



Review Article

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Brazil and the (Un)Natural Selection of SARS-CoV-2

Hesley Machado Silva*

Department of Education and Research, University Center of Formiga, Brazil



Since the beginning of the Covid-19 pandemic in Brazil, President Bolsonaro has been speaking against all the recommendations of epidemiologists [1]. The president has always vociferated that everyone should go back to work and school, even in the worst periods of the pandemic. He defied the disease and the virus, and the Brazilian population, saying that the people of this country were resistant, that they jumped in the sewer and would not catch anything. Another aspect pointed out by the president is that the disease would not be serious for the healthy, like him, going as far as to say that nothing would happen to him because of his "athletic background". On this path, during the initial year of the pandemic, he diminished the importance of vaccines, and did not order them, while he propagated the use of drugs without scientific proof [2], and even proposed the need for herd immunity, in which a majority of the population would be resistant to the disease, logically at a human cost of unacceptable deaths in civilized societies.

The end of 2020 and the beginning of 2021 are marked by the continuity of this discourse, and its consequences. Bolsonaro's proposal is to protect the most vulnerable and the others should stop being cowards, stop crying and face the virus, because everyone will die one day, and the best vaccine would be the virus itself. This proposal obviously did not work, it only propitiated the evolution of the virus, it seems that the idea was the survival of the fittest, among humans, but this happened with the SARS-CoV-2 virus. The city of Manaus, the state capital of Amazonas, was the great laboratory of this dramatic evolutionary process. Many had already stated that the city, due to its large number of infected people in 2020, would have reached the so-called herd immunity, and therefore could be free from the aggravation of the pandemic [3], honest mistake [4]. While the numbers were growing again in early 2021, Manaus was showing signs of trouble, with a lack of oxygen and an increase in hospitalizations [5]; the federal government, instead of sending more cylinders, vaccines and increasing the number of beds, suggested its cocktail with innocuous drugs. The result was the selection of an apparently powerful variant of the Covid-19 virus that changed the whole panorama of the pandemic in Brazil and threatens the world, named P1 (and after "Gama"), a sad example of Darwinian evolution.

In March 2021, the new variant of the virus promotes the worsening of the Brazilian health crisis, with the dizzying increase in the number of deaths and cases, collapse in the

country's health system, crowded ICUs, lack of medicines, respirators, etc. While Bolsonaro continues his denialist fate [6] with the indications of ineffective medicines, against social distancing and, believe me, doubting the effectiveness of the masks. In parallel, the Brazilian vaccination program remains confused, as the president refused vaccines the previous year, with a shortage of immunizers and few positive perspectives, as Brazil would now be at the end of a world demand queue. This in a country notoriously efficient in this type of action. The risk is evident, as there is no control of the virus, new mutations will certainly emerge [7], with potential risk of appearance of new variants from the P1, with the possibility of resistance to available vaccines. Evolution is a fact, and Brazil may have become a large evolutionary laboratory, which can be a threat to the world, even to the countries that are fighting the pandemic through scientifically proven means.

Fortunately, against the indications contrary to the vaccines of the president, and unbelievably, even some doctors [8], Brazilians did not opt for the drugs without effectiveness, such as chloroquine and similar. The people of Brazil started to take the available vaccines, the immunization of the population was regularized, changing this scenario in the second half of 2021, improving the prospects of the pandemic picture.

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*Corresponding author: Hesley Machado Silva, Department of Education and Research, University Center of Formiga, Formiga, Minas Gerais, 35570000, Brazil

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