

»» Africa's long COVID: health consequences and vaccine shortages

No. 337, 21 July 2021

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The low number of infections in the African continent gave rise to the impression that the coronavirus pandemic has hit the region only moderately so far. In the context of the most recent rate of infections, this impression has turned out to be deceptive. However, inadequate reporting of case numbers and low testing rates make the situation difficult to assess. But there are many indications that the pandemic has already hit the continent just as hard as other regions. Africa will be grappling with the consequences of the pandemic for a very long time. The lockdowns have caused significant economic damage and health impacts that will only come to light in the medium term. Moreover, vaccinations are being rolled out sluggishly, which is also due to the absence of local vaccine production capacity. The highest priority here is to invest in the expansion of production and improve the market environment.

Introduction

When we look at how the pandemic evolved around the world we can see that SARS-CoV-2 virus infection rates in Sub-Saharan Africa have been lower than elsewhere. The case numbers of the first two infection waves were relatively low in international comparison. But the recent uptick in infection rates may take on much more drastic dimensions. The perception thus far has been that the health impacts of the pandemic are rather negligible. On closer inspection, however, it is evident that the pandemic in Sub-Saharan Africa has taken a similar course as in other regions of the world. So there is a corresponding urgency to provide the continent with vaccines and other medical supplies. Providing the population with healthcare remains the greatest challenge for the coming years. Unless the pandemic is contained, not only will the economy of the continent be unable to recover but possible virus mutations mean that the pandemic could flare up time and time again and thus hamper the development of the global economy.

This paper aims to analyse the development of the pandemic in Sub-Saharan Africa more closely and examine the medium-term consequences for the economy. We will take a closer look at the structure of the pharmaceutical

industry and raise the question of whether African companies would even benefit from the waiver of vaccine patents currently being debated.

In its 'Global Economic Prospects' of June 2021, the World Bank reported a drop in Sub-Saharan Africa's real gross domestic product (GDP) of 2.4% for the year 2020 and a decline in GDP per capita of 4.9% (in US dollars).¹ Compared with the calculations of January, that was a slight improvement on the forecast for Sub-Saharan Africa in the year 2020. But this will not diminish the challenges for the continent. The pandemic is still underway, making it difficult to issue statements about the economic and health impacts in the continent. But the following is undisputed:

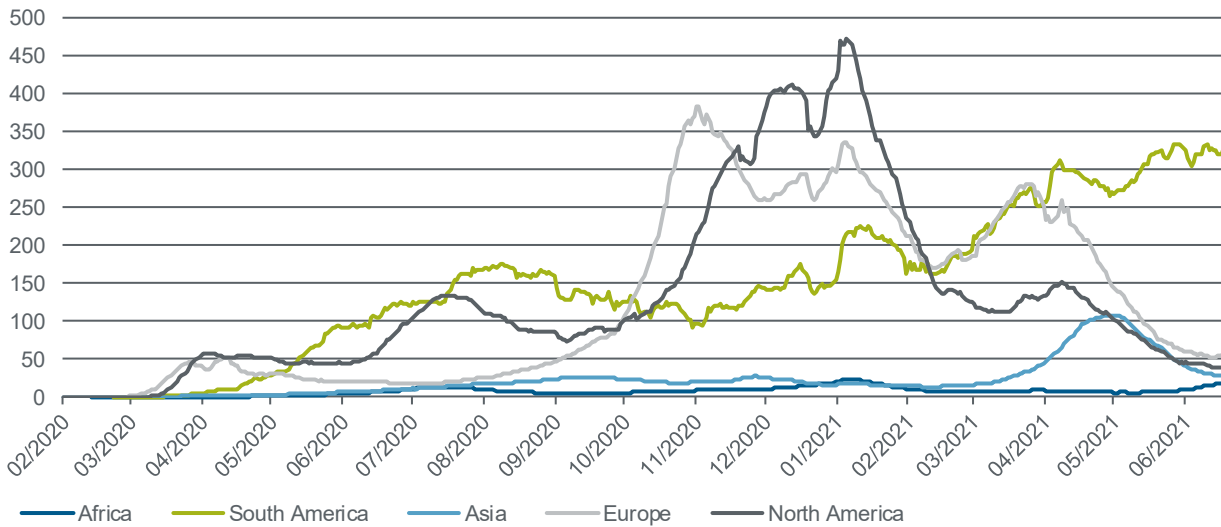
- Because of the very low testing rates, assertions regarding pandemic activity are fraught with considerable uncertainties.
- The lockdown and disruption of supply chains during the first wave led to supply shortages in many countries, particularly in the healthcare sector.
- The course of the pandemic so far and the third wave as well as delays in vaccine distribution will delay the economic recovery.

