

The Benefits and Challenges of Cardiac Mission in Sub-Saharan Africa

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ABSTRACT

The benefits and challenges of foreign missions have been of impact to the low- and middle-income countries. For many years, these missions have been taking place in sub-Saharan Africa especially in central, east, and west Africa. In this review article, we discuss the benefits and challenges of cardiac mission in the sub-region.

Keywords: Medical Care; Foreign; Missions; Healthcare; Africa

Introduction

Cardiovascular diseases are on the rise in the several countries of sub-Saharan Africa [SSA]. The countries in sub-Saharan Africa span from West, Central and East Africa.¹ These countries were initially regarded as low in non-communicable diseases but high in communicable diseases [1,2]. Today non-communicable diseases are now on the rise in sub-Saharan Africa [1-3]. This region has entered the zone of transition from communicable to non-communicable diseases [NCDs] bearing the proverbial double disease burden. The NCDs include cardiovascular and non-cardiovascular diseases [2]. The cardiovascular disease includes symptomatic bradycardia, cardiomyopathies, heart failure, ischemic heart diseases, valvular heart diseases, congenital heart diseases, rheumatic heart disease, atherosclerotic cardiovascular disease, peripheral artery disease, coronary artery disease, ischemic stroke, central venous diseases (central venous occlusion,

venous thrombus embolism), ventricular arrhythmias, supra-ventricular arrhythmia, etc [2-5]. Non cardiovascular NCDs include endocrine disorders like thyroid disease, diabetes mellitus (type I and type II), Auto immune disease like systemic lupus erythematosus, Rheumatoid arthritis, cancers, hematological cancers {lymphoid, and leukemia, breast cancers, cervical cancers, lung cancers, gastrointestinal cancers, etc} [6,7]. As cardiovascular disease increases, the burden of treatment falls on the health care provider.

Cardiovascular Diseases Burden

Cardiovascular diseases (CVDs), principally atherosclerotic cardiovascular disease (ischemic heart disease, peripheral artery disease), stroke, symptomatic Bradycardias, cardiomyopathies, hypertensive heart disease, etc are the leading cause of global mortality and a major contributor to disability [4-8]. Prevalent cases of

total CVDs nearly doubled from 271 million in 1990 to 523 million in 2019, and the number of CVD related deaths steadily increased from 12.1 million in 1990, reaching 18.6 million in 2019 [9]. The global trends for disability-adjusted life years (DALYs) and years of life lost also increased significantly, and years lived with disability doubled from 17.7 million to 34.4 million over that period. The total number of DALYs due to IHD has risen steadily since 1990, reaching 182 million DALYs, 9.14 million deaths in the year 2019, and 197 million prevalent cases of IHD in 2019. The total number of DALYs due to stroke has risen steadily since 1990, reaching 143 million DALYs, 6.55 million deaths in the year 2019, and 101 million prevalent cases of stroke in 2019 [9].

From the year 2000 to 2019, average global life expectancy rose by more than six years- from 66.8 years in 2000 to 73.4 in 2019. But there is a gap between overall life expectancy and healthy life expectancy, according to this report [10]. That measure has increased by 8%, from 58.3 years in 2000 to 63.7 in 2019. This indicates there is a point at which health, and possibly quality of life, starts to diminish-currently lasting almost 10 years [10]. Diabetes was found to have the largest impact on DALYs, the WHO says, increasing by 80% between 2000 and 2019. While DALYs caused by Alzheimer's disease and other forms of dementia have almost doubled [10]. CVD burden continues to rise for almost all countries outside high-income countries, and alarmingly, the age-standardized rate of CVD has begun to rise in some locations where it was previously declining in high-income countries [11-14]. There is an urgent need to focus on implementing existing cost-effective policies and interventions if the world is to meet the targets for Sustainable Development Goal 3 and achieve a 30% reduction in premature mortality due to non-communicable diseases [14]. Major adverse cardiac events following acute coronary event is seen in 30.8%, and in-hospital mortality is 8.1% [13,14]. Mortality rates at 30 days, 3 months, 6 months, and 1 year were 8.7%, 9.9%, 10.9%, and 13.3%, respectively. For heart failure, the mortality rate at 1 year is 12.3% [14]. Certain private organizations have taken it upon themselves to help provide, administer, and build a sustainable healthcare service to cater for indigent Sub-Saharan Africans through medical missions to the region amidst the socio-political-economic, demographic and security challenges in the region [15,16].

