



The Brazilian flag has gained prominence in the midst of the COVID-19 pandemic

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The Covid-19 pandemic has given the national flag a leading role in the search for solutions to the worst health crisis in the past 100 years. Since 2020, Brazil has conducted clinical research on vaccines and treatments, the results of which have proven to be closely related to the fight against the epidemic. In addition, many public institutions have also produced science and technology, with the development of tests to detect SARS-CoV-2, immune systems and potential respirators.

According to information from the National Health Surveillance Agency (Anvisa), 39 clinical studies of drugs and biological products, including vaccines and treatments against Covid-19, are currently underway in the country. Another 25 have been completed and 54 have not yet started.

Among the vaccines, Oxford-AstraZeneca was the first to be tested in Brazil. The third phase of the study recruited more than 10,000 volunteers from across the country in record time. The Brazilian speed allowed rapid demonstration of the efficacy and safety of the immunizing agent and approval in England in 2020. Half of the volunteers included in the article published in December in the prestigious scientific journal *scapellit* was a key step towards a breakaway vaccine approval from Brazil. After that, several developers of vaccines in use also began trials in the country, including Pfizer-BioNTech, Instituto Butantan and Janssen.

The most important recent example of the importance of Brazilian clinical research during a pandemic is the publication of a study with tofacitinib, by Pfizer. Coordinated by the Academic Research Organization (ARO) – the Department of Conducting Clinical Studies in Brazil – at the Israta Albert Einstein Hospital, in São Paulo, the research showed that the treatment reduced the risk of death or respiratory failure by 37% among hospitalized patients with Covid conditions. -19 moderates.

Says cardiologist Otavio Berwanger, director of the Academic Research Organization (ARO) at Einstein.

The study was published in *The New England Journal of Medicine*, the most important medical scientific journal in the world. It was a 100% Brazilian work, orchestrated by Einstein, that involved various centers across the country, providing answers relevant to the pandemic with worldwide impact. “New England saw this work as research changing clinical practice in Covid. The last time Brazil changed the practice of any disease was Chagas disease,” says immunologist Luiz Vicente Rizzo, director of the Albert Einstein Institute of Education and Research.

Clinical examinations by Coalizão Covid-19 Brasil, a research consortium bringing together Einstein, the Health Care Council, Serio Hospital Lebanon, Moinhos de Vento Hospital, Alimão Oswaldo Cruz Hospital, BP – Beneficência Portuguesa de São Paulo, and Brazilian Clinical Research also contributed. The Institute (BCRI) and the Brazilian Network for Intensive Care Research (BRICNet), using hydroxychloroquine, azithromycin and dexamethasone to adopt more effective clinical protocols against the disease.

“We did the first controlled work to show that hydroxychloroquine does not work. The moment this was revealed, the world looked at us and saw that we were able to do high quality research, with reliable data, that we were taking such good care of the patient, and more than anything else, We have good research specialists here,” says Rizzo.

Coalizão, an unprecedented initiative created to conduct research on Covid-19, is one of the legacies of the leading role of Brazilian science in this period. The group will continue to exist even after the pandemic is over and other studies, in addition to Covid-19, are ongoing.

The increase in the publication of high-impact articles is another legacy of this period. According to a survey conducted by the Syrian-Lebanese faculty and research, Brazilian scientific production increased by 24.6% in 2020 compared to the previous year. For comparison purposes, the United States recorded an increase of 14.8% in the same period.

Hospital Israelita Albert Einstein pioneered the establishment of a department to conduct clinical studies in Brazil, starting in 2017. The presence of the unit was a key factor for the country to lead large multicenter studies.

“The traditional influx of Brazil is only to participate as a supporting representative in a project that comes from abroad. What we did at ARO Einstein was just the opposite. We develop the protocol, design and lead the study. We wrote the article and submitted it for review for publication. This shows that Brazil, which has a professional structure for clinical research, like Einstein’s ARO, is comparable to

the world's largest AROs, able to conduct a study, provide a convincing answer, and publish the practice change result in the world's best clinician," explains Berwanger.

Between 2019 and 2020, 23 clinical research papers were completed in the fields of oncology, cardiology, immunology, and neuroscience at the Einstein ARO. Currently, 25 projects are under implementation, five of which are in the initial stage. Since its inception in 2017, 22 articles have been published in high-impact scientific journals.

In public universities, there was a large mobilization. The Federal University of São Paulo (Unifesp), for example, is coordinating the study with the Oxford Vaccine in Brazil and participating in more than 200 research projects on Covid, including vaccines, drugs, and the effects of the pandemic on the population. According to Soraya Smiley, professor of pharmacology at Unifesp and coordinator of the center Am_ScienceIn the past 18 months, Brazilian public universities have implemented more than 1,400 COVID projects.

One of the studies conducted at the institution is a master's thesis supervised by infectious disease scientist and virologist Nancy Bailey, coordinator of the Corona Virus Research Laboratory at Unifesp and advisor to the Ministry of Health for the Pan American Health Organization and the World Health Organization. CoronaVac response in cardiac patients. Partial results of this study, which is still ongoing, showed that 90 days after vaccination, most of them no longer had antibodies. In addition, five were injured during this period," Nancy says. The numbers were presented to the ministry [da Saúde] To prove that immunity does not last in these patients and to emphasize the importance of giving them the third dose now. This is what science is about. "It gives something back to the population," says the specialist.

One of the main legacies of the development of Brazilian science in this dark period is the rapprochement between society and the scientific universe. To some extent, terms such as clinical or preclinical trials and double-blind testing have become familiar, giving at least a glimpse into the methods serious science depends on. People didn't know much about science. Today, the realization and the desire to understand it is much greater," says Soraya Smiley. "It is an important legacy from this period. The more people understand, the more they are protected from misinformation and fake news."

A survey by Sou_Ciência showed that during the pandemic the support of people from the upper social strata of the SUS increased by more than 90%. The survey

also revealed that nearly 40% of the population would like to access scholarly articles, in addition to obtaining information by other means. At the same time, the interest of young Brazilians in practicing science is very low. A study by the São Paulo State Research Support Foundation showed that less than 2% of this population think of science as a profession. In Germany 10%. “This is a disaster,” said immunologist Luis Vicente Rizzo. “We need to take advantage of this moment of interest to create a new generation of researchers in the country,” he adds.

However, support for science in Brazil is still very fragile, and despite the enormous capacity and willingness of researchers, the work structure in many institutions is unstable. Not to mention the lack of funding. “In Brazil, research support, both economically and educationally, is very little. We live in a state of constantly declining funding, while the quality of our research and our researchers are recognized all over the world,” says Rizzo.

Infection scientist Nancy Bailey says that investments in research related to respiratory diseases, her area of expertise, have increased so much in the pandemic, that many studies have allowed. But in normal times the reality is different. “There is an enormous difficulty in everyday life, with funding delays and bureaucracy delaying research,” he says.

Brazilian scientists have already shown that they practice first-class science. Now, it is imperative that society and governments provide the necessary support for Brazil to advance in knowledge generation.

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