



Cancer control in Africa:
paving the way for
Universal Health Coverage



Table of Contents

Foreword AORTIC President	4
Foreword UICC President	5
Acknowledgements	6
Abbreviations	6
Introduction	7
Sonalı Johnson, Union for International Cancer Control, Switzerland	
Cristina Stefan, African Organisation for Research and Training in Cancer, South Africa	
The cancer burden in the African Region	9
D. Maxwell Parkin, African Cancer Registry Network & University of Oxford, UK	
The status of national cancer control plans in the African region	14
Dario Trapani, Department of Oncology and Haematology, University of Milan, Italy	
Sonalı Johnson, Union for International Cancer Control, Switzerland	
Rosie Tasker, Union for International Cancer Control, Switzerland	
Verna Vanderpuye, Consultant Oncologist, AORTIC Secretary Treasurer, Ghana	
Zuzanna Tittenbrun, Union for International Cancer Control, Switzerland	
Yannick Romero, Union for International Cancer Control, Switzerland	
Cancer control spotlights	17
Policy and legislation for the prevention and control of NCDs in Africa	17
David Makumi, Kenya Network of Cancer Organizations, Kenya	
Preethi Mistri, Cancer Association of South Africa, South Africa	
FCTC implementation in the African region	19
Tih Ntiabang, Framework Convention Alliance, Cameroon	
Early detection	21
Ophira Ginsburg, Department of Population Health, New York University School of Medicine, US	
Ashley Newcomb, Department of Population Health, New York University School of Medicine, US	
Pathology in Africa	24
J. Olufemi Ogunbiyi, University of Ibadan/ University College Hospital, Nigeria	
Cesaltina Lorenzoni, Ministry of Health, Mozambique & Maputo Central Hospital, Universidade Eduardo Mondlane, Mozambique	
WHO Model List of Essential Medicines and access to medicines across the African region	26
Shalini Jayasekar Zürn, Union for International Cancer Control, Switzerland	
Yehoda M. Martei, Hematology-Oncology Division, University of Pennsylvania, US	
Radiotherapy	28
Hannah Simonds, Division of Radiation Oncology, Stellenbosch University, Tygerberg Academic Hospital, South Africa	
Wilfred Ngwa, Brigham and Women's Hospital, Dana-Farber Cancer Institute, Harvard Medical School, US	
Surbhi Grover, Department of Radiation Oncology, University of Pennsylvania, US	
Improving surgical oncology in Africa	29
Miriam Mutebi, Aga Khan University Hospital, Kenya	
Palliative care and psycho-oncology in the African region	30
Christian R. Ntizimira, City Cancer Challenge, Rwanda	
Chioma C. Asuzu, Psycho-Oncology Unit, Department of Radiation Oncology, College of Medicine, University of Ibadan, Nigeria	

Breast cancer in the African region	32
Nazik Hammad, Queen's University, Canada	
Verna Vanderpuye, Consultant Oncologist, AORTIC Secretary Treasurer, Ghana	
Beatrice Wiafe Addai, Peace and Love Hospital and Breast Care International, Ghana	
Miriam Mutebi, Aga Khan University Hospital, Kenya	
Naomi Ohene Oti, National Radiotherapy, Oncology and Nuclear Medicine Centre, Korle Bu Teaching Hospital, Ghana	
Childhood cancer in Africa	34
Cristina Stefan, African Organisation for Research and Training in Cancer, South Africa	
Fidel Rubagumya, Rwanda Military Hospital &University of Global Health Equity & Rwanda Children's Cancer Relief, Rwanda	
Biobele J. Brown, Haematology & Oncology Unit, Department of Paediatrics, College of Medicine University of Ibadan / University College Hospital Ibadan, Nigeria	
Prostate cancer	36
Timothy R. Rebbeck, Dana Farber Cancer Institute and Harvard TH Chan School of Public Health, US	
Cervical cancer elimination	38
Julie Torode, Union for International Cancer Control, Switzerland	
Verna Vanderpuye, Consultant Oncologist, AORTIC Secretary Treasurer, Ghana	
Alex Mutombo, Gynaecologic Oncologist, Kinshasa University Hospital, Democratic Republic of the Congo	
Cesaltina Lorenzoni, Ministry of Health, Mozambique & Hospital Central do Maputo, Universidade Eduardo Mondlane, Mozambique	
Lucy Muchiri, Department of Human Pathology, College of Health Sciences, University of Nairobi, Kenya	
Moving forwards through partnerships	42
Women in global oncology forum: expanding the oncology workforce	42
Miriam Mutebi, Aga Khan University Hospital, Kenya	
Supporting AORTIC's young generation	44
Fidel Rubagumya, Rwanda Military Hospital &University of Global Health Equity & Rwanda Children's Cancer Relief, Rwanda	
Cristina Stefan, African Organisation for Research and Training in Cancer, South Africa	
Kwanele Asante, University of Witwatersrand, South Africa	
African Cancer Registry Network: Accomplishments, activities and plans for the future	45
D. Maxwell Parkin, African Organisation for Research and Training in Cancer & University of Oxford, UK	
J. Olufemi Ogunbiyi, University of Ibadan/ University College Hospital, Nigeria	
Eric Chokunonga, Zimbabwe National Cancer Registry, Zimbabwe	
Biyang Liu, African Organisation for Research and Training in Cancer, UK	
Capacity Building for Civil Society in the African Region: Key UICC Programmes and Opportunities	47
Mélanie Samson, Union for International Cancer Control, Switzerland	
Kirstie Graham, Union for International Cancer Control, Switzerland	
Sally Donaldson, Union for International Cancer Control, Switzerland	
Alessandro Di Capua, Union for International Cancer Control, Switzerland	
Domenico Iaia, Union for International Cancer Control, Switzerland	
Sabrina Zucchello, Union for International Cancer Control, Switzerland	
The Africa Cancer Research and Control ECHO: Utilising technology-enabled collaborative learning to advance national cancer control plan implementation	51
Kalina Duncan, Center for Global Health, U.S. National Cancer Institute, US	
Mishka K. Cira, Clinical Monitoring Research Program Directorate, Frederick National Laboratory for Cancer Research, US	
Anne Ng'ang'a, Ministry of Health, Kenya	
Civil society organisations and integrating cancer in Universal Health Coverage	53
Rosie Tasker, Union for International Cancer Control, Switzerland	
Recommendations for AORTIC members	55
References	56

Foreword



In 2015, I became the first woman from the African continent to be elected President of AORTIC. I felt honoured but also humbled when contemplating the task ahead, with numerous far-reaching changes needed for greater progress in cancer control in the region. I was determined to do all I could to significantly increase the contribution of our organisation to improving cancer care in Africa and achieve our vision of transforming cancer control through collaboration in education, research and delivery of equitable and timely interventions to minimise the impact of cancer. AORTIC has taken a number of steps in the right direction to achieve this goal. The publication of this first book on cancer control and Universal Health Coverage (UHC) in Africa, together with our trusted partners, the Union for International Cancer Control (UICC) and the International Cancer Control Partnership (ICCP) is another key step in laying the groundwork for evidence-informed advocacy and building partnerships to achieve the objective of improved coverage of quality cancer services from prevention through to palliative care. The election of Dr Tedros Adhanom Ghebreyesus, the first African Director General of the World Health Organization, has brought increased commitment in the region and globally to fundamental changes in the accessibility of health care and the promotion of health equity under UHC. UICC and AORTIC are proud to join this global force to achieve the vision of 'Health for All'.

This remarkable book tells us not only the story of the considerable progress made during the last few years in battling cancer on the continent, but also the challenges that remain and areas for action. Written by and for African leaders, health care specialists, advocates, survivors and many others working on cancer control, the book critically analyses the present cancer environment on the continent, while also looking towards the future in the context of UHC.

The chapters concisely address a diverse selection of topics, including cervical cancer, childhood cancer, surgery and cancer surveillance and feature important collaborations, projects and partnerships underway to strengthen cancer control in Africa, such as programmes for young African leaders and many others. It also contains reflections and proposals meant to reduce cancer related morbidity and mortality, to improve prevention, early diagnosis and treatment, with the aim to promote the best care and a better life for all people living on the continent.

The aim of the book is to highlight and share existing information related to cancer in Africa, as well as to disseminate plans and measures to advance cancer care in the context of UHC. The lesson that emerges is not only that a major difference can be made in reducing the incidence, improving the management, and increasing survivorship for many cancers in Africa, but that cervical cancer, a major threat to women's health on the continent, can be eliminated. These actions can be done in cost-effective and affordable ways. Understanding the many facets of the disease and determination in fighting it are the keys to success.

This is a book for all AORTIC members: scientists, health care practitioners, patients, survivors, experts, advocates and government officials, but also for the general public who will be the beneficiary of stronger cancer prevention and care and whose place of birth will no longer impact negatively on their future.

It is a book about current challenges, but with a strong invitation to action.

Cristina Stefan

President,
African Organisation for Research
and Training in Cancer

Foreword



UICC is honoured to publish this booklet with the African Organisation for Research and Training in Cancer (AORTIC) on Cancer control in Africa: paving the way for Universal Health Coverage. The goal of cancer control to reduce the burden of cancer and improve the quality of life of cancer patients and the general population is complementary to achieving the vision of UHC, where all people have access to quality health services without suffering the financial hardship associated with paying for care. The impact of cancer can be catastrophic not just on the physical and emotional health of patients, but also has a huge financial impact in settings where treatment and care must be paid for out-of-pocket. This can result in catastrophic health spending, resulting in greater impoverishment, inequality and, in many cases, treatment abandonment.

But it need not be so. Proven and effective solutions exist, from the prevention of cancer and other NCDs to the early diagnosis and management of cancer, including pain relief and palliative care. As an advocate who has worked in cancer control for eighteen years; as former Director General of the King Hussein Cancer Foundation in Jordan and now as President of UICC, I know only too well of the challenges that cancer patients and their families face daily in accessing the lifesaving care they need. As the mother of a cancer survivor, I also know of the incredible advances in cancer treatment and care that exist and must be available to all those who need it, regardless of geography or ability to pay.

The African region has enormous resources at its disposal, with a young population and a growing and vibrant economy. The region has dynamic and committed scientists, health providers and advocates, who come together through AORTIC and its conferences to plan a better future for cancer patients and to take steps to reduce the incidence of cancer on the continent. As this booklet will show, there are many steps that can be taken from now to reduce the cancer burden that are cost effective and feasible to implement across health systems.

I greatly thank the International Cancer Control Partnership (ICCP) for reviewing and contributing to this booklet, as well as the experts who developed the chapters. UICC stands ready to support national cancer control efforts in Africa and around the world and applauds the efforts already underway in many countries in the region to integrate cancer control into Universal Health Coverage.

HRH Princess Dina Mired

President,
Union for International Cancer Control



Acknowledgements

This publication has been coordinated by an editorial group composed of the UICC Knowledge, Advocacy and Policy team: Sonali Johnson, Zuzanna Tittenbrun, Rosie Tasker and Yannick Romero and the AORTIC Council represented by AORTIC President Cristina Stefan.

The editorial group would like to thank the experts and organisations who reviewed and provided comments to the draft versions of this booklet:

ABC Foundation, Ben Anderson, Jean-Marc Bourque, Nina Caleffi, Cancer Association of South Africa (CANSA), Alison Cox, Alessandro Di Capua, Sally Donaldson, Jacqui Drope, Jeff Dunn, Allison Dvaladze, Leslie Given, Kirstie Graham, Karin Hohman, Domenico Iaia, André Ilbawi, International Cancer Control Partnership (ICCP), Shalini Jayasekar Zürn, Rosemary Kennedy, Kenya Network of Cancer Organizations (KENCO), Dan Milner, NCD Alliance of Kenya, Micaela Neumann, Marta Pazos, Katherine Pettus, Marion Piñeros, Belmira Rodrigues, Mélanie Samson, Sinéad Troy, Sabrina Zucchello



Abbreviations

AFCRN – The African Cancer Registry Network

AFRO – WHO Regional Office for Africa

AORTIC – African Organisation for Research and Training in Cancer

CSO – Civil Society Organisation

EML – The WHO Model list of Essential Medicines

FCTC – The WHO Framework Convention on Tobacco Control

HIC – High-income country

IARC – The International Agency for Research on Cancer

ICCP – International Cancer Control Partnership

LIC – Low-income country

LMIC – Lower middle-income country

NCCP – National Cancer Control Plan

NCDs – Non-communicable diseases

NEML – National list of Essential Medicines

PBCR – Population-based cancer registry

SDGs – Sustainable Development Goals

SSA – Sub-Saharan Africa

UHC – Universal Health Coverage

UICC – Union for International Cancer Control

UMIC – Upper middle-income country

WHO – World Health Organization

Introduction

Universal Health Coverage (UHC) is a concept that has been talked about for decades. The concept of 'Health for All' is reflected in WHO's constitution and was the key driver in the 1978 Alma-Ata declaration on primary health care (PHC). Achieving 'Health for All' is a goal of the World Health Organization and its member states and implies the attainment by all the people of the world of a level of health that would permit them to lead a socially and economically productive life. (1) It depends on continued progress in medical care and public health to the benefit of all populations, but also the removal of obstacles in accessing quality health services and the development of policies and programmes that promote health.

Indeed, inequalities in access to health care and differential health outcomes globally have defined the health agenda in the late 20th and early 21st centuries. Inequalities in health status reflect, to a large extent, the socio-economic disparities that exist between low- and high-income countries, but also those inequalities that are prevalent between or among different socioeconomic, ethnic, racial and cultural groups within countries. The Millennium Development Goals (MDGs) targeted eight key areas with strong inequalities not only in terms of outcomes, but also in relation to the availability of and access to services. While progress has been made on many of the indicators, including the health-related goals corresponding to reductions in child mortality, maternal mortality and HIV infections, the agenda is still unfinished and is reflected in the MDGs' successor, the Sustainable Development Goals (SDGs). In addition to including communicable conditions, the SDGs reflect the changing global epidemiological burden of disease, with a separate target to reduce Non-Communicable Diseases by a third by 2030, where currently, 70% of global deaths are due to NCDs. The health goal of the SDGs also has a target related to Universal Health Coverage, which includes financial risk protection, access to quality essential health care services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all.

Cancer is one of the most compelling examples of inequity in health outcomes, with survival rates and cancer mortality varying greatly between and within countries particularly for cancers that are amenable to prevention and early diagnosis. These inequities are not just due to the variation in the occurrence of cancer risk factors and cancer epidemiology but also inequalities in access to prevention, treatment and care interventions. Given the increasing burden of cancer in Africa, accounting for an estimated 1,055,172 new cases in 2018, (2) cancer must be included in the national UHC package in all countries in the region.

Despite high cure rates for childhood cancer in high-income countries, reaching 80% and higher for some cancers, survival rates in African countries are frequently as low as 20%. (3) While cervical cancer remains a rare cause of death among women in Europe and North America, 90% of cervical cancer deaths globally per year occur in low- and middle-income countries, with the highest burden borne by sub-Saharan African countries. Such stark inequalities in outcomes for preventable and treatable cancers are unjust and immoral, contradicting the right to health as enshrined in international human rights law.

The recently adopted Political Declaration on Universal Health Coverage at the United Nations General Assembly on 23 September 2019, provides strong global consensus on the urgent need for UHC and sustained political momentum. The Political Declaration comprehensively outlines the fundamental actions across the health and related sectors that countries can take both as a global community and in national contexts to achieve UHC by 2030. The Political Declaration includes the need for countries to strengthen efforts to address NCDs, including cardiovascular diseases, chronic respiratory diseases, diabetes and cancer. Yet beyond political will, implementing and scaling up UHC will require the planning and coordination of many actors including government, civil society and the private sector.

It is encouraging that African countries are already actively pursuing plans for UHC. Indeed, the African Union agreed to the setting of a more ambitious continental target of 2025 to achieve UHC that would galvanise its Member States to accelerate action.

Solutions to prevent and manage cancer exist and are accessible in all resource settings. In African countries with varying levels of resources, the challenge will be to derive a set of recommendations for investments across the cancer control spectrum. The identification of evidence-based and cost-effective interventions is an essential starting point in addressing the key question of how do we prioritise interventions as part of achieving UHC? This question will need to be answered with regard to each country's epidemiological profile, cancer burden and health system capacities. However, there are a number of cancer policy actions with strong evidence as to their cost effectiveness, that can be implemented in African countries within their UHC planning.

The following publication has been developed to reflect an advocacy and policy perspective on the status of national cancer control planning efforts in the African region with a view to including cancer in UHC plans across the continent. The focus of each chapter is to place a 'spotlight' on the current status of a specific aspect of cancer control, challenges and gaps in each area as well as policy recommendations for improvement to achieve the 'Health for All' vision of Universal Health Coverage. This publication is by no means exhaustive and does not cover the full range of cancer control interventions, nor does it fully describe cancer epidemiology in the African continent. Rather, its purpose is to provide members of the African Organisation for Research and Training in Cancer, representatives of Ministries of Health, and civil society organisations with a resource to assist them in identifying some key areas for advocacy and policy attention with regard to integrating cancer within emerging UHC plans. It encourages cancer scientists, researchers, medical practitioners, patients and advocates to look beyond their individual areas of specialty towards broader issues of cancer control, to engage in coalition-building and create partnerships with other stakeholders that can identify and implement cancer control interventions in their national context to help achieve the vision of 'Health for All'.

The cancer burden in the African Region

The cancer burden is conventionally measured as numbers of new cases or deaths from cancer (most usefully as rates – the number per 100,000 population per year), or as prevalence – the number of cancer survivors. More complex indicators such as the number of person-years of life lost due to cancer, or the disability-adjusted life years lost may be used, especially where an economic dimension, and comparisons with other diseases, are being considered.

Here we discuss only the first three indicators, for which estimates for 36 cancers are available from the GLOBOCAN 2018 database of the International Agency for Research on Cancer (IARC). (4) The numbers presented are for the 47 countries of the African region of WHO (AFRO) in the year 2018.

The Cancer Burden

Incidence

Overall 811,200 new cancer cases (4.5% of the world total) and 534,000 cancer deaths (7.3% of the world total) were estimated to have occurred in the AFRO countries in 2018 (Table 1). Crude rates of incidence and mortality are much lower than the global average because of the young age of the African population (the median age in sub-Saharan Africa in 2015 was 18.2, compared with 29.6 for the world). (5) In terms of cumulative risk, however, the difference is much less pronounced. Indeed, cumulative mortality in African women is greater than the global average.

Table 1.
Numbers of new cancer cases and deaths, crude and cumulative rates of incidence and mortality (2018)
R Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2018). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: <https://gco.iarc.fr/today>, accessed 22/08/2019

	Incidence				Mortality			
	Cases (000's)	% of world	Crude rate (per 100,000)	Cum risk % (0-74)	Deaths (000's)	% of world	Crude rate (per 100,000)	Cum risk % (0-74)
Both Sexes								
World	18079		236.9	20.2	9555		125.2	10.6
Africa	1055	5.8%	81.9	13.4	694	7.3%	53.8	9.4
AFRO	811	4.5%	75.5	13.0	534	5.6%	49.7	9.2
Male								
World	9456		254.6	22.4	5386		139.9	12.7
Africa	447	4.7%	69.4	12.7	317	5.9%	49.2	9.2
AFRO	330	3.5%	52.4	12.0	232	4.3%	43.2	8.6
Female								
World	8623		228.0	18.3	4169		110.2	8.7
Africa	609	7.1%	94.4	14.1	377	9.0%	58.5	9.8
AFRO	481	5.6%	89.3	14.1	302	7.2%	56.2	9.6

Table 2.
Estimation of cancer incidence for 47 countries of the WHO (AFRO) region

Ferlay J, Colombet M, Soerjomataram I, Mathers C, Parkin DM, Piñeros M, Znaor A, Bray F (2019). Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. *Int J Cancer*. 144(8):1941–1953.

Source of data and method	Region					Africa
	East	Middle	North	South	West	
1 Rates from a national registry	1			1	1	3
2a Rates from a single registry	3	2		2	5	12
2b Weighted/simple average of two or more registries	5		1		1	7
3b Estimated from national mortality				1	2	3
4 "All sites" estimates partitioned using frequency data	1	1			3	5
9 No data: the rates of neighbouring countries or registries	6	5		1	5	17
	16	8	1	5	17	47

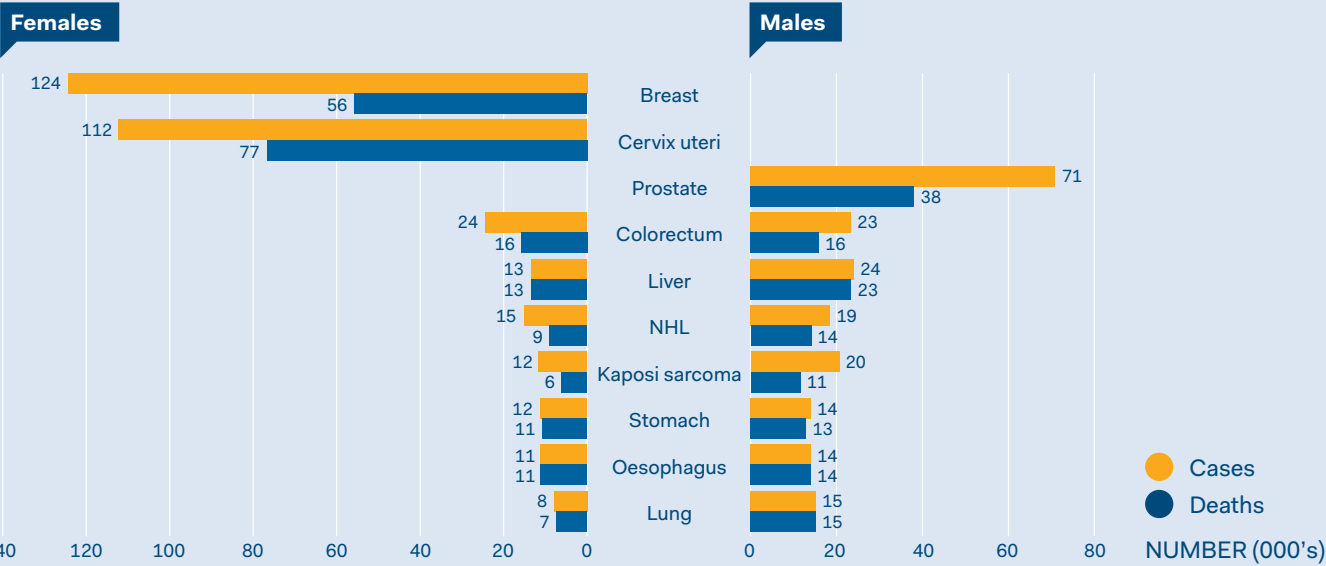
Figure 1 shows the contribution of different cancers to the total burden of incidence and mortality in the AFRO countries. In females, cancer of the breast (124,000 or 27% of cases) and cervix (112,000–24.4% of cases) are by far the most burdensome.

In males, cancer of the prostate dominates in terms of number of cases, (71,000 cases, 22.7% of the total), followed by liver cancer (24,000; 7.6%) and colorectal cancers (23,000; 7.5%).

Within Africa there are, however, quite marked geographic variations in these and other cancers. This is due, presumably, to different risk factor exposures and potentially the susceptibility of populations to them. Figure 2 shows the most numerous cancers in each country, for males (left) and females (right).

