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Technologies developed at Universities in the Pandemic – 02/10/2023 – Sou Ciência

By Dias

In our panel “Universities in defense of life”, SoU_Ciência tried to tell the story of a portion of those who tirelessly fought for life in the pandemic, even facing the precarious conditions of our institutions, with drastically reduced budgets, suffering from false defamation attacks , cutting grants, threats to freedom of teaching and research, and interference in the selection of deans, among others.

In the last 4 years the resources for investment in universities have been reduced by 90%, which means that laboratories and research centers have not been able to expand and modernize their infrastructure to renew their equipment parks. In other words, the scenario was really a war and the universities made a joint effort in the conditions they had, on all fronts, as we have already mentioned in other thematic studies.

In our latest study of good practices from 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 frontline professionals and the general population. To this end, laboratories with other purposes were quickly converted and mobilized to work with the most critical areas of emergency care.

Let’s look at some examples:

The first emergency front was to build or repair ventilators/mechanical ventilators to increase oxygenation of patients requiring intensive care. There was a shortage in the market, difficulty in replacing parts, and international production was bought by the wealthier 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 collaboration with municipal and state health services, at low or no cost. Among those registered with the commission are the federal ones of Alagoas, Brasília, Goias, Juiz de Fora, Lavras, Oeste do Pará, Ouro Preto, Recôncavo Baiano, Santa Maria, São Carlos and Tecnológica do Paraná.

For ventilators, rapid and effective decontamination procedures for immediate re-use on new patients, sealing for non-invasive positive pressure ventilation masks

and improved sealing of the tracheal intubation system were improved. New disinfection systems and biodegradable and anti-viral filters, reduction of airborne micro-organism concentration by capture and sterilization, and UV disinfection chambers to sterilize environments were also developed.

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

Other initiatives worth highlighting: the development of a detector for rapid detection, in collaboration between the Federal da Bahia and Harvard, the use of artificial intelligence to diagnose infection through imaging tests (UniRio), the development of a low-cost joystick to exercise respiratory devices, with an electronic device connected to a computer in which a patient controls free games available on the Internet, related to blowing and sucking exercises (UTFPR).

Finally, the development of software and applications with different and complementary purposes was also abundant: for real-time mapping of settlements and danger zones, for use on mobile phones for guidance and recommendations to every citizen. for symptom monitoring and referral to SUS teleconsultations and assistance; to monitor vaccination progress; with seminars on mask use and hygiene. software to monitor hospital capacity and optimize bed occupancy. apart from those aimed at supporting telehealth and the clinical reasoning of professionals (already highlighted in our first thematic study of this Table).

We close with this last article the balance and overview of the performance of the Federal Universities during the Covid-19 pandemic in Brazil. 40 Federal Universities actively participated in the research, with the support of ANDIFES, National Association of Directors of Federal Educational Institutions. The material gathered and presented leaves no doubt that public universities, and those who work in them, were among the main Brazilian institutions and professionals mobilized in the midst of the tragedy to defend the right to life. And much more they could have done had they not been faced with the destructive aim of the Federal Government itself.

The final report of the Pandemic CPI illustrates who was at the forefront of necropolitics in Brazil. Denouncing the government’s performance in the pandemic, with wrong, disorderly and negative measures, delaying the right moment to orientate the population, public health campaigns, vaccinations – in addition to the

war being waged against non-committal governors and mayors. Brazilian society has already given the first answer to the 2022 presidential election and will give many more. Justice and history will also judge.

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