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## Cancer in low and middle income countries - The same disease with a different face

### Keywords:

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Nkhoma Mission Hospital is a rural medical center in the heart of Malawi, a country in Sub-Saharan Africa (SSA). One of the authors worked here as a junior doctor in 2005 and revisited this clinic almost 15 years later. The hospital appeared to be the same, but the Malawian patient-population had changed drastically during those 15 years. In the years of his absence the life expectancy in Malawi has grown from 40.2 years to 56.2 years in 2016 [1]. This increase is mainly caused by a drastic reduction of pediatric mortality and the continuing high childbirth rates [1,2]. Next to this, the success of fighting the HIV-AIDS epidemic, well-organized tuberculosis treatment, the reduction of child mortality due to malnutrition and changing living standards all-over SSA, e.g. the former “tropics”, are having a tremendous effect on the population growth.

The current socioeconomic transition is not without consequences. Non-communicable diseases (NCD) which were previously considered “western diseases” are on the rise in low and middle-income countries (LMIC). For example, the prevalence of cardiovascular disease, obesity, diabetes mellitus type 2 and is rising [3]. As such, the incidence of cancer in SSA is increasing with a reduction in infection-related cancers and an increase of cancers associated with non-infectious risk factors [4]. In 2004, more than half of all the deaths in SSA were related to infection, while 25% was due to NCDs. The latter will rise to 46% by 2030 according to the predictions of the World Health Organization (WHO) [5]. As part of this increase in NCDs, an increase of 85% in cancer burden is expected by 2030 [6]. In the SSA region, we see one million new cases of cancer and over half a million cancer deaths annually. The most worrying part is the low cancer survival rate in SSA in comparison to other regions in the world. The International Agency for Research on Cancer (IARC) calculated in 2012 a mortality/incidence ratio of 72%, while the mortality/incidence ratio in Europe is calculated to be 44% [7].

This high cancer mortality is caused by several factors. First of all, lack of experience and knowledge of medical personnel in recognizing and diagnosing cancer is one of the main contributing factors leading to poor treatment outcomes [8]. In Malawi, education of both nurses and clinical officers is still much focused on infectious diseases. Knowledge about the behavior of malignant diseases, cancer classification systems, and associated prognoses is lacking. This makes it difficult to choose the right approach for patients with a suspected malignancy; is curative treatment a viable option or is palliative care the only remaining treatment strategy considering the local circumstances?

A second contributing factor is the lack of scientific knowledge about cancer. The lack of a cancer focused research framework, mostly due to prioritization of diseases of the “tropics”, is a major obstacle to create a more evidence based approach to cancer care. The focus of research in SSA still lies on the communicable disease like AIDS, malaria and tuberculosis. While in the Western world, oncology receives a significant amount of interest of scientific research efforts, there is little known about SSA cancer epidemiology, pathophysiology, diagnostic approach, and optimal treatment in the SSA population [8].

Thirdly, late-stage cancer presentation due to lack of awareness and subsequent patient delay, leads to poor prognosis and often need for palliative care. This patient delay is prolonged by insufficient number of medical care facilities and the lack of access to it, especially in rural areas [8]. On top of this, extreme poverty is an enormous obstacle to seek help, due to high costs of medical care and missed income during admission of patients and their guardians. Patient delay is also enforced by the cultural tendency to primarily seek the help of traditional healers. Only when traditional medicine does not seem to ameliorate their symptoms, patients visit a hospital, often already in a terminal stage of their disease [8]. Finally, the lack of education of the general population about cancer in general leads to fear and denial of the disease and its consequences.

Concerning treatment, options and means are scarce. Many countries in SSA do not have the availability of radiotherapy and chemotherapy is expensive and hardly available [8,9]. Therefore, surgery is the most valuable tool we have for non-hematological malignancies [8]. However, most cancer surgery is only available in large urban hospitals, as there is a reluctance to start a major surgical oncology procedure in rural health care facilities with lack of safety nets such as intensive care, donor blood transfusion or the availability of experienced physicians. The transport from a referral to an urban health care facility center is often too expensive for patients and in these referral centers, waiting lists are often long because of high volumes and limited resources.

