COMMENTARY

Beyond Limitations: Practical Strategies for Improving Cancer Care in Nigeria

Kelechi Eguzo[1]*, Brian Camazine[2]

Abstract

Background: The burden due to cancers is an emerging public health concern especially in resource-limited countries like Nigeria. The WHO estimates that cancer kills more people than tuberculosis, HIV/AIDS and malaria combined. As people in Nigeria and other developing countries are beginning to survive infectious diseases, there is an observed epidemiologic transition to chronic diseases, such as cancers. In 2008, 75 out of 1,000 Nigerians died of cancer. Despite the rising incidence and public health importance, Nigeria lacks an organized and comprehensive strategy to deal with cancers. Materials and Methods: This article reviewed 30 peer-reviewed manuscripts on cancer care in four countries. It highlights the limitations to cancer care in Nigeria; due to lack of awareness, low health literacy, absence of organized screening programs, inadequate manpower (in terms of quality and quantity) as well as limited treatment options. Results: This review led to the formulation of a proposal for Nigerian National Cancer Policy, mainly drawn from effective strategies used in Canada, Brazil and Kenya. This is a vertical cancer program that is patient-centered with an emphasis on tobacco control and cancer disease screening (similar to Canada and Brazil). Additionally, it emphasizes primary cancer prevention (similar to Kenya). Its horizontal integration with other disease programs like HIV/AIDS will improve affordability in a poor resourced country like Nigeria. Capacity building for health professionals, hub-and-spoke implementation of screening services, as well as investment in effective treatment options and increased research in cancer care are essential. International 'twinning collaborations' between institutions in richer countries and Nigeria will enhance effective knowledge translation and improve the quality of patient care. Conclusions: A national cancer policy must be developed and implemented in Nigeria in order to overcome the present limitations which help contribute to the observed increases in cancer morbidity and mortality rates. Cancer control is feasible in Nigeria if the nation was to consider and employ some of the cost-effective strategies proposed here.

Keywords: Cancer control program - Nigeria - capacity building - twinning collaboration

Asian Pacific J Cancer Prev, **14 (5)**, 3363-3368

State of Cancer Care in Nigeria

According Boyle and Levin (2008), cancer accounted for 7.6 million deaths globally, more than AIDS, malaria, and tuberculosis combined in 2008. In Nigeria, WHO (Fatimah, 2012) estimated the incidence of cancer from all sites at 90.7 and 100.9 per 10,000 for males and females respectively, while mortality rates were 72.2 and 76 respectively. The commonest cancers in Nigeria include breast, cervical, prostate, colorectal, liver cancer and non-Hodgkin lymphoma (NHL) (Kolawole, 2011; Eguzo and Camazine, 2012).

Limitations of Cancer Care in Nigeria

There is a myriad of factors that contribute to the current poor state of cancer care in Nigeria. The most critical among these is the lack of a formal cancer policy, as Nigeria lacks an organized strategy to deal with cancers. This may be attributed to a lack of political will on the part of the government/policy makers (Eguzo and Camazine, 2012). This is evident in the fact that cancer care is glaringly missing from the National Health policy of Nigeria, as well as the policy on National Health insurance. Still at the level of politics, it has become increasingly difficult to regulate cancer risk factors in Nigeria, such as tobacco and alcohol. Available evidence suggests that tobacco is an etiologic factor for about 30% of cancers (Kolawole, 2011).

Delay in presentation of cases is another problem with cancer care in Nigeria. Cancer-related health literacy is very low in Nigeria, leading to late presentation of cases, when little can be done. This delay is further worsened by lack of screening programs (Akhigbe and Omuemu, 2009). Many Nigerians are not aware of methods of diagnosing cancer early (screening). Where facilities for diagnosis

*[1]School of Public Health, University of Saskatchewan-Saskatoon, Canada, [2]Department of Surgery, Nigerian Christian Hospital-Aba, Nigeria *For correspondence: kelechi.eguzo@usask.ca*

exist, chances are that they may not be very accessible to the public due to user-fees. Nigeria also lacks an organized cancer registry system, and this negatively impacts on the quality of cancer-related statistics available (Clement, 2007; EIU, 2009; Okobia, Bunker, Okonofua and Osime, 2009)