The Role of Cardiac Mission in SSA

There are shortage of skilled cardiac surgeons, interventional cardiologists, and general cardiologists across the SSA region. Other healthcare workers that complement the system are also lacking in number. The limited workforce hinders the effectiveness and management of cardiovascular diseases. Many African countries lack the necessary resources, specialized equipment, and organizations to provide effective diagnostic and treatment interventions for a lot of cardiovascular diseases. Poor diagnostic and treatment involvement rates among locals contribute to challenges in management of cardiovascular diseases. The cost of cardiac surgery or interventional

procedures is often unaffordable for most African countries due to their low-income status. Lack of cardiac surgical care stakeholders during planning processes leads to a lack of inclusion of cardiac surgical services in national healthcare plans. To improve access to cardiac surgery, electrophysiology, and interventional cardiology procedures in the subregion, it will be excellent to establish long-lasting and sustainable cardiac interventional and surgery programs [17]. This could be achieved through collaborations with international groups, and regional training programs. This is what the cardiac mission programs represent. Both the patients, local cardiologist and surgeons' benefit. The skills of the local physician are improved to meet with the demand of best practice in the world. The patients, especially indigents ones, benefit from the free interventions and surgeries.

Some Cardiac Missions in Nigeria

The Vincent Obioma Ohaju Memorial (VOOM) Foundation is a private international medical humanitarian organization made up of volunteer doctors, nurses, health workers and many other support professions who contribute to the mission of the VOOM Foundation. Their mission is to provide impartial sustainable healthcare programs dedicated to quality, with a particular interest in supporting the underprivileged and underserved. Their long-term goal is to develop a sustainable hospital system dedicated to quality, with an emphasis on education and training, public health and prevention, health fairs and outreach, providing new state of the art medical equipment and by providing life-saving heart procedures through our medical mission program.

Since March 2013, when VOOM Foundation restarted the open-heart program in Nigeria, they have partnered with three partner hospitals to train and educate the local staff providing necessary skills to support a sustainable open-heart program within the country. To date, VOOM Foundation leads all health organizations in Nigeria in open-heart procedures performed. It is the goal of VOOM and their partner hospitals to greatly increase our patients at each institution giving the necessary volume to train while continuing to provide open-heart surgery to the less privileged patients. Pace4Life, established in the year 2012, is a Not-for-Profit charity-based organization that reuses donated pacemakers in the developing world. Their mission is to make an enduring impact in the health and wellbeing of people in low and middle - income countries. Pace4life sponsors several missions in developing countries yearly, including Nigeria, and Ghana. This helps our indigent patients, who otherwise would not be able to afford and access these services, to benefit from pacemakers, implantable cardiac defibrillators and cardiac resynchronization therapy implantation free of charge.

The Cardiovascular Education Foundation (CVEF) was established in 2012 and headed by Dr Obinnaya Emeriole. CVEF is an international nonprofit organization dedicated to the goal of promoting cardiovascular education, research and patient care in underserved communities, especially in SSA. CVEF was founded to address some

of the challenges of that SSA which is currently undergoing especially epidemiologic transition in the region which is characterized by a rapid increase in the prevalence of NCDs especially CVDs. One of the major barriers to optimal cardiovascular care in the region is a shortage of healthcare professionals with advanced training in the specialty. This shortage is compounded by the emigration of physicians and other healthcare professionals from Africa to Europe and America for economic and other reasons. The mission aim is to change this trend so that quality and affordable healthcare can still be obtained in Africa.

