GLOBAL INITIATIVE FOR CANCER REGISTRY DEVELOPMENT

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Cancer in Sub-Saharan Africa

Volume III

Edited by D.M. Parkin, A. Jemal, F. Bray, A.R. Korir, B. Kamaté, E. Singh, W.Y. Joko, M. Sengayi-Muchengeti, B. Liu and J. Ferlay

International Agency for Research on Cancer

World Health Organization

AFRICAN CANCER REGISTRY NETWORK
AFCRN
Answers for Cancer Control

Cancer in Sub-Saharan Africa

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Cover image: Lake Victoria where discussions about the third volume of ‘Cancer in sub-Saharan Africa’ took place.

Contents

List of tables

List of figures

Foreword

On 30 May 2017, health leaders from around the world attending the 70th World Health Assembly (WHA) in Geneva reaffirmed cancer control as a health and development priority by adopting resolution WHA 70.12, entitled "Cancer Prevention and Control in the Context of an Integrated Approach".

The resolution draws on targets set out in the Global Action Plan on NCDs and the Sustainable Development Goals (SDGs) to help make the case for increasing national action on cancer and sets out a number of actions for Member states to implement so as to reduce the burden of cancer in their respective countries. Cancer surveillance is essential to informing governments about cancer incidence and mortality, the impact of cancer control strategies and programmes and, more broadly, efforts towards the realization of Universal Health Coverage (UHC). Since the adoption of the WHA resolution, the International Agency for Research on Cancer (IARC) and the Union for International Cancer Control (UICC), together with the International Cancer Control Partnership (ICCP) which represents a group of organizations working to advance cancer control, are stepping up efforts to support the development, implementation and evaluation of national cancer control plans (NCCPs) informed by robust cancer surveillance data.

The Global Initiative for Cancer Registry Development (GICR) was launched by IARC in 2011 as a partnership with UICC and other international organizations. The overall objective of GICR is to coordinate actions to strengthen cancer surveillance data through increasing the availability and quality of population-based cancer registry (PBCR) information on the incidence, characteristics, and outcome of cancer. By doing so, GICR aids governments in obtaining the information needed to guide national cancer planning efforts, and the World Health Organization with a mechanism for supporting Member States in measuring cancer incidence as a core indicator within the NCD Global Monitoring Framework. The executive arm of GICR is its six Regional Hubs that directly support the countries in each designated region. Each Hub is designed to provide training, directed support through site visits and mentorship arrangements, analysis to produce scientific and policy reports that support cancer control, and the formation of regional networks to assist with developing the exchange of information among peers.

The African Cancer Registry Network (AFCRN), established in 2012, provides the Hub activities for the GICR in sub-Saharan Africa (SSA), acting as a consortium of all the PBCRs of the region that meet the designated criteria of validity and completeness of data collection (www.afcrn.org). The activities of the African network are guided by an advisory group (steering committee), comprising representatives of IARC and UICC, as well as the International Association of Cancer Registries (IACR), and the African regional office of the World Health Organization (WHO-AFRO).

This volume is testimony to the commitment of IARC and UICC to the recommendation in the WHA resolution "to collect high-quality population-based incidence and mortality data on cancer, for all age groups by cancer type, including measurements of inequalities, through population-based cancer registries, household surveys and other health information systems in order to guide policies and plans". It represents the fruits of the labours of the members of the Network over the past few years, bringing together their results in terms of the incidence of different cancers (by age group and sex) in the populations which they serve, for periods generally between 2010 and 2017. It is the third such compilation and expands the number of populations from which data are available from 25 (in Volume II, published by IARC in 2018 (Parkin et al., 2018)) to 31.

Alongside the well-known "Cancer Incidence in Five Continents" series, this monograph (like those from other GICR Hubs) is seen as an essential means of disseminating results from cancer registries, making the data available for the dual purposes of cancer control planning and cancer research.

However, our organizations are not only concerned with the analysis and publication of data on cancer; GICR is primarily about supporting the development of statistical infrastructure for health information, especially in low- and middle-income countries. This is achieved through capacity building programmes such as technology transfer, training courses and fellowships, and, not least, the networking of cancer registry professionals, resulting in the establishment (and maintenance) of a cadre of skilled technical experts in WHO member states. We perceive this as a vital role, empowering national governments to take control of monitoring cancer in their own populations and for the planning and evaluation of cancer services.

It is hoped that GICR and AFCRN can help to measurably improve the availability and quality of cancer registry data in SSA in the coming years, so that the surveillance map of a decade from now will be a clear advance on what we observe today.

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Coordination of the project was undertaken within the framework of AFCRN's activities. AFCRN is a Cancer Registration Programme of the International Network for Cancer Treatment and Research (INCTR). It is supported financially through The Challenge Fund, a UK-registered charity (charity number 1079181) that raises funds for INCTR projects. The Challenge Fund in turn receives donations to support cancer registry activities in low- and middle-income countries.[1] For this project in particular, the support of the American Cancer Society (Contract #50137) and the IARC collaborative research agreement (CRA/CSU/2018/8), is gratefully acknowledged.

AFCRN is the Regional Network Hub for Sub-Saharan Africa within the framework of the Global Initiative for Cancer Registry Development (GICR). GICR owes its success to the support of several international organizations that contribute to this common purpose (http://gicr.iarc.fr/Partners).

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CHAPTER 1
Introduction

Cancer is an increasing problem in Africa because of the ageing and growth of the population, as well as an increased risk of the disease due to changing prevalence of risk factors associated with social and economic transition (including smoking, alcohol, obesity, physical inactivity, and reproductive behaviours). The number of new cancer cases will more than double between 2018 and 2040 – faster than any other region of the world – simply because of demographic changes (Ferlay et al, 2018). The increase is likely to be even greater, given the ongoing urbanisation of Africa, with associated changes in lifestyles (Bray, 2014).

Despite this growing cancer burden, cancer continues to receive a relatively low public health priority in Africa, largely because of limited resources and other pressing public health problems, including communicable diseases such as Acquired Immune Deficiency Syndrome (AIDS) / Human Immunodeficiency Virus (HIV) infection, malaria, and tuberculosis. Another factor may be a general lack of awareness among policy makers, the general public, and international private or public health agencies, concerning the magnitude of the current and future cancer burden on the continent and its economic impact.

The World Health Organization has promoted the development of National Cancer Control Programmes in order to reduce the incidence and mortality of cancer and improve the quality of life of cancer patients in a particular country or state, through the systematic and equitable implementation of evidence-based strategies for prevention, early detection, treatment, and palliation, making the best use of available resources (WHO, 2002). This approach was endorsed by the World Health Assembly in 2017, which called on member states: "to develop, as appropriate, and implement national cancer control plans that are inclusive of all age groups; that have adequate resources, monitoring and accountability; and that seek synergies and cost-efficiencies with other health interventions", and, as part of this: "to collect high-quality population-based incidence and mortality data on cancer, for all age groups by cancer type, including measurements of inequalities, through population-based cancer registries, household surveys and other health information systems in order to guide policies and plans".

Although national statistics on incidence, mortality, and prevalence of 36 cancers are available from the Globocan 2018 database of the International Agency for Research on Cancer (IARC), it must be stressed that these are estimates, based on the best available data. Usually, these are statistics from one or more local cancer registries, while for 17 countries in Africa, the estimates are based on data from registries in neighbouring countries (Ferlay et al., 2019). Though these estimates provide a valuable overview of the likely magnitude of the cancer problem, they are not intended as a substitute for the continuous approaches to data recording from high-quality PBCRs and vital registration systems. As part of NCD planning, a cancer surveillance program built around a PBCR provides a means for governments to effectively monitor progress in operationalizing a national cancer control program, as well as to evaluate individual cancer control activities (Parkin, 2012; Pineros et al., 2017)

In 2012, IARC established the Global Initiative for Cancer Registry Development in Low- and Middle-Income Countries (GICR) (http://gicr.iarc.fr/en/) in 2011 as a coordinated, multi-partner approach to improving availability of the data necessary to drive policy and reduce the burden and suffering due to cancer. GICR works through a group of Regional Hubs, which are tasked with providing expertise and support to registries in their respective regions.

In 2012, the African Cancer Registry Network (AFCRN) was formally inaugurated as a consortium of registries with an agreed set of membership criteria (http://afcrn.org/membership/membership-criteria), becoming the Regional Hub for sub-Saharan Africa in the same year. AFCRN is a project of the Cancer Registry Programme of the International Network for Cancer Treatment and Research (INCTR). The aims of AFCRN are to improve the effectiveness of cancer surveillance in sub-Saharan Africa by providing expert evaluation of current problems and technical support to remedy identified barriers, with long-term goals of strengthening health systems and creating research platforms for the identification of problems, priorities, and targets for intervention.

This volume represents one of the agreed Hub activities, which is to provide regional reports on cancer, to complement IARC's role in publishing international cancer incidence data in its *Cancer Incidence in Five Continents* series.

This is not the first volume presenting statistics on cancer incidence from the continent. In 2003, the IARC Scientific Publication, "Cancer in Africa", was published (Parkin et al., 2003) as a description of all recent and historical cancer registration activity in Africa, including data published in Volumes I – VIII of *Cancer Incidence in Five Continents*, as well as from other sources. A second publication - Cancer in sub-Saharan Africa - published by IARC in 2018, brought together the results from 25 cancer registries in 20 sub-Saharan African countries, for varying time periods, generally around the year 2010 (Table 1). The present volume (Volume III) includes results

from 31 cancer registries in 22 countries, eight of which are new (not appearing in Volume II). For those registries whose results appear in Volume II, the data are usually presented for a succeeding time period (Table 1). For two registries included in Volume II (Blantyre (Malawi) and Conakry (Guinee)), the editors judged that, in view of the deterioration in quality, it would have been misleading to present more recent data. The individual sections from each registry include a commentary on any factors that should be considered in interpreting the observations.

As previously, it is hoped that the compiled data in this volume will be of value to those interested in the pattern and evolution of cancer in Africa, as a means of elucidating, confirming, and evaluating causes of the disease. In addition, for those concerned with determining priorities for preventive and curative programs at regional or national levels, evaluating whether goals are reached in the target groups, and determining what has been achieved in relation to resources expended, they will be an invaluable resource.

Although WHO reports that 60% of the 46 countries of sub-Saharan Africa (members of the African region of the World Health Organisation) had population-based cancer registries in 2015 (WHO, 2016), in January 2019 only 24 countries had registries that qualified as members of AFCRN (membership requires that registries meet minimum criteria for completeness of cases ascertainment (> 70% of the cases expected in the area being registered)). In this volume, we included results from 22 of them (and, of them, we considered that only 18 could produce incidence rates that were a reasonably accurate reflection of the true cancer profile (see Chapter 2).

It is to be hoped that IARC, through GICR and AFCRN, as its regional Hub, will be able to improve this situation in the years to come. They will need the support of international donors with a concern for developing health surveillance systems, recognising the importance of developing local capacity for generating, analysing, and interpreting data on cancer occurrence and outcome.

Table 1. Registries contributing to the Volumes II and III

REGION	COUNTRY	REGISTRY	VOLUME II	VOLUME III	
Africa Central	Congo	Brazzaville	2009-2013	1	2014-2016
Africa East	Ethiopia	Addis Ababa	2012-2013	2	2014-2016*
	France	Reunion	2011	3	2011-2013
	Kenya	Eldoret	2008-2011	4	2012-2016*
	Kenya	Nairobi	2007-2011	5	2012-2014
	Malawi	Blantyre	2008-2009	-	-
	Mauritius		2010-2012	6	2013-2015
	Mozambique	Beira	2009-2013	7	2014-2017
	Mozambique	Maputo	-	8	2015-2017
	Seychelles		2009-2012	9	2013-2017
	Uganda	Gulu	-	10	2013-2015
	Uganda	Kyadondo	2008-2012	11	2011-2013
	Tanzania	Mwanza	-	12	2016-2017
	Tanzania	Kilimanjaro	-	13	2013-2017#
	Zambia	Lusaka	-	14	2011-2015
	Zimbabwe	Bulawayo	2011-2013	15	2013-2015
	Zimbabwe	Harare	2010-2012	16	2013-2015
Africa South	Botswana		2005-2008	17	2009-2013#
	E swatini		-	18	2016-2017*
	Namibia		2009	19	2013-2015
	South Africa		2007	20	2010-2013
	South Africa	Eastern Cape	2008-2012	21	2013-2016
Africa West	Benin	Cotonou	2013-2015	22	2014-2016
	Cote d'Ivoire	Abidjan	2012-2013	23	2014-2015
	Gambia		2007-2011	24	2012-2014#
	Ghana	Kumasi	-	25	2014-2016#
	Guinea	Conakry	2001-2010	-	-
	Mali	Bamako	2010-2014	26	2015-2017
	Niger	Niamey	2006-2009	27	2013-2017#
	Nigeria	Abuja	2013	28	2013-2016*
	Nigeria	Calabar	2009-2013	29	2016-2017
	Nigeria	Ekiti	-	30	2013-2017*
	Nigeria	Ibadan	2006-2009	31	2015-2017#

Tables appear as numbers of cases; no incidence rates were calculated

* Text includes notes on data quality: observed rates lower than expected

CHAPTER 2
Processing and presentation of the data

PROCESSING OF THE DATA

The data used to create the tables presented in this book were extracted from the database of the African Cancer Registry Network. A listing of individual anonymous cases with the following variables was extracted for each contributor:

1. a registration number which identifies the patient or the case
2. sex
3. ethnic group or race (optional)
4. age
5. date of incidence
6. site of the tumour
7. morphology of the tumour
8. behaviour of the tumour
9. basis of diagnosis

All data had been coded according to the *International Classification of Diseases for Oncology, 3rd edition* (ICD-O-3) (Fritz et al., 2000). They were processed by the IARC software packages DEPedits and IARCcrgTools (Ferlay et al., 2005) for verification. After validation, the records were converted to ICD-10 (WHO, 1992) for presentation purposes. Since all contributing registries used the CanReg system, a software program developed at IARC and designed for population-based cancer registries, the data had already been submitted to the same edits as those performed by the IARCcrgTools programs. This simplified and speeded up the data validation process.

PRESENTATION OF THE DATA

The main sets of tables in this book are in two formats:

- Tables that present data on age-specific and age-standardized incidence for a cancer registry.
- Tables that show the distribution of cases, by sex and age group, without incidence rates.

The latter format is used when, for various reasons, there is doubt as to the validity of calculated incidence rates, as explained in the sections devoted to the registry concerned.

In addition, *Summary Tables,* which present the numbers of cases, and age standardised rates, by cancer type (anatomical site), and *tables of indicators of data quality,* are presented in Chapters 6 and 5, respectively.

Tables of incidence by registry

Population-at-risk: The AFCRN database contains data for each registry on population at risk by sex and age for as many years as possible. A denominator corresponding to the period of the incident cases (person-years at risk) was estimated based on this information, with intercensal estimates and postcensal projections, as necessary. For each registry, the average annual population at risk for the period analysed is presented as a population pyramid, within the description of the registry. The numbers (by 5-year age group) are shown at the foot of the tables for each registry.

The age-specific incidence table: The numbers given in the body of the tables are the number of cancer cases registered during the corresponding period by sex, site and age-group, along with summary rates of incidence. An example is given in Table 2. The column headings are defined as below:

Site: A shortened version of the full ICD-10 title describing each site or site grouping.

All ages: The total number of cases (all ages) by site.

Age unk: The number of cases of unknown age. They are included in the total number of cases and in the calculation of the crude rate. They are also taken into account in the computation of the world age-standardized and cumulative incidence rates.

MV (%): This is the proportion of cases known to be diagnosed by a microscopic method (either histology or cytology) and expressed as a percentage of all cases registered, including cases of unknown age or of unknown basis of diagnosis.

Age group (0-, 5-, , ,75+ years): The number of cancer cases registered by age-groups.

Crude rate: The crude average annual incidence rate, calculated by dividing the total number of cases (including unknown age) by the corresponding population at risk (all males or all females) and expressed per 100,000 person-years.

%: The proportional frequency of each site to the total of all sites excluding C44 (other skin).

CR 74: The cumulative incidence rate up to age 74 years. This is the sum over each year of age of the age-specific incidence rates, taken from birth to age 74. The cumulative rates are computed using five-year age-bands 0-, 5-, 10-, ..., 70-, and have been adjusted to account for cases of unknown age (Parkin et al., 1997).

ASR (W): The world age-standardized incidence rate. It is calculated by the direct method, using the world standard population and five-year age-bands 0-, 5-, 10-, ..., 74-, 75+, and has been adjusted to account for cases of unknown age (Bray and Ferlay, 2014).

ICD-10: The ICD-10 code(s) corresponding to the site or group of sites given in the left-hand column.

Average annual population: The average annual population at risk in each 5 year age group**.** To calculate the annual incidence rate per 100,000 for a particular age group, cancer site and sex, the number of cancer cases should be divided by the average annual population and the number of years for which the data are presented, then multiplied by 100,000.

The Asterisk

The tables for 6 of the cancer registries are marked with an asterisk *. The comments on the results shown in these tables indicate why the editors considered that the incidence rates should be interpreted with caution. This is generally because there were doubts about the accuracy of the population at risk, or the completeness of registration for all or certain sites.

Tables of numbers and percentage frequency, by registry

The format of these tables is much the same, EXCEPT that the columns for the incidence rates (Crude rate, CR74, and ASR(W)) are omitted, as is the Average annual population at the foot of the table.

Data quality tables

These appear in Chapter 5. Two indicators of data quality are presented.

1. The percentage of cases for the given site that were morphologically verified (MV).
2. The percentage of cases for the given site which had been registered in the basic of information on the death certificate only (DCO). As described in the relevant registry descriptions, not all of the cancer registries have access to routinely processed death registry data.

Summary tables

The summary tables appear in Chapter 6. They present the summary incidence (number of cases, world age-standardized and cumulative rates), by sex and tumour type. There is a table for each site or grouping of sites presented in the age-specific tables. The cancer registries are grouped by geographical area.

Table 2. Example of an age-specific incidence table

Country, Registry (period)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	16	0	94	6	-	-	-	-	-	-	-	2	1	5	3	2	3	-	-	-	1.0	1.4	0.16	**1.6**	C00-06
Salivary gland	4	0	75	25	-	-	-	-	-	1	-	-	-	1	-	-	-	-	2	-	0.3	0.3	0.10	**0.5**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	9	0	78	11	-	-	-	-	-	-	-	-	2	1	2	3	1	-	-	-	0.6	0.8	0.09	**0.9**	C09-10, C12-14
Oesophagus	68	0	72	15	-	-	-	-	-	1	-	1	5	7	14	13	7	8	7	5	4.4	5.8	0.99	**7.7**	C15
Stomach	20	0	70	30	-	-	-	-	-	1	-	1	1	-	3	1	2	3	5	3	1.3	1.7	0.37	**2.5**	C16
Colon	16	0	81	19	-	-	-	-	1	1	3	2	1	1	1	-	2	-	2	2	1.0	1.4	0.17	**1.5**	C18
Rectum	16	0	75	25	-	-	-	-	-	2	1	1	-	3	-	2	1	3	1	2	1.0	1.4	0.20	**1.7**	C19-20
Anus	2	0	50	50	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	0.1	0.2	0.03	**0.2**	C21
Liver	151	0	60	30	-	-	1	5	4	8	19	16	10	11	12	18	15	10	11	11	9.8	13.0	1.65	**14.1**	C22
Gallbladder etc.	2	0	100	0	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	0.1	0.2	0.02	**0.2**	C23-24
Pancreas	8	0	50	38	-	-	-	-	-	1	-	1	-	1	1	2	1	1	-	-	0.5	0.7	0.09	**0.8**	C25
Larynx	13	0	92	8	-	-	-	-	-	1	-	-	-	-	4	2	3	1	1	1	0.8	1.1	0.18	**1.4**	C32
Trachea, bronchus, and lung	30	1	57	37	-	-	-	-	-	2	1	1	1	2	6	3	8	2	2	1	1.9	2.6	0.40	**3.2**	C33-34
Bone	7	0	86	14	-	-	-	3	2	-	-	1	-	-	-	-	1	-	-	-	0.5	0.6	0.03	**0.4**	C40-41
Melanoma of skin	3	0	100	0	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	0.2	0.3	0.01	**0.3**	C43
Non-melanoma skin	38	0	95	5	-	-	-	3	4	2	3	7	1	4	3	-	1	5	1	4	2.5	3.3	0.33	**3.4**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	311	0	61	11	4	4	3	6	12	42	60	50	43	21	20	15	9	13	2	7	20.1	26.7	2.14	**23.3**	C46
Connective and soft tissue	21	0	90	5	-	1	2	2	4	1	-	1	1	1	1	4	1	1	-	1	1.4	1.8	0.14	**1.6**	C47, C49
Breast	10	0	50	50	-	-	-	-	-	-	-	2	1	-	1	1	2	-	1	2	0.6	0.9	0.11	**1.0**	C50
Penis	15	0	87	7	-	-	-	-	-	-	-	5	2	-	-	3	2	1	-	2	1.0	1.3	0.13	**1.4**	C60
Prostate	185	0	77	19	-	-	-	-	1	1	-	1	3	3	11	20	35	31	33	46	12.0	15.9	3.10	**23.5**	C61
Testis	2	0	50	0	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C62
Kidney and renal pelvis	6	0	33	33	3	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.4	0.5	0.02	**0.4**	C64-65
Bladder	23	0	74	22	-	-	-	-	2	1	1	-	5	1	1	3	5	1	2	1	1.5	2.0	0.28	**2.3**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C66, C68
Eye	28	0	96	4	2	-	-	-	-	1	5	7	7	2	-	1	1	-	1	1	1.8	2.4	0.20	**2.2**	C69
Brain and nervous system	5	0	20	60	-	1	1	-	-	-	-	1	-	-	2	-	-	-	-	-	0.3	0.4	0.03	**0.4**	C70-72
Thyroid	8	0	88	0	-	-	-	-	1	1	1	-	1	-	-	3	-	1	-	-	0.5	0.7	0.08	**0.6**	C73
Hodgkin lymphoma	7	0	100	0	-	-	1	-	-	2	-	2	1	-	-	1	-	-	-	-	0.5	0.6	0.04	**0.5**	C81
Non-Hodgkin lymphoma	49	0	69	29	3	-	1	1	4	1	6	8	5	3	8	4	3	-	1	1	3.2	4.2	0.37	**3.9**	C82-86, C96
Multiple myeloma	7	1	86	0	-	-	-	-	-	-	2	-	-	-	-	4	-	-	-	-	0.5	0.6	0.06	**0.5**	C90
Lymphoid leukaemia	13	0	69	15	2	-	2	-	3	-	1	-	-	-	-	3	-	1	1	-	0.8	1.1	0.13	**1.0**	C91
Myeloid leukaemia	8	0	50	12	1	1	-	2	-	1	1	1	-	-	-	-	-	-	-	1	0.5	0.7	0.02	**0.5**	C92-94
Leukaemia, unspecified	7	0	0	100	1	-	-	-	1	1	-	2	1	-	-	1	-	-	-	-	0.5	0.6	0.04	**0.5**	C95
Other and unspecified	54	0	72	26	-	1	2	-	3	2	5	3	5	2	4	5	11	5	2	4	3.5	4.6	0.58	**5.2**	O&U
All sites	1164	2	70	19	16	10	14	22	42	75	110	119	99	69	99	114	114	88	75	96	75.3	100.0	12.31	**109.2**	C00-96
All sites except C44	1126	2	69	19	16	10	14	19	38	73	107	112	98	65	96	114	113	83	74	92	72.8	96.7	11.97	**105.9**	C00-96 exc. C44
Average annual population					56290	58070	53893	59495	61930	52582	41349	30854	23143	17756	17305	15316	11482	6477	3914	5605	515460				

CHAPTER 3
Editorial process

The purpose of this volume is to present incidence rates for different types of cancer from the population based cancer registries of sub-Saharan Africa. These registries are all members of the African Cancer Registry Network (AFCRN) and, as such, meet minimum criteria for the quality of their data. Specifically, the member registries should be collecting information on at least 70% of the cancer cases in their target population (www.afcrn.org/membership/memberhip-criteria).

Nevertheless, the quality of the data from the members is not necessarily constant from one year to the next, nor is the completeness (or validity) of the data on cancer cases the same for the different types of cancers. Therefore, in order to present incidence rates which are reasonably comparable, the datasets were submitted to an editorial process in order to:

- decide which period (years) of data should be presented
- decide whether the calculated rates met the criterion of 70% completeness (for all cancers combined), or were comparable with those presented in the Cancer in sub-Saharan Africa (CiSSA), Volume II.
- provide at least some indication of possible problems in interpreting the published rates.

The methods used in this editorial process are described below, and the results of the evaluations are incorporated into the "Comment" section in the description of the registry results, and in the 'data quality' tables (Chapter 5) showing the results for two indicators: percentage of cases (by site & sex) with morphological verification of diagnosis (MV%); percentage of cases (by site & sex) registered from information on a death certificate only (DCO%).

Where there was concern about overall completeness of registration falling below 70%, or of differing markedly from the period presented in Volume II, Tables showing numbers of cases registered, by site, sex, and age group, without incidence rates, are presented for the registry concerned.

ELEMENTS OF THE EVALUATION

The practical aspects and techniques of evaluating cancer registry data quality have been examined in a two-part review (Bray and Parkin, 2009; Parkin and Bray, 2009), and were briefly described – with an emphasis on low- and middle- income settings – in the recent IARC Technical Publication No. 43: Planning and Developing Population-based Cancer Registration in Low- and Middle-income Settings (Bray et al., 2014).

The Editors of this volume attempted to evaluate the completeness and validity of each registries contribution, using a specially designed set of Editorial Tables, based upon those used in the IARC's "Cancer Incidence in Five Continents" series.

Changes in the completeness of registration may lead to the appearance of unexpected or implausible incidence trends within a registry's dataset. Therefore, one of the key editorial tables (see **Editorial Table 1**) lists the number of new cases registered by site per calendar year (and the corresponding percentage of the total number of cases), broken down by sex. At the bottom of the column for 'both sexes' is the average number of cases registered per month.

In some cases, these visual checks may suggest potential problems with the registration process (or the source population data) during the registration period.

An accompanying bar chart that provides a visual check of the amount of variation in the total numbers of cases per month (at all sites and in both sexes) over the time period covered.

The choice of years for the main analysis was based on this Table. A more limited time period therefore appears in subsequent editorial tables, and in the final ('Main') tables that accompany the entry for each registry.

Editorial Table 2 which is generated separately for males and females, presents average annual incidence rates (per 100 000 person-years) by site and age group, as well as summary rates for the period selected, based on Editorial Table 1.

The table shows, for each site, the number of cases registered with unknown age (column 3, "Age Unk") and the percentage of cases registered that were microscopically verified (MV%).

The definition of microscopically verified cases includes histologically confirmed cases, cases diagnosed on the basis of exfoliative cytology specimens, and cases of leukaemia diagnosed on the basis of haematological examination (without examination of bone marrow). The main use of MV% as an indicator of data quality is as a measure of validity, but a very high proportion of cases diagnosed by histology, cytology, or haematology – higher than might reasonably be expected – may also suggest that a registry is over-reliant on pathology laboratories as a source of information and is failing to find cases diagnosed by other means. Editorial Table 4 (q.v.) also includes a column showing observed MV% values for 21 sites (and the total of all sites) in males and females. In this MV% column, any observed values that are significantly greater than or less than the expected value (an average for 28 cancer registries in sub-Saharan Africa) are shown in bold and flagged

with a greater-than symbol (>) or a less-than symbol (<), respectively.

At the foot of Editorial Table 2 is a comparison of the incidence rates in the childhood age range (0-4, 5-9, 10-14) with a set of "standard" rates. The incidence rates of cancer (all types combined) within children tend to exhibit much less variability than do the incidence rates of cancer in adults, although there are some well-documented geographical and ethnic differences for certain childhood cancers. The possibility of under-enumeration (and duplicate registration) in this age range within the data was investigated by comparing incidence rates within the childhood age groups with the corresponding values from Volume X of Cancer Incidence in Five Continents.

Editorial Table 3 shows a set of age-specific incidence (per 100 000 person-years) curves for 12 sites by sex. These were examined to detect any abnormal fluctuations in the anticipated patterns, such as an unexpected drop in the rate of increase in incidence in older age groups, which may be indicative of under-ascertainment within these groups (although there can also be other explanations). These curves can also reveal problems with the source files used to determine the size of the populations at risk in the various age groups.

The main purpose of **Editorial Table 4** is to investigate the possibility of incomplete registration by comparing observed incidence rates with expected values, calculated using data from registries in the same region. The table presents the age-standardized incidence rates (and their standard errors) for 24 sites (and the total for all sites) in males and females, along with the ratio of the observed value to the expected value (O/E). If the observed age-standardized rate is significantly different from the expected value for the corresponding country or region, the O/E is shown in bold and flagged with a greater-than symbol (>) if the value is higher than expected or a less-than symbol (<) if the value is lower than expected. The statistical test used for this comparison is decided in Cancer Incidence in Five Continents Volume VIII (Parkin and Plummer, 2002). The standard values of the ASR were those for the same region of Africa (Eastern, Central, Southern, Western) in Globocan 2018 (Ferlay et al., 2019). In some cases, deviation from regional standards may be the result of specific local variations in the prevalence and distribution of risk factors, or in the presence or intensity of screening for certain cancers, but systematic discrepancies (i.e. those seen for several different sites) suggest the possibility of underregistration (or overregistration – e.g. due to the in the inclusion of duplicate records).

As noted above (Editorial Table 2) percentage of cancers morphologically verified (MV%) is shown for each site, with an indication as to whether this percentage in greater than (>) or less than (<) that expected on the basis of the mean value observed in 28 registries (noted at the foot of the table). The statistical test used is described in Parkin and Plummer 2002.

For these registries with access to death certificates, and who use these as a source of information on new cancer cases, the column "DCO(%)" indicates the percentage of cases at the given site for which registration was based on information only on a death certificate (and for which no other information could be traced, in hospital or pathology records). Only some of the registries use death certificates to trace new cancer cases, and not all include DCO cases in their database – as described in the individual registry sections. For these that do use death certificates, an elevated DCO% may indicate incomplete registration (since it suggests that cancer cases are not being identified before they die). However, the DCO% must be interpreted in the context of local circumstances. In some countries, the quality of death certificates may be very poor, with many deaths erroneously attributed to cancer, and registries may have difficult tracing these notifications back to a hospital capable of confirming (or contradicting) the death certificate statement.

Editorial Table 1. Stability of the incidence rates (the number of new cases) over time

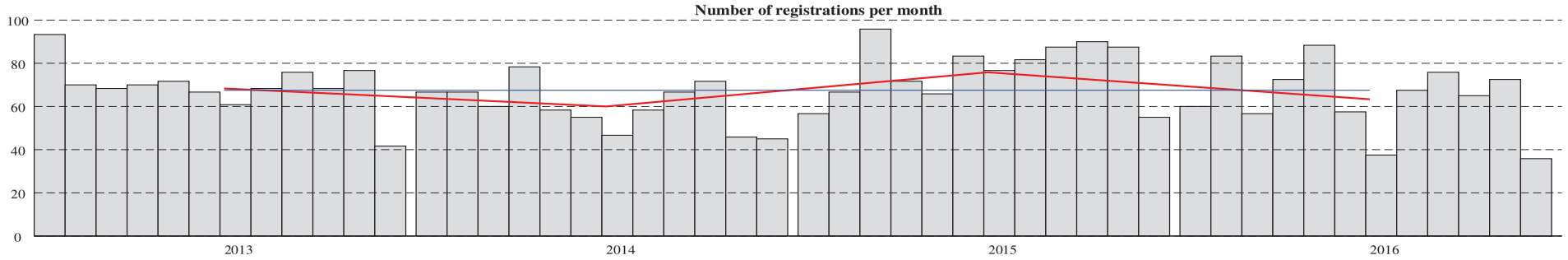
Country, Registry (period)

Cancer in Africa Volume III (editorial table 1)
Number of cases in major diagnosis groups in single calendar years of observation

SITE	MALE 2013	2014	2015	2016	Total	EAPC
Lip, oral cavity and pharynx (C00–14)	30 (9.7)	18 (6.5)	13 (4.4)	19 (8.5)	80 (7.2)	–15.60
Digestive organs (C15–26)	107 (34.6)	96 (34.4)	108 (36.9)	56 (25.1)	367 (33.2)	–16.68
Respiratory organs (C30–39)	22 (7.1)	18 (6.5)	31 (10.6)	30 (13.5)	101 (9.1)	15.88
Bone, cartilage, melanoma (C40–43)	4 (1.3)	5 (1.8)	2 (0.7)	1 (0.4)	12 (1.1)	–39.80
Kaposi sarcoma (C46)	24 (7.8)	26 (9.3)	28 (9.6)	38 (17.0)	116 (10.5)	15.64
Male genital (C60–63)	83 (26.9)	79 (28.3)	69 (23.5)	36 (16.1)	267 (24.2)	–23.21
Urinary organs (C64–68)	5 (1.6)	4 (1.4)	2 (0.7)	8 (3.6)	19 (1.7)	7.43
Eye, brain, thyroid etc. (C69–75)	7 (2.3)	4 (1.4)	12 (4.1)	7 (3.1)	30 (2.7)	11.61
Haematopoietic (C81–96)	17 (5.5)	4 (1.4)	6 (2.0)	7 (3.1)	34 (3.1)	–20.20
Other and unspecified	10 (3.2)	25 (9.0)	22 (7.5)	21 (9.4)	78 (7.1)	23.34
All sites but skin (C00–96/C44)	309 (100.0)	279 (100.0)	293 (100.0)	223 (100.0)	1104 (100.0)	–8.88

SITE	FEMALE 2013	2014	2015	2016	Total	EAPC
Lip, oral cavity and pharynx (C00–14)	7 (1.3)	6 (1.4)	11 (1.7)	9 (1.6)	33 (1.5)	14.57
Digestive organs (C15–26)	147 (27.9)	108 (24.3)	121 (19.2)	104 (18.8)	480 (22.3)	–8.83
Respiratory organs (C30–39)	3 (0.6)	9 (2.0)	14 (2.2)	14 (2.5)	40 (1.9)	65.92
Bone, cartilage, melanoma (C40–43)	8 (1.5)	3 (0.7)	2 (0.3)	2 (0.4)	15 (0.7)	–36.65
Kaposi sarcoma (C46)	32 (6.1)	21 (4.7)	26 (4.1)	26 (4.7)	105 (4.9)	–4.01
Breast (C50)	55 (10.4)	48 (10.8)	67 (10.7)	80 (14.4)	250 (11.6)	15.69
Female genital (C51–58)	220 (41.7)	201 (45.3)	343 (54.5)	284 (51.3)	1048 (48.7)	13.89
Urinary organs (C64–68)	8 (1.5)	6 (1.4)	5 (0.8)	2 (0.4)	21 (1.0)	–35.22
Eye, brain, thyroid etc. (C69–75)	7 (1.3)	14 (3.2)	14 (2.2)	10 (1.8)	45 (2.1)	11.29
Haematopoietic (C81–96)	15 (2.8)	10 (2.3)	13 (2.1)	10 (1.8)	48 (2.2)	–9.10
Other and unspecified	25 (4.7)	18 (4.1)	13 (2.1)	13 (2.3)	69 (3.2)	–20.44
All sites but skin (C00–96/C44)	527 (100.0)	444 (100.0)	629 (100.0)	554 (100.0)	2154 (100.0)	5.11

SITE	BOTH SEXES 2013	2014	2015	2016	Total	EAPC
Lip, oral cavity and pharynx (C00–14)	37 (4.4)	24 (3.3)	24 (2.6)	28 (3.6)	113 (3.5)	–8.02
Digestive organs (C15–26)	254 (30.4)	204 (28.2)	229 (24.8)	160 (20.6)	847 (26.0)	–11.93
Respiratory organs (C30–39)	25 (3.0)	27 (3.7)	45 (4.9)	44 (5.7)	141 (4.3)	24.69
Bone, cartilage, melanoma (C40–43)	12 (1.4)	8 (1.1)	4 (0.4)	3 (0.4)	27 (0.8)	–38.44
Kaposi sarcoma (C46)	56 (6.7)	47 (6.5)	54 (5.9)	64 (8.2)	221 (6.8)	5.54
Breast (C50)	55 (6.6)	48 (6.6)	67 (7.3)	80 (10.3)	250 (7.7)	15.69
Female genital (C51–58)	220 (26.3)	201 (27.8)	343 (37.2)	284 (36.6)	1048 (32.2)	13.89
Male genital (C60–63)	83 (9.9)	79 (10.9)	69 (7.5)	36 (4.6)	267 (8.2)	–23.21
Urinary organs (C64–68)	13 (1.6)	10 (1.4)	7 (0.8)	10 (1.3)	40 (1.2)	–10.81
Eye, brain, thyroid etc. (C69–75)	14 (1.7)	18 (2.5)	26 (2.8)	17 (2.2)	75 (2.3)	9.97
Haematopoietic (C81–96)	32 (3.8)	14 (1.9)	19 (2.1)	17 (2.2)	82 (2.5)	–14.72
Other and unspecified	35 (4.2)	43 (5.9)	35 (3.8)	34 (4.4)	147 (4.5)	–2.89
All sites but skin (C00–96/C44)	836 (100.0)	723 (100.0)	922 (100.0)	777 (100.0)	3258 (100.0)	**0.24**
Average registrations per month	**70**	**60**	**77**	**65**		



Editorial Table 2. Annual Incidence per 100,000 by age group (years)

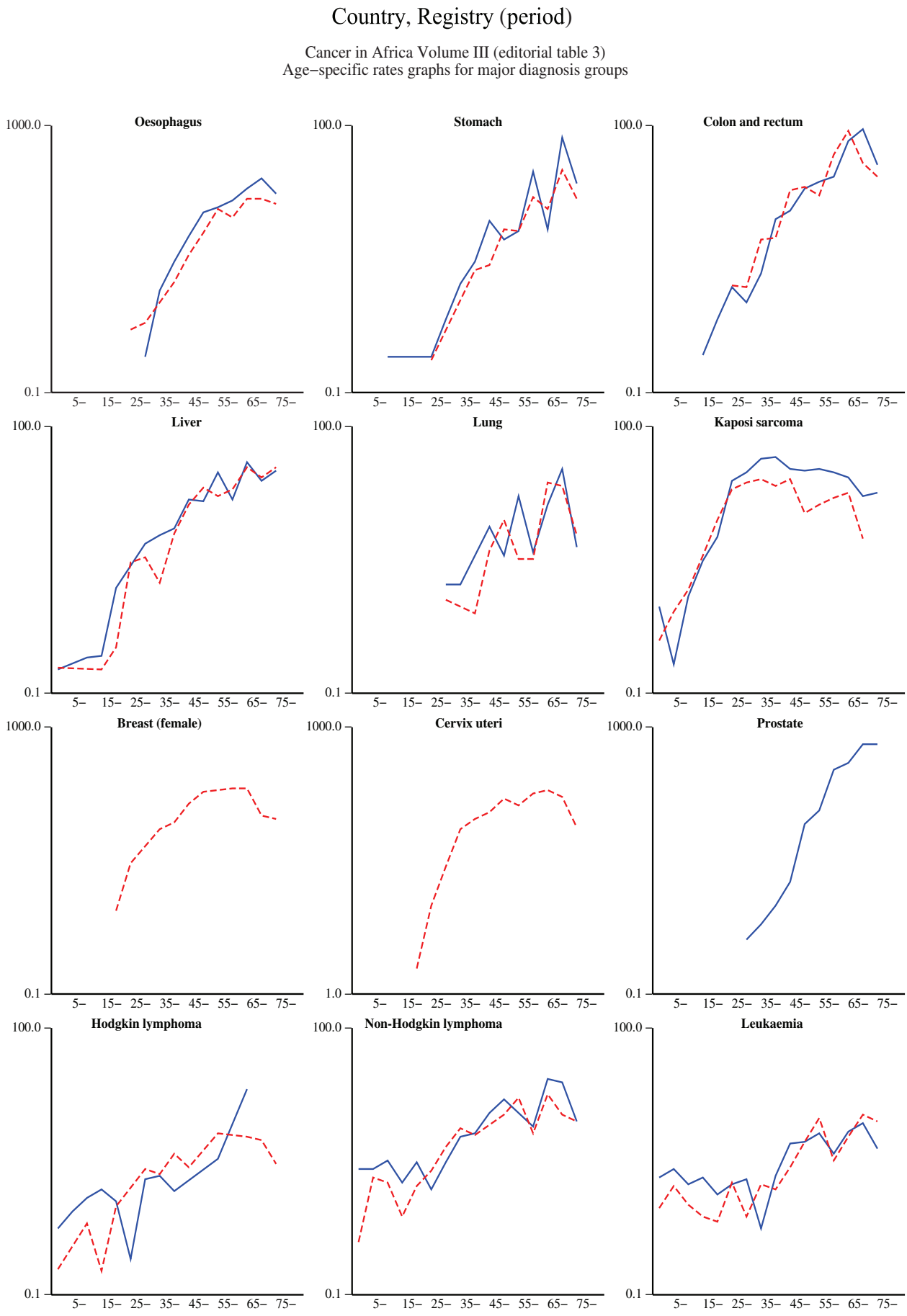
Country, Registry (2015–2017)

Cancer in Africa Volume III (editorial table 2)
ANNUAL INCIDENCE PER 100,000 BY AGE GROUP (YEARS) – MALE

SITE	ALL AGES	AGE UNK	0–	5–	10–	15–	20–	25–	30–	35–	40–	45–	50–	55–	60–	65–	70–	75+	CRUDE RATE	(%)	MV (%)	**ASR (W)**	*ICD (10th)*
Lip	0	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.0	0.0	–	**0.0**	*C00*
Tongue	6	0	–	–	–	–	–	–	–	–	–	3.0	–	5.1	6.9	–	–	–	0.4	0.5	83	**0.7**	*C01-02*
Mouth	10	0	–	–	–	–	–	–	–	2.0	1.3	4.6	6.1	–	3.4	–	–	–	0.6	0.9	100	**0.9**	*C03-06*
Salivary glands	4	0	–	–	–	–	–	0.6	–	–	–	1.5	–	–	–	–	18.4	–	0.3	0.4	75	**0.5**	*C07-08*
Tonsil	5	0	–	–	–	–	–	–	–	–	–	1.5	2.0	7.6	–	–	–	–	0.3	0.4	100	**0.5**	*C09*
Other oropharynx	2	0	–	–	–	–	–	–	–	–	2.5	–	–	–	–	–	–	–	0.1	0.2	50	**0.2**	*C10*
Nasopharynx	1	0	–	–	–	–	–	–	–	1.0	–	–	–	–	–	–	–	–	0.1	0.1	100	**0.1**	*C11*
Hypopharynx	1	0	–	–	–	–	–	–	–	–	–	–	2.0	–	–	–	–	–	0.1	0.1	100	**0.1**	*C12-13*
Pharynx unspecified	1	0	–	–	–	–	–	–	–	–	–	–	–	–	3.4	–	–	–	0.1	0.1	0	**0.1**	*C14*
Oesophagus	66	0	–	–	–	–	–	0.6	–	1.0	6.3	9.1	28.4	33.0	24.0	35.3	64.6	46.6	4.2	5.9	71	**8.0**	*C15*
Stomach	20	0	–	–	–	–	–	0.6	–	1.0	1.3	–	6.1	2.5	6.9	15.1	46.1	28.0	1.3	1.8	70	**2.8**	*C16*
Small intestine	2	0	–	–	–	–	–	–	–	–	–	1.5	–	–	3.4	–	–	–	0.1	0.2	100	**0.2**	*C17*
Colon	16	0	–	–	–	–	0.6	0.6	2.3	2.0	1.3	1.5	2.0	–	6.9	–	18.4	18.6	1.0	1.4	81	**1.6**	*C18*
Rectum	16	0	–	–	–	–	–	1.3	0.8	1.0	–	4.6	–	5.1	3.4	15.1	9.2	18.6	1.0	1.4	75	**1.8**	*C19-20*
Anus	2	0	–	–	0.6	–	–	–	–	–	–	–	–	–	–	5.0	–	–	0.1	0.2	50	**0.2**	*C21*
Liver	151	0	–	–	0.6	2.8	2.3	5.1	14.8	16.0	12.5	16.8	24.4	45.6	51.5	50.5	101.5	102.6	9.6	13.5	60	**15.2**	*C22*
Gallbladder etc.	2	0	–	–	–	–	–	–	–	–	–	–	4.1	–	–	–	–	–	0.1	0.2	100	**0.2**	*C23-24*
Pancreas	8	0	–	–	–	–	–	0.6	–	1.0	–	1.5	2.0	5.1	3.4	5.0	–	–	0.5	0.7	50	**0.8**	*C25*
Nose, sinuses etc.	5	0	–	0.6	–	–	0.6	0.6	–	–	–	–	–	2.5	3.4	–	–	–	0.3	0.4	80	**0.4**	*C30-31*
Larynx	13	0	–	–	–	–	–	0.6	–	–	–	–	8.1	5.1	10.3	5.0	9.2	9.3	0.8	1.2	92	**1.6**	*C32*
Trachea, bronchus and lung	30	1	–	–	–	–	–	1.3	0.8	1.0	1.3	3.0	12.2	7.6	27.5	10.1	18.4	9.3	1.9	2.7	57	**3.5**	*C33-34*
Other thoracic organs	5	0	–	–	–	–	–	–	–	–	–	–	–	–	10.3	–	9.2	9.3	0.3	0.4	100	**0.8**	*C37-38*
Bone	7	0	–	–	–	1.7	1.1	–	–	1.0	–	–	–	–	3.4	–	–	–	0.4	0.6	86	**0.4**	*C40-41*
Melanoma of skin	3	0	–	–	–	–	–	–	–	1.0	1.3	–	–	–	–	–	–	9.3	0.2	0.3	100	**0.3**	*C43*
Other skin	38	0	–	–	–	1.7	2.3	1.3	2.3	7.0	1.3	6.1	6.1	–	3.4	25.2	9.2	37.3	2.4	3.4	95	**3.6**	*C44*
Mesothelioma	0	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.0	0.0	–	**0.0**	*C45*
Kaposi sarcoma	303	0	2.3	1.7	1.7	2.8	6.3	26.8	46.7	49.0	50.1	30.5	40.6	38.0	30.9	65.6	18.4	65.3	19.3	27.1	63	**22.5**	*C46*
Connective and soft tissue	21	0	–	0.6	1.1	1.1	2.3	0.6	–	1.0	1.3	1.5	2.0	10.1	3.4	5.0	–	9.3	1.3	1.9	90	**1.7**	*C47+C49*
Breast	10	0	–	–	–	–	–	–	–	2.0	1.3	–	2.0	2.5	6.9	–	9.2	18.6	0.6	0.9	50	**1.2**	*C50*
Penis	15	0	–	–	–	–	–	–	–	5.0	2.5	–	–	7.6	6.9	5.0	–	18.6	1.0	1.3	87	**1.6**	*C60*
Prostate	184	0	–	–	–	–	0.6	0.6	–	1.0	3.8	4.6	22.4	50.7	120.1	156.5	304.4	419.6	11.7	16.5	77	**27.8**	*C61*
Testis	2	0	–	–	–	–	–	0.6	0.8	–	–	–	–	–	–	–	–	–	0.1	0.2	50	**0.1**	*C62*
Other male genital organs	3	0	–	–	–	–	–	–	–	–	2.5	–	2.0	–	–	–	–	–	0.2	0.3	100	**0.3**	*C63*
Kidney	6	0	1.7	1.1	–	–	–	–	–	–	1.3	–	–	–	–	–	–	–	0.4	0.5	33	**0.4**	*C64*
Renal pelvis	0	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.0	0.0	–	**0.0**	*C65*
Ureter	0	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.0	0.0	–	**0.0**	*C66*
Bladder	23	0	–	–	–	–	1.1	0.6	0.8	–	6.3	1.5	2.0	7.6	17.2	5.0	18.4	9.3	1.5	2.1	74	**2.5**	*C67*
Other urinary organs	1	0	–	–	–	–	–	–	–	1.0	–	–	–	–	–	–	–	–	0.1	0.1	100	**0.1**	*C68*
Eye	28	0	1.1	–	–	–	–	0.6	3.9	7.0	8.8	3.0	–	2.5	3.4	–	9.2	9.3	1.8	2.5	96	**2.2**	*C69*
Brain, nervous system	5	0	–	0.6	0.6	–	–	–	–	1.0	–	–	4.1	–	–	–	–	–	0.3	0.4	20	**0.4**	*C70-72*
Thyroid	8	0	–	–	–	–	0.6	0.6	0.8	–	1.3	–	–	7.6	–	5.0	–	–	0.5	0.7	88	**0.7**	*C73*
Adrenal gland	1	0	–	–	–	–	–	–	–	–	–	–	–	–	3.4	–	–	–	0.1	0.1	0	**0.1**	*C74*
Other endocrine	0	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.0	0.0	–	**0.0**	*C75*
Hodgkin lymphoma	7	0	–	–	0.6	–	–	1.3	–	2.0	1.3	–	–	2.5	–	–	–	–	0.4	0.6	100	**0.4**	*C81*
Non–Hodgkin lymphoma	49	0	1.7	–	0.6	0.6	2.3	0.6	4.7	8.0	6.3	4.6	16.3	10.1	10.3	–	9.2	9.3	3.1	4.4	69	**4.0**	*C82-85,C96*
Immunoproliferative diseases	1	0	–	–	–	–	–	–	–	–	–	–	2.0	–	–	–	–	–	0.1	0.1	0	**0.1**	*C88*
Multiple myeloma	7	1	–	–	–	–	–	–	1.6	–	–	–	–	10.1	–	–	–	–	0.4	0.6	86	**0.6**	*C90*
Lymphoid leukaemia	12	0	1.1	–	1.1	–	1.7	–	–	–	–	–	–	7.6	–	5.0	9.2	–	0.8	1.1	67	**1.0**	*C91*
Myeloid leukaemia	8	0	0.6	0.6	–	1.1	–	0.6	0.8	1.0	–	–	–	–	–	–	–	9.3	0.5	0.7	50	**0.6**	*C92-94*
Leukaemia unspecified	7	0	0.6	–	–	–	0.6	0.6	–	2.0	1.3	–	–	2.5	–	–	–	–	0.4	0.6	0	**0.5**	*C95*
Other and unspecified	41	0	–	0.6	1.1	–	1.7	0.6	3.9	4.0	5.0	1.5	4.1	10.1	17.2	25.2	9.2	28.0	2.6	3.7	61	**4.0**	*O&U*
All sites	1156	2	9.1	5.6	7.9	11.9	24.0	47.9	84.8	119.1	121.4	102.1	201.2	289.1	391.2	439.3	691.8	885.8	73.6	103.4	70	**117.0**	*C00-96*
All sites but C44	1118	2	9.1	5.6	7.9	10.2	21.7	46.6	82.5	112.1	120.1	96.0	195.1	289.1	387.7	414.1	682.5	848.5	71.2	100.0	69	**113.5**	*C00-96/C44*

Reference values for incidence rates (all sites), per 100 000 person-years: age 0–4 years: <13.1; age 5–9 years: < 9.1; age 10–14 years: < 9.2.

Editorial Table3. Age-specific incidence rates (per 100,00 person-year) graphs for major diagnosis groups in males (solid blue lines) and females (dashed redlines)



Editorial Table 4. Comparison of observed values versus expected (reference) values from registries in the same region.

Country, Registry (period)

Cancer in Africa Volume III (editorial table 4)
International comparison

MALE

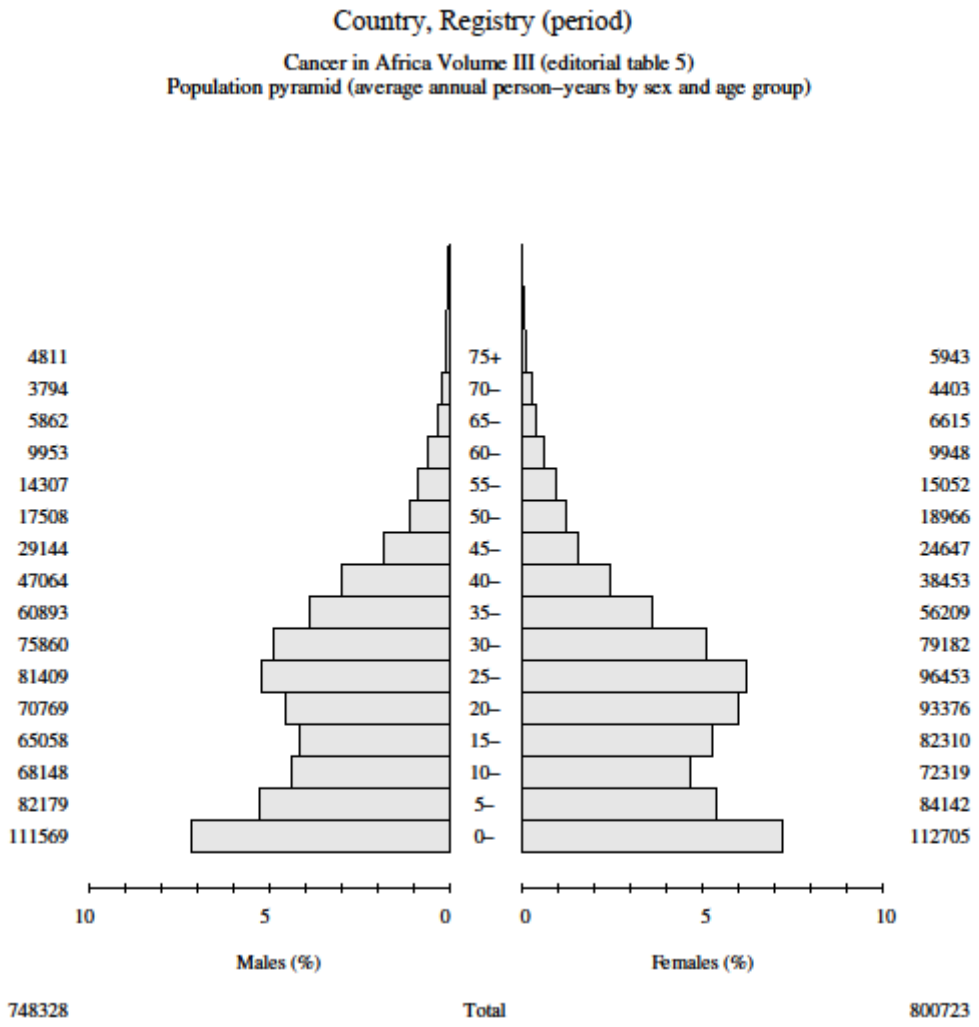
SITE	Cases	ASR (se)	O/E	MV(%)	DCO(%)	ICD-10
Lip, oral cavity and pharynx	117	8.9 (1.02) >	1.56	76.1	2.6	C00−14
Oesophagus	166	19.5 (1.66) >	2.01	42.8	1.2	C15
Stomach	46	4.9 (0.81)	1.05	43.5	4.3	C16
Colon, rectum and anus	92	9.3 (1.13)	1.19	51.1	1.1	C18−21
Liver	106	7.5 (0.93)	1.21	32.1	2.8	C22
Pancreas	20	1.7 (0.43)	1.18	40.0	5.0	C25
Larynx	20	2.7 (0.63)	1.46	75.0	0.0	C32
Lung (incl. trachea)	30	3.0 (0.64)	0.86	43.3	13.3	C33−34
Melanoma of skin	5	0.7 (0.35)	0.79	100.0	0.0	C43
Non−melanoma skin	26	1.4 (0.34) <	0.54	65.4	0.0	C44
Kaposi sarcoma	463	18.6 (1.15) >	1.99	74.5	3.0	C46
Penis	36	3.0 (0.60) >	2.45	61.1 <	0.0	C60
Prostate	351	46.8 (2.66) >	1.96	43.9	0.9	C61
Testis	10	0.4 (0.19)	1.47	60.0	0.0	C62
Kidney etc.	30	1.2 (0.29)	1.08	60.0	0.0	C64−66
Bladder	22	2.3 (0.53)	0.72	45.5	0.0	C67
Brain, central nervous system	48	3.2 (0.61) >	2.53	29.2 <	2.1	C70−72
Thyroid	18	1.4 (0.44)	1.23	50.0 <	0.0	C73
Lymphoma	177	8.7 (0.93)	1.11	72.9	4.0	C81−88,C90
Leukaemia	76	3.0 (0.49)	0.79	69.7	2.6	C91−95
Ill−defined (2.9% of total)	61	3.9 (0.63)		32.8	0.0	C76−80
All sites	2107	162.1 (4.49) >	1.44	57.9	2.1	C00−96
All sites but non−melanoma skin	2081	160.8 (4.47) >	1.46	57.9	2.2	C00−96/C44

FEMALE

SITE	Cases	ASR (se)	O/E	MV(%)	DCO(%)	ICD-10
Lip, oral cavity and pharynx	61	4.1 (0.64)	1.03	55.7 <	0.0	C00−14
Oesophagus	119	12.1 (1.21) >	1.71	45.4	0.0	C15
Stomach	30	2.9 (0.58)	0.72	23.3 <	0.0	C16
Colon, rectum and anus	104	9.8 (1.09)	1.27	51.0 <	1.9	C18−21
Liver	93	6.7 (0.83) >	1.88	31.2	2.2	C22
Pancreas	19	2.0 (0.50)	1.38	10.5	15.8	C25
Larynx	5	0.5 (0.24)	0.89	20.0 <	0.0	C32
Lung (incl. trachea)	24	2.4 (0.53)	1.06	33.3	4.2	C33−34
Melanoma of skin	14	1.1 (0.35)	1.00	50.0 <	0.0	C43
Non−melanoma skin	34	1.6 (0.35) <	0.50	70.6	2.9	C44
Kaposi sarcoma	348	11.2 (0.81) >	2.39	76.1	1.7	C46
Breast	431	31.5 (1.80)	1.05	56.6 <	2.1	C50
Cervix uteri	739	52.0 (2.27) >	1.30	55.8	0.7	C53
O&U part of uterus	72	6.7 (0.89) >	2.08	59.7	2.8	C54−55
Ovary	96	6.8 (0.82) >	1.34	49.0	2.1	C56
Kidney etc.	26	1.0 (0.25)	0.82	46.2	3.8	C64−66
Bladder	22	1.9 (0.48)	0.79	63.6	0.0	C67
Brain, central nervous system	30	1.3 (0.32)	1.25	30.0	0.0	C70−72
Thyroid	34	2.2 (0.45)	0.88	58.8 <	0.0	C73
Lymphoma	165	8.2 (0.86) >	1.39	73.9	3.6	C81−88,C90
Leukaemia	56	2.5 (0.45) <	0.70	75.0	5.4	C91−95
Ill−defined (2.6% of total)	74	4.8 (0.69)		33.8	0.0	C76−80
All sites	2811	182.0 (4.26) >	1.21	57.6	1.7	C00−96
All sites but non−melanoma skin	2777	180.4 (4.24) >	1.22	57.4	1.7	C00−96/C44

Significant lower (<) or higher (>) differences are marked in bold.
ASR: rates compared with those estimated in Eastern Africa (source GLOBOCAN 2018)
MV(%). Percentages compared with that from 28 cancer registries in Sub−Saharan Africa:
Congo, Brazzaville; Benin, Cotonou; Cote d Ivoire, Abidjan; Ethiopia, Addis Ababa; The Gambia; France, Reunion
Ghana, Kumasi; Guinea, Conakry; Kenya, Eldoret and Nairobi; Malawi, Blantyre; Mali, Bamako; Mauritius
Mozambique, Beira; Namibia; Niger, Niamey; Nigeria, Ibadan, Abuja and Calabar; Seychelles
South Africa, national and Eastern Cape; Uganda, Kampala and Gulu; Zambia, Lusaka; Zimbabwe, Bulawayo and Harare (Black)

Editorial Table 5. Average annual population at risk for the period selected



Editorial Table 5 shows the population at risk (usually the average annual population) for the period selected for analysis, as a population pyramid. The nature of the estimate, and the source of the population data, are described in the accompanying text.

Mortality-to-incidence (M:I) ratio

The M:I ratio is an important indicator of completeness, and its use for this purpose is an example of the independent case ascertainment method of evaluation registry completeness (Parkin and Bray, 2009). The M:I ratio compares the number of deaths due to a specific type of cancer over a specific period of time (obtained from a source that is independent of the registry – usually the vital statistics system) with the number of new cases of that type of cancer registered during the same period. When the quality of the mortality data is good (especially in terms of the accuracy of cause of death) and incidence and survival are in steady state, the M:I ratio is approximated by 1 minus that 5-year survival probability.

Very few countries in Africa have comprehensive registration of death, with cause of death medically certified. For three of the countries that do so (Mauritius, France (Reunion), South Africa) we include with the 'Comments' on the registry results, tables comparing numbers of deaths and numbers of cases registered, for the same time period, and the ratio of deaths:cases (as a % of the latter: M:I%)

M:I ratios that are higher than expected raise suspicion of incompleteness (i.e. incident cancers missed by the registry), especially if the values are high for several different sites. However, under- or overreporting of tumours on the death certificates distorts this relationship, as does a lack of constancy in incidence and case fatality (the rate of death among incident cases) over time. In none of the three countries is death registration considered to be of 'high quality' (Mathers et al., 2005) and it is considered to be of 'low quality' in South Africa. Nevertheless, the tables may give an indication of possible completeness, when the ratios are compared with those estimated for the same geographical region in Globocan 2018 (Ferlay et al., 2019).

CHAPTER 4
Results by registry (by region)

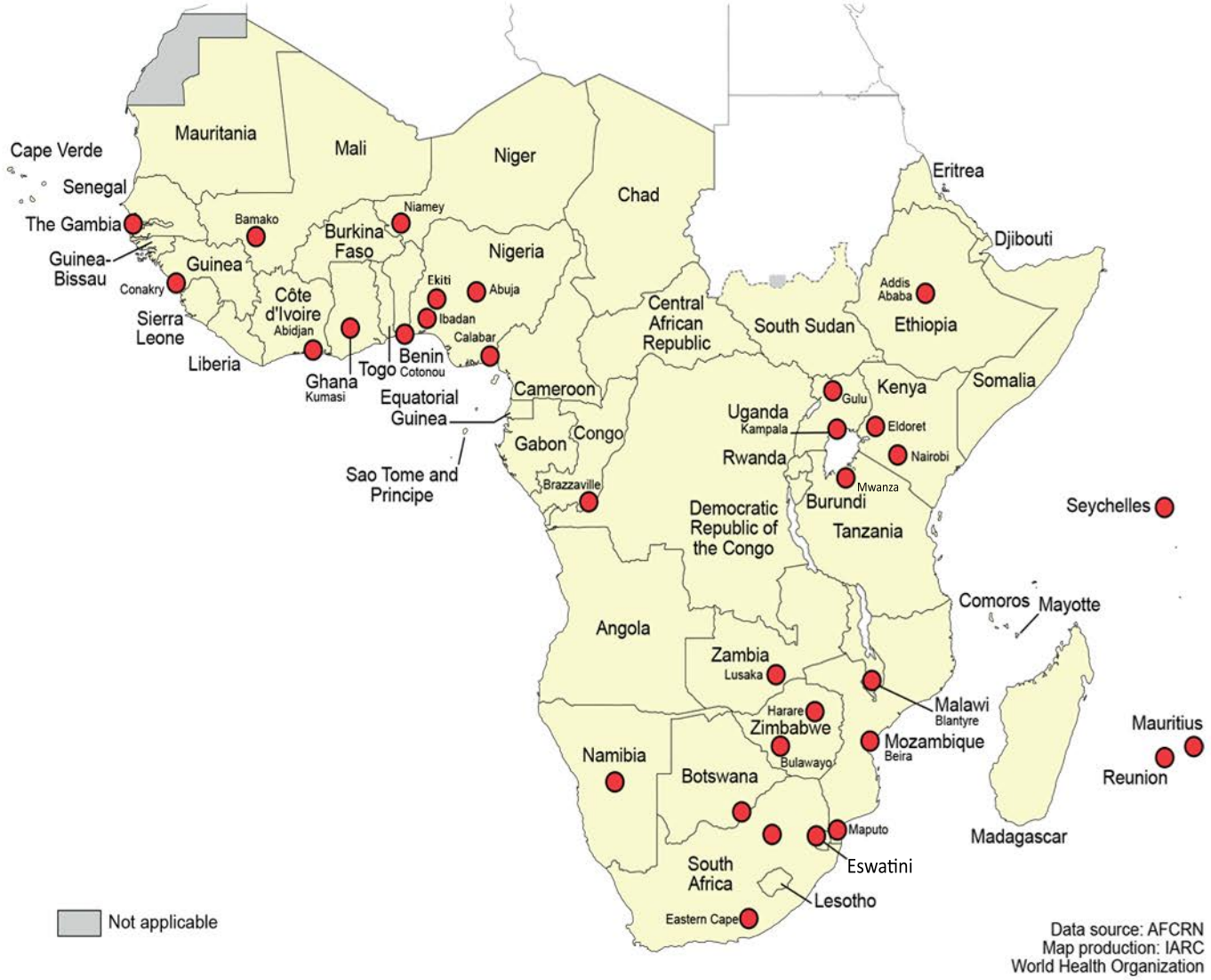


Fig. 4.01. The members of the African Cancer Registry Network (AFCRN) as of spring 2019, with the location of the cancer registries marked

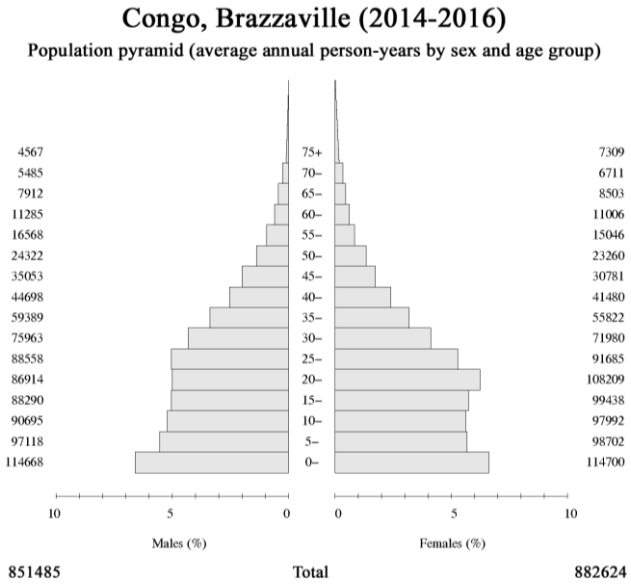
Congo, Brazzaville

The Registre des Cancers de Brazzaville (RCB) was created in 1996 under an agreement between Marien Ngouabi University and IARC. It is located in the University College Hospital (CHU) of Brazzaville, the largest hospital in the capital. The registry is led by a management committee, chaired by the Director of the registry, and there are two cancer registrars, responsible for data collection and management. The registry is financed from various sources, including La Fondation Congo Assistance of the First Lady, the ministries of Higher Education, and of Health and Welfare, AFCRN and WHO-Congo.

All cancer cases from the whole of Brazzaville are registered, with cases of residents and those of non-residents registered separately. The city comprises nine districts: Makelekele, Bakongo, Poto-Poto, Moungali, Ouenze, Talangai, Mfilou, Madibou and Djiri.

The most recent census (2007) gave the population as 1,376,382, with an estimate by Centre National de la Statistique et des Etudes Economiques of 1,549,693 in 2011. Estimates for 2014-2016 were prepared assuming that the growth rates projected for 2007-2011 (by sex and age group) persisted until 2016. The average annual population at risk for this period was 1,734,000.

The CHU of Brazzaville's oncology and radiotherapy services, together with the histopathology laboratory and other clinical departments, are the most important source of information for the registry. Less than 10% of cases were found in the remaining sources (Makélékélé Hospital, Military Hospital Pierre Mobengo and Talangaï Hospital as well as four private clinics where patients may be hospitalized).



Registration is active by registering the information required from case records identified in the CHU, where cases are traced from the registers of admissions/discharges. The other hospitals are visited periodically, when cases identified by "focal point" personnel are registered, and all pathology reports mentioning cancer are collected. Information on deaths is obtained from a hospital registry and municipal service. Death certification is available, but the quality of information is poor, so death certificates are not used for regular registration at present.

The registry uses CanReg 5 for data entry, management and checks for duplication.

YEARS PRESENTED

Three year period, 2014 – 2016

COMMENT

The rate of registration in the three-year period considered (2014-2016) at 48 per month is rather greater than in the preceding 5-year period, published in Volume II (45/month).

The cancer profile is almost unchanged. Age adjusted incidence rates (2014-16) for all sites (excluding NMSC) were 75.8 per 10^5 in men and 71.6 per 10^5 in women, values somewhat lower (76% in men, 67% in women) the average for Central Africa in Globocan 2018. The rates for most sites are low, with the exception of cancers of the liver and prostate (the two most common cancers of men). Cancers of the breast and cervix comprise 60% of cancers of females.

The percentage of cases with morphological verification of diagnosis is much higher than in the preceding 5 years (91% in males, 89% in females).

Summary

The rates of incidence remain rather low, with a high proportion of cases diagnosed by pathology. This probably reflects some degree of under-ascertainment.

PUBLICATIONS and ACHIEVEMENTS

The Brazzaville Cancer Registry became a member of AFCRN in 2012. It hosted the 4th AFCRN Annual Review Meeting in 2016.

Mbassi DBE, Nsonde Malanda J, Nkoua Mbon JB, Sangaré AH, Gombe Mbalawa C. Problème posé par la prise en charge diagnostique et thérapeutique des cancers colo-rectaux au CHU de Brazzaville. Med Afr Noire 2010 ; 12 : 407

Nsonde Malanda J, Peko JF, Gombe Mbalawa C. Rémission complète d'un sarcome intra testiculaire. Oncologie 2010 ; 12 : 545

Djabanga SC, Nsonde Malanda J, Gombe Mbalawa C. Les sarcomes mammaires primitifs au CHU de Brazzaville. J Afr Cancer 2011 ; 3 : 20

Peko JF, Martin A, Poaty H, Ngolet A. Profil morphologique et immunologique des lymphomes. Carcinol Clin Afrique 2012 ; 11 : 13

Rapport quadriennial 2010-2013

Rapport biennial 2014-2015

Rapport biennial 2016-2017

Rapport des cancers pédiatriques du Congo Brazzaville 2017-2018

Congo, Brazzaville (2014–2016)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	6	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	3	-	-	1	0.2	0.7	0.06	**0.6**	C00-06
Salivary gland	4	0	100	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	2	0.2	0.5	0.01	**0.4**	C07-08
Nasopharynx	8	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	4	1	2	-	0.3	1.0	0.14	**0.9**	C11
Other pharynx	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.0	0.1	0.00	**0.0**	C09-10, C12-14
Oesophagus	8	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	1	0.3	1.0	0.14	**0.9**	C15
Stomach	45	0	93	0	-	-	-	-	-	-	2	1	4	2	7	12	5	4	5	3	1.8	5.6	0.51	**4.0**	C16
Colon	18	0	94	0	-	-	-	-	1	-	-	1	3	1	5	2	3	1	1	-	0.7	2.2	0.17	**1.4**	C18
Rectum	16	0	100	0	-	-	-	-	1	2	1	-	-	1	4	4	2	-	-	1	0.6	2.0	0.11	**1.2**	C19-20
Anus	10	0	80	0	-	-	-	-	-	-	-	-	-	1	2	1	3	2	1	-	0.4	1.2	0.15	**1.0**	C21
Liver	153	0	88	0	-	1	2	1	2	10	8	12	29	15	24	19	6	11	8	5	6.0	19.1	1.18	**10.2**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	18	0	78	0	-	-	-	-	-	-	-	-	2	-	2	4	1	2	2	5	0.7	2.2	0.18	**1.9**	C25
Larynx	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	0.1	0.4	0.08	**0.4**	C32
Trachea, bronchus, and lung	16	0	81	0	-	-	-	-	-	-	-	-	-	-	1	1	1	8	5	-	0.6	2.0	0.35	**1.9**	C33-34
Bone	16	0	94	0	-	2	4	4	3	1	1	-	-	1	-	-	-	-	-	-	0.6	2.0	0.03	**0.5**	C40-41
Melanoma of skin	16	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	6	10	-	0.6	2.0	0.43	**2.0**	C43
Non-melanoma skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	6	0	83	0	-	-	-	-	-	-	-	-	1	-	1	2	-	-	2	-	0.2	0.7	0.09	**0.5**	C46
Connective and soft tissue	22	0	77	0	-	-	-	-	1	-	3	2	1	-	4	4	4	2	1	-	0.9	2.7	0.22	**1.7**	C47, C49
Breast	22	0	91	0	-	-	-	-	-	-	1	2	-	3	2	3	1	5	3	2	0.9	2.7	0.28	**2.1**	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C60
Prostate	286	0	95	0	-	-	-	-	-	-	-	-	-	1	4	7	25	106	105	38	11.2	35.6	5.90	**35.6**	C61
Testis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C62
Kidney and renal pelvis	18	0	72	0	8	5	1	-	-	-	1	1	-	-	1	-	-	-	1	-	0.7	2.2	0.06	**0.7**	C64-65
Bladder	6	0	83	0	-	-	-	-	-	2	-	-	-	-	1	-	-	2	1	-	0.2	0.7	0.08	**0.5**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	15	0	60	0	13	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.9	0.02	**0.5**	C69
Brain and nervous system	4	0	0	0	1	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	0.2	0.5	0.02	**0.2**	C70-72
Thyroid	7	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	3	2	1	0.3	0.9	0.13	**0.8**	C73
Hodgkin lymphoma	5	0	100	0	1	1	1	-	-	-	-	1	-	-	-	-	-	-	1	-	0.2	0.6	0.04	**0.3**	C81
Non-Hodgkin lymphoma	15	0	100	0	2	1	1	-	-	-	-	-	1	-	2	2	1	1	2	2	0.6	1.9	0.14	**1.3**	C82-86, C96
Multiple myeloma	10	0	100	0	-	-	-	-	-	-	-	-	1	-	2	1	-	3	2	1	0.4	1.2	0.15	**1.0**	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C91
Myeloid leukaemia	23	0	100	0	3	1	1	1	2	-	1	3	-	-	2	3	3	2	1	-	0.9	2.9	0.18	**1.5**	C92-94
Leukaemia, unspecified	24	0	100	0	2	1	5	1	-	-	1	1	-	1	-	4	1	5	1	1	0.9	3.0	0.22	**1.8**	C95
Other and unspecified	2	0	100	0	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	0.1	0.2	0.01	**0.1**	O&U
All sites	803	0	91	0	30	14	15	7	10	15	21	25	44	27	67	73	65	167	160	63	31.4	100.0	11.10	**75.8**	C00-96
All sites except C44	803	0	91	0	30	14	15	7	10	15	21	25	44	27	67	73	65	167	160	63	31.4	100.0	11.10	**75.8**	C00-96 exc. C44
Average annual population					114668	97118	90695	88290	86914	88558	75963	59389	44698	35053	24322	16568	11285	7912	5485	4567	851486				

Congo, Brazzaville (2014–2016)

Number of cases by age group and summary rates of incidence: females

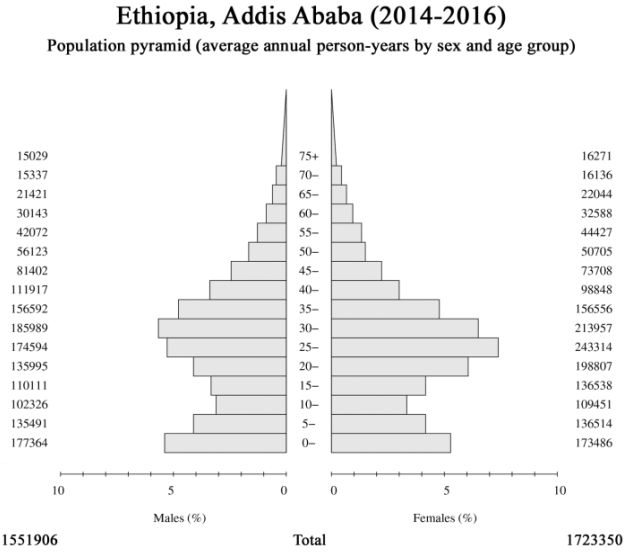
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	5	0	80	0	-	-	-	-	-	-	-	-	-	-	1	1	1	2	-	-	0.2	0.5	0.07	**0.5**	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C07-08
Nasopharynx	4	0	100	0	-	-	-	-	1	-	-	-	-	-	1	1	-	1	-	-	0.2	0.4	0.04	**0.3**	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C09-10, C12-14
Oesophagus	2	0	100	0	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C15
Stomach	18	0	94	0	-	-	-	-	1	1	1	-	1	3	1	4	1	3	1	1	0.7	1.9	0.18	**1.4**	C16
Colon	22	0	91	0	-	-	-	1	-	1	-	3	1	3	3	2	-	3	3	2	0.8	2.3	0.21	**1.6**	C18
Rectum	12	0	92	0	-	-	-	-	1	-	2	1	1	-	1	3	-	1	1	1	0.5	1.3	0.10	**0.8**	C19-20
Anus	6	0	100	0	-	-	-	-	-	-	-	1	-	1	-	2	-	1	-	1	0.2	0.6	0.05	**0.5**	C21
Liver	69	0	75	0	1	1	1	1	2	4	9	3	9	3	8	5	5	4	6	7	2.6	7.3	0.51	**4.6**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	13	0	100	0	-	-	-	-	-	-	1	-	1	-	3	4	-	1	1	2	0.5	1.4	0.12	**1.0**	C25
Larynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.0	0.1	0.02	**0.1**	C32
Trachea, bronchus, and lung	8	0	38	0	-	-	-	-	-	-	-	-	-	1	2	2	2	1	-	-	0.3	0.8	0.09	**0.7**	C33-34
Bone	8	0	100	0	-	-	2	-	1	1	-	1	1	-	2	-	-	-	-	-	0.3	0.8	0.03	**0.3**	C40-41
Melanoma of skin	13	0	69	0	-	-	-	-	-	-	-	-	1	1	-	1	1	8	1	-	0.5	1.4	0.22	**1.4**	C43
Non-melanoma skin	2	0	50	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C46
Connective and soft tissue	10	0	60	0	-	-	-	1	-	3	1	1	1	-	-	1	-	1	-	1	0.4	1.1	0.05	**0.5**	C47, C49
Breast	329	0	95	0	-	-	-	-	1	6	16	27	34	46	55	77	35	13	11	8	12.4	34.9	2.82	**24.6**	C50
Vulva	15	0	93	0	-	-	-	-	-	-	-	-	1	1	1	-	-	8	3	1	0.6	1.6	0.25	**1.5**	C51
Vagina	4	0	100	0	-	-	-	-	-	-	-	-	-	-	1	2	1	-	-	-	0.2	0.4	0.04	**0.4**	C52
Cervix uteri	236	0	90	0	-	-	-	-	1	2	3	9	15	16	36	61	32	32	22	7	8.9	25.0	2.78	**20.7**	C53
Uterus	14	0	93	0	-	-	-	-	-	-	-	1	-	-	3	3	1	2	1	3	0.5	1.5	0.14	**1.2**	C54-55
Ovary	44	0	82	0	-	-	1	3	-	2	-	4	5	5	3	11	2	3	4	1	1.7	4.7	0.40	**3.2**	C56
Placenta	2	0	50	0	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.1**	C58
Kidney and renal pelvis	16	0	69	0	5	9	1	-	-	-	-	-	-	-	1	-	-	-	-	-	0.6	1.7	0.03	**0.6**	C64-65
Bladder	5	0	80	0	-	-	-	-	-	-	-	1	-	-	-	2	1	-	-	1	0.2	0.5	0.04	**0.4**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	17	0	65	0	10	2	2	-	1	-	-	-	1	-	1	-	-	-	-	-	0.6	1.8	0.03	**0.6**	C69
Brain and nervous system	6	0	33	0	1	-	1	-	-	-	-	2	1	-	-	-	-	-	1	-	0.2	0.6	0.04	**0.3**	C70-72
Thyroid	3	0	100	0	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	0.1	0.3	0.03	**0.2**	C73
Hodgkin lymphoma	2	0	100	0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.1**	C81
Non-Hodgkin lymphoma	7	0	100	0	1	-	-	-	-	-	1	-	-	-	4	1	-	-	-	-	0.3	0.7	0.04	**0.4**	C82-86, C96
Multiple myeloma	11	0	100	0	-	-	-	-	-	-	2	-	-	1	-	3	2	-	-	3	0.4	1.2	0.07	**0.9**	C90
Lymphoid leukaemia	4	0	100	0	-	-	-	-	-	-	-	1	1	-	1	1	-	-	-	-	0.2	0.4	0.03	**0.2**	C91
Myeloid leukaemia	12	0	100	0	2	1	1	1	-	-	2	1	1	-	1	-	-	1	1	-	0.5	1.3	0.07	**0.6**	C92-94
Leukaemia, unspecified	18	0	100	0	2	3	3	-	-	-	-	1	1	2	-	2	1	2	1	-	0.7	1.9	0.13	**1.1**	C95
Other and unspecified	6	0	67	0	-	-	-	-	-	-	-	1	1	1	-	2	-	1	-	-	0.2	0.6	0.05	**0.4**	O&U
All sites	944	0	89	0	23	16	13	8	10	20	39	58	78	88	129	191	85	90	57	39	35.7	100.0	8.71	**71.7**	C00-96
All sites except C44	942	0	89	0	23	16	13	8	10	20	38	58	77	88	129	191	85	90	57	39	35.6	99.8	8.70	**71.6**	C00-96 exc. C44
Average annual population					114700	98702	97992	99438	108209	91685	71980	55822	41480	30781	23260	15046	11006	8503	6711	7309	882626				

Ethiopia, Addis Ababa

The Addis Ababa City Cancer Registry (AACCR) is the first population based cancer registry in Ethiopia. It was established in September 2011 at the Radiotherapy Centre, Tikur Anbessa Specialized Hospital, School of Medicine, Addis Ababa University. The overall registration is directed by the head of Radiotherapy Centre. The cancer registry activities are run by four full time employees, who receive assistance with data collection from 22 selected hospital staff within their health institutions. Support for registry activity has been provided by the Federal German Ministry of Education and Research, through research collaborators with the Martin Luther University Halle-Wittenberg (Germany), the American Cancer Society (ACS), WHO national coordinating office in Ethiopia and the Ethiopian Government.

Administratively, Addis Ababa City is divided into 10 sub cities (Addis Ketema, Akaki Kality, Arada, Bole, Gulele, Lideta, Kirkos, Kolfekeranyo, Lafto and Yeka). The criterion for consideration as an Addis Ababa resident is a stay in the city of a minimum of 6 months.

The population of Addis Ababa City as projected by the Central Statistics Office (CSA) for the year 2017 is 3.43 million. The population for the years included here (2014-2016) was estimated by interpolation (by age and sex) between this estimate, and the 2009 census results.



The major sources of information are from Tikur Anbessa Specialized Hospital (57% of case in 2014) followed by the United Vision Medical Service, Hallelujah Hospital, Korean General Hospital (MCM), Bethzatha General Hospital and ARSHO Diagnostic Laboratory. The new Saint Paul Specialized Hospital will become another new and significant source of data, with its specialties services for cancer diagnosis and treatment. Both Tikur Anbessa and St Paul hospitals, being the major teaching hospitals, offer specialised medical services such as CT scan, radiotherapy, histopathology, MRI, and other diagnostic equipment and services.

In view of the large registration area of Addis Ababa City, the cancer registry employs both active and passive data collection mechanisms, with over 90% of cases collected actively.

The 22 selected hospital staff register all new cases. The AACCR staff pay regular visits to these focal point personnel as scheduled. The major items of information are collected, using the standard data forms for cancer registries.

Information on deaths is collected if cause of death was defined as cancer, although the death certificates statistics contain inadequate information

The registry uses the Canreg5 system for data entry, analysis and management.

YEARS PRESENTED

Three year period, 2014 – 2016

COMMENT

The numbers of cases registered per month showed a steady increase over the 3-year period (from 176 per month in 2014 to 217 in 2016). Nevertheless, the results are much the same as in the preceding period (2012-2013), presented in Volume II.

Overall, the incidence is rather low, compared with the Globocan 2018 estimate for East Africa, the ASR in males (all sites, excl. non melanoma skin cancer) is 66.8 per 10^5, about 61% the East African estimate, and in females (ASR 122.1 per 10^5), about 83% of that "expected".

In males, it is noticeable that incidence rates for cancers of the prostate are low, as are - relative to that those elsewhere in East Africa – rates of liver and oesophageal cancers. On the other hand, the most common cancers registered – leukaemia, thyroid, and colorectal cancers have relatively high rates – a most unusual pattern.

In females, the incidence of breast cancer is about 30% higher than the East African standard (an ASR 38.8 per 10^5), and, as in males, there are relatively high rates of leukaemia, colo-rectal and thyroid cancers.

Summary

The registry is attempting to cover a very large population, with many hospitals and clinics. It is not possible to cover all possible sources data, so it is likely that there is modest under-registration. The percentage of cases registered from pathology (histology and cytology verified) is relatively high by African standards (88% in men, 91% in women). However, it is unlikely that there is a significant bias in the profile (relative frequency) of different cancer types, so that the rather unusual cancer patterns are likely to be correct.

PUBLICATIONS and ACHIEVEMENTS

The Addis Ababa City Cancer Registry became a member of AFCRN in 2012.

Timotewos G, Solomon A, Mathewos A, Addissie A, Bogale S, Wondemagegnehu T, Aynalem A, Ayalnesh B, Dagnechew H, Bireda W, Kroeber ES, Mikolajczyk R, Bray F, Jemal A, Kantelhardt EJ. First data from a population based cancer registry in Ethiopia. Cancer Epidemiol. 2018;53:93-98.

Ethiopia, Addis Ababa (2014–2016)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	51	0	100	0	-	-	3	2	2	2	1	4	6	3	6	4	5	4	6	3	1.1	2.2	0.19	**1.6**	C00-06
Salivary gland	17	0	94	0	-	1	-	-	-	-	-	3	2	-	-	2	2	2	1	4	0.4	0.7	0.05	**0.6**	C07-08
Nasopharynx	37	0	97	0	-	-	-	1	4	4	1	5	6	3	4	1	3	1	2	2	0.8	1.6	0.09	**0.9**	C11
Other pharynx	17	0	100	0	-	-	-	2	1	2	-	-	2	3	2	1	3	-	1	-	0.4	0.7	0.05	**0.5**	C09-10, C12-14
Oesophagus	45	0	93	0	-	-	-	-	1	-	2	1	4	1	8	8	6	4	5	5	1.0	1.9	0.19	**1.5**	C15
Stomach	107	1	85	0	1	2	-	2	3	4	8	11	9	5	15	6	17	11	6	6	2.3	4.6	0.37	**3.2**	C16
Colon	154	0	93	0	-	-	-	-	2	4	11	8	20	10	17	18	21	24	11	8	3.3	6.6	0.62	**4.9**	C18
Rectum	156	0	88	0	-	1	-	-	5	13	13	13	21	11	18	17	10	10	11	13	3.4	6.7	0.47	**4.3**	C19-20
Anus	16	0	100	0	-	-	-	-	-	-	1	2	3	-	3	2	2	1	2	-	0.3	0.7	0.06	**0.5**	C21
Liver	87	0	55	0	-	3	-	-	1	4	2	4	11	9	6	6	18	7	7	9	1.9	3.7	0.32	**2.8**	C22
Gallbladder etc.	17	0	88	0	-	-	-	-	-	-	-	2	-	1	2	2	3	2	4	1	0.4	0.7	0.09	**0.6**	C23-24
Pancreas	35	0	51	0	-	-	-	-	1	2	-	1	6	4	4	1	4	3	3	6	0.8	1.5	0.12	**1.1**	C25
Larynx	41	0	95	0	1	-	-	1	-	-	1	2	4	6	3	8	3	4	6	2	0.9	1.8	0.18	**1.3**	C32
Trachea, bronchus, and lung	106	0	79	0	1	-	-	-	1	1	3	11	5	9	15	15	13	14	8	10	2.3	4.6	0.42	**3.5**	C33-34
Bone	53	0	87	0	2	3	7	6	6	4	4	4	2	-	4	1	3	2	2	3	1.1	2.3	0.12	**1.4**	C40-41
Melanoma of skin	11	0	100	0	-	-	-	-	-	-	2	2	-	1	-	1	1	2	1	1	0.2	0.5	0.04	**0.3**	C43
Non-melanoma skin	118	0	98	0	2	-	1	3	2	6	9	12	11	17	14	11	13	8	4	5	2.5	5.1	0.35	**3.3**	C44
Mesothelioma	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.0	0.0	0.01	**0.0**	C45
Kaposi sarcoma	13	0	77	0	-	-	-	-	-	1	3	1	1	-	2	2	1	1	1	-	0.3	0.6	0.04	**0.3**	C46
Connective and soft tissue	89	0	93	0	3	-	1	6	11	13	8	8	7	5	4	7	3	5	6	2	1.9	3.8	0.24	**2.2**	C47, C49
Breast	68	0	96	0	-	-	-	-	1	3	1	2	7	4	13	3	6	4	12	12	1.5	2.9	0.27	**2.3**	C50
Penis	3	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	0.1	0.1	0.00	**0.1**	C60
Prostate	172	1	81	0	-	-	-	-	2	-	1	1	3	2	8	20	20	45	34	35	3.7	7.4	0.95	**7.1**	C61
Testis	29	0	90	0	-	-	-	1	4	5	4	5	1	-	3	2	2	1	1	-	0.6	1.2	0.07	**0.6**	C62
Kidney and renal pelvis	70	0	73	0	5	2	2	1	3	2	4	6	2	6	5	2	11	5	5	9	1.5	3.0	0.22	**2.2**	C64-65
Bladder	89	0	83	0	-	1	-	-	-	3	3	5	5	9	9	6	14	16	8	10	1.9	3.8	0.38	**3.1**	C67
Ureter and other urinary	4	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	2	0.1	0.2	0.01	**0.2**	C66, C68
Eye	29	1	93	0	7	-	-	-	1	1	-	1	2	5	2	4	1	2	1	1	0.6	1.2	0.08	**0.8**	C69
Brain and nervous system	29	0	59	0	-	-	-	1	3	1	3	5	2	5	1	1	5	2	-	-	0.6	1.2	0.08	**0.7**	C70-72
Thyroid	65	0	97	0	-	-	-	-	3	7	2	9	4	6	5	5	7	7	6	4	1.4	2.8	0.23	**1.9**	C73
Hodgkin lymphoma	36	0	100	0	-	4	3	4	3	5	4	4	1	2	4	-	1	-	1	-	0.8	1.5	0.07	**0.8**	C81
Non-Hodgkin lymphoma	200	0	96	0	2	7	10	7	10	15	10	20	15	22	17	11	24	11	7	12	4.3	8.6	0.55	**5.6**	C82-86, C96
Multiple myeloma	16	0	88	0	-	-	-	-	-	-	-	4	1	-	1	3	3	2	2	-	0.3	0.7	0.07	**0.5**	C90
Lymphoid leukaemia	89	0	97	0	11	9	4	8	5	6	7	2	7	2	5	3	4	3	7	6	1.9	3.8	0.22	**2.4**	C91
Myeloid leukaemia	139	0	100	0	2	1	2	4	8	14	17	17	14	10	10	10	13	5	3	9	3.0	6.0	0.32	**3.5**	C92-94
Leukaemia, unspecified	5	0	100	0	2	-	-	1	-	-	-	-	-	-	1	-	-	-	1	-	0.1	0.2	0.02	**0.1**	C95
Other and unspecified	113	0	85	0	1	-	-	3	3	8	6	13	8	5	15	14	4	12	10	11	2.4	4.9	0.38	**3.3**	O&U
All sites	2327	3	88	0	40	34	33	53	86	130	131	189	192	166	227	197	246	222	185	193	50.0	100.0	7.95	**70.1**	C00-96
All sites except C44	2209	3	88	0	38	34	32	50	84	124	122	177	181	149	213	186	233	214	181	188	47.4	94.9	7.60	**66.8**	C00-96 exc. C44
Average annual population					177364	135491	102326	110111	135995	174594	185989	156592	111917	81402	56123	42072	30143	21421	15337	15029	1551906				

Ethiopia, Addis Ababa (2014–2016)

Number of cases by age group and summary rates of incidence: females

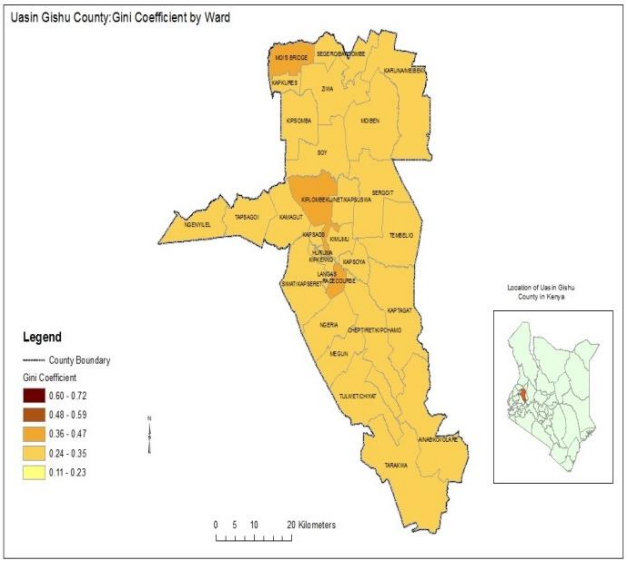
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	51	0	94	0	-	-	1	-	2	4	2	2	6	5	4	9	8	3	4	1	1.0	1.0	0.18	**1.5**	C00-06
Salivary gland	24	0	100	0	-	-	2	-	1	1	3	4	1	-	2	4	3	1	1	1	0.5	0.5	0.07	**0.6**	C07-08
Nasopharynx	26	0	100	0	-	-	1	-	2	5	5	3	-	4	-	2	2	1	-	1	0.5	0.5	0.05	**0.5**	C11
Other pharynx	13	0	92	0	-	-	-	-	-	2	3	1	1	-	2	1	2	1	-	-	0.3	0.3	0.03	**0.3**	C09-10, C12-14
Oesophagus	56	0	86	0	-	-	-	-	-	2	3	2	2	10	8	14	7	3	4	1	1.1	1.1	0.21	**1.7**	C15
Stomach	113	0	78	0	1	-	-	-	1	7	7	10	11	16	19	12	8	9	8	4	2.2	2.3	0.38	**3.2**	C16
Colon	156	0	89	0	-	-	-	-	2	7	14	16	16	19	26	14	19	9	5	9	3.0	3.2	0.46	**4.3**	C18
Rectum	127	0	87	0	-	-	-	-	9	7	18	18	6	15	18	6	11	6	9	4	2.5	2.6	0.37	**3.2**	C19-20
Anus	20	0	100	0	-	-	-	-	-	1	-	7	3	3	1	1	1	1	2	-	0.4	0.4	0.06	**0.5**	C21
Liver	80	0	68	0	1	-	-	-	-	4	4	3	4	10	9	7	13	9	8	8	1.5	1.6	0.31	**2.6**	C22
Gallbladder etc.	29	0	76	0	-	-	-	-	-	1	-	3	1	1	1	2	7	6	5	2	0.6	0.6	0.15	**1.0**	C23-24
Pancreas	35	0	71	0	-	-	-	-	2	1	1	1	3	8	4	5	3	4	1	2	0.7	0.7	0.12	**1.0**	C25
Larynx	7	0	100	0	-	-	-	-	-	1	-	1	1	-	1	-	-	-	2	1	0.1	0.1	0.03	**0.2**	C32
Trachea, bronchus, and lung	91	0	77	0	-	-	-	-	-	2	4	5	7	5	10	19	10	7	13	9	1.8	1.9	0.38	**2.9**	C33-34
Bone	57	0	82	0	-	2	6	8	7	8	2	4	5	1	2	5	1	1	2	3	1.1	1.2	0.11	**1.3**	C40-41
Melanoma of skin	13	0	100	0	-	-	-	-	-	1	2	-	2	1	2	-	2	1	-	2	0.3	0.3	0.03	**0.4**	C43
Non-melanoma skin	162	0	98	0	-	1	-	2	8	8	12	26	9	23	17	14	14	8	6	14	3.1	3.3	0.42	**4.3**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	4	0	100	0	-	-	-	-	1	1	-	-	-	-	1	-	-	1	-	-	0.1	0.1	0.01	**0.1**	C46
Connective and soft tissue	75	0	92	0	3	3	1	2	3	13	5	8	6	9	4	7	4	5	1	1	1.5	1.5	0.17	**1.7**	C47, C49
Breast	1651	1	97	0	-	-	-	2	38	125	162	310	230	203	175	127	116	64	58	40	31.9	33.7	4.15	**38.8**	C50
Vulva	54	0	98	0	-	1	-	-	1	8	15	10	5	1	4	-	3	1	3	2	1.0	1.1	0.11	**1.0**	C51
Vagina	21	0	90	0	-	-	-	-	-	3	-	3	2	1	2	2	5	-	3	-	0.4	0.4	0.08	**0.6**	C52
Cervix uteri	696	0	94	0	-	-	-	-	2	16	42	71	66	99	113	86	88	46	38	29	13.5	14.2	2.34	**20.3**	C53
Uterus	125	0	87	0	-	-	-	-	5	7	8	15	8	11	19	11	14	10	10	7	2.4	2.5	0.42	**3.6**	C54-55
Ovary	275	0	80	0	-	-	3	1	10	18	23	33	26	34	34	34	24	16	7	12	5.3	5.6	0.76	**7.1**	C56
Placenta	9	0	78	0	-	-	-	-	-	3	5	-	-	-	-	-	1	-	-	-	0.2	0.2	0.01	**0.1**	C58
Kidney and renal pelvis	60	0	70	0	8	5	-	-	3	4	1	6	4	5	7	7	3	3	2	2	1.2	1.2	0.15	**1.6**	C64-65
Bladder	39	0	82	0	-	-	-	-	-	-	1	-	4	1	7	10	5	3	4	4	0.8	0.8	0.16	**1.3**	C67
Ureter and other urinary	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0.0	0.0	0.01	**0.1**	C66, C68
Eye	28	0	82	0	8	2	-	2	1	-	2	3	1	3	-	-	-	3	3	-	0.5	0.6	0.08	**0.7**	C69
Brain and nervous system	39	0	46	5	2	2	-	4	2	2	3	2	5	3	2	5	3	3	-	1	0.8	0.8	0.10	**1.0**	C70-72
Thyroid	255	0	95	0	-	-	-	10	22	42	15	41	15	17	31	17	19	6	12	8	4.9	5.2	0.61	**5.8**	C73
Hodgkin lymphoma	18	0	100	0	-	-	-	3	2	3	-	1	4	3	1	-	-	-	-	1	0.3	0.4	0.03	**0.4**	C81
Non-Hodgkin lymphoma	140	0	93	1	4	3	3	3	6	17	13	12	13	14	10	10	9	12	7	4	2.7	2.9	0.39	**3.5**	C82-86, C96
Multiple myeloma	17	0	88	0	-	-	-	-	-	-	1	5	1	1	1	2	1	4	-	1	0.3	0.3	0.06	**0.5**	C90
Lymphoid leukaemia	67	0	96	0	10	5	6	1	4	5	2	5	5	4	5	3	2	6	2	2	1.3	1.4	0.16	**1.7**	C91
Myeloid leukaemia	112	0	97	0	1	3	3	6	10	8	16	7	7	13	8	10	8	3	6	3	2.2	2.3	0.28	**2.7**	C92-94
Leukaemia, unspecified	5	0	100	0	-	-	-	-	-	1	-	1	-	-	1	-	1	-	1	-	0.1	0.1	0.02	**0.1**	C95
Other and unspecified	153	0	86	0	6	2	-	1	4	15	8	12	10	18	21	17	11	11	9	8	3.0	3.1	0.46	**4.2**	O&U
All sites	4905	1	91	0	44	29	26	45	148	353	402	651	490	561	573	464	428	267	236	187	94.9	100.0	13.91	**126.3**	C00-96
All sites except C44	4743	1	91	0	44	28	26	43	140	345	390	625	481	538	556	450	414	259	230	173	91.7	96.7	13.49	**122.1**	C00-96 exc. C44
Average annual population					173486	136514	109451	136538	198807	243314	213957	156556	98848	73708	50705	44427	32588	22044	16136	16271	1723350				

Kenya, Eldoret

The Eldoret Cancer Registry (ECR) was established in 1999. It is situated in the Department of Haematology and Blood Transfusion of the Moi University College of Health Sciences. It aims to record information on all cancer cases diagnosed among the population of Uasin Gishu County in the Rift Valley region of Kenya.

ECR is headed by a director and is staffed with five full-time trained cancer registrars: 3 employees and 2 volunteers. Medical students on placement occasionally help with data collection.

The registry has largely relied on donor support since 1999. During the initial years, contributions were from IARC and Brown University (Providence, RI, USA). Moi University School of Medicine continues to support the ECR with work space, utilities and basic stationery. Since 2018, the AMPATH Haemato-Oncology Division has been providing salaries for three full time registrars and one on part-time basis, and has equipped the registry with computers, book shelves and printing of stationery. It also funded cancer registration courses and the establishment of new population based cancer registries in Kenya. AFCRN also provided some financial support for staff training, training materials and equipment, and research projects.



The ECR covers Uasin Gishu County and the neighbouring districts in the Western region of Kenya. Uasin Gishu County had a population of 894,179 at the 2009 the Kenyan National Census.

Case finding is performed as an active, systematic process. The files of patients who reside in the catchment area and hospital based cases are identified and those with malignant tumours are retained for data abstraction. The relevant information is abstracted onto the case notification forms, which are then submitted to the registry office for further checks of completeness and accuracy, and ICD-O-3 coding, before being passed on for data entry.

The ECR collects all cancer cases that are diagnosed at or referred to Moi Teaching & Referral Hospital (MTRH) regardless of whether the cases originate from Uasin Gishu. MTRH is the second largest hospital in Kenya and it sees patients from the whole of the western part of the country and neighbouring countries i.e. South Sudan and Uganda.

Registrars also collect data from various units within the collaborating government and, private hospitals and cancer centres. Sources in these hospitals include the medical records departments, radiology units, haematology and histopathology laboratories, outpatient clinics, medical wards and autopsy reports. In the medical records unit, disease index cards and patient-care registers are used to identify cancer cases. Each facility has its own filing system as well as procedures for the diagnosis and management of cancer patients which need to be studied and understood comprehensively for effective case finding. Most of the filing systems are completely paper-based, although a few are partly electronic. In both cases the hospital staffs are actively involved to provide file numbers and files of cancer cases.

Data is also captured at the Eldoret Hospice and run through the database. Often, these cases have already been captured through the hospital collection, but the hospice provides up-to-date information on patients' vital status.

The ECR has access to the civil registration office to identify cancer-related deaths from death certificates. These death certificate notified cases are matched against the registry database, and, for cases already registered, status at last contact is updated and the cause of death included. Unmatched cases are traced back to the hospital where the death occurred, and an attempt is made to trace the case record, to confirm that the individual did indeed have cancer. Cases that cannot be traced are registered as "death certificate only" (DCO) cases.

The MTRH mortuary is the main mortuary for the population, and a register of all patients deceased during care within the facility as well those "brought-in-dead" is maintained. The ECR staff utilises these records by collecting all cancer related deaths and using the hospital numbers to trace the patient files.

The ECR reaches out to clinics of private physicians to collect cases that may have been missed at hospital level. Private physicians keep most of the patient records in their consultation clinics for purposes of follow up of their patients. For these cases, although a file will exist in the hospital, the

information is often scanty. This requires the registrar to link up with the doctors' clinics to get full information on the case. This source of data has not been fully utilized due to insufficient staff.

The ECR regularly collects data on cancer diagnoses from laboratory sources, both public and private. All cancer diagnoses are collected regardless of primary site and patients' place of residence. Additional information on patients' age and hospital file numbers are abstracted. The pathology reports are mostly scanty with information only on pathological diagnoses and patient names. The patient file numbers are then used as a link to gaining more information on the patients. Following up out patients and patients whose samples were sent from external facilities posed a big challenge because of lack of resources to visit the far flung facilities.

The cancer registry uses CanReg 5 for data management and analysis.

YEARS PRESENTED

Five year period, 2012 – 2016

COMMENT

During the five-year period 2012-2016, the number of registrations was relatively constant, at 27-31 new cases per month.

In the preceding 4 years (2008-2011), the incidence rates for "All Cancers" was 25% greater that the estimated average for East Africa in males, and almost identical in females. Now (2012-2016) rates for almost all sites except for oesophagus, nasopharynx, and leukaemia are significantly lower.

DCO cases comprise only 2.5% of registrations in men and 1.5% in women (compared with 13.3% and 16.4%, respectively, in the earlier period).

Summary

The percentage of cases diagnosed by clinical/ radiological means is rather less than 10%, which is lower than in Nairobi (q.v.) and this, plus the decline in the numbers of cases being registered each month, suggests some under-registration. The incidence rates are now only about half what they were in the preceding period (2008-2011), and, although these may have been too high (in part by inclusion of DCO cases of doubtful validity) the suspicion of under-registration in the present data remains

Conclusion

There is concern about the use of these rates (2012-2016) for comparative studies, because of the marked changes since 2008-2011.

PUBLICATIONS and ACHIEVEMENTS

The Eldoret Cancer Registry became a member of the AFCRN in 2012. The registry and its senior staff provided support to the establishment of PBCRs in two Western Kenya Counties; enhanced capacity building through hosting international training courses; provided technical support on the use of CanReg software to fellow registries in sub-Saharan Africa (Ms. Gladys Chesumbai is a trained IARC CanReg Instructor); advocated for PBCRs in Kenyan Counties.

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*Kenya, Eldoret (2012–2016)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	5	0	100	0	-	-	-	-	-	-	-	-	1	1	-	1	1	1	-	-	0.2	0.7	0.06	**0.5**	C00-06
Salivary gland	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	0.1	0.4	0.08	**0.4**	C07-08
Nasopharynx	29	0	90	3	-	-	-	3	3	-	1	-	3	3	6	1	2	4	2	1	1.1	4.2	0.29	**2.3**	C11
Other pharynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.1	0.02	**0.1**	C09-10, C12-14
Oesophagus	109	1	83	1	-	-	-	-	-	1	1	6	8	9	13	11	15	12	14	18	4.1	15.7	1.30	**10.2**	C15
Stomach	33	0	91	6	-	-	-	-	-	-	2	3	2	4	2	2	7	3	4	4	1.2	4.8	0.39	**3.0**	C16
Colon	24	0	96	0	-	-	-	-	1	1	1	4	1	1	1	4	5	2	2	1	0.9	3.5	0.27	**2.1**	C18
Rectum	16	0	94	0	-	-	-	-	-	1	1	2	1	1	1	2	3	1	1	2	0.6	2.3	0.15	**1.3**	C19-20
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C21
Liver	30	0	63	10	-	-	-	-	2	1	4	7	1	-	2	1	5	1	1	5	1.1	4.3	0.21	**2.1**	C22
Gallbladder etc.	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.1	0.3	0.00	**0.2**	C23-24
Pancreas	17	0	65	0	-	-	-	-	-	-	-	1	-	1	1	1	2	2	3	6	0.6	2.5	0.20	**1.6**	C25
Larynx	9	0	100	0	-	-	-	-	-	-	-	-	1	1	1	1	3	-	-	2	0.3	1.3	0.08	**0.8**	C32
Trachea, bronchus, and lung	12	0	92	0	-	-	-	-	-	-	-	-	-	1	2	3	1	1	3	1	0.5	1.7	0.19	**1.2**	C33-34
Bone	14	0	100	0	-	1	2	3	1	1	-	3	-	1	-	-	-	-	-	2	0.5	2.0	0.03	**0.6**	C40-41
Melanoma of skin	7	0	100	0	-	1	-	-	-	-	-	-	1	-	-	1	2	1	-	1	0.3	1.0	0.07	**0.6**	C43
Non-melanoma skin	4	0	100	0	-	-	-	-	-	1	1	1	-	1	-	-	-	-	-	-	0.2	0.6	0.01	**0.2**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	48	0	77	10	-	2	1	2	3	3	5	9	8	6	3	2	2	-	1	1	1.8	6.9	0.24	**2.6**	C46
Connective and soft tissue	17	0	88	6	2	3	-	1	1	-	2	3	1	2	-	2	-	-	-	-	0.6	2.5	0.06	**0.8**	C47, C49
Breast	14	0	100	0	-	-	-	-	-	-	-	1	1	-	3	1	4	3	1	-	0.5	2.0	0.21	**1.5**	C50
Penis	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.1	0.02	**0.1**	C60
Prostate	83	1	75	4	-	-	1	-	-	-	-	1	-	1	-	4	3	16	21	35	3.1	12.0	1.13	**8.4**	C61
Testis	2	0	100	0	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.00	**0.1**	C62
Kidney and renal pelvis	10	0	80	0	4	4	-	-	-	-	-	1	-	-	-	1	-	-	-	-	0.4	1.4	0.03	**0.4**	C64-65
Bladder	8	0	100	0	-	-	-	-	-	-	-	-	-	1	-	1	2	-	1	3	0.3	1.2	0.08	**0.8**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	7	0	71	0	2	1	-	-	-	-	1	-	2	-	-	-	-	1	-	-	0.3	1.0	0.04	**0.3**	C69
Brain and nervous system	8	0	75	12	1	-	-	-	1	-	2	-	-	-	-	1	-	2	1	-	0.3	1.2	0.09	**0.6**	C70-72
Thyroid	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	0.1	0.3	0.03	**0.2**	C73
Hodgkin lymphoma	13	0	100	0	1	2	4	2	-	2	-	1	-	1	-	-	-	-	-	-	0.5	1.9	0.03	**0.4**	C81
Non-Hodgkin lymphoma	37	0	95	3	1	5	3	4	1	3	1	4	2	2	5	1	1	2	1	1	1.4	5.3	0.21	**2.0**	C82-86, C96
Multiple myeloma	14	0	100	0	-	-	-	-	-	-	1	1	-	5	1	1	3	-	1	1	0.5	2.0	0.14	**1.2**	C90
Lymphoid leukaemia	36	0	100	0	2	5	2	4	1	5	1	1	1	-	2	3	-	5	-	4	1.4	5.2	0.20	**2.1**	C91
Myeloid leukaemia	36	0	100	0	1	3	4	2	-	2	6	1	6	3	2	1	1	2	-	2	1.4	5.2	0.17	**1.9**	C92-94
Leukaemia, unspecified	5	0	100	0	1	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-	0.2	0.7	0.05	**0.3**	C95
Other and unspecified	37	0	95	0	-	-	2	-	1	1	-	4	1	5	8	3	2	4	2	4	1.4	5.3	0.34	**2.9**	O&U
All sites	693	2	87	3	15	28	21	21	16	22	30	54	41	50	54	49	67	66	61	96	26.1	100.0	6.39	**53.8**	C00-96
All sites except C44	689	2	87	3	15	28	21	21	16	21	29	53	41	49	54	49	67	66	61	96	26.0	99.4	6.37	**53.6**	C00-96 exc. C44
Average annual population					80361	68247	59979	56215	63978	50038	39705	31116	23450	16974	12140	8841	6046	4691	3151	5200	530133				

*Kenya, Eldoret (2012–2016)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	8	0	100	0	-	-	-	-	-	1	-	-	-	-	-	1	5	-	1	-	0.3	0.8	0.13	**0.9**	C00-06
Salivary gland	3	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	0.1	0.3	0.00	**0.2**	C07-08
Nasopharynx	13	0	100	0	-	-	-	1	2	1	-	4	1	-	-	-	2	1	1	-	0.5	1.4	0.11	**0.9**	C11
Other pharynx	4	0	100	0	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	1	0.2	0.4	0.01	**0.2**	C09-10, C12-14
Oesophagus	92	0	88	0	-	-	-	-	-	4	3	2	2	4	6	9	13	18	14	17	3.5	9.6	1.26	**9.1**	C15
Stomach	22	0	100	0	-	-	-	-	-	2	2	1	2	2	1	1	2	3	1	5	0.8	2.3	0.19	**1.7**	C16
Colon	24	0	92	0	-	-	-	-	-	1	4	1	4	3	1	4	2	2	-	2	0.9	2.5	0.19	**1.8**	C18
Rectum	18	0	89	0	-	-	-	-	1	1	-	1	4	2	-	1	1	2	3	2	0.7	1.9	0.20	**1.5**	C19-20
Anus	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.1	0.02	**0.1**	C21
Liver	29	0	72	7	-	-	1	1	-	1	1	2	2	3	1	5	1	4	-	7	1.1	3.0	0.22	**2.2**	C22
Gallbladder etc.	6	0	100	0	-	-	-	-	-	-	-	-	-	1	-	2	1	1	1	-	0.2	0.6	0.10	**0.7**	C23-24
Pancreas	17	0	59	6	-	-	-	-	-	-	1	-	1	3	2	-	1	1	3	5	0.6	1.8	0.18	**1.5**	C25
Larynx	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	0.1	0.2	0.04	**0.3**	C32
Trachea, bronchus, and lung	6	0	67	33	-	-	-	-	-	-	-	-	-	1	-	-	1	1	1	2	0.2	0.6	0.08	**0.6**	C33-34
Bone	10	0	100	0	-	-	4	2	1	-	2	-	-	-	-	-	-	-	-	1	0.4	1.0	0.02	**0.3**	C40-41
Melanoma of skin	5	1	100	0	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	0.2	0.5	0.08	**0.5**	C43
Non-melanoma skin	8	0	100	0	-	-	-	1	-	2	-	1	-	1	-	2	-	-	-	1	0.3	0.8	0.04	**0.5**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	39	0	67	8	-	1	-	2	2	4	5	10	6	4	3	1	-	1	-	-	1.5	4.1	0.18	**2.0**	C46
Connective and soft tissue	9	0	100	0	2	-	-	3	-	-	-	-	1	1	-	-	-	1	1	-	0.3	0.9	0.07	**0.5**	C47, C49
Breast	165	0	96	1	-	-	-	-	2	9	14	19	23	26	18	11	15	10	4	14	6.3	17.3	1.30	**12.4**	C50
Vulva	8	0	100	0	-	-	-	-	-	-	1	2	3	1	-	-	-	-	1	-	0.3	0.8	0.06	**0.5**	C51
Vagina	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C52
Cervix uteri	212	0	96	0	-	-	-	-	1	7	9	24	28	31	30	23	23	11	15	10	8.1	22.2	2.11	**17.7**	C53
Uterus	29	0	97	0	-	-	-	-	1	-	1	3	2	3	6	3	6	2	2	-	1.1	3.0	0.34	**2.7**	C54-55
Ovary	25	0	92	4	-	-	-	1	-	-	2	2	2	5	3	2	1	7	-	-	1.0	2.6	0.28	**2.2**	C56
Placenta	2	0	100	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C58
Kidney and renal pelvis	11	0	82	0	6	1	1	-	-	-	-	-	-	-	-	-	-	2	-	1	0.4	1.2	0.05	**0.6**	C64-65
Bladder	5	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	2	-	1	1	0.2	0.5	0.07	**0.5**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	9	0	78	0	4	1	-	-	-	-	-	-	1	2	-	-	1	-	-	-	0.3	0.9	0.04	**0.5**	C69
Brain and nervous system	4	0	100	0	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-	1	0.2	0.4	0.02	**0.3**	C70-72
Thyroid	11	0	100	0	-	-	-	1	2	-	-	1	1	-	2	1	2	-	-	1	0.4	1.2	0.08	**0.8**	C73
Hodgkin lymphoma	7	0	100	0	-	-	2	-	1	-	1	-	-	-	-	-	2	-	1	-	0.3	0.7	0.07	**0.5**	C81
Non-Hodgkin lymphoma	30	0	100	0	3	2	-	1	3	1	1	3	1	1	3	2	3	3	2	1	1.1	3.1	0.27	**2.2**	C82-86, C96
Multiple myeloma	18	0	100	0	-	-	-	-	-	2	-	3	1	5	1	1	-	-	-	5	0.7	1.9	0.07	**1.1**	C90
Lymphoid leukaemia	27	0	100	0	1	2	2	4	-	-	1	1	-	3	2	2	2	3	2	2	1.0	2.8	0.24	**2.0**	C91
Myeloid leukaemia	39	0	100	0	2	2	1	4	4	2	3	2	1	4	5	3	1	-	2	3	1.5	4.1	0.23	**2.3**	C92-94
Leukaemia, unspecified	4	0	100	0	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	2	0.2	0.4	0.01	**0.3**	C95
Other and unspecified	34	0	88	6	1	-	1	1	1	-	1	2	3	3	2	7	4	1	3	4	1.3	3.6	0.34	**2.8**	O&U
All sites	956	1	93	1	19	9	12	23	21	38	54	85	94	109	87	84	95	74	60	91	36.4	100.0	8.72	**74.9**	C00-96
All sites except C44	948	1	93	1	19	9	12	22	21	36	54	84	94	108	87	82	95	74	60	90	36.1	99.2	8.68	**74.4**	C00-96 exc. C44
Average annual population					80479	67602	59574	58640	61861	53171	40590	28356	20588	15087	10914	8340	5707	4648	3269	6452	525278				

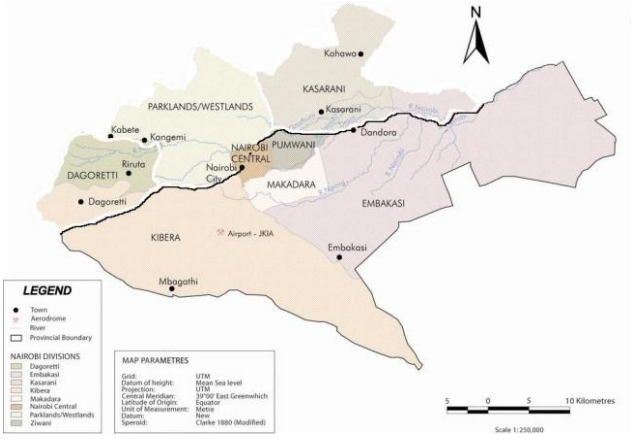
Kenya, Nairobi

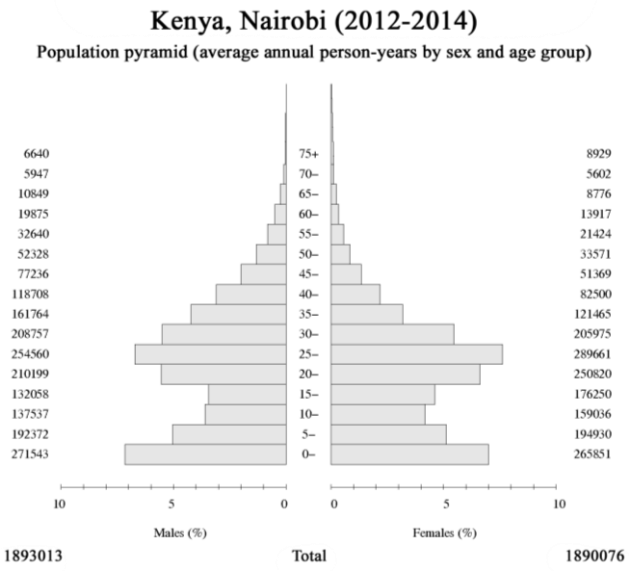
The Nairobi Cancer Registry was established in 2001 after consultation between the Office of International Affairs of the US National Cancer Institute (US NCI), IARC, the Ministry of Health (MOH) and the Kenya Medical Research Institute (KEMRI). The registry is situated within the Centre for Clinical Research (CCR) at the KEMRI headquarters, Nairobi.

In 2009, recognising the problems of recording large numbers of cases with limited staff; a grant was received from INCTR to support case finding for Nairobi residents only. Later in 2016, the US NCI together with the Kenya government through KEMRI Internal Research Grants (IRG), funded the cancer registry to expand its activities to establish a National Cancer Registry which is essentially a centralized database for population-based registries in Kenya. This will enable Kenya to have a pool of data that will be utilized to undertake more research studies, to inform cancer control initiatives and policy development.

The population of Nairobi County was at 3,138,369 at the 2009

census. Although the city is a large cosmopolitan centre located in the Central Highlands predominantly occupied by Bantus, its population is made up of most of the ethnic groups in the country. There are 17 sub-counties in Nairobi replacing the previous 8 administrative divisions.





There is currently provision for 3 full-time staff, 3 interns and eight full time contractual staff supported though funding from US-NCI. Funding for registry activities has largely been through grants. In 2019, KEMRI launched a new staff establishment that placed the national cancer registry under the population and surveillance division with plans to hire over twenty staff within the next five-years.

The registry has attempted to register all cancer cases reported in various health institutions in Nairobi. Initially, the methodology was to recruit cancer registrars from employees of medical records services, including hospitals, oncology clinics, laboratories and death registers, laboratory and clinical services. However this proved ineffective given that the staff were preoccupied with their routine duties, giving less attention to cancer registry activities. The registry therefore recruited its own staff with the basic qualifications of Diploma in Health Information Management or any health-related field. They were then trained at KEMRI and deployed to various hospitals to undertake case finding, abstraction and coding. The registrars work full time from Monday to Thursday and on Friday they review each cases with the registry supervisor tackle any difficulties or challenges faced. Cases are coded using ICD-O-3. After checks are performed, data is entered into computers. The CanReg5 software has been used for data management and analysis.

The registry collects data from five sources of information:

Government and Private Hospitals: Registrars collect data from medical records service. They use disease index cards and patient-care service registers to identify cancer cases in both in-patient and out-patient departments. A few hospitals

have established computer based disease indices which can be used to identify cancer cases.

Medical laboratories: Most of the government and private hospitals mentioned above have various specialty laboratories including histology, haematology and cytology. NCR staff visit laboratories that are probable sources of cancer incidence data.

Radiotherapy treatment centres: NCR registrars regularly visit the radiotherapy units at Kenyatta National Hospital (KNH), Cancer Care Kenya, Aga-Khan University Hospital Nairobi, Texas Cancer Centre and The Nairobi Hospital to carry out active case abstraction.

The Nairobi Hospice: The Nairobi Hospice submits data to NCR. Although most patients have been referred from KNH and other health-care facilities within and outside Nairobi, the hospice gives up-to-date information on patients' status, which is important for follow up and case assessment purposes.

Vital Statistics - Registrar of Births & Deaths (Death Certificates Office): In 2006 NCR established a link with Vital Statistics, to access cancer-specific mortality data from the registrar of the Births & Deaths Office. Trace-back of cancer deaths to obtain corresponding hospital records has shown that the quality of diagnostic information on cancer cases is poor. However, for 3 years (2009-2011), deaths from cancer which could not be matched (with the registry database, or hospital records) were included as DCO cases in the registry database, if the patient had a confirmed Nairobi address.

Private stand-alone pathology laboratories were not employed as primary source because the demographic information available on cancer cases is limited.

YEARS PRESENTED

Three year period, 2012-2014

COMMENT

In Volume II, results were presented for the period 2007-2011. Here we present those for the succeeding 3 year period (2012-2014), during which the registration rate was 170-210 cases per month.

Overall incidence rates (all cancer sites) for the period are slightly above the average for East Africa (42% higher in males, 38% in females). The age standardised incidence rates are rather similar to those recorded for 2007-2011, although there have been decreases for cancer of the breast (from 59.7 per 10^5 to 51.3 per 10^5), and for cancer of the cervix (43.3 to 35.5 per 10^5).

The incidence of nasopharynx cancer is relatively high, as is that of cancers of the oral cavity & pharynx, colo-rectal cancer, and breast cancer (at an ASR of 51.3 per 10^5, the highest recorded in mainland sub Saharan Africa).

The percentage of cases with a non-morphological diagnosis is around 20%, with 5.3% of cases registered as "death certificate only" (DCO) cases.

Summary

The results appear to be an accurate reflection of the true cancer profile.

PUBLICATIONS and ACHIEVEMENTS

The Nairobi Cancer Registry is one of the founding registries of AFCRN. It hosted the 1st AFCRN Annual Review Meeting in 2013. Data for 2008-2012 were published in Cancer Incidence in Five Continents (CI5) Volume XI. The registry hosted trainings and mentorship programmes for fellow registrars from sub-Saharan Africa.

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Cancer incidence report 2009-2013, Nairobi cancer registry.

Kenya, Nairobi (2012–2014)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	72	0	85	8	2	-	-	-	3	2	1	2	6	14	9	8	8	4	4	9	1.3	2.4	0.36	**3.5**	C00-06
Salivary gland	8	0	100	0	-	-	-	-	-	4	1	-	2	-	1	-	-	-	-	-	0.1	0.3	0.01	**0.1**	C07-08
Nasopharynx	113	0	91	2	-	1	4	8	10	5	8	10	11	9	13	12	15	1	3	3	2.0	3.8	0.41	**3.7**	C11
Other pharynx	34	0	56	26	-	-	-	-	-	2	-	2	2	2	4	7	6	4	2	3	0.6	1.1	0.23	**1.8**	C09-10, C12-14
Oesophagus	249	0	71	10	-	-	-	-	1	4	4	14	16	18	26	29	42	32	30	33	4.4	8.4	2.00	**15.5**	C15
Stomach	171	0	78	6	1	1	1	-	1	4	5	17	9	15	19	18	22	20	17	21	3.0	5.8	1.19	**9.6**	C16
Colon	141	0	82	4	-	-	-	2	3	2	5	10	9	14	15	22	13	15	17	14	2.5	4.7	1.04	**7.7**	C18
Rectum	105	0	82	4	-	-	-	1	1	2	6	12	7	10	14	9	15	11	7	10	1.8	3.5	0.63	**5.3**	C19-20
Anus	13	0	92	0	-	-	-	-	1	1	-	-	-	1	3	1	1	1	1	3	0.2	0.4	0.07	**0.8**	C21
Liver	100	0	80	11	2	-	-	2	-	8	7	8	13	10	14	12	5	7	7	5	1.8	3.4	0.51	**4.0**	C22
Gallbladder etc.	39	0	82	15	-	-	-	-	-	-	-	2	3	3	9	6	3	2	4	7	0.7	1.3	0.24	**2.2**	C23-24
Pancreas	51	0	55	12	-	-	-	-	-	2	1	2	2	3	7	6	9	7	4	8	0.9	1.7	0.36	**3.1**	C25
Larynx	60	0	85	5	-	-	-	-	-	2	1	1	2	4	3	13	21	4	4	5	1.1	2.0	0.44	**3.5**	C32
Trachea, bronchus, and lung	75	0	75	8	-	-	-	-	1	-	1	1	4	6	11	9	14	12	9	7	1.3	2.5	0.66	**4.7**	C33-34
Bone	61	0	79	5	1	3	5	16	7	3	7	3	2	4	2	2	1	3	2	-	1.1	2.1	0.18	**1.6**	C40-41
Melanoma of skin	15	0	100	0	-	-	-	-	-	-	-	-	2	-	1	2	2	1	1	6	0.3	0.5	0.08	**1.1**	C43
Non-melanoma skin	65	0	92	0	-	3	2	2	2	4	1	3	1	6	11	4	6	6	8	6	1.1	2.2	0.45	**3.4**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.0	0.01	**0.1**	C45
Kaposi sarcoma	74	0	89	0	-	2	2	-	1	3	12	12	6	11	7	6	7	3	1	1	1.3	2.5	0.25	**2.2**	C46
Connective and soft tissue	79	0	96	0	9	6	4	4	4	5	7	4	6	9	5	2	3	6	2	3	1.4	2.7	0.26	**2.5**	C47, C49
Breast	38	0	84	0	-	-	-	-	-	3	3	-	5	2	5	4	8	3	1	4	0.7	1.3	0.19	**1.8**	C50
Penis	7	0	71	0	-	-	-	-	-	-	1	-	-	1	-	1	3	-	-	1	0.1	0.2	0.03	**0.4**	C60
Prostate	601	0	70	5	-	-	-	-	1	-	-	1	1	10	40	63	101	105	103	176	10.6	20.2	5.82	**49.8**	C61
Testis	12	0	75	0	-	1	-	2	-	5	3	-	-	-	-	-	-	-	1	-	0.2	0.4	0.04	**0.3**	C62
Kidney and renal pelvis	41	0	90	7	6	4	1	-	2	-	5	1	3	-	4	5	1	4	4	1	0.7	1.4	0.24	**1.6**	C64-65
Bladder	60	0	70	8	1	-	-	-	-	-	1	3	2	3	5	3	10	5	9	18	1.1	2.0	0.46	**4.4**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	51	0	88	0	22	1	-	1	2	1	2	3	4	3	4	2	-	3	-	3	0.9	1.7	0.10	**1.4**	C69
Brain and nervous system	62	0	81	5	3	4	-	2	6	4	6	4	7	4	3	6	4	4	3	2	1.1	2.1	0.26	**2.1**	C70-72
Thyroid	13	0	92	0	-	-	-	-	-	-	1	1	2	3	-	-	2	4	-	-	0.2	0.4	0.09	**0.6**	C73
Hodgkin lymphoma	44	0	100	0	1	1	10	12	3	1	2	2	6	2	-	2	1	-	1	-	0.8	1.5	0.09	**1.0**	C81
Non-Hodgkin lymphoma	185	0	98	0	7	10	4	12	6	9	9	15	20	19	13	21	12	9	8	11	3.3	6.2	0.75	**6.8**	C82-86, C96
Multiple myeloma	51	0	100	0	1	-	-	-	-	-	-	2	5	5	9	8	8	5	4	4	0.9	1.7	0.35	**2.7**	C90
Lymphoid leukaemia	63	0	100	0	3	11	10	7	1	3	1	1	3	3	4	2	3	4	2	5	1.1	2.1	0.21	**2.3**	C91
Myeloid leukaemia	87	0	100	0	1	1	5	7	9	13	10	7	6	6	8	1	5	4	1	3	1.5	2.9	0.23	**2.4**	C92-94
Leukaemia, unspecified	17	0	82	12	1	1	2	2	2	1	-	2	3	1	1	-	-	1	-	-	0.3	0.6	0.04	**0.4**	C95
Other and unspecified	112	0	62	18	1	5	2	1	4	4	7	8	9	11	8	9	12	12	9	10	2.0	3.8	0.67	**5.4**	O&U
All sites	2970	0	81	5	62	55	52	81	71	97	118	153	179	212	278	295	364	302	269	382	52.3	100.0	18.95	**160.0**	C00-96
All sites except C44	2905	0	80	5	62	52	50	79	69	93	117	150	178	206	267	291	358	296	261	376	51.2	97.8	18.50	**156.6**	C00-96 exc. C44
Average annual population					271543	192372	137537	132058	210199	254560	208757	161764	118708	77236	52328	32640	19875	10849	5947	6640	1893011				

Kenya, Nairobi (2012–2014)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	63	0	89	3	-	-	-	-	1	-	1	7	7	5	5	6	15	4	4	8	1.1	1.6	0.49	**4.1**	C00-06
Salivary gland	15	0	87	0	-	-	-	-	1	3	1	4	1	1	1	-	-	2	1	-	0.3	0.4	0.09	**0.6**	C07-08
Nasopharynx	46	0	85	4	-	1	1	2	4	2	5	5	5	5	6	1	2	5	-	2	0.8	1.1	0.20	**1.8**	C11
Other pharynx	18	0	50	33	1	-	-	2	-	1	-	1	3	1	-	1	1	1	4	2	0.3	0.4	0.17	**1.1**	C09-10, C12-14
Oesophagus	191	0	74	7	-	-	-	-	-	1	6	11	13	15	28	24	22	22	18	31	3.4	4.8	1.64	**13.1**	C15
Stomach	140	0	75	9	1	-	-	1	3	1	7	13	7	9	12	12	21	18	14	21	2.5	3.5	1.23	**9.5**	C16
Colon	123	0	76	10	-	-	1	1	3	5	6	5	6	10	20	12	11	9	11	23	2.2	3.1	0.89	**7.6**	C18
Rectum	84	0	80	2	-	-	-	-	3	1	10	3	7	11	14	14	10	4	3	4	1.5	2.1	0.53	**4.4**	C19-20
Anus	20	0	95	0	-	-	-	-	-	2	1	2	-	3	-	5	5	-	-	2	0.4	0.5	0.11	**1.1**	C21
Liver	66	0	70	23	-	-	-	-	2	7	4	3	6	7	6	4	6	8	8	5	1.2	1.6	0.57	**4.0**	C22
Gallbladder etc.	60	0	92	2	-	-	-	-	-	-	1	5	10	4	8	13	5	4	6	4	1.1	1.5	0.50	**3.6**	C23-24
Pancreas	62	0	45	19	-	-	-	-	-	3	1	4	3	6	3	8	6	15	6	7	1.1	1.5	0.65	**4.6**	C25
Larynx	4	0	75	0	-	-	-	-	-	-	-	-	-	1	-	1	-	1	1	-	0.1	0.1	0.06	**0.3**	C32
Trachea, bronchus, and lung	68	0	74	7	-	-	-	-	-	-	3	6	2	4	11	10	8	8	9	7	1.2	1.7	0.68	**4.8**	C33-34
Bone	40	0	82	2	-	1	4	4	5	5	6	1	2	2	2	5	1	2	-	-	0.7	1.0	0.13	**1.2**	C40-41
Melanoma of skin	21	0	100	0	-	-	-	-	-	2	1	-	1	3	3	5	2	1	2	1	0.4	0.5	0.17	**1.2**	C43
Non-melanoma skin	55	0	85	7	1	1	1	1	-	1	5	3	7	8	3	7	4	4	5	4	1.0	1.4	0.39	**3.0**	C44
Mesothelioma	1	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	55	0	85	2	-	-	-	1	3	5	9	15	15	2	2	1	1	1	-	-	1.0	1.4	0.12	**1.2**	C46
Connective and soft tissue	59	0	98	0	4	1	3	4	7	8	10	5	2	3	5	2	1	2	1	1	1.0	1.5	0.17	**1.6**	C47, C49
Breast	1049	0	81	5	-	-	-	3	6	36	69	115	158	147	170	112	78	52	50	53	18.5	26.2	6.16	**51.3**	C50
Vulva	31	0	84	3	1	-	-	-	-	-	4	3	5	1	1	2	6	3	1	4	0.5	0.8	0.20	**1.8**	C51
Vagina	11	0	100	0	1	-	-	-	-	-	1	1	3	-	1	1	1	1	1	-	0.2	0.3	0.08	**0.6**	C52
Cervix uteri	745	0	75	4	-	-	-	1	4	26	53	81	121	114	122	63	55	38	31	36	13.1	18.6	4.19	**35.5**	C53
Uterus	130	0	82	5	-	-	-	-	1	1	5	7	5	6	12	18	19	17	21	18	2.3	3.2	1.42	**9.9**	C54-55
Ovary	173	0	72	8	-	2	2	-	11	5	8	10	8	23	18	18	23	18	12	15	3.1	4.3	1.33	**10.4**	C56
Placenta	2	0	50	0	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	0.0	0.0	0.01	**0.1**	C58
Kidney and renal pelvis	44	0	84	5	14	8	1	1	1	1	2	3	1	2	3	1	1	1	3	1	0.8	1.1	0.18	**1.4**	C64-65
Bladder	32	0	69	0	-	-	-	-	-	-	-	3	2	2	10	1	2	4	2	6	0.6	0.8	0.23	**2.1**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	28	0	96	0	11	1	-	-	-	4	3	1	1	6	1	-	-	-	-	-	0.5	0.7	0.04	**0.6**	C69
Brain and nervous system	69	0	78	6	3	5	7	-	3	4	7	4	8	5	5	2	8	4	3	1	1.2	1.7	0.36	**2.9**	C70-72
Thyroid	50	0	90	6	-	-	-	-	6	1	6	5	4	2	3	5	5	4	5	4	0.9	1.2	0.37	**2.7**	C73
Hodgkin lymphoma	33	0	100	0	-	4	1	4	6	6	-	3	4	1	2	-	1	1	-	-	0.6	0.8	0.07	**0.8**	C81
Non-Hodgkin lymphoma	131	0	98	0	3	6	2	1	2	5	14	18	23	13	9	11	7	2	5	10	2.3	3.3	0.54	**5.1**	C82-86, C96
Multiple myeloma	57	0	96	2	-	-	-	1	-	-	1	-	3	11	7	6	8	3	3	14	1.0	1.4	0.37	**3.8**	C90
Lymphoid leukaemia	47	0	100	0	14	6	4	1	2	2	1	1	1	1	2	2	2	1	2	5	0.8	1.2	0.16	**1.7**	C91
Myeloid leukaemia	66	0	100	0	4	1	6	2	5	5	5	5	10	5	3	3	4	2	1	5	1.2	1.6	0.22	**2.3**	C92-94
Leukaemia, unspecified	12	0	100	0	2	2	2	-	1	-	1	2	1	-	-	-	-	-	-	1	0.2	0.3	0.01	**0.3**	C95
Other and unspecified	106	0	79	11	1	1	2	2	2	7	8	7	11	13	6	16	9	7	5	9	1.9	2.6	0.64	**5.4**	O&U
All sites	4008	0	80	5	61	40	37	32	82	150	265	362	467	454	505	392	350	269	238	304	70.7	100.0	25.35	**207.3**	C00-96
All sites except C44	3953	0	80	5	60	39	36	31	82	149	260	359	460	446	502	385	346	265	233	300	69.7	98.6	24.95	**204.3**	C00-96 exc. C44
Average annual population					265851	194930	159036	176250	250820	289661	205975	121465	82500	51369	33571	21424	13917	8776	5602	8929	1890078				

Mozambique, Beira

The Registro de Cancro de Beira was founded in 2005. The purpose was to record the incidence of cancer in Beira city, to provide information to the Ministry of Health and for research and teaching within the Faculty of Health Sciences and by other health professionals.

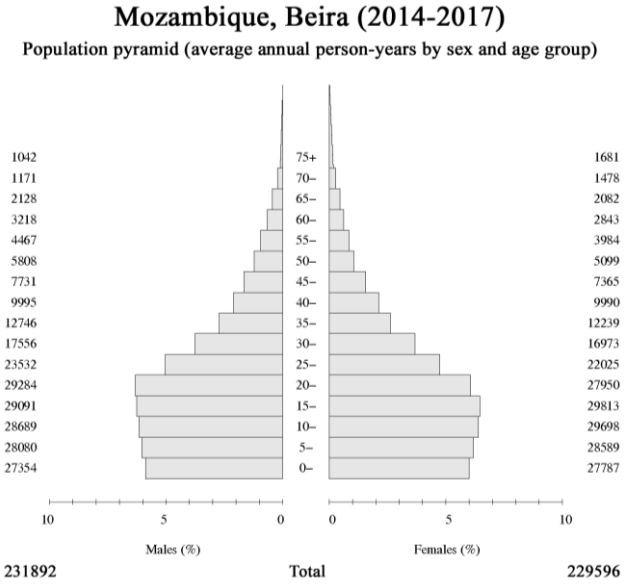
The registry is situated in the department of pathology of the Hospital Central de Beira (HCB). The pathologist directs the activities of the registry. At present, there is only one full time registrar.

The National Cancer Program in Mozambique was established in 2016, and since then the registry has provided annual data from Beira: the most common cancers for both males and females. Locally, the information is also being used by the Provincial Heath Authorities (Provincial Public Health Department).