Figure 1.
The most common cancers in the WHO/AFRO region (numbers of cases and deaths, in thousands)

R Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2018). *Global Cancer Observatory: Cancer Today*. Lyon, France: International Agency for Research on Cancer. Available from: <https://gco.iarc.fr/today>, accessed 22/08/2019

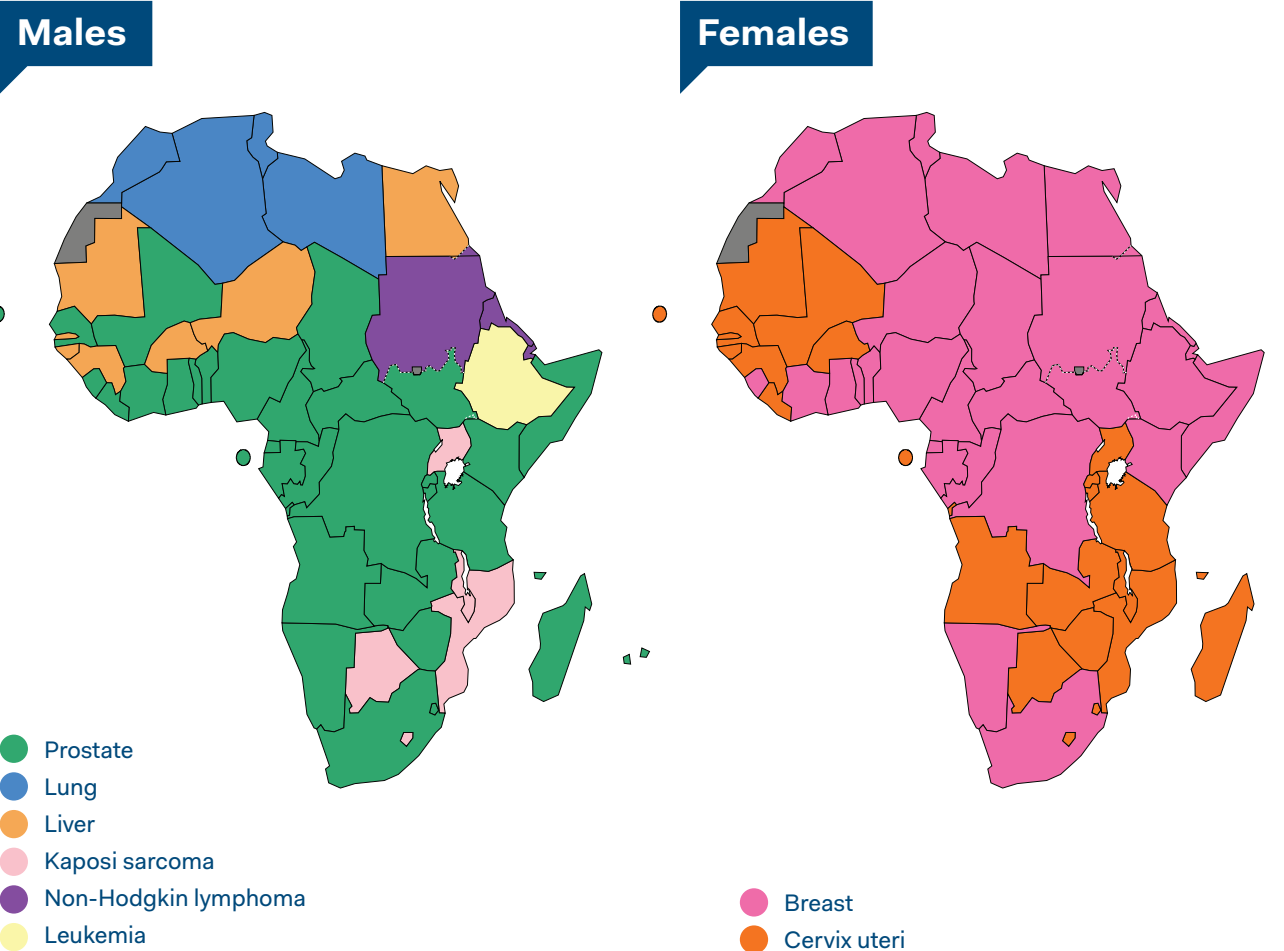


Since very few countries in Africa have statistics on mortality from death registration, the numbers of deaths are estimated from incidence rates and survival appropriate to the level of development of the country (as described below). Ratios of incidence to mortality of the different cancers are therefore somewhat similar in the various countries, and geographic patterns of mortality follow closely those of incidence.

Figure 2 shows the numbers of deaths for the 10 major cancers in the AFRO region. The ratio of deaths to cases provides an approximate measure of case fatality (the inverse of survival probability). As can be deduced from Figure 2, the mortality to incidence ratio (M:I) for individual cancers is 45% for breast cancer, 68% for cervix, 53% for prostate, 55% for Kaposi sarcoma, 66% for colorectal cancers, and 98% for liver and oesophagus cancer.

Figure 2.
The most frequent cancer in the countries of Africa in Males (LEFT) and Females (RIGHT)

R Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2018). *Global Cancer Observatory: Cancer Today*. Lyon, France: International Agency for Research on Cancer. Available from: <https://gco.iarc.fr/today>, accessed 22/08/2019



Prevalence

There were an estimated 1.45 million cancer survivors (at 5 years post diagnosis) in the AFRO region in 2018. This is just 3.3% of the world total – a lower proportion than for new cases (4.5% - Table 1) because of the poorer prognosis for cancer cases in Africa. This is reflected in the M:I ratio- it is 53% for the world, 66% for AFRO, and is a consequence of the type of cancers seen (case mix), but also of poorer prognosis for individual cancer types, due to late presentation and poorer therapeutic facilities.

Methods and limitations of the data presented

It should be remembered that the figures for incidence, mortality, and prevalence in Globocan are estimates based on the best available data from each country. The data sources and methods used to estimate incidence in each country are described in Ferlay et al. (6)

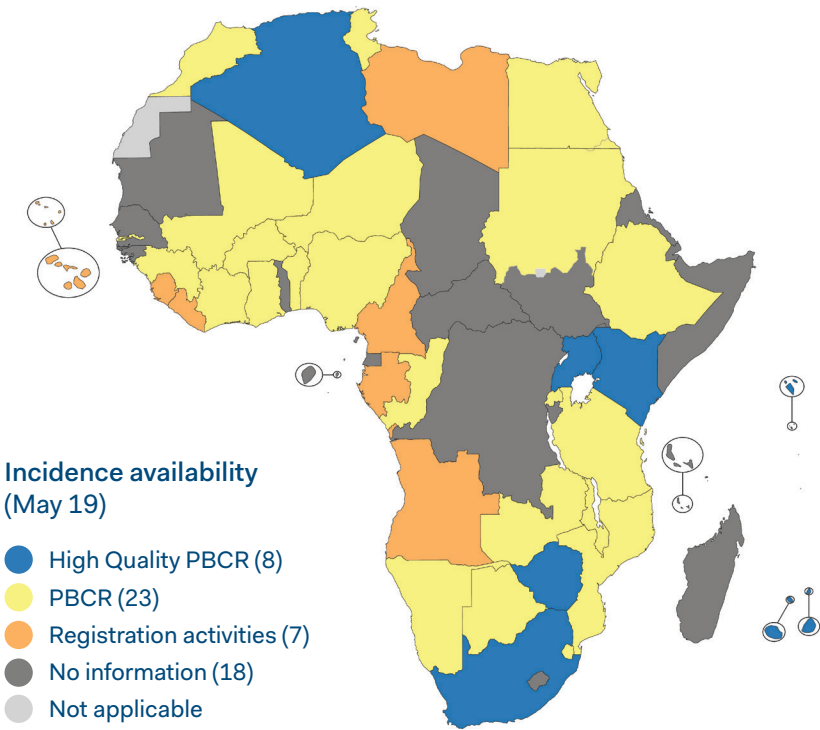
In Africa, few countries have national vital statistics systems capable of registering all deaths with medical certification of cause of death. Recent cancer-specific mortality statistics were available from only two countries (Mauritius and South Africa), while older data from São Tomé and Príncipe and Cape Verde were also used to estimate 2018 mortality rates. However, most countries have developed cancer registration systems, recording the numbers of new cancer cases occurring in a defined population (of known composition, by sex and age), allowing incidence rates to be calculated. For 43 countries, mortality was estimated by combining the estimates of cancer incidence with estimated survival probabilities. (6)

The sources of data on cancer incidence are summarised in Table 2. Of the 47 countries of AFRO for which estimates are available, relatively recent cancer registry data were used for 30, while the absence of any recent data for 17 meant that estimates were based on data from neighbouring countries. Figure 3 depicts the data sources and methods used in map form.

Prevalence is a point estimate, not a rate – it is the number of cases present at a given point in time. For cancer, the total number of survivors (i.e. persons who have ever had a cancer at some time in their life and survived it) would be difficult to estimate and would be of little practical value. Globocan presents prevalence as number of survivors (in 2018) 1, 3 and 5 years after diagnosis. It is estimated from the incidence of cancer and survival probabilities at these intervals post diagnosis.

Figure 3. Sources of data on cancer incidence

Data source: GICR , Map production: IARC World Health Organization



Discussion

For Africa, almost all of the estimates of the cancer burden, derive from data on cancer incidence produced by population-based cancer registries. Although this means that rates for limited areas in a country have been assumed to represent the whole national population, at least the data are real (rather than being based on statistical models using the estimated prevalence of risk factors or correlates of cancer incidence). This provides an incentive to develop cancer registries or to improve their coverage. Local data are obviously essential to assess how cancer patterns are affecting populations and how trends in different cancers are evolving.

Population-based cancer registries provide the solid basis for the establishment, monitoring, and evaluation of cancer control programmes. Synthetic estimates based on modelling cannot fulfil this role, nor develop and sustain institutional knowledge and skills for data generation, analysis, interpretation, and translation. (7) Increased demand for country-led monitoring in the context of the SDGs is called for in the 2030 agenda for sustainable development (8) and reflected in the indicators in the Global Action Plan for the Prevention and Control of NCDs. (9)



The status of national cancer control plans in the African Region

National cancer control plans (NCCPs) are the foundation for cancer control, supporting countries to identify, prioritise and implement the most impactful and cost-effective interventions. Politically, they represent a clear, public commitment to action and can also serve as a valuable tool to engage national and international support, through multi-sectoral partnerships with civil society and relevant private sector stakeholders in order to reduce the national cancer burden and improve patient outcomes.

The African region has seen a significant increase in the number of countries with a national cancer control plan (NCCP) from 46% of countries in 2013 up to 74% 2017, (10) in line with global trends.

Cancer-related plans from 39 countries from the continent were analysed to provide an overview of cancer control planning efforts across Africa, discuss strengths and highlight remaining challenges to tackle this public health issue. Thirty-five countries belong to the World Health Organization (WHO) African region and four to the Eastern Mediterranean region.

Methods

The data used in this regional analysis comes from “National Cancer Control Plans: a global analysis” (the Global Review), (11) a review of 527 publicly available cancer-related health plans including national cancer control plans, noncommunicable disease (NCD) plans which included cancer, and other cancer-related health strategies and policies, as relevant. The Global Review analysed documents from 157 countries across all regions and income levels. The Global Review was conducted using a questionnaire with 121 questions covering 11 domains across the cancer control continuum, framed through a health systems approach, namely introduction and overview, prevention, early detection, treatment, palliative and supportive care, service delivery, governance, health workforce, health information systems, research and financing. (12) Each of the 121 questions was investigated and scored. The overall score represents the proportion of total questions addressed by a plan. For the purpose of this publication we have analysed an additional two NCCPs that were not available when the Global Review was conducted.

National cancer control planning efforts

Nearly 50% (n=18) of the countries surveyed had an NCCP. Of the countries with an NCCP, more than half are classified as LMICs (n=10). Of those countries without a cancer- specific plan (n=21) (i.e. where cancer was addressed through an NCD plan that encompassed several diseases), two-thirds (n=14) were LICs. NCCPs across the region were found to be more comprehensive (addressing key elements of the cancer control continuum and health system), coherent (linked to other national health plans) and consistent (aligned with global norms and standards), in comparison to where cancer was addressed through NCD plans only. This regional analysis is consistent with the findings from the Global Review and underlines the importance of a specific strategy for cancer control. The majority of the plans reviewed had been produced in the last 5 years (2013 to 2018).

The Global Review assessed the quality and performance of the plans across the 11 domains, and this analysis was used to develop a regional score for the African continent. The average score for the region was 35% (Figure 4) and individual country scores ranged from 8%-55%, with a standard deviation of 11% (Figure 5). This was close to the average score in the global analysis of 36%. We also analysed the distribution of country scores according to the income level within the region (Figure 6). The results indicate that income level can have an impact on the quality and the level of detail of planning for cancer control activities; however, the scores may also be affected by countries with weaker health systems that are facing many competing health demands.

Figure 4.
Distribution of overall scores of cancer-related plans reviewed for each region

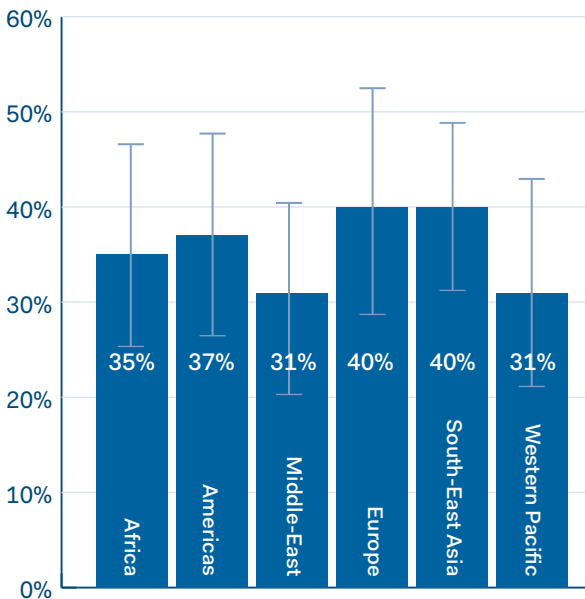


Figure 5.
Individual country scores

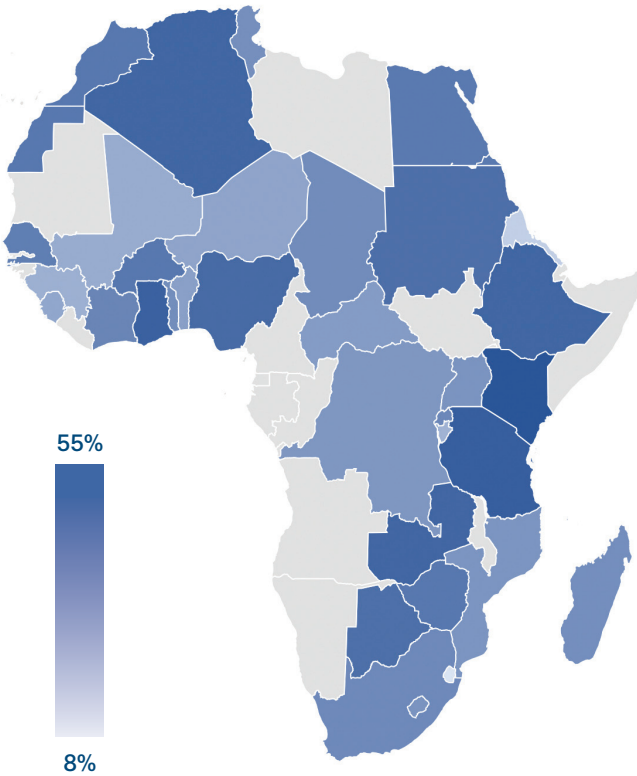


Figure 6.
Representation of overall scores for African countries

Category	Score (%)
Global average	36
African continent average	35
African high-income average	42
African upper middle-income average	42
African lower middle-income average	38
African low-income average	32

The main challenges regionally were found in three domains; namely prevention (35% regional average vs 39% global average), early detection (32% regional average vs 44% global average), and service delivery (20% regional average vs 23% global average). Domains such as palliative care (35% regional average and globally), health workforce (21% vs 23%), health information systems (32% vs 34%) research (22% vs 24%) and treatment (27% vs 29%) were all well-defined and equal or very close to the global score. Finally, governance (42% vs 36%) and the financial domains' scores (27% vs 22%) were higher in Africa compared to the global average score.

Overall, the quality of the plans from Africa was similar to the global average, however, we observed discrepancies between countries. These discrepancies may have resulted from the lack of a specific cancer plan in certain countries and the use of an NCD plan only, which may not necessarily cover cancer control planning in as comprehensive a way as a dedicated cancer control plan.

Readiness for implementation

The review explored to what extent the plans had mechanisms for accountability, monitoring and evaluation and had identified financial resources required for implementation. Thirty-eight of the thirty-nine plans had the endorsement of the Ministry of Health and other relevant governmental authorities. Furthermore, 87% of the plans identified a body responsible for implementation of the plan.

Leadership for implementation was more commonly reported in LICs (90% of plans) and LMICs (90% of plans) compared to UMICs (50% of plans).

Civil society organisations (CSOs) are important stakeholders and often contribute to the development of plans by playing an active role on planning committees. The role of CSOs is reinforced in the region's NCCPs. They were acknowledged the 85% of plans regionally, compared to 72% globally.

Monitoring and evaluation were incorporated in 85% of the plans. However, only one country specified a strategy to implement an accountability and monitoring framework for progress in the operationalisation phase. Again, this omission mirrors a global trend, as no more than 7% of the global plans included an implementation strategy for monitoring and evaluation.

Half of the plans specify financial resources for implementation, in line with the global average. In the region, 60% of plans report the costs for further planned activities and 20% have an implementation strategy for resource allocation and sustainable resource mobilisation, compared to 10% globally.

Conclusion

The analysis of the cancer-related plans from Africa is encouraging as many countries have developed new plans since 2013. These cancer plans rely on data originating from robust and reliable sources such as population-based and hospital-based cancer registries. Many plans address core topics and have a clear accountability framework. These can be further strengthened to improve the comprehensiveness, coherency and consistency of the plans.

The remaining challenges in cancer control planning such as a developing a comprehensive strategy in cancer prevention, early detection, service delivery, as well as identifying financial resources and enhancing monitoring and evaluation could be addressed through existing international collaborations, or through partnerships with countries with similar cancer burdens and health system capacities. The analysis highlights a clear opportunity for countries across the region to share successful experiences and best practices to improve the efficiency of cancer control planning.

Cancer control spotlights

Policy and legislation for the prevention and control of NCDs in Africa

Governments across many African countries are increasingly aware of the heavy burden of NCDs including cancers. This is evidenced by the Brazzaville Declaration on Non-Communicable Diseases Prevention and Control in the WHO African Region adopted in 2011, which member countries signed to affirm their political willingness to put in place strategies and resources to control NCDs. (13)

Civil society and patient groups across Africa play a major role in pressuring governments to develop, fund, and implement NCD control plans.

Opportunities for change

Kenya and South Africa are two countries that have made strides in addressing the prevention and control of NCDs through developing a policy and legislative framework.

Kenya

Kenya, like many SSA countries, faces a triple burden from communicable, non-communicable diseases, and injuries. The country has legislation, guidelines and policy documents that directly impact the prevention and control of NCDs. These include a National Cancer Control and Prevention Act, the Non-Communicable Diseases strategic plan as well as policy documents and guidelines on nutrition and physical exercise. Kenya also has legislation on tobacco and alcohol as well as relatively high taxes on these products. (14) However, implementation of existing policy and legislation has been slow due to resource constraints.

To accelerate progress in combating NCDs in Kenya- civil society, private sector, academics, patient groups and the government have now joined efforts to drive the NCD policy and legislative agenda forward. This model is much more effective because the government has recognised and leveraged the expertise and skills that non- state actors have, which are not always available in the public sector. A multistakeholder approach can also be replicated in other countries seeking to improve their policy and legislative environment to tackle NCDs.

South Africa

In South Africa (SA), NCDs accounted for 39% of deaths in 2010 with cancer being the second most common cause following cardiovascular disease. (15) In recognition of the growing burden of NCDs in SA, the country's commitment to the Political Declaration on NCDs was made at the United Nations General Assembly in 2011 for the first UN High Level Meeting on NCDs. (16) The 2011 National Department of Health NCD Declaration followed, paving the way for strategies and policies promoting a multisectoral approach to NCD control and addressing modifiable risk factors such as diet, physical activity, obesity, tobacco and alcohol. (17) These included the Strategic Plan for the Prevention and Control of NCDs, (16) National Health Promotion Strategy, (18) Strategy to Prevent and Control Obesity (promoting healthy diets, food environments and physical activity), (19) National Food and Nutrition Security Policy, (20) regulations requiring salt reduction in foodstuffs, (21) marketing of breastfeed milk substitutes (22) and the sugar sweetened beverage tax. (17) (23) Amendments to tobacco legislation have contributed to reduced tobacco use as shown empirically. (17) Civil society organisations have advocated and continue to campaign for policy change including the aforementioned statutes and strategies.

Submissions were made in support of sodium reduction, the sugar sweetened beverage tax, the Draft Liquor Amendment Bill seeking to further regulate alcohol marketing and sales, and the Draft Tobacco Products and Electronic Delivery Systems Bill to further enforce legislation aligning with the Framework Convention on Tobacco Control. Contributions were also made to the National Cancer Control Strategic Framework, breast and cervical cancer policies, and the draft prostate cancer policy which also highlight the aforementioned risk factors. Other advocacy work included promoting universal health coverage; submissions on the proposed National Health Insurance Bill which seeks equality in access to healthcare, the Medical Schemes Bill and activism on drug patent laws to make cancer medications more accessible.



Call to action

With the rising health and economic burden of NCDs in Africa, cost-effective interventions are particularly pertinent. The World Health Organization's "Best Buys" offer cost-effective approaches on interventions to reduce modifiable risk factors for NCDs and these are beginning to be reflected in different national policy and regulatory efforts (24) with some early reductions in, for example, tobacco use. (17) (25) Strong and continued advocacy efforts are required for policy change, implementation and enforcement of these programmes in African countries. Additionally, ongoing evaluation of these interventions in LMICs is essential to ascertain their efficacy. (26)

FCTC implementation in the African region

Challenges across the region

In February 2005, when the World Health Organization's Framework Convention on Tobacco Control (WHO FCTC) entered into force, 40 countries around the world had ratified the treaty with Ghana, Kenya, Madagascar, Mauritius and Seychelles being amongst these. (27) To date, 44 of the 181 parties to the FCTC are WHO AFRO member states and only three countries from the region, Malawi, Mozambique and South Sudan, are not Parties. (28) Similarly, in June 2018 when the Protocol to Eliminate Illicit Trade in Tobacco Products entered into force, 16 of the required 40 Parties were African. (29) This was particularly important as the Protocol was the first legally binding instrument adopted under the WHO FCTC. A look at these numbers confirms that countries in the African region have rapidly embraced the FCTC and are doing the same with respect to this Protocol. However, FCTC implementation has failed to be identified in many countries as a national priority. Tobacco control initiatives are frequently placed exclusively under the responsibility of Ministries of Health with little support from international development partners or from other government ministries and departments.

Prevalence of tobacco smoking among adults in the African region is estimated to be 21% for males (94 million people) and 3% for females (13 million people), although some countries have a prevalence of up to 48% for males and 20% for females. (30) Despite the relatively low tobacco prevalence in Africa compared to other regions, a combination of rising incomes, young population and the tobacco industry's vigorous marketing accounts for a rapid increase in tobacco use in the region. (31) Therefore, without comprehensive tobacco prevention and control policies, smoking prevalence in Africa is expected to rise by nearly 39% by 2030, from 15.8% in 2010 to 21.9% – the largest expected regional increase globally. (32)

Opportunities for change

Though many countries in the region are yet to fully establish essential infrastructure for tobacco control, such as a functional national coordinating mechanism, development and implementation of comprehensive, multisectoral tobacco-control strategies, some countries have been able to make remarkable progress to transpose their treaty obligations into national action. For example, in February 2019, the Ethiopian Parliament approved a historic public health legislation that will become one of the strongest laws in Africa on reducing tobacco use. (33) In 2016, Uganda became one of few sub-Saharan African countries to implement comprehensive national smoke-free legislation. In March 2014, Senegal's parliament adopted a law on the manufacturing, packaging and labelling, sale and use of tobacco. Senegal's law prohibits, amongst other things, any interference by the tobacco industry in national health policy. This is worth mentioning because tobacco industry interference has been noted to be one of the reasons why FCTC implementation is lagging in Africa.

