time. Areas covered include vaccine-preventable diseases; infectious diseases and maternal and child health; non-communicable diseases; and gastrointestinal conditions from which surgery can easily avert death.	2018	Fullman, N., Yearwood, J., Abay, S. M., Abbafati, C., Abd-Allah, F., Abdela, J., ... & Abraha, H. N. (2018). Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: a systematic analysis from the Global Burden of Disease Study 2016. <i>The Lancet</i> , 391(10136), 2236-2271.