Before 2017, the registry was supported by various international organisations. For three years (2012-14), the registry director was personally paying the registrar and covering the expenses. Since 2017, the HCB has been providing the salary of the registrar and the consumables for the registry.

The registry covers the district of Beira, in Sofala Province, one of the 11 provinces of Mozambique. Beira district comprises 23 barrios.

The population at risk is taken from official projections from the 2007 census (National Institute of Statistics, 2010), although the most recent census (2017), gives a rather smaller figure (443,369) than the projection for that year (463,410). The predominant ethnic group in Beira is Bangwe, which originated by the admixture of Machangas, Matewes and Podzos from the Zambezi valley. The majority of the population is Christian, with a minority of Muslims and Hindus.



The local facilities for cancer management remain limited (no oncologist, no radiotherapy, CT scan is not constant). There has been no significant improvement in this situation since the inception of the registry. It partially explains the low incidence of some cancer sites, such as GI, brain, bone marrow. During 2017-2018, there was one haematologist with a short-term contract (3 years) from Brazil. Since 2017, there has been one gastroenterologist (who performs GI endoscopy and biopsies) and one pneumonologist.

HCB is the only public hospital in Beira. It is the referral hospital for the provinces of Sofala, Manica, Tete and Zambezia. The hospital has some 733 beds and almost all specialties are present, although there is no specialist oncology service. The registrar makes daily visits to the different services according to yield of cases, and completes the registration forms. The archive service of HCB is only a repository for medical records; there is no patient index. The register of patients is arranged in chronological sequence, so tracing the records of returning patients requires them to recall when they were last at the hospital. The hospital statistics department is currently compiling only numbers of admissions and deaths by department.

HCB has the only pathology laboratory (3 pathologists) in the region. The lab processes about 2,500 biopsies and 2,200 cytologies annually. The registrar uses the printed report forms on cancer cases, sorted by the pathologists, for case finding. Since 2013, the request form to the labs includes the Place of Residence to help the registry to identify Beira residents.

There are 3 private clinics in Beira. Specimens from their patients are sent to the HCB under an institutional agreement

for diagnostic purposes. The registry also has access to the medical records in these three clinics to check for cancer cases.

Death registration is mandatory. The bodies of all who die in Beira district must be brought to the mortuary at the HCB. For hospital deaths, a physician completes a death certificate in the relevant service (and accompanies the body). It contains all details on the deceased, including "direct" and "underlying" cause of death. For non-suspicious/violent deaths at home, the certificate is completed by the statistical office in the mortuary, the cause of death information is obtained by interviews with family members (verbal autopsy). Violent deaths are autopsied and the forensic pathologist completes the certificate. The relatives take the original to the Vital Statistics Office, the second copy (of all certificates) is sent to the Statistical Department at HCB. The third copy remains in the mortuary, wards and the Legal Medicine (Forensic Medicine) Department.

The HCB statistics department has created a computer file of all hospital deaths since 2011. It can produce some standard tables, and an EXCEL file of all variables including names but the access is limited (coded). In terms of geographical information, the database only records the province of residence.

The registrar visits the mortuary registry and the Vital Statistics Office to check for death certificates with a mention of cancer. Although it is possible to generate a list of cancer deaths from the database in the statistics department it is also necessary to trace the relevant certificates.

Cancer diagnosis (site/histology) is coded by ICD-O 3. Since 2014, CanReg 5 has been used for data entry and management. Quality control and duplicate checks are now performed in CanReg 5. Access to registry information is limited to registry staff only. Paper forms are locked in the special cabinets and electronic data are password-protected.

YEAR PRESENTED

Four year period, 2014-2017

COMMENT

The data published in CiSSA Volume II were for 2009-2012. In that period, the main hospital (Hospital Central) had no specialist oncology, haematology or pulmonology services; a situation largely unchanged during the four year period (2014-2017) presented here. In these years an average of 31 cases were recorded monthly.

The overall (all sites) incidence rates are similar to those for East Africa, but this disguises the very high incidence rates of Kaposi sarcoma (32 per 10^5 in men, 11.2 per 10^5 in women), cervix cancer (56.9 per 10^5) and bladder cancer (11.8 per 10^5 in men, 8.4 per 10^5 in women). Incidence rates for many other sites are low -especially GI tract cancers (other than liver), brain (only one case recorded) and leukaemia (only 7 cases registered in the 4 year period). However, compared with the earlier data set (2009-2012) the incidence rates of prostate cancer and lymphomas are now unremarkable.

The percentage of cases registered with morphological verification of diagnosis (MV %) is modest : - 53.9% in males, 73.5% in females - much lower than previously – in part because of the inclusion of substantial numbers of DCO cases (15.8% of cases in men, 10% in women).

Summary

The figures are more plausible than those previously published, but for several sites appear to be too low, probably due to under-diagnosis of cancers requiring more complex diagnostic methods (brain, leukaemia, GI tract).

PUBLICATIONS and ACHIEVEMENTS

The Registro de Cancro de Beira became a member of AFCRN in 2013.

Ferro J, Schiavone M, Gannaro FD, Putoto G, Bertoldo A, Pizzol D. Frequency and pattern of gynecoloic cancers from 2010 to 2014 in Beira, Mozambique. Curr Gynecol Oncol 2017, 15(3): 189-193.

Mozambique, Beira (2014–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	13	0	62	31	-	-	-	3	1	1	1	-	-	-	2	4	-	-	1	-	1.4	1.9	0.29	**2.2**	C00-06
Salivary gland	4	0	50	50	-	-	-	-	-	-	-	-	1	-	1	-	2	-	-	-	0.4	0.6	0.11	**1.0**	C07-08
Nasopharynx	1	0	0	100	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	8	0	38	62	-	-	-	1	1	-	1	-	-	-	1	2	1	-	1	-	0.9	1.1	0.24	**1.6**	C09-10, C12-14
Oesophagus	44	0	25	32	-	-	1	1	2	1	2	7	3	2	4	5	11	3	2	-	4.7	6.3	1.22	**9.5**	C15
Stomach	2	0	50	50	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	0.2	0.3	0.03	**0.3**	C16
Colon	5	0	60	20	-	-	-	-	-	-	1	1	-	-	-	-	1	1	1	-	0.5	0.7	0.22	**1.3**	C18
Rectum	6	0	67	33	-	-	-	-	-	1	1	-	1	-	1	-	1	1	-	-	0.6	0.9	0.14	**1.2**	C19-20
Anus	2	0	0	50	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	0.2	0.3	0.03	**0.3**	C21
Liver	40	0	58	42	-	-	-	2	1	3	10	3	1	4	6	2	5	1	-	2	4.3	5.7	0.64	**7.2**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	2	0	50	50	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	0.2	0.3	0.04	**0.4**	C25
Larynx	2	0	50	50	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	0.2	0.3	0.07	**0.4**	C32
Trachea, bronchus, and lung	3	0	0	67	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	0.3	0.4	0.07	**1.0**	C33-34
Bone	2	0	100	0	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0.2	0.3	0.03	**0.3**	C40-41
Melanoma of skin	6	0	100	0	-	-	-	-	-	-	-	1	2	-	1	1	-	-	-	1	0.6	0.9	0.08	**1.3**	C43
Non-melanoma skin	36	0	92	3	-	-	-	1	3	3	5	3	1	3	1	2	3	4	3	4	3.9	5.1	0.91	**8.3**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.2**	C45
Kaposi sarcoma	238	0	50	8	1	2	2	3	14	38	54	43	27	16	17	9	3	3	4	2	25.7	33.9	3.04	**32.0**	C46
Connective and soft tissue	10	0	100	0	2	2	-	-	3	-	1	1	-	-	-	-	1	-	-	-	1.1	1.4	0.09	**1.1**	C47, C49
Breast	2	0	50	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	0.2	0.3	0.11	**0.5**	C50
Penis	12	0	92	0	-	-	-	-	2	-	1	1	1	2	2	2	1	-	-	-	1.3	1.7	0.21	**2.1**	C60
Prostate	55	0	56	13	-	-	-	-	-	1	1	-	1	-	4	7	10	13	10	8	5.9	7.8	2.53	**18.5**	C61
Testis	2	0	50	0	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	0.3	0.03	**0.3**	C62
Kidney and renal pelvis	3	0	67	33	2	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.3	0.4	0.03	**0.4**	C64-65
Bladder	44	0	9	14	-	-	1	1	1	1	3	4	2	2	4	2	9	4	4	6	4.7	6.3	1.29	**11.8**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	55	0	75	0	2	-	-	-	3	5	16	10	7	3	4	4	-	1	-	-	5.9	7.8	0.65	**7.1**	C69
Brain and nervous system	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C70-72
Thyroid	1	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C73
Hodgkin lymphoma	11	0	100	0	-	1	2	-	-	1	2	1	1	1	-	1	-	1	-	-	1.2	1.6	0.16	**1.5**	C81
Non-Hodgkin lymphoma	41	0	68	32	3	2	5	2	1	1	3	4	6	6	3	1	2	-	1	1	4.4	5.8	0.57	**6.4**	C82-86, C96
Multiple myeloma	1	0	100	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C90
Lymphoid leukaemia	2	0	100	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3	0.01	**0.2**	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C92-94
Leukaemia, unspecified	1	0	0	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C95
Other and unspecified	47	0	66	17	2	2	1	1	1	3	3	6	3	5	6	4	5	2	2	1	5.1	6.7	1.01	**9.0**	O&U
All sites	702	0	56	15	14	10	13	15	35	61	109	85	58	46	60	49	56	35	30	26	75.7	100.0	13.88	**128.0**	C00-96
All sites except C44	666	0	54	16	14	10	13	14	32	58	104	82	57	43	59	47	53	31	27	22	71.8	94.9	12.97	**119.8**	C00-96 exc. C44
Average annual population					27354	28080	28689	29091	29284	23532	17556	12746	9995	7730	5808	4467	3218	2128	1170	1042	231890				

Mozambique, Beira (2014–2017)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	7	0	57	43	1	1	-	-	1	-	1	-	-	-	1	-	1	-	-	1	0.8	0.8	0.09	**1.2**	C00-06
Salivary gland	3	0	100	0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.3	0.4	0.00	**0.7**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	2	0	0	100	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	0.2	0.2	0.10	**0.5**	C09-10, C12-14
Oesophagus	38	0	29	39	-	-	-	-	-	-	2	4	8	7	4	3	1	5	2	2	4.1	4.4	0.98	**8.5**	C15
Stomach	2	0	50	50	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	**0.2**	C16
Colon	6	0	50	17	-	1	-	-	-	-	-	-	-	-	2	-	-	2	-	1	0.7	0.7	0.17	**1.6**	C18
Rectum	3	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	0.3	0.4	0.14	**0.8**	C19-20
Anus	7	0	86	0	-	-	-	-	-	1	2	1	-	-	1	-	-	-	1	1	0.8	0.8	0.14	**1.3**	C21
Liver	22	0	64	36	1	2	-	2	1	1	2	1	3	2	2	1	2	1	1	-	2.4	2.6	0.44	**3.9**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	1	0	0	100	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.1	0.1	0.02	**0.2**	C25
Larynx	1	0	0	100	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C32
Trachea, bronchus, and lung	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C33-34
Bone	2	0	100	0	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.2	0.2	0.02	**0.3**	C40-41
Melanoma of skin	6	0	100	0	-	-	-	-	1	2	-	1	-	-	-	-	1	1	-	-	0.7	0.7	0.13	**1.1**	C43
Non-melanoma skin	28	0	86	0	-	1	1	-	1	4	6	1	1	3	5	1	-	1	1	2	3.0	3.3	0.45	**4.8**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	92	0	54	14	1	2	2	6	16	15	16	7	13	5	4	2	3	-	-	-	10.0	10.8	0.93	**11.2**	C46
Connective and soft tissue	5	0	100	0	1	-	-	1	-	1	1	-	-	-	-	1	-	-	-	-	0.5	0.6	0.05	**0.6**	C47, C49
Breast	83	0	82	2	-	-	-	-	-	3	10	7	14	5	17	6	7	4	5	5	9.0	9.7	2.00	**17.9**	C50
Vulva	19	0	89	11	-	-	-	-	-	4	3	4	2	-	2	3	1	-	-	-	2.1	2.2	0.30	**3.0**	C51
Vagina	3	0	100	0	-	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	0.3	0.4	0.03	**0.4**	C52
Cervix uteri	319	0	87	4	-	-	-	-	5	25	51	58	45	34	31	31	20	12	5	2	34.7	37.3	6.03	**56.9**	C53
Uterus	7	0	100	0	-	-	-	-	-	-	1	-	-	-	1	2	1	-	1	1	0.8	0.8	0.22	**1.8**	C54-55
Ovary	6	0	83	17	-	-	-	-	1	-	-	1	1	-	-	-	3	-	-	-	0.7	0.7	0.16	**1.4**	C56
Placenta	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C58
Kidney and renal pelvis	9	0	100	0	4	1	1	-	-	-	-	-	-	3	-	-	-	-	-	-	1.0	1.1	0.08	**1.2**	C64-65
Bladder	35	0	9	23	-	-	-	1	1	-	3	2	3	4	5	1	2	3	6	4	3.8	4.1	1.09	**8.4**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	59	0	76	0	1	-	-	1	5	9	12	12	9	3	4	1	1	1	-	-	6.4	6.9	0.69	**7.8**	C69
Brain and nervous system	1	0	0	0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C70-72
Thyroid	6	0	100	0	-	-	-	-	-	1	-	-	1	2	-	1	1	-	-	-	0.7	0.7	0.13	**1.3**	C73
Hodgkin lymphoma	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C81
Non-Hodgkin lymphoma	38	0	84	16	2	4	1	1	6	4	5	2	2	2	1	3	2	-	2	1	4.1	4.4	0.58	**5.6**	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C91
Myeloid leukaemia	3	0	100	0	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	0.3	0.4	0.05	**0.6**	C92-94
Leukaemia, unspecified	1	0	0	0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C95
Other and unspecified	38	0	61	16	2	7	2	-	2	1	4	1	7	2	2	3	-	1	1	3	4.1	4.4	0.51	**6.0**	O&U
All sites	855	0	74	10	13	25	7	12	40	73	121	106	109	75	85	59	47	31	27	25	93.1	100.0	15.60	**149.8**	C00-96
All sites except C44	827	0	74	10	13	24	6	12	39	69	115	105	108	72	80	58	47	30	26	23	90.0	96.7	15.14	**145.0**	C00-96 exc. C44
Average annual population					27787	28589	29698	29812	27950	22025	16973	12239	9990	7364	5099	3984	2843	2082	1478	1681	229596				

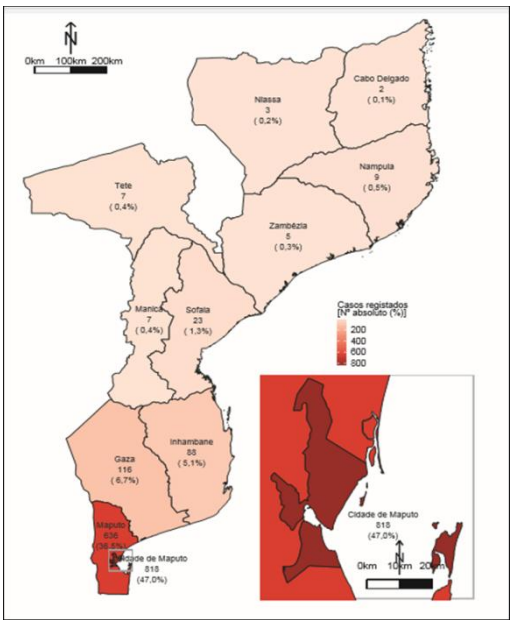
Mozambique, Maputo

The Maputo City Cancer Registry (*Registo de Cancro da Cidade de Maputo*) was founded in July 2014 and aims to collect data on all cancer cases occurring in residents of Maputo City, to provide information to the Ministry of Health through the National Cancer Control Program, and for research and training.

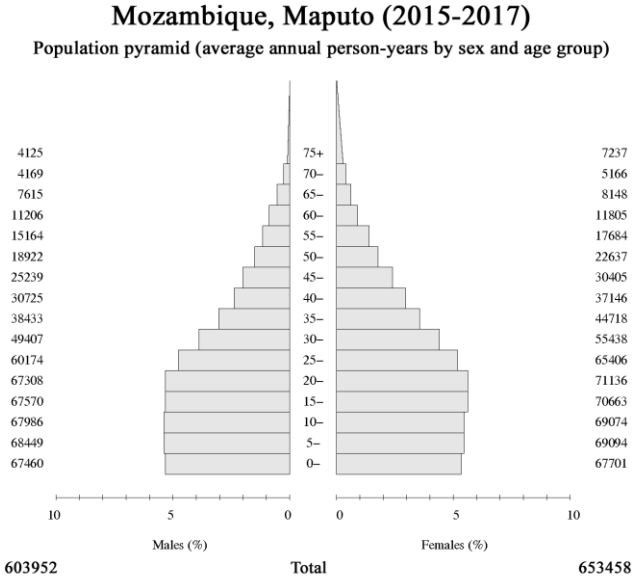
The registry is located in the Department of Pathology within the Maputo Central Hospital (MCH).

The registry activity started with the implementation of the hospital-based registry of MCH in January 2014, with funds from Fundação Calouste Gulbenkian and its partners, with technical support of the Instituto de Saúde Pública da Universidade do Porto through the "*Atenção integrada ao doente oncológico*"project (Integrated Attention to the Oncologic Patient). During 2014 -2016, this project provided funds for the registry salaries and other activities.

In July 2014, the population-based registry of the Maputo city was inaugurated with support from IARC and AFCRN, who also organized and provided formal training of the registrars. Since 2017 the registrar's salaries are supported by the MCH, which also provided a motorcycle (and funded lessons for one of the registrars) to facilitate visits to sources outside MCH. There have also been some government contributions to cover indirect costs, internet access, office supplies and the salary of one additional registrar since 2017.



Maputo city is the capital of Mozambique and is considered as a Province. The registry covers the area of 300km^2 of the Maputo city and includes 53 neighbourhoods. The population of Maputo city was 443,369 at the census of 2007, and 1,080,277 at that of 2017. For the period considered (2015-2017) the population at risk is based on the census data, plus estimates for 2015 and 2016, based on the two censuses.



The information for the population-based registry is drawn from the following sources, using a combination of active and passive methods: MCH; Mavalane General Hospital; Jose Macamo General Hospital; Private Laboratory of Pathology (PATLAB) and the Civil Registry Office for registries for death certification ("*1a e 2a Conservatórias do Registo Civil*").

MCH is a tertiary hospital with around 1500 beds and, as the national referral hospital, is responsible for most of the cancer cases diagnoses and registrations. In the MCH, the registrar obtains information from seven departments: department of pathology (passive), oncology service, onco-paediatics service, adult haematology, *clínica especial* (private patients), the pain unit, dermatology (for KS cases without biopsy), department of statistics and the Morgue (to identify cancer deaths via death certificates completed by the clinicians).

At the Mavalane General Hospital the pathology service provides the cancer registry annually with information on cancer cases diagnosed by cytology. Information on registered cases of Kaposi sarcoma is collected from the department of dermatology at José Macamo General Hospital. PATLAB processes specimens from private clinics. Cancer cases are noted in a spread sheet. Once a month the registrar goes to the PATLAB to complete the registration for each cancer case. In order to trace deaths at home, the registry included data from the Civil Register Office. Data collection is done in the largest of these (*Primeira Conservatória*) serving the majority of the city of Maputo, and started recently in another one (*Segunda*

conservatória). The death certificates are archived in paper form.

Cancer registry data are collected onto paper forms. They are checked by pathologists before being entered onto the computer. Cases are coded according to ICD-O-3 and entered using CanReg5 system. Both hospital-based and population-based registries have used a single database (CanReg system) since 2015 to save resources and enhance efficiency. Paper forms are archived in folders alphabetically by surname. There are folders for living patients; if a patient dies, their form is transferred to a deaths folder. These folders are stored in locked cabinets to which only the registry staff have access.

Data is checked for duplication and quality control is performed by using CanReg regularly.

There are many challenges. Trained registrars are regularly transferred to other departments in the hospital and replaced by others without training. Such staff mobility interferes with the quality of the data and retention strategies are needed; principally salary incentives. Most of the time the motorcycle provided by MCH does not work properly, making the collection of data outside the hospital challenging.

At MCH, the archives are paper-based; the case notes are not centrally filed but dispersed through different departments. In almost two thirds of the cases the National ID numbers are not present, making retrospective case finding very difficult. Stage information is often not very well written in clinical records. The whole process of completing each form is time-consuming for the pathologists.

YEARS PRESENTED

Three year period, 2015-2017

COMMENT

The rate of registration was fairly constant over the three years, averaging 75 cases (from Maputo) per month. A very high percentage of cases were registered as DCOs (19.2% in Men, 17.8% in women). With 68.8% of cases morphologically verified in men and 74.1% in women, only about 10% of cases were diagnosed by other means.

In males, KS (26.2% of cases), with an ASR of 22.7 per 10^5 (11.6 per 10^5 in females) was the most common cancer. Otherwise, except for liver cancer (ASR 14.1 per 10^5) the incidence rates tend to be rather low.

In females, cervix cancer accounts for almost one in three registered cases, with an ASR of 39.4 per 10^5, breast cancer is considerably less frequent (ASR 15.6 per 10^5).

In both sexes, oesophageal cancer rates are relatively high by world standards, typical of the pattern in East Africa, while other GI tract cancers – stomach and colon-rectum – appear to have low rates.

Summary

These are the first population-based data from the city of Maputo since those for 1956-1960 published in Cancer Incidence in Five Continents, Volume I. With the problems in registration described, and the rather high percentage of DCO cases, the data are not yet perfect, but appear to be a fair reflection of the local cancer profile.

PUBLICATIONS and ACHIEVEMENTS

The Maputo City Cancer Registry became a member of AFCRN in 2015.

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Mozambique, Maputo (2015–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	16	0	94	6	-	-	-	-	-	-	-	2	1	5	3	2	3	-	-	-	1.0	1.4	0.16	**1.6**	C00-06
Salivary gland	4	0	75	25	-	-	-	-	-	1	-	-	-	1	-	-	-	-	2	-	0.3	0.3	0.10	**0.5**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	9	0	78	11	-	-	-	-	-	-	-	-	2	1	2	3	1	-	-	-	0.6	0.8	0.09	**0.9**	C09-10, C12-14
Oesophagus	66	0	71	17	-	-	-	-	-	1	-	1	5	6	14	13	7	7	7	5	4.3	5.7	0.96	**7.4**	C15
Stomach	20	0	70	30	-	-	-	-	-	1	-	1	1	-	3	1	2	3	5	3	1.3	1.7	0.37	**2.5**	C16
Colon	16	0	81	19	-	-	-	-	1	1	3	2	1	1	1	-	2	-	2	2	1.0	1.4	0.17	**1.5**	C18
Rectum	16	0	75	25	-	-	-	-	-	2	1	1	-	3	-	2	1	3	1	2	1.0	1.4	0.20	**1.7**	C19-20
Anus	2	0	50	50	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	0.1	0.2	0.03	**0.2**	C21
Liver	151	0	60	30	-	-	1	5	4	8	19	16	10	11	12	18	15	10	11	11	9.8	13.1	1.65	**14.1**	C22
Gallbladder etc.	2	0	100	0	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	0.1	0.2	0.02	**0.2**	C23-24
Pancreas	8	0	50	38	-	-	-	-	-	1	-	1	-	1	1	2	1	1	-	-	0.5	0.7	0.09	**0.8**	C25
Larynx	13	0	92	8	-	-	-	-	-	1	-	-	-	-	4	2	3	1	1	1	0.8	1.1	0.18	**1.4**	C32
Trachea, bronchus, and lung	30	1	57	37	-	-	-	-	-	2	1	1	1	2	6	3	8	2	2	1	1.9	2.6	0.40	**3.2**	C33-34
Bone	7	0	86	14	-	-	-	3	2	-	-	1	-	-	-	-	1	-	-	-	0.5	0.6	0.03	**0.4**	C40-41
Melanoma of skin	3	0	100	0	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	0.2	0.3	0.01	**0.3**	C43
Non-melanoma skin	38	0	95	5	-	-	-	3	4	2	3	7	1	4	3	-	1	5	1	4	2.5	3.3	0.33	**3.4**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	303	0	63	10	4	3	3	5	11	42	60	49	40	20	20	15	9	13	2	7	19.6	26.2	2.09	**22.7**	C46
Connective and soft tissue	21	0	90	5	-	1	2	2	4	1	-	1	1	1	1	4	1	1	-	1	1.4	1.8	0.14	**1.6**	C47, C49
Breast	10	0	50	50	-	-	-	-	-	-	-	2	1	-	1	1	2	-	1	2	0.6	0.9	0.11	**1.0**	C50
Penis	15	0	87	7	-	-	-	-	-	-	-	5	2	-	-	3	2	1	-	2	1.0	1.3	0.13	**1.4**	C60
Prostate	184	0	77	20	-	-	-	-	1	1	-	1	3	3	11	20	35	31	33	45	11.9	15.9	3.10	**23.4**	C61
Testis	2	0	50	0	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C62
Kidney and renal pelvis	6	0	33	33	3	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.4	0.5	0.02	**0.4**	C64-65
Bladder	23	0	74	22	-	-	-	-	2	1	1	-	5	1	1	3	5	1	2	1	1.5	2.0	0.28	**2.3**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C66, C68
Eye	28	0	96	4	2	-	-	-	-	1	5	7	7	2	-	1	1	-	1	1	1.8	2.4	0.20	**2.2**	C69
Brain and nervous system	5	0	20	60	-	1	1	-	-	-	-	1	-	-	2	-	-	-	-	-	0.3	0.4	0.03	**0.4**	C70-72
Thyroid	8	0	88	0	-	-	-	-	1	1	1	-	1	-	-	3	-	1	-	-	0.5	0.7	0.08	**0.6**	C73
Hodgkin lymphoma	7	0	100	0	-	-	1	-	-	2	-	2	1	-	-	1	-	-	-	-	0.5	0.6	0.04	**0.5**	C81
Non-Hodgkin lymphoma	49	0	69	29	3	-	1	1	4	1	6	8	5	3	8	4	3	-	1	1	3.2	4.2	0.37	**3.9**	C82-86, C96
Multiple myeloma	7	1	86	0	-	-	-	-	-	-	2	-	-	-	-	4	-	-	-	-	0.5	0.6	0.06	**0.5**	C90
Lymphoid leukaemia	12	0	67	17	2	-	2	-	3	-	-	-	-	-	-	3	-	1	1	-	0.8	1.0	0.12	**1.0**	C91
Myeloid leukaemia	8	0	50	12	1	1	-	2	-	1	1	1	-	-	-	-	-	-	-	1	0.5	0.7	0.02	**0.5**	C92-94
Leukaemia, unspecified	7	0	0	100	1	-	-	-	1	1	-	2	1	-	-	1	-	-	-	-	0.5	0.6	0.04	**0.5**	C95
Other and unspecified	58	0	67	31	-	2	2	-	4	2	5	4	6	2	4	5	11	5	2	4	3.8	5.0	0.60	**5.4**	O&U
All sites	1156	2	70	19	16	10	14	21	42	75	109	119	97	67	99	114	114	87	75	95	74.8	100.0	12.24	**108.5**	C00-96
All sites except C44	1118	2	69	19	16	10	14	18	38	73	106	112	96	63	96	114	113	82	74	91	72.3	96.7	11.91	**105.1**	C00-96 exc. C44
Average annual population					56290	58070	53893	59495	61930	52582	41349	30854	23143	17756	17305	15316	11482	6477	3914	5605	515460				

Mozambique, Maputo (2015–2017)

Number of cases by age group and summary rates of incidence: females

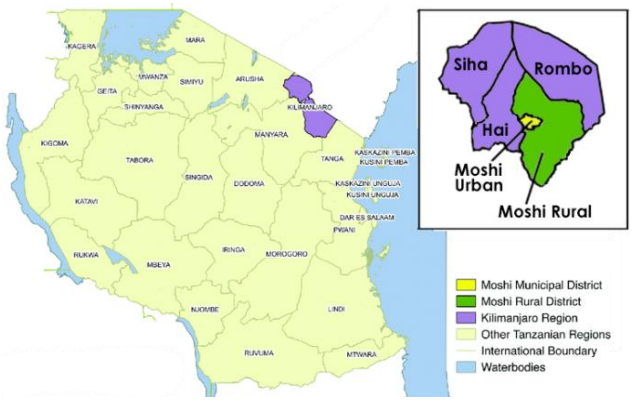
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	9	0	89	11	-	-	-	-	-	-	-	-	1	2	1	-	-	3	2	-	0.5	0.5	0.16	**1.0**	C00-06
Salivary gland	3	0	100	0	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	**0.1**	C07-08
Nasopharynx	2	0	100	0	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	4	0	75	0	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	1	0.2	0.2	0.02	**0.3**	C09-10, C12-14
Oesophagus	117	0	81	13	-	-	-	-	1	-	8	4	8	13	19	20	15	11	8	10	7.1	7.1	1.29	**10.6**	C15
Stomach	9	0	67	33	-	-	-	-	-	-	1	-	-	2	-	1	1	2	1	1	0.5	0.5	0.12	**0.9**	C16
Colon	16	0	100	0	-	-	-	-	-	-	1	2	1	2	2	4	2	2	-	-	1.0	1.0	0.16	**1.4**	C18
Rectum	13	0	77	8	-	-	-	-	-	-	-	2	1	2	1	-	1	3	-	3	0.8	0.8	0.12	**1.2**	C19-20
Anus	11	0	91	9	-	-	-	-	-	-	2	2	2	1	-	-	1	2	-	1	0.7	0.7	0.10	**0.9**	C21
Liver	107	0	51	39	3	1	-	3	4	10	9	10	10	6	8	9	5	9	7	13	6.5	6.5	0.92	**8.4**	C22
Gallbladder etc.	1	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.1	0.01	**0.1**	C23-24
Pancreas	9	0	11	56	-	-	-	-	1	1	-	1	-	1	-	1	2	1	1	-	0.5	0.5	0.11	**0.8**	C25
Larynx	3	0	67	33	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	0.2	0.2	0.04	**0.3**	C32
Trachea, bronchus, and lung	21	0	52	33	-	-	-	-	1	-	1	1	2	-	6	2	6	-	1	1	1.3	1.3	0.21	**1.8**	C33-34
Bone	7	0	71	29	1	-	1	-	3	-	-	-	-	-	-	-	2	-	-	-	0.4	0.4	0.04	**0.5**	C40-41
Melanoma of skin	5	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	3	1	-	0.3	0.3	0.11	**0.6**	C43
Non-melanoma skin	50	0	98	2	1	-	1	-	3	10	4	8	4	4	5	3	-	1	-	6	3.0	3.0	0.24	**3.3**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	190	0	56	18	1	2	3	5	19	34	41	31	18	13	6	5	4	2	5	1	11.5	11.5	1.07	**11.6**	C46
Connective and soft tissue	16	0	88	6	-	-	1	1	-	1	1	2	2	1	-	3	2	-	-	2	1.0	1.0	0.10	**1.2**	C47, C49
Breast	193	0	81	17	-	-	-	1	2	8	17	25	23	23	17	28	18	9	9	13	11.7	11.7	1.72	**15.6**	C50
Vulva	19	0	100	0	-	-	-	-	-	-	3	5	3	-	6	1	1	-	-	-	1.1	1.2	0.13	**1.3**	C51
Vagina	5	0	100	0	-	-	-	-	-	-	-	2	-	1	1	-	-	-	-	1	0.3	0.3	0.02	**0.4**	C52
Cervix uteri	498	0	80	14	-	-	2	-	7	14	32	69	90	65	70	43	38	24	13	31	30.1	30.2	4.06	**39.4**	C53
Uterus	23	0	91	4	-	-	-	-	-	-	-	2	-	1	3	4	5	3	1	4	1.4	1.4	0.26	**2.2**	C54-55
Ovary	29	0	62	38	-	-	-	-	1	1	4	4	1	2	2	3	5	2	1	3	1.8	1.8	0.26	**2.4**	C56
Placenta	12	0	75	17	-	-	-	1	1	4	1	1	3	-	-	-	-	-	-	1	0.7	0.7	0.04	**0.7**	C58
Kidney and renal pelvis	10	0	60	20	4	3	-	-	-	-	-	-	-	-	-	2	1	-	-	-	0.6	0.6	0.06	**0.7**	C64-65
Bladder	25	0	48	40	-	-	-	1	-	1	-	2	-	3	1	4	5	2	1	5	1.5	1.5	0.24	**2.2**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	62	0	97	3	2	-	-	1	3	5	11	8	10	6	10	2	3	1	-	-	3.7	3.8	0.38	**4.2**	C69
Brain and nervous system	12	0	67	8	3	2	-	-	-	-	2	1	-	-	2	-	1	-	1	-	0.7	0.7	0.09	**0.9**	C70-72
Thyroid	19	0	100	0	-	1	1	-	-	2	2	-	-	5	2	1	1	2	1	1	1.1	1.2	0.18	**1.6**	C73
Hodgkin lymphoma	5	0	100	0	-	-	-	2	-	1	-	-	1	1	-	-	-	-	-	-	0.3	0.3	0.02	**0.3**	C81
Non-Hodgkin lymphoma	49	0	78	18	2	1	1	1	3	6	8	8	7	2	2	4	1	1	-	2	3.0	3.0	0.26	**3.1**	C82-86, C96
Multiple myeloma	4	0	50	0	-	-	-	-	-	-	-	-	1	-	-	-	2	1	-	-	0.2	0.2	0.06	**0.4**	C90
Lymphoid leukaemia	13	0	77	8	3	3	2	1	-	-	-	-	-	-	2	1	-	1	-	-	0.8	0.8	0.07	**0.9**	C91
Myeloid leukaemia	7	0	86	0	-	1	1	-	-	-	-	-	1	3	1	-	-	-	-	-	0.4	0.4	0.04	**0.5**	C92-94
Leukaemia, unspecified	10	0	0	80	2	-	-	-	-	-	2	-	1	1	1	-	1	1	-	1	0.6	0.6	0.07	**0.8**	C95
Other and unspecified	62	1	66	32	3	-	-	1	4	3	4	4	5	8	3	8	6	5	3	4	3.7	3.8	0.57	**5.1**	O&U
All sites	1650	1	75	17	25	14	13	19	54	102	155	197	196	168	173	149	130	91	57	106	99.7	100.0	13.38	**127.9**	C00-96
All sites except C44	1600	1	74	18	24	14	12	19	51	92	151	189	192	164	168	146	130	90	57	100	96.7	97.0	13.13	**124.6**	C00-96 exc. C44
Average annual population					56432	59641	57004	63584	65149	51891	41453	35236	28463	22611	21139	16247	11414	7549	4840	8843	551497				

Tanzania, Kilimanjaro

The registry was started in 1974 and recorded pathology-based data between 1975 and 1981 (Lauren and Kitinya, 1986). Approximately half of the cases at that time were from Kilimanjaro Christian Medical Centre (KCMC), the remainder coming from many other hospitals in the northern part of the country. In 1998, with the support of IARC, the registry was restarted as a population-based registry, under the direction of the resident pathologist (Dr. Emma Moshi), and covered four districts (Moshi, urban and rural, Rombo, Hai) in Kilimanjaro region, with a population of about 840,000. Data collection was not only from the pathology department, but also by scheduled visits by the cancer registrar to other hospitals within these four districts. Some results (from 1998-2000) were reported in "Cancer in Africa" (Parkin et al, 2003).

With the departure of the pathologist around 2007 the registry was left without a Director (and KCMC with no resident pathologist), and, although the registrar continued to collect and record data, there was no supervision or oversight of her work, until 2013, when KCMC revived the registry. In 2018, the registry became part of the Cancer Centre; it is staffed by three cancer registrars and supervised by the head of the oncology department and the executive director of KCMC Hospital and his management team.

The principal aim of the KMCR is to determine cancer incidence in the population of five districts: Moshi Urban, Moshi Rural, Rombo, Hai and Siha Districs.



According to the National Population Census 2002 and 2012, the estimated population from 2013 to 2018 averaged 1.14 million. The major ethnic groups include Chagga, Pare, Masai and Sambaa and the main economic activities include business, farmers and pastoralists.

The registry collects information on all cancer cases diagnosed clinically with or without biopsy confirmation at KCMC as well as in 13 other missionary and government hospitals within Kilimanjaro region, as well as private laboratories.

KCMC is a tertiary referral and teaching hospital situated in north of the Kilimanjaro Region in Moshi, with a total capacity of 450 bed and providing services to approximately 12 million people. It has all major disciplines and some essential subspecialties. The main sources of information at KCMC are the pathology laboratory, cancer care centre, medical records department, radiology department, and the mortuary. The pathologists in KCMC provide request forms as initial point to check for malignancies. The request form contains diagnosis and clinical summary which is useful for identifying cases from other medical records.

Other sources of cases are private laboratories, and 13 government and mission hospitals within the catchment area, which the registrars visit regularly. In these other hospitals, cancer registry assistants, appointed by the facility, identify all newly diagnosed cancer cases in the wards. They assist the cancer registry staff with case finding and abstraction. The registrars review patient records such as admission forms, pathology and cytology result forms, patient registry book, request forms, discharge summary, patient files, or electronic medical records (if available) to abstract information. Interviews with medical staff may be conducted to clarify any uncertain cases. Follow-up of patients is done on a regular basis to update patient status.

Data are stored and managed in CanReg5. The registry reports its results to the KCMC hospital management, Ministry of Health and other supporting agencies including AFCRN. The registry data have been used to describe and estimate the cancer burden in the Kilimanjaro Region, therefore increasing public awareness of cancer. The data from the registry have also been used by the Ministry of Health in Tanzania as part of the national cancer registration programme. Medical students and health specialists also use the data for research purposes.

The registry is currently being assisted by several key players: Vital Strategies (for the Bloomberg Data for Health Initiative) coordinating with the MoH and the AFCRN, as well as the Cancer Care Support Group TAKEDA/KCMC Partnership who support the allowances and outreach activities. With the cancer care centre achieving the status of a semi autonomous department, it will have more liberty to plan its finances and allocate a budget consistent with its needs, particularly in sustaining its registry in the near future.

YEARS PRESENTED

Five year period, 2013 – 2017

COMMENT

The registry recorded about 290 cases per year over the 5 year period 2013-2017, which is well below the number of cases that

might be expected in a population of 1.14 million, based on incidence rates recorded elsewhere in the region. Results are therefore presented as numbers of cases and percentage frequencies.

They show that, in males, the cancer profile is dominated by cancer of the prostate (25.6% of cases), oesophagus (17.5%) and liver (6%). In females, cervix cancer (31.5% of cases) is considerably more frequent than breast cancer (17.9%); oesophageal cancer (36 cases, 6% of cancers in females) is only about one quarter as commonly recorded as in males.

The cancer profile remains very similar to that of 1998-2000 (pp160-166 of Parkin et al, 2003).

PUBLICATIONS and ACHIEVEMENTS

Lauren P, and Kitinya J. (1986) Kilimanjaro Cancer Registry, 1975-1979. In: Parkin DM, ed., Cancer Occurrence in Developing Countries (IARC Scientific Publications No. 75), Lyon, IARC, pp. 108-11 0

Parkin DM, Ferlay J, Hamdi-Chérif M, Sitas F, Thomas JO, Wabinga H and Whelan SL. (eds) (2003) Cancer in Africa: Epidemiology and Prevention. IARC Scientific Publications No.153, IARC, Lyon, France

Tanzania, Kilimanjaro (2013–2017)

Number of cases by age group: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	12	0	92	0	-	-	1	-	-	-	-	-	1	1	1	-	1	1	3	3	1.5	C00-06
Salivary gland	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	0.3	C07-08
Nasopharynx	8	0	100	0	-	-	-	-	-	-	-	-	-	-	-	2	2	2	1	1	1.0	C11
Other pharynx	7	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	3	1	1	-	0.9	C09-10, C12-14
Oesophagus	136	0	56	0	-	-	-	-	-	1	2	2	4	21	19	23	17	8	16	23	17.5	C15
Stomach	31	0	77	0	-	-	-	-	-	-	-	2	1	2	2	4	2	2	5	11	4.0	C16
Colon	16	0	94	0	-	-	-	-	1	-	1	3	2	2	-	2	-	2	2	1	2.1	C18
Rectum	17	0	94	0	-	-	-	-	-	2	-	2	-	-	2	-	2	4	1	4	2.2	C19-20
Anus	4	0	100	0	-	-	-	-	1	-	-	-	-	-	-	1	1	1	-	-	0.5	C21
Liver	47	0	26	0	-	-	-	2	-	-	5	5	6	2	5	8	3	5	2	4	6.0	C22
Gallbladder etc.	3	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	0.4	C23-24
Pancreas	5	0	80	0	-	-	-	-	-	-	-	-	-	-	1	-	-	2	1	1	0.6	C25
Larynx	13	0	85	0	-	-	-	-	-	-	-	1	2	1	-	2	-	4	-	3	1.7	C32
Trachea, bronchus, and lung	6	0	67	0	-	-	-	-	-	-	-	-	-	1	-	-	2	-	2	1	0.8	C33-34
Bone	10	0	90	0	-	1	1	-	2	-	-	1	1	-	3	1	-	-	-	-	1.3	C40-41
Melanoma of skin	3	0	100	0	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	0.4	C43
Non-melanoma skin	25	0	92	0	-	-	-	1	1	1	1	2	5	2	1	5	2	3	-	1	3.2	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	27	0	81	0	-	-	-	-	-	3	4	4	7	1	3	2	-	2	-	1	3.5	C46
Connective and soft tissue	12	0	100	0	-	-	2	1	2	-	-	1	-	1	2	-	2	1	-	-	1.5	C47, C49
Breast	11	0	100	0	-	-	-	-	-	-	-	1	-	1	-	-	1	2	3	3	1.4	C50
Penis	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	0.4	C60
Prostate	199	0	92	0	-	-	-	-	-	1	-	-	1	1	4	11	17	37	25	102	25.6	C61
Testis	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.3	C62
Kidney and renal pelvis	8	0	75	0	4	1	1	-	-	-	-	-	-	-	-	-	-	1	-	1	1.0	C64-65
Bladder	49	0	88	0	-	-	-	-	2	-	1	-	-	2	3	6	3	8	5	19	6.3	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0.1	C66, C68
Eye	16	0	100	0	-	-	-	1	1	2	-	1	4	1	2	1	1	2	-	-	2.1	C69
Brain and nervous system	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.1	C70-72
Thyroid	5	0	80	0	-	-	-	-	-	-	-	-	-	-	2	1	2	-	-	-	0.6	C73
Hodgkin lymphoma	2	0	100	0	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.3	C81
Non-Hodgkin lymphoma	33	0	100	0	4	-	1	1	1	1	2	5	1	4	1	2	2	4	3	1	4.2	C82-86, C96
Multiple myeloma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	C90
Lymphoid leukaemia	3	0	100	0	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0.4	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C92-94
Leukaemia, unspecified	5	0	40	0	2	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	0.6	C95
Other and unspecified	55	0	91	0	-	2	2	5	1	3	1	-	3	7	5	4	7	4	5	6	7.1	O&U
All sites	778	0	80	0	12	5	9	11	13	14	17	31	39	50	61	78	71	98	79	190	100.0	C00-96
All sites except C44	753	0	80	0	12	5	9	10	12	13	16	29	34	48	60	73	69	95	79	189	96.8	C00-96 exc. C44

Tanzania, Kilimanjaro (2013–2017)

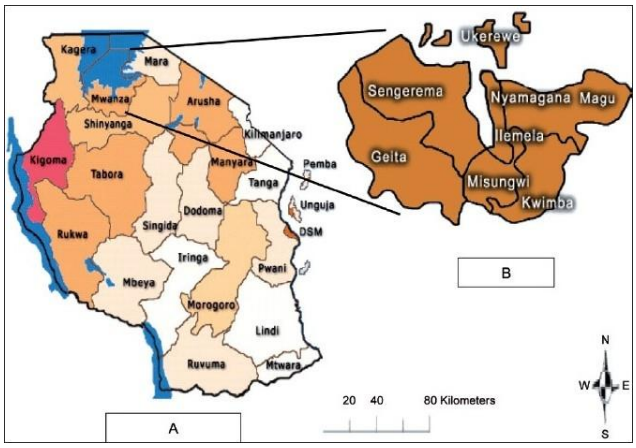
Number of cases by age group: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	11	0	91	0	1	1	-	-	-	-	-	-	-	1	1	-	-	2	2	3	1.5	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C07-08
Nasopharynx	4	0	100	0	-	-	-	-	1	-	-	1	-	-	-	-	-	1	1	-	0.6	C11
Other pharynx	6	0	100	0	-	-	-	-	-	-	-	-	-	1	-	3	-	1	1	-	0.8	C09-10, C12-14
Oesophagus	36	0	64	0	-	-	-	-	-	-	1	1	2	3	4	4	4	4	2	11	5.0	C15
Stomach	27	0	85	0	-	-	-	-	-	-	-	-	3	2	3	10	2	2	3	2	3.8	C16
Colon	7	0	100	0	-	-	-	-	-	-	1	-	-	-	-	2	2	-	1	1	1.0	C18
Rectum	15	0	100	0	-	-	-	-	-	1	-	2	-	1	2	1	1	4	-	3	2.1	C19-20
Anus	4	0	75	0	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	1	0.6	C21
Liver	10	0	60	0	-	-	-	-	1	-	-	1	1	2	-	-	1	1	1	2	1.4	C22
Gallbladder etc.	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	0.3	C23-24
Pancreas	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	C25
Larynx	3	0	100	0	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	-	0.4	C32
Trachea, bronchus, and lung	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	0.3	C33-34
Bone	7	0	86	0	-	-	1	2	2	1	-	-	-	-	-	-	1	-	-	-	1.0	C40-41
Melanoma of skin	7	0	100	0	-	-	-	-	-	-	-	1	-	-	-	1	1	-	1	3	1.0	C43
Non-melanoma skin	19	0	95	0	-	-	4	1	1	2	-	-	1	-	1	4	2	-	-	3	2.7	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	19	0	47	0	1	-	2	-	2	2	5	3	1	-	-	1	-	1	-	1	2.7	C46
Connective and soft tissue	9	0	100	0	-	1	-	1	1	-	1	-	2	-	-	-	1	-	1	1	1.3	C47, C49
Breast	128	0	92	0	-	-	-	-	3	3	12	11	14	15	14	13	9	12	10	12	17.9	C50
Vulva	3	0	100	0	-	-	-	-	1	-	-	1	-	1	-	-	-	-	-	-	0.4	C51
Vagina	4	0	100	0	-	-	1	-	-	-	-	1	-	1	1	-	-	-	-	-	0.6	C52
Cervix uteri	225	1	93	0	-	-	-	-	-	8	8	20	27	33	27	24	21	19	10	27	31.5	C53
Uterus	23	0	96	0	-	-	-	-	-	-	-	1	2	2	-	1	6	1	8	2	3.2	C54-55
Ovary	27	0	81	0	-	-	-	2	-	1	1	2	-	2	5	5	3	2	1	3	3.8	C56
Placenta	2	0	100	0	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	0.3	C58
Kidney and renal pelvis	7	0	43	0	5	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1.0	C64-65
Bladder	6	0	67	0	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	3	0.8	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.1	C66, C68
Eye	17	0	100	0	2	-	-	1	-	1	3	3	2	-	2	1	-	2	-	-	2.4	C69
Brain and nervous system	1	0	0	0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	C70-72
Thyroid	9	0	100	0	-	-	-	-	1	-	1	1	1	2	-	1	-	2	-	-	1.3	C73
Hodgkin lymphoma	3	0	100	0	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	0.4	C81
Non-Hodgkin lymphoma	24	0	100	0	4	1	1	2	2	1	-	2	4	-	2	1	1	2	-	1	3.4	C82-86, C96
Multiple myeloma	6	0	100	0	-	-	-	1	-	-	-	-	1	-	-	1	2	-	-	1	0.8	C90
Lymphoid leukaemia	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.1	C91
Myeloid leukaemia	1	0	100	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0.1	C92-94
Leukaemia, unspecified	2	0	100	0	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.3	C95
Other and unspecified	36	0	92	0	2	-	1	1	3	2	2	1	6	3	1	3	2	2	3	4	5.0	O&U
All sites	715	1	89	0	16	4	10	11	19	25	35	54	70	75	63	78	64	60	45	85	100.0	C00-96
All sites except C44	696	1	89	0	16	4	6	10	18	23	35	54	69	75	62	74	62	60	45	82	97.3	C00-96 exc. C44

Tanzania, Mwanza

The Mwanza Cancer Registry (MCR) was established in 2016 in the department of oncology of Bugando Medical Centre with support from AFCRN, as an expansion and improvement of the hospital based cancer registry. This had been started in 2015, funded by the Duke University Global Health Institute. The department has had its own registry with a clinical component since 2010. Personnel include an oncologist as the director and a cancer registrar. The director of the registry is an employee of the Bugando Medical Centre under the Ministry of Health, while the registrar's salary and allowance are being paid using the project funding.

As an expansion of the registry and in order to reach the goal of population cancer registration, MCR has appointed and trained registrars in three districts in cancer registration management, i.e. case finding, data abstraction, data cleaning, and data storage. The registrar from MCR pays supportive visits to these districts at least twice a month, where information on the cases recorded are cross checked and validated, and a copy is taken back to MCR for data entering.

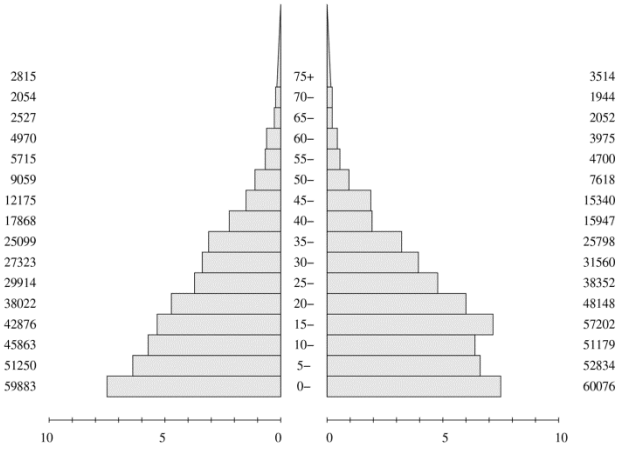


The aim of the MCR is to determine cancer incidence in three districts of the Mwanza region: Nyamagana which is the city centre, Ilemela, and Sengerema – a large mainly rural district separated from the other two by the Mwanza Gulf, an inlet of Lake Victoria. The MCR collects data on all cases of cancer detected in the sources of information (below), for the population concerned. The inhabitants come from all of the 127 ethnic groups found in Tanzania, although the majority are Sukuma, Haya, Kurya, Zanaki, and Ha.

In the first 3 years of operation, the calculated incidence rate for Sengerema is barely one fifth of that of the other two districts, suggesting that case finding is inadequate in this more remote district. In this report, we present incidence rates only for the populations of Nyamagana and Ilemela. The population of the two districts in 2016 and 2017 was about 800,000, according to the census of 2002 and 2012, and post-censal projections.

Tanzania, Mwanza [two districts] (2016-2017)

Population pyramid (average annual person-years by sex and age group)



377413 Total 420239

The main sources of information are the hospital medical records department in the Bugando Medical Centre, which is a Zonal Referral Hospital; Sekou Toure Regional Referral Hospital and Sengerema District Hospital, and Bugando pathology laboratory.

Admission and discharge forms are used to abstract patient case data from out-patients and in-patients medical records. During ward visits, the cancer registrar notes all newly admitted cases and data collection forms are initiated. The patient's medical file is retrieved from the medical records department in order to complete registration. The registrar also reviews the register of hospital deaths to detect new cases otherwise missed. Pathology reports on new cancer cases and hematologic malignancy diagnoses made based on peripheral blood evaluation and bone marrow aspiration are collected from the Bugando pathology laboratory. The file number is noted to enable case finding within the medical records and hence completion of notification forms.

The cancer notification forms are filed numerically by registration number and stored in a locked cabinet. The documents are secure and inaccessible to unauthorized persons. Tbe Canreg5 database is password-protected, only authorized persons can access the information. A backup of the CanReg5 database is made each day. The backup is stored on an external portable hard drive, which is stored in a secure, locked drawer inaccessible to unauthorized persons.

YEARS PRESENTED

Two year period, 2016 – 2017, for two districts

COMMENT

The registry only began in 2015, so the results presented are preliminary, and, for 2017, remain possibly incomplete (300 cases registered, compared with 583 in 2016). Despite this, the calculated rates (all sites) are rather are close to the regional average – slightly lower in males (94.8 per 10^5), slightly higher in females (164.4 per 10^5). The rates for most individual cancers are low, with the exception of cervix cancer (85.9 per 10^5) and prostate cancer (37.1 per 10^5). The rates of oesophageal cancer and non-Hodgkin lymphoma are close to the regional average.

Summary

These are preliminary results from a new registry yet to refine its case finding methods, but are of interest in suggesting a very high incidence of cervix cancer in this region of Tanzania.

PUBLICATIONS and ACHIEVEMENTS

The Mwanza Cancer Registry has become a member of AFCRN in 2019.

Tanzania, Mwanza [two districts] (2016–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C07-08
Nasopharynx	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	0.3	0.6	0.03	**0.6**	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C09-10, C12-14
Oesophagus	23	0	87	0	-	-	-	-	-	-	3	-	3	-	4	3	3	1	1	5	3.0	6.9	0.68	**7.1**	C15
Stomach	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	0.3	0.6	0.13	**0.9**	C16
Colon	3	0	67	0	-	-	-	-	1	-	1	-	-	1	-	-	-	-	-	-	0.4	0.9	0.04	**0.5**	C18
Rectum	7	0	100	0	-	-	-	-	1	-	-	-	-	-	2	1	-	-	3	-	0.9	2.1	0.47	**2.5**	C19-20
Anus	4	0	100	0	-	-	-	-	1	-	-	-	1	1	-	1	-	-	-	-	0.5	1.2	0.08	**0.9**	C21
Liver	18	0	50	0	1	-	-	-	1	2	3	1	2	2	1	2	2	-	1	-	2.4	5.4	0.47	**4.0**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	3	0	0	0	-	-	-	-	-	-	1	-	1	-	-	-	1	-	-	-	0.4	0.9	0.07	**0.7**	C25
Larynx	3	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	0.4	0.9	0.11	**1.0**	C32
Trachea, bronchus, and lung	2	0	50	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	0.3	0.6	0.14	**0.7**	C33-34
Bone	7	0	86	0	-	1	2	3	-	-	-	-	1	-	-	-	-	-	-	-	0.9	2.1	0.05	**0.8**	C40-41
Melanoma of skin	6	0	83	0	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	2	0.8	1.8	0.08	**1.6**	C43
Non-melanoma skin	2	0	100	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	0.3	0.6	0.02	**0.3**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	27	0	56	0	-	1	-	1	-	3	5	6	2	3	2	1	1	1	1	-	3.6	8.2	0.60	**5.3**	C46
Connective and soft tissue	9	0	100	0	-	-	-	2	1	-	-	-	1	1	-	-	2	-	1	1	1.2	2.7	0.28	**2.4**	C47, C49
Breast	7	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	1	1	1	3	0.9	2.1	0.29	**2.8**	C50
Penis	7	0	86	0	-	-	-	-	-	-	-	-	1	1	1	-	1	2	-	1	0.9	2.1	0.31	**2.6**	C60
Prostate	91	0	92	0	-	-	-	1	-	-	-	-	2	-	1	6	16	10	18	37	12.1	27.5	4.31	**37.1**	C61
Testis	1	0	0	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.1	0.3	0.01	**0.2**	C62
Kidney and renal pelvis	4	0	75	0	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.2	0.02	**0.4**	C64-65
Bladder	10	0	100	0	-	-	-	-	-	-	1	1	3	1	1	2	-	-	-	1	1.3	3.0	0.20	**2.3**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	14	0	71	0	3	1	1	-	-	-	-	1	2	4	-	1	-	1	-	-	1.9	4.2	0.29	**2.9**	C69
Brain and nervous system	2	0	0	0	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	0.3	0.6	0.02	**0.2**	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C73
Hodgkin lymphoma	7	0	100	0	-	-	-	2	2	2	-	-	1	-	-	-	-	-	-	-	0.9	2.1	0.06	**0.9**	C81
Non-Hodgkin lymphoma	28	0	75	4	2	1	3	5	-	-	4	1	3	2	5	1	-	1	-	-	3.7	8.5	0.47	**5.0**	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C90
Lymphoid leukaemia	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	0.3	0.6	0.24	**1.0**	C91
Myeloid leukaemia	4	0	100	0	-	-	2	-	-	-	-	-	1	-	-	-	-	1	-	-	0.5	1.2	0.12	**1.0**	C92-94
Leukaemia, unspecified	3	0	100	0	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.9	0.02	**0.3**	C95
Other and unspecified	33	0	100	0	-	1	-	2	1	3	2	5	4	-	1	1	3	5	2	3	4.4	10.0	1.13	**9.1**	O&U
All sites	331	0	84	0	9	8	10	16	8	10	21	16	33	18	22	19	32	24	31	54	43.9	100.0	10.74	**94.8**	C00-96
All sites except C44	329	0	84	0	9	8	10	16	8	10	20	16	32	18	22	19	32	24	31	54	43.6	99.4	10.72	**94.6**	C00-96 exc. C44
Average annual population					59883	51250	45863	42876	38022	29914	27322	25099	17868	12175	9058	5714	4970	2527	2054	2815	377410				

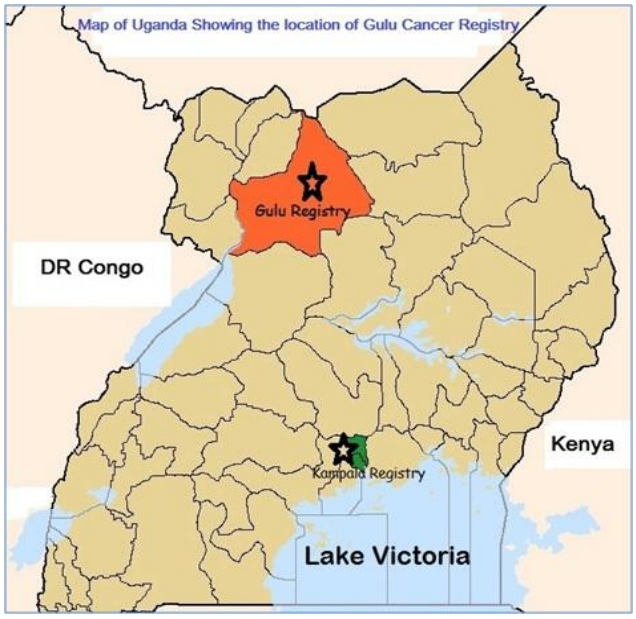
Tanzania, Mwanza [two districts] (2016–2017)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C07-08
Nasopharynx	4	0	100	0	-	-	-	-	1	-	-	-	-	-	1	1	1	-	-	-	0.5	0.7	0.15	**1.3**	C11
Other pharynx	2	0	100	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	0.2	0.4	0.02	**0.3**	C09-10, C12-14
Oesophagus	18	0	94	0	-	-	-	-	-	-	2	-	1	2	1	2	5	3	1	1	2.1	3.2	1.01	**7.5**	C15
Stomach	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C16
Colon	4	0	100	0	-	-	-	-	-	-	-	1	-	3	-	-	-	-	-	-	0.5	0.7	0.06	**0.7**	C18
Rectum	9	0	100	0	-	-	1	-	-	-	-	-	-	5	-	-	1	-	2	-	1.1	1.6	0.41	**2.6**	C19-20
Anus	7	0	100	0	-	-	-	-	-	-	-	1	1	2	2	1	-	-	-	-	0.8	1.3	0.18	**1.8**	C21
Liver	7	0	29	0	1	-	-	-	1	-	2	-	-	-	-	2	-	-	-	1	0.8	1.3	0.13	**1.5**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.2	0.00	**0.3**	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C32
Trachea, bronchus, and lung	1	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C33-34
Bone	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.1	0.2	0.02	**0.2**	C40-41
Melanoma of skin	4	0	100	0	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	1	0.5	0.7	0.04	**0.7**	C43
Non-melanoma skin	3	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	0.4	0.5	0.01	**0.7**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	17	0	53	0	-	-	-	-	1	-	1	5	2	1	1	1	1	-	2	2	2.0	3.1	0.52	**4.2**	C46
Connective and soft tissue	5	0	100	0	-	-	-	-	1	-	1	1	1	-	-	-	-	1	-	-	0.6	0.9	0.16	**1.2**	C47, C49
Breast	57	0	89	2	-	-	-	-	3	1	2	5	10	13	8	3	3	5	2	2	6.8	10.2	1.93	**16.2**	C50
Vulva	6	0	100	0	-	-	-	-	-	-	1	-	-	2	1	-	1	-	1	-	0.7	1.1	0.26	**1.8**	C51
Vagina	5	0	100	0	-	-	-	-	-	-	-	1	2	-	-	2	-	-	-	-	0.6	0.9	0.15	**1.3**	C52
Cervix uteri	263	0	98	0	-	-	-	-	-	2	13	34	30	38	29	26	35	21	17	18	31.3	47.2	10.82	**85.9**	C53
Uterus	33	0	100	0	-	-	-	-	1	-	7	5	10	6	1	-	1	1	-	1	3.9	5.9	0.58	**6.2**	C54-55
Ovary	19	0	84	5	-	-	-	-	3	3	1	1	-	2	1	2	1	3	2	-	2.3	3.4	0.91	**6.1**	C56
Placenta	6	0	67	0	-	-	-	-	1	1	-	2	1	-	1	-	-	-	-	-	0.7	1.1	0.08	**0.9**	C58
Kidney and renal pelvis	7	0	57	0	4	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	0.8	1.3	0.05	**0.9**	C64-65
Bladder	14	0	100	0	-	-	-	-	-	-	1	-	5	-	4	2	1	1	-	-	1.7	2.5	0.51	**4.4**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	10	0	100	0	-	-	2	1	-	-	2	1	-	-	3	1	-	-	-	-	1.2	1.8	0.19	**2.0**	C69
Brain and nervous system	1	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.1**	C70-72
Thyroid	2	0	100	0	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	0.2	0.4	0.03	**0.4**	C73
Hodgkin lymphoma	5	0	80	0	-	-	-	-	1	-	2	-	1	-	1	-	-	-	-	-	0.6	0.9	0.07	**0.8**	C81
Non-Hodgkin lymphoma	16	0	62	0	-	3	1	-	1	2	1	-	2	1	-	-	-	2	2	1	1.9	2.9	0.59	**4.1**	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C91
Myeloid leukaemia	2	0	100	0	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	0.2	0.4	0.01	**0.2**	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C95
Other and unspecified	28	0	89	0	-	1	-	2	-	1	1	1	-	1	4	4	3	4	-	6	3.3	5.0	1.07	**9.9**	O&U
All sites	557	0	92	0	6	4	5	5	14	11	38	60	71	79	58	47	53	41	29	36	66.3	100.0	19.98	**164.4**	C00-96
All sites except C44	554	0	92	0	6	4	5	5	14	11	38	59	71	79	58	47	53	41	29	34	65.9	99.5	19.97	**163.7**	C00-96 exc. C44
Average annual population					60076	52834	51179	57202	48148	38352	31560	25798	15946	15340	7618	4700	3975	2052	1944	3514	420236				

Uganda, Gulu

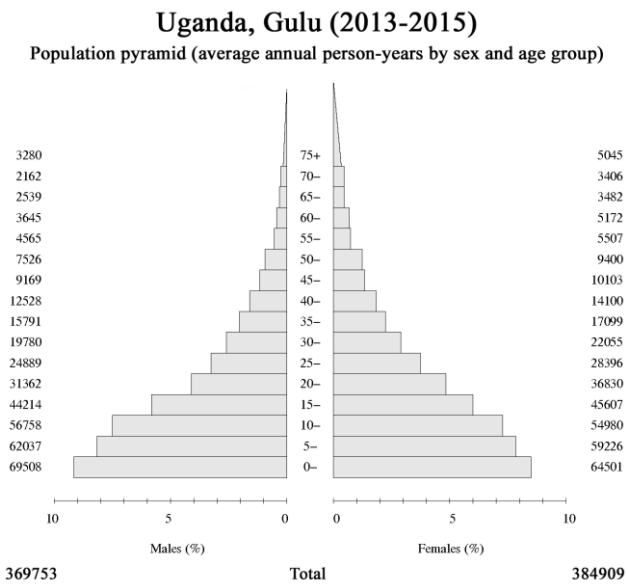
The Gulu Cancer Registry was established in 2014 to determine cancer incidence in the Northern part of Uganda. The registry is run by three staff, the director who is a consultant surgeon, a cancer registrar and an assistant cancer registrar. All are employees of the St. Mary's Hospital, Lacor in Gulu district, where the registry is located. The registry depends solely on the funding from the hospital to carry out its activities.



The registry covers the population of four districts namely Gulu, Omoro, Nwoya and Amuru, referred to as the Acholi Sub-region of Uganda. The population at risk for the four districts was estimated assuming constant growth between, and after, 2014, based on the national censuses of 2002 and 2014. The average annual population for the period was 754,662.

Ethnically, the predominant tribes (90%) are known as the Luo tribes (Acholi, Alur and Lango) who share a common language and culture with those of the Nyanza province of Kenya. Their major economic activity is farming and cattle keeping, the staple food crops being cereals, peas and vegetables.

St. Mary's Hospital is the regional referral centre for cancer diagnosis and treatment. It is the main source of data. It has a fully equipped histopathology department with a resident pathologist and consultant radiologists diagnosing cancers by histology and imaging.



The cancer registrar actively collects cancer data from all the wards in the source hospitals: St. Mary's Hospital Lacor, Gulu Regional Hospital, Gulu Independent Hospital, Gulu Military Hospital, Anaka Hospital and from the medical centres and pathology or clinical laboratories in the catchment area. The record officers of the source hospitals form part of the registry team as they assist in the case findings by pulling out the files/records while the registrars do the abstraction.

The region does not have a death and birth registration office. Deaths from cancer are identified in the mortuary of the hospital, traced back to the hospital records and registered with the best basis of diagnosis. Cancer cases referred to Mulago National Referral Hospital, Uganda Cancer Institute and radiotherapy units in Kampala will be followed up to have their information updated. All other hospitals and medical centres in Kampala (where patients from northern Uganda may access services) are also visited to collect information on cases that are residents of the 4 districts. The information on cancer is coded and entered into CanReg5, checked for consistency, duplication and errors. The abstracted and registered cancer data are securely kept in a dedicated lockable cancer registry office with restricted access to only the registrars, director and permitted visitors. The CanReg5 software is installed on a standalone computer protected by a user account and CanReg5 login passwords known only to the two cancer registrars. The abstraction forms are kept in lockable cabinets within the office premises and the keys kept only the two registrars. The same CanReg5 software is also used for analysis of the data to produce tables and graphs for various cancer publications

YEARS PRESENTED

Three year period, 2013-2015

COMMENT

We report the results of the first 3 years of registration (2013–2015) in this largely rural population. In total there were 1,319 cases of cancers registered; 591 among men (corresponding to an ASR of 110.1 per 10^5 population) and 728 cancer cases among women (ASR 111.0 per 10^5 – some 25% lower than the East African average). The most common cancers were cancers of the cervix and non-Hodgkin lymphoma in females, and non-Hodgkin lymphoma, Kaposi Sarcoma, prostate and liver cancers in men. Incidence rates of Burkitt lymphoma in children were high in comparison to elsewhere in Africa, whilst the incidence of breast cancer in women only 1/3 the average for East Africa (10.5 per 10^5).

Morphological verification of diagnosis is low (53% in men, 48% in women), and surprisingly so for cancers of the cervix (39%). Only 20 cases (1.5%) were registered on the basis of death certificate information only.

Summary

The figures from this rural population show a rather different pattern from that observed in the metropolitan population of Kampala. The findings are useful in providing a more complete picture of the Uganda national cancer profile, permitting more targeted interventions in prevention, early detection and treatment services in Uganda.

PUBLICATIONS and ACHIEVEMENTS

The establishment of Gulu Cancer Registry in 2014 has added value to estimation of cancer incidence for the entire Uganda which was based on the Kampala registry data since 1951 that covers only one county in the central part of Uganda. The Gulu Cancer Registry joined AFCRN in 2016.

Okongo F, Ogwang DM, Liu B, Maxwell Parkin D. Cancer incidence in Northern Uganda (2013-2016). Int J Cancer. 2019 Jun 15;144(12):2985-2991

Wabinga H, Subramanian S, Nambooze S, Amulen PM, Edwards P, et al. Uganda experience-Using cost assessment of an established registry to project resources required to expand cancer registration. Cancer Epidemiol. 2016 Dec;45 Suppl 1:S30-S36

Uganda, Gulu (2013–2015)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	5	0	80	0	-	-	-	-	-	-	-	-	-	-	-	1	3	1	-	-	0.4	0.8	0.24	**1.8**	C00-06
Salivary gland	1	0	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C07-08
Nasopharynx	8	0	62	0	-	-	1	-	-	1	2	-	-	-	1	2	1	-	-	-	0.7	1.4	0.17	**1.5**	C11
Other pharynx	3	0	33	0	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	0.3	0.5	0.12	**0.9**	C09-10, C12-14
Oesophagus	31	0	58	0	-	-	-	-	-	1	-	1	2	5	7	6	4	1	2	2	2.8	5.2	0.91	**7.8**	C15
Stomach	6	0	33	0	-	-	-	-	-	-	1	-	-	-	-	-	-	1	2	2	0.5	1.0	0.23	**1.5**	C16
Colon	7	0	14	0	-	-	-	-	-	1	2	1	1	-	-	-	1	-	-	1	0.6	1.2	0.09	**1.2**	C18
Rectum	3	0	33	0	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	0.3	0.5	0.08	**0.7**	C19-20
Anus	4	0	25	0	-	-	-	-	1	1	-	1	-	-	-	-	1	-	-	-	0.4	0.7	0.07	**0.7**	C21
Liver	78	0	78	1	-	1	-	4	6	10	14	6	9	8	5	-	6	5	3	1	7.0	13.2	1.50	**13.6**	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.2	0.05	**0.4**	C23-24
Pancreas	8	0	25	25	-	-	1	-	-	-	4	2	-	-	-	-	-	1	-	-	0.7	1.4	0.12	**1.1**	C25
Larynx	7	0	14	14	-	-	-	-	-	-	-	-	-	2	2	-	1	-	-	2	0.6	1.2	0.13	**1.6**	C32
Trachea, bronchus, and lung	10	0	30	0	-	-	-	-	-	1	1	-	-	2	-	-	2	3	-	1	0.9	1.7	0.34	**2.8**	C33-34
Bone	3	0	67	0	-	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	0.3	0.5	0.02	**0.3**	C40-41
Melanoma of skin	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.2	0.00	**0.2**	C43
Non-melanoma skin	11	0	73	0	-	-	1	-	-	-	1	1	-	2	1	1	1	1	-	2	1.0	1.9	0.23	**2.4**	C44
Mesothelioma	2	0	100	0	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	0.2	0.3	0.03	**0.3**	C45
Kaposi sarcoma	78	0	62	0	2	1	2	3	10	13	21	7	6	3	2	3	1	1	1	2	7.0	13.2	0.89	**10.1**	C46
Connective and soft tissue	13	0	38	0	-	2	-	1	1	2	1	1	-	1	1	-	1	-	1	1	1.2	2.2	0.21	**2.0**	C47, C49
Breast	16	0	62	0	-	-	-	-	-	2	-	2	3	3	2	1	1	1	-	1	1.4	2.7	0.32	**3.3**	C50
Penis	21	0	52	0	-	-	1	-	-	-	-	1	2	3	2	2	4	2	-	4	1.9	3.6	0.53	**5.2**	C60
Prostate	83	0	58	0	-	-	-	-	-	-	-	1	-	-	6	5	7	14	18	32	7.5	14.0	2.95	**23.0**	C61
Testis	2	0	50	0	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	0.2	0.3	0.07	**0.5**	C62
Kidney and renal pelvis	8	0	100	0	6	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	0.7	1.4	0.03	**0.5**	C64-65
Bladder	4	0	75	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	2	0.4	0.7	0.09	**0.9**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	17	0	71	0	3	-	-	-	1	2	3	4	3	1	-	-	-	-	-	-	1.5	2.9	0.15	**2.0**	C69
Brain and nervous system	4	0	50	0	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	0.4	0.7	0.04	**0.8**	C70-72
Thyroid	4	0	50	0	-	-	-	-	-	-	1	-	-	1	-	-	-	1	1	-	0.4	0.7	0.17	**1.0**	C73
Hodgkin lymphoma	6	0	100	0	-	-	1	-	-	1	2	1	-	-	1	-	-	-	-	-	0.5	1.0	0.06	**0.7**	C81
Non-Hodgkin lymphoma	91	0	56	3	14	8	17	7	6	2	3	6	6	3	3	6	3	2	2	3	8.2	15.4	1.11	**11.5**	C82-86, C96
Multiple myeloma	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C90
Lymphoid leukaemia	2	0	100	0	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	0.2	0.3	0.02	**0.2**	C91
Myeloid leukaemia	5	0	100	0	-	-	-	-	-	-	-	2	1	-	-	1	-	-	1	-	0.4	0.8	0.15	**1.0**	C92-94
Leukaemia, unspecified	8	0	50	12	-	2	2	-	1	-	-	2	1	-	-	-	-	-	-	-	0.7	1.4	0.05	**0.7**	C95
Other and unspecified	39	0	33	5	3	2	1	1	1	4	5	3	1	1	2	4	4	2	2	3	3.5	6.6	0.81	**7.3**	O&U
All sites	591	0	59	2	29	16	29	16	27	41	66	45	38	35	37	35	44	37	34	62	53.1	100.0	11.99	**109.9**	C00-96
All sites except C44	580	0	58	2	29	16	28	16	27	41	65	44	38	33	36	34	43	36	34	60	52.1	98.1	11.76	**107.5**	C00-96 exc. C44
Average annual population					69649	62203	56994	44379	31436	24917	19795	15830	12565	9207	7558	4576	3648	2543	2164	3286	370748				

Uganda, Gulu (2013–2015)

Number of cases by age group and summary rates of incidence: females

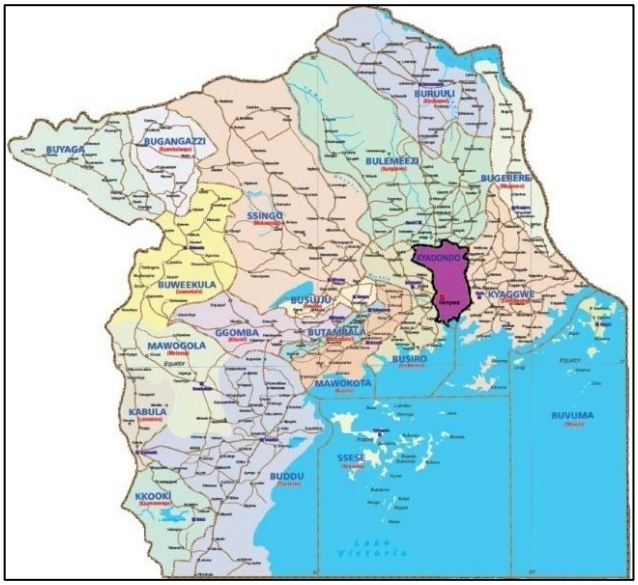
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	3	0	33	0	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	0.3	0.4	0.01	**0.3**	C00-06
Salivary gland	1	0	100	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C07-08
Nasopharynx	5	0	40	0	-	-	-	-	1	-	-	-	1	1	-	1	1	-	-	-	0.4	0.7	0.10	**0.9**	C11
Other pharynx	1	0	0	0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C09-10, C12-14
Oesophagus	7	0	0	0	-	-	-	-	1	-	-	-	-	-	1	1	-	-	2	2	0.6	1.0	0.15	**1.1**	C15
Stomach	4	0	25	0	-	-	-	1	-	-	-	-	-	-	1	-	2	-	-	-	0.3	0.5	0.09	**0.8**	C16
Colon	4	0	50	0	-	-	-	-	-	-	-	-	1	1	1	-	-	-	1	-	0.3	0.5	0.09	**0.7**	C18
Rectum	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	0.2	0.3	0.06	**0.5**	C19-20
Anus	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.1	0.1	0.05	**0.3**	C21
Liver	38	0	53	3	-	-	-	1	2	1	-	3	4	5	6	4	6	1	2	3	3.3	5.2	0.74	**6.8**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	8	0	38	12	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	3	0.7	1.1	0.23	**1.6**	C25
Larynx	3	0	0	0	-	-	-	-	1	-	1	-	-	1	-	-	-	-	-	-	0.3	0.4	0.03	**0.4**	C32
Trachea, bronchus, and lung	9	0	22	22	-	-	-	-	-	-	-	1	2	-	1	-	-	-	2	3	0.8	1.2	0.15	**1.4**	C33-34
Bone	1	0	100	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C40-41
Melanoma of skin	6	0	67	0	-	-	-	-	-	-	-	1	2	-	-	-	1	1	-	1	0.5	0.8	0.11	**1.1**	C43
Non-melanoma skin	10	0	60	0	-	-	1	-	-	1	-	1	1	1	1	-	1	2	1	-	0.9	1.4	0.24	**1.8**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C45
Kaposi sarcoma	35	0	46	0	1	-	-	2	4	10	8	4	2	2	-	-	1	-	1	-	3.0	4.8	0.32	**3.7**	C46
Connective and soft tissue	1	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.1	0.1	0.02	**0.2**	C47, C49
Breast	63	0	68	0	-	-	-	-	4	2	2	13	7	6	8	9	4	1	5	2	5.4	8.7	1.19	**10.5**	C50
Vulva	3	0	67	0	-	-	-	-	-	1	-	-	1	-	1	-	-	-	-	-	0.3	0.4	0.04	**0.4**	C51
Vagina	3	0	100	0	-	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	0.3	0.4	0.09	**0.6**	C52
Cervix uteri	332	0	39	0	-	-	-	1	11	18	34	53	51	35	28	22	31	16	10	22	28.7	45.6	5.51	**53.6**	C53
Uterus	11	0	73	0	-	-	-	-	-	1	3	1	1	1	1	1	-	-	1	1	0.9	1.5	0.16	**1.6**	C54-55
Ovary	17	0	35	6	-	-	-	-	1	-	1	1	2	2	2	2	-	-	2	4	1.5	2.3	0.27	**2.7**	C56
Placenta	8	0	88	0	-	-	-	-	3	1	2	2	-	-	-	-	-	-	-	-	0.7	1.1	0.05	**0.7**	C58
Kidney and renal pelvis	8	0	75	0	3	3	-	-	-	-	-	-	1	1	-	-	-	-	-	-	0.7	1.1	0.04	**0.7**	C64-65
Bladder	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.1	0.00	**0.1**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	9	0	44	0	1	-	-	-	-	2	2	1	-	1	1	1	-	-	-	-	0.8	1.2	0.10	**1.2**	C69
Brain and nervous system	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C70-72
Thyroid	10	0	60	0	-	-	-	-	1	1	-	1	-	2	3	2	-	-	-	-	0.9	1.4	0.17	**1.7**	C73
Hodgkin lymphoma	10	0	100	0	-	-	1	-	1	2	1	-	-	-	1	-	1	-	1	2	0.9	1.4	0.13	**1.3**	C81
Non-Hodgkin lymphoma	83	0	61	4	5	12	8	1	3	8	7	11	8	5	4	2	3	2	4	-	7.2	11.4	0.99	**9.8**	C82-86, C96
Multiple myeloma	2	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	0.2	0.3	0.01	**0.2**	C90
Lymphoid leukaemia	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0.3	0.4	0.05	**0.5**	C91
Myeloid leukaemia	2	0	100	0	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	0.2	0.3	0.02	**0.3**	C92-94
Leukaemia, unspecified	9	0	44	11	1	3	1	-	-	-	-	-	-	1	-	1	-	1	-	1	0.8	1.2	0.11	**1.1**	C95
Other and unspecified	14	0	36	0	-	-	1	2	3	1	-	-	-	-	1	-	3	-	-	3	1.2	1.9	0.14	**1.8**	O&U
All sites	728	0	48	1	11	19	13	8	38	51	61	94	87	66	61	47	57	27	36	52	62.9	100.0	11.48	**110.7**	C00-96
All sites except C44	718	0	48	1	11	19	12	8	38	50	61	93	86	65	60	47	56	25	35	52	62.0	98.6	11.24	**108.9**	C00-96 exc. C44
Average annual population					64595	59360	55215	45806	36924	28439	22098	17147	14155	10129	9438	5517	5181	3494	3416	5066	385981				

Uganda, Kampala

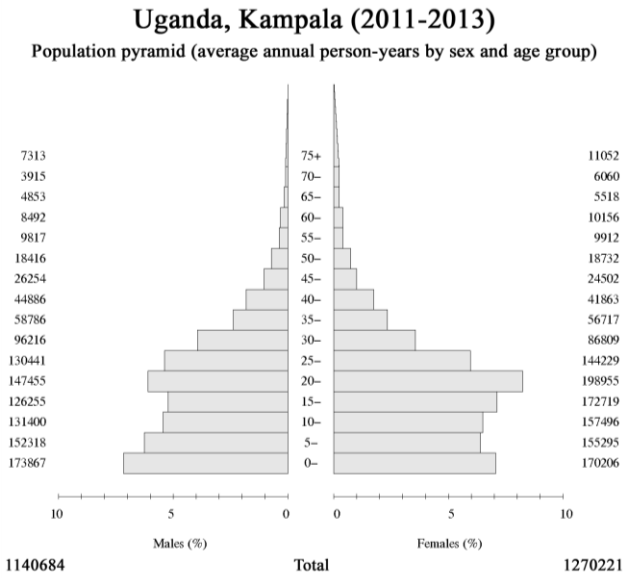
In 1951, the Kampala Cancer Registry (KCR) was established in the Department of Pathology of Makerere Faculty of Medicine (now the College of Health Sciences at the Makerere University) as a population-based cancer registry with the aim of determining cancer incidence in the population of Kyadondo County.

KCR is a unit within the Makerere University College of Health Sciences with physical facilities being partly maintained by the university. The registry personnel comprises a pathologist as the director, a cancer registrar and an assistant cancer registrar. Only the cancer registrar is on the university payroll. This is totally inadequate for the work of registering a population of 2 ½ million. Collaborations with AFRCN, Uganda Cancer Institute and the Medical College of Wisconsin provide some financial support to the registry.

The Ministry of Health is currently in the process of preparing a National Cancer Control Program. The KCR data plays a core role in this process.



The Kampala Cancer Registry collects data on cancer cases in the population of Kyadondo County, which comprises Kampala District (including the city of Kampala - the capital of Uganda) and part of Wakiso District. The population of Kampala district is available from the censuses of 2002 and 2014. For Kyodondo County (excluding Kampala), only the total population, by sex (but not age), was available for 2014. The distribution by 5 year age groups was assumed to be the same as at the 2002 census. The average annual population for 2011-2013 is 2.41 million (52.8% females).



The inhabitants come from all of the 31 ethnic groups found in Uganda, although the majority (about 50%) is from the Ganda ethnicity. There are also many migrants from neighbouring countries (particularly from Kenya, Sudan and Rwanda), and 1% of the residents are of European and Asian descent. About 50% of the population are Catholic, 30% are Anglican, 15% Muslim and 5% other religion.

The main sources of information on cancer cases are **hospitals and other healthcare facilities**: Mulago referral hospital & complex (including radiotherapy and haematology departments), the Uganda Cancer Institute, Mengo Hospital, Rubaga Hospital, St. Francis Nsambya Hospital, private clinics, nursing homes, the Hospice Africa Uganda and the Makindye Hospice.

Medical laboratories: Makerere University histopathology laboratory, Multi-system Histopathology laboratory, Metro Med histopathology laboratory, Kampala Histopathology Laboratory, Mengo Hospital histopathology laboratory, St. Francis Hospital Nsambya histopathology laboratory, the Path Diagnostics Ltm and other public and private haematology laboratories.

The registrars visit the hospitals on a scheduled time table, at a frequency depending on the anticipated number of cases to be registered. Designated staff in the hospital records departments assists in retrieving records of patients diagnosed with cancer. These are checked against registers of admissions and discharges. Data are abstracted from cases notes onto a registration form.

The pathology laboratories actively assist the registration process, either by making the pathology logs and report forms available, or in sending copies of reports on cases diagnosed

with cancer directly to the registry. Almost all of the required information is available, although place of residence is missing in some cases, and must be traced via the referring hospital.

Patients are not interviewed in person. Place of residence is considered to be that recorded on the medical record. In Kampala, detailed addresses are not used for individuals – addresses are given as the district (neighbourhood) of the city (or as the village in the peri-urban parts of Kyadondo) where the individual resides.

The government of Uganda has created the National Identification and Registration Authority (NIRA) which is responsible for registration of births and death in the entire country; however no data on deaths by cause are available. Death certificates are issued for all deaths occurring in hospital and copied into a death register in the hospital mortuary. This source of information is used by the registry.

The registry uses CanReg5 software for data management, which includes checks for consistency, validity and duplication. Confidentiality is maintained by using only registration numbers (no names) during analysis of data. The registry is accessible only to authorised personnel.

YEARS PRESENTED

Three year period, 2011 – 2013

COMMENT

Registration has been relatively constant (a slow increase in numbers) for the last 20 years. For the three years presented the monthly registrations averaged 130.

The calculated age standardised incidence rates for "All Sites" are rather higher than the average for East Africa in males (158.8 per 10^5 – 43% above the average) and females (178.2.per 10^5 – 20% higher). Rates at several sites are relatively high: oesophagus, liver, Kaposi sarcoma, prostate. The incidence of cervix cancer (51.2 per 10^5) remains high, more or less unchanged since 2008-12 (51.1 per 10^5), while there has been a decrease in the incidence of cancers associated with HIV-AIDS: Kaposi sarcoma, non Hodgkin lymphoma and eye cancers, in both sexes.

The overall MV% seems rather low - 57%, but the low percentage is due to the large numbers of oesophagus and liver cancers, most of which are diagnosed without histology; similarly, less than half of the prostate cancers had a morphological diagnosis.

Summary

The incidence rates look plausible, and in keeping with previous results published for 2008-2012 in Cancer Incidence in Five Continents, Volume XI.

PUBLICATIONS and ACHIEVEMENTS

The Kampala Cancer Registry is one of the longest standing cancer registries in SSA. It was one of the founding registries of AFCRN in 2012. Data from KCR has been published in six of the 11 volumes of Cancer Incidence in Five Continents, IARC Scientific Publications (Vol. I, VII, VIII, IX, X, XI).

Wabinga H, Subramanian S, Nambooze S, et al. Uganda experience-using cost assessment of an established registry to project resources required to expand cancer registration. Cancer Epidemiol 2016 24:S30-S36.

Menya D, Mbalawa CG, Guy N'da. et al. Eosophageal cancer male to female incidence ratios in Africa: A systematic review and meta-analysis of geographic, time and age trends. Cancer Epidemiol; 2018 53: 119-128.

W Yvonne Joko-Fru, Parkin DM, Borok M. Et al. Survival from childhood cancers in Eastern Africa: A population-based registry study. Int J Cancer 2018 143:2409-2415.

Pilleroon S, Soerjomataram I, Charvat H et al. Cancer incidence in selected regions of sub-saharan Africa 2008-2012. Int J Cancer 2019 144: 1824-1833.

Chaabna K, Bray F, Wabinga HR et al. Kaposi sarcoma trends in Uganda and Zimbabwe: a sustained decline in incidence. Int J Cancer 2013 133:1197-203.

Cheng ML, Li Zhang, Borok M, et al. The incidence of oesophageal cancer in Eastern Africa: identification of a new geographic hot spot. Cancer Epidemiol 2015 39:143-9

Mutyaba I, Phipps W, Krantz EM, Goldman JD, Nambooze S, Orem J, Wabinga HR, Casper C. A population-level evaluation of the effect of antiretroviral therapy on cancer incidence in Kyadondo County, Uganda, 1999-2008. J Acquir Immune Defic Syndr 2015 69:481-6

Uganda, Kampala (2011–2013)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	40	1	82	2	-	1	-	-	1	1	3	7	7	3	8	-	3	1	2	2	1.2	1.9	0.33	**2.9**	C00-06
Salivary gland	12	0	75	8	-	-	-	1	-	2	1	1	1	-	1	2	-	1	1	1	0.4	0.6	0.13	**1.0**	C07-08
Nasopharynx	46	0	70	2	-	-	1	2	4	4	6	5	4	2	5	2	4	2	1	4	1.3	2.2	0.33	**3.1**	C11
Other pharynx	19	0	79	0	-	-	-	-	1	-	-	4	2	3	1	2	3	2	-	1	0.6	0.9	0.21	**1.8**	C09-10, C12-14
Oesophagus	166	2	43	1	-	-	-	-	-	-	1	6	13	18	29	18	20	17	20	22	4.9	7.9	2.61	**19.5**	C15
Stomach	46	0	43	4	-	-	1	-	-	1	2	3	4	7	3	2	8	1	9	5	1.3	2.2	0.71	**4.9**	C16
Colon	50	0	54	2	-	-	-	1	2	4	3	1	8	6	5	3	3	4	7	3	1.5	2.4	0.67	**4.7**	C18
Rectum	38	0	47	0	-	-	-	-	1	1	-	3	3	3	5	4	4	6	4	4	1.1	1.8	0.61	**4.4**	C19-20
Anus	4	0	50	0	-	-	-	-	-	1	-	-	1	-	1	-	-	-	-	1	0.1	0.2	0.01	**0.2**	C21
Liver	106	1	32	3	1	-	1	1	7	11	14	11	10	12	8	9	4	6	3	7	3.1	5.0	0.84	**7.5**	C22
Gallbladder etc.	2	0	50	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.1	0.1	0.00	**0.1**	C23-24
Pancreas	20	0	40	5	-	-	-	-	-	1	1	3	2	4	1	1	3	-	1	3	0.6	0.9	0.17	**1.7**	C25
Larynx	20	0	75	0	-	-	-	-	-	-	-	-	1	-	3	2	6	3	1	4	0.6	0.9	0.33	**2.7**	C32
Trachea, bronchus, and lung	30	1	43	13	-	-	-	-	-	-	5	3	-	6	2	5	1	2	4	1	0.9	1.4	0.43	**3.0**	C33-34
Bone	40	0	60	2	-	5	7	5	9	6	2	2	2	1	-	-	-	-	1	-	1.2	1.9	0.10	**1.1**	C40-41
Melanoma of skin	5	0	100	0	-	-	-	-	-	-	-	-	-	2	-	-	1	2	-	-	0.1	0.2	0.10	**0.7**	C43
Non-melanoma skin	26	0	65	0	1	1	1	1	2	3	2	2	7	-	2	3	1	-	-	-	0.8	1.2	0.13	**1.4**	C44
Mesothelioma	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.0	0.0	0.03	**0.2**	C45
Kaposi sarcoma	463	11	75	3	5	1	5	12	26	99	91	78	62	27	18	10	8	4	2	4	13.5	22.0	1.72	**18.6**	C46
Connective and soft tissue	38	0	61	3	3	3	2	3	6	2	3	8	2	1	1	1	-	1	-	2	1.1	1.8	0.12	**1.5**	C47, C49
Breast	27	2	44	0	-	-	-	-	-	3	2	-	2	6	3	1	3	2	2	1	0.8	1.3	0.33	**2.6**	C50
Penis	36	0	61	0	1	-	-	-	-	1	3	3	5	4	7	-	1	3	2	6	1.1	1.7	0.33	**3.0**	C60
Prostate	351	6	44	1	-	-	-	-	-	-	2	2	3	4	20	17	60	43	68	126	10.3	16.7	6.17	**46.8**	C61
Testis	10	0	60	0	-	-	1	1	1	2	1	1	1	1	-	-	1	-	-	-	0.3	0.5	0.04	**0.4**	C62
Kidney and renal pelvis	29	0	62	0	12	4	1	-	-	1	4	1	1	-	2	2	-	-	-	1	0.8	1.4	0.08	**1.1**	C64-65
Bladder	22	0	45	0	-	-	-	-	1	1	-	2	-	-	1	6	3	-	1	7	0.6	1.0	0.22	**2.3**	C67
Ureter and other urinary	2	0	50	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.1	0.1	0.00	**0.1**	C66, C68
Eye	51	2	80	0	6	-	1	1	1	6	7	6	10	5	1	-	2	2	-	1	1.5	2.4	0.24	**2.5**	C69
Brain and nervous system	48	0	29	2	2	3	2	3	6	3	5	2	2	1	8	2	4	3	-	2	1.4	2.3	0.34	**3.2**	C70-72
Thyroid	18	0	50	0	-	1	-	-	2	3	1	2	-	2	2	1	1	2	1	-	0.5	0.9	0.19	**1.4**	C73
Hodgkin lymphoma	40	0	90	2	3	4	5	6	5	1	6	4	2	-	-	1	-	3	-	-	1.2	1.9	0.18	**1.6**	C81
Non-Hodgkin lymphoma	125	1	66	4	14	12	13	7	14	6	9	11	9	9	9	-	2	4	3	2	3.7	5.9	0.60	**5.8**	C82-86, C96
Multiple myeloma	12	0	92	8	-	-	-	-	-	-	-	-	1	3	-	-	4	-	1	3	0.4	0.6	0.14	**1.3**	C90
Lymphoid leukaemia	27	0	96	4	5	9	2	2	3	1	-	-	-	1	1	1	-	1	1	-	0.8	1.3	0.13	**1.2**	C91
Myeloid leukaemia	26	2	85	4	4	3	-	1	1	5	3	1	2	2	1	1	-	-	-	-	0.8	1.2	0.08	**0.9**	C92-94
Leukaemia, unspecified	23	0	22	0	2	-	5	5	2	1	3	-	1	1	1	-	1	-	-	1	0.7	1.1	0.06	**0.9**	C95
Other and unspecified	88	1	45	0	1	1	1	5	3	5	9	14	12	10	4	5	7	2	2	6	2.6	4.2	0.60	**5.8**	O&U
All sites	2107	30	58	2	60	48	49	57	98	175	190	186	181	144	153	101	158	118	137	222	61.6	100.0	19.39	**162.1**	C00-96
All sites except C44	2081	30	58	2	59	47	48	56	96	172	188	184	174	144	151	98	157	118	137	222	60.8	98.8	19.25	**160.8**	C00-96 exc. C44
Average annual population					173867	152318	131400	126255	147455	130441	96216	58786	44886	26254	18416	9817	8492	4853	3915	7313	1140683				

Uganda, Kampala (2011–2013)

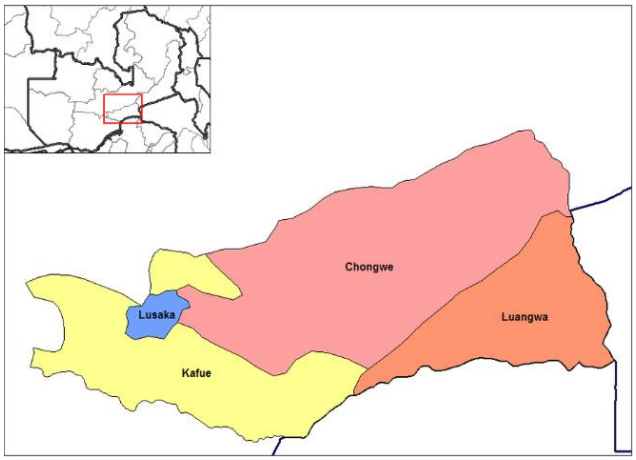
Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	19	0	74	0	-	-	-	-	1	2	-	2	2	1	-	2	4	2	-	3	0.5	0.7	0.18	**1.6**	C00-06
Salivary gland	8	0	25	0	-	-	-	1	-	2	-	2	-	1	-	-	1	-	1	-	0.2	0.3	0.06	**0.4**	C07-08
Nasopharynx	29	0	59	0	-	-	1	5	1	2	2	3	3	2	2	3	3	-	1	1	0.8	1.0	0.19	**1.8**	C11
Other pharynx	5	0	20	0	-	-	-	-	-	1	2	-	-	-	1	-	-	-	-	1	0.1	0.2	0.01	**0.2**	C09-10, C12-14
Oesophagus	119	1	45	0	-	-	-	-	-	4	3	-	6	9	14	17	13	14	15	23	3.1	4.2	1.57	**12.1**	C15
Stomach	30	0	23	0	-	-	-	-	-	1	-	-	3	2	4	2	5	2	6	5	0.8	1.1	0.40	**2.9**	C16
Colon	40	0	48	5	-	-	-	-	-	3	1	3	3	4	1	3	8	7	3	4	1.0	1.4	0.54	**4.0**	C18
Rectum	57	0	49	0	-	-	-	-	-	4	3	3	4	10	7	2	7	8	4	5	1.5	2.0	0.67	**5.3**	C19-20
Anus	7	0	86	0	-	-	-	-	-	-	-	3	-	-	4	-	-	-	-	-	0.2	0.2	0.04	**0.5**	C21
Liver	93	0	31	2	1	-	-	1	2	13	9	3	8	10	12	5	6	6	5	12	2.4	3.3	0.75	**6.7**	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.0	0.02	**0.1**	C23-24
Pancreas	19	0	11	16	-	-	-	-	-	-	-	-	3	1	2	2	2	3	3	3	0.5	0.7	0.28	**2.0**	C25
Larynx	5	0	20	0	-	-	-	-	1	-	-	-	-	2	-	-	-	1	1	-	0.1	0.2	0.07	**0.5**	C32
Trachea, bronchus, and lung	24	0	33	4	-	-	-	-	-	-	3	-	1	3	5	1	1	4	4	2	0.6	0.9	0.34	**2.4**	C33-34
Bone	22	0	64	0	-	1	4	5	5	5	-	1	-	1	-	-	-	-	-	-	0.6	0.8	0.03	**0.5**	C40-41
Melanoma of skin	14	1	50	0	-	-	-	-	1	-	1	-	1	1	2	2	2	-	-	3	0.4	0.5	0.11	**1.1**	C43
Non-melanoma skin	34	2	71	3	2	-	-	2	4	4	3	5	4	3	2	3	-	-	-	-	0.9	1.2	0.15	**1.6**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.0	0.00	**0.1**	C45
Kaposi sarcoma	348	2	76	2	2	4	7	19	55	88	62	44	27	19	6	4	5	3	1	-	9.1	12.4	0.99	**11.2**	C46
Connective and soft tissue	42	0	60	0	1	8	2	2	5	5	4	6	2	2	2	2	1	-	-	-	1.1	1.5	0.14	**1.6**	C47, C49
Breast	431	4	57	2	-	-	-	-	11	41	43	51	49	54	62	35	37	21	9	14	11.3	15.3	3.51	**31.5**	C50
Vulva	24	1	67	0	-	-	-	1	-	2	1	1	4	1	5	-	4	1	2	1	0.6	0.9	0.24	**1.9**	C51
Vagina	4	0	75	0	-	-	-	-	1	-	-	1	1	1	-	-	-	-	-	-	0.1	0.1	0.01	**0.2**	C52
Cervix uteri	739	11	56	1	-	-	-	-	12	43	71	122	120	83	92	40	56	33	31	25	19.4	26.3	5.94	**52.0**	C53
Uterus	72	1	60	3	-	-	-	-	1	2	4	7	4	6	11	4	9	8	9	6	1.9	2.6	0.90	**6.7**	C54-55
Ovary	96	2	49	2	-	-	1	1	5	6	13	6	8	8	14	7	11	-	9	5	2.5	3.4	0.83	**6.8**	C56
Placenta	24	0	58	12	-	-	-	4	3	8	3	5	1	-	-	-	-	-	-	-	0.6	0.9	0.04	**0.6**	C58
Kidney and renal pelvis	26	0	46	4	10	3	-	1	2	2	2	-	2	1	1	2	-	-	-	-	0.7	0.9	0.08	**1.0**	C64-65
Bladder	22	0	64	0	-	-	-	1	1	1	1	-	1	1	2	-	2	4	1	7	0.6	0.8	0.21	**1.9**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.0	0.0	0.03	**0.2**	C66, C68
Eye	72	2	74	1	15	4	2	2	6	4	16	7	8	5	-	-	1	-	-	-	1.9	2.6	0.17	**2.3**	C69
Brain and nervous system	30	1	30	0	3	-	2	3	3	2	2	2	4	1	2	1	1	-	1	2	0.8	1.1	0.13	**1.3**	C70-72
Thyroid	34	0	59	0	-	-	-	-	2	3	5	6	2	3	1	2	2	1	4	3	0.9	1.2	0.28	**2.2**	C73
Hodgkin lymphoma	41	0	85	0	1	-	3	1	6	7	7	4	5	2	-	2	-	1	1	1	1.1	1.5	0.17	**1.6**	C81
Non-Hodgkin lymphoma	109	2	68	5	2	10	9	4	10	11	12	13	9	6	6	5	2	3	2	3	2.9	3.9	0.51	**5.0**	C82-86, C96
Multiple myeloma	15	0	87	7	-	-	-	-	-	-	1	-	1	2	1	4	2	1	2	1	0.4	0.5	0.21	**1.6**	C90
Lymphoid leukaemia	21	0	95	5	4	2	3	1	1	4	-	1	-	-	-	1	1	1	1	1	0.6	0.7	0.11	**1.0**	C91
Myeloid leukaemia	23	0	83	9	1	2	2	2	3	3	2	1	2	1	1	1	-	-	1	1	0.6	0.8	0.09	**0.9**	C92-94
Leukaemia, unspecified	12	0	25	0	-	4	-	1	-	1	-	1	-	1	2	1	-	-	-	1	0.3	0.4	0.05	**0.6**	C95
Other and unspecified	98	1	42	0	2	2	1	2	7	5	10	11	11	3	12	5	6	6	4	10	2.6	3.5	0.72	**6.4**	O&U
All sites	2811	31	58	2	44	40	37	59	149	279	286	314	299	250	276	158	193	131	121	144	73.8	100.0	20.79	**182.0**	C00-96
All sites except C44	2777	29	57	2	42	40	37	57	145	275	283	309	295	247	274	155	193	131	121	144	72.9	98.8	20.64	**180.4**	C00-96 exc. C44
Average annual population					170206	155295	157496	172719	198955	144229	86809	56717	41863	24502	18732	9912	10156	5518	6060	11052	1270220				

Republic of Zambia, Lusaka

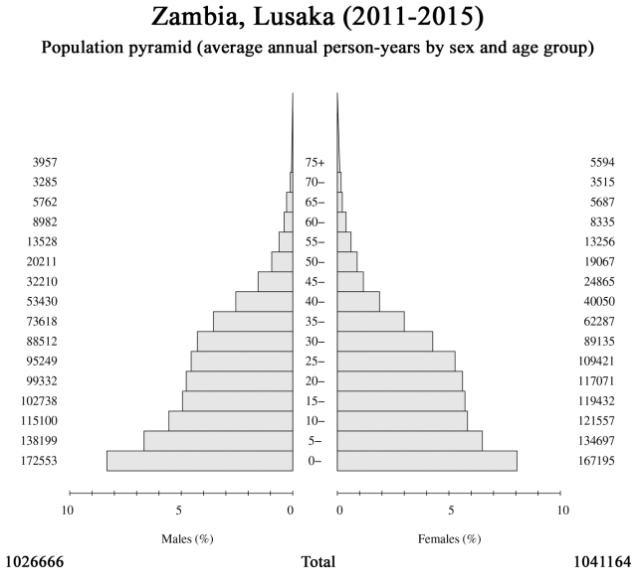
The Zambia National Cancer Registry was established by the Medical Research Council in November 1977 under the supervision of the Ministry of Health Headquarters. In early 1982 the Registry was transferred from the Ministry of Health to University Teaching Hospital (UTH). The National Registry has continued to collect data by passive notification from all the provinces within the country. Over the last 40 years, the low calculated incidence rates have testified to the high level of under-registration achieved by this methodology. In 2014, the recommendation, made on previous occasions, to implement population-based registry for Lusaka District was implemented, thanks to a grant from the US NCI, brokered by the UICC.

The registry is now supported by the Ministry of Health while other stakeholders have assisted with financial and material support and human resource training. They are the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO) and AFCRN.



The ZNCR is situated at the Paediatric Centre of Excellence within the premises of the University Teaching Hospitals and in close proximity to the country's only Cancer Diseases Hospital. The Registry is managed by a registrar and three data entry clerks. The staff are responsible not only for the population based registry of Lusaka (see below), but also for the ZNCR, which involves data-entry of forms completed by records staff throughout the country (3,500-4,000 every year).

The most recent census was in 2010. At that time, the population of Lusaka District was 1.74 million. For the period considered here (2011-2015) the population at risk is from the Population and Demographic Projections 2011-2015 published by the Central Statistical Office. The average annual population at risk for the period is 2.07 million.



The Registry employs both passive and active registration methods. The Registry staff visit data collection sources and abstract information from patient files which is entered onto a cancer notification form, then the CanReg-5 database. The Registry captures information on all suspected and confirmed cancer cases. In Lusaka District, the Registry records between 800 and 1 300 new cancer cases annually. Data are collected from 60 public, military, mission and private hospitals, one public pathology laboratory, hospices, and the Births and Deaths Registration Office.

At times, notification forms are filled by hospital information staff who then forward them to the registry, but this has not worked very well. In addition, it is still a challenge to collect information from private pathology labs due to patient confidentiality issues.

Death Registration is carried out in the Department of National Registration. Until 2014, abstraction of data on deaths related to cancer was done by scanning the files of paper certificates. However, since then, the department has created a computer file of registered deaths, and it is possible to interrogate this file (ICD-10 coding of cause of death was introduced in 2015). Cancer deaths are compared with the CanReg database to update existing records or include new cases.

The collected data are entered and stored in the CanReg5 system.

YEARS PRESENTED

Five year period, 2011-2015

COMMENT

The rate of registration has not been constant and varied depending on the private facilities that reported or whose data could be accessed for abstracting. During the five-year period, the average rate of registration is 87 cases per month but the number of registrations per month varies widely, from 63 to 108.

The age-standardized incidence rate (ASR) of cancer at all sites (excluding non-melanoma skin cancer) is 110.4 cases per 10^5 in males and 138.9 cases per 10^5 in females. These values are similar with the values reported for Eastern Africa in Globocan 2018 with an observed-to-expected ratio (O/E) of 1.0 for males and 0.94 for females.

In females, the incidence of cervix cancer is high (ASR 64.7 per 10^5 – three times as high as breast cancer. The incidence of Kaposi sarcoma is high in both sexes. KS is the most commonly registered cancer of men (27.7% of cases) although the rate of prostate cancer is higher (at 45.5 per 10^5 - almost twice the regional average rate. In general, the rates of gastrointestinal cancers are rather low, while the implausibly low rates of leukaemia is a consequence results of known challenges in case finding in UTH.

The overall percentage of microscopically verified cases (MV%) is relatively high (80% in males and 89% in females), while 11% of cases in males, and 7.5% in females were from death certificates only information. Taken together, these figures suggest some under-ascertainment of cancers diagnosed clinically or by imaging.

Summary

The incidence rates are plausible, and, given continuation of the improvements in case finding through this period (2011-2015), the registry be a valuable source of population based data, both locally and internationally.

PUBLICATIONS and ACHIEVEMENTS

The Zambia National Cancer Registry became a member of the AFCRN in 2018.

Zambia data from the registry was published in the global cancer observatory report (Globocan) for 2018.

The Registry has produced two reports for the periods 2008 to 2012 and 2013.

Zambia, Lusaka (2011–2015)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	23	0	100	0	-	-	1	1	1	1	1	2	-	4	3	2	-	2	4	1	0.4	1.0	0.21	**1.3**	C00-06
Salivary gland	17	0	94	0	-	1	-	1	2	1	1	1	1	-	1	-	2	3	-	3	0.3	0.8	0.09	**1.0**	C07-08
Nasopharynx	16	0	100	0	-	-	1	1	-	-	2	1	2	2	2	2	1	1	1	-	0.3	0.7	0.10	**0.7**	C11
Other pharynx	7	0	100	0	-	-	-	-	-	-	-	-	1	1	-	-	1	2	1	1	0.1	0.3	0.08	**0.6**	C09-10, C12-14
Oesophagus	127	0	88	9	-	-	-	-	2	2	2	14	19	12	13	11	16	11	13	12	2.5	5.8	1.01	**7.9**	C15
Stomach	63	1	89	11	-	-	-	1	1	2	8	7	7	4	5	5	9	2	3	8	1.2	2.9	0.34	**3.4**	C16
Colon	40	0	95	5	-	-	-	-	-	3	1	5	4	3	3	4	6	8	3	-	0.8	1.8	0.37	**2.5**	C18
Rectum	35	0	94	3	-	-	-	1	1	4	2	2	4	2	4	4	3	3	2	3	0.7	1.6	0.22	**1.9**	C19-20
Anus	8	0	100	0	-	-	-	-	1	1	-	1	1	2	-	1	-	1	-	-	0.2	0.4	0.04	**0.3**	C21
Liver	61	0	69	28	1	-	-	-	-	8	3	6	9	10	5	3	4	2	5	5	1.2	2.8	0.35	**3.0**	C22
Gallbladder etc.	3	0	67	33	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	-	0.1	0.1	0.03	**0.2**	C23-24
Pancreas	12	0	33	67	-	-	-	-	-	-	1	2	-	2	2	1	-	1	1	2	0.2	0.5	0.08	**0.7**	C25
Larynx	26	0	92	8	1	-	-	-	-	-	-	-	1	3	6	2	6	3	1	3	0.5	1.2	0.21	**1.8**	C32
Trachea, bronchus, and lung	30	0	67	30	-	-	-	-	-	1	1	3	2	4	3	5	-	1	5	5	0.6	1.4	0.24	**1.9**	C33-34
Bone	40	0	85	15	1	4	6	7	4	5	3	4	2	1	2	-	1	-	-	-	0.8	1.8	0.06	**0.8**	C40-41
Melanoma of skin	12	0	92	8	-	-	-	-	1	1	-	2	2	-	3	1	2	-	-	-	0.2	0.5	0.05	**0.5**	C43
Non-melanoma skin	47	0	98	2	-	2	2	3	-	1	6	4	3	-	6	4	4	3	4	5	0.9	2.1	0.30	**2.5**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.0	0.00	**0.1**	C45
Kaposi sarcoma	611	1	65	8	3	10	9	8	26	74	142	129	99	45	23	17	8	6	4	7	11.9	27.7	1.35	**14.8**	C46
Connective and soft tissue	24	0	100	0	3	1	4	3	2	-	1	2	1	5	-	-	-	1	1	-	0.5	1.1	0.08	**0.7**	C47, C49
Breast	11	0	100	0	-	-	-	-	-	-	1	-	1	1	3	2	1	1	1	-	0.2	0.5	0.09	**0.7**	C50
Penis	47	3	100	0	-	-	-	-	-	-	1	7	7	7	8	4	5	4	1	-	0.9	2.1	0.29	**2.3**	C60
Prostate	453	1	84	15	-	-	-	-	-	-	-	-	2	3	16	23	49	96	103	160	8.8	20.6	5.62	**45.5**	C61
Testis	9	0	78	22	2	-	-	1	-	1	-	3	-	-	-	2	-	-	-	-	0.2	0.4	0.02	**0.2**	C62
Kidney and renal pelvis	22	0	91	5	6	3	4	1	1	-	1	3	-	-	-	1	-	1	-	1	0.4	1.0	0.04	**0.5**	C64-65
Bladder	51	0	94	4	-	-	-	-	1	1	1	5	1	8	7	1	6	6	4	10	1.0	2.3	0.37	**3.5**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	128	3	98	1	19	4	4	1	1	8	14	17	20	13	5	8	3	4	2	2	2.5	5.8	0.40	**3.9**	C69
Brain and nervous system	28	1	71	29	4	6	3	3	1	1	1	1	-	1	4	-	1	1	-	-	0.5	1.3	0.07	**0.8**	C70-72
Thyroid	8	0	88	12	-	-	-	3	-	-	-	-	1	-	1	-	1	1	1	-	0.2	0.4	0.07	**0.4**	C73
Hodgkin lymphoma	33	1	100	0	1	5	5	5	2	1	2	2	2	1	-	2	2	1	-	1	0.6	1.5	0.09	**1.0**	C81
Non-Hodgkin lymphoma	73	1	90	7	5	5	3	5	7	5	7	3	9	2	8	1	4	6	1	1	1.4	3.3	0.29	**2.6**	C82-86, C96
Multiple myeloma	3	0	100	0	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	1	0.1	0.1	0.01	**0.2**	C90
Lymphoid leukaemia	6	0	100	0	3	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.3	0.00	**0.1**	C91
Myeloid leukaemia	7	0	100	0	2	2	2	-	-	1	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	**0.1**	C92-94
Leukaemia, unspecified	35	0	66	26	3	10	4	5	1	3	3	3	1	1	-	-	-	1	-	-	0.7	1.6	0.05	**0.7**	C95
Other and unspecified	85	1	68	29	6	2	2	3	2	4	3	7	12	9	7	8	7	6	4	2	1.7	3.9	0.48	**3.9**	O&U
All sites	2202	13	81	11	60	56	51	54	57	129	208	237	214	147	141	114	143	179	165	234	42.9	100.0	13.12	**112.9**	C00-96
All sites except C44	2155	13	80	11	60	54	49	51	57	128	202	233	211	147	135	110	139	176	161	229	42.0	97.9	12.81	**110.4**	C00-96 exc. C44
Average annual population					172553	138199	115100	102738	99332	95249	88512	73618	53430	32210	20211	13528	8982	5762	3285	3957	1026667				

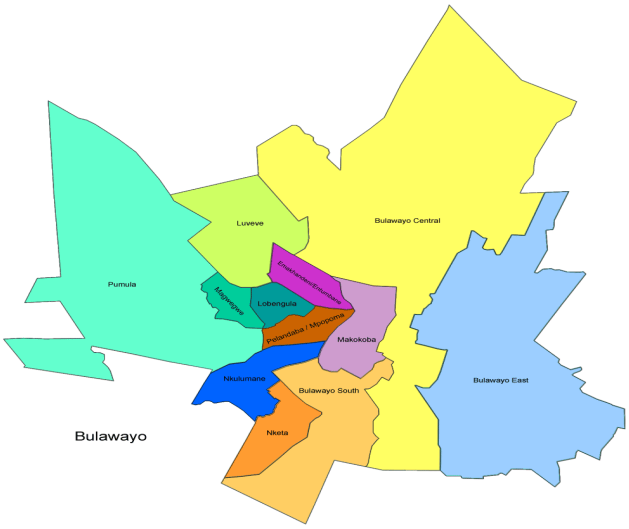
Zambia, Lusaka (2011–2015)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	17	0	94	6	1	-	-	-	1	2	2	-	2	3	2	-	-	1	2	1	0.3	0.5	0.11	**0.8**	C00-06
Salivary gland	12	0	100	0	1	1	-	3	-	-	1	2	-	2	1	1	-	-	-	-	0.2	0.4	0.03	**0.3**	C07-08
Nasopharynx	13	0	85	15	-	-	1	1	1	-	2	3	1	2	1	-	-	1	-	-	0.2	0.4	0.04	**0.4**	C11
Other pharynx	4	0	100	0	-	-	-	-	-	-	-	1	1	1	-	-	-	-	1	-	0.1	0.1	0.04	**0.2**	C09-10, C12-14
Oesophagus	63	0	92	6	-	-	-	-	1	2	2	9	11	4	6	7	9	1	5	6	1.2	2.0	0.42	**3.5**	C15
Stomach	52	0	96	4	-	-	-	1	-	1	4	8	3	6	8	4	4	6	3	4	1.0	1.7	0.36	**2.9**	C16
Colon	30	0	97	3	-	-	1	-	-	3	2	2	2	3	4	-	1	10	-	2	0.6	1.0	0.23	**1.8**	C18
Rectum	35	0	94	6	-	-	-	-	-	-	4	4	3	3	8	5	6	1	1	-	0.7	1.1	0.23	**1.9**	C19-20
Anus	21	0	95	5	-	-	-	-	-	1	6	4	3	5	-	1	1	-	-	-	0.4	0.7	0.06	**0.7**	C21
Liver	39	0	74	26	1	-	1	1	1	1	5	2	6	4	6	4	2	1	2	2	0.7	1.3	0.20	**1.8**	C22
Gallbladder etc.	1	0	100	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	9	0	22	67	-	-	-	-	-	-	-	-	1	1	1	1	4	1	-	-	0.2	0.3	0.08	**0.7**	C25
Larynx	7	0	86	0	1	2	-	-	-	-	-	-	1	2	-	-	-	1	-	-	0.1	0.2	0.03	**0.3**	C32
Trachea, bronchus, and lung	23	0	70	26	-	-	-	-	1	-	1	1	-	4	-	2	7	1	2	4	0.4	0.7	0.19	**1.7**	C33-34
Bone	21	0	81	19	-	2	4	3	1	3	-	2	2	2	1	-	-	-	1	-	0.4	0.7	0.06	**0.6**	C40-41
Melanoma of skin	13	0	92	0	-	-	-	-	-	-	-	2	-	-	1	1	4	3	1	1	0.2	0.4	0.15	**1.0**	C43
Non-melanoma skin	46	0	91	7	-	1	-	1	3	4	4	6	2	5	4	4	1	3	2	6	0.9	1.5	0.22	**2.1**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	367	1	72	7	4	5	8	11	23	73	94	69	40	15	8	4	6	4	-	2	7.0	11.8	0.70	**8.1**	C46
Connective and soft tissue	24	0	96	0	4	2	5	2	2	1	2	-	1	2	2	-	-	-	1	-	0.5	0.8	0.06	**0.6**	C47, C49
Breast	384	1	97	2	-	-	-	-	8	13	33	46	54	47	49	27	34	26	26	20	7.4	12.4	2.53	**20.2**	C50
Vulva	53	0	92	8	-	-	-	-	-	4	6	10	9	7	5	1	4	2	1	4	1.0	1.7	0.22	**2.3**	C51
Vagina	24	0	100	0	-	-	-	-	-	1	5	3	1	3	2	2	4	1	1	1	0.5	0.8	0.15	**1.2**	C52
Cervix uteri	1276	10	92	7	-	-	-	-	12	41	92	186	196	157	153	123	97	89	57	63	24.5	41.1	7.71	**64.7**	C53
Uterus	46	0	100	0	-	-	-	-	-	-	2	3	9	2	4	7	8	4	6	1	0.9	1.5	0.45	**3.0**	C54-55
Ovary	62	0	85	13	-	1	1	3	2	14	2	7	7	8	5	3	4	2	1	2	1.2	2.0	0.24	**2.4**	C56
Placenta	2	0	100	0	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	0.0	0.1	0.00	**0.0**	C58
Kidney and renal pelvis	31	0	87	13	13	7	4	1	-	-	1	-	1	-	2	-	-	-	1	1	0.6	1.0	0.06	**0.7**	C64-65
Bladder	55	0	85	15	-	-	-	1	-	-	3	-	9	4	8	3	8	8	5	6	1.1	1.8	0.49	**3.7**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	125	5	97	3	18	5	-	2	2	7	19	24	17	10	2	8	3	-	1	2	2.4	4.0	0.31	**3.5**	C69
Brain and nervous system	30	0	80	17	6	4	-	3	-	-	2	-	2	4	4	1	1	1	2	-	0.6	1.0	0.15	**1.2**	C70-72
Thyroid	15	0	93	7	-	-	-	-	-	1	1	1	1	1	4	1	-	2	3	-	0.3	0.5	0.16	**0.9**	C73
Hodgkin lymphoma	25	0	100	0	1	-	2	5	1	2	1	2	3	3	1	-	2	2	-	-	0.5	0.8	0.10	**0.9**	C81
Non-Hodgkin lymphoma	70	0	94	4	3	3	6	2	2	9	6	11	4	3	8	3	4	1	1	4	1.3	2.3	0.23	**2.4**	C82-86, C96
Multiple myeloma	7	0	86	14	-	-	-	-	-	-	1	1	-	-	-	2	3	-	-	-	0.1	0.2	0.05	**0.4**	C90
Lymphoid leukaemia	3	0	100	0	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.0**	C91
Myeloid leukaemia	3	0	100	0	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.0**	C92-94
Leukaemia, unspecified	13	0	62	38	1	2	1	4	-	-	-	1	1	-	1	-	-	-	1	1	0.2	0.4	0.04	**0.4**	C95
Other and unspecified	81	0	63	37	5	2	1	7	1	7	9	6	7	1	9	5	5	5	3	8	1.6	2.6	0.38	**3.5**	O&U
All sites	3103	17	89	7	63	38	36	52	62	190	313	417	401	314	310	220	222	177	130	141	59.6	100.0	16.50	**141.0**	C00-96
All sites except C44	3057	17	89	7	63	37	36	51	59	186	309	411	399	309	306	216	221	174	128	135	58.7	98.5	16.28	**138.9**	C00-96 exc. C44
Average annual population					167195	134697	121557	119432	117071	109421	89135	62287	40050	24865	19067	13256	8335	5687	3515	5594	1041166				

Zimbabwe, Bulawayo

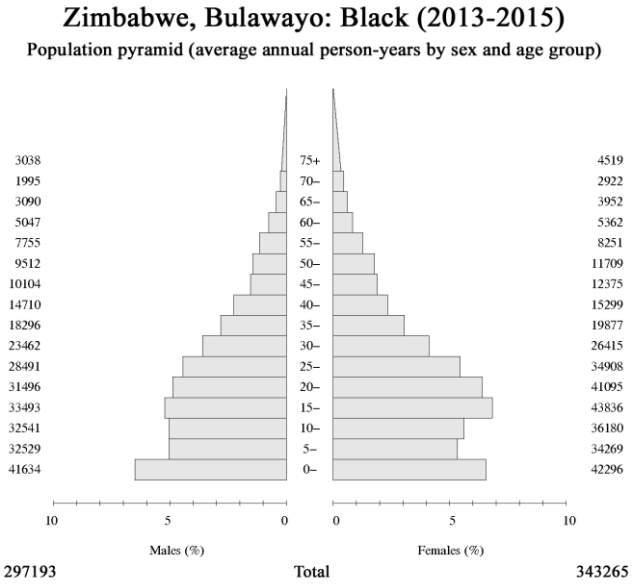
The Bulawayo Cancer Registry was founded in 1963 and functioned for 15 years before it ceased activity in 1978. It was located in an office in the Department of Radiotherapy at the Mpilo Central Hospital which, in addition to providing the only hospital service to the black African population of the city of Bulawayo, also acted as the referral centre for cancer cases from the south-western part of Zimbabwe (until 1980, Rhodesia), including the provinces of Matabeleland (North and South), Masvingo (formerly Victoria) and Midlands. New cancer cases were registered from all hospital wards and departments; case notes with a diagnosis of cancer or suspected cancer were sent to the registry upon patient discharge or death.



The activity of the registry was restarted by the Ministry of Health and Child Care (MoHCC) in 2013 in order to strengthen the Zimbabwe National Cancer Registry (ZNCR) as it moves towards becoming a national population-based cancer registry. This is in line with the National Cancer Prevention and Control Strategy (2014-2018) which was unveiled by the MoHCC in 2014.

The registry is funded by the MoHCC as an integral part of the ZNCR and Mpilo Central Hospital. It is supervised by the head of the Radiotherapy Centre, and the two full time staff are employed by the ZNCR. Their salaries are paid by the Ministry of Health. Running costs (including transport) are provided through the Mpilo Central Hospital. The registry recently relocated from the Radiotherapy Centre to the main hospital building where it occupies a single spacious room.

Population-based data presented in this publication are for the city of Bulawayo. The results of the 2012 census put the total population at 653,000, with the black population estimated at 640,490. For the period considered here (2013-2015), the population at risk was calculated from the official projections of the total population, and annual estimates of the non-Black population (about 12,300 in 2014).



The main sources of information are from hospitals and laboratories within the registration area, either publicly or privately owned. They are the Mpilo Central Hospital (including radiotherapy and oncology departments), the United Bulawayo Hospital, Mater Dei Hospital, Bulawayo Surgical Hospital, Corporate 24 Hospital, Premier Hillside Hospital, oncology and haematology clinics (outpatient consultations), the government pathology laboratory at Mpilo Central Hospital, the Diagnostic Pathology Centre (private), the Island Hospice and the Death Registry Unit of Registrar General within the Ministry of Home Affairs and Cultural Heritage.

Data collection is mainly active. In the Mpilo Central Hospital, the main source is the hospital records department. A staff member of the records department staff separates the folders of discharged cases with a diagnosis of cancer, and the registry staff visit weekly to abstract the cases notes onto registration forms. Visits are also made to key hospital services (gynaecology, medical, paediatric and surgical ward) to check the discharge registers. The radiotherapy department has its own case records, which are abstracted directly because almost all cases are cancers. The registry staff also visit the medical records department of the United Bulawayo Hospitals weekly, where all files of recently discharged patients were scanned thoroughly to identify cancer cases, which are then abstracted. The staff make weekly visits to the two private oncology clinics in the city where they have direct access to the case records.

Almost all deaths are registered, the death notification comes from the hospital mortuary. All deaths are medically certified, although the information for home deaths may be of a verbal autopsy from relatives. Deaths of which cancer is mentioned on the certificate are used to update the registry database. Cases that are not already recorded in the registry, and cannot be traced back via the hospitals, are registered as "death certificate only" (DCO) cases. The registry uses the same CanReg-4 system as Harare for data entry and management.

YEARS PRESENTED

Three-year period, 2013-2015

COMMENT

The period presented (2013-2015) overlaps with that in Volume II (2011-2013). The numbers of cases recorded (in the black population) has increased throughout this period, from 619 in 2011 to 988 in 2015.

The incidence rates for many individual sites are high, although lower than those recorded in Harare (q.v.). For All sites (excl. non-melanoma skin), age standardised rates (ASR) were (including those for deaths that occurred at home) usually 202.8 per 10^6 in males and 240.9 per 10^6 in females. The rates non-Hodgkin lymphoma and cancer of cervix, although very high, are now more or less comparable to those in Harare.

8% of cases in males and 6% in females were registered based on death certificate only.

Summary

Some of the changes since 2010-2013 may be due to change in the estimation of the population denominators. The calculated rates are high, and, as for Harare, we believe this is in part due to inaccurate enumeration of the population at the 2012 census.

PUBLICATIONS and ACHIEVEMENTS

The Bulawayo Cancer Registry became a member of the AFCRN in 2015.

Chokunonga E, Borok MZ, Chingonzoh T, Chirenje ZM, Makunike-Mutasa R, Manangazira P, Ndlovu N,Nyakabau AM. Pattern of Cancer in Zimbabwe in 2016, ZNCR (2018)

Zimbabwe, Bulawayo: Black (2013–2015)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	8	0	88	0	-	-	-	-	-	-	-	-	-	1	-	1	3	-	1	2	0.8	0.8	0.20	**1.8**	C00-06
Salivary gland	4	0	100	0	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	1	0.4	0.4	0.08	**0.9**	C07-08
Nasopharynx	3	0	100	0	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	0.3	0.3	0.08	**0.6**	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C09-10, C12-14
Oesophagus	93	1	57	12	-	-	-	-	-	2	-	1	6	8	11	9	8	9	13	25	9.6	8.7	2.27	**20.3**	C15
Stomach	27	0	78	4	-	-	-	-	-	-	-	-	2	-	3	5	4	3	2	8	2.8	2.5	0.59	**5.8**	C16
Colon	35	0	80	3	-	-	-	-	1	-	1	2	1	3	2	8	9	2	3	3	3.6	3.3	0.86	**6.9**	C18
Rectum	18	0	83	6	-	-	-	-	-	-	-	-	1	-	1	2	3	2	6	3	1.9	1.7	0.72	**4.5**	C19-20
Anus	8	0	100	0	-	-	-	-	-	-	-	1	3	1	-	-	1	1	1	-	0.8	0.8	0.21	**1.5**	C21
Liver	56	0	64	20	-	-	-	-	1	1	4	4	7	7	7	2	6	4	3	10	5.8	5.3	1.00	**10.3**	C22
Gallbladder etc.	5	0	100	0	-	-	-	-	-	-	-	-	1	-	1	-	1	2	-	-	0.5	0.5	0.15	**1.1**	C23-24
Pancreas	18	0	39	6	-	-	-	-	-	-	1	-	-	1	3	5	-	3	5	-	1.9	1.7	0.71	**4.0**	C25
Larynx	11	0	91	0	-	-	-	-	-	-	-	-	-	2	-	4	1	2	-	2	1.1	1.0	0.23	**2.3**	C32
Trachea, bronchus, and lung	25	0	64	8	-	-	-	-	-	-	-	1	2	-	2	5	2	5	5	3	2.6	2.3	0.85	**5.6**	C33-34
Bone	7	0	100	0	-	-	-	1	1	1	1	-	1	-	1	-	1	-	-	-	0.7	0.7	0.08	**0.9**	C40-41
Melanoma of skin	7	0	100	0	-	-	-	-	-	1	-	-	1	-	-	1	1	-	1	2	0.7	0.7	0.14	**1.4**	C43
Non-melanoma skin	35	1	100	0	1	-	-	2	3	-	1	4	3	1	4	5	3	1	3	3	3.6	3.3	0.67	**5.8**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	119	0	29	4	-	-	1	2	4	12	24	23	12	8	8	11	6	4	2	2	12.3	11.2	1.57	**15.5**	C46
Connective and soft tissue	11	0	100	0	1	-	-	1	-	1	1	1	-	2	-	2	1	-	-	1	1.1	1.0	0.13	**1.6**	C47, C49
Breast	10	2	100	0	-	-	-	-	-	-	1	1	-	1	1	1	1	-	2	-	1.0	0.9	0.31	**1.9**	C50
Penis	29	0	79	0	-	-	-	-	-	1	1	2	1	3	5	2	3	5	2	4	3.0	2.7	0.69	**5.9**	C60
Prostate	271	5	48	11	-	-	-	-	-	-	-	-	-	1	5	7	26	38	56	133	27.9	25.5	7.30	**68.9**	C61
Testis	3	0	100	0	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	0.3	0.3	0.02	**0.3**	C62
Kidney and renal pelvis	4	0	50	25	-	-	1	-	-	-	-	1	-	-	-	-	-	-	1	1	0.4	0.4	0.09	**0.7**	C64-65
Bladder	10	0	20	30	-	-	-	-	-	-	1	1	-	-	1	-	1	-	-	6	1.0	0.9	0.06	**2.0**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	37	1	100	0	3	-	-	-	2	1	5	8	6	4	2	3	1	1	-	-	3.8	3.5	0.43	**4.6**	C69
Brain and nervous system	8	0	38	12	2	1	1	1	-	-	1	1	-	-	-	1	-	-	-	-	0.8	0.8	0.06	**0.8**	C70-72
Thyroid	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.1	0.00	**0.2**	C73
Hodgkin lymphoma	11	0	100	0	-	1	2	2	-	1	3	-	-	1	-	-	1	-	-	-	1.1	1.0	0.09	**1.2**	C81
Non-Hodgkin lymphoma	92	0	96	2	-	1	-	2	2	9	8	9	9	10	12	8	7	6	1	8	9.5	8.6	1.38	**14.5**	C82-86, C96
Multiple myeloma	24	0	100	0	-	-	-	-	-	-	-	1	4	6	3	2	3	2	1	2	2.5	2.3	0.49	**4.5**	C90
Lymphoid leukaemia	11	0	100	0	5	2	1	1	-	-	1	-	-	-	-	1	-	-	-	-	1.1	1.0	0.06	**1.0**	C91
Myeloid leukaemia	12	0	100	0	-	-	1	1	2	2	-	1	-	-	2	2	1	-	-	-	1.2	1.1	0.14	**1.5**	C92-94
Leukaemia, unspecified	2	0	50	50	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	0.2	0.2	0.01	**0.3**	C95
Other and unspecified	49	0	82	14	2	1	-	-	-	4	1	1	2	1	3	9	6	7	3	9	5.1	4.6	1.05	**9.6**	O&U
All sites	1064	10	66	7	14	6	7	13	16	39	55	64	62	64	77	97	100	99	111	230	109.7	100.0	22.67	**208.6**	C00-96
All sites except C44	1029	9	65	8	13	6	7	11	13	39	54	60	59	63	73	92	97	98	108	227	106.1	96.7	22.00	**202.8**	C00-96 exc. C44
Average annual population					55772	35751	31879	33156	32247	29564	25346	20000	15957	11515	9370	8370	5861	3514	2132	2839	323275				

Zimbabwe, Bulawayo: Black (2013–2015)

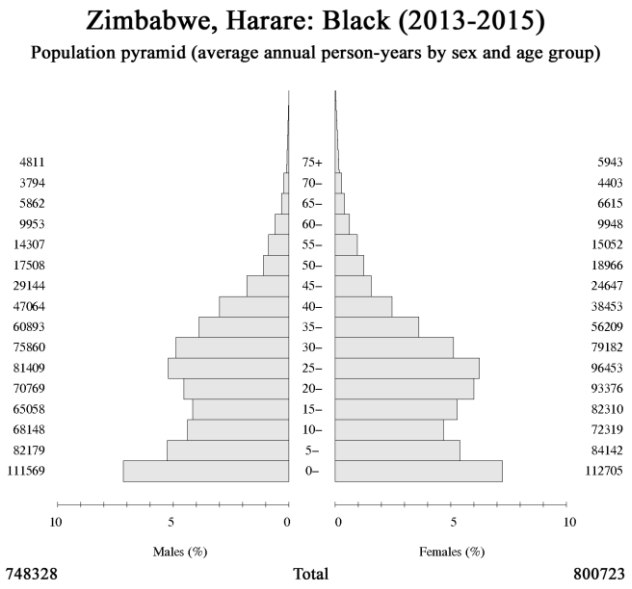
Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	5	0	100	0	-	-	-	-	1	-	-	1	-	-	-	-	-	2	-	1	0.5	0.3	0.09	**0.8**	C00-06
Salivary gland	4	0	100	0	-	-	-	-	-	-	-	-	-	1	-	1	1	-	-	1	0.4	0.2	0.06	**0.7**	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C11
Other pharynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.1	0.1	0.02	**0.1**	C09-10, C12-14
Oesophagus	77	0	61	17	-	-	-	-	-	-	2	-	6	8	2	6	16	7	5	25	6.9	4.6	1.29	**13.3**	C15
Stomach	32	0	69	16	-	-	-	1	-	-	-	-	2	-	4	4	1	11	5	4	2.9	1.9	0.89	**6.0**	C16
Colon	32	0	88	0	-	-	-	-	1	-	3	2	1	4	2	4	3	3	4	5	2.9	1.9	0.61	**5.0**	C18
Rectum	13	0	54	8	-	-	-	-	-	-	1	3	-	1	1	-	-	3	1	3	1.2	0.8	0.23	**2.0**	C19-20
Anus	14	0	93	7	-	-	-	-	-	2	-	2	2	-	4	1	1	-	1	1	1.3	0.8	0.20	**1.9**	C21
Liver	45	0	62	22	-	-	-	1	-	-	3	1	3	3	3	7	7	5	2	10	4.1	2.7	0.76	**7.3**	C22
Gallbladder etc.	9	0	100	0	-	-	-	-	-	-	-	-	2	-	2	2	-	-	2	1	0.8	0.5	0.19	**1.4**	C23-24
Pancreas	12	0	8	33	-	-	-	-	-	-	2	1	-	-	-	-	1	3	1	4	1.1	0.7	0.22	**2.0**	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C32
Trachea, bronchus, and lung	16	0	69	19	-	-	-	-	1	1	2	-	1	-	3	3	-	1	-	4	1.4	1.0	0.16	**2.1**	C33-34
Bone	10	0	100	0	-	-	2	3	-	-	2	-	1	-	2	-	-	-	-	-	0.9	0.6	0.07	**0.9**	C40-41
Melanoma of skin	20	0	100	0	-	-	-	-	-	-	-	1	-	1	3	2	2	1	5	5	1.8	1.2	0.47	**3.5**	C43
Non-melanoma skin	47	0	100	0	-	1	-	-	2	1	2	3	5	5	3	4	5	3	2	11	4.2	2.8	0.64	**7.0**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	54	0	39	2	1	-	1	-	4	9	9	9	4	6	1	3	4	1	2	-	4.9	3.2	0.62	**6.0**	C46
Connective and soft tissue	13	1	100	0	2	-	-	-	-	1	2	2	1	-	1	1	1	-	1	-	1.2	0.8	0.17	**1.5**	C47, C49
Breast	237	0	83	7	-	-	-	-	2	6	14	19	24	32	33	31	29	24	11	12	21.4	14.2	4.25	**36.2**	C50
Vulva	24	0	79	0	-	-	-	-	3	-	1	4	2	7	-	2	-	1	1	3	2.2	1.4	0.29	**3.1**	C51
Vagina	7	0	86	0	-	-	-	-	-	-	-	-	-	4	1	-	-	1	-	1	0.6	0.4	0.10	**1.1**	C52
Cervix uteri	547	7	74	3	-	-	-	2	4	10	27	62	80	78	68	45	47	42	34	41	49.3	32.9	9.15	**80.9**	C53
Uterus	69	0	55	3	-	-	-	-	-	-	3	-	3	7	3	7	13	10	10	13	6.2	4.1	1.60	**12.4**	C54-55
Ovary	49	0	69	6	-	1	1	3	3	3	3	1	3	2	10	-	4	5	4	6	4.4	2.9	0.79	**7.0**	C56
Placenta	10	0	100	0	-	-	-	-	-	3	4	1	1	-	1	-	-	-	-	-	0.9	0.6	0.07	**0.8**	C58
Kidney and renal pelvis	12	0	100	0	5	-	-	-	-	-	-	-	-	1	-	3	2	1	-	-	1.1	0.7	0.17	**1.6**	C64-65
Bladder	13	0	69	8	-	-	-	-	-	-	-	-	1	3	-	1	1	1	3	3	1.2	0.8	0.30	**2.3**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	39	1	100	0	3	1	-	-	1	3	5	5	4	6	2	3	2	1	-	2	3.5	2.3	0.40	**4.6**	C69
Brain and nervous system	10	0	50	0	2	1	1	1	-	1	-	-	-	1	1	-	1	-	-	1	0.9	0.6	0.08	**1.1**	C70-72
Thyroid	18	0	78	6	-	-	-	-	-	-	1	-	1	1	3	3	1	1	2	5	1.6	1.1	0.30	**2.8**	C73
Hodgkin lymphoma	11	0	100	0	-	-	-	-	2	-	3	-	-	3	1	1	1	-	-	-	1.0	0.7	0.12	**1.3**	C81
Non-Hodgkin lymphoma	90	0	96	1	3	1	1	2	7	5	7	13	12	9	10	8	6	4	1	1	8.1	5.4	1.10	**10.9**	C82-86, C96
Multiple myeloma	27	0	93	7	-	-	-	-	-	-	-	-	-	2	-	2	4	7	1	11	2.4	1.6	0.50	**5.0**	C90
Lymphoid leukaemia	8	0	100	0	3	1	-	-	-	1	-	-	-	-	-	1	1	-	-	1	0.7	0.5	0.06	**0.9**	C91
Myeloid leukaemia	12	0	100	0	1	1	1	-	2	-	2	-	-	1	-	-	1	-	1	2	1.1	0.7	0.13	**1.4**	C92-94
Leukaemia, unspecified	6	0	83	17	-	1	-	1	-	-	-	-	1	1	-	-	1	-	-	1	0.5	0.4	0.06	**0.8**	C95
Other and unspecified	71	0	68	27	1	1	-	-	3	1	3	1	3	1	10	4	7	14	6	16	6.4	4.3	1.38	**11.8**	O&U
All sites	1664	9	76	6	21	9	7	14	36	47	101	131	163	188	174	150	163	152	105	194	150.0	100.0	27.56	**247.8**	C00-96
All sites except C44	1617	9	76	6	21	8	7	14	34	46	99	128	158	183	171	146	158	149	103	183	145.7	97.2	26.92	**240.9**	C00-96 exc. C44
Average annual population					56643	37014	34360	41061	42801	37410	29568	22047	16766	13099	11860	9531	6171	4166	3045	4313	369856				

Zimbabwe, Harare

The Zimbabwe National Cancer Registry (ZNCR), formerly named the Harare Cancer Registry, was established in 1985 as a result of a collaborative research agreement between the Ministry of Health and Child Care (MoHCC) and IARC. Although at inception the registry targeted the population of the capital city of Harare, it did not exclude cancer cases from other parts of the country. After achieving complete reporting and coverage of the Harare in 1990, the ZNCR has since been aiming to achieve complete reporting for the entire population of Zimbabwe. Progress has been made in this direction following the successful revival of the Bulawayo Cancer Registry in 2011. The Zimbabwe Cancer Prevention and Control Strategy (2014-2018) unveiled by the MoHCC in February 2014 envisages the strengthening of the ZNCR by extending registration to other parts of the country.

