

# Lack of focus on cardiovascular disease in sub-Saharan Africa

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**Abstract:** Research into cardiovascular disease in Sub-Saharan Africa has been hampered by lack of funding and expertise. However, hospital- and community-based data reveal high economic and social costs of these diseases to the national health services and the communities, with the region facing a mixed burden of diseases related to poverty and infections, emergence of risk factors and diseases of affluence, as well as new cardiovascular problems caused by the HIV/AIDS epidemics. The availability of echocardiography has raised the profile of these conditions in sub-Saharan Africa, stimulating several projects led by local cardiologists under the umbrella of the Pan-African Society of Cardiology. This research may help to overcome the lack of focus on cardiovascular diseases in Sub-Saharan Africa, as well as increase the awareness of the public and policymakers on the burden of cardiovascular diseases.

**Key Words:** Cardiovascular disease; sub-Saharan Africa; HIV/AIDS epidemics; echocardiography



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## Introduction

The shortage of data on the burden of cardiovascular diseases in Sub-Saharan Africa results from lack of research, which is caused by reduced local expertise and poor funding. Most international funding agencies working in this region have been devoted to investigating the major determinants of child and maternal mortality, as well as the acute aspects of endemic infectious diseases. Although some data from the continent demonstrate a relatively low burden of heart disease in urban patients seeking primary health care (1), according to the World's Health Organization Committee for Africa the burden is increasing rapidly in Africa, and these conditions are now a public health problem throughout the continent (2). Arterial hypertension, stroke, cardiomyopathies and rheumatic heart disease are important cardiovascular diseases in adults in sub-Saharan Africa (2). On the other hand, African children have high prevalence of rheumatic heart disease, cardiomyopathy and untreated congenital heart disease (3).

## Trends in epidemiology of heart disease in sub-Saharan Africa

As a result of progressive urbanization and westernization of lifestyle in Sub-Saharan Africa the spectrum and pattern of cardiovascular diseases along with their risk factors are changing in urban areas (4). Non-communicable diseases such as systemic hypertension, diabetes and coronary heart disease are increasing, while the burden of infectious diseases remains important, specially the current human immunodeficiency virus epidemic. Sub-Saharan Africa is facing an epidemiological shift from AIDS to cardiovascular diseases being the leading cause of death. Although the USA has higher rates of cardiovascular diseases now, these are declining compared to the rates of the sub-Saharan African region (5). Thus, this region of Africa faces not an epidemiological transition but rather the simultaneous burden of cardiovascular diseases related to poverty and infections, emergence of risk factors and diseases of affluence, as well as new cardiovascular problems caused by HIV/AIDS epidemic and its management.

## Burden of cardiovascular diseases in sub-Saharan Africa

Cardiovascular diseases are the main non-communicable conditions, are major public health concern worldwide and account for 9.2% of total deaths in the African region (2), where they are the leading cause of death in those over the age of 45 (6). Cardiovascular diseases account for 7-10% of all adult medical admissions to hospitals in Africa, with heart failure contributing to 3-7% (7,8). The reported hospital mortality by cardiovascular disease is high reaching 9.2% in Cameroon (4) and 21.9% in Tanzania (9). Stroke has a disproportionately higher burden, with lower national income being associated with higher relative mortality ( $P < 0.001$ ) (10).

Rheumatic heart disease, hypertensive disease and cardiomyopathies account for over 75% of cases of heart failure (11). Right heart failure is not a rare usually related to dilated cardiomyopathies, chronic lung disease, rheumatic heart disease, HIV infection and Schistosomiasis (12). Ischemic heart disease continues to be a less common cause of heart failure and relatively small problem in terms of burden (10,13). Congenital heart diseases remain an important cause of heart failure in Africa in children (14,15). The low availability of surgery, loss for follow-up after diagnosis and refusal of surgery earlier in life leads to accumulation of large numbers of children and adults with uncorrected and/or complicated CHD (16,17).

The world's highest prevalence of RHD (15-20 per 1000 people) is found in sub-Saharan Africa, where the disease is the most important form of acquired cardiovascular disease in children and adolescents (2). Rheumatic heart disease is a major problem in all ages and the large number of young patients with severe disease who require surgery attests to the virulent nature of the disease in this part of the world (17,18). Multivalvular lesions are common and several problems affect the management of these patients, therefore turning surgery into a dangerous and often palliative procedure (17). Marked cardiopulmonary impairment and poor general and nutritional condition of most children make them a high-risk group prior to surgery, and the severity of valvular abnormalities precludes reparative procedures leading to the use of tissue valves or artificial valves in this young population.

Cardiomyopathies remain a challenge in Africa, particularly endomyocardial fibrosis and peripartum cardiomyopathy. Endomyocardial fibrosis affects young people and has poor prognosis, despite promising results recently achieved with the use of new surgical approaches (19). Peripartum

cardiomyopathy affects several thousand women and reaches an incidence of 1 per 100 deliveries in Nigeria (20).