As the use of tobacco has declined in high-income countries, the tobacco industry has increasingly turned to low- and middle-income countries, particularly in Africa, Asia, and Eastern Europe, to recruit new users. Transnational Tobacco Companies are expanding into African countries where, excluding South Africa, the tobacco market grew by almost 70% through the 1990s and into the first decade of the 21st century. (34) The industry's influence is conspicuous within the political and economic spheres. Internal industry documents, such as those of British American Tobacco, reveal that tobacco companies have strategically planned their expansion across Africa for over two decades, seeking to "aggressively and consistently" exploit these "profitable opportunities". (34)



However, world leaders have always recognised the power of the FCTC in achieving the health target of the SDGs. For example, in 2015, at the end of the third international conference on financing for development in Addis Ababa, world leaders endorsed increasing tobacco taxes as a key strategy to reduce tobacco consumption and the global burden of NCDs and help finance sustainable development. (35) Also, while SDG 3 focuses on health, accelerated implementation of the FCTC is recognised as one of the “means of implementation” to reach this goal and the target on NCDs.

We have seen many African countries prioritising UHC within their national health strategies. To make UHC feasible, African countries need both political will and sufficient funding. Strengthening tobacco taxation programs, which are a win-win for both public health and domestic revenue generation, is a solution that is being implemented in some countries. (36) Madagascar, for example, already has a specific tax levied for the benefit of the national tobacco control program which has helped the country to sustainably enforce tobacco control measures under the FCTC.



Call to action

To ensure the sustainability of tobacco control, African countries need to continuously increase taxes on tobacco products to reduce the affordability of all tobacco products and reduce consumption. For this to be effective, there is need for a whole of government approach to tobacco control. (37) It is important that African countries raise awareness of the risks of tobacco use particularly among youth populations and to take actions to monitor and limit the interference of the tobacco industry in health-related policy.

Early detection

Challenges across the region

In cancer care, time is of the essence. When cancer is detected early and effective treatment is provided in a timely manner, the probability of survival increases, while the cost and complexity of treatment decreases. (38) In the AFRO region in 2018, an estimated 811,228 people were diagnosed with cancer, including almost 300,000 (36%) with either breast, cervical, colorectal, or oral cavity cancer. (39) When detected and treated at an early stage, patients with these common cancers are more likely to survive. (40) Despite the increase in global efforts to prevent and control NCDs, (9) there are still vast global disparities in cancer survival, with the lowest survival rates in LMICs. (41) In many settings, health systems are fragile, fragmented, and otherwise inadequately prepared to address effectively and equitably, the growing burden of NCDs, including cancer.

To significantly reduce global, regional, and within-country inequities in access to cancer care, “strategies are needed that link public health policies to clinical outcomes.” (42) This is of particular relevance to early detection across Africa, as patients can face a complex interplay of geographic, sociocultural, and financial barriers to accessing effective and affordable cancer care services. Even when patients present for care soon after noticing a symptom that requires evaluation for a possible cancer, they are sometimes misdiagnosed, turned away, or otherwise face inordinate delays to an accurate diagnosis and prompt treatment. What is sometimes called “patient delay” might in fact reflect inadequate health systems for cancer early detection and care.

Opportunities for change

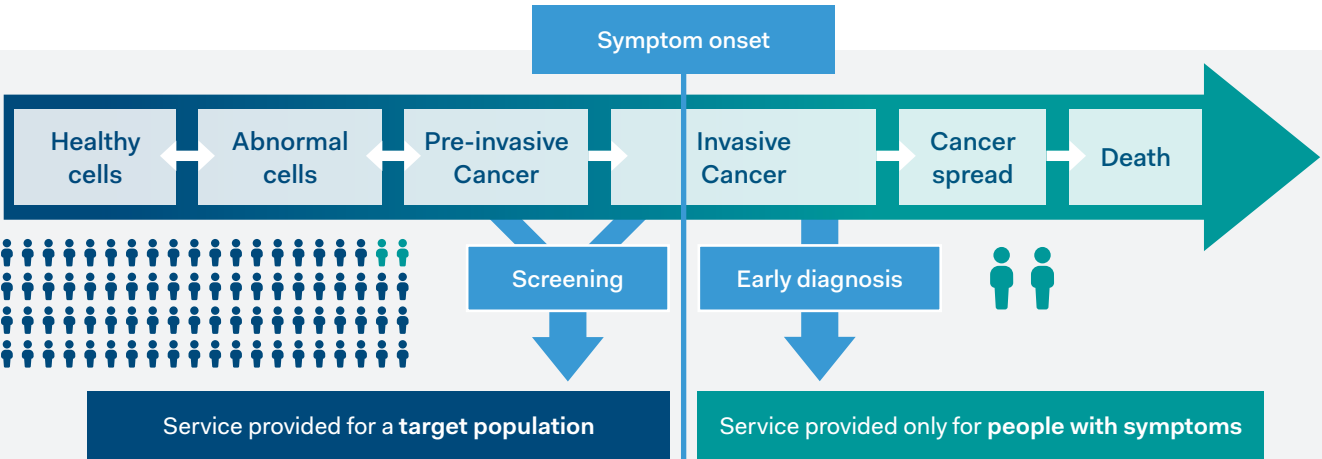
Two Strategies for Early Detection

Early detection comprises two distinct public health strategies recognised by the World Health Organization: early diagnosis and screening. Early diagnosis is defined as the early identification of cancer in patients who already show symptoms of disease, whereas screening is a process that aims to identify pre-clinical disease in an otherwise healthy and asymptomatic population (Figure 7). (38)

Early diagnosis focuses on identifying the disease at the earliest possible opportunity and ensuring timely and coordinated access to diagnosis and treatment. The WHO outlines three steps to effective early diagnosis: “1) awareness of cancer symptoms and accessing care; 2) clinical evaluation, diagnosis and staging, and; 3) access to treatment and palliative care.” (38)

Screening involves the use of tests or examinations to identify previously unknown cancers or their precursors in an asymptomatic target population. Screening should be viewed as a process, as it requires additional resources and coordination to: inform and invite the target population to participate; administer the screening test and follow up with test results; refer as needed for diagnostic testing (often requiring imaging and biopsy); and ensure that the necessary care pathways are accessible without delay. (38)

Figure 7.
Distinguishing screening from early diagnosis according to symptom onset (38)
Guide to Cancer Early Diagnosis. Geneva, Switzerland: World Health Organization; [2017]. Licence: CC BY-NC-SA 3.0 IGO

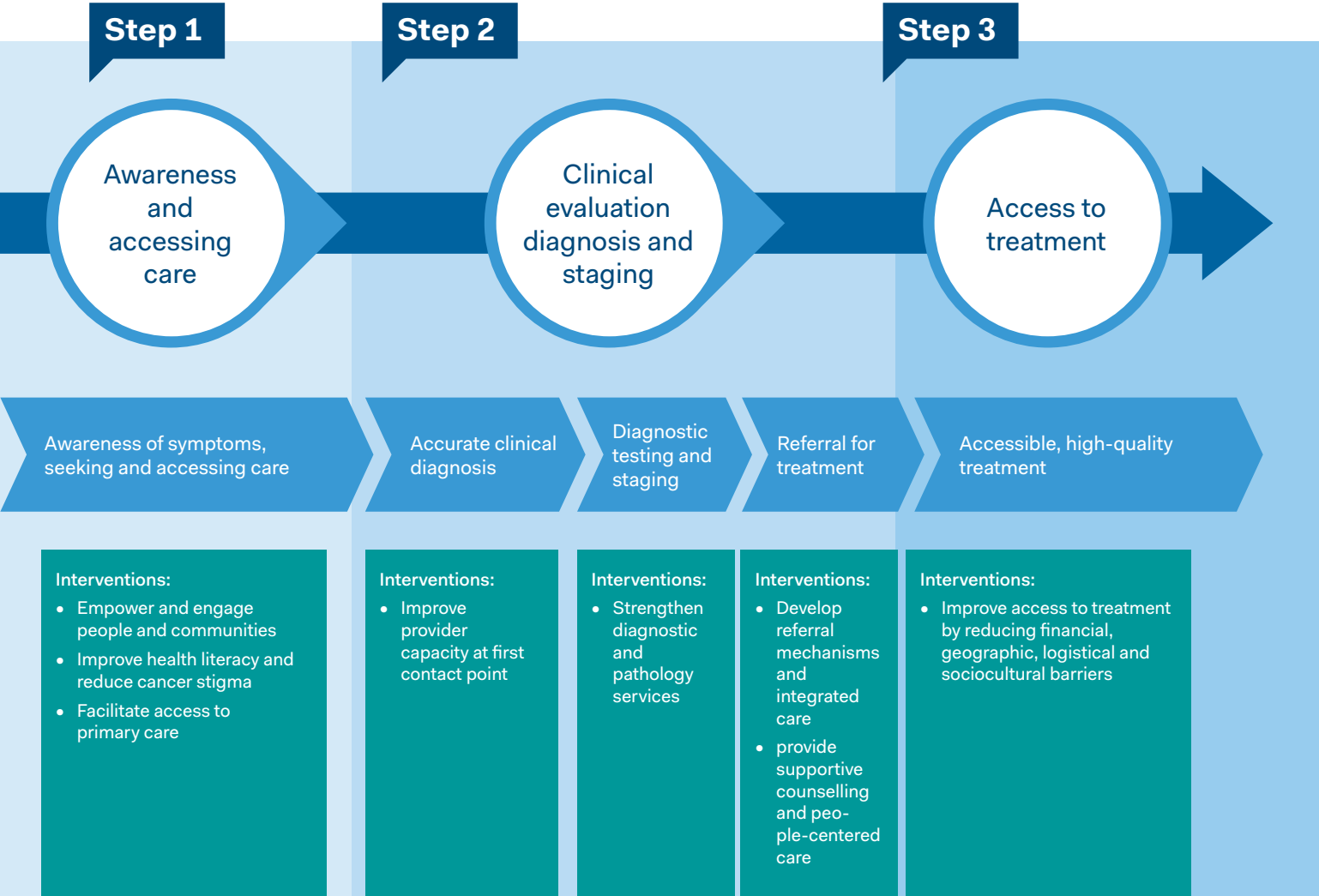


Health System Considerations

Early detection is a central component of comprehensive cancer control. However, it is essential to note that early diagnosis and screening are fundamentally different strategies in terms of resource and infrastructure requirements, as well as overall impact and cost. (38) To effectively implement early detection programmes, health planners and policy-makers must be equipped with good data on the local/ regional disease burdens (which can be addressed with population-based cancer registries), and on sociocultural norms, that can influence acceptability, feasibility and uptake of services.

At the same time, community-engaged awareness, adoption of evidence-based screening and treatment guidelines, and provider education at all levels of the health care system have important roles to play in ensuring any early detection strategy is effective to improve cancer outcomes (Figure 8).

Figure 8.
Potential interventions to strengthen early diagnosis (38)
Guide to Cancer Early Diagnosis. Geneva, Switzerland: World Health Organization; [2017]. Licence: CC BY-NC-SA 3.0 IGO



Screening can be highly effective and cost-effective for certain cancers, in particular cervical and colorectal cancers, where pre-clinical disease (such as cervical pre-cancer and colorectal polyps) can be readily detected and treated. Many countries in Africa have now introduced national cervical cancer screening programmes, with varying degrees of success. South Africa's national programme has had little impact to date, having reached only 14% of the target population by 2014. (43) In comparison, Zambia has been relatively successful in transitioning to scale, with implementation in as many as 75 government-run health facilities across 10 provinces. (43) In both Zambia and Tanzania, where resources have been appropriately allocated and health systems have been supportive, such programmes have led to sharp declines in both incidence and mortality from invasive cervical cancer over time (see the chapter on cervical cancer). In the case of colorectal cancer, population-level screening programmes have not yet been implemented across the AFRO region. (44) Careful planning with appropriate pre-implementation community and provider awareness, accompanied by the allocation of adequate financial and human resources, will be required to ensure sustainable management and financing of organised programmes.

Breast cancer highlights the complexity of selecting the appropriate early detection strategy. Early detection is particularly effective for cancers with self-identifiable symptoms, like a breast mass, where improving awareness of signs and symptoms can prompt patients to seek timely evaluation. Screening with mammography, on the other hand, can be effective and even cost-effective in some settings, but is generally resource intensive and expensive. (45), (46) According to WHO, population-based breast screening should only be considered where programmatic infrastructure, including quality control, monitoring and evaluation are assured. (45) For this reason, screening mammography is not recommended until a health system is (at least) able to adequately serve the needs of all women with palpable breast masses or other symptoms and signs of breast cancer. (47)



Call to action

The evidence is clear: early detection, combined with accessible, affordable, effective, timely treatment, can improve survival and reduce morbidity and mortality from cancer. As the number of cancer cases rises annually, and the economic burden of cancer continues to take its toll disproportionately in LMICs, the need for timely, cost-effective, population-level interventions grows urgently. Health systems across the AFRO region must be strengthened to meet the growing need for cancer care and control. Multilateral, regional and local partnerships to support these efforts can be part of the solution.



"The evidence is clear: early detection, combined with accessible, affordable, effective, timely treatment, can improve survival and reduce morbidity and mortality from cancer"



Pathology in Africa

Challenges across the region

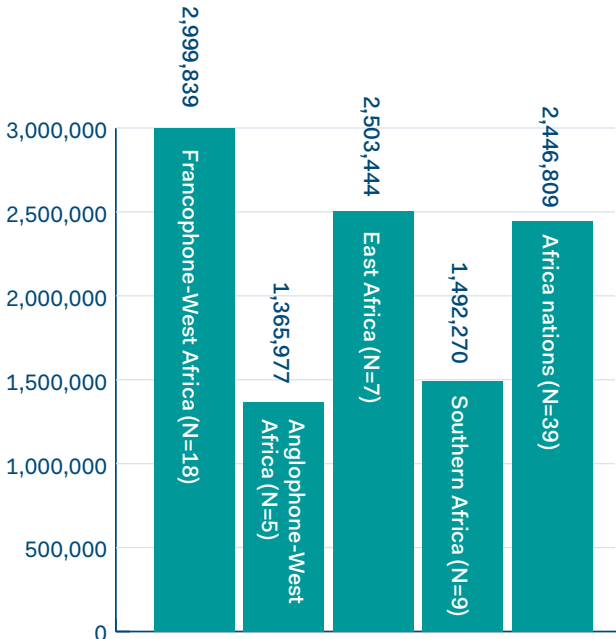
Pathology is central to cancer control because it is critical for diagnosis, including screening and early detection, as well as managing and monitoring cancer treatment, and for prognosis. This vital role requires adequate infrastructure including the required testing and sampling equipment, supplies, reagents and personnel to deliver quick, accurate and reliable diagnoses to the treating physicians.

The density and distribution of pathologists varies greatly within the AFRO region. Currently in West Africa, Nigeria has about 209 qualified anatomical pathologists practicing in-country covering the most populous country of the continent with a population of approximately 180 million. (48) The Francophone West African countries have approximately 124 pathologists across 15 countries, (49) whilst East, Central and Southern African countries show similar shortages of pathologists and pathology resources. (49) Compared to a ratio of about 1 pathologist to 18,333 persons in the US, the ratios for Africa are too high. (50)

Figure 9 shows the current status of available pathologists in Africa by region as well as the average numbers of persons served by pathologists in these areas. There are fewer than 10 pathologists in South Sudan, Malawi, Namibia, Swaziland, Zimbabwe and Botswana and there is no pathologist in Lesotho. (49) Formal pathology training programs are not available in all countries, and where courses are available, trainees are self-sponsored. After training, many countries struggle to retain trained pathologists due to poor job satisfaction, career development and remuneration.

In addition to trained staff, there is a shortage of reliable supplies and trained technicians to run the tests and to maintain the equipment. Essential quality control systems to ensure reliable, accurate and consistent results and that allow rapid turnaround to report results are also inadequate.

Figure 9. Number of persons per pathologist



No of persons per pathologist

Moreover, without specialised tools, safe and effective delivery of high-quality care will not be possible. Recent years have seen the development of advances in molecular diagnostics and specialised testing to guide targeted therapies; however, few of these have made it to the laboratories of sub-Saharan Africa due to constraints in infrastructure and training. This has implications for the treatment of patients as, for example, immunohistochemistry (IHC) for oestrogen receptor status in breast cancer patients is not available in at least 14 countries. (51) Where these tests are available, a lack of reagents and frequent stock-outs may mean they are inaccessible to patients. In Nigeria, only 12 of the 65 pathology centres are able to perform IHC. (52) primarily for breast tumours, and only a few are able to conduct IHC for lymphoma and other high incidence cancers. While South Africa is the only country in which IHC is available for patients in the public sector, there is no centre able to perform genetic analyses.

Finally, urgent work to ensure the adequate, effective and equitable distribution of financial resources is required, (50) as this will be critical to address the investment needs described above.

Opportunities for change

The majority of countries across the region now have a formal national cancer control plan but access to data on the cancer burden is limited as are pathology resources. Consequently, countries are struggling to accurately identify and prioritise investments in cancer treatment and care, including the needs for pathologists and pathology resources, which are lacking across much of the continent. Where resources are available, they tend to be centralised in major cities and in academic centres, whereas more than half the population of African countries live in rural areas. This means that pathologists are poorly situated to provide access to services for rural dwellers and, even in the best-staffed countries, the ratio of pathologists to clinicians and to the population is poor.

One strategy that is being implemented to address this shortage is telepathology. (53) Telepathology requires partnerships with external pathologists, frequently located in academic institutions in high-income countries, who often volunteer their time. The costs associated with telepathology are much lower, however its effective use still requires facilities including those to prepare samples for sharing, skilled laboratory technicians, and a reliable broad band internet connection. Several countries have successfully implemented telepathology systems which have improved diagnostic accuracy, established a platform for teaching and training, and helped develop partnerships to expand and initiate other programs and research projects. Telepathology is available in only a few centres in West Africa, all of which use static images, while in East Africa, Rwanda, Tanzania, and Uganda have formal telepathology services.



Call to action

Pathology is critical to UHC as it is the basis for diagnosis, treatment and care. In the absence of pathology services, a country cannot feasibly make progress towards achieving UHC, especially in lowering cancer related mortality.

Governments in Africa must make strategic political and economic investments in training and equipping adequate numbers of pathologists to serve the health system, supported by adequate and reliable infrastructure required to maintain supply chains, transport specimens, and improve collaboration between diagnostic and treatment facilities. Given the lead time to train staff and develop pathology services, governments in African countries should implement strategies like telepathology to address some of these shortfalls in the short- to medium-term. At the same time, governments need to invest in long term initiatives and incentives to retain trained pathologists and adjunct pathology staff.



"Without laboratories men of science are soldiers without arms."
Louis Pasteur



© Olufemi Ogunbiyi

WHO Model List of Essential Medicines and access to medicines across the African region

“Africa carries 25% of the world’s disease burden, but consumes less than 1% of global health expenditure,” said Dr Matshidiso Moeti, Regional Director, World Health Organization Regional Office for Africa (AFRO). “Largely this is because of insufficient access to quality medicines. Without greater and more concerted efforts in this area, we will not achieve universal health coverage.”

Essential medicines, as defined by the WHO, are those medicines that satisfy the priority health care needs of the population and should be accessible in sufficient quantities. (54) The WHO Model list of Essential Medicines (EML) is updated every two years and serves as a tool to help countries prioritise what is included in their national EML (NEML) for public procurement and reimbursement.

In 2015, the methodology for the selection of essential cancer medicines was revised to propose medicines based on specific regimens for specific cancers, which would make it easier for policymakers to identify cancer medicines relevant to their national disease burden. (55) Using this process, the WHO EML was further updated, with the inclusion of additional of cancer medicines in 2017 and 2019.

Challenges across the region

An analysis of 37 NEMLs in the AFRO region found that of the 25 cancer medicines on the 2013 WHO EML, a median of 13 appeared in NEMLS and, of the 16 added on the 2015 WHO EML, a median of 1 appeared in NEMLs. (56) This suggests that many countries in the region are not likely to be on track to meet the target of 80% availability of essential medicines for NCDs, including cancer, set out in the Global Action Plan for the Prevention and Control of NCDs.

However, the inclusion of cancer medicines on the NEML does not guarantee their availability to patients. (57) Barriers to access include the catastrophic costs of cancer medicines, including high out-of-pocket payments (OOP) (58) for the newer targeted medicines for cancer treatment, (55) quality assurance, (59) and medicine stockouts. (60) Specific examples from the AFRO region are listed in Table 3.

Opportunities for change

Cancer control within the AFRO region cannot be achieved without sustainable access to affordable and high-quality essential cancer medicines, including in some cases, expensive targeted medicines for cancer treatment. Subsequently, national and international policies are needed to address the existing barriers. The inclusion of these medicines in the WHO EML and the NEML plays an important role in efforts to reduce prices and in the optimal use of scarce resources, leading to an increase in accessibility, affordability and availability. Furthermore, the creation of the African Medicines Agency in 2018, is an opportunity to improve national medicines regulatory capacity in the region. It is essential that cancer drugs are also included in the scope of work of this new regional agency as regulatory capacity is a key barrier for better access to quality drugs. Possible solutions to the barriers of cost, regulatory capacity, quality assurance and stock-outs are provided in Table 3.

Challenge	Country examples	Recommended Policy options
Affordability of cancer medicines	The majority of cancer medicines are available only at full OOP price to patients in the AFRO region. (58) For example, Trastuzumab, used in treating HER2 positive breast cancer and added to the 2015 WHO EML, costs US\$ 789 and US\$ 7,214 / month in Kenya and South Africa respectively, (61) which is more expensive than US\$ 6,849 in the USA. (62)	Strengthening pricing policies at the regional and national level (63) Negotiating better prices with manufacturers Effective policies for procurement, including pooled procurement Use of public health oriented voluntary licencing (VL), using the Medicines Patent Pool model. Use of TRIPS flexibilities, when VLs are not an option Increase the uptake of generics and biosimilars. In South Africa, generic manufacturing and competition has led to 98.5% reduction in the price of imatinib. (64) National governments should provide cancer medicines listed on their NEML as part of the national Universal Health Coverage package to reduce the burden of out of pocket expenditure on cancer patients
Current medicines regulatory capacity and systems for Quality Assurance	In July 2017, falsified Avastin (bevacizumab) and Sutent (sunitinib) were distributed in cancer treatment centres in Uganda. These products did not originate from the original manufacturers and were being distributed in the wrong formulation. (65)	Increased investment in regulatory systems and pharmacovigilance along the medicine supply chain including suppliers, distributors, healthcare facilities and pharmacies. Develop and implement risk-based post-marketing quality surveillance systems (59) and product verification tools for healthcare providers and patients.

Table 3. Challenges and possible policy options to increasing essential medicines access for cancer treatment in the WHO-AFRO region.



Call to action

Governments need to play a central role in cancer control in the AFRO region. Access to cancer medicines should be offered within a national framework for cancer control along the continuum of care, including cancer awareness, screening, pathology and molecular diagnostics, surgery, radiation therapy, and palliative care. (55) Improvement in therapy options for cancer treatment have led to significant declines in cancer mortality in high-income countries. (66) It is, therefore, imperative for national governments, in partnership with key stakeholders, to formulate policies to ensure access to essential cancer medicines for all cancer patients in the AFRO region in order to mitigate the increasing burden of cancer in Africa.