The ZNCR is situated in the Parirenyatwa Group of Hospitals complex, a large government tertiary referral centre, which provides most of the cancer management services for the northern part of the country and is one of the two teaching hospitals of the University of Zimbabwe College of Health Sciences. The activities of the ZNCR are overseen by a constituted multidisciplinary advisory committee. The registry manager, supported by five health information assistants and an executive assistant is responsible for the day-to-day management under the guidance of the medical director. The ZNCR is supported by the MoHCC and other organisations.



The ZNCR uses a combination of active and passive methods of case-finding. In order to register cases, ZNCR staff visit institutions within the healthcare delivery system in Harare that are involved in the management of cancer patients. Regular routine visits are made to the inpatient wards, oncology outpatient clinics and medical records departments of the three government referral hospitals (Parirenyatwa Group of Hospitals, Harare Central Hospital and Chitungwiza Central Hospital). Patient interviews are also conducted in order to record patient demographics accurately. The three major private hospitals (St. Anne's Hospital, Avenues Clinic and West End Hospital) are visited regularly to collect cancer registration forms where have been prepared by the hospital staff. The registry staff also visit the two municipal hospitals in Harare (Beatrice Road Infectious Diseases Hospital and Wilkins Infectious Diseases Hospital).

Other important sources of information are public and private pathology laboratories in the city, the radiotherapy centre and the radiology department, and the haematology department at the Parirenyatwa Group of Hospitals, the oral health centre of the University of Zimbabwe College of Health Sciences, the Island Hospice and Health Care, the Cancer Association of Zimbabwe, the Kidzcan Children's Cancer Centre, Harare Death Registry and, the newly established private Oncocare Radiotherapy and Oncology Centre.

A cancer notification form is completed for each cancer case identified at the various sources. The abstract forms are matched manually and electronically with the records in the database to prevent duplicate registrations. Death certificates for deaths occurring in the greater Harare and the dormitory town of Chitungwiza are reviewed weekly to identify deaths

caused by cancer. ICD-O-3 is used for coding topography (tumour site) and morphology (histology). The ZNCR observes the IARC/IACR rules on multiple primary cancers. It follows the IARC/IACR guidelines on confidentiality. The CanReg4 cancer registration software is used for data processing and arrangements are underway to migrate to CanReg5. Requests for data made in writing must be approved by the medical director and the data release sub-committee of the Advisory Committee.

YEARS PRESENTED

Three year period, 2013-2015

COMMENT

Results for 2010-2012 were reported in Volume II as well as in Cancer Incidence in Five Continents, Volume XI. We report here results for the black (African) population of Harare for the following 3 years 2013-2015.

Estimates of the black (African) population at risk are based on the census of 2012, and annual post-censal projections of the total population (all races) by age group and sex. Annual estimates of the non-black population were made assuming that it remained the same proportion of the total population (by age and sex) as in 2012.

Possible under-enumeration of the population at the census would account for the extraordinarily high calculated incidence rates: Age standardised incidence for all sites (excl. NMSC 320.4 per 10^5 in males and 205.8 per 10^5 in females. There are especially high rates for cancer of the cervix (ASR 81.1 per 10^5 is the one of the highest ever recorded) and prostate (118.6 per 10^5 – not dissimilar to the incidence in the USA where rates are inflated by screening). There are high incidence rates for cancers of the stomach, pancreas, corpus uteri, myeloma, non-Hodgkin lymphoma, and lung (the latter the highest recorded in this volume).

The percentage of cases with morphological verification of diagnosis (MV%) is 70% in males and 79% in females, values lowered by the numbers of cases of oesophagus, liver, and lung cancers and Kaposi sarcoma (all with low MV%) and the cases registered on the basis of information from death certificates (11% males, 8% females).

Comparing the age standardised incidence rates with the values calculated for 2010-2012 (Volume II) suggest increases in incidence of cancers of the oesophagus (from 16.4 to 20.3 per 10^5 in males; 13.1 to 16.1 per 10^5 in females), lung (from 13.4 to 17.7 per 10^5 in males; 4.6 to 9.4 per 10^5 in females), and, especially, prostate (from 86 to 118.6 per 10^5). Cancers associated with HIV-AIDS (Kaposi sarcoma, non Hodgkin lymphoma, and eye cancers) show some reduction in incidence, as does cancer of the cervix (from 85.9 to 81.6 per 10^5).

Summary

These rates are very high, and we believe this is in part due to inaccurate enumeration of the Harare population. Some distortion may be due to the relatively large numbers of cases registered from death certificate information (sites of DCO cases suggest metastases). Some of the changes since 2003-2006 may be due to change in the estimation of the population denominators (since the availability of the census results for 2012).

PUBLICATIONS and ACHIEVEMENTS

The ZNCR is one of the founding registries of the AFCRN. It hosted the 2nd AFCRN Annual Review Meeting in 2014. The registry has been providing technical and capacity building support to other registries in the region on behalf of the IARC/WHO and the AFCRN.

The ZNCR has contributed data to five successive volumes of "Cancer Incidence in Five Continents" (Volumes VII, VIII, IX, X, XI), two successive editions of "International Incidence of Childhood Cancer" (Volumes II, III) and "Cancer in Africa" (Volumes I, II).

Zimbabwe, Harare: Black (2013–2015)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	38	0	97	3	1	-	-	-	-	-	1	5	-	4	3	3	4	7	2	8	1.7	1.2	0.46	**4.3**	C00-06
Salivary gland	11	0	100	0	-	-	-	-	-	-	2	1	1	3	-	1	1	2	-	-	0.5	0.4	0.11	**0.9**	C07-08
Nasopharynx	17	0	76	6	-	-	1	-	3	-	-	2	3	-	-	4	1	1	1	1	0.8	0.6	0.16	**1.3**	C11
Other pharynx	9	0	89	11	-	-	-	-	-	-	1	1	-	1	1	3	2	-	-	-	0.4	0.3	0.09	**0.8**	C09-10, C12-14
Oesophagus	167	3	56	16	-	-	-	-	-	1	1	8	10	11	13	18	16	17	24	45	7.4	5.5	2.30	**20.3**	C15
Stomach	155	1	81	7	-	-	-	-	-	1	6	7	10	4	9	16	14	16	26	45	6.9	5.1	2.21	**19.0**	C16
Colon	83	0	76	12	-	-	-	1	1	3	4	4	3	5	9	8	6	14	5	20	3.7	2.7	0.97	**9.3**	C18
Rectum	66	0	88	11	-	1	-	-	2	1	4	4	7	1	5	9	10	6	3	13	2.9	2.2	0.68	**6.8**	C19-20
Anus	14	0	93	0	-	-	-	-	-	-	1	1	3	1	1	1	1	2	1	2	0.6	0.5	0.16	**1.4**	C21
Liver	192	0	39	24	1	-	-	1	2	8	16	21	26	13	18	14	12	12	16	32	8.6	6.3	1.86	**17.4**	C22
Gallbladder etc.	19	0	89	11	-	-	-	-	-	-	-	1	-	1	-	4	1	1	3	8	0.8	0.6	0.23	**2.4**	C23-24
Pancreas	49	0	31	39	-	-	-	-	-	-	1	-	3	4	3	6	7	5	7	13	2.2	1.6	0.70	**6.1**	C25
Larynx	48	0	83	6	-	-	-	-	-	-	-	1	-	2	3	9	9	13	3	8	2.1	1.6	0.80	**6.4**	C32
Trachea, bronchus, and lung	139	0	41	17	-	-	-	-	2	-	3	3	6	5	14	14	14	21	22	35	6.2	4.6	2.16	**17.7**	C33-34
Bone	33	0	82	6	-	2	3	2	4	3	4	2	1	2	1	1	-	2	2	4	1.5	1.1	0.23	**2.3**	C40-41
Melanoma of skin	27	0	100	0	-	-	-	-	1	2	-	1	4	2	1	1	1	4	4	6	1.2	0.9	0.36	**3.0**	C43
Non-melanoma skin	80	0	100	0	1	-	-	4	4	6	6	5	6	5	5	3	8	4	9	14	3.6	2.6	0.84	**7.5**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.0	0.00	**0.1**	C45
Kaposi sarcoma	311	2	49	7	1	-	3	8	5	21	48	53	61	33	26	17	8	7	6	12	13.9	10.2	1.79	**18.4**	C46
Connective and soft tissue	46	0	93	0	2	-	2	4	1	4	6	5	2	7	5	2	1	1	1	3	2.0	1.5	0.26	**3.0**	C47, C49
Breast	14	0	86	7	-	-	-	-	-	-	2	2	2	-	1	-	2	-	1	4	0.6	0.5	0.10	**1.3**	C50
Penis	41	0	98	0	-	-	-	-	-	1	3	4	7	3	6	3	1	1	3	9	1.8	1.3	0.33	**3.7**	C60
Prostate	815	3	70	14	-	-	-	-	-	-	1	2	1	3	18	41	66	132	135	413	36.3	26.7	11.51	**118.6**	C61
Testis	4	0	75	0	2	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	0.2	0.1	0.01	**0.3**	C62
Kidney and renal pelvis	20	0	85	0	5	2	-	-	-	-	-	-	1	2	1	-	3	1	4	1	0.9	0.7	0.29	**1.9**	C64-65
Bladder	49	0	57	14	-	-	-	1	-	-	-	3	1	3	6	5	2	7	10	11	2.2	1.6	0.82	**6.2**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.0	0.00	**0.1**	C66, C68
Eye	57	0	100	0	7	1	1	-	-	1	4	11	9	7	5	3	2	1	2	3	2.5	1.9	0.36	**3.7**	C69
Brain and nervous system	54	0	48	15	5	6	4	1	-	3	5	3	5	6	5	1	5	3	-	2	2.4	1.8	0.34	**3.6**	C70-72
Thyroid	10	0	50	10	-	-	-	-	1	-	-	-	-	1	2	2	-	-	3	1	0.4	0.3	0.18	**1.1**	C73
Hodgkin lymphoma	18	0	100	0	-	1	3	2	3	2	1	3	-	2	-	-	-	-	1	-	0.8	0.6	0.09	**0.9**	C81
Non-Hodgkin lymphoma	197	0	96	2	5	-	8	8	6	6	11	25	31	39	14	12	14	2	9	7	8.8	6.5	1.46	**13.6**	C82-86, C96
Multiple myeloma	38	0	100	0	-	-	-	-	-	1	-	-	4	4	3	2	4	5	8	7	1.7	1.2	0.65	**4.7**	C90
Lymphoid leukaemia	20	0	100	0	5	2	5	1	1	2	-	-	1	-	1	-	1	-	-	1	0.9	0.7	0.06	**1.0**	C91
Myeloid leukaemia	31	0	100	0	2	3	3	2	3	-	6	2	2	1	2	1	1	1	1	1	1.4	1.0	0.18	**1.8**	C92-94
Leukaemia, unspecified	13	0	100	0	1	1	1	2	1	3	2	-	-	-	-	-	-	-	1	1	0.6	0.4	0.07	**0.7**	C95
Other and unspecified	160	1	79	4	3	-	3	4	5	3	5	11	12	16	11	12	18	13	16	27	7.1	5.3	1.84	**16.3**	O&U
All sites	3047	10	70	10	41	19	37	41	45	72	144	191	222	192	192	216	235	301	329	760	135.7	100.0	34.68	**327.9**	C00-96
All sites except C44	2967	10	70	11	40	19	37	37	41	66	138	186	216	187	187	213	227	297	320	746	132.2	97.4	33.84	**320.4**	C00-96 exc. C44
Average annual population					111569	82179	68148	65058	70769	81409	75860	60893	47064	29144	17508	14307	9953	5862	3794	4811	748328				

Zimbabwe, Harare: Black (2013–2015)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	27	0	93	4	2	-	-	1	-	1	2	1	2	2	1	5	2	1	4	3	1.1	0.7	0.31	**2.4**	C00-06
Salivary gland	9	0	100	0	-	-	-	-	-	1	1	1	-	2	1	-	1	2	-	-	0.4	0.2	0.10	**0.8**	C07-08
Nasopharynx	8	0	75	12	1	-	1	2	-	-	1	-	-	-	1	1	-	-	-	1	0.3	0.2	0.03	**0.5**	C11
Other pharynx	6	0	83	17	-	-	-	-	-	-	1	-	-	-	-	3	-	-	1	1	0.2	0.2	0.07	**0.6**	C09-10, C12-14
Oesophagus	147	0	68	9	-	-	-	-	-	-	8	2	9	8	15	14	18	22	18	33	6.1	4.1	1.94	**16.1**	C15
Stomach	180	4	74	9	-	-	-	-	-	1	5	7	6	8	12	19	16	19	21	62	7.5	5.0	2.02	**19.7**	C16
Colon	62	0	81	10	-	-	-	1	-	1	2	5	4	2	5	8	7	11	6	10	2.6	1.7	0.81	**6.4**	C18
Rectum	59	0	71	10	-	-	-	-	1	3	1	10	6	3	6	4	3	5	5	12	2.5	1.6	0.55	**5.2**	C19-20
Anus	11	0	91	9	-	-	-	-	-	-	1	2	3	1	2	1	-	1	-	-	0.5	0.3	0.08	**0.7**	C21
Liver	110	0	34	35	-	-	1	-	1	1	3	10	8	8	11	4	7	12	11	33	4.6	3.0	1.11	**11.0**	C22
Gallbladder etc.	21	0	86	10	-	-	-	-	-	-	-	-	2	1	-	2	3	4	6	3	0.9	0.6	0.42	**2.6**	C23-24
Pancreas	56	1	30	36	-	-	-	-	1	-	-	2	1	3	7	7	6	4	6	18	2.3	1.6	0.61	**6.1**	C25
Larynx	6	0	83	0	-	-	-	-	-	-	-	-	2	-	-	1	1	-	-	2	0.2	0.2	0.04	**0.6**	C32
Trachea, bronchus, and lung	79	1	68	13	-	-	-	-	-	-	-	3	4	5	2	9	10	16	15	14	3.3	2.2	1.33	**9.4**	C33-34
Bone	30	0	100	0	-	1	1	2	9	4	3	2	-	1	1	2	-	1	1	2	1.2	0.8	0.14	**1.5**	C40-41
Melanoma of skin	35	1	97	3	-	-	-	-	-	1	-	-	1	2	2	6	4	5	6	7	1.5	1.0	0.54	**4.1**	C43
Non-melanoma skin	85	1	99	0	-	-	-	-	3	3	6	5	9	10	9	6	8	5	7	13	3.5	2.4	0.82	**7.5**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	207	1	54	2	-	-	1	4	9	27	39	45	40	14	8	2	7	4	3	3	8.6	5.7	0.99	**10.3**	C46
Connective and soft tissue	49	1	98	2	3	3	1	-	4	2	4	8	3	2	5	3	2	3	-	5	2.0	1.4	0.27	**3.2**	C47, C49
Breast	499	1	86	8	-	-	-	-	1	16	22	58	64	58	62	57	55	36	20	49	20.8	13.8	4.69	**43.0**	C50
Vulva	45	0	93	2	-	-	-	-	1	-	6	12	7	4	4	3	2	2	1	3	1.9	1.2	0.30	**3.0**	C51
Vagina	12	0	100	0	-	-	1	1	-	-	2	2	1	1	-	2	-	-	-	2	0.5	0.3	0.05	**0.7**	C52
Cervix uteri	952	4	87	5	-	-	-	-	3	25	51	99	140	110	125	113	69	92	44	77	39.6	26.4	9.33	**81.6**	C53
Uterus	76	0	80	7	-	-	-	1	1	2	1	1	1	4	2	10	17	19	10	7	3.2	2.1	1.31	**9.1**	C54-55
Ovary	118	0	63	10	-	1	-	1	4	5	12	8	10	6	11	11	16	13	11	9	4.9	3.3	1.38	**10.6**	C56
Placenta	14	0	93	7	-	-	-	1	1	1	4	4	1	2	-	-	-	-	-	-	0.6	0.4	0.04	**0.6**	C58
Kidney and renal pelvis	30	0	97	0	13	4	1	1	-	-	1	1	2	2	-	1	1	2	-	1	1.2	0.8	0.14	**1.7**	C64-65
Bladder	43	0	67	16	-	-	-	-	-	-	-	3	-	2	4	4	9	9	4	8	1.8	1.2	0.63	**5.0**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.0	0.0	0.03	**0.2**	C66, C68
Eye	52	0	96	0	6	2	-	-	-	3	5	10	10	3	5	4	2	-	1	1	2.2	1.4	0.28	**2.9**	C69
Brain and nervous system	87	0	57	17	6	5	1	2	6	5	7	5	9	5	7	8	5	2	4	10	3.6	2.4	0.58	**6.1**	C70-72
Thyroid	53	0	64	9	-	-	-	-	-	1	-	1	1	3	7	3	13	7	11	6	2.2	1.5	0.93	**6.4**	C73
Hodgkin lymphoma	15	0	100	0	-	-	-	2	1	3	-	2	2	1	3	-	-	-	-	1	0.6	0.4	0.06	**0.8**	C81
Non-Hodgkin lymphoma	185	0	94	2	2	1	4	7	4	10	26	22	30	30	15	10	10	2	4	8	7.7	5.1	1.12	**11.7**	C82-86, C96
Multiple myeloma	43	0	100	0	-	-	-	-	-	-	-	1	3	1	4	8	5	11	5	5	1.8	1.2	0.70	**5.0**	C90
Lymphoid leukaemia	13	0	100	0	3	1	3	1	-	1	-	-	-	1	-	-	-	1	-	2	0.5	0.4	0.05	**0.8**	C91
Myeloid leukaemia	25	0	100	0	1	-	2	2	5	1	1	5	1	-	3	-	2	-	-	2	1.0	0.7	0.10	**1.4**	C92-94
Leukaemia, unspecified	10	0	100	0	2	-	-	-	-	1	2	-	-	1	-	1	-	1	1	1	0.4	0.3	0.09	**0.7**	C95
Other and unspecified	148	0	76	9	4	2	2	2	5	3	7	12	11	9	15	12	11	20	12	21	6.2	4.1	1.60	**13.6**	O&U
All sites	3608	15	79	8	43	20	19	31	60	122	224	349	393	315	355	344	312	333	238	435	150.2	100.0	35.57	**313.4**	C00-96
All sites except C44	3523	14	79	8	43	20	19	31	57	119	218	344	384	305	346	338	304	328	231	422	146.7	97.6	34.75	**305.8**	C00-96 exc. C44
Average annual population					112705	84142	72319	82310	93376	96453	79182	56209	38453	24647	18966	15052	9948	6615	4403	5943	800723				

France, Réunion

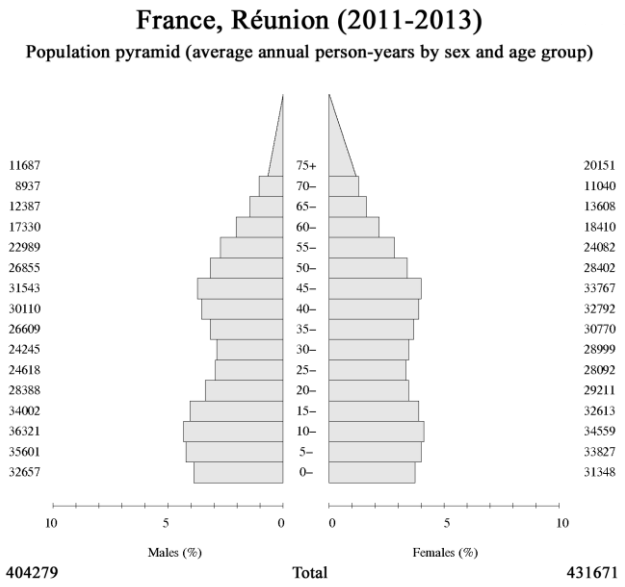
The Réunion Cancer Registry was founded in 1988. It has been managed by the Public Health Department of the Reunion University Hospital since 2010. The registry is run by a public health specialist and is staffed with two full-time registrars. It is based at the Clinical Research and Epidemiology Unit of Felix Guyon Hospital. It is financed by the regional health agency (ARS Réunion-Mayotte).

The registry covers the whole population of Réunion Island, which is one of the four French overseas departments, located in the Indian Ocean between Mauritius (170 km) and Madagascar (700 km). The population was estimated to be around 850 000 in 2016 (according to the estimations of the National Institute of Statistic and Economic Studies (INSEE)). It is a mixed and cosmopolitan population (European, African, Malagasy and Indian origin mainly). The population is relatively young for a developed country.

Since 2005, registration has been extended to paediatric cancer cases (age at diagnosis <18 years old) diagnosed in Mayotte, a small French island located in the Mozambique Channel. In 2017, the population of Mayotte was estimated to be around 257 000 inhabitants. 50% of the population was under 18 years of age in 2012 (data not yet available for 2017).

In Reunion, there are 4 cancer care units (two public hospitals and two private clinics) including four oncology/haematology units, two radiotherapy centres, one unit specialized in paediatric oncology, and one nuclear medicine unit (scintigraphy and PETSCAN); there are six pathology units distributed between the two cities, St Denis and St Pierre.

There is no histopathology laboratory in Mayotte; all analyses are performed in Reunion and all paediatric cancers diagnosed in Mayotte are treated in Reunion Island.



The registry collects cases from the four public hospitals: Centre Hospitalier Universitaire de la Réunion (Centre Hospitalier Félix Guyon in St Denis and Groupe Hospitalier Sud Réunion in St Pierre), Centre Hospitalier Ouest Réunion in St Paul; Groupe Hospitalier Est Réunion in St Benoit and Centre Hospitalier de Mayotte in Mamoudzou.

Five private clinics: Clinique Ste Clotilde in St Denis; Clinique St Vincent in St Denis; Clinique des Orchidées in Le Port; Clinique Jeanne d'Arc in Le Port and Clinique Durieux in Le Tampon.

The registry also collects cases from 5 of the six histopathology laboratories of the island; the two haematology laboratories located in the University Hospital; the regional cancer network (ONCORUN) and the Social Security.

Cases are registered using the Programme de Médicalisation des Systèmes d'Information (PMSI), the French equivalent of the Diagnosis-Related Groups used in the USA. The cancer case registration is active. For each notified case, inclusion criteria are controlled and data collected in medical records. Data are coded according to IARC, ENCR (European Network of Cancer Registries) and FRANCIM (French cancer registries network) guidelines, and entered into a database created in ACCESS®.

YEARS PRESENTED

Three year period, 2011 - 2013

COMMENT

Overall incidence (all sites excl NMSC are 251.3 per 10^5 in men and 172.8 per 10^5 in women). These rates are relatively high compared with the East African average, and the pattern of

cancers by site, with relatively high incidence of cancers of the prostate and lung (the highest recorded in this volume), oral cavity and pharynx (in males), colon-rectum, breast and leukaemia, and relatively low rates of cancers of the oesophagus and cervix, and of Kaposi sarcoma (only 4 cases, in males, recorded in 2011-2013) are quite different from those of the East African mainland countries. This is not surprising, given the very different population (in terms of ethnicity and lifestyle). Indeed, the pattern more resembles that of metropolitan France, than that of East Africa.

The registry does not record non-melanoma skin cancers. The registration of melanoma of skin is not exhaustive, an ad-hoc study in 2015 found 35 cases for men and 28 for women.

Morphological verification of diagnosis was 93% in males and 96% in females. There are no registrations based only upon from death certificate information.

Since death registration (by cause of death) is comprehensive in Reunion (as in all of France), the numbers of deaths and cancer cases, registered in the same time period can be compared. The ratios of deaths:cases for a period of 3 years (2011-2013) are shown in Table 4.01.

While the overall ratio (M:I) is reasonable (equivalent figures for Europe, according to Globocan 2018, are 52% in men, 43% in women), and the figures for individual sites are about what might be expected (100- survival), the ratio is above 1 for liver cancer. This is a typical finding in French cancer registries, and reflects vagaries in death certification practices in France.

Summary

The incidence rates seem broadly typical of those in a French department, and the M:I ratios are consistent with accurate registration practice.

ICD – 10 codes	MALES		FEMALES	
	Deaths	M/I%	Deaths	M/I%
Lip, oral cavity and pharynx (C00-14)	97	34.6	10	18.5
Oesophagus (C15)	96	78.7	14	100.0
Stomach (C16)	137	68.5	69	59.0
Colon, rectum and anus (C18-21)	159	36.6	145	37.2
Liver (C22)	118	110.3	57	158.3
Pancreas (C25)	69	76.7	74	85.1
Larynx (C32)	36	45.6	2	50.0
Lung (incl. trachea) (C33-34)	403	80.0	102	65.4
Melanoma of skin (C43)	13	22.4	10	18.9
Breast (C50)	-	-	161	16.4
Cervix uteri (C53)	-	-	46	26.3
O&U part of uterus (C54-55)	-	-	71	64.0
Ovary (C56)	-	-	51	48.6
Prostate (C61)	188	20.5	-	-
Kidney etc. (C64-66)	33	32.4	13	22.0
Bladder (C67)	46	34.6	15	35.7
Brain, central nervous system (C70-72)	30	58.8	27	62.8
Lymphoma (C81-88,C90)	79	42.9	63	42.0
Leukaemia (C91-95)	51	45.9	54	66.7
All sites but non-melanoma skin (C00-96/C44)	1796	49.1	1170	39.4

Table 4.01 Number of cancer deaths (source WHO mortality database) and M:I ratio (%) by sex, in Réunion, France, in 2011-2013.

PUBLICATIONS and ACHIEVEMENTS

Le cancer à la Réunion en 2015. Available at: https:www.ors-ocean-indien.org/IMG/pdf/tdb_cancer_2015.pdf

Les cancers à la Réunion en 2019. Available at: https://www.ors-ocean-indien.org/IMG/pdf/orsoi_tb_cancers_reunion_2019.pdf

The Reunion cancer registry is a member of AFCRN (African Cancer Registry Network) since 2015. The Reunion cancer registry is a member of FRANCIM (French Cancer Registry Network) since 2017.

France, Réunion (2011–2013)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	121	0	99	0	-	-	-	-	-	1	-	3	4	19	10	25	18	14	14	13	10.0	3.3	1.01	**8.2**	C00-06
Salivary gland	3	0	100	0	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	0.2	0.1	0.02	**0.2**	C07-08
Nasopharynx	11	0	100	0	-	-	-	1	-	-	-	-	-	1	-	1	1	3	-	4	0.9	0.3	0.07	**0.8**	C11
Other pharynx	145	0	99	0	-	-	-	-	-	-	-	-	6	11	26	34	20	24	14	10	12.0	4.0	1.28	**9.8**	C09-10, C12-14
Oesophagus	122	0	97	0	-	-	-	-	-	-	-	-	6	7	17	24	25	16	14	13	10.1	3.3	1.07	**8.3**	C15
Stomach	200	0	98	0	-	-	-	1	1	-	2	2	3	10	24	31	30	23	25	48	16.5	5.5	1.54	**13.4**	C16
Colon	251	0	99	0	-	-	1	-	-	1	1	3	4	10	26	31	31	39	46	58	20.7	6.9	2.18	**17.1**	C18
Rectum	179	0	97	0	-	-	-	-	-	1	-	3	1	12	20	20	36	20	22	44	14.8	4.9	1.39	**12.1**	C19-20
Anus	4	0	100	0	-	-	-	-	-	-	-	-	-	1	-	1	-	2	-	-	0.3	0.1	0.04	**0.3**	C21
Liver	107	0	54	0	1	-	-	-	-	-	1	2	3	3	7	23	13	16	15	23	8.8	2.9	0.89	**7.2**	C22
Gallbladder etc.	53	0	79	0	-	-	-	-	-	-	-	-	1	-	7	7	7	8	11	12	4.4	1.4	0.48	**3.6**	C23-24
Pancreas	90	0	83	0	-	-	-	-	1	-	1	1	4	6	4	12	13	10	15	23	7.4	2.5	0.72	**6.1**	C25
Larynx	79	0	99	0	-	-	-	-	-	-	-	-	2	4	13	17	20	10	6	7	6.5	2.2	0.67	**5.4**	C32
Trachea, bronchus, and lung	504	0	90	0	-	-	-	-	1	-	-	3	13	22	45	79	67	80	78	116	41.6	13.8	4.24	**34.0**	C33-34
Bone	12	0	100	0	-	1	1	1	1	-	2	-	2	-	-	-	-	-	1	3	1.0	0.3	0.06	**0.9**	C40-41
Melanoma of skin	58	0	100	0	-	-	-	-	-	1	4	5	4	6	12	5	4	7	4	6	4.8	1.6	0.44	**4.0**	C43
Non-melanoma skin	2	0	100	0	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	0.2	0.1	0.01	**0.2**	C44
Mesothelioma	5	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	2	0.4	0.1	0.03	**0.3**	C45
Kaposi sarcoma	4	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	2	-	-	1	0.3	0.1	0.03	**0.3**	C46
Connective and soft tissue	13	0	92	0	2	-	-	1	-	1	-	2	-	2	-	-	2	-	1	2	1.1	0.4	0.08	**1.1**	C47, C49
Breast	10	0	90	0	-	-	-	-	-	-	-	-	1	-	1	1	1	1	1	4	0.8	0.3	0.06	**0.6**	C50
Penis	4	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0.3	0.1	0.00	**0.2**	C60
Prostate	918	0	97	0	-	-	-	-	-	-	-	-	3	17	45	111	164	201	170	207	75.7	25.1	8.64	**63.8**	C61
Testis	28	0	100	0	-	-	-	2	2	5	9	3	3	1	-	1	1	1	-	-	2.3	0.8	0.19	**2.4**	C62
Kidney and renal pelvis	97	0	86	0	-	-	1	-	-	-	-	-	5	9	18	19	13	9	13	10	8.0	2.6	0.82	**6.5**	C64-65
Bladder	133	0	92	0	-	-	-	-	-	-	1	1	2	5	8	11	17	18	23	47	11.0	3.6	1.01	**8.9**	C67
Ureter and other urinary	5	0	100	0	-	-	-	-	-	-	-	-	-	-	2	1	1	-	-	1	0.4	0.1	0.03	**0.3**	C66, C68
Eye	10	0	90	0	2	-	-	-	-	-	-	-	-	1	1	1	1	-	2	2	0.8	0.3	0.08	**0.8**	C69
Brain and nervous system	51	0	57	0	1	4	-	-	2	2	1	1	3	6	5	2	8	4	6	6	4.2	1.4	0.40	**3.8**	C70-72
Thyroid	32	0	100	0	-	-	-	1	-	1	2	4	-	3	3	5	6	5	1	1	2.6	0.9	0.26	**2.3**	C73
Hodgkin lymphoma	29	0	100	0	-	-	1	6	2	4	2	1	2	1	2	5	1	1	1	-	2.4	0.8	0.20	**2.3**	C81
Non-Hodgkin lymphoma	103	0	98	0	1	-	1	1	1	-	1	1	6	7	12	17	8	11	12	24	8.5	2.8	0.75	**6.9**	C82-86, C96
Multiple myeloma	45	0	100	0	-	-	-	-	-	-	-	-	1	6	2	9	7	3	3	14	3.7	1.2	0.28	**2.9**	C90
Lymphoid leukaemia	43	0	100	0	4	6	1	-	-	-	1	1	3	1	-	3	3	8	5	7	3.5	1.2	0.34	**3.4**	C91
Myeloid leukaemia	68	0	100	0	1	-	2	-	1	1	2	1	7	2	4	5	9	5	7	21	5.6	1.9	0.44	**4.7**	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C95
Other and unspecified	123	0	80	0	1	-	2	1	-	-	-	2	7	3	9	8	22	22	14	32	10.1	3.4	0.97	**8.5**	O&U
All sites	3662	0	93	0	13	11	10	15	12	19	31	40	96	179	323	510	552	562	524	765	301.9	100.0	30.72	**251.4**	C00-96
All sites except C44	3660	0	93	0	13	11	10	15	12	18	31	40	96	178	323	510	552	562	524	765	301.8	99.9	30.71	**251.3**	C00-96 exc. C44
Average annual population					32657	35601	36321	34002	28388	24618	24245	26609	30110	31543	26855	22989	17330	12387	8937	11687	404278				

France, Réunion (2011–2013)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	30	0	97	0	-	-	-	-	-	-	-	1	-	1	2	3	6	5	2	10	2.3	1.0	0.19	**1.7**	C00-06
Salivary gland	13	0	100	0	-	1	-	1	-	-	-	-	2	1	-	-	2	1	1	4	1.0	0.4	0.07	**0.8**	C07-08
Nasopharynx	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	0.2	0.1	0.01	**0.1**	C11
Other pharynx	9	0	100	0	-	-	-	-	-	-	-	1	-	2	3	1	-	1	1	-	0.7	0.3	0.07	**0.5**	C09-10, C12-14
Oesophagus	14	0	100	0	-	-	-	-	-	-	-	-	1	-	2	3	2	1	1	4	1.1	0.5	0.08	**0.8**	C15
Stomach	117	0	99	0	-	-	-	-	-	2	1	3	5	3	12	10	7	15	16	43	9.0	3.9	0.70	**6.2**	C16
Colon	261	0	98	0	-	-	-	-	1	-	3	7	6	16	25	27	34	28	47	67	20.2	8.8	1.86	**14.6**	C18
Rectum	108	0	100	0	-	-	-	-	-	-	-	3	4	9	9	15	11	15	10	32	8.3	3.6	0.67	**5.9**	C19-20
Anus	21	0	100	0	-	-	-	-	-	-	-	-	-	1	2	5	4	2	2	5	1.6	0.7	0.14	**1.2**	C21
Liver	36	0	64	0	-	-	-	-	-	-	-	-	1	1	3	2	2	3	13	11	2.8	1.2	0.29	**1.9**	C22
Gallbladder etc.	63	0	78	0	-	-	-	-	-	-	-	-	2	1	6	3	8	10	10	23	4.9	2.1	0.42	**3.4**	C23-24
Pancreas	87	0	82	0	-	-	-	-	-	-	-	-	-	3	4	18	10	12	18	22	6.7	2.9	0.67	**4.8**	C25
Larynx	4	0	100	0	-	-	-	-	-	-	-	1	-	-	1	-	-	1	1	-	0.3	0.1	0.04	**0.3**	C32
Trachea, bronchus, and lung	156	0	94	0	2	-	-	-	-	1	1	5	6	8	7	20	22	16	18	50	12.0	5.3	0.97	**8.6**	C33-34
Bone	11	0	82	0	1	-	-	-	2	-	1	1	-	1	-	-	1	1	1	2	0.8	0.4	0.07	**0.8**	C40-41
Melanoma of skin	53	0	98	0	-	-	-	1	2	5	5	6	4	3	8	3	2	2	3	9	4.1	1.8	0.30	**3.3**	C43
Non-melanoma skin	1	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.1	0.0	0.00	**0.1**	C44
Mesothelioma	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	0.2	0.1	0.02	**0.2**	C45
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C46
Connective and soft tissue	12	0	92	0	3	1	-	1	-	-	-	1	-	2	2	-	-	-	-	2	0.9	0.4	0.05	**0.9**	C47, C49
Breast	982	0	100	0	-	-	-	-	-	12	25	58	118	148	149	105	105	81	73	108	75.8	33.1	6.50	**58.7**	C50
Vulva	21	0	100	0	-	-	-	-	-	-	-	-	-	2	3	3	-	2	4	7	1.6	0.7	0.13	**1.1**	C51
Vagina	3	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1	-	0.2	0.1	0.03	**0.2**	C52
Cervix uteri	175	0	99	0	1	-	-	-	-	1	8	16	19	23	17	13	15	17	10	35	13.5	5.9	1.04	**10.2**	C53
Uterus	111	0	100	0	-	-	-	-	-	-	1	5	3	6	4	22	17	17	16	20	8.6	3.7	0.86	**6.5**	C54-55
Ovary	105	0	97	0	-	-	-	4	-	1	-	2	8	14	14	9	17	15	5	16	8.1	3.5	0.70	**6.4**	C56
Placenta	2	0	100	0	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	0.2	0.1	0.01	**0.2**	C58
Kidney and renal pelvis	57	0	82	0	3	-	1	-	1	-	-	3	-	6	4	4	9	6	5	15	4.4	1.9	0.35	**3.5**	C64-65
Bladder	42	0	95	0	-	-	-	-	-	-	1	-	-	1	-	3	7	3	3	24	3.2	1.4	0.18	**2.0**	C67
Ureter and other urinary	5	0	100	0	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	3	0.4	0.2	0.01	**0.2**	C66, C68
Eye	2	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	0.2	0.1	0.01	**0.1**	C69
Brain and nervous system	43	0	49	0	-	4	2	1	-	3	3	2	2	3	4	4	5	2	2	6	3.3	1.4	0.26	**2.9**	C70-72
Thyroid	87	0	100	0	-	-	1	5	4	4	7	8	12	10	7	9	6	5	4	5	6.7	2.9	0.55	**5.7**	C73
Hodgkin lymphoma	24	0	100	0	-	1	3	1	3	3	1	1	2	1	1	2	2	-	1	2	1.9	0.8	0.14	**1.8**	C81
Non-Hodgkin lymphoma	73	0	100	0	1	-	2	-	2	1	1	-	5	8	5	4	9	8	8	19	5.6	2.5	0.46	**4.3**	C82-86, C96
Multiple myeloma	46	0	100	0	-	-	-	-	-	-	1	-	3	1	2	6	5	4	6	18	3.6	1.5	0.26	**2.4**	C90
Lymphoid leukaemia	28	0	100	0	2	3	3	1	1	-	-	1	3	1	1	1	1	2	4	4	2.2	0.9	0.18	**2.0**	C91
Myeloid leukaemia	51	0	100	0	2	-	-	-	1	1	1	3	6	3	7	4	4	5	2	12	3.9	1.7	0.29	**3.1**	C92-94
Leukaemia, unspecified	2	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.2	0.1	0.01	**0.1**	C95
Other and unspecified	110	0	82	0	-	-	-	-	-	3	-	2	5	8	5	11	4	14	13	45	8.5	3.7	0.60	**5.7**	O&U
All sites	2970	0	96	0	15	10	12	15	17	38	61	131	218	289	310	313	321	294	301	625	229.3	100.0	19.22	**172.8**	C00-96
All sites except C44	2969	0	96	0	15	10	12	15	17	38	61	131	218	288	310	313	321	294	301	625	229.3	100.0	19.21	**172.8**	C00-96 exc. C44
Average annual population					31348	33827	34559	32613	29211	28092	28999	30770	32792	33767	28402	24082	18410	13608	11040	20151	431670				

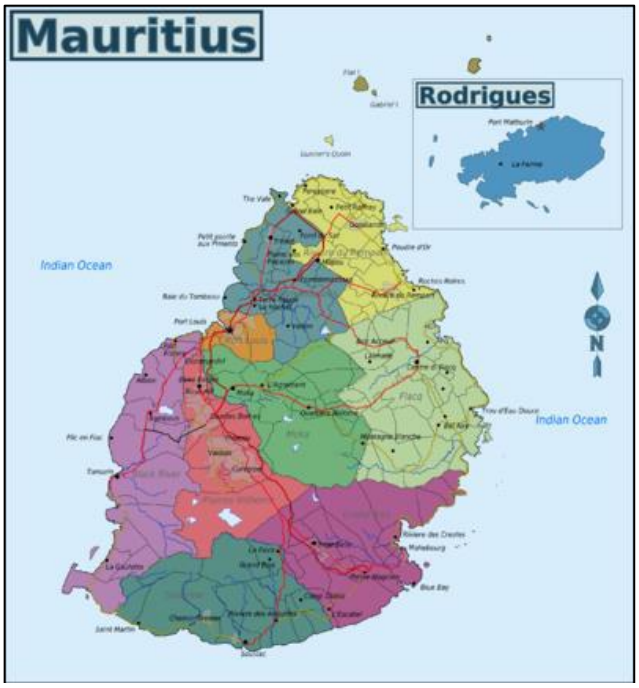
Mauritius

The Mauritius National Cancer Registry (MNCR) was established in 1993 following a study tour by the pathologist Dr Shyam Manraj to the University of Bordeaux II, with financial assistance from the French Cooperation. Since then, data on cancer incidence and mortality have been collected for the entire population of the Republic of Mauritius on a continuous basis, and retrospectively as from 1989. The registry achieved population-level coverage in 2000 and has been maintained with assistance from WHO/IARC.

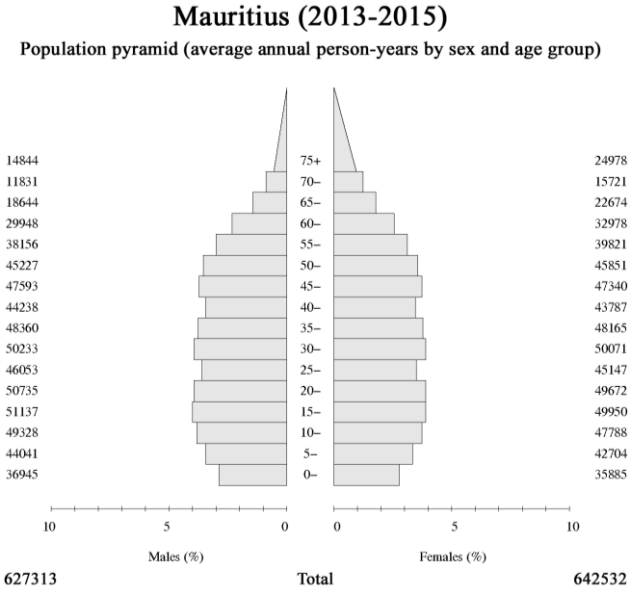
All of the Registry's activities (salaries, equipment and expenses) are financed by the Ministry of Health & Quality of Life of Mauritius and by the WHO Biennium Funds.

The MNCR is led by a Steering Committee and a Coordinator. It is based in the Central Health Laboratory, Victoria Hospital, Quatre Bornes. The MNCR working group is comprised of four part-time registry technicians/secretaries who are themselves members of laboratory staff.

The population of the Republic of Mauritius was estimated at 1,220,530 as at 31 December 2015, according to the Health Statistics Report 2015 – Republic of Mauritius, based on census data for the year 2011.



According to the last census that described the different ethnic groups in 1972, 68% are Indo-Mauritians (Indian subcontinent descent), 27% Creoles (African descent), 3% Sino-Mauritians (Chinese descent) and 2% Franco-Mauritians (French descent). The population density is 673 per square kilometre and the population growth rate was 0.1% for the year 2015.



Data have been collected on an annual basis retrospectively and semi-actively from various sources. There is a single Radiotherapy Unit and a centralized Pathology Department covering the needs of the entire Health Care Delivery System. MNCR has access to the computerised cancer-related databases of the latter department and to the hospital records department which greatly facilitate the data collection activities of the registry.

Radiotherapy Register. Valuable information on cancer patients is obtained through the Radiotherapy centre based at Victoria Hospital, Candos.

Medical Records Office. Up-to-date data on patient status is obtained from five regional hospitals.

Pathology Laboratory Register. At the Central Health Laboratory, Candos, all the cancer cases diagnosed are entered in the Pathology department computer system and are retrieved and submitted to MNCR.

Overseas Treatment Unit: It provides information on brain neoplasms cases in residents of Mauritius who receive treatment abroad through the Overseas Treatment Scheme.

Civil Status Office. A link with the civil registration office gives access to cancer specific mortality data from death certificates. These data are used to update vital status of registered cases.

Private Pathologists and Private Clinics. Mauritius NCR has reached out to private pathologists since 2001 to include cases that have not been notified at hospital level.

Sources of data are multiple with computerized listings of cancer patients coded according to ICD-10 submitted to the registry on a bi-annual basis. Data are processed and entered using CanReg5, which generates standard tables. Further

analysis is carried out by EPI-INFO for publications and presentations.

By comparing characteristics of each case with the master index, great care is taken to remove cases diagnosed in previous years, recurrences or metastases from a cancer already registered in order to avoid duplication.

The annual listings of summary discharge sheets from all regional hospitals with cancer mentioned as diagnosis have been obtained from the statistical department of the Ministry of Health. By comparing this list with the existing database, it enables the NCR to identify any omissions.

The MNCR obeys local laws and strictly follows the IACR/IARC guidelines on confidentiality. All computer systems and files are password-protected. Access to the registry office and registry files is restricted to authorised personnel. The MNCR has been registered with the Data Protection Office of Mauritius as a data controller since 2010.

YEARS PRESENTED

Three year period, 2013 – 2015

COMMENT

From 2013 to 2015, there has been a slow and steady increase in the number of registrations. In the three year period reported here, it was 180 per month.

It is not surprising to observe a cancer profile that is quite different from that of the East African mainland countries, given the very different population (in terms of ethnicity and lifestyle). Thus, compared with the East African regional averages, incidence rates for cancers of the oesophagus, liver, cervix and of Kaposi sarcoma are low, while the rates for other sites (notably colon-rectum, lung, breast and corpus uteri) are relatively high. Incidence rates of upper GI cancers (oral cavity and pharynx, oesophagus) are considerably lower than those estimated for India.

Morphological verification of diagnosis was 89% in males and 92% in females. Registration from death certificate information among males was 3.1% and 2.6% among females.

Since death registration (by cause of death) is comprehensive in Mauritius, the numbers of deaths can be compared with the number of cancer cases, registered in the same time period (2013-2015) (Table 4.02).

ICD – 10 code	MALE		FEMALE	
	Deaths	M:I	Deaths	M:I
Lip, oral cavity and pharynx (C00-14)	121	77%	45	48%
Oesophagus (C15)	75	91%	23	58%
Stomach (C16)	148	73%	99	80%
Colon and rectum (C18-21)	223	54%	180	46%
Liver (C22)	77	109%	62	130%
Pancreas (C25)	111	195%	64	144%
Lung (C33-34)	360	123%	135	110%
Breast (C50)	-		506	34%
Cervix uteri (C53)	-		140	34%
Uterus (Other and unspecd.) (C54-55)	-		37	41%
Prostate (C61)	220	60%	-	
Bladder (C67)	59	51%	22	54%
Kidney etc. (C64-66,C68)	38	63%	18	46%
Lymphoma (C81-90)	75	51%	54	53%
Leukaemia (C91-95)	67	63%	51	67%
All sites (C00-97)	1854	61%	1792	44%

Table 4.02 Number of cancer deaths (WHO Mortality Database (WHO, 2017)), and M: I ratio (%) by sex, in Mauritius, in 2013-2015.

While the overall ratio of deaths to cases (M:I) is reasonable (equivalent figures for Europe, according to Globocan 2018, are 48% in men, 43% in women), the ratio is above 100% for several sites of poor prognosis, and difficulty to biopsy for diagnostic purposes (e.g. liver, pancreas and lung).

Summary

The pattern of cancer incidence in Mauritius is distinct compared to East African countries and seems mostly Non Communicable Disease related. M:I ratio as quality indicator of the registry has improved compared with the previous period 2010-2012.

PUBLICATIONS and ACHIEVEMENTS

The NCR obtained affiliation to the International Association of Cancer Registries (IACR) in 1997 and its first report pertaining to an 8 year period (1989-1996) was published in 1999. It also became a member of AFCRN in 2013. The latest annual report published by the registry is for the year 2017. It hosted the 33rd Annual meeting of IACR at Balaclava, in October 2011 as well as the American Society of Clinical Oncology multidisciplinary cancer management course in April 2016.

Mauritius (2013–2015)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	80	0	92	6	-	-	-	-	-	-	-	2	5	5	13	14	16	13	5	7	4.3	2.7	0.43	**3.5**	C00-06
Salivary gland	16	0	94	0	-	-	-	-	1	-	-	-	1	2	1	1	3	4	1	2	0.9	0.5	0.09	**0.7**	C07-08
Nasopharynx	10	0	100	0	-	-	-	-	-	-	-	1	1	1	1	-	1	2	1	2	0.5	0.3	0.05	**0.5**	C11
Other pharynx	47	0	87	6	-	1	-	-	-	-	-	1	1	2	10	15	9	4	3	1	2.5	1.6	0.25	**2.0**	C09-10, C12-14
Oesophagus	81	0	93	1	-	-	-	-	-	1	2	2	3	1	9	11	12	17	10	13	4.3	2.7	0.47	**3.7**	C15
Stomach	191	1	88	8	-	-	-	-	-	2	-	2	5	9	13	18	38	25	23	55	10.1	6.5	0.95	**8.8**	C16
Colon	235	1	95	4	-	-	-	-	-	-	2	4	5	17	19	30	40	44	25	48	12.5	7.9	1.27	**10.7**	C18
Rectum	162	1	97	3	-	-	-	-	-	1	-	3	3	10	18	29	32	20	15	30	8.6	5.5	0.83	**7.1**	C19-20
Anus	11	0	91	0	-	-	-	-	-	-	1	-	-	-	1	2	2	-	1	4	0.6	0.4	0.04	**0.5**	C21
Liver	71	0	48	20	1	-	1	-	-	1	-	-	-	6	4	10	19	7	11	11	3.8	2.4	0.41	**3.3**	C22
Gallbladder etc.	19	0	74	5	-	-	-	-	-	-	-	-	2	1	5	-	2	1	3	5	1.0	0.6	0.09	**0.9**	C23-24
Pancreas	56	0	43	20	-	-	-	-	-	-	-	1	-	1	5	14	10	10	6	9	3.0	1.9	0.32	**2.5**	C25
Larynx	87	0	95	0	-	-	-	-	-	-	1	-	1	5	12	19	13	16	7	13	4.6	2.9	0.47	**3.8**	C32
Trachea, bronchus, and lung	283	4	70	10	-	-	-	-	1	4	2	4	7	18	31	38	37	41	40	56	15.0	9.6	1.57	**12.9**	C33-34
Bone	34	1	74	0	-	2	2	1	2	3	-	2	4	3	1	2	2	3	5	1	1.8	1.2	0.19	**1.7**	C40-41
Melanoma of skin	7	0	100	0	-	-	-	-	1	-	-	-	2	-	1	2	-	1	-	-	0.4	0.2	0.03	**0.3**	C43
Non-melanoma skin	243	49	100	0	-	-	2	-	1	5	4	7	8	14	19	21	30	25	9	49	12.9	8.2	1.03	**10.9**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C46
Connective and soft tissue	50	0	94	0	-	1	-	3	1	1	3	2	3	4	3	11	6	3	1	8	2.7	1.7	0.20	**2.2**	C47, C49
Breast	27	0	100	0	-	-	-	-	-	-	-	1	4	-	1	3	4	4	5	5	1.4	0.9	0.16	**1.3**	C50
Penis	8	0	100	0	-	-	-	-	-	-	-	1	1	-	-	1	1	3	-	1	0.4	0.3	0.04	**0.4**	C60
Prostate	361	4	96	0	-	-	-	-	-	-	-	-	2	6	13	20	64	63	63	126	19.2	12.2	1.99	**17.1**	C61
Testis	41	0	100	0	1	-	1	3	6	8	5	6	2	3	2	1	1	-	1	1	2.2	1.4	0.15	**2.0**	C62
Kidney and renal pelvis	50	0	94	0	2	-	1	-	-	1	-	4	1	5	7	7	5	8	5	4	2.7	1.7	0.28	**2.4**	C64-65
Bladder	120	2	98	0	1	-	-	-	-	1	-	1	1	3	12	12	12	23	21	31	6.4	4.1	0.70	**5.7**	C67
Ureter and other urinary	4	0	50	0	-	-	-	-	-	-	-	-	-	1	-	1	-	1	1	-	0.2	0.1	0.03	**0.2**	C66, C68
Eye	1	0	100	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.0	0.00	**0.1**	C69
Brain and nervous system	65	0	71	0	2	3	2	2	3	1	4	3	4	3	9	10	8	7	2	2	3.5	2.2	0.31	**3.1**	C70-72
Thyroid	26	0	96	0	1	-	-	1	-	1	1	5	2	-	5	4	2	2	1	1	1.4	0.9	0.12	**1.2**	C73
Hodgkin lymphoma	19	0	100	0	-	1	-	1	5	2	1	2	1	1	-	1	1	1	-	2	1.0	0.6	0.07	**0.9**	C81
Non-Hodgkin lymphoma	75	1	100	0	2	1	3	3	6	2	-	3	3	3	9	5	13	4	7	10	4.0	2.5	0.36	**3.7**	C82-86, C96
Multiple myeloma	55	0	95	0	-	-	-	-	1	-	-	2	3	3	6	6	8	13	4	9	2.9	1.9	0.30	**2.5**	C90
Lymphoid leukaemia	17	0	100	0	1	2	1	-	-	-	-	-	1	-	2	-	-	5	1	4	0.9	0.6	0.09	**0.9**	C91
Myeloid leukaemia	51	0	100	0	-	-	1	5	-	1	2	2	1	5	-	8	6	5	6	9	2.7	1.7	0.26	**2.4**	C92-94
Leukaemia, unspecified	37	1	100	0	5	2	3	7	2	-	-	-	4	2	1	4	2	2	-	2	2.0	1.3	0.15	**2.2**	C95
Other and unspecified	316	4	85	0	4	2	2	4	2	4	1	11	11	18	35	44	45	49	31	49	16.8	10.7	1.68	**14.6**	O&U
All sites	2956	69	89	3	21	15	19	30	32	39	29	72	92	152	268	364	444	426	314	570	157.1	100.0	15.42	**136.6**	C00-96
All sites except C44	2713	20	88	3	21	15	17	30	31	34	25	65	84	138	249	343	414	401	305	521	144.2	91.8	14.35	**125.7**	C00-96 exc. C44
Average annual population					36945	44041	49328	51137	50735	46053	50233	48360	44238	47593	45227	38156	29948	18644	11831	14844	627312				

Mauritius (2013–2015)

Number of cases by age group and summary rates of incidence: females

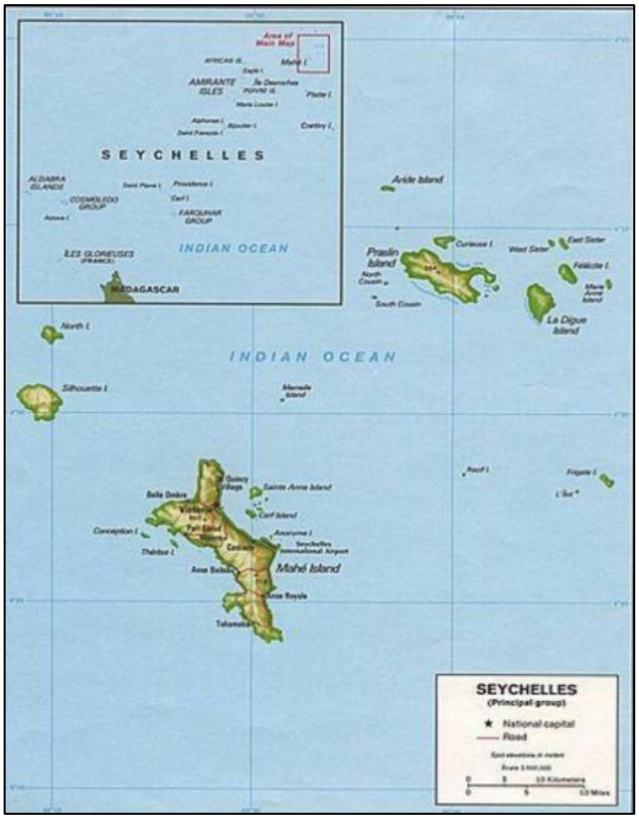
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	53	1	87	13	-	-	-	-	1	1	-	-	1	3	15	4	9	3	5	10	2.7	1.3	0.22	**2.0**	C00-06
Salivary gland	23	0	83	13	-	-	-	1	1	-	3	-	1	2	2	3	4	2	1	3	1.2	0.6	0.09	**0.9**	C07-08
Nasopharynx	2	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	16	0	94	0	-	-	-	-	-	-	-	-	-	3	1	2	1	2	1	6	0.8	0.4	0.05	**0.6**	C09-10, C12-14
Oesophagus	40	0	82	8	-	-	-	-	-	-	-	1	1	2	3	5	3	3	10	12	2.1	1.0	0.19	**1.4**	C15
Stomach	124	3	77	20	-	-	-	-	-	-	1	1	6	2	10	14	18	16	20	33	6.4	3.2	0.57	**4.5**	C16
Colon	273	1	84	13	-	-	2	1	1	1	4	6	12	22	23	21	35	38	31	75	14.2	6.9	1.14	**10.2**	C18
Rectum	106	1	94	4	-	-	-	-	-	-	1	4	8	4	12	12	19	17	13	15	5.5	2.7	0.52	**4.1**	C19-20
Anus	10	0	100	0	-	-	-	-	-	-	-	-	1	1	2	-	-	1	3	2	0.5	0.3	0.05	**0.4**	C21
Liver	47	0	34	40	-	-	-	-	-	-	-	2	2	2	5	4	6	9	3	14	2.4	1.2	0.18	**1.7**	C22
Gallbladder etc.	40	1	75	15	-	-	-	-	-	-	-	1	-	2	6	5	6	3	9	7	2.1	1.0	0.21	**1.5**	C23-24
Pancreas	43	0	51	5	-	-	-	-	-	-	-	-	2	3	6	9	7	5	5	6	2.2	1.1	0.20	**1.6**	C25
Larynx	6	0	50	0	-	-	-	-	-	-	-	1	-	-	-	1	2	-	1	1	0.3	0.2	0.03	**0.2**	C32
Trachea, bronchus, and lung	120	1	76	0	-	-	-	-	1	-	2	4	4	7	12	17	21	13	14	24	6.2	3.1	0.53	**4.5**	C33-34
Bone	17	0	82	0	-	-	-	2	1	-	-	1	2	1	1	1	2	2	-	4	0.9	0.4	0.06	**0.7**	C40-41
Melanoma of skin	7	1	100	0	-	-	-	-	-	1	-	-	-	1	1	1	-	1	-	1	0.4	0.2	0.03	**0.3**	C43
Non-melanoma skin	169	35	100	0	-	-	-	1	-	3	1	5	8	7	10	17	13	11	23	35	8.8	4.3	0.74	**6.3**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C46
Connective and soft tissue	40	1	92	0	2	-	1	2	1	2	3	1	5	1	4	2	5	1	2	7	2.1	1.0	0.15	**1.8**	C47, C49
Breast	1440	10	98	0	-	-	-	-	2	20	35	74	129	174	217	213	187	128	110	141	74.7	36.6	6.33	**56.0**	C50
Vulva	17	0	94	0	-	-	-	-	-	-	-	-	1	-	1	1	3	1	2	8	0.9	0.4	0.06	**0.6**	C51
Vagina	13	0	100	0	1	-	-	-	-	-	-	-	-	-	3	1	1	1	3	3	0.7	0.3	0.06	**0.5**	C52
Cervix uteri	283	2	95	0	-	-	-	-	2	4	19	28	28	26	45	24	33	19	31	22	14.7	7.2	1.29	**11.2**	C53
Uterus	241	4	99	0	-	-	-	1	2	2	3	4	10	17	28	38	45	37	21	29	12.5	6.1	1.14	**9.3**	C54-55
Ovary	135	2	94	0	-	-	-	1	4	-	6	4	14	13	19	17	24	14	10	7	7.0	3.4	0.63	**5.4**	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C58
Kidney and renal pelvis	36	0	97	0	-	1	-	-	-	2	1	1	1	4	3	2	7	6	3	5	1.9	0.9	0.17	**1.5**	C64-65
Bladder	41	2	98	0	-	-	-	-	-	-	-	2	-	-	1	3	4	3	3	23	2.1	1.0	0.10	**1.3**	C67
Ureter and other urinary	3	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	1	1	-	-	0.2	0.1	0.02	**0.1**	C66, C68
Eye	6	0	83	0	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	3	0.3	0.2	0.01	**0.3**	C69
Brain and nervous system	61	0	66	0	-	-	2	1	3	-	1	6	7	6	9	9	7	5	1	4	3.2	1.6	0.25	**2.5**	C70-72
Thyroid	53	1	91	0	-	-	1	-	1	-	1	9	7	4	6	8	8	4	-	3	2.7	1.3	0.21	**2.1**	C73
Hodgkin lymphoma	20	0	100	0	-	-	1	4	4	2	-	-	2	1	2	1	-	2	-	1	1.0	0.5	0.07	**1.0**	C81
Non-Hodgkin lymphoma	42	0	100	0	1	-	2	2	1	1	-	1	1	2	8	6	3	7	5	2	2.2	1.1	0.21	**1.8**	C82-86, C96
Multiple myeloma	37	1	92	0	-	-	-	-	-	-	-	-	1	4	4	4	5	7	3	8	1.9	0.9	0.16	**1.4**	C90
Lymphoid leukaemia	11	0	100	0	1	1	-	2	-	1	-	-	-	-	-	1	-	1	2	2	0.6	0.3	0.05	**0.6**	C91
Myeloid leukaemia	41	0	100	0	1	1	-	-	2	4	-	3	5	4	3	5	2	6	3	2	2.1	1.0	0.19	**1.9**	C92-94
Leukaemia, unspecified	24	1	100	0	7	-	-	1	4	2	1	-	1	1	-	-	-	3	-	3	1.2	0.6	0.09	**1.6**	C95
Other and unspecified	292	2	88	0	3	1	3	5	2	1	7	16	13	21	25	34	44	39	29	47	15.1	7.4	1.32	**11.6**	O&U
All sites	3932	70	92	3	17	4	12	24	33	48	89	175	273	340	489	486	526	411	367	568	204.0	100.0	17.33	**153.6**	C00-96
All sites except C44	3763	35	91	3	17	4	12	23	33	45	88	170	265	333	479	469	513	400	344	533	195.2	95.7	16.59	**147.2**	C00-96 exc. C44
Average annual population					35885	42704	47788	49950	49672	45147	50071	48165	43787	47340	45851	39821	32978	22674	15721	24978	642531				

Seychelles

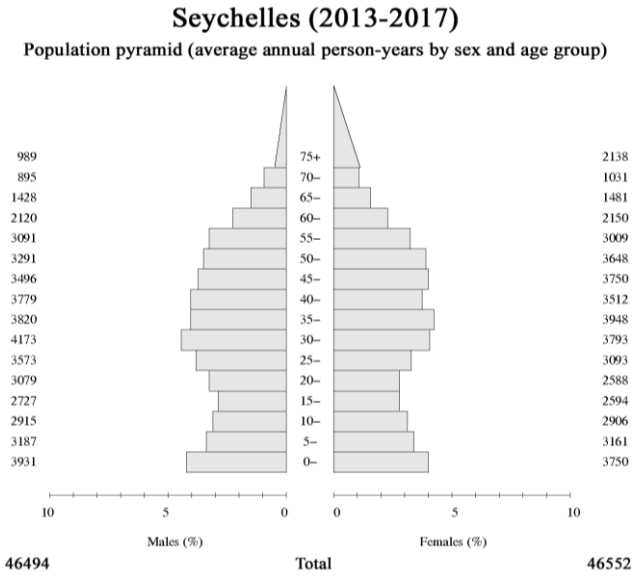
The Seychelles National Cancer Registry (SNCR) was established in 2008 under the Cancer and Mental Health Programme of the Ministry of Health within the Public Health Department, to address the burden of cancer in the country. Registration is not mandatory by law in Seychelles.

The Seychelles National Cancer Registry is located within the Public Health Authority (PHA) of the Seychelles Hospital. The registry is fully funded by the PHA; this includes finance for the staff salaries and equipment purchase and for consultancy visits. Training and international travel are supported via AFCRN and WHO.

The registry has a cancer registrar and one health information assistant to help in the abstraction of the cases. Five medical specialists provide assistance in stage coding and a part time lab technologist is responsible for notifying all new cancer cases recorded at the laboratory. An advisory committee consisting of various medical and public health experts oversees the development of the registry.



The Republic of Seychelles consists of 116 islands, of which Mahe, Praslin, La Digue and Silhouette are permanently populated. Mahe Island is home to almost 90% of the national population. Administratively, the Seychelles is divided into 26 districts. The population of Seychelles was estimated to be 89,949 in 2013 by the National Statistics Bureau. The main ethnic group is Creole (85-90% population) and the main religion is Roman Catholic.



There are five hospitals in the registration area, on Mahe, Praslin, La Digue, and Silhouette islands. However, apart from the Seychelles Hospital in Mahe, the others serve mostly as emergency hospitals, and provide only basic diagnostics. There is one hospice on Mahe Island.

The Seychelles Hospital has 429 beds capacity and consists of female health, male health, surgery, internal medicine, paediatric, oncology, pathology cytology, and psychiatric wards. The pathology laboratory at the Seychelles Hospital is the only pathology laboratory in the country. It employs two pathologists, and three technicians. The pathology department keeps a database from 2005. However, the laboratory software is mainly used for registering and printing out the pathological findings, while the data reported to the cancer registry is saved in Excel files. The haematology laboratory employs five laboratory technicians. Bone marrow examinations and immunodiagnostics are available. The diagnostic unit disposes of X-ray, one ultra sound, one digital mammography machine, CT and MRI scans, colonoscopy, and gastroscopy services.

All health centres, as well as all hospital wards, record the cases in the "cancer register" books – lists of patient data that are filled in upon every visit or prescription of palliative treatment. The cancer registrar collects the books every three months and returns them after data are entered. On Praslin and La Digue Islands, nurses have been appointed to fill in the cancer register books.

The SNCR uses a combination of active and passive case finding methods. Upon confirmation of diagnosis, every

notification is checked and corrected if necessary. After the patient has received treatment, the registrar collects his/her medical record from the ward. The availability and location of the medical records can be checked in the hospital documentation centre. The database at the documentation centre does not contain medical data, but personal identification data and the medical record number. Based on the data from the medical record, the registrar completes the rest of the cancer notification form. The personal ID number is always available, since it is required to obtain free medical treatment.

When a patient is diagnosed and/or treated overseas, the hospital in Seychelles receives medical records from the hospital abroad and a notification form is completed at the registry based on those records.

The cancer notification data are usually checked with the respective consultant. When the cancer register books are collected, every new notification entered is cross-checked with the registry database for duplicates, and updated where necessary. For new cases, records are tracked and identified; cancer notification forms are filled in and entered into the database. Mortality data are used to register date and cause of death. After the end of each data year, all cancer cases for that year are checked for missing data, and completed if possible.

The registry uses CanReg5 for data management and checks.

YEARS PRESENTED

Five year period, 2013 – 2017

COMMENT

1062 cases were registered in the five year period. The rate of registration (18 per month) was higher than in the period reported in Volume II (2009-2012), which averaged 12-13 per month. Despite an increasing population-at-risk, incidence rates are now significantly higher than previously. The calculated age standardised incidence rates for males are almost twice the average for East Africa in males (O/E 1.91), and similar for females.

The increased incidence concerns most sites, especially (in men) lung and prostate, and in females breast, colon-rectum, and cervix and corpus uteri.

The incidence rates for cancers of the oral cavity (males), and prostate are high, while the incidence of colo-rectal cancers (ASR 25.0 per 10^5 in men, 19.6 per 10^5 in women) are second only to those recorded in Reunion. On the other hand, the incidence of cancer of the cervix uteri (ASR 18.5 per 10^5), less than half the average for East Africa.

The percentages of cancers with morphological verification of diagnosis (83% M, 89% F) are reasonable; 5% of cases were registered with only a death certificate diagnosis.

Summary

The results appear to be an accurate reflection of the national cancer profile.

PUBLICATIONS and ACHIEVEMENTS

The Seychelles National Cancer Registry became a member of AFCRN in 2012. Became a voting member of IACR in 2017.

Inclusion in Cancer Incidence in Five Continents Vol. XI publication.

Seychelles (2013–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	33	0	100	0	-	-	-	-	-	-	-	1	1	3	6	7	1	4	2	8	14.2	5.7	1.10	**11.5**	C00-06
Salivary gland	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C11
Other pharynx	23	0	65	9	-	-	-	-	-	-	-	-	-	1	6	4	4	2	3	3	9.9	4.0	1.00	**8.1**	C09-10, C12-14
Oesophagus	14	0	86	7	-	-	-	-	-	-	-	-	-	-	3	3	3	1	3	1	6.0	2.4	0.73	**5.0**	C15
Stomach	12	0	75	8	-	-	-	-	1	-	-	-	1	-	1	1	1	1	-	6	5.2	2.1	0.24	**4.6**	C16
Colon	36	0	86	6	-	-	-	-	-	1	-	1	-	1	3	6	3	9	4	8	15.5	6.3	1.59	**13.5**	C18
Rectum	31	0	97	3	-	-	-	-	-	-	1	1	-	1	3	4	4	2	4	11	13.3	5.4	1.07	**11.5**	C19-20
Anus	2	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	0.9	0.3	0.14	**0.8**	C21
Liver	17	0	53	24	-	-	-	-	1	-	-	-	1	-	5	2	-	-	2	6	7.3	3.0	0.50	**6.2**	C22
Gallbladder etc.	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	0.9	0.3	0.10	**0.7**	C23-24
Pancreas	12	0	33	33	-	-	-	-	-	-	-	-	-	1	-	2	4	1	2	2	5.2	2.1	0.58	**4.5**	C25
Larynx	19	0	63	11	-	-	-	-	-	-	-	-	1	1	1	3	4	1	4	4	8.2	3.3	0.89	**7.1**	C32
Trachea, bronchus, and lung	43	0	60	14	-	-	-	-	-	-	1	-	-	3	4	4	6	9	6	10	18.5	7.5	1.94	**16.3**	C33-34
Bone	6	0	100	0	-	1	-	1	-	-	2	-	1	-	-	-	1	-	-	-	2.6	1.0	0.19	**2.6**	C40-41
Melanoma of skin	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.4	0.2	0.03	**0.3**	C43
Non-melanoma skin	23	0	100	0	-	-	-	-	-	-	-	-	-	1	2	2	5	5	6	2	9.9	4.0	1.41	**8.9**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C46
Connective and soft tissue	1	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.4	0.2	0.03	**0.4**	C47, C49
Breast	4	0	100	0	-	-	-	-	-	-	-	-	-	2	-	-	1	1	-	-	1.7	0.7	0.17	**1.5**	C50
Penis	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.4	0.2	0.00	**0.4**	C60
Prostate	192	0	94	1	-	-	-	-	-	-	-	-	1	2	8	19	29	40	38	55	82.6	33.4	9.36	**75.3**	C61
Testis	2	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	0.9	0.3	0.07	**0.8**	C62
Kidney and renal pelvis	3	0	67	0	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	1.3	0.5	0.12	**1.4**	C64-65
Bladder	12	0	83	0	-	-	-	-	-	-	-	-	-	-	1	4	3	1	-	3	5.2	2.1	0.37	**4.1**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.4	0.2	0.03	**0.3**	C66, C68
Eye	1	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.2	0.03	**0.6**	C69
Brain and nervous system	8	0	25	0	-	-	-	-	1	-	-	1	-	-	3	1	1	-	-	1	3.4	1.4	0.23	**2.8**	C70-72
Thyroid	2	0	100	0	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	0.9	0.3	0.06	**0.6**	C73
Hodgkin lymphoma	4	0	100	0	-	-	-	1	-	-	-	-	1	-	-	-	-	1	1	-	1.7	0.7	0.24	**1.8**	C81
Non-Hodgkin lymphoma	9	0	100	0	-	-	-	-	-	-	-	2	-	2	1	-	2	1	1	-	3.9	1.6	0.42	**3.2**	C82-86, C96
Multiple myeloma	7	0	100	0	-	-	-	-	-	-	-	-	1	-	1	-	2	2	1	-	3.0	1.2	0.40	**2.7**	C90
Lymphoid leukaemia	5	0	100	0	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	2	2.2	0.9	0.10	**2.0**	C91
Myeloid leukaemia	9	0	100	0	1	-	-	-	-	1	1	-	-	-	-	-	-	2	3	1	3.9	1.6	0.55	**3.9**	C92-94
Leukaemia, unspecified	2	0	100	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.9	0.3	0.03	**1.0**	C95
Other and unspecified	35	0	74	11	-	-	-	-	1	1	1	1	3	1	3	4	5	5	5	5	15.1	6.1	1.58	**13.1**	O&U
All sites	575	0	84	5	4	1	1	2	4	4	6	10	12	20	53	70	81	90	86	131	247.3	100.0	25.38	**218.4**	C00-96
All sites except C44	552	0	83	5	4	1	1	2	4	4	6	10	12	19	51	68	76	85	80	129	237.4	96.0	23.97	**209.5**	C00-96 exc. C44
Average annual population					3931	3187	2915	2727	3079	3573	4173	3820	3779	3496	3291	3091	2120	1428	895	989	46494				

Seychelles (2013–2017)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	7	0	100	0	-	-	-	-	-	-	-	-	-	1	-	1	-	1	2	2	3.0	1.4	0.32	**2.1**	C00-06
Salivary gland	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.4	0.2	0.05	**0.4**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C11
Other pharynx	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	0.9	0.4	0.08	**0.6**	C09-10, C12-14
Oesophagus	1	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C15
Stomach	10	0	90	10	-	-	-	-	-	1	-	-	-	-	2	2	2	-	1	2	4.3	1.9	0.34	**3.1**	C16
Colon	36	0	86	6	-	-	-	-	-	-	2	-	2	2	4	3	4	2	9	8	15.5	6.9	1.57	**11.1**	C18
Rectum	28	0	100	0	-	-	-	-	-	-	1	1	2	3	3	3	3	3	3	6	12.0	5.4	1.00	**8.5**	C19-20
Anus	4	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	1.7	0.8	0.07	**1.0**	C21
Liver	7	0	71	29	-	-	-	-	-	-	-	-	-	-	2	-	-	1	2	2	3.0	1.4	0.32	**2.1**	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.4	0.2	0.05	**0.4**	C23-24
Pancreas	6	0	67	17	-	-	-	-	-	-	-	-	-	1	-	1	-	-	1	3	2.6	1.2	0.16	**1.5**	C25
Larynx	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	0.9	0.4	0.03	**0.5**	C32
Trachea, bronchus, and lung	15	0	53	13	-	-	-	-	-	-	-	-	-	-	3	-	2	2	2	6	6.4	2.9	0.50	**4.3**	C33-34
Bone	3	0	100	0	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	1.3	0.6	0.17	**1.6**	C40-41
Melanoma of skin	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.4	0.2	0.00	**0.2**	C43
Non-melanoma skin	8	0	100	0	-	-	-	-	-	-	-	-	2	-	1	1	1	2	-	1	3.4	1.5	0.30	**2.6**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C46
Connective and soft tissue	3	0	100	0	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-	1.3	0.6	0.13	**1.3**	C47, C49
Breast	171	0	95	3	-	-	-	-	-	-	7	12	16	19	22	21	18	18	10	28	73.5	33.0	5.77	**52.1**	C50
Vulva	2	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	0.9	0.4	0.03	**0.5**	C51
Vagina	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C52
Cervix uteri	58	0	97	2	-	-	-	-	1	2	3	8	6	6	9	7	5	3	3	5	24.9	11.2	1.92	**18.5**	C53
Uterus	37	0	84	8	-	-	-	-	-	-	-	1	-	2	2	5	3	9	3	12	15.9	7.1	1.34	**11.0**	C54-55
Ovary	21	0	81	10	-	-	-	-	2	1	1	2	1	-	4	1	3	-	1	5	9.0	4.1	0.59	**6.8**	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C58
Kidney and renal pelvis	5	0	80	20	-	1	-	-	-	-	-	-	-	-	-	1	1	-	-	2	2.1	1.0	0.11	**1.6**	C64-65
Bladder	6	0	67	17	-	-	-	-	-	-	-	-	-	1	-	1	1	-	1	2	2.6	1.2	0.20	**1.7**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.4	0.2	0.03	**0.3**	C66, C68
Eye	1	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.4	0.2	0.03	**0.3**	C69
Brain and nervous system	9	0	78	11	-	-	-	-	1	-	-	2	-	-	2	-	-	3	-	1	3.9	1.7	0.35	**3.2**	C70-72
Thyroid	7	0	100	0	-	-	-	-	-	-	-	1	1	-	1	1	1	1	-	1	3.0	1.4	0.23	**2.1**	C73
Hodgkin lymphoma	6	0	100	0	-	-	1	-	1	-	1	-	-	-	2	-	-	-	1	-	2.6	1.2	0.25	**2.5**	C81
Non-Hodgkin lymphoma	11	0	100	0	-	-	1	1	-	-	1	1	1	-	1	-	2	1	1	1	4.7	2.1	0.44	**4.3**	C82-86, C96
Multiple myeloma	7	0	100	0	-	-	-	-	-	-	-	-	-	-	2	3	1	1	-	-	3.0	1.4	0.27	**2.1**	C90
Lymphoid leukaemia	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	0.9	0.4	0.07	**0.6**	C91
Myeloid leukaemia	5	0	100	0	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-	2	2.1	1.0	0.12	**1.4**	C92-94
Leukaemia, unspecified	6	0	100	0	-	-	1	-	-	2	-	-	-	1	-	1	-	-	-	1	2.6	1.2	0.16	**2.4**	C95
Other and unspecified	25	0	64	16	-	-	-	-	-	1	-	1	1	1	-	2	1	2	3	13	10.7	4.8	0.65	**6.8**	O&U
All sites	518	0	90	5	-	1	3	1	7	8	16	32	35	39	62	56	51	53	44	110	222.5	100.0	17.75	**160.8**	C00-96
All sites except C44	510	0	89	5	-	1	3	1	7	8	16	32	33	39	61	55	50	51	44	109	219.1	98.5	17.45	**158.3**	C00-96 exc. C44
Average annual population					3750	3161	2906	2594	2588	3093	3793	3948	3512	3750	3648	3009	2150	1481	1031	2138	46555				

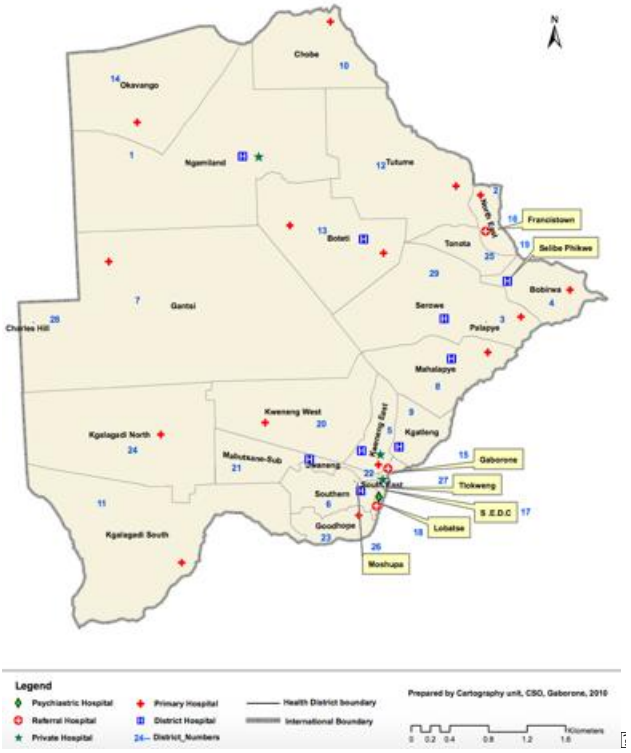
Botswana

The Ministry of Health and Wellness, with the assistance of IARC, established the Botswana National Cancer Registry under the Division of Diseases Control in 1999. The objectives of this registry were to (i) determine the incidence of cancer in the country; (ii) map the distribution of cancer; (iii) identify potential risk factors involved in cancer; (iv) evaluate cancer treatment, control and prevention programs and (v) encourage epidemiological research on cancer.

The BNCR is housed and managed within the national Non-Communicable Diseases (NCD) Programme within the Department of Public Health in the Ministry of Health and Wellness. The registry is staffed with a registry manager and two technical officers. Since BNCR is one of the activities of the NCD programme everyone has a role and stake in it: educating the public, data collection and management, and use and dissemination of the information. The registry is funded entirely by the MoHW.

The BNCR is a population-based cancer registry and collects information on demographics, risk factors, treatment and care of cancers in the whole country through its referral and district hospitals.

Botswana is an upper-middle income country situated in Southern Africa. The population at the Botswana Population and Housing Census of 2011 was 2,024,787 with a sex ratio of 96 males/100 females. The population density is 3.5 persons/square kilometer, with most of the population located along the Eastern border.



Botswana's 27 health districts

Technical officers actively collect cancer data from two referral hospitals (Princess Marina Hospital and Nyangabwe Referral Hospital), two district hospitals (Sekgoma Memorial Hospital in Serowe and Letsholathebe Memorial Hospital in Maun), the National Health Laboratory and the Department of Oncology in Gaborone Private Hospital. The officers periodically visit the data sources to collect cancer notification forms, which have been completed by staff of the different departments within the health facility. The forms contain identification and clinical details of cancer patients that are required for the database. Information is also collected from the Health Statistics Unit as well as from the electronic database known as IPMS (Integrated Patient Management System).

The information is then cleaned, coded and entered into CanReg5 software. Checks for duplicate, completeness and consistency are performed regularly in the CanReg system.

YEARS PRESENTED

Five year period, 2009-2013

COMMENT

There has been a marked decline in the numbers of cases registered – in the period presented in Volume II (2005-2008) it was 132 cases per month, in the period 2009-2013 it had declined to 112 per month (and has declined further since then). In consequence the calculated incidence rates – already

considered to be low in 2005-2008 (due to under-registration) are now implausible. The results are presented as numbers (and percentages) of cases only.

In males, the most commonly recorded cancers are Kaposi sarcoma (19.1%), oesophagus cancer (10.1%) and non-Hodgkin lymphoma (7.4%). In females, the principal cancers are cervix (29.8%), breast (17%) and Kaposi sarcoma (9.9%).

The great majority of cases are now registered with microscopic verification of diagnosis (92% in men, 97% in women), suggesting inadequate case finding from other sources. Death certificates are obviously not being used as a source of information for the registry (no DCO registrations during the period).

The registry notes the following problems: Limited human resources, which causes delays in reporting and limits quality of data; inadequate/missing data on the reporting forms and in the electronic data systems (IPMS); health care providers at facilities not attending to filing, and organization of reporting.

PUBLICATIONS and ACHIEVEMENTS

The Botswana National Cancer Registry became a member of AFCRN in 2013.

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Simbiri KO, Jha HC, Kayembe MK, Kovarik C, Robertson ES. Oncogenic viruses associated with vulva cancer in HIV-1 patients in Botswana. Infectious agents and cancer 2014. 9(1):28.

Suneja G, Dryden-Peterson S, Boyer M, Musimar Z, Nsingo-Bvochora M, Ramogola-Masire D, Medhin H, Bekelman J, Lockman S, Rebbeck T. Cancer in Botswana: A prospective cohort study of cancer type, treatment, and outcomes. International Journal of Radiation Oncology Biology Physics 2013 87(2):S492-S493.

Suneja G, Ramogola-Masire D, Medhin HG, Dryden-Peterson S, Bekelman JE. Cancer in Botswana: resources and opportunities. Lancet Oncol. 2013; 14(8):e290–1

Botswana (2009–2013)

Number of cases by age group: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	187	0	100	0	1	-	1	-	-	1	4	4	14	18	28	26	28	22	17	23	6.8	C00-06
Salivary gland	21	0	100	0	-	-	-	-	-	-	2	-	1	-	4	4	5	4	-	1	0.8	C07-08
Nasopharynx	28	0	100	0	-	-	1	2	5	2	3	2	1	-	1	4	2	4	-	1	1.0	C11
Other pharynx	43	0	100	0	-	-	-	-	-	-	1	-	2	2	3	9	10	6	2	8	1.6	C09-10, C12-14
Oesophagus	273	0	100	0	-	-	-	-	-	1	2	3	11	11	27	43	42	29	37	67	10.0	C15
Stomach	23	0	100	0	-	-	-	-	-	-	-	-	2	3	2	4	5	1	3	3	0.8	C16
Colon	72	0	100	0	-	-	-	-	3	6	7	3	7	5	8	10	5	5	8	5	2.6	C18
Rectum	45	0	100	0	-	-	-	-	1	2	2	4	6	4	7	4	3	4	4	4	1.6	C19-20
Anus	17	0	100	0	-	-	-	-	1	1	-	3	3	-	5	2	-	1	1	-	0.6	C21
Liver	80	0	82	0	2	-	-	2	-	3	3	3	7	9	6	8	9	9	5	14	2.9	C22
Gallbladder etc.	7	0	100	0	-	-	-	-	-	-	-	1	-	-	-	3	-	1	1	1	0.3	C23-24
Pancreas	10	0	100	0	-	-	-	-	-	-	1	2	-	1	-	1	1	-	1	3	0.4	C25
Larynx	88	0	100	0	-	-	-	-	-	-	-	2	1	7	10	11	13	17	10	17	3.2	C32
Trachea, bronchus, and lung	123	0	100	0	-	-	-	-	-	1	2	3	1	5	22	25	22	13	17	12	4.5	C33-34
Bone	32	0	100	0	1	1	3	6	3	7	3	2	1	1	-	-	1	1	-	2	1.2	C40-41
Melanoma of skin	42	0	100	0	-	-	-	-	1	-	1	1	6	3	2	9	1	4	4	10	1.5	C43
Non-melanoma skin	176	0	100	0	1	-	1	-	2	5	9	14	17	17	17	19	10	20	17	27	6.4	C44
Mesothelioma	7	0	100	0	-	-	-	-	-	-	-	-	1	-	1	1	1	1	-	2	0.3	C45
Kaposi sarcoma	522	0	64	0	-	-	7	8	7	55	105	123	80	55	32	23	13	5	4	5	19.1	C46
Connective and soft tissue	34	0	100	0	2	2	-	3	3	3	3	5	1	-	2	2	1	-	4	3	1.2	C47, C49
Breast	28	0	100	0	-	-	-	-	-	-	-	2	2	2	3	4	4	6	-	5	1.0	C50
Penis	111	0	100	0	-	-	-	-	-	2	2	15	18	16	16	15	7	5	5	10	4.1	C60
Prostate	205	0	98	0	-	-	-	-	-	-	1	-	2	4	5	14	22	25	29	103	7.5	C61
Testis	10	0	100	0	-	-	-	2	3	1	-	1	1	1	-	-	-	1	-	-	0.4	C62
Kidney and renal pelvis	20	0	100	0	8	-	-	-	-	-	-	1	-	5	-	1	2	-	-	3	0.7	C64-65
Bladder	18	0	100	0	-	-	-	-	-	-	1	1	1	-	4	1	2	2	1	5	0.7	C67
Ureter and other urinary	2	0	100	0	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	0.1	C66, C68
Eye	144	0	100	0	1	1	1	-	3	7	21	27	24	16	10	8	7	7	6	5	5.3	C69
Brain and nervous system	8	0	100	0	2	-	-	-	-	1	2	-	-	-	1	1	-	1	-	-	0.3	C70-72
Thyroid	8	0	100	0	-	-	-	-	1	-	-	1	1	1	1	-	1	1	1	-	0.3	C73
Hodgkin lymphoma	49	0	100	0	-	5	3	2	3	4	4	9	7	4	4	3	1	-	-	-	1.8	C81
Non-Hodgkin lymphoma	204	0	100	0	1	5	2	5	4	17	24	31	39	23	16	15	9	5	2	6	7.4	C82-86, C96
Multiple myeloma	33	0	100	0	-	-	1	-	1	-	-	2	4	2	5	7	2	3	1	5	1.2	C90
Lymphoid leukaemia	7	0	100	0	-	-	1	-	-	-	-	-	-	-	1	-	1	3	-	1	0.3	C91
Myeloid leukaemia	13	0	100	0	-	-	-	2	3	-	-	1	1	2	-	2	1	1	-	-	0.5	C92-94
Leukaemia, unspecified	3	0	100	0	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	C95
Other and unspecified	46	0	100	0	-	-	-	1	-	1	4	4	3	1	5	10	2	8	3	4	1.7	O&U
All sites	2739	0	92	0	21	14	22	33	44	121	207	270	265	218	249	289	233	215	183	355	100.0	C00-96
All sites except C44	2563	0	92	0	20	14	21	33	42	116	198	256	248	201	232	270	223	195	166	328	93.6	C00-96 exc. C44

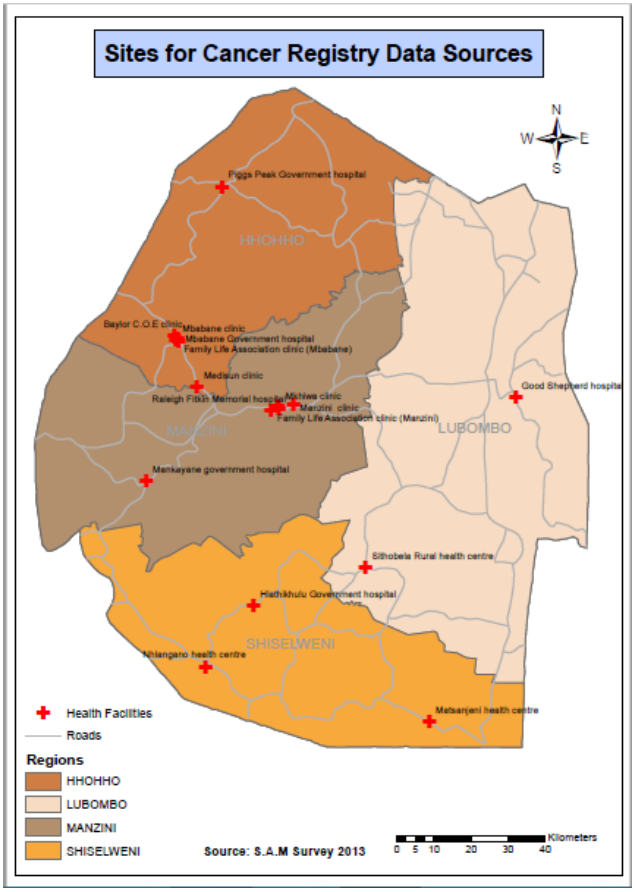
Botswana (2009–2013)

Number of cases by age group: females

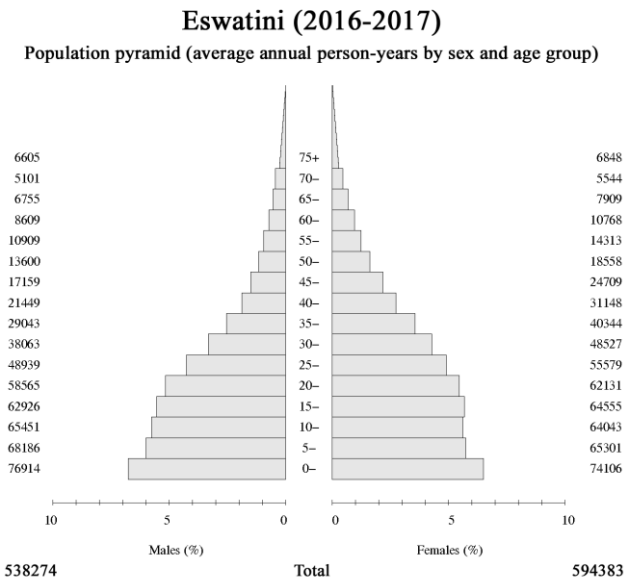
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	38	0	100	0	-	-	-	1	1	3	2	2	2	2	5	3	5	1	2	9	1.0	C00-06
Salivary gland	20	0	100	0	-	-	-	1	-	-	-	6	-	1	1	3	1	-	-	7	0.5	C07-08
Nasopharynx	8	0	100	0	-	-	-	1	1	-	1	1	-	1	-	2	-	-	1	-	0.2	C11
Other pharynx	7	0	100	0	-	-	-	-	-	1	1	1	-	-	1	-	2	-	-	1	0.2	C09-10, C12-14
Oesophagus	125	0	100	0	-	-	-	-	1	-	-	4	5	4	24	7	11	16	15	38	3.2	C15
Stomach	26	0	100	0	-	-	-	-	-	-	1	5	3	-	2	3	2	3	3	4	0.7	C16
Colon	51	0	100	0	-	-	-	-	3	3	1	3	5	2	9	3	4	4	3	11	1.3	C18
Rectum	38	0	100	0	-	-	-	-	-	4	5	2	3	6	4	4	2	2	2	4	1.0	C19-20
Anus	29	0	100	0	-	-	-	-	-	-	6	4	5	5	-	1	2	-	4	2	0.7	C21
Liver	47	0	83	0	-	-	-	-	1	2	2	2	2	2	3	6	9	5	6	7	1.2	C22
Gallbladder etc.	9	0	100	0	-	-	-	-	-	-	-	-	-	1	1	2	1	-	1	3	0.2	C23-24
Pancreas	12	0	100	0	-	-	-	-	-	1	-	2	1	2	-	-	1	-	2	3	0.3	C25
Larynx	14	0	100	0	-	-	-	-	-	-	-	-	1	-	2	4	2	-	3	2	0.4	C32
Trachea, bronchus, and lung	26	0	100	0	-	-	-	-	-	-	-	3	2	3	1	3	4	5	1	4	0.7	C33-34
Bone	34	0	100	0	-	2	5	6	4	3	7	1	2	-	2	1	-	-	1	-	0.9	C40-41
Melanoma of skin	71	0	100	0	-	-	-	1	1	-	-	1	-	6	8	2	10	6	7	29	1.8	C43
Non-melanoma skin	153	0	99	0	-	-	1	-	6	7	13	17	9	13	16	9	14	8	8	32	3.9	C44
Mesothelioma	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	0.1	C45
Kaposi sarcoma	392	0	69	0	1	6	3	13	16	64	92	67	44	28	16	9	13	6	4	10	9.9	C46
Connective and soft tissue	61	0	100	0	1	2	4	3	1	9	3	1	5	2	9	5	3	2	5	6	1.5	C47, C49
Breast	675	0	100	0	-	-	-	-	1	16	49	56	76	83	88	72	46	52	42	94	17.0	C50
Vulva	101	0	100	0	-	-	-	1	-	7	22	18	21	11	5	4	2	1	4	5	2.5	C51
Vagina	22	0	100	0	1	-	-	-	-	-	4	4	-	2	2	2	3	1	1	2	0.6	C52
Cervix uteri	1181	0	100	0	-	-	-	-	2	30	94	181	190	149	127	106	91	74	46	91	29.8	C53
Uterus	137	0	100	0	-	-	-	-	-	1	4	9	7	7	8	9	24	19	19	30	3.5	C54-55
Ovary	99	0	100	0	-	2	3	2	6	4	5	1	5	12	7	7	8	13	11	13	2.5	C56
Placenta	21	0	100	0	-	-	-	1	4	5	6	2	2	1	-	-	-	-	-	-	0.5	C58
Kidney and renal pelvis	35	0	100	0	4	3	-	-	1	3	2	3	4	4	4	3	1	2	1	-	0.9	C64-65
Bladder	20	0	100	0	-	-	-	-	-	1	1	2	2	1	2	1	1	1	5	3	0.5	C67
Ureter and other urinary	4	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	1	1	1	-	0.1	C66, C68
Eye	155	0	100	0	4	-	1	-	5	14	40	22	23	10	13	8	6	2	2	5	3.9	C69
Brain and nervous system	7	0	100	0	1	1	-	1	-	-	-	-	-	2	-	1	-	1	-	-	0.2	C70-72
Thyroid	19	0	100	0	-	-	-	-	-	4	1	1	-	3	3	3	2	-	1	1	0.5	C73
Hodgkin lymphoma	51	0	100	0	1	3	1	4	8	3	5	11	3	4	4	1	1	1	1	-	1.3	C81
Non-Hodgkin lymphoma	163	0	99	0	5	3	2	9	12	11	16	40	21	9	12	7	3	6	3	4	4.1	C82-86, C96
Multiple myeloma	33	0	100	0	-	-	-	-	-	-	-	1	2	3	5	2	3	10	3	4	0.8	C90
Lymphoid leukaemia	7	0	100	0	-	1	-	-	-	-	1	-	-	-	-	1	2	1	-	1	0.2	C91
Myeloid leukaemia	15	0	100	0	-	-	-	-	1	1	-	2	-	2	1	2	1	1	1	3	0.4	C92-94
Leukaemia, unspecified	6	0	100	0	-	-	-	-	-	-	-	-	1	1	2	-	-	-	1	1	0.2	C95
Other and unspecified	50	0	100	0	1	-	-	1	1	3	2	6	5	4	6	6	3	3	3	6	1.3	O&U
All sites	3964	0	97	0	19	23	20	45	76	200	386	481	451	387	393	302	284	248	213	436	100.0	C00-96
All sites except C44	3811	0	97	0	19	23	19	45	70	193	373	464	442	374	377	293	270	240	205	404	96.1	C00-96 exc. C44

Eswatini

Cancer registration has a long history in Eswatini (formerly Swaziland). The first registry operated in 1979-83 and was primarily concerned with estimating regional incidence of liver cancer (in relation to variation in prevalence of hepatitis B and aflatoxin) (see Peers et al, 1987). The registry was reactivated, via the department of pathology, in the late 1990's and reported incidence rates for the country for the period 1996-1999 in Volume I (Parkin et al 2003). The present population cancer registry, known as Eswatini National Cancer Registry (ENCR), was established in 2015. The main aim of establishing the ENCR was to obtain information on cancer occurrence in the population of Eswatini.



ENCR is situated in its own premises and it is coordinated by the cancer registry coordinator (NCD epidemiologist) and the cancer registrar. The registry is financed by the Eswatini government (infrastructure and the permanent staff) whilst the two data abstractors are being financed through the Multinational Lung Cancer Control Program (MLCCP) which is funded by Bristol-Myers Squibb Foundation (BMSF).



The total population of the Kingdom of Eswatini was 1,093,238 at the population census in 2017. 56% of the population is below 25 years of age (median age is 21.7 years). HIV prevalence is 26%, the highest in the world, resulting in a low total life expectancy of 57.7 (males 55.1 years, females 59.9 years). A resident was defined as anyone who has continuously lived/worked in the country for a period of at least six months and excludes persons who visited the country for purposes of accessing treatment.

Since cancer is not a reportable disease in the country, the Registry adopts active methods of case finding, from multiple sources including those indicated in red on the map. These are the regional hospitals (Piggs Peak, Mankayane, RFM, Good Shepherd and Hlathikhulu), referral hospitals (Mbabane, Government National Referral), private hospitals (Manzini cancer care, Mkhiwa Clinic, Mbabane and Manzini Clinic, Philani Clinic), pathology laboratories (Lancet lab, Mbabane national referral laboratory), palliative centres (Hospice at Home and Hope House), the Phalala Fund (government referral system is responsible for funding citizens to receive treatment aboard) and the vital statistics office of the Ministry of Home Affairs (death certificate).

Data collection involves registry personnel visiting these sources of data and abstracting the required information onto data abstraction forms. The data are captured with the Canreg5 software. Only data from cancer cases that are residents of the country are collected, including those cases diagnosed outside the country. The registry adheres to the guidelines of the IACR/IARC (2004) with respect to the preservation of confidentiality in connection with or during the

process of collection, storage, use and transmission of identifiable data.

YEARS PRESENTED

Two year period, 2016-2017

COMMENT

These represent the first years of registration. The overall incidence rates (ASR in males 101.5 per 10^5 and 140.5 per 10^5 in females) are low. The incidence of Kaposi sarcoma is high in both sexes, as is cervix cancer in women (72.0 per 10^5) and penile cancer in males (6.5 per 10^5).

Compared with the earlier period of registration (1996-1999), there appear to have been declines in the incidence of cancers of the oesophagus and liver, and increases in the incidence of prostate, breast and cervix cancer.

The reported incidence of leukaemia is very low, reflecting lack of any haematology service in the country.

PUBLICATIONS and ACHIEVEMENTS

The Eswatini National Cancer Registry became a provisional member of AFCRN in 2015. Eswatini is a beneficiary of the Multinational Lung Cancer Control Program (MLCCP), an initiative for the African region, funded by BMSF/STF.

Parkin DM, Ferlay J, Hamdi-Cherif M, Sitas F, Thomas J, Wabinga H and Whelan SL [eds] Swaziland, in Cancer in Africa: Epidemiology and Prevention (pp 242-246). IARC Scientific Publications No. 153, Lyon, IARC, 2003

Peers F, Bosch X, Kaldor J, Linsell A, Pluijmen M. Aflatoxin exposure, hepatitis B virus infection and liver cancer in Swaziland. Int J Cancer. 1987 15; 39:545-53.

Xolisile D, Priscilla H (2016) Report on cases of cancer in Swaziland, 2014-2015. Eswatini.

*Eswatini (2016–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	9	0	78	0	-	-	-	-	-	-	-	2	1	1	-	1	2	1	1	-	0.8	1.4	0.21	**1.6**	C00-06
Salivary gland	4	0	75	0	-	-	-	1	-	-	-	-	-	-	-	-	1	-	2	-	0.4	0.6	0.13	**0.7**	C07-08
Nasopharynx	3	0	33	33	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1	0.3	0.5	0.02	**0.4**	C11
Other pharynx	3	0	33	33	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	0.3	0.5	0.04	**0.5**	C09-10, C12-14
Oesophagus	20	0	10	15	-	-	-	-	-	1	1	1	-	1	1	2	4	2	1	6	1.9	3.1	0.34	**3.5**	C15
Stomach	5	0	80	0	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	2	0.5	0.8	0.07	**0.8**	C16
Colon	17	0	76	12	-	-	-	-	-	1	-	2	2	2	1	1	6	-	-	2	1.6	2.7	0.29	**3.0**	C18
Rectum	10	0	60	10	-	-	-	-	-	-	2	1	1	2	2	1	-	1	-	-	0.9	1.6	0.16	**1.5**	C19-20
Anus	3	0	100	0	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	0.3	0.5	0.07	**0.6**	C21
Liver	34	0	35	26	-	-	-	-	-	1	1	6	6	2	2	6	3	3	1	3	3.2	5.4	0.58	**5.5**	C22
Gallbladder etc.	3	0	67	0	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-	0.3	0.5	0.08	**0.6**	C23-24
Pancreas	6	0	17	17	-	-	-	-	-	-	-	2	-	1	1	-	1	-	1	-	0.6	0.9	0.13	**1.0**	C25
Larynx	4	0	50	0	-	-	-	-	1	-	-	-	-	-	-	-	1	1	1	-	0.4	0.6	0.12	**0.7**	C32
Trachea, bronchus, and lung	22	1	23	36	-	-	-	-	-	-	-	1	-	1	-	3	1	5	3	7	2.0	3.5	0.47	**4.0**	C33-34
Bone	5	0	100	0	-	-	1	-	2	-	-	-	1	1	-	-	-	-	-	-	0.5	0.8	0.04	**0.5**	C40-41
Melanoma of skin	5	0	80	0	-	-	-	-	-	-	-	1	1	-	1	-	-	1	-	1	0.5	0.8	0.08	**0.8**	C43
Non-melanoma skin	35	2	74	0	-	-	-	-	1	2	2	2	3	4	2	2	2	9	1	3	3.3	5.5	0.70	**5.9**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	117	3	46	3	-	3	2	3	2	15	25	24	15	11	5	3	3	2	-	1	10.9	18.4	1.17	**13.5**	C46
Connective and soft tissue	9	0	100	0	-	-	-	-	-	-	-	-	2	2	1	1	-	1	1	1	0.8	1.4	0.18	**1.6**	C47, C49
Breast	6	0	33	17	-	-	-	-	-	-	-	2	-	-	-	-	1	-	2	1	0.6	0.9	0.14	**1.0**	C50
Penis	39	1	72	0	-	-	-	-	-	-	3	3	4	4	4	2	4	4	3	7	3.6	6.1	0.70	**6.5**	C60
Prostate	160	3	32	14	-	-	-	-	-	1	-	-	2	2	5	4	26	41	23	53	14.9	25.2	3.71	**30.6**	C61
Testis	6	0	50	17	-	-	-	-	-	2	1	1	-	1	-	-	-	-	-	1	0.6	0.9	0.04	**0.7**	C62
Kidney and renal pelvis	3	0	67	33	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	0.3	0.5	0.03	**0.4**	C64-65
Bladder	11	1	45	0	-	-	-	-	-	-	-	-	-	-	2	2	3	2	-	1	1.0	1.7	0.27	**2.2**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	30	0	83	0	2	-	1	-	1	1	3	5	3	3	2	3	2	1	3	-	2.8	4.7	0.51	**4.3**	C69
Brain and nervous system	5	0	40	20	-	1	-	-	-	-	1	1	1	1	-	-	-	-	-	-	0.5	0.8	0.05	**0.6**	C70-72
Thyroid	2	0	50	0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	0.2	0.3	0.06	**0.4**	C73
Hodgkin lymphoma	8	0	100	0	-	-	-	-	-	-	-	3	2	-	-	-	1	1	1	-	0.7	1.3	0.16	**1.2**	C81
Non-Hodgkin lymphoma	19	0	79	16	-	-	1	1	3	1	3	2	1	-	1	-	-	2	1	3	1.8	3.0	0.22	**2.3**	C82-86, C96
Multiple myeloma	2	0	50	0	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	0.2	0.3	0.03	**0.3**	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C92-94
Leukaemia, unspecified	4	0	0	75	-	-	-	-	1	-	-	1	-	-	1	-	-	-	1	-	0.4	0.6	0.08	**0.6**	C95
Other and unspecified	26	0	69	12	-	1	1	-	2	1	2	2	4	3	3	1	5	-	1	-	2.4	4.1	0.41	**3.9**	O&U
All sites	635	11	51	10	3	5	6	5	13	26	44	66	51	44	37	35	67	81	47	94	59.0	100.0	11.28	**101.5**	C00-96
All sites except C44	600	9	49	11	3	5	6	5	12	24	42	64	48	40	35	33	65	72	46	91	55.7	94.5	10.58	**95.6**	C00-96 exc. C44
Average annual population					76914	68186	65451	62926	58565	48939	38063	29043	21449	17159	13600	10909	8609	6755	5101	6605	538274				

*Eswatini (2016–2017)

Number of cases by age group and summary rates of incidence: females

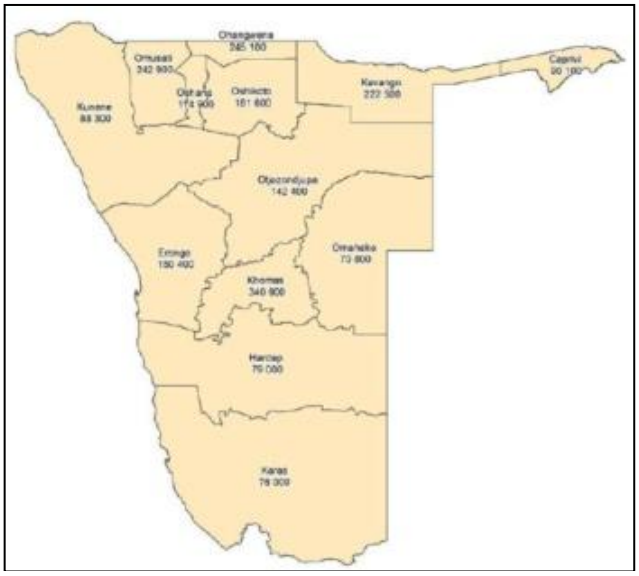
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	7	0	71	0	-	-	1	-	-	-	3	-	-	-	-	-	-	2	1	-	0.6	0.6	0.13	**0.8**	C00-06
Salivary gland	7	0	43	14	-	-	-	-	-	1	1	1	2	-	-	1	1	-	-	-	0.6	0.6	0.07	**0.7**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	2	0	50	0	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	0.2	0.2	0.01	**0.2**	C09-10, C12-14
Oesophagus	7	0	29	14	-	-	-	-	-	1	-	-	-	1	2	-	-	2	-	1	0.6	0.6	0.10	**1.0**	C15
Stomach	9	0	56	11	-	-	-	-	-	-	1	2	-	1	-	-	2	1	-	2	0.8	0.8	0.11	**1.2**	C16
Colon	14	0	50	7	-	-	-	-	-	-	1	-	3	2	2	-	-	2	3	1	1.2	1.2	0.27	**1.9**	C18
Rectum	15	0	87	7	-	-	-	-	-	-	4	3	2	3	-	-	1	2	-	-	1.3	1.3	0.17	**1.6**	C19-20
Anus	5	0	80	0	-	-	-	-	-	1	-	-	1	-	1	2	-	-	-	-	0.4	0.4	0.06	**0.6**	C21
Liver	24	0	29	46	-	-	-	-	-	1	2	5	3	1	3	2	1	1	2	3	2.0	2.0	0.30	**2.8**	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.1	0.02	**0.2**	C23-24
Pancreas	6	0	0	50	-	-	-	-	-	-	-	1	-	-	-	2	-	1	-	2	0.5	0.5	0.07	**0.8**	C25
Larynx	2	0	50	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	0.2	0.2	0.00	**0.2**	C32
Trachea, bronchus, and lung	12	0	17	33	-	-	-	-	-	-	1	-	-	-	4	3	1	1	2	-	1.0	1.0	0.26	**1.8**	C33-34
Bone	5	0	60	0	-	-	-	-	1	-	-	1	-	1	-	-	1	1	-	-	0.4	0.4	0.08	**0.6**	C40-41
Melanoma of skin	9	0	78	0	-	-	-	-	-	-	1	-	1	1	2	-	-	2	1	1	0.8	0.8	0.16	**1.3**	C43
Non-melanoma skin	44	0	66	11	1	-	-	1	1	2	6	4	9	-	7	2	2	2	3	4	3.7	3.7	0.52	**5.0**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	70	1	39	3	-	1	1	1	8	12	15	6	7	6	5	-	3	2	2	-	5.9	6.0	0.63	**6.4**	C46
Connective and soft tissue	3	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	1	-	1	-	0.3	0.3	0.07	**0.4**	C47, C49
Breast	138	2	78	4	-	-	-	-	3	6	7	14	14	19	14	11	18	7	9	14	11.6	11.7	1.92	**17.8**	C50
Vulva	29	0	72	3	-	-	-	-	-	2	-	12	6	4	1	2	2	-	-	-	2.4	2.5	0.27	**2.9**	C51
Vagina	5	0	100	0	-	1	-	-	-	-	-	-	-	2	-	-	1	-	-	1	0.4	0.4	0.05	**0.7**	C52
Cervix uteri	603	11	62	7	-	-	-	-	4	19	65	82	89	69	75	42	50	40	25	32	50.7	51.3	7.80	**72.0**	C53
Uterus	38	1	87	3	-	-	-	-	-	-	-	4	1	-	-	7	4	10	3	8	3.2	3.2	0.72	**5.9**	C54-55
Ovary	24	0	42	8	-	-	-	1	-	2	3	1	3	2	2	3	1	1	4	1	2.0	2.0	0.39	**2.9**	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C58
Kidney and renal pelvis	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.1	0.02	**0.2**	C64-65
Bladder	6	0	33	33	-	-	-	-	-	-	-	2	1	-	-	1	2	-	-	-	0.5	0.5	0.08	**0.8**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	22	0	68	0	2	1	-	-	-	3	3	3	1	2	-	-	3	2	1	1	1.9	1.9	0.26	**2.5**	C69
Brain and nervous system	8	0	12	25	-	-	-	-	-	-	-	2	2	2	-	1	1	-	-	-	0.7	0.7	0.09	**0.9**	C70-72
Thyroid	6	0	67	17	-	-	-	-	-	1	-	1	-	-	-	-	2	-	1	1	0.5	0.5	0.10	**0.8**	C73
Hodgkin lymphoma	2	0	100	0	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	0.2	0.2	0.04	**0.3**	C81
Non-Hodgkin lymphoma	16	1	81	6	-	-	-	-	-	3	2	1	2	-	4	-	-	1	1	1	1.3	1.4	0.19	**1.8**	C82-86, C96
Multiple myeloma	2	0	100	0	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	0.2	0.2	0.02	**0.2**	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C91
Myeloid leukaemia	1	0	100	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C92-94
Leukaemia, unspecified	2	0	100	0	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	**0.2**	C95
Other and unspecified	29	0	48	10	1	2	4	1	1	1	3	2	4	1	1	1	2	2	2	1	2.4	2.5	0.34	**3.1**	O&U
All sites	1175	16	62	8	4	7	8	5	18	57	119	148	151	118	124	80	101	83	61	75	98.8	100.0	15.35	**140.5**	C00-96
All sites except C44	1131	16	62	8	3	7	8	4	17	55	113	144	142	118	117	78	99	81	58	71	95.1	96.3	14.83	**135.5**	C00-96 exc. C44
Average annual population					74106	65301	64043	64555	62131	55579	48527	40344	31148	24709	18558	14313	10768	7909	5544	6848	594383				

Namibia

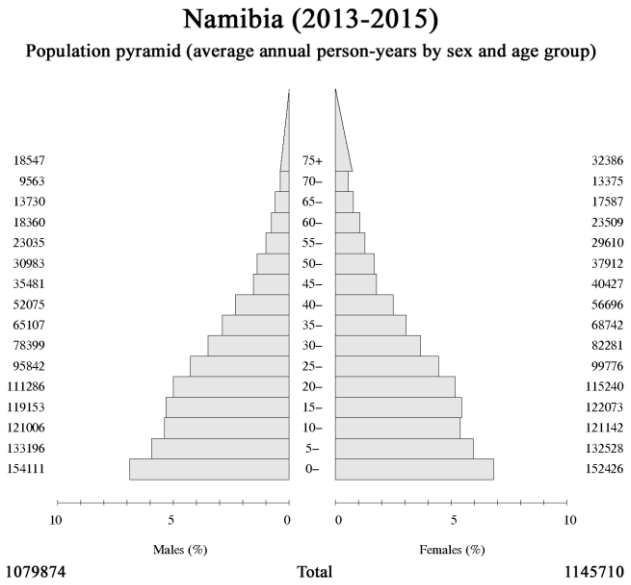
The Namibian National Cancer Registry (NNCR) was established in 1995. Concern about potential cancer risks at a local uranium mine led to the registration of all cancers diagnosed by the only central pathology service in Namibia. The project was a cooperation between the Rossing Uranium Company, the Namibian Ministry of Health and Social Services (oncology clinic) and the Cancer Association of Namibia.

The registry collected all cancer cases presented to the Windhoek state pathology laboratory and the only private pathology laboratory from 1979 to 1994. From 1995 onwards, the Namibian Cancer Registry commenced active registration of both pathology-based and clinical cases for all 13 regions (14 regions since 2013 with "Kavango East" and "Kavango West" while the "Caprivi" was renamed "Zambezi") of Namibia. Cases that are diagnosed in Republic of South Africa are re-routed to the Namibian registry via a network of registries, which are technically supported by IARC. The Registry aims to provide information that will ultimately lead to improved cancer prevention and control among the Namibian population.

The registry is based at the head office of the Cancer Association of Namibia (CAN) in the capital, Windhoek. Activities of the registry are overseen by the CEO of CAN, and the association has facilitated and provided staff support for the registration. At present, the registry has no independent budget or resources.



The registry covers the entire population of Namibia. It was estimated at 2,104,900 at the national census in 2011. Annual projections of the population (by age group and sex) have been published by the Namibia Statistics Agency (2014). About 87.5% of the population is black. About 50% of the population belong to the Ovambo tribe and 9% to the Kavangos tribe. The Christian community makes up 80%–90% of the population of Namibia.



At present, data collection takes place primarily at the Dr A.B. May Cancer Care Centre of Windhoek Central Hospital to which all state cancer patients are referred for assessment and possible treatment. The majority of private cases are routed to the private Namibian Oncology Centre and all these cases are electronically submitted to the registry via a newly developed e-capturing system of the Association. Several private chemotherapy centres now also exist throughout the country.

There are two primary pathology laboratories in the country, the state National Institute of Pathology (NIP) and the private PathCare, in addition to several smaller laboratories that have been established in the last 5 years. The pathology reports from NIP include demographic data, but place of residence is noted in less than one third of cases. The print-out received from PathCare only includes the age and sex. Some case information is received from the laboratory in Cape Town (South Africa). There is no service of clinical haematology.

Civil registration of deaths by cause is carried out by the Ministry of Home Affairs and Immigration. The registry has only gained access to the new electronic death registry in 2018. The quality of cause of death information is not known.

Case finding relies upon receipt of completed registration forms filled in by registered nurses employed by CAN in the admissions unit of the Dr A.B. May Cancer Centre, Namibian Oncology Centre and copies of pathology reports, as described above. Currently, there is no active case finding due to lack of funding.

CanReg5 is used for data entry and checks. There has been no formal evaluation of registry quality. Cases are coded according to ICD-O-3. Only authorised personnel have access to the registry data; the electronic files are password-protected and the registry office is kept locked.

YEAR PRESENTED

Three year period, 2013-2015

COMMENT

Almost all cases registered had morphological verification of diagnosis. At least partly in consequence (failure to identify cases diagnosed by other modalities) the overall incidence rates are rather low (all sites, excluding non-melanoma skin cancer, 149.3 per 10^5 in men, 152.5 per 10^5 in women). There are, in fact, rather high incidence rates of skin cancers (both melanoma and non-melanoma) as well as other cancers related to solar irradiation (lip and oral cavity).

The incidence of Kaposi sarcoma is well above the regional average (KS is indeed, the second most frequently registered cancer of men (with 100% pathology diagnosis), after prostate cancer).

In the period considered, no cases had been registered based on information from a death certificate.

Summary

Because of the case finding methods, there is over-emphasis on pathologically diagnosed cancers, and those reaching specialist services in the capital, resulting in an under-recording, most likely for those cancers frequently diagnosed by other modalities, or not amenable to curative interventions (e.g. oesophagus, liver, lung).

PUBLICATIONS and ACHIEVEMENTS

The Namibian National Cancer Registry became a member of AFCRN in 2013.

There are 4 published reports on the registry's results (1995-1998, 2000-2005, 2006-2009, and 2010-2014).

Namibia (2013–2015)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	148	0	100	0	-	-	2	1	2	3	3	3	5	8	26	10	27	12	18	28	4.6	4.3	1.00	**8.1**	C00-06
Salivary gland	27	0	100	0	-	1	2	-	2	1	1	3	6	2	-	1	-	2	3	3	0.8	0.8	0.13	**1.1**	C07-08
Nasopharynx	19	0	100	0	-	-	1	-	1	-	-	2	3	1	3	3	1	1	1	2	0.6	0.6	0.10	**0.9**	C11
Other pharynx	37	0	100	0	-	1	-	1	-	-	-	1	-	2	6	5	5	5	9	2	1.1	1.1	0.35	**2.2**	C09-10, C12-14
Oesophagus	71	0	100	0	-	-	-	-	-	-	-	1	3	6	9	7	12	12	2	19	2.2	2.1	0.43	**3.9**	C15
Stomach	39	0	100	0	-	-	-	-	-	2	1	2	1	2	4	9	3	3	5	7	1.2	1.1	0.26	**2.1**	C16
Colon	100	0	100	0	-	-	-	-	1	2	3	8	6	8	15	13	14	10	7	13	3.1	2.9	0.63	**5.3**	C18
Rectum	48	0	100	0	1	-	-	-	2	2	3	3	2	6	4	2	5	5	4	9	1.5	1.4	0.27	**2.4**	C19-20
Anus	17	0	100	0	-	-	-	2	-	-	-	-	2	3	3	-	1	-	3	3	0.5	0.5	0.10	**0.8**	C21
Liver	77	0	97	0	2	-	-	-	1	1	3	3	4	11	8	8	6	11	7	12	2.4	2.3	0.49	**4.1**	C22
Gallbladder etc.	10	0	100	0	-	-	-	-	-	-	1	-	-	1	-	-	3	2	-	3	0.3	0.3	0.06	**0.6**	C23-24
Pancreas	22	0	100	0	-	-	-	-	-	-	-	-	2	1	3	5	4	2	4	1	0.7	0.6	0.19	**1.3**	C25
Larynx	73	0	100	0	-	-	-	-	-	-	-	1	-	3	8	13	13	9	13	13	2.3	2.1	0.61	**4.4**	C32
Trachea, bronchus, and lung	119	0	100	0	-	-	-	-	1	-	1	1	7	7	11	29	17	17	17	11	3.7	3.5	0.99	**7.1**	C33-34
Bone	64	0	100	0	-	1	7	6	7	8	3	2	3	4	2	5	2	4	1	9	2.0	1.9	0.21	**2.4**	C40-41
Melanoma of skin	65	0	100	0	-	-	-	1	1	-	4	2	5	7	9	6	4	4	6	16	2.0	1.9	0.35	**3.2**	C43
Non-melanoma skin	391	0	100	0	-	-	3	7	9	3	23	17	22	21	47	40	38	41	47	73	12.1	11.4	2.50	**20.2**	C44
Mesothelioma	7	0	100	0	-	-	-	-	-	-	-	-	-	1	1	-	2	1	1	1	0.2	0.2	0.06	**0.4**	C45
Kaposi sarcoma	407	0	100	0	1	2	-	9	5	20	79	67	68	49	30	15	16	7	11	28	12.6	11.9	1.54	**16.4**	C46
Connective and soft tissue	51	0	100	0	2	4	-	5	2	3	10	-	5	2	3	1	5	-	3	6	1.6	1.5	0.19	**2.0**	C47, C49
Breast	27	0	100	0	-	-	-	-	-	-	1	-	2	5	1	3	1	4	4	6	0.8	0.8	0.19	**1.5**	C50
Penis	40	0	98	0	-	-	-	-	-	1	-	3	5	7	10	-	1	5	1	7	1.2	1.2	0.20	**2.0**	C60
Prostate	741	0	100	0	-	-	-	-	-	-	4	2	1	16	33	59	74	125	130	297	22.9	21.7	5.15	**40.5**	C61
Testis	23	0	100	0	2	1	-	2	2	5	-	1	4	-	2	1	-	1	-	2	0.7	0.7	0.06	**0.8**	C62
Kidney and renal pelvis	61	0	100	0	9	4	1	3	-	-	1	-	8	8	3	7	3	9	3	2	1.9	1.8	0.34	**2.9**	C64-65
Bladder	48	0	100	0	-	1	1	-	-	-	1	3	2	2	6	7	8	7	4	6	1.5	1.4	0.34	**2.7**	C67
Ureter and other urinary	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	0.1	0.1	0.02	**0.1**	C66, C68
Eye	111	0	100	0	7	1	-	1	3	3	7	26	17	12	6	8	5	4	4	7	3.4	3.2	0.47	**4.7**	C69
Brain and nervous system	40	0	92	0	1	3	4	4	1	1	6	1	2	6	2	2	2	2	1	2	1.2	1.2	0.15	**1.6**	C70-72
Thyroid	13	0	100	0	-	-	-	-	1	2	2	1	1	-	1	-	1	-	2	2	0.4	0.4	0.06	**0.5**	C73
Hodgkin lymphoma	15	0	100	0	-	3	1	1	1	2	1	-	1	-	1	2	-	1	-	1	0.5	0.4	0.05	**0.5**	C81
Non-Hodgkin lymphoma	165	0	100	0	7	10	1	5	5	14	19	19	14	16	10	5	10	6	6	18	5.1	4.8	0.63	**6.7**	C82-86, C96
Multiple myeloma	22	0	95	0	-	-	-	-	-	-	-	1	2	2	5	4	3	2	-	3	0.7	0.6	0.13	**1.2**	C90
Lymphoid leukaemia	41	0	100	0	5	5	1	4	3	1	2	1	-	1	3	2	1	1	3	8	1.3	1.2	0.14	**1.5**	C91
Myeloid leukaemia	43	0	100	0	2	1	2	5	1	5	2	2	5	2	3	2	5	1	1	4	1.3	1.3	0.16	**1.8**	C92-94
Leukaemia, unspecified	5	0	100	0	-	1	-	1	-	1	-	-	-	-	1	-	-	-	1	-	0.2	0.1	0.03	**0.2**	C95
Other and unspecified	230	0	100	0	5	1	1	3	6	7	13	13	16	20	24	27	16	27	13	38	7.1	6.7	1.26	**11.3**	O&U
All sites	3419	0	100	0	44	40	27	61	57	87	194	189	224	242	304	301	308	343	336	662	105.5	100.0	19.84	**169.5**	C00-96
All sites except C44	3028	0	100	0	44	40	24	54	48	84	171	172	202	221	257	261	270	302	289	589	93.5	88.6	17.34	**149.3**	C00-96 exc. C44
Average annual population					154111	133196	121006	119153	111286	95842	78399	65107	52075	35481	30983	23035	18360	13730	9563	18547	1079875				

Namibia (2013–2015)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	96	0	100	0	-	-	1	1	-	3	7	3	4	3	13	9	14	11	7	20	2.8	2.3	0.45	**3.8**	C00-06
Salivary gland	20	0	100	0	-	-	-	-	-	2	4	1	3	-	-	3	2	3	1	1	0.6	0.5	0.09	**0.8**	C07-08
Nasopharynx	11	0	100	0	-	-	1	-	-	2	3	-	2	1	-	-	1	-	-	1	0.3	0.3	0.03	**0.3**	C11
Other pharynx	19	0	100	0	-	-	-	-	-	-	-	-	-	-	2	8	4	1	1	3	0.6	0.5	0.10	**0.8**	C09-10, C12-14
Oesophagus	33	0	100	0	-	-	-	-	-	1	1	2	-	1	6	4	3	4	-	11	1.0	0.8	0.12	**1.2**	C15
Stomach	43	0	100	0	-	-	-	-	-	2	6	6	5	1	4	4	5	4	3	3	1.3	1.0	0.20	**1.7**	C16
Colon	68	0	100	0	-	-	-	-	1	-	1	2	7	5	11	8	6	10	7	10	2.0	1.6	0.37	**2.9**	C18
Rectum	49	0	100	0	-	-	-	-	2	-	4	3	5	3	1	10	5	6	4	6	1.4	1.2	0.25	**2.0**	C19-20
Anus	14	0	100	0	-	-	-	1	-	1	-	-	3	-	1	-	1	4	3	-	0.4	0.3	0.10	**0.6**	C21
Liver	53	0	100	0	-	1	-	-	-	-	2	5	2	6	7	3	6	5	5	11	1.5	1.3	0.25	**2.1**	C22
Gallbladder etc.	18	0	100	0	-	-	-	-	-	-	-	-	1	1	2	4	5	1	2	2	0.5	0.4	0.11	**0.8**	C23-24
Pancreas	17	0	100	0	-	-	-	-	1	-	-	-	-	1	1	-	4	3	4	3	0.5	0.4	0.12	**0.8**	C25
Larynx	11	0	100	0	-	-	-	-	-	-	-	-	-	-	2	2	4	-	2	1	0.3	0.3	0.07	**0.5**	C32
Trachea, bronchus, and lung	74	0	100	0	1	-	-	1	-	1	2	-	1	3	10	13	14	10	7	11	2.2	1.8	0.42	**3.3**	C33-34
Bone	47	0	100	0	-	1	3	6	1	2	5	1	3	4	2	3	6	5	1	4	1.4	1.1	0.18	**1.8**	C40-41
Melanoma of skin	93	0	100	0	-	-	-	1	-	-	3	2	2	11	6	7	14	12	6	29	2.7	2.2	0.42	**3.7**	C43
Non-melanoma skin	286	0	100	0	-	1	1	-	9	7	17	20	25	17	21	25	26	17	24	76	8.3	6.8	1.13	**10.4**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.0	0.01	**0.1**	C45
Kaposi sarcoma	215	0	99	0	1	3	1	7	11	17	50	42	30	17	10	7	5	1	6	7	6.3	5.1	0.62	**6.9**	C46
Connective and soft tissue	57	0	100	0	3	2	1	2	10	1	6	7	5	3	2	2	7	3	-	3	1.7	1.4	0.18	**1.9**	C47, C49
Breast	1115	0	100	0	-	-	-	1	9	29	72	78	109	134	140	140	107	83	71	142	32.4	26.6	5.10	**45.2**	C50
Vulva	35	0	100	0	-	-	-	-	1	1	1	4	3	5	5	5	7	1	-	2	1.0	0.8	0.15	**1.5**	C51
Vagina	21	0	100	0	-	-	-	-	-	-	3	1	2	3	3	4	2	1	-	2	0.6	0.5	0.09	**0.8**	C52
Cervix uteri	789	0	100	0	-	-	-	3	2	20	49	94	130	100	72	65	63	50	39	102	23.0	18.8	3.25	**30.7**	C53
Uterus	104	0	100	0	-	-	-	-	5	2	1	1	8	6	10	12	16	14	20	9	3.0	2.5	0.67	**4.7**	C54-55
Ovary	103	0	99	0	2	2	6	4	6	4	2	9	9	13	10	4	12	7	9	4	3.0	2.5	0.47	**4.1**	C56
Placenta	5	0	100	0	-	-	-	-	-	2	-	1	2	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.2**	C58
Kidney and renal pelvis	64	0	100	0	8	2	-	1	6	2	2	1	2	4	6	8	11	4	4	3	1.9	1.5	0.29	**2.6**	C64-65
Bladder	30	0	100	0	-	-	-	-	-	1	2	2	3	3	4	1	3	3	3	5	0.9	0.7	0.14	**1.2**	C67
Ureter and other urinary	4	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	2	1	-	-	0.1	0.1	0.03	**0.2**	C66, C68
Eye	123	0	99	0	13	2	3	-	1	9	22	11	13	15	13	6	5	1	3	6	3.6	2.9	0.38	**4.2**	C69
Brain and nervous system	45	0	100	0	3	4	3	4	1	1	4	2	3	4	3	4	1	3	1	4	1.3	1.1	0.14	**1.5**	C70-72
Thyroid	53	0	100	0	-	-	-	1	1	3	10	6	7	5	6	6	2	1	1	4	1.5	1.3	0.18	**1.9**	C73
Hodgkin lymphoma	16	0	100	0	-	-	-	3	1	3	1	3	1	1	-	-	1	1	1	-	0.5	0.4	0.06	**0.5**	C81
Non-Hodgkin lymphoma	135	0	99	0	7	4	4	4	1	14	14	12	18	15	14	7	-	6	2	13	3.9	3.2	0.40	**4.6**	C82-86, C96
Multiple myeloma	23	0	91	0	-	-	-	-	-	-	-	2	1	1	2	3	-	2	6	6	0.7	0.5	0.13	**0.9**	C90
Lymphoid leukaemia	22	0	100	0	5	3	3	-	-	-	-	-	2	-	-	1	3	-	3	2	0.6	0.5	0.08	**0.8**	C91
Myeloid leukaemia	43	0	100	0	1	2	4	-	1	3	4	-	6	4	4	1	3	2	4	4	1.3	1.0	0.17	**1.6**	C92-94
Leukaemia, unspecified	3	0	100	0	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C95
Other and unspecified	236	0	100	0	4	2	4	2	6	11	13	10	14	21	22	22	22	26	15	42	6.9	5.6	1.03	**9.2**	O&U
All sites	4194	0	100	0	49	29	35	42	77	145	311	331	431	411	416	401	393	306	265	552	122.0	100.0	18.02	**162.9**	C00-96
All sites except C44	3908	0	100	0	49	28	34	42	68	138	294	311	406	394	395	376	367	289	241	476	113.7	93.2	16.89	**152.5**	C00-96 exc. C44
Average annual population					152426	132528	121142	122073	115240	99776	82281	68742	56696	40427	37912	29610	23509	17587	13375	32386	1145712				

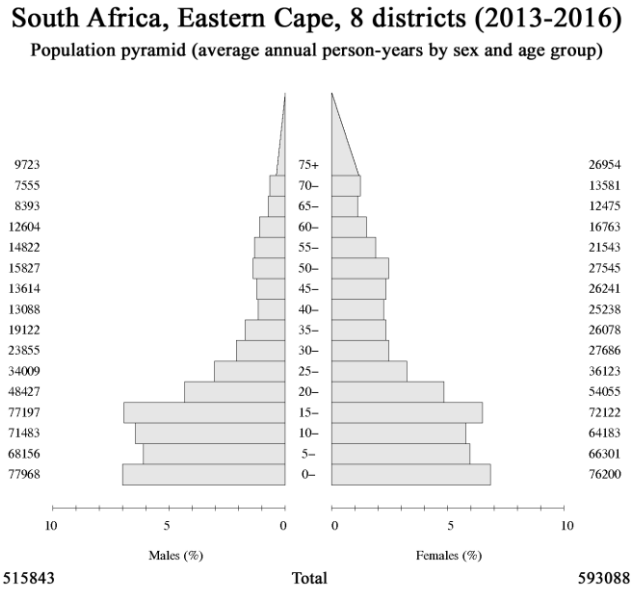
Republic of South Africa, Eastern Cape Province

Eastern Cape Cancer Registry (ECCR) is a population-based registry established in the 1980s as a special registry by the Programme on Mycotoxin and Experimental Carcinogenesis (PROMEC) of the South African Medical Research Council (SAMRC). Initially, the register was set up to monitor trends in the incidence and spatial geographical variations of oesophageal cancer in four magisterial areas of the former Transkei region of the Eastern Cape Province. In 1998, the registry expanded its scope to collect data on all cancers and expanded the catchment area to cover the population of eight magisterial areas that include the initial four plus Idutywa, Nqamakwe, Willowvale and Flagstaff. These magisterial areas are in the municipalities of Ntabankulu, Mbizana and Qaukeni in the north-eastern part of the former Transkei region and Mnquma and Mbashe in the south-western part of the region. The registry is funded mainly by the SAMRC.

The population covered by the registry at the most recent census 2011 was 1.1 million, of which, 99% of the population are Black Africans who speak isiXhosa supporting both Christian and traditional norms and values. The population for the period considered here (2013-2016) was estimated by assuming that the annual growth rates (by sex and age group) observed in each district continued (as a linear change) to 2012 and later.

ECCR operates with both fulltime and part time staff. The full time director is assisted by three full time employed researchers; one senior scientist and two research assistants. In addition, there are four part time research support personnel.

Case finding is primarily active and involves annual visits to collaborating hospitals by ECCR staff to review patients' records and extract all available information with those with a cancer diagnosis. A standardized cancer data collection tool is used.



Passive registration accounts for about 20% of recorded cases. In this method, data collectors, who are part time personnel working in four collaborating hospitals as oncology nurses or clerks in oncology patient administration, use tablets to collect data and send them in encrypted files to ECCR by email on monthly basis. Data collectors receive training through workshops and formal courses on cancer registration, principles and methods including good clinical practice. Periodically they are tested for competency and efficiency by the ECCR staff in consultation with their hospitals' managers.

The national death register, kept in the Department of Home Affairs, is also used as a source of information. However, since information on cause of death is very limited, it is only used to update vital status for registered cases; records that include the patient's South African Identify Number can be linked easily.

Cancer site and morphology are coded according to the ICD-O-3 and registered using CanReg5. Only malignant cases are included in analysis. Potential duplicates are carefully assessed to determine whether they are new malignancies, secondary cancers or duplicate information. Geographic information is coded according to a list of village codes based on the 1985 census, and amended as new residential areas form.

The confidentiality of registry data is carefully maintained. Access to the dataset by registry staff is at different levels and controlled by the use of pin codes. Only the registry manager has the authority to make changes in the dataset. Papers containing confidential information are shredded before disposal.

There are standard procedures for the release of confidential data, and requests for data are dealt with by the registry manager.

YEARS PRESENTED

Four year period, 2013 – 2016

COMMENT

Results from the previous 5-year period (2008-2012) were presented in Volume II, and in Cancer Incidence in Five Continents (CI5) Volume XI.

The age standardised incidence rates for all sites (excl. NMSC) are slightly higher than in the preceding 5 years, although they remain relatively low compared with the Southern Africa average. The incidence of cancer of the oesophagus remains high (ASR 19.4 per 10^5 in males, 15.9 per 10^5 in females) as is the incidence of Kaposi sarcoma (8.8 per 10^5 in men, 5.4 per 10^5 in women) and cancer of the cervix uteri (43.6 per 10^5). The incidence of leukaemia (and lymphoma) is implausibly low.

The percentage of cases with morphological verification of diagnosis is a little low (66% in males, 79% in females), but higher than in earlier periods.

The changes since the previous 5 years (2008-2012) include significant increases in the incidence of cancers of the prostate, cervix, and Kaposi sarcoma (in both sexes), with almost no change in the incidence of breast cancer.

Summary

The data seem of a quality comparable to that of 2008-2012 (published in CI5 Volume XI). The low rates for many sites are probably due to the rural lifestyles of the population, as well as some under-diagnosis of cancer (particularly those needing specialists services – e.g. leukaemia) in these rather remote communities.

PUBLICATIONS and ACHIEVEMENTS

In 2012 ECCR became a full member of the IACR. ECCR staff also works closely with Non-Governmental Organisations and the government at both national and provincial levels in planning cancer control and intervention programmes including health education to communities at risk.

Pilleron S, Soerjomataram I, Charvat H, Chokunonga E, Somdyala I.M, Wabinga H, Korir A, Bray F, Jemal A, Parkin DM. Cancer incidence in older adults in selected regions of sub-Saharan Africa, 2008-2012. Int J Cancer 2019 144(8):1824-1833. doi: 10.1002/ijc.31880

Sithole N, Somdyala NIM. Hospital-Based Cancer Registry Frere Hospital, East London, Cancer Incidence 1991-2009 Technical Report. Cape Town: South African Medical Research Council, 2017. ISBN: 978-1-928340-24-9.

Matz M, Coleman MP, Carreira H, Salmeron D, Chirlaque MD, Allemani C [include: Bradshaw D, Stefan DC, Somdyala NIM]. Worldwide comparison of ovarian cancer survival: Histological group and stage at diagnosis (CONCORD-2). Gynecologic Oncology. 2017 144(2):396-404. Epub 2016 Dec 07.

Nojilana B, Bradshaw D, Pillay-van Wyk V, Msemburi W, Somdyala N, Joubert JD, Groenewald P. Persistent burden from non-communicable diseases in South Africa needs strong action. S Afr Med J. 2016 106(5): 436-437.

Nojilana B, Bradshaw D, Pillay-van Wyk V, Msemburi W, Laubscher R, Somdyala NIM, Joubert JD, Groenewald P, Dorrington RE. Emerging trends in non-communicable disease mortality in South Africa, 1997–2010. S Afr Med J 2016 106(5):477-484.