Also, there is a dearth of diagnosis and treatment options available in Nigeria. There are few laboratories that offer pathology services, and fewer even offer immuno-histochemistry. Where such facilities exist (usually in the public sector) chances are that they may be out of service frequently due to industrial actions that plague the health sector in Nigeria. Nigeria has few cancer-care experts. With a population above 140 million, this country currently has about 100 oncologists and pathologists, respectively (Kolawole, 2011; Eguzo and Camazine, 2012). Where expertise exists for chemotherapy services, the drugs may be unavailable or too expensive for the patients to afford. Only a few tertiary hospitals have functioning radiotherapy services (Clement, 2007), which is usually too expensive for the average Nigerian. Today, a diagnosis of cancer can be viewed as a 'death sentence' to the average Nigerian who is battling poverty, insecurity and infectious diseases. These challenges, amongst others, are the limitations of cancer care in Nigeria. This paper, Beyond Limitations, is aimed at suggesting practical strategies in the form of a policy that will overcome those limitations.

Cancer Care Policy Models (What works)

It is imperative from the foregoing that the first step to improving cancer care in Nigeria is to organize the system. Only an organized, population-focused approach can curb the rising trend of cancer in Nigeria. Such organization would see to the birth of Nigerian National Cancer Institute (NNCI). This institute will provide leadership in cancer control for Nigerians through prevention, early detection, treatment, and research programs. According to WHO (Alwan, Resnikoff and Sepúlveda, 2008), "Public policy for cancer control includes legislation, laws, statements, policies or prevailing practices enacted by those in authority to guide or control institutional, community and sometimes individual behavior to prevent or cure cancer and to care for cancer patients and cancer survivors".

At this point, it is important to review functional models from different parts of the world.

Brazil

Brazil is the largest country in Latin America and the seventh richest country in the world, with a population above 196 million (World Bank, 2012). Cancer care policy is administered by the Brazilian National Cancer Institute-INCA, which is an organ of the Ministry of Health. INCA has the federal mandate to lead a country-wide policy for cancer control in Brazil. It provides this leadership through the "design, implementation and operation of effective and equitable programs focusing: Prevention, Diagnosis, Treatment, Supportive and Palliative Care, Education and Research, as well as Cancer Registries". National Cancer Institute of Brazil was established by Decree 50251/01 of 1961, following a long history of metamorphosis which started in 1919 (INCA, 2012).

This organization is headed by a Director-General, nominated by the Minister of Health. Other constituents of the Organizational Structure that support the Director General include: the General Strategic Affairs Coordination, the General Cancer Care Coordination, the General Technical-Scientific Coordination and the General Management and Human Resources Coordination. The key strategies of the Brazilian National Cancer Institute include the following (INCA, 2012):

Cancer care: INCA is considered to be the most prestigious public health institution in Brazil, with an excellent reputation for providing high quality of care at no cost to patients with cancer, from staging to rehabilitation and palliative care.

Prevention: Programs for prevention, early detection and surveillance on cancer are handled by the Cancer Prevention and Surveillance Coordination Unit - CONPREV in collaboration with the State Health Departments all over the Brazilian territory. The Program for Smoking Cessation and Control of Other Cancer Risk Factors and the Program for Cervical Cancer and Breast Cancer Control - VIVA MULHER are developed throughout the country in communities, health units, schools and work environments respectively.

Education: The Education Program comprises teaching activities closely linked to research and treatment, in order to prepare professionals in oncology to be able to meet the needs of the Integrated Public Health System (SUS). This involves relevant health professionals in the areas of Medicine, Nursing, Nutrition, Physiotherapy, Social Service, Psychology and Pharmacology among others

Research: Studies are focused on basic and translational aspects of cellular biology, pharmacology, genetics and experimental medicine.

Meanwhile, the Brazilian National Cancer Institute is largely funded by the Integrated Public Health System – SUS. It also receives donations from individuals, corporate organization and non-governmental organizations in Brazil. The government has increased its cancer spending by 103% in the last 6 years [14]. With this robust program in cancer care, it is important to review the accomplishments of INCA. Evidence shows that INCA is able to diagnose most cancers at early stages, with good survival (Figures 1). The agency is also able to implement successful tobacco control programs as well as prevention/early detection programs for breast and cervical cancers. They have also made good progress in the aspects of Cancer research, bone marrow transplantation and radiation therapy (Santini, 2007). One could surmise that the Brazilian model is working well.

