

Some Aspects of the COVID-19 Pandemic in Brazil

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Brazil is the country most affected by the coronavirus disease 2019 (COVID-19) pandemic in South America, and is one of the world's most affected countries, according to the World Health Organisation. A total of 177,094,781 vaccine doses were administered by 27 August 2021.

The virus is highly transmissible and according to Do Rosario et al. (2021), socioeconomic factors are a main contributor to the lack of total control of the pandemic in Brazil. The high transmissibility of the virus in Brazil is associated with several factors, such as high rates of informal employment, and overcrowded and precarious housing with many people in few rooms. These characteristics are present in most low-income countries and put people at greater risk for exposure to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Although the government introduced an emergency programme to help low-income families with approximately \$110 USD for three months and with approximately \$70 USD in this sequence, it was not enough to achieve the primary basic needs of some poor people, especially those who were not able to receive the aid. This directly impacted the protective measures required by the pandemic, since the personal budgets for acquiring masks and sanitisers remained too reduced or almost zero (Dall'Alba et al., 2021). Helping the most vulnerable communities in the most disadvantaged areas of Brazil

is a continuous challenge because of the lack of access of the health system. In reality, Brazil could never acknowledge that it was facing a new wave of the pandemic because there has never been a significant reduction in cases since the onset of the disease. The stabilisation of the number of cases was always at a high level and then rose again.

In the course of the pandemic, Manaus, the capital of Amazonas state, faced a dramatic scenario. Last January, the supply chains of oxygen were lacking and collapsed hospitals and caused significant numbers of deaths due to asphyxiation. Other people died at home while their families roamed the city in search of oxygen, showing the most cruel and inhumane face of the lack of public health policy; truly a terrible scenario. Also, at that time, a new variant of the virus, P.1 (also known as N501Y.V3), was detected in Manaus (Naveca et al., 2021). It proved to be more infectious than the original previous strain of SARS-CoV-2. Taken together, these occurrences were chaotic and placed Manaus as the epicentre of Brazil's pandemic last January.

The new variant strains of SARS-CoV-2 has just accelerated the number of cases and deaths. The virus have become better adapted to infect its human host. Several so-called variants of concern have evolved, and these variants have been named after letters of the Greek alphabet. The *Alpha* variant, which appeared late in 2020 and became dominant worldwide, was followed by the now-dominant *Delta* variant in the second quarter of 2021. Considering the different strains that have been found in Brazil, thus far, the *Delta* strain is the most transmissible and aggressive variant. As of 10 August 2021, Brazil reported 570 people infected with the *Delta* variant. According to the Brazilian Health Ministry, the strain has caused the deaths of at least 36 people in eight of the 27 Brazilian states. Rio de Janeiro has the highest number of confirmed cases of infection with the variant, (<https://covid.saude.gov.br>, accessed in 03 September 2021). This is of great concern since, in the last weeks, Brazil has triplicated the number of registered samples by the *Delta* variant.

Concerning the approved drugs for the treatment for COVID-19, the Brazilian Health Regulatory Agency (ANVISA) has formerly authorised the use of the antiviral remdesevir and two associations of monoclonal antibodies (mAbs), namely casirivimab + imdevimab, and banlanivimab + etesevimab. Recently, ANVISA also approved the use of other mAbs, such as regdanvimab and sotrovimab. Remdesivir is a nucleoside analogue that acts as an inhibitor of RNA-directed RNA polymerase. Until now, the clinical results of remdesevir unfortunately have not proven to be consistent regarding the remission of the disease and reduction of time in the intensive care unit (Young et al., 2021). Concerning the mAbs, some of them are able to bind to the spike protein of SARS-CoV-2 and block the virus from invading human cells. In addition, some aspects related to the patient immune response to SARS-CoV-2 infection can also be targeted by mAbs (Teixeira and Santos, 2021). Although the pharmacological effects and use of mAbs in COVID-19 have already been described, some other concerns exist in Brazil and should be considered. The prices of monoclonal antibodies and even remdesevir are high, and the social security system (SUS) in Brazil is not prepared to furnish these drugs for all patients that really need them. On the other hand, for those who can afford a private health plan, access to medication is guaranteed. Therefore,

affordability across the economic spectrum in low-income countries is questionable. This inequality increases and can be considered as a kind of apartheid regarding access to the most advanced medications and treatments. Consequently, plenty of judicial actions demanding the right for the use of approved medicines for COVID-19 have been addressed in the courts. Since there is no financial plan for it, the deficit of the Brazilian budget is increasing. This is of concern because other areas of investment are also reduced to attend to it, as a replacement of costs.

Regarding the vaccines for COVID-19, the ANVISA has emergently approved the use of three vaccines: CoronaVac (from Butantan Institute and the Chinese Institute Sinovac), Covishield (Oxford/AstraZeneca and the Indian Serum Institute) and Janssen vaccine. Two other vaccines have received the definitive health register: Comirnaty from Pfizer and AstraZeneca/Fiocruz vaccine. In addition, six other companies have already received authorisation to conduct clinical studies in Brazil (<https://www.gov.br/anvisa/pt-br/assuntos/noticias-anvisa/2021/anvisa-apresenta-um-panorama-das-vacinas-e-medicamentos-contra-a-covid-19>, accessed in 12 september 2021). The vaccinating campaign in Brazil started in January, and currently, approximately 40% of the population have received the two doses of the vaccines. Vaccination is a collective measure that, if it does not reach the entire population, it loses its effectiveness. However, cases of infections have emerged, even in people immunised with two vaccine doses, and are causing many deaths among older people. As a result, Brazil shall be aware that new waves of the pandemic may again cause new pressure on the health care system and increase the number of deaths, especially considering the new strains of SARS-CoV-2. Brazil presents 20,989,164 confirmed cases of COVID-19, with 586,558 deaths and 20,029,040 recovered cases (accessed on 12 September 2021).

Due to the panorama of the COVID-19 pandemic in Brazil, one should consider that encouraging protective measures, a strong testing campaign to detect the virus in the early stage, a vaccination campaign and a programme to help low-income families are essential to deal with the disease. These aspects are also for collaboration to put an end to the dramatic scenario we have witnessed in Brazil.

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