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South Africa, Eastern Cape, 8 districts (2013–2016)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	59	0	92	0	-	-	-	-	-	-	1	1	1	7	9	6	11	7	6	10	2.9	5.3	0.52	**4.6**	C00-06
Salivary gland	5	0	80	0	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	0.2	0.4	0.04	**0.3**	C07-08
Nasopharynx	3	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	0.1	0.3	0.02	**0.2**	C11
Other pharynx	13	0	100	0	1	-	-	-	-	-	-	-	-	1	-	2	-	2	2	5	0.6	1.2	0.09	**0.9**	C09-10, C12-14
Oesophagus	267	0	59	0	-	1	-	-	2	5	4	4	7	13	19	36	49	31	46	50	12.9	23.9	2.42	**19.4**	C15
Stomach	11	0	82	0	-	-	-	-	-	-	-	-	-	2	2	1	1	1	-	4	0.5	1.0	0.07	**0.8**	C16
Colon	16	0	88	0	-	-	-	1	-	-	1	1	1	-	7	1	1	-	2	1	0.8	1.4	0.13	**1.2**	C18
Rectum	14	0	93	0	-	-	-	-	1	-	-	-	-	1	1	2	-	5	-	4	0.7	1.3	0.11	**1.0**	C19-20
Anus	11	0	82	0	-	-	-	-	-	-	1	2	-	1	1	-	1	1	2	2	0.5	1.0	0.09	**0.8**	C21
Liver	40	0	58	0	-	-	-	1	1	1	2	5	3	4	5	5	4	-	5	4	1.9	3.6	0.32	**3.0**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	8	0	0	0	-	-	-	-	-	-	-	-	-	1	2	2	3	-	-	-	0.4	0.7	0.07	**0.6**	C25
Larynx	39	0	92	0	2	-	-	-	-	-	-	-	1	2	3	6	10	6	5	4	1.9	3.5	0.38	**2.9**	C32
Trachea, bronchus, and lung	56	0	89	0	-	-	-	-	1	-	1	-	3	-	10	12	11	9	5	4	2.7	5.0	0.54	**4.3**	C33-34
Bone	3	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	0.1	0.3	0.04	**0.2**	C40-41
Melanoma of skin	9	0	67	0	-	-	-	1	-	-	1	-	-	-	2	1	2	-	2	-	0.4	0.8	0.08	**0.6**	C43
Non-melanoma skin	12	0	100	0	1	-	-	-	-	-	-	-	-	-	1	3	4	3	-	-	0.6	1.1	0.12	**0.9**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	116	0	64	0	-	-	1	4	3	9	20	32	17	6	6	5	2	2	1	8	5.6	10.4	0.74	**8.8**	C46
Connective and soft tissue	11	0	82	0	2	1	-	-	-	1	-	-	-	1	1	-	2	-	2	1	0.5	1.0	0.08	**0.7**	C47, C49
Breast	17	0	88	0	-	-	-	-	-	-	-	-	-	1	1	1	3	2	6	3	0.8	1.5	0.18	**1.2**	C50
Penis	10	0	70	0	-	-	-	-	-	-	-	-	3	-	1	2	-	2	1	1	0.5	0.9	0.10	**0.9**	C60
Prostate	246	0	49	0	-	-	-	-	-	-	3	1	2	3	7	18	34	46	53	79	11.9	22.0	2.18	**17.0**	C61
Testis	10	0	30	0	-	-	-	2	-	-	-	-	-	1	2	1	1	-	1	2	0.5	0.9	0.06	**0.6**	C62
Kidney and renal pelvis	9	0	100	0	2	1	-	1	-	-	1	-	-	-	1	1	1	-	-	1	0.4	0.8	0.04	**0.5**	C64-65
Bladder	10	0	90	0	-	-	-	-	-	-	1	1	2	1	1	-	1	-	-	3	0.5	0.9	0.06	**0.8**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	23	0	70	0	2	1	3	1	1	-	-	2	5	1	2	3	1	-	-	1	1.1	2.1	0.14	**1.6**	C69
Brain and nervous system	4	0	25	0	-	-	1	2	1	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.01	**0.1**	C70-72
Thyroid	3	0	100	0	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	0.1	0.3	0.02	**0.3**	C73
Hodgkin lymphoma	3	0	100	0	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	**0.1**	C81
Non-Hodgkin lymphoma	17	0	71	0	-	3	1	-	-	-	-	2	-	2	1	2	2	2	2	-	0.8	1.5	0.15	**1.2**	C82-86, C96
Multiple myeloma	6	0	17	0	-	-	-	-	-	-	1	-	1	-	-	1	2	-	1	-	0.3	0.5	0.06	**0.5**	C90
Lymphoid leukaemia	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.1	0.00	**0.1**	C91
Myeloid leukaemia	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0.0	0.1	0.02	**0.1**	C92-94
Leukaemia, unspecified	6	0	33	0	2	2	-	1	-	-	-	1	-	-	-	-	-	-	-	-	0.3	0.5	0.02	**0.3**	C95
Other and unspecified	57	0	81	0	2	1	1	1	2	-	1	3	1	6	1	7	10	5	10	6	2.8	5.1	0.51	**4.1**	O&U
All sites	1116	0	66	0	14	10	8	16	13	18	38	55	47	56	87	118	157	125	157	197	54.1	100.0	9.40	**80.5**	C00-96
All sites except C44	1104	0	66	0	13	10	8	16	13	18	38	55	47	56	86	115	153	122	157	197	53.5	98.9	9.28	**79.6**	C00-96 exc. C44
Average annual population					77968	68156	71482	77196	48427	34009	23855	19122	13088	13614	15827	14822	12604	8393	7555	9723	515842				

South Africa, Eastern Cape, 8 districts (2013–2016)

Number of cases by age group and summary rates of incidence: females

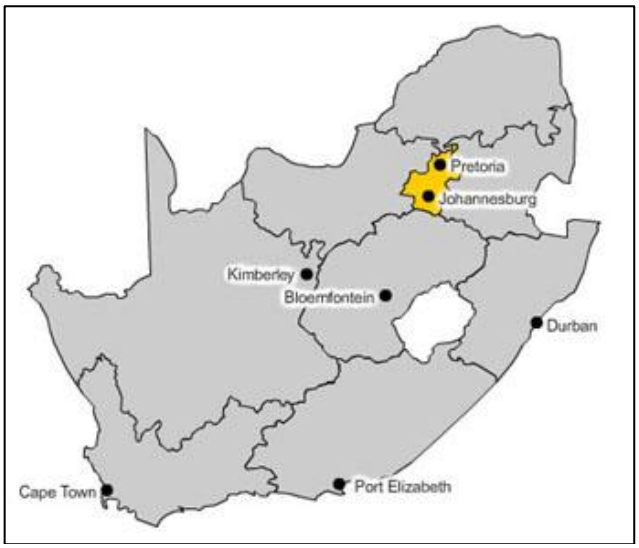
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	22	0	91	0	-	1	-	-	1	-	-	1	1	1	-	1	3	2	6	5	0.9	1.0	0.12	**0.9**	C00-06
Salivary gland	7	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	1	3	2	0.3	0.3	0.04	**0.3**	C07-08
Nasopharynx	2	0	100	0	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C11
Other pharynx	2	0	50	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	0.1	0.1	0.00	**0.1**	C09-10, C12-14
Oesophagus	388	0	58	0	-	-	-	-	-	-	-	2	11	18	34	45	50	40	85	103	16.4	17.9	2.12	**15.9**	C15
Stomach	14	0	86	0	-	-	-	-	-	-	1	-	-	1	4	2	2	1	1	2	0.6	0.6	0.07	**0.6**	C16
Colon	16	0	94	0	-	-	-	-	2	1	-	2	-	2	3	1	1	-	3	1	0.7	0.7	0.08	**0.7**	C18
Rectum	20	0	85	0	-	-	-	-	1	-	1	2	-	2	2	-	2	3	3	4	0.8	0.9	0.11	**0.9**	C19-20
Anus	5	0	100	0	-	-	-	-	-	-	1	1	1	-	1	-	-	-	-	1	0.2	0.2	0.02	**0.2**	C21
Liver	28	0	36	0	-	-	-	1	-	1	1	-	2	1	2	2	6	6	1	5	1.2	1.3	0.16	**1.3**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	7	0	43	0	-	-	-	-	-	-	-	1	-	-	-	4	-	1	-	1	0.3	0.3	0.04	**0.3**	C25
Larynx	5	0	80	0	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	1	0.2	0.2	0.03	**0.2**	C32
Trachea, bronchus, and lung	34	0	62	0	-	-	-	-	1	-	2	-	2	5	3	3	2	3	7	6	1.4	1.6	0.19	**1.5**	C33-34
Bone	7	0	71	0	-	-	2	1	-	1	-	1	-	-	-	-	1	-	-	1	0.3	0.3	0.02	**0.3**	C40-41
Melanoma of skin	8	0	75	0	-	-	-	-	-	-	-	-	-	1	1	-	-	3	1	2	0.3	0.4	0.05	**0.4**	C43
Non-melanoma skin	13	0	92	0	-	-	-	-	-	1	1	2	3	-	1	1	-	-	2	2	0.5	0.6	0.06	**0.6**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	105	0	70	0	-	1	1	2	15	21	22	16	9	9	3	1	1	1	2	1	4.4	4.8	0.43	**5.4**	C46
Connective and soft tissue	12	0	92	0	-	-	1	-	-	-	3	1	-	1	1	3	1	-	1	-	0.5	0.6	0.06	**0.6**	C47, C49
Breast	250	0	95	0	-	-	-	-	7	7	16	14	18	38	25	28	22	19	25	31	10.5	11.5	1.31	**11.9**	C50
Vulva	46	0	89	0	-	-	-	1	4	7	14	7	2	1	3	2	-	1	1	3	1.9	2.1	0.19	**2.3**	C51
Vagina	8	0	88	0	-	-	-	-	1	-	2	2	1	-	-	-	-	-	-	2	0.3	0.4	0.03	**0.4**	C52
Cervix uteri	869	0	85	0	-	-	-	1	7	36	62	95	105	88	87	86	89	67	66	80	36.6	40.1	4.65	**43.6**	C53
Uterus	58	0	88	0	-	-	-	-	3	-	1	-	3	5	3	7	6	5	10	15	2.4	2.7	0.29	**2.4**	C54-55
Ovary	61	0	95	0	1	1	-	-	4	3	6	5	6	5	7	2	6	7	3	5	2.6	2.8	0.31	**3.0**	C56
Placenta	6	0	33	0	-	-	-	1	2	-	-	2	-	1	-	-	-	-	-	-	0.3	0.3	0.02	**0.3**	C58
Kidney and renal pelvis	12	0	50	0	5	1	-	1	-	-	-	-	-	2	-	1	-	-	-	2	0.5	0.6	0.03	**0.5**	C64-65
Bladder	9	0	78	0	-	-	-	-	-	-	-	-	-	1	2	1	-	1	3	1	0.4	0.4	0.06	**0.4**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	20	0	85	0	4	1	-	-	-	-	1	2	6	-	3	-	1	1	-	1	0.8	0.9	0.08	**1.0**	C69
Brain and nervous system	9	0	56	0	2	3	-	-	1	-	-	-	-	1	-	1	1	-	-	-	0.4	0.4	0.03	**0.4**	C70-72
Thyroid	15	0	60	0	-	-	-	-	-	-	-	1	1	-	2	3	6	1	-	1	0.6	0.7	0.09	**0.8**	C73
Hodgkin lymphoma	3	0	100	0	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	**0.1**	C81
Non-Hodgkin lymphoma	26	0	77	0	-	2	-	1	-	2	2	2	3	3	1	2	3	1	2	2	1.1	1.2	0.13	**1.3**	C82-86, C96
Multiple myeloma	10	0	70	0	-	-	-	-	-	-	-	-	-	1	1	1	2	2	2	1	0.4	0.5	0.07	**0.5**	C90
Lymphoid leukaemia	3	0	100	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0.1	0.1	0.01	**0.1**	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C92-94
Leukaemia, unspecified	5	0	60	0	-	1	1	2	1	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	**0.2**	C95
Other and unspecified	62	0	87	0	2	-	2	1	5	2	1	4	2	2	8	5	4	4	9	11	2.6	2.9	0.29	**2.6**	O&U
All sites	2167	0	79	0	16	12	8	13	55	84	138	165	176	189	197	203	209	170	239	293	91.3	100.0	11.22	**102.0**	C00-96
All sites except C44	2154	0	79	0	16	12	8	13	55	83	137	163	173	189	196	202	209	170	237	291	90.8	99.4	11.16	**101.4**	C00-96 exc. C44
Average annual population					76200	66301	64183	72122	54055	36123	27686	26078	25238	26241	27545	21543	16762	12474	13581	26954	593086				

Republic of South Africa, National Cancer Registry of South Africa (NCR-SA)

The NCR-SA was established as a pathology-based cancer registry in 1986 by the then South African Institute of Medical Research, Pathology Division, and the Department of Health. NCR-SA is currently a division of the National Health Laboratory Services (NHLS).

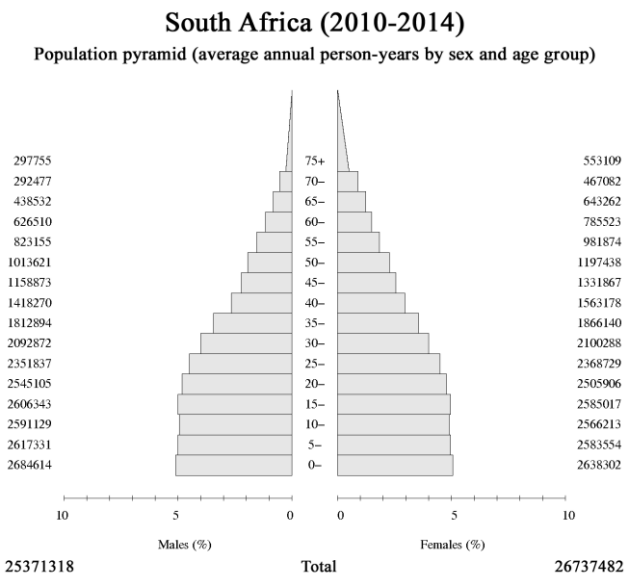
The pathology-based registry run by NCR-SA has 15 cancer registry staff including cancer coders, data capturers, a quality assurance manager and an operations manager. The historical lag in data capturing and analysis has been addressed with the recruitment of additional staff and automation of data capturing processes. The reporting lag of NCR-SA is now at 4 years, within international benchmarks for cancer surveillance reporting.

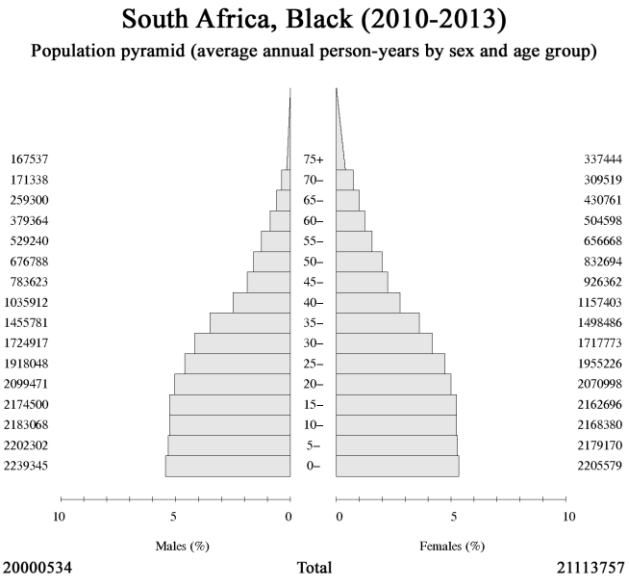
Being a pathology-based registry, the NCR-SA captures data for pathologically confirmed cancer cases including histology, cytology and bone marrow aspirates and trephines (BMAT). It obtains 100% notification from the public sector laboratories due to a data drawn directly from the public laboratory archives at the NHLS. As of April 2011, Regulation 380 of the National Health Act has made cancer a notifiable condition. Thus reporting from private healthcare laboratories has been improved. The registry receives between 90,000 to 110,000 cancer notifications annually, of which between 50,000 to 70,000 are new cancers.

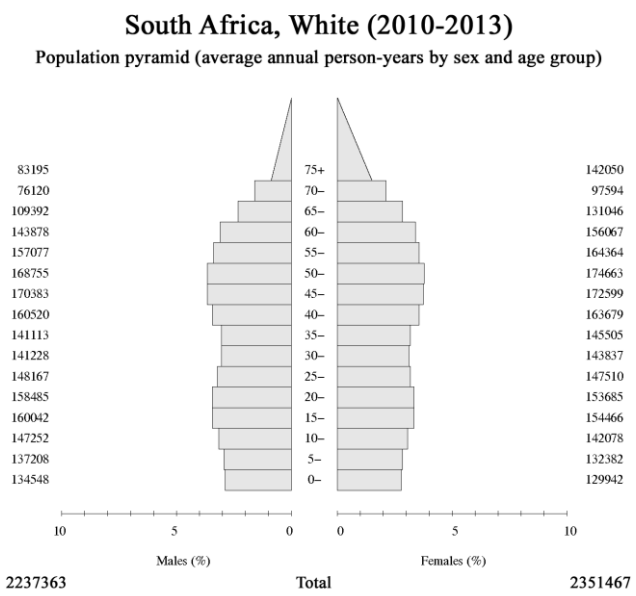


NCR-SA has been piloting a population-based registry at a sentinel site since 2016. The Ekurhuleni Health District in Gauteng has an approximate population of 3 million people, with 5 regional hospitals in the public health sector. The private health sector consists of eight cancer treatment centres and three hospices. A system of active reporting for every newly diagnosed cancer case to the NCR–SA has been established in both the private and public sector hospitals in this district. The first report from this registry was published in 2019 and provided valuable information regarding the status of cancer prevention and control services in South Africa to policy makers and health managers.

We present results for the five year period for the total population (2010-2014) of South Africa, and for a four-year period (2010-2013) separately for the black and white populations. The populations at risk are taken from the Statistics South Africa mid-year population estimates, which are available by race, sex and age group.







YEARS PRESENTED

Five year period, 2010-2014

COMMENT

As described above, the cancer cases are those reported from pathology laboratories country-wide. The results for the five-year period 2010-2014 are presented with incidence rates calculated using the national population estimates for the same years. The tables show numbers and rates for the total population, and separately for the black and white populations.

With the cases restricted to those diagnosed by pathology (MV=100%), as expected, the calculated rates are lower than the estimated average for Southern African (in Globocan 2018).The registrations in 2014 can be compared with death registrations in the same year, to calculate the ratio of deaths: cases (Table 4.03.)

Even allowing for misclassification of cause of death for liver, lung (metastases coded as primary site), there is likely under-recording of cases of oesophagus, liver, pancreas, lung (all difficult to biopsy) and leukaemia if BMAT are not performed.

Comparisons between incidence rates in the black and white populations must be interpreted with caution – not all of the difference is due to lifestyle (or genetics) – quite probably the proportion of cancers with histological verification of diagnosis will be higher in the white population (enhancing the rates based on pathology data). The exceptions (oesophagus, Kaposi sarcoma, cervix cancer) therefore certainly represent a higher incidence in blacks than whites. Conversely, the huge differential in rates of skin cancer (melanoma and non-melanoma) surely represents an excess in whites.

Summary

The data have the advantage of being fairly comprehensive (the great majority of pathology diagnoses are reported); although some of the cases will be non-residents (specimens are sent to South African labs from several neighbouring countries). Good national estimates of incidence could be made if one had data on the likely MV% (proportion of cases with a biopsy) in the SA population by sex, site (and, ideally, race) so that the recorded data could be appropriately scaled.

ICD-10 codes	MALES		FEMALES	
	Deaths	M/I%	Deaths	M/I%
Oral cavity and pharynx (C00-14)	3796	64.7	1628	59.6
Oesophagus (C15)	8628	181.7	5344	157.8
Stomach (C16)	3480	94.8	2343	114.0
Colon, rectum and anus (C18-21)	5977	65.9	5313	68.0
Liver (C22)	4904	518.9	3000	787.4
Pancreas (C25)	3309	447.2	3198	483.1
Larynx (C32)	1754	72.2	336	80.8
Lung (C33-34)	16839	202.1	8170	194.7
Melanoma of skin (C43)	920	25.7	676	20.8
Kaposi sarcoma	2324	40.9	1848	44.8
Breast (C50)	-	-	15029	39.9
Cervix uteri (C53)	-	-	15542	56.1
Other uterus (C54-55)	-	-	2465	43.1
Ovary (C56)	-	-	3394	141.1
Penis (C60)	192	25.3	-	-
Prostate (C61)	12957	41.0	-	-
Testis (C62)	247	30.8	-	-
Kidney etc. (C64-66)	1094	59.4	625	52.0
Bladder (C67)	1793	39.8	861	56.7
Brain, CNS (C70-72)	1349	131.6	1077	148.8
Thyroid (C73)	139	25.6	328	17.8
Lymphoma (C81-88,C90)	4639	67.5	4085	67.1
Leukaemia (C91-95)	2617	137.5	2238	159.2
All sites (C00-96)	91168	53.8	91314	52.4
All sites excl NMSC (C00-96/C44)	90367	82.5	90854	69.1

Table 4.03 Number of cancer deaths (WHO mortality database (WHO, 2017)), and M:I ratio (%) by sex, in South Africa, in 2010-2014.

PUBLICATIONS and ACHIEVEMENTS

The National Cancer Registry of South African became a member of AFCRN in 2012.

Singh E, Naidu G, Davies M, Bohlius J. HIV-associated malignancies in children. Curr. Opin. HIV AIDS 2017;12(1):77–83.

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South Africa (2010–2014)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	3886	94	100	1	3	2	1	14	23	39	91	184	381	609	699	691	443	302	309	3.1	2.3	0.53	**4.4**	C00-06
Salivary gland	548	4	100	2	1	9	2	6	10	21	19	33	46	65	57	68	61	60	84	0.4	0.3	0.07	**0.6**	C07-08
Nasopharynx	254	4	100	1	-	14	15	18	7	20	24	25	21	32	19	27	15	7	5	0.2	0.1	0.02	**0.2**	C11
Other pharynx	1178	31	100	1	1	2	-	2	3	7	22	40	87	168	254	216	162	113	69	0.9	0.7	0.17	**1.3**	C09-10, C12-14
Oesophagus	4749	210	100	-	-	-	-	4	9	30	68	174	368	706	805	787	589	478	521	3.7	2.8	0.67	**5.5**	C15
Stomach	3670	63	100	-	1	-	3	8	29	41	93	179	272	419	531	536	473	450	572	2.9	2.2	0.51	**4.3**	C16
Colon	5363	46	100	-	1	3	10	21	66	107	164	219	344	495	653	720	801	675	1038	4.2	3.2	0.73	**6.3**	C18
Rectum	3251	37	100	-	2	1	6	22	46	82	90	143	194	300	442	467	485	413	521	2.6	1.9	0.45	**3.8**	C19-20
Anus	454	5	100	-	-	1	2	5	7	23	30	37	46	54	53	57	51	39	44	0.4	0.3	0.06	**0.5**	C21
Liver	945	25	100	17	7	5	7	18	45	50	87	75	108	82	91	95	70	65	98	0.7	0.6	0.10	**1.0**	C22
Gallbladder etc.	435	9	100	-	1	-	-	-	2	2	12	32	38	43	52	67	72	45	60	0.3	0.3	0.06	**0.5**	C23-24
Pancreas	740	8	100	-	-	-	-	-	2	6	11	29	53	98	117	154	101	76	85	0.6	0.4	0.11	**0.9**	C25
Larynx	2430	61	100	-	-	-	-	2	9	8	21	76	194	324	454	491	324	264	202	1.9	1.4	0.36	**2.8**	C32
Trachea, bronchus, and lung	8332	118	100	4	1	4	4	7	12	33	111	304	661	1091	1428	1451	1212	955	936	6.6	4.9	1.22	**9.7**	C33-34
Bone	486	7	100	8	19	60	105	70	32	26	17	19	16	27	25	21	13	12	9	0.4	0.3	0.03	**0.4**	C40-41
Melanoma of skin	3583	48	100	3	2	1	17	32	44	114	166	226	255	322	374	454	451	433	641	2.8	2.1	0.46	**4.1**	C43
Non-melanoma skin	59975	561	100	7	12	22	43	122	349	757	1446	2524	3510	5101	6538	7894	8632	8223	14234	47.3	35.4	8.03	**71.9**	C44
Mesothelioma	571	7	100	-	-	-	-	-	-	1	3	11	20	57	86	95	98	85	108	0.5	0.3	0.09	**0.7**	C45
Kaposi sarcoma	5678	228	100	15	17	42	33	144	594	1088	1185	929	553	359	200	111	71	41	68	4.5	3.3	0.39	**4.5**	C46
Connective and soft tissue	1368	21	100	77	26	37	56	64	68	80	71	92	104	132	125	112	88	78	137	1.1	0.8	0.13	**1.3**	C47, C49
Breast	829	31	100	-	-	1	1	1	6	10	30	47	57	97	99	132	96	100	121	0.7	0.5	0.11	**1.0**	C50
Penis	760	30	100	-	-	-	-	2	8	49	81	104	92	95	68	68	67	44	52	0.6	0.4	0.08	**0.8**	C60
Prostate	31637	472	100	1	-	1	7	6	6	16	30	167	700	1986	3939	5761	6323	5628	6594	24.9	18.7	5.11	**39.9**	C61
Testis	803	6	100	16	8	5	53	84	137	139	109	96	57	37	15	17	10	6	8	0.6	0.5	0.05	**0.6**	C62
Kidney and renal pelvis	1794	8	100	187	55	9	7	11	16	21	39	88	141	192	227	262	211	175	145	1.4	1.1	0.23	**2.0**	C64-65
Bladder	4506	24	100	12	1	1	2	2	13	20	39	121	185	320	472	625	745	738	1186	3.6	2.7	0.64	**5.6**	C67
Ureter and other urinary	88	2	100	-	-	-	-	1	1	1	1	4	4	11	12	4	12	15	20	0.1	0.1	0.01	**0.1**	C66, C68
Eye	1534	64	100	117	21	4	7	11	69	193	274	254	170	115	82	52	29	29	43	1.2	0.9	0.12	**1.3**	C69
Brain and nervous system	1025	8	100	83	68	38	35	38	48	43	47	76	75	104	82	89	88	60	43	0.8	0.6	0.10	**1.0**	C70-72
Thyroid	542	8	100	-	3	1	4	14	21	37	45	60	43	68	67	52	57	40	22	0.4	0.3	0.06	**0.5**	C73
Hodgkin lymphoma	1182	20	100	19	66	64	84	79	114	153	157	130	100	64	51	33	19	15	14	0.9	0.7	0.08	**0.9**	C81
Non-Hodgkin lymphoma	4830	71	100	65	79	97	100	110	218	370	514	588	537	467	428	344	300	249	293	3.8	2.8	0.47	**4.6**	C82-86, C96
Multiple myeloma	763	7	100	-	-	-	-	2	2	16	30	53	73	91	117	113	96	77	86	0.6	0.5	0.10	**0.9**	C90
Lymphoid leukaemia	849	7	100	88	91	47	46	28	29	17	23	32	39	47	79	74	74	53	75	0.7	0.5	0.08	**0.8**	C91
Myeloid leukaemia	925	12	100	43	44	28	35	37	66	65	60	65	72	60	63	77	58	62	78	0.7	0.5	0.09	**0.9**	C92-94
Leukaemia, unspecified	129	4	100	17	7	5	11	6	9	3	7	9	8	2	8	6	8	7	12	0.1	0.1	0.01	**0.1**	C95
Other and unspecified	9401	303	100	60	22	25	52	70	113	186	307	539	862	1149	1381	1432	1117	844	939	7.4	5.5	1.24	**10.5**	O&U
All sites	169493	2664	100	844	559	529	748	1061	2233	3874	5524	7784	10486	15389	20193	23655	23522	20956	29472	133.6	100.0	22.82	**196.1**	C00-96
All sites except C44	109518	2103	100	837	547	507	705	939	1884	3117	4078	5260	6976	10288	13655	15761	14890	12733	15238	86.3	64.6	14.78	**124.2**	C00-96 exc. C44
Average annual population (thousands)				2684.6	2617.3	2591.1	2606.3	2545.1	2351.8	2092.9	1812.9	1418.3	1158.9	1013.6	823.2	626.5	438.5	292.5	297.8	25371.3				

South Africa (2010–2014)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	1912	40	100	3	3	6	7	16	25	38	51	70	169	263	254	258	225	187	297	1.4	1.1	0.18	**1.6**	C00-06
Salivary gland	395	5	100	-	7	8	14	11	18	21	25	24	36	47	39	26	30	29	55	0.3	0.2	0.03	**0.3**	C07-08
Nasopharynx	119	4	100	1	1	4	15	10	9	4	11	7	9	17	8	5	8	3	3	0.1	0.1	0.01	**0.1**	C11
Other pharynx	305	2	100	-	2	-	1	1	6	3	7	9	21	41	58	55	42	29	28	0.2	0.2	0.03	**0.3**	C09-10, C12-14
Oesophagus	3386	148	100	-	-	-	1	3	10	24	38	109	228	433	436	505	394	420	637	2.5	1.9	0.34	**2.9**	C15
Stomach	2055	50	100	-	-	-	5	5	34	43	92	125	160	195	212	243	242	238	411	1.5	1.2	0.19	**1.7**	C16
Colon	4595	48	100	-	-	2	2	17	47	75	141	213	366	433	498	537	625	561	1030	3.4	2.6	0.43	**3.8**	C18
Rectum	2618	38	100	-	-	1	5	14	44	71	104	133	193	252	322	333	323	275	510	2.0	1.5	0.24	**2.2**	C19-20
Anus	602	16	100	-	-	-	3	5	22	64	65	38	63	65	53	56	51	26	75	0.5	0.3	0.05	**0.5**	C21
Liver	381	13	100	11	6	3	5	9	23	24	28	26	29	30	33	28	38	31	44	0.3	0.2	0.03	**0.3**	C22
Gallbladder etc.	529	17	100	-	-	-	-	-	2	7	11	22	42	68	70	68	60	62	100	0.4	0.3	0.05	**0.4**	C23-24
Pancreas	662	6	100	1	1	-	4	1	3	9	15	22	41	56	94	116	104	90	99	0.5	0.4	0.07	**0.6**	C25
Larynx	416	7	100	-	-	1	-	2	2	8	13	15	34	49	74	67	63	40	41	0.3	0.2	0.04	**0.4**	C32
Trachea, bronchus, and lung	4196	38	100	1	1	2	2	7	19	29	55	119	253	445	586	652	741	628	618	3.1	2.4	0.47	**3.6**	C33-34
Bone	408	3	100	4	22	64	61	32	28	21	17	24	23	29	18	23	13	10	16	0.3	0.2	0.03	**0.3**	C40-41
Melanoma of skin	3243	43	100	3	1	8	23	35	93	150	205	249	282	328	317	340	305	282	579	2.4	1.9	0.28	**2.6**	C43
Non-melanoma skin	42550	483	100	5	14	23	43	155	396	764	1273	1928	2474	3392	4092	4853	5444	5282	11929	31.8	24.4	3.78	**35.1**	C44
Mesothelioma	218	2	100	-	-	-	-	1	2	2	1	5	7	26	28	33	38	33	40	0.2	0.1	0.02	**0.2**	C45
Kaposi sarcoma	4122	163	100	13	18	27	63	349	729	881	687	463	308	165	113	51	29	20	43	3.1	2.4	0.23	**2.9**	C46
Connective and soft tissue	1311	27	100	96	36	38	48	57	64	61	80	82	85	122	111	104	93	84	123	1.0	0.8	0.10	**1.0**	C47, C49
Breast	37660	561	100	-	-	3	21	89	463	1327	2364	3574	4396	4575	4497	4460	3662	3188	4480	28.2	21.6	3.48	**31.2**	C50
Vulva	1525	30	100	2	-	3	3	16	93	197	189	167	149	141	115	116	81	70	153	1.1	0.9	0.11	**1.2**	C51
Vagina	790	27	100	4	-	1	-	5	22	41	62	79	83	109	89	74	68	54	72	0.6	0.5	0.07	**0.6**	C52
Cervix uteri	27684	782	100	-	-	5	17	85	698	1845	3031	3511	3604	3420	3094	2476	1808	1471	1837	20.7	15.9	2.36	**22.3**	C53
Uterus	5725	92	100	1	1	2	4	13	18	47	83	157	271	402	712	1051	1013	887	971	4.3	3.3	0.64	**4.9**	C54-55
Ovary	2405	27	100	7	13	15	30	40	64	53	97	147	206	284	286	352	297	232	255	1.8	1.4	0.24	**2.0**	C56
Placenta	222	4	100	-	-	1	16	40	44	36	33	23	17	6	1	1	-	-	-	0.2	0.1	0.01	**0.2**	C58
Kidney and renal pelvis	1178	9	100	173	74	13	7	13	10	32	49	75	64	115	134	118	102	99	91	0.9	0.7	0.10	**1.0**	C64-65
Bladder	1518	24	100	3	1	-	1	2	7	27	41	68	80	130	143	188	187	217	399	1.1	0.9	0.14	**1.3**	C67
Ureter and other urinary	118	5	100	-	-	-	-	-	2	8	9	7	4	10	14	13	17	12	17	0.1	0.1	0.01	**0.1**	C66, C68
Eye	1958	78	100	109	15	3	5	44	181	321	389	332	197	103	47	50	23	18	43	1.5	1.1	0.12	**1.4**	C69
Brain and nervous system	724	2	100	59	55	39	18	20	27	37	40	44	53	50	73	67	60	41	39	0.5	0.4	0.06	**0.6**	C70-72
Thyroid	1842	13	100	-	2	5	35	60	124	162	184	217	214	198	180	154	101	95	98	1.4	1.1	0.15	**1.4**	C73
Hodgkin lymphoma	924	16	100	2	24	29	66	92	128	120	112	79	66	67	38	31	24	16	14	0.7	0.5	0.06	**0.7**	C81
Non-Hodgkin lymphoma	4298	69	100	32	27	50	63	106	281	426	509	511	393	305	312	288	286	240	400	3.2	2.5	0.33	**3.3**	C82-86, C96
Multiple myeloma	793	11	100	-	-	-	-	1	3	10	21	36	67	88	114	128	119	98	97	0.6	0.5	0.09	**0.7**	C90
Lymphoid leukaemia	558	6	100	78	53	31	23	14	17	14	13	16	20	27	52	38	49	38	69	0.4	0.3	0.04	**0.5**	C91
Myeloid leukaemia	768	4	100	42	15	25	36	56	56	44	60	74	57	49	61	44	52	39	54	0.6	0.4	0.06	**0.6**	C92-94
Leukaemia, unspecified	80	3	100	6	2	2	3	6	5	4	4	4	7	5	5	8	4	8	4	0.1	0.0	0.01	**0.1**	C95
Other and unspecified	9325	301	100	63	24	30	37	69	149	258	384	500	746	967	1125	1231	1073	1018	1350	7.0	5.4	0.90	**7.8**	O&U
All sites	174118	3217	100	719	418	444	687	1501	3968	7308	10593	13304	15517	17507	18508	19241	17894	16171	27121	130.2	100.0	15.57	**142.7**	C00-96
All sites except C44	131568	2734	100	714	404	421	644	1346	3572	6544	9320	11376	13043	14115	14416	14388	12450	10889	15192	98.4	75.6	11.80	**107.5**	C00-96 exc. C44
Average annual population (thousands)				2638.3	2583.6	2566.2	2585.0	2505.9	2368.7	2100.3	1866.1	1563.2	1331.9	1197.4	981.9	785.5	643.3	467.1	553.1	26737.5					

South Africa: Black (2010–2013)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	1481	39	100	1	1	2	1	10	7	20	29	81	144	263	276	261	147	106	93	1.9	3.6	0.40	**3.3**	C00-06
Salivary gland	198	1	100	1	1	3	2	2	7	13	10	15	20	32	27	22	11	17	14	0.2	0.5	0.05	**0.4**	C07-08
Nasopharynx	116	1	100	-	-	7	8	14	3	8	10	10	13	16	11	8	4	2	1	0.1	0.3	0.02	**0.2**	C11
Other pharynx	476	18	100	1	1	-	-	1	-	3	7	14	36	85	107	78	57	45	23	0.6	1.1	0.14	**1.1**	C09-10, C12-14
Oesophagus	2706	146	100	-	-	-	-	2	4	17	42	117	237	407	466	432	307	254	275	3.4	6.5	0.76	**6.2**	C15
Stomach	1006	28	100	-	1	-	1	7	12	18	33	65	84	140	156	154	113	105	89	1.3	2.4	0.28	**2.2**	C16
Colon	1057	17	100	-	1	1	4	6	32	42	60	69	111	139	159	141	100	70	105	1.3	2.5	0.25	**2.2**	C18
Rectum	688	16	100	-	1	1	3	14	18	37	42	41	61	82	94	95	68	58	57	0.9	1.7	0.17	**1.4**	C19-20
Anus	198	4	100	-	-	1	2	4	3	15	17	23	22	22	21	16	14	16	18	0.2	0.5	0.04	**0.4**	C21
Liver	498	17	100	10	6	5	5	10	29	34	54	48	74	45	51	30	31	20	29	0.6	1.2	0.09	**0.9**	C22
Gallbladder etc.	165	7	100	-	1	-	-	-	-	-	9	12	16	20	19	24	24	20	13	0.2	0.4	0.05	**0.4**	C23-24
Pancreas	172	4	100	-	-	-	-	-	1	2	6	9	17	28	30	35	15	12	13	0.2	0.4	0.05	**0.4**	C25
Larynx	1058	30	100	-	-	-	-	1	3	5	10	36	87	147	203	219	148	100	69	1.3	2.6	0.32	**2.5**	C32
Trachea, bronchus, and lung	2559	57	100	1	-	1	-	4	6	9	37	112	265	417	511	492	285	204	158	3.2	6.2	0.72	**5.8**	C33-34
Bone	215	3	100	3	13	35	50	39	18	9	5	7	7	12	5	5	1	1	2	0.3	0.5	0.02	**0.3**	C40-41
Melanoma of skin	300	8	100	1	1	-	2	5	4	11	17	22	20	38	32	35	28	35	41	0.4	0.7	0.08	**0.7**	C43
Non-melanoma skin	3022	63	100	3	5	7	11	28	63	98	173	194	242	322	350	366	308	323	466	3.8	7.3	0.75	**6.7**	C44
Mesothelioma	163	4	100	-	-	-	-	-	-	-	1	4	9	27	42	30	21	11	14	0.2	0.4	0.05	**0.4**	C45
Kaposi sarcoma	4149	157	100	12	14	30	25	106	430	771	902	677	414	273	144	79	50	30	35	5.2	10.0	0.50	**5.5**	C46
Connective and soft tissue	619	12	100	41	16	21	31	31	35	46	39	40	53	66	64	46	30	19	29	0.8	1.5	0.10	**1.0**	C47, C49
Breast	361	17	100	-	-	1	1	1	6	4	21	27	29	47	43	47	37	36	44	0.5	0.9	0.09	**0.8**	C50
Penis	416	19	100	-	-	-	-	1	3	41	52	65	41	64	34	30	27	21	18	0.5	1.0	0.08	**0.8**	C60
Prostate	9610	235	100	1	-	1	2	2	3	7	9	48	241	637	1310	1745	1673	1640	2056	12.0	23.2	3.13	**25.2**	C61
Testis	107	2	100	6	4	2	15	12	12	10	13	9	7	1	5	4	3	1	1	0.1	0.3	0.01	**0.1**	C62
Kidney and renal pelvis	404	4	100	119	31	5	3	8	8	7	10	21	22	41	44	26	24	17	14	0.5	1.0	0.07	**0.7**	C64-65
Bladder	565	6	100	3	1	-	1	-	8	4	8	35	44	65	68	84	75	66	97	0.7	1.4	0.15	**1.3**	C67
Ureter and other urinary	15	1	100	-	-	-	-	1	1	-	-	1	2	2	3	1	2	-	1	0.0	0.0	0.00	**0.0**	C66, C68
Eye	1016	47	100	65	11	3	3	6	52	136	205	176	121	73	47	28	14	12	17	1.3	2.4	0.13	**1.5**	C69
Brain and nervous system	245	3	100	28	30	18	13	13	16	13	14	21	13	18	17	15	9	3	1	0.3	0.6	0.03	**0.4**	C70-72
Thyroid	86	5	100	-	-	-	1	2	4	5	8	8	4	12	11	9	9	7	1	0.1	0.2	0.02	**0.2**	C73
Hodgkin lymphoma	587	6	100	10	44	35	44	33	57	78	87	68	53	34	21	11	5	1	-	0.7	1.4	0.06	**0.7**	C81
Non-Hodgkin lymphoma	2269	34	100	44	41	52	52	64	129	233	330	358	286	232	191	87	51	47	38	2.8	5.5	0.34	**3.5**	C82-86, C96
Multiple myeloma	287	3	100	-	-	-	-	1	1	10	17	28	32	39	49	37	24	24	22	0.4	0.7	0.07	**0.6**	C90
Lymphoid leukaemia	325	5	100	29	55	26	24	16	16	6	10	13	11	21	27	26	14	12	14	0.4	0.8	0.05	**0.5**	C91
Myeloid leukaemia	392	7	100	17	28	18	23	20	35	33	31	31	37	22	23	19	13	16	19	0.5	0.9	0.06	**0.6**	C92-94
Leukaemia, unspecified	55	3	100	14	3	2	9	3	4	1	5	3	2	2	1	1	-	1	1	0.1	0.1	0.01	**0.1**	C95
Other and unspecified	3894	161	100	29	13	16	30	38	61	92	151	247	432	553	598	561	369	273	270	4.9	9.4	0.98	**8.3**	O&U
All sites	41480	1190	100	439	323	293	366	505	1091	1838	2474	2755	3309	4444	5260	5299	4111	3625	4158	51.8	100.0	10.11	**87.2**	C00-96
All sites except C44	38458	1127	100	436	318	286	355	477	1028	1740	2301	2561	3067	4122	4910	4933	3803	3302	3692	48.1	92.7	9.36	**80.5**	C00-96 exc. C44
Average annual population (thousands)				2239.3	2202.3	2183.1	2174.5	2099.5	1918.0	1724.9	1455.8	1035.9	783.6	676.8	529.2	379.4	259.3	171.3	167.5	20000.5				

South Africa: Black (2010–2013)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	562	17	100	2	2	1	3	10	14	13	23	24	49	88	71	62	52	53	78	0.7	0.9	0.10	**0.9**	C00-06
Salivary gland	186	4	100	-	4	5	7	4	10	14	15	15	25	22	16	10	10	10	15	0.2	0.3	0.03	**0.3**	C07-08
Nasopharynx	59	1	100	1	-	2	11	5	7	3	6	2	5	8	2	2	3	1	-	0.1	0.1	0.01	**0.1**	C11
Other pharynx	95	1	100	-	2	-	1	1	5	1	3	3	6	11	16	18	10	7	10	0.1	0.2	0.02	**0.1**	C09-10, C12-14
Oesophagus	2096	97	100	-	-	-	-	3	3	14	26	69	138	270	255	329	239	265	388	2.5	3.5	0.39	**3.4**	C15
Stomach	688	28	100	-	-	-	4	4	20	23	39	58	60	59	80	76	62	78	97	0.8	1.1	0.12	**1.0**	C16
Colon	917	16	100	-	-	1	-	7	24	31	58	70	114	112	135	86	86	79	98	1.1	1.5	0.16	**1.4**	C18
Rectum	656	15	100	-	-	-	4	9	22	29	54	56	67	67	76	63	54	52	88	0.8	1.1	0.10	**1.0**	C19-20
Anus	291	8	100	-	-	-	2	1	16	45	41	22	31	28	26	22	11	10	28	0.3	0.5	0.04	**0.4**	C21
Liver	205	9	100	6	-	2	3	6	14	19	24	14	14	16	19	12	12	14	21	0.2	0.3	0.03	**0.3**	C22
Gallbladder etc.	235	9	100	-	-	-	-	-	-	5	7	14	23	43	34	30	20	21	29	0.3	0.4	0.04	**0.4**	C23-24
Pancreas	149	4	100	-	1	-	3	1	1	3	6	4	13	17	20	27	24	14	11	0.2	0.2	0.03	**0.2**	C25
Larynx	140	5	100	-	-	1	-	1	-	5	8	9	12	20	26	18	14	9	12	0.2	0.2	0.02	**0.2**	C32
Trachea, bronchus, and lung	875	13	100	-	-	1	2	3	10	12	20	25	77	113	138	139	112	124	86	1.0	1.5	0.18	**1.4**	C33-34
Bone	201	1	100	3	12	39	37	16	16	13	10	13	9	7	6	10	2	3	4	0.2	0.3	0.02	**0.2**	C40-41
Melanoma of skin	534	20	100	2	1	4	6	4	8	11	26	29	38	40	53	65	43	63	121	0.6	0.9	0.09	**0.8**	C43
Non-melanoma skin	2705	42	100	4	6	6	12	58	130	158	208	185	199	233	241	231	205	248	539	3.2	4.5	0.39	**3.9**	C44
Mesothelioma	58	0	100	-	-	-	-	-	1	1	1	2	5	14	9	5	7	7	6	0.1	0.1	0.01	**0.1**	C45
Kaposi sarcoma	3097	124	100	11	14	24	42	255	556	657	524	349	227	124	84	40	23	14	29	3.7	5.2	0.28	**3.5**	C46
Connective and soft tissue	630	15	100	53	13	20	28	32	33	32	46	43	42	63	47	43	33	37	50	0.7	1.1	0.08	**0.9**	C47, C49
Breast	12428	264	100	-	-	2	11	45	231	636	1040	1431	1615	1595	1455	1218	861	858	1166	14.7	20.7	1.98	**18.4**	C50
Vulva	774	12	100	1	-	2	3	11	71	127	121	90	87	60	56	48	26	24	35	0.9	1.3	0.10	**1.0**	C51
Vagina	452	16	100	3	-	-	-	5	14	28	41	48	50	62	48	34	34	31	38	0.5	0.8	0.07	**0.7**	C52
Cervix uteri	18071	496	100	-	-	4	13	58	468	1210	1960	2294	2305	2189	1956	1616	1210	1025	1267	21.4	30.2	2.79	**26.1**	C53
Uterus	2567	46	100	-	1	2	2	8	10	20	39	60	115	154	306	482	440	431	451	3.0	4.3	0.54	**4.2**	C54-55
Ovary	722	12	100	6	10	12	17	14	30	24	32	67	69	74	86	88	74	47	60	0.9	1.2	0.12	**1.1**	C56
Placenta	147	2	100	-	-	1	10	27	32	23	19	17	14	2	-	-	-	-	-	0.2	0.2	0.01	**0.2**	C58
Kidney and renal pelvis	421	5	100	106	53	10	6	8	7	18	22	29	21	34	28	36	17	14	7	0.5	0.7	0.05	**0.6**	C64-65
Bladder	357	16	100	1	-	-	-	1	3	14	13	31	33	49	44	36	30	38	48	0.4	0.6	0.06	**0.5**	C67
Ureter and other urinary	64	3	100	-	-	-	-	-	1	7	7	4	3	7	8	7	8	3	6	0.1	0.1	0.01	**0.1**	C66, C68
Eye	1399	47	100	71	5	1	4	32	133	243	298	233	155	61	35	36	15	8	22	1.7	2.3	0.14	**1.7**	C69
Brain and nervous system	179	0	100	25	27	18	6	2	11	8	8	7	18	11	18	12	5	2	1	0.2	0.3	0.02	**0.2**	C70-72
Thyroid	472	2	100	-	-	4	9	10	32	48	49	43	65	47	44	39	29	24	27	0.6	0.8	0.07	**0.7**	C73
Hodgkin lymphoma	456	7	100	2	12	10	27	43	64	67	62	47	45	28	16	14	6	4	2	0.5	0.8	0.05	**0.5**	C81
Non-Hodgkin lymphoma	2069	32	100	18	16	26	42	63	192	283	345	319	223	152	113	73	60	40	72	2.4	3.5	0.24	**2.6**	C82-86, C96
Multiple myeloma	316	5	100	-	-	-	-	1	-	5	14	16	39	44	48	46	38	29	31	0.4	0.5	0.06	**0.5**	C90
Lymphoid leukaemia	221	5	100	27	30	18	10	8	6	8	8	8	9	11	11	11	13	14	24	0.3	0.4	0.03	**0.3**	C91
Myeloid leukaemia	332	3	100	12	8	16	24	32	31	26	31	32	25	18	23	15	14	11	11	0.4	0.6	0.04	**0.4**	C92-94
Leukaemia, unspecified	41	3	100	4	2	1	1	4	3	2	1	3	3	3	1	3	3	3	1	0.0	0.1	0.01	**0.1**	C95
Other and unspecified	4047	176	100	36	13	18	25	41	93	172	194	271	353	441	465	479	398	389	483	4.8	6.8	0.70	**6.1**	O&U
All sites	59914	1581	100	394	232	251	375	833	2322	4058	5449	6056	6401	6397	6115	5581	4303	4104	5462	70.9	100.0	9.19	**86.3**	C00-96
All sites except C44	57209	1539	100	390	226	245	363	775	2192	3900	5241	5871	6202	6164	5874	5350	4098	3856	4923	67.7	95.5	8.80	**82.4**	C00-96 exc. C44
Average annual population (thousands)				2205.6	2179.2	2168.4	2162.7	2071.0	1955.2	1717.8	1498.5	1157.4	926.4	832.7	656.7	504.6	430.8	309.5	337.4	21113.8				

South Africa: White (2010–2013)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	986	8	100	-	-	-	-	-	5	9	29	36	86	131	181	173	123	92	113	11.0	1.4	0.82	**7.1**	C00-06
Salivary gland	160	1	100	-	-	-	-	2	2	3	2	5	8	12	11	21	27	28	38	1.8	0.2	0.13	**1.1**	C07-08
Nasopharynx	36	0	100	1	-	2	2	-	1	2	1	3	1	7	2	6	4	2	2	0.4	0.1	0.03	**0.3**	C11
Other pharynx	252	1	100	-	-	-	-	-	1	1	9	6	14	28	60	44	38	31	19	2.8	0.4	0.23	**1.8**	C09-10, C12-14
Oesophagus	605	6	100	-	-	-	-	1	-	6	6	12	32	77	92	111	82	96	84	6.8	0.9	0.53	**4.2**	C15
Stomach	1100	4	100	-	-	-	-	-	5	7	21	39	61	81	146	175	159	155	247	12.3	1.6	0.87	**7.6**	C16
Colon	2168	3	100	-	-	1	1	5	12	26	42	59	96	168	214	302	393	318	528	24.2	3.2	1.72	**15.1**	C18
Rectum	1217	8	100	-	-	-	-	2	8	11	11	37	61	90	164	165	222	187	251	13.6	1.8	1.01	**8.4**	C19-20
Anus	87	0	100	-	-	-	-	-	-	2	3	5	6	10	11	12	16	8	14	1.0	0.1	0.07	**0.6**	C21
Liver	152	1	100	1	1	-	-	2	2	1	6	5	7	9	11	34	20	18	34	1.7	0.2	0.12	**1.1**	C22
Gallbladder etc.	120	0	100	-	-	-	-	-	-	-	2	12	7	5	14	25	20	9	26	1.3	0.2	0.09	**0.8**	C23-24
Pancreas	280	2	100	-	-	-	-	-	1	2	3	7	13	31	40	65	44	31	41	3.1	0.4	0.23	**1.9**	C25
Larynx	495	5	100	-	-	-	-	-	2	-	5	10	26	62	82	90	74	80	59	5.5	0.7	0.44	**3.4**	C32
Trachea, bronchus, and lung	2170	13	100	1	-	-	1	2	1	10	16	55	111	206	287	355	378	319	415	24.2	3.2	1.81	**14.9**	C33-34
Bone	105	0	100	1	1	6	19	7	8	-	5	4	6	10	14	8	6	7	3	1.2	0.2	0.09	**1.1**	C40-41
Melanoma of skin	2097	17	100	-	-	-	7	19	30	62	102	131	161	177	223	274	280	249	365	23.4	3.1	1.70	**15.6**	C43
Non-melanoma skin	37435	281	100	-	1	9	22	58	184	435	828	1498	2215	3155	4093	5026	5483	5145	9002	418.3	54.5	29.03	**262.4**	C44
Mesothelioma	225	0	100	-	-	-	-	-	-	-	1	2	3	9	20	36	48	47	59	2.5	0.3	0.19	**1.5**	C45
Kaposi sarcoma	179	1	100	-	-	-	2	6	18	33	35	31	20	9	8	4	2	3	7	2.0	0.3	0.15	**1.8**	C46
Connective and soft tissue	277	3	100	8	2	4	8	8	5	14	10	23	18	15	19	31	26	28	55	3.1	0.4	0.21	**2.4**	C47, C49
Breast	174	3	100	-	-	-	-	-	-	2	2	10	11	13	19	35	20	24	35	1.9	0.3	0.14	**1.2**	C50
Penis	94	0	100	-	-	-	-	-	-	1	2	5	7	9	14	15	15	11	15	1.1	0.1	0.08	**0.7**	C60
Prostate	10555	31	100	-	-	-	2	1	1	2	10	64	198	633	1218	1891	2311	1958	2235	117.9	15.4	9.17	**70.5**	C61
Testis	368	1	100	4	-	2	19	39	65	70	48	49	29	17	5	8	4	4	4	4.1	0.5	0.31	**4.0**	C62
Kidney and renal pelvis	665	2	100	16	6	2	1	-	4	5	14	31	49	73	83	121	88	95	75	7.4	1.0	0.59	**5.1**	C64-65
Bladder	2203	1	100	2	-	1	1	-	3	5	16	39	69	127	210	282	373	393	681	24.6	3.2	1.68	**14.8**	C67
Ureter and other urinary	39	0	100	-	-	-	-	-	-	-	-	1	-	6	6	2	4	8	12	0.4	0.1	0.03	**0.3**	C66, C68
Eye	104	1	100	9	1	1	-	1	-	6	8	8	5	9	12	13	7	8	15	1.2	0.2	0.08	**0.9**	C69
Brain and nervous system	372	0	100	20	11	2	9	13	13	11	18	23	32	49	29	43	49	31	19	4.2	0.5	0.33	**3.4**	C70-72
Thyroid	239	0	100	-	2	-	-	7	9	10	15	24	20	34	31	25	27	24	11	2.7	0.3	0.21	**1.9**	C73
Hodgkin lymphoma	190	2	100	2	4	5	15	24	16	18	20	18	14	10	11	7	10	8	6	2.1	0.3	0.16	**2.0**	C81
Non-Hodgkin lymphoma	956	4	100	4	12	10	7	8	26	35	35	60	69	82	92	123	131	108	150	10.7	1.4	0.79	**7.5**	C82-86, C96
Multiple myeloma	181	3	100	-	-	-	-	-	-	1	3	9	10	16	22	36	29	26	26	2.0	0.3	0.16	**1.3**	C90
Lymphoid leukaemia	222	1	100	17	8	10	12	2	3	1	8	5	12	10	27	24	23	23	36	2.5	0.3	0.18	**2.1**	C91
Myeloid leukaemia	225	0	100	7	1	3	2	7	11	9	13	15	15	15	16	28	26	27	30	2.5	0.3	0.19	**1.9**	C92-94
Leukaemia, unspecified	37	0	100	1	3	2	-	-	-	-	1	3	3	-	4	1	5	5	9	0.4	0.1	0.03	**0.3**	C95
Other and unspecified	1964	20	100	12	4	3	6	9	13	16	43	84	123	198	266	305	311	246	305	21.9	2.9	1.65	**14.3**	O&U
All sites	68734	423	100	106	57	63	136	223	449	816	1393	2428	3618	5593	7757	9916	10878	9852	15026	768.0	100.0	55.25	**485.5**	C00-96
All sites except C44	31299	142	100	106	56	54	114	165	265	381	565	930	1403	2438	3664	4890	5395	4707	6024	349.7	45.5	26.21	**223.1**	C00-96 exc. C44
Average annual population (thousands)				134.5	137.2	147.3	160.0	158.5	148.2	141.2	141.1	160.5	170.4	168.8	157.1	143.9	109.4	76.1	83.2	2237.4				

South Africa: White (2010–2013)

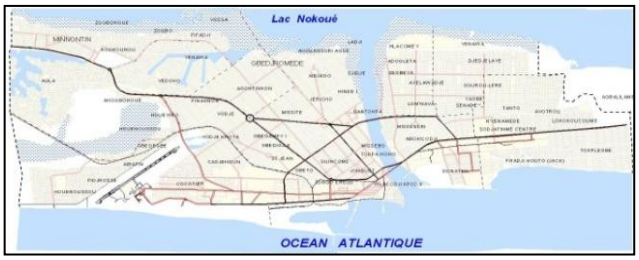
Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	549	5	100	-	-	1	2	1	3	11	11	14	46	65	60	78	75	72	105	5.8	1.0	0.39	**3.4**	C00-06
Salivary gland	76	0	100	-	-	1	5	2	-	2	-	1	3	9	9	7	11	4	22	0.8	0.1	0.05	**0.5**	C07-08
Nasopharynx	11	0	100	-	-	1	1	1	1	-	-	1	-	4	-	1	1	-	-	0.1	0.0	0.01	**0.1**	C11
Other pharynx	83	0	100	-	-	-	-	-	1	-	1	3	3	7	18	20	14	8	8	0.9	0.2	0.06	**0.5**	C09-10, C12-14
Oesophagus	262	4	100	-	-	-	-	-	1	-	2	3	24	29	34	39	33	28	65	2.8	0.5	0.17	**1.5**	C15
Stomach	488	2	100	-	-	-	1	-	4	5	10	18	27	46	45	67	65	65	133	5.2	0.9	0.32	**2.8**	C16
Colon	1840	6	100	-	-	-	1	4	9	16	34	61	99	126	186	221	270	270	537	19.6	3.4	1.19	**10.4**	C18
Rectum	902	3	100	-	-	-	-	-	4	7	12	30	52	71	136	128	131	115	213	9.6	1.7	0.61	**5.2**	C19-20
Anus	108	2	100	-	-	-	1	2	1	2	3	6	8	11	10	14	15	8	25	1.1	0.2	0.07	**0.7**	C21
Liver	60	1	100	1	2	1	1	-	3	-	1	4	5	5	2	6	16	5	7	0.6	0.1	0.05	**0.5**	C22
Gallbladder etc.	136	1	100	-	-	-	-	-	-	1	1	-	6	6	12	22	19	18	50	1.4	0.3	0.08	**0.7**	C23-24
Pancreas	240	0	100	-	-	-	1	-	-	2	1	4	15	18	32	50	37	34	46	2.6	0.4	0.17	**1.4**	C25
Larynx	104	1	100	-	-	-	-	-	-	-	2	2	14	10	16	18	18	14	9	1.1	0.2	0.08	**0.7**	C32
Trachea, bronchus, and lung	1446	9	100	-	-	1	-	1	4	3	12	36	55	135	162	237	266	242	283	15.4	2.7	1.07	**8.3**	C33-34
Bone	75	0	100	1	3	8	6	5	3	2	4	3	8	7	3	7	5	4	6	0.8	0.1	0.06	**0.7**	C40-41
Melanoma of skin	1658	11	100	1	-	-	11	20	60	88	108	139	165	176	161	160	157	131	270	17.6	3.1	1.17	**11.9**	C43
Non-melanoma skin	25642	269	100	-	4	6	21	52	144	378	698	1085	1468	2019	2459	2998	3336	3282	7423	272.6	47.4	16.28	**149.2**	C44
Mesothelioma	90	1	100	-	-	-	-	1	1	-	-	2	1	6	12	13	21	12	20	1.0	0.2	0.06	**0.5**	C45
Kaposi sarcoma	131	2	100	1	1	-	2	9	27	24	22	17	7	8	7	-	1	-	3	1.4	0.2	0.11	**1.4**	C46
Connective and soft tissue	220	1	100	9	7	5	4	6	6	6	13	5	16	17	19	29	22	25	30	2.3	0.4	0.17	**1.8**	C47, C49
Breast	10804	62	100	-	-	-	-	9	72	208	484	781	1064	1271	1268	1497	1346	1084	1658	114.9	20.0	7.82	**70.6**	C50
Vulva	211	1	100	-	-	-	-	-	4	9	6	15	9	28	9	26	22	20	62	2.2	0.4	0.13	**1.3**	C51
Vagina	84	0	100	-	-	-	-	-	2	2	5	4	6	14	12	10	14	8	7	0.9	0.2	0.07	**0.6**	C52
Cervix uteri	1792	18	100	-	-	-	-	7	63	122	209	245	249	239	221	147	111	67	94	19.1	3.3	1.37	**14.2**	C53
Uterus	1014	4	100	-	-	-	-	3	1	10	12	41	70	89	126	164	184	143	167	10.8	1.9	0.76	**6.1**	C54-55
Ovary	766	2	100	-	2	1	5	5	13	11	30	23	64	100	87	131	107	85	100	8.1	1.4	0.58	**5.1**	C56
Placenta	15	0	100	-	-	-	1	3	2	3	3	-	-	2	-	1	-	-	-	0.2	0.0	0.01	**0.2**	C58
Kidney and renal pelvis	337	0	100	13	6	1	-	-	1	5	8	22	15	32	48	38	49	49	50	3.6	0.6	0.26	**2.4**	C64-65
Bladder	578	0	100	-	-	-	-	1	1	5	5	5	17	34	49	78	80	95	208	6.1	1.1	0.35	**3.0**	C67
Ureter and other urinary	24	0	100	-	-	-	-	-	-	-	-	1	-	2	3	1	6	6	5	0.3	0.0	0.02	**0.1**	C66, C68
Eye	74	1	100	5	-	2	-	1	5	4	5	13	3	10	1	4	2	5	13	0.8	0.1	0.05	**0.7**	C69
Brain and nervous system	235	0	100	11	7	6	5	5	6	15	13	17	21	17	26	23	25	24	14	2.5	0.4	0.19	**2.1**	C70-72
Thyroid	622	1	100	-	1	-	11	22	46	44	60	81	68	83	52	58	29	33	33	6.6	1.2	0.48	**5.2**	C73
Hodgkin lymphoma	148	0	100	-	1	5	18	13	22	15	16	8	5	7	7	6	9	10	6	1.6	0.3	0.12	**1.5**	C81
Non-Hodgkin lymphoma	814	5	100	4	2	6	5	13	23	21	40	31	43	59	87	93	110	100	172	8.7	1.5	0.57	**5.4**	C82-86, C96
Multiple myeloma	160	2	100	-	-	-	-	-	-	2	1	7	9	11	19	25	33	25	26	1.7	0.3	0.12	**0.9**	C90
Lymphoid leukaemia	148	0	100	21	4	4	4	3	2	-	5	1	4	6	21	14	18	16	25	1.6	0.3	0.11	**1.4**	C91
Myeloid leukaemia	159	0	100	5	2	6	3	4	6	6	5	13	8	17	22	14	12	13	23	1.7	0.3	0.12	**1.3**	C92-94
Leukaemia, unspecified	23	0	100	2	-	1	1	1	1	1	1	-	3	-	3	3	1	4	1	0.2	0.0	0.02	**0.2**	C95
Other and unspecified	1923	14	100	7	2	3	1	2	12	18	58	65	115	173	232	260	281	272	408	20.4	3.6	1.36	**11.7**	O&U
All sites	54052	428	100	81	44	59	111	196	554	1048	1901	2807	3795	4969	5676	6708	6952	6396	12327	574.7	100.0	36.69	**336.2**	C00-96
All sites except C44	28410	159	100	81	40	53	90	144	410	670	1203	1722	2327	2950	3217	3710	3616	3114	4904	302.0	52.6	20.40	**187.0**	C00-96 exc. C44
Average annual population (thousands)				129.9	132.4	142.1	154.5	153.7	147.5	143.8	145.5	163.7	172.6	174.7	164.4	156.1	131.0	97.6	142.0	2351.5				

Benin, Cotonou

The Cotonou Cancer Registry, established by the Benin Ministry of Health in 2014, is a population based cancer registry under the control of the National Program for the Fight against Noncommunicable Diseases (PNLMNT). Cancer registration in Benin first started in 2013, in the pathology department of the University of Benin's health sciences faculty.

The registry is supervised by a committee, whose president is an epidemiologist and coordinator of the PNLMNT. The registry has a team of five members (one medical director, one deputy medical director and three epidemiologists) who are responsible for data collection and management. The Registry is financed by the PNLMNT. Visits to data sources are by public transport or in personal vehicles; there is a budget for fuel but no dedicated registry vehicle.



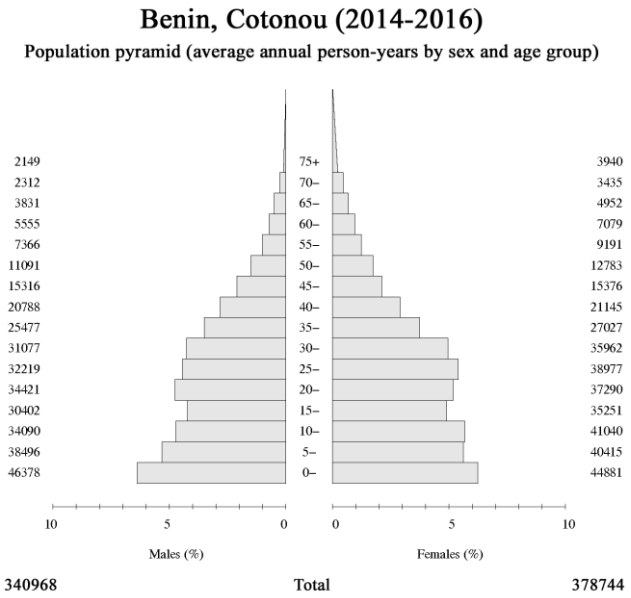
The registry's catchment area is the city of Cotonou, which is subdivided into 13 arrondissements. The largest ethnic group in Cotonou is the Fon followed by Yoruba, Goun, Mina, Xueda, and Aja, and many others. The largest religious group in Benin is Roman Catholicism, followed closely by Islam, Vodun and Protestantism.

The population was estimated to be 678,874 at the census in 2013. For the period presented here (2014-2016) the population at risk is based on annual projections by the Institut National de la Statistique et de l'Analyse Economique (2015).

The registry collects information from 28 sources (9 Hospitals, 14 private clinics, 5 private pathology laboratories) where patients may be diagnosed, treated or hospitalized.

The Centre National Hospitalier Universitaire (CNHU) is by far the largest hospital, and the only centre with specialist services, although there is no separate oncology department nor radiotherapy service. It is the most important source of information for the registry.

Case finding in hospitals is through visits by the cancer registrar to all services where cancer patients may be treated. Only Hospital Menontin has a central records section with a proper index of patients (both inpatient and outpatient), with demographic and diagnostic details on computer. Elsewhere, case finding is through regular scrutiny of ward registers. Generally these include diagnosis, but full information (on personal data – especially address – and details such as histological type) requires tracing the clinical records from wherever they have been stored in each service. A "focal point" has been identified in each service (generally the head nurse). Focal point personnel received some training in cancer registration principles and methods.



There is no systematic death registration, even for hospital deaths.

The registry use CanReg 5 for data entry, management and quality control. The registry has well developed security procedures to maintain confidentiality of documents and computer files.

YEARS PRESENTED

Three year period, 2014 – 2016

COMMENT

1084 cancer cases were registered in the three year period 2014-2016, 607 cases (56.0%) in women (ASR 78.3 per 10^5) and 477 cases (44.0%) in men (ASR 90.3 per 10^5). 64.5% of cases were morphologically verified.

Breast and cervical cancer accounted for half (50.2%) of all cancers in women. Breast cancer (ASR 22.6 per 10^5) was more common than cervical cancer (ASR 14.8 per 10^5), both values being significantly lower than the average for West Africa and the mean age of cases was lower.

The incidence of prostate cancer (one quarter of all cancers in men), 29.3 per 10^5, was similar to that in other West African registries. Cancers of the liver and digestive tract were also relatively common in both sexes.

Summary

The rates reported are lower than those for the first 2 years of registration, reported in CIA volume II. This is probably because of the inclusion of prevalent cases in the data from the early period, as well as some under-estimation of the population at risk.

PUBLICATIONS and ACHIEVEMENTS

The Cotnou Cancer Registry became a member of AFCRN in 2015.

Egue M, Gnangnon FHR, Akele-Akpo MT, Maxwell Parkin D. Cancer incidence in Cotonou (Benin), 2014-2016: First results from the cancer Registry of Cotonou. Cancer Epidemiol. 2019 ;59:46-50.

Joko-Fru WY, Miranda-Filho A, Soerjomataram I, Egue M, Akele-Akpo MT, N'da G, et al. Breast cancer survival in sub-Saharan Africa by age, stage at diagnosis and Human Development Index (HDI): A population-based registry study. Int J Cancer. 2019 May 14. doi:10.1002/ijc.32406.

Akele-Akpo MT, Egue M. (2016) Biennial Report 2014-2015: Cancer incidence in Cotonou. Cotonou, Benin

Benin, Cotonou (2014–2016)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	6	0	67	0	-	-	-	1	1	-	-	1	1	-	-	1	-	-	1	-	0.6	1.3	0.12	**0.8**	C00-06
Salivary gland	9	0	33	0	1	-	-	-	1	-	1	2	-	-	-	-	2	-	1	1	0.9	1.9	0.16	**1.5**	C07-08
Nasopharynx	4	0	75	0	-	-	-	-	2	-	-	-	-	1	-	1	-	-	-	-	0.4	0.8	0.04	**0.5**	C11
Other pharynx	7	0	71	0	-	-	-	1	1	1	1	1	-	1	-	-	1	-	-	-	0.7	1.5	0.07	**0.8**	C09-10, C12-14
Oesophagus	24	0	75	0	-	-	-	-	-	-	-	1	2	-	4	3	3	5	4	2	2.3	5.0	0.75	**5.2**	C15
Stomach	29	0	62	0	-	-	-	-	-	1	-	2	3	2	4	4	6	4	1	2	2.8	6.1	0.64	**5.5**	C16
Colon	25	0	80	0	-	-	-	-	-	-	-	1	2	5	4	4	1	3	4	1	2.4	5.2	0.68	**4.7**	C18
Rectum	15	0	80	0	-	-	-	-	-	-	-	1	1	2	3	3	2	2	-	1	1.5	3.1	0.30	**2.7**	C19-20
Anus	9	0	67	0	-	-	-	-	-	2	1	-	1	1	2	-	-	1	1	-	0.9	1.9	0.18	**1.3**	C21
Liver	53	0	11	0	-	-	-	-	-	4	3	11	7	3	6	4	4	3	3	5	5.2	11.1	0.84	**8.2**	C22
Gallbladder etc.	5	0	60	0	-	-	-	-	-	-	-	1	-	1	1	-	-	-	1	1	0.5	1.0	0.10	**1.0**	C23-24
Pancreas	11	0	27	0	-	-	-	-	-	-	1	-	2	-	3	2	2	1	-	-	1.1	2.3	0.22	**1.8**	C25
Larynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.2	0.03	**0.2**	C32
Trachea, bronchus, and lung	7	0	43	0	-	-	-	-	-	-	-	-	2	-	1	1	1	1	-	1	0.7	1.5	0.13	**1.3**	C33-34
Bone	13	0	69	0	-	-	1	2	1	1	1	4	-	1	-	-	-	1	1	-	1.3	2.7	0.18	**1.5**	C40-41
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C43
Non-melanoma skin	16	0	62	0	-	-	-	1	-	-	1	3	4	2	-	-	1	-	2	2	1.6	3.4	0.26	**2.5**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	3	0	100	0	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	0.3	0.6	0.04	**0.4**	C46
Connective and soft tissue	2	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	0.2	0.4	0.04	**0.3**	C47, C49
Breast	9	0	78	0	-	-	-	-	-	-	-	-	1	-	1	-	3	3	1	-	0.9	1.9	0.32	**2.0**	C50
Penis	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.2	0.00	**0.3**	C60
Prostate	111	0	45	0	-	-	-	-	-	-	-	1	-	-	5	11	17	20	22	35	10.9	23.3	3.30	**29.3**	C61
Testis	4	0	25	0	-	-	1	1	-	-	-	-	-	-	1	-	-	-	-	1	0.4	0.8	0.03	**0.6**	C62
Kidney and renal pelvis	12	0	75	0	-	1	-	-	-	-	-	1	1	1	4	-	1	2	1	-	1.2	2.5	0.28	**2.0**	C64-65
Bladder	12	0	8	0	-	-	-	-	-	-	1	1	-	2	2	1	1	2	2	-	1.2	2.5	0.35	**2.2**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	2	0	100	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0.2	0.4	0.08	**0.4**	C69
Brain and nervous system	11	0	18	0	-	-	-	-	-	-	4	1	-	-	-	-	3	-	3	-	1.1	2.3	0.33	**1.9**	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C73
Hodgkin lymphoma	8	0	100	0	-	-	1	1	-	2	-	2	2	-	-	-	-	-	-	-	0.8	1.7	0.05	**0.7**	C81
Non-Hodgkin lymphoma	10	0	70	0	-	-	1	-	1	-	1	1	1	-	1	-	3	1	-	-	1.0	2.1	0.18	**1.5**	C82-86, C96
Multiple myeloma	9	0	100	0	-	-	-	-	1	-	-	1	1	2	3	-	-	1	-	-	0.9	1.9	0.13	**1.2**	C90
Lymphoid leukaemia	13	0	100	0	-	2	2	-	-	-	-	1	-	-	1	-	-	1	1	5	1.3	2.7	0.16	**2.7**	C91
Myeloid leukaemia	18	0	100	0	-	-	-	2	1	4	3	2	2	-	1	-	2	-	1	-	1.8	3.8	0.23	**2.1**	C92-94
Leukaemia, unspecified	2	0	100	0	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	0.2	0.4	0.03	**0.3**	C95
Other and unspecified	16	0	69	0	-	-	-	3	1	-	1	-	2	3	-	1	2	1	-	2	1.6	3.4	0.20	**2.6**	O&U
All sites	477	0	57	0	2	3	6	13	10	15	19	40	35	29	48	37	57	52	51	60	46.6	100.0	10.41	**90.3**	C00-96
All sites except C44	461	0	56	0	2	3	6	12	10	15	18	37	31	27	48	37	56	52	49	58	45.1	96.6	10.16	**87.8**	C00-96 exc. C44
Average annual population					46378	38496	34090	30402	34421	32219	31077	25477	20788	15316	11091	7366	5555	3831	2312	2149	340967				

Benin, Cotonou (2014–2016)

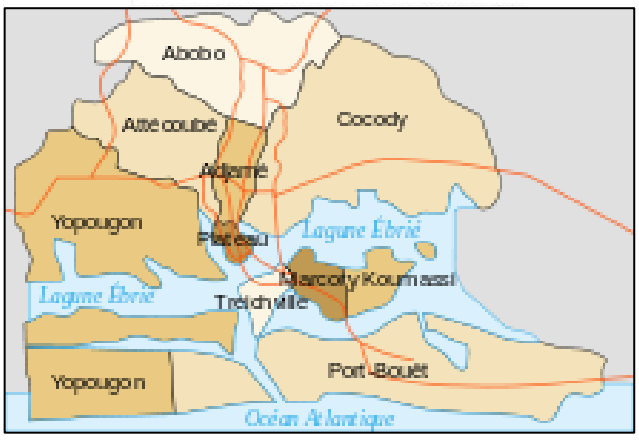
Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	5	0	40	0	-	-	-	-	1	-	-	-	-	-	-	-	1	2	1	-	0.4	0.8	0.14	**0.9**	C00-06
Salivary gland	6	0	50	0	-	-	-	-	-	-	-	-	-	-	1	1	1	2	1	-	0.5	1.0	0.17	**1.1**	C07-08
Nasopharynx	3	0	100	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	1	0.3	0.5	0.01	**0.3**	C11
Other pharynx	10	0	50	0	-	-	2	-	-	-	1	-	2	-	2	2	1	-	-	-	0.9	1.6	0.11	**1.1**	C09-10, C12-14
Oesophagus	15	0	67	0	-	-	-	-	-	-	-	1	-	-	2	2	5	1	2	2	1.3	2.5	0.32	**2.5**	C15
Stomach	17	0	82	0	-	-	-	1	-	-	-	2	2	1	3	-	4	1	1	2	1.5	2.8	0.26	**2.4**	C16
Colon	16	0	69	0	-	-	-	-	-	-	1	1	2	4	2	2	2	1	-	1	1.4	2.6	0.21	**2.1**	C18
Rectum	6	0	50	0	-	-	-	-	-	-	-	1	-	3	1	-	-	1	-	-	0.5	1.0	0.09	**0.8**	C19-20
Anus	3	0	100	0	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	0.3	0.5	0.05	**0.4**	C21
Liver	19	0	5	0	-	-	-	-	-	-	-	1	1	3	4	1	5	1	1	2	1.7	3.1	0.32	**2.9**	C22
Gallbladder etc.	4	0	75	0	-	-	-	-	-	1	-	-	-	1	1	-	-	1	-	-	0.4	0.7	0.06	**0.5**	C23-24
Pancreas	14	0	0	0	-	-	-	-	-	-	-	1	1	2	1	1	2	5	1	-	1.2	2.3	0.33	**2.3**	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C32
Trachea, bronchus, and lung	6	0	67	0	-	-	-	-	-	-	1	-	-	1	1	-	1	-	2	-	0.5	1.0	0.15	**0.9**	C33-34
Bone	14	0	64	0	1	-	4	1	2	1	1	-	-	1	1	1	1	-	-	-	1.2	2.3	0.11	**1.3**	C40-41
Melanoma of skin	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.2	0.02	**0.2**	C43
Non-melanoma skin	14	0	64	0	-	1	-	-	-	-	1	2	2	3	2	1	1	-	1	-	1.2	2.3	0.19	**1.7**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C46
Connective and soft tissue	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.1	0.2	0.02	**0.1**	C47, C49
Breast	194	0	74	0	-	-	-	-	3	7	24	20	34	30	28	16	14	6	5	7	17.1	32.0	2.30	**22.6**	C50
Vulva	4	0	100	0	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	0.4	0.7	0.08	**0.7**	C51
Vagina	1	0	100	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.1**	C52
Cervix uteri	104	0	85	0	-	-	-	-	2	2	5	8	9	11	14	8	16	9	8	12	9.2	17.1	1.68	**14.8**	C53
Uterus	23	0	87	0	-	-	-	-	-	-	-	1	1	1	-	3	5	4	7	1	2.0	3.8	0.67	**4.0**	C54-55
Ovary	22	0	55	0	-	-	1	1	2	1	1	1	4	1	1	3	3	2	1	-	1.9	3.6	0.33	**2.7**	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C58
Kidney and renal pelvis	10	0	20	0	1	1	-	-	-	1	1	-	-	-	3	1	2	-	-	-	0.9	1.6	0.12	**1.2**	C64-65
Bladder	3	0	67	0	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	0.3	0.5	0.03	**0.4**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	12	0	67	0	5	1	-	-	-	2	1	2	-	-	-	-	1	-	-	-	1.1	2.0	0.07	**1.1**	C69
Brain and nervous system	7	0	29	0	-	-	-	1	-	2	-	1	-	2	-	-	1	-	-	-	0.6	1.2	0.06	**0.7**	C70-72
Thyroid	7	0	100	0	-	-	-	-	-	2	-	-	1	1	1	-	-	1	-	1	0.6	1.2	0.07	**0.9**	C73
Hodgkin lymphoma	2	0	100	0	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	0.2	0.3	0.01	**0.1**	C81
Non-Hodgkin lymphoma	10	0	50	0	1	2	2	1	2	-	-	-	1	-	-	-	1	-	-	-	0.9	1.6	0.07	**0.9**	C82-86, C96
Multiple myeloma	4	0	100	0	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-	-	0.4	0.7	0.08	**0.6**	C90
Lymphoid leukaemia	7	0	100	0	-	-	-	-	-	-	1	-	-	-	1	-	3	2	-	-	0.6	1.2	0.16	**1.2**	C91
Myeloid leukaemia	18	0	100	0	1	-	-	-	1	1	2	2	3	2	3	-	2	-	1	-	1.6	3.0	0.21	**2.0**	C92-94
Leukaemia, unspecified	2	0	100	0	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3	0.01	**0.2**	C95
Other and unspecified	23	0	91	0	1	-	1	-	2	1	2	3	3	4	-	2	2	-	1	1	2.0	3.8	0.25	**2.5**	O&U
All sites	607	0	71	0	11	5	11	5	15	23	43	48	68	73	77	47	77	41	33	30	53.4	100.0	8.77	**78.3**	C00-96
All sites except C44	593	0	71	0	11	4	11	5	15	23	42	46	66	70	75	46	76	41	32	30	52.2	97.7	8.58	**76.6**	C00-96 exc. C44
Average annual population					44881	40415	41040	35251	37290	38977	35962	27027	21145	15376	12783	9191	7079	4952	3435	3940	378745				

Côte d'Ivoire, Abidjan

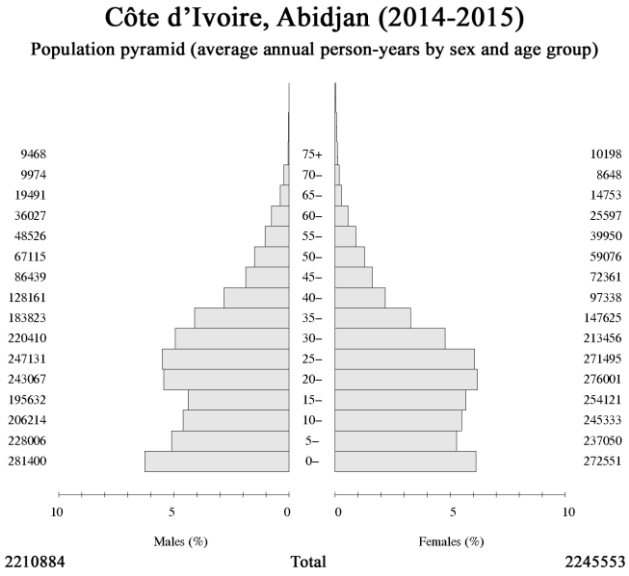
The Registre des Cancers d'Abidjan was established in 1994 under the leadership of the Ministry of Health and Public Hygiene and IARC. It served as a population based cancer registry from 1995 to 2000. The operation of the registry was then interrupted for 10 years due to political instability in the country. The registry restarted in late 2011 as the initiative of the National Program for the Fight against Cancer (PNLCa) to record all cancer cases in the city of Abidjan and suburbs. The registry is located in the offices of the PNLCa, whose Coordinating Director oversees the activities of the registry. A Coordinator manages the day-to-day work of the registry, assisted by a full-time data clerk and three data collectors.

Staff are paid by the state from the PNLCa budget. Apart from the registry director, who is a state employee, all other registry employees are contractors. Their contract is renewed each year. Transportation costs, particularly travel costs, are covered by the PNLCa budget. Specific research studies are funded by project partners. The national cancer control program, which is the technical structure of the government that deals with the subject of cancer, draws on the registry data to develop its cancer control policies and uses it to prioritize the fight against cancer.



The Registre du Cancer d'Abidjan covers the city of Abidjan and some of its suburbs (Alépé, Anyama, Bingerville, Bonoua, Dabou, and Grand-Bassam).

The data presented in this volume are specifically for the city of Abidjan, which consists of 10 communes: Abobo, Adjamé, Attécoubé, Cocody, Koumassi, Marcory, Plateau, Port-Bouët, Treichville, and Yopougon.



The most recent census of the population was in 2014 by the National Institute of Statistics with an estimated population of 4,395,243 inhabitants. The projection for 2015 assumes linear increase after 2014 at the rate observed in 2009-2014.

The main sources of information are the three major teaching hospitals (CHU) of the city- Treichville, Cocody and Yopougon- with each offering a full range of diagnostic and treatment services. A new public teaching hospital has been created, although so far, it sees very few cancer patients. Other public hospitals in the area are relatively small. There is also a military hospital and a number of small private clinics, some of which have been an important source of cases (such as the Polychinique International St. Anne-Marie).

There is an oncology department at the CHU of Treichville; a national center for radiotherapy and medical oncology at the CHU of Cocody; two oncopediatric units at the CHU of Treichville and the Mother-Child Hospital; and a haematology department at the CHU of Yopougon which treats a large number of lymphomas and hematological malignancies. The department of paediatrics at the CHU of Cocody provides paediatric oncology services.

There are three major pathology institutes – in the CHUs of Treichville and Cocody, and the private clinic Wilic. All three

provide only basic histopathology examination. For specialized diagnostic procedures (immunohistochemical), specimens must be sent to centres in Europe or the USA.

None of the hospitals have a centralized registration system. Medical records are kept in each service. In general, each department maintains a register of admissions and discharges, and these records include: hospital number, name, age, sex and diagnosis (as well as the exit status), but not the residential address. Some non-oncology services (for example, ENT at CHU Treichville) keep a record of cancer patients.

Case finding is active, which requires regular visits to the sources of information. Data are abstracted by hand onto the notification form. Passive registration - records completed by physicians or focal points - is rarely used.

Death certificates are completed for deaths occurring in hospital, with cause of death certified by doctors. Deaths at home are often the subject of forensic autopsy in one of the pathology departments. The use of death certificate as a source of information is recent and certificates are found in the archives of the administrative offices of hospitals.

The database of the initial registration period (1994-2002) in CanReg4 was recovered by IARC and has now been merged with the more recent records (since 2012) in CanReg5.

The principal difficulties encountered by the registry relate to the inadequate diagnostic capacity (as in several countries of sub-Saharan Africa), poor record keeping, and the lack of stable funding.

YEARS PRESENTED

Two year period, 2014-2015

COMMENT

The age-adjusted incidence rate (for all sites) for males changed from ASR 83.7 (1995-1997) to 69.9 (2012-2013) and rose to 103.8 per 10^5 in 2014-15.

For women, the rates increased from ASR 98.6 (1995-1997) to 113.3 (2012-2013) and to 132.5 per 10^5 in 2014-2015.

In women, 54.5% of cancers were either breast (ASR 39.6 per 10^5) or cervix (ASR 30.3 per 10^5). In males, prostate cancer was the most common (30.1% of cases, ASR 46.9 per 10^5) followed by liver cancer (12.4%, ASR 9.7 per 10^5).

Morphological confirmation although significantly improved from 60.6% to 69.8% compared to the previous report, remains rather low, while death certificate only registrations now comprise 7.6% of cases.

PUBLICATIONS and ACHIEVEMENTS

The Abidjan Cancer Registry became a member of AFCRN in 2013.

N'da GG, Ayemou A, Adoubi I, Parkin DM. (2016) Registre du Cancer d'Abidjan Rapport Biennal: 2014 – 2015. Abidjan, Cote d'Ivoire

N'da GG, Ayemou A, Adoubi I etc. (2015) Registre du Cancer d'Abidjan Rapport Biennal: 2012 – 2013. Abidjan, Cote d'Ivoire

Echimane AK, Ahnoux AA, Adoubi I, Hien S, M'Bra K, D'Horpock A, et al. Cancer incidence in Abidjan, Ivory Coast: first results from the cancer registry, 1995-1997. Cancer. 2000 Aug 1;89(3):653-63.

Cancer in Africa Volume II. IARC scientific publication. Lyon, France: International Agency for Research.

Côte d´Ivoire, Abidjan (2014–2015)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	27	0	81	0	1	1	-	-	1	-	1	3	4	4	4	4	1	1	-	2	0.6	1.3	0.08	**1.0**	C00-06
Salivary gland	19	0	79	0	-	1	-	-	1	3	-	4	5	1	1	2	-	-	1	-	0.4	0.9	0.06	**0.5**	C07-08
Nasopharynx	18	0	50	11	-	1	-	-	-	1	1	2	6	2	2	2	1	-	-	-	0.4	0.9	0.05	**0.5**	C11
Other pharynx	11	0	91	0	-	-	-	1	-	-	-	3	-	3	-	1	1	2	-	-	0.2	0.5	0.05	**0.4**	C09-10, C12-14
Oesophagus	17	0	82	12	-	-	-	-	-	-	1	2	3	-	2	-	3	2	1	3	0.4	0.8	0.09	**0.9**	C15
Stomach	83	0	81	7	-	-	-	-	-	2	1	3	4	7	13	12	14	5	15	7	1.9	4.1	0.68	**4.8**	C16
Colon	82	0	72	9	-	-	-	-	-	1	5	3	12	9	14	8	11	7	9	3	1.9	4.1	0.55	**3.9**	C18
Rectum	20	0	80	10	-	-	-	-	-	1	-	1	2	2	4	3	2	4	-	1	0.5	1.0	0.11	**0.9**	C19-20
Anus	12	0	58	0	-	-	-	-	1	2	-	1	3	1	-	-	2	1	1	-	0.3	0.6	0.06	**0.5**	C21
Liver	243	0	14	19	2	1	-	2	4	13	21	33	30	29	27	19	18	20	9	15	5.5	12.1	1.04	**9.7**	C22
Gallbladder etc.	7	0	57	29	-	-	-	-	-	1	-	-	-	2	-	1	2	1	-	-	0.2	0.3	0.04	**0.3**	C23-24
Pancreas	35	0	14	20	-	-	-	-	1	-	1	5	-	4	3	4	8	5	1	3	0.8	1.7	0.20	**1.8**	C25
Larynx	30	0	83	0	-	-	-	-	-	-	-	3	-	4	3	3	6	3	3	5	0.7	1.5	0.20	**1.8**	C32
Trachea, bronchus, and lung	58	0	50	19	-	-	-	-	-	1	-	4	6	7	9	5	7	9	1	9	1.3	2.9	0.29	**3.1**	C33-34
Bone	46	0	67	9	4	3	3	4	4	4	8	3	3	3	2	-	3	-	1	1	1.0	2.3	0.10	**1.2**	C40-41
Melanoma of skin	4	0	50	0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	1	0.1	0.2	0.03	**0.3**	C43
Non-melanoma skin	36	0	86	3	-	-	1	2	1	-	2	1	6	4	7	3	3	2	3	1	0.8	1.8	0.19	**1.5**	C44
Mesothelioma	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	0.0	0.1	0.05	**0.2**	C45
Kaposi sarcoma	41	0	66	2	1	-	-	-	-	2	1	8	11	6	2	5	3	2	-	-	0.9	2.0	0.13	**1.3**	C46
Connective and soft tissue	36	0	81	3	3	-	2	2	6	2	3	5	3	2	2	2	-	1	3	-	0.8	1.8	0.14	**1.1**	C47, C49
Breast	18	0	94	0	-	-	-	1	-	-	2	2	1	4	6	1	1	-	-	-	0.4	0.9	0.05	**0.6**	C50
Penis	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.0	0.01	**0.1**	C60
Prostate	591	0	73	7	-	-	-	-	-	-	-	-	1	4	26	54	108	133	127	138	13.4	29.5	6.03	**46.9**	C61
Testis	3	0	33	0	1	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	0.1	0.1	0.01	**0.1**	C62
Kidney and renal pelvis	32	0	50	3	8	6	2	2	-	-	1	-	4	1	2	-	3	2	-	1	0.7	1.6	0.08	**1.0**	C64-65
Bladder	20	0	55	10	-	-	-	-	-	1	-	1	2	2	1	1	6	4	1	1	0.5	1.0	0.14	**1.1**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	45	0	64	0	18	4	2	-	1	2	1	2	2	3	3	1	1	1	1	3	1.0	2.2	0.10	**1.5**	C69
Brain and nervous system	26	0	15	38	1	4	-	2	1	2	2	-	2	3	2	2	1	2	-	2	0.6	1.3	0.08	**1.0**	C70-72
Thyroid	7	0	100	0	-	-	-	-	-	2	-	1	-	-	1	-	1	1	1	-	0.2	0.3	0.05	**0.3**	C73
Hodgkin lymphoma	25	1	96	4	-	2	-	4	4	3	3	1	3	1	-	-	1	1	-	1	0.6	1.2	0.05	**0.7**	C81
Non-Hodgkin lymphoma	162	0	91	2	4	29	14	6	5	7	11	10	16	13	13	8	13	4	4	5	3.7	8.1	0.50	**5.3**	C82-86, C96
Multiple myeloma	27	0	89	0	1	1	-	1	1	-	-	2	2	5	3	3	5	1	1	1	0.6	1.3	0.12	**1.1**	C90
Lymphoid leukaemia	10	0	90	10	-	-	-	1	3	-	1	-	1	2	1	-	-	1	-	-	0.2	0.5	0.03	**0.3**	C91
Myeloid leukaemia	25	0	100	0	-	1	-	2	2	1	2	3	1	4	2	4	2	-	1	-	0.6	1.2	0.09	**0.8**	C92-94
Leukaemia, unspecified	27	0	70	19	-	-	3	2	1	2	5	1	2	4	1	1	1	2	1	1	0.6	1.3	0.10	**0.9**	C95
Other and unspecified	154	1	58	18	3	3	2	3	10	5	11	8	13	17	21	13	17	16	8	3	3.5	7.7	0.80	**6.3**	O&U
All sites	2001	2	65	9	47	57	29	35	49	58	84	115	148	153	178	163	247	233	196	207	45.3	100.0	12.41	**103.8**	C00-96
All sites except C44	1965	2	64	9	47	57	28	33	48	58	82	114	142	149	171	160	244	231	193	206	44.4	98.2	12.21	**102.3**	C00-96 exc. C44
Average annual population					281400	228006	206214	195632	243067	247131	220410	183823	128160	86438	67114	48526	36026	19490	9974	9468	2210880				

Côte d´Ivoire, Abidjan (2014–2015)

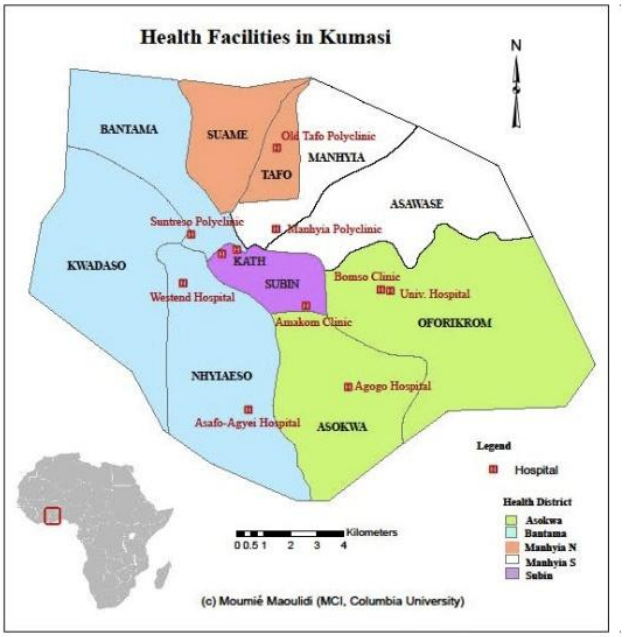
Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	25	0	84	0	-	-	-	-	-	2	2	2	3	2	1	2	3	2	4	2	0.6	0.9	0.22	**1.5**	C00-06
Salivary gland	17	0	71	0	-	1	1	1	-	-	2	1	2	2	2	-	3	1	-	1	0.4	0.6	0.07	**0.8**	C07-08
Nasopharynx	17	0	71	0	-	1	1	1	2	-	6	-	3	1	-	-	2	-	-	-	0.4	0.6	0.04	**0.5**	C11
Other pharynx	8	0	25	12	-	-	-	-	1	-	1	1	-	1	1	-	1	1	-	1	0.2	0.3	0.04	**0.4**	C09-10, C12-14
Oesophagus	6	0	67	0	-	-	-	-	-	-	-	1	1	1	-	1	1	-	-	1	0.1	0.2	0.02	**0.3**	C15
Stomach	82	0	71	13	-	-	-	-	-	-	1	7	8	5	12	5	15	8	8	13	1.8	2.9	0.65	**5.6**	C16
Colon	59	0	71	5	-	-	-	-	-	1	3	3	2	6	5	12	12	6	2	7	1.3	2.1	0.41	**3.7**	C18
Rectum	40	0	72	5	-	-	-	-	1	-	5	6	8	5	3	5	1	1	1	4	0.9	1.4	0.15	**1.7**	C19-20
Anus	13	0	62	0	-	-	-	-	1	1	-	2	1	3	-	-	2	2	-	1	0.3	0.5	0.07	**0.7**	C21
Liver	105	0	22	19	2	-	-	1	1	3	5	11	11	12	12	13	12	6	8	8	2.3	3.7	0.68	**5.7**	C22
Gallbladder etc.	21	0	43	10	-	-	-	-	-	1	2	1	3	2	2	4	3	-	1	2	0.5	0.7	0.11	**1.1**	C23-24
Pancreas	32	0	12	22	-	-	-	-	-	-	-	2	-	8	7	3	3	4	1	4	0.7	1.1	0.21	**2.0**	C25
Larynx	2	0	50	0	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	0.0	0.1	0.02	**0.1**	C32
Trachea, bronchus, and lung	23	0	61	17	-	-	-	-	-	1	-	1	2	3	4	2	1	3	4	2	0.5	0.8	0.22	**1.5**	C33-34
Bone	32	0	47	9	-	1	2	2	2	3	6	6	1	1	2	1	2	3	-	-	0.7	1.1	0.12	**1.0**	C40-41
Melanoma of skin	8	1	75	0	-	1	-	-	-	-	-	-	-	-	1	1	3	1	-	-	0.2	0.3	0.07	**0.5**	C43
Non-melanoma skin	48	0	90	2	-	-	1	2	5	-	6	5	5	6	3	3	6	1	2	3	1.1	1.7	0.22	**2.1**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	37	0	46	3	2	-	1	-	1	5	12	3	4	4	-	4	-	-	-	1	0.8	1.3	0.08	**1.0**	C46
Connective and soft tissue	36	0	86	3	3	3	3	4	2	3	3	2	3	5	-	1	2	2	-	-	0.8	1.3	0.11	**1.1**	C47, C49
Breast	939	1	85	4	-	-	-	3	10	26	86	158	133	140	122	107	67	42	18	26	20.9	33.5	4.31	**39.6**	C50
Vulva	10	0	90	0	-	-	-	-	-	-	1	1	2	2	1	2	1	-	-	-	0.2	0.4	0.04	**0.4**	C51
Vagina	13	0	100	0	-	-	-	-	-	-	-	3	-	-	4	3	-	-	1	2	0.3	0.5	0.07	**0.7**	C52
Cervix uteri	565	2	80	5	-	-	-	1	4	7	25	45	61	76	97	84	59	54	22	28	12.6	20.1	3.61	**30.3**	C53
Uterus	67	0	67	9	-	-	-	-	-	-	-	3	2	5	9	10	10	10	8	10	1.5	2.4	0.63	**4.9**	C54-55
Ovary	86	0	51	13	-	-	2	3	3	3	7	5	8	12	13	9	7	7	4	3	1.9	3.1	0.50	**4.1**	C56
Placenta	21	0	76	10	-	-	-	1	3	2	5	2	3	3	-	1	-	1	-	-	0.5	0.7	0.06	**0.6**	C58
Kidney and renal pelvis	31	0	32	0	14	1	1	1	-	2	1	-	-	1	4	2	1	-	-	3	0.7	1.1	0.06	**1.1**	C64-65
Bladder	14	0	43	0	-	-	-	-	-	-	-	1	1	3	2	1	1	2	1	2	0.3	0.5	0.10	**0.9**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	53	0	55	2	17	-	3	2	2	1	4	6	4	4	3	3	2	1	-	1	1.2	1.9	0.13	**1.6**	C69
Brain and nervous system	28	0	21	29	-	1	2	1	1	-	3	4	1	1	2	1	5	5	1	-	0.6	1.0	0.20	**1.4**	C70-72
Thyroid	28	1	57	4	-	-	-	1	1	4	2	2	3	1	4	3	1	3	-	2	0.6	1.0	0.12	**1.2**	C73
Hodgkin lymphoma	15	0	100	0	-	-	-	-	1	3	3	2	2	2	-	-	-	2	-	-	0.3	0.5	0.06	**0.5**	C81
Non-Hodgkin lymphoma	127	0	91	0	9	17	18	5	4	5	3	14	14	10	8	6	5	4	2	3	2.8	4.5	0.40	**4.2**	C82-86, C96
Multiple myeloma	21	0	86	5	-	-	-	-	2	2	-	1	1	-	2	4	3	5	1	-	0.5	0.7	0.18	**1.3**	C90
Lymphoid leukaemia	7	0	86	14	-	1	1	1	-	-	2	-	-	-	1	1	-	-	-	-	0.2	0.2	0.02	**0.2**	C91
Myeloid leukaemia	8	0	100	0	-	-	-	3	-	-	-	2	-	-	1	1	-	-	-	1	0.2	0.3	0.02	**0.3**	C92-94
Leukaemia, unspecified	21	0	86	14	2	2	2	2	-	5	3	-	-	-	2	2	-	-	-	1	0.5	0.7	0.04	**0.6**	C95
Other and unspecified	141	1	62	16	1	3	3	2	3	3	8	13	11	15	24	13	8	13	9	11	3.1	5.0	0.87	**7.4**	O&U
All sites	2806	6	74	6	50	32	41	37	51	83	207	316	303	342	354	310	242	191	98	143	62.5	100.0	14.92	**132.5**	C00-96
All sites except C44	2758	6	73	7	50	32	40	35	46	83	201	311	298	336	351	307	236	190	96	140	61.4	98.3	14.70	**130.4**	C00-96 exc. C44
Average annual population					272551	237050	245332	254121	276000	271494	213456	147625	97338	72360	59076	39950	25596	14752	8648	10198	2245548				

Ghana, Kumasi

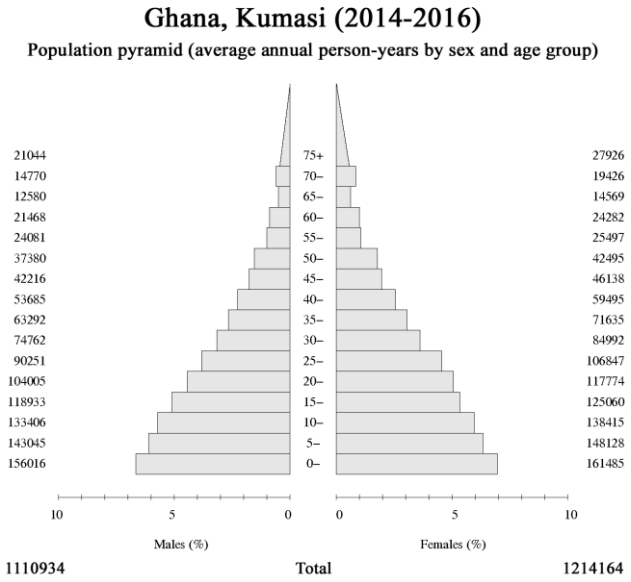
The Kumasi Cancer Registry started with the commencement of radiotherapy and oncology services at Komfo Anokye Teaching Hospital (KATH) in 2004. Located in the city of Kumasi, the regional capital of the Ashanti region in the centre of Ghana, KATH is the second largest teaching hospital in Ghana. The Radiotherapy center in Kumasi is the second National Radiotherapy and Nuclear Medicine centre in Ghana covering the Northern sector of the country with current average population of 15 million people.

The registry is recognized by the Ministry of Health and there are plans to expand cancer registration to the Northern and Southern parts of Ghana. The goal is to develop a National Population Based Cancer Registry. The Kumasi cancer registry is also recognized by the Ashanti Regional Coordinating Council, which has donated a building facility to be used as the registry office.



The Kumasi cancer registry is located at KATH under the supervision of the hospital's Public Health Unit and Oncology Directorate. The registry has an advisory board comprising of heads of departments and senior staff of KATH, the Kumasi Metro director of health services, and the medical directors of the Ghana health services facilities which contribute data to the registry. The staff comprise a director, a registry manager/ coordinator and 5 part-time registrars. The registry has been supported by the AFCRN through sponsorships including training of two registrars. The University of Michigan through a collaborative research has also supported the remuneration of registry staff and purchase of registry equipment. Private support has been received from individuals with an interest and passion for the registry.

Based on the most recent population and housing census in 2010, using annual projections by the Ghana Statistical Service, the average annual population for the period 2014-2016 was 2.32 million.



The registry is the first and currently the only population-based registry in Ghana. At its inception, over 70% cancer cases recorded were diagnosed clinically because there were challenges with the anatomical pathology services of the hospital. The head of department, with the support of KATH management, collaborated with the department of pathology at University of North Norway at Tromso to overcome these challenges. The collaboration led to increased capacity in both human and logistical resources, and enhanced the anatomical and other pathology services for cancer diagnosis at KATH. Cancer data collection was extended to include other clinical departments from 2008 to 2010, after a Fulbright scholar from the USA with knowledge in cancer registration spent six months at the KATH oncology service to assist in the training of cancer registry staff to improve data collection.

At KATH, registrars visit the wards, the oncology department record unit, the breast care clinic and the pathology department to collect data. Designated staff of the other hospitals - which are visited quarterly- assist in retrieval of folders of patients diagnosed with cancer for data abstraction. Registrars do not interview patients directly. Although it is estimated that over 90% cancer cases are seen in KATH, since 2012 the registry extended data collection to Kumasi South Hospital, Tafo Government Hospital, Manhyia District Hospital, the Suntreso Government Hospital and private hospitals. The following laboratories provide information on cancer cases: Medi lab, Plus Diagnostics Lab, MDS-Lancet, Soyuz Lab, Medlab, and Histo Lab. To ensure completeness, registrars also visit the Birth and Death Registry to collect data on patients who have died from cancer or had cancer diagnosis in conditions contributing to their death.

After data abstraction, the data are coded according to ICD-O-3 and entered into the CanReg 5 software. Challenges include difficulty in obtaining abstraction forms and difficulty in retrieving folders which have been filed.

YEARS PRESENTED

Three year period, 2014-2016

COMMENT

2059 cases were registered in the 3-year period, 62% of them females. The percentage of morphologically verified cases is now 53.6%, although the value for some sites is very low: prostate 20%, bladder 29%, ovary 40%. Only 0.4% of cases were registered from death certificate information.

The calculated incidence rates are low – some 35-40% of the regional average- so data are presented in terms of numbers and percentages only. The most common cancers of men were liver (22.6%), prostate (21.6%) and non-Hodgkin lymphoma (7.8%). In women, the leading cancers are breast (31.5%), cervix (21%) and liver (5.6%).

Summary

The low incidence rates indicate that there is still some under-ascertainment of cases.

PUBLICATIONS and ACHIEVEMENTS

Laryea DO, Awittor FK, Sonia C, Boadu KO. Three years of Population-Based Cancer Registration in Kumasi: Providing Evidence for Population-Based Cancer Surveillance in Ghana, published by Online J Public Health Inform. 2016;8(1)

Laryea DO, Awuah B, Amoako YA, Mensah S, Awittor FK. Follow-up of Breast Cancer Patients in Ghana: Challenge to Community-based Surveillance. Online J Public Health Inform. 2015;7(1).

Laryea DO, Awuah B, Amoako YA, Osei – Bonsu E, Dogbe J, Larsen-Reindolf R, et al. Cancer incidence in Ghana, 2012: evidence from a population – based cancer registry. BMC Cancer. 2014 May 23; 14 : 362

Awuah B, Laryea DO, Awittor FK (2017) Kumasi Cancer Registry Report, 2012 – 2015. Kumasi, Ghana

Ghana, Kumasi (2014–2016)

Number of cases by age group: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	13	0	92	0	-	-	-	-	-	-	-	1	1	2	-	2	3	-	3	1	1.7	C00-06
Salivary gland	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	0.3	C07-08
Nasopharynx	10	0	80	0	-	-	-	1	1	1	2	-	2	1	1	-	1	-	-	-	1.3	C11
Other pharynx	6	0	67	0	-	-	-	-	-	-	-	-	-	2	-	1	1	-	2	-	0.8	C09-10, C12-14
Oesophagus	10	0	60	0	-	-	-	-	-	-	-	-	1	1	3	1	1	1	2	-	1.3	C15
Stomach	35	0	37	0	-	-	-	-	-	-	-	3	-	2	5	6	8	7	1	3	4.5	C16
Colon	11	0	64	0	-	-	-	-	-	1	2	1	-	-	-	-	2	3	-	2	1.4	C18
Rectum	23	0	35	0	-	-	-	-	-	1	4	3	2	-	2	2	3	2	-	4	2.9	C19-20
Anus	6	0	33	0	-	-	-	-	-	1	-	-	-	2	2	1	-	-	-	-	0.8	C21
Liver	173	0	11	0	1	-	-	1	-	9	24	29	20	20	19	17	14	9	3	7	22.2	C22
Gallbladder etc.	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	0.3	C23-24
Pancreas	15	0	13	0	-	-	-	-	-	-	-	-	1	1	1	-	4	3	-	5	1.9	C25
Larynx	12	0	67	8	-	-	-	-	-	1	-	1	-	1	2	1	2	-	3	1	1.5	C32
Trachea, bronchus, and lung	22	0	45	5	-	-	-	-	1	-	-	1	1	1	3	3	3	3	4	2	2.8	C33-34
Bone	17	0	94	0	-	-	1	1	2	4	-	3	-	1	2	2	-	-	-	1	2.2	C40-41
Melanoma of skin	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	C43
Non-melanoma skin	15	0	100	0	-	-	-	-	1	1	2	1	3	-	1	3	2	-	-	1	1.9	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	6	0	67	0	-	-	-	-	-	-	1	1	1	1	1	-	1	-	-	-	0.8	C46
Connective and soft tissue	25	0	100	0	4	1	3	-	2	2	1	3	3	2	3	-	-	1	-	-	3.2	C47, C49
Breast	11	0	82	0	-	-	-	-	1	-	-	-	2	2	-	1	-	1	-	4	1.4	C50
Penis	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	0.3	C60
Prostate	165	0	21	1	-	-	-	-	-	-	1	1	2	1	4	10	30	29	21	66	21.2	C61
Testis	4	0	75	0	-	-	-	-	1	-	-	-	2	-	1	-	-	-	-	-	0.5	C62
Kidney and renal pelvis	11	0	91	0	5	-	-	-	-	-	1	1	-	2	-	1	-	1	-	-	1.4	C64-65
Bladder	23	0	39	0	-	-	-	-	-	1	2	-	3	-	3	2	4	-	5	3	2.9	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C66, C68
Eye	8	0	62	0	6	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1.0	C69
Brain and nervous system	6	0	83	0	2	-	-	-	-	-	-	-	-	1	1	-	1	-	-	1	0.8	C70-72
Thyroid	5	0	80	0	-	-	-	-	-	-	1	2	-	1	-	-	-	-	1	-	0.6	C73
Hodgkin lymphoma	9	0	100	0	-	-	2	2	1	-	1	-	-	-	2	-	-	1	-	-	1.2	C81
Non-Hodgkin lymphoma	60	0	73	0	4	13	3	2	4	4	7	3	3	2	3	4	2	2	2	2	7.7	C82-86, C96
Multiple myeloma	5	0	60	0	-	-	-	-	-	-	-	-	-	1	-	-	2	-	-	2	0.6	C90
Lymphoid leukaemia	6	0	100	0	3	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	0.8	C91
Myeloid leukaemia	5	0	100	0	1	-	-	1	-	1	-	-	2	-	-	-	-	-	-	-	0.6	C92-94
Leukaemia, unspecified	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.1	C95
Other and unspecified	55	0	53	2	2	1	2	4	3	4	3	3	4	8	4	5	2	3	4	3	7.1	O&U
All sites	780	0	44	1	28	16	12	12	17	31	53	57	53	56	64	63	87	68	54	109	100.0	C00-96
All sites except C44	765	0	43	1	28	16	12	12	16	30	51	56	50	56	63	60	85	68	54	108	98.1	C00-96 exc. C44

Ghana, Kumasi (2014–2016)

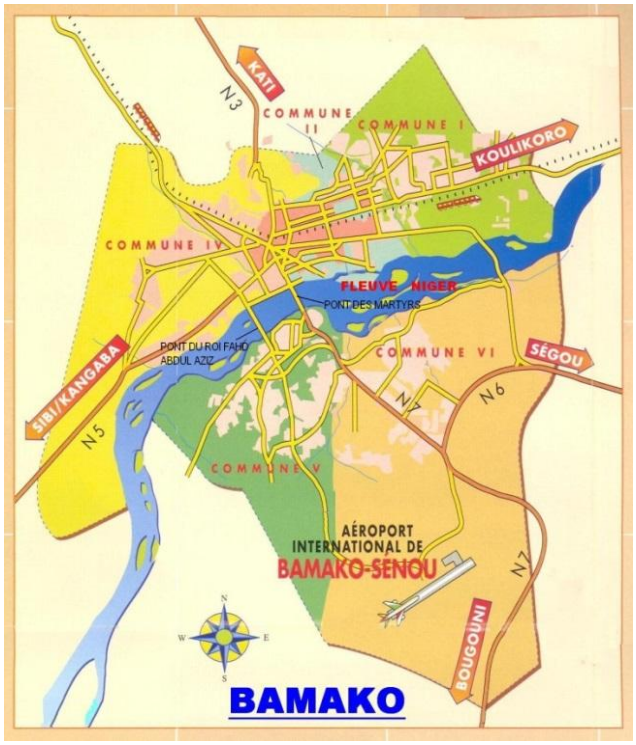
Number of cases by age group: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	5	0	80	0	-	-	-	-	-	-	1	-	1	-	1	1	-	-	-	1	0.4	C00-06
Salivary gland	8	0	100	0	-	-	-	-	-	-	-	-	2	1	2	-	-	1	1	1	0.6	C07-08
Nasopharynx	5	0	100	0	-	1	1	-	-	-	-	-	1	1	-	1	-	-	-	-	0.4	C11
Other pharynx	3	0	67	0	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	0.2	C09-10, C12-14
Oesophagus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C15
Stomach	39	0	31	0	-	-	-	-	1	1	-	2	1	4	2	5	2	5	7	9	3.0	C16
Colon	15	0	60	0	-	-	-	-	-	1	-	2	2	-	1	-	3	2	2	2	1.2	C18
Rectum	17	0	53	0	-	-	-	-	1	-	1	3	-	2	-	3	1	-	3	3	1.3	C19-20
Anus	11	0	55	0	-	-	-	-	-	-	1	-	-	-	3	3	-	-	2	2	0.9	C21
Liver	71	0	7	0	-	1	-	1	2	5	5	8	8	6	8	5	2	10	5	5	5.6	C22
Gallbladder etc.	4	0	25	0	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	2	0.3	C23-24
Pancreas	17	0	12	12	-	-	-	-	-	-	-	-	1	-	3	3	6	1	-	3	1.3	C25
Larynx	7	0	43	0	-	-	-	-	-	-	-	2	-	-	-	-	2	1	2	-	0.5	C32
Trachea, bronchus, and lung	18	0	50	0	-	-	-	-	1	1	-	3	-	-	2	-	3	-	2	6	1.4	C33-34
Bone	13	0	100	0	-	1	2	2	1	2	2	1	1	-	-	-	1	-	-	-	1.0	C40-41
Melanoma of skin	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	0.2	C43
Non-melanoma skin	10	0	100	0	-	-	-	-	-	-	2	-	2	1	-	-	-	3	1	1	0.8	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	3	0	100	0	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	0.2	C46
Connective and soft tissue	20	0	100	0	1	1	4	3	1	1	-	-	2	2	1	1	2	1	-	-	1.6	C47, C49
Breast	400	0	75	0	-	-	-	1	6	8	35	46	58	47	61	43	33	20	14	28	31.3	C50
Vulva	6	0	67	0	-	-	-	-	-	1	-	-	1	-	-	1	1	-	1	1	0.5	C51
Vagina	2	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	0.2	C52
Cervix uteri	267	0	60	0	-	-	-	-	1	5	6	14	22	31	33	27	34	24	21	49	20.9	C53
Uterus	48	0	52	0	-	-	-	-	-	-	1	1	2	1	10	9	6	7	6	5	3.8	C54-55
Ovary	101	0	41	1	-	-	1	3	7	5	9	4	10	11	15	7	5	6	7	11	7.9	C56
Placenta	15	0	60	0	-	-	-	-	4	2	1	3	2	1	1	-	-	-	1	-	1.2	C58
Kidney and renal pelvis	7	0	57	0	1	-	-	1	-	1	-	-	-	-	1	1	-	1	-	1	0.5	C64-65
Bladder	22	0	18	0	-	-	-	-	-	-	1	-	2	-	4	3	2	2	2	6	1.7	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C66, C68
Eye	5	0	20	0	3	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.4	C69
Brain and nervous system	18	0	22	0	1	2	1	1	-	1	-	3	1	2	1	-	-	3	-	2	1.4	C70-72
Thyroid	5	0	60	0	-	-	-	-	-	-	-	-	-	1	1	1	1	-	1	-	0.4	C73
Hodgkin lymphoma	7	0	100	0	-	-	1	-	-	2	-	2	-	1	-	-	-	-	-	1	0.5	C81
Non-Hodgkin lymphoma	41	0	73	0	1	4	2	3	1	1	3	5	4	3	5	2	2	-	1	4	3.2	C82-86, C96
Multiple myeloma	6	0	67	0	-	-	-	-	-	-	-	-	-	-	2	1	-	1	2	-	0.5	C90
Lymphoid leukaemia	4	0	100	0	1	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	0.3	C91
Myeloid leukaemia	15	0	100	0	5	-	1	-	-	2	1	-	2	2	-	2	-	-	-	-	1.2	C92-94
Leukaemia, unspecified	3	0	100	0	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	0.2	C95
Other and unspecified	38	0	50	5	-	2	1	4	-	3	-	2	5	3	6	2	2	2	2	4	3.0	O&U
All sites	1279	0	60	0	13	15	14	19	26	43	71	103	130	124	166	123	109	90	83	150	100.0	C00-96
All sites except C44	1269	0	59	0	13	15	14	19	26	43	69	103	128	123	166	123	109	87	82	149	99.2	C00-96 exc. C44

Mali, Bamako

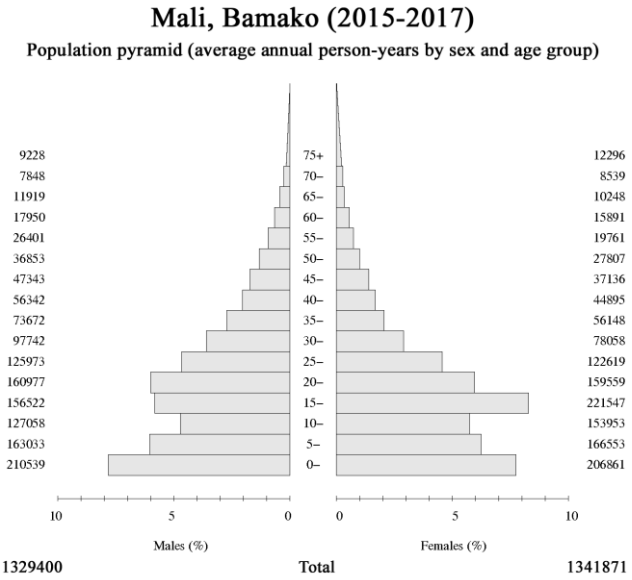
The Registre de Cancer du Mali was established in 1986. It is based in the department of pathology of the Centre Hospitalier Universitaire (CHU) du Point G, in the capital city of Bamako. The work of the registry is entirely financed via the department of pathology.

Since its inception, the registry has collected information on cases of cancer from all possible sources within the city, and has aimed to be population based for Bamako. The city consists of 6 communes. The most recent census was in 2009, at which time, the population was 1,810,366. The population at risk for 2015-2017 was estimated by assuming that the observed inter-censal (1999-2009) rate of growth (within age-sex groups) continued in linear fashion after 2009.



The head of the pathology department oversees the activities of the registry. The work of data collection is the responsibility of two junior pathologists, with the data abstraction carried out by the lab technician, as part of his routine work. The registrar visits the clinical services which potentially generate cancer cases, and abstracts the information onto a registration form. The pathologists visit the key services (oncology and gynaecology) at a more frequent intervals, as well as collecting information from the pathology department, where the data are retrieved from the request / reporting forms onto the registration form.

There are four major hospitals in the city: the CHU of Point G, CHU Gabriel Touré, the Hôpital du Mali and the Hôpital de Kati - some 15km distant. There are some specialist services for ophthalmology, dermatology, and dental/ENT, as well as six small district hospitals. There are specialised cancer treatment services (including a specialised haematology clinic) in CHU du Point G (medical oncology and paediatric oncology) and a radiotherapy service in the Hôpital du Mali.



There are four pathology laboratories in the city. The main one is located in CHU Point G with 4 qualified pathologists, which does the great bulk of the work in Bamako (and nationally). The lab at Hôpital du Mali deals with some of the specimens from that hospital. Several clinicians send specimens to overseas labs.

All deaths must be certified at the civil registry in order to receive a burial permit. The registry uses death certificates listing cancer as cause of death to update the vital status for the matched cases in the database. Cases not found in any hospital records are registered as DCO cases.

Data entry and management is carried out using CanReg 4 (the registry was one of the first to use this system, which has remained unmodified for more than 20 years).

YEARS PRESENTED

Three year period, 2015-2017

COMMENT

The average annual number of cases registered among Bamako residents averaged 2010, compared with 1550 in the preceding 5 years. There has been a corresponding increase in the age standardised rates, from 125 to 134 per 10^5 in men, and 179 to 213 per 10^5 in females, values some 40% (in men) – 70% (in women) higher than the average for West Africa in

Globocan2018. The percentage of cases with morphological verification of diagnosis (MV%) is has declined, to 66% in men and 71% in women.

Table 4.04 compares the age standardised incidence rates for a few major sites with those recorded in Volumes VI – VIII of Cancer Incidence in Five Continents, and Volume II of Cancer in Sub Saharan Africa.

Cancer Incidence in Five Continents Vol:						
		VI	**VII**	**VIII**	**CiSSA II**	**CiSSA III**
Period		1987-1989	1988-1992	1994-1996	2010-2014	**2015-2017**
Stomach	M	19.4	17	17.7	19.1	**15.7**
	F	10.3	12.7	20.8	15.3	**13.4**
Liver	M	47.9	43	31.2	11.5	**10.7**
	F	21.4	20.6	14	4.0	**5.4**
Colon-rectum	M	5.4	5.2	4.5	8.8	**9.5**
	F	3	2.4	3.6	9.7	**9.4**
Prostate	M	6.3	5.2	7.6	19.8	**23.4**
Bladder	M	12.4	9.6	11.3	10.5	**10.4**
Breast	F	10.2	12.4	20	37.0	**56.9**
Cervix uteri	F	23.4	29.1	35.9	48.4	**42.3**

Table 4.04 Mali, Bamako - Incidence rates from current period, CiSSA Vol. II and CI5 Vol. VI-VIII.

Incidence rates for cancers of the gastro-intestinal tract remain high, especially cancer of the stomach (ASR of 15.7 per 10^5 in men and 13.4 per 10^5 in women), although lower than in the preceding 5 years. There are high rates too for cancers of the bladder (ASR of 10.4 per 10^5 in men and 8.4 per 10^5 in women). Breast cancer has shown a dramatic increase in incidence since 2010-2014; with an ASR of 56.9 per 10^5 (50% higher than the regional average) it has now overtaken cancer of the cervix (ASR 42.3 per 10^5) to become the leading cancer of women. Incidence rates of leukaemias remain low.

Summary

The registry appears to have improved its case finding procedures since the preceding 5 year period reported in CiSSA Volume II. The dramatic increase in breast cancer cases must represent improved case ascertainment, although there remain problems in case finding (and/or diagnosis) of haematological malignancies

The rates are coherent with those recorded over the last 30 years, with relatively constant rates for stomach and bladder cancers, and increases in the incidence of large bowel, prostate and breast cancers, and with a rise, then recent fall, in the incidence of cervix cancer. As noted in Volume II, much of the decline in liver cancer – at least until 2010-2014, may have represented some possible misclassification of diagnosis in the earlier periods.

PUBLICATIONS and ACHIEVEMENTS

The Registre de Cancer de Mali became a member of AFCRN in 2015.

Joko-Fru WY, Miranda-Filho A, Soerjomataram I, Egue M, Akele-Akpo MT, N'da G, et al. Breast cancer survival in sub-Saharan Africa by age, stage at diagnosis and Human Development Index (HDI): A population-based registry study. Int J Cancer. 2019 May 14.

Mali, Bamako (2015–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	61	0	75	0	1	3	1	1	2	4	4	-	3	4	8	3	8	4	3	12	1.5	2.4	0.29	**3.2**	C00-06
Salivary gland	13	1	62	0	-	1	-	-	-	1	1	2	2	2	-	-	-	1	-	2	0.3	0.5	0.04	**0.5**	C07-08
Nasopharynx	12	0	58	0	-	-	-	-	1	-	2	3	-	2	2	-	2	-	-	-	0.3	0.5	0.05	**0.5**	C11
Other pharynx	15	0	67	0	-	1	-	-	-	-	1	1	1	2	1	1	-	4	2	1	0.4	0.6	0.12	**0.9**	C09-10, C12-14
Oesophagus	53	2	75	0	-	-	-	-	-	4	6	2	5	2	3	11	8	7	-	3	1.3	2.1	0.31	**2.7**	C15
Stomach	260	4	81	0	-	-	1	-	-	1	7	14	12	23	22	44	48	28	25	31	6.5	10.2	1.94	**15.7**	C16
Colon	91	0	79	0	-	-	1	1	1	2	5	11	10	5	12	11	8	11	9	4	2.3	3.6	0.63	**4.7**	C18
Rectum	97	2	76	0	-	-	-	-	4	4	10	7	6	14	9	10	6	7	8	10	2.4	3.8	0.55	**4.8**	C19-20
Anus	13	0	85	0	-	-	-	-	-	3	1	2	1	1	3	-	1	-	1	-	0.3	0.5	0.06	**0.5**	C21
Liver	225	0	38	0	-	1	1	5	1	10	23	20	31	20	21	27	25	10	14	16	5.6	8.8	1.20	**10.7**	C22
Gallbladder etc.	7	0	71	0	-	-	-	-	1	-	-	1	-	-	-	1	3	-	-	1	0.2	0.3	0.04	**0.4**	C23-24
Pancreas	75	0	36	1	1	-	-	-	-	2	1	2	5	7	6	15	9	13	7	7	1.9	2.9	0.58	**4.5**	C25
Larynx	27	1	93	0	-	-	1	-	1	-	1	1	-	4	2	4	5	5	2	-	0.7	1.1	0.22	**1.6**	C32
Trachea, bronchus, and lung	121	2	50	0	-	-	2	1	-	-	4	5	9	9	17	12	15	17	14	14	3.0	4.7	0.92	**7.2**	C33-34
Bone	110	2	71	1	1	3	12	13	7	7	7	3	5	7	4	10	9	5	10	5	2.8	4.3	0.57	**4.6**	C40-41
Melanoma of skin	9	0	89	0	-	-	-	1	-	-	-	-	1	-	-	1	1	3	-	2	0.2	0.4	0.06	**0.6**	C43
Non-melanoma skin	79	0	85	0	-	1	3	2	-	8	5	4	5	3	5	8	7	11	10	7	2.0	3.1	0.56	**4.2**	C44
Mesothelioma	2	0	100	0	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.1**	C45
Kaposi sarcoma	21	0	95	0	-	1	2	1	2	-	3	2	2	2	-	1	2	-	1	2	0.5	0.8	0.08	**0.8**	C46
Connective and soft tissue	65	0	91	0	-	1	5	3	9	5	4	-	4	8	5	4	7	6	2	2	1.6	2.5	0.31	**2.8**	C47, C49
Breast	56	1	64	0	-	-	-	1	1	1	3	7	7	6	6	5	4	3	5	6	1.4	2.2	0.32	**2.8**	C50
Penis	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.0	0.0	0.01	**0.1**	C60
Prostate	309	5	66	1	-	-	-	-	-	-	-	-	1	1	7	16	38	59	69	113	7.7	12.1	2.83	**23.4**	C61
Testis	8	0	50	0	-	-	-	1	4	-	-	2	-	-	-	-	-	-	-	1	0.2	0.3	0.01	**0.2**	C62
Kidney and renal pelvis	44	0	68	0	17	4	1	-	1	-	1	-	-	2	3	3	4	4	2	2	1.1	1.7	0.20	**1.8**	C64-65
Bladder	173	1	64	0	2	-	1	1	2	2	6	9	10	10	15	24	24	29	20	17	4.3	6.8	1.38	**10.4**	C67
Ureter and other urinary	1	0	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	103	0	60	0	46	14	3	4	5	2	2	2	4	4	5	1	-	4	4	3	2.6	4.0	0.27	**3.0**	C69
Brain and nervous system	76	0	29	0	4	2	7	5	5	4	8	3	8	4	8	2	4	5	2	5	1.9	3.0	0.29	**3.0**	C70-72
Thyroid	10	0	90	0	-	-	-	-	1	-	2	1	-	1	2	-	2	-	-	1	0.3	0.4	0.04	**0.4**	C73
Hodgkin lymphoma	31	1	97	0	-	-	5	4	1	2	2	-	2	4	2	3	-	2	2	1	0.8	1.2	0.14	**1.2**	C81
Non-Hodgkin lymphoma	113	0	96	0	4	13	13	11	8	12	13	4	2	5	4	8	7	5	3	1	2.8	4.4	0.39	**3.8**	C82-86, C96
Multiple myeloma	6	0	100	0	-	-	-	-	-	-	-	-	3	-	1	-	-	1	-	1	0.2	0.2	0.03	**0.3**	C90
Lymphoid leukaemia	2	0	100	0	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.0**	C91
Myeloid leukaemia	8	0	88	0	1	2	1	2	-	-	1	-	-	-	-	-	1	-	-	-	0.2	0.3	0.02	**0.2**	C92-94
Leukaemia, unspecified	2	0	100	0	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	**0.0**	C95
Other and unspecified	260	1	62	1	5	7	13	14	8	9	18	11	19	20	24	24	35	14	22	16	6.5	10.2	1.50	**12.5**	O&U
All sites	2559	23	67	0	82	56	74	71	66	84	142	119	159	172	197	249	283	259	237	286	64.2	100.0	15.95	**134.0**	C00-96
All sites except C44	2480	23	66	0	82	55	71	69	66	76	137	115	154	169	192	241	276	248	227	279	62.2	96.9	15.38	**129.7**	C00-96 exc. C44
Average annual population					210539	163033	127058	156522	160977	125973	97742	73672	56342	47343	36853	26401	17950	11919	7848	9228	1329399				

Mali, Bamako (2015–2017)

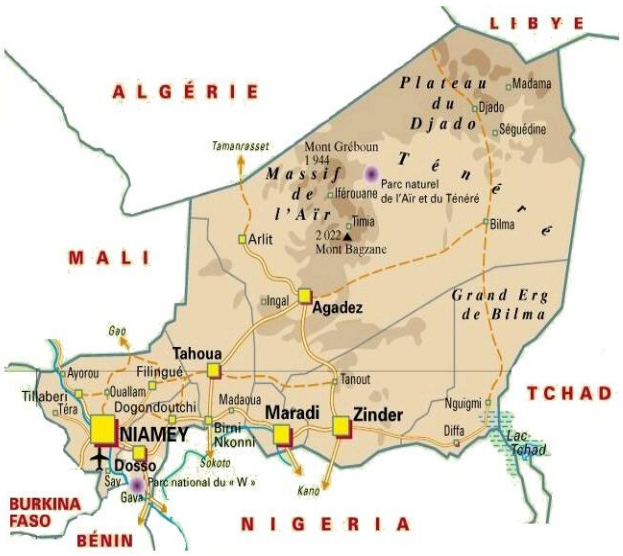
Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	88	1	74	0	1	2	2	3	6	7	1	9	8	2	5	9	7	11	6	8	2.2	2.2	0.57	**4.7**	C00-06
Salivary gland	14	0	50	0	-	1	-	3	-	1	-	-	2	-	2	2	1	1	1	-	0.3	0.4	0.09	**0.7**	C07-08
Nasopharynx	7	0	43	0	1	-	-	-	1	-	1	-	-	-	2	-	1	1	-	-	0.2	0.2	0.04	**0.4**	C11
Other pharynx	10	1	80	0	-	-	-	-	-	-	-	-	1	2	1	3	-	2	-	-	0.2	0.3	0.09	**0.7**	C09-10, C12-14
Oesophagus	46	1	72	0	-	-	-	-	1	3	3	2	7	-	7	7	5	3	1	6	1.1	1.2	0.27	**2.6**	C15
Stomach	202	2	73	1	-	-	-	-	2	5	6	11	16	20	26	20	42	24	19	9	5.0	5.1	1.75	**13.4**	C16
Colon	78	1	76	0	-	-	-	2	3	6	2	8	7	6	7	11	7	7	6	5	1.9	2.0	0.54	**4.4**	C18
Rectum	90	1	82	0	1	-	-	5	3	5	5	8	11	6	6	8	12	10	4	5	2.2	2.3	0.59	**5.0**	C19-20
Anus	10	0	100	0	-	-	-	-	-	-	2	5	1	-	2	-	-	-	-	-	0.2	0.3	0.03	**0.4**	C21
Liver	93	0	35	0	-	-	2	-	1	3	7	6	11	11	10	8	14	5	6	9	2.3	2.4	0.60	**5.4**	C22
Gallbladder etc.	5	0	80	0	-	-	-	-	-	-	1	1	-	-	-	-	2	-	-	1	0.1	0.1	0.03	**0.3**	C23-24
Pancreas	47	0	36	0	-	-	-	1	-	1	-	4	1	7	7	4	10	5	5	2	1.2	1.2	0.41	**3.1**	C25
Larynx	4	0	75	0	-	-	-	-	1	-	-	-	-	-	1	1	-	1	-	-	0.1	0.1	0.03	**0.2**	C32
Trachea, bronchus, and lung	49	0	51	0	-	-	-	1	3	3	1	2	2	2	5	6	10	8	1	5	1.2	1.2	0.37	**3.1**	C33-34
Bone	89	3	71	0	1	-	7	9	4	7	4	6	5	8	11	6	6	5	6	1	2.2	2.3	0.50	**4.2**	C40-41
Melanoma of skin	14	0	100	0	-	-	-	-	-	-	1	-	-	1	-	-	-	-	3	9	0.3	0.4	0.07	**0.8**	C43
Non-melanoma skin	71	1	82	1	-	-	2	1	3	5	3	3	8	6	7	10	8	3	7	4	1.8	1.8	0.49	**4.0**	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.0	0.0	0.01	**0.1**	C45
Kaposi sarcoma	13	0	100	0	-	-	1	-	-	2	1	2	3	1	-	1	1	-	1	-	0.3	0.3	0.07	**0.6**	C46
Connective and soft tissue	41	1	98	0	1	1	2	5	6	1	3	3	3	3	2	2	4	1	1	2	1.0	1.0	0.17	**1.7**	C47, C49
Breast	1098	18	72	0	-	2	2	13	27	39	102	143	170	132	131	111	90	47	31	40	27.3	27.8	6.10	**56.9**	C50
Vulva	19	0	84	0	-	-	-	1	2	-	3	4	1	-	1	-	3	-	3	1	0.5	0.5	0.12	**0.9**	C51
Vagina	10	0	70	0	-	-	-	1	-	2	1	2	-	1	-	-	1	1	-	1	0.2	0.3	0.04	**0.4**	C52
Cervix uteri	717	4	83	0	-	-	-	-	5	19	26	78	82	100	116	75	92	43	43	34	17.8	18.1	4.93	**42.3**	C53
Uterus	201	11	68	0	-	-	-	3	3	5	9	17	17	14	21	20	29	21	13	18	5.0	5.1	1.48	**12.3**	C54-55
Ovary	138	1	52	1	1	1	-	6	7	9	6	14	14	9	10	7	17	11	11	14	3.4	3.5	0.87	**7.4**	C56
Placenta	33	0	85	0	-	-	-	3	4	4	8	9	3	1	1	-	-	-	-	-	0.8	0.8	0.08	**1.0**	C58
Kidney and renal pelvis	47	0	85	0	22	4	1	1	5	-	2	2	4	-	1	3	1	-	1	-	1.2	1.2	0.12	**1.3**	C64-65
Bladder	143	1	63	0	-	-	2	-	3	4	5	17	14	17	17	15	12	13	13	10	3.6	3.6	1.03	**8.4**	C67
Ureter and other urinary	2	0	50	0	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	0.0	0.1	0.01	**0.1**	C66, C68
Eye	87	0	74	0	32	12	5	2	2	2	3	7	7	5	4	2	4	-	-	-	2.2	2.2	0.21	**2.7**	C69
Brain and nervous system	77	1	30	0	-	7	4	6	5	5	7	8	5	6	6	6	3	4	3	1	1.9	1.9	0.36	**3.2**	C70-72
Thyroid	33	0	85	3	-	-	-	-	1	-	1	2	3	8	4	3	6	2	1	2	0.8	0.8	0.22	**2.0**	C73
Hodgkin lymphoma	18	0	89	0	-	1	-	1	-	-	1	5	2	1	-	2	2	1	1	1	0.4	0.5	0.10	**0.9**	C81
Non-Hodgkin lymphoma	54	0	93	0	-	6	4	3	-	6	5	5	4	6	6	2	2	3	2	-	1.3	1.4	0.25	**2.3**	C82-86, C96
Multiple myeloma	3	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	0.1	0.1	0.03	**0.2**	C90
Lymphoid leukaemia	4	0	100	0	-	1	-	2	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.1	0.01	**0.1**	C91
Myeloid leukaemia	11	0	100	0	1	-	1	2	1	3	-	-	-	1	2	-	-	-	-	-	0.3	0.3	0.02	**0.3**	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C95
Other and unspecified	285	0	61	0	4	5	10	8	15	15	18	25	29	27	27	30	23	20	12	17	7.1	7.2	1.62	**14.5**	O&U
All sites	3952	48	72	0	65	43	45	82	114	162	238	408	443	404	449	374	417	253	202	205	98.2	100.0	24.29	**212.9**	C00-96
All sites except C44	3881	47	71	0	65	43	43	81	111	157	235	405	435	398	442	364	409	250	195	201	96.4	98.2	23.81	**209.0**	C00-96 exc. C44
Average annual population					206861	166553	153953	221547	159559	122619	78058	56148	44895	37136	27807	19761	15891	10248	8539	12296	1341873				

Niger, Niamey

The Registre des Cancers du Niger was founded in 1992, in the Faculté des Sciences de la Santé of the University of Niamey. It is located in the department of pathology of the University Hospital. This department is a referral centre for pathology services for the whole country. Nevertheless, the registry was designed to be population based with complete recording of all cancer cases diagnosed among the population of the capital city, Niamey. The head of the department of pathology acts as registry director. The laboratory has five staff, one pathologist, one epidemiologist, one laboratory assistant as the cancer registrar, one nurse and one secretary.

In 2017, the government re-launched the National Center for Cancer Control (CNLC) programme. The programme provides support to the registry for expansion of data collection to other regions. Since 2019, the WHO office in Niger and the West African Health Organisation also provide support to the registry. Data collected by the registry have been used for the planning of a national programme of cervical cancer screening.



Niger comprises eight administrative subdivisions, three in the capital city. The population of Niger at the 2012 census was 17,138,707, and of the Region of Niamey was 1,026,848.

