

FEATURE

COVID-19: How the Oswaldo Cruz Foundation is Working to Address the Pandemic in Brazil

The COVID-19 pandemic caused by the new coronavirus (SARS-CoV-2) has presented itself as one of the greatest health challenges on a global scale at the beginning of this century. Insufficient scientific knowledge about the new coronavirus, its high speed of dissemination and the capacity to cause deaths in vulnerable populations has generated uncertainties about what would be the best strategies to use to face the pandemic in different parts of the world.

In Brazil, the challenges are even greater, as little is known about the transmission characteristics of the new coronavirus in the context of great social inequality, with populations living in precarious housing and sanitation conditions, without systematic access to water and in a situation of overcrowding. According to the National Council of Health Secretaries (Conass), from the beginning of the pandemic in March until October 8 2020, Brazil recorded 148,957 deaths from COVID-19, and 5,028,444 infected individuals. Given this scenario, institutions such as the Oswaldo Cruz Foundation (Fiocruz) are extremely important in the fight against COVID-19 in Brazil. One of the initiatives of this institution was the creation of the 'Observatory COVID-19 Fiocruz' whose general objective is the development of integrated analyses, technologies, proposals and solutions to face the pandemic by COVID-19 by the Brazilian Unified Health System (SUS) and by Brazilian society. The observatory is structured in a collaborative way, allowing the initiatives and work already developed in the different laboratories, research groups and sectors of Fiocruz to develop their activities in an agile way, with internal and external cooperation networks for the production and dissemination of materials to face the pandemic. Its work dynamics involves the production of information, dashboards and analyses, the development of technologies and communication.



COVID-19 is an infectious disease caused by the coronavirus of severe acute respiratory syndrome 2 (SARS-CoV-2) – Photo: Divulgação.

In addition, Fiocruz is also at the forefront of the development of one of the main vaccines in the fight against the new coronavirus. The vaccine ChAdOx-1 or AZD1222, also known as the Oxford vaccine,

is currently one of the most advanced in development in the world and, in Brazil, will be produced by Fiocruz, according to a technological order agreement with the pharmaceutical AstraZeneca, the holder of the patent. At Fiocruz, the production of this vaccine will be the responsibility of the Immunobiological Technology Institute (Bio-Manguinhos), which already has a history of manufacturing this type of product and incorporating technology. The funds for the adaptation of the Bio-Manguinhos plant and for the purchase of the first batch of vaccines will come from a national provisional measure that will allocate R\$ 1.9 billion to Fiocruz. Dr. Nísia Trindade Lima, president of Fiocruz, foresees the production of up to 265 million doses of the ChAdOx-1 vaccine in 2021. The number cited by Dr. Nísia takes into account the forecast of the finalization of the initial 30 million doses of the vaccine in January 2021.



Brazilian Ministry of Health estimates production of 140 million doses of vaccine in the first half of 2021 – Photo: Divulgação/Fiocruz Minas.

The Oswaldo Cruz Foundation acts with the objective of promoting health and social development, generating and disseminating scientific and technological knowledge, and being an agent of citizenship. Fiocruz is linked to the Brazilian Ministry of Health and is the most prominent health science and technology institution in Latin America, operating in several cities in Brazil and internationally. Below, a brief history of each of Fiocruz's research centers is presented.

Oswaldo Cruz Foundation - The beginning

On May 25th 1900, the Federal Serum Therapeutic Institute was created at 'Fazenda de Manguinhos' in the North Zone of Rio de Janeiro city to manufacture sera and vaccines against the Bubonic Plague. Through the hands of the young Brazilian doctor and scientist Oswaldo Gonçalves Cruz, the institute was responsible for the sanitary reform that eradicated the Bubonic Plague and Yellow Fever epidemics from the city of Rio de Janeiro. Since then, the institution has experienced an intense trajectory, which is confused with the development of public health in Brazil.