Kenya

This relatively small eastern African country is just beginning to organize her cancer control project. In Kenya, cancer accounts for 7% of the national mortality yearly, and ranks third as a cause of death after infectious diseases and cardiovascular diseases (Sharif and Kimani, 2011). Prior to August 2011, there was no cancer control policy

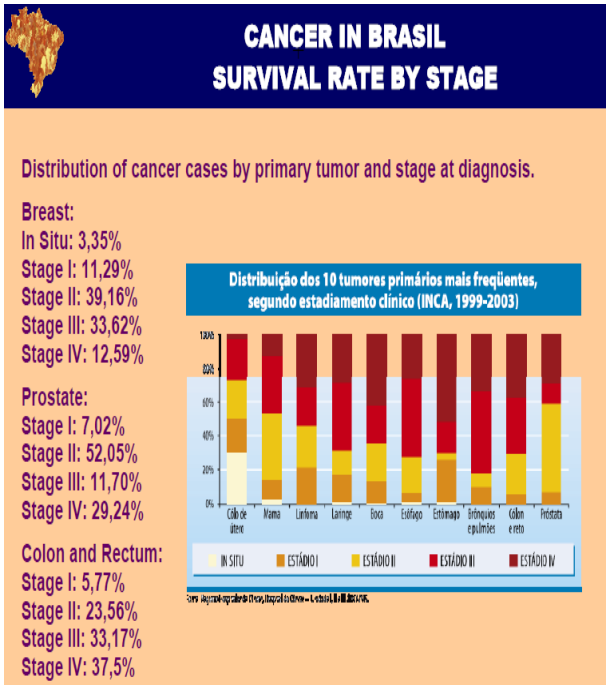

Figure 1. Cancer Survival Rates in Brazil

at work in Kenya. A policy brief by the Kenyan National Assembly (KDR, 2011) found that there was increasing incidence and mortality from cancer. It also identified lack of manpower and resources, as well as poor funding as limitations to cancer care. Just like Nigeria, Kenya did not have a functional National Cancer Registry, and there is low research on the cancer burden in that country.

To tackle the challenge of cancer care, the Government of Kenya (GoK) developed the National Cancer Control Strategy (2011-2016). The main policy thrust here is to adopt a multi-sectoral and multi-disciplinary approach to combat cancer under the following tenets.

Primary prevention of cancer: The policy seeks to reduce tobacco smoking by 5% in 5 years through various tobacco control initiatives. It will also control alcohol use, obesity and environmental carcinogens.

Early detection of cancer: The policy will implement health education and develop screening guidelines (but not specific on the type of cancer).

Diagnosis and treatment of cancer: The policy seeks to ensure prompt diagnosis, equip 15 cancer treatment centers and improve manpower development. But unlike the Brazilian model, did not offer to pay for cancer diagnosis and treatment.

Pain relief and palliative care: Improve the quality of life of cancer patients, as well as introduce nutritional support.

Cancer surveillance and research: To establish national and regional registries with well-trained staff.

Coordination of Cancer prevention and control activities.

Monitoring and evaluation: Develop and deploy various M&E tools, starting with a baseline survey.

These lofty goals were articulated in the Cancer prevention and control act of 2012 [17], leading to the establishment of National Cancer Institute of Kenya. This institute is saddled with the task of implementing the National Cancer Control Strategy, among other things (KDR, 2011; Gazzette, 2012). Since this is a new initiative (one of the first in Sub-Saharan Africa) it will be premature to evaluate its success in this paper.

Canada

Canada lacks an organized, national coordinating agency for its cancer control because health care delivery is a provincial responsibility but in recent years it has formed a partnership with different agencies and interest groups that work on cancer. This resulted in the formation of Council of the Canadian Strategy for Cancer Control (CCSC) in 2002. The CCSC strategy is essentially to reduce the number of new cancer cases, enhance the quality of life of cancer survivors and reducing mortality (Sutcliffe, 2006). This they intend to achieve by harnessing the robust provincial and territorial health/cancer control system. At the national level, Canada continues its anti-tobacco campaign while increasing investment in cancer-related research (CSCC, 2005)

A closer look at one cancer agency in Canada (British Columbia Cancer Agency-BCCA) will shed more light on the Canadian cancer control system. In 2006 BCCA reviewed its organizational strategy in order to respond better to challenging cancer data. Their plan is to improve cancer services through early detection, public education, continuous professional training for health professionals, and sustained research. The BCCA adopts a population-based model of cancer care, with centralized policy, planning and financing. They maintain a well coordinated regional cancer centre/community network (BCCA, 2006). This looks much like the hub-and-spoke (McKinley, 2002) model of health networking, with one centre and many branches. They have developed provincial tumor-boards, each of which specializes in an aspect of cancer care. In addition, BCCA publishes and maintains a web-based, standardized treatment protocol. This makes their services unified and well structured.

