

EDITORIAL

Heart with Mozambique

Coração com Moçambique

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Mozambique, with a population estimated around 32,500,000 (more than 60% living in rural areas), still remains one of the poorest and least developed countries in the world. Poverty in the country is the result of a series of economical and social factors: low income, poor coverage of health services, lack of potable water and basic sanitation. The health sector is predominately public and is organized into four levels of care:

1. A public subsystem, dependent on the Ministry of Health, the National Health Service (NHS), the largest provider of care. It employs over 90 per cent of health workers in Mozambique and includes four central hospitals, seven provincial hospitals, two psychiatric hospitals, fifty district hospitals and 1,585 health centres distributed throughout the country.
2. A private subsystem divided into
 - a) private for-profit, mostly concentrated in Maputo ;
 - b) private not-for-profit subsystem includes religious organisations and non-governmental organisations (NGOs), the majority foreign and directly funded by the cooperation partners (donors) and health facilities in some public and private companies and in educational establishments, such as the Eduardo Mondlane University.
3. A military and paramilitary health subsystem, still embryonic;
4. Socio-professional organisations such as the Medical Council, the Nursing Council, and the Medical Association of Mozambique, considered part of the National Health System. In a country with drastic inequalities between urban and rural areas and between regions (North, Centre, and South), with

political instability during decades, financial constraints, lack of infrastructures and technology and deficit of human resources, the NHS faces serious problems and still does not cover the entire territory or respond to the basic needs of all citizens (less than 50% of the population covered), and is struggling to embrace the evolution of medicine and public health, the pace of technology and innovation, or research and development (Figure 1).

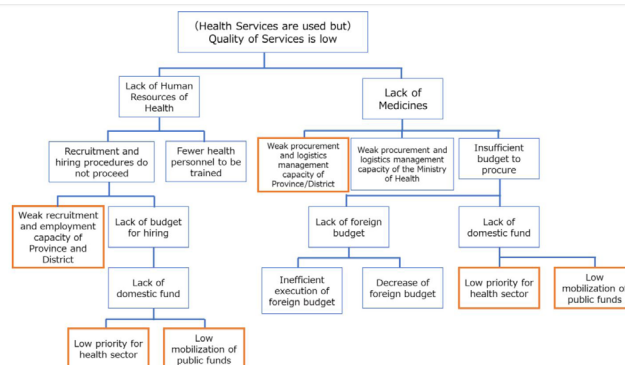


Figure 1 - Relationship between Challenges and factors in Mozambique Health Care

Source: Japan International Cooperation Agency. Data Collection Survey on the Health System in Mozambique Final Report. Available at: <https://openjicareport.jica.go.jp/pdf/1000045945.pdf>

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Human resources and training

One of the major issues of Mozambique NHS is the shortage of qualified healthcare professionals and an uneven distribution in rural and peri

urban areas (**Table 1**). Differences in educational content among training institutions and the lack of an established continuing education system represent a challenge in the quality of care.

	Mozambique	Maputo City
Estimated workforce density	88.0 (76.2, 102.0)	411.4(256.5, 659.9)
Estimated physicians's density	2.5 (2.03, 3.07)	41.0 (24.1, 69.8)
Estimated MCH nurses density	56.5 (48.5, 65.9)	193.3 (123.9, 301.8)
Estimated nurses density	25.4 (22.1, 22.1)	113.3 (55.1, 233.0)
Estimated Community Health Workers density	1.86 (1.55, 2.24)	-

Modified from : Fernandes et al Human Resources for Health, 2023

To train nurses, clinical technicians and specially doctors is an extended and lasting process (**Table 2**) and demands a long term strategy planning. For a doctor to qualify as a specialist, after medical school (6 years), mandatory internship and residency, it can take up

to 11 years. It should be noted that there is not lack of interest in post graduate education by the young doctors who are very much interested in pursuing their career and in the development of their capabilities.

Table 2 - Training duration for health worker main cadres in Mozambique health system

