Webinar-AIR CENTRE

Networking Friday with
Minister Maria do Rosário Sambo, Angola

Contribution of scientific research to the COVID-19 approach in Angola - a challenge for funding science

Luanda
14-08-20

Maria do Rosário Bragança Sambo
OUTLINE

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2. Purpose
3. Brief socio-demographic characterization of Angola
4. Angola and scientific productivity
5. COVID-19 and research
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7. Conclusions
INTRODUCTION
Adoption of measures to mitigate harmful effects

Creativity and innovation

Projects and actions

Adequate resilience

- Strengthening after the crisis
- To face future threatening crises with the learned lessons

One of the greatest challenges facing humanity – 21st century

- Global scale
- Morbidity and mortality
- Huge psychological, social and economic impact on people and countries

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This pandemic revealed that even the best prepared countries with strong health systems, having been taken by surprise, suffered from the unexpected overload of the emergency.

This challenge assumes even larger proportions in countries with greater vulnerability in their health systems, with the need to increase the number of beds and supplies available, which are also crucial in preparing for possible local transmission after importation.
Communicable diseases burden still very heavy

Non-communicable diseases progressive increase

Angola morbidity and mortality

HIV/AIDS
- Tuberculosis
- Malaria

one of the main causes of death mainly in children under 5 years old

2018 - Angola contributed with 3% to the global malaria cases

In the last decades - epidemic outbreaks of Cholera, Marburg Hemorrhagic Fever, Yellow Fever and Zika
Angola

Moderate capacity
High vulnerability

Characterization of the countries

Preparation - Monitoring and Evaluation Framework of the WHO International Health Regulations

Vulnerability - Infectious Disease Vulnerability Index

In all countries - other indirect factors can further compromise the control of the pandemic, such as demographic, environmental, socioeconomic and political conditions
Angola

Early introduction of border control measures, airport surveillance and the implementation of temperature screening at ports of entry were initial containment measures to limit and delay the importation of cases that occurred from March, when the first cases imported from Portugal were registered.
Disease surveillance system

Laboratory networks

Human capacity - epidemiological surveillance, clinical and laboratory training

Involvement of the local, national and international community

Base of national public health infrastructures

Requirements

Essential to catalyze the preparation of the plan and its implementation
Purpose
Role of scientific research for the approach of COVID-19 and how Angola is facing this challenge as an opportunity to leverage human resources training and infrastructural capacity for health research
Brief socio-demographic characterization of Angola
2020 Estimate Angolan Population

- 32,866,272 inhabitants

First population census (2014)
- 25,789,024 inhabitants

Average annual population growth rate
- 3%
In the last 20 years

- Inversion of the distribution of the Angolan population between rural and urban areas has been consolidated
- Sustained growth of the urban population

From an estimate of 50%, in 2000, to 66.7% (21,035,940) in 2020

Currently, 66.1% of the population of Angola is urban (21,035,940 people in 2019)
Average age
Estimated at 16.7 years

Life expectancy
Both sexes 62.2 years
(women 65.1; men 59.5)
1970 was close to 40 years
Angola and scientific productivity
Angola has a low scientific productivity, although in recent years there has been an increase in the number of publications, especially in the field of medical and health sciences, with a clear trend towards research in epidemiology and, predominantly, related to malaria.

With the expansion of higher education in Angola, since 2009, universities need to build and strengthen their capacities for scientific research.

The alignment of the national health research agenda with national health development programs and the widespread use of multilateral international cooperation are critical to developing operational tools for universal health.
The lack of effective funding for science constitutes the biggest obstacle to the implementation of the National Science, Technology and Innovation Policy (NSTIP) and the National Science, Technology and Innovation Strategy (NSTIS).

In order to fill this serious gap, the government is in the process of leading to the creation of the science funding agency.