Throughout the 20th century, Fiocruz experienced the many political transformations in Brazil. It lost its autonomy with the so-called "1930 Revolution", a coup that gave Getúlio Vargas the presidency of the Brazilian Republic. With the 1964 Brazilian civil-military coup, Fiocruz was hit by the so-called 'Massacre de Manguinhos', the impeachment of the political rights of some of its scientists. However, in the 1980s, Fiocruz experienced democracy again, and in an expanded way. Under the management of the sanitarian Sergio Arouca, from 1985 to 1988, Fiocruz had programs and structures recreated, and held its 1st Internal Congress, a landmark of modern Fiocruz; the Internal Congress is an event in which strategic issues related to the institutional macro-project, among others, are defined. The Internal Congress is held every

four years, always in the first year of each new Fiocruz presidency. In the following years, Fiocruz was the scene of major advances, such as the isolation of the HIV virus for the first time in Latin America. As a centenary institution, Fiocruz has a robust history in the early years of the 21st century. It expanded its facilities and, in 2003, its statute was finally published. It has achieved great scientific advances, with achievements such as the decoding of the bacillus Calmette–Guérin (BCG) genome, used in the vaccine for tuberculosis prevention.



Fiocruz Manguinhos, in Rio de Janeiro – Photo: César Guerra Chevrant (COC/Fiocruz).

Fiocruz has its headquarters in the neighborhood called ‘Manguinhos’, in the North Zone of Rio de Janeiro city, where a series of historical constructions are located that call attention for the beauty of the architecture. This group of buildings form the Manguinhos Historical Architectural Center is composed of buildings erected in the first decades of the 20th century. Fiocruz has other units installed in 10 states in the Northeast, North, Southeast and South regions of Brazil and has an office in Maputo, the capital of Mozambique, Africa.

Fiocruz Ceará

Since February 2009, Fiocruz has been present in the State of Ceará; its main initiative is the creation of the Northeastern Family Health Training Network (Renasf), carried out in partnership with teaching and research institutions in the region and with State and Municipal Health Secretariats.

In 2018, the new headquarters of Fiocruz Ceará was built on a 10-hectare plot ceded by the State Government and located in the Technological and Industrial Pole of Health, in the municipality of Eusébio.



Fiocruz in Ceará – Photo: Fiocruz Portal.

Fiocruz Amazonia

The Leônidas & Maria Deane Institute (ILMD/Fiocruz Amazonia) is Fiocruz's technical-scientific unit in the State of Amazonas. Based in Manaus, its mission is to contribute to the improvement of the living and health conditions of the Amazonian populations and to the regional scientific and technological development, integrating research, education and public health actions.

For the development of its actions, ILMD/Fiocruz Amazonia establishes cooperation agreements with the other units of Fiocruz, with national and international partner institutions of Science, Technology and Innovation in Health that support multidisciplinary and inter-institutional projects, generating essential knowledge for the creation of public policies, which contribute to the improvement of society's quality of life. The production of scientific knowledge at ILMD/Fiocruz Amazonia also occurs through technical cooperation actions carried out through technical-scientific assistance developed alongside the National Unified Health System (SUS), with special focus on knowledge of the socio-sanitary and epidemiological realities of Amazonia.



Fiocruz in Manaus – Photo: Divulgação.

Fiocruz Bahia

In 1950, the then governor of the State of Bahia created the Gonçalves Moniz Foundation in Salvador, the capital of Bahia. The purpose of this entity was to maintain and provide public health services, with focus on laboratory tests and the production of vaccines and sera required by Bahia, as well as the training of technical-specialized personnel in collaboration with universities and other research establishments.



Technological Park of Bahia will house the Fiocruz's Data and Knowledge Integration Center for Health – Photo: Nilton Souza/Divulgação.

Subsequently, in 1957, the Nucleus of Bahia Research (NEP) was created through an agreement between Fiocruz, the National Institute of Rural Endemics (INERU) and the Gonçalves Moniz Foundation. This collaboration aimed to study parasitic endemics in Bahia, at a time when collaboration between the federal and state governments was strengthened, developing a favorable environment for the establishment of activities related to science, technology and innovation in the area of health in Bahia.