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Abbreviations: SSA, Sub-Saharan Africa; NCD, Non-communicable diseases; LMIC, Low and middle-income countries.

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So where to start in solving these major problems? In our opinion, the western world has the moral obligation to share its oncological knowledge, built up during almost a century. To address these issues, numerous actions have to be taken in the near future.

As experience and knowledge in recognizing and diagnosing cancer have to grow, oncology training programs for clinicians have to be put in place and medical curricula need to be made more cancer orientated. As an effort to improve oncology training in Malawi, we will organize the first Malawian oncology course in Blantyre, in 2020 for registrars and clinical officers. The main goal of this course, and future similar initiatives, will be to provide interaction and share knowledge between local clinicians and visiting oncology experts. Of vital importance is that all surgical oncology training initiatives should be embedded in larger structures, to achieve its maximal effect.

With regard to treatment of oncological diseases, a wide implementation of radiotherapy and chemotherapy seems an unrealistic goal for the near future. Therefore, the focus should be on increasing the number of surgical specialists, specifically in rural areas. Current surgical training initiatives, such as COSESCA, PAACS, SurgAfrica are too limited to fill the current gap between available surgeons and necessary surgical interventions. Therefore, financial support should not only go to urgent patient care, but also has to be invested more in human capital and surgical infrastructure to fulfill the need for more trained surgeons in the SSA region [10].

To deal with late-stage presentation and fear among the general population, investment is required to raise public awareness on the early signs and symptoms of common cancers. This can be achieved by health-talks in the rural communities, collaboration with local chiefs of tribes and other religious or spiritual leaders. But also, an educational strategy should be designed to better guide end-stage cancer patients who are send back to their village on palliative care. Palliative care for patients with cancer in Africa currently receives far less research attention than does palliative care for patients with HIV/AIDS. Right now, most people in need of this care live in LMICs and the access to basic palliative care and medicine-based pain relief is extremely limited or non-existent. Every year, millions of people die in serious pain that could have been prevented with morphine at just a few cents per dose.

The strategy of screening programs for detection of common malignancies is widely employed in affluent, developed countries, resulting in early identification of cancer patients. Even though screening programs play a pivotal role in the early detection of cancer, they are rarely available in SSA, with a screening programs for cervical cancer in Malawi as an exception. Nationwide screening programs require full financial support from governments and non-governmental organizations to make it widely accessible.

To address inter-hospital treatment delay, medical networks between rural district hospitals and central urban hospitals need to be improved, providing quick assessment by specialized clinicians. These connections between general and specialized hospitals can be very beneficial for both patients needing referral and patients for whom palliative treatment should be provided. In the end, it's not the "surgical trick" that makes the most impact, but the distinction between who can undergo surgical treatment and who cannot.

Moreover, to reduce the rise of cancer in the tropics, prevention of the development of malignant diseases should be part of the nationwide health programs. Although, the increasing usage of antiretroviral treatment has significantly reduced the risk of developing HIV-AIDS-related malignancies, much progression can still be made on lifestyle related adjustments, such as the reduction of smoking, alcohol consumption and unhealthy diets. Again,

education is pivotal.

Finally, a more optimistic point should be made. Standing up against cancer will require improving health care in all his facets, with ameliorated screening, diagnostics, including imaging, pathology, medical networks, treatment options and follow-up programs. Healthcare in SSA will further mature to a higher level. Eventually the entire healthcare system will benefit from this, not only cancer care. This is the next needed step in their medical evolution and we should be of assistance.

In conclusion, there is an urgent demand for experienced surgical oncologists to educate and share knowledge and skills in SSA. Let's start to make a difference at a place where the impact can be so significant.

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