In Africa the pandemic has evolved in similar ways as in other regions but the reporting level is lower

In the first year of the pandemic, Africa was believed to have been largely 'spared' by the SARS-CoV-2 virus – especially in the eyes of the public – compared with other regions. As a result of the most recent acceleration in infections in the continent, this perception is changing, although the underlying conditions for assessing the situation have remained the same. However, it is worth taking a closer look at the situation in order to make a more accurate assessment. Scientists believe that the relatively low case numbers recorded during the first wave are the result of low testing capacities, poor healthcare and underreporting but also early response measures adopted as part of existing infection control systems and a lower risk of virus introduction from hotspots.²

Figure 1: Pandemic progression in Africa by comparison

Seven-day average of daily new infections per 1 million people



Source: Source: Our World in Data, Coronavirus (SARS-CoV-2-Virus) Cases, own rendition.

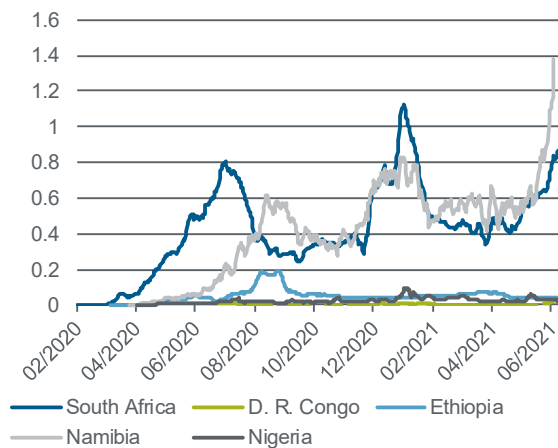
At the start of the year, daily deaths from infection with the SARS-CoV-2 virus as a percentage of a country’s population exceeded the global average in many regions of Africa.³ Compared with other regions of the world, case numbers in Africa are lower on average (Figure 1), although significant regional differences must be taken into account. On closer inspection, it is evident that South Africa in particular has had high infection rates. It is also evident that South Africa has been much less severely impacted by the pandemic in the course of this year. Now, however, the country is reporting rising case numbers again. But Namibia and Botswana in particular exhibited or rather currently exhibit accelerating infection rates that by far exceed the level of South Africa.

In order to analyse the health situation on the continent, however, we must take into account testing levels, which are below the global average in Sub-Saharan Africa. Here as well, major regional differences influence the identification and hence the level of new infections and respective indicators, making it difficult to interpret the pandemic situation on the continent (see Figure 2).

Overall, it is apparent that Sub-Saharan Africa is not testing enough. As an indicator to assess the epidemiological situation, the WHO specifies a test positivity rate of 5% as a benchmark for (re-)gaining control over the spread of infections.⁴ The high positivity rates of tests that have been identified on the African continent since the start of the year are also determined by the low testing level which results from, among other things, the relevant national testing strategy and inadequate reporting. These conditions are also a basis for the assumption of a high rate of unreported cases of SARS-CoV-2 infections. It should be pointed out, however, that exceeding the WHO benchmark is not specific to the African continent but a global phenomenon.⁵

Figure 2: SARS-CoV-2 virus testing rates

Average daily testing rates per 1,000 persons on a 7-day average



Source: Hasell, J., Mathieu, E., Beltekian, D. et al. A cross-country database of SARS-CoV-2-Virus testing. Sci Data 7, 345 (2020), own rendition.