Radiotherapy in Africa

Challenges across the region

Multiple tools are needed to treat cancer patients – one of the most challenging for the African continent is the provision of radiotherapy. While 52% of cancer patients need radiation, (67) access to a functional radiation machine is severely limited in many countries, in particular the West and Central African regions. (68)

Data from the Directory of Radiotherapy Centres (DIRAC) database, run by the International Atomic Energy Agency (IAEA), provides the most comprehensive statistics on availability of equipment. (69) There are currently 318 external beam radiotherapy machines in Africa, with the vast majority situated in northern and southern Africa. It is noteworthy that the linear accelerators in Africa make up only 2.6% of all the accelerators available worldwide. Many countries regionally only have access to one machine. The IAEA recommends a density of 1 machine per 250 000 population. However, no African country reaches the 'ideal' of 1 radiotherapy machine per 250,000; only Tunisia and Mauritius have more than 2 machines per million, and Egypt, South Africa and Morocco have between 1 and 2 machines per million. The rest are below 1, with half of the 54 countries having no radiotherapy at all. Consequently, overall, the whole continent's resources for radiotherapy are grossly below what is needed for even a basic service for the overall population (which is also growing). (69)

There are a number of challenges to the provision and availability of radiotherapy in the region. These include the high upfront cost of equipment, which is prohibitive particularly for low-income countries. Many countries have competing financial demands within the health sector, including infectious diseases and maternal and child health services, both of which are high priority issues in Africa.

Adequate infrastructure is a further challenge. For radiotherapy to be provided efficiently, safely and securely, countries require a stable power supply, and service contracts or readily available spare parts are essential to prevent prolonged periods of downtime and the deterioration of unused equipment. Clearly, there is a need to increase availability of equipment; however, this needs to be supported by infrastructure and human resources- the key being sustainability.

In centres where radiotherapy resources are available, barriers to access remain. These include the need for transportation from remote regions, patient fees, accommodation, the time commitment to a course of radiation and subsequent loss of income as well as separation from family. These barriers can be addressed through policy and programmatic interventions related to UHC, such as removing user fees and supporting transportation for patients to radiotherapy services.

Opportunities for change

The teaching and training of radiation oncologists, medical physicists, nursing staff and radiation therapy technicians has increased both on-site in local centres and through country partnerships in Africa. The widespread availability of internet access allows for the integration of online content into training schemes which support countries with fewer educational resources. AORTIC has implemented online training to complement regional training workshops in Africa.

Ongoing support for those in practice include tele-medicine multidisciplinary meetings, radiotherapy plan reviews and radiotherapy planning resources. (70) High resource centres have, in some cases, provided remote treatment planning for centres with limited dosimetrists. Despite these initiatives, lack of human resources remains a major barrier to provision of high-quality radiotherapy.

In more recent years, local governments and other funding agencies have increased the number of external beam radiotherapy machines and brachytherapy units available with support from the IAEA, NGOs, and private companies. (71) (72) This includes countries that previously had no access to radiation. Other mechanisms to increase access to radiotherapy include regional collaborations that enable access for those who have no local radiation centres – this includes arrangements for patients to be treated in other centres or countries if needed.



Call to action

The Lancet Oncology Commission on expanding global access to radiotherapy clearly shows the long-term benefits of investment in radiotherapy resources and the sustainable and cost-effective running costs in low-income countries. (67) Continuing progress in integrating radiotherapy in NCCPs, implementation and scale-up of radiotherapy capacity and successful ongoing programs can help significantly in increasing access.

Improving surgical oncology in Africa

Surgery is one of the primary pillars of health care, but one out of nine people lack access to safe and timely surgical services. There is a worldwide deficiency in surgical services with an additional 143 million surgical procedures required to prevent death or disability. (73) Surgery is a key pillar of oncological care with 80% of cancer patients requiring a surgical procedure, some more than once. Surgery can be diagnostic, such as a biopsy, curative as in excising a tumour, palliative, such as in improving the quality of life of patients, or reconstructive. (74)

Opportunities for change

Though long considered a peripheral or ancillary service, the narrative around surgery has recently shifted with the 68th World Health Assembly adopting resolution WHA 68.15 which called for the strengthening of emergency and essential surgery and anaesthesia as components of Universal Health Coverage. (75) The mainstay of providing good oncological surgery rests in developing the framework to provide good basic surgical services.

A critical consideration when improving access is the cost of these services to the population. Many patients in LMICs and Africa incur catastrophic health expenditure as a result of surgical interventions. (73) Oncology care is not cheap and the added burden of a surgical intervention can further strain already limited financial resources. There is a need to strengthen the infrastructure to support provision of these services to all and to include surgery as part of cancer management in the UHC packages being progressively rolled out in countries in the region.

Equally important is the quality of surgical services provided. The provision of basic surgical services has been very heterogeneous on the continent with surgical oncology services emerging only recently. There is a need to broaden access to comprehensive surgical oncology services for patients in Africa. This includes strengthening supportive allied diagnostic services like radiology and pathology and complementary services like anaesthesia, which are critical to the provision of surgical care.

There is also the need to standardise the provision of surgical oncology services which would require developing communities of practice between regional surgical colleges and training universities and local, regional and continental oncology groups like AORTIC. Key metrics, like adherence to guidelines and surgical outcomes such as margins, nodes harvested, and complication rates, must be actively collected and reviewed as a measure of the quality of services provided. Equally important are the patient related outcomes for oncological surgeries performed, such as the quality of life after provision of a permanent stoma or a mastectomy or return to function post amputation.



Call to action

Key to successful oncology surgery is the development of a robust multi-disciplinary team of medical oncologists, radiation oncologists, diagnostics and supportive services such as physiotherapy, nutrition and psychological support services. As the drive for UHC continues, policymakers must take into account these components to improve access and invest in scaling up surgery services for cancer. Delivering this will ensure protecting patients from catastrophic health expenditure caused by undergoing a surgical procedure and prevent LMICs from losing 0.5–1.0% of GDP annually by 2030 from cancers amenable to surgical treatment. (74)

Palliative care and psycho-oncology in the African region

Challenges across the region



Definition: Palliative care

Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and assessment and treatment of pain and other problems, physical, psychosocial and spiritual. (76)

Palliative care is not optional or a luxury. As an approach, it focuses on the reduction of pain and suffering, to care for people as whole human beings. (76) In the last decade, the prevalence of cancer and other NCDs has increased across the African continent, and with it, the demand for palliative care services. According to WHO estimates, NCD deaths accounted for 3.1 million out of the total 9.2 million deaths in 2015 compared to 2.7 million of the 9.28 million deaths in the region in 2010. (77)

According to the World Hospice and Palliative Care Alliance (WHPCA), 40 million people need palliative care every year, and more than 20 million need this care at the end of life. Unfortunately, among those who need palliative care, 18 million of them will die with pain and in distress. (76)

More than 80% of the population who experience serious health suffering live in LMICs where there are limited or no palliative care services (78) integrated into the health system. (79) The Lancet Commission on Palliative Care and Pain Relief reported that 91% of the morphine-equivalent opioids is consumed by only 17% of the global population, primarily from the USA, Canada and Australia. In comparison, 83% of the global population, particularly people from LMICs, consumed only 9% of morphine-equivalent opioids (80) meaning that much of the need goes unmet. This is a global moral failing and the lack of consideration given to alleviating pain through palliative care (81) is especially acute among cancer patients whose suffering can be significant and prolonged. (82)

In addition to physical pain relief, many patients across the region have limited or no access to psycho-oncology services. These services help to address the psychological, social, behavioural and broader aspects of a patient's cancer journey and should be offered to patients, their families and caregivers. These services should be available to all cancer patients and at all stages of the disease, but services are currently rudimentary across the continent.

Opportunities for change

Palliative care is needed to address serious health related suffering, yet only 5% of those who need palliative care in Africa receive it. (83) People with palliative care needs, and their families, are often the “furthest behind” and so the effective implementation of UHC will require a local and international paradigm shift across the spectrum from policy development to implementation.

As the first African country to integrate palliative care in the public health system using “Mutuelle de santé”, Rwanda's experiences could be an inspiration for other countries across the region. Strong educational programmes for health providers and adapting global recommendations to the local context would help to develop a model of care appropriate to the region. The experiences of the HIV/AIDS, TB and Malaria response provide new models such as “task shifting” programs where nurses prescribe anti-retroviral therapies (ART) at primary level thereby reducing the barriers to care, and community health workers have been trained to provide support to reduce psychological distress. (84)

Access to morphine is one of the major challenges in palliative care. To address this, it is imperative that we have a global approach to bridge disparities between HICs and LMICs to alleviate suffering. It is a cruel injustice to the millions of cancer patients around the world who suffer needlessly if we talk about cancer treatment and UHC without a clear palliative care program.

Discussions are rightly exploring access to screening, surgery and cancer medicines, - all of which are vitally important – but they must also be talking in equal measure and with equal conviction about access to palliative care and psychosocial support. Moreover, with the drive towards UHC there is a clear recognition by WHO, governments and civil society that there can be no health without mental health. The introduction of psychosocial services can provide a steppingstone for the development and implementation of a comprehensive and holistic approach to patient care across all disease areas.



Call to action

- Reform national policies and regulatory frameworks to improve the availability, affordability and accessibility of morphine and other essential palliative care medicines
- Promote and implement national policies, strategies and an implementation plan to ensure that palliative care is covered by health insurance to reduce financial hardship for patients and their families
- Increase global awareness, international solidarity, international cooperation and action in palliative care for LMICs by promoting national, regional and global collaborative frameworks
- Ensure continuing training and educational programs in palliative care for health professionals (medical students, doctors, nurses, social workers and community health workers) and non-health professionals, including cancer patients.
- Ensure provision of psychosocial support for patients and caregivers.



Breast cancer in the African region

Challenges across the region

Globally, a woman dies of breast cancer every minute, making it the second most diagnosed cancer and the most common female cancer. (85) (39) In Africa, breast cancer is the most commonly diagnosed cancer and the second leading cause of cancer deaths. (4) In just six years, the incidence of breast cancer on the African continent rose by over 23% from 1.7 million new patients in 2012 to 2.1 million in 2018. (39) (86) At the same time, breast cancer mortality rates in Africa remain among the highest in the world (Figure 10).

Despite the growing burden on the continent, inadequate attention is being paid to cancer prevention and early detection. Africa is challenged by delayed breast cancer diagnosis and advanced stage at presentation, which augments poor cancer outcomes across the region; where effective, timely treatment is commonly unavailable or inaccessible. These primary gaps in diagnosis and treatment are magnified by high noncompliance rates even in the

uncommon settings where effective therapies are available. (87) (88) (89) (90) (91) Failure to deliver standard treatments is due to multiple factors including sociocultural and financial barriers, scarcity of comprehensive treatment centres and limited capacity for health workers' education to triage patients with subtle symptoms of early stage disease. (92) These and other obstacles synergistically contribute to poor outcomes for breast cancer patients in Africa and other LMICs. (87) (89) (93) (94)

An essential component of cancer prevention and early detection is awareness among the population, (95) (96) (97) which tends to be low in Africa. (98) (99) Low levels of health literacy are compounded by low rates of general literacy amongst African women. (100) In spite of increasing efforts by many governments in keeping with SDGs, more efforts are still needed to expand awareness of breast cancer. (101) (102) It is welcoming to note that many countries include in their NCCP prevention strategies to reduce obesity, alcohol consumption, and improve physical activity which are tied to increased risk of breast cancer. (98) (103) (104) (105) (106) (107)

Opportunities for change

Primary health care workers have an integral role in breast cancer prevention, early detection, referrals and palliation. (87) (108) Several African countries have initiated training programs for primary health care workers on early warning signs of breast cancer and referral pathways. (102) (109) The promise of mobile health (mHealth) and the incorporation of patient navigation is expected to improve breast health promotion. (110) (111) The impressive penetration of mobile technology to a huge population (400 million) in sub-Saharan Africa, including hard-to-reach hinterlands, (100) provides an opportunity to use mobile applications and text messaging as health education tools to potentially increase breast health promotion. Mobile technology could boost the effectiveness of community health workers with training in patient navigation to address misconceptions about breast cancer, guide patients with breast symptoms using culturally appropriate information, and provide moral support to access the perceived complicated and unfriendly health system. This could, in effect, bridge the gaps to screening, early diagnosis and treatment. (110) (113)

As described in the chapter on early detection, population-based mammography screening is impractical and unaffordable for most African countries. (87) (114) Evidence based, cost-effective solutions to promote early breast cancer diagnosis are needed. Awareness education and effective clinical breast assessment can effectively downstage disease and potentially reverse the trend of advanced stage at initial diagnosis, the antecedent increase in breast cancer mortality and locally advanced or metastatic disease. (87) (114) Specific guidelines for the target population, intervals and precise methods for early detection need to be established.

Resource-stratified breast cancer management guidelines are being developed by African oncology health professionals, such as those by the African Cancer Coalition in collaboration with other partners, and should be emulated. (103)

Recently, African countries are investing in human resource training for surgery, radiation, systemic therapy, oncology nursing, pathology services, psychological, palliative care and other services required to improve breast cancer outcomes. (116) (105)

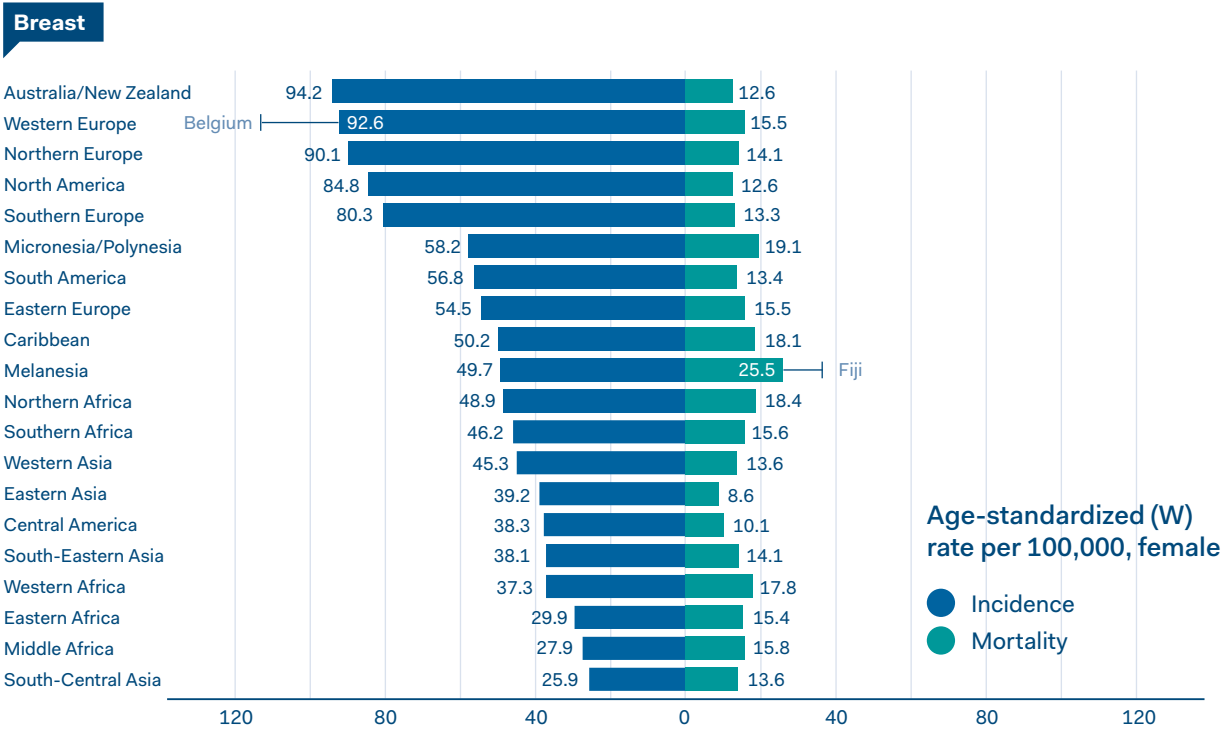
Kenya, Rwanda and Botswana incorporated the majority of the WHO essential medicines for breast cancer management including trastuzumab. These 3 countries have universal coverage to improve access to the effective breast cancer fighting medications.

As described in the chapter on palliative care, in 2011, Rwanda became one of the first African countries to pass a law on palliative care. (118) (119) Certain health professionals, including nurses, may prescribe morphine. (83) (120) This is an important step, as many breast cancer patients require palliative interventions.

Due to increasing awareness and efforts, there is an increasing population of breast cancer survivors in Africa. Holistic follow-up and survivorship care plans including fertility and sexuality concerns, and long-term sequelae related to treatment are needed to address this growing need. The African Cancer Coalition has recently released resource-stratified survivorship guidelines in partnership with the National Comprehensive Cancer Network. (89) (103) (121) (122)

Figure 10. Breast cancer burden by United Nations world areas

IARC/WHO. GLOBOCAN 2018: Estimated cancer incidence, mortality and prevalence worldwide in .2018. Breast Cancer Fact Sheet. Available at: <https://gco.iarc.fr/today/data/factsheets/cancers/20-Breast-fact-sheet.pdf>



Call to action

- Dedicated funding should be allotted to support the training of community workers/volunteers to help increase awareness and early detection of the most common cancer in women in Africa and could be packaged together with cervical cancer awareness strategies in the region.
- Comprehensive access to breast cancer screening, pathology, imaging, surgery radiation, systemic therapy, and palliative therapy, should be part of the Universal Health Coverage package.
- Implementation of all breast cancer control programs should be monitored through health information systems with functional registries to collect data and drive breast cancer implementation research to improve effectiveness.

Childhood cancer in Africa

Challenges across the region

Africa is a young continent. Nearly 500 million children live in Africa yet, on the entire continent, there are only a few dedicated specialist children's hospitals and there are even fewer children's cancer centres or hospitals. (3) In addition, sub-Saharan Africa suffers from the highest rate of child mortality on the planet: one in nine African children die before the age of five. (123)

It is estimated that there are more than 200,000 children diagnosed and registered with cancer each year in Africa (124) though the real number of new cases is not known, (125) with an estimated 57% of childhood cancers cases in 2015 in western Africa undiagnosed. (126) The overall incidence rates across the region are likely to be lower than the reported incidence in high-income countries (HICs), but as the majority of the African population are children (43%), (127) childhood cancers are proportionately more common (4.6% of cancers in sub-Saharan Africa compared to 0.5% in high-income countries). (128)

While the survival rate of many childhood cancers surpassed 80% in resource HICs, in lower middle-income countries survival rates of 20% or less are not uncommon as a result of limited access to care. (129) This gap in survival results in many avoidable deaths and unnecessary suffering.

African children, in particular, suffer disproportionately poor outcomes because of limited access to care. Fundamentally, where a child lives and the income of his or her family determines the likelihood of successful treatment – this is not ethical in the era of Sustainable Development and is inconsistent with political commitments for UHC.

Opportunities for change

Cancer control programmes in Africa have usually paid limited, if any, attention to cancers in children. (130) This paradigm has to change to place more emphasis on childhood cancers that have potentially better outcomes when treated properly, are generally more cost-effective and are more feasible to treat given budget constraints many governments are facing.

Recognising this, in 2018, WHO announced the WHO Global Initiative for Childhood Cancer following on from the 2017 WHA Cancer resolution. The initiative's aims are to:

1. Prioritise childhood cancer at the national and global levels
2. Increase the capacity of countries to deliver best practice in childhood cancer diagnosis and treatment including by improving access to affordable essential cancer medicines and technologies for childhood cancer.

It is expected that, as a result of the WHO Global Initiative for Childhood Cancer, a survival rate of at least 60% for children with cancer be achieved by 2030. This represents a doubling of the global cure rate for childhood cancer and will result in an additional one million lives of children saved in the next decade, including many in Africa. (131)

Progress is possible in all settings. Foundational to cancer control measures is the establishment of population-based cancer registries which are lacking in Africa. Other important elements include awareness and health education on childhood cancer, improved access to health care to facilitate early diagnosis, multidisciplinary manpower development, inclusion of cancer care in national health insurance schemes and access to affordable chemotherapy and other treatment. Partnerships between governments and private institutions in financing and/or implementing treatment can ensure delivery of effective cancer care. Governments need to include childhood cancer in their national cancer control plans, commit to the course of treatment and care in their budgets and follow on to implementation.



Call to action

Where a patient is born should not determine whether they will survive from a cancer. Childhood cancers are generally curable when given due focus. Building capacity, saving lives and reducing suffering for children with cancer is not only the right thing to do, it also acts as a bright ray of hope for the cancer community. International research collaborations and twinning programmes have resulted in better outcomes and capacity building of health workers in managing childhood cancer in some parts of the continent. Standards of care have improved in selected centres through these collaborations supported by governments. This shows that, together, we can fight childhood cancer in Africa; with further investments by governments, advocates, clinical staff and most importantly patients and their families, progress can be made and children can live their lives to their greatest potential.

© Mike Hill



Prostate cancer

Challenges across the region

Prostate cancer (CaP) is a leading cancer in men across the African diaspora. (132) There is considerable variation in CaP incidence (Figure 11) and mortality (Figure 12) across Africa, with higher rates in sub-Saharan Africa compared with North Africa. Accurate estimates of CaP incidence in Africa are not available. CaP incidence in Africa is reported by GLOBOCAN to be lower than that in Europe or North America. This is in part due to under-ascertainment and under-reporting of cases, limited population-based registries in Africa, and limited CaP screening. In one population-based sample in Ghana, CaP prevalence was comparable to that of African Americans, (133) who have among the highest reported incidence of CaP in the world. (134) (135)

Figure 11.
Estimated Age-Standardised Prostate Cancer Incidence Rates, 2018 (GLOBOCAN)

R Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2018). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: <https://gco.iarc.fr/today>, accessed 22/08/2019

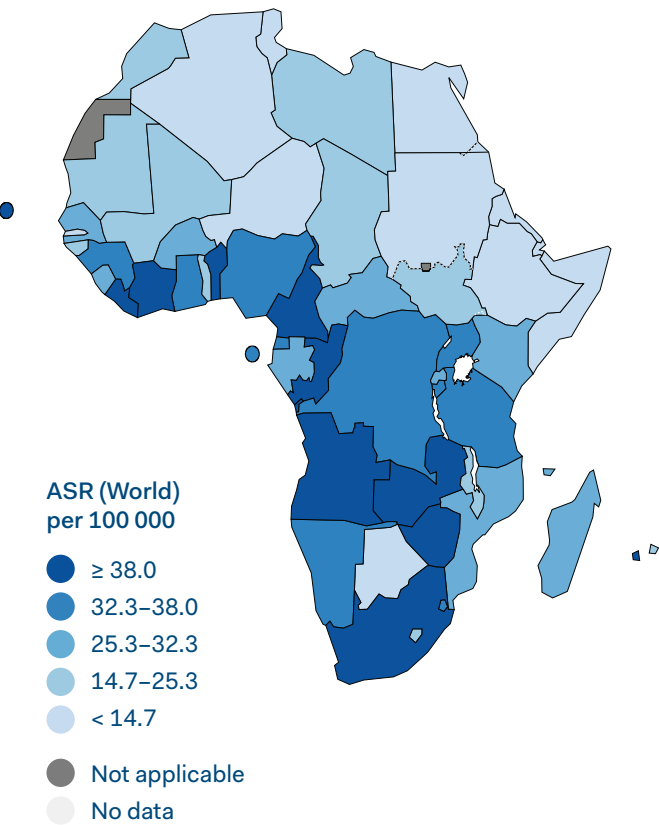
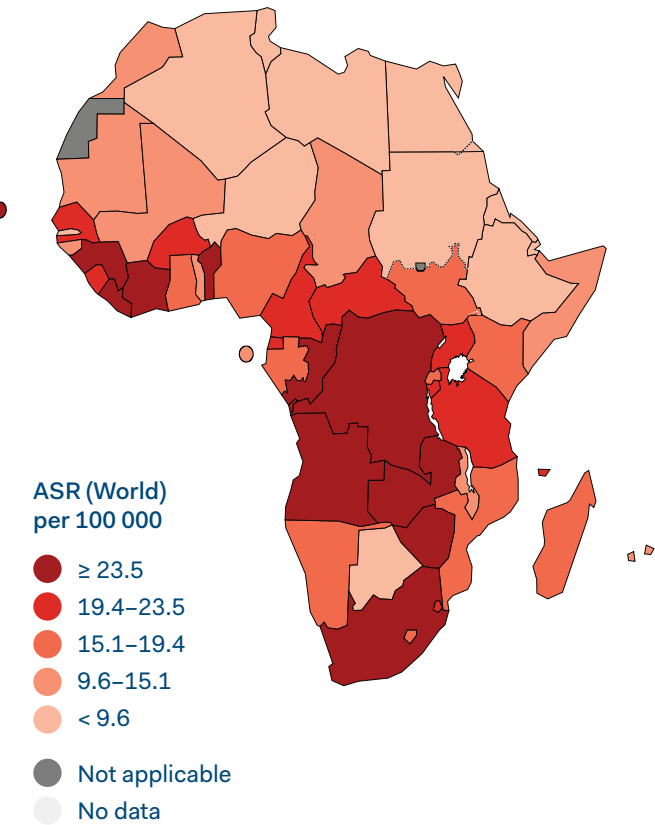


Figure 12.
Estimated Age-Standardised Prostate Cancer Mortality Rates, 2018 (GLOBOCAN)

R Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2018). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: <https://gco.iarc.fr/today>, accessed 22/08/2019



Among the highest CaP mortality rates in the world have been reported in Africa. (136) The explanations for this observation are two-fold. First, the high incidence of CaP corresponds to high mortality rates if tumours are not detected early and progress until they reach an advanced stage. Second, CaP treatment options for many men in Africa are inadequate. Radiotherapy access is limited and while any new therapies have emerged to treat advanced CaP in recent years such as Abiraterone Acetate and Enzalutamide, these drugs are unavailable to the majority of African CaP patients.