Nurses (including maternal and child health nurses)
→ Primary level nurse (<i>Técnicos de nível elementar</i>): 7 years of basic education + 8 months of specialized training)
→ Basic level nurse (<i>Técnicos de nível básico</i>): 10 years of basic education + 18 months of specialized training
→ Intermediate level nurses (<i>Técnicos de nível médio</i>): 12 years of basic or higher education plus 2.5 years of specialized education; however, 10 years of basic or higher education is acceptable to reduce the shortage of nurses. Includes maternal and child health nurses.)
→ Advanced level nurses (<i>Enfermeiros graduados</i>): 12 years of basic and higher education + a 4- year university nursing degree. Includes maternal and child health nurses.
Various technicians
→ Intermediate level technician (<i>Técnicos de nível médio</i>): 12 years of basic and higher education plus 2 to 2.5 years of specialized education. Prosthetic technicians, pharmaceutical technicians, laboratory technicians, anesthesiology technicians, hospital administration technicians, nutritionists, radiology technicians, dental technicians, psychiatric and mental health technicians, physical therapists and rehabilitation technicians, health statistics technicians, and hospital equipment maintenance technicians exist)
→ Advanced level Technician (<i>Técnicos de nível superior</i>): 12 years of basic and advanced education + 4 years of university studies. There are physiotherapists, pharmacists, laboratory technicians, equipment technicians, hospital administration technicians, nutritionists, clinical psychologists, orthopedic technicians, dental technicians, anesthesiology technicians, radiotherapy technicians, radiology technicians, and optometrists.
Physician
→ Auxiliary doctor Medical technician (<i>Técnico de Medicina</i>): 2–3 years of specialized nursing education + at least 3 years of work experience) Surgical Technician (<i>Técnico de Cirurgia</i>): above + 2 years surgical training + a 1-year internship)
→ Physician generalist doctor: 6 years of education at a university medical school specialist doctor +4-5 years residence programme

Source: Prepared by Survey team based on the data from Mid-level health workers for delivery of essential health services, Annex 6. Mozambique (Global Health Workforce Alliance, WHO, 2013)

The need of improvement of the quality of the health working force is expressed in the National Development Strategy 2015–2035 (Estratégia National Development 2015–2035), a long-term development plan, and the Mozambique Health Sector Strategic Plan 2014–2019 (PESS, Plano Estratégico do Sector de Saúde). The former aims to improve the living standards of the people by implementing four main strategies: (1) human capital development, (2) infrastructure development, (3) research, innovation and technology development, and (4) organization, coordination and institutional articulation.

Disease Structure

In the last decades the proportion of deaths due to infectious diseases decreased comparing to non communicable diseases (NCD) in the African region. At the present time, in Mozambique, cardiovascular diseases (CVD) are the leading cause of morbidity and mortality of NCD (ischemic heart disease, rheumatic heart disease-RHD, stroke). The prevalence of RHD is estimated at 3.04%, (Figure 2 and Table 3)

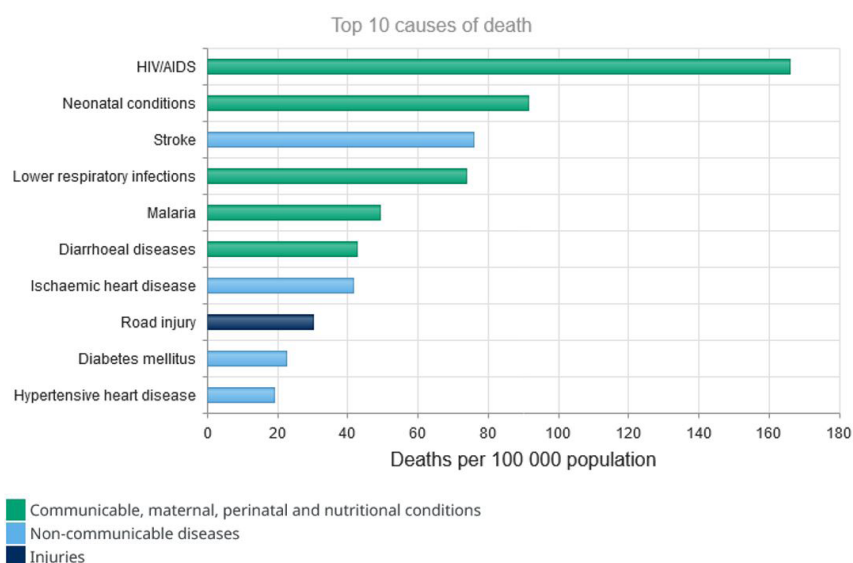


Figure 2 - Top 10 causes of death in Mozambique (2019)

Source: Global Health Estimates 2020: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019. Geneva, World Health Organization; 2020.

Table 3 - Cardiovascular Deaths in Mozambique (2019)

	Deaths	%	Adjusted death rate (n/100.000)	World Rank
Stroke	23.110	9.05	199.97	5
Coronary Heart Disease	12.621	4.94	114.09	88
Hypertension	5,786	2.27	55.74	7
Rheumatic Heart Disease	516	0.20	3.33	36

Source: <https://www.worldlifeexpectancy.com › mozambique>

Recognizing:

1. the importance of medical education of the health care professionals in the field of cardiovascular diseases (CVD) and of improving skills in clinical evaluation, electrocardiography

2. the burden of rheumatic heart (RHD) disease, a preventable CVD, affecting 39 million people worldwide, mostly children and young adults, attaining in Mozambique one of the highest

rates in sub-Saharan Africa among school-age children, the Portuguese Society of Cardiology (PSC) and the University Eduardo Mondlane (UEM) developed the programme **Heart with Mozambique 2023**. This project coordinated by Professor Victor Gil and Professor Ana Olga Mocumbi (UEM), had also roots in the programme of the World Health Federation "Colours to Save Hearts".