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<tr>
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<td>Regular</td>
<td>Regular</td>
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<td>Regular</td>
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**I - Human resources training**
**II - Creation and strengthening of the infrastructural base**
**III - Scientific and technological cooperation**
**IV - Legal framework and institutionalization of the National Science, Technology and Innovation System**
**V - Scientific culture promotion**
**VI - Answers to specific questions**
**VII - Economic and Business Development**
**VIII - STI action in Governance**
**IX - Financing**
ANGOLA AND SCIENCE, TECHNOLOGY AND INNOVATION FUNDING

SCIENCE AND TECHNOLOGY DEVELOPMENT PROJECT (PDCT)
Finish at March 2022

Program for Higher Education Quality Improvement and Scientific Research Development

Program for Innovation Promotion and Technology Transfer

National Development Plan 2018-2022
(PDN 2018-2022)

PDCT
Co-financed by the Government of Angola and the African Development Bank

US $100 million
US $7 million research projects

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Launched in December 2018

- 25 projects were approved and are being funded in a total amount of USD 985 139,95
- 39 projects were rejected

Second call in preparation - will be preceded by a training action on the methodology for scientific research projects conception and submission
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COVID-19 and research
"This outbreak is a test of political, financial and scientific solidarity for the world to fight a common enemy that does not respect borders... what matters now is stopping the outbreak and saving lives.”

Dr Tedros, Director General, WHO

- Intense communication between researchers
- Information sharing

High collaboration between researchers

Rapid implementation of scientific research projects, as never seen before in a pandemic

Technological innovation
THE BROAD AGENDA TO FILL THE KNOWLEDGE GAPS ABOUT COVID-19

- Virus: natural history, transmission and diagnosis
- Animal and environmental research on the origin of the virus and approach measures at the human-animal interface
- Characterization and clinical approach
- Candidate therapies and vaccines
- Prevention and control of infection, including the protection of health professionals
- Epidemiological studies
- Ethical aspects
- Integration of social sciences in the response to the pandemic

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COVID-19 and health research projects in Angola
The Angolan Ministry of Higher Education, Science, Technology and Innovation launched the challenge to university professors, researchers and specialists in the fields of medical and health sciences for the submission of projects that sought to answer the main knowledge gaps of the pandemic, with relevance to the particular aspects of the population of Angola, without neglecting the global aspects.
Principles of the methodology of the Global Coordination Mechanism of the WHO R&D Blueprint

Funding that focuses mainly on the identified research priorities, considering the main knowledge gaps, avoiding organizational silos and harmful competition and encouraging multidisciplinary collaboration

Simplification for the submission process with suitable forms

Inclusion of clauses that promote the timely sharing of research data relevant to the response to the outbreak

https://www.who.int/blueprint/priority-diseases/key-action/Coronavirus_Roadmap_V9.pdf?ua=1
The clinical presentation of COVID-19 is quite heterogeneous and can lead to delay in diagnosis, thus representing a challenge for health professionals.

Characterization of asymptomatic infected people and cases of COVID-19 from an epidemiological, clinical and laboratory point of view

Identification of the SARS-CoV-2 strains

Description of the viral load kinetics in asymptomatic individuals and patients with COVID-19

Determination of protective factors for SARS-CoV-2 infection among contacts of patients with COVID-19
It is also patent the need, currently pressing, but limited capacity for:

- Timely country-wide diagnosis and tracing of infected populations
- Characterizing the dynamics of SARS-CoV-2 genomes affecting communities
- Capability to assess SARS-CoV-2 antibody titers in patients
COVID-19 - ANGOLA

Angola
1,815 Confirmed cases
80 Deaths
577 Recovered
1,158 Active cases

https://covid19.who.int/
13-08-20
At the date of data collection (April 2020) it was found that 7 institutions (five in Luanda) have open-platform RT-qPCR equipments that could be used for SARS-CoV-2 diagnosis and research

There were 57 available closed-platform equipment (20 in Luanda), that do not allow for customization of testing protocols, relying only on the test kits made available by the manufacturer

Moreover, most of the laboratories lack adequate biosafety conditions and have different needs for reagents and other consumables
The knowledge of the phylogeny of the strains responsible for the pandemic in a given population is based on the ability to quickly characterize viral genomes.

Analyzes based on whole genome sequencing (WGS) of single nucleotide polymorphisms (SNPs) and other infrequent genetic variants provide a robust phylogenetic structure.

As with other viruses, the transmissibility of SARS-CoV-2 between different human communities is under pressure from the immune response and environmental characteristics, which are expected to influence the development of genome variants.
Currently, in Angola, the National Institute for Health Research (INIS) is the reference laboratory for sequencing in the country, having collaborated with other institutions in the development of studies with international projection.

- These studies include epidemiological surveillance of genetic diversity and mobility of strains of Dengue, Chikungunya, Yellow Fever and HIV/SIDA.