While already a major public health issue, the burden of CaP in Africa is likely to become worse in the coming decades. In 2018, GLOBOCAN estimated that 1.3 million men in Africa were diagnosed with CaP and 360,000 died of the disease. By 2040, this number is expected to increase to 2.3 million new cases and 738,000 deaths. This doubling in the number of annual CaP deaths over two decades represents a major public health concern for African men.

Opportunities for change

Few CaP risk factors have been identified aside from family history, age, and African descent. (137) Obesity is a likely contributor to advanced CaP and poor outcomes. (138) As obesity is increasingly prevalent in Africa, aggressive CaP cases and unfavourable CaP outcomes are therefore likely to further increase. Few well designed epidemiological studies have been undertaken to identify CaP risk factors in African men. Thus, it remains unclear if the limited modifiable risk factors reported to date will also be the case in African men. In contrast, many CaP susceptibility genes have been identified including BRCA2, (139) although to date few novel genetic associations have been identified in men of African descent in Africa or in the African diaspora (140) and most genetic associations have not been replicated in African descent populations. (140) (141) (142) (143)



Call to action

The limited availability of modifiable risk factors suggest that two strategies should be considered to minimise the burden of CaP in Africa: approaches for screening and early detection of CaP in low resource settings and implementation of CaP treatments, particularly for advanced disease. Unfortunately, there have been few systematic efforts to identify resource-appropriate strategies for the early detection or treatment of CaP in Africa. Thus, an important first step will be to undertake basic and population research to better understand the distribution and determinants of CaP in Africa, and then to use this information to devise detection and treatment strategies that will be cost effective and limit the burden of disease on the continent. It will be critical to implement strategies that will detect aggressive (fatal) cancers yet avoid over-diagnosis of cancers that are likely to remain indolent. This effort in CaP early detection must be linked to the availability of appropriate treatment regimens so that early detection of cancers will lead to lower mortality.

Cervical cancer elimination

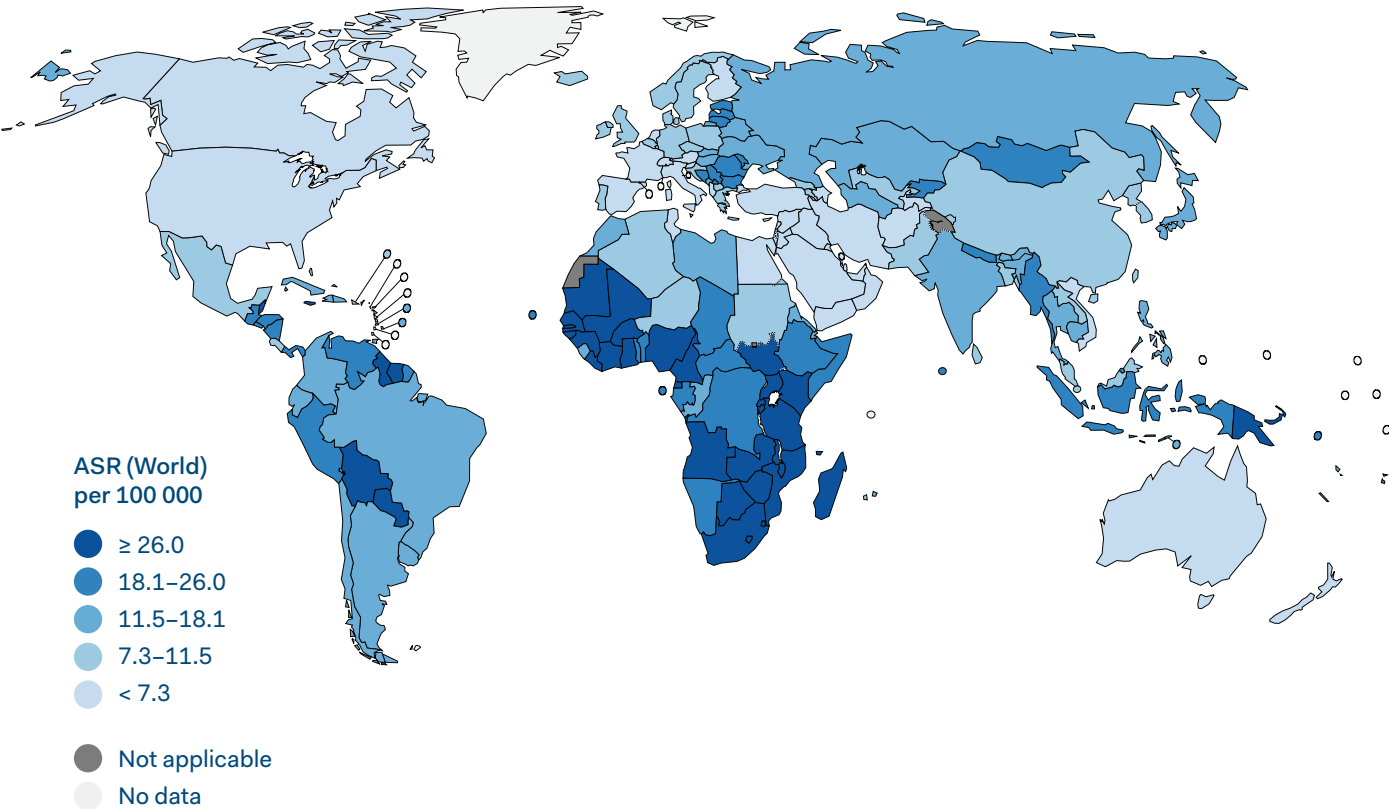
Challenges across the region

Globally, there are now 570,000 new cases of cervical cancer each year. This means a woman is diagnosed with cervical cancer every minute of every day. She is most likely to be African and she is more likely to die from the disease than women elsewhere, due to the high deaths to cases ratio described in the chapter on the burden in the region. The AFRO region contributes at least 112,000 (37%) of the estimated 311,000 cervical cancer deaths worldwide each year. (6)

Figure 14 illustrates the varied and often very high burden of cervical cancer present in Africa versus other regions. (144) This increased burden is driven in part by higher HIV prevalence resulting in greater HIV-HPV co-infection rates. Data indicates that women living with HIV are 4-5 times more likely to progress to cervical cancer than HIV negative women and do so at a younger age. (145) It is key for African communities to be aware that women on anti-retroviral therapies have a uniquely high risk. (146)

Figure 13. Global cervical cancer incidence, Globocan 2018

IARC/WHO. GLOBOCAN 2018: Estimated cancer incidence, mortality and prevalence worldwide in .2018. Cervical Cancer Fact Sheet. Available at: <https://gco.iarc.fr/today/data/factsheets/cancers/23-Cervix-Uteri-fact-sheet.pdf>.



Opportunities for change

Global disparities in access to prevention and treatment services for cervical cancer motivated WHO Director General Dr Tedros Adhanom Ghebreyesus to issue a global call to action towards the elimination of cervical cancer, stating “we have the tools, we know vaccination, screening, early detection, treatment and palliative care are cost effective, we have the imperative to act and confine cervical cancer to the history books”. Member States across all regions, including Africa, support the call to action and have tasked WHO with the development of a global strategy 2020-2030 to unite all stakeholders behind a common goal. (147)

Figure 14. Regional status of incidence and mortality due to cervical cancer

IARC/WHO. GLOBOCAN 2018: Estimated cancer incidence, mortality and prevalence worldwide in .2018. Cervical Cancer Fact Sheet. Available at: <https://gco.iarc.fr/today/data/factsheets/cancers/23-Cervix-Uteri-fact-sheet.pdf>.

Age-standardized (W) rate per 100,000

- Incidence
- Mortality

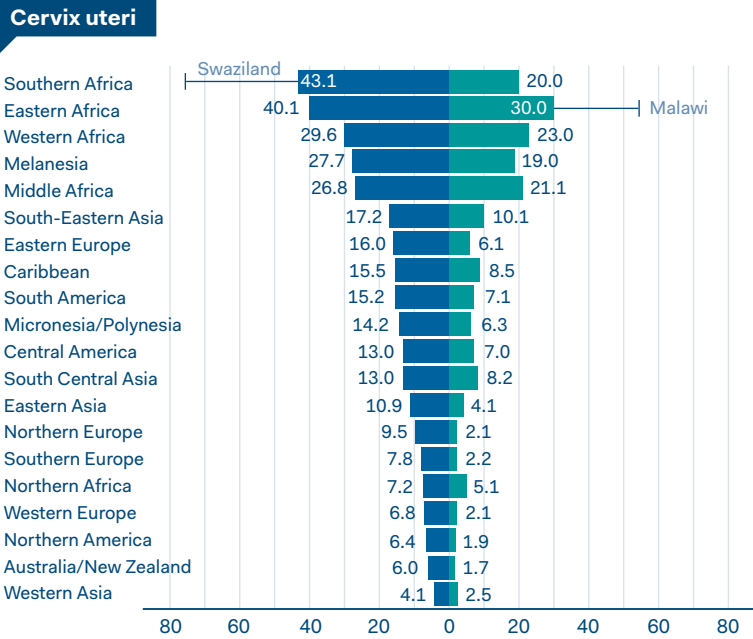
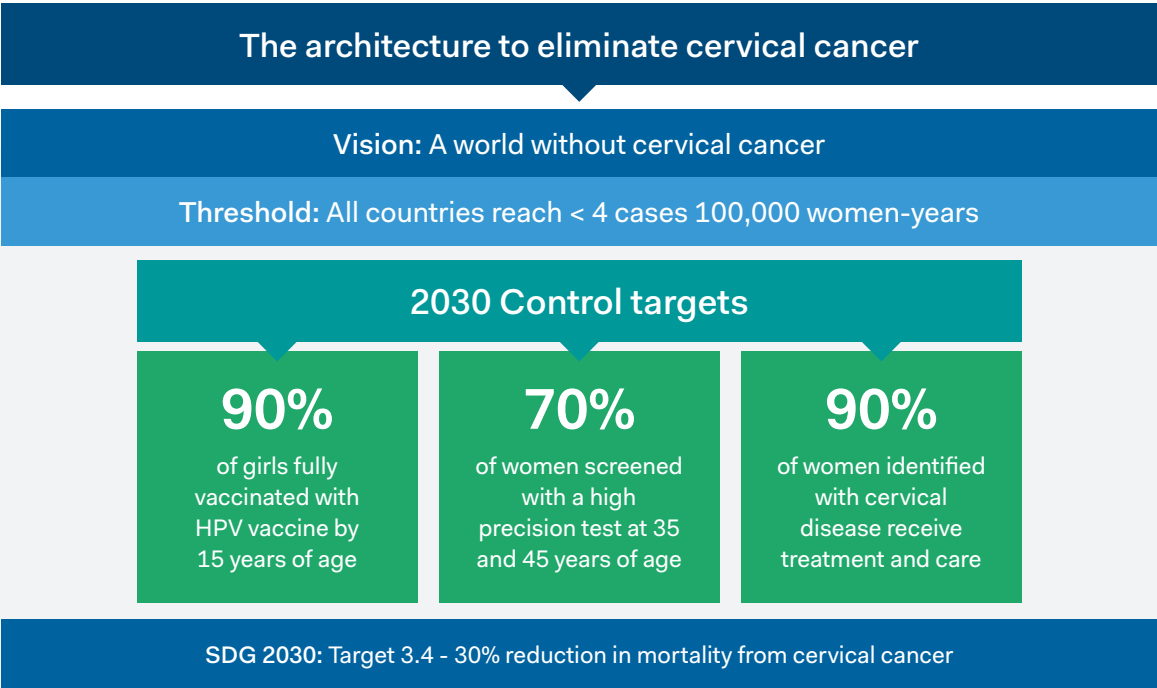


Figure 15. The emerging WHO global strategy 2020-2030 towards elimination of cervical cancer

www.who.int/cancer/cervical-cancer/cervical-cancer-elimination-strategy



The 2030 targets and elimination threshold are subject to revision depending on the outcomes of the modeling and the WHO approval process

Elimination of cervical cancer is defined as the reduction of cervical cancer incidence to less than four cases per 100,000 women per year. Progress in global action on cervical cancer mortality is embedded as one of the indicators for SDG 3. This underscores the urgent need to increase access to prevention, early detection, treatment and palliative care services in national UHC packages, to support a shift to detecting pre-cancer and early stage disease and to provide protection against the risk of catastrophic spending that paying for treatment out-of-pocket currently poses to patients.

Across Africa, countries are facing a common challenge to build the sustainable and integrated services required across each of the three 2030 targets (Figure 15), with equity in access and affordability at the fore. Existing capacities and cervical cancer burden vary between countries with very high incidence such as Eswatini and Malawi (current rates between 70-80/100,000 women) and countries with relatively low rates such as Niger (10/100,000 women) and Tunisia (4/100,000 women). (144)

At the Brazzaville consultation on the WHO 2020-2030 global strategy in May 2019, it was noted that the 90:70:90 targets (Figure 15) are reminiscent of the HIV-2020 framework, which was equally intimidating at its inception. (148) Further, participants recognised that while ambitious, these targets are already being met by some African countries. The general consensus was summarised well by one participant - "we recognise that we will only impact this disease and bend the curve in the right direction in the face of the growing burden by stepping up to the challenge – Africa will uniquely benefit from achieving the elimination vision". There was also a recognition that while some countries are leading the way, there is also an urgent need to ensure that no country is left behind, which will require significant catalytic investment to help establish effective population-based services.

As Swanson et al, documented for Uganda, (149) two key challenges across the region are training and retaining the necessary qualified personnel including community health workers, gynaecologic oncologists and surgeons, and establishing robust referral mechanisms between primary care services for screening and treatment with tertiary cancer centres for advanced management. The critical role of frontline health workers in providing information on prevention and risk factors, accurately recognising the signs and symptoms of cancer and promptly referring women in need of additional care cannot be overstated.

A recent assessment of global vaccine confidence rates found that over 80% of respondents in low- and middle-income countries (92% in East Africa) agreed that vaccines are safe. (150) The HPV vaccine introduction can and should build on this positive attitude toward vaccines. For example, with GAVI support, Rwanda is on track to achieve 90% coverage, and is a case study in effective approaches to designing and implementing an HPV vaccine program. Key features of Rwanda's success include:

1. moving directly to national rollout without a demonstration phase;
2. using a school-based delivery program;
3. implementing a communication and social mobilisation plan from the outset. (151)

Further lessons will come from the 12 African countries that have introduced HPV vaccination nationally and the 12 countries with pilot or demonstration programmes. (151) Although affordability for LMICs in Africa is still a major barrier, national cost-effectiveness analyses support vaccination programs. (152) However, it should be noted that the introduction of HPV vaccination programs will take time to impact the national burden and therefore does not replace the need for continued screening and early detection measures, which will save lives every year in the coming decades.

Efforts are also being undertaken to scale-up low-cost approaches to secondary prevention across the African continent. (153) Tanzania (154) and Zambia (155) have addressed the heavy burden of cervical disease among previously unscreened women by providing training at the community level and establishing effective patient navigation to scale-up screening and treatment services. Technologies such as self-sampling in combination with HPV testing have been shown to be acceptable to women in South Africa and Senegal, (156) (157) and an effective route to reaching underserved communities. (158) Importantly, integration with both HIV and reproductive health services has been shown to be effective across a number of African countries and can increase access, demand, and uptake of both services, with combined mobile services improving access in rural communities. (159) Recent international commitments by Unitaids and PEPFAR are enabling countries, particularly those with a high coinfection rate, to scale screening services, address inequalities and ensure that all women can access these life-saving services. (160) (161)

Other aspects of multidisciplinary care addressed in this booklet are critical to comprehensive management and care of cervical cancer patients. We note here that surgery is a fundamental treatment modality for both curative and palliative management of cervical cancer but, only 5-20% of LMICs have access to safe, affordable, and timely surgery. (74) This is of particular importance in cervical cancer as, with effective screening, we expect to find more early stage cancers amenable to surgery. While radical abdominal hysterectomy can cure women diagnosed with early stage disease, few surgeons in Africa have formal training in this practice or measure quality of outcomes. (162) Two of the major challenges in developing surgical oncology capacity is the time required to train surgeons and the availability of mentors. Bing et al. addressed this and concluded that low-cost virtual reality may be an effective tool to help surgeons gain essential skills in complex surgical oncology procedures and may help increase access to appropriate surgical cancer care in LMICs. (163)



Call to action

Expert modelling by a WHO-led collaborative has shown that all countries can achieve the cervical cancer elimination goals. Creating the political will and effective strategies to engage African communities and mobilise action in the short-, mid- and long-term will be key to sustaining the three-pronged approach of the global strategy and achieving high coverage of services. Therefore, we call on all African Heads of State to follow the leadership of President Lungu of Zambia, who co-hosted a high-level event at the United Nations in September 2018, and Rwanda, which aims to be the first African country to achieve elimination, in making public commitments towards elimination of cervical cancer.

National leadership at the highest levels will be needed to prioritise and facilitate coordinated action for optimal integration and linkage of services with a focus on UHC. Other key factors include:

- Mobilisation of communities to champion women-centred services and build demand
- Engaging youth to build health literacy in the next generation and leadership for the long-term goal of elimination
- Scaling of services to provide community level information and access with robust referral to treatment and palliative care services, with an equity and social justice lens





Moving forwards through partnerships

Women in global oncology forum: expanding the oncology workforce

A health worker is a care practitioner providing or facilitating medical services. This definition includes nurses, doctors, allied technicians, and community health care workers. The WHO has highlighted a worldwide deficit of 4.3 million health workers, (75) with a noticeable disparity in LMICs. Furthermore, 57 of the poorest countries face an imminent crisis where health workers are unable to provide the minimum in essential health services. (164) Most low-income countries have suboptimal health worker to population ratios. (164) Workers in these locations are frequently overworked and underpaid, raising significant concerns about job motivation and staff retention.

The shortage of health care workers in LMICs trained in oncology is especially acute. The shortage results from a deficiency in educational programs and problems in recruiting and retaining health workers trained through 'in-country' or in foreign programs. Africa has the highest health worker deficit, and factors such as attrition and poor retention of skilled health providers due to migration, burnout and other factors further weaken the existing workforce. (165) (166)

The vast majority of cancers in low-income countries present at a clinically advanced stage, substantially adding to the burden on already limited cancer treatment services. Whereas survival and cure rates for breast cancer reach 75% in high-income countries, patients presenting with the same disease at an advanced stage and with more limited treatment options, may be associated with a mortality rate of 80% in sub-Saharan Africa. Currently, cancer deaths account for more than the total number of deaths caused by malaria, HIV and TB, suggesting the need to reprioritise cancer care and direct further resources toward cancer control and management.

Responding to the challenge

Measures to raise awareness of cancer and initiate cancer control are urgently required. Critical to the success of any strategy will be addressing the essential role of well-trained health workers experienced in cancer prevention, screening, diagnosis, and treatment, and the current deficit of this professional group in SSA.

Health workers, particularly at community level, play a key role in promoting cancer awareness, more so in resource limited environments where access to media, formal education, and information about cancer may be limited in the general population. Consequently, there is a clear need to build community-based cancer control capacity in LMICs.

In addition, in contrast to many other illnesses, cancer management requires a greater array of sub-specialty trained physicians (surgeons, radiation oncologists, medical oncologists) to plan and deliver appropriate treatment. These specialists are frequently located in tertiary care centres and provide the highly specialised interventions that are in critical short supply in SSA. The region faces challenges in developing both community-based expertise and sophisticated subspecialty care in tertiary care centres and in forming sustainable solutions to capacity building in cancer care.

Part of the barriers to accessing cancer care in Africa are related to socio-cultural, gender norms that frequently affect women in certain communities. Women are often unable to make autonomous decisions regarding their health and health-seeking behaviour. Women may also delay seeking care, for instance in reproductive cancers, due to the social stigma associated with some of these cancers or because of their reluctance to be examined by a physician of the opposite sex.

The Women in Global Oncology Forum, a Special Interest Group of AORTIC, aims to expand the existing workforce in the African region through building a supportive network to enhance the enrolment and retention of women in oncology practice. Through the network, women in oncology are encouraged to develop local, regional and international communities of practice that help to improve patient care and ensure their own professional development.

The forum provides mentorship and leverages other organisations and collaborations with existing networks such as the Pan African Women's Association of Surgeons who aim to improve surgical oncology care and other surgical services in Africa, (167) and Women in Global Health Research.

It is anticipated that through these collaborative efforts to unite health providers in oncology and share expertise and knowledge to tackle barriers to cancer services, the care of cancer patients on the continent can be improved. Women in oncology may be uniquely placed to mitigate some of the cultural barriers limiting women's health seeking behaviour and their visibility in the field may help create a space where women feel more comfortable presenting to health services and are more likely to report health concerns early. They could also serve to enhance the acceptance of potentially invasive screening options, such as cervical cancer screening in the community. In addition to the provision and expansion of oncology services to all patients on the continent, the role of female health providers could be expanded to patient advocacy and health promotion to provide key information on cancer signs and symptoms.



Supporting AORTIC's young generation

Over the last ten years, growing emphasis has been placed on training cancer health professionals and researchers in Africa as a response to the growing cancer burden in the region. Africa has the youngest population in the world, and this has enormous potential to drive socio-economic development on the continent. A significant proportion of AORTIC members are below the age of forty-five.

Young medical practitioners, nurses, researchers, programme managers and advocates are the emerging leaders of the future who are expected to transform the cancer control landscape on the continent. They are highly motivated, locally responsive and globally connected and have already infused the organisation with tremendous energy and purpose. AORTIC recognises that this cadre needs to be trained and prepared to perform a growing and rapidly evolving role in clinical and research leadership, in addition to stewardship and health system strengthening roles.