BCCA routinely carries out screening programs for cervical cancer (pap smear) and breast cancer (mammography). They conduct pap smears every year for first three consecutive years for the population at risk. However, this practice may be difficult to implement in resource limited-settings. It is generally advocated that such settings, like Nigeria should adopt visual inspection with Acetic acid (VIA), using the see-and-treat method (RTCOG, 2003).

Cancer Policy Suggestions for Nigeria (Resource-limited Settings)

In the light of the foregoing, it is imperative that Nigeria must step-up their response to cancer in order to stem their rising incidence and mortality. It is proper therefore to start from the top to the bottom in order to formulate such policy. Following from the Kenyan model, it will be necessary to have a 'cancer-round-table', where all stakeholders will have to assess the cancer burden, current care options available, and then draft a cancer

response strategy.

Next, one would advocate for the establishment of Nigerian National Cancer Institute (NNCI), "for the design, implementation and operation of effective and equitable programs focusing: Prevention, Diagnosis, Treatment, Supportive and Palliative Care, Education and Research, as well as Cancer Registries" [12]. This institute will have affiliate bodies as State Cancer Control Agencies (like the Canadian Model). In addition, the NNCI will develop, maintain and circulate standards of care that are tailored to our resource-limited setting, just like the one already developed by Eguzo et al. (2012) in 'Where There is no Oncologist: A Manual of Practical Oncology in Resource-Limited settings.

One of the challenges in cancer care is the dearth of board-certified Oncology professionals in Nigeria, as in other resource limited settings (Sharif and Kimani, 2011; Eguzo and Camazine, 2012). Such professionals include medical oncologists, surgical oncologists, and radio-oncologists. First, the country would have to develop a program where more primary care physicians (general practitioners), nurses and laboratory technicians are trained in basic cancer screening, diagnosis and treatment. A similar method is being used in British Columbia through their 'Preceptor Program' (BCCA, 2012). This will lead to significant manpower improvements in a short time, and at a cheaper cost than training oncologists for every service point. This is not to say that Oncologists are not necessary in the fight against cancer, but at the short run, it will be more effective to train middle-level manpower. Evidence from Nigerian Christian Hospital shows that a lot can be achieved in cancer care through this method (Eguzo and Camazine, 2012; GTFEA, 2012).

Next, it will be expedient to invest in the training of medical, surgical and radiation oncologists (radio-oncologists) in Nigeria. This can be achieved by formation of partnerships with established oncology agencies like BCCA in Canada. Such collaboration could ensure the translation of knowledge and technology by having Nigerian professionals undertake rotations in Canada, especially regarding medical and radio-oncologists. In Saskatchewan Cancer Agency (Canada), there exists a formal program where imaging scientist are trained in Radiotherapy. If every state in Nigeria should train at least 2 persons in this three-year program within 4 years we can triple the number of radiotherapists in Nigeria. It will also be expedient to train support staff for equipment maintenance alongside the radiotherapists, to achieve some level of clinical and technical independence in administering cancer care in Nigeria. Currently, Nigerian Christian Hospital has a program where Earthwide Surgical Foundation (USA) sends a surgical oncologist to the hospital quarterly. Nigerian surgeons who participate in the surgical workshops get significant knowledge and skills transfer, at no cost. Similar programs can be initiated in other hospitals, to increase the skills base of Nigerian surgeons.

More importantly, cancer policy in Nigeria and similar resource-limited settings must lay emphasis on prevention and early diagnosis. Much of the cancer morbidity and mortality is associated with ignorance and late presentation (Kolawole, 2011). Efforts must be intensified to check cancer-predisposing factors like smoking, alcohol and diet. It is unfortunate that an anti-tobacco campaign has not gained much momentum in Nigeria (Oyebade, 2012), and this is the time to make the change. It is equally important to start controlling modifiable risk factors, such as human papilloma virus (for cervical cancer) and hepatitis B virus (liver cancer), as can be done with appropriate vaccination programs. As part of the proposed National Cancer Policy, every female child between 9 and 15 years must receive at least a dose of HPV vaccine. There is overwhelming evidence that this will reduce the incidence of cervical cancer. Also, the administration of Hepatitis B vaccine, which is currently included in the routine immunization in Nigeria, must be intensified to reduce the incidence of liver cancer.