Finally, cardiovascular complications of endemic infectious diseases such as Schistosomiasis, Tuberculosis, and HIV/AIDS are also important (3). Cor pulmonale is an important disease, with an age distribution that differs from that found in other areas of the globe, probably due to the high prevalence of the above mentioned infectious risk factors (12). The mixture of high prevalence of both HIV and tuberculosis with limited access to antiretroviral therapy, results in the dominant forms of HIV-associated heart disease in Sub-Saharan Africa being pericardial tuberculosis, cardiomyopathy and pulmonary hypertension (21).

In summary, the pattern of cardiovascular diseases in Sub-Saharan Africa is unique, including uncorrected congenital heart defects, persistence of conditions associated with poverty and infections which have not yet been controlled (rheumatic heart disease, endomyocardial fibrosis, cor pulmonale due to schistosomiasis), emergence of diseases related to changes in living habits (hypertension and stroke, ischaemic heart disease) and diseases associated to the HIV infection (tuberculous pericarditis, pulmonary hypertension, cardiomyopathy).

Data on the economic implications of cardiovascular disease and heart failure in sub-Saharan Africa are scarce, but, there is clear evidence that the cost of managing cardiovascular emergencies such as stroke, heart failure and hypertensive emergencies cannot be afforded by the majority of the population (22). Recent data on the high economic and social costs of cardiovascular diseases to the national health services and the communities comes also from Tanzania, where respondents from all income strata reported decrease in self-rated health, worsening of the ability to participate in moderate and vigorous activities, and emotional problems following cardiovascular-related hospitalization (23).

## Diagnosis and management of cardiovascular diseases

The confirmation of the diagnosis of cardiovascular diseases in sub-Saharan Africa relies essentially on echocardiography, which is performed in few referral centres in urban areas due to low availability of human resources for cardiovascular care. Interventional cardiology and cardiac surgery are not readily available in most countries. In some, these services rely essentially on collaborative partnerships that bring teams from overseas to perform cardiac catheterization and

surgery at subsidised prices, while progressively training the local teams. An example of such partnerships is Mozambique, a country in Southern Africa, with more than 22 million people living in an area of over 800,000 km<sup>2</sup>. It only has one catheterization laboratory and two centres performing open heart surgery, all located in the country's capital. The country has 13 cardiologists and 3 cardiac surgeons.

Owing to the high prevalence of rheumatic heart valve disease and the high costs of prosthetic valves and consumables for cardiac surgery, the sustainability of the cardiac services started under North-South partnerships in sub-Saharan Africa, depend on improving diagnostic skills of the local cardiologists, completing the training of local surgical teams, promoting retention policies for the highly trained personal, and acquiring consumables and prostheses at lower costs.

Few countries in sub-Saharan Africa have adequate availability of drugs for cardiovascular disorders, and even less comply with the World Health Organization National Essential Medicines List for reasons that seem to be related to lack of political will, insufficiency of human resources or funding, and conflict of interests (24). Social security or medical insurance systems covering the whole population are not found in most countries, hampering the adequate provision of medical drugs to patients. Moreover, the price of drugs varies greatly and the cost of transport from distanced rural areas to the medical centres is considerable, making the treatment unaffordable to most patients. This can partially explain why despite systemic hypertension being highly prevalent in both urban and rural communities (11,25), alarming low control rates are found in some countries (11,23).

### Research priorities in cardiovascular diseases in sub-Saharan Africa

The exact epidemiology of cardiovascular diseases in sub-Saharan Africa is unclear. The advent of portable echocardiography, and its use for screening and management of cardiovascular diseases, constitutes an opportunity for African scientists to tackle the issue of lack of systematic data on prevalence and incidence of these conditions. This technique can be used to improve quality of research in the continent, and raise the profile of neglected cardiovascular diseases (26).

The Pan-African Society of Cardiology and several African institutions have been working together to promote research into cardiovascular in sub-Saharan Africa aiming at gathering relevant epidemiological data. Research projects such as multicentre prospective observational of acute heart

failure registry (THESUS-HF), Pilot Trial of Adjunctive Prednisolone and Mycobacterium with Immunotherapy in Tuberculous Pericarditis (IMPI), rheumatic heart disease global registry (REMEDY) and Pan-African pulmonary hypertension cohort (PAPUCO) are good examples of this commitment. The results of these projects are expected to help increasing awareness of the public and policy-makers towards prevention and control of cardiovascular diseases, include local data in the training curricula for medical schools, and stimulate the integration of medical care for non-communicable diseases with the current efforts for control of endemic infectious diseases in sub-Saharan Africa.

### Conclusions

Cardiovascular diseases have been neglected in sub-Saharan Africa, but there are recent efforts trying to gather information on their epidemiology, clinical characterization and outcomes. Owing to the specific pattern of heart failure in this region research into the determinants of cardiovascular diseases must go beyond the conventional risk factors, and attempt at understanding the role of local practices and cultural habits in determining the incidence of conditions that are particularly common in this region of the world.

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