Save a Heart Foundation is based in Northern Ireland. This charity organization consists of a team of cardiac medical and surgical experts. Their aim is to transfer skills and knowledge to Nigeria and help bridge the inequality in access to good cardiovascular treatment. They seek to fill certain gaps in the Nigerian Healthcare and help children and adult in desperate need for cardiac surgical interventions. Some other charity organizations involved in saving children and adult's hearts are the Heart for Humanity, King Salman Foundation, Cardio Start International, etc. Heart for Humanity is a grassroots project that is focused and geared towards helping others and the community. The heart for humanity project is centered around helping and assisting with hunger, homelessness, health & wellness within a humanitarian effort. Heart for humans is about H.O.P.E. = Healing, Opportunity, Purpose, Empowerment. King Salman Foundation is a nongovernmental organization based in Saudi Arabia. It has done cardiac mission in Nigeria. Cardio Start International aims to educate and assist local medical teams in providing heart surgery and cardiac services to adults and children of underserved regions of the world.

Mode of Payment in Nigeria

There are different ways patients pay for their procedures in Nigeria. Most patients pay from their pocket, or their relatives pay out-of-pocket for them while others use Health Maintenance Organizations {HMO} to pay their medical bills.

Classification of Indigent Patients

The Cambridge dictionary defines indigent as being very poor, destitute impoverished, and poverty-stricken. Medical indigency is when a patient does not have the financial means to pay for their medical expenses. There is no universal classification of medical indigency. We proposed the following classification of medical indigency:

Group A

Those that cannot afford the cost of their treatment, that is, the cost of the cardiac device, stent or surgery but can pay for the use of the Cardiac Catheterization [Cath Lab] or surgical theatre and hospital admission.

Group B

Those that cannot afford the cost of the cardiac device, stent or

surgery and also cannot afford to pay for the use of the Cath Lab and surgical theatre but can afford to pay for hospital admission.

Group C

Those that cannot afford the cost of the cardiac device, stent, surgery, use of the Cath Lab, surgical theatre and hospital admission.

Group D

This includes the group of indigent patients that cannot afford transportation to the hospital, cost of the cardiac device or stent, use of the Cath Lab and hospital admission.

Benefit of Foreign Cardiac Missions to Patients

Cardiac missions have helped to alleviate the financial burden of accessing specialized healthcare services to our indigent patients, who otherwise would not be able to afford and access these services. Furthermore, our indigent patients have not only been able to access specialized healthcare services but in addition, they have also accessed world standard healthcare services through this mission. These specialized healthcare services have caused our patients to benefit from open heart surgeries, valve repair, coronary artery bypass procedures, coronary angiographies, percutaneous coronary interventions with balloons and stents, and the implantation of pacemakers, ICDs and CRTs freely. The financial cost of visa and travel overseas, medical bills in dollars are off the table and the patients will still get the best of care in the world.

Benefits of Foreign Cardiac Mission to the Local Healthcare Providers

These benefits go to the Cardiologists, Cardiothoracic Surgeons, Nurses and Cardiac Physiologists, Laboratory Technologists, Pharmacists etc. Learning is a function of time, exposure and (practical) experience, and as a proven cost-effective and sustainable approach for providing specialized healthcare services to every Nigerian, even outside the cardiac mission period, these charity organizations have taken it upon themselves to ensure the local team of healthcare providers which includes Cardiologists, Cardiothoracic Surgeons, Nurses and Cardiac Physiologists gain hands-on experience preceded by or alongside academic sessions during the cardiac missions in such that over the years these local professionals have gained an advantage and have become independent in rendering these services to every Nigerian. Currently, these charity organizations have been able to sponsor all year-round charitable cardiac interventions to Nigerians through the independent local team by simply supplying free specialized consumables for the indigent Nigerians.

Benefits of Foreign Cardiac Mission to the Country

These missions provide health care for Nigerians who can afford these cardiac interventions (and probably would not have been able to travel abroad) thus reversing medical tourism and also facilitating

the participation and business opportunities of local healthcare consumable and equipment vendors which in turn has provided economic value for the Nigerian naira.