Thus, another challenge is to monitor the evolution of SARS-CoV-2 genomes circulating in the country, which will allow tracking infection routes, informing about selection, as well as developing molecular and serological diagnostic tests.
Approved research projects

- The recognition of limitations and needs resulted in the work of several teams that culminated in two research projects that, in fact, are two macro-projects, since they integrate six projects as a whole.

- Thus, through the PDCT these two macro-projects on COVID-19, are being financed, which were recently presented in a public session, and the respective financing agreements were signed.
Summary of the two macroprojects

1. "Building COVID Capacity in Angola" - general aim is to strengthen Angola's infrastructure for the diagnosis of SARS-CoV-2 and provide the scientific basis for decision-making to mitigate the impact of the COVID-19 pandemic

The National Institute for Health Research (INIS) is the proposing institution and its research team is composed of 9 members, with a schedule of activities that indicates 18 months for its execution
Summary of the two macroprojects

2. “COVID-19 Epidemiological, Clinical and Laboratory Profile in Angola” - general aim is to contribute to a better understanding of the epidemiological, clinical and laboratory profile and of the protective factors against SARS-CoV-2 infection and to produce evidence for improve the prevention, control and treatment of COVID-19 in Angola

The Faculty of Medicine of the Agostinho Neto University is the proposing institution and the research team is made up of 40 members and has a 12-month schedule of activities
Both projects are implemented at national level and involve institutions of higher education, scientific research and the Ministry of Health, namely:

**Angolan Institutions**

- Three medical schools from public universities (Luanda, Lubango and Benguela)
- Two higher institutes of health sciences from public universities (Luanda and Menongue)
- One national health research institute (supervised by the Ministry of Health)
- One center of health research
- The national directorate of public health
- One private clinic in Luanda

**Foreign institutions**

- One research institute - university (Lisbon - Portugal)
- One medical university (Stockholm - Sweden)
- Three universities (United Kingdom and Brazil)

Collaboration with the World Health Organization and the Center for Disease Control and Prevention is foreseen
THE SPECIFIC AIMS OF THE PROJECTS

- To build Angola capacity to improve detection of SARS-CoV-2 and other pathogens across-the-country using real-time quantitative polymerase chain reaction (RTq-PCR)

- To identify the SARS-CoV-2 strains in patients with COVID-19 and their contacts and characterize the dynamic evolution of SARS-CoV-2 genomes

- To establish serological assay for detection and quantification of IgM and IgG antibodies to SARS-CoV-2 and in the process to develop operational conditions to conduct serologic experiments with animals
THE SPECIFIC AIMS OF THE PROJECTS

- To identify the epidemiological and clinical characteristics of patients with COVID-19
- To describe the prescribed therapy and the clinical response of patients with COVID-19
- To identify the behavior of COVID-19 in patients with comorbidities
- To analyze the kinetics of viral load in asymptomatic individuals and patients with COVID-19
- To determine the protective factors for SARS-CoV-2 infection among the contacts of patients with COVID-19
Conclusions
We hope that the results will contribute to the adoption of informed national policies and procedures, to the strengthening of Angolan-based biomedical research and to south-north collaboration.

Specifically, we hope that the results will be important for:

- Support to decision making
- The creation of new knowledge
- The contribution to the improvement of medical care and prevention of COVID-19
- Strengthening the capacity for scientific research
- Strengthening national and international cooperation
FINANCIAMENTO

COMMITMENT AND ENGAGEMENT

SCIENTIFIC RESEARCH

COVID-19

Society challenges

FUNDING

RESULTS

Decision-making support
New knowledge
Contribution to the improvement of medical care and prevention of COVID-19
Capacity building for scientific research
Strengthening national and international cooperation

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<th>N°</th>
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<td>1</td>
<td>Epidemiological, Clinical and Laboratory Profile of COVID-19 in Angola</td>
<td>431,590.12</td>
<td>Maria Fernanda Afonso Dias Monteiro</td>
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<tr>
<td>2</td>
<td>Building COVID-19 Response Capacity in Angola</td>
<td>613,029.00</td>
<td>Joana Filipa Machado de Morais Afonso</td>
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</table>

TOTAL= 1 044 619,12 USD

Commitment and Engagement

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REFERENCES

• UNESCO Science Report 2015; http://www.uis.unesco.org
OBRIGADA!