The Department of Pathology is the most important source of information. It provides histopathology and cytology services for the whole country. Although some specimens are sent abroad, the registry receives copies of reports of all cancer cases diagnosed by other pathology services in the city, including biochemical tests such as human chorionic gonadotrophin (HCG), prostate-specific antigen (PSA) and alpha-fetoprotein.

Case finding elsewhere was carried out actively by the cancer registrar with some assistance from medical students, through searching for cases in the hospital services in the city where cancer might be diagnosed. These include, especially, the National Hospital, the University Hospital and the main Maternity Hospital. Visits are made to the major services (surgery, urology, medicine, gynaecology, paediatrics and the biology laboratory) twice a week. The clerk examines sources such as the ward admission books, consultation registers, medical records in the departments (though information is often missing from this source) to obtain details of cancer cases including diagnosis and place of residence. The nurses at each unit are encouraged to make a note of new cancer cases, which can then be abstracted by the registrar. Other clinics visited include maternal and child health clinics and occasionally some private clinics with clinicians to collect biopsies.

Since cause of death is not recorded on death certificates in Niger, they are not used for cancer registration.

The registration process is carried out using the CanReg 4 software for data entry and management.

YEARS PRESENTED

Five year period, 2013 – 2017

COMMENT

Considering registrations among residents of Niamey, the annual number of cases recorded has fluctuated considerably in the last 10 years, from 407 in 2009 to 163 in 2015. The rate of registration in the 5 years considered here (2013-2017) was 21 per month, significantly below that for the period presented in Volume II (2006-2009) which was 33 per month. Accordingly, the estimated incidence rates for Niamey are now implausibly low, so that results are presented as numbers and percentages only.

The cancer profile remains much the same as previously. Liver cancer (24.9% of cases) is the dominant cancer of men, with a very low frequency of prostate cancer (just 5.7%). In women, breast cancer (37.1%) is considerably more frequent than cervix cancer (11.4%) which is only marginally more frequently recorded than cancer of the ovary (9.6%).

The percentage of cases with morphological verification is very low 23% in males and 28% in females, and exceptionally low for some sites – 1% for liver, 16% for cervix.

Summary

The steady decrease in incidence rates since the earlier reports (Cancer in Africa I (1993-1999); CiSSA Vol. II (2006-2009)) suggest a progressive decline in performance.

PUBLICATIONS and ACHIEVEMENTS

The Registre des Cancers du Niger became a member of AFCRN in 2012.

Niger, Niamey (2013–2017)

Number of cases by age group: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	16	0	31	0	-	-	-	-	-	-	-	-	3	2	2	3	2	-	1	3	2.9	C00-06
Salivary gland	6	0	0	0	-	-	-	-	-	-	-	-	-	1	-	4	-	-	1	-	1.1	C07-08
Nasopharynx	1	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.2	C11
Other pharynx	3	0	67	0	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	0.6	C09-10, C12-14
Oesophagus	12	0	42	0	-	-	-	-	-	-	-	-	-	2	-	3	5	2	-	-	2.2	C15
Stomach	45	0	33	0	5	-	-	5	1	1	2	1	2	6	5	4	6	-	4	3	8.3	C16
Colon	25	0	28	0	-	-	-	-	1	-	3	2	3	3	1	4	3	2	2	1	4.6	C18
Rectum	7	0	29	0	-	-	-	-	1	-	-	-	1	-	1	1	2	-	-	1	1.3	C19-20
Anus	7	0	14	0	-	-	-	-	-	-	-	1	1	-	2	-	1	-	-	2	1.3	C21
Liver	135	0	0	0	1	-	-	-	3	2	11	14	28	17	17	14	8	10	4	6	24.9	C22
Gallbladder etc.	3	0	33	0	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	1	0.6	C23-24
Pancreas	22	0	0	0	-	-	-	-	1	1	-	2	1	2	3	1	5	3	3	-	4.1	C25
Larynx	7	0	86	0	-	-	-	1	-	-	-	-	-	1	-	-	2	2	1	-	1.3	C32
Trachea, bronchus, and lung	17	0	0	0	-	-	-	-	-	2	2	-	1	2	3	1	3	-	2	1	3.1	C33-34
Bone	18	0	6	0	-	-	2	1	3	-	-	1	3	2	-	4	-	-	2	-	3.3	C40-41
Melanoma of skin	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0.2	C43
Non-melanoma skin	45	0	36	0	3	1	4	4	5	5	6	1	2	3	-	2	3	3	2	1	8.3	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	2	0	50	0	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	0.4	C46
Connective and soft tissue	10	0	100	0	1	-	-	1	1	1	-	-	1	1	1	1	1	-	1	-	1.8	C47, C49
Breast	6	0	17	0	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	1	1.1	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C60
Prostate	31	0	45	0	-	-	-	-	-	-	-	-	-	-	1	3	4	6	10	7	5.7	C61
Testis	6	0	17	0	2	-	-	1	1	-	-	-	1	-	-	-	-	-	-	1	1.1	C62
Kidney and renal pelvis	15	0	0	0	7	3	-	-	-	1	-	1	-	1	-	-	2	-	-	-	2.8	C64-65
Bladder	24	0	25	0	-	-	1	1	1	-	-	-	2	2	3	2	3	2	5	2	4.4	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C66, C68
Eye	13	0	31	0	3	-	-	-	2	-	-	1	2	-	1	-	3	-	1	-	2.4	C69
Brain and nervous system	10	0	40	0	-	1	-	1	1	-	-	-	1	1	-	1	1	3	-	-	1.8	C70-72
Thyroid	9	0	44	0	-	-	-	1	-	-	2	1	1	-	1	1	1	1	-	-	1.7	C73
Hodgkin lymphoma	3	0	67	0	-	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-	0.6	C81
Non-Hodgkin lymphoma	14	0	64	0	1	-	3	1	-	-	-	-	1	-	2	1	-	2	1	2	2.6	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C90
Lymphoid leukaemia	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0.4	C91
Myeloid leukaemia	3	0	67	0	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	0.6	C92-94
Leukaemia, unspecified	3	0	100	0	1	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	0.6	C95
Other and unspecified	22	0	18	0	1	-	-	-	-	4	1	1	2	1	2	1	2	1	1	5	4.1	O&U
All sites	543	0	24	0	25	5	10	18	21	17	29	26	57	53	47	53	62	39	44	37	100.0	C00-96
All sites except C44	498	0	23	0	22	4	6	14	16	12	23	25	55	50	47	51	59	36	42	36	91.7	C00-96 exc. C44

Niger, Niamey (2013–2017)

Number of cases by age group: females

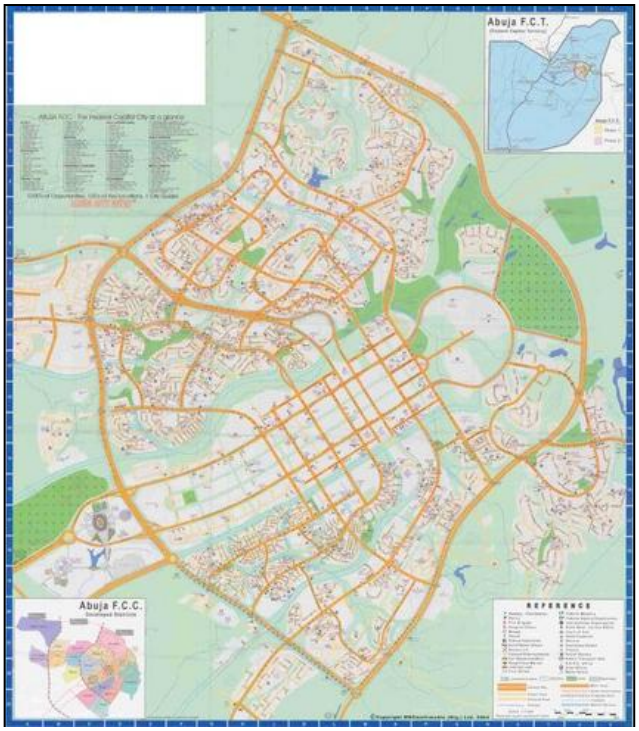
Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	13	0	31	0	-	-	-	-	1	1	-	-	-	3	6	1	1	-	-	-	1.6	C00-06
Salivary gland	3	0	33	0	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-	0.4	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C11
Other pharynx	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	C09-10, C12-14
Oesophagus	9	0	44	0	-	-	-	-	-	-	-	-	-	2	-	3	1	1	2	-	1.1	C15
Stomach	17	0	24	0	1	-	-	2	-	1	-	-	2	1	5	1	2	1	1	-	2.1	C16
Colon	18	0	44	0	-	-	-	-	-	-	1	1	2	3	3	1	1	4	1	1	2.2	C18
Rectum	11	0	9	0	-	-	-	-	-	3	-	1	1	3	1	-	1	1	-	-	1.4	C19-20
Anus	3	0	100	0	-	-	-	-	-	1	-	-	-	-	-	1	-	1	-	-	0.4	C21
Liver	48	0	4	0	-	-	-	1	2	1	3	6	3	4	2	6	8	-	6	6	6.0	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0.1	C23-24
Pancreas	12	0	0	0	-	-	-	-	-	-	-	2	1	2	3	1	1	-	2	-	1.5	C25
Larynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	C32
Trachea, bronchus, and lung	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.1	C33-34
Bone	18	0	6	0	2	1	-	-	1	3	1	3	-	2	1	2	1	1	-	-	2.2	C40-41
Melanoma of skin	4	0	100	0	-	-	-	-	-	-	-	2	-	-	-	-	-	-	1	1	0.5	C43
Non-melanoma skin	34	0	24	0	4	1	2	1	-	5	3	3	1	2	3	1	3	3	1	1	4.2	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	1	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	C46
Connective and soft tissue	5	0	100	0	-	-	-	-	-	1	-	1	-	-	-	-	1	1	-	1	0.6	C47, C49
Breast	297	0	33	0	-	-	-	-	5	23	27	36	40	52	43	18	27	7	12	7	37.1	C50
Vulva	1	0	0	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.1	C51
Vagina	3	0	67	0	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	0.4	C52
Cervix uteri	91	0	16	0	-	-	-	-	-	2	4	10	10	8	16	12	9	8	7	5	11.4	C53
Uterus	33	0	33	0	-	-	-	-	4	-	2	3	4	5	5	2	3	2	2	1	4.1	C54-55
Ovary	77	0	23	0	-	-	1	1	7	6	-	6	8	13	7	11	8	5	2	2	9.6	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C58
Kidney and renal pelvis	15	0	0	0	4	4	-	-	1	1	1	-	-	-	2	-	1	1	-	-	1.9	C64-65
Bladder	17	0	6	0	-	1	-	-	1	-	-	-	3	2	-	2	5	1	1	1	2.1	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C66, C68
Eye	10	0	40	0	3	-	-	-	-	1	-	-	1	1	1	1	-	-	1	1	1.2	C69
Brain and nervous system	3	0	0	0	-	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-	0.4	C70-72
Thyroid	7	0	71	0	-	-	-	-	-	1	-	1	-	1	1	1	1	-	-	1	0.9	C73
Hodgkin lymphoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C81
Non-Hodgkin lymphoma	9	0	100	0	1	-	1	1	1	1	1	-	1	-	-	-	2	-	-	-	1.1	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C90
Lymphoid leukaemia	9	0	22	0	-	-	-	-	-	-	3	-	2	-	-	1	-	-	2	1	1.1	C91
Myeloid leukaemia	4	0	75	0	-	-	-	1	-	1	1	1	-	-	-	-	-	-	-	-	0.5	C92-94
Leukaemia, unspecified	6	0	67	0	-	2	-	-	1	-	-	1	-	1	-	-	1	-	-	-	0.8	C95
Other and unspecified	18	0	11	0	-	1	1	1	-	-	2	1	4	2	-	2	-	1	2	1	2.2	O&U
All sites	800	0	28	0	15	10	5	8	24	55	52	78	83	107	100	67	78	41	45	32	100.0	C00-96
All sites except C44	766	0	28	0	11	9	3	7	24	50	49	75	82	105	97	66	75	38	44	31	95.8	C00-96 exc. C44

Nigeria, Abuja

The Abuja Cancer Registry started operation as a hospital-based registry in 2006. It is situated in the National Hospital Abuja in Nigeria's Federal Capital Territory (FCT). With the collaboration of Federal Ministry of Health and the Nigeria National System of Cancer Registries, it graduated to become a population based cancer registry in January 2009.

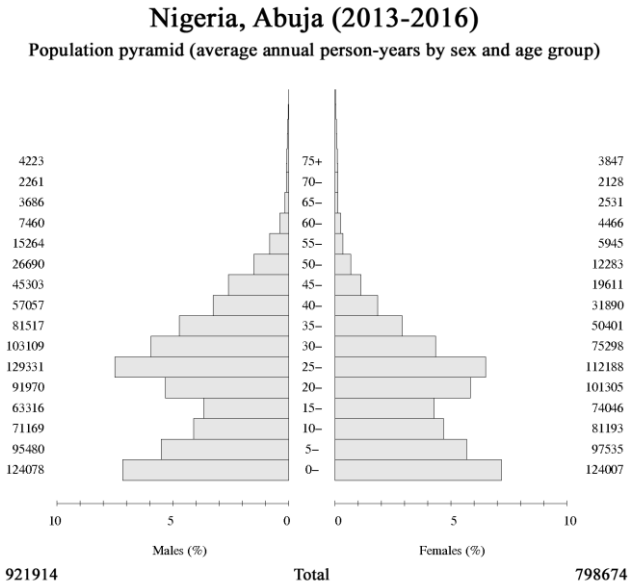
The National Hospital Abuja is one of the leading hospitals in the country, notably with respect to diagnostic and treatment services for cancer, including radiotherapy and nuclear medicine. Most patients within the environs and beyond are referred to the hospital. The registry falls under the Oncology Department and the Medical Records Department. Both departments are important stakeholders.

The Registry is staffed with a registrar and a data collection officer, with supervision from a three member committee, consisting of the registry director (an oncologist), the head of the department of medical records and a pathologist. Equipment, transport for data collection and salaries are provided by the hospital.



The Registry is population-based for Abuja City and Abuja FCT. The target population was estimated at about 1.72 million inhabitants in 2013-2016, based on the census of 2006.

Most of the cancer management services (diagnostic and treatment) in Abuja are located at the National Hospital. The registry utilises the sources of information available at the hospital including, pathology laboratory, medical records department, oncology department and in-patient wards and out-patient clinics.



The Registry employs both active and passive methods of case-finding. Data are also collected from 9 hospitals (both public and private) in the FCT. Four pathology laboratories also supply pathology reports to the registry. Registry staff visit departments and units in the nine hospitals to register cases from the oncology departments, in-patient wards and out-patient clinics. All cancer cases that are identified at the various sources of information are registered, including those in non-residents. Non-resident cases are however excluded from the analysis. Death certificates are accessed and abstracted. Data are recorded on the cancer registry abstract form. The CanReg 4 system is used for data processing and management.

YEAR PRESENTED

Four year period, 2013- 2016

COMMENT

The four year period presented here includes the one year (2013) that appeared in Volume II. In the absence of recent population data (the most recent census was in 2006) population estimates are made using very uncertain projections, so that little confidence can be placed in the calculated incidence rates.

These rates (all sites) of 46.9 per 10^5 for males and 94.7 per 10^5 for females are now very much lower than those reported for 2013 in Volume II (which were calculated using the 2006 population). Nevertheless the incidence of breast cancer

(43.0 per 10^5) remains high (although much lower than the rather incredible 78.4 per 10^5 in Volume II).

The percentage of cases registered with morphological verification of diagnosis (96.6% in males, 92.5% in females) is high and suggests over-reliance on pathology sources by the registry. As previously, there are rather few childhood cancer cases recorded (43/1516 total).

Summary

In the absence of reasonable data on population at risk, the quality of the data are difficult to evaluate, and little confidence can be placed in the calculated incidence rates.

PUBLICATIONS and ACHIEVEMENTS

The Abuja Cancer Registry became a member of AFCRN in 2012.

Al-Haddad BJ, Jedy-Agba E, Oga E, Ezeome ER, Obiorah CC, Okobia M, et al. Comparability, diagnostic validity and completeness of Nigerian cancer registries. CancerEpidemiol. 2015 Jun;39(3):456-64.

Akarolo-Anthony SN, Maso LD, Igbinoba F, Mbulaiteye SM, Adebamowo CA. Cancer burden among HIV-positive persons in Nigeria: preliminary findings from the Nigerian AIDS-cancer match study. Infect Agent Cancer. 2014 Mar 5;9(1):1.

Jedy-Agba E, Curado MP, Ogunbiyi O, Oga E, Fabowale T, Igbinoba F, et al. Cancer incidence in Nigeria: a report from population-based cancer registries. Cancer Epidemiol. 2012 Oct;36(5):e271-8

*Nigeria, Abuja (2013–2016)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	8	0	100	0	-	-	-	-	-	-	-	-	1	1	2	1	2	-	-	1	0.2	1.5	0.06	**0.6**	C00-06
Salivary gland	7	0	100	0	-	-	-	-	-	1	1	-	-	1	-	-	1	-	1	2	0.2	1.3	0.08	**0.7**	C07-08
Nasopharynx	19	2	95	0	-	1	-	-	-	2	2	5	-	4	1	-	-	2	-	-	0.5	3.4	0.11	**0.9**	C11
Other pharynx	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0.1	0.4	0.01	**0.1**	C09-10, C12-14
Oesophagus	5	0	100	0	-	-	-	-	-	-	1	-	1	-	1	2	-	-	-	-	0.1	0.9	0.02	**0.2**	C15
Stomach	17	0	94	0	-	-	-	-	-	1	1	1	1	1	2	-	3	3	-	4	0.5	3.1	0.17	**1.7**	C16
Colon	37	1	100	0	-	-	-	-	-	2	4	2	4	1	3	11	6	2	1	-	1.0	6.7	0.36	**2.6**	C18
Rectum	17	0	100	0	-	-	-	-	-	1	2	-	2	3	1	3	4	1	-	-	0.5	3.1	0.15	**1.2**	C19-20
Anus	6	0	100	0	-	-	-	-	-	-	-	-	1	2	2	-	-	-	1	-	0.2	1.1	0.07	**0.4**	C21
Liver	13	0	92	0	-	-	-	-	-	2	3	1	3	-	1	2	-	1	-	-	0.4	2.4	0.07	**0.6**	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.2	0.02	**0.1**	C23-24
Pancreas	3	0	100	0	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	0.1	0.5	0.09	**0.5**	C25
Larynx	4	0	100	0	-	-	-	-	-	-	-	-	1	-	2	-	-	1	-	-	0.1	0.7	0.05	**0.3**	C32
Trachea, bronchus, and lung	5	0	100	0	-	-	-	-	-	-	-	-	2	-	1	1	-	-	1	-	0.1	0.9	0.07	**0.4**	C33-34
Bone	7	0	100	0	-	-	-	1	-	1	3	2	-	-	-	-	-	-	-	-	0.2	1.3	0.01	**0.1**	C40-41
Melanoma of skin	4	0	100	0	-	-	-	-	-	1	1	2	-	-	-	-	-	-	-	-	0.1	0.7	0.01	**0.1**	C43
Non-melanoma skin	28	0	96	0	-	-	-	-	1	4	4	4	1	4	3	1	3	1	1	1	0.8	5.1	0.19	**1.5**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	18	2	94	0	-	-	1	1	-	-	3	1	3	2	3	-	1	1	-	-	0.5	3.3	0.10	**0.8**	C46
Connective and soft tissue	24	0	96	0	-	-	-	1	-	7	4	2	1	3	3	2	-	1	-	-	0.7	4.4	0.09	**0.8**	C47, C49
Breast	9	1	89	0	-	-	-	-	-	-	-	-	1	1	-	1	-	2	1	2	0.2	1.6	0.15	**1.1**	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C60
Prostate	189	5	98	0	-	-	-	-	-	1	-	1	2	3	19	32	29	40	29	28	5.1	34.3	3.92	**25.6**	C61
Testis	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	0.1	0.4	0.00	**0.2**	C62
Kidney and renal pelvis	7	0	100	0	1	1	-	-	-	-	-	1	1	-	1	2	-	-	-	-	0.2	1.3	0.03	**0.3**	C64-65
Bladder	17	0	94	6	-	-	-	1	-	-	2	1	4	3	1	1	1	1	-	2	0.5	3.1	0.09	**1.0**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	8	0	100	0	3	-	-	-	-	-	-	-	2	-	-	2	-	1	-	-	0.2	1.5	0.06	**0.5**	C69
Brain and nervous system	10	0	90	0	3	-	1	-	-	-	1	-	1	2	-	1	-	1	-	-	0.3	1.8	0.06	**0.5**	C70-72
Thyroid	2	0	100	0	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	0.1	0.4	0.01	**0.1**	C73
Hodgkin lymphoma	10	0	100	0	-	-	1	1	-	1	3	-	2	2	-	-	-	-	-	-	0.3	1.8	0.02	**0.2**	C81
Non-Hodgkin lymphoma	20	0	100	0	-	-	1	-	1	-	1	5	2	1	4	2	-	-	2	1	0.5	3.6	0.16	**1.1**	C82-86, C96
Multiple myeloma	3	0	67	0	-	-	-	-	1	-	-	-	-	-	-	-	1	-	1	-	0.1	0.5	0.07	**0.4**	C90
Lymphoid leukaemia	4	0	100	0	1	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	0.1	0.7	0.06	**0.4**	C91
Myeloid leukaemia	13	0	77	0	-	-	-	-	-	2	3	3	1	1	2	1	-	-	-	-	0.4	2.4	0.03	**0.3**	C92-94
Leukaemia, unspecified	1	0	0	100	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.00	**0.0**	C95
Other and unspecified	31	0	97	0	1	-	-	1	1	2	-	5	4	4	8	1	1	1	2	-	0.8	5.6	0.24	**1.7**	O&U
All sites	551	11	97	0	9	3	4	6	4	28	39	36	42	40	62	69	54	61	41	42	14.9	100.0	6.60	**46.9**	C00-96
All sites except C44	523	11	97	0	9	3	4	6	3	24	35	32	41	36	59	68	51	60	40	41	14.2	94.9	6.41	**45.4**	C00-96 exc. C44
Average annual population					124078	95480	71169	63316	91970	129331	103109	81517	57057	45303	26690	15264	7460	3686	2261	4222	921913				

*Nigeria, Abuja (2013–2016)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	8	0	100	0	-	-	-	-	1	-	1	-	1	-	2	-	-	-	1	2	0.3	0.8	0.09	**0.8**	C00-06
Salivary gland	8	0	100	0	-	-	-	-	-	-	-	-	3	-	1	1	1	1	-	1	0.3	0.8	0.12	**1.1**	C07-08
Nasopharynx	9	0	100	0	-	-	-	1	2	1	-	1	2	-	1	-	-	-	-	1	0.3	0.9	0.03	**0.4**	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C09-10, C12-14
Oesophagus	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.1	0.00	**0.1**	C15
Stomach	8	0	100	0	-	-	1	-	-	-	1	1	-	-	1	-	3	-	1	-	0.3	0.8	0.16	**1.1**	C16
Colon	17	2	100	0	-	-	-	-	-	-	1	1	1	-	1	3	3	3	-	2	0.5	1.8	0.36	**2.9**	C18
Rectum	22	0	100	0	-	-	-	-	1	1	1	1	5	3	4	1	2	1	2	-	0.7	2.3	0.33	**2.3**	C19-20
Anus	5	0	100	0	-	-	-	-	-	1	-	-	1	1	2	-	-	-	-	-	0.2	0.5	0.03	**0.3**	C21
Liver	4	0	100	0	-	-	-	-	-	-	-	-	-	1	-	1	2	-	-	-	0.1	0.4	0.08	**0.7**	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.0	0.1	0.01	**0.1**	C23-24
Pancreas	3	0	100	0	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	0.1	0.3	0.04	**0.3**	C25
Larynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.0	0.1	0.03	**0.2**	C32
Trachea, bronchus, and lung	9	0	100	0	-	-	-	-	-	-	-	-	-	2	2	-	1	3	1	-	0.3	0.9	0.27	**1.7**	C33-34
Bone	8	0	100	0	-	-	-	-	1	2	1	-	2	1	-	1	-	-	-	-	0.3	0.8	0.04	**0.4**	C40-41
Melanoma of skin	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.0	0.1	0.00	**0.0**	C43
Non-melanoma skin	24	0	96	0	-	-	-	4	3	4	3	3	1	2	2	-	1	1	-	-	0.8	2.5	0.14	**1.3**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	5	0	80	0	-	-	-	-	-	1	-	2	2	-	-	-	-	-	-	-	0.2	0.5	0.01	**0.2**	C46
Connective and soft tissue	18	0	100	0	1	2	3	1	-	1	-	2	1	1	-	1	-	2	1	2	0.6	1.9	0.20	**1.6**	C47, C49
Breast	505	13	88	0	-	-	-	-	4	25	64	82	77	67	66	41	26	19	11	10	15.8	52.3	5.05	**43.0**	C50
Vulva	4	1	100	0	-	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	0.1	0.4	0.07	**0.5**	C51
Vagina	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C52
Cervix uteri	125	0	100	0	-	-	-	-	-	2	6	7	12	21	18	16	13	14	8	8	3.9	13.0	2.26	**17.0**	C53
Uterus	20	1	100	0	-	-	-	-	-	-	-	-	2	3	1	2	5	3	2	1	0.6	2.1	0.51	**3.5**	C54-55
Ovary	42	1	98	0	-	-	-	-	-	3	5	3	8	4	6	5	4	1	-	2	1.3	4.4	0.41	**3.9**	C56
Placenta	2	0	100	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C58
Kidney and renal pelvis	18	0	89	0	4	1	1	-	-	1	2	-	1	1	1	2	1	1	-	2	0.6	1.9	0.15	**1.5**	C64-65
Bladder	5	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	-	0.2	0.5	0.17	**1.0**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	6	0	100	0	1	-	1	-	-	1	3	-	-	-	-	-	-	-	-	-	0.2	0.6	0.01	**0.1**	C69
Brain and nervous system	10	0	80	0	-	1	1	-	-	-	-	1	3	-	2	1	-	-	1	-	0.3	1.0	0.12	**0.8**	C70-72
Thyroid	11	0	100	0	-	-	-	-	2	-	-	-	-	-	2	3	1	3	-	-	0.3	1.1	0.26	**1.9**	C73
Hodgkin lymphoma	4	0	100	0	-	-	1	1	-	1	-	-	-	-	-	-	-	-	1	-	0.1	0.4	0.06	**0.3**	C81
Non-Hodgkin lymphoma	16	0	94	0	1	-	2	-	1	2	1	1	1	-	4	1	1	-	1	-	0.5	1.7	0.16	**1.3**	C82-86, C96
Multiple myeloma	3	1	100	0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0.1	0.3	0.05	**0.4**	C90
Lymphoid leukaemia	3	0	100	0	-	1	1	-	-	-	-	-	-	-	-	1	-	-	-	-	0.1	0.3	0.02	**0.2**	C91
Myeloid leukaemia	10	0	90	0	1	-	2	1	-	1	1	1	-	-	-	1	-	2	-	-	0.3	1.0	0.13	**0.9**	C92-94
Leukaemia, unspecified	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.0	0.1	0.00	**0.0**	C95
Other and unspecified	28	0	96	0	1	1	1	-	1	2	1	4	6	-	4	3	2	1	1	-	0.9	2.9	0.31	**2.4**	O&U
All sites	965	19	93	0	9	6	14	8	16	49	94	112	131	107	124	86	69	57	32	32	30.2	100.0	11.68	**94.7**	C00-96
All sites except C44	941	19	92	0	9	6	14	4	13	45	91	109	130	105	122	86	68	56	32	32	29.5	97.5	11.54	**93.4**	C00-96 exc. C44
Average annual population					124007	97535	81193	74046	101305	112188	75298	50401	31890	19610	12283	5944	4466	2531	2128	3847	798672				

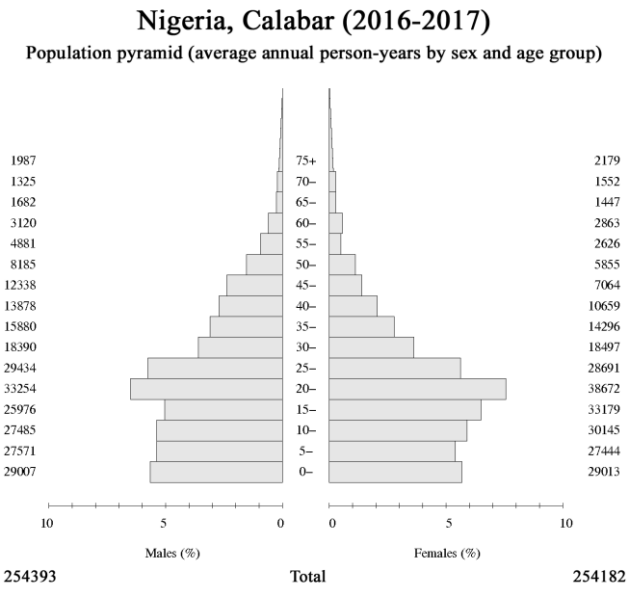
Nigeria, Calabar

The Calabar Cancer Registry started as a hospital-based registry in 1979 then became population-based in 2004. It is located in the Department of Pathology of the University of Calabar Teaching Hospital (UCTH) in Calabar, Cross River state, Nigeria.

The registry received its first equipment from the national headquarters of cancer registries in Nigeria coordinated by professor T.F.Solanke in June 1994. This was followed by a grant from WHO/IARC for 2004-2006. In 2009, a set of computer and accessories was donated by the Nigeria's Federal Ministry of Health. Since 2007, the registry has had no regular source of funding.

The registry is led by a consultant pathologist as the director, and staffed by a principal administrative officer as the acting registrar, a senior clerical officer as the data collector and data-entry clerk, a medical social worker in charge of patients' counselling. There is also an oncology nurse who counsels patients on the detection of early warning signals of cancer and assists during the collection of cervical smears and breast biopsies in the cytology clinic.

Registration is predominantly active, involving visits to all the health institutions within the area of coverage. The registration area includes the following Local Government Areas (LGAS): Akamkpa, Akpabuyo, Biase, Calabar Municipality, Calabar South and Odukpani. Population-coverage is considered to be relatively complete for two of these: Calabar South & Calabar Municipality, with a population (2006 national population census) of 375,196. Based on a projected population of 501,400 in 2016, an estimate for 2016/7 was prepared assuming a constant growth of 2.9% within each age-sex group.



Regular visits are made to the hospital wards, health records department and laboratory departments including the haematology clinic at the UCTH. For logistical reasons, data collection is limited to the health facilities (such as government tertiary, secondary and primary health centres, private hospitals, clinics and laboratories) located in only three local government areas: Akpabuyo, Calabar Municipality and Calabar South.

The information on the patient and the tumour is abstracted from the patients' health records, laboratory reports, in-patients and clinic attendance records. Date last seen or date of death is also obtained. When applicable, autopsy records are also examined for available data on cancer-related deaths. Presently, there is no mandatory death registration in Nigeria; only death certificates issued in hospitals are used for updating the vital status of the cancer cases.

To ensure quality control, as far as possible, histological confirmation is obtained in cases registered. All entries are cross-checked validated and updated regularly by the director. The cancers are coded according to ICD-O-3. New cancer cases registered are stored and managed with CanReg 4, and CanReg 5 recently. Strict confidential practice is maintained throughout the data handling processes. The patients' data on a paper form is kept securely in locked cabinets.

YEARS PRESENTED

Two year period, 2016 – 2017

COMMENT

359 cases among inhabitants of the two LGAs were recorded in the two-year period (2016-2017), although with quite marked monthly variation in cases registered.

The calculated age standardised incidence rates for all sites (excl. NMSC) are 53.9 per 10^5 in men and 103.9 per 10^5 in women, values rather lower than the average estimated for West Africa in Globocan2018. Low incidence rates are observed for almost all individual cancers (especially liver, lung and brain cancers). In males, cancers of the prostate account for 35.8% of cases, with an incidence rate (ASR) of 28.1 per 10^5. In females, the incidence of breast cancer (30.4% of cancers in women) at 28.4 per 10^5) is some 80% of the regional average. Cervix cancer (23.6% of cases) has a relatively high incidence (ASR 31.9 per 10^5).

The percentage of cases based on morphological verification of diagnosis (MV%) is much lower) - at 67% in males and 56% in females than in the period reported in Volume II (2009-2013) when it was about 96%.

Summary

Despite the considerable uncertainty concerning the population at risk, we report estimated incidence rates. Compared with the results reported in CiSSA Vol. II (2009-2013), the incidence of prostate cancer is very much lower, and the incidence of cervix cancer now exceeds that of breast cancer.

PUBLICATIONS and ACHIEVEMENTS

The Calabar Cancer Registry became a member of AFCRN in 2012.

Ekanem IA, Parkin DM. Five year cancer incidence In Calabar, Nigeria (2009-2013). Cancer Epidemiol. 2016 Jun;42:167-72.

Odutola MK, Jedy-Agba E, Oga E, Igbinoba F, Otu T, Ezeome E, et al. Cancers attributable to infectious agents in Nigeria: 2012-2014 journal of global oncology 2 (3_suppl), 77s-78s, 2016

Ebughe GA, Ekanem IA, Omoronyia OE, Omotoso AJ, Ago BU, Agan TU, Ugbem TI. Incidence of cervical cancer in Calabar, Nigeria. Journal of Cancer and Tumor International 3(2): 1-13, 2016

Ebughe GA, Ekanem IA, Omoronyia OE, Nnoli MA, Ikpi EE, Ugbem TI. Prostate Cancer Incidence in Calabar-Nigeria. British Journal of Medicine and Medical Research 14 (5), 1, 2016

Jedy-Agba E, Dareng E, Oga E, Odutola M, Adebamowo S, Igbinoba F, et al. The burden of human papilloma virus associated cancers in Nigeria 2012–2014. JAIDS, Journal of Acquired Immune Deficiency Syndromes 71, 79, 2016

Ekanem IA, Asuquo M, Odey F. Cancers in childhood and young adults in Calabar, Nigeria (2009-2013) American Journal of Clinical Pathology 2018;150:s90-s92

Nigeria, Calabar (2016–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	0.7	0.03	**0.3**	C11
Other pharynx	1	0	100	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.01	**0.1**	C09-10, C12-14
Oesophagus	1	0	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	0.7	0.03	**0.3**	C15
Stomach	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C16
Colon	6	0	50	0	-	-	-	-	-	-	-	1	-	-	2	-	-	-	1	2	1.2	4.4	0.27	**2.6**	C18
Rectum	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	0.4	1.5	0.24	**1.2**	C19-20
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C21
Liver	1	0	0	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.2	0.7	0.02	**0.2**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	2	0	0	0	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	0.4	1.5	0.20	**0.9**	C25
Larynx	3	0	100	0	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	0.6	2.2	0.13	**1.2**	C32
Trachea, bronchus, and lung	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.2	0.7	0.15	**0.9**	C33-34
Bone	5	0	100	0	-	1	-	-	-	-	1	2	1	-	-	-	-	-	-	-	1.0	3.6	0.07	**0.9**	C40-41
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C43
Non-melanoma skin	9	0	100	0	-	-	-	-	1	-	1	2	2	-	-	1	1	1	-	-	1.8	6.6	0.37	**3.0**	C44
Mesothelioma	2	0	100	0	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	0.4	1.5	0.05	**0.5**	C45
Kaposi sarcoma	4	0	0	0	-	-	-	-	1	2	-	-	-	-	1	-	-	-	-	-	0.8	2.9	0.06	**0.7**	C46
Connective and soft tissue	4	0	75	0	-	-	-	-	-	-	-	-	2	1	-	1	-	-	-	-	0.8	2.9	0.11	**1.1**	C47, C49
Breast	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C60
Prostate	49	0	90	0	-	-	-	-	-	-	-	-	1	3	3	7	13	5	8	9	9.6	35.8	3.82	**28.1**	C61
Testis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C62
Kidney and renal pelvis	6	0	50	0	3	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1.2	4.4	0.10	**1.4**	C64-65
Bladder	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	11	0	45	0	7	2	-	-	1	-	-	-	1	-	-	-	-	-	-	-	2.2	8.0	0.10	**2.1**	C69
Brain and nervous system	1	0	100	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.01	**0.2**	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C73
Hodgkin lymphoma	4	0	50	0	-	-	-	1	-	-	-	1	1	-	-	-	-	-	1	-	0.8	2.9	0.23	**1.3**	C81
Non-Hodgkin lymphoma	10	0	30	0	-	1	1	-	-	-	-	1	1	-	2	1	1	-	2	-	2.0	7.3	0.62	**3.9**	C82-86, C96
Multiple myeloma	3	0	0	0	-	-	-	-	-	-	-	-	-	1	-	1	1	-	-	-	0.6	2.2	0.15	**1.3**	C90
Lymphoid leukaemia	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.2	0.7	0.00	**0.5**	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C92-94
Leukaemia, unspecified	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	0.4	1.5	0.15	**1.4**	C95
Other and unspecified	8	0	88	0	1	-	1	-	-	-	-	2	1	-	-	1	-	1	-	1	1.6	5.8	0.27	**2.8**	O&U
All sites	137	0	69	0	11	5	3	1	4	3	2	10	11	6	14	13	17	9	14	14	26.9	100.0	7.17	**56.9**	C00-96
All sites except C44	128	0	67	0	11	5	3	1	3	3	1	8	9	6	14	12	16	8	14	14	25.2	93.4	6.80	**53.9**	C00-96 exc. C44
Average annual population					29007	27570	27485	25976	33254	29434	18390	15880	13878	12338	8184	4881	3120	1682	1324	1987	254390				

Nigeria, Calabar (2016–2017)

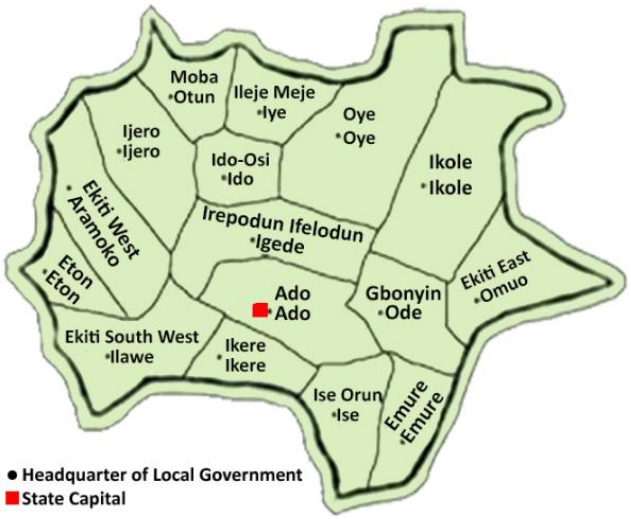
Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	0.4	0.8	0.18	**1.5**	C00-06
Salivary gland	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	0.4	0.8	0.18	**1.5**	C07-08
Nasopharynx	1	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.2	0.4	0.02	**0.3**	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C09-10, C12-14
Oesophagus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C15
Stomach	3	0	67	0	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	0.6	1.3	0.19	**1.6**	C16
Colon	1	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.2	0.4	0.04	**0.4**	C18
Rectum	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	0.4	0.8	0.25	**1.3**	C19-20
Anus	1	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.2	0.4	0.01	**0.2**	C21
Liver	3	1	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.6	1.3	0.02	**0.9**	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C23-24
Pancreas	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C32
Trachea, bronchus, and lung	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.2	0.4	0.09	**0.7**	C33-34
Bone	3	0	100	0	-	-	-	-	-	-	-	1	-	-	1	1	-	-	-	-	0.6	1.3	0.16	**1.4**	C40-41
Melanoma of skin	5	0	60	0	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	-	1.0	2.1	0.67	**3.7**	C43
Non-melanoma skin	6	0	100	0	-	-	-	-	-	2	-	-	1	-	1	2	-	-	-	-	1.2	2.5	0.27	**2.5**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	4	0	50	0	-	-	-	-	-	1	1	-	1	1	-	-	-	-	-	-	0.8	1.7	0.08	**1.0**	C46
Connective and soft tissue	3	0	100	0	-	-	-	-	-	-	-	1	-	1	-	-	1	-	-	-	0.6	1.3	0.14	**1.3**	C47, C49
Breast	72	0	72	0	-	-	-	2	1	4	8	10	13	11	5	6	9	2	1	-	14.2	30.4	3.11	**28.4**	C50
Vulva	8	0	62	0	1	-	-	-	-	-	-	2	3	-	-	2	-	-	-	-	1.6	3.4	0.30	**3.0**	C51
Vagina	2	0	50	0	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	0.4	0.8	0.09	**0.9**	C52
Cervix uteri	56	0	39	0	-	-	-	-	-	2	4	3	2	3	14	8	7	9	2	2	11.0	23.6	4.13	**31.9**	C53
Uterus	6	0	50	0	-	-	-	-	-	-	-	2	-	1	-	-	-	1	1	1	1.2	2.5	0.40	**3.0**	C54-55
Ovary	11	0	27	0	-	-	-	-	-	-	2	2	2	-	2	3	-	-	-	-	2.2	4.6	0.48	**4.4**	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C58
Kidney and renal pelvis	2	0	50	0	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.4	0.8	0.04	**0.6**	C64-65
Bladder	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	4	0	50	0	2	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	0.8	1.7	0.07	**1.0**	C69
Brain and nervous system	1	0	100	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.01	**0.1**	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C73
Hodgkin lymphoma	3	0	67	0	-	1	-	1	-	-	-	-	1	-	-	-	-	-	-	-	0.6	1.3	0.04	**0.6**	C81
Non-Hodgkin lymphoma	15	0	53	0	1	1	-	2	3	-	1	-	1	2	2	-	1	1	-	-	3.0	6.3	0.51	**4.9**	C82-86, C96
Multiple myeloma	8	0	0	0	-	-	-	-	-	-	-	-	-	1	4	1	1	-	1	-	1.6	3.4	0.55	**4.2**	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C91
Myeloid leukaemia	1	0	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	0.4	0.04	**0.4**	C92-94
Leukaemia, unspecified	1	0	100	0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.01	**0.2**	C95
Other and unspecified	10	0	100	0	1	-	1	1	-	-	1	1	1	-	1	-	1	2	-	-	2.0	4.2	0.55	**4.3**	O&U
All sites	237	1	57	0	5	4	3	7	4	9	19	22	26	22	34	26	27	16	8	4	46.6	100.0	12.68	**106.4**	C00-96
All sites except C44	231	1	56	0	5	4	3	7	4	7	19	22	25	22	33	24	27	16	8	4	45.4	97.5	12.41	**103.9**	C00-96 exc. C44
Average annual population					29012	27444	30144	33179	38672	28691	18496	14296	10659	7064	5854	2626	2862	1446	1552	2178	254177				

Nigeria, Ekiti

Ekiti Cancer Registry (ECR) is a population based cancer registry located at Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, Ekiti State, Nigeria. It was established by the Nigerian National System of Cancer Registries (NSCR) in July 2014, to incorporate the operation of the hospital-based registry which was established in 2009 at the Federal Teaching Hospital (FTH), Ido-Ekiti. Although located in different Local Government Areas of Ekiti State, the hospital-based registry supplies data to ECR and the two registries work closely together to ensure complete coverage in cancer registration in Ekiti State.

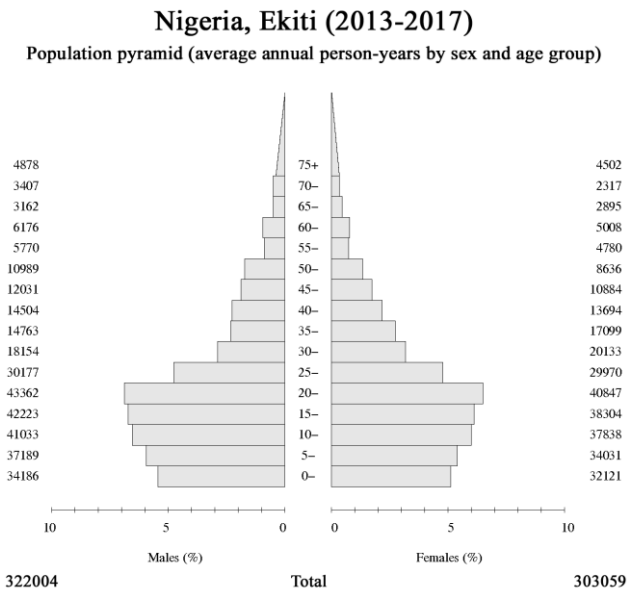
The registry is financed by EKSUTH. The registry has also received technical support from the NSCR, Federal Ministry of Health, Abuja and AFCRN.



The registry covers two LGAs in Ekiti State (Ado and Ido-Osi). Estimated total population for these two LGAs was of 473,691 at the National Population Census of 2006. For the five year period for which data are presented here (2013-2017) the average annual population was estimated at about 625,000 inhabitants, based on projections from the census of 2006.

The main objectives of Ekiti Cancer Registry are to maintain a cancer incidence database; to provide a basis for monitoring cancer incidence, mortality and intervention in Ekiti State; to provide timely, complete and high quality cancer data for researchers and health policy makers; to contribute data to the NSCR, AFCRN and IARC/WHO.

ECR has eight staff members. It is headed by the Principal Investigator, a consultant anatomic pathologist, assisted by a deputy director and a registrar who directly supervises the three trained abstractors. The registry also has a trained bio-statistician, who does the coding, data entry and analysis using the CanReg 5 software. The registry also has a medical records officer, who assists in retrieving case notes of patients diagnosed with cancer. The medical record officer is also responsible for the safe keeping of records. The registry has a follow-up nurse, who assists with cancer patients counselling and patients follow up at home.



ECR uses active data collection methods, searching for information from data sources including the outpatient clinics, wards, pathology and haematology laboratories of the teaching hospitals, private hospitals and clinics, cancer diagnostic centres, and records from autopsies. The registry has a timetable for daily case finding within the hospital and a monthly schedule for visits to data sources outside the teaching hospital. The registry also keeps a data abstraction log book, where details of data sources visited, dates, and number of cases abstracted are recorded, which is reviewed weekly.

The registry uses death certificates completed in hospital as a source of information. These are issued by the Chairman, Medical Advisory Committee (CMAC)'s Office and the Department of Anatomic Pathology.

The data are collected using data abstraction forms and ICD-O-3 coding done by the registry staff deployed from the medical records department. All abstracted cancer cases are reviewed weekly by the registry Director before entering into CanReg 5. Completed abstraction forms are filled and archived in a locked cabinet at the registry's office to ensure safety and confidentiality of data.

YEARS PRESENTED

Five year period, 2013 – 2017

COMMENT

These are the first data from this newly established registry. The rate of registration was relatively constant at 20 cases per month over the 5-year period.

In the absence of recent population data (the most recent census was in 2006) population estimates are made using very uncertain projections, so that little confidence can be placed in the calculated incidence rates.

These rates (all sites) of 59.6 per 10^5 for males and 68.9 per 10^5 for females are low in comparison with the regional average, as are the rates at most individual sites (except for lymphomas in females). Breast cancer accounts for 47% of cancers in women, and cervix cancer for 11.5%; more than half of cancers in men (51.8%) are prostate cancers.

The percentage of cases registered with morphological verification of diagnosis (75.6%) and death certificates (4%) suggests diversity of data sources. Few childhood cancer cases (1.5%) were recorded.

Summary

In the absence reasonable data on population at risk, the estimated incidence rates are very uncertain.

PUBLICATIONS and ACHIEVEMENTS

The Ekiti Cancer Registry became a provisional member of AFCRN in 2019.

Elima Jedy- Agba et al. The role of hospital- based cancer registries in low and middle income countries – The Nigerian case Study . cancer Epidemiol.2012 Oct; 36(5): 430-5.

Jedy-Agba E, Oga A, Odutola M, Abdullahi M, Popoola A, Achara P, et al. Adebamowo. Developing National Cancer Registration in Developing Countries – Case Study of the Nigeria National System of Cancer Registries. Frontiers in Public Health 3:188.

Omonisi AE, Erinomo OO, Inubile AJ, Adebayo O, Ayodele J, Areo PO, et al. 1st Cancer Incidence Report from Ekiti, Southwest, Nigeria, 2013- 2017, Ekiti Cancer Registry Nigeria Technical Report, 2018.

Data from the registry were included in Cancer Incidence in Nigeria Book: 2009- 2013. https://nigeriancancer registries.net /Cancer in Nigeria 2009- 2013.pdf.

*Nigeria, Ekiti (2013–2017)

Number of cases by age group and summary rates of incidence: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	9	0	89	0	-	-	-	1	2	3	-	-	-	1	-	1	-	-	1	-	0.6	1.6	0.07	**0.6**	C00-06
Salivary gland	2	0	50	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.1	0.4	0.01	**0.1**	C07-08
Nasopharynx	5	0	60	20	1	-	-	-	1	-	-	-	-	-	2	-	-	1	-	-	0.3	0.9	0.06	**0.5**	C11
Other pharynx	5	0	0	0	1	-	-	-	-	-	-	-	1	-	-	-	1	-	1	1	0.3	0.9	0.06	**0.5**	C09-10, C12-14
Oesophagus	6	0	33	0	-	-	-	-	-	-	-	-	2	-	-	1	-	-	2	1	0.4	1.1	0.09	**0.6**	C15
Stomach	8	0	50	0	-	-	-	-	-	-	-	-	-	-	2	-	2	-	1	3	0.5	1.4	0.08	**0.8**	C16
Colon	14	0	71	0	-	-	-	-	1	2	1	2	2	1	-	-	1	-	1	3	0.9	2.5	0.10	**1.1**	C18
Rectum	9	0	67	11	-	-	-	-	-	-	-	-	1	1	-	2	3	1	-	1	0.6	1.6	0.13	**1.1**	C19-20
Anus	7	0	57	0	-	-	-	-	-	-	-	-	-	2	2	-	-	-	1	2	0.4	1.2	0.06	**0.7**	C21
Liver	29	0	21	34	-	-	-	-	-	-	3	5	3	5	3	2	-	1	2	5	1.8	5.1	0.26	**2.7**	C22
Gallbladder etc.	6	0	83	0	-	-	-	-	-	1	-	-	1	1	-	-	-	1	2	-	0.4	1.1	0.11	**0.7**	C23-24
Pancreas	4	0	25	0	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	1	0.2	0.7	0.02	**0.3**	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C32
Trachea, bronchus, and lung	1	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.2	0.02	**0.1**	C33-34
Bone	1	0	100	0	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.1**	C40-41
Melanoma of skin	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	0.1	0.4	0.04	**0.2**	C43
Non-melanoma skin	5	0	80	20	-	-	-	-	-	-	-	1	1	-	-	1	-	2	-	-	0.3	0.9	0.09	**0.7**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C46
Connective and soft tissue	12	0	83	0	-	-	-	1	1	2	1	-	-	1	3	-	1	2	-	-	0.7	2.1	0.13	**1.1**	C47, C49
Breast	7	0	100	0	-	-	-	-	-	-	-	1	-	1	-	-	1	-	-	4	0.4	1.2	0.03	**0.6**	C50
Penis	1	0	100	0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.0**	C60
Prostate	290	0	88	1	-	-	-	-	1	-	3	1	2	2	9	21	37	39	58	117	18.0	51.3	4.04	**33.0**	C61
Testis	16	0	94	0	-	-	1	1	3	1	2	2	1	-	1	-	-	1	-	3	1.0	2.8	0.09	**1.2**	C62
Kidney and renal pelvis	3	0	100	0	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.2	0.5	0.01	**0.2**	C64-65
Bladder	11	0	91	0	-	-	-	-	-	-	-	-	1	1	2	-	2	1	3	1	0.7	1.9	0.19	**1.2**	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C66, C68
Eye	2	0	50	0	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	0.1	0.4	0.04	**0.3**	C69
Brain and nervous system	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.1	0.2	0.02	**0.1**	C70-72
Thyroid	3	0	100	0	-	-	-	-	-	1	1	-	-	-	-	1	-	-	-	-	0.2	0.5	0.03	**0.3**	C73
Hodgkin lymphoma	14	0	100	0	-	-	1	-	1	1	-	3	1	1	1	1	1	1	1	1	0.9	2.5	0.15	**1.3**	C81
Non-Hodgkin lymphoma	35	0	94	3	2	1	-	1	1	1	-	1	3	1	2	4	3	2	3	10	2.2	6.2	0.34	**3.4**	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C91
Myeloid leukaemia	11	0	100	0	-	-	1	1	1	-	-	1	1	1	2	-	1	-	1	1	0.7	1.9	0.09	**0.9**	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C95
Other and unspecified	45	0	49	7	1	-	3	1	-	1	2	2	3	4	2	5	5	7	2	7	2.8	8.0	0.56	**4.9**	O&U
All sites	565	0	78	4	6	2	6	7	12	13	15	22	23	23	34	39	60	60	80	163	35.1	100.0	6.91	**59.6**	C00-96
All sites except C44	560	0	78	3	6	2	6	7	12	13	15	21	22	23	34	38	60	58	80	163	34.8	99.1	6.81	**58.9**	C00-96 exc. C44
Average annual population					34186	37189	41033	42223	43362	30177	18154	14763	14504	12031	10989	5770	6176	3162	3407	4878	322004				

*Nigeria, Ekiti (2013–2017)

Number of cases by age group and summary rates of incidence: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	%	CR 74	ASR (W)	ICD-10
Mouth	7	0	71	0	1	-	-	-	1	1	-	1	1	-	-	-	-	-	1	1	0.5	1.1	0.07	**0.6**	C00-06
Salivary gland	2	0	50	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	0.1	0.3	0.05	**0.3**	C07-08
Nasopharynx	4	0	50	0	1	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	0.3	0.6	0.03	**0.3**	C11
Other pharynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.1	0.2	0.02	**0.2**	C09-10, C12-14
Oesophagus	2	0	50	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.1	0.3	0.01	**0.2**	C15
Stomach	7	0	29	14	-	-	-	-	-	-	-	-	1	1	-	1	1	1	1	1	0.5	1.1	0.14	**1.0**	C16
Colon	13	0	54	8	-	-	-	-	-	-	1	1	1	1	1	1	1	1	4	1	0.9	2.0	0.29	**1.8**	C18
Rectum	4	0	25	25	-	-	-	-	-	-	-	1	-	1	2	-	-	-	-	-	0.3	0.6	0.04	**0.4**	C19-20
Anus	2	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	0.1	0.3	0.01	**0.2**	C21
Liver	10	0	30	20	-	-	-	-	1	-	1	-	-	2	-	1	-	2	-	3	0.7	1.6	0.12	**1.2**	C22
Gallbladder etc.	1	0	0	100	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.1	0.2	0.02	**0.2**	C23-24
Pancreas	4	0	100	0	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	0.3	0.6	0.01	**0.4**	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C32
Trachea, bronchus, and lung	2	0	50	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	0.1	0.3	0.01	**0.2**	C33-34
Bone	3	0	67	0	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	0.2	0.5	0.06	**0.4**	C40-41
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C43
Non-melanoma skin	4	0	75	0	-	-	-	-	-	-	-	-	-	-	1	2	1	-	-	-	0.3	0.6	0.07	**0.6**	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C45
Kaposi sarcoma	3	0	100	0	-	-	-	-	-	-	1	-	-	1	-	1	-	-	-	-	0.2	0.5	0.04	**0.3**	C46
Connective and soft tissue	14	0	71	7	-	-	-	2	-	-	2	2	-	-	1	1	3	2	-	1	0.9	2.2	0.19	**1.6**	C47, C49
Breast	297	0	76	4	-	-	-	-	22	44	30	31	31	29	23	26	15	18	15	13	19.6	46.3	3.40	**30.0**	C50
Vulva	4	0	75	0	-	-	-	-	-	-	1	-	-	-	-	-	-	2	-	1	0.3	0.6	0.07	**0.6**	C51
Vagina	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C52
Cervix uteri	73	0	67	1	-	-	-	-	1	1	1	6	1	12	12	9	7	6	7	10	4.8	11.4	1.14	**9.3**	C53
Uterus	24	0	75	0	-	-	-	-	-	3	1	3	3	3	3	5	1	1	-	1	1.6	3.7	0.28	**2.7**	C54-55
Ovary	33	0	70	9	-	-	-	1	1	5	3	6	5	4	3	1	2	-	1	1	2.2	5.1	0.28	**2.9**	C56
Placenta	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.1	0.2	0.01	**0.1**	C58
Kidney and renal pelvis	2	0	50	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	0.1	0.3	0.01	**0.2**	C64-65
Bladder	6	0	67	0	-	-	-	-	-	-	-	-	-	-	1	2	-	2	-	1	0.4	0.9	0.12	**1.0**	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C66, C68
Eye	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C69
Brain and nervous system	1	0	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.1**	C70-72
Thyroid	3	0	100	0	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	0.2	0.5	0.04	**0.4**	C73
Hodgkin lymphoma	10	0	100	0	-	-	-	-	1	2	-	3	1	-	-	-	-	1	2	-	0.7	1.6	0.15	**1.0**	C81
Non-Hodgkin lymphoma	63	0	98	2	-	-	1	-	1	5	6	6	13	7	4	6	3	6	2	3	4.2	9.8	0.77	**6.8**	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C90
Lymphoid leukaemia	1	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.2	0.00	**0.1**	C91
Myeloid leukaemia	5	0	100	0	-	-	1	-	-	1	1	-	1	-	1	-	-	-	-	-	0.3	0.8	0.03	**0.4**	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	**0.0**	C95
Other and unspecified	35	0	40	11	-	-	-	1	2	2	4	3	3	4	5	-	2	3	3	3	2.3	5.5	0.44	**3.7**	O&U
All sites	641	0	73	5	2	-	2	6	30	65	54	65	64	65	62	60	37	46	37	46	42.3	100.0	7.93	**68.9**	C00-96
All sites except C44	637	0	73	5	2	-	2	6	30	65	54	65	64	65	61	58	36	46	37	46	42.0	99.4	7.85	**68.3**	C00-96 exc. C44
Average annual population					32121	34031	37838	38304	40847	29970	20133	17099	13694	10884	8636	4780	5008	2895	2317	4502	303060				

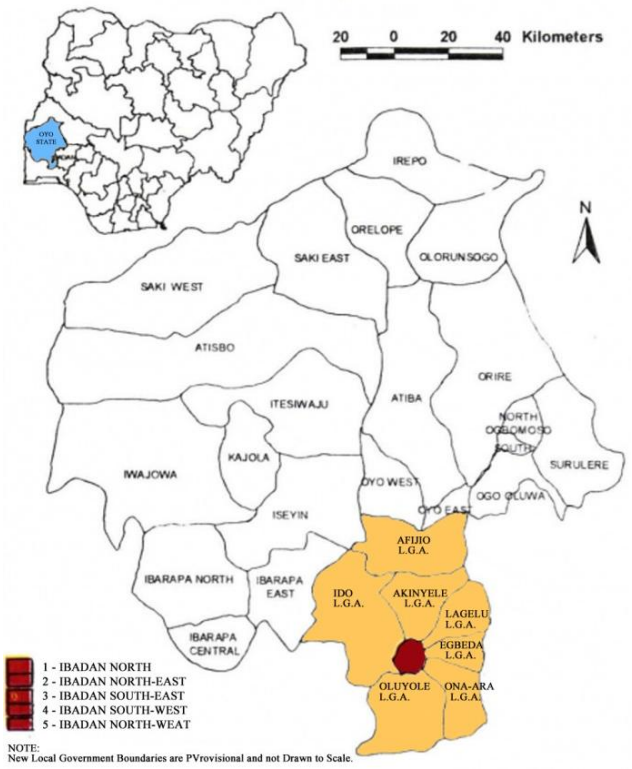
Nigeria, Ibadan

The Ibadan Cancer Registry (IBCR) was the second population-based cancer registry established in Africa. It was set up in April 1960 with the aim of providing incidence rates for different cancer types in Ibadan and its environs, and to provide baseline data for use by health planners, physicians and research workers. The registry is based in the Pathology Department of the University College Hospital (UCH) in Ibadan.

The Registry is led by its Principal Investigator (Consultant Pathologist) and the deputy principal investigator and is staffed with 5 members (registrar, assisted by another trained registrar, a data manager/ computer analyst, a data collection officer/clerk, and a secretarial assistant.

The registry is funded only in part by the University College Hospital and the College of Medicine of the University of Ibadan. It has received grant support from the IARC in the past as well as grant support for studies through the AFCRN.

The registry collaborates with the Nigerian Federal Ministry of Health and the local state ministry of health by providing data to help with Cancer Control Plans, including through the Nigerian National System of Cancer Registries (NSCR).



Ibadan is the capital of Oyo State and is the second largest city in Nigeria by geographical area. With 2,549,265 inhabitants at the 2006 population census, the current population estimate is about 3 million people for the catchment area of the registry, comprising 11 Local Government Areas (LGAs): Akinyele, Egbeda, Ibadan North, Ibadan North East/North West/South East/South West, Ido, Lagelu, Oluyole and Ona-ara). Residents are defined as persons who have been living in the relevant area for at least one year.

Oyo State, for the most part, is homogenous, mainly inhabited by the Yoruba ethnic group who are primarily agrarian. Ibadan, the administrative centre of the state, is also home to other ethnicities that have migrated for business, education or other living. About 10% of the population are of Hausa/Fulani, Igbo and Efik/Ibibio descent. There are about 55% Muslims and 45% Christians.

The registry actively collects cases from specialist cancer services available in the UCH including radiotherapy, pathology laboratory, the fine needle aspiration cytology clinic (FNAC) and other diagnostic cytological services. Regular visits to the haematology department provide the opportunity to retrieve information on haematological malignancies. IBCR also collects data from two state government hospitals (Adeoyo Hospital and Ring Road Hospital) and several private and mission hospitals that provide general medical, gynaecological and paediatric services. Seven private pathology laboratories in the registry area also provide data.

Apart from these, the registry receives some cases from medical centres in its environs including the Baptist Medical Centre (Ogbomosho North local Government Area); Ladoke Akintola University of Technology Teaching Hospital, Oshogbo; and Obafemi Awolowo University Teaching Hospital (Ife North Local Government area).

The Ibadan Cancer Registry utilizes an active data collection method to obtain cases from sources mentioned above as well as from the state Office of Statistics, and a hospice located within the UCH premises. Registry staff visit these sources to scrutinize the records kept in the medical records departments and the registers of individual departments that diagnose and treat cancers to identify and abstract information on cancer cases among confirmed residents of the registry region. Although cancer is not a notifiable disease, some registration forms are received from private practitioners. A recently established local comprehensive cancer screening and diagnostic facility also provides data to the registry.

The death registration system in the state is inadequate and incomplete; however, death certificates issued by physicians at UCH are considered to be accurate. Hopefully there will be improvement in casefinding with the presence of hospice, access to population records, and the presence of the newly introduced hospital mortality publication.

The CanReg 4 system has been used for data recording and management since 1997. Cases are coded according to

ICD-O-3. Difficult cases are clarified with the pathologists. Double entry is randomly checked by combining entries by two different data managers in the registry (abstraction and re-coding). Periodic review of data is done to rule out duplicates and confirm multiple primaries. Electronic data are password protected and only the registry staff have access to the passwords.

YEARS PRESENTED

Three years provided, 2015-2017

COMMENT

The rate of registration (80 cases per month) is slightly less than in the period presented in CiSSA Vol. II (2006-2009), which was 82 per month, and the proportion of cases with morphological verification of diagnosis is slightly higher (at 73%).

Rates for 2006-2009 were based on the population at risk enumerated at the 2006 census. In the absence of more recent data, the projections for the current period (3.1 million) are very uncertain, so that little confidence can be placed in calculated rates. The results are therefore presented as numbers and percentages.

In men, prostate cancer is by far the most common malignancy (33.7% of cases) followed by large bowel (9.3%) and liver (8.3%). In females, the rank order is breast 45.7%, cervix 12.2%, ovary 5% and large bowel (4.2%). The pattern is more or less the same as 8 years earlier, although the proportionate contributions of prostate (in men) and breast cancer (in women) are rather greater.

Summary

The absence of reliable population denominators means that estimated incidence rates are uncertain, and comparisons with those from earlier periods would be misleading. The cancer profile (in terms of relative proportions of different cancers) is rather similar to that in Volume II, although there may have been increases in the occurrence of breast and prostate cancer.

PUBLICATIONS and ACHIEVEMENTS

The cancer registry data featured in CI5, Vol. I, II, and III; the International Incidence of Childhood Cancer Vol. I and II, and also participated in a variety of research studies.

Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, Nikšić M, et al; CONCORD Working Group. 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. Lancet. 2018 ;391(10125):1023-1075.

Jedy-Agba E, Curado MP, Ogunbiyi JO, Oga E, Fabowale T, Igbinoba F, et al. Cancer Incidence in Nigeria: A report from population based cancer registries. Cancer Epidemiology. 2012; 36/5): e 271-8.

Cancer incidence in Ibadan including childhood cancers 2009-2012. Ibadan Cancer Registry Report October 2016.

Nigeria, Ibadan (2015–2017)

Number of cases by age group: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	12	0	92	0	-	-	1	-	-	1	1	-	-	1	1	-	1	3	-	3	1.0	C00-06
Salivary gland	7	0	100	0	-	-	-	-	-	1	-	-	1	1	1	1	-	1	1	-	0.6	C07-08
Nasopharynx	18	0	89	0	-	-	2	-	1	-	2	1	5	-	2	3	-	1	1	-	1.6	C11
Other pharynx	3	0	67	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	0.3	C09-10, C12-14
Oesophagus	4	0	75	0	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	0.3	C15
Stomach	36	0	56	0	-	-	-	-	-	-	-	2	1	4	3	6	10	1	5	4	3.1	C16
Colon	48	0	81	0	-	-	-	-	2	-	3	2	5	3	1	7	10	4	6	5	4.2	C18
Rectum	59	0	59	0	-	1	-	1	1	1	3	3	5	9	8	9	6	5	4	3	5.1	C19-20
Anus	14	0	36	0	-	-	-	-	-	1	-	1	-	3	4	1	1	2	-	1	1.2	C21
Liver	96	3	15	0	3	-	-	1	3	3	7	14	15	4	9	12	6	7	3	6	8.3	C22
Gallbladder etc.	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	0.2	C23-24
Pancreas	34	1	15	0	-	-	-	1	-	1	-	1	-	2	3	7	2	3	4	9	2.9	C25
Larynx	22	0	82	0	-	-	-	-	1	-	-	2	1	-	4	3	5	3	-	3	1.9	C32
Trachea, bronchus, and lung	40	3	65	0	1	-	-	-	-	-	1	3	3	3	5	5	7	3	1	5	3.5	C33-34
Bone	18	0	78	0	1	1	2	1	5	3	1	1	-	2	1	-	-	-	-	-	1.6	C40-41
Melanoma of skin	5	0	80	0	-	-	-	-	-	-	-	-	1	1	-	1	2	-	-	-	0.4	C43
Non-melanoma skin	30	0	93	0	-	-	2	1	-	1	7	2	3	1	1	-	5	2	3	2	2.6	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	C45
Kaposi sarcoma	5	0	60	0	-	-	-	-	-	1	1	-	-	1	1	-	-	1	-	-	0.4	C46
Connective and soft tissue	31	0	77	0	-	-	-	7	-	4	2	3	4	1	3	1	2	1	2	1	2.7	C47, C49
Breast	7	1	86	0	-	-	-	-	-	-	-	-	-	1	-	1	-	-	1	3	0.6	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C60
Prostate	388	1	75	0	-	1	1	-	-	1	1	-	2	4	12	30	48	68	81	138	33.7	C61
Testis	6	0	83	0	-	-	-	1	-	-	-	2	2	-	-	1	-	-	-	-	0.5	C62
Kidney and renal pelvis	20	0	60	0	6	4	3	-	-	1	1	-	-	-	4	-	-	1	-	-	1.7	C64-65
Bladder	22	0	68	0	1	-	-	-	1	1	-	-	1	1	2	3	1	2	5	4	1.9	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.1	C66, C68
Eye	17	2	71	0	7	-	-	1	1	-	-	3	-	1	-	1	-	-	-	1	1.5	C69
Brain and nervous system	9	0	56	0	-	1	2	-	-	1	1	-	-	-	-	2	1	1	-	-	0.8	C70-72
Thyroid	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0.2	C73
Hodgkin lymphoma	12	0	92	0	-	3	2	3	-	1	1	-	1	1	-	-	-	-	-	-	1.0	C81
Non-Hodgkin lymphoma	70	0	97	0	6	5	4	6	4	4	4	4	6	4	5	6	3	4	1	4	6.1	C82-86, C96
Multiple myeloma	14	0	86	0	-	-	-	-	-	-	-	-	1	3	-	2	1	3	3	1	1.2	C90
Lymphoid leukaemia	15	0	100	0	-	-	-	-	-	1	-	-	1	-	2	-	2	3	3	3	1.3	C91
Myeloid leukaemia	18	0	89	0	2	1	1	2	1	-	3	1	2	2	1	1	-	1	-	-	1.6	C92-94
Leukaemia, unspecified	7	0	71	0	-	1	3	1	-	-	1	-	-	-	-	-	-	1	-	-	0.6	C95
Other and unspecified	60	2	53	0	2	1	-	1	1	1	3	4	4	4	5	3	12	4	5	8	5.2	O&U
All sites	1153	13	68	0	29	19	23	27	21	28	43	50	64	57	79	107	126	129	130	208	100.0	C00-96
All sites except C44	1123	13	67	0	29	19	21	26	21	27	36	48	61	56	78	107	121	127	127	206	97.4	C00-96 exc. C44

Nigeria, Ibadan (2015–2017)

Number of cases by age group: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	7	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	1	-	2	3	0.4	C00-06
Salivary gland	6	0	83	0	-	1	-	-	-	1	1	-	1	-	1	-	-	-	-	1	0.3	C07-08
Nasopharynx	6	0	100	0	-	-	-	-	-	-	1	1	-	2	-	2	-	-	-	-	0.3	C11
Other pharynx	3	0	67	0	1	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	0.2	C09-10, C12-14
Oesophagus	7	0	71	0	-	-	-	-	-	-	-	1	-	1	-	-	-	2	1	2	0.4	C15
Stomach	34	0	56	0	-	-	-	1	1	-	1	1	3	2	4	5	1	6	2	7	2.0	C16
Colon	36	0	78	0	-	-	-	-	1	1	1	2	-	1	6	7	6	4	5	2	2.1	C18
Rectum	36	0	64	0	-	-	-	1	-	2	1	6	4	3	2	5	3	4	1	4	2.1	C19-20
Anus	12	0	58	0	-	-	-	-	-	3	-	-	1	3	1	-	1	1	1	1	0.7	C21
Liver	52	1	17	0	-	1	-	-	-	2	4	2	4	9	4	6	9	3	3	4	3.0	C22
Gallbladder etc.	10	0	50	0	-	-	-	-	-	-	1	-	-	-	2	3	4	-	-	-	0.6	C23-24
Pancreas	23	0	9	0	-	-	-	-	-	-	-	-	3	2	4	4	2	2	2	4	1.3	C25
Larynx	5	0	100	0	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	1	0.3	C32
Trachea, bronchus, and lung	29	0	79	0	-	-	-	-	-	-	-	2	1	1	2	4	5	6	6	2	1.7	C33-34
Bone	16	0	75	0	1	-	3	3	2	1	-	-	-	5	-	-	-	1	-	-	0.9	C40-41
Melanoma of skin	5	1	100	0	-	-	-	-	-	-	-	1	-	1	1	-	-	1	-	-	0.3	C43
Non-melanoma skin	31	0	84	0	-	1	1	1	-	2	1	3	2	2	4	4	4	2	-	4	1.8	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	4	0	50	0	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	0.2	C46
Connective and soft tissue	26	0	85	0	1	1	1	1	3	1	3	2	1	-	3	2	4	-	-	3	1.5	C47, C49
Breast	783	3	85	0	-	-	-	-	5	21	55	87	100	117	112	76	91	53	33	30	45.7	C50
Vulva	12	0	83	0	-	-	-	-	-	-	-	-	-	3	1	1	1	1	-	5	0.7	C51
Vagina	3	0	100	0	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	0.2	C52
Cervix uteri	210	3	80	0	-	-	-	-	-	2	3	16	15	32	24	24	23	25	18	25	12.2	C53
Uterus	51	1	82	0	-	-	-	-	-	-	-	-	4	4	9	10	10	5	4	4	3.0	C54-55
Ovary	85	2	71	0	1	1	-	1	2	4	6	6	3	9	5	16	10	5	9	5	5.0	C56
Placenta	5	0	0	0	-	-	-	1	-	2	1	-	-	1	-	-	-	-	-	-	0.3	C58
Kidney and renal pelvis	21	0	76	0	2	2	3	-	-	2	1	1	1	-	1	-	1	3	4	-	1.2	C64-65
Bladder	8	0	75	0	1	-	-	-	-	-	-	1	-	-	2	2	-	-	1	1	0.5	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C66, C68
Eye	14	0	64	0	8	-	-	-	-	-	1	1	-	1	1	1	-	-	-	1	0.8	C69
Brain and nervous system	7	0	71	0	2	-	2	-	-	-	-	-	-	1	-	1	-	-	-	1	0.4	C70-72
Thyroid	18	0	83	0	-	-	-	2	-	2	-	2	5	-	1	3	-	2	1	-	1.0	C73
Hodgkin lymphoma	3	0	100	0	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	0.2	C81
Non-Hodgkin lymphoma	42	1	93	0	2	4	-	2	1	-	4	5	4	4	3	1	4	4	1	2	2.4	C82-86, C96
Multiple myeloma	11	0	82	0	-	-	1	-	-	-	-	-	1	1	1	2	1	3	-	1	0.6	C90
Lymphoid leukaemia	21	0	90	0	-	1	-	2	1	-	1	-	-	-	2	3	1	2	4	4	1.2	C91
Myeloid leukaemia	8	0	100	0	1	-	-	-	1	1	-	1	2	1	-	-	-	1	-	-	0.5	C92-94
Leukaemia, unspecified	6	0	50	0	1	-	-	1	-	-	-	1	1	-	-	-	1	-	-	1	0.3	C95
Other and unspecified	59	3	54	0	1	-	3	-	1	1	-	7	3	2	3	9	12	3	4	7	3.4	O&U
All sites	1715	15	77	0	23	12	14	16	19	49	87	153	160	208	201	193	198	140	102	125	100.0	C00-96
All sites except C44	1684	15	77	0	23	11	13	15	19	47	86	150	158	206	197	189	194	138	102	121	98.2	C00-96 exc. C44

The Gambia

The Gambia National Cancer Registry (GNCR) was initially established in 1986 as part of the Gambia Hepatitis Intervention Study (GHIS) to record data on the pattern of cancer occurrence in The Gambia. This collaborative project, involving IARC, the Government of The Gambia and the UK Medical Research Council, was initially supported by the Government of Italy through its Ministry of Foreign Affairs and the Swedish Medical Research Council. The registry is wholly funded by IARC through the Gambia Hepatitis Intervention Study. The Registry is based at the Medical Research Council Unit, Fajara, and employs ten staff.

Since the inception of the GHIS, improvements have been made in the diagnoses of liver cancer and chronic liver disease. A Gambian hepatologist was recruited in 2011 by IARC to head the GHIS with duties to not only improve the diagnoses and the management of chronic liver disease, but also to supervise the activities of the GNCR. Histopathology services are provided in the main Edward Francis Small Teaching Hospital (EFSTH) in Banjul, with support from IARC in Lyon, where tissue blocks are sent for additional staining and reporting, especially with respect to liver cancer. The registry receives copies of all histology reports from the EFSTH and, since mid-2014, from a dedicated histopathologist at IARC.

According to the 2017 revision of the UN World Population Prospects the total population of The Gambia in 2013 was 1.86 million.

The main source of the data is from four government hospitals, the main ones being the EFSTH in Banjul, the AFPRC hospital in Farafenni on the north bank, Bwiam hospital in the West Coast region and Bansang Hospital in the eastern region of the country which serves mainly a rural population. These hospitals are the major referral centres for the various government dispensaries and health centres, which are evenly located around the country. They provide general medical and laboratory services. The MRC clinic in Fajara is also a major referral centre, with three out-reach stations in rural areas; this institution has a broad-based laboratory research facility, and since 2011 has been the national referral centre for all patients with suspected liver disease.

In addition, there are over a dozen private clinics and hospitals located mainly in and around Banjul and the coastal areas together with a few mission clinics in the peri-urban and rural areas that offer general medical care.

The registry gets information from the following sources: medical records, log books, ward/admission books, central medical records, histology report books, ultrasonography and CT scan reports, specific biochemistry request books, surgical operation lists, nursing report books and death certificate stubs. These are scanned for diagnoses of cancer. Data are also obtained from the Prevention of Liver Fibrosis and Cancer in Africa (PROLIFICA) project database, a 5-year EU-funded study involving The Gambia and 2 other West African countries.

Case finding is entirely active, by trained tumour registration officers. They visit the clinical services expected to generate cancer cases, and collect the information onto a standard registration form. They cross check these against ward and central medical records, in addition to registers of admissions/discharges.

Registration of death is incomplete in The Gambia. A death certificate is only needed in order to obtain a permit for burial within the capital city of Banjul and within the West Coast administrative region which extends up to the town of Brikama (approximately 30% of the population), or for legal purposes. Copies of certificates mentioning cancer are obtained from the registration office. Death Certificate Only cases are not included in the database.

Follow-up has been carried out predominantly by active methods. Cancer mortality information obtained from accessible death certificates in the registration office is matched with the registry database. The vital status of the unmatched incident cases is then ascertained by repeated scrutiny of hospital records and telephone calls to patients or their next-of-kin.

Data entry and management uses the CanReg-5 software. Both electronic and paper data are well secured on a central server with access restriction for the former and in locked cabinets for the latter.

YEARS PRESENTED

Three year period, 2012-2014

COMMENT

Incidence rates for the period 2012-2014 are significantly lower than the regional average for all cancers except liver, and the overall incidence rates (all sites) are little more than half of the values reported for 2007-2011 in the previous Volume of CiSSA.

The results are therefore presented as numbers and percentages only.

Liver cancers account for 62.1% of registrations in men and 22.2% in women. The only other sites with more than 40 cases recorded are cervix cancers (35.6% cancers in women) and breast (12.8%).

Summary

Although the cancer profile in 2012-2014 is similar to that reported 4 years earlier (2007-2011), the performance of the registry appears to have deteriorated, so that any comparisons with results from earlier periods would be misleading.

PUBLICATIONS and ACHIEVEMENTS

The Gambian National Cancer Registry became a member of AFCRN in 2012.

The Gambia (2012–2014)

Number of cases by age group: males

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	1	0	0	0	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.2	C00-06
Salivary gland	1	0	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.2	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C11
Other pharynx	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	0.3	C09-10, C12-14
Oesophagus	14	0	0	7	-	-	-	1	1	1	1	-	-	1	1	1	3	-	4	-	2.3	C15
Stomach	8	0	0	0	-	-	-	-	2	-	-	1	1	-	-	1	1	-	2	-	1.3	C16
Colon	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.3	C18
Rectum	9	0	0	0	-	-	-	-	1	-	-	1	1	-	1	1	1	-	1	2	1.5	C19-20
Anus	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.2	C21
Liver	375	0	0	0	-	1	2	3	16	44	42	62	49	30	33	23	20	12	15	23	62.1	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C23-24
Pancreas	10	0	0	0	-	1	1	-	-	-	1	-	-	-	4	1	2	-	-	-	1.7	C25
Larynx	8	0	0	0	-	-	-	1	-	-	-	-	2	-	2	1	1	-	-	1	1.3	C32
Trachea, bronchus, and lung	43	0	0	0	-	-	-	1	-	1	-	1	3	6	4	4	5	3	9	6	7.1	C33-34
Bone	8	0	12	0	-	-	-	3	-	-	-	1	-	2	-	-	-	1	1	-	1.3	C40-41
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C43
Non-melanoma skin	2	0	0	0	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	0.3	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	4	0	0	0	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	1	0.7	C46
Connective and soft tissue	7	0	14	0	-	-	1	1	-	-	-	1	-	-	1	-	-	1	2	-	1.2	C47, C49
Breast	4	0	0	0	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	2	0.7	C50
Penis	1	0	0	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	C60
Prostate	34	0	0	0	-	-	-	-	-	-	-	-	1	2	2	5	5	5	7	7	5.6	C61
Testis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C62
Kidney and renal pelvis	1	0	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.2	C64-65
Bladder	13	0	8	0	-	-	-	-	-	-	-	-	-	-	1	1	1	3	5	2	2.2	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C66, C68
Eye	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C69
Brain and nervous system	15	0	0	0	-	-	-	2	1	-	2	-	2	2	1	-	2	2	1	-	2.5	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C73
Hodgkin lymphoma	1	0	100	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.2	C81
Non-Hodgkin lymphoma	8	0	0	0	-	-	2	1	1	-	-	1	-	-	-	1	-	2	-	-	1.3	C82-86, C96
Multiple myeloma	1	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.2	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C91
Myeloid leukaemia	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.2	C92-94
Leukaemia, unspecified	7	0	0	0	3	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	1.2	C95
Other and unspecified	23	0	13	0	1	1	1	4	2	-	2	2	1	2	1	1	3	1	1	-	3.8	O&U
All sites	604	0	1	0	4	5	9	18	25	46	52	71	61	46	54	40	49	30	49	45	100.0	C00-96
All sites except C44	602	0	1	0	4	5	8	18	25	46	52	71	61	46	54	40	48	30	49	45	99.7	C00-96 exc. C44

The Gambia (2012–2014)

Number of cases by age group: females

Site	All ages	Age unk	MV %	DCO %	Age group (years) 0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	%	ICD-10
Mouth	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.2	C00-06
Salivary gland	2	0	50	0	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	0.4	C07-08
Nasopharynx	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.2	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C09-10, C12-14
Oesophagus	6	1	0	0	-	-	-	-	1	-	-	1	1	-	-	1	-	1	-	-	1.1	C15
Stomach	11	0	0	0	-	-	-	-	-	-	1	-	1	-	1	2	4	-	1	1	2.1	C16
Colon	1	0	0	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.2	C18
Rectum	14	0	7	0	-	-	-	-	1	2	-	1	-	2	-	3	4	1	-	-	2.7	C19-20
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C21
Liver	116	0	3	0	-	-	1	-	4	12	12	10	18	12	8	7	14	6	9	3	22.2	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C23-24
Pancreas	11	0	0	0	-	-	-	-	-	-	-	-	-	3	3	-	1	1	2	1	2.1	C25
Larynx	3	0	0	0	-	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	0.6	C32
Trachea, bronchus, and lung	8	0	0	0	-	-	-	-	-	-	-	1	-	3	-	1	-	-	-	3	1.5	C33-34
Bone	8	0	12	0	-	-	-	1	1	1	-	2	1	1	-	-	1	-	-	-	1.5	C40-41
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C43
Non-melanoma skin	5	0	0	0	-	-	-	1	-	-	-	-	1	-	-	-	-	2	1	-	1.0	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C45
Kaposi sarcoma	1	0	0	0	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.2	C46
Connective and soft tissue	3	0	0	0	-	-	-	1	-	-	-	-	1	-	-	-	-	-	1	-	0.6	C47, C49
Breast	67	0	43	0	-	-	-	2	2	5	7	8	8	12	8	5	5	1	2	2	12.8	C50
Vulva	2	0	0	0	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	0.4	C51
Vagina	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C52
Cervix uteri	186	0	11	0	-	-	-	2	2	7	20	21	31	22	20	11	22	9	12	7	35.6	C53
Uterus	15	0	7	0	-	-	-	-	-	-	-	2	1	2	1	3	4	-	1	1	2.9	C54-55
Ovary	15	0	7	0	-	-	-	-	3	3	-	2	3	-	1	1	1	-	1	-	2.9	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C58
Kidney and renal pelvis	2	0	0	0	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.4	C64-65
Bladder	5	0	0	0	-	-	-	-	-	1	-	-	-	-	2	-	2	-	-	-	1.0	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C66, C68
Eye	4	0	0	0	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	0.8	C69
Brain and nervous system	11	0	0	9	-	1	-	2	1	3	-	1	-	-	2	1	-	-	-	-	2.1	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C73
Hodgkin lymphoma	1	0	0	0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	0.2	C81
Non-Hodgkin lymphoma	3	0	33	0	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	C82-86, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	C92-94
Leukaemia, unspecified	5	0	0	0	1	2	-	-	-	1	-	-	1	-	-	-	-	-	-	-	1.0	C95
Other and unspecified	15	0	0	0	2	-	-	1	2	-	1	1	1	-	-	2	4	-	-	1	2.9	O&U
All sites	522	1	11	0	4	5	2	11	17	38	45	53	69	59	46	38	63	22	30	19	100.0	C00-96
All sites except C44	517	1	11	0	4	5	2	10	17	38	45	53	68	59	46	38	63	20	29	19	99.0	C00-96 exc. C44

CHAPTER 5
Data quality indicators tables

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

All sites (C00-96)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014−2016)	803	91.4	n/a	944	89.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014−2016)	2327	88.3	0.0	4905	91.3	0.1
France, Réunion (2011−2013)	3662	93.3	n/a	2970	95.8	n/a
*Kenya, Eldoret (2012−2016)	693	87.3	2.6	956	92.7	1.5
Kenya, Nairobi (2012−2014)	2970	80.7	5.3	4008	80.4	5.3
Mauritius (2013−2015)	2956	89.0	3.1	3932	91.8	2.6
Mozambique, Beira (2014−2017)	702	55.8	15.1	855	73.9	9.7
Mozambique, Maputo (2015−2017)	1156	69.6	18.8	1650	74.8	17.3
Seychelles (2013−2017)	575	84.0	5.2	518	89.6	5.0
Tanzania, Kilimanjaro (2013−2017)	778	80.3	n/a	715	89.0	n/a
Tanzania, Mwanza [two districts] (2016−2017)	331	83.7	0.3	557	92.1	0.4
Uganda, Gulu (2013−2015)	591	58.5	1.7	728	48.2	1.4
Uganda, Kampala (2011−2013)	2107	57.9	2.1	2811	57.6	1.7
Zambia, Lusaka (2011−2015)	2202	80.6	10.8	3103	88.9	7.5
Zimbabwe, Bulawayo: Black (2013−2015)	1064	66.3	7.4	1664	76.3	6.0
Zimbabwe, Harare: Black (2013−2015)	3047	70.5	10.4	3608	79.4	7.7
Africa, southern						
Botswana (2009−2013)	2739	92.4	0.0	3964	96.7	0.0
*Eswatini (2016−2017)	635	50.7	10.2	1175	61.8	8.0
Namibia (2013−2015)	3419	99.7	n/a	4194	99.8	n/a
South Africa (2010−2014)	169493	100.0	n/a	174118	100.0	n/a
South Africa: Black (2010−2013)	41480	100.0	n/a	59914	100.0	n/a
South Africa: White (2010−2013)	68734	100.0	n/a	54052	100.0	n/a
South Africa, Eastern Cape (2013−2016)	1116	66.2	n/a	2167	79.3	n/a
Africa, western						
Benin, Cotonou (2014−2016)	477	56.6	n/a	607	70.8	n/a
Côte d´Ivoire, Abidjan (2014−2015)	2001	64.5	9.2	2806	73.6	6.5
The Gambia (2012−2014)	604	1.2	0.2	522	11.3	0.2
Ghana, Kumasi (2014−2016)	780	43.7	0.5	1279	59.7	0.4
Mali, Bamako (2015−2017)	2559	66.8	0.3	3952	71.5	0.2
Niger, Niamey (2013−2017)	543	23.8	n/a	800	27.9	n/a
*Nigeria, Abuja (2013−2016)	551	96.6	0.4	965	92.5	0.1
Nigeria, Calabar (2016−2017)	137	69.3	n/a	237	57.4	n/a
*Nigeria, Ekiti (2013−2017)	565	78.4	3.5	641	73.2	4.5
Nigeria, Ibadan (2015−2017)	1153	68.0	n/a	1715	77.1	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Lip, oral cavity, and pharynx, except nasopharynx (C00-14 exc. C11)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	11	100.0	n/a	5	80.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	85	98.8	0.0	88	95.5	0.0
France, Réunion (2011–2013)	269	99.3	n/a	52	98.1	n/a
*Kenya, Eldoret (2012–2016)	9	100.0	0.0	15	100.0	0.0
Kenya, Nairobi (2012–2014)	114	77.2	13.2	96	81.2	8.3
Mauritius (2013–2015)	143	90.9	5.6	92	87.0	10.9
Mozambique, Beira (2014–2017)	25	52.0	44.0	12	58.3	41.7
Mozambique, Maputo (2015–2017)	29	86.2	10.3	16	87.5	6.2
Seychelles (2013–2017)	57	86.0	3.5	10	100.0	0.0
Tanzania, Kilimanjaro (2013–2017)	21	95.2	n/a	17	94.1	n/a
Tanzania, Mwanza [two districts] (2016–2017)	0	–	–	2	100.0	0.0
Uganda, Gulu (2013–2015)	9	55.6	0.0	5	40.0	0.0
Uganda, Kampala (2011–2013)	71	80.3	2.8	32	53.1	0.0
Zambia, Lusaka (2011–2015)	47	97.9	0.0	33	97.0	3.0
Zimbabwe, Bulawayo: Black (2013–2015)	12	91.7	0.0	10	100.0	0.0
Zimbabwe, Harare: Black (2013–2015)	58	96.6	3.4	42	92.9	4.8
Africa, southern						
Botswana (2009–2013)	251	100.0	0.0	65	100.0	0.0
*Eswatini (2016–2017)	16	68.8	6.2	16	56.2	6.2
Namibia (2013–2015)	212	100.0	n/a	135	100.0	n/a
South Africa (2010–2014)	5612	100.0	n/a	2612	100.0	n/a
South Africa: Black (2010–2013)	2155	100.0	n/a	843	100.0	n/a
South Africa: White (2010–2013)	1398	100.0	n/a	708	100.0	n/a
South Africa, Eastern Cape (2013–2016)	77	92.2	n/a	31	90.3	n/a
Africa, western						
Benin, Cotonou (2014–2016)	22	54.5	n/a	21	47.6	n/a
Côte d´Ivoire, Abidjan (2014–2015)	57	82.5	0.0	50	70.0	2.0
The Gambia (2012–2014)	4	0.0	0.0	3	66.7	0.0
Ghana, Kumasi (2014–2016)	21	85.7	0.0	16	87.5	0.0
Mali, Bamako (2015–2017)	89	71.9	0.0	112	71.4	0.0
Niger, Niamey (2013–2017)	25	28.0	n/a	17	29.4	n/a
*Nigeria, Abuja (2013–2016)	17	100.0	0.0	16	100.0	0.0
Nigeria, Calabar (2016–2017)	1	100.0	n/a	4	75.0	n/a
*Nigeria, Ekiti (2013–2017)	16	56.2	0.0	10	70.0	0.0
Nigeria, Ibadan (2015–2017)	22	90.9	n/a	16	87.5	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Nasopharynx (C11)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	8	100.0	n/a	4	100.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	37	97.3	0.0	26	100.0	0.0
France, Réunion (2011–2013)	11	100.0	n/a	2	100.0	n/a
*Kenya, Eldoret (2012–2016)	29	89.7	3.4	13	100.0	0.0
Kenya, Nairobi (2012–2014)	113	91.2	1.8	46	84.8	4.3
Mauritius (2013–2015)	10	100.0	0.0	2	100.0	0.0
Mozambique, Beira (2014–2017)	1	0.0	100.0	1	100.0	0.0
Mozambique, Maputo (2015–2017)	1	100.0	0.0	2	100.0	0.0
Seychelles (2013–2017)	1	100.0	0.0	1	100.0	0.0
Tanzania, Kilimanjaro (2013–2017)	8	100.0	n/a	4	100.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	2	100.0	0.0	4	100.0	0.0
Uganda, Gulu (2013–2015)	8	62.5	0.0	5	40.0	0.0
Uganda, Kampala (2011–2013)	46	69.6	2.2	29	58.6	0.0
Zambia, Lusaka (2011–2015)	16	100.0	0.0	13	84.6	15.4
Zimbabwe, Bulawayo: Black (2013–2015)	3	100.0	0.0	0	–	–
Zimbabwe, Harare: Black (2013–2015)	17	76.5	5.9	8	75.0	12.5
Africa, southern						
Botswana (2009–2013)	28	100.0	0.0	8	100.0	0.0
*Eswatini (2016–2017)	3	33.3	33.3	1	100.0	0.0
Namibia (2013–2015)	19	100.0	n/a	11	100.0	n/a
South Africa (2010–2014)	254	100.0	n/a	119	100.0	n/a
South Africa: Black (2010–2013)	116	100.0	n/a	59	100.0	n/a
South Africa: White (2010–2013)	36	100.0	n/a	11	100.0	n/a
South Africa, Eastern Cape (2013–2016)	3	100.0	n/a	2	100.0	n/a
Africa, western						
Benin, Cotonou (2014–2016)	4	75.0	n/a	3	100.0	n/a
Côte d´Ivoire, Abidjan (2014–2015)	18	50.0	11.1	17	70.6	0.0
The Gambia (2012–2014)	0	–	–	1	0.0	0.0
Ghana, Kumasi (2014–2016)	10	80.0	0.0	5	100.0	0.0
Mali, Bamako (2015–2017)	12	58.3	0.0	7	42.9	0.0
Niger, Niamey (2013–2017)	1	0.0	n/a	0	–	n/a
*Nigeria, Abuja (2013–2016)	19	94.7	0.0	9	100.0	0.0
Nigeria, Calabar (2016–2017)	1	100.0	n/a	1	100.0	n/a
*Nigeria, Ekiti (2013–2017)	5	60.0	20.0	4	50.0	0.0
Nigeria, Ibadan (2015–2017)	18	88.9	n/a	6	100.0	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Oesophagus (C15)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	8	100.0	n/a	2	100.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	45	93.3	0.0	56	85.7	0.0
France, Réunion (2011–2013)	122	96.7	n/a	14	100.0	n/a
*Kenya, Eldoret (2012–2016)	109	83.5	0.9	92	88.0	0.0
Kenya, Nairobi (2012–2014)	249	71.5	9.6	191	74.3	6.8
Mauritius (2013–2015)	81	92.6	1.2	40	82.5	7.5
Mozambique, Beira (2014–2017)	44	25.0	31.8	38	28.9	39.5
Mozambique, Maputo (2015–2017)	66	71.2	16.7	117	81.2	12.8
Seychelles (2013–2017)	14	85.7	7.1	1	100.0	0.0
Tanzania, Kilimanjaro (2013–2017)	136	55.9	n/a	36	63.9	n/a
Tanzania, Mwanza [two districts] (2016–2017)	23	87.0	0.0	18	94.4	0.0
Uganda, Gulu (2013–2015)	31	58.1	0.0	7	0.0	0.0
Uganda, Kampala (2011–2013)	166	42.8	1.2	119	45.4	0.0
Zambia, Lusaka (2011–2015)	127	88.2	8.7	63	92.1	6.3
Zimbabwe, Bulawayo: Black (2013–2015)	93	57.0	11.8	77	61.0	16.9
Zimbabwe, Harare: Black (2013–2015)	167	55.7	16.2	147	68.0	8.8
Africa, southern						
Botswana (2009–2013)	273	99.6	0.0	125	100.0	0.0
*Eswatini (2016–2017)	20	10.0	15.0	7	28.6	14.3
Namibia (2013–2015)	71	100.0	n/a	33	100.0	n/a
South Africa (2010–2014)	4749	100.0	n/a	3386	100.0	n/a
South Africa: Black (2010–2013)	2706	100.0	n/a	2096	100.0	n/a
South Africa: White (2010–2013)	605	100.0	n/a	262	100.0	n/a
South Africa, Eastern Cape (2013–2016)	267	59.2	n/a	388	58.0	n/a
Africa, western						
Benin, Cotonou (2014–2016)	24	75.0	n/a	15	66.7	n/a
Côte d´Ivoire, Abidjan (2014–2015)	17	82.4	11.8	6	66.7	0.0
The Gambia (2012–2014)	14	0.0	7.1	6	0.0	0.0
Ghana, Kumasi (2014–2016)	10	60.0	0.0	0	–	–
Mali, Bamako (2015–2017)	53	75.5	0.0	46	71.7	0.0
Niger, Niamey (2013–2017)	12	41.7	n/a	9	44.4	n/a
*Nigeria, Abuja (2013–2016)	5	100.0	0.0	1	100.0	0.0
Nigeria, Calabar (2016–2017)	1	0.0	n/a	0	–	n/a
*Nigeria, Ekiti (2013–2017)	6	33.3	0.0	2	50.0	0.0
Nigeria, Ibadan (2015–2017)	4	75.0	n/a	7	71.4	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Stomach (C16)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	45	93.3	n/a	18	94.4	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	107	85.0	0.0	113	77.9	0.0
France, Réunion (2011–2013)	200	98.0	n/a	117	99.1	n/a
*Kenya, Eldoret (2012–2016)	33	90.9	6.1	22	100.0	0.0
Kenya, Nairobi (2012–2014)	171	78.4	6.4	140	75.0	9.3
Mauritius (2013–2015)	191	88.0	8.4	124	76.6	20.2
Mozambique, Beira (2014–2017)	2	50.0	50.0	2	50.0	50.0
Mozambique, Maputo (2015–2017)	20	70.0	30.0	9	66.7	33.3
Seychelles (2013–2017)	12	75.0	8.3	10	90.0	10.0
Tanzania, Kilimanjaro (2013–2017)	31	77.4	n/a	27	85.2	n/a
Tanzania, Mwanza [two districts] (2016–2017)	2	100.0	0.0	0	–	–
Uganda, Gulu (2013–2015)	6	33.3	0.0	4	25.0	0.0
Uganda, Kampala (2011–2013)	46	43.5	4.3	30	23.3	0.0
Zambia, Lusaka (2011–2015)	63	88.9	11.1	52	96.2	3.8
Zimbabwe, Bulawayo: Black (2013–2015)	27	77.8	3.7	32	68.8	15.6
Zimbabwe, Harare: Black (2013–2015)	155	81.3	7.1	180	74.4	8.9
Africa, southern						
Botswana (2009–2013)	23	100.0	0.0	26	100.0	0.0
*Eswatini (2016–2017)	5	80.0	0.0	9	55.6	11.1
Namibia (2013–2015)	39	100.0	n/a	43	100.0	n/a
South Africa (2010–2014)	3670	100.0	n/a	2055	100.0	n/a
South Africa: Black (2010–2013)	1006	100.0	n/a	688	100.0	n/a
South Africa: White (2010–2013)	1100	100.0	n/a	488	100.0	n/a
South Africa, Eastern Cape (2013–2016)	11	81.8	n/a	14	85.7	n/a
Africa, western						
Benin, Cotonou (2014–2016)	29	62.1	n/a	17	82.4	n/a
Côte d´Ivoire, Abidjan (2014–2015)	83	80.7	7.2	82	70.7	13.4
The Gambia (2012–2014)	8	0.0	0.0	11	0.0	0.0
Ghana, Kumasi (2014–2016)	35	37.1	0.0	39	30.8	0.0
Mali, Bamako (2015–2017)	260	80.8	0.0	202	72.8	1.0
Niger, Niamey (2013–2017)	45	33.3	n/a	17	23.5	n/a
*Nigeria, Abuja (2013–2016)	17	94.1	0.0	8	100.0	0.0
Nigeria, Calabar (2016–2017)	0	–	n/a	3	66.7	n/a
*Nigeria, Ekiti (2013–2017)	8	50.0	0.0	7	28.6	14.3
Nigeria, Ibadan (2015–2017)	36	55.6	n/a	34	55.9	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Colon (C18)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	18	94.4	n/a	22	90.9	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	154	92.9	0.0	156	89.1	0.0
France, Réunion (2011–2013)	251	99.2	n/a	261	97.7	n/a
*Kenya, Eldoret (2012–2016)	24	95.8	0.0	24	91.7	0.0
Kenya, Nairobi (2012–2014)	141	82.3	4.3	123	76.4	9.8
Mauritius (2013–2015)	235	94.9	3.8	273	83.5	12.8
Mozambique, Beira (2014–2017)	5	60.0	20.0	6	50.0	16.7
Mozambique, Maputo (2015–2017)	16	81.2	18.8	16	100.0	0.0
Seychelles (2013–2017)	36	86.1	5.6	36	86.1	5.6
Tanzania, Kilimanjaro (2013–2017)	16	93.8	n/a	7	100.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	3	66.7	0.0	4	100.0	0.0
Uganda, Gulu (2013–2015)	7	14.3	0.0	4	50.0	0.0
Uganda, Kampala (2011–2013)	50	54.0	2.0	40	47.5	5.0
Zambia, Lusaka (2011–2015)	40	95.0	5.0	30	96.7	3.3
Zimbabwe, Bulawayo: Black (2013–2015)	35	80.0	2.9	32	87.5	0.0
Zimbabwe, Harare: Black (2013–2015)	83	75.9	12.0	62	80.6	9.7
Africa, southern						
Botswana (2009–2013)	72	100.0	0.0	51	100.0	0.0
*Eswatini (2016–2017)	17	76.5	11.8	14	50.0	7.1
Namibia (2013–2015)	100	100.0	n/a	68	100.0	n/a
South Africa (2010–2014)	5363	100.0	n/a	4595	100.0	n/a
South Africa: Black (2010–2013)	1057	100.0	n/a	917	100.0	n/a
South Africa: White (2010–2013)	2168	100.0	n/a	1840	100.0	n/a
South Africa, Eastern Cape (2013–2016)	16	87.5	n/a	16	93.8	n/a
Africa, western						
Benin, Cotonou (2014–2016)	25	80.0	n/a	16	68.8	n/a
Côte d´Ivoire, Abidjan (2014–2015)	82	72.0	8.5	59	71.2	5.1
The Gambia (2012–2014)	2	0.0	0.0	1	0.0	0.0
Ghana, Kumasi (2014–2016)	11	63.6	0.0	15	60.0	0.0
Mali, Bamako (2015–2017)	91	79.1	0.0	78	75.6	0.0
Niger, Niamey (2013–2017)	25	28.0	n/a	18	44.4	n/a
*Nigeria, Abuja (2013–2016)	37	100.0	0.0	17	100.0	0.0
Nigeria, Calabar (2016–2017)	6	50.0	n/a	1	0.0	n/a
*Nigeria, Ekiti (2013–2017)	14	71.4	0.0	13	53.8	7.7
Nigeria, Ibadan (2015–2017)	48	81.2	n/a	36	77.8	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Liver (C22)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	153	88.2	n/a	69	75.4	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	87	55.2	0.0	80	67.5	0.0
France, Réunion (2011–2013)	107	54.2	n/a	36	63.9	n/a
*Kenya, Eldoret (2012–2016)	30	63.3	10.0	29	72.4	6.9
Kenya, Nairobi (2012–2014)	100	80.0	11.0	66	69.7	22.7
Mauritius (2013–2015)	71	47.9	19.7	47	34.0	40.4
Mozambique, Beira (2014–2017)	40	57.5	42.5	22	63.6	36.4
Mozambique, Maputo (2015–2017)	151	59.6	29.8	107	51.4	39.3
Seychelles (2013–2017)	17	52.9	23.5	7	71.4	28.6
Tanzania, Kilimanjaro (2013–2017)	47	25.5	n/a	10	60.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	18	50.0	0.0	7	28.6	0.0
Uganda, Gulu (2013–2015)	78	78.2	1.3	38	52.6	2.6
Uganda, Kampala (2011–2013)	106	32.1	2.8	93	31.2	2.2
Zambia, Lusaka (2011–2015)	61	68.9	27.9	39	74.4	25.6
Zimbabwe, Bulawayo: Black (2013–2015)	56	64.3	19.6	45	62.2	22.2
Zimbabwe, Harare: Black (2013–2015)	192	38.5	24.5	110	33.6	34.5
Africa, southern						
Botswana (2009–2013)	80	82.5	0.0	47	83.0	0.0
*Eswatini (2016–2017)	34	35.3	26.5	24	29.2	45.8
Namibia (2013–2015)	77	97.4	n/a	53	100.0	n/a
South Africa (2010–2014)	945	100.0	n/a	381	100.0	n/a
South Africa: Black (2010–2013)	498	100.0	n/a	205	100.0	n/a
South Africa: White (2010–2013)	152	100.0	n/a	60	100.0	n/a
South Africa, Eastern Cape (2013–2016)	40	57.5	n/a	28	35.7	n/a
Africa, western						
Benin, Cotonou (2014–2016)	53	11.3	n/a	19	5.3	n/a
Côte d´Ivoire, Abidjan (2014–2015)	243	14.0	19.3	105	21.9	19.0
The Gambia (2012–2014)	375	0.0	0.0	116	2.6	0.0
Ghana, Kumasi (2014–2016)	173	11.0	0.0	71	7.0	0.0
Mali, Bamako (2015–2017)	225	37.8	0.4	93	35.5	0.0
Niger, Niamey (2013–2017)	135	0.0	n/a	48	4.2	n/a
*Nigeria, Abuja (2013–2016)	13	92.3	0.0	4	100.0	0.0
Nigeria, Calabar (2016–2017)	1	0.0	n/a	3	0.0	n/a
*Nigeria, Ekiti (2013–2017)	29	20.7	34.5	10	30.0	20.0
Nigeria, Ibadan (2015–2017)	96	14.6	n/a	52	17.3	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Trachea, bronchus, and lung (C33-34)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	16	81.2	n/a	8	37.5	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	106	79.2	0.0	91	76.9	0.0
France, Réunion (2011–2013)	504	89.9	n/a	156	94.2	n/a
*Kenya, Eldoret (2012–2016)	12	91.7	0.0	6	66.7	33.3
Kenya, Nairobi (2012–2014)	75	74.7	8.0	68	73.5	7.4
Mauritius (2013–2015)	283	70.0	9.9	120	75.8	0.0
Mozambique, Beira (2014–2017)	3	0.0	66.7	0	–	–
Mozambique, Maputo (2015–2017)	30	56.7	36.7	21	52.4	33.3
Seychelles (2013–2017)	43	60.5	14.0	15	53.3	13.3
Tanzania, Kilimanjaro (2013–2017)	6	66.7	n/a	2	0.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	2	50.0	0.0	1	100.0	0.0
Uganda, Gulu (2013–2015)	10	30.0	0.0	9	22.2	22.2
Uganda, Kampala (2011–2013)	30	43.3	13.3	24	33.3	4.2
Zambia, Lusaka (2011–2015)	30	66.7	30.0	23	69.6	26.1
Zimbabwe, Bulawayo: Black (2013–2015)	25	64.0	8.0	16	68.8	18.8
Zimbabwe, Harare: Black (2013–2015)	139	41.0	17.3	79	68.4	12.7
Africa, southern						
Botswana (2009–2013)	123	100.0	0.0	26	100.0	0.0
*Eswatini (2016–2017)	22	22.7	36.4	12	16.7	33.3
Namibia (2013–2015)	119	100.0	n/a	74	100.0	n/a
South Africa (2010–2014)	8332	100.0	n/a	4196	100.0	n/a
South Africa: Black (2010–2013)	2559	100.0	n/a	875	100.0	n/a
South Africa: White (2010–2013)	2170	100.0	n/a	1446	100.0	n/a
South Africa, Eastern Cape (2013–2016)	56	89.3	n/a	34	61.8	n/a
Africa, western						
Benin, Cotonou (2014–2016)	7	42.9	n/a	6	66.7	n/a
Côte d´Ivoire, Abidjan (2014–2015)	58	50.0	19.0	23	60.9	17.4
The Gambia (2012–2014)	43	0.0	0.0	8	0.0	0.0
Ghana, Kumasi (2014–2016)	22	45.5	4.5	18	50.0	0.0
Mali, Bamako (2015–2017)	121	50.4	0.0	49	51.0	0.0
Niger, Niamey (2013–2017)	17	0.0	n/a	1	0.0	n/a
*Nigeria, Abuja (2013–2016)	5	100.0	0.0	9	100.0	0.0
Nigeria, Calabar (2016–2017)	1	100.0	n/a	1	100.0	n/a
*Nigeria, Ekiti (2013–2017)	1	0.0	100.0	2	50.0	0.0
Nigeria, Ibadan (2015–2017)	40	65.0	n/a	29	79.3	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Melanoma of skin (C43)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	16	100.0	n/a	13	69.2	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	11	100.0	0.0	13	100.0	0.0
France, Réunion (2011–2013)	58	100.0	n/a	53	98.1	n/a
*Kenya, Eldoret (2012–2016)	7	100.0	0.0	5	100.0	0.0
Kenya, Nairobi (2012–2014)	15	100.0	0.0	21	100.0	0.0
Mauritius (2013–2015)	7	100.0	0.0	7	100.0	0.0
Mozambique, Beira (2014–2017)	6	100.0	0.0	6	100.0	0.0
Mozambique, Maputo (2015–2017)	3	100.0	0.0	5	100.0	0.0
Seychelles (2013–2017)	1	100.0	0.0	1	0.0	0.0
Tanzania, Kilimanjaro (2013–2017)	3	100.0	n/a	7	100.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	6	83.3	0.0	4	100.0	0.0
Uganda, Gulu (2013–2015)	1	100.0	0.0	6	66.7	0.0
Uganda, Kampala (2011–2013)	5	100.0	0.0	14	50.0	0.0
Zambia, Lusaka (2011–2015)	12	91.7	8.3	13	92.3	0.0
Zimbabwe, Bulawayo: Black (2013–2015)	7	100.0	0.0	20	100.0	0.0
Zimbabwe, Harare: Black (2013–2015)	27	100.0	0.0	35	97.1	2.9
Africa, southern						
Botswana (2009–2013)	42	100.0	0.0	71	100.0	0.0
*Eswatini (2016–2017)	5	80.0	0.0	9	77.8	0.0
Namibia (2013–2015)	65	100.0	n/a	93	100.0	n/a
South Africa (2010–2014)	3583	100.0	n/a	3243	100.0	n/a
South Africa: Black (2010–2013)	300	100.0	n/a	534	100.0	n/a
South Africa: White (2010–2013)	2097	100.0	n/a	1658	100.0	n/a
South Africa, Eastern Cape (2013–2016)	9	66.7	n/a	8	75.0	n/a
Africa, western						
Benin, Cotonou (2014–2016)	0	–	n/a	1	0.0	n/a
Côte d´Ivoire, Abidjan (2014–2015)	4	50.0	0.0	8	75.0	0.0
The Gambia (2012–2014)	0	–	–	0	–	–
Ghana, Kumasi (2014–2016)	1	100.0	0.0	3	100.0	0.0
Mali, Bamako (2015–2017)	9	88.9	0.0	14	100.0	0.0
Niger, Niamey (2013–2017)	1	100.0	n/a	4	100.0	n/a
*Nigeria, Abuja (2013–2016)	4	100.0	0.0	1	100.0	0.0
Nigeria, Calabar (2016–2017)	0	–	n/a	5	60.0	n/a
*Nigeria, Ekiti (2013–2017)	2	100.0	0.0	0	–	–
Nigeria, Ibadan (2015–2017)	5	80.0	n/a	5	100.0	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Non-melanoma skin (C44)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	0	–	n/a	2	50.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	118	98.3	0.0	162	97.5	0.0
France, Réunion (2011–2013)	2	100.0	n/a	1	100.0	n/a
*Kenya, Eldoret (2012–2016)	4	100.0	0.0	8	100.0	0.0
Kenya, Nairobi (2012–2014)	65	92.3	0.0	55	85.5	7.3
Mauritius (2013–2015)	243	100.0	0.0	169	100.0	0.0
Mozambique, Beira (2014–2017)	36	91.7	2.8	28	85.7	0.0
Mozambique, Maputo (2015–2017)	38	94.7	5.3	50	98.0	2.0
Seychelles (2013–2017)	23	100.0	0.0	8	100.0	0.0
Tanzania, Kilimanjaro (2013–2017)	25	92.0	n/a	19	94.7	n/a
Tanzania, Mwanza [two districts] (2016–2017)	2	100.0	0.0	3	100.0	0.0
Uganda, Gulu (2013–2015)	11	72.7	0.0	10	60.0	0.0
Uganda, Kampala (2011–2013)	26	65.4	0.0	34	70.6	2.9
Zambia, Lusaka (2011–2015)	47	97.9	2.1	46	91.3	6.5
Zimbabwe, Bulawayo: Black (2013–2015)	35	100.0	0.0	47	100.0	0.0
Zimbabwe, Harare: Black (2013–2015)	80	100.0	0.0	85	98.8	0.0
Africa, southern						
Botswana (2009–2013)	176	100.0	0.0	153	99.3	0.0
*Eswatini (2016–2017)	35	74.3	0.0	44	65.9	11.4
Namibia (2013–2015)	391	100.0	n/a	286	100.0	n/a
South Africa (2010–2014)	59975	100.0	n/a	42550	100.0	n/a
South Africa: Black (2010–2013)	3022	100.0	n/a	2705	100.0	n/a
South Africa: White (2010–2013)	37435	100.0	n/a	25642	100.0	n/a
South Africa, Eastern Cape (2013–2016)	12	100.0	n/a	13	92.3	n/a
Africa, western						
Benin, Cotonou (2014–2016)	16	62.5	n/a	14	64.3	n/a
Côte d´Ivoire, Abidjan (2014–2015)	36	86.1	2.8	48	89.6	2.1
The Gambia (2012–2014)	2	0.0	0.0	5	0.0	0.0
Ghana, Kumasi (2014–2016)	15	100.0	0.0	10	100.0	0.0
Mali, Bamako (2015–2017)	79	84.8	0.0	71	81.7	1.4
Niger, Niamey (2013–2017)	45	35.6	n/a	34	23.5	n/a
*Nigeria, Abuja (2013–2016)	28	96.4	0.0	24	95.8	0.0
Nigeria, Calabar (2016–2017)	9	100.0	n/a	6	100.0	n/a
*Nigeria, Ekiti (2013–2017)	5	80.0	20.0	4	75.0	0.0
Nigeria, Ibadan (2015–2017)	30	93.3	n/a	31	83.9	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Kaposi sarcoma (C46)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	6	83.3	n/a	0	–	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	13	76.9	0.0	4	100.0	0.0
France, Réunion (2011–2013)	4	100.0	n/a	0	–	n/a
*Kenya, Eldoret (2012–2016)	48	77.1	10.4	39	66.7	7.7
Kenya, Nairobi (2012–2014)	74	89.2	0.0	55	85.5	1.8
Mauritius (2013–2015)	0	–	–	0	–	–
Mozambique, Beira (2014–2017)	238	49.6	7.6	92	54.3	14.1
Mozambique, Maputo (2015–2017)	303	62.7	9.9	190	56.3	18.4
Seychelles (2013–2017)	1	100.0	0.0	1	100.0	0.0
Tanzania, Kilimanjaro (2013–2017)	27	81.5	n/a	19	47.4	n/a
Tanzania, Mwanza [two districts] (2016–2017)	27	55.6	0.0	17	52.9	0.0
Uganda, Gulu (2013–2015)	78	61.5	0.0	35	45.7	0.0
Uganda, Kampala (2011–2013)	463	74.5	3.0	348	76.1	1.7
Zambia, Lusaka (2011–2015)	611	65.1	8.2	367	71.7	7.1
Zimbabwe, Bulawayo: Black (2013–2015)	119	29.4	4.2	54	38.9	1.9
Zimbabwe, Harare: Black (2013–2015)	311	48.6	7.4	207	54.1	2.4
Africa, southern						
Botswana (2009–2013)	522	64.0	0.2	392	69.1	0.3
*Eswatini (2016–2017)	117	46.2	2.6	70	38.6	2.9
Namibia (2013–2015)	407	100.0	n/a	215	99.1	n/a
South Africa (2010–2014)	5678	100.0	n/a	4122	100.0	n/a
South Africa: Black (2010–2013)	4149	100.0	n/a	3097	100.0	n/a
South Africa: White (2010–2013)	179	100.0	n/a	131	100.0	n/a
South Africa, Eastern Cape (2013–2016)	116	63.8	n/a	105	70.5	n/a
Africa, western						
Benin, Cotonou (2014–2016)	3	100.0	n/a	0	–	n/a
Côte d´Ivoire, Abidjan (2014–2015)	41	65.9	2.4	37	45.9	2.7
The Gambia (2012–2014)	4	0.0	0.0	1	0.0	0.0
Ghana, Kumasi (2014–2016)	6	66.7	0.0	3	100.0	0.0
Mali, Bamako (2015–2017)	21	95.2	0.0	13	100.0	0.0
Niger, Niamey (2013–2017)	2	50.0	n/a	1	100.0	n/a
*Nigeria, Abuja (2013–2016)	18	94.4	0.0	5	80.0	0.0
Nigeria, Calabar (2016–2017)	4	0.0	n/a	4	50.0	n/a
*Nigeria, Ekiti (2013–2017)	0	–	–	3	100.0	0.0
Nigeria, Ibadan (2015–2017)	5	60.0	n/a	4	50.0	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Breast (C50)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	22	90.9	n/a	329	95.1	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	68	95.6	0.0	1651	96.5	0.0
France, Réunion (2011–2013)	10	90.0	n/a	982	99.7	n/a
*Kenya, Eldoret (2012–2016)	14	100.0	0.0	165	96.4	1.2
Kenya, Nairobi (2012–2014)	38	84.2	0.0	1049	81.4	4.6
Mauritius (2013–2015)	27	100.0	0.0	1440	97.8	0.0
Mozambique, Beira (2014–2017)	2	50.0	0.0	83	81.9	2.4
Mozambique, Maputo (2015–2017)	10	50.0	50.0	193	81.3	16.6
Seychelles (2013–2017)	4	100.0	0.0	171	94.7	2.9
Tanzania, Kilimanjaro (2013–2017)	11	100.0	n/a	128	92.2	n/a
Tanzania, Mwanza [two districts] (2016–2017)	7	100.0	0.0	57	89.5	1.8
Uganda, Gulu (2013–2015)	16	62.5	0.0	63	68.3	0.0
Uganda, Kampala (2011–2013)	27	44.4	0.0	431	56.6	2.1
Zambia, Lusaka (2011–2015)	11	100.0	0.0	384	96.9	1.8
Zimbabwe, Bulawayo: Black (2013–2015)	10	100.0	0.0	237	83.1	6.8
Zimbabwe, Harare: Black (2013–2015)	14	85.7	7.1	499	85.6	8.2
Africa, southern						
Botswana (2009–2013)	28	100.0	0.0	675	100.0	0.0
*Eswatini (2016–2017)	6	33.3	16.7	138	78.3	4.3
Namibia (2013–2015)	27	100.0	n/a	1115	99.9	n/a
South Africa (2010–2014)	829	100.0	n/a	37660	100.0	n/a
South Africa: Black (2010–2013)	361	100.0	n/a	12428	100.0	n/a
South Africa: White (2010–2013)	174	100.0	n/a	10804	100.0	n/a
South Africa, Eastern Cape (2013–2016)	17	88.2	n/a	250	94.8	n/a
Africa, western						
Benin, Cotonou (2014–2016)	9	77.8	n/a	194	74.2	n/a
Côte d´Ivoire, Abidjan (2014–2015)	18	94.4	0.0	939	85.0	4.2
The Gambia (2012–2014)	4	0.0	0.0	67	43.3	0.0
Ghana, Kumasi (2014–2016)	11	81.8	0.0	400	74.8	0.0
Mali, Bamako (2015–2017)	56	64.3	0.0	1098	71.9	0.1
Niger, Niamey (2013–2017)	6	16.7	n/a	297	33.3	n/a
*Nigeria, Abuja (2013–2016)	9	88.9	0.0	505	87.7	0.2
Nigeria, Calabar (2016–2017)	0	–	n/a	72	72.2	n/a
*Nigeria, Ekiti (2013–2017)	7	100.0	0.0	297	76.4	4.4
Nigeria, Ibadan (2015–2017)	7	85.7	n/a	783	84.5	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Cervix uteri (C53)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014−2016)				236	90.3	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014−2016)				696	94.4	0.0
France, Réunion (2011−2013)				175	98.9	n/a
*Kenya, Eldoret (2012−2016)				212	96.2	0.5
Kenya, Nairobi (2012−2014)				745	74.6	4.3
Mauritius (2013−2015)				283	95.1	0.0
Mozambique, Beira (2014−2017)				319	86.5	4.1
Mozambique, Maputo (2015−2017)				498	79.5	14.3
Seychelles (2013−2017)				58	96.6	1.7
Tanzania, Kilimanjaro (2013−2017)				225	93.3	n/a
Tanzania, Mwanza [two districts] (2016−2017)				263	98.5	0.0
Uganda, Gulu (2013−2015)				332	38.6	0.3
Uganda, Kampala (2011−2013)				739	55.8	0.7
Zambia, Lusaka (2011−2015)				1276	91.8	6.6
Zimbabwe, Bulawayo: Black (2013−2015)				547	74.0	2.9
Zimbabwe, Harare: Black (2013−2015)				952	87.1	5.4
Africa, southern						
Botswana (2009−2013)				1181	100.0	0.0
*Eswatini (2016−2017)				603	61.7	7.5
Namibia (2013−2015)				789	100.0	n/a
South Africa (2010−2014)				27684	100.0	n/a
South Africa: Black (2010−2013)				18071	100.0	n/a
South Africa: White (2010−2013)				1792	100.0	n/a
South Africa, Eastern Cape (2013−2016)				869	84.9	n/a
Africa, western						
Benin, Cotonou (2014−2016)				104	84.6	n/a
Côte d´Ivoire, Abidjan (2014−2015)				565	80.2	5.3
The Gambia (2012−2014)				186	10.8	0.0
Ghana, Kumasi (2014−2016)				267	60.3	0.0
Mali, Bamako (2015−2017)				717	83.1	0.0
Niger, Niamey (2013−2017)				91	16.5	n/a
*Nigeria, Abuja (2013−2016)				125	100.0	0.0
Nigeria, Calabar (2016−2017)				56	39.3	n/a
*Nigeria, Ekiti (2013−2017)				73	67.1	1.4
Nigeria, Ibadan (2015−2017)				210	80.0	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Uterus (C54-55)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)				14	92.9	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)				125	87.2	0.0
France, Réunion (2011–2013)				111	100.0	n/a
*Kenya, Eldoret (2012–2016)				29	96.6	0.0
Kenya, Nairobi (2012–2014)				130	82.3	4.6
Mauritius (2013–2015)				241	98.8	0.0
Mozambique, Beira (2014–2017)				7	100.0	0.0
Mozambique, Maputo (2015–2017)				23	91.3	4.3
Seychelles (2013–2017)				37	83.8	8.1
Tanzania, Kilimanjaro (2013–2017)				23	95.7	n/a
Tanzania, Mwanza [two districts] (2016–2017)				33	100.0	0.0
Uganda, Gulu (2013–2015)				11	72.7	0.0
Uganda, Kampala (2011–2013)				72	59.7	2.8
Zambia, Lusaka (2011–2015)				46	100.0	0.0
Zimbabwe, Bulawayo: Black (2013–2015)				69	55.1	2.9
Zimbabwe, Harare: Black (2013–2015)				76	80.3	6.6
Africa, southern						
Botswana (2009–2013)				137	100.0	0.0
*Eswatini (2016–2017)				38	86.8	2.6
Namibia (2013–2015)				104	100.0	n/a
South Africa (2010–2014)				5725	100.0	n/a
South Africa: Black (2010–2013)				2567	100.0	n/a
South Africa: White (2010–2013)				1014	100.0	n/a
South Africa, Eastern Cape (2013–2016)				58	87.9	n/a
Africa, western						
Benin, Cotonou (2014–2016)				23	87.0	n/a
Côte d´Ivoire, Abidjan (2014–2015)				67	67.2	9.0
The Gambia (2012–2014)				15	6.7	0.0
Ghana, Kumasi (2014–2016)				48	52.1	0.0
Mali, Bamako (2015–2017)				201	68.2	0.0
Niger, Niamey (2013–2017)				33	33.3	n/a
*Nigeria, Abuja (2013–2016)				20	100.0	0.0
Nigeria, Calabar (2016–2017)				6	50.0	n/a
*Nigeria, Ekiti (2013–2017)				24	75.0	0.0
Nigeria, Ibadan (2015–2017)				51	82.4	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Ovary (C56)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014−2016)				44	81.8	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014−2016)				275	80.4	0.0
France, Réunion (2011−2013)				105	97.1	n/a
*Kenya, Eldoret (2012−2016)				25	92.0	4.0
Kenya, Nairobi (2012−2014)				173	72.3	7.5
Mauritius (2013−2015)				135	94.1	0.0
Mozambique, Beira (2014−2017)				6	83.3	16.7
Mozambique, Maputo (2015−2017)				29	62.1	37.9
Seychelles (2013−2017)				21	81.0	9.5
Tanzania, Kilimanjaro (2013−2017)				27	81.5	n/a
Tanzania, Mwanza [two districts] (2016−2017)				19	84.2	5.3
Uganda, Gulu (2013−2015)				17	35.3	5.9
Uganda, Kampala (2011−2013)				96	49.0	2.1
Zambia, Lusaka (2011−2015)				62	85.5	12.9
Zimbabwe, Bulawayo: Black (2013−2015)				49	69.4	6.1
Zimbabwe, Harare: Black (2013−2015)				118	62.7	10.2
Africa, southern						
Botswana (2009−2013)				99	100.0	0.0
*Eswatini (2016−2017)				24	41.7	8.3
Namibia (2013−2015)				103	99.0	n/a
South Africa (2010−2014)				2405	100.0	n/a
South Africa: Black (2010−2013)				722	100.0	n/a
South Africa: White (2010−2013)				766	100.0	n/a
South Africa, Eastern Cape (2013−2016)				61	95.1	n/a
Africa, western						
Benin, Cotonou (2014−2016)				22	54.5	n/a
Côte d´Ivoire, Abidjan (2014−2015)				86	51.2	12.8
The Gambia (2012−2014)				15	6.7	0.0
Ghana, Kumasi (2014−2016)				101	40.6	1.0
Mali, Bamako (2015−2017)				138	52.2	1.4
Niger, Niamey (2013−2017)				77	23.4	n/a
*Nigeria, Abuja (2013−2016)				42	97.6	0.0
Nigeria, Calabar (2016−2017)				11	27.3	n/a
*Nigeria, Ekiti (2013−2017)				33	69.7	9.1
Nigeria, Ibadan (2015−2017)				85	70.6	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Prostate (C61)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014−2016)	286	95.5	n/a			
Africa, eastern						
*Ethiopia, Addis Ababa (2014−2016)	172	80.8	0.0			
France, Réunion (2011−2013)	918	97.5	n/a			
*Kenya, Eldoret (2012−2016)	83	74.7	3.6			
Kenya, Nairobi (2012−2014)	601	70.4	4.7			
Mauritius (2013−2015)	361	96.4	0.0			
Mozambique, Beira (2014−2017)	55	56.4	12.7			
Mozambique, Maputo (2015−2017)	184	76.6	19.6			
Seychelles (2013−2017)	192	93.8	0.5			
Tanzania, Kilimanjaro (2013−2017)	199	92.0	n/a			
Tanzania, Mwanza [two districts] (2016−2017)	91	92.3	0.0			
Uganda, Gulu (2013−2015)	83	57.8	0.0			
Uganda, Kampala (2011−2013)	351	43.9	0.9			
Zambia, Lusaka (2011−2015)	453	83.7	15.0			
Zimbabwe, Bulawayo: Black (2013−2015)	271	47.6	11.4			
Zimbabwe, Harare: Black (2013−2015)	815	69.8	13.6			
Africa, southern						
Botswana (2009−2013)	205	98.0	0.0			
*Eswatini (2016−2017)	160	32.5	14.4			
Namibia (2013−2015)	741	99.7	n/a			
South Africa (2010−2014)	31637	100.0	n/a			
South Africa: Black (2010−2013)	9610	100.0	n/a			
South Africa: White (2010−2013)	10555	100.0	n/a			
South Africa, Eastern Cape (2013−2016)	246	48.8	n/a			
Africa, western						
Benin, Cotonou (2014−2016)	111	45.0	n/a			
Côte d´Ivoire, Abidjan (2014−2015)	591	72.6	6.9			
The Gambia (2012−2014)	34	0.0	0.0			
Ghana, Kumasi (2014−2016)	165	20.6	0.6			
Mali, Bamako (2015−2017)	309	66.0	0.6			
Niger, Niamey (2013−2017)	31	45.2	n/a			
*Nigeria, Abuja (2013−2016)	189	97.9	0.0			
Nigeria, Calabar (2016−2017)	49	89.8	n/a			
*Nigeria, Ekiti (2013−2017)	290	87.9	0.7			
Nigeria, Ibadan (2015−2017)	388	75.0	n/a			

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Bladder (C67)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	6	83.3	n/a	5	80.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	89	83.1	0.0	39	82.1	0.0
France, Réunion (2011–2013)	133	91.7	n/a	42	95.2	n/a
*Kenya, Eldoret (2012–2016)	8	100.0	0.0	5	100.0	0.0
Kenya, Nairobi (2012–2014)	60	70.0	8.3	32	68.8	0.0
Mauritius (2013–2015)	120	97.5	0.0	41	97.6	0.0
Mozambique, Beira (2014–2017)	44	9.1	13.6	35	8.6	22.9
Mozambique, Maputo (2015–2017)	23	73.9	21.7	25	48.0	40.0
Seychelles (2013–2017)	12	83.3	0.0	6	66.7	16.7
Tanzania, Kilimanjaro (2013–2017)	49	87.8	n/a	6	66.7	n/a
Tanzania, Mwanza [two districts] (2016–2017)	10	100.0	0.0	14	100.0	0.0
Uganda, Gulu (2013–2015)	4	75.0	0.0	1	0.0	0.0
Uganda, Kampala (2011–2013)	22	45.5	0.0	22	63.6	0.0
Zambia, Lusaka (2011–2015)	51	94.1	3.9	55	85.5	14.5
Zimbabwe, Bulawayo: Black (2013–2015)	10	20.0	30.0	13	69.2	7.7
Zimbabwe, Harare: Black (2013–2015)	49	57.1	14.3	43	67.4	16.3
Africa, southern						
Botswana (2009–2013)	18	100.0	0.0	20	100.0	0.0
*Eswatini (2016–2017)	11	45.5	0.0	6	33.3	33.3
Namibia (2013–2015)	48	100.0	n/a	30	100.0	n/a
South Africa (2010–2014)	4506	100.0	n/a	1518	100.0	n/a
South Africa: Black (2010–2013)	565	100.0	n/a	357	100.0	n/a
South Africa: White (2010–2013)	2203	100.0	n/a	578	100.0	n/a
South Africa, Eastern Cape (2013–2016)	10	90.0	n/a	9	77.8	n/a
Africa, western						
Benin, Cotonou (2014–2016)	12	8.3	n/a	3	66.7	n/a
Côte d´Ivoire, Abidjan (2014–2015)	20	55.0	10.0	14	42.9	0.0
The Gambia (2012–2014)	13	7.7	0.0	5	0.0	0.0
Ghana, Kumasi (2014–2016)	23	39.1	0.0	22	18.2	0.0
Mali, Bamako (2015–2017)	173	63.6	0.0	143	62.9	0.0
Niger, Niamey (2013–2017)	24	25.0	n/a	17	5.9	n/a
*Nigeria, Abuja (2013–2016)	17	94.1	5.9	5	100.0	0.0
Nigeria, Calabar (2016–2017)	0	–	n/a	0	–	n/a
*Nigeria, Ekiti (2013–2017)	11	90.9	0.0	6	66.7	0.0
Nigeria, Ibadan (2015–2017)	22	68.2	n/a	8	75.0	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Eye (C69)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	15	60.0	n/a	17	64.7	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	29	93.1	0.0	28	82.1	0.0
France, Réunion (2011–2013)	10	90.0	n/a	2	100.0	n/a
*Kenya, Eldoret (2012–2016)	7	71.4	0.0	9	77.8	0.0
Kenya, Nairobi (2012–2014)	51	88.2	0.0	28	96.4	0.0
Mauritius (2013–2015)	1	100.0	0.0	6	83.3	0.0
Mozambique, Beira (2014–2017)	55	74.5	0.0	59	76.3	0.0
Mozambique, Maputo (2015–2017)	28	96.4	3.6	62	96.8	3.2
Seychelles (2013–2017)	1	0.0	0.0	1	0.0	0.0
Tanzania, Kilimanjaro (2013–2017)	16	100.0	n/a	17	100.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	24	75.0	0.0	24	75.0	0.0
Uganda, Gulu (2013–2015)	17	70.6	0.0	9	44.4	0.0
Uganda, Kampala (2011–2013)	52	78.8	0.0	73	72.6	1.4
Zambia, Lusaka (2011–2015)	128	97.7	0.8	125	96.8	3.2
Zimbabwe, Bulawayo: Black (2013–2015)	37	100.0	0.0	39	100.0	0.0
Zimbabwe, Harare: Black (2013–2015)	57	100.0	0.0	52	96.2	0.0
Africa, southern						
Botswana (2009–2013)	144	100.0	0.0	155	100.0	0.0
*eSwatini (2016–2017)	30	83.3	0.0	22	68.2	0.0
Namibia (2013–2015)	111	100.0	n/a	123	99.2	n/a
South Africa: Black (2010–2013)	1016	100.0	n/a	1399	100.0	n/a
South Africa, Eastern Cape (2013–2016)	23	69.6	n/a	20	85.0	n/a
Africa, western						
Benin, Cotonou (2014–2016)	2	100.0	n/a	12	66.7	n/a
Côte d´Ivoire, Abidjan (2014–2015)	45	64.4	0.0	53	54.7	1.9
The Gambia (2012–2014)	0	–	–	4	0.0	0.0
Ghana, Kumasi (2014–2016)	8	62.5	0.0	5	20.0	0.0
Mali, Bamako (2015–2017)	103	60.2	0.0	87	73.6	0.0
Niger, Niamey (2013–2017)	13	30.8	n/a	10	40.0	n/a
*Nigeria, Abuja (2013–2016)	8	100.0	0.0	6	100.0	0.0
Nigeria, Calabar (2016–2017)	11	45.5	n/a	4	50.0	n/a
*Nigeria, Ekiti (2013–2017)	2	50.0	0.0	0	–	–
Nigeria, Ibadan (2015–2017)	17	70.6	n/a	14	64.3	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Brain and nervous system (C70-72)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	4	0.0	n/a	6	33.3	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	29	58.6	0.0	39	46.2	5.1
France, Réunion (2011–2013)	51	56.9	n/a	43	48.8	n/a
*Kenya, Eldoret (2012–2016)	8	75.0	12.5	4	100.0	0.0
Kenya, Nairobi (2012–2014)	62	80.6	4.8	69	78.3	5.8
Mauritius (2013–2015)	65	70.8	0.0	61	65.6	0.0
Mozambique, Beira (2014–2017)	0	–	–	1	0.0	0.0
Mozambique, Maputo (2015–2017)	5	20.0	60.0	12	66.7	8.3
Seychelles (2013–2017)	8	25.0	0.0	9	77.8	11.1
Tanzania, Kilimanjaro (2013–2017)	1	0.0	n/a	1	0.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	2	0.0	0.0	1	0.0	0.0
Uganda, Gulu (2013–2015)	4	50.0	0.0	0	–	–
Uganda, Kampala (2011–2013)	48	29.2	2.1	30	30.0	0.0
Zambia, Lusaka (2011–2015)	28	71.4	28.6	30	80.0	16.7
Zimbabwe, Bulawayo: Black (2013–2015)	8	37.5	12.5	10	50.0	0.0
Zimbabwe, Harare: Black (2013–2015)	54	48.1	14.8	87	57.5	17.2
Africa, southern						
Botswana (2009–2013)	8	100.0	0.0	7	100.0	0.0
*Eswatini (2016–2017)	5	40.0	20.0	8	12.5	25.0
Namibia (2013–2015)	40	92.5	n/a	45	100.0	n/a
South Africa (2010–2014)	1025	100.0	n/a	724	100.0	n/a
South Africa: Black (2010–2013)	245	100.0	n/a	179	100.0	n/a
South Africa: White (2010–2013)	372	100.0	n/a	235	100.0	n/a
South Africa, Eastern Cape (2013–2016)	4	25.0	n/a	9	55.6	n/a
Africa, western						
Benin, Cotonou (2014–2016)	11	18.2	n/a	7	28.6	n/a
Côte d´Ivoire, Abidjan (2014–2015)	26	15.4	38.5	28	21.4	28.6
The Gambia (2012–2014)	15	0.0	0.0	11	0.0	9.1
Ghana, Kumasi (2014–2016)	6	83.3	0.0	18	22.2	0.0
Mali, Bamako (2015–2017)	76	28.9	0.0	77	29.9	0.0
Niger, Niamey (2013–2017)	10	40.0	n/a	3	0.0	n/a
*Nigeria, Abuja (2013–2016)	10	90.0	0.0	10	80.0	0.0
Nigeria, Calabar (2016–2017)	1	100.0	n/a	1	100.0	n/a
*Nigeria, Ekiti (2013–2017)	1	0.0	0.0	1	0.0	0.0
Nigeria, Ibadan (2015–2017)	9	55.6	n/a	7	71.4	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Thyroid (C73)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014–2016)	7	100.0	n/a	3	100.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014–2016)	65	96.9	0.0	255	94.9	0.0
France, Réunion (2011–2013)	32	100.0	n/a	87	100.0	n/a
*Kenya, Eldoret (2012–2016)	2	100.0	0.0	11	100.0	0.0
Kenya, Nairobi (2012–2014)	13	92.3	0.0	50	90.0	6.0
Mauritius (2013–2015)	26	96.2	0.0	53	90.6	0.0
Mozambique, Beira (2014–2017)	1	100.0	0.0	6	100.0	0.0
Mozambique, Maputo (2015–2017)	8	87.5	0.0	19	100.0	0.0
Seychelles (2013–2017)	2	100.0	0.0	7	100.0	0.0
Tanzania, Kilimanjaro (2013–2017)	5	80.0	n/a	9	100.0	n/a
Tanzania, Mwanza [two districts] (2016–2017)	0	–	–	2	100.0	0.0
Uganda, Gulu (2013–2015)	4	50.0	0.0	10	60.0	0.0
Uganda, Kampala (2011–2013)	18	50.0	0.0	34	58.8	0.0
Zambia, Lusaka (2011–2015)	8	87.5	12.5	15	93.3	6.7
Zimbabwe, Bulawayo: Black (2013–2015)	1	100.0	0.0	18	77.8	5.6
Zimbabwe, Harare: Black (2013–2015)	10	50.0	10.0	53	64.2	9.4
Africa, southern						
Botswana (2009–2013)	8	100.0	0.0	19	100.0	0.0
*Eswatini (2016–2017)	2	50.0	0.0	6	66.7	16.7
Namibia (2013–2015)	13	100.0	n/a	53	100.0	n/a
South Africa (2010–2014)	542	100.0	n/a	1842	100.0	n/a
South Africa: Black (2010–2013)	86	100.0	n/a	472	100.0	n/a
South Africa: White (2010–2013)	239	100.0	n/a	622	100.0	n/a
South Africa, Eastern Cape (2013–2016)	3	100.0	n/a	15	60.0	n/a
Africa, western						
Benin, Cotonou (2014–2016)	0	–	n/a	7	100.0	n/a
Côte d´Ivoire, Abidjan (2014–2015)	7	100.0	0.0	28	57.1	3.6
The Gambia (2012–2014)	0	–	–	0	–	–
Ghana, Kumasi (2014–2016)	5	80.0	0.0	5	60.0	0.0
Mali, Bamako (2015–2017)	10	90.0	0.0	33	84.8	3.0
Niger, Niamey (2013–2017)	9	44.4	n/a	7	71.4	n/a
*Nigeria, Abuja (2013–2016)	2	100.0	0.0	11	100.0	0.0
Nigeria, Calabar (2016–2017)	0	–	n/a	0	–	n/a
*Nigeria, Ekiti (2013–2017)	3	100.0	0.0	3	100.0	0.0
Nigeria, Ibadan (2015–2017)	2	100.0	n/a	18	83.3	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Lymphoma, including Hodgkin lymphoma (C81-85, C96)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014−2016)	20	100.0	n/a	9	100.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014−2016)	236	96.2	0.0	158	93.7	0.6
France, Réunion (2011−2013)	132	98.5	n/a	97	100.0	n/a
*Kenya, Eldoret (2012−2016)	50	96.0	2.0	37	100.0	0.0
Kenya, Nairobi (2012−2014)	229	98.7	0.0	164	98.2	0.0
Mauritius (2013−2015)	94	100.0	0.0	62	100.0	0.0
Mozambique, Beira (2014−2017)	52	75.0	25.0	39	84.6	15.4
Mozambique, Maputo (2015−2017)	56	73.2	25.0	54	79.6	16.7
Seychelles (2013−2017)	13	100.0	0.0	17	100.0	0.0
Tanzania, Kilimanjaro (2013−2017)	35	100.0	n/a	27	100.0	n/a
Tanzania, Mwanza [two districts] (2016−2017)	35	80.0	2.9	21	66.7	0.0
Uganda, Gulu (2013−2015)	97	58.8	3.1	93	65.6	3.2
Uganda, Kampala (2011−2013)	165	71.5	3.6	150	72.7	3.3
Zambia, Lusaka (2011−2015)	106	93.4	4.7	95	95.8	3.2
Zimbabwe, Bulawayo: Black (2013−2015)	103	96.1	1.9	101	96.0	1.0
Zimbabwe, Harare: Black (2013−2015)	215	96.3	1.9	200	94.5	2.0
Africa, southern						
Botswana (2009−2013)	253	100.0	0.0	214	99.5	0.0
*Eswatini (2016−2017)	27	85.2	11.1	18	83.3	5.6
Namibia (2013−2015)	180	100.0	n/a	151	98.7	n/a
South Africa (2010−2014)	6012	100.0	n/a	5222	100.0	n/a
South Africa: Black (2010−2013)	2856	100.0	n/a	2525	100.0	n/a
South Africa: White (2010−2013)	1146	100.0	n/a	962	100.0	n/a
South Africa, Eastern Cape (2013−2016)	20	75.0	n/a	29	79.3	n/a
Africa, western						
Benin, Cotonou (2014−2016)	18	83.3	n/a	12	58.3	n/a
Côte d´Ivoire, Abidjan (2014−2015)	187	91.4	2.1	142	91.5	0.0
The Gambia (2012−2014)	9	11.1	0.0	4	25.0	0.0
Ghana, Kumasi (2014−2016)	69	76.8	0.0	48	77.1	0.0
Mali, Bamako (2015−2017)	144	95.8	0.0	72	91.7	0.0
Niger, Niamey (2013−2017)	17	64.7	n/a	9	100.0	n/a
*Nigeria, Abuja (2013−2016)	30	100.0	0.0	20	95.0	0.0
Nigeria, Calabar (2016−2017)	14	35.7	n/a	18	55.6	n/a
*Nigeria, Ekiti (2013−2017)	49	95.9	2.0	73	98.6	1.4
Nigeria, Ibadan (2015−2017)	82	96.3	n/a	45	93.3	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

Number of cases, percentage of microscopically verified cases (MV%), and percentage of death-certificate-only cases (DCO%), by registry population and sex

Leukaemia (C91-95)

	Males			Females		
	Cases	MV%	DCO%	Cases	MV%	DCO%
Africa, central						
Congo, Brazzaville (2014−2016)	47	100.0	n/a	34	100.0	n/a
Africa, eastern						
*Ethiopia, Addis Ababa (2014−2016)	233	98.7	0.0	184	96.7	0.0
France, Réunion (2011−2013)	111	100.0	n/a	81	100.0	n/a
*Kenya, Eldoret (2012−2016)	77	100.0	0.0	70	100.0	0.0
Kenya, Nairobi (2012−2014)	167	98.2	1.2	125	100.0	0.0
Mauritius (2013−2015)	105	100.0	0.0	76	100.0	0.0
Mozambique, Beira (2014−2017)	3	66.7	0.0	4	75.0	0.0
Mozambique, Maputo (2015−2017)	27	44.4	37.0	30	53.3	30.0
Seychelles (2013−2017)	16	100.0	0.0	13	100.0	0.0
Tanzania, Kilimanjaro (2013−2017)	8	62.5	n/a	4	100.0	n/a
Tanzania, Mwanza [two districts] (2016−2017)	9	100.0	0.0	2	100.0	0.0
Uganda, Gulu (2013−2015)	15	73.3	6.7	14	64.3	7.1
Uganda, Kampala (2011−2013)	76	69.7	2.6	56	75.0	5.4
Zambia, Lusaka (2011−2015)	48	75.0	18.8	19	73.7	26.3
Zimbabwe, Bulawayo: Black (2013−2015)	25	96.0	4.0	26	96.2	3.8
Zimbabwe, Harare: Black (2013−2015)	64	100.0	0.0	48	100.0	0.0
Africa, southern						
Botswana (2009−2013)	23	100.0	0.0	28	100.0	0.0
*Eswatini (2016−2017)	4	0.0	75.0	3	100.0	0.0
Namibia (2013−2015)	89	100.0	n/a	68	100.0	n/a
South Africa (2010−2014)	1903	100.0	n/a	1406	100.0	n/a
South Africa: Black (2010−2013)	772	100.0	n/a	594	100.0	n/a
South Africa: White (2010−2013)	484	100.0	n/a	330	100.0	n/a
South Africa, Eastern Cape (2013−2016)	8	50.0	n/a	8	75.0	n/a
Africa, western						
Benin, Cotonou (2014−2016)	33	100.0	n/a	27	100.0	n/a
Côte d´Ivoire, Abidjan (2014−2015)	62	85.5	9.7	36	88.9	11.1
The Gambia (2012−2014)	8	0.0	0.0	5	0.0	0.0
Ghana, Kumasi (2014−2016)	12	100.0	0.0	22	100.0	0.0
Mali, Bamako (2015−2017)	12	91.7	0.0	15	100.0	0.0
Niger, Niamey (2013−2017)	8	87.5	n/a	19	47.4	n/a
*Nigeria, Abuja (2013−2016)	18	77.8	5.6	14	92.9	0.0
Nigeria, Calabar (2016−2017)	3	0.0	n/a	2	50.0	n/a
*Nigeria, Ekiti (2013−2017)	11	100.0	0.0	6	100.0	0.0
Nigeria, Ibadan (2015−2017)	40	90.0	n/a	35	85.7	n/a

n/a, not applicable: these registries do not include DCO cases in their databases.