Even though databases enable broad comparability, it is important to be mindful of the potential disruptive factors hampering the comparison of societies in different countries and continents such as average population age, population structure, mobility, pre-existing conditions or healthcare system disparities. Furthermore, regionally occurring mutations (e.g. B.1.351 / 501Y.V2 in South Africa) can influence the spread of infections and accelerate the transmission of the virus.⁶

Implications of inadequate healthcare on health and economic outcomes

During the first wave of infections, almost all African countries imposed massive lockdowns, some of which led to considerable restrictions on public life. This included business and school closures as well as curfews and restrictions on

travel between cities and regions. According to an Afrobarometer survey⁷, the majority of the African population supported the pandemic containment measures imposed by the governments, which were also rigorously implemented.

Restrictions on mobility in particular have meant that the population could not receive adequate medical care. According to an Afrobarometer survey⁸ from the years 2017/2018, around 40% of the African population are not able to access a health facility within walking distance. Many therefore rely on public transport. In addition, the work of community health workers, an important link between societies and their health systems in Sub-Saharan Africa, was significantly hampered during the first wave by the lack of personal protective equipment.⁹ A healthcare undersupply during this period affected mainly the group of patients with chronic diseases, which has public health consequences in the medium term. Model studies have already outlined the impact of the SARS-CoV-2 virus on other illnesses in developing and emerging economies. One study by the medical Journal *The Lancet Global Health* predicts higher death rates over the next five years of up to 10% from HIV, 20% from tuberculosis and 36% from malaria as a consequence of the SARS-CoV-2 virus.¹⁰ The maximum rates are based on a setting that assumes a high burden on the healthcare system from these illnesses. The main factors that need to be taken into account here are the different timeframes of a possible healthcare undersupply as a result of the SARS-CoV-2 virus:

- HIV: Interruption of antiretroviral therapies as a result of heavy strain on the healthcare system (particularly relevant during times of high infection numbers)
- Tuberculosis: Decline in the timely diagnosis and treatment of new cases during periods of reduced treatment (particularly during periods of sweeping contact restrictions)
- Malaria: Interruption of the distribution of insecticide-treated durable bednets (particularly during periods of contact restrictions, as these are often distributed through local public assemblies)¹¹

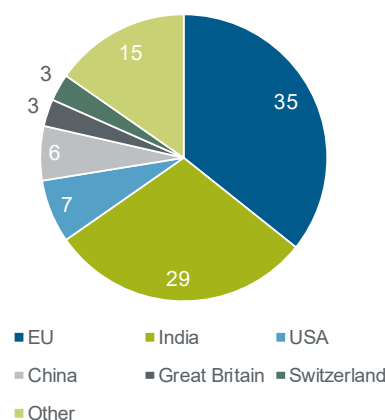
The 'RBM Partnership To End Malaria' documented only minor deficits in the distribution of mosquito bednets in the African continent for 2020. At the same time, in some countries campaigns are not envisaged until later in the year 2021, so that the situation can only partly be assessed.¹² However, other studies point to the overarching relevance of malaria medications caused by a change in the assumption of lethality in the context of untreated malaria infections.¹³ The WHO has voiced concern over growing malaria transmission.¹⁴ This is being additionally exacerbated by the recent rise in SARS-CoV-2 infections and the reintroduction of restrictions on public life.

A further bottleneck emerged in the care for chronically ill patients during the first wave of infections and the associated lockdown as a result of disruptions to international value

chains, which naturally affected the continent's supply of medicine as well. Just under 5% of medicines come from African production. A vast number of local pharmaceutical companies are merely engaged in 'fill and finish' production, often under licence from international corporations. Local production could not be maintained without the necessary inputs. More than 75% of medicine imports come from the EU, India and China (Figure 3).

Figure 3: Sources of African medicine imports 2017–2019

In per cent



Source: McKinsey, WTO, own calculations, as at 2018.

Anecdotal evidence shows that these disruptions, which were also a result of border closures, meant that fewer medications could be imported. Unfortunately, no up-to-date trade figures are as yet available, so the problem cannot yet be quantified.

The impacts of indirect effects on public health described here will also affect the development of African countries in the medium term, especially in places where the lockdown has lasted particularly long, and where difficulties arose in the supply of medicines owing to supply chain disruptions or price increases. A similar undersupply now appears to be repeating itself for vaccines.