The Young African Leaders in Oncology initiative

The AORTIC Young African Leaders in Oncology (YALO) Special Interest Group (SIG) was launched to strengthen and continue the formation of the new generation of cancer control leaders. The objectives of this SIG are to;

1. Integrate the interests of young AORTIC researchers, innovators and clinicians within AORTIC's broad objectives
2. Promote and advocate for the use of Information and Communications Technology (ICT) in the management of cancer patients on the continent
3. Create a broad-based platform for networking and collaboration amongst Young AORTIC members.

The YALO-SIG committee reports to the AORTIC council on the issues facing young AORTIC members especially regarding career and professional development. AORTIC aims to nurture and develop young professionals to be independent and successful cancer leaders in their respective countries and in the continent at large.

The nurturing of young professionals is also being promoted through the AORTIC African Cancer Leaders' Institute (ACLI), whose goal is to develop the next generation of leaders in cancer research, advocacy, education, policy, and clinical practice in Africa. ACLI creates a pathway for successful participants to demonstrate leadership skills within the Organisation by serving on AORTIC committees and the AORTIC Council. ACLI brings together top young oncologists and oncology researchers who will benefit from peer- to-peer learning, connecting with both young and experienced leaders in the field. This is done during a dedicated workshop held alongside the AORTIC conference and through teleconferences.

In addition, there are several other SIGs on topics such as radiation and surgical oncology, as well as committees in which young AORTIC members can participate in and develop their leadership and research skills.

AORTIC plans to further strengthen its programs for training its young members. These plans include building more suitable platforms to showcase and utilise their skills, talents and intellect as well as providing regional and sustainable leadership training and networking opportunities.

AORTIC's vision and mission of achieving equitable access to high quality cancer prevention, treatment and control will not be realised without its young cadres of health professionals and researchers. The organisation will therefore continue its efforts to harness their full potential while preparing them for future leadership roles in cancer control in the African region.

African Cancer Registry Network: Accomplishments, activities and plans for the future

For cancer – because of the nature of the disease – registration systems have proved a useful complement to mortality statistics in many countries. In sub-Saharan African countries, population-based cancer registries (PBCRs) are the unique source of data on disease incidence, characteristics, and outcome. This underlies the recommendations of the World Health Assembly for countries to develop cancer registration as a vital component in the planning and monitoring of cancer control programmes.

The African Cancer Registry Network (AFCRN), a consortium of all operational PBCRs in SSA, was founded in 2012. AFCRN is a partner of the IARC, within their Global Initiative for Cancer Registration (GICR), providing the services of a regional hub to support the establishment and development of cancer registries in SSA.

Over the last 7 years, the number of PBCRs in SSA has grown from just over 20 to 32, including in English, French and Portuguese speaking countries. All submit an abstract of their database annually to a central AFCRN database, which is used to prepare compilations of registry data on cancer incidence (168) (3) and survival, (169) as well as for the construction of national estimates of cancer incidence, mortality and prevalence for GLOBOCAN. (4) AFCRN's role to support the development of PBCRs can be summarized in four areas:

1. Providing tailored training and materials for cancer registrars and managers (Figure 16)
2. Providing consultation and advice on technical issues
3. Providing a platform for international communication and research
4. Disseminating findings and results.

AFCRN has a small secretariat located in Oxford which provides support for fundraising and coordination. The activities above are mainly carried out by a cadre of experienced personnel from the member registries, acting as consultants, mentors, trainers, CanReg instructors, and researchers (survival and trends). (170) (171)



AFCRN believes that all African countries should develop their capacity for cancer registration to provide the fundamental knowledge for planning services and monitoring the results of cancer control interventions. Building local expertise in data collection, handling and analysis is essential. The role of cancer registrars is a vital one. Their work requires the acquisition of special knowledge and skills, and in SSA also involves the repetitive and fatiguing tasks of scanning and abstracting from physical archives in multiple hospitals, clinics and laboratories. This group, formerly working in isolation, has benefitted from AFCRN training courses and symposia to intercommunicate (often via social media) to support and reinforce development of their professional expertise. Recently, AFCRN has introduced the Essential TNM staging system of UICC/IARC, designed a set of course materials and conducted a first training course in late 2018. A post-training analysis shows that cancer registrars in SSA can successfully abstract stage at diagnosis in a clinically recognised format with appropriate training. (172) This is extremely useful information for cancer control and public healthcare policy making.

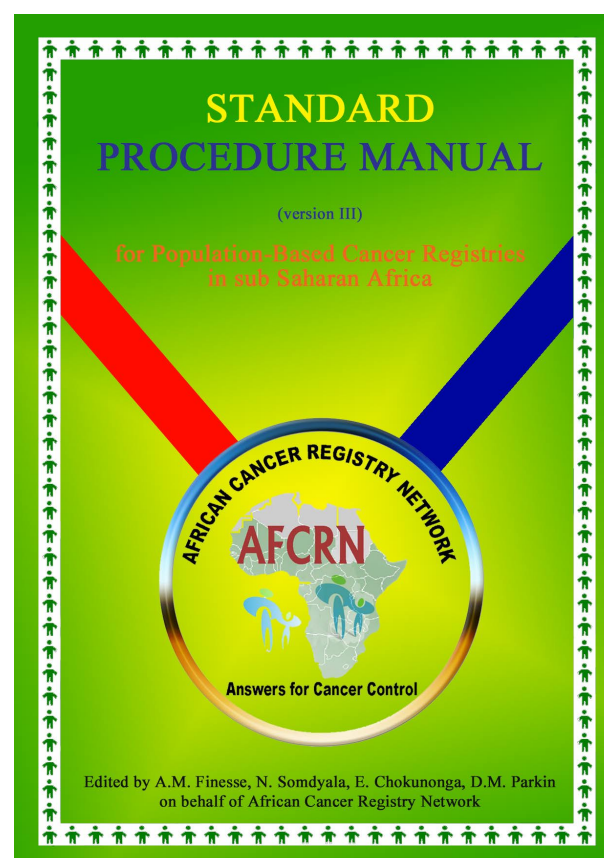
All these achievements would not be possible without the interest and commitment of the local governments and stakeholders, and support from international organisations (such as IARC/WHO, UICC, American Cancer Society, International Network for Cancer Treatment and Research), and other donors in academia and industry.

The ultimate goal of AFCRN is to help establish and nourish a mature and self-sustaining coordination centre(s) for the PBCRs of Africa, managed and run by African experts. We continue to work towards this goal by lobbying local governments, attracting funding from philanthropic foundations, and promoting research based on real data, of the highest possible quality.

For more information about the AFCRN, please visit: www.afcrn.org



Figure 16.
The Model Procedure Manual for African Cancer Registries



33

"among the available statistics for studying cancer ... the most valuable data are, undoubtedly, the rates obtained by recording the occurrence of every case of cancer over a specified period."

Doll R, Payne P, Waterhouse J. Cancer incidence in five continents: a technical report. New York: International Union Against Cancer/Springer-Verlag, 1966.

Capacity Building for Civil Society in the African Region: Key UICC Programmes and Opportunities

Identified as a priority in the UICC Strategy for 2020-2030, the regionalisation of UICC programmes focuses on facilitating access to UICC's capacity building programmes and to adapt them to the specific needs of cancer control organisations in their own regional and local contexts. To this end, UICC is progressively increasing its regional impact through key opportunities and platforms in synergy with regional actors, such as AORTIC, with a view to supporting national efforts to improve cancer control, in particular, implementation of national cancer control plans. The African region, with 172 UICC Member organisations, is a key focus of UICC's work, offering regional activities across the full portfolio of capacity building programmes.

Reinforcing Human Resources: Fellowships

For more than 50 years, UICC has promoted the development of human resources for cancer control through its Fellowship programmes and has supported more than 4000 individuals worldwide.

In 2017-2018, 57 fellows from Africa were able to conduct study visits to expand and learn new skills to respond to the specific needs of their countries, and the region as a whole. The projects included research on subtypes of HPV, psychosocial support for palliative care and the establishment of care pathways for cancer. As language was identified as a key barrier for applicants from Francophone Africa, the Bourses pour l'Afrique Francophone was launched in 2016 as part of the regionalisation efforts. Translating the application system and providing tailored assistance in French, this programme led to a 600% increase of applications within just two years. Another pilot programme dedicated to Africa was launched in 2016 with the African Cancer Fellows, which consisted of a cohort of 13 cancer control professionals based in Africa with a focus on cancer care delivery. These fellows also had the opportunity to participate at the World Cancer Congress in 2018 and present their respective projects.



Building Collaboration on Cancer Patients Education through the African Cancer Fellowships

In the Federal Medical Center, Abeokuta, Nigeria, one of the main challenges of cancer care delivery identified was the difficulties related to communication between clinicians, patients and families during cancer treatment. This is why Folaju Oyebola, who was selected as an African Cancer Fellow in 2018, chose to perform a study on "Cancer Patients Perceptions of Education During Treatment" at the Life Abundant Palliative Care Victoria Hospital Wynberg, South Africa. This South-South learning experience and collaboration led to the creation of a multidisciplinary team at the Medical Center and to a local training course to improve communication, as well as the experience of patients and their families along the cancer care pathway.

Key Opportunities

Applications for Technical fellowships and the Bourses pour l'Afrique Francophone programmes can be submitted throughout the year. The programme is open to applications from health professionals (physicians, nurses, pathologists, etc.) with a focus on public health, research or clinical topics including; prevention, cancer awareness, costing, planning and other aspects essential to developing better cancer control and delivery of cancer care.

Developing Leadership: CEO and Young Leaders Programmes

Recognising that organisations' ability to deliver high quality cancer care, research, patient support, training, and other strategic activities relies not only on technical expertise, but also on the capacity to build strong and efficient organisations with sustainable funding models and effective leaders, UICC developed the CEO and Young Leaders' programmes.

The CEO programme was launched in 2016 and provides CEOs of UICC member organisations with a suite of tailored opportunities to learn, network and share with peers. This includes dedicated activities and sessions delivered at UICC's global events; the World Cancer Congress, and World Cancer Leaders' Summit, and more recently, a series of regionally focused activities.

Regional 'Leadership in Action' meetings, launched as a pilot project in 2017, were scaled up in 2019 with the first in Africa, held in Dakar, Senegal in June 2019 with approximately 30 participants from Francophone Africa. Given the global momentum, the focus of these interactive meetings for 2019 was Universal Health Coverage, in addition to specific regionally relevant topics. For Francophone Africa, these covered coalition building and women's cancers in Africa, with the latter explored through a public-private dialogue to support multi-sectoral efforts.

To support continued learning and interaction, as a follow up to this meeting, participants had the opportunity to apply for a small grant to support a learning visit to another UICC member in the region. These learning visits are a key means to build collaborations between cancer organisations in Africa.

The UICC's Young Leaders programme aims to encourage aspiring young cancer control professionals to become successful leaders in global health. Through the programme, UICC facilitates opportunities for peer-to-peer learning, networking with experienced leaders, and participation in recognised international events. Of the 35 Young Leaders selected since the launch of the programme in 2014, eight come from the African region.



Building Cancer Registry Capacity through the Young Leaders Programme

At the time he was selected to join the programme in 2017, Dr. François Uwinkindi, Director of Cancer Diseases Unit at the Rwanda Biomedical Center in Kigali, was leading the development of Rwanda's first National Cancer Control Plan and one of the key challenges he was facing was the lack of reliable cancer data in the country.

As part of the programme, Dr Uwinkindi was able to undertake a learning visit to the Zimbabwe National Cancer Registry (ZNCR) to acquire the practical skills and knowledge to establish a population-based cancer registry in Rwanda. Established in 1985, ZNCR has been a model cancer registry for over 30 years. During the visit, Dr Uwinkindi not only learned processes and good practices around data collection and abstraction but was also offered the opportunity to discuss how to effectively leverage support from universities, private treatment facilities, and the government to ensure long term implementation of a registry.

Soon after the visit, the Rwandan National Cancer Registry began collecting its initial data starting from Rwandan University Teaching Hospitals and facilities located in the city of Kigali, with a clear plan to have a national coverage by 2021, with ZNCR committing to provide technical support throughout the implementation phase, thanks also to the collaborative relationship established through the Young Leaders programme.

Key Opportunities

Based on the success of 2019 regional 'Leadership in Action' meetings, UICC envisions to work with one of its members in Anglophone Africa to organise a 'Leadership in Action' meeting in 2020, as part of the CEO programme.

The new cohort of 2019 Young Leaders, who will meet for the first time at the World Cancer Leaders' Summit in Kazakhstan, will also be developing and engaged in activities in 2020 aimed at delivering regional impact.

Building Capacity for Advocacy: Treatment for All

Another key UICC Capacity Building programme is focused on strengthening the skills and capacity for advocacy. The initiative supports UICC members in low- and middle-income countries to engage and work collaboratively with governments to raise the profile of cancer through effective advocacy. In this context, selected UICC members, known as Country Champions, receive guidance and targeted technical support with a view to helping them unite with national-level civil society in their countries, jointly identify key advocacy priorities in line with the provisions of the World Health Assembly 2017 cancer resolution, and work collaboratively with the governments towards addressing inequities in their contexts. Seven out of the current twenty Country Champions are from the African region.



Fostering Political Momentum through Capacity Building for Advocacy

For the Uganda Cancer Society (UCS) joining the Treatment for All initiative has resulted in a new direction in the launch and implementation of a National Cancer Symposium, an annual event that aims to bring decision-makers, experts and civil society together to discuss current challenges, showcase success and jointly agree on the way forward. In so doing, UCS is working to create political will and advocate for a comprehensive, operational national cancer control plan, aligned with the global commitments of the cancer resolution.

Key Opportunities

All 2018 Country Champions will launch their national advocacy campaigns on World Cancer Day on February 4th, 2020, thereby creating a momentum for synergies, global and national impact. Further opportunities to engage with this initiative, or to access relevant resources, will be available in the coming months.

Supporting efforts to tackle women's cancers

In 2015, UICC launched the Seeding Progress and Resources for the Cancer Community (SPARC) Metastatic Breast Cancer (MBC) Challenge. This initiative has to date supported 40 cancer organisations worldwide, with seed funding, training, mentoring as well as networking opportunities through participation at key international events. It aims to support the launch of new projects to address the needs of MBC patients and, overall, reduce the number of women diagnosed at an advanced stage of breast cancer. To date, eleven cancer organisations in the African region have benefitted from the SPARC programme, and implemented projects focused on patient navigation, palliative care, community-based awareness campaigns and patient support groups.

Aligned with the momentum that will lead to the adoption of the WHO Global Strategy for the Elimination of Cervical Cancer, UICC also held a workshop in Dakar, Senegal in June 2019 with key stakeholders from ten countries in Francophone Africa, as well as regional technical partners and agencies, to initiate conversations towards building a regional partnership for women's cancers in Africa based on existing partnerships in global health.



SPARC Run for a Cure Africa Breast Cancer Foundation – Nigeria

Through the SPARC initiative, Ebele Mbanugo, Executive Director of Run for a Cure (RFCA), launched the MetaPink Programme, which aimed to create a database of accessible resources for patients, develop an informational booklet to support patients with MBC, establish monthly support groups and social network to communicate with health care workers. At the World Cancer Congress in 2018, in part as a result of the connections and networking opportunities offered through the programme, RFCA won the Astellas 2018 Grand Prize, which will contribute further support to an educational audio series for breast cancer patients.

Key Opportunities

In 2020, the third cohort of SPARC grantees will begin implementing their projects and benefit from the tailored opportunities and support offered through the programme, to further support effective delivery and sustainability of their activities. UICC will also continue efforts to translate the women's cancer regional partnership into concrete steps. Further capacity building opportunities are being developed to support efforts to tackle the burden of women's cancers.

UICC continues to develop and adapt the opportunities it offers in order to most effectively support its Members and the wider cancer community. To provide feedback or for more information, please contact us at RegionalCB@UICC.org

The Africa Cancer Research and Control ECHO: Utilising technology-enabled collaborative learning to advance national cancer control plan implementation

Many countries are establishing NCCPs and therefore attention is turning to the importance of plan implementation. WHO estimates that as many as one in four countries are not operationalising their NCCPs, making implementation a critical, but lacking piece of the planning process. (173) Plan implementation is a multi-year, multi-stakeholder process requiring high-level political buy-in and sustained commitment. (174) It requires evidence of successful implementation of interventions in similar settings, access to technical expertise, and partnerships. (11) However, stakeholders tasked with setting national cancer control priorities are often asked to meet aggressive timelines without the time or resources to work collaboratively.

What can countries in the African region do to address these challenges? Technology-enabled collaborative learning platforms, such as Project ECHO®, allow real-time knowledge exchange within a community of practice regardless of physical location. (175) The Africa Cancer Research and Control ECHO (Africa ECHO), convened by the U.S. National Cancer Institute and now led by the Africa ECHO Steering Committee*, brings together multi-disciplinary cancer control stakeholders and technical experts for monthly sessions through a web-based platform (Photo) to discuss priority cancer control topics as identified by ECHO participants (Table 4). Each session is typically one hour in length and consists of a case presentation by a participating country, a didactic presentation by an invited technical expert, and time for discussion. This case-based learning approach allows participating countries to share successes and challenges and receive immediate guidance from regional colleagues and experts. (176)

How has the Africa ECHO supported participating countries?

1. Engaging in a technology-enabled exchange reduces the sense of isolation and expands participants' network of technical partners
Example: The Kenya team learned about Ethiopia's experience in costing their NCCP during an ECHO session and were able to follow up to get the technical support they were missing, including tools to cost the plan.
2. Having real-time dialogue allows for debate of pertinent topics across the region. Example: The Zambia team described how they built the evidence case for investment in cancer prevention and treatment. They and others shared their experience that political interest is frequently focused on cancer treatment, as actions in this area can be undertaken relatively quickly and be attributed to the government, while prevention dividends take time. This sparked an active discussion about how participants deal with these types of political challenges in their settings and how participants can promote the cancer control continuum from prevention through to treatment, palliative care and survivorship through evidence-based advocacy.
3. The on-going nature of the Africa ECHO community of practice allows for long-term mentoring and relationship building to support cancer control planning.

Example: After receiving direct technical assistance to draft the NCCP in 2018, Eswatini joined the Africa ECHO community and now has access to continued regional support as they move into the NCCP implementation phase.

Individuals and institutions involved in cancer control and interested in replicating the Project ECHO model in their setting or for a specific topic, can contact the ECHO Institute (<https://echo.unm.edu>).



"Learning from other's experience not only allows quick implementation, but also allows us to gain from others' lessons learned."

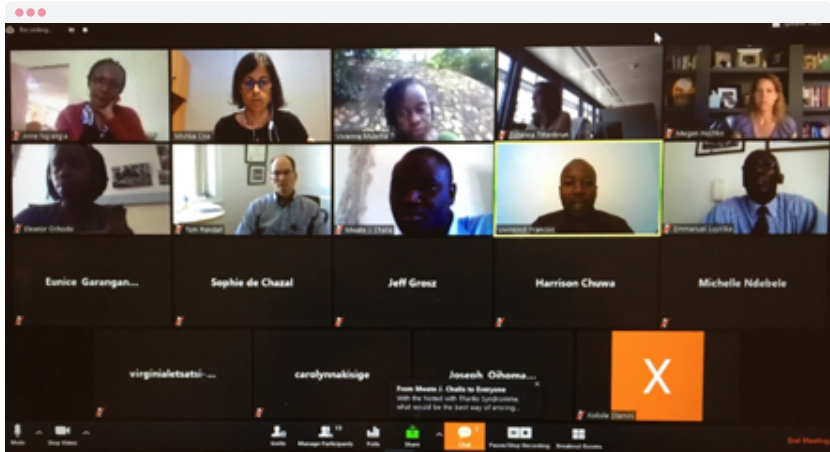
Eswatini ECHO Team

Notes

*The Africa ECHO Steering Committee consists of ECHO participants who volunteer their time to develop the curriculum, identify presenters, and lead each ECHO session. For more information, contact the Steering Committee Lead.

This project has been funded in whole or in part with federal funds from the National Cancer Institute, National Institutes of Health, under Contract No. HHSN261200800001E. The content of this publication does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organisations imply endorsement by the U.S. Government.

Africa ECHO Session, June 27 2019, Costing & Financing the National Cancer Control Plan - stakeholders and technical experts meeting for a monthly sessions on the Zoom™ web-based platform



© Mishka Cira

Civil society organisations and integrating cancer in Universal Health Coverage

Across the continent, civil society organisations (CSOs) play diverse and critically important roles in driving cancer control. This chapter explores some of those different roles and how organisations are building on their experiences to support the integration of core cancer services into national Universal Health Coverage plans and packages in their countries.

Current activities across the continent

Civil society organisations perform a variety of roles across the continent in response to unique social, economic and health system challenges; however, the most common activities can be divided into three categories; providing services, offering technical expertise and advocacy.

Many CSOs play an essential role in providing services directly to cancer patients. From health awareness and early detection services to treatment and palliative care provision, these organisations are essential components of health systems and can complement or even step in to expand access to essential cancer services.

Given their experience as providers of care, many CSOs play an additional role as technical experts to governments and participate frequently in multi-stakeholder consultations organised by Ministries of Health and other government ministries. The wealth of knowledge gathered through the engagement of CSOs with communities and through the research and other knowledge generation activities to support their programmes, provides a valuable input to the development of national policies and plans.

Finally, as advocates, CSOs have an important role in championing cancer control within national discussions in order to set the bar high for governments, as well as holding all actors accountable to their global and national commitments. Representing the voices of patients and their carers is critical to driving effective policies and programmes through to implementation in order to respond to unmet needs nationally. These have included the development, updating or implementation of NCCPs; the inclusion of core services into national insurance packages; an increase in budgetary allocations for cancer control; and championing the more effective integration of services in primary and secondary level facilities. A large part of this work also includes building national coalitions and common interest groups to amplify key messages and demonstrate the broad base of support for action.

Table 4.
2019 Africa Cancer Research and Control Session Plan

Session Date	Session Topic
Session 1 Thurs Mar 7	Building cancer control research capacity
Session 2 Thurs April 4	Integrating cancer into existing health services
Session 3 Thurs May 2	Monitoring and evaluation
Session 4 Thurs May 30	Increasing access and improving referral pathways for diagnosis/treatment
Session 5 Thurs June 27	Costing and financing the NCCP, Part I: The process of costing the NCCP and building political will for cancer control
Session 6 Thurs July 25	Setting priorities for implementation of NCCP strategies
Session 7 Thurs Aug 29	Costing and financing the NCCP, Part II: Mobilizing resources to finance cancer control and cancer treatment
Session 8 Thurs Sept 26	Implementation and scale up of evidence-based strategies



Opportunities for driving cancer in UHC

Recent WHO reports have identified that at least 50% of the world's population still do not have full coverage of essential health services and around 100 million people are pushed into extreme poverty as a result of paying for care. (177) The costs associated with seeking care, as discussed in the chapter on access to medicines and national EMLs and radiotherapy, pose a major hurdle to accessing cancer care and therefore a challenge to countries as they develop national UHC plans and packages.

Given the rising burden across countries in Africa, all governments will need to consider which cancer services to include within national UHC packages and how these might need to be expanded over time to effectively respond to changing patient needs. Advocacy will play an important role in building up the political will and public demand necessary for cancer services to be included in national UHC provisions. For example, following a Kenya Network of Cancer Organisations (KENCO) led roundtable workshop on cancer reporting held 2 years ago that targeted local journalists, the media in Kenya has played a commendable role in keeping the cancer agenda in the public domain. Working as a team, KENCO and NCD Alliance Kenya, CSOs have been using this public profile to raise the profile of cancer and NCDs with the government to improve the integration of essential prevention, treatment and palliative care services, particularly in the current UHC pilot nationally.