CHAPTER 6
Summary tables

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

All sites (C00-96)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	803	**75.8**	*2.90*	11.10	*0.50*	944	**71.7**	*2.51*	8.71	*0.35*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	2327	**70.1**	*1.57*	7.95	*0.22*	4905	**126.3**	*1.98*	13.91	*0.26*
France, Réunion (2011−2013)	3662	**251.4**	*4.20*	30.72	*0.62*	2970	**172.8**	*3.28*	19.22	*0.43*
*Kenya, Eldoret (2012−2016)	693	**53.8**	*2.28*	6.39	*0.35*	956	**74.9**	*2.68*	8.72	*0.38*
Kenya, Nairobi (2012−2014)	2970	**160.0**	*3.54*	18.95	*0.57*	4008	**207.3**	*3.96*	25.35	*0.63*
Mauritius (2013−2015)	2956	**136.6**	*2.59*	15.42	*0.36*	3932	**153.6**	*2.53*	17.33	*0.33*
Mozambique, Beira (2014−2017)	702	**128.0**	*5.70*	13.88	*0.81*	855	**149.8**	*5.77*	15.60	*0.75*
Mozambique, Maputo (2015−2017)	1156	**108.5**	*3.43*	12.24	*0.51*	1650	**127.9**	*3.32*	13.38	*0.44*
Seychelles (2013−2017)	575	**218.4**	*9.26*	25.38	*1.37*	518	**160.8**	*7.37*	17.75	*0.99*
Tanzania, Mwanza [two districts] (2016−2017)	331	**94.8**	*5.92*	10.74	*0.92*	557	**164.4**	*8.23*	19.98	*1.24*
Uganda, Gulu (2013−2015)	591	**109.9**	*5.21*	11.99	*0.74*	728	**110.7**	*4.45*	11.48	*0.56*
Uganda, Kampala (2011−2013)	2107	**162.1**	*4.49*	19.39	*0.72*	2811	**182.0**	*4.26*	20.79	*0.60*
Zambia, Lusaka (2011−2015)	2202	**112.9**	*3.05*	13.12	*0.49*	3103	**141.0**	*3.09*	16.50	*0.47*
Zimbabwe, Bulawayo: Black (2013−2015)	1064	**208.6**	*6.86*	22.67	*1.05*	1664	**247.8**	*6.46*	27.56	*0.91*
Zimbabwe, Harare: Black (2013−2015)	3047	**327.9**	*6.60*	34.68	*1.00*	3608	**313.4**	*5.82*	35.57	*0.86*
Africa, southern										
*Eswatini (2016−2017)	635	**101.5**	*4.28*	11.28	*0.59*	1175	**140.5**	*4.39*	15.35	*0.59*
Namibia (2013−2015)	3419	**169.5**	*3.07*	19.84	*0.46*	4194	**162.9**	*2.65*	18.02	*0.35*
South Africa (2010−2014)	169493	**196.1**	*0.49*	22.82	*0.07*	174118	**142.7**	*0.35*	15.57	*0.05*
South Africa: Black (2010−2013)	41480	**87.2**	*0.46*	10.11	*0.07*	59914	**86.3**	*0.37*	9.19	*0.05*
South Africa: White (2010−2013)	68734	**485.5**	*1.90*	55.25	*0.25*	54052	**336.2**	*1.55*	36.69	*0.18*
South Africa, Eastern Cape (2013−2016)	1116	**80.5**	*2.49*	9.40	*0.34*	2167	**102.0**	*2.28*	11.22	*0.28*
Africa, western										
Benin, Cotonou (2014−2016)	477	**90.3**	*4.54*	10.41	*0.67*	607	**78.3**	*3.38*	8.77	*0.46*
Côte d´Ivoire, Abidjan (2014−2015)	2001	**103.8**	*2.72*	12.41	*0.43*	2806	**132.5**	*2.95*	14.92	*0.43*
Mali, Bamako (2015−2017)	2559	**134.0**	*2.93*	15.95	*0.45*	3952	**212.9**	*3.71*	24.29	*0.51*
*Nigeria, Abuja (2013−2016)	551	**46.9**	*2.63*	6.60	*0.48*	965	**94.7**	*4.03*	11.68	*0.61*
Nigeria, Calabar (2016−2017)	137	**56.9**	*5.59*	7.17	*0.93*	237	**106.4**	*8.04*	12.68	*1.12*
*Nigeria, Ekiti (2013−2017)	565	**59.6**	*2.67*	6.91	*0.40*	641	**68.9**	*2.99*	7.93	*0.43*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

All sites except C44 (C00-96 exc. C44)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	803	**75.8**	*2.90*	11.10	*0.50*	942	**71.6**	*2.51*	8.70	*0.35*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	2209	**66.8**	*1.54*	7.60	*0.22*	4743	**122.1**	*1.95*	13.49	*0.26*
France, Réunion (2011−2013)	3660	**251.3**	*4.20*	30.71	*0.62*	2969	**172.8**	*3.28*	19.21	*0.43*
*Kenya, Eldoret (2012−2016)	689	**53.6**	*2.27*	6.37	*0.35*	948	**74.4**	*2.67*	8.68	*0.38*
Kenya, Nairobi (2012−2014)	2905	**156.6**	*3.51*	18.50	*0.56*	3953	**204.3**	*3.93*	24.95	*0.63*
Mauritius (2013−2015)	2713	**125.7**	*2.47*	14.35	*0.35*	3763	**147.2**	*2.47*	16.59	*0.32*
Mozambique, Beira (2014−2017)	666	**119.8**	*5.46*	12.97	*0.77*	827	**145.0**	*5.68*	15.14	*0.74*
Mozambique, Maputo (2015−2017)	1118	**105.1**	*3.38*	11.91	*0.50*	1600	**124.6**	*3.29*	13.13	*0.43*
Seychelles (2013−2017)	552	**209.5**	*9.06*	23.97	*1.32*	510	**158.3**	*7.31*	17.45	*0.99*
Tanzania, Mwanza [two districts] (2016−2017)	329	**94.6**	*5.91*	10.72	*0.92*	554	**163.7**	*8.22*	19.97	*1.24*
Uganda, Gulu (2013−2015)	580	**107.5**	*5.15*	11.76	*0.73*	718	**108.9**	*4.41*	11.24	*0.55*
Uganda, Kampala (2011−2013)	2081	**160.8**	*4.47*	19.25	*0.72*	2777	**180.4**	*4.24*	20.64	*0.60*
Zambia, Lusaka (2011−2015)	2155	**110.4**	*3.01*	12.81	*0.48*	3057	**138.9**	*3.07*	16.28	*0.47*
Zimbabwe, Bulawayo: Black (2013−2015)	1029	**202.8**	*6.78*	22.00	*1.03*	1617	**240.9**	*6.37*	26.92	*0.90*
Zimbabwe, Harare: Black (2013−2015)	2967	**320.4**	*6.53*	33.84	*0.99*	3523	**305.8**	*5.75*	34.75	*0.85*
Africa, southern										
*Eswatini (2016−2017)	600	**95.6**	*4.14*	10.58	*0.57*	1131	**135.5**	*4.32*	14.83	*0.58*
Namibia (2013−2015)	3028	**149.3**	*2.88*	17.34	*0.43*	3908	**152.5**	*2.57*	16.89	*0.34*
South Africa (2010−2014)	109518	**124.2**	*0.39*	14.78	*0.06*	131568	**107.5**	*0.30*	11.80	*0.04*
South Africa: Black (2010−2013)	38458	**80.5**	*0.44*	9.36	*0.06*	57209	**82.4**	*0.36*	8.80	*0.04*
South Africa: White (2010−2013)	31299	**223.1**	*1.30*	26.21	*0.17*	28410	**187.0**	*1.19*	20.40	*0.14*
South Africa, Eastern Cape (2013−2016)	1104	**79.6**	*2.48*	9.28	*0.33*	2154	**101.4**	*2.28*	11.16	*0.28*
Africa, western										
Benin, Cotonou (2014−2016)	461	**87.8**	*4.49*	10.16	*0.66*	593	**76.6**	*3.35*	8.58	*0.46*
Côte d´Ivoire, Abidjan (2014−2015)	1965	**102.3**	*2.70*	12.21	*0.42*	2758	**130.4**	*2.93*	14.70	*0.43*
Mali, Bamako (2015−2017)	2480	**129.7**	*2.89*	15.38	*0.44*	3881	**209.0**	*3.67*	23.81	*0.50*
*Nigeria, Abuja (2013−2016)	523	**45.4**	*2.60*	6.41	*0.47*	941	**93.4**	*4.01*	11.54	*0.61*
Nigeria, Calabar (2016−2017)	128	**53.9**	*5.45*	6.80	*0.91*	231	**103.9**	*7.95*	12.41	*1.11*
*Nigeria, Ekiti (2013−2017)	560	**58.9**	*2.65*	6.81	*0.40*	637	**68.3**	*2.98*	7.85	*0.43*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Mouth (C00-06)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	6	**0.6**	*0.27*	0.06	*0.03*	5	**0.5**	*0.24*	0.07	*0.03*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	51	**1.6**	*0.23*	0.19	*0.04*	51	**1.5**	*0.22*	0.18	*0.03*
France, Réunion (2011–2013)	121	**8.2**	*0.75*	1.01	*0.11*	30	**1.7**	*0.32*	0.19	*0.04*
*Kenya, Eldoret (2012–2016)	5	**0.5**	*0.22*	0.06	*0.03*	8	**0.9**	*0.35*	0.13	*0.05*
Kenya, Nairobi (2012–2014)	72	**3.5**	*0.50*	0.36	*0.07*	63	**4.1**	*0.58*	0.49	*0.09*
Mauritius (2013–2015)	80	**3.5**	*0.40*	0.43	*0.06*	53	**2.0**	*0.28*	0.22	*0.04*
Mozambique, Beira (2014–2017)	13	**2.2**	*0.72*	0.29	*0.12*	7	**1.2**	*0.55*	0.09	*0.05*
Mozambique, Maputo (2015–2017)	16	**1.6**	*0.40*	0.16	*0.04*	9	**1.0**	*0.34*	0.16	*0.06*
Seychelles (2013–2017)	33	**11.5**	*2.03*	1.10	*0.25*	7	**2.1**	*0.84*	0.32	*0.16*
Tanzania, Mwanza [two districts] (2016–2017)	0	**-**	-	–	-	0	**-**	-	–	-
Uganda, Gulu (2013–2015)	5	**1.8**	*0.80*	0.24	*0.11*	3	**0.3**	*0.18*	0.01	*0.01*
Uganda, Kampala (2011–2013)	40	**2.9**	*0.56*	0.33	*0.09*	19	**1.6**	*0.44*	0.18	*0.06*
Zambia, Lusaka (2011–2015)	23	**1.3**	*0.34*	0.21	*0.07*	17	**0.8**	*0.24*	0.11	*0.05*
Zimbabwe, Bulawayo: Black (2013–2015)	8	**1.8**	*0.65*	0.20	*0.10*	5	**0.8**	*0.39*	0.09	*0.06*
Zimbabwe, Harare: Black (2013–2015)	38	**4.3**	*0.76*	0.46	*0.11*	27	**2.4**	*0.51*	0.31	*0.09*
Africa, southern										
*Eswatini (2016–2017)	9	**1.6**	*0.55*	0.21	*0.08*	7	**0.8**	*0.35*	0.13	*0.06*
Namibia (2013–2015)	148	**8.1**	*0.69*	1.00	*0.10*	96	**3.8**	*0.41*	0.45	*0.06*
South Africa (2010–2014)	3886	**4.4**	*0.07*	0.53	*0.01*	1912	**1.6**	*0.04*	0.18	*0.01*
South Africa: Black (2010–2013)	1481	**3.3**	*0.09*	0.40	*0.01*	562	**0.9**	*0.04*	0.10	*0.00*
South Africa: White (2010–2013)	986	**7.1**	*0.23*	0.82	*0.03*	549	**3.4**	*0.15*	0.39	*0.02*
South Africa, Eastern Cape (2013–2016)	59	**4.6**	*0.61*	0.52	*0.08*	22	**0.9**	*0.21*	0.12	*0.03*
Africa, western										
Benin, Cotonou (2014–2016)	6	**0.8**	*0.38*	0.12	*0.08*	5	**0.9**	*0.40*	0.14	*0.07*
Côte d´Ivoire, Abidjan (2014–2015)	27	**1.0**	*0.23*	0.08	*0.02*	25	**1.5**	*0.36*	0.22	*0.07*
Mali, Bamako (2015–2017)	61	**3.2**	*0.45*	0.29	*0.06*	88	**4.7**	*0.57*	0.57	*0.08*
*Nigeria, Abuja (2013–2016)	8	**0.6**	*0.25*	0.06	*0.03*	8	**0.8**	*0.34*	0.09	*0.06*
Nigeria, Calabar (2016–2017)	0	**-**	-	–	-	2	**1.5**	*1.03*	0.18	*0.13*
*Nigeria, Ekiti (2013–2017)	9	**0.6**	*0.24*	0.07	*0.04*	7	**0.6**	*0.25*	0.07	*0.04*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Salivary gland (C07-08)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	4	**0.4**	*0.21*	0.01	*0.00*	0	-	-	–	-
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	17	**0.6**	*0.15*	0.05	*0.02*	24	**0.6**	*0.14*	0.07	*0.02*
France, Réunion (2011–2013)	3	**0.2**	*0.11*	0.02	*0.01*	13	**0.8**	*0.23*	0.07	*0.03*
*Kenya, Eldoret (2012–2016)	3	**0.4**	*0.22*	0.08	*0.05*	3	**0.2**	*0.11*	0.00	*0.00*
Kenya, Nairobi (2012–2014)	8	**0.1**	*0.05*	0.01	*0.00*	15	**0.6**	*0.22*	0.09	*0.04*
Mauritius (2013–2015)	16	**0.7**	*0.19*	0.09	*0.03*	23	**0.9**	*0.19*	0.09	*0.02*
Mozambique, Beira (2014–2017)	4	**1.0**	*0.51*	0.11	*0.06*	3	**0.7**	*0.43*	0.00	*0.00*
Mozambique, Maputo (2015–2017)	4	**0.5**	*0.27*	0.10	*0.06*	3	**0.1**	*0.08*	0.01	*0.01*
Seychelles (2013–2017)	1	**0.3**	*0.31*	0.03	*0.03*	1	**0.4**	*0.37*	0.05	*0.05*
Tanzania, Mwanza [two districts] (2016–2017)	0	-	-	–	-	0	-	-	–	-
Uganda, Gulu (2013–2015)	1	**0.1**	*0.10*	0.01	*0.01*	1	**0.1**	*0.07*	0.00	*0.00*
Uganda, Kampala (2011–2013)	12	**1.0**	*0.36*	0.13	*0.06*	8	**0.4**	*0.20*	0.06	*0.03*
Zambia, Lusaka (2011–2015)	17	**1.0**	*0.29*	0.09	*0.03*	12	**0.3**	*0.11*	0.03	*0.01*
Zimbabwe, Bulawayo: Black (2013–2015)	4	**0.9**	*0.44*	0.08	*0.05*	4	**0.7**	*0.34*	0.06	*0.03*
Zimbabwe, Harare: Black (2013–2015)	11	**0.9**	*0.32*	0.11	*0.05*	9	**0.8**	*0.30*	0.10	*0.04*
Africa, southern										
*Eswatini (2016–2017)	4	**0.7**	*0.37*	0.13	*0.08*	7	**0.7**	*0.30*	0.07	*0.03*
Namibia (2013–2015)	27	**1.1**	*0.23*	0.13	*0.04*	20	**0.8**	*0.18*	0.09	*0.03*
South Africa (2010–2014)	548	**0.6**	*0.03*	0.07	*0.00*	395	**0.3**	*0.02*	0.03	*0.00*
South Africa: Black (2010–2013)	198	**0.4**	*0.03*	0.05	*0.00*	186	**0.3**	*0.02*	0.03	*0.00*
South Africa: White (2010–2013)	160	**1.1**	*0.09*	0.13	*0.01*	76	**0.5**	*0.06*	0.05	*0.01*
South Africa, Eastern Cape (2013–2016)	5	**0.3**	*0.15*	0.04	*0.02*	7	**0.3**	*0.10*	0.04	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	9	**1.5**	*0.57*	0.16	*0.08*	6	**1.1**	*0.44*	0.17	*0.08*
Côte d´Ivoire, Abidjan (2014–2015)	19	**0.5**	*0.15*	0.06	*0.03*	17	**0.8**	*0.22*	0.07	*0.03*
Mali, Bamako (2015–2017)	13	**0.5**	*0.18*	0.04	*0.02*	14	**0.7**	*0.21*	0.09	*0.03*
*Nigeria, Abuja (2013–2016)	7	**0.7**	*0.31*	0.08	*0.06*	8	**1.1**	*0.45*	0.12	*0.06*
Nigeria, Calabar (2016–2017)	0	-	-	–	-	2	**1.5**	*1.03*	0.18	*0.13*
*Nigeria, Ekiti (2013–2017)	2	**0.1**	*0.11*	0.01	*0.01*	2	**0.3**	*0.21*	0.05	*0.04*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Pharynx, except nasopharynx (C09-10, C12-14)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	1	**0.0**	*0.04*	0.00	*0.00*	0	-	-	–	-
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	17	**0.5**	*0.12*	0.05	*0.02*	13	**0.3**	*0.10*	0.03	*0.01*
France, Réunion (2011–2013)	145	**9.8**	*0.82*	1.28	*0.12*	9	**0.5**	*0.18*	0.07	*0.02*
*Kenya, Eldoret (2012–2016)	1	**0.1**	*0.13*	0.02	*0.02*	4	**0.2**	*0.12*	0.01	*0.01*
Kenya, Nairobi (2012–2014)	34	**1.8**	*0.37*	0.23	*0.06*	18	**1.1**	*0.31*	0.17	*0.06*
Mauritius (2013–2015)	47	**2.0**	*0.29*	0.25	*0.04*	16	**0.6**	*0.14*	0.05	*0.02*
Mozambique, Beira (2014–2017)	8	**1.6**	*0.67*	0.24	*0.12*	2	**0.5**	*0.39*	0.10	*0.09*
Mozambique, Maputo (2015–2017)	9	**0.9**	*0.29*	0.09	*0.03*	4	**0.3**	*0.15*	0.02	*0.01*
Seychelles (2013–2017)	23	**8.1**	*1.72*	1.00	*0.26*	2	**0.6**	*0.46*	0.08	*0.06*
Tanzania, Mwanza [two districts] (2016–2017)	0	-	-	–	-	2	**0.3**	*0.21*	0.02	*0.02*
Uganda, Gulu (2013–2015)	3	**0.9**	*0.55*	0.12	*0.07*	1	**0.1**	*0.06*	0.00	*0.00*
Uganda, Kampala (2011–2013)	19	**1.8**	*0.49*	0.21	*0.07*	5	**0.2**	*0.11*	0.01	*0.01*
Zambia, Lusaka (2011–2015)	7	**0.6**	*0.24*	0.08	*0.04*	4	**0.2**	*0.13*	0.04	*0.03*
Zimbabwe, Bulawayo: Black (2013–2015)	0	-	-	–	-	1	**0.1**	*0.14*	0.02	*0.02*
Zimbabwe, Harare: Black (2013–2015)	9	**0.8**	*0.28*	0.09	*0.03*	6	**0.6**	*0.24*	0.07	*0.04*
Africa, southern										
*Eswatini (2016–2017)	3	**0.5**	*0.27*	0.04	*0.02*	2	**0.2**	*0.14*	0.01	*0.01*
Namibia (2013–2015)	37	**2.2**	*0.38*	0.35	*0.07*	19	**0.8**	*0.20*	0.10	*0.03*
South Africa (2010–2014)	1178	**1.3**	*0.04*	0.17	*0.01*	305	**0.3**	*0.02*	0.03	*0.00*
South Africa: Black (2010–2013)	476	**1.1**	*0.05*	0.14	*0.01*	95	**0.1**	*0.02*	0.02	*0.00*
South Africa: White (2010–2013)	252	**1.8**	*0.11*	0.23	*0.02*	83	**0.5**	*0.06*	0.06	*0.01*
South Africa, Eastern Cape (2013–2016)	13	**0.9**	*0.25*	0.09	*0.03*	2	**0.1**	*0.06*	0.00	*0.00*
Africa, western										
Benin, Cotonou (2014–2016)	7	**0.8**	*0.33*	0.07	*0.03*	10	**1.1**	*0.38*	0.11	*0.04*
Côte d´Ivoire, Abidjan (2014–2015)	11	**0.4**	*0.15*	0.05	*0.02*	8	**0.4**	*0.17*	0.04	*0.02*
Mali, Bamako (2015–2017)	15	**0.9**	*0.24*	0.12	*0.04*	10	**0.7**	*0.23*	0.09	*0.03*
*Nigeria, Abuja (2013–2016)	2	**0.1**	*0.08*	0.01	*0.01*	0	-	-	–	-
Nigeria, Calabar (2016–2017)	1	**0.1**	*0.12*	0.01	*0.01*	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	5	**0.5**	*0.22*	0.06	*0.03*	1	**0.2**	*0.17*	0.02	*0.02*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Nasopharynx (C11)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	8	**0.9**	*0.32*	0.14	*0.06*	4	**0.3**	*0.17*	0.04	*0.02*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	37	**0.9**	*0.17*	0.09	*0.02*	26	**0.5**	*0.12*	0.05	*0.01*
France, Réunion (2011–2013)	11	**0.8**	*0.23*	0.07	*0.03*	2	**0.1**	*0.09*	0.01	*0.01*
*Kenya, Eldoret (2012–2016)	29	**2.3**	*0.46*	0.29	*0.07*	13	**0.9**	*0.29*	0.11	*0.05*
Kenya, Nairobi (2012–2014)	113	**3.7**	*0.44*	0.41	*0.06*	46	**1.8**	*0.36*	0.20	*0.05*
Mauritius (2013–2015)	10	**0.5**	*0.15*	0.05	*0.02*	2	**0.1**	*0.07*	0.01	*0.01*
Mozambique, Beira (2014–2017)	1	**0.1**	*0.09*	0.01	*0.01*	1	**0.1**	*0.09*	0.01	*0.01*
Mozambique, Maputo (2015–2017)	1	**0.1**	*0.06*	0.01	*0.01*	2	**0.1**	*0.08*	0.01	*0.01*
Seychelles (2013–2017)	1	**0.3**	*0.34*	0.03	*0.03*	1	**0.3**	*0.30*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016–2017)	2	**0.6**	*0.45*	0.03	*0.03*	4	**1.3**	*0.74*	0.15	*0.09*
Uganda, Gulu (2013–2015)	8	**1.5**	*0.62*	0.17	*0.07*	5	**0.9**	*0.43*	0.10	*0.05*
Uganda, Kampala (2011–2013)	46	**3.1**	*0.60*	0.33	*0.08*	29	**1.8**	*0.41*	0.19	*0.05*
Zambia, Lusaka (2011–2015)	16	**0.7**	*0.22*	0.10	*0.04*	13	**0.4**	*0.15*	0.04	*0.02*
Zimbabwe, Bulawayo: Black (2013–2015)	3	**0.6**	*0.38*	0.08	*0.05*	0	-	-	–	-
Zimbabwe, Harare: Black (2013–2015)	17	**1.3**	*0.38*	0.16	*0.06*	8	**0.5**	*0.19*	0.03	*0.01*
Africa, southern										
*Eswatini (2016–2017)	3	**0.4**	*0.21*	0.02	*0.01*	1	**0.1**	*0.07*	0.01	*0.01*
Namibia (2013–2015)	19	**0.9**	*0.22*	0.10	*0.03*	11	**0.3**	*0.11*	0.03	*0.01*
South Africa (2010–2014)	254	**0.2**	*0.02*	0.02	*0.00*	119	**0.1**	*0.01*	0.01	*0.00*
South Africa: Black (2010–2013)	116	**0.2**	*0.02*	0.02	*0.00*	59	**0.1**	*0.01*	0.01	*0.00*
South Africa: White (2010–2013)	36	**0.3**	*0.06*	0.03	*0.01*	11	**0.1**	*0.03*	0.01	*0.00*
South Africa, Eastern Cape (2013–2016)	3	**0.2**	*0.10*	0.02	*0.02*	2	**0.1**	*0.05*	0.00	*0.00*
Africa, western										
Benin, Cotonou (2014–2016)	4	**0.5**	*0.25*	0.04	*0.03*	3	**0.3**	*0.20*	0.01	*0.01*
Côte d´Ivoire, Abidjan (2014–2015)	18	**0.5**	*0.13*	0.05	*0.01*	17	**0.5**	*0.14*	0.04	*0.02*
Mali, Bamako (2015–2017)	12	**0.5**	*0.15*	0.05	*0.02*	7	**0.4**	*0.16*	0.04	*0.02*
*Nigeria, Abuja (2013–2016)	19	**0.9**	*0.34*	0.11	*0.05*	9	**0.4**	*0.19*	0.03	*0.01*
Nigeria, Calabar (2016–2017)	1	**0.3**	*0.31*	0.03	*0.03*	1	**0.3**	*0.28*	0.02	*0.02*
*Nigeria, Ekiti (2013–2017)	5	**0.5**	*0.24*	0.06	*0.03*	4	**0.3**	*0.20*	0.03	*0.02*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Oesophagus (C15)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	8	**0.9**	*0.34*	0.14	*0.06*	2	**0.1**	*0.09*	0.01	*0.01*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	45	**1.5**	*0.24*	0.19	*0.04*	56	**1.7**	*0.24*	0.21	*0.03*
France, Réunion (2011–2013)	122	**8.3**	*0.76*	1.07	*0.11*	14	**0.8**	*0.21*	0.08	*0.03*
*Kenya, Eldoret (2012–2016)	109	**10.2**	*1.03*	1.30	*0.16*	92	**9.1**	*1.00*	1.26	*0.17*
Kenya, Nairobi (2012–2014)	249	**15.5**	*1.12*	2.00	*0.19*	191	**13.1**	*1.05*	1.64	*0.17*
Mauritius (2013–2015)	81	**3.7**	*0.42*	0.47	*0.06*	40	**1.4**	*0.23*	0.19	*0.04*
Mozambique, Beira (2014–2017)	44	**9.5**	*1.59*	1.22	*0.24*	38	**8.5**	*1.47*	0.98	*0.21*
Mozambique, Maputo (2015–2017)	66	**7.4**	*0.94*	0.96	*0.15*	117	**10.6**	*1.02*	1.29	*0.15*
Seychelles (2013–2017)	14	**5.0**	*1.36*	0.73	*0.23*	1	**0.3**	*0.32*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016–2017)	23	**7.1**	*1.58*	0.68	*0.20*	18	**7.5**	*1.95*	1.01	*0.30*
Uganda, Gulu (2013–2015)	31	**7.8**	*1.46*	0.91	*0.19*	7	**1.1**	*0.45*	0.15	*0.08*
Uganda, Kampala (2011–2013)	166	**19.5**	*1.66*	2.61	*0.27*	119	**12.1**	*1.21*	1.57	*0.19*
Zambia, Lusaka (2011–2015)	127	**7.9**	*0.81*	1.01	*0.14*	63	**3.5**	*0.50*	0.42	*0.08*
Zimbabwe, Bulawayo: Black (2013–2015)	93	**20.3**	*2.20*	2.27	*0.34*	77	**13.3**	*1.56*	1.29	*0.21*
Zimbabwe, Harare: Black (2013–2015)	167	**20.3**	*1.69*	2.30	*0.27*	147	**16.1**	*1.40*	1.94	*0.22*
Africa, southern										
*Eswatini (2016–2017)	20	**3.5**	*0.80*	0.34	*0.10*	7	**1.0**	*0.39*	0.10	*0.05*
Namibia (2013–2015)	71	**3.9**	*0.48*	0.43	*0.06*	33	**1.2**	*0.23*	0.12	*0.03*
South Africa (2010–2014)	4749	**5.5**	*0.08*	0.67	*0.01*	3386	**2.9**	*0.05*	0.34	*0.01*
South Africa: Black (2010–2013)	2706	**6.2**	*0.13*	0.76	*0.02*	2096	**3.4**	*0.08*	0.39	*0.01*
South Africa: White (2010–2013)	605	**4.2**	*0.17*	0.53	*0.02*	262	**1.5**	*0.10*	0.17	*0.01*
South Africa, Eastern Cape (2013–2016)	267	**19.4**	*1.22*	2.42	*0.17*	388	**15.9**	*0.86*	2.12	*0.13*
Africa, western										
Benin, Cotonou (2014–2016)	24	**5.2**	*1.12*	0.75	*0.19*	15	**2.5**	*0.66*	0.32	*0.10*
Côte d´Ivoire, Abidjan (2014–2015)	17	**0.9**	*0.26*	0.09	*0.03*	6	**0.3**	*0.15*	0.02	*0.01*
Mali, Bamako (2015–2017)	53	**2.7**	*0.41*	0.31	*0.05*	46	**2.6**	*0.41*	0.27	*0.05*
*Nigeria, Abuja (2013–2016)	5	**0.2**	*0.11*	0.02	*0.01*	1	**0.1**	*0.13*	–	-
Nigeria, Calabar (2016–2017)	1	**0.3**	*0.31*	0.03	*0.03*	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	6	**0.6**	*0.26*	0.09	*0.05*	2	**0.2**	*0.12*	0.01	*0.01*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Stomach (C16)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	45	**4.0**	*0.63*	0.51	*0.10*	18	**1.4**	*0.36*	0.18	*0.05*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	107	**3.2**	*0.34*	0.37	*0.05*	113	**3.2**	*0.32*	0.38	*0.05*
France, Réunion (2011–2013)	200	**13.4**	*0.96*	1.54	*0.14*	117	**6.2**	*0.60*	0.70	*0.09*
*Kenya, Eldoret (2012–2016)	33	**3.0**	*0.57*	0.39	*0.09*	22	**1.7**	*0.41*	0.19	*0.06*
Kenya, Nairobi (2012–2014)	171	**9.6**	*0.87*	1.19	*0.14*	140	**9.5**	*0.92*	1.23	*0.15*
Mauritius (2013–2015)	191	**8.8**	*0.64*	0.95	*0.09*	124	**4.5**	*0.42*	0.57	*0.07*
Mozambique, Beira (2014–2017)	2	**0.3**	*0.24*	0.03	*0.03*	2	**0.2**	*0.13*	0.01	*0.01*
Mozambique, Maputo (2015–2017)	20	**2.5**	*0.58*	0.37	*0.11*	9	**0.9**	*0.31*	0.12	*0.05*
Seychelles (2013–2017)	12	**4.6**	*1.35*	0.24	*0.10*	10	**3.1**	*1.03*	0.34	*0.14*
Tanzania, Mwanza [two districts] (2016–2017)	2	**0.9**	*0.65*	0.13	*0.10*	0	**-**	-	–	-
Uganda, Gulu (2013–2015)	6	**1.5**	*0.66*	0.23	*0.13*	4	**0.8**	*0.41*	0.09	*0.05*
Uganda, Kampala (2011–2013)	46	**4.9**	*0.81*	0.71	*0.15*	30	**2.9**	*0.58*	0.40	*0.09*
Zambia, Lusaka (2011–2015)	63	**3.4**	*0.52*	0.34	*0.07*	52	**2.9**	*0.47*	0.36	*0.07*
Zimbabwe, Bulawayo: Black (2013–2015)	27	**5.8**	*1.16*	0.59	*0.16*	32	**6.0**	*1.10*	0.89	*0.19*
Zimbabwe, Harare: Black (2013–2015)	155	**19.0**	*1.64*	2.21	*0.27*	180	**19.7**	*1.55*	2.02	*0.23*
Africa, southern										
*Eswatini (2016–2017)	5	**0.8**	*0.37*	0.07	*0.04*	9	**1.2**	*0.42*	0.11	*0.05*
Namibia (2013–2015)	39	**2.1**	*0.34*	0.26	*0.05*	43	**1.7**	*0.27*	0.20	*0.04*
South Africa (2010–2014)	3670	**4.3**	*0.07*	0.51	*0.01*	2055	**1.7**	*0.04*	0.19	*0.01*
South Africa: Black (2010–2013)	1006	**2.2**	*0.07*	0.28	*0.01*	688	**1.0**	*0.04*	0.12	*0.01*
South Africa: White (2010–2013)	1100	**7.6**	*0.23*	0.87	*0.03*	488	**2.8**	*0.14*	0.32	*0.02*
South Africa, Eastern Cape (2013–2016)	11	**0.8**	*0.26*	0.07	*0.03*	14	**0.6**	*0.18*	0.07	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	29	**5.5**	*1.09*	0.64	*0.15*	17	**2.4**	*0.62*	0.26	*0.08*
Côte d´Ivoire, Abidjan (2014–2015)	83	**4.8**	*0.59*	0.68	*0.11*	82	**5.6**	*0.68*	0.65	*0.10*
Mali, Bamako (2015–2017)	260	**15.7**	*1.03*	1.94	*0.16*	202	**13.4**	*0.99*	1.75	*0.15*
*Nigeria, Abuja (2013–2016)	17	**1.7**	*0.49*	0.17	*0.07*	8	**1.1**	*0.47*	0.16	*0.08*
Nigeria, Calabar (2016–2017)	0	**-**	-	–	-	3	**1.6**	*1.04*	0.19	*0.13*
*Nigeria, Ekiti (2013–2017)	8	**0.8**	*0.29*	0.08	*0.04*	7	**1.0**	*0.39*	0.14	*0.06*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Colon (C18)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	18	**1.4**	*0.35*	0.17	*0.05*	22	**1.6**	*0.37*	0.21	*0.06*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	154	**4.9**	*0.42*	0.62	*0.06*	156	**4.3**	*0.37*	0.46	*0.05*
France, Réunion (2011–2013)	251	**17.1**	*1.09*	2.18	*0.17*	261	**14.6**	*0.93*	1.86	*0.14*
*Kenya, Eldoret (2012–2016)	24	**2.1**	*0.46*	0.27	*0.07*	24	**1.8**	*0.41*	0.19	*0.05*
Kenya, Nairobi (2012–2014)	141	**7.7**	*0.78*	1.04	*0.14*	123	**7.6**	*0.79*	0.89	*0.13*
Mauritius (2013–2015)	235	**10.7**	*0.71*	1.27	*0.10*	273	**10.2**	*0.63*	1.14	*0.09*
Mozambique, Beira (2014–2017)	5	**1.3**	*0.65*	0.22	*0.13*	6	**1.6**	*0.69*	0.17	*0.09*
Mozambique, Maputo (2015–2017)	16	**1.5**	*0.40*	0.17	*0.07*	16	**1.4**	*0.36*	0.16	*0.05*
Seychelles (2013–2017)	36	**13.5**	*2.28*	1.59	*0.33*	36	**11.1**	*1.91*	1.57	*0.34*
Tanzania, Mwanza [two districts] (2016–2017)	3	**0.5**	*0.29*	0.04	*0.02*	4	**0.7**	*0.36*	0.06	*0.03*
Uganda, Gulu (2013–2015)	7	**1.2**	*0.50*	0.09	*0.05*	4	**0.7**	*0.36*	0.09	*0.06*
Uganda, Kampala (2011–2013)	50	**4.7**	*0.79*	0.67	*0.14*	40	**4.0**	*0.72*	0.54	*0.11*
Zambia, Lusaka (2011–2015)	40	**2.5**	*0.46*	0.37	*0.08*	30	**1.8**	*0.39*	0.23	*0.06*
Zimbabwe, Bulawayo: Black (2013–2015)	35	**6.9**	*1.22*	0.86	*0.19*	32	**5.0**	*0.94*	0.61	*0.15*
Zimbabwe, Harare: Black (2013–2015)	83	**9.3**	*1.12*	0.97	*0.16*	62	**6.4**	*0.88*	0.81	*0.14*
Africa, southern										
*Eswatini (2016–2017)	17	**3.0**	*0.75*	0.29	*0.08*	14	**1.9**	*0.54*	0.27	*0.09*
Namibia (2013–2015)	100	**5.3**	*0.56*	0.63	*0.08*	68	**2.9**	*0.37*	0.37	*0.05*
South Africa (2010–2014)	5363	**6.3**	*0.09*	0.73	*0.01*	4595	**3.8**	*0.06*	0.43	*0.01*
South Africa: Black (2010–2013)	1057	**2.2**	*0.07*	0.25	*0.01*	917	**1.4**	*0.05*	0.16	*0.01*
South Africa: White (2010–2013)	2168	**15.1**	*0.33*	1.72	*0.04*	1840	**10.4**	*0.26*	1.19	*0.03*
South Africa, Eastern Cape (2013–2016)	16	**1.2**	*0.30*	0.13	*0.04*	16	**0.7**	*0.19*	0.08	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	25	**4.7**	*1.01*	0.68	*0.18*	16	**2.1**	*0.56*	0.21	*0.06*
Côte d´Ivoire, Abidjan (2014–2015)	82	**3.9**	*0.50*	0.55	*0.09*	59	**3.7**	*0.53*	0.41	*0.07*
Mali, Bamako (2015–2017)	91	**4.7**	*0.54*	0.63	*0.09*	78	**4.4**	*0.54*	0.54	*0.08*
*Nigeria, Abuja (2013–2016)	37	**2.6**	*0.56*	0.36	*0.09*	17	**2.9**	*0.84*	0.36	*0.12*
Nigeria, Calabar (2016–2017)	6	**2.6**	*1.14*	0.27	*0.19*	1	**0.4**	*0.42*	0.04	*0.04*
*Nigeria, Ekiti (2013–2017)	14	**1.1**	*0.31*	0.10	*0.04*	13	**1.8**	*0.52*	0.29	*0.10*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Colorectum (C18-20)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	34	**2.5**	*0.47*	0.28	*0.06*	34	**2.4**	*0.45*	0.31	*0.07*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	310	**9.2**	*0.57*	1.09	*0.08*	283	**7.5**	*0.49*	0.83	*0.06*
France, Réunion (2011–2013)	430	**29.2**	*1.42*	3.57	*0.21*	369	**20.5**	*1.10*	2.54	*0.17*
*Kenya, Eldoret (2012–2016)	40	**3.4**	*0.59*	0.43	*0.09*	42	**3.3**	*0.56*	0.39	*0.08*
Kenya, Nairobi (2012–2014)	246	**13.0**	*1.00*	1.67	*0.17*	207	**12.1**	*0.97*	1.41	*0.15*
Mauritius (2013–2015)	397	**17.8**	*0.91*	2.10	*0.13*	379	**14.3**	*0.75*	1.65	*0.11*
Mozambique, Beira (2014–2017)	11	**2.5**	*0.85*	0.37	*0.15*	9	**2.4**	*0.85*	0.31	*0.13*
Mozambique, Maputo (2015–2017)	32	**3.2**	*0.61*	0.37	*0.09*	29	**2.6**	*0.50*	0.28	*0.06*
Seychelles (2013–2017)	67	**25.0**	*3.10*	2.66	*0.44*	64	**19.6**	*2.53*	2.57	*0.41*
Tanzania, Mwanza [two districts] (2016–2017)	10	**2.9**	*1.04*	0.51	*0.22*	13	**3.3**	*1.05*	0.47	*0.20*
Uganda, Gulu (2013–2015)	10	**1.9**	*0.67*	0.17	*0.07*	6	**1.2**	*0.51*	0.16	*0.07*
Uganda, Kampala (2011–2013)	88	**9.1**	*1.13*	1.28	*0.19*	97	**9.3**	*1.07*	1.20	*0.16*
Zambia, Lusaka (2011–2015)	75	**4.4**	*0.60*	0.59	*0.10*	65	**3.7**	*0.53*	0.46	*0.08*
Zimbabwe, Bulawayo: Black (2013–2015)	53	**11.4**	*1.63*	1.58	*0.28*	45	**7.1**	*1.12*	0.84	*0.17*
Zimbabwe, Harare: Black (2013–2015)	149	**16.1**	*1.45*	1.65	*0.20*	121	**11.6**	*1.16*	1.36	*0.18*
Africa, southern										
*Eswatini (2016–2017)	27	**4.5**	*0.91*	0.45	*0.10*	29	**3.5**	*0.70*	0.45	*0.11*
Namibia (2013–2015)	148	**7.7**	*0.67*	0.90	*0.09*	117	**4.9**	*0.47*	0.62	*0.07*
South Africa (2010–2014)	8614	**10.1**	*0.11*	1.18	*0.02*	7213	**6.0**	*0.07*	0.68	*0.01*
South Africa: Black (2010–2013)	1745	**3.7**	*0.09*	0.42	*0.01*	1573	**2.4**	*0.06*	0.26	*0.01*
South Africa: White (2010–2013)	3385	**23.5**	*0.41*	2.73	*0.06*	2742	**15.7**	*0.32*	1.80	*0.04*
South Africa, Eastern Cape (2013–2016)	30	**2.2**	*0.41*	0.24	*0.05*	36	**1.6**	*0.28*	0.19	*0.04*
Africa, western										
Benin, Cotonou (2014–2016)	40	**7.5**	*1.26*	0.97	*0.20*	22	**2.9**	*0.65*	0.30	*0.07*
Côte d´Ivoire, Abidjan (2014–2015)	102	**4.9**	*0.55*	0.65	*0.09*	99	**5.4**	*0.62*	0.56	*0.08*
Mali, Bamako (2015–2017)	188	**9.5**	*0.77*	1.18	*0.12*	168	**9.4**	*0.80*	1.13	*0.11*
*Nigeria, Abuja (2013–2016)	54	**3.8**	*0.67*	0.50	*0.10*	39	**5.1**	*1.02*	0.68	*0.16*
Nigeria, Calabar (2016–2017)	8	**3.7**	*1.43*	0.51	*0.28*	3	**1.8**	*1.04*	0.28	*0.19*
*Nigeria, Ekiti (2013–2017)	23	**2.2**	*0.50*	0.23	*0.06*	17	**2.2**	*0.56*	0.33	*0.10*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Rectum (C19-20)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	16	**1.2**	*0.32*	0.11	*0.03*	12	**0.8**	*0.26*	0.10	*0.04*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	156	**4.3**	*0.38*	0.47	*0.05*	127	**3.2**	*0.31*	0.37	*0.04*
France, Réunion (2011−2013)	179	**12.1**	*0.91*	1.39	*0.13*	108	**5.9**	*0.59*	0.67	*0.08*
*Kenya, Eldoret (2012−2016)	16	**1.3**	*0.36*	0.15	*0.05*	18	**1.5**	*0.38*	0.20	*0.07*
Kenya, Nairobi (2012−2014)	105	**5.3**	*0.63*	0.63	*0.10*	84	**4.4**	*0.57*	0.53	*0.08*
Mauritius (2013−2015)	162	**7.1**	*0.57*	0.83	*0.08*	106	**4.1**	*0.40*	0.52	*0.06*
Mozambique, Beira (2014−2017)	6	**1.2**	*0.55*	0.14	*0.08*	3	**0.8**	*0.50*	0.14	*0.10*
Mozambique, Maputo (2015−2017)	16	**1.7**	*0.46*	0.20	*0.07*	13	**1.2**	*0.34*	0.12	*0.04*
Seychelles (2013−2017)	31	**11.5**	*2.09*	1.07	*0.28*	28	**8.5**	*1.66*	1.00	*0.24*
Tanzania, Mwanza [two districts] (2016−2017)	7	**2.5**	*1.00*	0.47	*0.22*	9	**2.6**	*0.99*	0.41	*0.20*
Uganda, Gulu (2013−2015)	3	**0.7**	*0.46*	0.08	*0.05*	2	**0.5**	*0.36*	0.06	*0.05*
Uganda, Kampala (2011−2013)	38	**4.4**	*0.80*	0.61	*0.13*	57	**5.3**	*0.79*	0.67	*0.12*
Zambia, Lusaka (2011−2015)	35	**1.9**	*0.38*	0.22	*0.06*	35	**1.9**	*0.36*	0.23	*0.05*
Zimbabwe, Bulawayo: Black (2013−2015)	18	**4.5**	*1.08*	0.72	*0.21*	13	**2.0**	*0.60*	0.23	*0.09*
Zimbabwe, Harare: Black (2013−2015)	66	**6.8**	*0.92*	0.68	*0.12*	59	**5.2**	*0.75*	0.55	*0.11*
Africa, southern										
*Eswatini (2016−2017)	10	**1.5**	*0.50*	0.16	*0.06*	15	**1.6**	*0.45*	0.17	*0.06*
Namibia (2013−2015)	48	**2.4**	*0.36*	0.27	*0.05*	49	**2.0**	*0.30*	0.25	*0.04*
South Africa (2010−2014)	3251	**3.8**	*0.07*	0.45	*0.01*	2618	**2.2**	*0.04*	0.24	*0.01*
South Africa: Black (2010−2013)	688	**1.4**	*0.06*	0.17	*0.01*	656	**1.0**	*0.04*	0.10	*0.00*
South Africa: White (2010−2013)	1217	**8.4**	*0.25*	1.01	*0.03*	902	**5.2**	*0.18*	0.61	*0.02*
South Africa, Eastern Cape (2013−2016)	14	**1.0**	*0.28*	0.11	*0.04*	20	**0.9**	*0.21*	0.11	*0.03*
Africa, western										
Benin, Cotonou (2014−2016)	15	**2.7**	*0.75*	0.30	*0.09*	6	**0.8**	*0.34*	0.09	*0.04*
Côte d´Ivoire, Abidjan (2014−2015)	20	**0.9**	*0.24*	0.11	*0.03*	40	**1.7**	*0.33*	0.15	*0.04*
Mali, Bamako (2015−2017)	97	**4.8**	*0.54*	0.55	*0.08*	90	**5.0**	*0.58*	0.59	*0.08*
*Nigeria, Abuja (2013−2016)	17	**1.2**	*0.37*	0.15	*0.05*	22	**2.3**	*0.63*	0.33	*0.11*
Nigeria, Calabar (2016−2017)	2	**1.2**	*0.86*	0.24	*0.20*	2	**1.3**	*0.95*	0.25	*0.18*
*Nigeria, Ekiti (2013−2017)	9	**1.1**	*0.39*	0.13	*0.05*	4	**0.4**	*0.21*	0.04	*0.02*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Anus (C21)

	Males				Females			
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	10	**1.0**	*0.33*	0.15	*0.05*	6	**0.5**	*0.21*	0.05	*0.03*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	16	**0.5**	*0.13*	0.06	*0.02*	20	**0.5**	*0.12*	0.06	*0.02*
France, Réunion (2011−2013)	4	**0.3**	*0.14*	0.04	*0.02*	21	**1.2**	*0.27*	0.14	*0.04*
*Kenya, Eldoret (2012−2016)	0	-	-	–	-	1	**0.1**	*0.14*	0.02	*0.02*
Kenya, Nairobi (2012−2014)	13	**0.8**	*0.25*	0.07	*0.03*	20	**1.1**	*0.29*	0.11	*0.03*
Mauritius (2013−2015)	11	**0.5**	*0.14*	0.04	*0.02*	10	**0.4**	*0.12*	0.05	*0.02*
Mozambique, Beira (2014−2017)	2	**0.3**	*0.24*	0.03	*0.03*	7	**1.3**	*0.55*	0.14	*0.09*
Mozambique, Maputo (2015−2017)	2	**0.2**	*0.16*	0.03	*0.03*	11	**0.9**	*0.29*	0.10	*0.04*
Seychelles (2013−2017)	2	**0.8**	*0.55*	0.14	*0.11*	4	**1.0**	*0.52*	0.07	*0.07*
Tanzania, Mwanza [two districts] (2016−2017)	4	**0.9**	*0.47*	0.08	*0.05*	7	**1.8**	*0.72*	0.18	*0.08*
Uganda, Gulu (2013−2015)	4	**0.7**	*0.41*	0.07	*0.05*	1	**0.3**	*0.29*	0.05	*0.05*
Uganda, Kampala (2011−2013)	4	**0.2**	*0.14*	0.01	*0.01*	7	**0.5**	*0.19*	0.04	*0.02*
Zambia, Lusaka (2011−2015)	8	**0.3**	*0.14*	0.04	*0.02*	21	**0.7**	*0.17*	0.06	*0.02*
Zimbabwe, Bulawayo: Black (2013−2015)	8	**1.5**	*0.56*	0.21	*0.10*	14	**1.9**	*0.52*	0.20	*0.07*
Zimbabwe, Harare: Black (2013−2015)	14	**1.4**	*0.42*	0.16	*0.06*	11	**0.7**	*0.25*	0.08	*0.03*
Africa, southern										
*Eswatini (2016−2017)	3	**0.6**	*0.34*	0.07	*0.05*	5	**0.6**	*0.27*	0.06	*0.03*
Namibia (2013−2015)	17	**0.8**	*0.21*	0.10	*0.03*	14	**0.6**	*0.17*	0.10	*0.03*
South Africa (2010−2014)	454	**0.5**	*0.02*	0.06	*0.00*	602	**0.5**	*0.02*	0.05	*0.00*
South Africa: Black (2010−2013)	198	**0.4**	*0.03*	0.04	*0.00*	291	**0.4**	*0.02*	0.04	*0.00*
South Africa: White (2010−2013)	87	**0.6**	*0.07*	0.07	*0.01*	108	**0.7**	*0.07*	0.07	*0.01*
South Africa, Eastern Cape (2013−2016)	11	**0.8**	*0.25*	0.09	*0.03*	5	**0.2**	*0.11*	0.02	*0.01*
Africa, western										
Benin, Cotonou (2014−2016)	9	**1.3**	*0.49*	0.18	*0.09*	3	**0.4**	*0.26*	0.05	*0.03*
Côte d´Ivoire, Abidjan (2014−2015)	12	**0.5**	*0.16*	0.06	*0.03*	13	**0.7**	*0.22*	0.07	*0.03*
Mali, Bamako (2015−2017)	13	**0.5**	*0.16*	0.06	*0.03*	10	**0.4**	*0.13*	0.03	*0.01*
*Nigeria, Abuja (2013−2016)	6	**0.4**	*0.24*	0.07	*0.06*	5	**0.3**	*0.17*	0.03	*0.02*
Nigeria, Calabar (2016−2017)	0	-	-	–	-	1	**0.2**	*0.16*	0.01	*0.01*
*Nigeria, Ekiti (2013−2017)	7	**0.7**	*0.25*	0.06	*0.03*	2	**0.2**	*0.11*	0.01	*0.01*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Liver (C22)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	153	**10.2**	*0.93*	1.18	*0.13*	69	**4.6**	*0.62*	0.51	*0.09*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	87	**2.8**	*0.33*	0.32	*0.05*	80	**2.6**	*0.31*	0.31	*0.04*
France, Réunion (2011–2013)	107	**7.2**	*0.71*	0.89	*0.11*	36	**1.9**	*0.33*	0.29	*0.06*
*Kenya, Eldoret (2012–2016)	30	**2.1**	*0.44*	0.21	*0.06*	29	**2.2**	*0.45*	0.22	*0.06*
Kenya, Nairobi (2012–2014)	100	**4.0**	*0.52*	0.51	*0.09*	66	**4.0**	*0.59*	0.57	*0.11*
Mauritius (2013–2015)	71	**3.3**	*0.40*	0.41	*0.06*	47	**1.7**	*0.25*	0.18	*0.03*
Mozambique, Beira (2014–2017)	40	**7.2**	*1.33*	0.64	*0.13*	22	**3.9**	*0.95*	0.44	*0.13*
Mozambique, Maputo (2015–2017)	151	**14.1**	*1.24*	1.65	*0.19*	107	**8.4**	*0.87*	0.92	*0.13*
Seychelles (2013–2017)	17	**6.2**	*1.53*	0.50	*0.18*	7	**2.1**	*0.83*	0.32	*0.16*
Tanzania, Mwanza [two districts] (2016–2017)	18	**4.0**	*1.08*	0.47	*0.16*	7	**1.5**	*0.69*	0.13	*0.08*
Uganda, Gulu (2013–2015)	78	**13.6**	*1.78*	1.50	*0.25*	38	**6.8**	*1.17*	0.74	*0.15*
Uganda, Kampala (2011–2013)	106	**7.5**	*0.93*	0.84	*0.14*	93	**6.7**	*0.83*	0.75	*0.12*
Zambia, Lusaka (2011–2015)	61	**3.0**	*0.47*	0.35	*0.08*	39	**1.8**	*0.34*	0.20	*0.05*
Zimbabwe, Bulawayo: Black (2013–2015)	56	**10.3**	*1.47*	1.00	*0.19*	45	**7.3**	*1.13*	0.76	*0.15*
Zimbabwe, Harare: Black (2013–2015)	192	**17.4**	*1.45*	1.86	*0.22*	110	**11.0**	*1.13*	1.11	*0.17*
Africa, southern										
*Eswatini (2016–2017)	34	**5.5**	*0.97*	0.58	*0.12*	24	**2.8**	*0.61*	0.30	*0.09*
Namibia (2013–2015)	77	**4.1**	*0.49*	0.49	*0.07*	53	**2.1**	*0.31*	0.25	*0.04*
South Africa (2010–2014)	945	**1.0**	*0.03*	0.10	*0.00*	381	**0.3**	*0.02*	0.03	*0.00*
South Africa: Black (2010–2013)	498	**0.9**	*0.04*	0.09	*0.01*	205	**0.3**	*0.02*	0.03	*0.00*
South Africa: White (2010–2013)	152	**1.1**	*0.09*	0.12	*0.01*	60	**0.5**	*0.07*	0.05	*0.01*
South Africa, Eastern Cape (2013–2016)	40	**3.0**	*0.49*	0.32	*0.06*	28	**1.3**	*0.27*	0.16	*0.04*
Africa, western										
Benin, Cotonou (2014–2016)	53	**8.2**	*1.29*	0.84	*0.17*	19	**2.9**	*0.68*	0.32	*0.09*
Côte d´Ivoire, Abidjan (2014–2015)	243	**9.7**	*0.76*	1.04	*0.11*	105	**5.7**	*0.64*	0.68	*0.10*
Mali, Bamako (2015–2017)	225	**10.7**	*0.78*	1.20	*0.11*	93	**5.4**	*0.59*	0.60	*0.08*
*Nigeria, Abuja (2013–2016)	13	**0.6**	*0.24*	0.07	*0.04*	4	**0.7**	*0.37*	0.08	*0.05*
Nigeria, Calabar (2016–2017)	1	**0.2**	*0.19*	0.02	*0.02*	3	**0.9**	*0.73*	0.02	*0.02*
*Nigeria, Ekiti (2013–2017)	29	**2.7**	*0.53*	0.26	*0.07*	10	**1.2**	*0.41*	0.12	*0.05*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Gallbladder etc. (C23-24)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	0	-	-	−	-	0	-	-	−	-
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	17	**0.6**	*0.16*	0.09	*0.03*	29	**1.0**	*0.20*	0.15	*0.03*
France, Réunion (2011−2013)	53	**3.6**	*0.50*	0.48	*0.08*	63	**3.4**	*0.45*	0.42	*0.07*
*Kenya, Eldoret (2012−2016)	2	**0.2**	*0.11*	−	-	6	**0.7**	*0.28*	0.10	*0.05*
Kenya, Nairobi (2012−2014)	39	**2.2**	*0.42*	0.24	*0.06*	60	**3.6**	*0.54*	0.50	*0.09*
Mauritius (2013−2015)	19	**0.9**	*0.20*	0.09	*0.03*	40	**1.5**	*0.24*	0.21	*0.04*
Mozambique, Beira (2014−2017)	0	-	-	−	-	0	-	-	−	-
Mozambique, Maputo (2015−2017)	2	**0.2**	*0.14*	0.02	*0.01*	1	**0.1**	*0.12*	0.01	*0.01*
Seychelles (2013−2017)	2	**0.7**	*0.49*	0.10	*0.08*	1	**0.4**	*0.37*	0.05	*0.05*
Tanzania, Mwanza [two districts] (2016−2017)	0	-	-	−	-	0	-	-	−	-
Uganda, Gulu (2013−2015)	1	**0.4**	*0.37*	0.05	*0.05*	0	-	-	−	-
Uganda, Kampala (2011−2013)	2	**0.1**	*0.09*	0.00	*0.00*	1	**0.1**	*0.13*	0.02	*0.02*
Zambia, Lusaka (2011−2015)	3	**0.2**	*0.14*	0.03	*0.02*	1	**0.0**	*0.01*	0.00	*0.00*
Zimbabwe, Bulawayo: Black (2013−2015)	5	**1.1**	*0.51*	0.15	*0.08*	9	**1.4**	*0.48*	0.19	*0.08*
Zimbabwe, Harare: Black (2013−2015)	19	**2.4**	*0.58*	0.23	*0.09*	21	**2.6**	*0.59*	0.42	*0.11*
Africa, southern										
*Eswatini (2016−2017)	3	**0.6**	*0.35*	0.08	*0.05*	1	**0.2**	*0.19*	0.02	*0.02*
Namibia (2013−2015)	10	**0.6**	*0.18*	0.06	*0.02*	18	**0.8**	*0.20*	0.11	*0.03*
South Africa (2010−2014)	435	**0.5**	*0.02*	0.06	*0.00*	529	**0.4**	*0.02*	0.05	*0.00*
South Africa: Black (2010−2013)	165	**0.4**	*0.03*	0.05	*0.00*	235	**0.4**	*0.02*	0.04	*0.00*
South Africa: White (2010−2013)	120	**0.8**	*0.08*	0.09	*0.01*	136	**0.7**	*0.06*	0.08	*0.01*
South Africa, Eastern Cape (2013−2016)	0	-	-	−	-	0	-	-	−	-
Africa, western										
Benin, Cotonou (2014−2016)	5	**1.0**	*0.47*	0.10	*0.07*	4	**0.5**	*0.28*	0.06	*0.04*
Côte d´Ivoire, Abidjan (2014−2015)	7	**0.3**	*0.13*	0.04	*0.02*	21	**1.1**	*0.27*	0.11	*0.04*
Mali, Bamako (2015−2017)	7	**0.4**	*0.16*	0.04	*0.02*	5	**0.3**	*0.14*	0.03	*0.02*
*Nigeria, Abuja (2013−2016)	1	**0.1**	*0.13*	0.02	*0.02*	1	**0.1**	*0.10*	0.01	*0.01*
Nigeria, Calabar (2016−2017)	0	-	-	−	-	0	-	-	−	-
*Nigeria, Ekiti (2013−2017)	6	**0.7**	*0.29*	0.11	*0.05*	1	**0.2**	*0.17*	0.02	*0.02*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Pancreas (C25)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	18	**1.9**	*0.47*	0.18	*0.06*	13	**1.0**	*0.30*	0.12	*0.04*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	35	**1.1**	*0.20*	0.12	*0.03*	35	**1.0**	*0.19*	0.12	*0.02*
France, Réunion (2011–2013)	90	**6.1**	*0.65*	0.72	*0.10*	87	**4.8**	*0.54*	0.67	*0.09*
*Kenya, Eldoret (2012–2016)	17	**1.6**	*0.42*	0.20	*0.07*	17	**1.5**	*0.37*	0.18	*0.06*
Kenya, Nairobi (2012–2014)	51	**3.1**	*0.50*	0.36	*0.08*	62	**4.6**	*0.65*	0.65	*0.11*
Mauritius (2013–2015)	56	**2.5**	*0.34*	0.32	*0.05*	43	**1.6**	*0.25*	0.20	*0.04*
Mozambique, Beira (2014–2017)	2	**0.4**	*0.29*	0.04	*0.03*	1	**0.2**	*0.25*	0.02	*0.02*
Mozambique, Maputo (2015–2017)	8	**0.8**	*0.28*	0.09	*0.04*	9	**0.8**	*0.29*	0.11	*0.05*
Seychelles (2013–2017)	12	**4.5**	*1.31*	0.58	*0.20*	6	**1.5**	*0.65*	0.16	*0.11*
Tanzania, Mwanza [two districts] (2016–2017)	3	**0.7**	*0.45*	0.07	*0.05*	1	**0.3**	*0.28*	–	-
Uganda, Gulu (2013–2015)	8	**1.1**	*0.48*	0.12	*0.07*	8	**1.6**	*0.60*	0.23	*0.10*
Uganda, Kampala (2011–2013)	20	**1.7**	*0.43*	0.17	*0.06*	19	**2.0**	*0.50*	0.28	*0.08*
Zambia, Lusaka (2011–2015)	12	**0.7**	*0.24*	0.08	*0.04*	9	**0.7**	*0.24*	0.08	*0.03*
Zimbabwe, Bulawayo: Black (2013–2015)	18	**4.0**	*0.99*	0.71	*0.20*	12	**2.0**	*0.62*	0.22	*0.09*
Zimbabwe, Harare: Black (2013–2015)	49	**6.1**	*0.92*	0.70	*0.14*	56	**6.1**	*0.85*	0.61	*0.12*
Africa, southern										
*Eswatini (2016–2017)	6	**1.0**	*0.42*	0.13	*0.06*	6	**0.8**	*0.35*	0.07	*0.04*
Namibia (2013–2015)	22	**1.3**	*0.29*	0.19	*0.05*	17	**0.8**	*0.20*	0.12	*0.03*
South Africa (2010–2014)	740	**0.9**	*0.03*	0.11	*0.00*	662	**0.6**	*0.02*	0.07	*0.00*
South Africa: Black (2010–2013)	172	**0.4**	*0.03*	0.05	*0.00*	149	**0.2**	*0.02*	0.03	*0.00*
South Africa: White (2010–2013)	280	**1.9**	*0.12*	0.23	*0.02*	240	**1.4**	*0.09*	0.17	*0.01*
South Africa, Eastern Cape (2013–2016)	8	**0.6**	*0.23*	0.07	*0.03*	7	**0.3**	*0.13*	0.04	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	11	**1.8**	*0.58*	0.22	*0.07*	14	**2.3**	*0.63*	0.33	*0.10*
Côte d´Ivoire, Abidjan (2014–2015)	35	**1.8**	*0.34*	0.20	*0.05*	32	**2.0**	*0.38*	0.21	*0.05*
Mali, Bamako (2015–2017)	75	**4.5**	*0.55*	0.58	*0.09*	47	**3.1**	*0.48*	0.41	*0.07*
*Nigeria, Abuja (2013–2016)	3	**0.5**	*0.30*	0.09	*0.06*	3	**0.3**	*0.25*	0.04	*0.03*
Nigeria, Calabar (2016–2017)	2	**0.9**	*0.77*	0.20	*0.19*	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	4	**0.3**	*0.17*	0.02	*0.01*	4	**0.4**	*0.18*	0.01	*0.01*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Larynx (C32)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	3	**0.4**	*0.21*	0.08	*0.05*	1	**0.1**	*0.12*	0.02	*0.02*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	41	**1.3**	*0.22*	0.18	*0.04*	7	**0.2**	*0.08*	0.03	*0.02*
France, Réunion (2011–2013)	79	**5.4**	*0.61*	0.67	*0.09*	4	**0.3**	*0.13*	0.04	*0.02*
*Kenya, Eldoret (2012–2016)	9	**0.8**	*0.29*	0.08	*0.03*	2	**0.3**	*0.20*	0.04	*0.02*
Kenya, Nairobi (2012–2014)	60	**3.5**	*0.51*	0.44	*0.08*	4	**0.3**	*0.18*	0.06	*0.04*
Mauritius (2013–2015)	87	**3.8**	*0.41*	0.47	*0.06*	6	**0.2**	*0.09*	0.03	*0.01*
Mozambique, Beira (2014–2017)	2	**0.4**	*0.36*	0.07	*0.06*	1	**0.1**	*0.09*	0.01	*0.01*
Mozambique, Maputo (2015–2017)	13	**1.4**	*0.40*	0.18	*0.06*	3	**0.3**	*0.17*	0.04	*0.03*
Seychelles (2013–2017)	19	**7.1**	*1.65*	0.89	*0.26*	2	**0.5**	*0.33*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016–2017)	3	**1.0**	*0.59*	0.11	*0.07*	0	-	-	–	-
Uganda, Gulu (2013–2015)	7	**1.6**	*0.64*	0.13	*0.06*	3	**0.4**	*0.23*	0.03	*0.02*
Uganda, Kampala (2011–2013)	20	**2.7**	*0.63*	0.33	*0.09*	5	**0.5**	*0.24*	0.07	*0.04*
Zambia, Lusaka (2011–2015)	26	**1.8**	*0.39*	0.21	*0.05*	7	**0.3**	*0.13*	0.03	*0.02*
Zimbabwe, Bulawayo: Black (2013–2015)	11	**2.3**	*0.70*	0.23	*0.09*	0	-	-	–	-
Zimbabwe, Harare: Black (2013–2015)	48	**6.4**	*0.95*	0.80	*0.14*	6	**0.6**	*0.24*	0.04	*0.02*
Africa, southern										
*Eswatini (2016–2017)	4	**0.7**	*0.38*	0.12	*0.07*	2	**0.2**	*0.16*	0.00	*0.00*
Namibia (2013–2015)	73	**4.4**	*0.52*	0.61	*0.09*	11	**0.5**	*0.16*	0.07	*0.02*
South Africa (2010–2014)	2430	**2.8**	*0.06*	0.36	*0.01*	416	**0.4**	*0.02*	0.04	*0.00*
South Africa: Black (2010–2013)	1058	**2.5**	*0.08*	0.32	*0.01*	140	**0.2**	*0.02*	0.02	*0.00*
South Africa: White (2010–2013)	495	**3.4**	*0.16*	0.44	*0.02*	104	**0.7**	*0.07*	0.08	*0.01*
South Africa, Eastern Cape (2013–2016)	39	**2.9**	*0.48*	0.38	*0.07*	5	**0.2**	*0.10*	0.03	*0.01*
Africa, western										
Benin, Cotonou (2014–2016)	1	**0.2**	*0.24*	0.03	*0.03*	0	-	-	–	-
Côte d´Ivoire, Abidjan (2014–2015)	30	**1.8**	*0.37*	0.20	*0.05*	2	**0.1**	*0.10*	0.02	*0.02*
Mali, Bamako (2015–2017)	27	**1.6**	*0.33*	0.22	*0.05*	4	**0.2**	*0.13*	0.03	*0.02*
*Nigeria, Abuja (2013–2016)	4	**0.3**	*0.22*	0.05	*0.03*	1	**0.2**	*0.22*	0.03	*0.03*
Nigeria, Calabar (2016–2017)	3	**1.2**	*0.74*	0.13	*0.09*	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	0	-	-	–	-	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Trachea, bronchus, and lung (C33-34)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	16	**1.9**	*0.48*	0.35	*0.09*	8	**0.7**	*0.27*	0.09	*0.03*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	106	**3.5**	*0.36*	0.42	*0.05*	91	**2.9**	*0.32*	0.38	*0.05*
France, Réunion (2011−2013)	504	**34.0**	*1.53*	4.24	*0.23*	156	**8.6**	*0.72*	0.97	*0.10*
*Kenya, Eldoret (2012−2016)	12	**1.2**	*0.36*	0.19	*0.07*	6	**0.6**	*0.26*	0.08	*0.04*
Kenya, Nairobi (2012−2014)	75	**4.7**	*0.62*	0.66	*0.11*	68	**4.8**	*0.65*	0.68	*0.11*
Mauritius (2013−2015)	283	**12.9**	*0.78*	1.57	*0.12*	120	**4.5**	*0.42*	0.53	*0.06*
Mozambique, Beira (2014−2017)	3	**1.0**	*0.61*	0.07	*0.05*	0	-	-	–	-
Mozambique, Maputo (2015−2017)	30	**3.2**	*0.61*	0.40	*0.09*	21	**1.8**	*0.42*	0.21	*0.06*
Seychelles (2013−2017)	43	**16.3**	*2.52*	1.94	*0.38*	15	**4.3**	*1.16*	0.50	*0.19*
Tanzania, Mwanza [two districts] (2016−2017)	2	**0.7**	*0.55*	0.14	*0.12*	1	**0.1**	*0.10*	0.01	*0.01*
Uganda, Gulu (2013−2015)	10	**2.8**	*0.94*	0.34	*0.13*	9	**1.4**	*0.46*	0.15	*0.07*
Uganda, Kampala (2011−2013)	30	**3.0**	*0.64*	0.43	*0.11*	24	**2.4**	*0.53*	0.34	*0.09*
Zambia, Lusaka (2011−2015)	30	**1.9**	*0.41*	0.24	*0.07*	23	**1.7**	*0.37*	0.19	*0.06*
Zimbabwe, Bulawayo: Black (2013−2015)	25	**5.6**	*1.18*	0.85	*0.22*	16	**2.1**	*0.55*	0.16	*0.06*
Zimbabwe, Harare: Black (2013−2015)	139	**17.7**	*1.58*	2.16	*0.26*	79	**9.4**	*1.11*	1.33	*0.19*
Africa, southern										
*Eswatini (2016−2017)	22	**4.0**	*0.89*	0.47	*0.14*	12	**1.8**	*0.52*	0.26	*0.09*
Namibia (2013−2015)	119	**7.1**	*0.66*	0.99	*0.11*	74	**3.3**	*0.40*	0.42	*0.06*
South Africa (2010−2014)	8332	**9.7**	*0.11*	1.22	*0.02*	4196	**3.6**	*0.06*	0.47	*0.01*
South Africa: Black (2010−2013)	2559	**5.8**	*0.12*	0.72	*0.02*	875	**1.4**	*0.05*	0.18	*0.01*
South Africa: White (2010−2013)	2170	**14.9**	*0.32*	1.81	*0.05*	1446	**8.3**	*0.23*	1.07	*0.03*
South Africa, Eastern Cape (2013−2016)	56	**4.3**	*0.58*	0.54	*0.08*	34	**1.5**	*0.27*	0.19	*0.04*
Africa, western										
Benin, Cotonou (2014−2016)	7	**1.3**	*0.54*	0.13	*0.06*	6	**0.9**	*0.38*	0.15	*0.07*
Côte d´Ivoire, Abidjan (2014−2015)	58	**3.1**	*0.47*	0.29	*0.05*	23	**1.5**	*0.36*	0.22	*0.07*
Mali, Bamako (2015−2017)	121	**7.2**	*0.70*	0.92	*0.11*	49	**3.1**	*0.48*	0.37	*0.07*
*Nigeria, Abuja (2013−2016)	5	**0.4**	*0.24*	0.07	*0.06*	9	**1.7**	*0.63*	0.27	*0.11*
Nigeria, Calabar (2016−2017)	1	**0.9**	*0.89*	0.15	*0.15*	1	**0.7**	*0.70*	0.09	*0.09*
*Nigeria, Ekiti (2013−2017)	1	**0.1**	*0.13*	0.02	*0.02*	2	**0.2**	*0.15*	0.01	*0.01*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Bone (C40-41)

	Males				Females			
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	16	**0.5**	*0.14*	0.03	*0.01*	8	**0.3**	*0.13*	0.03	*0.01*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	53	**1.4**	*0.21*	0.12	*0.02*	57	**1.3**	*0.19*	0.11	*0.02*
France, Réunion (2011–2013)	12	**0.9**	*0.26*	0.06	*0.02*	11	**0.8**	*0.25*	0.07	*0.03*
*Kenya, Eldoret (2012–2016)	14	**0.6**	*0.17*	0.03	*0.01*	10	**0.3**	*0.11*	0.02	*0.01*
Kenya, Nairobi (2012–2014)	61	**1.6**	*0.28*	0.18	*0.05*	40	**1.2**	*0.26*	0.13	*0.04*
Mauritius (2013–2015)	34	**1.7**	*0.31*	0.19	*0.04*	17	**0.7**	*0.17*	0.06	*0.02*
Mozambique, Beira (2014–2017)	2	**0.3**	*0.23*	0.03	*0.02*	2	**0.3**	*0.22*	0.02	*0.02*
Mozambique, Maputo (2015–2017)	7	**0.4**	*0.17*	0.03	*0.02*	7	**0.5**	*0.20*	0.04	*0.02*
Seychelles (2013–2017)	6	**2.6**	*1.11*	0.19	*0.08*	3	**1.6**	*0.96*	0.17	*0.11*
Tanzania, Mwanza [two districts] (2016–2017)	7	**0.8**	*0.30*	0.05	*0.02*	1	**0.2**	*0.19*	0.02	*0.02*
Uganda, Gulu (2013–2015)	3	**0.3**	*0.20*	0.02	*0.02*	1	**0.1**	*0.05*	0.00	*0.00*
Uganda, Kampala (2011–2013)	40	**1.1**	*0.24*	0.10	*0.04*	22	**0.5**	*0.12*	0.03	*0.01*
Zambia, Lusaka (2011–2015)	40	**0.8**	*0.15*	0.06	*0.01*	21	**0.6**	*0.16*	0.06	*0.03*
Zimbabwe, Bulawayo: Black (2013–2015)	7	**0.9**	*0.36*	0.08	*0.04*	10	**0.9**	*0.31*	0.07	*0.03*
Zimbabwe, Harare: Black (2013–2015)	33	**2.3**	*0.50*	0.23	*0.08*	30	**1.5**	*0.35*	0.14	*0.05*
Africa, southern										
*Eswatini (2016–2017)	5	**0.5**	*0.25*	0.04	*0.02*	5	**0.6**	*0.31*	0.08	*0.04*
Namibia (2013–2015)	64	**2.4**	*0.33*	0.21	*0.04*	47	**1.8**	*0.27*	0.18	*0.03*
South Africa (2010–2014)	486	**0.4**	*0.02*	0.03	*0.00*	408	**0.3**	*0.02*	0.03	*0.00*
South Africa: Black (2010–2013)	215	**0.3**	*0.02*	0.02	*0.00*	201	**0.2**	*0.02*	0.02	*0.00*
South Africa: White (2010–2013)	105	**1.1**	*0.11*	0.09	*0.01*	75	**0.7**	*0.09*	0.06	*0.01*
South Africa, Eastern Cape (2013–2016)	3	**0.2**	*0.12*	0.04	*0.02*	7	**0.3**	*0.12*	0.02	*0.01*
Africa, western										
Benin, Cotonou (2014–2016)	13	**1.5**	*0.49*	0.18	*0.09*	14	**1.3**	*0.38*	0.11	*0.04*
Côte d´Ivoire, Abidjan (2014–2015)	46	**1.2**	*0.22*	0.10	*0.03*	32	**1.0**	*0.24*	0.12	*0.03*
Mali, Bamako (2015–2017)	110	**4.6**	*0.52*	0.57	*0.09*	89	**4.2**	*0.52*	0.50	*0.08*
*Nigeria, Abuja (2013–2016)	7	**0.1**	*0.05*	0.01	*0.00*	8	**0.4**	*0.20*	0.04	*0.02*
Nigeria, Calabar (2016–2017)	5	**0.9**	*0.42*	0.07	*0.03*	3	**1.4**	*0.90*	0.16	*0.11*
*Nigeria, Ekiti (2013–2017)	1	**0.1**	*0.05*	0.00	*0.00*	3	**0.4**	*0.26*	0.06	*0.04*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Melanoma of skin (C43)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	16	**2.0**	*0.49*	0.43	*0.11*	13	**1.4**	*0.39*	0.22	*0.06*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	11	**0.3**	*0.11*	0.04	*0.02*	13	**0.4**	*0.11*	0.03	*0.01*
France, Réunion (2011–2013)	58	**4.0**	*0.53*	0.44	*0.07*	53	**3.3**	*0.47*	0.30	*0.05*
*Kenya, Eldoret (2012–2016)	7	**0.6**	*0.26*	0.07	*0.03*	5	**0.5**	*0.27*	0.08	*0.05*
Kenya, Nairobi (2012–2014)	15	**1.1**	*0.31*	0.08	*0.04*	21	**1.2**	*0.31*	0.17	*0.05*
Mauritius (2013–2015)	7	**0.3**	*0.12*	0.03	*0.01*	7	**0.3**	*0.12*	0.03	*0.01*
Mozambique, Beira (2014–2017)	6	**1.3**	*0.62*	0.08	*0.04*	6	**1.1**	*0.54*	0.13	*0.08*
Mozambique, Maputo (2015–2017)	3	**0.3**	*0.16*	0.01	*0.01*	5	**0.6**	*0.27*	0.11	*0.05*
Seychelles (2013–2017)	1	**0.3**	*0.26*	0.03	*0.03*	1	**0.2**	*0.19*	–	-
Tanzania, Mwanza [two districts] (2016–2017)	6	**1.6**	*0.68*	0.08	*0.04*	4	**0.7**	*0.40*	0.04	*0.02*
Uganda, Gulu (2013–2015)	1	**0.2**	*0.20*	–	-	6	**1.1**	*0.47*	0.11	*0.06*
Uganda, Kampala (2011–2013)	5	**0.7**	*0.35*	0.10	*0.05*	14	**1.1**	*0.35*	0.11	*0.04*
Zambia, Lusaka (2011–2015)	12	**0.5**	*0.17*	0.05	*0.02*	13	**1.0**	*0.31*	0.15	*0.05*
Zimbabwe, Bulawayo: Black (2013–2015)	7	**1.4**	*0.56*	0.14	*0.09*	20	**3.5**	*0.80*	0.47	*0.14*
Zimbabwe, Harare: Black (2013–2015)	27	**3.0**	*0.64*	0.36	*0.11*	35	**4.1**	*0.72*	0.54	*0.12*
Africa, southern										
*Eswatini (2016–2017)	5	**0.8**	*0.37*	0.08	*0.04*	9	**1.3**	*0.44*	0.16	*0.07*
Namibia (2013–2015)	65	**3.2**	*0.42*	0.35	*0.06*	93	**3.7**	*0.41*	0.42	*0.06*
South Africa (2010–2014)	3583	**4.1**	*0.07*	0.46	*0.01*	3243	**2.6**	*0.05*	0.28	*0.01*
South Africa: Black (2010–2013)	300	**0.7**	*0.04*	0.08	*0.01*	534	**0.8**	*0.04*	0.09	*0.00*
South Africa: White (2010–2013)	2097	**15.6**	*0.35*	1.70	*0.04*	1658	**11.9**	*0.31*	1.17	*0.03*
South Africa, Eastern Cape (2013–2016)	9	**0.6**	*0.21*	0.08	*0.03*	8	**0.4**	*0.13*	0.05	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	0	-	-	–	-	1	**0.2**	*0.19*	0.02	*0.02*
Côte d´Ivoire, Abidjan (2014–2015)	4	**0.3**	*0.16*	0.03	*0.03*	8	**0.5**	*0.21*	0.07	*0.03*
Mali, Bamako (2015–2017)	9	**0.6**	*0.20*	0.06	*0.03*	14	**0.8**	*0.22*	0.07	*0.03*
*Nigeria, Abuja (2013–2016)	4	**0.1**	*0.03*	0.01	*0.00*	1	**0.0**	*0.03*	0.00	*0.00*
Nigeria, Calabar (2016–2017)	0	-	-	–	-	5	**3.7**	*1.70*	0.67	*0.31*
*Nigeria, Ekiti (2013–2017)	2	**0.2**	*0.15*	0.04	*0.03*	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Non-melanoma skin (C44)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	0	-	-	−	-	2	**0.1**	*0.06*	0.01	*0.00*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	118	**3.3**	*0.33*	0.35	*0.04*	162	**4.3**	*0.37*	0.42	*0.05*
France, Réunion (2011−2013)	2	**0.2**	*0.13*	0.01	*0.01*	1	**0.1**	*0.06*	0.00	*0.00*
*Kenya, Eldoret (2012−2016)	4	**0.2**	*0.09*	0.01	*0.01*	8	**0.5**	*0.18*	0.04	*0.02*
Kenya, Nairobi (2012−2014)	65	**3.4**	*0.52*	0.45	*0.09*	55	**3.0**	*0.48*	0.39	*0.08*
Mauritius (2013−2015)	243	**10.9**	*0.79*	1.03	*0.10*	169	**6.3**	*0.56*	0.74	*0.08*
Mozambique, Beira (2014−2017)	36	**8.3**	*1.63*	0.91	*0.24*	28	**4.8**	*1.02*	0.45	*0.13*
Mozambique, Maputo (2015−2017)	38	**3.4**	*0.60*	0.33	*0.08*	50	**3.3**	*0.48*	0.24	*0.04*
Seychelles (2013−2017)	23	**8.9**	*1.89*	1.41	*0.34*	8	**2.6**	*0.94*	0.30	*0.12*
Tanzania, Mwanza [two districts] (2016−2017)	2	**0.3**	*0.20*	0.02	*0.02*	3	**0.7**	*0.42*	0.01	*0.01*
Uganda, Gulu (2013−2015)	11	**2.4**	*0.79*	0.23	*0.10*	10	**1.8**	*0.62*	0.24	*0.09*
Uganda, Kampala (2011−2013)	26	**1.4**	*0.34*	0.13	*0.04*	34	**1.6**	*0.35*	0.15	*0.04*
Zambia, Lusaka (2011−2015)	47	**2.5**	*0.46*	0.30	*0.07*	46	**2.1**	*0.38*	0.22	*0.06*
Zimbabwe, Bulawayo: Black (2013−2015)	35	**5.8**	*1.09*	0.67	*0.17*	47	**7.0**	*1.07*	0.64	*0.13*
Zimbabwe, Harare: Black (2013−2015)	80	**7.5**	*0.97*	0.84	*0.16*	85	**7.5**	*0.91*	0.82	*0.13*
Africa, southern										
*Eswatini (2016−2017)	35	**5.9**	*1.07*	0.70	*0.15*	44	**5.0**	*0.80*	0.52	*0.11*
Namibia (2013−2015)	391	**20.2**	*1.07*	2.50	*0.17*	286	**10.4**	*0.66*	1.13	*0.09*
South Africa (2010−2014)	59975	**71.9**	*0.30*	8.03	*0.04*	42550	**35.1**	*0.17*	3.78	*0.02*
South Africa: Black (2010−2013)	3022	**6.7**	*0.13*	0.75	*0.02*	2705	**3.9**	*0.08*	0.39	*0.01*
South Africa: White (2010−2013)	37435	**262.4**	*1.38*	29.03	*0.18*	25642	**149.2**	*0.99*	16.28	*0.12*
South Africa, Eastern Cape (2013−2016)	12	**0.9**	*0.27*	0.12	*0.04*	13	**0.6**	*0.18*	0.06	*0.02*
Africa, western										
Benin, Cotonou (2014−2016)	16	**2.5**	*0.72*	0.26	*0.11*	14	**1.7**	*0.47*	0.19	*0.06*
Côte d´Ivoire, Abidjan (2014−2015)	36	**1.5**	*0.30*	0.19	*0.05*	48	**2.1**	*0.37*	0.22	*0.05*
Mali, Bamako (2015−2017)	79	**4.2**	*0.53*	0.56	*0.09*	71	**4.0**	*0.51*	0.49	*0.08*
*Nigeria, Abuja (2013−2016)	28	**1.5**	*0.42*	0.19	*0.07*	24	**1.3**	*0.43*	0.14	*0.06*
Nigeria, Calabar (2016−2017)	9	**3.0**	*1.26*	0.37	*0.18*	6	**2.5**	*1.21*	0.27	*0.14*
*Nigeria, Ekiti (2013−2017)	5	**0.7**	*0.32*	0.09	*0.05*	4	**0.6**	*0.31*	0.07	*0.04*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Mesothelioma (C45)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	0	-	-	–	-	0	-	-	–	-
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	1	**0.0**	*0.05*	0.01	*0.01*	0	-	-	–	-
France, Réunion (2011–2013)	5	**0.3**	*0.16*	0.03	*0.02*	3	**0.2**	*0.10*	0.02	*0.01*
*Kenya, Eldoret (2012–2016)	0	-	-	–	-	0	-	-	–	-
Kenya, Nairobi (2012–2014)	1	**0.1**	*0.07*	0.01	*0.01*	1	**0.0**	*0.04*	0.00	*0.00*
Mauritius (2013–2015)	0	-	-	–	-	0	-	-	–	-
Mozambique, Beira (2014–2017)	1	**0.2**	*0.15*	0.01	*0.01*	0	-	-	–	-
Mozambique, Maputo (2015–2017)	0	-	-	–	-	0	-	-	–	-
Seychelles (2013–2017)	0	-	-	–	-	0	-	-	–	-
Tanzania, Mwanza [two districts] (2016–2017)	0	-	-	–	-	0	-	-	–	-
Uganda, Gulu (2013–2015)	2	**0.3**	*0.24*	0.03	*0.02*	1	**0.1**	*0.14*	0.01	*0.01*
Uganda, Kampala (2011–2013)	1	**0.2**	*0.21*	0.03	*0.03*	1	**0.1**	*0.06*	–	-
Zambia, Lusaka (2011–2015)	1	**0.1**	*0.10*	–	-	1	**0.0**	*0.01*	0.00	*0.00*
Zimbabwe, Bulawayo: Black (2013–2015)	0	-	-	–	-	0	-	-	–	-
Zimbabwe, Harare: Black (2013–2015)	1	**0.1**	*0.14*	–	-	0	-	-	–	-
Africa, southern										
*Eswatini (2016–2017)	0	-	-	–	-	0	-	-	–	-
Namibia (2013–2015)	7	**0.4**	*0.17*	0.06	*0.03*	1	**0.1**	*0.06*	0.01	*0.01*
South Africa (2010–2014)	571	**0.7**	*0.03*	0.09	*0.00*	218	**0.2**	*0.01*	0.02	*0.00*
South Africa: Black (2010–2013)	163	**0.4**	*0.03*	0.05	*0.00*	58	**0.1**	*0.01*	0.01	*0.00*
South Africa: White (2010–2013)	225	**1.5**	*0.10*	0.19	*0.02*	90	**0.5**	*0.06*	0.06	*0.01*
South Africa, Eastern Cape (2013–2016)	0	-	-	–	-	0	-	-	–	-
Africa, western										
Benin, Cotonou (2014–2016)	0	-	-	–	-	0	-	-	–	-
Côte d´Ivoire, Abidjan (2014–2015)	2	**0.2**	*0.14*	0.05	*0.04*	0	-	-	–	-
Mali, Bamako (2015–2017)	2	**0.1**	*0.04*	0.00	*0.00*	1	**0.1**	*0.06*	0.01	*0.01*
*Nigeria, Abuja (2013–2016)	0	-	-	–	-	0	-	-	–	-
Nigeria, Calabar (2016–2017)	2	**0.5**	*0.39*	0.05	*0.04*	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	0	-	-	–	-	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Kaposi sarcoma (C46)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	6	**0.5**	*0.22*	0.09	*0.05*	0	-	-	–	-
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	13	**0.3**	*0.10*	0.04	*0.02*	4	**0.1**	*0.06*	0.01	*0.01*
France, Réunion (2011–2013)	4	**0.3**	*0.15*	0.03	*0.02*	0	-	-	–	-
*Kenya, Eldoret (2012–2016)	48	**2.6**	*0.42*	0.24	*0.05*	39	**2.0**	*0.36*	0.18	*0.04*
Kenya, Nairobi (2012–2014)	74	**2.2**	*0.33*	0.25	*0.05*	55	**1.2**	*0.22*	0.12	*0.03*
Mauritius (2013–2015)	0	-	-	–	-	0	-	-	–	-
Mozambique, Beira (2014–2017)	238	**32.0**	*2.39*	3.04	*0.30*	92	**11.2**	*1.32*	0.93	*0.13*
Mozambique, Maputo (2015–2017)	303	**22.7**	*1.40*	2.09	*0.16*	190	**11.6**	*0.89*	1.07	*0.11*
Seychelles (2013–2017)	1	**0.3**	*0.31*	0.03	*0.03*	1	**0.3**	*0.34*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016–2017)	27	**5.3**	*1.22*	0.60	*0.18*	17	**4.2**	*1.19*	0.52	*0.21*
Uganda, Gulu (2013–2015)	78	**10.1**	*1.30*	0.89	*0.15*	35	**3.7**	*0.68*	0.32	*0.07*
Uganda, Kampala (2011–2013)	463	**18.6**	*1.15*	1.72	*0.14*	348	**11.2**	*0.81*	0.99	*0.09*
Zambia, Lusaka (2011–2015)	611	**14.8**	*0.76*	1.35	*0.10*	367	**8.1**	*0.54*	0.70	*0.06*
Zimbabwe, Bulawayo: Black (2013–2015)	119	**15.5**	*1.56*	1.57	*0.20*	54	**6.0**	*0.90*	0.62	*0.12*
Zimbabwe, Harare: Black (2013–2015)	311	**18.4**	*1.26*	1.79	*0.16*	207	**10.3**	*0.85*	0.99	*0.11*
Africa, southern										
*Eswatini (2016–2017)	117	**13.5**	*1.36*	1.17	*0.13*	70	**6.4**	*0.84*	0.63	*0.10*
Namibia (2013–2015)	407	**16.4**	*0.86*	1.54	*0.10*	215	**6.9**	*0.49*	0.62	*0.05*
South Africa (2010–2014)	5678	**4.5**	*0.06*	0.39	*0.01*	4122	**2.9**	*0.05*	0.23	*0.00*
South Africa: Black (2010–2013)	4149	**5.5**	*0.09*	0.50	*0.01*	3097	**3.5**	*0.07*	0.28	*0.01*
South Africa: White (2010–2013)	179	**1.8**	*0.14*	0.15	*0.01*	131	**1.4**	*0.13*	0.11	*0.01*
South Africa, Eastern Cape (2013–2016)	116	**8.8**	*0.85*	0.74	*0.08*	105	**5.4**	*0.54*	0.43	*0.04*
Africa, western										
Benin, Cotonou (2014–2016)	3	**0.4**	*0.24*	0.04	*0.02*	0	-	-	–	-
Côte d´Ivoire, Abidjan (2014–2015)	41	**1.3**	*0.22*	0.13	*0.03*	37	**1.0**	*0.19*	0.08	*0.02*
Mali, Bamako (2015–2017)	21	**0.8**	*0.21*	0.08	*0.03*	13	**0.6**	*0.18*	0.07	*0.03*
*Nigeria, Abuja (2013–2016)	18	**0.8**	*0.30*	0.10	*0.04*	5	**0.2**	*0.08*	0.01	*0.01*
Nigeria, Calabar (2016–2017)	4	**0.7**	*0.38*	0.06	*0.03*	4	**1.0**	*0.55*	0.08	*0.05*
*Nigeria, Ekiti (2013–2017)	0	-	-	–	-	3	**0.3**	*0.21*	0.04	*0.02*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Connective and soft tissue (C47, C49)

	Males				Females			
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	22	**1.7**	*0.39*	0.22	*0.06*	10	**0.5**	*0.19*	0.05	*0.02*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	89	**2.2**	*0.25*	0.24	*0.04*	75	**1.7**	*0.22*	0.17	*0.03*
France, Réunion (2011–2013)	13	**1.1**	*0.30*	0.08	*0.03*	12	**0.9**	*0.30*	0.05	*0.02*
*Kenya, Eldoret (2012–2016)	17	**0.8**	*0.20*	0.06	*0.02*	9	**0.5**	*0.21*	0.07	*0.04*
Kenya, Nairobi (2012–2014)	79	**2.5**	*0.38*	0.26	*0.06*	59	**1.6**	*0.30*	0.17	*0.05*
Mauritius (2013–2015)	50	**2.2**	*0.32*	0.20	*0.03*	40	**1.8**	*0.31*	0.15	*0.03*
Mozambique, Beira (2014–2017)	10	**1.1**	*0.41*	0.09	*0.04*	5	**0.6**	*0.31*	0.05	*0.03*
Mozambique, Maputo (2015–2017)	21	**1.6**	*0.37*	0.14	*0.04*	16	**1.2**	*0.30*	0.10	*0.03*
Seychelles (2013–2017)	1	**0.4**	*0.45*	0.03	*0.03*	3	**1.3**	*0.74*	0.13	*0.08*
Tanzania, Mwanza [two districts] (2016–2017)	9	**2.4**	*0.90*	0.28	*0.14*	5	**1.2**	*0.77*	0.16	*0.12*
Uganda, Gulu (2013–2015)	13	**2.0**	*0.66*	0.21	*0.10*	1	**0.2**	*0.20*	0.02	*0.02*
Uganda, Kampala (2011–2013)	38	**1.5**	*0.34*	0.12	*0.04*	42	**1.6**	*0.32*	0.14	*0.03*
Zambia, Lusaka (2011–2015)	24	**0.7**	*0.19*	0.08	*0.04*	24	**0.6**	*0.17*	0.06	*0.03*
Zimbabwe, Bulawayo: Black (2013–2015)	11	**1.6**	*0.51*	0.13	*0.05*	13	**1.5**	*0.47*	0.17	*0.07*
Zimbabwe, Harare: Black (2013–2015)	46	**3.0**	*0.51*	0.26	*0.06*	49	**3.2**	*0.54*	0.27	*0.06*
Africa, southern										
*Eswatini (2016–2017)	9	**1.6**	*0.53*	0.18	*0.07*	3	**0.4**	*0.27*	0.07	*0.05*
Namibia (2013–2015)	51	**2.0**	*0.30*	0.19	*0.04*	57	**1.9**	*0.28*	0.18	*0.03*
South Africa (2010–2014)	1368	**1.3**	*0.04*	0.13	*0.00*	1311	**1.0**	*0.03*	0.10	*0.00*
South Africa: Black (2010–2013)	619	**1.0**	*0.05*	0.10	*0.01*	630	**0.9**	*0.04*	0.08	*0.00*
South Africa: White (2010–2013)	277	**2.4**	*0.15*	0.21	*0.02*	220	**1.8**	*0.14*	0.17	*0.01*
South Africa, Eastern Cape (2013–2016)	11	**0.7**	*0.22*	0.08	*0.03*	12	**0.6**	*0.17*	0.06	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	2	**0.3**	*0.25*	0.04	*0.03*	1	**0.1**	*0.15*	0.02	*0.02*
Côte d´Ivoire, Abidjan (2014–2015)	36	**1.1**	*0.23*	0.14	*0.05*	36	**1.1**	*0.23*	0.11	*0.03*
Mali, Bamako (2015–2017)	65	**2.8**	*0.40*	0.31	*0.06*	41	**1.7**	*0.31*	0.17	*0.04*
*Nigeria, Abuja (2013–2016)	24	**0.8**	*0.25*	0.09	*0.04*	18	**1.6**	*0.56*	0.20	*0.09*
Nigeria, Calabar (2016–2017)	4	**1.1**	*0.57*	0.11	*0.06*	3	**1.3**	*0.84*	0.14	*0.10*
*Nigeria, Ekiti (2013–2017)	12	**1.1**	*0.37*	0.13	*0.05*	14	**1.6**	*0.48*	0.19	*0.07*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Breast (C50)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	22	**2.1**	*0.47*	0.28	*0.08*	329	**24.6**	*1.44*	2.82	*0.19*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	68	**2.3**	*0.30*	0.27	*0.05*	1651	**38.8**	*1.06*	4.15	*0.14*
France, Réunion (2011–2013)	10	**0.6**	*0.21*	0.06	*0.03*	982	**58.7**	*1.91*	6.50	*0.24*
*Kenya, Eldoret (2012–2016)	14	**1.5**	*0.41*	0.21	*0.06*	165	**12.4**	*1.06*	1.30	*0.13*
Kenya, Nairobi (2012–2014)	38	**1.8**	*0.36*	0.19	*0.05*	1049	**51.3**	*1.90*	6.16	*0.30*
Mauritius (2013–2015)	27	**1.3**	*0.25*	0.16	*0.04*	1440	**56.0**	*1.50*	6.33	*0.19*
Mozambique, Beira (2014–2017)	2	**0.5**	*0.44*	0.11	*0.11*	83	**17.9**	*2.13*	2.00	*0.29*
Mozambique, Maputo (2015–2017)	10	**1.0**	*0.34*	0.11	*0.05*	193	**15.6**	*1.18*	1.72	*0.16*
Seychelles (2013–2017)	4	**1.5**	*0.74*	0.17	*0.09*	171	**52.1**	*4.09*	5.77	*0.54*
Tanzania, Mwanza [two districts] (2016–2017)	7	**2.8**	*1.09*	0.29	*0.17*	57	**16.2**	*2.55*	1.93	*0.38*
Uganda, Gulu (2013–2015)	16	**3.3**	*0.89*	0.32	*0.10*	63	**10.5**	*1.40*	1.19	*0.18*
Uganda, Kampala (2011–2013)	27	**2.6**	*0.60*	0.33	*0.10*	431	**31.5**	*1.80*	3.51	*0.24*
Zambia, Lusaka (2011–2015)	11	**0.7**	*0.22*	0.09	*0.04*	384	**20.2**	*1.21*	2.53	*0.20*
Zimbabwe, Bulawayo: Black (2013–2015)	10	**1.9**	*0.74*	0.31	*0.15*	237	**36.2**	*2.48*	4.25	*0.34*
Zimbabwe, Harare: Black (2013–2015)	14	**1.3**	*0.40*	0.10	*0.05*	499	**43.0**	*2.12*	4.69	*0.29*
Africa, southern										
*Eswatini (2016–2017)	6	**1.0**	*0.42*	0.14	*0.08*	138	**17.8**	*1.60*	1.92	*0.21*
Namibia (2013–2015)	27	**1.5**	*0.29*	0.19	*0.05*	1115	**45.2**	*1.41*	5.10	*0.19*
South Africa (2010–2014)	829	**1.0**	*0.03*	0.11	*0.01*	37660	**31.2**	*0.16*	3.48	*0.02*
South Africa: Black (2010–2013)	361	**0.8**	*0.05*	0.09	*0.01*	12428	**18.4**	*0.17*	1.98	*0.02*
South Africa: White (2010–2013)	174	**1.2**	*0.09*	0.14	*0.01*	10804	**70.6**	*0.71*	7.82	*0.08*
South Africa, Eastern Cape (2013–2016)	17	**1.2**	*0.30*	0.18	*0.05*	250	**11.9**	*0.78*	1.31	*0.09*
Africa, western										
Benin, Cotonou (2014–2016)	9	**2.0**	*0.70*	0.32	*0.12*	194	**22.6**	*1.73*	2.30	*0.21*
Côte d´Ivoire, Abidjan (2014–2015)	18	**0.6**	*0.14*	0.05	*0.01*	939	**39.6**	*1.51*	4.31	*0.21*
Mali, Bamako (2015–2017)	56	**2.8**	*0.41*	0.32	*0.06*	1098	**56.9**	*1.86*	6.10	*0.24*
*Nigeria, Abuja (2013–2016)	9	**1.1**	*0.46*	0.15	*0.08*	505	**43.0**	*2.57*	5.05	*0.38*
Nigeria, Calabar (2016–2017)	0	**-**	-	–	-	72	**28.4**	*3.89*	3.11	*0.49*
*Nigeria, Ekiti (2013–2017)	7	**0.6**	*0.25*	0.03	*0.02*	297	**30.0**	*1.94*	3.40	*0.28*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Vulva (C51)

	Males				Females			
	Cases	ASR (W)		CUM%	Cases	ASR (W)		CUM%	
Africa, central									
Congo, Brazzaville (2014−2016)					15	**1.5**	*0.40*	0.25	*0.07*
Africa, eastern									
*Ethiopia, Addis Ababa (2014−2016)					54	**1.0**	*0.17*	0.11	*0.02*
France, Réunion (2011−2013)					21	**1.1**	*0.24*	0.13	*0.04*
*Kenya, Eldoret (2012−2016)					8	**0.5**	*0.19*	0.06	*0.03*
Kenya, Nairobi (2012−2014)					31	**1.8**	*0.38*	0.20	*0.05*
Mauritius (2013−2015)					17	**0.6**	*0.14*	0.06	*0.02*
Mozambique, Beira (2014−2017)					19	**3.0**	*0.77*	0.30	*0.08*
Mozambique, Maputo (2015−2017)					19	**1.3**	*0.31*	0.13	*0.03*
Seychelles (2013−2017)					2	**0.5**	*0.36*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016−2017)					6	**1.8**	*0.84*	0.26	*0.15*
Uganda, Gulu (2013−2015)					3	**0.4**	*0.24*	0.04	*0.02*
Uganda, Kampala (2011−2013)					24	**1.9**	*0.45*	0.24	*0.07*
Zambia, Lusaka (2011−2015)					53	**2.3**	*0.37*	0.22	*0.05*
Zimbabwe, Bulawayo: Black (2013−2015)					24	**3.1**	*0.68*	0.29	*0.08*
Zimbabwe, Harare: Black (2013−2015)					45	**3.0**	*0.51*	0.30	*0.07*
Africa, southern									
*Eswatini (2016−2017)					29	**2.9**	*0.56*	0.27	*0.06*
Namibia (2013−2015)					35	**1.5**	*0.26*	0.15	*0.03*
South Africa (2010−2014)					1525	**1.2**	*0.03*	0.11	*0.00*
South Africa: Black (2010−2013)					774	**1.0**	*0.04*	0.10	*0.00*
South Africa: White (2010−2013)					211	**1.3**	*0.10*	0.13	*0.01*
South Africa, Eastern Cape (2013−2016)					46	**2.3**	*0.34*	0.19	*0.03*
Africa, western									
Benin, Cotonou (2014−2016)					4	**0.7**	*0.33*	0.08	*0.04*
Côte d´Ivoire, Abidjan (2014−2015)					10	**0.4**	*0.14*	0.04	*0.02*
Mali, Bamako (2015−2017)					19	**0.9**	*0.24*	0.12	*0.04*
*Nigeria, Abuja (2013−2016)					4	**0.5**	*0.40*	0.07	*0.07*
Nigeria, Calabar (2016−2017)					8	**3.0**	*1.24*	0.30	*0.14*
*Nigeria, Ekiti (2013−2017)					4	**0.6**	*0.31*	0.07	*0.05*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Vagina (C52)

	Males				Females			
	Cases	ASR (W)		CUM%	Cases	ASR (W)		CUM%	
Africa, central									
Congo, Brazzaville (2014−2016)					4	**0.4**	*0.19*	0.04	*0.02*
Africa, eastern									
*Ethiopia, Addis Ababa (2014−2016)					21	**0.6**	*0.14*	0.08	*0.02*
France, Réunion (2011−2013)					3	**0.2**	*0.11*	0.03	*0.02*
*Kenya, Eldoret (2012−2016)					0	-	-	–	-
Kenya, Nairobi (2012−2014)					11	**0.6**	*0.21*	0.08	*0.04*
Mauritius (2013−2015)					13	**0.5**	*0.17*	0.06	*0.02*
Mozambique, Beira (2014−2017)					3	**0.4**	*0.25*	0.03	*0.02*
Mozambique, Maputo (2015−2017)					5	**0.4**	*0.16*	0.02	*0.01*
Seychelles (2013−2017)					1	**0.3**	*0.27*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016−2017)					5	**1.3**	*0.67*	0.15	*0.08*
Uganda, Gulu (2013−2015)					3	**0.6**	*0.34*	0.09	*0.06*
Uganda, Kampala (2011−2013)					4	**0.2**	*0.10*	0.01	*0.01*
Zambia, Lusaka (2011−2015)					24	**1.2**	*0.30*	0.15	*0.04*
Zimbabwe, Bulawayo: Black (2013−2015)					7	**1.1**	*0.44*	0.10	*0.05*
Zimbabwe, Harare: Black (2013−2015)					12	**0.7**	*0.24*	0.05	*0.02*
Africa, southern									
*Eswatini (2016−2017)					5	**0.7**	*0.30*	0.05	*0.03*
Namibia (2013−2015)					21	**0.8**	*0.19*	0.09	*0.02*
South Africa (2010−2014)					790	**0.6**	*0.02*	0.07	*0.00*
South Africa: Black (2010−2013)					452	**0.7**	*0.03*	0.07	*0.00*
South Africa: White (2010−2013)					84	**0.6**	*0.07*	0.07	*0.01*
South Africa, Eastern Cape (2013−2016)					8	**0.4**	*0.13*	0.03	*0.01*
Africa, western									
Benin, Cotonou (2014−2016)					1	**0.1**	*0.07*	0.00	*0.00*
Côte d´Ivoire, Abidjan (2014−2015)					13	**0.7**	*0.22*	0.07	*0.03*
Mali, Bamako (2015−2017)					10	**0.4**	*0.16*	0.04	*0.02*
*Nigeria, Abuja (2013−2016)					0	-	-	–	-
Nigeria, Calabar (2016−2017)					2	**0.9**	*0.60*	0.09	*0.06*
*Nigeria, Ekiti (2013−2017)					0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Cervix uteri (C53)

	Males			Females			
	Cases	ASR (W)	CUM	Cases	ASR (W)		CUM%	
Africa, central								
Congo, Brazzaville (2014−2016)				236	**20.7**	*1.40*	2.78	*0.21*
Africa, eastern								
*Ethiopia, Addis Ababa (2014−2016)				696	**20.3**	*0.82*	2.34	*0.11*
France, Réunion (2011−2013)				175	**10.2**	*0.79*	1.04	*0.10*
*Kenya, Eldoret (2012−2016)				212	**17.7**	*1.31*	2.11	*0.19*
Kenya, Nairobi (2012−2014)				745	**35.5**	*1.57*	4.19	*0.24*
Mauritius (2013−2015)				283	**11.2**	*0.68*	1.29	*0.09*
Mozambique, Beira (2014−2017)				319	**56.9**	*3.54*	6.03	*0.44*
Mozambique, Maputo (2015−2017)				498	**39.4**	*1.84*	4.06	*0.23*
Seychelles (2013−2017)				58	**18.5**	*2.50*	1.92	*0.30*
Tanzania, Mwanza [two districts] (2016−2017)				263	**85.9**	*6.08*	10.82	*0.93*
Uganda, Gulu (2013−2015)				332	**53.6**	*3.14*	5.51	*0.38*
Uganda, Kampala (2011−2013)				739	**52.0**	*2.27*	5.94	*0.31*
Zambia, Lusaka (2011−2015)				1276	**64.7**	*2.13*	7.71	*0.32*
Zimbabwe, Bulawayo: Black (2013−2015)				547	**80.9**	*3.67*	9.15	*0.51*
Zimbabwe, Harare: Black (2013−2015)				952	**81.6**	*2.92*	9.33	*0.42*
Africa, southern								
*Eswatini (2016−2017)				603	**72.0**	*3.14*	7.80	*0.41*
Namibia (2013−2015)				789	**30.7**	*1.14*	3.25	*0.14*
South Africa (2010−2014)				27684	**22.3**	*0.14*	2.36	*0.02*
South Africa: Black (2010−2013)				18071	**26.1**	*0.20*	2.79	*0.02*
South Africa: White (2010−2013)				1792	**14.2**	*0.35*	1.37	*0.03*
South Africa, Eastern Cape (2013−2016)				869	**43.6**	*1.52*	4.65	*0.17*
Africa, western								
Benin, Cotonou (2014−2016)				104	**14.8**	*1.53*	1.68	*0.21*
Côte d′Ivoire, Abidjan (2014−2015)				565	**30.3**	*1.45*	3.61	*0.22*
Mali, Bamako (2015−2017)				717	**42.3**	*1.67*	4.93	*0.23*
*Nigeria, Abuja (2013−2016)				125	**17.0**	*1.80*	2.26	*0.29*
Nigeria, Calabar (2016−2017)				56	**31.9**	*4.75*	4.13	*0.69*
*Nigeria, Ekiti (2013−2017)				73	**9.3**	*1.15*	1.14	*0.17*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Uterus (C54-55)

	Males				Females			
	Cases	ASR (W)		CUM%	Cases	ASR (W)		CUM%	
Africa, central									
Congo, Brazzaville (2014−2016)					14	**1.2**	*0.34*	0.14	*0.05*
Africa, eastern									
*Ethiopia, Addis Ababa (2014−2016)					125	**3.6**	*0.35*	0.42	*0.05*
France, Réunion (2011−2013)					111	**6.5**	*0.63*	0.86	*0.10*
*Kenya, Eldoret (2012−2016)					29	**2.7**	*0.54*	0.34	*0.08*
Kenya, Nairobi (2012−2014)					130	**9.9**	*0.95*	1.42	*0.17*
Mauritius (2013−2015)					241	**9.3**	*0.61*	1.14	*0.09*
Mozambique, Beira (2014−2017)					7	**1.8**	*0.72*	0.22	*0.11*
Mozambique, Maputo (2015−2017)					23	**2.2**	*0.47*	0.26	*0.07*
Seychelles (2013−2017)					37	**11.0**	*1.89*	1.34	*0.29*
Tanzania, Mwanza [two districts] (2016−2017)					33	**6.2**	*1.30*	0.58	*0.16*
Uganda, Gulu (2013−2015)					11	**1.6**	*0.50*	0.16	*0.07*
Uganda, Kampala (2011−2013)					72	**6.7**	*0.89*	0.90	*0.14*
Zambia, Lusaka (2011−2015)					46	**3.0**	*0.50*	0.45	*0.09*
Zimbabwe, Bulawayo: Black (2013−2015)					69	**12.4**	*1.55*	1.60	*0.24*
Zimbabwe, Harare: Black (2013−2015)					76	**9.1**	*1.09*	1.31	*0.18*
Africa, southern									
*Eswatini (2016−2017)					38	**5.9**	*0.99*	0.72	*0.15*
Namibia (2013−2015)					104	**4.7**	*0.47*	0.67	*0.08*
South Africa (2010−2014)					5725	**4.9**	*0.07*	0.64	*0.01*
South Africa: Black (2010−2013)					2567	**4.2**	*0.08*	0.54	*0.01*
South Africa: White (2010−2013)					1014	**6.1**	*0.20*	0.76	*0.03*
South Africa, Eastern Cape (2013−2016)					58	**2.4**	*0.34*	0.29	*0.05*
Africa, western									
Benin, Cotonou (2014−2016)					23	**4.0**	*0.85*	0.67	*0.16*
Côte d´Ivoire, Abidjan (2014−2015)					67	**4.9**	*0.65*	0.63	*0.11*
Mali, Bamako (2015−2017)					201	**12.3**	*0.95*	1.48	*0.14*
*Nigeria, Abuja (2013−2016)					20	**3.5**	*0.90*	0.51	*0.15*
Nigeria, Calabar (2016−2017)					6	**3.0**	*1.40*	0.40	*0.24*
*Nigeria, Ekiti (2013−2017)					24	**2.7**	*0.59*	0.28	*0.07*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Ovary (C56)

	Males				Females			
	Cases	ASR (W)		CUM%	Cases	ASR (W)		CUM%	
Africa, central									
Congo, Brazzaville (2014−2016)					44	**3.2**	*0.51*	0.40	*0.08*
Africa, eastern									
*Ethiopia, Addis Ababa (2014−2016)					275	**7.1**	*0.47*	0.76	*0.06*
France, Réunion (2011−2013)					105	**6.4**	*0.64*	0.70	*0.08*
*Kenya, Eldoret (2012−2016)					25	**2.2**	*0.47*	0.28	*0.07*
Kenya, Nairobi (2012−2014)					173	**10.4**	*0.93*	1.33	*0.15*
Mauritius (2013−2015)					135	**5.4**	*0.47*	0.63	*0.06*
Mozambique, Beira (2014−2017)					6	**1.4**	*0.64*	0.16	*0.08*
Mozambique, Maputo (2015−2017)					29	**2.4**	*0.47*	0.26	*0.06*
Seychelles (2013−2017)					21	**6.8**	*1.60*	0.59	*0.16*
Tanzania, Mwanza [two districts] (2016−2017)					19	**6.1**	*1.73*	0.91	*0.30*
Uganda, Gulu (2013−2015)					17	**2.7**	*0.69*	0.27	*0.09*
Uganda, Kampala (2011−2013)					96	**6.8**	*0.82*	0.83	*0.12*
Zambia, Lusaka (2011−2015)					62	**2.4**	*0.37*	0.24	*0.05*
Zimbabwe, Bulawayo: Black (2013−2015)					49	**7.0**	*1.09*	0.79	*0.16*
Zimbabwe, Harare: Black (2013−2015)					118	**10.6**	*1.10*	1.38	*0.18*
Africa, southern									
*Eswatini (2016−2017)					24	**2.9**	*0.64*	0.39	*0.11*
Namibia (2013−2015)					103	**4.1**	*0.42*	0.47	*0.06*
South Africa (2010−2014)					2405	**2.0**	*0.04*	0.24	*0.01*
South Africa: Black (2010−2013)					722	**1.1**	*0.04*	0.12	*0.01*
South Africa: White (2010−2013)					766	**5.1**	*0.19*	0.58	*0.02*
South Africa, Eastern Cape (2013−2016)					61	**3.0**	*0.40*	0.31	*0.05*
Africa, western									
Benin, Cotonou (2014−2016)					22	**2.7**	*0.63*	0.33	*0.09*
Côte d´Ivoire, Abidjan (2014−2015)					86	**4.1**	*0.53*	0.50	*0.08*
Mali, Bamako (2015−2017)					138	**7.4**	*0.70*	0.87	*0.10*
*Nigeria, Abuja (2013−2016)					42	**3.9**	*0.78*	0.41	*0.10*
Nigeria, Calabar (2016−2017)					11	**4.4**	*1.55*	0.48	*0.18*
*Nigeria, Ekiti (2013−2017)					33	**2.9**	*0.55*	0.28	*0.07*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Placenta (C58)

	Males			Females			
	Cases	ASR (W)	CUM%	Cases	ASR (W)	CUM%	
Africa, central							
Congo, Brazzaville (2014−2016)				2	**0.1** *0.04*	0.00	*0.00*
Africa, eastern							
*Ethiopia, Addis Ababa (2014−2016)				9	**0.1** *0.05*	0.01	*0.01*
France, Réunion (2011−2013)				2	**0.2** *0.12*	0.01	*0.01*
*Kenya, Eldoret (2012−2016)				2	**0.1** *0.07*	0.01	*0.01*
Kenya, Nairobi (2012−2014)				2	**0.1** *0.05*	0.01	*0.00*
Mauritius (2013−2015)				0	- -	–	-
Mozambique, Beira (2014−2017)				1	**0.1** *0.12*	0.01	*0.01*
Mozambique, Maputo (2015−2017)				12	**0.7** *0.20*	0.04	*0.01*
Seychelles (2013−2017)				0	- -	–	-
Tanzania, Mwanza [two districts] (2016−2017)				6	**0.9** *0.43*	0.08	*0.04*
Uganda, Gulu (2013−2015)				8	**0.7** *0.26*	0.05	*0.02*
Uganda, Kampala (2011−2013)				24	**0.6** *0.12*	0.04	*0.01*
Zambia, Lusaka (2011−2015)				2	**0.0** *0.03*	0.00	*0.00*
Zimbabwe, Bulawayo: Black (2013−2015)				10	**0.8** *0.28*	0.07	*0.02*
Zimbabwe, Harare: Black (2013−2015)				14	**0.6** *0.16*	0.04	*0.01*
Africa, southern							
*Eswatini (2016−2017)				0	- -	–	-
Namibia (2013−2015)				5	**0.2** *0.07*	0.01	*0.01*
South Africa (2010−2014)				222	**0.2** *0.01*	0.01	*0.00*
South Africa: Black (2010−2013)				147	**0.2** *0.01*	0.01	*0.00*
South Africa: White (2010−2013)				15	**0.2** *0.04*	0.01	*0.00*
South Africa, Eastern Cape (2013−2016)				6	**0.3** *0.12*	0.02	*0.01*
Africa, western							
Benin, Cotonou (2014−2016)				0	- -	–	-
Côte d´Ivoire, Abidjan (2014−2015)				21	**0.6** *0.16*	0.06	*0.02*
Mali, Bamako (2015−2017)				33	**1.0** *0.18*	0.08	*0.02*
*Nigeria, Abuja (2013−2016)				2	**0.1** *0.05*	0.01	*0.00*
Nigeria, Calabar (2016−2017)				0	- -	–	-
*Nigeria, Ekiti (2013−2017)				1	**0.1** *0.07*	0.01	*0.01*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Penis (C60)

	Males				Females			
	Cases	ASR (W)		CUM%	Cases	ASR (W)		CUM%
Africa, central								
Congo, Brazzaville (2014–2016)	0	-	-	–	-			
Africa, eastern								
*Ethiopia, Addis Ababa (2014–2016)	3	**0.1**	*0.06*	0.00	*0.00*			
France, Réunion (2011–2013)	4	**0.2**	*0.11*	–	-			
*Kenya, Eldoret (2012–2016)	1	**0.1**	*0.13*	0.02	*0.02*			
Kenya, Nairobi (2012–2014)	7	**0.4**	*0.16*	0.03	*0.02*			
Mauritius (2013–2015)	8	**0.4**	*0.13*	0.04	*0.02*			
Mozambique, Beira (2014–2017)	12	**2.1**	*0.65*	0.21	*0.07*			
Mozambique, Maputo (2015–2017)	15	**1.4**	*0.37*	0.13	*0.04*			
Seychelles (2013–2017)	1	**0.4**	*0.40*	–	-			
Tanzania, Mwanza [two districts] (2016–2017)	7	**2.6**	*1.08*	0.31	*0.15*			
Uganda, Gulu (2013–2015)	21	**5.2**	*1.22*	0.53	*0.15*			
Uganda, Kampala (2011–2013)	36	**3.0**	*0.60*	0.33	*0.09*			
Zambia, Lusaka (2011–2015)	47	**2.3**	*0.41*	0.29	*0.06*			
Zimbabwe, Bulawayo: Black (2013–2015)	29	**5.9**	*1.15*	0.69	*0.17*			
Zimbabwe, Harare: Black (2013–2015)	41	**3.7**	*0.65*	0.33	*0.09*			
Africa, southern								
*Eswatini (2016–2017)	39	**6.5**	*1.10*	0.70	*0.15*			
Namibia (2013–2015)	40	**2.0**	*0.33*	0.20	*0.04*			
South Africa (2010–2014)	760	**0.8**	*0.03*	0.08	*0.00*			
South Africa: Black (2010–2013)	416	**0.8**	*0.04*	0.08	*0.01*			
South Africa: White (2010–2013)	94	**0.7**	*0.07*	0.08	*0.01*			
South Africa, Eastern Cape (2013–2016)	10	**0.9**	*0.28*	0.10	*0.03*			
Africa, western								
Benin, Cotonou (2014–2016)	1	**0.3**	*0.31*	–	-			
Côte d´Ivoire, Abidjan (2014–2015)	1	**0.1**	*0.06*	0.01	*0.01*			
Mali, Bamako (2015–2017)	1	**0.1**	*0.08*	0.01	*0.01*			
*Nigeria, Abuja (2013–2016)	0	-	-	–	-			
Nigeria, Calabar (2016–2017)	0	-	-	–	-			
*Nigeria, Ekiti (2013–2017)	1	**0.0**	*0.04*	0.00	*0.00*			

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Prostate (C61)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	286	**35.6**	*2.11*	5.90	*0.39*					
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	172	**7.1**	*0.55*	0.95	*0.09*					
France, Réunion (2011–2013)	918	**63.8**	*2.13*	8.64	*0.34*					
*Kenya, Eldoret (2012–2016)	83	**8.4**	*0.96*	1.13	*0.17*					
Kenya, Nairobi (2012–2014)	601	**49.8**	*2.14*	5.82	*0.34*					
Mauritius (2013–2015)	361	**17.1**	*0.92*	1.99	*0.14*					
Mozambique, Beira (2014–2017)	55	**18.5**	*2.61*	2.53	*0.43*					
Mozambique, Maputo (2015–2017)	184	**23.4**	*1.77*	3.10	*0.30*					
Seychelles (2013–2017)	192	**75.3**	*5.49*	9.36	*0.87*					
Tanzania, Mwanza [two districts] (2016–2017)	91	**37.1**	*3.99*	4.31	*0.65*					
Uganda, Gulu (2013–2015)	83	**23.0**	*2.62*	2.95	*0.44*					
Uganda, Kampala (2011–2013)	351	**46.8**	*2.66*	6.17	*0.46*					
Zambia, Lusaka (2011–2015)	453	**45.5**	*2.18*	5.62	*0.36*					
Zimbabwe, Bulawayo: Black (2013–2015)	271	**68.9**	*4.27*	7.30	*0.69*					
Zimbabwe, Harare: Black (2013–2015)	815	**118.6**	*4.22*	11.51	*0.63*					
Africa, southern										
*Eswatini (2016–2017)	160	**30.6**	*2.48*	3.71	*0.38*					
Namibia (2013–2015)	741	**40.5**	*1.56*	5.15	*0.26*					
South Africa (2010–2014)	31637	**39.9**	*0.23*	5.11	*0.04*					
South Africa: Black (2010–2013)	9610	**25.2**	*0.26*	3.13	*0.04*					
South Africa: White (2010–2013)	10555	**70.5**	*0.69*	9.17	*0.11*					
South Africa, Eastern Cape (2013–2016)	246	**17.0**	*1.11*	2.18	*0.17*					
Africa, western										
Benin, Cotonou (2014–2016)	111	**29.3**	*2.83*	3.30	*0.42*					
Côte d´Ivoire, Abidjan (2014–2015)	591	**46.9**	*2.02*	6.03	*0.33*					
Mali, Bamako (2015–2017)	309	**23.4**	*1.35*	2.83	*0.22*					
*Nigeria, Abuja (2013–2016)	189	**25.6**	*2.10*	3.92	*0.39*					
Nigeria, Calabar (2016–2017)	49	**28.1**	*4.22*	3.82	*0.71*					
*Nigeria, Ekiti (2013–2017)	290	**33.0**	*2.04*	4.04	*0.33*					

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Testis (C62)

	Males				Females			
	Cases	ASR (W)		CUM%	Cases	ASR (W)		CUM%
Africa, central								
Congo, Brazzaville (2014−2016)	0	-	-	− -				
Africa, eastern								
*Ethiopia, Addis Ababa (2014−2016)	29	**0.6**	*0.13*	0.07 *0.02*				
France, Réunion (2011−2013)	28	**2.4**	*0.45*	0.19 *0.04*				
*Kenya, Eldoret (2012−2016)	2	**0.1**	*0.04*	0.00 *0.00*				
Kenya, Nairobi (2012−2014)	12	**0.3**	*0.12*	0.04 *0.03*				
Mauritius (2013−2015)	41	**2.0**	*0.33*	0.15 *0.03*				
Mozambique, Beira (2014−2017)	2	**0.3**	*0.24*	0.03 *0.02*				
Mozambique, Maputo (2015−2017)	2	**0.1**	*0.07*	0.01 *0.01*				
Seychelles (2013−2017)	2	**0.8**	*0.58*	0.07 *0.07*				
Tanzania, Mwanza [two districts] (2016−2017)	1	**0.2**	*0.17*	0.01 *0.01*				
Uganda, Gulu (2013−2015)	2	**0.5**	*0.41*	0.07 *0.07*				
Uganda, Kampala (2011−2013)	10	**0.4**	*0.19*	0.04 *0.02*				
Zambia, Lusaka (2011−2015)	9	**0.2**	*0.09*	0.02 *0.01*				
Zimbabwe, Bulawayo: Black (2013−2015)	3	**0.3**	*0.16*	0.02 *0.01*				
Zimbabwe, Harare: Black (2013−2015)	4	**0.3**	*0.16*	0.01 *0.01*				
Africa, southern								
*Eswatini (2016−2017)	6	**0.7**	*0.29*	0.04 *0.02*				
Namibia (2013−2015)	23	**0.8**	*0.18*	0.06 *0.02*				
South Africa (2010−2014)	803	**0.6**	*0.02*	0.05 *0.00*				
South Africa: Black (2010−2013)	107	**0.1**	*0.01*	0.01 *0.00*				
South Africa: White (2010−2013)	368	**4.0**	*0.22*	0.31 *0.02*				
South Africa, Eastern Cape (2013−2016)	10	**0.6**	*0.22*	0.06 *0.03*				
Africa, western								
Benin, Cotonou (2014−2016)	4	**0.6**	*0.37*	0.03 *0.02*				
Côte d´Ivoire, Abidjan (2014−2015)	3	**0.1**	*0.06*	0.01 *0.01*				
Mali, Bamako (2015−2017)	8	**0.2**	*0.09*	0.01 *0.00*				
*Nigeria, Abuja (2013−2016)	2	**0.2**	*0.13*	0.00 *0.00*				
Nigeria, Calabar (2016−2017)	0	-	-	− -				
*Nigeria, Ekiti (2013−2017)	16	**1.2**	*0.32*	0.09 *0.04*				

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Kidney and renal pelvis (C64-65)