In 1970, the NEP was incorporated into Fiocruz and became known as the Gonçalves Moniz Research Center (CPqGM). Ten years later, CPqGM became the Gonçalves Moniz Institute (IGM), a technical and scientific unit of Fiocruz. Currently, IGM, also known as Fiocruz Bahia,

focuses on the study of infectious and parasitic diseases, in conducting anatomopathological exams, in addition to hosting two *stricto sensu* postgraduate courses at master and doctoral levels.

Fiocruz Brasília

In 1976, during a time of political transformation and the constitution of the 'Sanitary Reform' movement in Brazil, the then vice-president of Fiocruz, Dr. Vinícius Fonseca, decided to establish a Fiocruz unit in Brasília, the capital of Brazil. At that time, the office was named Brasília Regional Directorate (Direb) and was installed at the headquarters of the Pan American Health Organization (1976), and, later, in the building of the National Institute of Food and Nutrition – INAN (1977), which currently belongs to the National Ministry of Health. In the 1980s, Fiocruz Brasília changed its name to Fiocruz Regional Coordination (Coreb) and entered into strategic partnerships with the University of Brasília (UnB) and the Science and Technology Advisory of the Ministry of Health.

The 1990s began a new period of staff structuring and the expansion of activities, with regionalized actions and the formalization of institutional representation. In 1995, still as Coreb, the headquarters of Fiocruz Brasília started to occupy some rooms in the Ministry of Health, returning, in 1999, to the building of INAN. During the first decade of the 2000s, it was officially renamed Brasília Regional Directorate, later adopting the name Fiocruz Brasília, following the same strategy as other Fiocruz regional units.



Fiocruz in Brasília – Photo: @fiocruzbrasil.

In June 2010, the Fiocruz Brasília building was inaugurated at the UnB campus, three years after the foundation stone was laid. This building, with four independent blocks, houses the Fiocruz Brasília School of Government, the SUS Open University (UNA-SUS) and several projects and programs divided into areas of knowledge such as: Sanitary Law; Food, Nutrition and Culture; Education, Culture and Health; Health Promotion, Environment and Work; Epidemiology and Health Surveillance; Economy and Public Policies; and Bioethics and Health Diplomacy. Each of these areas develops varied activities, such as projects and research, courses, events and publications.

Fiocruz Mato Grosso do Sul

In 2007, a delegation composed of authorities from the State of Mato Grosso do Sul (MS) visited Fiocruz/RJ to express interest in hosting one of the Fiocruz's new regional units. In 2008, the first Fiocruz/MS seminar was held in the city of Bonito, MS, with representatives from teaching and research institutions and the management of the Unified Health System (SUS) in the Brazilian Midwest Region. The main objectives of the meeting were to discuss the importance of the new unit and define the main themes that should be prioritized by Fiocruz/MS: "Environment, Health and Agribusiness", "Health on the Frontiers", "Indigenous Health", "Most Relevant Diseases and Aggravates in the Midwest Region" and "Cerrado and Pantanal Formation".

The Master Plan of the Campus Fiocruz/MS foresees its implementation in stages associated with the availability of land, the budgetary disbursement and the expected implementation of the planned activities, thus assuming a commitment to economic, social and environmental sustainability. Stage I, which consisted of the construction of the administrative office building and support area, was inaugurated on December 8, 2011.

Fiocruz Minas

At the beginning of the 20th century, the Governor of the state of Minas Gerais proposed the creation of a branch of the Federal Serum Therapeutic Institute in Belo Horizonte, the capital of Minas Gerais, to Oswaldo Cruz. In 1907, the Institute René Rachou was created with its headquarters at 'Praça da Liberdade', in Belo Horizonte and, at the request of cattle ranchers in Minas Gerais, research was initiated



Fiocruz in Minas Gerais – Photo: Divulgação.

to develop a vaccine against the “Pest of Manqueira” or Carbúnculo Sintomático, epizooty that mainly attacked herds of cattle in Minas Gerais. The production and sale of this vaccine enabled the survival and expansion of the institution’s activities in the following years to a large extent.

Nowadays, Fiocruz-Minas is mainly dedicated to the development of research on infectious and parasitic diseases such as Chagas disease, schistosomiasis, leishmaniasis and malaria, in addition to research into the epidemiology of aging, risky and occupational behavior.