The main scope of this programme is to train healthcare professionals:

- a) in the clinical assessment and management area of CVD, interpretation of ECG and performance of echocardiography
- b) in the performance and interpretation of echocardiography in children to detect abnormal cardiac anatomy and RHD (clinical and subclinical).

The implementation of this programme included:

- I. The constitution of a Task Force, under the coordination of Professor Victor Gil, integrating an Organizing Committee (Isabel Monteiro, Kevin Domingues, Fernando Montenegro Sá, Mariana Lemos) and medical volunteers (cardiologists and pediatric cardiologists).
- II. A survey to the health professionals in Mozambique to identify their educational and training needs in the field of CVD in order to improve their clinical practice.
- III. Online course "Cardiovascular Diseases: diagnosis and management", with nine sessions, covering scientific subjects selected by the Mozambican health professionals. The course had clear learning objectives, a strong interactive and practical component, including echocardiographic screening. The Portuguese scientific programme team had the contribution of Cláudio Guerreiro, Luís Morais, Ana Esteves, Ana Neto, Inês Almeida, Marisa Passos Silva, Sara Fernandes, Isabel Graça, Miguel Mata, Kevin Domingues, Isabel Monteiro, Helder Santos and Mariana Lemos. The course had a total of 64 attendees - doctors (General Practice, Gynecology-Obstetrics, Cardiology, Internal Medicine), nurses and senior technicians.
- IV. Mission in Mozambique:
The PSC organized a Mission in Maputo with a team of eight cardiologists and three pediatric cardiologists: Victor Gil, Cláudio Guerreiro, Luís Morais, Ana Esteves, Ana Neto, Inês Almeida, Marisa Passos Silva, Sara Fernandes, Catarina Brandão, Mariana Lemos e Sílvia Alvares. Additionally acquired ten portable and handheld ultrasound devices to perform echocardiography.

The mission occurred from the 1st to the 15th of July 2023 with two major activities:

1. Education in CVD: practical daily courses with clinical cases to develop clinical assessment, diagnosis and management of the principal CVD at the UEM Clinic
2. Clinical activity and screening for CVD in three locations:

Maputo Central Hospital, Matxiqui-Txiqui Primary School and UEM Clinic.

- a) Maputo Central Hospital
Screening for RHD was carried out in pregnant and postpartum women in the Obstetrics I, II and VI wards of the Maputo Central Hospital; 213 women were screened and a total of 279 echocardiograms were performed, with 42 echocardiograms (19.7%) reported as abnormal.
- b) Community/School: Matxiqui-Txiqui Primary School
Screening for RHD was carried out in children aged between 5 and 15 years : 1853 children were screened and 1787 echocardiograms were performed, with 279 (15.6%) reported as abnormal. These cases were referred to local clinics for follow up.
- c) UEM Clinic
Twenty four 24 Health Professionals were trained in transthoracic echocardiography and 219 patients were screened with subsequent management guidance.

The "Heart with Mozambique" project was sponsored by His Excellency the President of the Portuguese Republic and has the support of the Secretary of State for Foreign Affairs, the Portuguese Ministry of Health and the Camões, I.P.(Camões instituto da Cooperação e Língua). The acquisition by the Portuguese Society of Cardiology of the ten portable and handheld ultrasound devices proved to be essential to carry out the project; these were later donated to UEM where they will be used in future editions of the program, as well as in activities and places in need in the country.

This first Mission represented the launching of a desirable and regular In country health programme to provide medical training and capacity building in the area of CVD in Mozambique. With future editions of the project, the team hopes to consolidate the training already provided but also extend it to other professionals who did not have the opportunity to participate in the first edition. The trainees can subsequently train other health providers, enabling expansion of skills and knowledge. We achieved in 2023 a partnership with Mozambican health professionals that extended beyond the mission trip and allowed the establishment of telemedicine network and interaction to improve continuous professional education and the quality of services delivered. Major challenge is fundraising. Fortunately the relevance of this project was recognized by Camões, I.P.(Camões instituto da Cooperação e Língua), providing financial support for a three years' programme. Additionally, the effective commitment of the PSC and the UEM in this project, aiming at capacity building and training of health professionals and improvement of health care in CVD, its sustainability can be assured and we plan to assess its benefits and results in the future programs.

CONCLUSION

Mozambique has the cooperation of a large number of international organizations in the field of health care and provision of care. The major objective of *Heart with Mozambique* is the training and development of the local health care professionals in the diagnosis and management of CVD, improving their skills in echocardiography. The close relationship that was achieved among the Portuguese and Mozambican health professionals motivates us to continue these missions. Because, as Nelson Mandela said " Education is the most powerful weapon you can use to change the world".

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