Challenges of Foreign Cardiac Mission in sub-Saharan Africa

Considering the above missions of the listed organizations sponsoring cardiac missions to Nigeria, it is obvious that they would love to ensure sustainability of their sponsorships, programs and very importantly, the services they have helped to build locally. Unfortunately, our society is encumbered with factors that threaten the path to sustaining these high-end services locally. These factors include:

1. Social Factor

Our diverse culture, social behavior and sometimes presumptuous societal class mentality in Nigeria sometimes create avoidable problems within the workplace to the point of limiting the smooth running of charitable services and in certain situations, it could totally prevent these services from being carried out. Eventually, office and professional politicking among healthcare providers/institutions results in unsatisfactory outcomes both for the charity organization, local healthcare providers willing to volunteer and for our patients. Lack of adequate collaboration between local and foreign teams during some missions impede on the skill transfer.

2. Political Factor

The true political class either does not see the benefits or are not convinced of the immense benefits these charity organizations bring to our country; otherwise, clear policies and strict guidelines would have been laid out for easy logistics, rendering of these services and transfer of skills to the local team. So sometimes, volunteers might have a hard time getting their VISAs or difficulty in bringing in medical consumables and equipment to facilitate their charity programs.

3. Economic Factor

It is quite appalling to mention that the status of the Nigerian economy is so bleak that it is difficult to plan around these programs because local vendors need to be patronized for certain consumables which would make more sense to acquire them locally; also logistics, accommodation and welfare for all critical members of the team, including the local team, would require unusual cost margins to help cater for the unpredictable market inflation in order to have a successful event. Also, the rising cost of living is affecting these missions in several ways. For instance, the cost of diesel to power the generator, the cost of transportation, accommodation and food are all on the increase and all have negative impact on these missions.

4. Security Factor

As a result of the economic unrest, insecurity has been on the rise; however, it is generally prevalent in certain regions across the country, regardless of volunteers in Diaspora are threatened to change their

decision to visit Nigeria, especially certain regions in Nigeria, which may rather have a significant number of patients targeted by this cardiac mission. Unfortunately, these indigent patients will have to travel far to access these services at their own expense.

5. Infrastructure Factor

Over 90% of our public hospitals are not adequately equipped with human resources and especially with equipment for contemporary cardiovascular interventions, therefore a good portion of cardiac missions have required the charity organizations to sponsor local volunteers, provide both consumables and key equipment for cardiac interventions in public institutions and as a result they may have to go through much hassle even at our ports. On the other hand, certain private and public-private healthcare institutions in Nigeria have been helpful in lessening this burden thus requiring these organizations to provide key consumables only, and in some cases still sponsor local volunteers to the hub centre for the cardiac mission.

6. Demography Factor

Due to the development of certain states in Nigeria relative to others in terms of presence of quality healthcare infrastructure, good or better roads, international/local airports or proximity to one, some level of security, etc a significant number of states in Nigeria have been directly underserved; but indigent patients in those underserved states who can afford to travel have been required to do so to the major cities in Nigeria where these cardiac missions are usually hosted.

7. Procedural Risk Factor

In general, due to the lack of a competent and robust healthcare insurance system for every Nigerian, many Nigerians (including the indigent) are very much likely to present late to the hospitals with other co-morbidities which increases their risk some cardiac interventions and therefore puts them in a disadvantage position during the cardiac mission. So, it takes a lot of grit for these charity organizations to attempt to provide healthcare to this patient selection and in many situations have had to turn them down right from the selection process.

8. The Nigerian Brain Drain [Japa' Syndrome]

The emigration of Nigerian healthcare workers to other countries of the world for various personal reasons has been a longstanding phenomenon; however, due to the recent persistent economic decline in Nigeria and dire need of healthcare workers in developed countries offering better remuneration, security, and other benefits, an avalanche of Nigerian healthcare workers has left the country for greener pastures abroad causing a brain drain in the Nigerian healthcare sector. This has significantly reduced the number of specialized and experienced medical doctors, nurses, pharmacists, cardiac physiologists, cardiac catheterization technologists, and laboratory scientists in the country to cater for over 200million people. Some of these

healthcare workers were direct and indirect beneficiaries of the training offered through the various cardiac missions in Nigeria.