Screening programs for the common cancers must be strengthened in order to reduce high cancer morbidity and mortality. Resources must be deployed to screen and treat at least 20% of Nigerian women for cervical cancers within 5 years. This target is both realistic and achievable, if the country adopts the hub-and-spoke model in setting up the cancer framework. In this model, each state cancer control agency will have at least two cancer-involved hospitals, which will be service providers.

Similarly, screening for breast cancer should be encouraged, starting with individual monthly Breast Self Examination (BSE). Although there is no conclusive scientific evidence on the effectiveness of BSE (WHO, 2012), it raises the awareness of the disease among women, and could possibly lead to 'down staging'. This means the women could find the disease earlier, and have better treatment outcome. The policy for breast cancer would have to include an annual clinical breast examination and mammography, especially for those at greater risk. Mammography is capable of detecting cancer very early, but however very cost intensive. It may be more feasible to have at least one mobile mammogram in each state in Nigeria, where the machine could be used for frequent multiphasic, screening at various locations. Unfortunately, although colorectal cancer ranks among the most common in Nigeria, there is no cost-effective screening method available for resource-poor settings (Lambert et al., 2009). It may be more feasible to encourage people aged above 50 years to obtain annual fecal occult blood test, for a certain fee.

From the foregoing, it is evident that although these interventions will require funding and administration, they are not cost-prohibitive. These are practical strategies that Nigeria can afford, as most of them do not require costly services like CT scan and Radiotherapy to function. But basic facilities for clinical screening, examination and chemotherapy must be provided. Again evidence from Nigerian Christian Hospital supports that this is practicable, cost-effective and beneficial to the average Nigerian population (Clement, 2007; Eguzo and Camazine, 2012).

Pathologic diagnosis is inseparable from Cancer care. It will be expensive to invest in diagnostic equipment for every proposed cancer center in Nigeria. In order to enhance accuracy and timeliness of diagnosis, one would

suggest the use of laboratory technicians and available scientists in the preparation of microscope slides from biopsy samples. Well prepared slides can be photographed, transmitted via the internet to pathologists in distant places for interpretation. Evidence supports this approach in improving diagnosis and turn-around time in patient treatment (Farmer et al., 2010).

Closely related to diagnosis is data management. Most resource-limited settings lack a good system of cancer-related data collection and management. It will be necessary to establish population-based cancer registries across Nigeria. At least, there should be a registry associated with every cancer hospital, with adequate manpower and machinery deployed for its functioning. Using the example for various HIV/AIDS treatment program in Nigeria, there is evidence that computerized data collection and management is possible even in remote places (AIDSRelief, 2012).

The bane of all these suggestions is finance. In the face of low resources, even the cheapest plan or policy may not be implemented. So the question 'how can Nigeria fund the National Cancer Policy, under the Nigerian National Cancer Institute' must be answered. Examples from Brazil, Kenya and Canada show that State funding is crucial. There must be a budget for cancer in Nigeria, just like there is a budget for HIV/AIDS. In addition, funding should be sourced for cancer care from donor agencies like the WHO. In the face of rising global cancer incidence and disease burden, the time is ripe to create a Global Fund for Cancer (just like the one for HIV/AIDS, TB and Malaria). Increasing taxes on cigarette and alcohol, which are known risk factors for many cancers, will not only enhance prevention of the disease spectrum but it will help fund the treatment (DCP2, 2007). It is important to highlight that funding must not only be in the form of financial donations; manpower development, donation of treatment modalities, and technical collaboration are important aspects of funding.