	Males				Females			
	Cases	ASR (W)		CUM%	Cases	ASR (W)		CUM%
Africa, central								
Congo, Brazzaville (2014–2016)	18	**0.7**	*0.19*	0.06 *0.03*	16	**0.6**	*0.15*	0.03 *0.01*
Africa, eastern								
*Ethiopia, Addis Ababa (2014–2016)	70	**2.2**	*0.28*	0.22 *0.04*	60	**1.6**	*0.22*	0.15 *0.03*
France, Réunion (2011–2013)	97	**6.5**	*0.66*	0.82 *0.10*	57	**3.5**	*0.49*	0.35 *0.06*
*Kenya, Eldoret (2012–2016)	10	**0.4**	*0.13*	0.03 *0.01*	11	**0.6**	*0.21*	0.05 *0.03*
Kenya, Nairobi (2012–2014)	41	**1.6**	*0.34*	0.24 *0.07*	44	**1.4**	*0.30*	0.18 *0.06*
Mauritius (2013–2015)	50	**2.4**	*0.35*	0.28 *0.05*	36	**1.5**	*0.25*	0.17 *0.03*
Mozambique, Beira (2014–2017)	3	**0.4**	*0.25*	0.03 *0.02*	9	**1.2**	*0.43*	0.08 *0.03*
Mozambique, Maputo (2015–2017)	6	**0.4**	*0.17*	0.02 *0.01*	10	**0.7**	*0.24*	0.06 *0.02*
Seychelles (2013–2017)	3	**1.4**	*0.81*	0.12 *0.07*	5	**1.6**	*0.82*	0.11 *0.07*
Tanzania, Mwanza [two districts] (2016–2017)	4	**0.4**	*0.20*	0.02 *0.01*	7	**0.9**	*0.35*	0.05 *0.02*
Uganda, Gulu (2013–2015)	8	**0.5**	*0.20*	0.03 *0.01*	8	**0.7**	*0.28*	0.04 *0.02*
Uganda, Kampala (2011–2013)	29	**1.1**	*0.28*	0.08 *0.03*	26	**1.0**	*0.25*	0.08 *0.03*
Zambia, Lusaka (2011–2015)	22	**0.5**	*0.17*	0.04 *0.02*	31	**0.7**	*0.17*	0.06 *0.03*
Zimbabwe, Bulawayo: Black (2013–2015)	4	**0.7**	*0.41*	0.09 *0.08*	12	**1.6**	*0.51*	0.17 *0.06*
Zimbabwe, Harare: Black (2013–2015)	20	**1.9**	*0.51*	0.29 *0.10*	30	**1.7**	*0.36*	0.14 *0.04*
Africa, southern								
*Eswatini (2016–2017)	3	**0.4**	*0.25*	0.03 *0.02*	1	**0.2**	*0.19*	0.02 *0.02*
Namibia (2013–2015)	61	**2.9**	*0.40*	0.34 *0.06*	64	**2.6**	*0.34*	0.29 *0.05*
South Africa (2010–2014)	1794	**2.0**	*0.05*	0.23 *0.01*	1178	**1.0**	*0.03*	0.10 *0.00*
South Africa: Black (2010–2013)	404	**0.7**	*0.04*	0.07 *0.00*	421	**0.6**	*0.03*	0.05 *0.00*
South Africa: White (2010–2013)	665	**5.1**	*0.21*	0.59 *0.03*	337	**2.4**	*0.15*	0.26 *0.02*
South Africa, Eastern Cape (2013–2016)	9	**0.5**	*0.17*	0.04 *0.02*	12	**0.5**	*0.14*	0.03 *0.01*
Africa, western								
Benin, Cotonou (2014–2016)	12	**2.0**	*0.64*	0.28 *0.11*	10	**1.2**	*0.41*	0.12 *0.04*
Côte d´Ivoire, Abidjan (2014–2015)	32	**1.0**	*0.22*	0.08 *0.02*	31	**1.1**	*0.24*	0.06 *0.02*
Mali, Bamako (2015–2017)	44	**1.8**	*0.32*	0.20 *0.05*	47	**1.3**	*0.23*	0.12 *0.03*
*Nigeria, Abuja (2013–2016)	7	**0.3**	*0.11*	0.03 *0.01*	18	**1.5**	*0.50*	0.15 *0.07*
Nigeria, Calabar (2016–2017)	6	**1.4**	*0.59*	0.10 *0.05*	2	**0.6**	*0.46*	0.04 *0.04*
*Nigeria, Ekiti (2013–2017)	3	**0.2**	*0.13*	0.01 *0.01*	2	**0.2**	*0.15*	0.01 *0.01*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Ureter and other urinary (C66, C68)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	0	-	-	–	-	0	-	-	–	-
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	4	**0.2**	*0.08*	0.01	*0.01*	2	**0.1**	*0.04*	0.01	*0.00*
France, Réunion (2011–2013)	5	**0.3**	*0.14*	0.03	*0.01*	5	**0.2**	*0.10*	0.01	*0.01*
*Kenya, Eldoret (2012–2016)	0	-	-	–	-	0	-	-	–	-
Kenya, Nairobi (2012–2014)	0	-	-	–	-	1	**0.0**	*0.05*	0.00	*0.00*
Mauritius (2013–2015)	4	**0.2**	*0.10*	0.03	*0.02*	3	**0.1**	*0.07*	0.02	*0.01*
Mozambique, Beira (2014–2017)	0	-	-	–	-	0	-	-	–	-
Mozambique, Maputo (2015–2017)	1	**0.1**	*0.06*	0.01	*0.01*	0	-	-	–	-
Seychelles (2013–2017)	1	**0.3**	*0.26*	0.03	*0.03*	1	**0.3**	*0.27*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016–2017)	0	-	-	–	-	0	-	-	–	-
Uganda, Gulu (2013–2015)	0	-	-	–	-	0	-	-	–	-
Uganda, Kampala (2011–2013)	2	**0.1**	*0.10*	0.00	*0.00*	1	**0.2**	*0.18*	0.03	*0.03*
Zambia, Lusaka (2011–2015)	0	-	-	–	-	0	-	-	–	-
Zimbabwe, Bulawayo: Black (2013–2015)	0	-	-	–	-	0	-	-	–	-
Zimbabwe, Harare: Black (2013–2015)	1	**0.1**	*0.14*	–	-	1	**0.2**	*0.15*	0.03	*0.03*
Africa, southern										
*Eswatini (2016–2017)	0	-	-	–	-	0	-	-	–	-
Namibia (2013–2015)	2	**0.1**	*0.09*	0.02	*0.02*	4	**0.2**	*0.11*	0.03	*0.01*
South Africa (2010–2014)	88	**0.1**	*0.01*	0.01	*0.00*	118	**0.1**	*0.01*	0.01	*0.00*
South Africa: Black (2010–2013)	15	**0.0**	*0.01*	0.00	*0.00*	64	**0.1**	*0.01*	0.01	*0.00*
South Africa: White (2010–2013)	39	**0.3**	*0.04*	0.03	*0.01*	24	**0.1**	*0.03*	0.02	*0.00*
South Africa, Eastern Cape (2013–2016)	0	-	-	–	-	0	-	-	–	-
Africa, western										
Benin, Cotonou (2014–2016)	0	-	-	–	-	0	-	-	–	-
Côte d´Ivoire, Abidjan (2014–2015)	1	**0.0**	*0.02*	0.00	*0.00*	0	-	-	–	-
Mali, Bamako (2015–2017)	1	**0.0**	*0.02*	0.00	*0.00*	2	**0.1**	*0.07*	0.01	*0.01*
*Nigeria, Abuja (2013–2016)	0	-	-	–	-	0	-	-	–	-
Nigeria, Calabar (2016–2017)	0	-	-	–	-	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	1	**0.1**	*0.08*	0.01	*0.01*	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Bladder (C67)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	6	**0.5**	*0.23*	0.08	*0.04*	5	**0.4**	*0.20*	0.04	*0.02*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	89	**3.1**	*0.35*	0.38	*0.05*	39	**1.3**	*0.22*	0.16	*0.03*
France, Réunion (2011–2013)	133	**8.9**	*0.78*	1.01	*0.12*	42	**2.0**	*0.33*	0.18	*0.04*
*Kenya, Eldoret (2012–2016)	8	**0.8**	*0.29*	0.08	*0.04*	5	**0.5**	*0.24*	0.07	*0.04*
Kenya, Nairobi (2012–2014)	60	**4.4**	*0.63*	0.46	*0.10*	32	**2.1**	*0.41*	0.23	*0.06*
Mauritius (2013–2015)	120	**5.7**	*0.53*	0.70	*0.08*	41	**1.3**	*0.22*	0.10	*0.03*
Mozambique, Beira (2014–2017)	44	**11.8**	*2.00*	1.29	*0.28*	35	**8.4**	*1.53*	1.09	*0.25*
Mozambique, Maputo (2015–2017)	23	**2.3**	*0.50*	0.28	*0.08*	25	**2.2**	*0.47*	0.24	*0.06*
Seychelles (2013–2017)	12	**4.1**	*1.21*	0.37	*0.13*	6	**1.7**	*0.73*	0.20	*0.12*
Tanzania, Mwanza [two districts] (2016–2017)	10	**2.3**	*0.79*	0.20	*0.08*	14	**4.4**	*1.33*	0.51	*0.17*
Uganda, Gulu (2013–2015)	4	**0.9**	*0.45*	0.09	*0.08*	1	**0.1**	*0.13*	–	-
Uganda, Kampala (2011–2013)	22	**2.3**	*0.53*	0.22	*0.07*	22	**1.9**	*0.48*	0.21	*0.07*
Zambia, Lusaka (2011–2015)	51	**3.5**	*0.56*	0.37	*0.08*	55	**3.7**	*0.56*	0.49	*0.09*
Zimbabwe, Bulawayo: Black (2013–2015)	10	**2.0**	*0.66*	0.06	*0.04*	13	**2.3**	*0.65*	0.30	*0.11*
Zimbabwe, Harare: Black (2013–2015)	49	**6.2**	*0.94*	0.82	*0.16*	43	**5.0**	*0.80*	0.63	*0.12*
Africa, southern										
*Eswatini (2016–2017)	11	**2.2**	*0.71*	0.27	*0.09*	6	**0.8**	*0.33*	0.08	*0.04*
Namibia (2013–2015)	48	**2.7**	*0.40*	0.34	*0.06*	30	**1.2**	*0.23*	0.14	*0.03*
South Africa (2010–2014)	4506	**5.6**	*0.08*	0.64	*0.01*	1518	**1.3**	*0.03*	0.14	*0.00*
South Africa: Black (2010–2013)	565	**1.3**	*0.06*	0.15	*0.01*	357	**0.5**	*0.03*	0.06	*0.00*
South Africa: White (2010–2013)	2203	**14.8**	*0.32*	1.68	*0.05*	578	**3.0**	*0.13*	0.35	*0.02*
South Africa, Eastern Cape (2013–2016)	10	**0.8**	*0.26*	0.06	*0.02*	9	**0.4**	*0.13*	0.06	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	12	**2.2**	*0.69*	0.35	*0.13*	3	**0.4**	*0.21*	0.03	*0.02*
Côte d´Ivoire, Abidjan (2014–2015)	20	**1.1**	*0.27*	0.14	*0.04*	14	**0.9**	*0.27*	0.10	*0.04*
Mali, Bamako (2015–2017)	173	**10.4**	*0.84*	1.38	*0.14*	143	**8.4**	*0.75*	1.03	*0.11*
*Nigeria, Abuja (2013–2016)	17	**1.0**	*0.32*	0.09	*0.04*	5	**1.0**	*0.48*	0.17	*0.08*
Nigeria, Calabar (2016–2017)	0	-	-	–	-	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	11	**1.2**	*0.39*	0.19	*0.07*	6	**1.0**	*0.40*	0.12	*0.06*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Eye (C69)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	15	**0.5**	*0.13*	0.02	*0.01*	17	**0.6**	*0.16*	0.03	*0.01*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	29	**0.8**	*0.16*	0.08	*0.02*	28	**0.7**	*0.15*	0.08	*0.02*
France, Réunion (2011–2013)	10	**0.8**	*0.25*	0.08	*0.03*	2	**0.1**	*0.09*	0.01	*0.01*
*Kenya, Eldoret (2012–2016)	7	**0.3**	*0.16*	0.04	*0.02*	9	**0.5**	*0.20*	0.04	*0.02*
Kenya, Nairobi (2012–2014)	51	**1.4**	*0.27*	0.10	*0.03*	28	**0.6**	*0.13*	0.04	*0.01*
Mauritius (2013–2015)	1	**0.1**	*0.11*	0.00	*0.00*	6	**0.3**	*0.13*	0.01	*0.01*
Mozambique, Beira (2014–2017)	55	**7.1**	*1.05*	0.65	*0.11*	59	**7.8**	*1.13*	0.69	*0.12*
Mozambique, Maputo (2015–2017)	28	**2.2**	*0.44*	0.20	*0.05*	62	**4.2**	*0.56*	0.38	*0.06*
Seychelles (2013–2017)	1	**0.6**	*0.61*	0.03	*0.03*	1	**0.3**	*0.32*	0.03	*0.03*
Tanzania, Mwanza [two districts] (2016–2017)	14	**2.9**	*0.92*	0.29	*0.12*	10	**2.0**	*0.75*	0.19	*0.08*
Uganda, Gulu (2013–2015)	17	**2.0**	*0.51*	0.15	*0.04*	9	**1.2**	*0.42*	0.10	*0.04*
Uganda, Kampala (2011–2013)	51	**2.5**	*0.48*	0.24	*0.06*	72	**2.3**	*0.33*	0.17	*0.03*
Zambia, Lusaka (2011–2015)	128	**3.9**	*0.46*	0.40	*0.07*	125	**3.5**	*0.39*	0.31	*0.05*
Zimbabwe, Bulawayo: Black (2013–2015)	37	**4.6**	*0.82*	0.43	*0.09*	39	**4.6**	*0.79*	0.40	*0.08*
Zimbabwe, Harare: Black (2013–2015)	57	**3.7**	*0.58*	0.36	*0.08*	52	**2.9**	*0.47*	0.28	*0.06*
Africa, southern										
*Eswatini (2016–2017)	30	**4.3**	*0.83*	0.51	*0.12*	22	**2.5**	*0.57*	0.26	*0.08*
Namibia (2013–2015)	111	**4.7**	*0.47*	0.47	*0.06*	123	**4.2**	*0.40*	0.38	*0.04*
South Africa (2010–2014)	1534	**1.3**	*0.04*	0.12	*0.00*	1958	**1.4**	*0.03*	0.12	*0.00*
South Africa: Black (2010–2013)	1016	**1.5**	*0.05*	0.13	*0.01*	1399	**1.7**	*0.05*	0.14	*0.00*
South Africa: White (2010–2013)	104	**0.9**	*0.10*	0.08	*0.01*	74	**0.7**	*0.09*	0.05	*0.01*
South Africa, Eastern Cape (2013–2016)	23	**1.6**	*0.37*	0.14	*0.03*	20	**1.0**	*0.23*	0.08	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	2	**0.4**	*0.30*	0.08	*0.07*	12	**1.1**	*0.32*	0.07	*0.03*
Côte d´Ivoire, Abidjan (2014–2015)	45	**1.5**	*0.28*	0.10	*0.03*	53	**1.6**	*0.26*	0.13	*0.03*
Mali, Bamako (2015–2017)	103	**3.0**	*0.36*	0.27	*0.05*	87	**2.7**	*0.33*	0.21	*0.03*
*Nigeria, Abuja (2013–2016)	8	**0.5**	*0.23*	0.06	*0.04*	6	**0.1**	*0.05*	0.01	*0.00*
Nigeria, Calabar (2016–2017)	11	**2.1**	*0.65*	0.10	*0.03*	4	**1.0**	*0.54*	0.07	*0.05*
*Nigeria, Ekiti (2013–2017)	2	**0.3**	*0.21*	0.04	*0.03*	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Brain and nervous system (C70-72)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	4	**0.2**	*0.12*	0.02	*0.01*	6	**0.3**	*0.13*	0.04	*0.03*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	29	**0.7**	*0.15*	0.08	*0.02*	39	**1.0**	*0.17*	0.10	*0.02*
France, Réunion (2011–2013)	51	**3.8**	*0.54*	0.40	*0.07*	43	**2.9**	*0.45*	0.26	*0.05*
*Kenya, Eldoret (2012–2016)	8	**0.6**	*0.25*	0.09	*0.05*	4	**0.3**	*0.15*	0.02	*0.02*
Kenya, Nairobi (2012–2014)	62	**2.1**	*0.36*	0.26	*0.06*	69	**2.9**	*0.46*	0.36	*0.07*
Mauritius (2013–2015)	65	**3.1**	*0.40*	0.31	*0.04*	61	**2.5**	*0.32*	0.25	*0.03*
Mozambique, Beira (2014–2017)	0	-	-	–	-	1	**0.1**	*0.09*	0.00	*0.00*
Mozambique, Maputo (2015–2017)	5	**0.4**	*0.17*	0.03	*0.02*	12	**0.9**	*0.27*	0.09	*0.04*
Seychelles (2013–2017)	8	**2.8**	*1.01*	0.23	*0.09*	9	**3.2**	*1.12*	0.35	*0.13*
Tanzania, Mwanza [two districts] (2016–2017)	2	**0.2**	*0.15*	0.02	*0.01*	1	**0.1**	*0.10*	0.00	*0.00*
Uganda, Gulu (2013–2015)	4	**0.8**	*0.41*	0.04	*0.04*	0	-	-	–	-
Uganda, Kampala (2011–2013)	48	**3.2**	*0.61*	0.34	*0.08*	30	**1.3**	*0.32*	0.13	*0.04*
Zambia, Lusaka (2011–2015)	28	**0.8**	*0.19*	0.07	*0.02*	30	**1.2**	*0.27*	0.15	*0.05*
Zimbabwe, Bulawayo: Black (2013–2015)	8	**0.8**	*0.28*	0.06	*0.02*	10	**1.1**	*0.39*	0.08	*0.03*
Zimbabwe, Harare: Black (2013–2015)	54	**3.6**	*0.59*	0.34	*0.07*	87	**6.1**	*0.75*	0.58	*0.10*
Africa, southern										
*Eswatini (2016–2017)	5	**0.6**	*0.27*	0.05	*0.02*	8	**0.9**	*0.34*	0.09	*0.04*
Namibia (2013–2015)	40	**1.6**	*0.28*	0.15	*0.03*	45	**1.5**	*0.24*	0.14	*0.03*
South Africa (2010–2014)	1025	**1.0**	*0.03*	0.10	*0.00*	724	**0.6**	*0.02*	0.06	*0.00*
South Africa: Black (2010–2013)	245	**0.4**	*0.02*	0.03	*0.00*	179	**0.2**	*0.02*	0.02	*0.00*
South Africa: White (2010–2013)	372	**3.4**	*0.20*	0.33	*0.02*	235	**2.1**	*0.15*	0.19	*0.01*
South Africa, Eastern Cape (2013–2016)	4	**0.1**	*0.07*	0.01	*0.00*	9	**0.4**	*0.13*	0.03	*0.01*
Africa, western										
Benin, Cotonou (2014–2016)	11	**1.9**	*0.67*	0.33	*0.14*	7	**0.7**	*0.30*	0.06	*0.03*
Côte d´Ivoire, Abidjan (2014–2015)	26	**1.0**	*0.23*	0.08	*0.02*	28	**1.4**	*0.33*	0.20	*0.05*
Mali, Bamako (2015–2017)	76	**3.0**	*0.39*	0.29	*0.05*	77	**3.2**	*0.43*	0.36	*0.06*
*Nigeria, Abuja (2013–2016)	10	**0.5**	*0.23*	0.06	*0.04*	10	**0.8**	*0.34*	0.12	*0.06*
Nigeria, Calabar (2016–2017)	1	**0.2**	*0.16*	0.01	*0.01*	1	**0.1**	*0.15*	0.01	*0.01*
*Nigeria, Ekiti (2013–2017)	1	**0.1**	*0.13*	0.02	*0.02*	1	**0.1**	*0.06*	0.00	*0.00*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Thyroid (C73)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	7	**0.8**	*0.32*	0.13	*0.06*	3	**0.2**	*0.15*	0.03	*0.02*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	65	**1.9**	*0.26*	0.23	*0.04*	255	**5.8**	*0.41*	0.61	*0.05*
France, Réunion (2011–2013)	32	**2.3**	*0.42*	0.26	*0.05*	87	**5.7**	*0.63*	0.55	*0.07*
*Kenya, Eldoret (2012–2016)	2	**0.2**	*0.15*	0.03	*0.02*	11	**0.8**	*0.28*	0.08	*0.03*
Kenya, Nairobi (2012–2014)	13	**0.6**	*0.21*	0.09	*0.03*	50	**2.7**	*0.48*	0.37	*0.08*
Mauritius (2013–2015)	26	**1.2**	*0.24*	0.12	*0.03*	53	**2.1**	*0.30*	0.21	*0.03*
Mozambique, Beira (2014–2017)	1	**0.1**	*0.09*	0.01	*0.01*	6	**1.3**	*0.55*	0.13	*0.06*
Mozambique, Maputo (2015–2017)	8	**0.6**	*0.25*	0.08	*0.03*	19	**1.6**	*0.38*	0.18	*0.05*
Seychelles (2013–2017)	2	**0.6**	*0.44*	0.06	*0.04*	7	**2.1**	*0.83*	0.23	*0.10*
Tanzania, Mwanza [two districts] (2016–2017)	0	-	-	–	-	2	**0.4**	*0.27*	0.03	*0.02*
Uganda, Gulu (2013–2015)	4	**1.0**	*0.55*	0.17	*0.10*	10	**1.7**	*0.56*	0.17	*0.06*
Uganda, Kampala (2011–2013)	18	**1.4**	*0.44*	0.19	*0.07*	34	**2.2**	*0.45*	0.28	*0.07*
Zambia, Lusaka (2011–2015)	8	**0.4**	*0.19*	0.07	*0.04*	15	**0.9**	*0.28*	0.16	*0.06*
Zimbabwe, Bulawayo: Black (2013–2015)	1	**0.2**	*0.23*	–	-	18	**2.8**	*0.69*	0.30	*0.10*
Zimbabwe, Harare: Black (2013–2015)	10	**1.1**	*0.39*	0.18	*0.08*	53	**6.4**	*0.91*	0.93	*0.16*
Africa, southern										
*Eswatini (2016–2017)	2	**0.4**	*0.29*	0.06	*0.04*	6	**0.8**	*0.37*	0.10	*0.06*
Namibia (2013–2015)	13	**0.5**	*0.16*	0.06	*0.03*	53	**1.9**	*0.27*	0.18	*0.03*
South Africa (2010–2014)	542	**0.5**	*0.02*	0.06	*0.00*	1842	**1.4**	*0.03*	0.15	*0.00*
South Africa: Black (2010–2013)	86	**0.2**	*0.02*	0.02	*0.00*	472	**0.7**	*0.03*	0.07	*0.00*
South Africa: White (2010–2013)	239	**1.9**	*0.13*	0.21	*0.01*	622	**5.2**	*0.22*	0.48	*0.02*
South Africa, Eastern Cape (2013–2016)	3	**0.3**	*0.17*	0.02	*0.01*	15	**0.8**	*0.21*	0.09	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	0	-	-	–	-	7	**0.9**	*0.35*	0.07	*0.04*
Côte d´Ivoire, Abidjan (2014–2015)	7	**0.3**	*0.15*	0.05	*0.03*	28	**1.2**	*0.29*	0.12	*0.04*
Mali, Bamako (2015–2017)	10	**0.4**	*0.15*	0.04	*0.02*	33	**2.0**	*0.37*	0.22	*0.05*
*Nigeria, Abuja (2013–2016)	2	**0.1**	*0.07*	0.01	*0.01*	11	**1.9**	*0.65*	0.26	*0.10*
Nigeria, Calabar (2016–2017)	0	-	-	–	-	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	3	**0.3**	*0.16*	0.03	*0.02*	3	**0.4**	*0.24*	0.04	*0.03*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Hodgkin lymphoma (C81)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	5	**0.3**	*0.14*	0.04	*0.03*	2	**0.1**	*0.05*	0.00	*0.00*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	36	**0.8**	*0.14*	0.07	*0.02*	18	**0.4**	*0.09*	0.03	*0.01*
France, Réunion (2011−2013)	29	**2.3**	*0.44*	0.20	*0.04*	24	**1.8**	*0.37*	0.14	*0.03*
*Kenya, Eldoret (2012−2016)	13	**0.4**	*0.13*	0.03	*0.01*	7	**0.5**	*0.24*	0.07	*0.04*
Kenya, Nairobi (2012−2014)	44	**1.0**	*0.19*	0.09	*0.03*	33	**0.8**	*0.19*	0.07	*0.02*
Mauritius (2013−2015)	19	**0.9**	*0.22*	0.07	*0.02*	20	**1.0**	*0.23*	0.07	*0.02*
Mozambique, Beira (2014−2017)	11	**1.5**	*0.54*	0.16	*0.07*	1	**0.1**	*0.12*	0.01	*0.01*
Mozambique, Maputo (2015−2017)	7	**0.5**	*0.18*	0.04	*0.02*	5	**0.3**	*0.14*	0.02	*0.01*
Seychelles (2013−2017)	4	**1.8**	*0.96*	0.24	*0.14*	6	**2.5**	*1.08*	0.25	*0.12*
Tanzania, Mwanza [two districts] (2016−2017)	7	**0.9**	*0.33*	0.06	*0.02*	5	**0.8**	*0.41*	0.07	*0.04*
Uganda, Gulu (2013−2015)	6	**0.7**	*0.32*	0.06	*0.03*	10	**1.3**	*0.45*	0.13	*0.06*
Uganda, Kampala (2011−2013)	40	**1.6**	*0.41*	0.18	*0.06*	41	**1.6**	*0.35*	0.17	*0.05*
Zambia, Lusaka (2011−2015)	33	**1.0**	*0.24*	0.09	*0.03*	25	**0.9**	*0.24*	0.10	*0.03*
Zimbabwe, Bulawayo: Black (2013−2015)	11	**1.2**	*0.39*	0.09	*0.04*	11	**1.3**	*0.42*	0.12	*0.04*
Zimbabwe, Harare: Black (2013−2015)	18	**0.9**	*0.25*	0.09	*0.05*	15	**0.8**	*0.24*	0.06	*0.02*
Africa, southern										
*Eswatini (2016−2017)	8	**1.2**	*0.46*	0.16	*0.07*	2	**0.3**	*0.20*	0.04	*0.03*
Namibia (2013−2015)	15	**0.5**	*0.15*	0.05	*0.02*	16	**0.5**	*0.14*	0.06	*0.02*
South Africa (2010−2014)	1182	**0.9**	*0.03*	0.08	*0.00*	924	**0.7**	*0.02*	0.06	*0.00*
South Africa: Black (2010−2013)	587	**0.7**	*0.03*	0.06	*0.00*	456	**0.5**	*0.03*	0.05	*0.00*
South Africa: White (2010−2013)	190	**2.0**	*0.15*	0.16	*0.01*	148	**1.5**	*0.13*	0.12	*0.01*
South Africa, Eastern Cape (2013−2016)	3	**0.1**	*0.06*	0.01	*0.00*	3	**0.1**	*0.09*	0.01	*0.01*
Africa, western										
Benin, Cotonou (2014−2016)	8	**0.7**	*0.25*	0.05	*0.02*	2	**0.1**	*0.10*	0.01	*0.01*
Côte d´Ivoire, Abidjan (2014−2015)	25	**0.7**	*0.18*	0.05	*0.02*	15	**0.5**	*0.17*	0.06	*0.02*
Mali, Bamako (2015−2017)	31	**1.2**	*0.26*	0.14	*0.04*	18	**0.9**	*0.24*	0.10	*0.03*
*Nigeria, Abuja (2013−2016)	10	**0.2**	*0.08*	0.02	*0.01*	4	**0.3**	*0.24*	0.06	*0.06*
Nigeria, Calabar (2016−2017)	4	**1.3**	*0.83*	0.23	*0.19*	3	**0.6**	*0.36*	0.04	*0.03*
*Nigeria, Ekiti (2013−2017)	14	**1.3**	*0.38*	0.15	*0.05*	10	**1.0**	*0.36*	0.15	*0.07*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Non-Hodgkin lymphoma (C82-86, C96)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	15	**1.3**	*0.36*	0.14	*0.05*	7	**0.4**	*0.17*	0.04	*0.02*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	200	**5.6**	*0.43*	0.55	*0.05*	140	**3.5**	*0.33*	0.39	*0.05*
France, Réunion (2011–2013)	103	**6.9**	*0.69*	0.75	*0.09*	73	**4.3**	*0.53*	0.46	*0.07*
*Kenya, Eldoret (2012–2016)	37	**2.0**	*0.39*	0.21	*0.05*	30	**2.2**	*0.46*	0.27	*0.07*
Kenya, Nairobi (2012–2014)	185	**6.8**	*0.65*	0.75	*0.10*	131	**5.1**	*0.57*	0.54	*0.09*
Mauritius (2013–2015)	75	**3.7**	*0.44*	0.36	*0.05*	42	**1.8**	*0.30*	0.21	*0.04*
Mozambique, Beira (2014–2017)	41	**6.4**	*1.16*	0.57	*0.14*	38	**5.6**	*1.07*	0.58	*0.15*
Mozambique, Maputo (2015–2017)	49	**3.9**	*0.58*	0.37	*0.07*	49	**3.1**	*0.46*	0.26	*0.05*
Seychelles (2013–2017)	9	**3.2**	*1.09*	0.42	*0.16*	11	**4.3**	*1.37*	0.44	*0.15*
Tanzania, Mwanza [two districts] (2016–2017)	28	**5.0**	*1.11*	0.47	*0.13*	16	**4.1**	*1.36*	0.59	*0.25*
Uganda, Gulu (2013–2015)	91	**11.5**	*1.52*	1.11	*0.20*	83	**9.8**	*1.22*	0.99	*0.16*
Uganda, Kampala (2011–2013)	125	**5.8**	*0.72*	0.60	*0.11*	109	**5.0**	*0.65*	0.51	*0.09*
Zambia, Lusaka (2011–2015)	73	**2.6**	*0.41*	0.29	*0.06*	70	**2.4**	*0.37*	0.23	*0.05*
Zimbabwe, Bulawayo: Black (2013–2015)	92	**14.5**	*1.63*	1.38	*0.19*	90	**10.9**	*1.24*	1.10	*0.15*
Zimbabwe, Harare: Black (2013–2015)	197	**13.6**	*1.13*	1.46	*0.17*	185	**11.7**	*0.98*	1.12	*0.12*
Africa, southern										
*Eswatini (2016–2017)	19	**2.3**	*0.57*	0.22	*0.08*	16	**1.8**	*0.49*	0.19	*0.07*
Namibia (2013–2015)	165	**6.7**	*0.56*	0.63	*0.07*	135	**4.6**	*0.41*	0.40	*0.04*
South Africa (2010–2014)	4830	**4.6**	*0.07*	0.47	*0.01*	4298	**3.3**	*0.05*	0.33	*0.01*
South Africa: Black (2010–2013)	2269	**3.5**	*0.08*	0.34	*0.01*	2069	**2.6**	*0.06*	0.24	*0.01*
South Africa: White (2010–2013)	956	**7.5**	*0.26*	0.79	*0.03*	814	**5.4**	*0.21*	0.57	*0.02*
South Africa, Eastern Cape (2013–2016)	17	**1.2**	*0.31*	0.15	*0.04*	26	**1.3**	*0.26*	0.13	*0.03*
Africa, western										
Benin, Cotonou (2014–2016)	10	**1.5**	*0.54*	0.18	*0.07*	10	**0.9**	*0.31*	0.07	*0.03*
Côte d´Ivoire, Abidjan (2014–2015)	162	**5.3**	*0.50*	0.50	*0.07*	127	**4.2**	*0.46*	0.40	*0.06*
Mali, Bamako (2015–2017)	113	**3.8**	*0.42*	0.39	*0.06*	54	**2.3**	*0.36*	0.25	*0.05*
*Nigeria, Abuja (2013–2016)	20	**1.1**	*0.37*	0.16	*0.08*	16	**1.3**	*0.43*	0.16	*0.07*
Nigeria, Calabar (2016–2017)	10	**3.9**	*1.43*	0.62	*0.29*	15	**4.9**	*1.59*	0.51	*0.21*
*Nigeria, Ekiti (2013–2017)	35	**3.4**	*0.62*	0.34	*0.08*	63	**6.8**	*0.95*	0.77	*0.13*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Burkitt lymphoma, patient age 0-14 years (C83.7)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	4	**0.4**	*0.22*	0.01	*0.00*	0	-	-	−	-
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	1	**0.1**	*0.09*	0.00	*0.00*	1	**0.1**	*0.07*	0.00	*0.00*
France, Réunion (2011−2013)	1	**0.4**	*0.40*	0.01	*0.01*	0	-	-	−	-
*Kenya, Eldoret (2012−2016)	1	**0.1**	*0.09*	0.00	*0.00*	0	-	-	−	-
Kenya, Nairobi (2012−2014)	6	**0.3**	*0.14*	0.01	*0.00*	6	**0.3**	*0.13*	0.00	*0.00*
Mauritius (2013−2015)	0	-	-	−	-	0	-	-	−	-
Mozambique, Beira (2014−2017)	3	**1.0**	*0.56*	0.01	*0.01*	2	**0.6**	*0.40*	0.01	*0.01*
Mozambique, Maputo (2015−2017)	0	-	-	−	-	0	-	-	−	-
Seychelles (2013−2017)	0	-	-	−	-	0	-	-	−	-
Tanzania, Mwanza [two districts] (2016−2017)	5	**1.6**	*0.71*	0.02	*0.01*	1	**0.3**	*0.28*	0.00	*0.00*
Uganda, Gulu (2013−2015)	24	**4.2**	*0.85*	0.07	*0.01*	12	**2.2**	*0.63*	0.03	*0.01*
Uganda, Kampala (2011−2013)	15	**1.1**	*0.28*	0.02	*0.00*	11	**0.7**	*0.22*	0.01	*0.00*
Zambia, Lusaka (2011−2015)	9	**0.4**	*0.14*	0.01	*0.00*	4	**0.2**	*0.09*	0.00	*0.00*
Zimbabwe, Bulawayo: Black (2013−2015)	1	**0.3**	*0.30*	0.00	*0.00*	3	**0.8**	*0.46*	0.01	*0.01*
Zimbabwe, Harare: Black (2013−2015)	2	**0.2**	*0.16*	0.00	*0.00*	1	**0.1**	*0.11*	0.00	*0.00*
Africa, southern										
*Eswatini (2016−2017)	0	-	-	−	-	0	-	-	−	-
Namibia (2013−2015)	6	**0.5**	*0.20*	0.01	*0.00*	3	**0.3**	*0.15*	0.00	*0.00*
South Africa (2010−2014)	93	**0.2**	*0.03*	0.00	*0.00*	30	**0.1**	*0.01*	0.00	*0.00*
South Africa: Black (2010−2013)	50	**0.2**	*0.03*	0.00	*0.00*	17	**0.1**	*0.02*	0.00	*0.00*
South Africa: White (2010−2013)	13	**0.7**	*0.20*	0.01	*0.00*	5	**0.3**	*0.15*	0.00	*0.00*
South Africa, Eastern Cape (2013−2016)	1	**0.1**	*0.12*	0.00	*0.00*	0	-	-	−	-
Africa, western										
Benin, Cotonou (2014−2016)	0	-	-	−	-	4	**1.0**	*0.51*	0.02	*0.01*
Côte d´Ivoire, Abidjan (2014−2015)	40	**2.8**	*0.45*	0.04	*0.01*	37	**2.4**	*0.40*	0.04	*0.01*
Mali, Bamako (2015−2017)	18	**1.2**	*0.30*	0.02	*0.00*	7	**0.4**	*0.17*	0.01	*0.00*
*Nigeria, Abuja (2013−2016)	0	-	-	−	-	0	-	-	−	-
Nigeria, Calabar (2016−2017)	1	**0.6**	*0.59*	0.01	*0.01*	0	-	-	−	-
*Nigeria, Ekiti (2013−2017)	3	**0.6**	*0.36*	0.01	*0.00*	0	-	-	−	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 14 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Multiple myeloma (C90)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	10	**1.0**	*0.34*	0.15	*0.06*	11	**0.9**	*0.29*	0.07	*0.03*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	16	**0.5**	*0.14*	0.07	*0.02*	17	**0.5**	*0.13*	0.06	*0.02*
France, Réunion (2011–2013)	45	**2.9**	*0.44*	0.28	*0.05*	46	**2.4**	*0.37*	0.26	*0.05*
*Kenya, Eldoret (2012–2016)	14	**1.2**	*0.34*	0.14	*0.05*	18	**1.1**	*0.28*	0.07	*0.02*
Kenya, Nairobi (2012–2014)	51	**2.7**	*0.44*	0.35	*0.07*	57	**3.8**	*0.54*	0.37	*0.07*
Mauritius (2013–2015)	55	**2.5**	*0.34*	0.30	*0.05*	37	**1.4**	*0.23*	0.16	*0.03*
Mozambique, Beira (2014–2017)	1	**0.1**	*0.07*	0.00	*0.00*	0	-	-	–	-
Mozambique, Maputo (2015–2017)	7	**0.5**	*0.22*	0.06	*0.03*	4	**0.4**	*0.22*	0.06	*0.03*
Seychelles (2013–2017)	7	**2.7**	*1.02*	0.40	*0.17*	7	**2.1**	*0.82*	0.27	*0.11*
Tanzania, Mwanza [two districts] (2016–2017)	0	-	-	–	-	0	-	-	–	-
Uganda, Gulu (2013–2015)	1	**0.1**	*0.13*	0.01	*0.01*	2	**0.2**	*0.16*	0.01	*0.01*
Uganda, Kampala (2011–2013)	12	**1.3**	*0.41*	0.14	*0.06*	15	**1.6**	*0.44*	0.21	*0.07*
Zambia, Lusaka (2011–2015)	3	**0.2**	*0.11*	0.01	*0.01*	7	**0.4**	*0.19*	0.05	*0.02*
Zimbabwe, Bulawayo: Black (2013–2015)	24	**4.5**	*0.96*	0.49	*0.13*	27	**5.0**	*0.99*	0.50	*0.13*
Zimbabwe, Harare: Black (2013–2015)	38	**4.7**	*0.82*	0.65	*0.15*	43	**5.0**	*0.79*	0.70	*0.13*
Africa, southern										
*Eswatini (2016–2017)	2	**0.3**	*0.23*	0.03	*0.03*	2	**0.2**	*0.15*	0.02	*0.01*
Namibia (2013–2015)	22	**1.2**	*0.26*	0.13	*0.03*	23	**0.9**	*0.20*	0.13	*0.04*
South Africa (2010–2014)	763	**0.9**	*0.03*	0.10	*0.00*	793	**0.7**	*0.02*	0.09	*0.00*
South Africa: Black (2010–2013)	287	**0.6**	*0.04*	0.07	*0.01*	316	**0.5**	*0.03*	0.06	*0.00*
South Africa: White (2010–2013)	181	**1.3**	*0.10*	0.16	*0.01*	160	**0.9**	*0.08*	0.12	*0.01*
South Africa, Eastern Cape (2013–2016)	6	**0.5**	*0.20*	0.06	*0.03*	10	**0.5**	*0.16*	0.07	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	9	**1.2**	*0.44*	0.13	*0.05*	4	**0.6**	*0.32*	0.08	*0.04*
Côte d´Ivoire, Abidjan (2014–2015)	27	**1.1**	*0.25*	0.12	*0.03*	21	**1.3**	*0.31*	0.18	*0.05*
Mali, Bamako (2015–2017)	6	**0.3**	*0.13*	0.03	*0.02*	3	**0.2**	*0.12*	0.03	*0.02*
*Nigeria, Abuja (2013–2016)	3	**0.4**	*0.26*	0.07	*0.06*	3	**0.4**	*0.29*	0.05	*0.04*
Nigeria, Calabar (2016–2017)	3	**1.3**	*0.80*	0.15	*0.10*	8	**4.2**	*1.55*	0.55	*0.23*
*Nigeria, Ekiti (2013–2017)	0	-	-	–	-	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Lymphoid leukaemia (C91)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	0	-	-	–	-	4	**0.2**	*0.13*	0.03	*0.01*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	89	**2.4**	*0.27*	0.22	*0.04*	67	**1.7**	*0.23*	0.16	*0.03*
France, Réunion (2011–2013)	43	**3.4**	*0.53*	0.34	*0.06*	28	**2.0**	*0.40*	0.18	*0.04*
*Kenya, Eldoret (2012–2016)	36	**2.1**	*0.41*	0.20	*0.05*	27	**2.0**	*0.44*	0.24	*0.07*
Kenya, Nairobi (2012–2014)	63	**2.3**	*0.38*	0.21	*0.05*	47	**1.7**	*0.33*	0.16	*0.05*
Mauritius (2013–2015)	17	**0.9**	*0.24*	0.09	*0.03*	11	**0.6**	*0.19*	0.05	*0.02*
Mozambique, Beira (2014–2017)	2	**0.2**	*0.14*	0.01	*0.01*	0	-	-	–	-
Mozambique, Maputo (2015–2017)	12	**1.0**	*0.31*	0.12	*0.05*	13	**0.9**	*0.26*	0.07	*0.03*
Seychelles (2013–2017)	5	**2.0**	*0.93*	0.10	*0.06*	2	**0.6**	*0.45*	0.07	*0.07*
Tanzania, Mwanza [two districts] (2016–2017)	2	**1.0**	*0.69*	0.24	*0.17*	0	-	-	–	-
Uganda, Gulu (2013–2015)	2	**0.2**	*0.16*	0.02	*0.01*	3	**0.5**	*0.27*	0.05	*0.05*
Uganda, Kampala (2011–2013)	27	**1.2**	*0.34*	0.13	*0.06*	21	**1.0**	*0.30*	0.11	*0.05*
Zambia, Lusaka (2011–2015)	6	**0.1**	*0.04*	0.00	*0.00*	3	**0.0**	*0.03*	0.00	*0.00*
Zimbabwe, Bulawayo: Black (2013–2015)	11	**1.0**	*0.30*	0.06	*0.02*	8	**0.9**	*0.34*	0.06	*0.03*
Zimbabwe, Harare: Black (2013–2015)	20	**1.0**	*0.27*	0.06	*0.02*	13	**0.8**	*0.26*	0.05	*0.03*
Africa, southern										
*Eswatini (2016–2017)	0	-	-	–	-	0	-	-	–	-
Namibia (2013–2015)	41	**1.5**	*0.26*	0.14	*0.04*	22	**0.8**	*0.17*	0.08	*0.03*
South Africa (2010–2014)	849	**0.8**	*0.03*	0.08	*0.00*	558	**0.5**	*0.02*	0.04	*0.00*
South Africa: Black (2010–2013)	325	**0.5**	*0.03*	0.05	*0.00*	221	**0.3**	*0.02*	0.03	*0.00*
South Africa: White (2010–2013)	222	**2.1**	*0.16*	0.18	*0.01*	148	**1.4**	*0.14*	0.11	*0.01*
South Africa, Eastern Cape (2013–2016)	1	**0.1**	*0.05*	–	-	3	**0.1**	*0.07*	0.01	*0.01*
Africa, western										
Benin, Cotonou (2014–2016)	13	**2.7**	*0.83*	0.16	*0.09*	7	**1.2**	*0.46*	0.16	*0.06*
Côte d´Ivoire, Abidjan (2014–2015)	10	**0.3**	*0.11*	0.03	*0.01*	7	**0.2**	*0.08*	0.02	*0.01*
Mali, Bamako (2015–2017)	2	**0.0**	*0.03*	0.00	*0.00*	4	**0.1**	*0.09*	0.01	*0.01*
*Nigeria, Abuja (2013–2016)	4	**0.4**	*0.25*	0.06	*0.04*	3	**0.2**	*0.17*	0.02	*0.02*
Nigeria, Calabar (2016–2017)	1	**0.5**	*0.50*	–	-	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	0	-	-	–	-	1	**0.1**	*0.06*	0.00	*0.00*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Leukaemia (C91-95)

	Males				Females			
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	47	**3.3**	*0.55*	0.40	*0.08*	34	**1.9**	*0.38*	0.23	*0.06*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	233	**6.0**	*0.43*	0.56	*0.05*	184	**4.5**	*0.37*	0.46	*0.05*
France, Réunion (2011–2013)	111	**8.1**	*0.78*	0.78	*0.10*	81	**5.2**	*0.61*	0.47	*0.07*
*Kenya, Eldoret (2012–2016)	77	**4.3**	*0.58*	0.41	*0.07*	70	**4.5**	*0.62*	0.49	*0.09*
Kenya, Nairobi (2012–2014)	167	**5.1**	*0.54*	0.48	*0.07*	125	**4.3**	*0.51*	0.39	*0.07*
Mauritius (2013–2015)	105	**5.5**	*0.57*	0.49	*0.06*	76	**4.0**	*0.51*	0.34	*0.04*
Mozambique, Beira (2014–2017)	3	**0.3**	*0.16*	0.01	*0.01*	4	**0.7**	*0.37*	0.06	*0.04*
Mozambique, Maputo (2015–2017)	27	**1.9**	*0.41*	0.18	*0.06*	30	**2.2**	*0.42*	0.19	*0.04*
Seychelles (2013–2017)	16	**6.9**	*1.78*	0.68	*0.23*	13	**4.4**	*1.33*	0.35	*0.13*
Tanzania, Mwanza [two districts] (2016–2017)	9	**2.2**	*0.95*	0.38	*0.20*	2	**0.2**	*0.15*	0.01	*0.01*
Uganda, Gulu (2013–2015)	15	**1.9**	*0.58*	0.22	*0.09*	14	**1.9**	*0.56*	0.18	*0.08*
Uganda, Kampala (2011–2013)	76	**3.0**	*0.49*	0.27	*0.07*	56	**2.5**	*0.45*	0.25	*0.06*
Zambia, Lusaka (2011–2015)	48	**0.8**	*0.15*	0.06	*0.02*	19	**0.5**	*0.16*	0.05	*0.03*
Zimbabwe, Bulawayo: Black (2013–2015)	25	**2.8**	*0.61*	0.21	*0.06*	26	**3.1**	*0.67*	0.25	*0.08*
Zimbabwe, Harare: Black (2013–2015)	64	**3.6**	*0.55*	0.31	*0.08*	48	**2.9**	*0.50*	0.24	*0.06*
Africa, southern										
*Eswatini (2016–2017)	4	**0.6**	*0.30*	0.08	*0.05*	3	**0.2**	*0.13*	0.01	*0.01*
Namibia (2013–2015)	89	**3.5**	*0.40*	0.33	*0.05*	68	**2.4**	*0.31*	0.26	*0.04*
South Africa (2010–2014)	1903	**1.9**	*0.04*	0.18	*0.01*	1406	**1.1**	*0.03*	0.10	*0.00*
South Africa: Black (2010–2013)	772	**1.2**	*0.05*	0.11	*0.01*	594	**0.8**	*0.03*	0.07	*0.00*
South Africa: White (2010–2013)	484	**4.4**	*0.22*	0.40	*0.02*	330	**2.9**	*0.19*	0.25	*0.02*
South Africa, Eastern Cape (2013–2016)	8	**0.4**	*0.14*	0.03	*0.02*	8	**0.3**	*0.10*	0.02	*0.01*
Africa, western										
Benin, Cotonou (2014–2016)	33	**5.0**	*1.03*	0.41	*0.13*	27	**3.3**	*0.69*	0.38	*0.09*
Côte d´Ivoire, Abidjan (2014–2015)	62	**2.0**	*0.31*	0.22	*0.05*	36	**1.0**	*0.21*	0.07	*0.02*
Mali, Bamako (2015–2017)	12	**0.3**	*0.10*	0.02	*0.01*	15	**0.5**	*0.14*	0.04	*0.01*
*Nigeria, Abuja (2013–2016)	18	**0.8**	*0.28*	0.09	*0.04*	14	**1.2**	*0.49*	0.16	*0.08*
Nigeria, Calabar (2016–2017)	3	**1.9**	*1.14*	0.15	*0.15*	2	**0.6**	*0.46*	0.05	*0.04*
*Nigeria, Ekiti (2013–2017)	11	**0.9**	*0.29*	0.09	*0.04*	6	**0.4**	*0.18*	0.03	*0.02*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Myeloid leukaemia (C92-94)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	23	**1.5**	*0.36*	0.18	*0.05*	12	**0.6**	*0.20*	0.07	*0.03*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	139	**3.5**	*0.33*	0.32	*0.04*	112	**2.7**	*0.28*	0.28	*0.04*
France, Réunion (2011–2013)	68	**4.7**	*0.58*	0.44	*0.07*	51	**3.1**	*0.45*	0.29	*0.05*
*Kenya, Eldoret (2012–2016)	36	**1.9**	*0.36*	0.17	*0.04*	39	**2.3**	*0.42*	0.23	*0.06*
Kenya, Nairobi (2012–2014)	87	**2.4**	*0.36*	0.23	*0.05*	66	**2.3**	*0.38*	0.22	*0.05*
Mauritius (2013–2015)	51	**2.4**	*0.34*	0.26	*0.05*	41	**1.9**	*0.30*	0.19	*0.03*
Mozambique, Beira (2014–2017)	0	-	-	–	-	3	**0.6**	*0.36*	0.05	*0.03*
Mozambique, Maputo (2015–2017)	8	**0.5**	*0.19*	0.02	*0.01*	7	**0.5**	*0.20*	0.04	*0.02*
Seychelles (2013–2017)	9	**3.9**	*1.33*	0.55	*0.22*	5	**1.4**	*0.67*	0.12	*0.08*
Tanzania, Mwanza [two districts] (2016–2017)	4	**1.0**	*0.63*	0.12	*0.10*	2	**0.2**	*0.15*	0.01	*0.01*
Uganda, Gulu (2013–2015)	5	**1.0**	*0.49*	0.15	*0.09*	2	**0.3**	*0.18*	0.02	*0.02*
Uganda, Kampala (2011–2013)	26	**0.9**	*0.25*	0.08	*0.02*	23	**0.9**	*0.24*	0.09	*0.04*
Zambia, Lusaka (2011–2015)	7	**0.1**	*0.04*	0.01	*0.00*	3	**0.0**	*0.03*	0.00	*0.00*
Zimbabwe, Bulawayo: Black (2013–2015)	12	**1.5**	*0.47*	0.14	*0.05*	12	**1.4**	*0.45*	0.13	*0.06*
Zimbabwe, Harare: Black (2013–2015)	31	**1.8**	*0.40*	0.18	*0.06*	25	**1.4**	*0.33*	0.10	*0.03*
Africa, southern										
*Eswatini (2016–2017)	0	-	-	–	-	1	**0.1**	*0.07*	0.00	*0.00*
Namibia (2013–2015)	43	**1.8**	*0.29*	0.16	*0.03*	43	**1.6**	*0.25*	0.17	*0.03*
South Africa (2010–2014)	925	**0.9**	*0.03*	0.09	*0.00*	768	**0.6**	*0.02*	0.06	*0.00*
South Africa: Black (2010–2013)	392	**0.6**	*0.03*	0.06	*0.00*	332	**0.4**	*0.02*	0.04	*0.00*
South Africa: White (2010–2013)	225	**1.9**	*0.14*	0.19	*0.01*	159	**1.3**	*0.12*	0.12	*0.01*
South Africa, Eastern Cape (2013–2016)	1	**0.1**	*0.07*	0.02	*0.02*	0	-	-	–	-
Africa, western										
Benin, Cotonou (2014–2016)	18	**2.1**	*0.56*	0.23	*0.09*	18	**2.0**	*0.51*	0.21	*0.07*
Côte d´Ivoire, Abidjan (2014–2015)	25	**0.8**	*0.19*	0.09	*0.03*	8	**0.3**	*0.13*	0.02	*0.01*
Mali, Bamako (2015–2017)	8	**0.2**	*0.09*	0.02	*0.01*	11	**0.3**	*0.11*	0.02	*0.01*
*Nigeria, Abuja (2013–2016)	13	**0.3**	*0.11*	0.03	*0.01*	10	**0.9**	*0.46*	0.13	*0.07*
Nigeria, Calabar (2016–2017)	0	-	-	–	-	1	**0.4**	*0.43*	0.04	*0.04*
*Nigeria, Ekiti (2013–2017)	11	**0.9**	*0.29*	0.09	*0.04*	5	**0.4**	*0.17*	0.03	*0.02*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Leukaemia, unspecified (C95)

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	24	**1.8**	*0.41*	0.22	*0.06*	18	**1.1**	*0.30*	0.13	*0.04*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	5	**0.1**	*0.07*	0.02	*0.01*	5	**0.1**	*0.07*	0.02	*0.01*
France, Réunion (2011–2013)	0	-	-	–	-	2	**0.1**	*0.08*	0.01	*0.01*
*Kenya, Eldoret (2012–2016)	5	**0.3**	*0.19*	0.05	*0.03*	4	**0.3**	*0.13*	0.01	*0.01*
Kenya, Nairobi (2012–2014)	17	**0.4**	*0.12*	0.04	*0.02*	12	**0.3**	*0.09*	0.01	*0.00*
Mauritius (2013–2015)	37	**2.2**	*0.39*	0.15	*0.03*	24	**1.6**	*0.37*	0.09	*0.02*
Mozambique, Beira (2014–2017)	1	**0.1**	*0.08*	0.00	*0.00*	1	**0.1**	*0.09*	0.00	*0.00*
Mozambique, Maputo (2015–2017)	7	**0.5**	*0.18*	0.04	*0.02*	10	**0.8**	*0.27*	0.07	*0.03*
Seychelles (2013–2017)	2	**1.0**	*0.73*	0.03	*0.03*	6	**2.4**	*1.06*	0.16	*0.07*
Tanzania, Mwanza [two districts] (2016–2017)	3	**0.3**	*0.17*	0.02	*0.01*	0	-	-	–	-
Uganda, Gulu (2013–2015)	8	**0.7**	*0.28*	0.05	*0.02*	9	**1.1**	*0.46*	0.11	*0.06*
Uganda, Kampala (2011–2013)	23	**0.9**	*0.24*	0.06	*0.02*	12	**0.6**	*0.22*	0.05	*0.02*
Zambia, Lusaka (2011–2015)	35	**0.7**	*0.14*	0.05	*0.02*	13	**0.4**	*0.15*	0.04	*0.03*
Zimbabwe, Bulawayo: Black (2013–2015)	2	**0.3**	*0.25*	0.01	*0.01*	6	**0.8**	*0.35*	0.06	*0.03*
Zimbabwe, Harare: Black (2013–2015)	13	**0.7**	*0.26*	0.07	*0.04*	10	**0.7**	*0.28*	0.09	*0.05*
Africa, southern										
*Eswatini (2016–2017)	4	**0.6**	*0.30*	0.08	*0.05*	2	**0.2**	*0.11*	0.01	*0.01*
Namibia (2013–2015)	5	**0.2**	*0.10*	0.03	*0.02*	3	**0.1**	*0.04*	0.00	*0.00*
South Africa (2010–2014)	129	**0.1**	*0.01*	0.01	*0.00*	80	**0.1**	*0.01*	0.01	*0.00*
South Africa: Black (2010–2013)	55	**0.1**	*0.01*	0.01	*0.00*	41	**0.1**	*0.01*	0.01	*0.00*
South Africa: White (2010–2013)	37	**0.3**	*0.06*	0.03	*0.01*	23	**0.2**	*0.05*	0.02	*0.00*
South Africa, Eastern Cape (2013–2016)	6	**0.3**	*0.11*	0.02	*0.01*	5	**0.2**	*0.08*	0.01	*0.00*
Africa, western										
Benin, Cotonou (2014–2016)	2	**0.3**	*0.21*	0.03	*0.02*	2	**0.2**	*0.12*	0.01	*0.01*
Côte d´Ivoire, Abidjan (2014–2015)	27	**0.9**	*0.22*	0.10	*0.03*	21	**0.6**	*0.15*	0.04	*0.01*
Mali, Bamako (2015–2017)	2	**0.0**	*0.03*	0.00	*0.00*	0	-	-	–	-
*Nigeria, Abuja (2013–2016)	1	**0.0**	*0.03*	0.00	*0.00*	1	**0.0**	*0.05*	0.00	*0.00*
Nigeria, Calabar (2016–2017)	2	**1.4**	*1.02*	0.15	*0.15*	1	**0.2**	*0.18*	0.01	*0.01*
*Nigeria, Ekiti (2013–2017)	0	-	-	–	-	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Conjunctiva: squamous cell carcinoma*

	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014–2016)	1	**0.0**	*0.03*	0.00	*0.00*	2	**0.1**	*0.09*	0.01	*0.01*
Africa, eastern										
*Ethiopia, Addis Ababa (2014–2016)	16	**0.5**	*0.13*	0.05	*0.02*	10	**0.2**	*0.08*	0.03	*0.02*
France, Réunion (2011–2013)	3	**0.2**	*0.10*	0.01	*0.01*	1	**0.1**	*0.06*	0.01	*0.01*
*Kenya, Eldoret (2012–2016)	1	**0.1**	*0.05*	0.00	*0.00*	3	**0.2**	*0.13*	0.02	*0.01*
Kenya, Nairobi (2012–2014)	16	**0.5**	*0.16*	0.04	*0.02*	13	**0.3**	*0.10*	0.03	*0.01*
Mauritius (2013–2015)	0	-	-	–	-	0	-	-	–	-
Mozambique, Beira (2014–2017)	52	**6.8**	*1.03*	0.63	*0.11*	56	**7.4**	*1.10*	0.66	*0.11*
Mozambique, Maputo (2015–2017)	24	**1.9**	*0.40*	0.19	*0.05*	54	**3.6**	*0.51*	0.33	*0.05*
Seychelles (2013–2017)	0	-	-	–	-	0	-	-	–	-
Tanzania, Mwanza [two districts] (2016–2017)	5	**1.5**	*0.74*	0.17	*0.11*	6	**1.3**	*0.60*	0.12	*0.06*
Uganda, Gulu (2013–2015)	12	**1.6**	*0.48*	0.13	*0.04*	8	**1.1**	*0.42*	0.10	*0.04*
Uganda, Kampala (2011–2013)	38	**1.8**	*0.36*	0.15	*0.04*	41	**1.4**	*0.27*	0.12	*0.03*
Zambia, Lusaka (2011–2015)	77	**2.8**	*0.41*	0.33	*0.06*	78	**2.4**	*0.34*	0.24	*0.04*
Zimbabwe, Bulawayo: Black (2013–2015)	30	**3.8**	*0.76*	0.36	*0.08*	31	**3.7**	*0.73*	0.35	*0.08*
Zimbabwe, Harare: Black (2013–2015)	41	**2.8**	*0.51*	0.30	*0.08*	29	**1.8**	*0.37*	0.19	*0.05*
Africa, southern										
*Eswatini (2016–2017)	20	**3.0**	*0.71*	0.37	*0.10*	11	**1.2**	*0.39*	0.15	*0.06*
Namibia (2013–2015)	84	**3.5**	*0.40*	0.34	*0.05*	89	**3.1**	*0.35*	0.29	*0.04*
South Africa (2010–2014)	1243	**1.0**	*0.03*	0.10	*0.00*	1690	**1.2**	*0.03*	0.10	*0.00*
South Africa: Black (2010–2013)	864	**1.2**	*0.05*	0.12	*0.00*	1240	**1.5**	*0.04*	0.13	*0.00*
South Africa: White (2010–2013)	58	**0.5**	*0.06*	0.04	*0.01*	42	**0.4**	*0.06*	0.03	*0.01*
South Africa, Eastern Cape (2013–2016)	16	**1.2**	*0.33*	0.11	*0.03*	16	**0.8**	*0.21*	0.08	*0.02*
Africa, western										
Benin, Cotonou (2014–2016)	0	-	-	–	-	2	**0.1**	*0.09*	0.01	*0.01*
Côte d´Ivoire, Abidjan (2014–2015)	5	**0.2**	*0.12*	0.01	*0.01*	15	**0.7**	*0.20*	0.06	*0.02*
Mali, Bamako (2015–2017)	21	**0.9**	*0.22*	0.10	*0.04*	21	**0.8**	*0.20*	0.07	*0.02*
*Nigeria, Abuja (2013–2016)	5	**0.4**	*0.23*	0.05	*0.04*	4	**0.1**	*0.04*	0.01	*0.00*
Nigeria, Calabar (2016–2017)	0	-	-	–	-	0	-	-	–	-
*Nigeria, Ekiti (2013–2017)	0	-	-	–	-	0	-	-	–	-

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

*Includes malignant neoplasm of conjunctiva (C69.0) with unspecified histology or carcinoma NOS (M8000-8034) and squamous cell carcinoma (M8070) of eye NOS (C69.9).

Number of cases, world age-standardized incidence rate (and standard error), and cumulative incidence rate (and standard error), by registry population and sex

Other and unspecified (O&U)

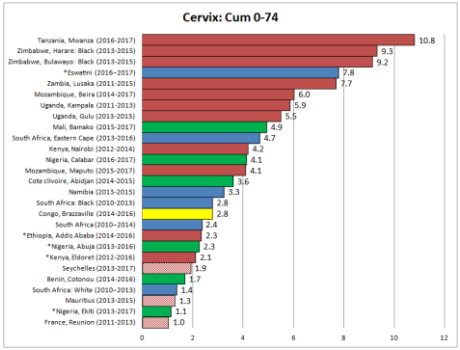
	Males					Females				
	Cases	ASR (W)		CUM%		Cases	ASR (W)		CUM%	
Africa, central										
Congo, Brazzaville (2014−2016)	2	**0.1**	*0.10*	0.01	*0.01*	6	**0.4**	*0.19*	0.05	*0.03*
Africa, eastern										
*Ethiopia, Addis Ababa (2014−2016)	113	**3.3**	*0.34*	0.38	*0.05*	153	**4.2**	*0.37*	0.46	*0.05*
France, Réunion (2011−2013)	123	**8.5**	*0.78*	0.97	*0.11*	110	**5.7**	*0.57*	0.60	*0.08*
*Kenya, Eldoret (2012−2016)	37	**2.9**	*0.52*	0.34	*0.07*	34	**2.8**	*0.52*	0.34	*0.08*
Kenya, Nairobi (2012−2014)	112	**5.4**	*0.64*	0.67	*0.11*	106	**5.4**	*0.63*	0.64	*0.10*
Mauritius (2013−2015)	316	**14.6**	*0.85*	1.68	*0.12*	292	**11.6**	*0.71*	1.32	*0.09*
Mozambique, Beira (2014−2017)	47	**9.0**	*1.50*	1.01	*0.21*	38	**6.0**	*1.10*	0.51	*0.13*
Mozambique, Maputo (2015−2017)	58	**5.4**	*0.76*	0.60	*0.10*	62	**5.1**	*0.69*	0.57	*0.10*
Seychelles (2013−2017)	35	**13.1**	*2.24*	1.58	*0.33*	25	**6.8**	*1.45*	0.65	*0.21*
Tanzania, Mwanza [two districts] (2016−2017)	33	**9.1**	*1.90*	1.13	*0.30*	28	**9.9**	*2.15*	1.07	*0.30*
Uganda, Gulu (2013−2015)	39	**7.3**	*1.36*	0.81	*0.19*	14	**1.8**	*0.56*	0.14	*0.06*
Uganda, Kampala (2011−2013)	88	**5.8**	*0.78*	0.60	*0.11*	98	**6.4**	*0.81*	0.72	*0.11*
Zambia, Lusaka (2011−2015)	85	**3.9**	*0.53*	0.48	*0.09*	81	**3.5**	*0.49*	0.38	*0.07*
Zimbabwe, Bulawayo: Black (2013−2015)	49	**9.6**	*1.46*	1.05	*0.21*	71	**11.8**	*1.48*	1.38	*0.22*
Zimbabwe, Harare: Black (2013−2015)	160	**16.3**	*1.44*	1.84	*0.22*	148	**13.6**	*1.24*	1.60	*0.19*
Africa, southern										
*Eswatini (2016−2017)	26	**3.9**	*0.82*	0.41	*0.10*	29	**3.1**	*0.63*	0.34	*0.09*
Namibia (2013−2015)	230	**11.3**	*0.79*	1.26	*0.11*	236	**9.2**	*0.63*	1.03	*0.09*
South Africa (2010−2014)	9401	**10.5**	*0.11*	1.24	*0.02*	9325	**7.8**	*0.08*	0.90	*0.01*
South Africa: Black (2010−2013)	3894	**8.3**	*0.14*	0.98	*0.02*	4047	**6.1**	*0.10*	0.70	*0.01*
South Africa: White (2010−2013)	1964	**14.3**	*0.33*	1.65	*0.04*	1923	**11.7**	*0.28*	1.36	*0.04*
South Africa, Eastern Cape (2013−2016)	57	**4.1**	*0.56*	0.51	*0.08*	62	**2.6**	*0.35*	0.29	*0.04*
Africa, western										
Benin, Cotonou (2014−2016)	16	**2.6**	*0.72*	0.20	*0.07*	23	**2.5**	*0.57*	0.25	*0.07*
Côte d´Ivoire, Abidjan (2014−2015)	154	**6.3**	*0.60*	0.80	*0.10*	141	**7.4**	*0.74*	0.87	*0.12*
Mali, Bamako (2015−2017)	260	**12.5**	*0.87*	1.50	*0.13*	285	**14.5**	*0.95*	1.62	*0.13*
*Nigeria, Abuja (2013−2016)	31	**1.7**	*0.44*	0.24	*0.09*	28	**2.4**	*0.62*	0.31	*0.10*
Nigeria, Calabar (2016−2017)	8	**2.8**	*1.18*	0.27	*0.16*	10	**4.3**	*1.75*	0.55	*0.27*
*Nigeria, Ekiti (2013−2017)	45	**4.9**	*0.79*	0.56	*0.11*	35	**3.7**	*0.69*	0.44	*0.11*

ASR(W), world age-standardized incidence rate, expressed as cases per 100 000 person-years; CUM%, cumulative incidence rate up to and including the age of 74 years, expressed as a percentage.

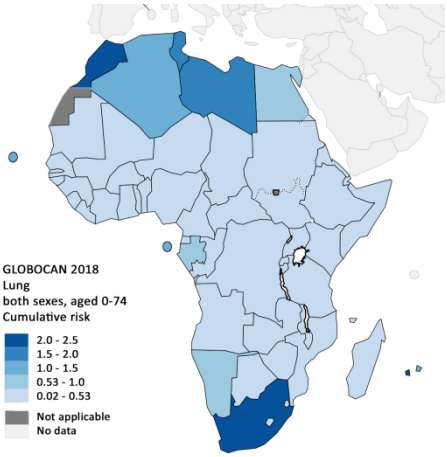
CHAPTER 7
Discussion of results by cancer

In this section, we review the results presented in Chapters 6, for the 13 most common cancers diagnosed in sub-Saharan Africa.

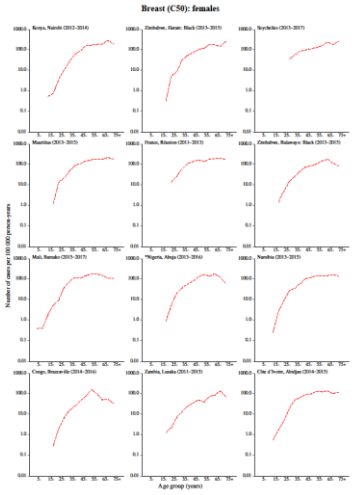
The cumulative incidence bar charts: these show the cumulative incidence rates (%) ages 0-74 in the form of bar charts, for males and for females (Fig. 7.01). The bars are coded by region, with green for cancer registries in Western Africa, yellow for the registry (Brazzaville) in Central Africa, blue for those in Southern Africa, and red for those in Eastern Africa (with hatching to separate the 3 Indian Ocean island populations: Mauritius, Reunion and Seychelles). For registries with so few cases of a specific cancer that the 95% confidence interval of the rate includes 0, the corresponding bars are omitted from the chart.



Maps of the cumulative risk (%): These show the cumulative risk of the cancer, ages 0-74 (%), by country, for both sexes combined, for the whole of Africa. The rates shown are taken from the national estimates of incidence in Globocan 2018 (Ferlay et al., 2018). The maps shown are created via IARC's Global Cancer Observatory, Cancer Today (http://gco.iarc.fr/today/online-analysis-map).



Age-specific incidence graphs: These show the age-specific incidence rates for each registry (cases per 100,000 person-years), with blue solid lines for rates in males, red dashed lines for those in females. Of the 25 registries for which incidence rates were calculated, only Calabar is excluded, because of the low number of cases (and consequent unstable estimates of age specific rates).



For each cancer, there is a brief discussion of the observations in these 3 figures, including some pertinent references relating to the reasons for observed differences, and some notes on the possible future evolution of the cancer in Africa, and relevant prevention strategies.

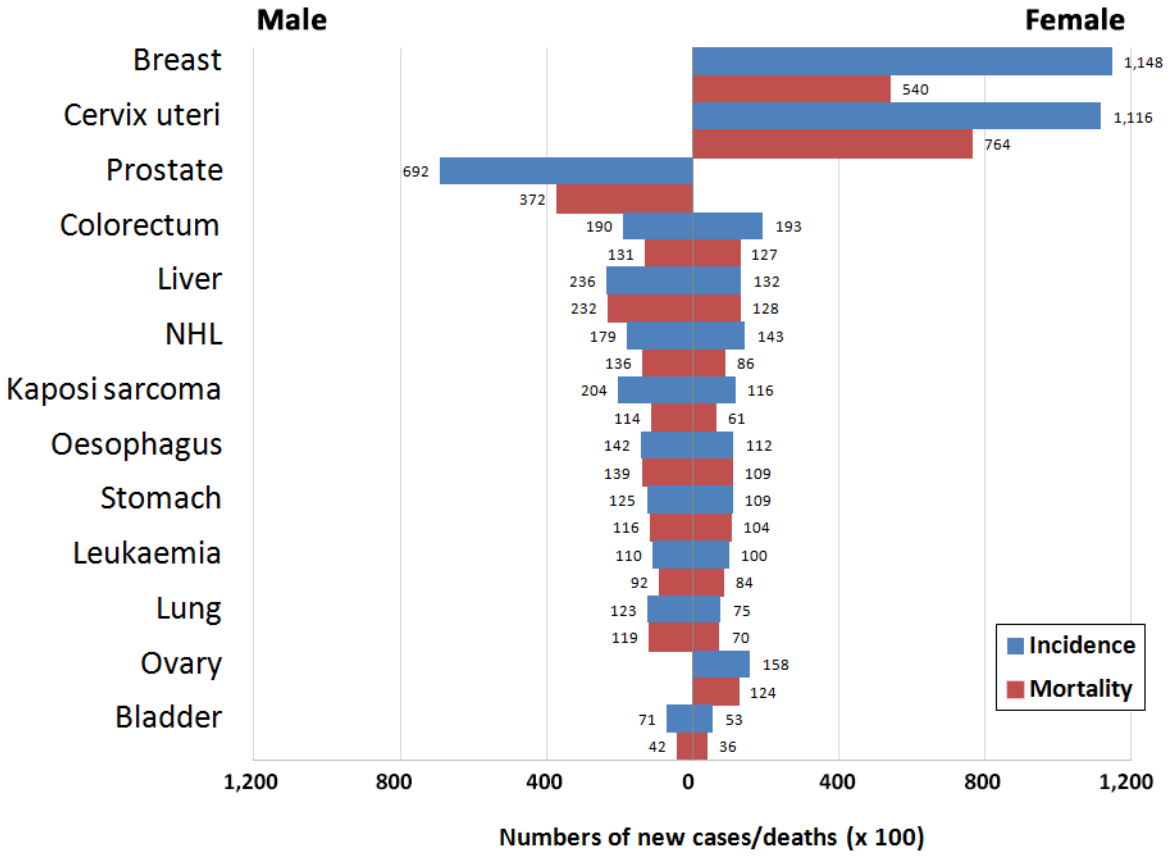


Fig. 7.01 The 13 most common cancers in sub-Saharan Africa: numbers of cases and deaths in 2018, by sex

Cancer of the breast

Breast cancer was the most commonly diagnosed cancer in Africa in 2018 with approximately 168,690 new cases. It is the second leading cause of cancer deaths after cervical cancer, responsible for approximately 74,072 deaths in 2018 (Ferlay et al., 2018). Breast cancer is the leading cause of cancer in women in 30 of the 54 African countries (Fig. 7.03).

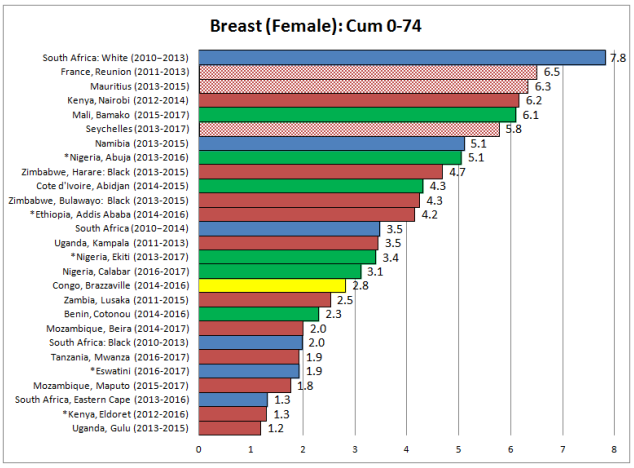


Fig. 7.02 Cumulative incidence 0-74 (%) of the cancer of the breast among females in sub-Saharan Africa, by registry population

Breast cancer incidence rates in Africa are relatively low compared to high income countries; 6 countries report cumulative rates of more than 6% in females (Fig. 7.04), in contrast to an 11.3% life-time risk of developing breast cancer in 2014-2016 among US black women (SEER 2019). There are

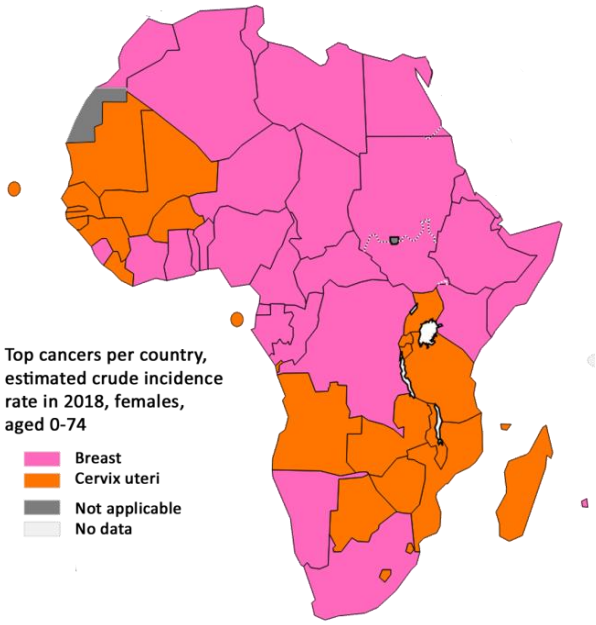


Fig. 7.03 The most common cancers in women, by country

no clearly defined geographical patterns of incidence, with varied rates across the continent as reported in Globocan 2018 (Fig. 7.04). However, the national territories with the highest incidence rates in are in the Northern and Southern extremes of the continent (Algeria, Egypt, Morocco, and South Africa) as well as the island nations of Mauritius, Seychelles and Reunion. Apart from these countries, sub-nationally, areas with cumulative risks greater than 5% include Nairobi (Kenya), Mali (Bamako) and Abuja (Nigeria). In contrast, the lowest incidence rates are recorded in Gulu (Uganda), Eldoret (Kenya) and in the rural Eastern Cape Region of South Africa (Fig. 7.01).

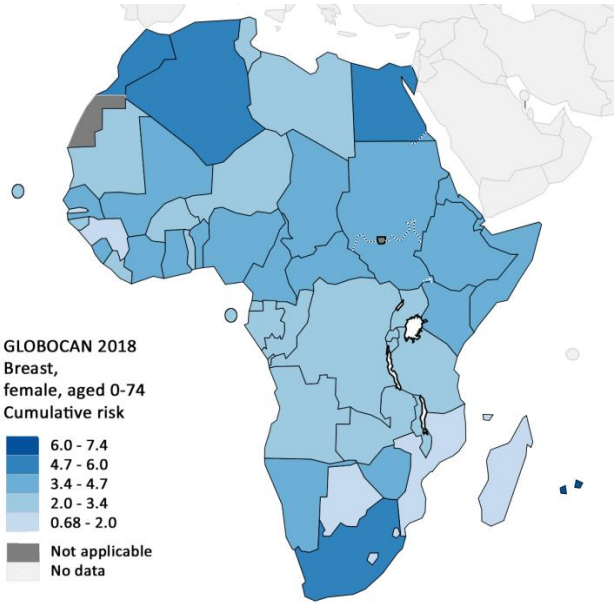


Fig. 7.04 Map of cumulative risk 0-74 (%) of cancer of the breast among females in Africa, by country

The age-specific incidence rates in contributing population-based cancer registries are presented in Fig. 7.05. In this cross-sectional graphic, we observe a steep increase in age-specific incidence rates till about age 45, after which there is a flattening of the curve and in some cases a decline in older age groups. This most likely reflects a generational effect, with increasing breast cancer risk in younger generations of women compared to the older generations at similar ages. Reports from population-based registries in Africa suggest rapid increases in incidence rates, with rates of 3.6% per year reported in Uganda, Kampala (Wabinga et al., 2014) and 4.9% per year among black African women in Harare (Zimbabwe) (Chokunonga et al., 2013). In the Eastern Cape Region of South Africa, which is predominantly rural, there was a 1.6-fold increase in the breast cancer standardised rate ratio from 1998 to 2012, although the absolute rates remained relatively low (Somdyala et al., 2015). These changes are most marked in post-menopausal women,

and are most likely associated with declining fertility in successive generations of African women (Corbex et al., 2014), and changing lifestyles with respect to, for example, increasing overweight/obesity, declining levels of physical activity, reduced prevalence and duration of breast feeding and, possibly, increasing alcohol consumption. The roles of these risk factors in sub-Saharan Africa are discussed in more detail below.

The young age structure of African populations coupled with the rather flat cross-sectional age-specific incidence curve in post-menopausal age groups (Fig. 7.05) means that the average age at diagnosis in Africa is lower than in populations in North America and Europe. However, black females in the USA do have a slightly higher incidence of breast cancer at young ages (<45 years) than white females (DeSantis et al., 2016a).

Stage & Survival

In Africa, tumour stage at presentation is generally advanced, with about 70% of patients presenting at stages III and IV (Islami et al., 2015; Jedy-Agba et al., 2016). Of patients with known stage, approximately 18.7% present with distant metastases on a population-level, however, this may be an underestimation as a result of limitations in access to diagnostic tools such as ultrasound, X-rays and CT-scans (Joko-Fru et al., 2019). An association between tumour stage and distance to health service has been shown (Dickens et al., 2014). Other reasons for late presentation include mostly modifiable factors such as poor patient awareness, low level of education, poorer socio-economic status and health system inefficiencies (Akuoko et al., 2017; Jedy-Agba et al., 2017; Espina et al., 2017; Joffe et al., 2018). This delayed presentation has detrimental effects on survival. The overall relative survival (RS) from breast cancer from 14 SSA population-based registries was estimated at 86.1% (84.4–87.6) at Year 1, 65.8% (63.5–68.1) at Year 3 and 59.0% (56.3–61.6) at Year 5. Survival was influenced by stage at diagnosis and country-level human-development index, a proxy for access to care (Joko-Fru et al., 2019). In rural Ethiopia, overall survival at 1 and 2 years after diagnosis was poorer than observed in urban Addis Ababa (Kantelhardt et al., 2014b; Eber-Schulz et al., 2018); equally related to differences in access to quality care. In Uganda, survival was poorest for patients with triple negative breast cancer and HER-2 enriched tumours after adjusting for the stage at diagnosis (Galukande et al., 2015). Preliminary results from the Zambian cohort of the African Breast Cancer – Disparities in Outcome study report increased mortality risk with age > 70 and advanced stage at diagnosis (Pinder et al., 2019). In Soweto, South Africa, survival from breast cancer was associated with stage, triple negative and HER-2 enriched tumours but not with age nor HIV status (Cubasch et al., 2018). In the USA, there are extensive data on breast-cancer incidence, mortality, and survival by ethnicity, the 5-year survival for breast cancer among African-American women from 2005-2011 was 80% compared to 91% in whites. These data show that black females are diagnosed with later-stage disease and have poorer survival (even within stage groups) than whites (DeSantis et al., 2016b).

Biology

Differences in the biology of breast carcinomas between black and white females have been sought to explain these findings. There is little or no evidence for differences in histopathological type (Middleton et al., 2003), but tumours in black Americans are more likely to be of higher grade and estrogen receptor (ER) negative than is observed among white Americans (DeSantis et al., 2016b; Newman and Kaljee, 2017) and the same is true in the black population of the United Kingdom (Bowen et al., 2008). The molecular features of breast cancer tumours in Nigerian women comparative to Americans of European ancestry are indicative of poor prognosis disease phenotypes (Pitt et al., 2018). These aggressive clinical features such as triple negative and inflammatory disease have frequently been documented in clinical series from Africa. Case series from several centres in Africa have reported that hormone receptor negative cases are predominant. However, in a meta-analysis, Eng et al. (2014) found that, in prospectively collected specimens, the pooled proportions for ER+ and triple negative tumours were 0.59 (0.56-0.62) and 0.21 (0.17-0.25), respectively (Eng et al., 2014). However, they noted the low methodological quality of many studies in terms of the representativeness of the case series and the quality of the procedures for collection, fixation, and receptor testing, which undoubtedly influenced many of the results. In a consecutively recruited series involving 678 women from Sudan and Eritrea, 54% of patients were ER- and this ER negativity was associated with younger age at diagnosis and grade III tumours; with 1 in 3 women presenting with triple negative breast cancer (TNBC) (Sengal et al., 2017). Other recent studies from the Eastern African region, report a lower proportion of ER negative disease (Kantelhardt et al., 2014a; Sayed et al., 2014; Hadgu et al., 2018). Studies comparing African American (AA), White American (WA) to West or East African born women, report a higher proportion of ER- and TNBC in AA and West -African born women compared with Eastern-African born women (Jiagge et al., 2016; Sung et al., 2019). This possibility of geographical differences in molecular sub-types across Africa could have implications for therapy recommendations in the absence of routine immunohistochemistry; however larger prospective comparative studies in Africa will be needed for improved study precision.

Risk Factors

Breast cancer incidence rates among women in sub-Saharan Africa are approximately 4-times lower than rates observed in more developed countries. Likewise, the incidence in white females living in Africa is much higher than in black females; in South Africa in 2009, the age-standardized incidence rate in blacks was 18.7 compared to 51.2 per 100,000 whites (Singh et al., 2016); however, the risk differential is decreasing in Africans

and African-Americans, reflecting the rising incidence rates in the black population (Chokunonga et al., 2016; DeSantis et al., 2016a).

Breast cancer aetiology is complex, with several contributing factors, however, the influence of oestrogens on breast cancer pathogenesis is probably similar across different regions of the world (Key et al., 2001), the variability in the magnitude of these rates could be related to different risk factor profiles as well as the influence of population aging.

Family history has been shown to be a marker of breast cancer risk in the African setting (Rosenburg et al., 2002; Okobia et al., 2006). Part of this risk is mediated by the major susceptibility genes *BRCA1* and *BRCA2* (about 2% of breast-cancer cases in Europe), but although several distinct mutations in these genes have been identified in black people in the USA, very little is known of the prevalence of these mutations in African populations (Oluwagbemiga et al., 2012; Zouré et al., 2018). Among women with a family history of breast cancer in Ghana, 61.7% had mutations in the *BRCA* gene (Amankwaa-Frempong et al., 2017). Abbad and colleagues (2018) reported that fewer than ten African countries have had studies on genetic risk factors for breast cancer; most of these studies are in populations from Northern Africa, the Republic of South Africa and Nigeria. Due to the great genetic diversity throughout the continent (Gomez et al., 2014; Rotimi et al., 2017) evidence will remain limited until genetic testing is easily accessible in more African settings. In Ibadan, Nigeria, inherited genetic mutations in *BRCA1*, *BRCA2*, *PALB2* and *TP53* were detected in 1 out of every 8 women with breast cancer (12.5%); patients with *BRCA1* mutations often presented at younger ages and with triple negative disease (Zheng et al., 2018). Genome-wide association studies in women of African ancestry in the USA has suggested the possibility of some distinctive common variants associated with breast cancer as compared with European populations (Chen et al., 2013). Although these genetic associations are recognised, there is a complex interplay between genetic and environmental factors in the pathogenesis of breast cancer.

Breast-cancer risk is also related to menstrual and reproductive factors, high body-mass index (BMI), high alcohol consumption, low physical exercise levels, and exposure to exogenous hormones either as contraceptives or postmenopausal hormone replacement therapy. A recent review by Brinton et al. (2014) provides a useful summary of knowledge concerning the role of these risk factors on breast cancer risk in sub-Saharan Africa.

With respect to reproductive and hormonal factors, increases in risk are reported with advanced age at first pregnancy or delivery, low parity, and late age at menarche (Adebamowo and Adekunle 1999; Rosenberg et al., 2002; Huo et al., 2008). As in developed countries, body size (including height, body mass and waist–hip ratio) has been shown to relate to breast cancer risk in sub-Saharan Africa (Okobia et al., 2006; Ogundiran et al., 2010). Physical activity levels varies greatly across African countries and population subgroups; mostly this is related to work (including housework) and transport, while physical activity during leisure time appears to be rare (Guthold et al., 2011, 2018). Breast cancer risk (in both pre- and post-menopausal women) was significantly associated with reduced physical activity in a three-country (Cameroon, Nigeria, and Uganda) case control study (Hou et al., 2014). In Nigeria, post-menopausal breast cancer was the most common cancer attributable to overweight and obesity (Odutola et al., 2019). Demographic and Health Surveys (DHS), provide insights on the prevalence and changes in some of these risk factors over time at population level in Africa and these studies report rises in the prevalence of obesity and overweight across African populations (DHS, 2018).

Although most African women are lifetime abstainers, prevalence of alcohol drinking varies widely, and is in general increasing (Martinez et al., 2011). In the three-country study alluded to above, Qian et al. (2014) found a positive relationship between alcohol consumption and breast cancer risk, with a dose-response relationship observed for duration of alcohol drinking.

Concerning dietary factors, there has been shown to be an inverse association between the consumption of cruciferous vegetables on breast cancer incidence (Liu and Lv, 2013). Consumption of ≥ 35mg/day of soy proteins is associated with a 10% risk reduction in Chinese women (Trock et al., 2006). In Tanzania, diets with a low polyunsaturated to saturated fat ratios were associated with increased breast cancer risk (Jordan et al., 2013). In a population-based case control study in South Africa, consumption of fresh fruits and nuts were associated with a risk reduction, while there was increased risk with the consumption of energy-dense nutrient-poor foods (Jacobs et al., 2019). Across low- and middle-income settings, although there have been reductions in the burden of food insecurity this has been coupled with the increased availability of fast, calorie-rich and nutrient poor foods contributing to the rising non-communicable disease epidemic.

Breast feeding is thought to protect against breast cancer, and two-thirds of the difference in breast cancer incidence between developed and developing countries has been estimated to be attributed to breastfeeding (Collaborative Group on Hormonal Factors in Breast Cancer, 2002). Although some African studies have found no association (Coogan et al., 1999), a Nigerian study found that breast cancer risk decreased by 7% for every 12 months of breastfeeding (Huo et al., 2008). In Uganda and Ghana, studies have shown the protective association of breastfeeding on breast cancer incidence (Galukande et al., 2016; Figueroa et al., 2019).

As for most cancers, attempts have been made to link risk to HIV status. Grover et al. (2017) recently reviewed the HIV-Breast cancer literature in sub-Saharan Africa and the United States and concluded on the need for more prospective studies on this association. Hospital-based studies from RSA have shown similar rates of HIV positive cases among breast

cancer patients compared with the general population (Cubasch et al., 2013; Phakathi et al., 2016). However, women living with HIV have breast cancer at younger ages than HIV-negative women (Cubasch et al., 2013). In making global estimates of the number of new breast cancers among women living with HIV in 2012, McCormack and colleagues assumed a no HIV-breast cancer risk association, which was supported by the fact that, their estimated HIV-prevalence among women with breast cancer was similar to the prevalence rates in the sub-region. Although there is little evidence for a direct link between HIV infection and breast cancer incidence, further research is needed to investigate indirect pathways such as an altered distribution of breast cancer risk factors, e.g. the duration of breastfeeding, among women living with HIV (McCormack et al., 2018).

Brinton et al. (2014) speculate also upon the possible role of microbiomes, compromised immune states (due to infections, or exposure to chemicals such as insecticides), environmental oestrogens, and the widespread use of skin lighteners and hair relaxers by African women. In a case-control population-based study in Ghana, Brinton et al. (2018) report that there is at present, insufficient evidence for the use of skin lighteners as a risk factor in this setting, however, the use of hair relaxers requires further investigation given the greater odds of breast cancer with use of non-lye hair relaxers and the biological plausibility. As pertains to pesticides, 2,4-dichlorophenoxyacetic acid (DDT) is an endocrine disruptor and has been classed as a probable cause of cancer (Group 2A) by the International Agency for Research on Cancer (IARC). DDT is used in many sub-Saharan African countries for malaria control; although DDT is a relatively low-cost intervention, its possible long-term effects on human health should be weighted carefully (Sadasivaiah et al., 2007). DDT has been associated with a 3-fold increase in breast cancer risk in pre-menopausal breast cancer, when exposure occurs in-utero and before puberty (Cohn et al., 2019).

Early detection

Mammography screening is associated with a reduction in breast cancer mortality rates in high income countries. In Africa, resources are lacking and mammography is less useful for a predominantly premenopausal population. Since hospital case series have shown markedly better outcome in early stage disease, earlier detection through improved awareness is a logical approach to reducing mortality (Joffe et al., 2018). In Addis Ababa, Ethiopia, awareness of breast cancer and screening methods was low among women who came for maternal and child health services; about two-thirds were not aware of screening methods and less than 10% had done a clinical breast examination (Abeje et al., 2019). In a review on improving early detection for breast cancer in sub-Saharan Africa, Black and colleague (2019) report on the low availability and higher cost-benefit ratio of mammography in sub-Saharan Africa and discuss context-specific approaches such as breast self-examination, clinical breast examination for downstaging. To date, there are no randomized trials of effectiveness in reducing mortality. In Sudan, trained volunteers screened 70% of a target population of 15,000 women. They found 138 breast masses with four early and five advanced breast cancers compared to one early and three advanced cases self-reporting from the control villages (Abuidris et al., 2013). In Tanzania a similar intervention led to an increasing number of early stage BC during three years (9% to 67%) (Ngoma et al., 2015). Feasibility and costs of such programs need further investigation.

In order to take into account the differences in the demographic and genetic profile of African women with breast cancer, risk prediction models specific to sub-Saharan African women are being developed to detect women at highest risk who will benefit from cost-effective early detection practices (Salih et al., 2017; Wang et al., 2018).

Treatment

To the clinician, breast cancer presents as a different disease in Africa compared with developed countries, with predominantly young patients and advanced stage tumours typical of low resource settings. Vanderpuye and colleagues (2017) reviewed the therapy options available to African patients. Open questions still remain on how to de-centralize palliative care (Distelhorst et al., 2015), how to optimize neoadjuvant treatment, how to up-scale the use of endocrine treatment and how to best utilize scarce radiotherapy facilities (Abdel-Wahab et al., 2013). Several organisations such as the Breast Health Global Initiative and the National Comprehensive Cancer Network have developed and published resource-stratified guidelines to take this situation into account (Anderson, 2014). The National Comprehensive Cancer Network Harmonized Guidelines for sub-Saharan Africa were published in 2017 in collaboration with the African Cancer Coalition (National Comprehensive Cancer Network (NCCN), 2017). It provides guidelines for optimal and pragmatic cancer care. However, the appropriate use of these guidelines requires appropriate staging, access to hormone receptor status testing and available cancer-specific therapy. Several reports have highlighted the paucity of the oncology workforce (Mathew, 2018), surgical oncology (Gyorki et al., 2012; Sullivan et al., 2015), chemotherapy (Wilson et al., 2019), radiotherapy (Abdel-Wahab et al., 2013; Rodin et al., 2016) and palliative care services (Seya et al., 2011) in sub-Saharan Africa. Multi-national African prospective studies are ongoing to assess the impact on the quality of care on patient survival (McKenzie et al., 2016), as well as the treatment tolerance and outcome for patients living with HIV (Cubasch et al., 2016).

The cost of therapy is still a major impediment to patients receiving appropriate care, as many patients have to pay out of pocket for care (Knaul et al., 2015). The cost of treating patients with regional and distant breast cancer are 41% and 165% higher than for local disease (Sun et al., 2018). This treatment

cost is highly prohibitive for the majority of African patients who present with advanced disease. The efficacy and cost-effectiveness of interventions for breast cancer care and prevention must be critically evaluated to inform policy in low- and middle-income settings (Ginsburg et al., 2017).

Conclusion

The breast cancer burden in Africa is on the rise, due to changes in demographics and changing risk factor profiles. The majority of women in Africa are diagnosed at advanced stages, and as a result, survival is poor. We need to scale up interventions to raise breast cancer awareness in Africa and advocate for use of clinical breast examination for tumour "downstaging". Continued efforts will need to be made to facilitate the use of therapy guidelines and improve access to appropriate cancer care.

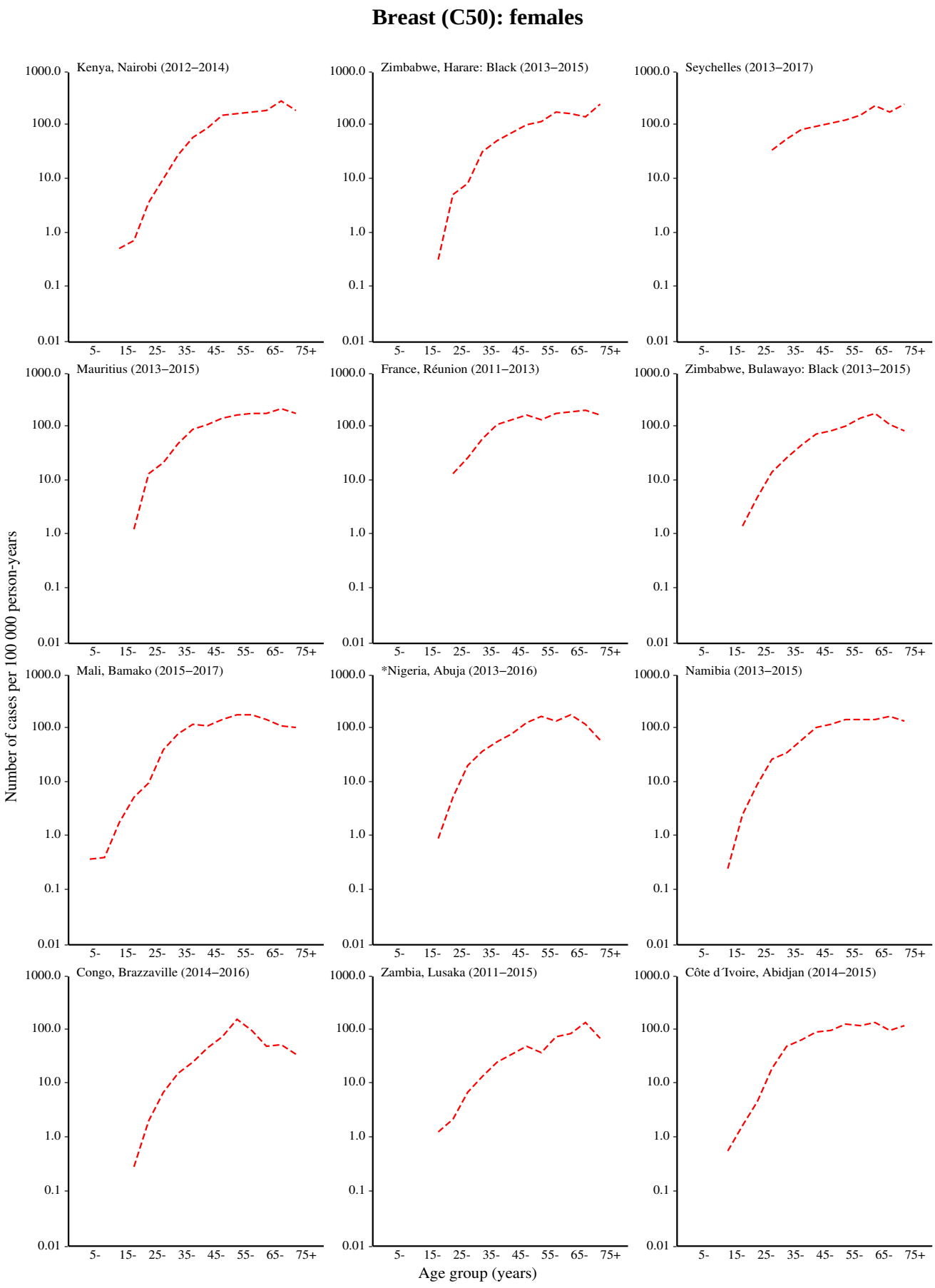


Fig. 7.05 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the breast among females, by registry population

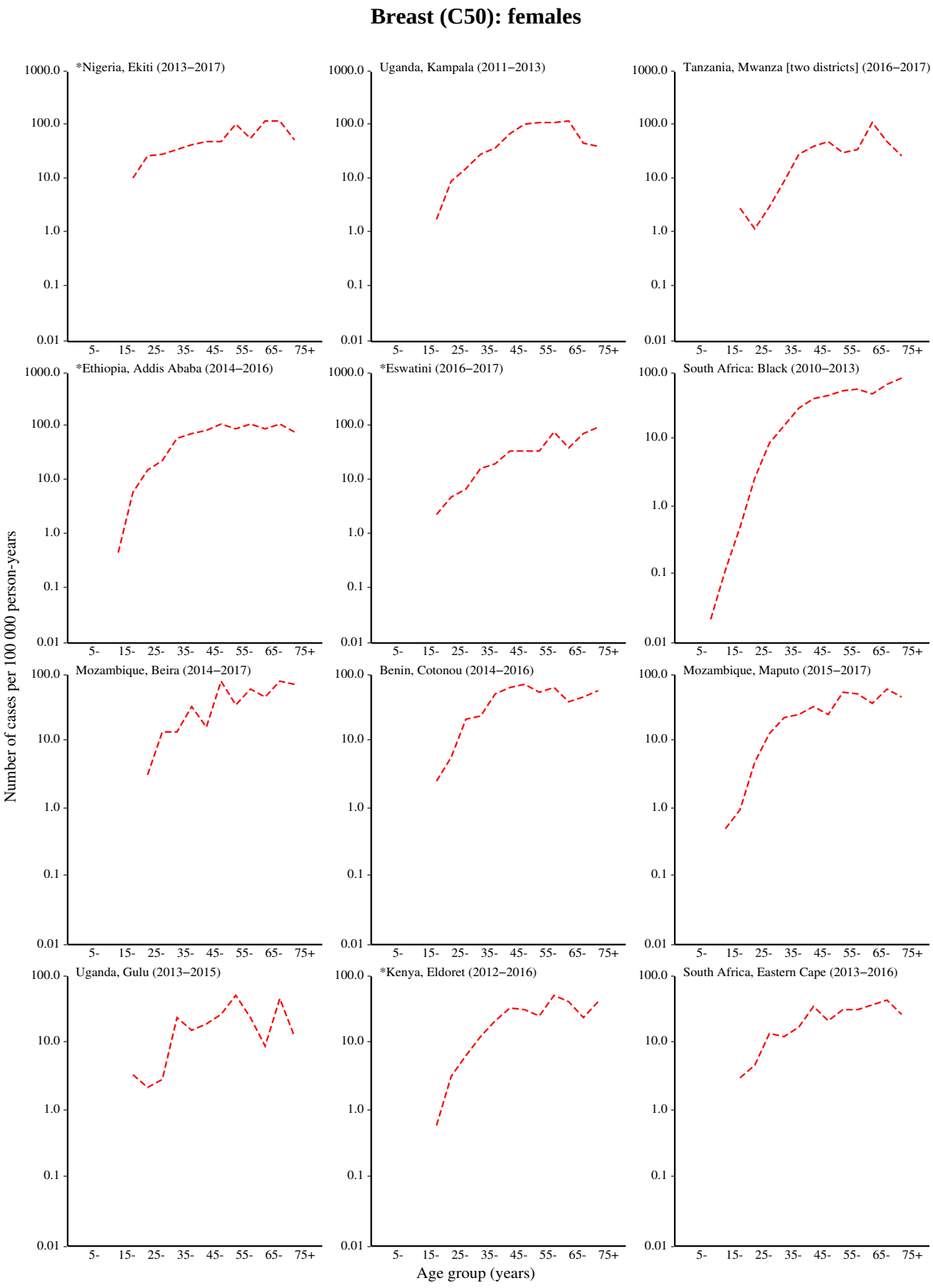


Fig. 7.05 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the breast among females, by registry population

Cancer of the cervix uteri

Cervical cancer is the second most common cancer and the leading cause of cancer death in African women. In 2018, an estimated 119,192 newly diagnosed cervical cancer cases and 81,620 cancer deaths occurred in Africa (Ferlay et al., 2018). Eastern, Western, Southern, Central and Northern African regions contributed 44.1%, 26.8%, 12.1%, 10.6% and 6.4%, respectively, of cervical cancers diagnosed in 2018 in African women (Ferlay et al., 2018).

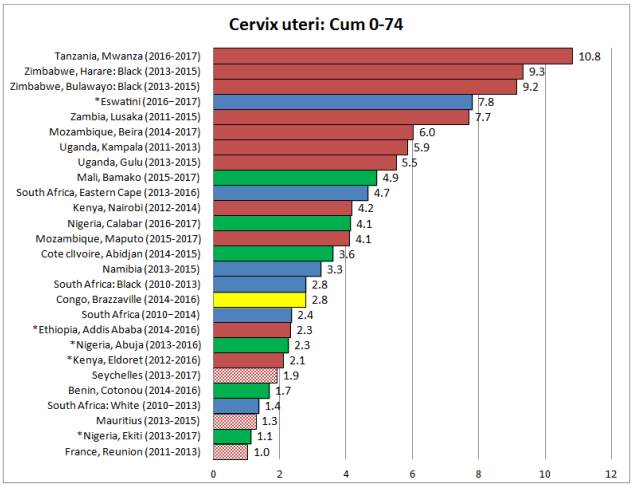


Fig. 7.06 Cumulative incidence 0-74 (%) of the cancer of cervix uteri in sub-Saharan Africa, by registry population

Fig. 7.06 shows the cumulative incidence rates of cervical cancer observed in the registry populations of sub-Saharan

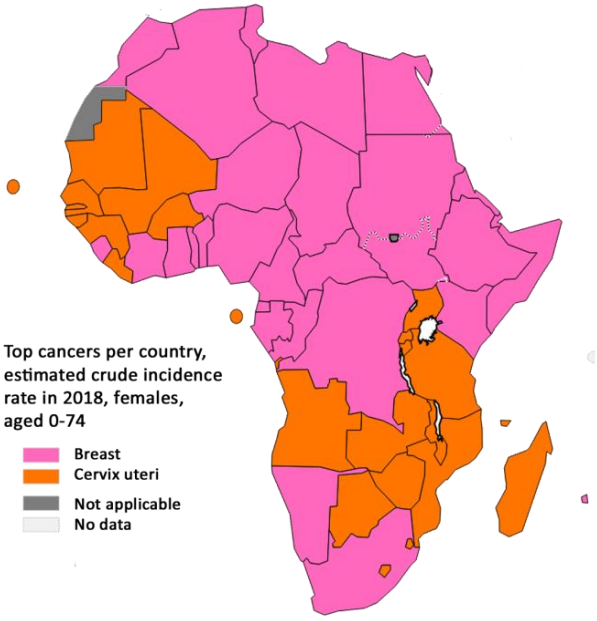


Fig. 7.03 The most common cancers in women, by country

Africa included in this volume. The cumulative incidence of the

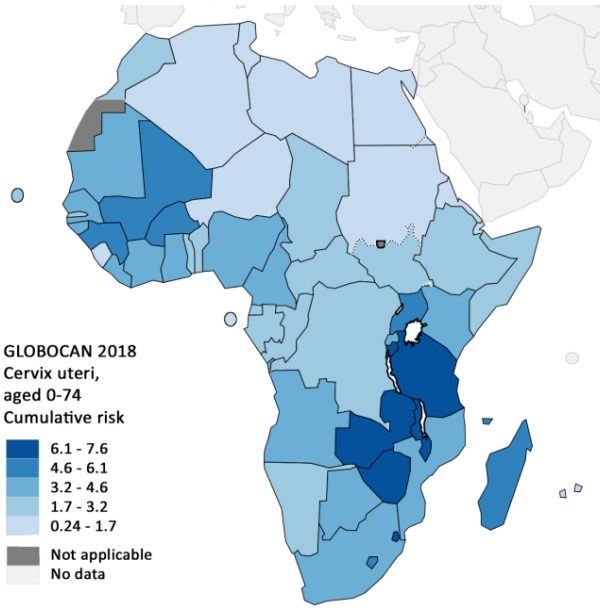


Fig. 7.07 Map of cumulative risk 0-74 (%) of cancer of cervix uteri in Africa, by country

disease before age 75 expressed as a percentage substantially varies from 1% in the Reunion to 9.3% in Zimbabwe (Harare), 10.8% in Tanzania (Mwanza). Eastern African countries (shown in red) mostly had the highest cumulative incidence rates.

Cancer of the cervix is the most frequently diagnosed cancer in 24 of 54 African countries (Fig. 7.03) and the leading cause of death in 36 countries, accounting for about 21.7% of total cancer deaths in women the region (Ferlay et al., 2018). Countries with the highest cervical cancer incidence are mostly in Eastern Africa, Southern Africa and in parts of Western Africa (Fig. 7.07). Countries in Northern Africa have the lowest incidence rates on the continent (Fig 10.1.3a). Among the sub-Saharan African registries included in this volume, the highest age-standardized incidence rates were in Tanzania (Mwanza) ASR 85.9 per 10^5, Zimbabwe (Harare – 81.6, Bulawayo – 80.9), Eswatini - 72.0, Zambia (Lusaka – 64.7), and Mozambique (Beira – 56.9).

This variation in part reflects regional differences in the prevalence of chronic human papilloma virus (HPV) infection, the major risk factor for cervical cancer (ICO/IARC HPV Information Centre, 2019). HPV prevalence in women in the general population is highest in Eastern Africa (20.5%) and lowest in Central Africa (9.8%) (ICO/IARC HPV Information Centre, 2019). Male circumcision reduces HPV transmission to female sexual partners (Rakai et al., 2011). Countries with high male circumcision rates in Northern Africa and especially Muslim countries with conservative sexual practices have lower cervical cancer rates (Vaccarella et al., 2017).

Sub-Saharan Africa has the highest prevalence of both HPV (Bruni et al., 2010; ICO/IARC HPV Information Centre, 2019) and human immunodeficiency virus (HIV) (UNAIDS, 2018) worldwide. The synergy of these two infections in a largely unscreened and unvaccinated (Bruni et al., 2016) populations explain the high cervical cancer rates observed. Women infected with HIV have been shown to have multiple, diverse high risk HPV subtypes, persistence of HPV infection and rapid progression of cervical precancer to invasive cervical cancer (Firnhaber et al., 2010; McDonald et al., 2012). Eswatini, Zambia, Zimbabwe and Mozambique are among the countries with the highest adult HIV prevalence in SSA (UN, 2019). It is not surprising that the same countries also have the highest cervical incidence rates (Fig. 7.07 and Fig. 7.08). High cervical cancer incidence rates were also observed in the countries with functional population-based cancer registries Cancer in SSA vol. II, 2018), and may reflect systematic collection of population-based cancer data in these countries. SSA has a dearth of population-based cancer registries, and as cancer registration efforts on the continent improve, the true picture and extent of the cervical cancer burden in SSA will become more apparent.

Fig. 7.08 shows incidence rates by age. In general, rates increase with advancing age. This contrasts with the pattern commonly seen in western countries (e.g. USA), where rates peak in the early 40s likely due to removal of precancerous lesions in middle age through screening (Noone et al., 2018). It is noteworthy that, however, before the introduction and wide dissemination of PAP testing after the middle of last century, cervical cancer incidence rates in the USA were as high as those found in East Africa today (Dorn and Cutler, 1959). It is also apparent that women in sub-Saharan Africa are being diagnosed relatively young, with a steep rise in incidence from the third and fourth decades of life, and a high plateau after the age of 45 (Fig. 7.08). This may reflect the early sexual debut with rapid HPV acquisition in SSA (Houlihan et al., 2016) and high HIV prevalence which is associated with young age at cervical cancer diagnosis (van Bogaert, 2011).

In addition to the high incidence rates, a majority of cervical cancer patients in SSA are diagnosed at late stages of the disease, when the choice of treatment is limited and survival is poor, largely because of lack of screening services (Lim and Ojo, 2017). Five-year survival in SSA for patients diagnosed and treated in 1990s ranged from 18% in Uganda to 31% in black population in Zimbabwe (Gondos et al., 2005; Gondos et al., 2004), compared to over 80% in Western countries (Allemani et al., 2015). In a recent study evaluating cervical cancer survival in African women for the period 2005 – 2015, average 5-year relative survival from 11 SSA countries was 33.1% and specifically in Uganda and Zimbabwe, 5-year survival was 24.0% (11.4 – 39.7) and 30.3% (23.2 – 37.9) respectively (Sengayi-Muchengeti et al 2019, under review). This confirms that 16 years later, cervical cancer survival in these SSA countries remains very poor.

Furthermore, the burden of the disease in SSA as measured by age standardized incidence rate appears to be increasing rather than decreasing based on data from three recent studies in Zimbabwe (Harare) (Chokunonga et al., 2016), Uganda (Kampala) (Wabinga et al., 2013), and South Africa (rural Eastern Cape Province) (Somdyala et al., 2015). The reasons for this increase are unknown, but in view of the HIV epidemic in the region, the increase may in part reflect improved survival of HIV patients due to better access to high active antiretroviral therapy and greater opportunity for progression of precancerous cervical lesions to cancer. Recent studies have demonstrated a steep rise in the risk of cervical cancer in HIV-positive women in South Africa in the era of antiretroviral treatment (2004 – 2014) (Dhokotera et al., 2019), high recurrence of cervical cancer lesions (Debeaudrap et al., 2018) and high cervical cancer incidence as HIV-infected women age in a high HPV prevalence setting.

Major preventive measures for cervical cancer include HPV vaccination and screening. Vaccines, which protect against HPV 16 and 18 infections that cause 70% of cervical cancer have been commercially available since 2006/2007 and an improved vaccine that protects against nine types of oncogenic HPV causing 90% of cervical cancer has been approved for commercial use in 2014. The nonavalent vaccine provides a wider protection compared to the bivalent vaccine, however, considering its prohibitive prices and the resource constraints in SSA, it might be more cost-effective to vaccinate more girls with the bivalent vaccine (Menon et al., 2018). In 2014, the World Health Organization recommended vaccination of girls age 9-13 years (before they initiate sexual activity) with two doses of the vaccine administered six months apart (Cervical Cancer Action Coalition, 2012). Major barriers to the introduction of the vaccine in SSA include cost and accessibility (Cunningham et al., 2014; Sankaranarayanan et al., 2013). In 2011, GAVI negotiated a lower price ($5 per dose) with the vaccine manufacturers to facilitate the introduction of the vaccine in low and middle income countries (Castro et al., 2017), where the disease burden is highest and the vaccine is most needed. As of July 2019, the vaccine has been introduced in nine SSA countries (Botswana, Lesotho, Mauritius, Rwanda, Senegal, Seychelles, South Africa, Uganda and Zimbabwe) as part of national immunization program to vaccinate preadolescent girls in schools, and in several other countries as demonstration projects. Reported 3-dose coverage ranged from 73% in Uganda to 98.7% in Rwanda (Black and Richmond, 2018; Mugisha et al., 2015), remarkably high enough to provide herd immunity (Brisson et al., 2016). Some of the implementation strategies that have been effective in Rwanda include use of school-based model, defining the target group using class-based rather than age-based criteria, tracking of out-of-school girls using community health workers, sensitization of communities prior to programme initiation and collaboration between ministries of Health and Education (Black and Richmond, 2018).

Screening by cytology has been credited with the dramatic decrease in cervical cancer rates in western countries, with rates decreasing by over 70% in several Scandinavian countries (Vaccarella et al., 2014). However, population screening by cytology testing in Africa has been impeded by weak healthcare infrastructure and lack of trained staff, and the need for multiple health facility visits (Lim and Ojo, 2017; Sankaranarayanan et al., 2013). Many SSA countries lack clear cervical cancer policies to stipulate who to screen, by whom and how often (Maseko et al., 2015), and where they do exist, age guidelines are often not followed (Tsu et al., 2018). According to a recent review, the coverage of cervical cancer screening in SSA ranged from 2% to 20% in urban areas and from <1% to 14% in rural areas (Louie et al., 2009). In the past two decades, however, alternative screening approaches proven to be effective for use in low resource settings have been developed (Denny et al., 2005; Fokom-Domgue et al., 2015). These approaches include visual inspection with acetic acid (VIA) or Lugol's iodine (VILI) and HPV DNA testing for detecting lesions followed by cryotherapy on the same day, known as "single visit" or "screen and treat" approach. Several countries in SSA have introduced cervical cancer screening programs using these approaches at the national level (e.g. Rwanda) or sub national level (Binagwaho et al., 2013). Other innovative strategies that have been explored to improve participation of women in screening include screening of women attending HIV clinics (Kahesa et al., 2008) and invitation of mothers for self-screening using HPV testing during HPV vaccination of girls in school (Snyman et al., 2015).

In May 2018, the Director General of the World Health Organization, Dr Tedros Ghebreyesus made a call for coordinated global action to eliminate cervical cancer and identified cervical cancer as an entirely preventable global threat to women's health (Ghebreyesus, 2018). There is a need for urgent coordinated efforts to improve HPV vaccination coverage in girls in the target population, catch-up vaccination in adolescents and young women, tailored policy and screening in HIV-infected women, high screening coverage in women over 30 and timely appropriate treatment in women with cervical cancer and pre-cancer to ensure that no woman is left behind.

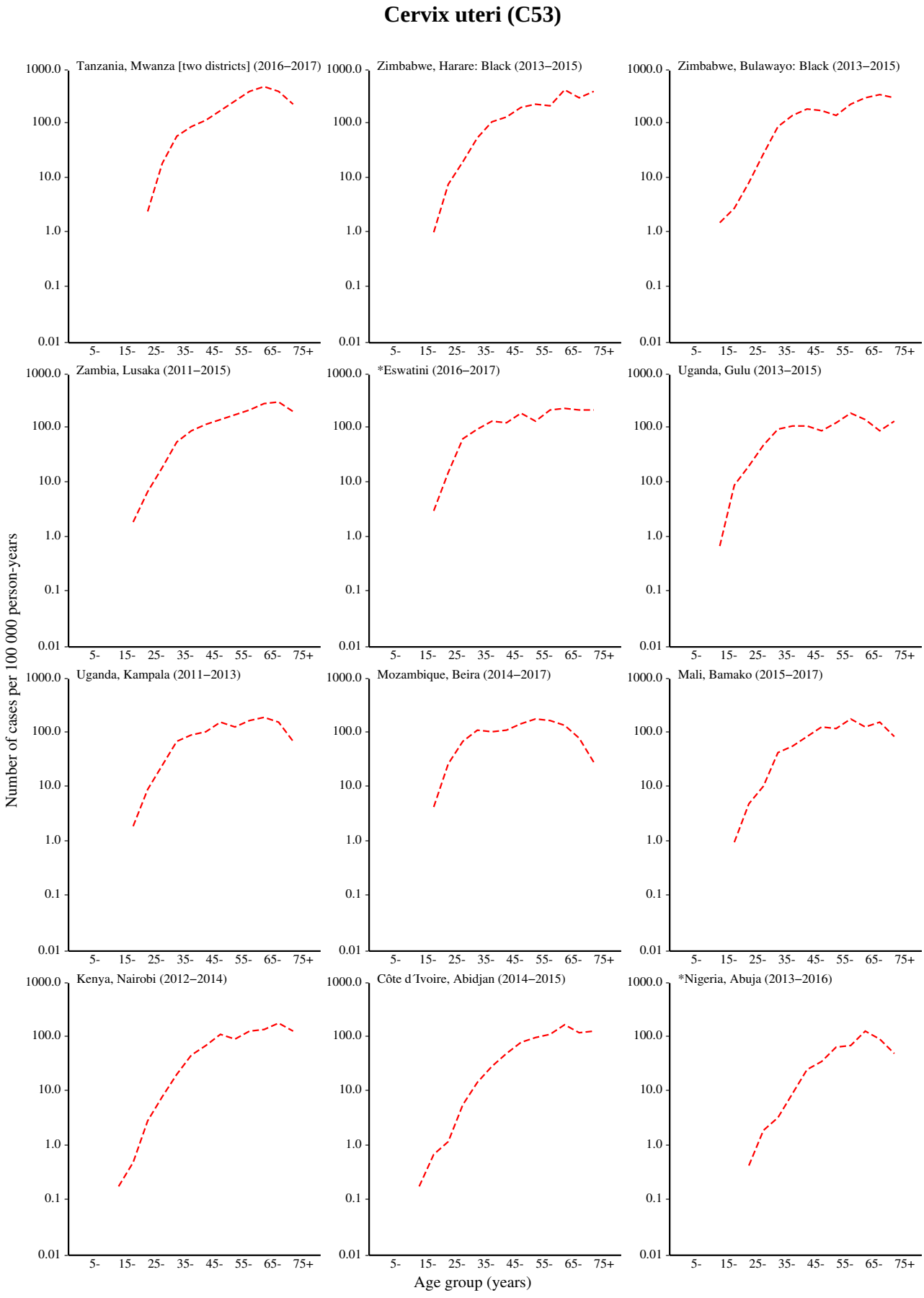


Fig. 7.08 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the cervix uteri, by registry population

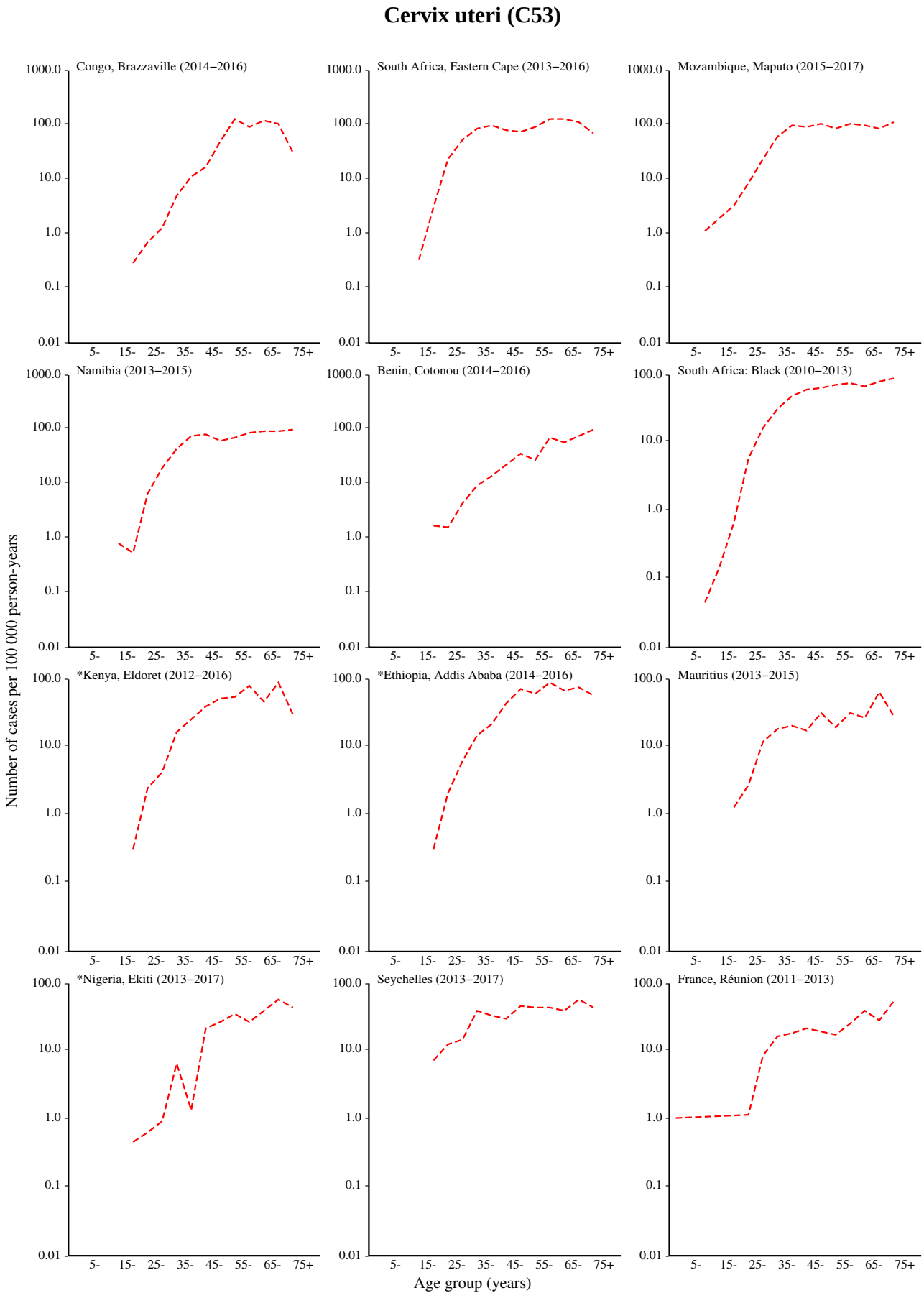


Fig. 7.08 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the cervix uteri, by registry population

Cancer of the prostate

Prostate cancer is the commonest non cutaneous malignancy amongst men worldwide (Bray et al., 2018; Rebbeck, 2018). It is the leading cause of cancer in men in over half the countries in the world and in over 60% of countries on the African continent (34 of 54 countries) (Fig. 7.10). It is estimated that 1.3 million new cases of prostate cancer occurred in 2018 worldwide with 359,000 deaths (Bray et al., 2018). In Southern Africa, 12,950 new cases were diagnosed in 2018 accounting for 11.3% of all cancers on the continent (Ferlay et al., 2019).

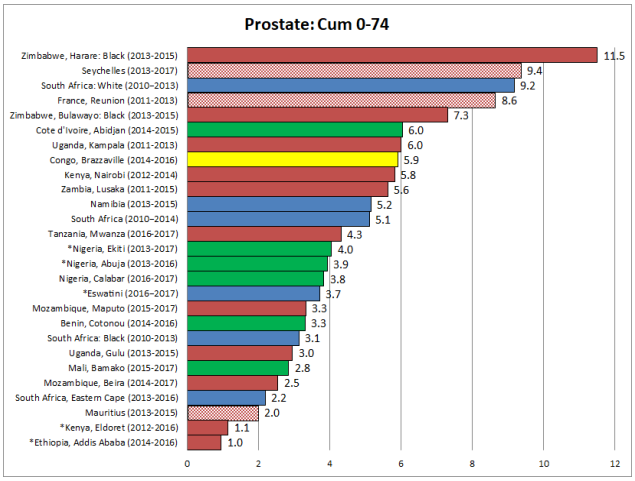


Fig. 7.09 Cumulative incidence 0-74 (%) of the cancer of prostate in sub-Saharan Africa, by registry population

The highest age standardised incidence rates for prostate cancer in 2018 were reported in developed regions of the world such as Western and Northern Europe, North America and Australia (Rebbeck, 2018; Ferlay et al., 2019). Rates in sub-Saharan Africa vary by 15 fold with highest age-standardised rates estimated for South Africa at 68/100,000 followed by Benin (55.7/100,000) and Zambia (45.6/100,000), compared to the lowest rate estimated for Niger at 4.4 /100,000.

The cumulative risk of prostate cancer for Africa is 3.1%, second only to breast cancer at 4.0%. Fig. 7.11 shows cumulative risks estimated for countries in Africa. Men residing in Reunion, South Africa, and Benin are at highest risk for prostate cancer with cumulative risks greater than 6.5%. Examining cumulative risks for individual registry data, wide variation is noted in prostate cancer risk from 11.5% in white men in South Africa to 1% in Addis Ababa, Ethiopia (Fig. 7.09).

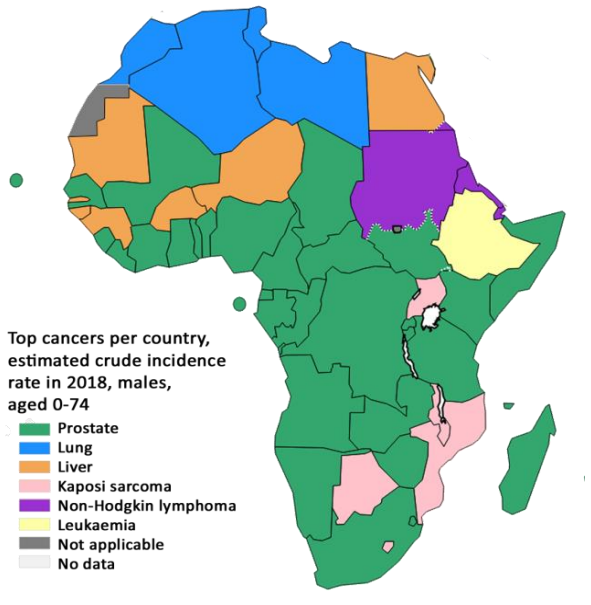


Fig. 7.10 The most common cancers in men, by country

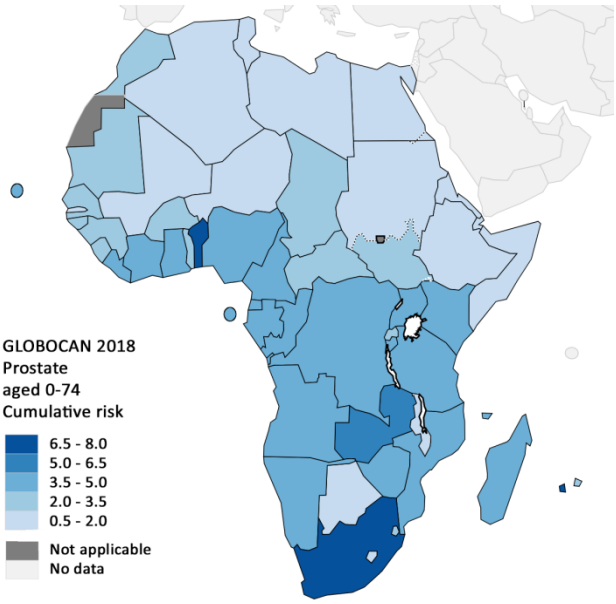


Fig. 7.11 Map of cumulative risk 0-74 (%) of cancer of prostate in Africa, by country

Fig. 7.12 shows the age specific prostate cancer rates for 24 registries in SSA. As with other cancers, incidence rates of prostate cancer increase with age. However, it is notable that African men are diagnosed with prostate cancer at a younger age than European or American men. In fact, 50% of Caucasian men have latent prostate cancer by the age of 80 years. This 50% prevalence is reached by age 60 in men of African descent (Rebbeck and Haas, 2014). This disparity in age at onset is the subject of intense research efforts in cohorts of men of African descent resident in Africa.

While incidence rates are highest among African American men globally, sub-Saharan African men bear a disproportionate mortality burden (Rebbeck, 2018) with tumours being diagnosed at a late stage and having poorer outcomes. African prostate cancer mortality rates are highest in Southern Africa in Zimbabwe (29.7/100,000) and Zambia

(28.4/100,000) and in Western Africa (Benin 36.3/100,000; Liberia 29.0/100,000). In comparison mortality rates in high incidence countries in the developed world are much lower at 7.7/100,000 in the USA and 10.0/100,000 in Australia (Ferlay et al., 2019).

Advanced age, race/ethnicity/ family history and genetic susceptibility are well established risk factors for prostate cancer (Tangen et al., 2018). However, the specific aetiology of early age at presentation, aggressive disease and poor prognosis in African descent populations remains poorly elucidated. Possible variations in single-nucleotide-polymorphism patterns of the genes of the enzymes involved in androgen biosynthesis and metabolism, such as CYP17, and CYP3A4; in vitamin D synthesis; in regulating cell apoptosis, such as BCL2; and polymorphisms at 17q21, 11q13 and 8q24 may be involved. Epigenetic changes and variations in fusion-gene products among men of African origin may also be involved in the genetic differences underlying this disease (Mcginley et al., 2015; Hatcher et al., 2009).

Increasing incidence rates of prostate cancer have been recorded in Harare (Zimbabwe) (Chokunonga et al., 2013), Kampala (Uganda) (Wabinga et al., 2014), as well as in the rural population of Eastern Cape province of Rep. South Africa (Somdyala et al., 2015), and mortality rates are increasing in South Africa (Nojilana et al., 2016). In Harare, the risk of prostate cancer has increased much faster in the black than in the white population, and is now higher in the former (Chokunonga et al., 2016). These increases are certainly not due to screening, although it is quite likely that increased awareness, a greater readiness to perform prostatectomy for urinary symptoms in elderly men, and histological examination of operative biopsies have played a role. Most cancer registries are situated in major cities or urban populations on the continent, and it thus remains difficult to ascribe such geographical and temporal differences to risk factors linked to increasing affluence (a westernization of lifestyle), or to inherent and well-known artefacts (enhanced diagnostic capabilities, notably via the increasing availability and affordability of PSA testing).

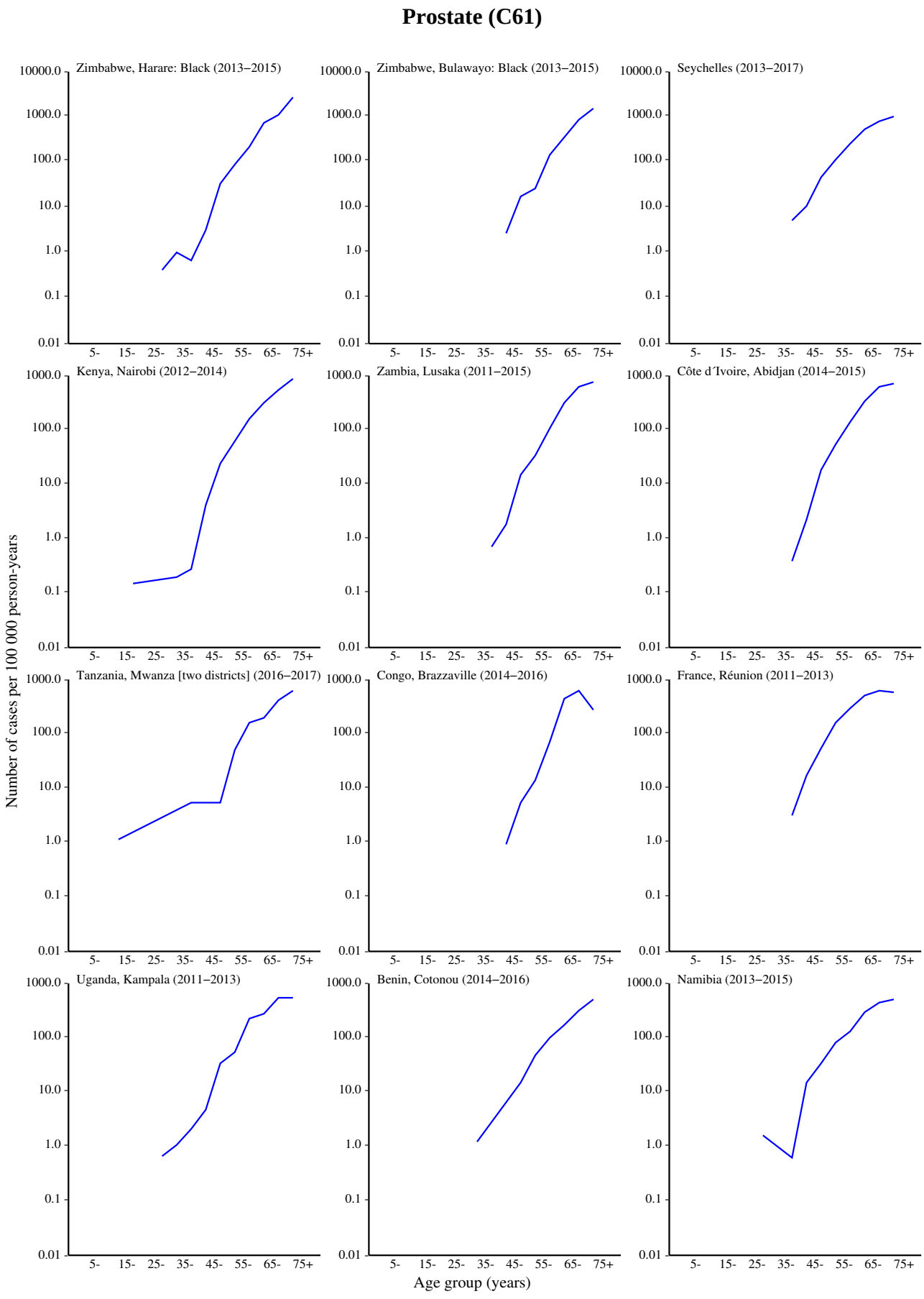


Fig. 7.12 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the prostate, by registry population

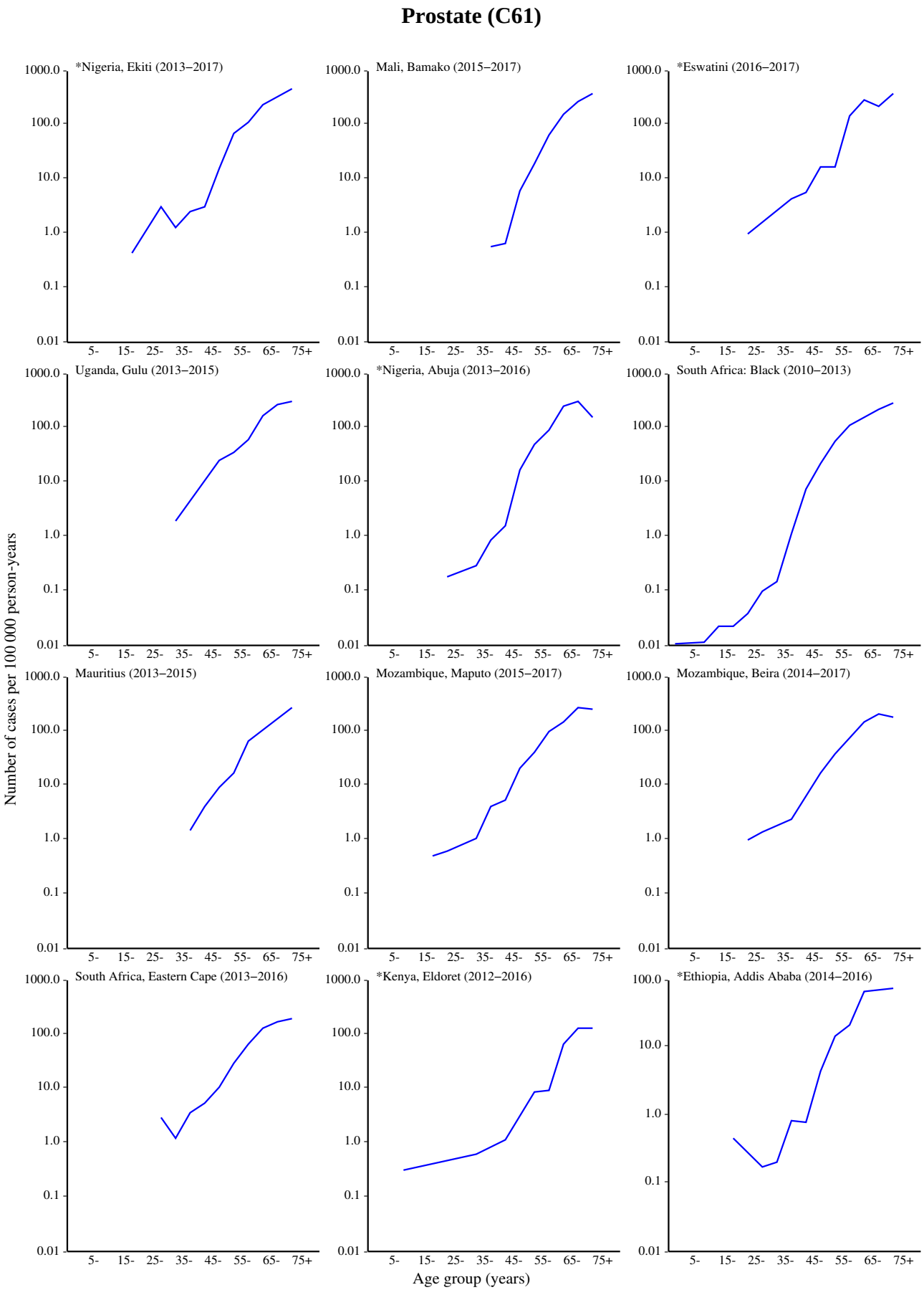
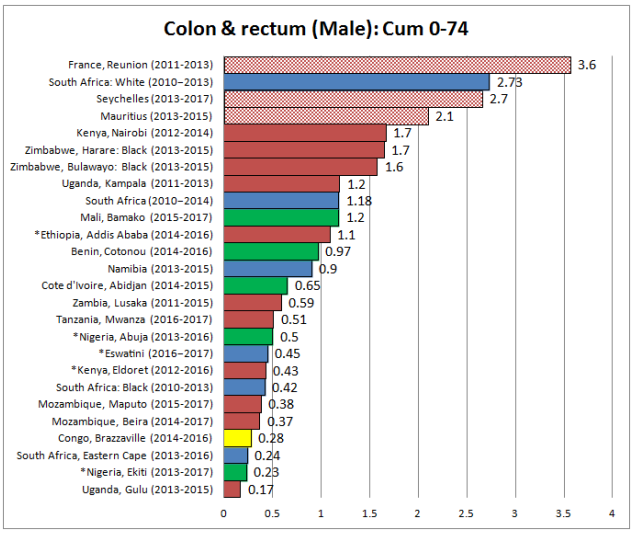


Fig. 7.12 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the prostate, by registry population

Cancer of the colon and rectum

Colorectal cancer (CRC) is the third most commonly diagnosed cancer in males and the second in females worldwide, with an estimated 1.8 million new cases and about 181,000 deaths in 2018 (Bray et al., 2018). In Africa, CRC is ranked as the fifth most common malignancy, with 61,846 (5.9%) new cases and around 40,000 deaths in 2018 (Bray et al., 2018), with higher rates observed in males than in females.



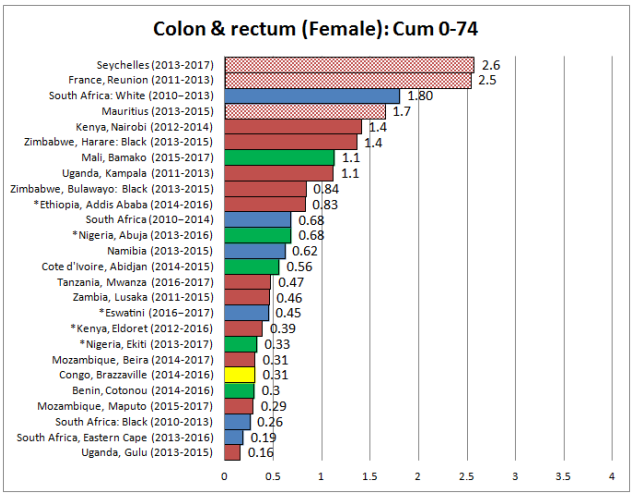


Fig. 7.13 Cumulative incidence 0-74 (%) of the cancer of colon and rectum among males and females in sub-Saharan Africa, by registry population

The cumulative risk of the disease by cancer registry ranged from less than 0.2% in Gulu, Uganda to over 3.6% in Reunion, France in men and from less than 0.2% in Gulu, Uganda to 3.5% and 3.6% in Reunion, France and Seychelles respectively in women (Fig . 7.13)

Internationally, the highest risk of the disease for both sexes combined were found in parts of North Africa, Southern Africa, and East Africa and the lowest in parts of Western Africa (Fig. 7.14). In South Africa the rates were much higher among the white than the black population.

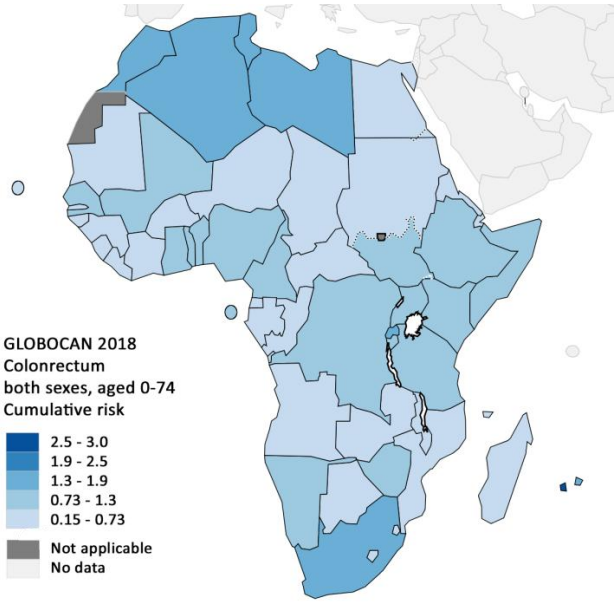


Figure 7.14 Map of cumulative risk 0-74 (%) of cancer of colon and rectum among males and females in Africa, by country

Incidence rates increase with advancing age in all registries (although there is often a decline after age 75), with the rates generally higher in men than in women (Fig. 7.15).

Previous studies have documented increases in incidence rates of CRC in several African countries, including Uganda (Kampala), South Africa (rural Eastern Cape Province), Zimbabwe (Harare, black population), and Tunisia (Sousse region) (Wabinga et al., 2014; Somdyala et al., 2015; Chokunonga et al., 2013; Missaoui et al., 2010). Among the black population in Zimbabwe for example, age-standardized incidence rates per 100,000 men and women increased by about 4% per year during 1991-2010 (Chokunonga et al., 2013). The increasing cases of colorectal cancer in the sub-Saharan African have been observed with increase in age especially in South Africa (Graham et al., 2012).

Both environmental and genetic factors have been associated with the risk of colorectal cancer. Low socioeconomic status (SES) has been associated with an increased risk. A prospective study in US found that the overall incidence of CRC was significantly higher among people who had low education level or lived in low-SES neighbourhoods relative to respective highest-SES groups (Doubeni et al., 2012). In general, nutritional habits and dietary factors are the greatest contributors (30-50%) to the increased burden of CRC (Vargas and Thompson, 2012). Prospective studies have demonstrated that a high intake of red and processed meats, and of highly

refined grains and sugars are associated with increased risk of CRC (Chan and Giovannucci, 2010). The adoption of western lifestyles and changes in dietary patterns from plant-based and fibre-rich food to animal-based and caloric-dense food have largely contributed to the increasing rates of CRC in Africa (Vargas and Thompson, 2012). Modifying these diets and replacing with poultry, fish, plant sources for proteins; unsaturated fats as sources of fats; unrefined grains, legumes and fruits as primary sources of carbohydrates, is likely to lower the risk of CRC.

Other lifestyle factors, such as increases in sedentary lifestyles, and increases in prevalence of obesity and smoking have exacerbated the burden of CRC in Africa (Vargas and Thompson, 2012). Lifestyle modifications such as avoidance of smoking and heavy alcohol use, prevention of weight gain, and maintenance of a reasonable level of physical activity are associated with markedly lower risks of colorectal cancer (Chan and Giovannucci, 2010; Siegel et al., 2017).

Mortality from colorectal cancer can be reduced by screening, to detect faecal occult blood using stool-based tests (guaiac testing and faecal immunochemical test) or using lower endoscopy (sigmoidoscopy and colonoscopy) depending on the resources available. Screening allows detection and removal of premalignant lesions (adenomatous polyps) – and hence reduces incidence of invasive cancer - and early invasive cancers, improving survival and reducing mortality (IARC, 2019). However, the relatively low incidence of CRC and the current inadequate health care infrastructure in most parts of Africa preclude the introduction of organized CRC screening programmes (Kingham et al., 2013).