The rising unmet need for advanced healthcare in Nigeria and Sub-Saharan Africa. The cardiovascular burden is doubtless taking root and growing from available studies and even occurring at a comparatively earlier age than in the western world, however, the rising need for new healthcare technologies and expertise has not been similarly progressing in Nigeria. [see (Figure 1)]. The need for healthcare in the form of prevention, diagnosis and treatment is multifaceted and unfortunately not rising at the same rate as the cardiovascular disease occurrence producing a “care gap” that requires filling either for individual patients or for communities. Similarly, the local healthcare education, policy, programs and manpower development had largely focused, over the years, on the initial communicable diseases which

were predominant at the time. However, the new double burden casts great light on the “manpower gap” characterized by both a dearth of training as well as the number of qualified professionals. Notwithstanding this handicap, the brain drain phenomenon, has been a tremendous handicap for staying and trainable manpower. Beyond the above gaps in healthcare delivery, one of the most significant is the “finance gap” which is like a double-edged sword striking at both its supply and demand sides. Much finance is needed to close the “infrastructure gap” which in turn closes the vicious cycle of the revolving unmet need that could potentially have far-reaching implications. To combat these challenges and stop the endless spiral, a major gap, the “sustainability gap”, has to be approached with locally pragmatic and proactive systems that will have perennial solutions even as events and seasons change; this, according to one of the authors, is called the “systems gap”.

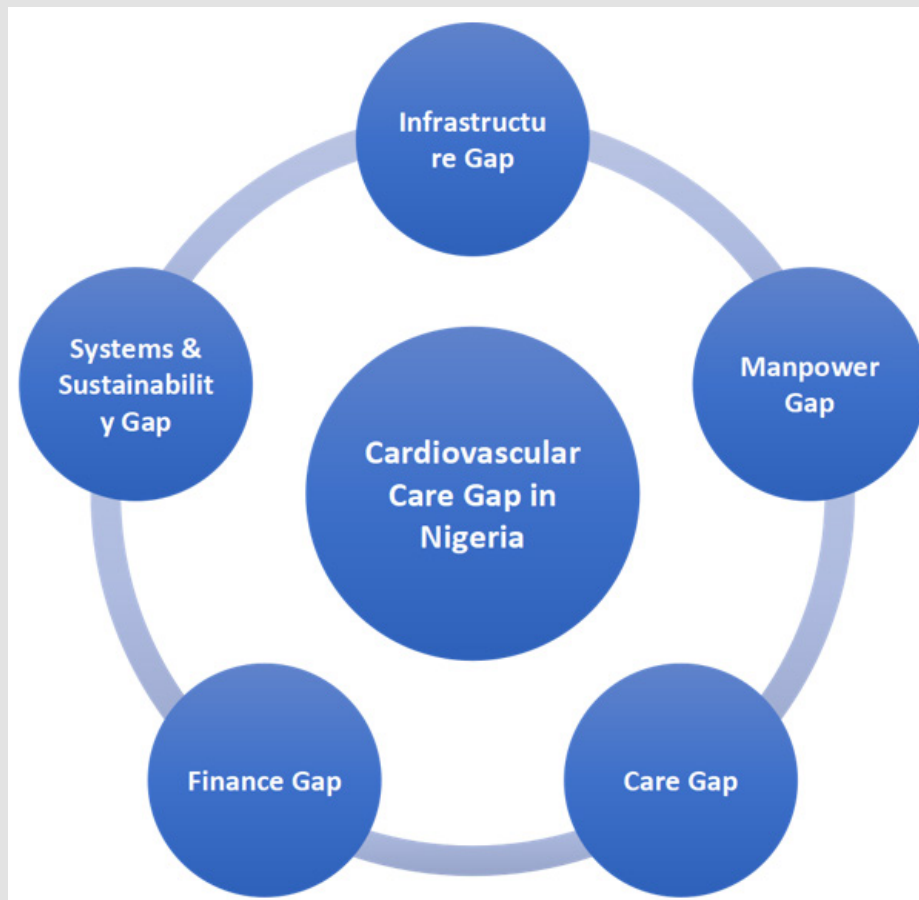


Figure 1: Rising unmet need in Nigeria.