Also, funding challenges can be conquered by the local manufacture of generic cytotoxics. The most common cancers in Nigeria will generally respond to generic anti-neoplastics. Hence, local pharmaceutical companies must be empowered or stimulated to produce these drugs in Nigeria. Such economic stimulus will not only make drugs available, but will also provide jobs for Nigerians. More importantly, manufacturers/distributors of cancer-predisposing agents (cigarettes, alcohol, fast foods) must be compelled to pay higher taxes in order to fund the Nigerian National Cancer Institute. In fact, judging from the benevolence of Nigerians in alms giving, a national call for donations to NNCI may yield dividends. The policy suggestions may not be exhaustive in one article, but these will definitely set the ball of National Cancer care project rolling in Nigeria

Monitoring and evaluation of the Nigerian cancer care project is very crucial to its successful implementation. The proposed Nigerian National Cancer Institute should be able to develop a performance monitoring system that is based on periodic targets and reporting, such as monthly, quarterly and annual. This will enable objective evaluation of the program using set objectives. Borrowing from the model developed by AIDSRelief consortium under the Catholic Relief Services (AIDSRelief, 2012), it is feasible to have cancer care sites, upload their reports to a central server that will generate reports about the project. In order to reduce the technical challenges of implementing the cancer policy, we would recommend linking the HIV care programs and the cancer program at the hospital level. This will improve the use of existing manpower and computers. It will also tackle the finance limitations. A proposal for the monitoring and evaluation of the cancer policy is included in the appendix.

Furthermore, cancer care in Nigeria will not happen in a vacuum. It will involve all the relevant stakeholders in the business of healthcare. These stakeholders will have key roles to play to ensure the success of the cancer policy. A detailed analysis of the stakeholders is included in the appendix.

Conclusions

The design, planning, implementation and monitoring of a national cancer project is by no means a small task. It will involve a wide array of professionals from different fields of human endeavor, and not just health professionals. Despite the challenges that were outlined earlier in this discourse, there are huge benefits. In the first instance, there will be improved health for all. The huge potential years of life lost to various cancers will be used in national development. Nigerians will then live to their utmost potentials. Who knows, this may just be the most feasible way to achieve the vision 20: 2020, of putting Nigeria among the twenty most developed countries in the year 2020; although this all-important national strategic plan did not include cancer care (FMOH, 2004; NPC, 2010).

This project demands political will from the policy makers and dedication from the professionals to ensure its success. It is however crucial to emphasize that cancer control interventions take time for the benefits to be apparent. The gains we will make as a nation may not be evident in a few years, but over a decade (for instance) we will begin to appreciate our investment. This time lag however should not discourage such policy. Due to the complex nature of the proposed policy, it is advised that the implementation of the proposed National Cancer Policy should start on a small scale, with gradual but steady expansion based on success with pilot areas and increasing availability of resources (DCP2, 2007)

Finally, in the words of Farmer et al, "the time has come to challenge and disprove the widespread assumption that cancer will remain untreated in poor countries" (Farmer et al., 2010). A national emergency must be declared on cancer care in Nigeria, which will culminate in the formation of a National Cancer Policy and the establishment of Nigerian National Cancer Institute.

References

AIDSRelief (2012). AIDSRelief Nigeria: Strengthening Local Health Networks for Sustainable HIV Care and Treatment http://issuu.com/catholicreliefservices/docs/aidsrelief_nigeria_health_networks?mode=window&backgroundCo

lor=%23222222

Akhiqbe AO, Omuemu VO (2009). Knowledge, attitudes and practice of breast cancer screening among female health workers in a Nigerian urban city. *BMC Cancer*, **9**, 203.

Alwan A, Resnikoff S, Sepúlveda C (2008). Cancer control: knowledge into action - WHO guide for effective programmes Geneva.

Boyle P, Levin B (2008). World Cancer Report 2008. Lyon available on http://www.iarc.fr/en/publications/pdfs-online/wcr/2008/index.php

British Columbia Cancer Agency (2006). BC Cancer Agency Strategic Plan. Vancouver http://www.bccancer.bc.ca/NR/rdonlyres/1C2F0481-8451-4CF8-82EC-0294BB2D492B/19827/BCCA_Strategic_Plan_Updated_Oct06.pdf.

British Columbia Cancer Agency (2012), Preceptor Program http://www.bccancer.bc.ca/HPI/FPON/Precep/default.htm

Canadian Strategy for Cancer Control (2005): Statement from the Chief Public Health Officer, Public Health Agency of Canada. Ottawa. http://www.phac-aspc.gc.ca/media/cpho-acsp/cancer0527-eng.php

Clement AA (2007). Cancer in Nigeria. ASCO News and Forum, April 2007.

Disease Control Priorities Project (2007). Controlling Cancer in Developing Countries. http://www.dcp2.org/file/79/DCPP-Cancer.pdf.

Economist Intelligence Unit (2009). Breakaway: the global burden of cancer—challenges and opportunities. The Economist. London available on http://www.livestrong.org/pdfs/GlobalEconomicImpact.

