

Greater dialogue with society is a matter of survival for Brazilian science

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doi: 10.1590/0102-311X00089619

In late March this year, an announcement by Brazil's current administration hit the country's scientific community like a bombshell: a 42% budget freeze in the Ministry of Science, Technology, Innovation, and Communications.

The announcement directly contradicted campaign promises, since then-presidential candidate Jair Bolsonaro had promised to increase investment in science from 1.2% to 3% of the GDP. The budget freeze also dumped cold water on Brazilian science when it was already suffering from serious underfunding.

Even before the budget cut, the Brazilian National Research Council (CNPq) had announced that the existing funds were only sufficient to pay the research scholarships until September 2019.

All this translates as the lowest budget for science in the last 15 years. Brazil is thus marching in the opposite direction from countries like China, which increased its budget funding for science from 0.563% of the GDP in 1996 to 2.1% in 2015 ¹.

Immediately afterwards, Brazil's President announced a 30% cut in the public universities, which produce at least 90% of the country's research. This also means a huge step backwards in access to university education: according to the last *Census of Higher Education – Statistical Notes* (2017), some 10.7 million places had been offered in undergraduate courses, 73.3% of which were for new enrollment.

The situation is even more serious in the federal budget because of a constitutional amendment that places a cap on expenditures for the next 20 years, destroying any hopes that the situation might improve next year.

The situation is also serious in the states. Nearly all the states of Brazil now have their own research support foundations ("FAPs" in Portuguese), as the result of a movement that grew momentum since the 1980s to create state-level organizations along the lines of the successful model used by São Paulo (FAPESP), which had earmarked state budget funding for science and technology since the 1960s. Many of these state research funding agencies are now in dire straits themselves.

In addition to the death knell for research funding, the feeling of frustration is exacerbated by recalling that in a not-so-distant past, Brazilian science had achieved respectable levels in international terms as the result of proactive policies to support domestic research.

An example is the fact that from 2011 to 2016, Brazil ranked 13th in the world in scientific publications ². Although still below the world average, the country increased its citation impact by 15% during the same period.

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Science on the tightrope

As serious as the drastic cutback in funding is the prevailing view of science and the reduced status awarded to the field.

The government's recent announcement that Brazil should no longer invest in the human and social sciences has sparked outrage in Brazil and abroad.

Another example of how Brazilian science has come under attack and is suffering discredit is the case of phosphoethanolamine, known as the "cancer pill". Offered to the population since the 1980s by a researcher from the University of São Paulo in São Carlos, the pill had its distribution suspended in 2015, on grounds that proper tests to prove its efficacy had not been performed.

Responding to protests by patients and families, independent tests were conducted by four different research groups. The tests showed that there was no evidence that the drug had any effect against cancer and that it could even induce metastases. However, members of Congress from São Paulo decided to launch an inquiry into the scientific studies, questioning the role of science itself.

Another case that merits attention is vaccination – or the lack of it.

The World Health Organization (WHO) has just revoked Brazil's certified status as a measles-free country. In 2016, measles was declared eradicated in Brazil; in 2000, in the United States. However, the disease is now spreading around the world at breakneck speed, leading the United Nations Children's Fund (UNICEF) to launch the #VaccinesWork campaign this April, calling attention to the fact that every year more than 20 million children in the world fail to receive the measles vaccine ³.

Various factors have led to the decline in vaccination, including lack of access to health services, but also fear and skepticism towards vaccines, which have fueled growing anti-vaccination movements. However, rather than blaming society for its purported ignorance, it might be worthwhile to ask: what are we doing wrong?

After all, many of these anti-vaccination movements systematically cite the study that linked autism to vaccination.

The study's results were announced more than 20 years ago, in 1998. According to the WHO, the existing studies show that there is no evidence of an association between autism and vaccination, in this case the measles-mumps-rubella vaccine. *The Lancet* itself even retracted the article in 2000. Why, then, did the message persist in the social imaginary, insisting on reproducing the idea of autism risk associated with vaccination? Why have so many other studies showing the positive effects of vaccination gained less space in the public imagination?

Scientists and society

The situation is desperate.

Yet this is also a call to the scientific community that it is not time to sit back with arms crossed. More than ever, measures are needed to increase dialogue between the scientific community and society.

It is not the first time this has happened. In the 1920s, the country's embryonic scientific community mobilized in the Brazilian Academy of Science to launch a series of initiatives in science communication, including the first Brazilian radio station, to show ordinary citizens and decisionmakers that science has a central role to be shared.

A recent study showed that Brazilian scientists have participated in science communication activities, giving talks to the general public and interviews to the mass media ⁴. But they have still not been sufficiently proactive to maintain a direct, constant dialogue with society and policymakers.

Equally important are the activities to increase the visibility of science and its importance for the country's economic and social development. Since such activities are still incipient, they have been unable to fully demonstrate that innovation and creativity are the basis for modern nations' technological and industrial growth.

From a broader perspective, in the field of health, education, and the environment, Brazilian scientists have fulfilled a historical commitment to respond to the challenges of producing knowledge to confront the inequalities directly affecting the country's more underprivileged population.

A recent example was the case of the Zika virus epidemic, with the appearance of cases of microcephaly, when resources were allocated for research and the scientific community responded promptly, generating decisive scientific knowledge for confronting the disease.

The time is now. We need to mobilize to show society and decisionmakers that science is truly relevant for the country's development.

Additional informations

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1. World Bank. Research and development expenditure (% of GDP). <https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations=CN> (accessed on 07/May/2019).
2. Cross D, Thomson S, Sinclair A. Research in Brazil. A report for CAPES by Clarivate Analytics. <https://www.capes.gov.br/images/stories/download/diversos/17012018-CAPES-InCites-Report-Final.pdf> (accessed on 07/May/2019).
3. Fundo das Nações Unidas para a Infância. A cada ano, mais de 20 milhões de crianças em todo o mundo não recebem a vacina contra o sarampo. <https://www.unicef.org/brazil/comunicados-de-imprensa/cada-ano-mais-de-20-milhoes-de-criancas-em-todo-o-mundo-nao-recebem-vacinas> (accessed on 08/May/2019).
4. Massarani L, Peters HP. Scientists in the public realm: interactions of scientists and journalists in Brazil. *An Acad Bras Ciênc* 2016; 88:1165-75.