Recommendations

The following are our recommendations:

1. The Nigerian government should improve on the security services across the country, such that every Nigerian and foreigner in Nigeria feels safe security for their lives and properties every across the country.
2. The Nigerian government needs to make the national health-care insurance efficient and effective to cover for life saving cardiac interventions.
3. Patient education as well as sensitization of healthcare workers is key to providing a high success rate for cardiac mission.
4. Commensurate pay with other workplace benefits should be adapted for all healthcare workers in order to reverse the brain drain.

Conclusion

We will always encourage foreign cardiac mission programs to hold in Nigeria due to the huge impact it has on the local team, patients, hospital, and the country at large.

References

1. (2021) World Health Organization.
2. (2014) Health Organization regional committee for Africa. Noncommunicable Diseases.
3. (2011) Regional Committee for Africa. Cardiovascular diseases in the African region: current situation and perspectives: Report of the Regional Director.
4. Bigna JJ, JJ Noubiap (2019) The rising burden of non-communicable diseases in sub-Saharan Africa. *The Lancet Global Health* 7(10): e1295-e1296.
5. Matthew Fomonyuy Yuyun, Karen Sliwa, Andre Pascal Kengne, Ana Olga Mocumbi, Gene Bukhman (2020) Cardiovascular Diseases in Sub-Saharan Africa Compared to High-Income Countries: An Epidemiological Perspective. *Glob Heart* 15(1): 15.
6. (2018) World Bank Poverty and shared prosperity 2018: piecing together the poverty puzzle.
7. Vos T, Lim SS, Abbafati C (2020) Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 396: 1204-1222.
8. Mensah GA, Roth GA, Fuster V (2019) The global burden of cardiovascular diseases and risk factors: 2020 and beyond. *J Am Coll Cardiol* 74: 2529-2532.
9. Roth GA, Mensah GA, Johnson CO, Addolorato G, Ammirati E, et al. (2020) GBD-NHLBI-JACC Global Burden of Cardiovascular Diseases Writing Group. Global Burden of Cardiovascular Diseases and Risk Factors, 1990–2019: Update From the GBD 2019 Study. *J Am Coll Cardiol* 76(25): 2982-3021.
10. (2019) Africa Organization health. Heart disease remains the number-one killer in the world. The leading cause of death in the world in 2019 was ischaemic heart disease, also known as coronary heart disease. It was responsible for 16% of total deaths and since 2000 has seen the largest increase in mortalities, killing 8.9 million people in 2019.
11. Ogah OS, Stewart S, Falase AO, Akinyemi JO, Adegbite GD, et al. (2014) Contemporary profile of acute heart failure in Southern Nigeria: data from the Abeokuta Heart Failure Clinical Registry. *JACC Heart Fail* 2: 250-259.
12. Karaye KM, Ishaq NA, Sa'idu H, Balarabe SA, Talle MA, et al. (2020) PEACE Registry Investigators. Incidence, clinical characteristics, and risk factors of peripartum cardiomyopathy in Nigeria: results from the PEACE Registry. *ESC Heart Fail* 7: 235-243.
13. Abubakar I, Dalglish SL, Angell B, Sanuade O, Abimbola S, et al. (2022) The Lancet Nigeria Commission: investing in health and the future of the nation. *Lancet* 399: 1155-1200.
14. Ogah SO, Orimolade OA, Jinadu TO (2023) Cardiovascular Diseases in Nigeria: Current Status, Threats, and opportunities. *Circulation* 148: 1441-1444.
15. Murray CJL, Aravkin AY, Zheng P (2020) Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 396: 1223-1249.
16. (2018) GBD 2017 Risk Factor Collaborators Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 392: 1923-1994.
17. Mensah GA, Wei GS, Sorlie PD (2017) Decline in cardiovascular mortality. *Circ Res* 120: 366-380.

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