Structural deficits of vaccine production

Africa's vaccination rate lags behind that of other regions in the world (only 3% of the population is vaccinated). This is primarily due to a lack of vaccines, of which Africa is a net importer, as it is of other medicines as well. Almost 70% of vaccine doses ordered by Africa come from Indian production. But India has blocked the exportation of coronavirus vaccines since the beginning of March in order to be able to contain the pandemic at home. India's export ban has dealt a heavy blow to the fight against the coronavirus pandemic in Africa because the vaccination campaign in Africa never really took off since vaccines became available. At the beginning, this was because industrialised countries, especially the US, were very reluctant to provide funds to the vaccine alliance Gavi. After that, uncertainties emerged in connection with the vaccine of AstraZeneca and the Global Serum Institute of India and now the export ban is preventing the vac-

cine rollout from progressing. In the context of current developments and the need to bring the pandemic under control fast, calls to waive patents for coronavirus vaccines are growing increasingly louder. The debate over the waiver of patent rights is currently gaining traction after the US declared its willingness to support this endeavour. Whether the waiver of patents can accelerate vaccine rollout in developing and emerging economies is unclear, however. In most countries, vaccine producers do not possess the necessary expertise and production technologies to be able to produce vaccines on their own. According to a study by McKinsey, only around four companies in Africa have a manufacturing infrastructure. Like other pharmaceutical companies, most operate in ‘fill and finish’ or even just ‘pack and label’ production (Table 1). Manufacturing or own research capacities hardly exist. But these areas in particular are crucial to the application of vaccine patents. Given the manufacturing infrastructure it is unsurprising that only around 1% of all vaccines used in Africa are made locally.

Table: Overview of Sub-Saharan Africa’s vaccine manufacturers

Country	Company	Re-search	Produc-tion	Fill and finish	Pack and label	Import
Ethiopia	Ethiopia Public Health Institute					+
Nigeria	Biovaccines					+
Nigeria	Innovative Biotech	+				
Senegal	Institute Pasteur		+	+	+	
South Africa	Biovac	+	+	+	+	+

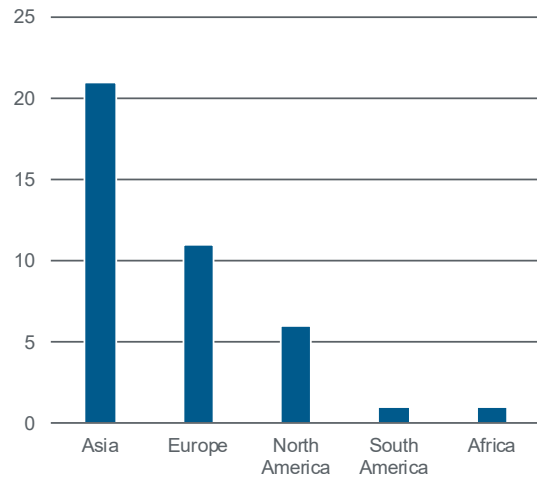
Source: McKinsey, own rendition.

The lack of expertise is also evident from the WHO list of licensed vaccines (Figure 4). The list contains only one firm from Africa. The lack of WHO approval of African companies creates a further structural disadvantage for vaccine manufacturers.

The majority of vaccine campaigns in developing countries is being financed by international donors such as the vaccine alliance Gavi. At the same time, the procurement of vaccines is organised largely at global level and takes place where aid organisations have their head office, for example in Geneva. Addis Ababa, the head office of the African Union (AU), joined only recently.

In order to be able to participate in tenders of global aid organisations, manufacturers must have a WHO licence, meaning that only one supplier from Africa can even submit a bid. Over the past decades the rising dominance of international aid organisations has led to the gradual contraction of the market for local vaccine suppliers.

Figure 4: Vaccine manufacturers with WHO licence by region



Source: WHO, own calculations.

Germany, too, has shifted the financing of vaccines from the bilateral to the international level, thereby contributing to the globalisation of the vaccine market. This development has weakened local demand and contributed to the structural deficits in vaccine manufacturing.

Figure 5 illustrates that the demand for coronavirus vaccines from individual African states is quite significant. One reason for this is that the more prosperous African countries, such as South Africa or North African countries, do not receive any international support. Angola was recently disqualified from receiving international support on the grounds of its higher income. Another reason is that the vaccines procured through Gavi satisfy only 20% of demand. All countries therefore need to procure additional vaccines if they aim to immunise 70 to 80% of their population.