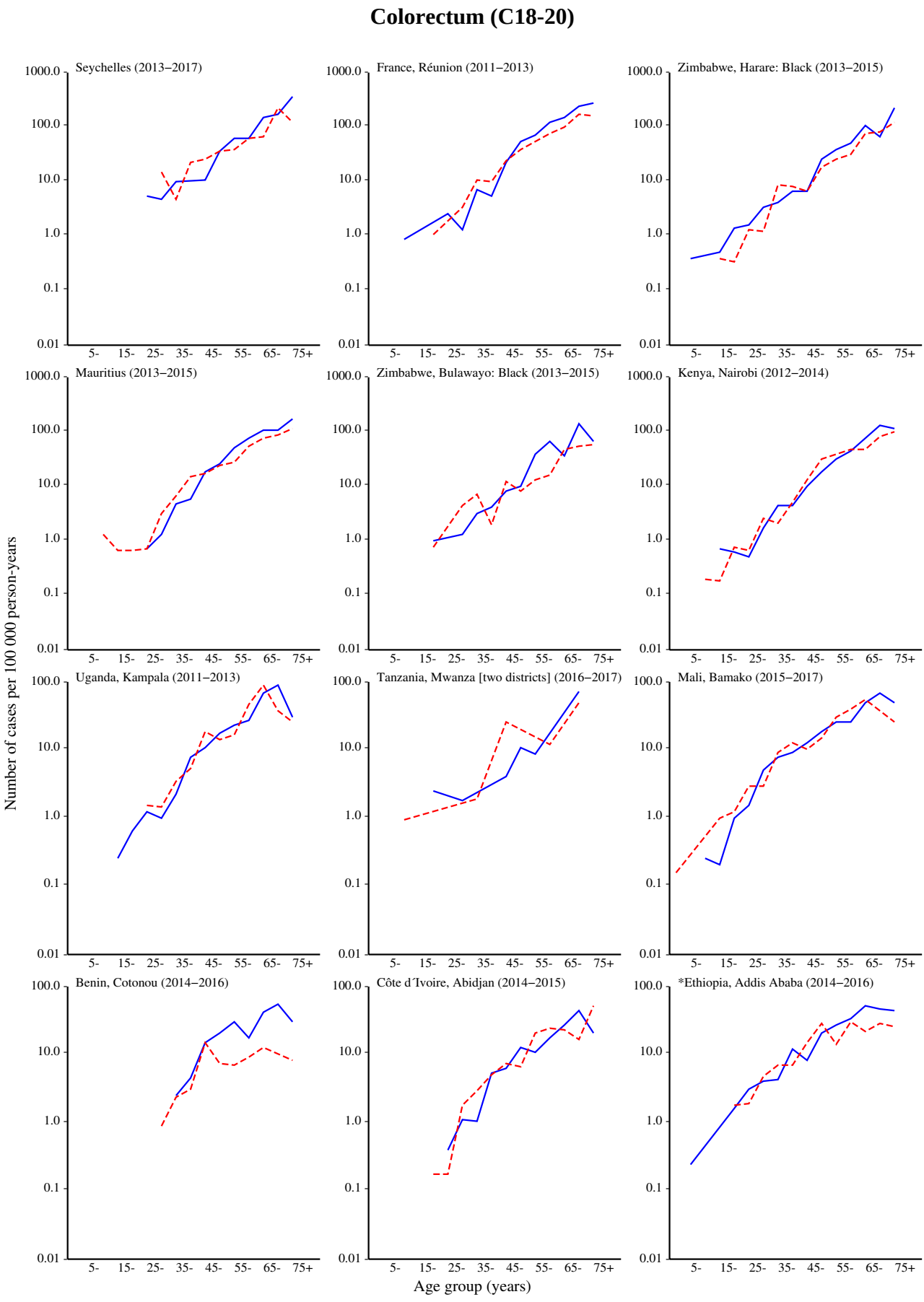


Fig. 7.15 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the colon and rectum among males and females, by registry population

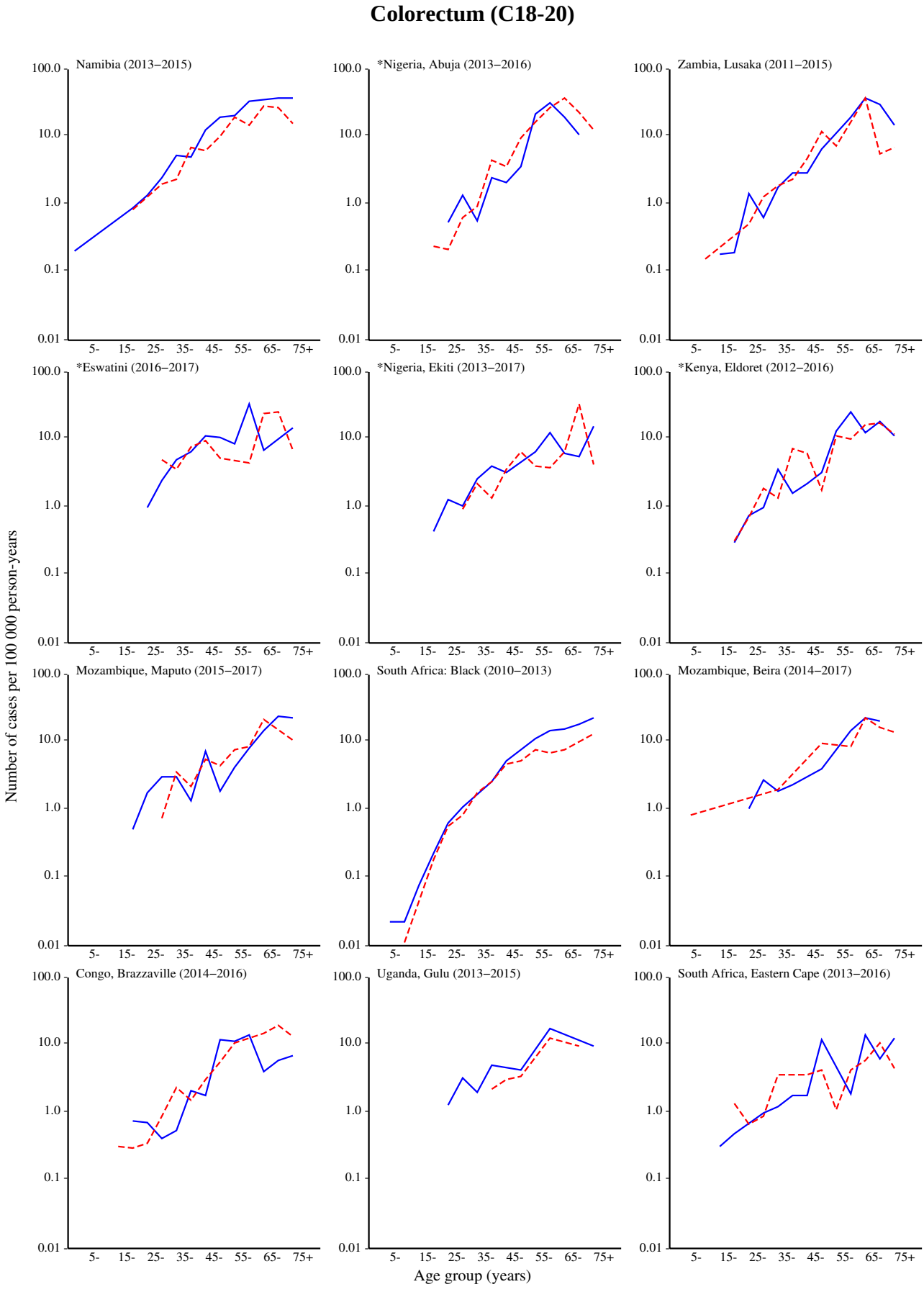
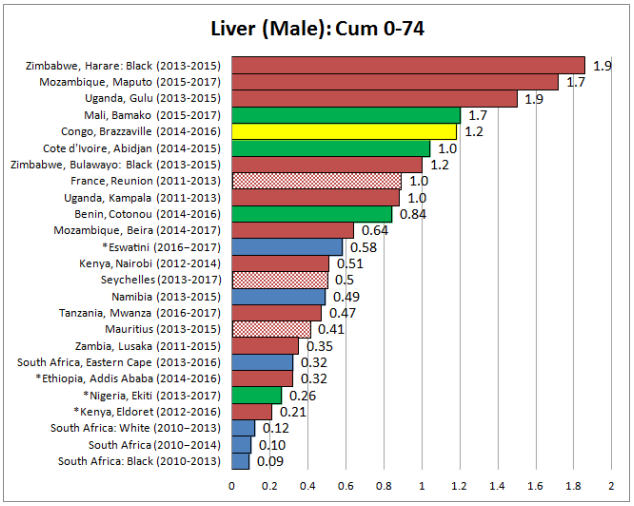


Fig. 7.15 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the colon and rectum among males and females, by registry population

Cancer of the liver

About 65,000 newly diagnosed liver cancer cases and 64,000 liver cancer deaths occurred in 2018 in Africa, with rather more than half (57%) of these cases and deaths occurring in sub-Saharan Africa (Ferlay et al., 2018). The highest incidence rates are found in parts of West and East Africa, with cumulative incidence before age 75 in men as high as 3.5% in The Gambia and 3.3% in Guinea (Conakry), compared with less <1% in parts of middle and Southern Africa (Ferlay et al., 2018). In general, incidence rates continue to increase with advancing age, and are higher in men than women (Fig. 7.18). In sub-Saharan Africa, almost 80% of liver cancers are hepatocellular carcinomas (HCC) (Parkin et al., 2019).



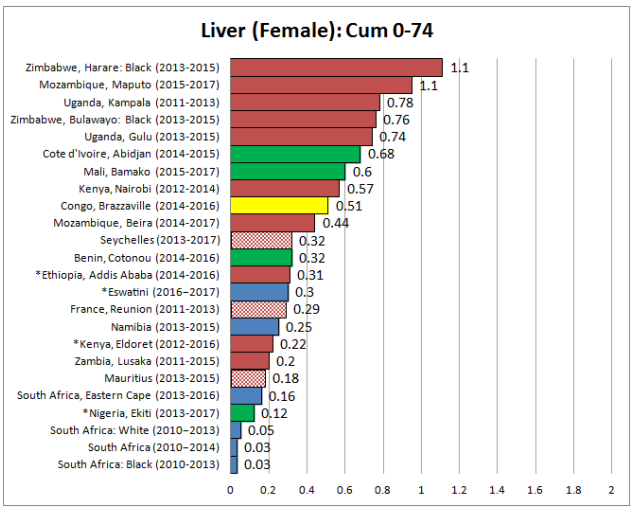


Fig. 7.16 Cumulative incidence 0-74 (%) of cancer of the liver among males and females in sub-Saharan Africa, by registry population

There are rather few data on trends in rates of incidence or mortality over time. In Uganda (Kampala), incidence rates increased (at least in females) between 1991 and 2010

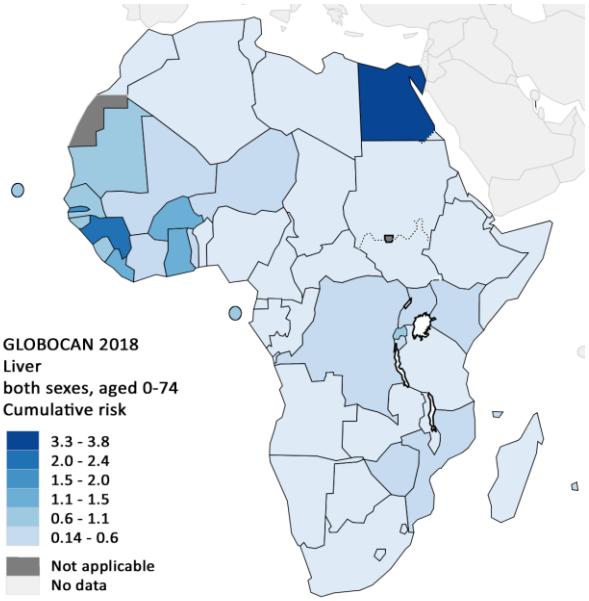


Fig. 7.17 Map of cumulative risk 0-74 (%) of cancer of the liver among males and females in Africa, by country

(Wabinga et al., 2014), while in the same period they declined in Zimbabwe (Harare) (Chokunonga et al., 2013). In Mali (Bamako) there has been a marked decline in incidence since the 1980's, although much of the decline – at least until 2010-2014, may have represented some possible misclassification of diagnosis in the earlier periods [this volume]. In South Africa, between 1999 and 2015, overall liver cancer mortality significantly decreased in men (-4.9%) and women (-2.7%), although there were differences in trends by age and sex – with decreasing mortality rates among younger black Africans while increasing rates in older black Africans (Mak et al., 2018).

Major risk factors for liver cancer in Africa vary by region. Chronic Hepatitis B virus (HBV) infection is the dominant risk factor for liver cancer in sub-Saharan Africa, accounting for two thirds of HCC cases (50% of all liver cancers) (Parkin et al., 2019). Most HBV infections in these regions occur during childhood (Whittle et al., 1983) as opposed during the perinatal period in parts of Asia, and in adulthood in economically developed world (IARC, 2012). West Africa and Central Africa represent regions with the highest chronic HBV infection worldwide, with the prevalence in the general population estimated to be as high as 15% in some countries, and with regional averages around 10% (Razavi-Shearer et al., 2018). Aflatoxin, produced by some species of fungi (*Aspergillus*), is another important risk factor for the occurrence of HCC in sub-Saharan Africa, and it has a synergetic effect in the presence of chronic HBV infection (Kew, 2003; Kirk et al., 2006; Wild and Montesano, 2009). Exposure to the toxin often occurs through ingestion of

contaminated staple foods, particularly maize and ground nuts (Wild et al., 2015; Kew et al., 2013; Egal et al., 2005).

In contrast to sub-Saharan Africa, HCV is the dominant risk factor for liver cancer in North Africa, with prevalence estimated at 6.3% in Egypt in 2015, compared with an average of 1% for sub-Saharan Africa (Blach et al., 2017). The high prevalence of chronic HCV infection in Egypt is likely due to parenteral antischistosomiasis therapy mass campaign during 1960-1980s (Strickland, 2006). HCV infection, as well as HBV infection, can also be transmitted through contaminated blood products and unsafe sex (IARC, 2010). Other known risk factors for liver cancer include alcohol consumption, obesity, diabetes, smoking, and HIV infection (Nordenstedt et al., 2010).

A vaccine against HBV infection has been commercially available since 1982, and it has been demonstrated to reduce chronic infection in children in African settings, including in The Gambia, Cote d'Ivoire and RSA (Hino et al., 2001; Peto et al., 2014; Viviani et al., 1999; Magoni et al., 2009). Although evidence on the effect of the vaccine on occurrence of liver cancer has yet to be documented in Africa, the vaccine was associated with a 80% reduction in liver cancer incidence rates among adolescents and young adults in Taiwan, thirty years after the introduction of a national vaccination program in 1984 (Chiang et al., 2013). The WHO has recommended since 1992 that the vaccine is included in routine national infant immunization programs in endemic areas such as sub-Saharan Africa. However, the introduction of the vaccine has been slow in this region because of its cost. According to WHO vaccination database, as of 2017, all 48 countries in sub-Saharan Africa have introduced Hepatitis B vaccine into their infant national immunization schedules although receipt of 3-doses in one-year old infants was 90% or more in only 13 countries, and less than 50% in six (https://www.who.int/gho/immunization/hepatitis/en/). Pregnant women infected with HBV (especially if they are seropositive for both the HBs and HBe antigens) are at higher risk of transmitting the infection to their infants, so that delaying the start of vaccination (first dose) more than a day or two after birth substantially increases the risk of chronic HBV infection in children (WHO, 2017). These findings reinforce the recommendation to starting vaccination at birth (Andersson et al., 2015), which is not practiced in most countries because of a long standing assumption about the rarity of mother-to-child transmission of HBV infection in the region.

Liver cancer in sub-Saharan Africa can also be substantially reduced through the application of proven postharvest interventions to prevent aflatoxin contamination, including sorting and grain cleaning and drying (Wild et al., 2015). One such community intervention among groundnut farmers in West Africa reported significant aflatoxin reduction in both groundnut contamination levels (70%) and in blood (Turner et al., 2005). Biocontrol (introduction of non-toxigenic strains of fungi) has been mooted as a control measure, but has had little practical impact (Kagot et al., 2019).

Additional primary preventive measures for liver cancer include safe sex, sterilization of injection needles, and screening blood products to minimize horizontal transmission of HCV and HBV infections. Secondary prevention includes treatment of patients chronically infected with HBV and HCV and increased disease awareness for early stage presentation and treatment. Egypt established a national network of 23 viral hepatitis facilities throughout the country in 2008 in order to treat patients chronically infected HBV and HCV at a reduced cost (CDC, 2012). In The Gambia and Senegal, population-based demonstration projects to screen for HBV chronic infections and treatment of positive patients with antiviral therapy (tenofovir) was carried out for 5 years 2011-2016 (Cohen et al., 2019).

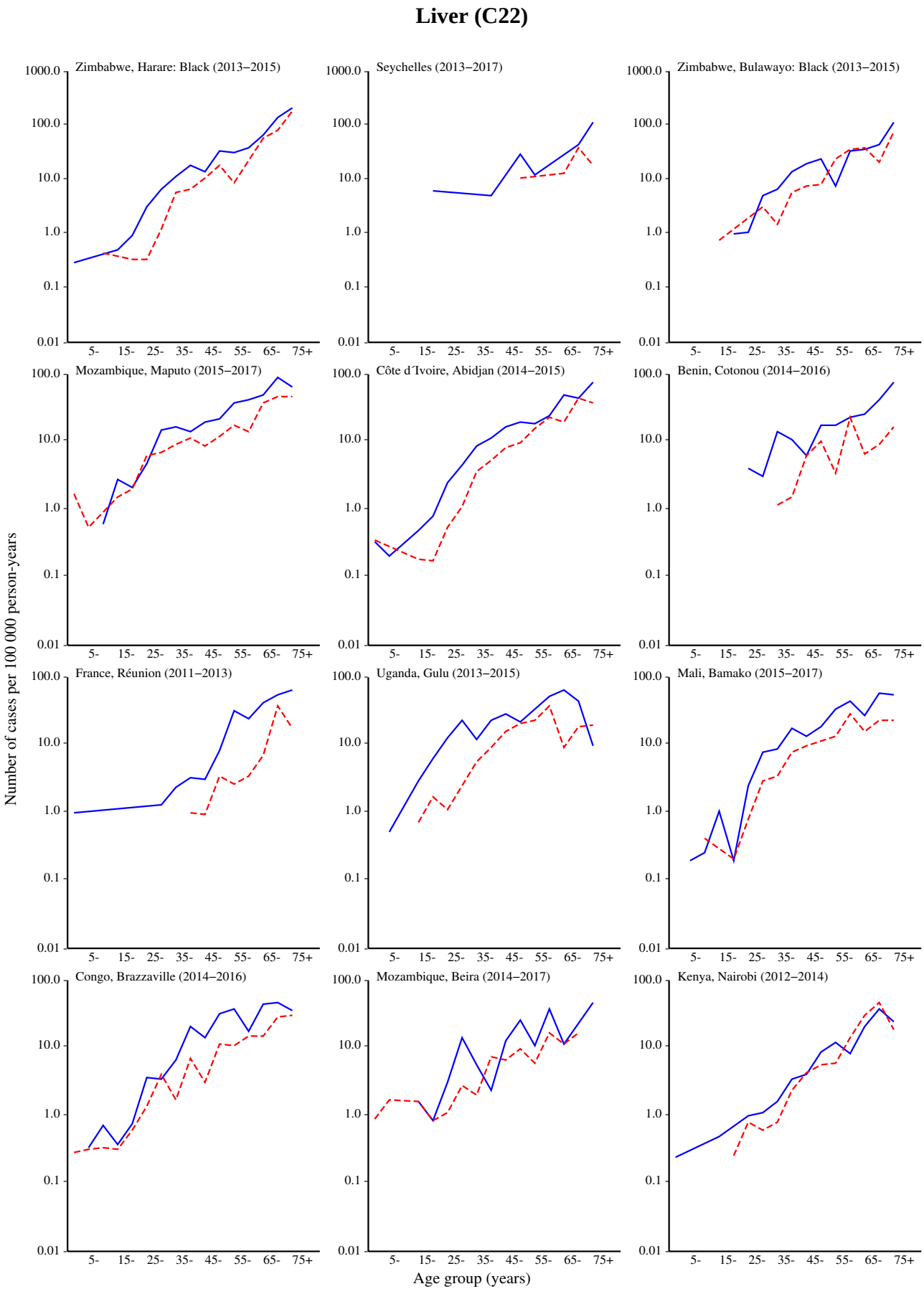


Fig. 7.18 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the liver among males and females, by registry population

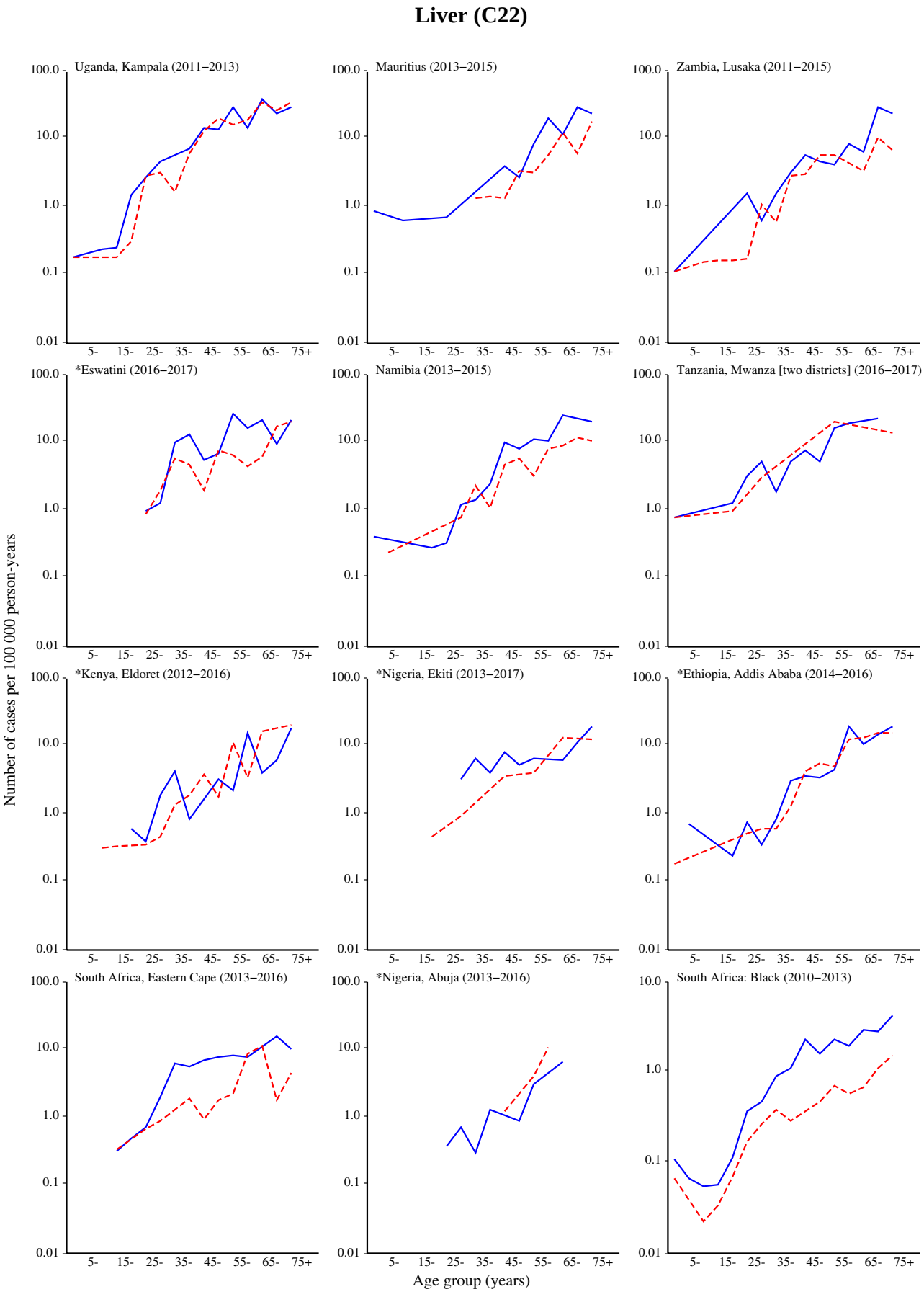
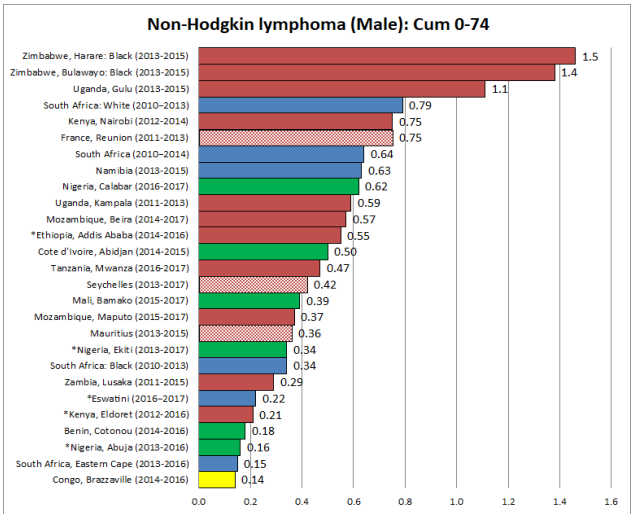


Fig. 7.18 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the liver among males and females, by registry population

Non-Hodgkin lymphoma

An estimated 48,600 new cases and 32,400 deaths from NHL occurred in Africa in 2018. Incidence rates in both sexes in Sub-Saharan Africa are rather lower (cum. risk 0.44%) than the world average (cum. risk 0.61%). NHL encompasses a variety of histologically distinct forms. The summary tables (Chapter 6) provide results (as number of cases, age standardized, and cumulative rate) for Burkitt lymphoma of childhood and NHL (0-74). The results for NHL are summarized in Fig. 7.19, and in map form (cumulative risk, 0-74) in Fig. 7.20.



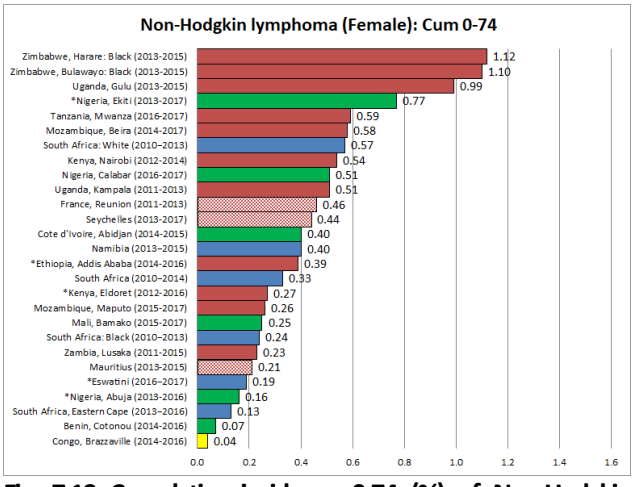


Fig. 7.19 Cumulative incidence 0-74 (%) of Non-Hodgkin lymphoma among males and females in sub-Saharan Africa, by registry population

Although the lymphomas are a very heterogenous group of malignancies, the lack of diagnostic facilities in pathology laboratories in Africa (immunophenotyping, molecular studies, and/or cytogenetics) means that they can reliably be separated only into Hodgkin lymphoma (with diagnostic Reed Sternberg cells visible), and non-Hodgkin lymphoma (NHL) - the remainder. Within the NHL group, Burkitt lymphoma is something of an exception, since diagnosis on simple light microscopy is possible, albeit with a considerable degree of misclassification (Ogwang et al., 2011).

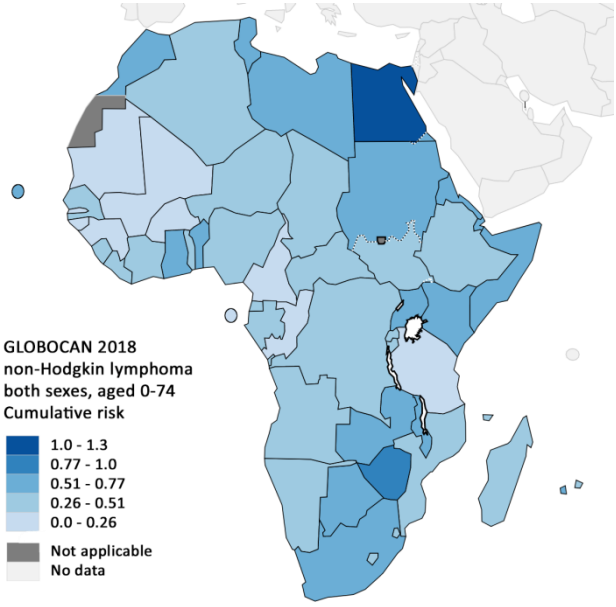


Fig. 7.20 Map of cumulative risk 0-74 (%) of Non-Hodgkin lymphoma among males and females in Africa, by country

Burkitt lymphoma (BL) is an aggressive B cell lymphoma which occurs throughout the world, although by far the highest incidence rates are found in tropical African countries (Stefan et al., 2017), and the tumour in these regions is consequently referred to as "endemic BL". Other African countries outside the equatorial belt have much lower incidence rates, which are similar to those in high income countries. BL in these regions is consequently referred to as "sporadic BL". The unifying characteristic of BL is the unique morphology and the chromosomal translocation involving MYC oncogene, which is present in BL irrespective of geographical location, and immunodeficiency status (Swerdlow et al., 2017). Another distinguishing feature of BL is the association with Epstein-Barr virus (EBV) infection. The endemic form is almost always EBV-positive (as demonstrated by the presence of either EBV nuclear antigen (EBNA) or EBV DNA in the tumour cells) while the sporadic BL tumours are less than 30% EBV-positive. Intense (holo-endemic) malaria infection is a co-factor: BL cases have evidence of more frequent or intense infection with malaria than control children (Molyneux et al., 2012).

In many of the graphs of age specific incidence (Fig. 7.21) a peak of incidence can be seen in the 5-9 year age group (higher in boys than girls) representing cases of BL.

In this volume, high incidence rates are seen in Tanzania (Mwanza), Uganda (especially in Gulu in the north), as well as in Abidjan (Cote d'Ivoire) in West Africa. High rates have also been reported from Malawi (Blantyre) and Ibadan (Nigeria) (Stefan et al., 2017) as well as northern Cameroon (Lewis et al., 2012).

An estimated total of 3,900 cases of BL occurred in Africa in 2018, two thirds in males, and 81% in children aged 0-14 (about half of all NHL in childhood). On a national basis, the geographic distribution of incidence rates among children in sub-Saharan Africa resembles that of the prevalence of infection with Falciparum malaria, and an estimated 81% of cases are associated with infection with Epstein Barr virus (EBV) (Haemmerl et al., 2019).

In adults, the highest incidence rates of non-Hodgkin lymphoma are observed in East Africa (Fig. 7.19). Most NHL in Africa is of the B-cell type, and clinical series show an excess of high-grade lymphomas (especially diffuse large B-cell lymphomas) and a deficit of nodular lymphomas (Naresh et al., 2011; Perry et al., 2016).

Little is known of the causes of non-Hodgkin lymphoma. Human T-cell lymphotropic viruses (HTLV; e.g. HTLV-I) are common in tropical Africa (Fox et al., 2017) and are a cause of T-cell lymphomas (IARC, 2012), but the incidence of these cancers in Africa is low. Although Epstein Barr virus (EBV) DNA is present in a small proportion of lymphomas, its role in causing non-Hodgkin lymphoma in subjects who are not immunosuppressed is unclear (IARC, 2012). Infection with Hepatitis C is considered to be a cause of B-cell non-Hodgkin lymphoma (IARC, 2012), and this accounts for the high incidence of NHL in Egypt, where prevalence of infection with HCV is high (Alter, 2007).

The risk of adult NHL is increased by HIV infection, although the relative risk in HIV positive subjects in Africa is lower than in Europe and North America, and the association between endemic BL and HIV is even less clear (Mbulaiteye et al., 2011). In 2018, it was estimated that about one eighth of NHL cases in Sub-Saharan region were associated with AIDS (Parkin et al., 2019). However, it is not clear that the incidence of NHL in areas where there is a high prevalence of HIV infection has been much impacted by increasing use of the antiretroviral therapies (ART). In the Western Cape of South Africa, for example, cases of HIV-related lymphoma accounted for 37% of all lymphomas seen in 2009 (an increase from 5% in 2002), and BL is now the commonest HIV-related lymphoma, followed by diffuse large B-cell lymphoma subtypes (Abayomi et al., 2011). In Harare (Zimbabwe) the incidence of non-Hodgkin lymphoma has shown a steady increase since 1991 (6.7–6.9% annually), although rates in young adults (15–39) have decreased since 2001 (Chokunonga et al., 2014). The rate of increase in Kampala (Uganda) in 1991-2010 was similar (5.2% annually in men, 6.9% in women), although there was a small decrease among young adults (15-49) since 2007/8 (Wabinga et al., 2013). In an international prospective study of adults living with HIV who started ART after 1995 it was observed that the decline in risk of NHL was much less in South African women than those in Europe, Latin, and North America (AIDS defining group, 2018). It is not clear why ART appears to have been less successful in reducing incidence of NHL compared to that of KS, although as noted, the risk associated with HIV infection is much lower for NHL than for KS, and poor coverage, late commencement of ART and incomplete viral suppression may mask any effect at population level.

In neither Harare nor Kampala has there been much change in incidence of BL, although a recent decline in incidence has been reported in northern Tanzania (Aka, 2012).

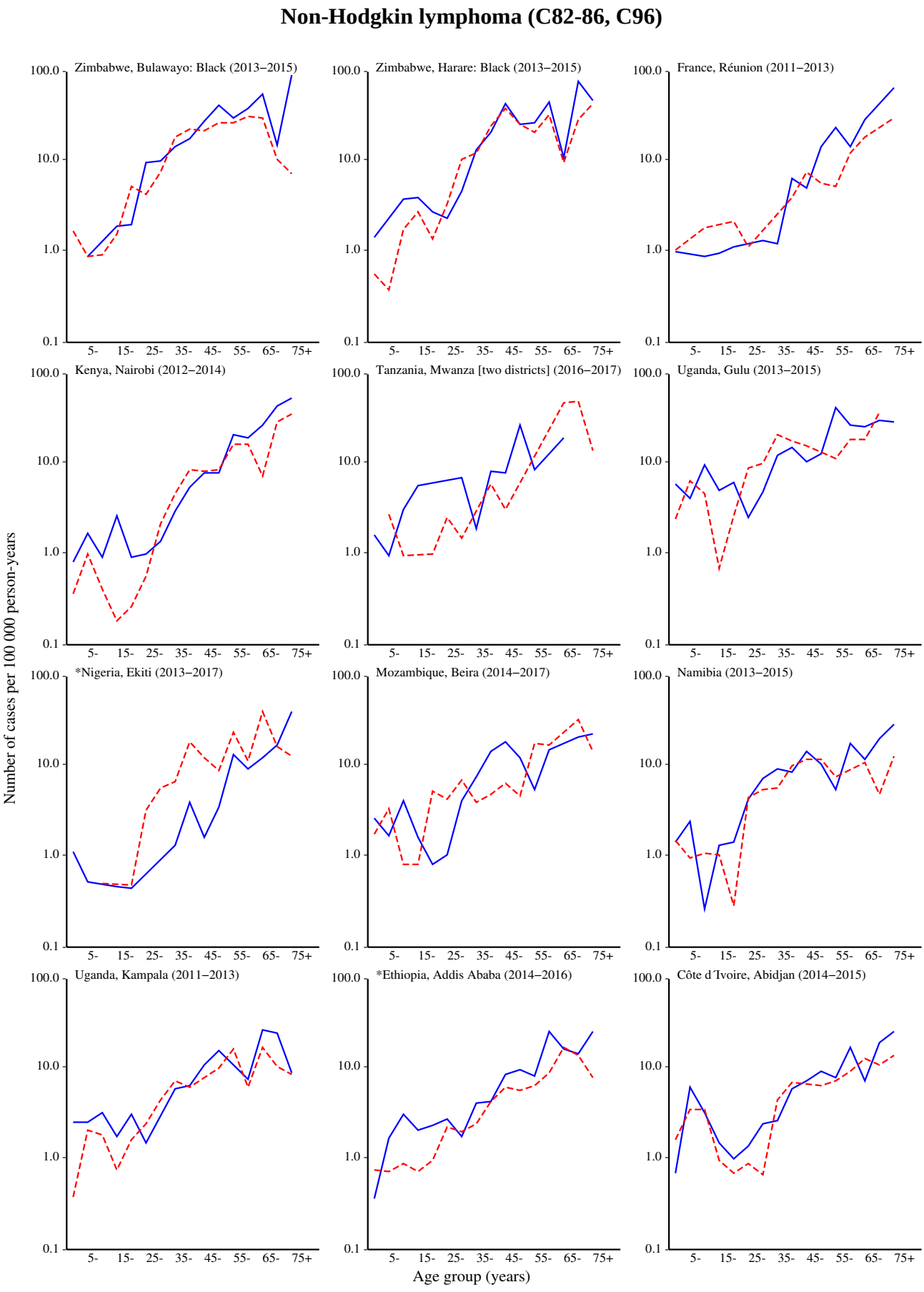


Fig. 7.21 Age-specific incidence rates (cases per 100,000 person-years) of non-Hodgkin lymphoma among males and females, by registry population

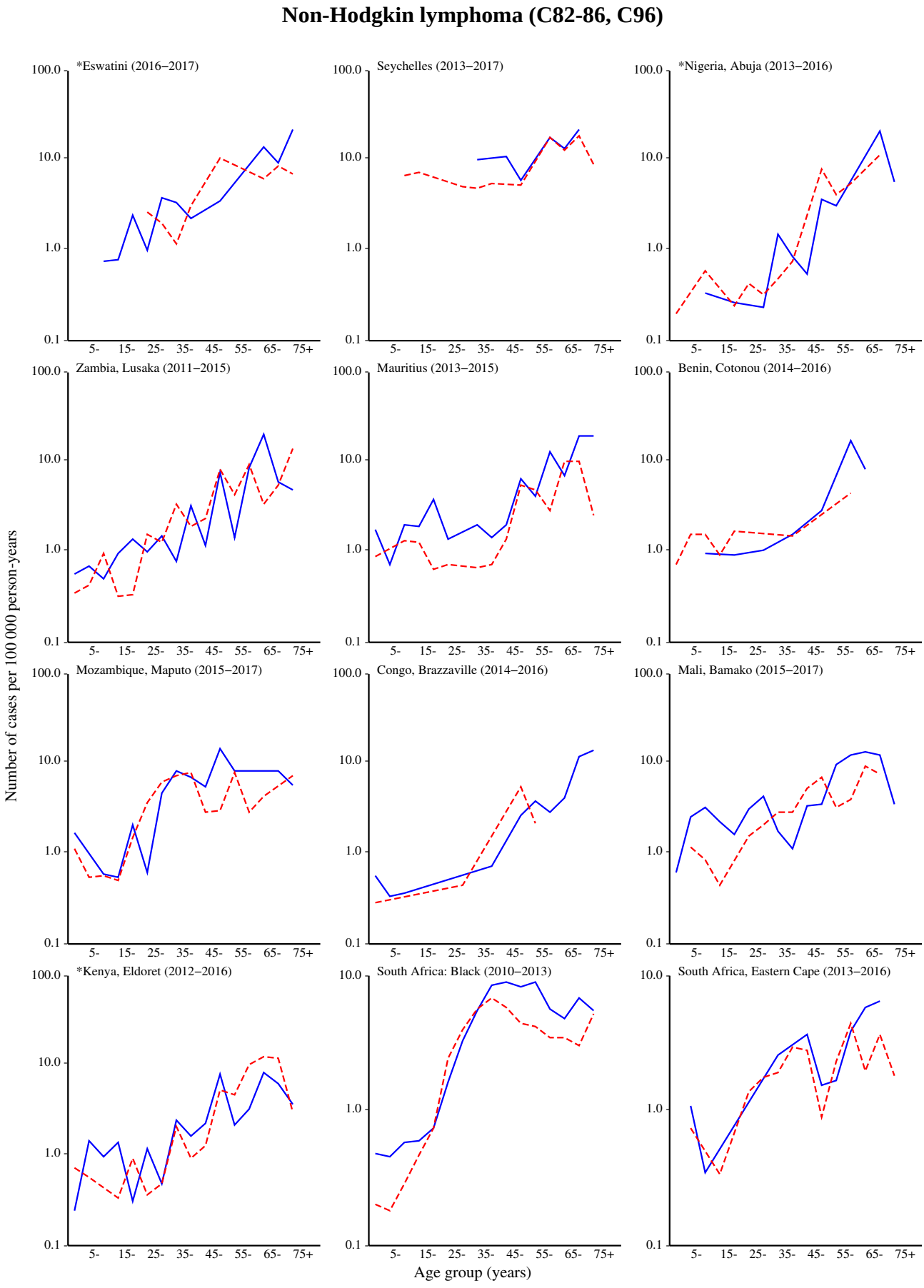
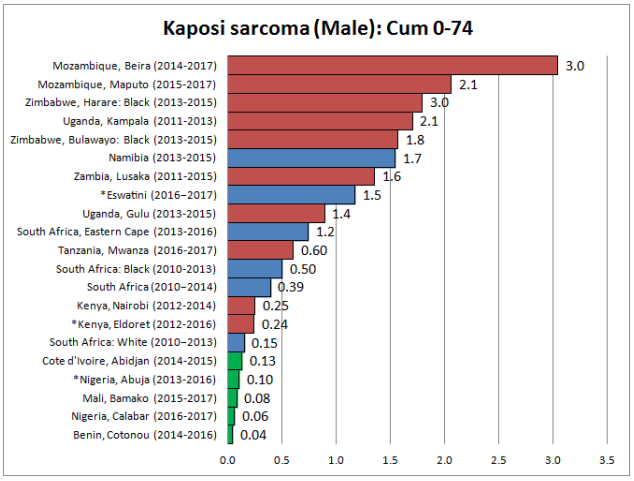


Fig. 7.21 Age-specific incidence rates (cases per 100,000 person-years) of non-Hodgkin lymphoma among males and females, by registry population

Kaposi sarcoma

Kaposi sarcoma is still an important cancer in Africa and was responsible for over 32,446 new cases and an estimated 17,659 deaths in 2018 making it the seventh most commonly diagnosed cancer (Ferlay et al., 2019)



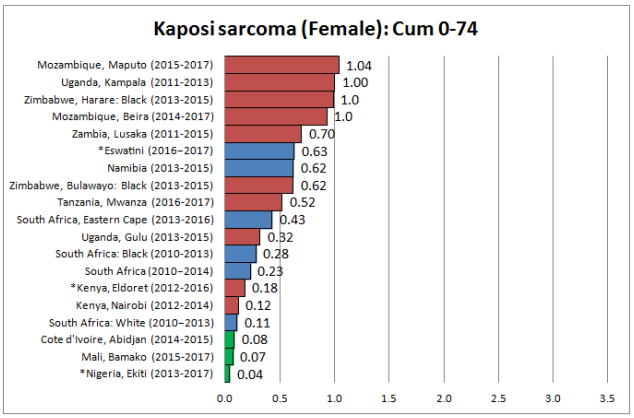


Fig. 7.22 Cumulative incidence 0-74 (%) of Kaposi sarcoma among males and females in sub-Saharan Africa, by registry population

The incidence of KS increased exponentially with the onset of the epidemic of HIV/AIDs, with Eastern Africa being the most affected. High rates of KS are observed in Kampala (Uganda) and Harare (Zimbabwe) followed by Southern Africa region, with the lowest rates seen in West Africa (Fig. 7.22) and (Fig. 7.23). These findings are consistent with the prevalence of HIV in these countries (Fig. 7.24). The majority of people living with HIV are located in low-and-middle- income countries (LMICs) with an estimated 66% living in sub-Saharan Africa, which bears 70% of global HIV-burden.

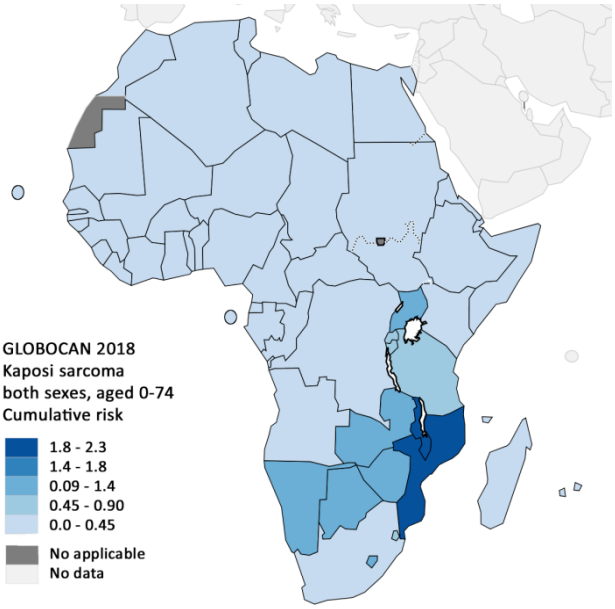


Fig. 7.23 Map of cumulative risk 0-74 (%) of Kaposi sarcoma among males and females in Africa, by country

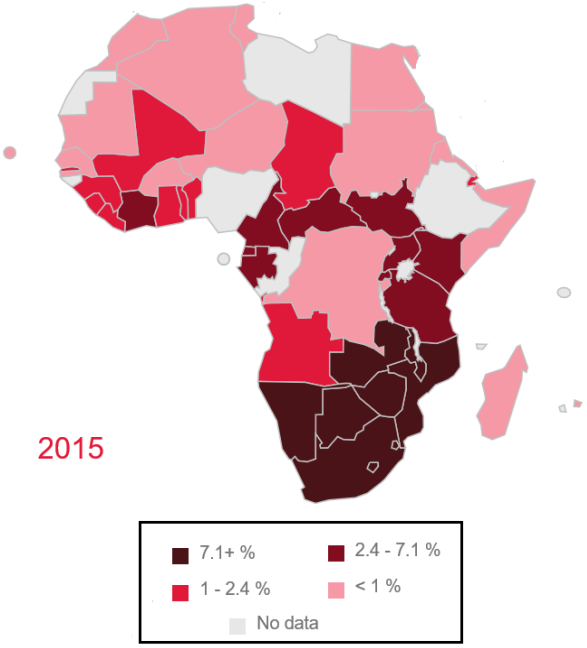


Fig. 7.24 Prevalence of HIV infection in adults (15-49) in 2015. Source: UNAIDS.

Kaposi sarcoma is a malignant vascular neoplasm classified into four clinical variants on the basis of their natural history, sites involved and prognosis, namely: classic, endemic, immunosuppression-related and AIDs-related (Fatahzadeh, 2012); all are associated with an infection with human herpes virus type 8 (HHV-8) (Antman and Chang, 2000; Mbulaiteye et al., 2003; IARC, 2012). Kaposi Sarcoma Herpes Virus (KSHV)/

HHV-8, is therefore considered to be a necessary cause for the development of Kaposi sarcoma, although there is only a weak correlation between KSHV prevalence and the occurrence of endemic Kaposi sarcoma, so that other co-factors are certainly involved (Dedicoat and Newton, 2003).

Endemic KS had long been recognised as relatively common cancer in Africa (Parkin et al., 2003) with quite distinctive geographic distribution, common in central and eastern Africa (Hutt, 1984). It was mainly a disease of the elderly, with its incidence increasing progressively after the age of 30–35 years. In older age groups, endemic Kaposi sarcoma was about ten-times more common in males than in females (Oettle, 1962; Hutt, 1981).

HIV-related immunosuppression increases the risk of KS by several orders of magnitude (IARC, 2012). As a result of the HIV epidemic, the incidence of Kaposi sarcoma has also increased in countries where it was previously relatively rare, but where KSHV was prevalent, such as Southern Africa and some parts of East Africa. In Africa, the relative risks of KS in HIV infected individuals, although elevated, are substantially lower than those reported in developed countries. In prospective studies, linking registers of subjects with HIV to cancer registries, the risk of KS in HIV positive subjects was 6.4 (relative to the general population) in Uganda (Mbulaiteye et al., 2003) and 134 (relative to HIV negative subjects) in South Africa (Dhokotera et al., 2019). The reasons for the lower relative risk in Africa are unclear but may reflect differences in background risk and competing mortality. Treatment of HIV-AIDS with highly active antiretroviral therapy (HAART) significantly lowers the risk of KS (Bohlius et al., 2014). One meta-analysis suggested that the incidence was 6.6-fold lower compared with people who had never received HAART (Liu et al., 2018).

HIV-associated Kaposi sarcoma involves internal organs and lymph nodes, features that were typical of childhood Kaposi sarcoma in the pre-AIDS era. The age-specific incidence curve in those centres with high rates of HIV-related KS has also changed. Epidemic Kaposi sarcoma shows a pattern reminiscent of the prevalence of HIV infection, with a modest peak in children aged zero to four years, a decrease until the age of 15 years, and then a progressive increase to a peak in young adults, at rather younger ages in females than in males (Fig. 7.25).

Although KS continues to be a leading cause of cancer in most parts of sub-Saharan Africa, rates are decreasing significantly due to reduction in prevalence of HIV and wider availability of highly active antiretroviral therapy (Wabinga et al., 2014; Chokunonga et al., 2013; Mills et al., 2011; Semeere et al., 2019).

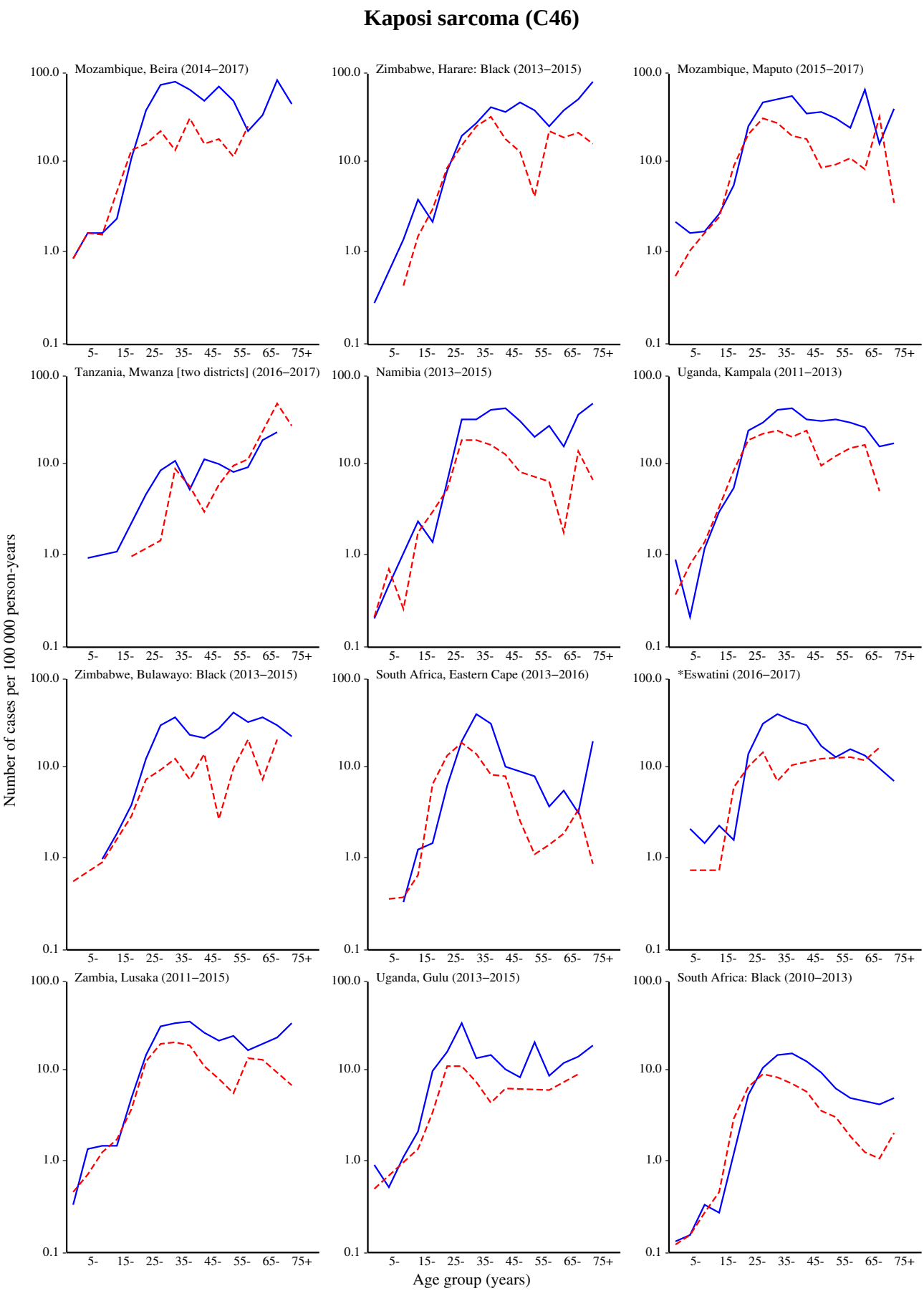


Fig. 7.25 Age-specific incidence rates (cases per 100,000 person-years) of Kaposi sarcoma among males and females, by registry population

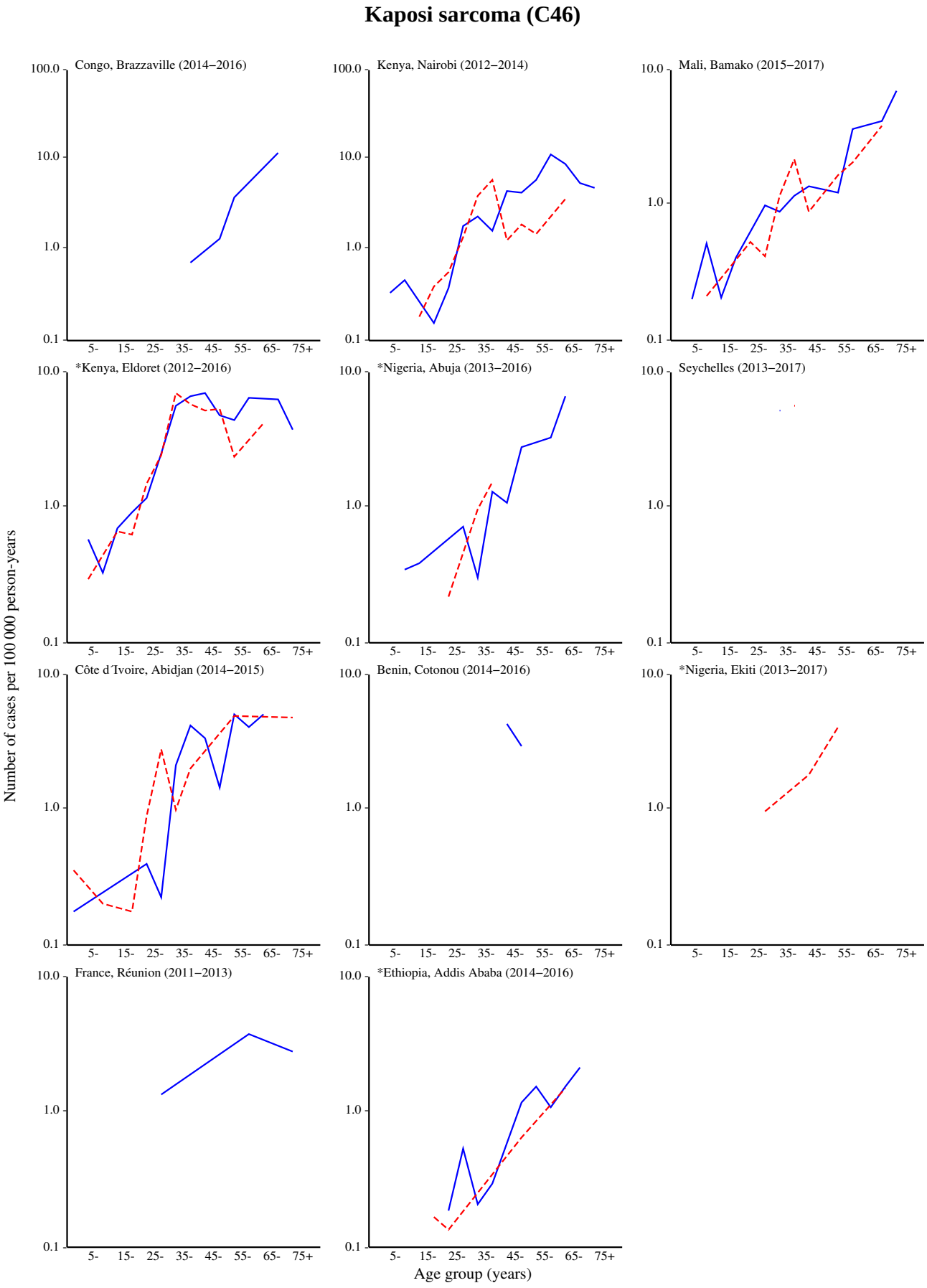
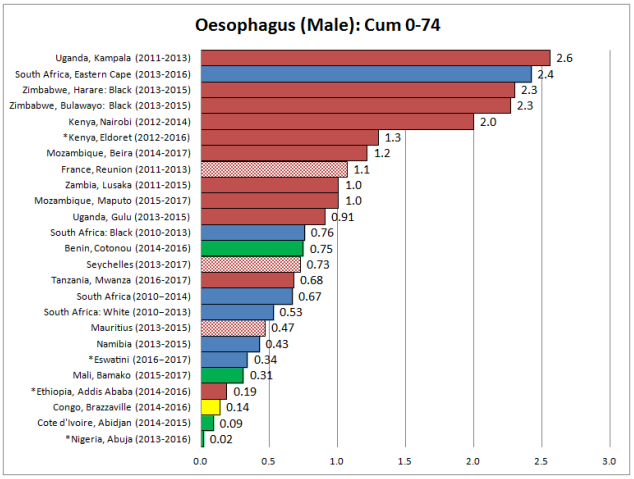


Fig. 7.25 Age-specific incidence rates (cases per 100,000 person-years) of Kaposi sarcoma among males and females, by registry population

Cancer of the oesophagus

Oesophageal cancer was the seventh most common cancer worldwide and the sixth most common cause of cancer mortality accounting 1:20 cancer deaths in 2018 (Bray et al., 2018). The most common histological sub type is oral squamous cell carcinoma (OSCC) and there is a marked geographic distribution. High incidence areas of OSCC stretch from Asia (China and Iran) to Eastern and Southern Africa and parts of South America (Murphy et al., 2017). For Africa, about 28,494 new oesophageal cancer cases and 27,707 deaths were estimated to have occurred in 2018, with over 90% of these African cases and deaths occurring in sub-Saharan Africa (Ferlay et al., 2019).



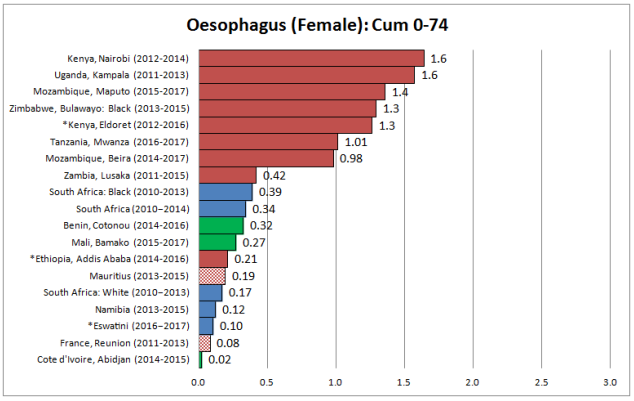


Fig. 7.26 Cumulative incidence 0-74 (%) of cancer of the oesophagus among males and females in sub-Saharan Africa, by registry population

Cumulative risk varies widely across the continent with risks of 2% and over in Kenya and Malawi to less than 0.1% in some North and West African regions (Fig. 7.27). Cumulative risks from specific cancer registries in sub-Saharan Africa show similar heterogeneity with the highest risk for men recorded in Kampala Uganda at 2.6% followed by the Eastern Cape region of South Africa, Zimbabwe and Kenya. A similar pattern of risk was noted for women, albeit with lower cumulative risks than in men.

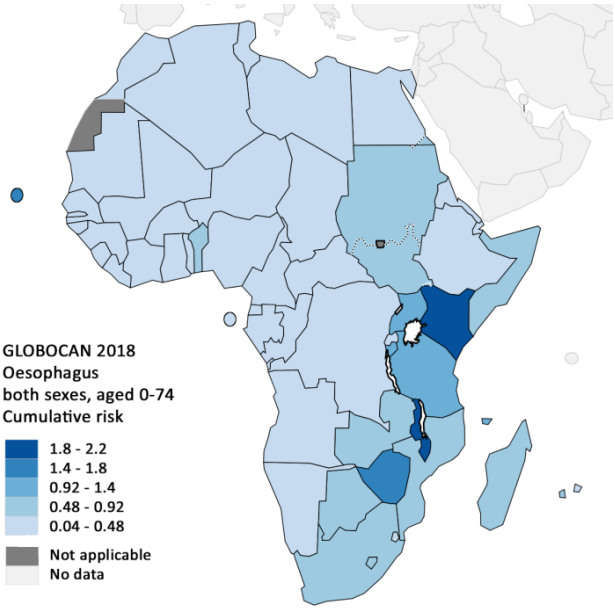


Fig. 7.27 Map of cumulative risk (%) 0-74 of cancer of the oesophagus among males and females in Africa, by country

Age standardised incidence rates ranged from 20.3 and 16.1/100,000 in Harare (Zimbabwe) for men and women respectively to 0.2/100,000 in Abuja (Nigeria) for men and 0.1/100,000 for women (Summary Table, Oesophagus). The male excess risk for oesophageal cancer is well recorded for developed countries. A recent meta analysis examined the male to female incidence ratios in Africa using cancer registry data and a systematic review of literature. A significant male excess was reported of 1.6 and 1.8 in Eastern and Southern Africa respectively (Middleton et al., 2018), although these ratios were noted to have decreased since the pre-1990's.

Incidence rates increase steeply with age, so that approximately 80% of cases in Eastern Africa occur in individuals aged 50 years and over. However, cases of oesophageal cancer in patients younger than 30 years constituted 8% of all cases in one hospital series from Western Kenya (McCormack et al., 2018).

Oesophageal cancer cases in Africa present late and have a poor prognosis. Therefore, it is imperative that the aetiologic factors associated with OSSC in Africa are well defined in order to devise primary prevention strategies (Middleton et al., 2018). While tobacco and alcohol are well established risk factors for oesophageal cancer in high incidence developed countries, they are likely to explain a smaller percentage of oesophageal cancer in Africa, given the lower prevalence rates of these risk factors. Sub-Saharan Africa is the region of the world with the lowest per capital cigarette consumption, with very little

increase observed in the last 30 years (Eriksen et al., 2015). The marked geographic distribution in Africa (Fig. 7.27) is by no means related to patterns of tobacco and alcohol consumption.

A recent study investigated hot tea drinking habits in Northern Tanzania and found that participants consumed their tea at a mean temperature of 70.6 degrees Celsius (Munishi et al., 2016). This is similar to the tea temperature consumed in the Golestan province of Iran where hot tea drinkers (>70 degrees) had an 8.2 fold increase in OSCC (Islami et al., 2009).

The role of genetic susceptibility is also an important consideration for OSCC (Murphy et al., 2017). There is strong evidence for increased risk in patients who report a family history of OSCC. With regards to somatic mutations, there have been a number of genome wide association studies undertaken in Europe and Asia (Murphy et al., 2017). However, there is a paucity of such studies for high incidence African populations. It will be interesting to examine whether the 16 high risk loci identified for Chinese populations can be replicated in African Descent populations (Murphy et al., 2017).

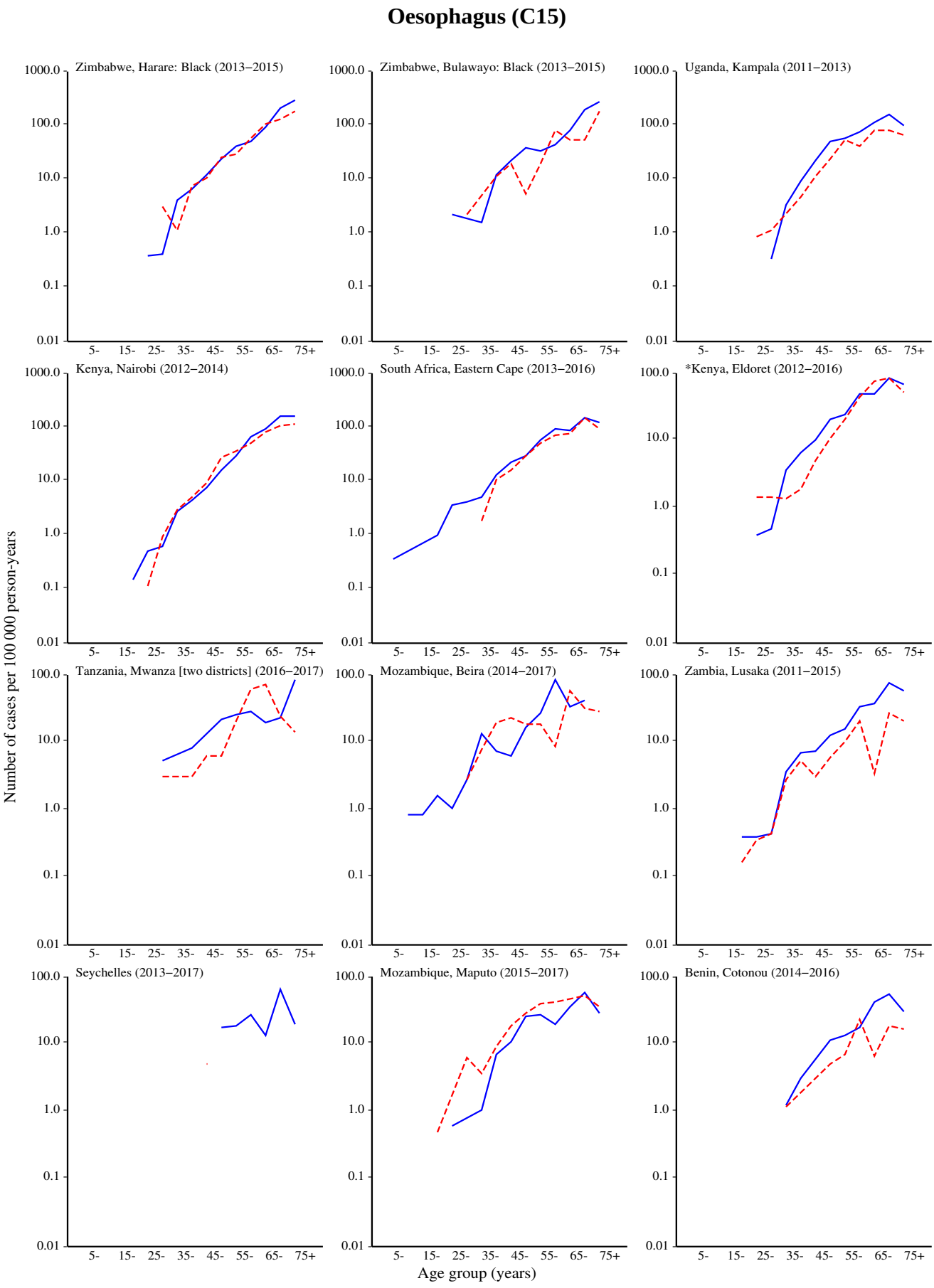


Fig. 7.28 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the oesophagus among males and females, by registry population

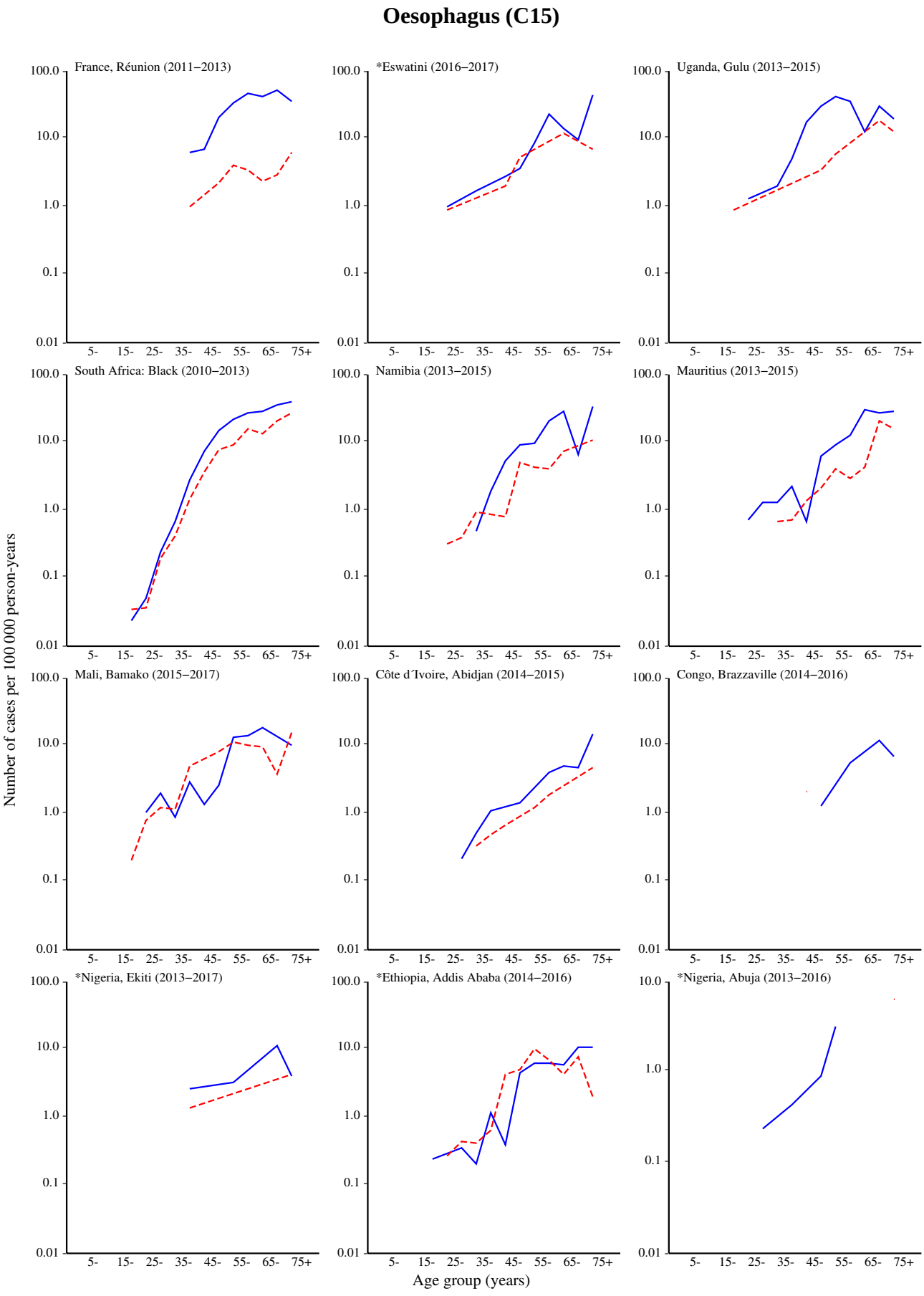
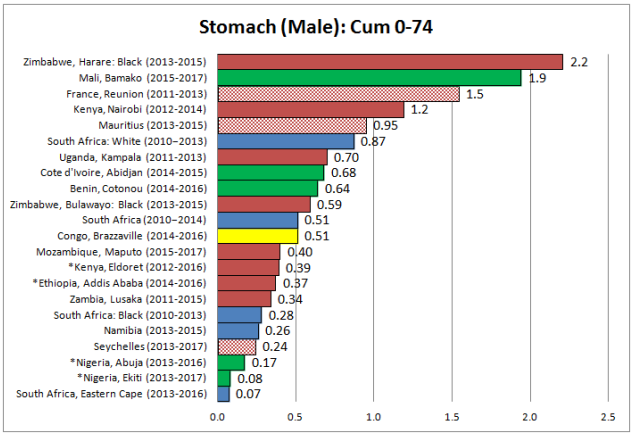


Fig. 7.28 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the oesophagus among males and females, by registry population

Cancer of the stomach

About 31,100 new cases of stomach cancer and 28,700 deaths were estimated to have occurred in 2018 in Africa, with three quarters of them in sub-Saharan Africa (23,400 new cases). There is a small predominance in males (sex ratio 1.2). Incidence rates are rather low by world standards: the cumulative risk (0-74) for sub Saharan Africa is 0.48% (very similar to that in the USA), compared with 1.31% globally.



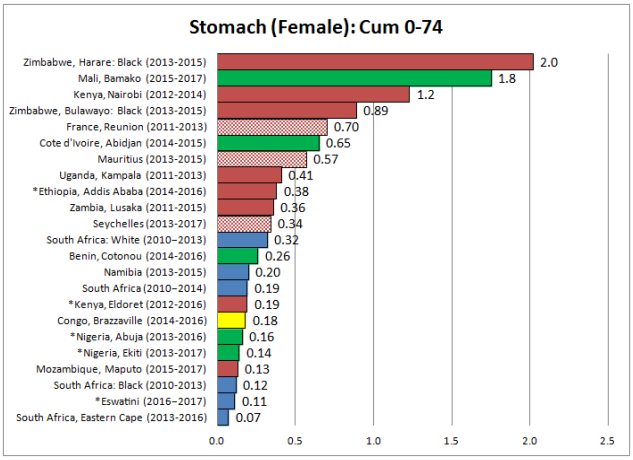


Fig. 7.29 Cumulative incidence 0-74 (%) of the cancer of the stomach among males and females in sub-Saharan Africa, by registry population

The centres with the highest recorded rates are in Zimbabwe (Harare), Mali (Bamako), Kenya (Nairobi) and France (Reunion) (Fig. 7.29). This scattered occurrence is reflected in the Globocan estimates (Fig. 7.30). It seems probable that gastric cancer is somewhat under-diagnosed, or confused with cancers of the oesophagus, when endoscopy services are not well developed: a significant proportion of cases are diagnosed without histology in several centres (Chapter 5). In rural Kenya, the reported incidence of stomach cancer increased when the main hospital in this region acquired an endoscope (MacFarlane et al., 2001).

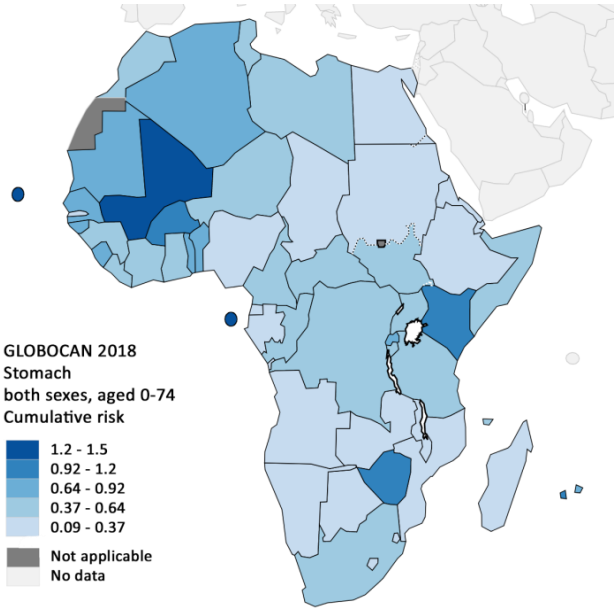


Fig. 7.30 Map of cumulative risk 0-74 (%) of cancer of the stomach among males and females in Africa, by country

The relatively high rates in Mali have been noted previously (Bayo et al., 1990). Historical data also suggests an area of relatively high risk in the Great Lakes region. A relatively high frequency of stomach cancers has been recorded in Rwanda (Newton et al., 1996). In western Uganda, stomach cancer was reported to be the second most common cancer, accounting for 12% of all cancers in males and 6% of all cancers in females (Parkin et al., 2003).

Age distribution is similar in most countries except Seychelles and South African (Eastern Cape). The incidence increases regularly with age. Gastric cancer cases are diagnosed in children in some countries: Ethiopia, Kenya, Mali, South Africa and Uganda (Fig. 7.31).

The dramatic declines in the incidence of gastric cancer in high income countries is a well-known phenomenon (Howson et al., 1986), linked to improvements in food preservation and a decline in transmission of, and infection by, Helicobacter pylori. However, there is no suggestion that the disease is on the decline in Africa; time trends for the cancer registries in Uganda (Kampala) (Wabinga et al., 2014), Zimbabwe (Harare) (Chokunonga et al., 2013) and Mali (Bamako) (this volume) indicate little or no change in incidence in the last 20 years. No decline was noted in rates of histologically diagnosed cases in South Africa between 1986 and 1995 (Sitas et al., 1998).

Helicobacter pylori infection is now recognised as the most important risk factor for non-cardia gastric cancers (IARC, 2012) and is estimated to be responsible for some 85% of cases in sub-Saharan Africa (Parkin et al., 2019). The fact that prevalence infection with of H pylori appears to be high in

African populations (IARC, 1994), and yet, in many areas, incidence of gastric cancer is low, has been referred to as "an enigma" (Holcombe, 1992). However, the pathway from infection to cancer is indirect, involving chronic inflammation resulting in progressively severe, then chronic atrophic gastritis and ultimately intestinal metaplasia. This process is modulated by host-determined inflammatory responses and specific *H. pylori* virulence factors, including CagA. *H pylori Cag-A* positive strains are the predominant strains in Africa (Mitchell et al., 2002), but there is much genetic variation within Cag-A positive H pylori, with quite different carcinogenic potential (Kidd et al., 1999; Yamaoka et al., 2008). In addition to the large differences in the carcinogenic potential of generic variants of H pylori, other factors are involved in modulating risk, including diets low in fruit and vegetables and vitamin C, and/or high in salts, and tobacco smoking. There has been almost no research in Africa in this area; while there are many places where food is salted or pickled to aid preservation, the relative importance of these risk factors in local settings is unknown.

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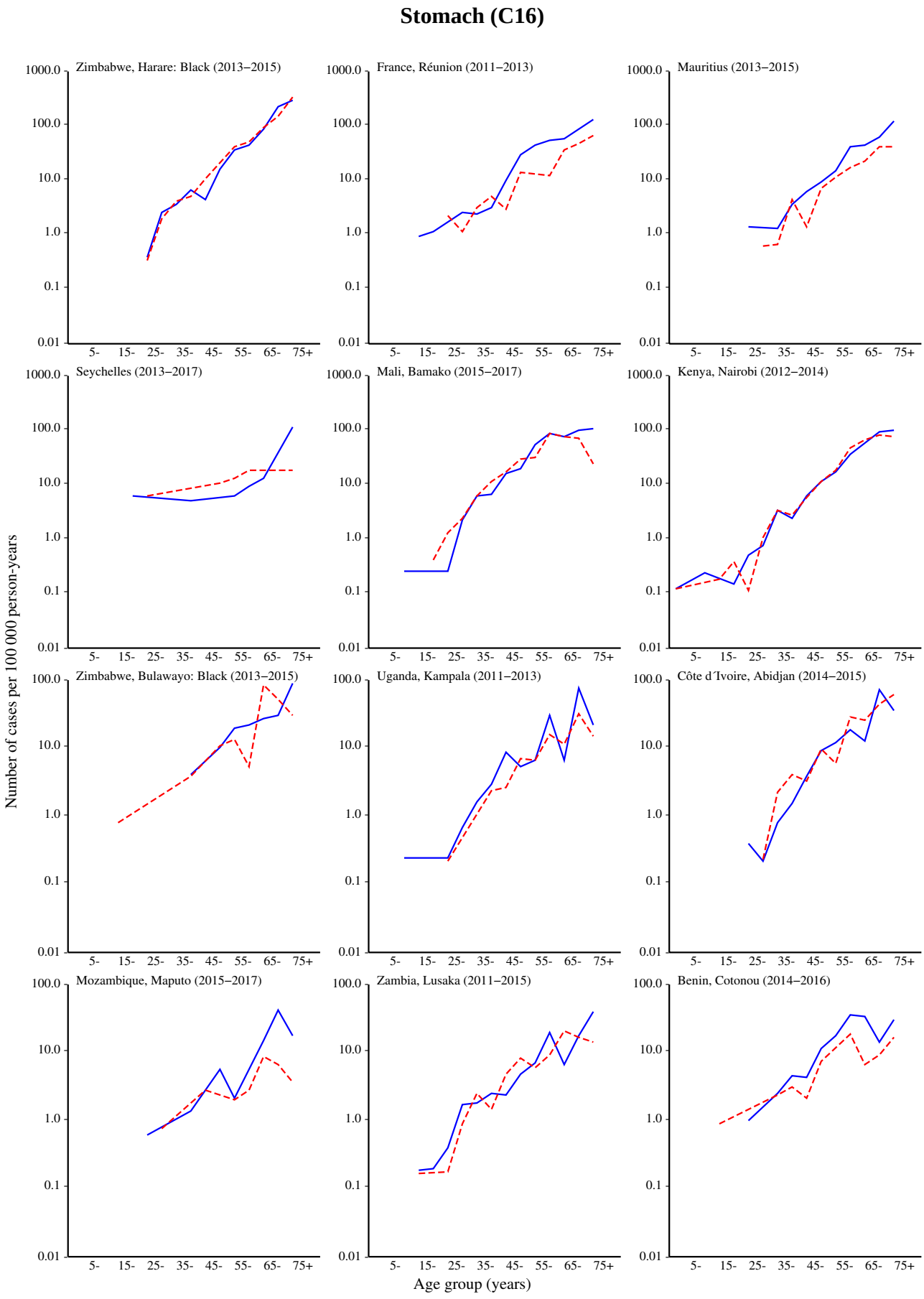


Fig. 7.31 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the stomach among males and females, by registry population

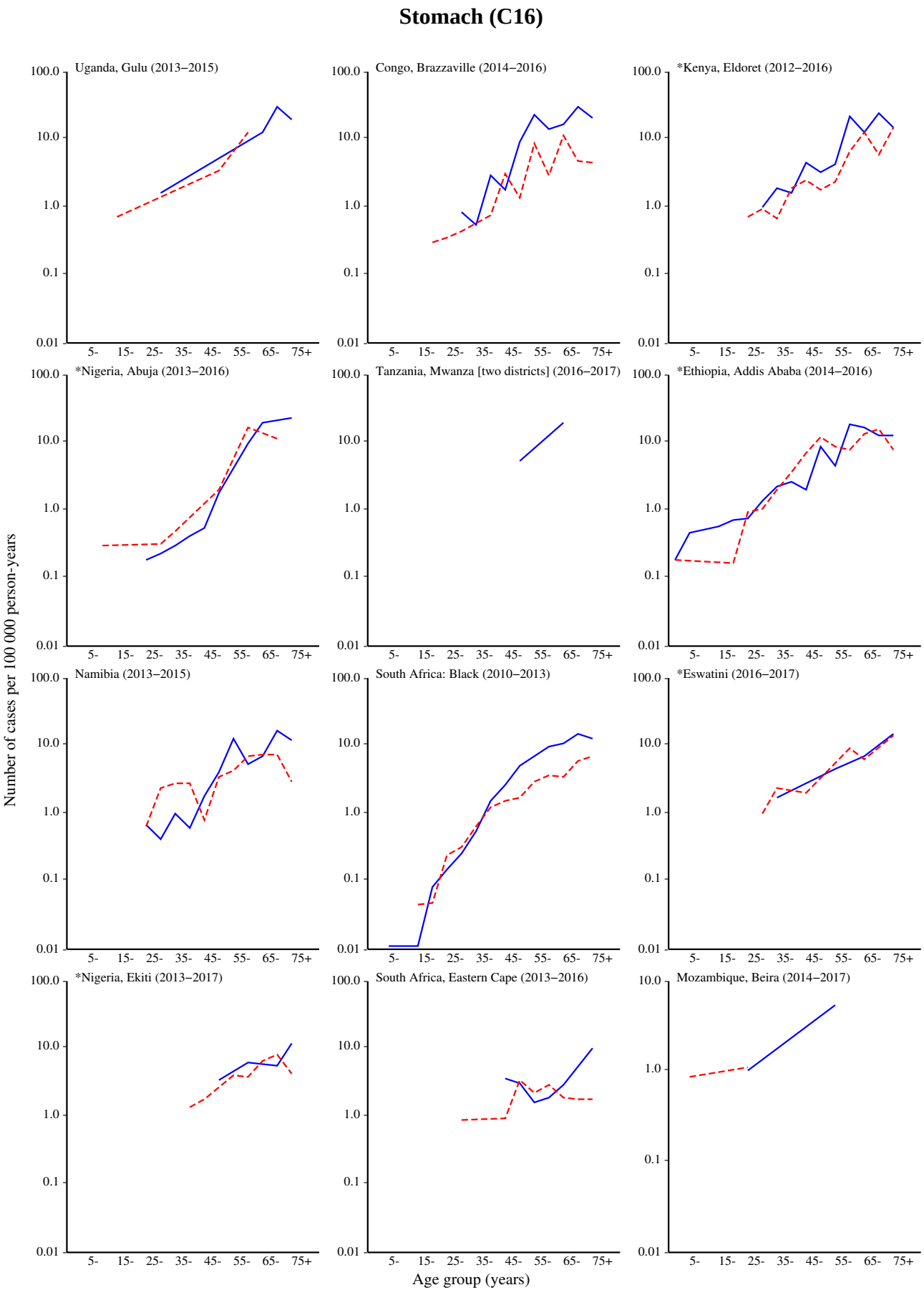


Fig. 7.31 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the stomach among males and females, by registry population

Leukaemia

An estimated 20,900 new cases and 17,600 deaths from leukaemia occurred in sub-Saharan Africa in 2018, making it the 10th most common cancer type (Ferlay et al., 2018). Leukaemias are slightly more common in males than females (sex ratio = 1.06) and about 1/4 of the cases occurred in the childhood age range.

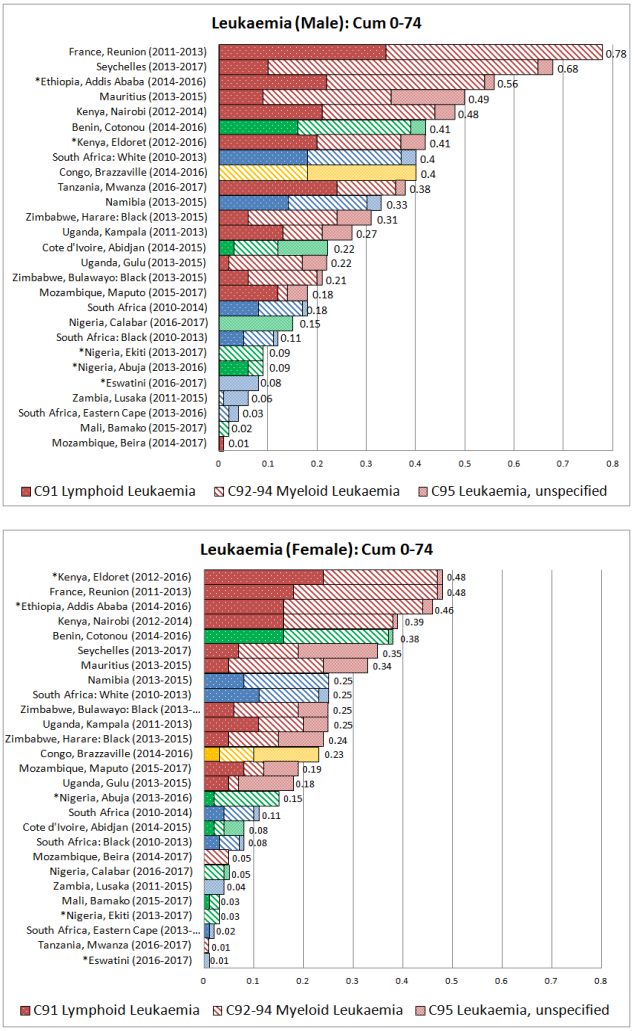


Fig. 7.32 Cumulative incidence 0-74 (%) of Leukaemia, males and females, by registry population

Overall, incidence rates are much lower than observed in western countries. Globocan 2018 gives the following estimates of cumulative incidence (0-74):

World	**0.48**
Very High HDI countries	**0.74**
High HDI countries	**0.46**
Medium HDI countries	**0.33**
Low HDI countries	**0.29**
Africa	**0.32**
Sub Saharan Africa	**0.29**

With respect to the rates recorded in the cancer registries, the incidence appears to be higher in those in East Africa. Of note is the relatively high incidence rates in Addis Ababa (Ethiopia), where leukaemias are the most common cancer of men, and fourth in rank in females.

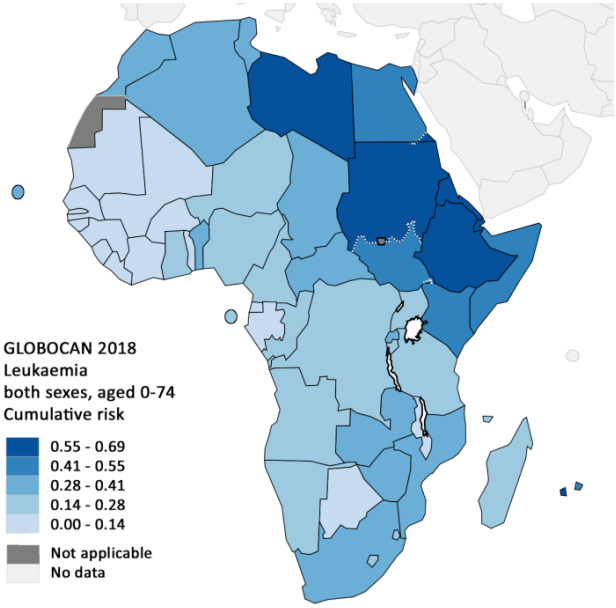


Fig. 7.33 Map of cumulative risk 0-74 (%) of leukaemia among males and females in Africa, by country

It is quite possible that the low incidence rates reported from some cancer registries are the consequence of under-diagnosis and underreporting. Oncological haematology and clinical haematology services in general are few in Africa (Gopal et al., 2012). Some registries do not include services of clinical haematology in their case-finding routines, and so fail identify haematological malignancies even when they are diagnosed.

Most descriptions of leukaemia in Africa are based on clinical series, so that it is difficult to know how much the age structure of the population, and selective factors including access to hospital and diagnostic facilities, and the technical diagnostic methods available, influence the reported patterns.

The older literature (up to 1985) was summarised by Fleming (1986). In many series, chronic leukaemia apparently outnumbered acute leukaemias, and in early series from West Africa, chronic myeloid leukaemias appeared to be more frequent than chronic lymphoid leukaemia (Edington and Hendrickse, 1973; Williams, 1985). As far as one can see from the bar charts (Fig. 7.32), the ratio between lymphoid and myeloid leukaemias is quite variable, but, in general, there is no excess of lymphoid leukaemias, as observed in high income countries (Miranda-Filho et al., 2018) .

There are many reports suggesting that HTLV-I seroprevalence rates are elevated in several African countries. A systematic review of studies in 25 African countries found the average seroprevalence of HTLV-1 1.2% in Eastern and Southern Africa and 3.2% in Western and Central Africa (Fox et al., 2016). Adult T-cell leukaemia/lymphoma (ATLL) has been rarely identified in Africa, probably due to lack of diagnostic facilities, although when series of lymphoma cases are reviewed, some 10-20% have characteristics of ATLL (with positivity for HTLV-1 (Delaporte et al., 1993; Williams et al., 1993).

The information on leukaemia of childhood in Africa was reviewed in "Cancer of Childhood in sub-Saharan Africa" (Stefan et al., 2017). Even taking into account under-diagnosis, under-reporting, and lack of specificity of leukaemia diagnoses, they concluded that the results presented were consistent with other reports in suggesting that incidence rates – particularly of acute lymphoblastic leukaemia (ALL)- are low in African children. Although ALL was the most common specific type reported, there was no peak in incidence in the 0-4 age group (unlike populations from high income countries), consistent with the notion that pre-B ALL is linked with higher levels of socio-economic development.

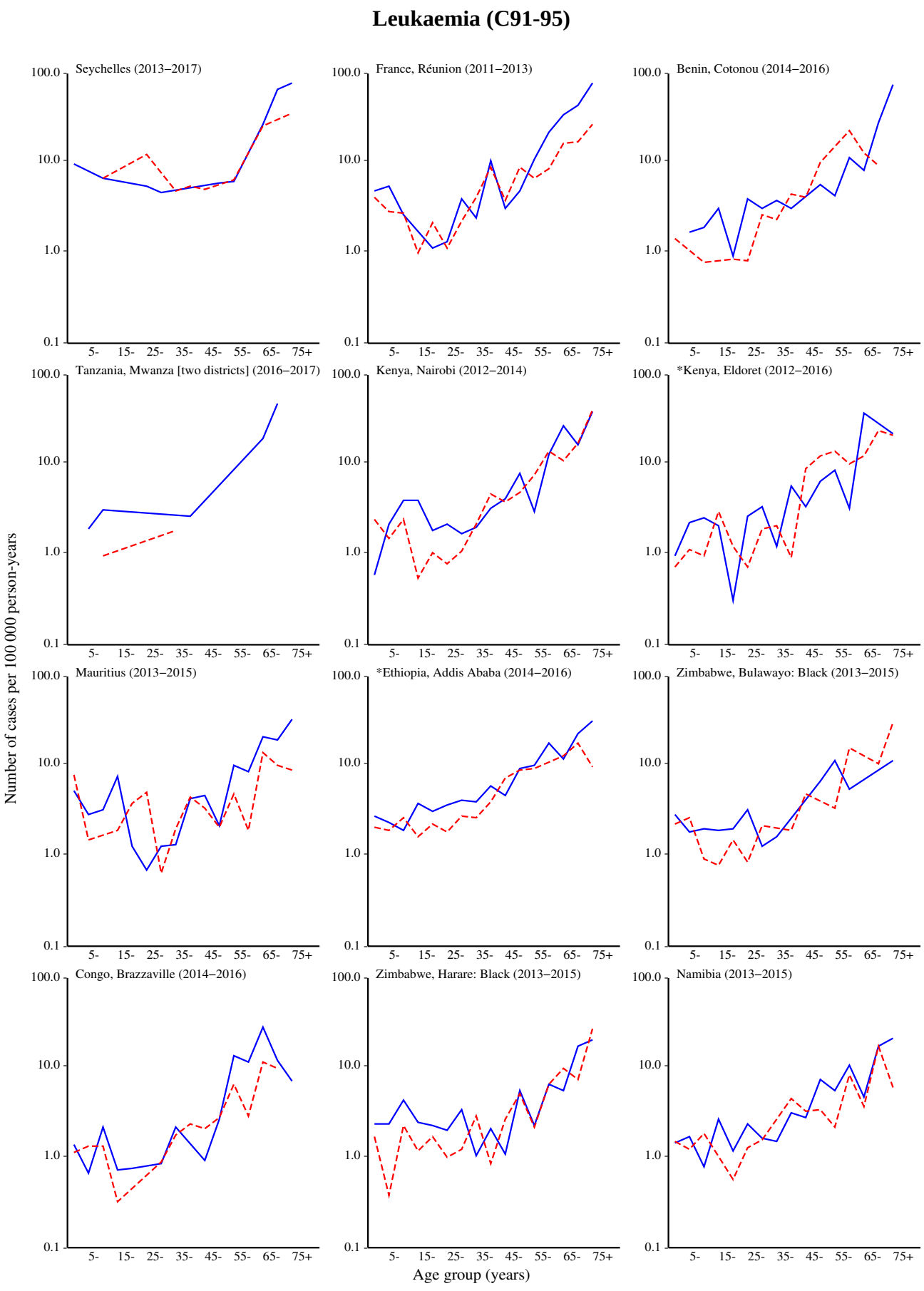


Fig. 7.34 Age-specific incidence rates (cases per 100,000 person-years) of leukaemia among males and females, by registry population

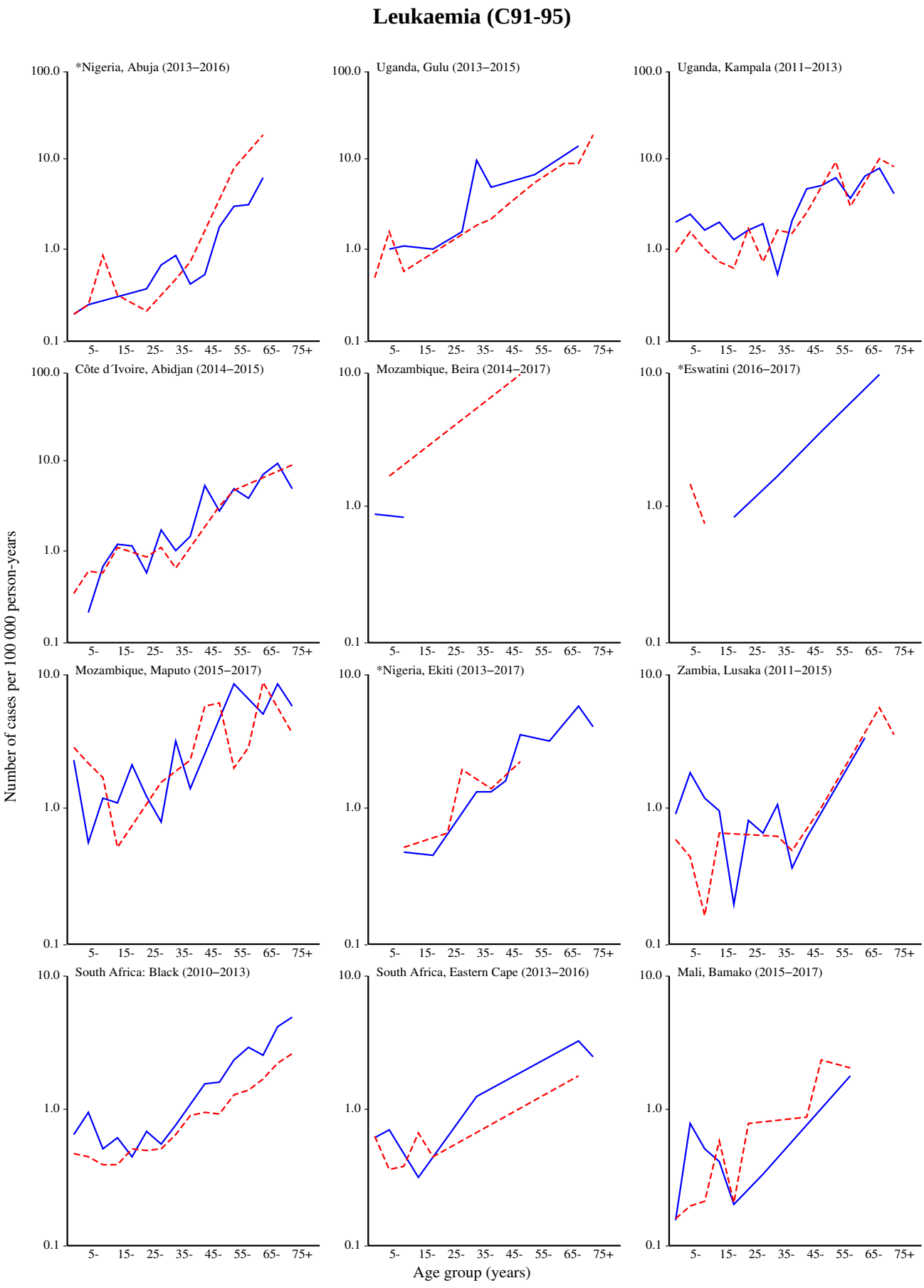
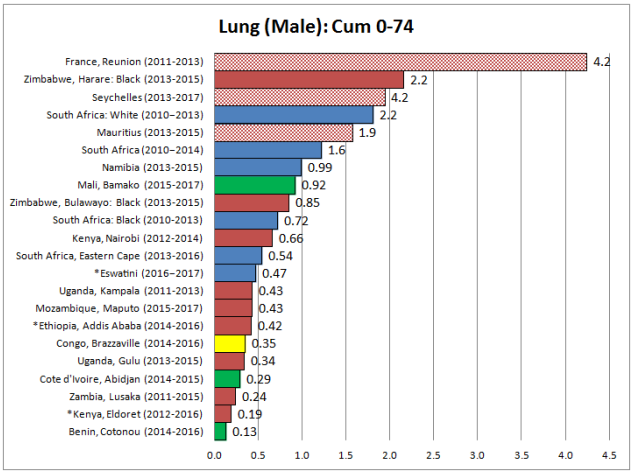


Fig. 7.34 Age-specific incidence rates (cases per 100,000 person-years) of leukaemia among males and females, by registry population

Cancer of the lung

About 39,400 new lung cancer cases and 37,700 deaths were estimated to have occurred in 2018 in Africa, with men accounting for over 70% of the total cases and deaths (Bray et al. 2019). The risk of lung cancer varies substantially across countries (registries) with cumulative risk before age 75 ranging from less than 0.2% in Eldoret (Kenya) to 4.2% in Reunion in men and from less than 0.1% to about 1.3% in the corresponding countries in women (Fig. 7.35). In general, the highest incidence rates are found in parts of North Africa (Morocco, Libya and Tunisia), South Africa Republic, and the Indian Ocean Islands (Fig. 7.36). In all of these countries, lung cancer is the leading cause of cancer death. Incidence rates exponentially increase with age and rates are substantially higher in men than in women.



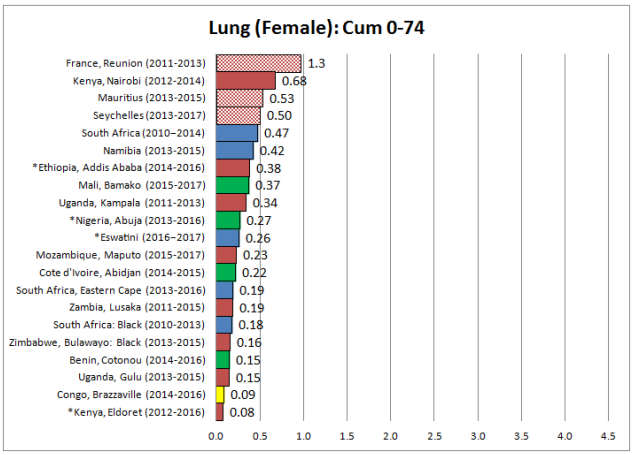


Fig. 7.35 Cumulative incidence 0-74 (%) of cancer of the lung among males and females in sub-Saharan Africa, by registry population

Few studies have been published on temporal trends in lung cancer rates in Africa and these studies showed decreasing rates in men in rural Eastern Cape Province (RSA) and in black

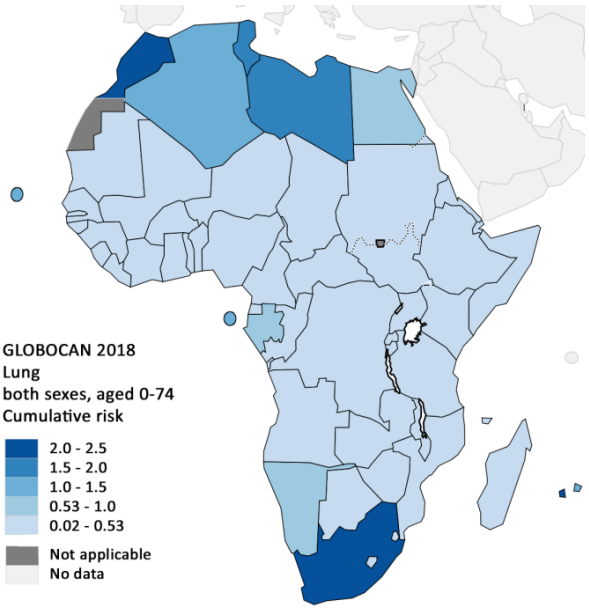


Fig. 7.36 Map of cumulative risk 0-74 (%) of cancer of the lung among males and females in Africa, by country

population of Zimbabwe (Chokunonga et al., 2013; Somdyala et al., 2015), and increasing rates in women in Kampala (Uganda) (Wabinga et al., 2014). Notwithstanding the lack of trend data, the substantial variation in lung cancer rates across countries and between men and women reflect differences in the degree of the tobacco epidemic. Over 25% of men in parts of North Africa and Southern Africa were current smokers in 2012 compared to less than 10% in most of west and central Africa (Ng et al., 2014). In women, in contrast, smoking prevalence was less than 5% in almost all parts of Africa (Ng et al., 2014). Despite the large variation in incidence rates within the continent, Africa represents the region with the lowest incidence rates worldwide. For example, the cumulative risk rate in men in 2012 for SSA (0.58%) was less than one sixth of the global average (3.92%). This is because of the early stage of the tobacco epidemic as well as low intensity of smoking (in most countries of SSA, consumption by smokers is less than 10 per day (Ng et al., 2014)). This relates to cigarette affordability, resulting in the purchase of cigarettes in sticks instead of in packs, in most parts of Africa.

The prevalence and intensity of smoking, however, is expected to increase in both men and women in Africa because of the economic transition (increases in affordability of cigarettes) and intensified marketing by tobacco companies as they attempt to increase their market share and maximize profit (Tobacco Control in Africa, 2011; Appau et al., 2017). According to findings from the Global Youth Tobacco Survey administered between 2009-2011 in ten select countries in Africa, smoking within the last 30 days in girls and boys aged 13-

15 years ranged from 3.4% in Malawi to 13.6% in Cote d'Ivoire for cigarettes and from 8.6% in Niger to 25.4% in Zambia for all tobacco products (Zhao et al., 2015). Notably, in some of these countries, cigarette smoking in girls were as high as in boys and higher than in adult in the same countries (Ng et al., 2014; https://tobaccoatlas.org/); and girls and boys initiate smoking as early as ages ≤ 7 years (Veeranki et al., 2017).

Tobacco use is the most preventable cause of cancer death. In response to the growing tobacco epidemic, members of states of the World Health Organization (WHO) adopted the WHO Framework Convention on Tobacco Control in 2005 (WHO FCTC, 2005). As of July 2019, 44 of the 47 countries in the WHO Africa region are parties to the FCTC; the non-parties are Eritrea, Malawi, and South Sudan (http://www.fctc.org/about-fca/tobacco-control-treaty/latest-ratifications/regional-breakdown). Heydari et al. (2016) compared tobacco control programs worldwide based on the 2015 WHO MPOWER report. They found large variations in the overall implementation of the FCTC (expressed as MPOWER score between 0 to 37, with 37 as full FCTC implementation) across the 47 WHO region African countries, ranging from 3% in South Sudan to 32% Mauritius (Heydari et al., 2016). Another study showed that implementation of tobacco policies as suggested by WHO in West African countries, although at low levels, was correlated with reduced smoking prevalence (Vinkler et al., 2015). These findings underscore the continued need for broad implementation of the FCTC provisions to curb the growing burden of lung cancer and other smoking-related diseases in the continent.

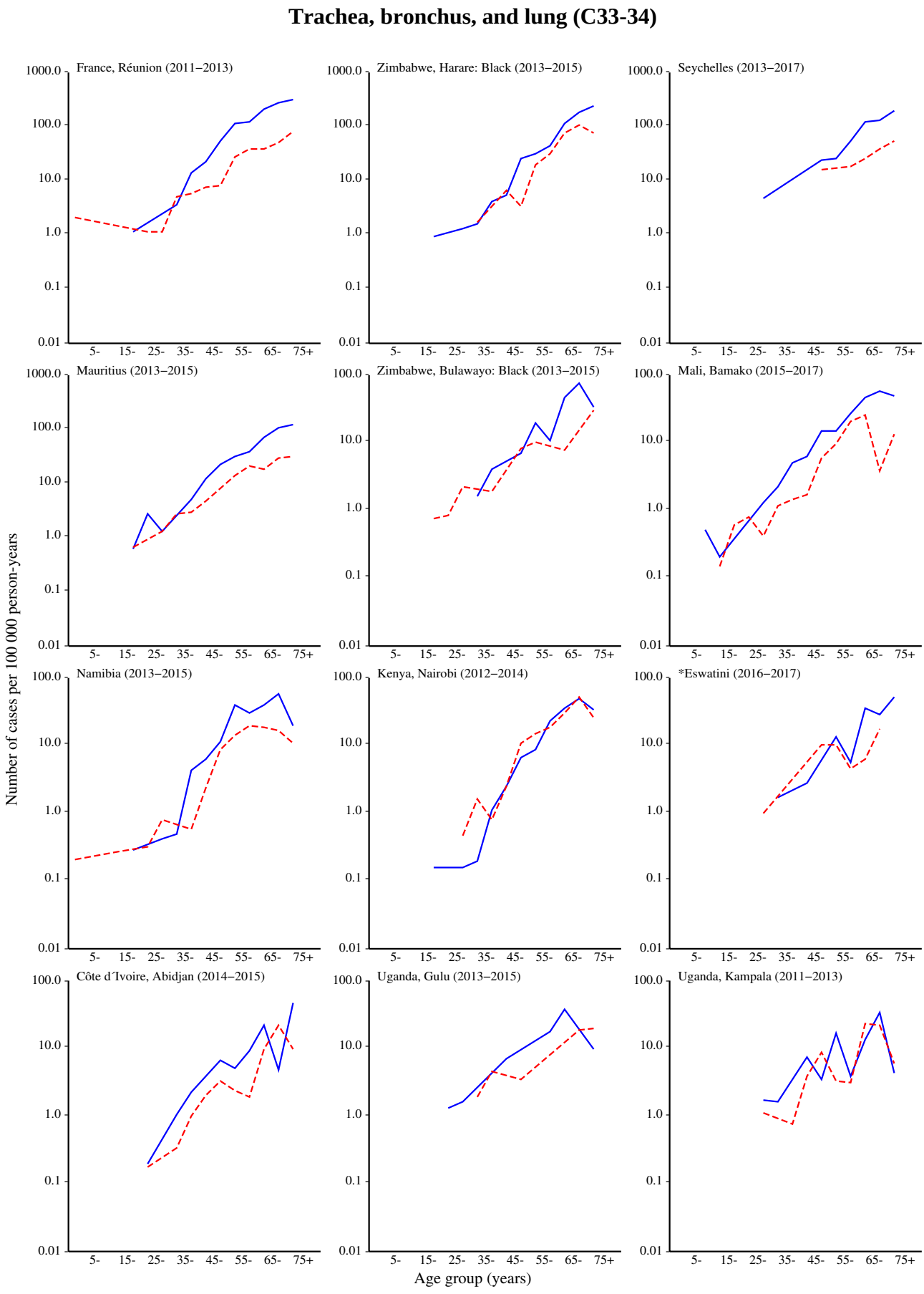


Fig. 7.37 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the lung among males and females, by registry population

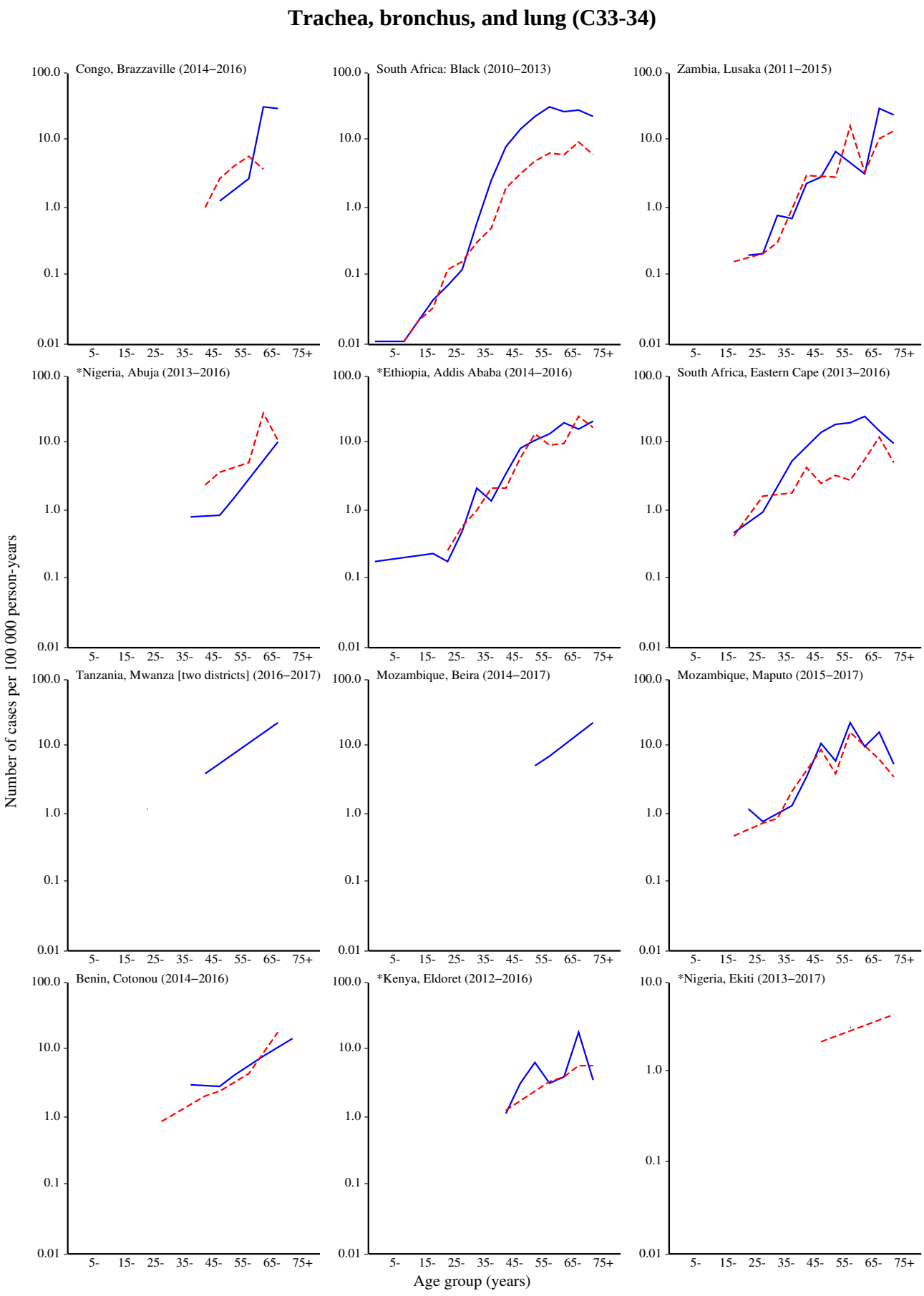


Fig. 7.37 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the lung among males and females, by registry population

Cancer of the ovary

Almost 16,000 ovarian cancer cases were estimated in the Sub-Saharan African region in 2018, constituting 2% of all cancer cases in both sexes, with the disease ranking the fourth most frequent neoplasm in women (Ferlay et al., 2018). The cumulative incidence varies at least ten-fold among the registry populations in the region (Fig. 7.38), although the risks of 1% or greater observed only in Zimbabwe (Bulawayo and Harare Blacks), Nairobi (Kenya) and Mali (Bamako) are equivalent to those seen in the highest risk populations in Europe (Ferlay et al., 2018). The national rates tend to elevated in parts of Eastern Africa, including Ethiopia, Uganda and Kenya (Fig. 7.39), based on recorded incidence, while the high rates in Sudan and South Sudan are speculative given they are based on partially estimates derived from the results of several higher-risk registries.

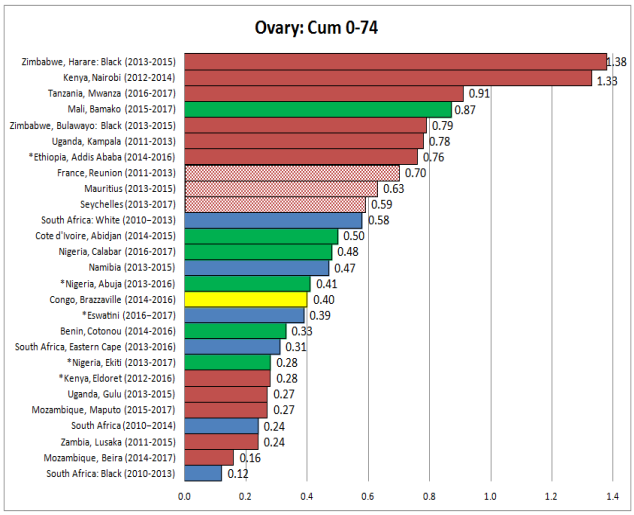


Fig. 7.38 Cumulative incidence 0-74 (%) of cancer of the ovary in sub-Saharan Africa, by registry population

While there is some variability due to the relative rarity of the cancer, the age-specific patterns indicate the rate of increase diminishes at postmenopausal ages, an established epidemiologic feature that pertains also to breast and

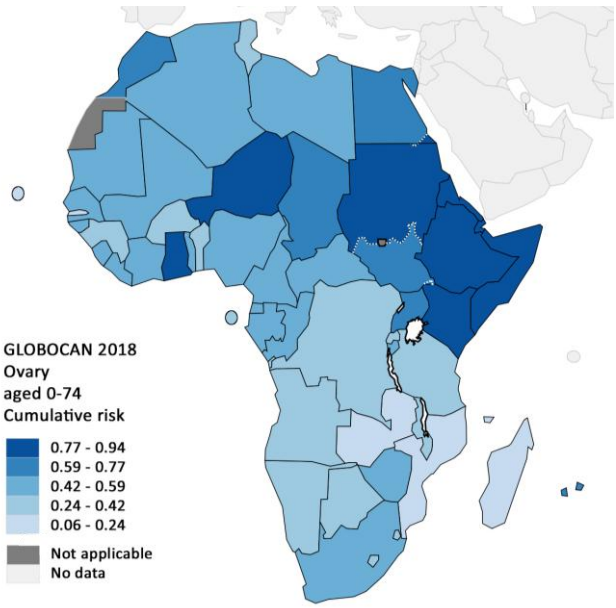


Fig. 7.39 Map of cumulative risk 0-74 (%) of cancer of the ovary in Africa, by country

endometrial cancer of a rapidly increasing rate of 'effective cell-cycle time' at menarche and steep declines at menopause (Pike et al., 1987; Pike et al., 2004). Most ovarian cancers are epithelial in origin, with a number of reproductive and hormonal factors shown to confer protection (e.g. parity, oral contraceptive use and lactation), while others increase risk (e.g. late age at menopause and hormone replacement therapy) (Reid et al., 2017). Genetic factors are likely responsible for another 10% of ovarian cancer cases. It still remains largely unknown as whether a higher or lower prevalence of these determinants interplay in relation to the present cancer profile in sub-Saharan Africa. Irrespectively, the ongoing changes in reproductive and behavioural factor in these populations would suggest that incidence rates of ovarian cancer are likely to rise in future years in many populations in the region.

Fig. 7.40 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the ovary, by registry population

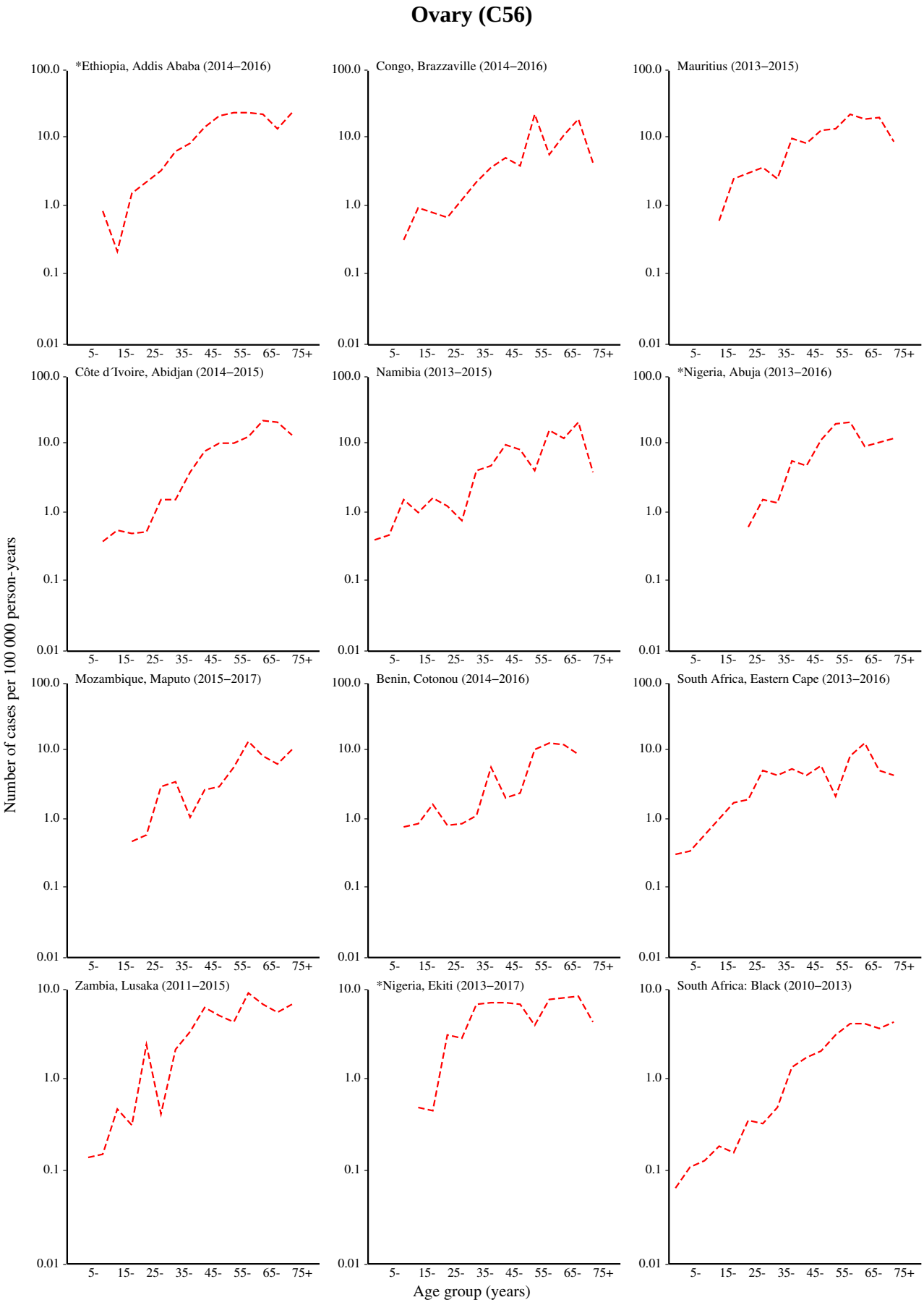
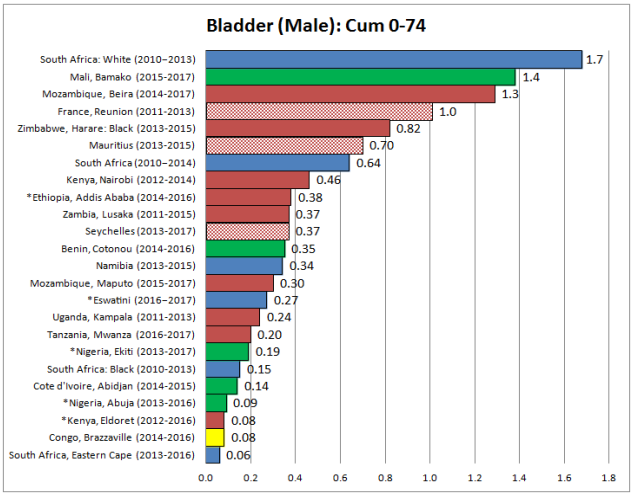


Fig. 7.40 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the ovary, by registry population

Cancer of the bladder

From an African perspective, bladder cancer is a considerably more important neoplasm in Northern Africa, where almost three-fifths of all new cases in 2018 occurred. This disease has become the third most commonly-occurring neoplasm among men in this region (Ferlay et al., 2018), with cumulative incidence estimates in Egypt and Tunisia in 2018 indicating at least 2% of males – or one in 50 – are diagnosed with bladder cancer before the age of 75. Male lifetime risks are lower than this in most sub-Saharan Africa populations (Fig. 7.42), although they still vary 15-fold (Fig. 7.41), with elevated risks of 1% or greater seen in the registry populations of Mali and Malawi, as noted in the previous volume (Parkin et al., 2015), with rates among whites in South Africa the highest overall (Fig. 7.41).



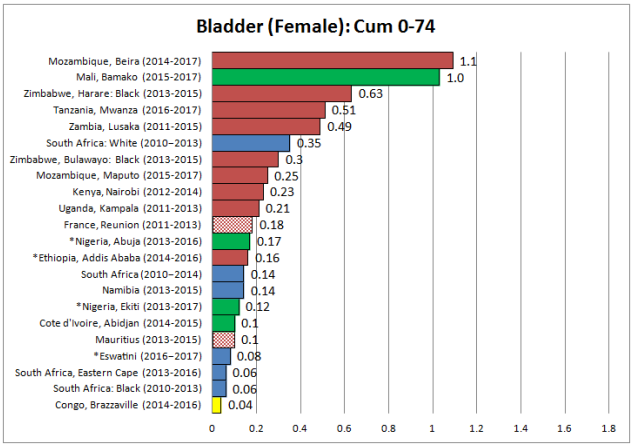


Fig. 7.41 Cumulative incidence 0-74 (%) of cancer of the bladder among males and females in sub-Saharan Africa, by registry population

Overall, almost 12,500 new cases of bladder cancer were estimated in 2018 in the Sub-Saharan region in both sexes, comprising 1.6% of all cancer cases. The disease ranks as the 13th most commonly diagnosed cancer in both sexes, but is

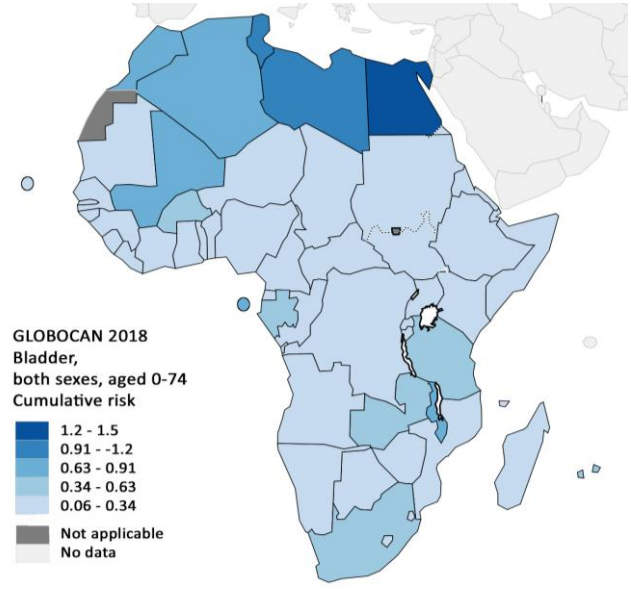


Fig. 7.42 Map of cumulative risk 0-74 (%) of cancer of the bladder among males and females in Africa, by country

positioned sixth among men, ahead of stomach cancer. Over 60% of bladder cancers are diagnosed among men, and while lower rates of bladder cancer are consistently observed among females (Fig. 7.41), some of the highest female rates estimated

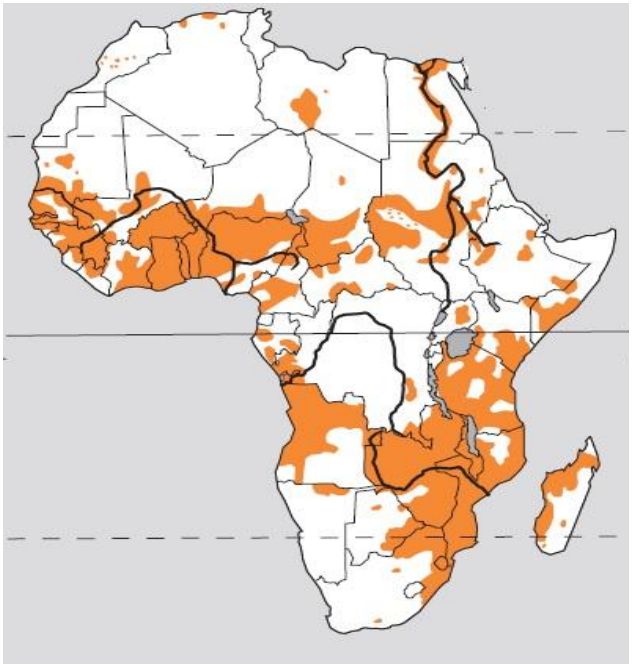


Fig. 7.43 Distribution of S. haematobium in Africa (from IARC, 2012)

worldwide are seen in sub-Saharan Africa (Antoni et al., 2016; Ferlay et al., 2018). As shown in Fig. 7.44, the age-specific patterns indicate some variability across age groups, but

generally, rates increase log-linearly from the age of 25 years onwards.

Although transitional cell carcinoma (TCC) is the dominant form in most Caucasian populations, a greater proportion of bladder cancer cases on the African continent are squamous cell carcinomas (SCC), with some exceptions e.g. South Africa and Mauritius (Table 7.01). The latter subtype is caused by infection with *Schistosoma haematobium* (IARC, 2012), and over half of the bladder cancer cases in Sub-Saharan Africa have been attributed to schistosomiasis, corresponding to 0.8% of all estimated cancers in the region (Parkin et al., 2019). Varying incidence patterns by histological subtype are observed in certain Western and Eastern African countries including Mali, Malawi and Zimbabwe (Fig. 7.41), where S. haematobium infection is more prevalent (Fig. 7.43), while there are clear differences in South Africa between black (24% SCC, 70% TCC) and white (1.5% SCC, 96% TCC) populations (Table 7.01).

There are several prevention measures at hand. Some that overlap with other infections may target populations at high risk (i.e. provision of sanitary water and toilet facilities), that together with mass drug administration (Praziquantel) can control schistosomiasis (Inobaya et al., 2014), thus reducing bladder SCC incidence rates on the continent. With social and economic transitions ongoing in the region however, further urbanization and increases in cigarette smoking in some African countries may lead to an increasing incidence of TCC relative to SCC.

An important caveat in the interpretation of incidence rates in western countries has been local registration practices with respect to the coding and reporting of in-situ tumours (Antoni et al, 2016), which can constitute a large proportion of all bladder tumours. Such comparability issues, and differences in registry practices with respect to cystoscopy, biopsy, and the extent of histological examination of biopsy specimens are likely relatively minor issues among the studied populations in sub-Saharan Africa, since an incident case usually constitutes a manifestly invasive and often relatively advanced tumour.

Number of microscopically verified cases by histological type

Bladder (C67) - Both sexes (all ages)

	Carcinoma					Sarcoma	Other	Unspec.	Number of cases	
	Squamous	Transitional	Adeno.	Other	Unspec.				MV	Total
Africa, central										
Congo, Brazzaville (2014–2016)	3	–	5	–	1	–	–	–	**9**	11
Africa, east										
*Ethiopia, Addis Ababa (2014–2016)	4	62	7	2	29	1	–	1	**106**	128
France, Réunion (2011–2013)	5	146	3	1	1	1	–	5	**162**	175
*Kenya, Eldoret (2012–2016)	1	7	3	–	1	–	–	1	**13**	13
Kenya, Nairobi (2012–2014)	2	41	9	–	11	1	–	–	**64**	92
Mauritius (2013–2015)	4	98	18	–	21	1	–	15	**157**	161
Mozambique, Beira (2014–2017)	5	–	1	–	1	–	–	–	**7**	79
Mozambique, Maputo (2015–2017)	18	8	1	–	1	–	–	1	**29**	48
Seychelles (2013–2017)	1	13	–	–	–	–	–	–	**14**	18
Tanzania, Kilimanjaro (2013–2017)	4	36	–	–	7	–	–	–	**47**	55
Tanzania, Mwanza [two districts] (2016–2017)	16	–	3	–	4	1	–	–	**24**	24
Uganda, Gulu (2013–2015)	–	1	–	–	–	–	–	2	**3**	5
Uganda, Kampala (2011–2013)	5	11	1	–	4	1	–	2	**24**	44
Zambia, Lusaka (2011–2015)	48	25	12	–	4	3	–	3	**95**	106
Zimbabwe, Bulawayo: Black (2013–2015)	4	6	–	–	1	–	–	–	**11**	23
Zimbabwe, Harare: Black (2013–2015)	19	32	3	–	3	–	–	–	**57**	92
Africa, south										
Botswana (2009–2013)	7	24	4	–	2	–	–	1	**38**	38
*Eswatini (2016–2017)	–	1	1	–	1	–	1	3	**7**	17
Namibia (2013–2015)	13	46	7	3	6	2	–	1	**78**	78
South Africa (2010–2014)	370	5281	138	42	108	32	11	42	**6024**	6024
South Africa: Black (2010–2013)	207	617	36	10	34	9	1	8	**922**	922
South Africa: White (2010–2013)	41	2614	42	14	40	8	6	16	**2781**	2781
South Africa, Eastern Cape (2013–2016)	3	11	–	–	2	–	–	–	**16**	19
Africa, west										
Benin, Cotonou (2014–2016)	–	1	2	–	–	–	–	–	**3**	15
Côte d´Ivoire, Abidjan (2014–2015)	4	5	1	–	5	1	1	–	**17**	34
The Gambia (2012–2014)	–	–	–	–	–	–	–	1	**1**	18
Ghana, Kumasi (2014–2016)	2	9	1	–	1	–	–	–	**13**	45
Mali, Bamako (2015–2017)	58	66	12	–	38	2	–	24	**200**	316
Niger, Niamey (2013–2017)	2	3	1	–	1	–	–	–	**7**	41
*Nigeria, Abuja (2013–2016)	3	16	–	–	2	–	–	–	**21**	22
*Nigeria, Ekiti (2013–2017)	2	1	9	–	2	–	–	–	**14**	17
Nigeria, Ibadan (2015–2017)	–	19	–	–	–	2	–	–	**21**	30

Table 7.01 Number of microscopically verified cases by histological type – Bladder, both sexes, all ages

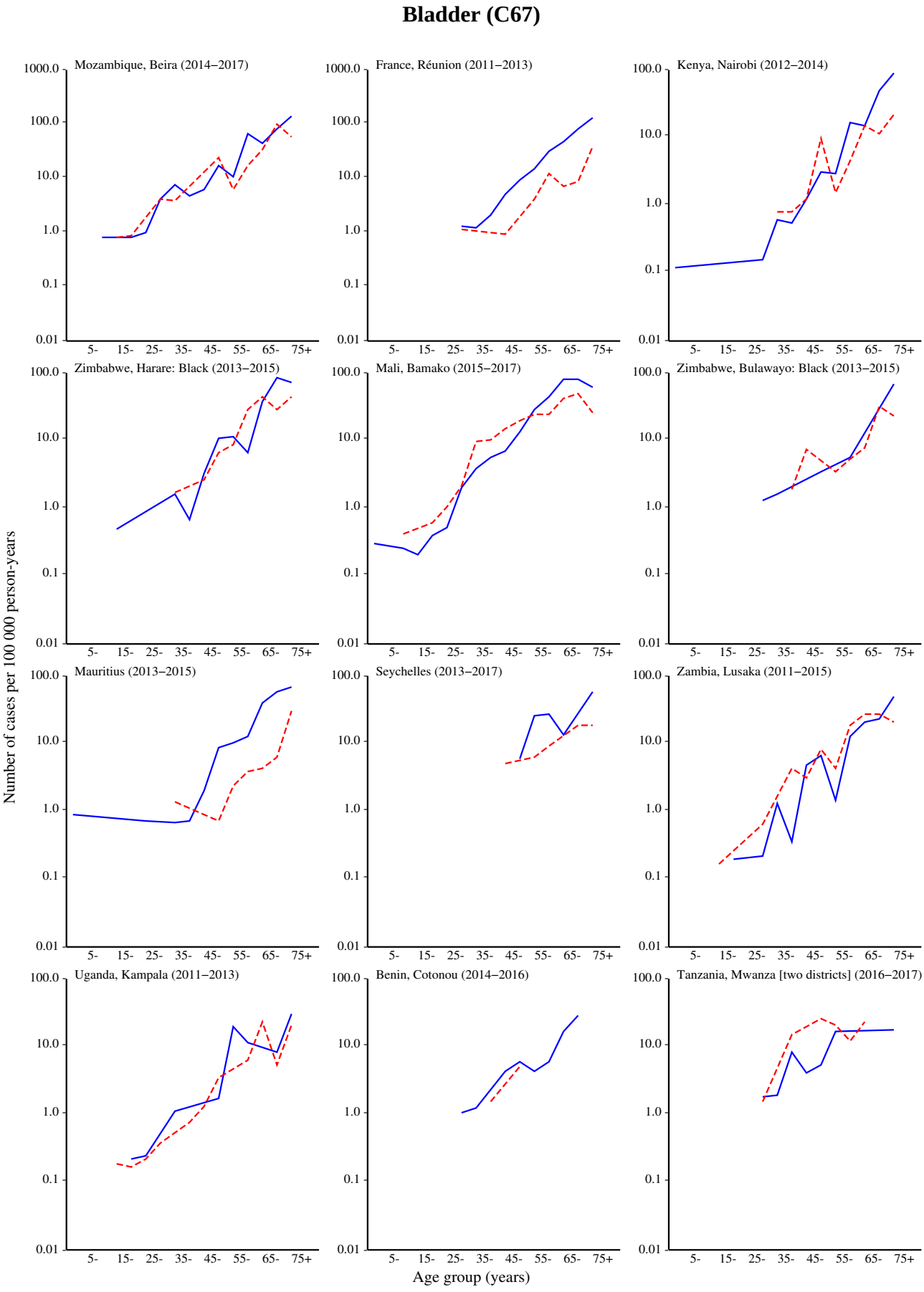


Fig. 7.44 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the bladder among males and females, by registry population

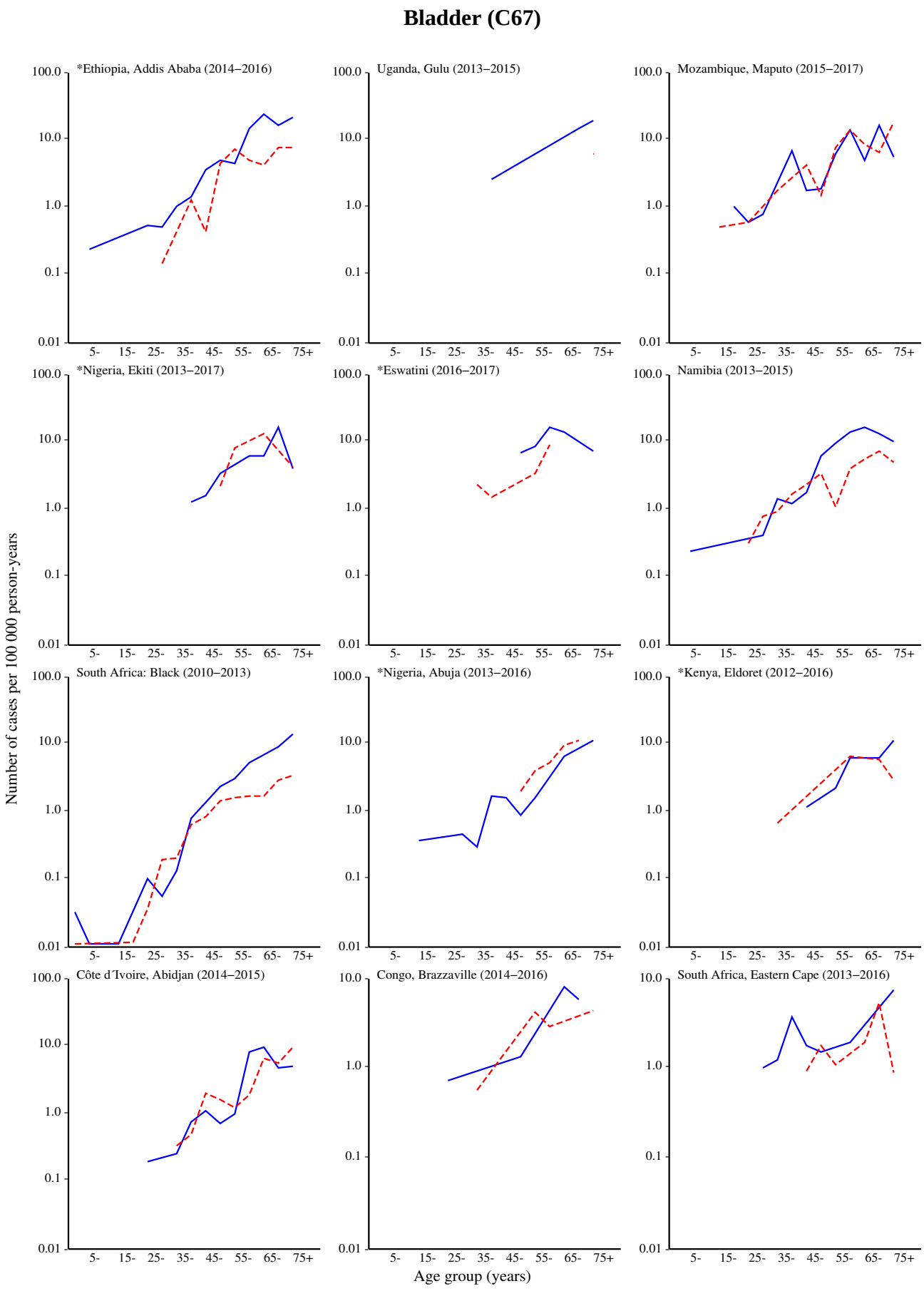


Fig. 7.44 Age-specific incidence rates (cases per 100,000 person-years) of cancer of the bladder among males and females, by registry population

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Abbreviations

ACS	American Cancer Society
AFCRN	African Cancer Registry Network
ASR	Age specific rate
CI5	Cancer Incidence in Five Continents
CiSSA	Cancer in sub-Saharan Africa
DCO	Death certificate only (when a cancer case can only be identified on a death certificate)
IACR	International Association of Cancer Registries
IARC	International Agency for Research on Cancer
ICD-O	International Classification of Diseases for Oncology
LMIC	Low and Middle Income Countries
NCD	Non-communicable disease
NCI	National Cancer Institute
SSA	sub-Saharan Africa
UICC	Union for International Cancer Control
WHO	World Health Organisation

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