Similarly, the Cancer Association of South Africa (CANSA) has been working with a coalition of 38 CSOs to advocate for changes to South Africa's patent laws to improve access to affordable quality medicines. Phase one of the **Fix the Patent Law** project leveraged the network's expertise and reach to develop a policy which was adopted by the cabinet, while phase two will focus on engagement with key governmental departments and committees to ensure relevant reports.

As technical experts, CSOs have an important role in supporting UHC planning and package development. From a cancer control perspective, the foundation for the planning and delivery of cancer services are **NCCPs**, and the cost-effective recommendations contained in the **WHO best buys**. In South Africa, CANSA has undertaken work with a network of stakeholders to support the development of the South African Values and Ethics for Universal Health Coverage (SAVE-UHC). This project has developed an ethics framework to use when making recommendations for National Health Insurance to help health professionals make decisions about health interventions that reflect South Africa's core values and constitution.

The third area where CSOs are driving change across the region is in the implementation and follow-up of UHC. In Nigeria, the ABC Foundation is a key partner to the Oyo State Health Insurance Agency which was designed to improve access to quality care amongst the poorest by reducing the barriers to insurance coverage. The Foundation provided expert input into the design and inclusion of cancer screening services in order to reduce the stage of diagnosis for priority national cancers in line with Nigeria's NCCP.



Call to action

Civil society organisations have a critical role to play in driving the integration of core cancer services in UHC. Not only are cancer services feasible and cost effective, but UHC cannot be achieved without the inclusion of cancer programmes and services to reduce the growing burden of cancer and respond to the needs of existing and future patients. These changes can be driven through advocacy, particularly raising the voices of patients and their carers; contributing technical expertise to the development of national plans; and as service providers.

Recommendations for AORTIC members

1. Use global health and development commitments (please see Global cancer commitments navigator on uicc.org) to support and reinforce your advocacy asks to your governments, recognising that your government will need to report back on this progress in global fora like the World Health Assembly, High-Level Political Forum on SDGs, UN High-Level meetings.
2. Draw on existing global and regional recommendations, best buys, guidelines and research to inform and provide evidence that supports your advocacy priorities.
3. Build bridges beyond your speciality area of cancer control. Partnerships and coalitions that include diverse partners can bring together new expertise, experiences and resources to help create stronger movements to drive change, and hold governments and other stakeholders accountable.
4. Share your successes and lessons learned with other AORTIC members as many organisations are facing similar challenges across the region for which solutions exist but may not be known.
5. Use regional and international partnerships to support your advocacy, capacity development and programme work.
6. Engage and invest in the young generation to develop future leaders in cancer control.
7. Mobilise communities and continue to put patients at the centre of AORTIC work. Your work is focused on improving the lives of cancer patients, and in addition their voices, along with families and caregivers are some of the most powerful when trying to reach communities, improve awareness and challenge myths and misconceptions.
8. Champion the integration of cancer services in UHC as without this, we run the risk of cancer patients being forgotten in a rapidly developing new agenda.

References

1. Mahler H. Present status of WHO's initiative, "Health for all by the year 2000". Annual Review of Public Health. 1988; 9.

2. International Agency for Research on Cancer. Cancer Today - African Fact Sheet. [Online].; 2018 [cited 2019 Aug. 14. Available from: <http://gco.iarc.fr/today/data/factsheets/populations/903-africa-fact-sheets.pdf>.

3. Stefan C, Bray F, Ferlay J, Liu B, Parkin DM. Cancer of childhood in sub-Saharan Africa. Ecancermedicalsecience. 2017 Jul; 11(755).

4. Ferlay J, Ervik M, Lam F, Colombet M, Mery L, et al. Global Cancer Observatory. [Online].; 2018 [cited 2019 Jun 29. Available from: <https://gco.iarc.fr/today>.

5. United Nations. World Population Prospects 2019. [Online].; 2019 [cited 2019 Aug. 14. Available from: <https://population.un.org/wpp/>.

6. Ferlay J, Colombet M, Soerjomataram I, Mathers C, Parkin DM, Piñeros M, Znaor A, Bray F. Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. International Journal of Cancer. 2019 Feb.; 144(8).

7. Boerma T, Victora C, Abouzahr C. Monitoring country progress and achievements by making global predictions: is the tail wagging the dog? The Lancet. 2018 Aug.; 92(10147).

8. United Nations. Transforming our world: the 2030 agenda for sustainable development. 2015. Resolution A/Res/70/1.

9. World Health Organization. WHO Global Action Plan for the Prevention and Control of NCDs 2013-202. [Online].; 2012 [cited 2019 Aug. 14. Available from: https://www.who.int/nmh/events/ncd_action_plan/en/.

10. World Health Organization. Global Health Observatory (GHO) data - National capacity to address and respond to NCDs. [Online].; 2018 [cited 2019 Aug. 14. Available from: https://www.who.int/gho/ncd/health_system_response/policy/en/.

11. Romero Y, Trapani D, Johnson S, Tittenbrun Z, Given L, et al. National cancer control plans: a global analysis. The Lancet Oncology. 2018 Oct.; 19(10).

12. Oar A, Moraes FY, Romero Y, Ilbawi AM, Yap ML. Core Elements of National Cancer Control Plans (NCCP): a Tool to Support Plan Development and Review. The Lancet Oncology. 2019 In Press.

13. World Health Organization. National Cancer Control Programmes (NCCP). [Online].; 2019 [cited 2019 Aug 22. Available from: <https://www.who.int/cancer/nccp/en>.

14. Centre for the Study of Adolescence. Legislative and Policy Landscape On NCDs In Kenya. [Online].; 2017 [cited 2019 Aug 22. Available from: http://csakenya.org/wp-content/uploads/2017/08/NCD_Policy_Report_May_28-Final-paper.pdf.

15. Nojilana B, Bradshaw D, Pillay-van Wyk V, Msemburi W, Laubscher R, et al. Emerging trends in non-communicable disease. South African Medical Journal Research. 2016 May; 106(5).

16. National Department of Health South Africa. Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013-17. [Online].; 2013 [cited 2019 Aug 22. Available from: <http://www.hsrc.ac.za/uploads/pageContent/3893/NCDs%20STRAT%20PLAN%20%20CONTENT%208%20april%20proof.pdf>.

17. Puoane TR, Tsolokile LP, Egbujie BA, Lewy M, Sanders D. Advancing the agenda on noncommunicable diseases : prevention and management at community level. South African Health Review. 2017; 2017(1).

18. Department of Health Republic of South Africa. The national health promotion policy and strategy 2015-2019. [Online].; 2015 [cited 2019 Aug 22. Available from: <http://www.health.gov.za/index.php/2014-03-17-09-09-38/strategic-documents/category/229-2015str?download=936:doh-promotion-policy-and-strategy-printed-version>.

19. Department of Health Republic of South Africa. Strategy for the prevention and control of obesity in South Africa 2015-2020. [Online].; 2015 [cited 2019 Aug 22. Available from: <https://www.health-e.org.za/wp-content/uploads/2015/12/National-Strategy-for-prevention-and-Control-of-Obesity-4-August-latest.pdf>.

20. Departments of Social Development and Agriculture, Forestry and Fisheries. National policy on food and nutrition security. [Online].; 2013 [cited 2019 Aug 22. Available from: https://www.nda.agric.za/docs/media/NATIONAL_POLICYon food and nutririton security.pdf.

21. Department of Health Republic of South Africa. Government Notices: REGULATIONS RELATING TO THE REDUCTION OF SODIUM IN CERTAIN FOODSTUFFS AND RELATED MATTERS: AMENDMENT. [Online].; 2016 [cited 2019 Aug 22. Available from: <http://www.health.gov.za/index.php/shortcodes/2015-03-29-10-42-47/2015-04-30-09-10-23/2015-04-30-09-11-35/category/36-documents-for-comment?download=1671:reduction-of-sodium-amendment>.

22. Department of Health Republic of South Africa. Government notice: http://blogs.sun.ac.za/iplaw/files/2013/12/ZAF-2012-Regulations-relating-to-foodstuffs-for-infants-and-young-children-R.-No.-991-of-2012_0.pdf. [Online].; 2012 [cited 2019 Aug 22. Available from: http://blogs.sun.ac.za/iplaw/files/2013/12/ZAF-2012-Regulations-relating-to-foodstuffs-for-infants-and-young-children-R.-No.-991-of-2012_0.pdf.

23. Department of the National Treasury Republic of South Africa. Taxation of sugar sweetened beverages policy paper. [Online].; 2016 [cited 2019 Aug 22. Available from: <http://www.treasury.gov.za/public comments/Sugar sweetened beverages/POLICY PAPER AND PROPOSALS ON THE TAXATION OF SUGAR SWEETENED BEVERAGES-8 JULY 2016.pdf>.

24. Department of Health Republic of South Africa. Draft National Strategy Plan for the Prevention and Control of Non-Communicable Diseases 2020-2025. 2020. Unpublished.

25. Winkler V, Mangolo NJ, Becher H. Lung cancer in South Africa: a forecast to 2025 based on smoking prevalence data. BMJ Open. 2015 e006993; 5(3).

26. Allen LN, Pullar J, Wickramasinghe KK, Williams J, Roberts N et al. Evaluation of research on interventions aligned to WHO 'Best Buys' for NCDs in low-income and lower-middle-income countries: a systematic review from 1990 to 2015. BMJ Global Health. 2018 Jan; 3(1).

27. World Health Organization - Regional Office for Africa. The who framework convention on tobacco control: 10 years of implementation in the African region. [Online].; 2015 [cited 2019 Aug 14. Available from: https://www.afro.who.int/sites/default/files/2017-06/who-fctc-10-year_report_web.pdf.

28. World Health Organization - Regional Office for Africa. The WHO Framework Convention on Tobacco Control (Ratification/accession status as of November 2018). [Online].; 2018 [cited 2018 Nov. Available from: https://www.afro.who.int/sites/default/files/2019-01/FCTC_AFRO_status_Nov_2018.pdf November 2018.

29. World Health Organization - Framework Convention on Tobacco Control. Parties to the Protocol to Eliminate Illicit Trade in Tobacco Products. [Online].; 2019 [cited 2019 Aug 14. Available from: <https://www.who.int/fctc/protocol/about/en/>.

30. World Health Organization - Regional Office for Africa. Policies for tobacco control in the African Region, 2013. [Online].; 2013 [cited 2019 Aug 14. Available from: <https://www.afro.who.int/publications/policies-tobacco-control-african-region-2013>.

31. World Health Organization - Framework Convention on Tobacco Control. Tobacco control governance in sub-Saharan Africa. [Online].; 2016 [cited 2019 Aug 14. Available from: <https://www.who.int/fctc/1321-TobaccoGovernance-20160211-v3.pdf>.

32. Network of African Science Academie. Preventing a tobacco epidemic in Africa: A call for effective action to support health, social, and economic development. [Online].; 2014 [cited 2019 Aug 14. Available from: <http://www.nationalacademies.org/asadi/Africa%-20Tobacco%20Control-FINAL.pdf>.

33. Campaign for Tobacco-Free Kids. Ethiopia's Historic Public Health Law Will Save Lives and Stem a Growing Tobacco Epidemic in Africa. [Online].; 2019 [cited 2019 Aug 14. Available from: https://www.tobaccofreekids.org/press-releases/2019_02_05_ethiopias-public-health-law-will-save-lives.

34. Tobacco Tactics. Africa's Tobacco Epidemic. [Online].; 2015 [cited 2019 Aug 14. Available from: https://www.tobaccotactics.org/index.php?title=Africa%27s_Tobacco_Epidemic.

35. Boseley S. Threats, bullying, lawsuits: tobacco industry's dirty war for the African market, The Guardian. [Online].; 2017 [cited 2019 Aug 14. Available from: <https://www.theguardian.com/world/2017/jul/12/big-tobacco-dirty-war-africa-market>.

36. United Nations. Inter-Agency Task Force on Financing for Development - Monitoring development finance. [Online].; 2016 [cited 2019 Aug 14. Available from: <https://developmentfinance.un.org/tobacco-taxation>.

37. World Health Organization - Framework Convention on Tobacco Control. Appel de Niamey des Premières Dames d'Afrique pour. [Online].; 2019 [cited 2019 Aug 14. Available from: https://www.fctc.org/wp-content/uploads/2019/07/FR-Appel-de-Niamey-Premi%C3%A8res-Dames-2019_WORKER.pdf.

38. World Health Organization. Guide to cancer early diagnosis. [Online].; 2017 [cited 2019 Aug 14. Available from: <https://apps.who.int/iris/bitstream/handle/10665/254500/9789241511940-eng.pdf;jsessionid=E5689E06A9873F39C16C4F39A94997FF?sequence=1>.

39. International Agency for Research on Cancer. Cancer Today. [Online].; 2018 [cited 2019 Aug 14. Available from: http://gco.iarc.fr/today/online-analysis-table?v=2018&mode=cancer&mode_population=continents&population=900&populations=991&key=asr&sex=0&cancer=39&type=0&statistic=5&prevalence=0&population_group=0&ages_group%5B%5D=0&ages_group%5B%5D=17&nb_items=5&group_.

40. Union for International Cancer Control. World Cancer Day 2019: Global cancer experts call for urgent action to improve early cancer detection. [Online].; 2019 [cited 2019 Aug 14. Available from: https://www.uicc.org/news/world-cancer-day-2019-global-cancer-experts-call-urgent-action-improve-early-cancer-detection#_ftn2.

41. Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, et al. Global surveillance of trends in cancer survival 2000–14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. The Lancet. 2018 Mar; 391(10125).

42. Prager GW, Braga S, Bystricky B, Qvortrup C, Criscitiello C, et al. Global cancer control: responding to the growing burden, rising costs and inequalities in access. ESMO open. 2018 Feb; 3(2).

43. Lodge M, Lethu T, Ginsburg O. Cancer Control - The Commonwealth and cervical cancer: Time for collective action. [Online].; 2019 [cited 2019 Aug 14. Available from: <http://www.cancercontrol.info/wp-content/uploads/2019/07/Mark-Lodge.pdf>.

44. Navarro M, Nicolas A, Ferrandez A, Lanas A. Colorectal cancer population screening programs worldwide in 2016: An update. World Journal of Gastroenterology. 2017 May; 23(20).

45. World Health Organization. WHO position paper on mammography screening. [Online].; 2014 [cited 2019 Jul 30. Available from: https://www.who.int/cancer/publications/mammography_screening/en/.

46. World Health Organization. Tackling NCDs - 'Best buys' and other recommended interventions for the prevention and control of noncommunicable diseases. [Online].; 2017 [cited 2019 Aug 14. Available from: <https://apps.who.int/iris/bitstream/>

47. Yip CH, Smith RA, Anderson BO, Miller AB, Thomas DB, et al. Guideline implementation for breast healthcare in low- and middle-income countries: early detection resource allocation. Cancer. 2008 Oct; 113(8 Suppl).

48. International Academy of Pathology - West African Division. 2019 Database of Nigerian Pathologists. 2019. Personal communication.

49. African Pathology Forum. Survey Update 2019. 2019. Personal communication.

50. Nelson AM, Milner DA, Rebbeck TR, Iliyasu Y. Oncologic Care and Pathology Resources in Africa: Survey and Recommendations. Journal of clinical oncology. 2016 Jan; 34(1).

51. Martei TM, Pace LE, Brock JE, and Shulman LN. Breast Cancer in Low- and Middle-Income Countries: Why We Need Pathology Capability to Solve This Challenge. Clinics in laboratory medicine. 2018 Mar; 38(1).

52. Ogunbiyi, JO. Federal Ministry of Nigeria Survey. 2019. Personal communication.

53. Montgomery ND, Tomoka T, Krysiak R, Powers E, Mulenga M, et al. Practical Successes in Telepathology Experiences in Africa. Clinics in laboratory medicine. 2018 Mar; 38(1).

54. World Health Organization. Essential medicines and health products. [Online].; 2019 [cited 2019 Aug 14. Available from: https://www.who.int/medicines/services/essmedicines_def/en/.

55. Shulman LN, Wagner CM, Barr R, Lopes G, Longo G, et al. Proposing Essential Medicines to Treat Cancer: Methodologies, Processes, and Outcomes. Journal of Clinical Oncology. 2016 Jan; 34(1).

56. Robertson J, Barr R, Shulman LN, Forte GB, Magrini N. Essential medicines for cancer: WHO recommendations and national priorities. Bulletin of the World Health Organization. 2016 Oct.; 94(10).

57. Martei YM, Chiyapo S, Grover S, Ramogola-Masire D, Dryden-Peterson S, Shulman LN, Tapela N. Availability of WHO Essential Medicines for Cancer Treatment in Botswana. Journal of Global Oncology. 2018 Sep.; 4.

58. Cherny NI, Sullivan R, Torode J, Saar M, Eniu A. ESMO International Consortium Study on the availability, out-of-pocket costs and accessibility of antineoplastic medicines in countries outside of Europe. Annals of Oncology: official journal of the European Society for Medical Oncology. 2017 Nov; 28(11).

59. Roth L, Bempong D, Babigumira JB, Banoo S, Cooke E, et al. Expanding global access to essential medicines: investment priorities for sustainably strengthening medical product regulatory systems. Globalization and Health. 2018 Nov; 14.

60. Martei YM, Grover S, Bilker WB, Monare B, Sethhako DI, Ralefala TB, Manshimba P, Gross R, Shulman LN, DeMichele A. Impact of Essential Medicine Stock Outs on Cancer Therapy Delivery in a Resource-Limited Setting. Journal of Global Oncology. 2019 Aug; 5.

61. Medicines Patent Pool. Exploring the Expansion of the Medicines Patent Pool's Mandate to Patented Essential Medicines: A Feasibility Study of the Public Health Needs and Potential Impact. [Online].; 2018 [cited 2019 Aug 14. Available from: <https://medicinespatentpool.org/resource-post/exploring-the-expansion-of-the-medicines-patent-pools-mandate-to-patented-essential-medicines/>.

62. Goldstein DA, Clark J, Tu Y, Zhang J, Fang F, et al. A global comparison of the cost of patented cancer drugs in relation to global differences in wealth. Oncotarget. 2017 May; 8(42).

63. World Health Organization. Technical report: pricing of cancer medicines and its impacts: a comprehensive technical report for the World Health Assembly Resolution 70.12: operative paragraph 2.9 on pricing approaches and their impacts on availability and affordability of medicines. [Online].; 2018 [cited 2019 Aug 14. Available from: <https://apps.who.int/iris/handle/10665/277190>.

64. Department of Health, Republic of South Africa. Medicine Procurement List. [Online].; 2019 [cited 2019 Aug 14. Available from: <http://www.health.gov.za/index.php/component/phocadownload/category/196>.

<https://www.who.int/iris/bitstream/handle/10665/259232/WHO-NMH-NVI-17.9-eng.pdf?sequence=1>.

56 Cancer control in Africa: paving the way for Universal Health Coverage

Cancer control in Africa: paving the way for Universal Health Coverage 57

65. World Health Organization. Essential medicines and health products: Medical Product Alert N° 3/2017. [Online].; 2017 [cited 2019 Aug 14. Available from: https://www.who.int/medicines/publications/drugalerts/drug_alert3-2017/en/.

66. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2019. CA: a cancer journal for clinicians. 2019 Jan; 69(1).

67. Atun R, Jaffray DA, Barton MB, Bray F, Baumann M, et al. Expanding global access to radiotherapy. The Lancet Oncology. 2016 Sep; 16(10).

68. Abdel-Wahab M, Bourque JM, Pynda Y, Izewska J, Van der Merwe D, et al. Status of radiotherapy resources in Africa: an International Atomic Energy Agency analysis. The Lancet Oncology. 2013 Apr; 14(4).

69. International Atomic Energy Agency. DIRAC (Directory of RAdiotherapy Centres) Regions Report. [Online].; 2019 [cited 2019 Jul 2. Available from: <https://dirac.iaea.org/Query/Regions>.

70. Chartrounds. Chartrounds Africa: Linking African Oncologists. [Online].; 2010 [cited 2019 Jul 15. Available from: <https://afr.chartrounds.com/default.aspx>.

71. Fisher BJ, Daugherty LC, Einck JP, Suneja G, Shah MM, et al. Radiation Oncology in Africa: Improving Access to Cancer Care on the African Continent. International Journal of Radiation Oncology Biology Physics. 2014 Jul; 89(3).

72. Balogun O, Rodin D, Ngwa W, Grover S, Longo J. Challenges and Prospects for Providing Radiation Oncology Services in Africa. Seminars in Radiation Oncology. 2017 Apr; 27(2).

73. Meara JG, Leather AJ, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfar, and economic development. The Lancet. 2015 Aug; 386(9993).

74. Sullivan R, Alatisé OI, Anderson BO, Audisio R, Autier P. Global cancer surgery: delivering safe, affordable, and timely cancer surgery. The Lancet Oncology. 2015 Sep; 16(11).

75. Crisp N, Gawanas B, Sharp I. Training the health workforce. Scaling up, saving lives. The Lancet. 2008 Feb; 371(9613).

76. World Health Organization. WHO Definition of Palliative Care. [Online].; 2019 [cited 2019 Aug 22. Available from: <https://www.who.int/cancer/palliative/definition/en/>.

77. World Health Organization. Disease burden and mortality estimates. [Online].; 2017 [cited 2019 Aug 22. Available from: http://www.who.int/healthinfo/global_burden_disease/estimates/en/.

78. Ntizimira CR, Nkuriikyimfura JL, Mukeshimana O, Ngizwenayo S, Mukasahaha D, et al. Palliative care in Africa: a global challenge. eCancer Medical Science. 2014 Dec; 8(493).

79. Knaul FM, Farmer PE, Bhadelia A, Berman P, Horton R. Closing the divide: the Harvard Global Equity Initiative–Lancet Commission on global access to pain control and palliative care. The Lancet. 2015 Aug; 386(9995).

80. Knaul FM, Farmer PE, Krakauer EL, De Lima L, Bhadelia A, et al. Alleviating the access abyss in palliative care and pain relief—an imperative of universal health coverage: the Lancet Commission report. The Lancet. 2017 Oct; 391(10128).

81. Krakauer EL, Rajagopal MR. End-of-life care across the world: a global moral failing. The Lancet. 2016 Jul; 388(10043).

82. Ngwa W, Ngoma T, Zietman A, Mayr N, Elzawawy A, et al. Closing the Cancer Divide Through Ubuntu: Information and Communication Technology-Powered Models for Global Radiation Oncology. International journal of radiation oncology, biology, physics. 2016 Mar; 94(3).

83. Fraser BA, Powell RA, Mwangi-Powell FN, Namisango E, Hannon B, et al. Palliative Care Development in Africa: Lessons From Uganda and Kenya. Journal of Global Oncology. 2017 Jun; 30(4).

84. Schmidt-Traub, G. The role of the Technical Review Panel of the Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria: an analysis of grant recommendations. Health policy and planning. 2018 Apr; 33(3).

85. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2018 Nov; 68(6).

86. Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-tieulent J, Jemal A. Global Cancer Statistics, 2012. CA: A Cancer Journal for Clinicians. 2015 Feb; 35(2).

87. Jedy-Agba E, McCormack V, Adebamowo C, Dos-Santos-Silva I. Stage at diagnosis of breast cancer in sub-Saharan Africa: a systematic review and meta-analysis. Lancet Global Health. 2016 Dec; 4(12).

88. Vanderpuye V, Olopade OI, Huo D. Pilot Survey of Breast Cancer Management in sub-Saharan Africa. Journal of global oncology. 2017 Jun; 3(3).