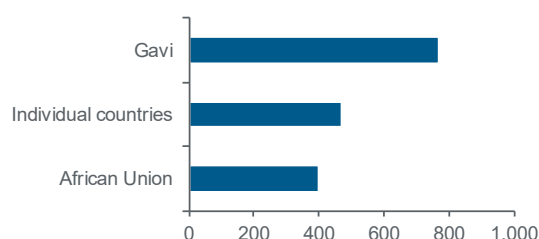
Excursus: Vaccine acceptance in Sub-Saharan Africa

Vaccination progress is being hampered by vaccine hesitancy in many African countries, as well as by other factors such as lack of access to vaccines. The few available doses can therefore not be fully administered. Vaccine hesitancy in the African population is due to a number of factors: lack of faith in the government and, consequently, reservations regarding vaccine safety. To make things worse, some governments have deliberately downplayed the danger posed by the coronavirus. But the low case numbers officially reported thus far in the region are also contributing to vaccine fatigue in Sub-Saharan Africa. Whereas the debate on the global vaccination campaign previously focused on distribution, logistics and financing problems, individual countries and international organisations must now shift their attention more strongly to improving vaccine acceptance as this is an important factor for developing a regional vaccine production.

The local demand for vaccines which this generates and will generate can make an important contribution to developing an African vaccine production. Companies and experts, however, believe the market environment needs to be right for this to occur. In the past, local procurement in Africa was characterised by very short procurement periods and African countries' inconsistent procurement policy, creating a barrier to investment. In this market environment, many local companies were hesitant to invest in developing or expanding vaccine production capacity. Now there are signs that this is changing, especially since supra-national institutions such as the African Union have joined vaccine procurement efforts. There are also aspirations to produce other vaccines besides coronavirus vaccines locally in order to achieve greater economies of scale in production. The emergence of local demand is a very important building block that will ultimately influence the success of a possible patent waiver as well.

Figure 5: Buyers of coronavirus vaccines

In USD million, as at Q2 2021



Source: Gavi, Financial Times, own rendition.

Another factor that will influence the development of vaccine production in Africa, at least in the short term, lies in the shortage of supplies such as glass vials, pharmaceutical films and lipids for the production of mRNA vaccines. The very fast ramp-up of vaccine production has led to shortages that will not be resolved until the end of the year at the earliest. African manufacturers would thus not be able to use these products before 2022. It is therefore unlikely that the waiver of patent rights currently being discussed will lead to a rapid improvement in the vaccine supply situation. The structural basis simply does not exist in Africa.

Summary

The direct and indirect impact of the SARS-CoV-2 virus on the African continent is massive. The direct effects of the SARS-CoV-2 virus have been severely underestimated. This assumption is corroborated by most recent study findings on the prevalence of SARS-CoV-2 antibodies existing in Sub-Saharan African populations. The indirect effects – particularly the consequences of inadequate healthcare far beyond the SARS-CoV-2 virus – will only become apparent in the medium to long term. They can significantly hamper the economic development of the African continent in the coming years.

The main concern for African countries is to overcome the direct impact of the pandemic with the aid of the international community. The majority of developing countries currently do not have an own vaccine production. Developing own vaccine production facilities in the future will take a long time and require high amounts of funds as the market for necessary inputs (including machines) is marred by shortages. In order to accelerate vaccination campaigns on the African continent, the current priority should be to continue strengthening the international vaccine alliance COVAX or provide countries with direct support. At the same time and in the interest of a build-back better approach that is designed to make economies more resilient, the development of an African vaccine production must be initiated.

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⁸ Afrobarometer (2016/2018) Survey Round 7: Socio-demographics & sample characteristics: household location: <https://afrobarometer.org/online-data-analysis/analyse-online>. Accessed on 15 June 2021.

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¹² RBM Partnership to End Malaria, CRSPC Country Tracker to Mitigate the Effect of COVID-19 on Malaria, 17 January 2021.

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¹⁴ World Health Organization (2020), *World Malaria Report, Malaria response during the COVID-19 pandemic*, p. 92–105.