Eguzo K, and Camazine B (2012). Cancer care in resource-limited settings: a call for action. *J Cancer Sci Ther*, **4**, 223-6.

Eguzo K, Umezurike CC, Charlotte J, Camazine B (2012). Where there is no Oncologist: A Manual of Practical Oncology in Resource-Limited Settings. Earthwide Surgical Foundation.

Farmer P, Frenk J, Knaul FM, et al (2010). Expansion of cancer care and control in countries of low and middle income: a call to action. *Lancet*, **376**, 1186-93.

Fatimah A (2012). Epidemiology and incidence of common cancers in Nigeria. Institute of Human Virology-Nigeria, www.ihvnigeria.org/.../cancer...cancers...nigeria/download accessed October 5, 2012

Federal Ministry of Health. Revised National Health Policy. Abuja: 2004

Global Task Force on Expanded Access to Cancer Care and Control in Developing Countries (2012), http://gtfccc.harvard.edu/icb/icb.do?keyword=k69586&pageid=icb.page342840.

Instituto Nacional De Cancer (2012). http://www.inca.gov.br/english/

Kenyan Department of Research (2011). Policy brief on the Situational analysis of cancer in Kenya, Republic of Kenya National Assembly. Nairobi.

Kenyan Gazette Supplement (2012). The Cancer Prevention and Control Act, **80**, 641-4.

Kolawole AO (2011), Feasible cancer control strategies for Nigeria: mini-review. *Am J Tropical Med & Public Health*, **1**, 1-10.

Lambert R, Sauvaget C, Sankaranarayanan R (2009). Mass screening for colorectal cancer is not justified in most developing countries. *Int J Cancer*, **125**, 253-6.

Matthew U, Stanley S (2012). Using communication technology to improve global hematologic care. *Hematologist*, **9**, 7.

McKinley KE, Bryan-Smith L, Dosch TL, Hamory BH, Fillipo BH (2002). A hub-and-spoke model of care: providing specialty care in patients' own communities, *Jt Comm J Qual Improv*, **28**, 574-5.

National Planning Commission (2010). Nigeria Vision 20: 2020. The First National Implementation Plan (2010 – 2013). Volume II: Sectoral Plans and Programmes, Abuja http://www.npc.gov.ng/vault/files/NV2020-NIP-Volume-II-Original-document_edited__versioin3_10_06_2010.pdf

Okobia MN, Bunker CH, Okonofua FE, Osime U (2006). Knowledge, attitude and practice of Nigerian women towards breast cancer: a cross-sectional study. *World J Surg Oncol*, **4**, 11.

Oyebade W (2012). Anti-tobacco groups task media on control bill. The Guardian. 2012 July 26. http://www.ngrguardiannews.com/index.php?option=com_content&view=article&id=93412:anti-tobacco-groups-task-media-on-control-bill&catid=93:science&Itemid=608

Royal Thai College of Obstetricians and Gynaecologists (RTCOG) and the JHPIEGO Corporation Cervical Cancer Prevention Group (2003). Safety, acceptability, and feasibility of a single-visit approach to cervical-cancer prevention in rural Thailand: a demonstration project. *Lancet*, **361**, 814-20.

Santini L (2007), Cancer Control in Brazil, Proceedings in the 7th INCTR Annual Meeting São Paulo, http://inctr.ctisinc.com:9000/sites/InCTR/Education/Annual%20Meeting%202007/Luis%20Santini%20-%20Cancer%20control%20in%20Brasil.pdf, 2007,March 1-4.

Sharif SK, Kimani F (2011). National Cancer Control Strategy (2011-2016), Ministry of Public Health and Sanitations and Ministry of Health Services. Nairobi.

Sutcliffe S, Allen B, Branton P, et al (2006) The Canadian Strategy for Cancer Control: A Cancer Plan for Canada. CSCC Governing Council. Ottawa. http://www.partnershipagainstcancer.ca/wp-content/uploads/CSCC_CancerPlan_20061.pdf

The World Bank (2012). Brazil Country Profile. http://www.worldbank.org/en/country/brazil

World Health Organization (2006). Cancer Factsheet No 97. www.who.int/mediacentre/factsheets/fs297/en/print/html. Geneva

World Health Organization (2012). Breast cancer prevention and control. http://www.who.int/cancer/detection/breastcancer/en/index3.html