Global Expansion of Cardiothoracic Surgery - The African Challenge

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"I keep six honest serving-men
(They taught me all I knew);
Their names are What and Why and When
and How and Where and Who

Rudyard Kipling

Background [1] [2] [3]

The world population of 6.5 billion people lives on 29.2% of the earth's surface, the remaining surface being covered with water. This population occupies 193 countries, 61 dependent areas, and 6 disputed territories. The annual world mortality rate is over 57 million. There is an annual overall population growth rate of 1.14% or 80 million more people per year increase in overall world population. The global birth rate of 20-24 births/1000 population, and the death rate of 8.86 deaths/1000 population is almost double in SubSaharan Africa (SSA). The global life expectancy of 64.05 years is less than 51 years in SSA.

A further insight into SSA statistics reveals that eight of the top ten countries with the highest infant mortality rate are in Africa. The human development index (HDI), which is an indicator of quality of life, again reveals that 27 of the top 30 countries in the world with the lowest HDI are also in Africa. HIV/AIDS infects 34-46 million people worldwide with 25.0-28.2 million cases in SSA. 2.2-2.4 million of the annual 3 million deaths secondary to HIV/AIDS are in SSA. The global prevalence rate of 0.9-1.3% is 7.5-8.5% in SSA.

The reasons for this disparity in SSA can be attributed to many causes. Simply stated the social, political, economic, environmental (geographic), and demographic factors (SPEED) are the basic elements. Unfortunately, education and health care are not high priority in many countries, especially developing countries or emerging economies. The debate between the Neo Malthusians who believe the growing world population is unsustainable and the Technocentrists who believe that emerging technologies can and will support a rising world population, continue to evoke a sustained emotional response. In the meantime, how do we approach the present situation in SSA? In summary, ego or the human factor, and money or economics play the dominant roles in the overall approach to the challenge of improved health care access and care.

Present Health Status

Given this broad background on the global and African situation, let us now focus on the health statistics insofar as SSA Africa is concerned. Of the 57 million worldwide deaths in 2002, over 18 million were from communicable diseases, over 33 million from non-communicable diseases, and over 5 million from injuries. [3]

Of interest to Cardiothoracic/vascular (CTV) surgeons are the death attributable to: cardiovascular disease (CD) – over 16 million (7.2 million ischemic heart disease);

tuberculosis over 1.5 million; esophageal cancer over 440,000; rheumatic heart disease over 325,000; congenital heart disease over 280,000; and over 1.1 million road traffic accidents. In SSA, the incidence of death from CVD rose from 8.15% in 1990 to 9.20% in 2000. This incidence continues to rise. Road accident mortality in SSA is > 25/100,000 in contrast to 15/100,000 in the Americas.[4] Smoking, hypertension, stress, and dietary changes continue to impact on SSA with resultant increases in non-communicable diseases, especially ischemic heart disease and lung cancer.

What are the resources now present worldwide and in Africa to deal with this present situation. Unger[5], Cox[6,7], and Pezzella[8] have summarized nicely the present situation, as well as future strategies and recommendations. Briefly, there are over 1.5 million open-heart operations done each year worldwide by over 6,000 surgeons, in over 3,000 centers or units. Unfortunately only 2 billion of the world 6.5 billion population has access to these operations. There are 1222 open-heart operations per million population in North America, compared to 18 per million in Africa. This translates into 1 center or unit per 120,000 people in the USA to 1 center/unit per 33 million people in Africa.

At the present time there are cardiac centers/units in 18 African countries Morocco, Algeria, Tunisia, Libya, Egypt, Mauritania, Senegal, Ivory Coast, Ghana, Nigeria, Cameroon, Sudan, Kenya, Tanzania, Mozambique, South Africa, Mauritius and Burkina-Faso). Several others are in planning or start up phases. With the exception of South Africa, the SSA programs face continual political and economic challenges.

Strategic Initiatives

The challenge to increase and improve Cardiothoracic/Vascular surgery in SSA must recognize the SPEED constraints. There must be a consenous that the project/program will succeed and be sustained. If the feasibility study for any given country or program is possible then a planned strategic/tactical approach should be undertaken.

The strategy for the development of cardiac surgery in the Subhararan Africa (SSA) should embrace the horizontal product line concept. What this means is the collaboration of the public health and curative health sectors to foster the prevention, promotion, diagnostic, therapeutic, and rehabilitation elements of cardiac disease. Prevention implies programs for rheumatic fever and maternal health. Promotion

encompasses the appropriate teaching of both health care workers and the general public on all aspects of preventative medicine with again specific programs for rheumatic fever, rheumatic heart disease,

maternal health and congenital heart disease, the risks of the western diet, smoking hypertension, and road safety. Diagnostic capability requires increased recognition and documentation of those with cardiothoracic diseases/problems. The therapeutic and curative element is broad based to include invasive, interventional, and surgical modalities. Finally, follow-up care and rehabilitation gets people back to a sustained functional and productive lifestyle.

