Board Nation
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Technologies developed in universities during the pandemic – 02/10/2023 – Sou Ciência

By Adeti

In our panel “Universities in Defense of Life”, SoU_Ciência sought to tell the story of some of those who fought tirelessly for life in the pandemic, even in the face of the precarious conditions of our institutions, with drastically reduced budgets, suffering defamatory false attacks, the reduction of subsidies, threats to the freedom of teaching and research and interference in the choice of deans, among others.

Over the past 4 years, the investment resources of universities have fallen by 90%, which means that laboratories and research centers have not been able to expand and modernize their infrastructures to renew their equipment parks. In other words, it was indeed a war scenario and the universities led a common effort under their conditions, on all fronts, as we have already pointed out in other thematic studies.

In our latest study on the best practices of federal universities in the fight against the pandemic, we highlight the development of software and applications for various purposes, the production and repair of hospital and personal protective equipment (PPE) for front-line professionals and the general population. To this end, laboratories for other purposes were quickly converted and mobilized to collaborate with the most critical sectors of emergency care.

Let’s look at some examples:

The first emergency front was the construction or repair of ventilators/mechanical ventilators to increase oxygenation for patients requiring intensive care. There was a shortage on the market, difficulty in replacing parts, and international production was bought by the richest countries and/or those who quickly mobilized for it. Universities have formed a network and task force to act on this front, including developing prototypes and new products, in partnership with city and state health departments, at little or no cost. Among them, registered in the Panel, are the Federals of Alagoas, Brasília, Goiás, Juiz de Fora, Lavras, Oeste do Pará, Ouro Preto, Recôncavo Baiano, Santa Maria, São Carlos and Tecnológica do Paraná.

Associated with ventilators, rapid and efficient decontamination processes have been improved for their immediate reuse in new patients, the seal of positive pressure non-invasive ventilation masks and the improvement of the seal of the tracheal intubation system. New disinfection systems and biodegradable and antiviral filters have also been developed, reduction of the concentration of microorganisms in the air, by capture and sterilization, and decontamination chambers by ultraviolet irradiation to sterilize environments.

In the research and production of personal protective equipment for health professionals and the population in general, several fronts have also been mobilized, in the federal states of Bahia, Espírito Santo, Juiz de Fora, Ouro Preto, Paraná, Uberlândia and Tecnológica do Paraná. Engineering labs have been mobilized to develop and produce masks, face shields, visors, helmets for non-invasive ventilation, and to test the filtering capacity, using nanotechnology, nanocellulose and printers 3D.

Other initiatives to highlight: the development of a rapid detection probe, as part of a partnership between Federal da Bahia and Harvard, the use of artificial intelligence to diagnose the infection through imaging tests (UniRio), the development of a low-cost joystick for respiratory exercise machines, with an electronic device connected to a computer in which a patient controls free games available on the internet, combined with blowing and sucking exercises (UTFPR).

Finally, the development of software and applications with various and complementary purposes has also been abundant: to map in real time the agglomerations and risk areas, with use on mobile phones to guide and recommend all citizens; for symptom monitoring and referral to teleconsultations and assistance in the SUS; to monitor the progress of vaccination; with tutorials on the use of masks and hygiene; software for monitoring hospital capacity and optimizing the occupancy of vacant beds; in addition to those aimed at supporting telehealth and the clinical reasoning of professionals (which was already highlighted in our first thematic study of this Panel).

We end with this last article the balance sheet and overview of the performance of federal universities during the Covid-19 pandemic in Brazil. 40 federal universities took an active part in the research, with the support of ANDIFES, the National Association of Directors of Federal Education Establishments. The material collected and presented leaves no doubt that public universities, and those who work there, have been among the main Brazilian institutions and professionals who have mobilized in the midst of the tragedy to defend the right to life. And they could have done so much more had they not

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been confronted with the destructive objective of the federal government itself.

The final report of the Pandemic CPI describes who was at the forefront of necropolitics in Brazil. Denouncing the government's performance in the pandemic, with misguided, erratic and Holocaust-denying measures, delaying the right time for population orientation, public health campaigns, vaccination – in addition to the war waged against governors and unaligned mayors. Brazilian society has already given the first response to the 2022 presidential elections, and will give many more. Justice and history will also judge.

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