89. Vanderpuye V, Grover S, Hammad N, PoojaPrabhakar, Simonds H, et al. An update on the management of breast cancer in Africa. Infectious agents and cancer. 2017 Feb; 14(12).

90. Espina C, McKenzie F, dos-Santos-Silva I. Delayed presentation and diagnosis of breast cancer in African women: a systematic review. Annals of epidemiology. 2017 Oct; 27(10).

91. Kantelhardt EJ, Muluken G, Sefonias G, Wondimu A, Gebert HC, Unverzagt S, et al. A Review on Breast Cancer Care in Africa. Breast Care (Basel). 2015 Dec; 10(6).

92. Tetteh DA, Faulkner SL. Sociocultural Factors and Breast Cancer in sub-Saharan Africa: Implications for Diagnosis and Management. Womens Health (London). 2016 Jan; 12(1).

93. Trimble, EL. Breast Cancer in sub-Saharan Africa. Journal of Global Oncology. 2017 Mar; 3(3).

94. Scherber S, Soliman AS, Awuah B, Osei-Bonsu E, Adjei E, et al. Characterizing breast cancer treatment pathways in Kumasi, Ghana from onset of symptoms to final outcome: outlook towards cancer control. Breast disease. 2014 Jan; 34(4).

95. Gebresillassie BM, Gebreyohannes EA, Belachew SA, Emiru YK. Evaluation of Knowledge, Perception, and Risk Awareness About Breast Cancer and Its Treatment Outcome Among University of Gondar Students, Northwest Ethiopia. Frontiers in oncology. 2018 Nov; 8(501).

96. Macdonald S, Cunningham Y, Patterson C, Robb K, Macleod U, et al. Mass media and risk factors for cancer: the under-representation of age. BMC Public Health. 2018 Apr; 18(1).

97. Tazhibi M, Feizi A. Awareness Levels about Breast Cancer Risk Factors, Early Warning Signs, and Screening and Therapeutic Approaches among Iranian Adult Women: A large Population Based Study Using Latent Class Analysis. BioMed research international. 2014 Sep; 2014.

98. Cabanes A, Kapambwe S, Citonje-Msadabwe S, Parham GP, Lishimpi K, et al. Challenges, Opportunities, and Priorities for Advancing Breast Cancer Control in Zambia: A Consultative Meeting on Breast Cancer Control. Journal of Global Oncology. 2019 Mar; 5.

99. Cazap E, Magrath I, Kingham TP, Elzawawy A. Structural barriers to diagnosis and treatment of cancer in low- and middle-income countries: The urgent need for scaling up. Journal of Global Oncology. 2016 Jan; 34(1).

100. The UNESCO Institute for Statistics. UNESCO. [Online].; 2017 [cited 2019 Aug 14. Available from: http://uis.unesco.org/sites/default/files/documents/fs45-literacy-rates-continue-rise-generation-to-next-en-2017_0.pdf.

101. McKenzie F, Zietsman A, Galukande M, Anele A, Adisa C, Parham G, et al. Breast cancer awareness in the sub-Saharan African ABC-DO cohort: African Breast Cancer-Disparities in Outcomes study. Cancer causes and control. 2018 Aug; 29(8).

102. Abuidris DO, Elsheikh A, Ali M, Musa H, Elgaili E, Ahmed AO, et al. Breast-cancer screening with trained volunteers in a rural area of Sudan: a pilot study. The Lancet Oncology. 2013 Apr; 14(4).

103. Lauby-Secretan B, Scoccianti C, Loomis D, Benbrahim-Tallaa L, Bouvard V, et al. Breast-Cancer Screening — Viewpoint of the IARC Working Group. New England journal of medicine. 2015 Jun; 372(24).

104. Abulkhair O, Saghir N, Sedky L, Saadedin A, Elzahwary H, Siddiqui N, et al. Modification and implementation of NCCN guidelines on breast cancer in the Middle East and North Africa region. Journal of the National Comprehensive Cancer Network. 2010 Jul; 8(Suppl 3).

105. Federal Ministry of Health of Nigeria. Nigergia National Cancer Control Plan. [Online].; 2018 [cited 2019 Aug 14. Available from: https://www.iccp-portal.org/system/files/plans/NCCP_Final%20%5B1%5D.pdf.

106. Ministry of Health of Kenya. Kenya National Cancer Screening Guidelines. [Online].; 2018 [cited 2019 Aug 14. Available from: <http://www.health.go.ke/wp-content/uploads/2019/02/National-Cancer-Screening-Guidelines-2018.pdf>.

107. Department of Health, Republic of South Africa. Policies and guidelines. [Online].; 2019 [cited 2019 Aug 14. Available from: <http://www.health.gov.za/index.php/2014-08-15-12-53-24>.

108. Challinor JM, Galassi AL, Al-Ruzzieh MA, Bigirimana JB, Buswell L, et al. Nursing’s potential to address the growing cancer burden in low- and middle-income countries. Journal of Global Oncology. 2016 Feb; 2(3).

109. Farmer P, Frenk J, Knaul FM, Shulman LN, Alleyne G, Armstrong L, et al. Expansion of cancer care and control in countries of low and middle income: a call to action. The Lancet. 2010 Oct; 376(9747).

110. Ginsburg OM, Chowdhury M, Wu W, Chowdhury MTI, Pal BC, et al. An mHealth Model to Increase Clinic Attendance for Breast Symptoms in Rural Bangladesh: Can Bridging the Digital Divide Help Close the Cancer Divide? Oncologist. 2014 Jan; 19(2).

111. Robinson-White S, Conroy B, Slavish KH, Rosenzweig M. Patient Navigation in Breast Cancer: A Systematic Review. Cancer nursing. 2010 Mar; 33(2).

112. GSMA. The Mobile Economy - sub-Saharan Africa Report. [Online].; 2019 [cited 2019 Aug 14. Available from: <https://www.gsma.com/r/mobileeconomy/sub-saharan-africa/>.

113. Rajan S, Sathiyarayanan M. Breast cancer awareness through smart mobile healthcare applications from Indian doctors' perspective. In International Conference On Smart Technologies For Smart Nation (SmartTechCon); 2017; Bengaluru, India. p. 607-612.

114. Black E, Richmond R. Improving early detection of breast cancer in sub-Saharan Africa: why mammography may not be the way forward. Global Health. 2019 Jan; 15(1).

115. NCCN African Cancer Coalition. NCCN Harmonized Guidelines. [Online].; 2019 [cited 2019 Aug 14. Available from: <https://www.nccn.org/harmonized/>.

116. Adesina A, Chumba D, Nelson AM, Orem J, Roberts DJ, et al. Improvement of pathology in sub-Saharan Africa. The Lancet Oncology. 2013 Apr; 14(4).

117. African Strategies for Advancing Pathology Group Members. Quality pathology and laboratory diagnostic services are key to improving global health outcomes: improving global health outcomes is not possible without accurate disease diagnosis. American journal of clinical pathology. 2015 Mar; 143(3).

118. Anderson T. Taking up Africa's cancer challenge. Bulletin of the World Health Organization. 2018 Apr; 96(4).

119. Tapela NM, Mpunga T, Hedt-Gauthier B, Moore M, Mpanumusingo E, et al. Pursuing equity in cancer care: implementation, challenges and preliminary findings of a public cancer referral center in rural Rwanda. BMC Cancer. 2016 Mar; 16(1).

120. Jagwe J, Merriman A. Uganda: delivering analgesia in rural Africa: opioid availability and nurse prescribing. Journal of pain and symptom management. 2007 May; 33(5).

121. Jedy-Agba EE, Oga EA, Odutola M, Abdullahi YM, Popoola A, Achara P, et al. Developing National Cancer Registration in Developing Countries – Case Study of the Nigerian National System of Cancer Registries. Frontiers in Public Health. 2015 Jul; 3.

122. Boyle P, Ngoma T, Sullivan R, Ndlovu N, Autier P, et al. The state of Oncology in Africa. [Online].; 2015 [cited 2019 Aug 14. Available from: <https://i-pri.org/wp-content/uploads/2017/02/STATE-OF-ONCOLOGY-IN-AFRICA-2015-WEB-VERSION.pdf>.

123. USAID. Africa Key Facts and Figures for Child Mortality. [Online]. [cited 2019 Aug 12. Available from: <https://www.usaid.gov/sites/default/files/documents/1860/Africa%20Key%20Facts%20and%20Figures.pdf>.

124. Rodriguez-Galindo C, Friedrich P, Morrissey L, Frazier L. Global challenges in pediatric oncology. Current opinion in pediatrics. 2013 Feb; 25(1).

125. Stefan DC, Baadjes B, Kruger M. Incidence of childhood cancer in Namibia: the need for registries in Africa. The Pan African medical journal. 2014 Mar; 17(191).

126. Ward ZJ, Yeh JM, Bhakta N, Frazier AL, Atun R. Estimating the total incidence of global childhood cancer: a simulation-based analysis. Lancet Oncology. 2019 Apr; 20(4).

127. UNICEF. Child Malnutrition in Africa. [Online].; 2014 [cited 2019 Aug 12. Available from: https://www.unicef.org/about/execboard/files/Africa_Brochure_Eng_14May14.pdf.

128. Parkin DM, Stefan C. Childhood Cancer in sub-Saharan Africa. eCancer Medical Science. 2017 Jul; 11.

129. Gupta S, Howard SC, Hunger SP, Antillon FG, Metzger ML, et al. Chapter 7: Treating Childhood Cancer in Low- and Middle-Income Countries (Disease Control Priorities, Volume 3). [Online].; 2015 [cited 2019 Aug 22. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK343626/>.

130. Weaver MS, Yao AJ, Renner LA, Harif M, Lam CG. The prioritisation of paediatrics and palliative care in cancer control plans in Africa. British Journal of cancer. 2015 Jun; 112(12).

131. World Health Organization. Global Initiative for Childhood Cancer. [Online].; 2019 [cited 2019 Aug 5. Available from: <https://www.who.int/cancer/childhood-cancer/en/>.

132. Ferlay J SHBFFDMCPD. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. International Journal of Cancer. 2010 Dec; 127(20).

133. Hsing AW, Yeboah E, Biritwum R, Tettey Y, De Marzo AM, et al. High prevalence of screen detected prostate cancer in West Africans: implications for racial disparity of prostate cancer. The Journal of urology. 2014 Sep; 192(3).

134. National Cancer Institute, USA. Surveillance, Epidemiology, and End Results (SEER) Program. [Online].; 2019 [cited 2019 Aug 14. Available from: <https://seer.cancer.gov/>.

135. Howlader N, Krapcho M, Neyman N, Aminou R, Waldron W, et al. SEER Cancer Statistics Review, 1975-2008. In Bethesda M. SEER Cancer Statistics Review, 1975-2008.: National Cancer Institute; 2011.

136. Rebbeck TR, Devesa SS, Chang BL, Bunker CH, Cheng I, et al. Global patterns of prostate cancer incidence, aggressiveness, and mortality in men of african descent. Prostate Cancer. 2013 Feb; 2013.

137. Boffetta P, Tubiana M, Hill C, Boniol M, Aurengo A, et al. The causes of cancer in France. Annals of oncology: official journal of the European Society for Medical Oncology. 2009 Mar; 20(3).

138. Xie B, Zhang G, Wang X, Xu X. Body mass index and incidence of nonaggressive and aggressive prostate cancer: a dose-response meta-analysis of cohort studies. Oncotarget. 2017 Sep; 15(8).

139. Giri VN, Knudsen KE, Kelly WK, Abida W, Andriole GL, et al. Role of Genetic Testing for Inherited Prostate Cancer Risk: Philadelphia Prostate Cancer Consensus Conference 2017. Journal of Clinical Oncology. 2018 Feb; 36(4).

140. Haiman CA, Chen GK, Blot WJ, Strom SS, Berndt SI. Genome-wide association study of prostate cancer in men of African ancestry identifies a susceptibility locus at 17q21. Nature Genetics. 2011 Jun; 43(6).

141. Chang BL, Spangler E, Gallagher S, Haiman CA, Henderson B, et al. Validation of genome-wide prostate cancer associations in men of African descent. Cancer Epidemiology, Biomarkers and Prevention. 2011 Jan; 20(1).

142. Cook MB, Wang Z, Yeboah ED, Tettey Y, Biritwum RB. A genome-wide association study of prostate cancer in West African men. Human genetics. 2014 May; 133(5).

143. Haiman CA, Chen GK, Blot WJ, Strom SS, Berndt SI, et al. Characterizing Genetic Risk at Known Prostate Cancer Susceptibility Loci in African Americans. PLoS Genetics. 2011 May; 7(5).

144. International Agency for Research on Cancer. Cancer Today - Cervix uteri factsheet. [Online].; 2018 [cited 2019 Aug 14. Available from: <https://gco.iarc.fr/today/data/factsheets/cancers/23-Cervix-uteri-fact-sheet.pdf>.

145. Palefsky JM, Minkoff H, Kalish LA, Levine A, Sacks HS, et al. Cervicovaginal human papillomavirus infection in human immunodeficiency virus-1 (HIV)-positive and high-risk HIV-negative women. *Journal of the National Cancer Institute*. 1999 Feb; 91(3).
146. Rohner E, Bütikofer L, Schmidlin K, Sengayi M, Maskew M, et al. Cervical cancer risk in women living with HIV across four continents: A multicohort study. *International journal of cancer*. 2019 Jun; In Press.
147. World Health Organization. WHO Director-General calls for all countries to take action to help end the suffering caused by cervical cancer. [Online].; 2018 [cited 2019 Aug 14. Available from: <https://www.who.int/reproductivehealth/call-to-action-elimination-cervical-cancer/en/>.
148. UNAIDS. 90–90–90 - An ambitious treatment target to help end the AIDS epidemic. [Online].; 2017 [cited 2019 Aug 14. Available from: <https://www.unaids.org/en/resources/documents/2017/90-90-90>.
149. Swanson M, Ueda S, Chen LM, Huchko MJ, Nakisige C, Namugga J. Evidence-based improvisation: Facing the challenges of cervical cancer care in Uganda. *Gynecologic oncology reports*. 2018 Jan; 24.
150. Wellcome. Chapter 5: Attitudes to vaccines - Wellcome Global Monitor 2018. [Online].; 2018 [cited 2019 Aug 14. Available from: <https://wellcome.ac.uk/reports/wellcome-global-monitor/2018/chapter-5-attitudes-vaccines>.
151. Black E, Richmond R. Prevention of Cervical Cancer in sub-Saharan Africa: The Advantages and Challenges of HPV Vaccination. *Vaccines (Basel)*. 2018 Sep; 6(3).
152. Ekwunife OI, Lhachimi SK. Cost-effectiveness of Human Papilloma Virus (HPV) vaccination in Nigeria: a decision analysis using pragmatic parameter estimates for cost and programme coverage. *BMC health services research*. 2017 Dec; 17(1).
153. Viviano M, DeBeaudrap P, Tebeu PM, Fouogue JT, Vassilakos P, Petignat P. A review of screening strategies for cervical cancer in human immunodeficiency virus-positive women in sub-Saharan Africa. *International Journal of Women's Health*. 2017 Feb; 9.
154. Runge AS, Bernstein ME, Lucas AN, Tewari KS. Cervical cancer in Tanzania: A systematic review of current challenges in six domains. *Gynecologic Oncology Reports*. 2019 Aug; 29.
155. Parham GP, Mwanahamuntu MH, Kapambwe S, Muwonge R, Bateman AC, et al. Population-level scale-up of cervical cancer prevention services in a low-resource setting: development, implementation, and evaluation of the cervical cancer prevention program in Zambia. *PLoS One*. 2015 Apr; 10(4).
156. Saidu R, Moodley J, Tergas A, Momberg M, Boa R, et al. South African women's perspectives on self-sampling for cervical cancer screening: A mixed-methods study. *The South African Medical Journal*. 2019 Jan; 109(1).
157. Fall NS, Tamalet C, Diagne N, Fenollar F, Raoult D, Sokhna C, Lagier JC. Feasibility, Acceptability, and Accuracy of Vaginal Self-Sampling for Screening Human Papillomavirus Types in Women from Rural Areas in Senegal. *The American journal of tropical medicine and hygiene*. 2019 Jun; 100(6).
158. Arbyn M, Smith SB, Temin S, Sultana F, Castle P. Detecting cervical precancer and reaching underscreened women by using HPV testing on self samples: updated meta-analyses. *The BMJ*. 2019 Dec; 2018(363).
159. White HL, Meglioli A, Chowdhury R, Nuccio O. Integrating cervical cancer screening and preventive treatment with family planning and HIV-related services. *International journal of gynaecology and obstetrics*. 2017 Jul; 138 Suppl.
160. UNITAID. Unitaid and CHAI sign grant to prevent cervical cancer deaths. [Online].; 2019 [cited 2019 May 17. Available from: <https://unitaid.org/news-blog/unitaid-and-chai-sign-grant-to-prevent-cervical-cancer-deaths/#en>.
161. PEPFAR. Renewed Partnership to Help End AIDS and Cervical Cancer in Africa. [Online].; 2018 [cited 2019 Aug 14. Available from: <https://www.pepfar.gov/press/releases/281984.htm>.
162. Johnston C, Ng JS, Manchanda R, Tsunoda, Chuang L. Variations in gynecologic oncology training in low (LIC) and middle income (MIC) countries (LMICs): Common efforts and challenges. *Gynecologic Oncology Reports*. 2017 May; 20(2017).
163. Bing EG, Parham GP, Cuevas A, Fisher B, Skinner J, Mwanahamuntu M, Sullivan R. Using Low-Cost Virtual Reality Simulation to Build Surgical Capacity for Cervical Cancer Treatment. *Journal of global oncology*. 2019 May; 5.
164. Crisp N, Chen L. Global survey of health professionals. *New England Journal of Medicine*. 2014 Mar; 370(10).
165. Awefeso, N. Improving health workforce recruitment and retention in rural and remote parts of Nigeria. *Rural Remote Health*. 2010 Jan-Mar; 10(1).
166. Dovlo D. Migration of nurses from sub-Saharan Africa: a review of issues and challenges. *Health services research*. 2007 Jun; 42(3 Pt2).
167. Pan African Women's Association of Surgeons. Pan African Women's Association of Surgeons. [Online].; 2019 [cited 2019 Aug 22. Available from: <https://africanwomensurgeons.org/>.
168. Parkin DM, Ferlay J, Jemal A, Borok M, Manraj SS, et al. Cancer in sub-Saharan Africa (IARC Scientific Publication No. 167). [Online].; 2018 [cited 2019 Aug 14. Available from: <https://publications.iarc.fr/Book-And-Report-Series/Iarc-Scientific-Publications/Cancer-In-sub-Saharan-Africa-2018>.
169. Soerjomataram I, Cabaasag C, Fidler M, Miranda A, Swaminathan R, et al. SURVCAN: Cancer Survival in Countries in Transition. [Online].; 2019 [cited 2019 Aug 14. Available from: <http://survival.iarc.fr/Survcn/en/>.
170. Middleton DRS, Bouaoun L, Hanisch R, Bray F, Dzamalala C, et al. Esophageal cancer male to female incidence ratios in Africa: A systematic review and meta-analysis of geographic, time and age trends. *Cancer epidemiology*. 2018 Apr; 53.
171. Joko-Fru WY, Miranda-Filho A, Soerjomataram I, Egue M, Akele-Akpo MT, et al. Breast cancer survival in sub-Saharan Africa by age, stage at diagnosis and human development index: A population-based registry study. *International journal of cancer*. 2019 May; In press.
172. Odutola M, Chokunonga E, Pineros M, Liu B, Jemal A. Essential TNM – Evaluation of a training exercise in Sub Saharan Africa. *Journal of registry management*. 2019 Spring; 46(1).
173. World Health Organization. Assessing national capacity for the prevention and control of NCDs: report of the 2010 global survey. [Online].; 2012 [cited 2019 Aug 14. Available from: https://www.who.int/chp/knowledge/national_prevention_ncds/en/.
174. Pearlman P VCSTMSLKB. Multi-stakeholder Partnerships: Breaking Down Barriers to Effective Cancer-Control Planning and Implementation in Low- and Middle-Income Countries. *Science and diplomacy*. 2016 Mar; 5(1).
175. Arora S, Kalishman S, Dion D, Thornton K, et al. Partnering urban academic medical centers and rural primary care clinicians to provide complex chronic disease care. *Health affairs*. 2011 Jun; 30(6).
176. Scallan E, Davis S, Thomas F, Cook C, Thomas K, Valverde P, et al. Supporting Peer Learning Networks for Case-Based Learning in Public Health: Experience of the Rocky Mountain Public Health Training Center With the ECHO Training Model. *Pedagogy in Health Promotion*. 2017 May; 3(1 suppl).
177. World Health Organization. Universal health coverage. Preparation for the high-level meeting of the United Nations General Assembly on universal health coverage. Report by the Director-General (A72/14). [Online].; 2019 [cited 2019 Aug 14. Available from: http://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_14-en.pdf.
178. World Health Organization. Sexual and reproductive health - Cervical cancer. [Online].; 2019 [cited 2019 Aug 14. Available from: <https://www.who.int/reproductivehealth/topics/cancers/en/>.
179. Worldometers. African countries by population. [Online].; 2019 [cited 2019 Aug 14. Available from: <https://www.worldometers.info/population/countries-in-africa-by-population/>.
180. Fleming K. Pathology and cancer in Africa. *ecancer medical science*. 2019 Jun; 13(945).
181. Martei YM, Chiyapo S, Grover S, Hanna C, Dryden-Peterson S, Pusoentsi M, Shulman LN, Tapela N. Methodology to Forecast Volume and Cost of Cancer Drugs in Low- and Middle-Income Countries. *Journal of Global Oncology*. 2018 Sep; 4.
182. Eggebraaten T, Urman A, Mangan J, Wang C-K, Suarez Saiz FJ. ChemoQuant: A novel approach to address the current chemotherapy supply problems in low resource countries. *Journal of Clinical Oncology*. 2018 Jun; 15_suppl.
183. Osegbe DN. Prostate cancer in Nigerians: facts and nonfacts. *The Journal of urology*. 1197 157; 157(4).
184. Azubuike SO, Muirhead C, Hayes L, McNally R. Rising global burden of breast cancer: The case of sub-Saharan Africa (with emphasis on Nigeria) and implications for regional development: A review. *World Journal of Surgical Oncology*. 2018 Mar; 16(1).
185. Adeloye D, Sowunmi OY, Jacobs W, David RA, Adeosun AA, et al. Estimating the incidence of breast cancer in Africa: a systematic review and meta-analysis. *Journal of global health*. 2018 Jun; 8(1).
186. Denslow SA, Rositch AF, Firnhaber C, Ting J, Smith JS. Incidence and progression of cervical lesions in women with HIV: a systematic global review. *International journal of STD and AIDS*. 2014 Mar; 25(3).
187. Omenge Orang'o E, Liu T, Christoffersen-Deb A, Itsura P, Oguda J, et al. Use of visual inspection with acetic acid, Pap smear, or high-risk human papillomavirus testing in women living with HIV/AIDS for posttreatment cervical cancer screening: same tests, different priorities. *AIDS*. 2017 Jan; 31(2).
188. Price R, Makasa E, Hollands M. World Health Assembly Resolution WHA68.15: Strengthening Emergency and Essential Surgical Care and Anesthesia as a Component of Universal Health Coverage—Addressing the Public Health Gaps Arising from Lack of Safe, Affordable and Accessible Surgical and A. *World journal of surgery*. 2015 Sep; 39(9).



A MEMBERSHIP ORGANISATION
FIGHTING CANCER TOGETHER

Union for International Cancer Control

31 – 33 Avenue Giuseppe Motta 1202 Geneva, Switzerland

T +41 (0) 22 809 1811 F +41 (0) 22 809 1810 E info@uicc.org

www.uicc.org