The present and future African Cardiothoracic surgeons must embrace this approach if they are to gain broad based support from the public health sector in advancing the cardiothoracic/vascular surgery initiative in SSA.

Tactical Initiatives

Against this background let us examine a tactical approach to advancing Cardiothoracic surgery in SSA. With the exception of programs in Sudan and South Africa, most of the existing or soon to start programs in SSA face enormous political and economic challenges. Without short-term (3-5 yrs) foreign or international support, these programs will have difficulty and many will fail. Financial support and political willingness are necessary for long-term success. This will require an organized political lobby to present to the particular governments a cohesive and organized plan to start, support, and supplement cardiothoracic surgery units/programs in any one given country. It will require dedicated leadership with both vision and attention to practical managerial challenges. Again, it must be stressed to the agencies that non-communicable diseases and trauma are rising in SSA and with a significant impact on the health care sector. Let us consider the four aspects of a cardiothoracic/vascular program, center, or unit: clinical, educational/ training; research/development; administrative/political/logistical.

Clinical

We all agree that the incidence/prevalence of Cardiothoracic diseases is increasing in SSA. Sending paying or non-paying patients abroad is of limited practical value, considering the cost and the logistical difficulties – Visa, housing, rehabilitation, follow-up at home. Yet paying patients will continue to go abroad for high cost, sophisticated care.

Regional referral centers offer a better solution as a temporary or long-term situation. There are several centers in South Africa that offer a model to study and consider (Walter Sisulu Pediatric Cardiac Centre for Africa in Johannesburg and the Christian Barnard Memorial Hospital in Cape Town). This may be a practical solution for neighboring countries. Additionally, training for future programs is within their scope of interest and influence. Also, it is easier to start an adult program in places that are new or being upgraded. Pediatric procedures are phased in progressively according to age, weight, complexity and experience of the medical staff.

Education/Training

The internet, especially the www.ctsnet.org offers a wealth of information, knowledge, and technology for the Cardiothoracic/vascular surgeon. Developing a relationship with a foreign program, especially Europe is of practical value, as well as in neighboring countries with successful programs e.g. South

Africa, Ghana, and Sudan. Outside of South Africa, there are no organized, standardized Cardiothoraic/vascular residency programs in SSA. A Pan-African initiative, like the Pan-African Society of Cardiology (PASC), may be a practical approach. Utilizing the knowledge of other African surgical societies like the West African College of Surgeons, and the Society of Cardiothoracic Surgery of South Africa can strengthen this unity and collaboration. The initiation of this African Annals of Thoracic and Cardiovascular Surgery is a major step forward in stimulating clinical reporting of results and disseminating information amongst the African cardiothoracic/vascular surgical community.

Research/Development

Certainly not a priority, but ultimately of major benefit is the initiation of clinical research, followed by bench research. Foreign programs are showing an increased interest in research of diseases where there is a high prevalence e.g. HIV/ AIDS, malaria, rheumatic fever and tuberculosis.[9] Establishing research centers in the area where the pathology is prevalent is both cost effective and practical. A word of caution is to establish strict guidelines according to the Helsinki principles, in recruiting clinical subjects.[10]

Administrative/Political/Logistical

A major problem in developing or emerging programs is the exodus of trained health care workers to developed programs. This "brain drain" is understandable on a personal level, but certainly not on a national or regional level. As an example, one-fourth of all physicians in the USA are international medical graduates.[11] Nurse poaching is a severe problem, especially for Africa. This is especially true in South Africa.[12] Training and retaining health care workers, especially doctors and nurses is crucial for overall health care planning, let alone Cardiothoracic programs.

The issue of product, i.e. equipment and supplies, be it disposable or non-disposable is a major problem. Donations are short term. Old donated equipment, or even newer equipment has problems insofar as preventive biomedical maintenance is concerned. Parts are a problem and equipment is frequently cannibalized to get needed parts. Logistical problems with customs and distributors also pose challenges. Inventory and organization is sorely needed in many programs. Ultimately the financial burden of obtaining the needed items for surgery falls on the patient and family since governmental or private insurance is unavailable or unattainable.

In summary, the challenge for the initiation and sustainment of Cardiothoarcic/vascular surgical programs in Africa is a difficult, but attainable goal. Cooperation and collaboration should succeed over conflict and competition.

"You can accomplish anything in life, provided that you do not mind who gets the credit."

Harry S. Truman

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