Fiocruz Paraná

In 1999, the Carlos Chagas Institute (ICC) was born as a result of a partnership between Fiocruz – RJ and the government of the State of Paraná, through the Technological Health Park (TECPAR). Ten years later, the Carlos Chagas Institute became a regional technical-scientific unit of Fiocruz in Paraná, within the context of Fiocruz’s nationalization project.

Located on the campus of the Paraná Institute of Technology, in the Industrial City of Curitiba, ICC/Fiocruz stands out as a productive and well-installed research center with nine research laboratories working in the areas of biochemistry, molecular biology and cell biology of infectious agents and their hosts, focused on studying the regulation of gene expression of microorganisms and parasites, the molecular characterization of stem cells, molecular virology and biotechnology.



Fiocruz in Paraná – Photo: Divulgação.

Fiocruz Pernambuco



Fiocruz in Recife – Photo: Diego Nigro/JC Imagem.

In 1950, the Aggeu Magalhães Institute (IAM) was opened in Recife, the capital of Pernambuco State. This institute belonged to the Sanitary Organization Division of the National Ministry of Education and Health. In the first decade of existence, the main studies carried out at the IAM were on schistosomiasis, mainly through studies of the ecology of mollusks and the action of molluscicides. Filariasis has also been the subject of studies, such as an epidemiological survey carried out in the neighborhood of ‘Afogados’ to raise the degree of prevalence of this disease in Recife.

In 1976, after the approval of Fiocruz's Programmatic Reorientation Plan by the Ministry of Health, the IAM became a special unit of Fiocruz. In 1987, IAM/Fiocruz started offering specialization courses in public health, through the then recently created Center for Studies in Collective Health. In 1991, the Multiprofessional Residency Program in Collective Health was established, in partnership with the State Health Secretariat.

Currently, IAM/Fiocruz offers graduate programs in academic and professional modality, as well as Lato Sensu specializations for health professionals. This institute meets the demand for highly complex diagnoses in the Chagas' disease Outpatient Clinics of the Federal University of Pernambuco (UFPE), the University of Pernambuco (UPE) and other institutions.

Fiocruz Piauí

In 2008, the project for the creation of a Fiocruz unit in the State of Piauí was born. The initiative was the result of a program called 'Mais Saúde' (more health) of the Brazilian federal government, which sought to improve public health management in locations that did not yet have basic healthcare.

In 2014, the activities of the Fiocruz office in Teresina, capital of Piauí, started with Master's courses. Currently, the Regional Technical Office of Fiocruz Piauí is located at the Regional Nucleus of the Ministry of Health, in Teresina. The consolidation of this office, which is under the coordination of the Vice-Presidency for Education, Information and Communication at Fiocruz, has been designed to contribute to the solution of the main health problems in the region and to improve the quality of life of the population, acting effectively in economic and technological developments, focused on research decentralization policies and the human resources training.

Fiocruz Rondônia

In 2009, Fiocruz's proposal to expand its presence in the national territory led to the establishment of Fiocruz's Technical Office in the city of Porto Velho, the capital of the State of Rondônia. Legally known as 'Fundação Oswaldo Cruz Noroeste', Fiocruz Rondônia incorporated the Institute for Research in Tropical Pathologies – IPEPATRO and expanded its activities in applied and epidemiological research, advanced and qualified training of human resources, and the provision of services, assistance and health surveillance. Marked by its insertion in the Western Amazon, Fiocruz Rondônia fills regional gaps, acting on infectious and parasitic pathologies, biotechnologies and vectors that transmit diseases of importance to public health.

Fiocruz Rondônia's activities will be expanded after the inauguration of its own building, which will allow Fiocruz to contribute even more to the reduction of regional inequalities in the fields of health and science and technology.

Fiocruz Africa

Fiocruz's first international office was opened on October 17, 2008, in Maputo, Mozambique. Fiocruz Africa offers Master's, doctoral and specialization courses in infectious and contagious diseases, public health, planning in health systems and attracting strategic human resources, among others. On the agenda of Fiocruz's actions on the African continent, are courses for the health area; also, exchanges in the area of vaccine production and diagnostic kits are planned.

Source: <https://portal.fiocruz.br/>