

CHAPTER 4

Results by registry (by region)

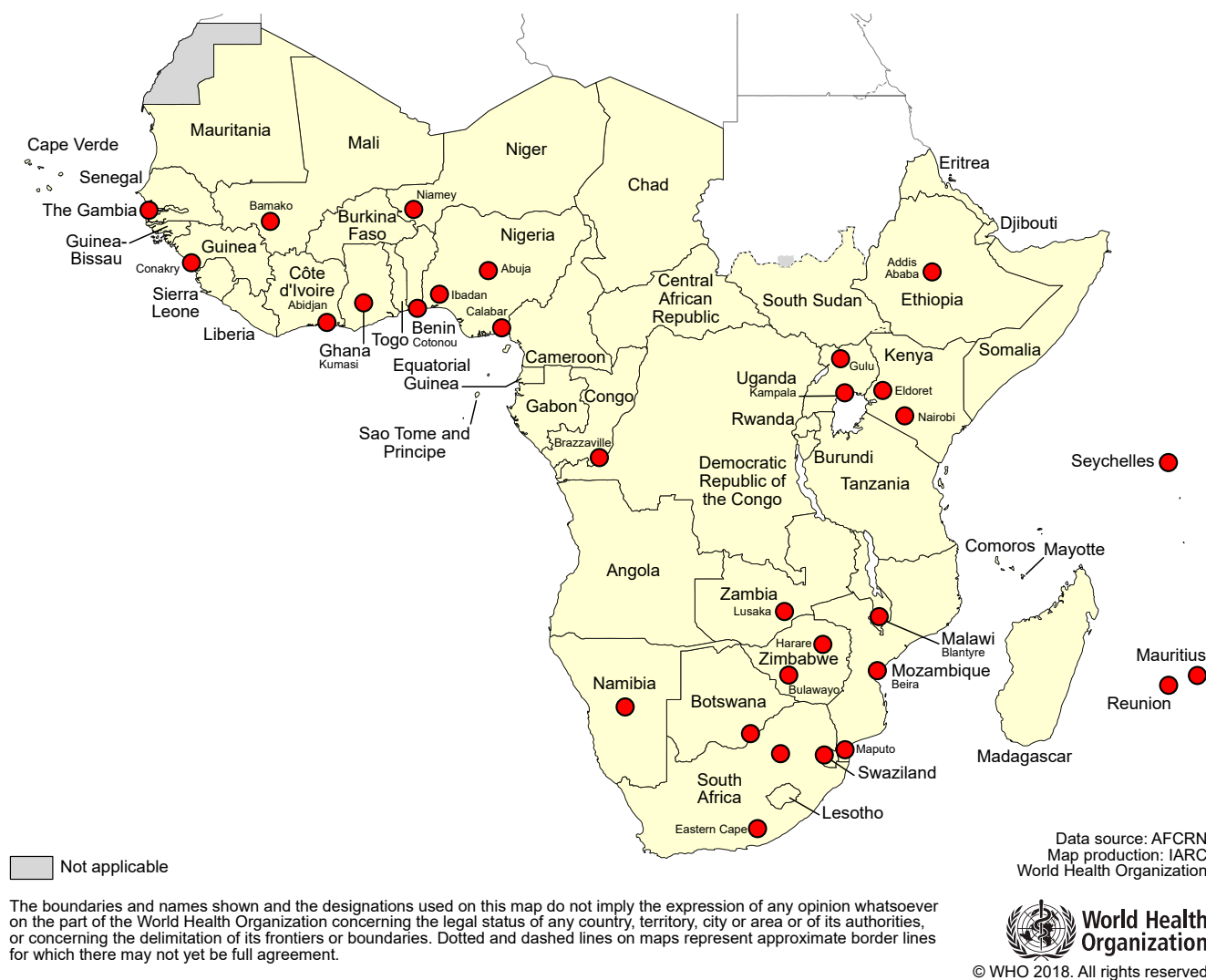


Fig. 4.01. The members of the African Cancer Registry Network (AFCRN) as of spring 2018, with the location of the cancer registries marked

Congo, Brazzaville

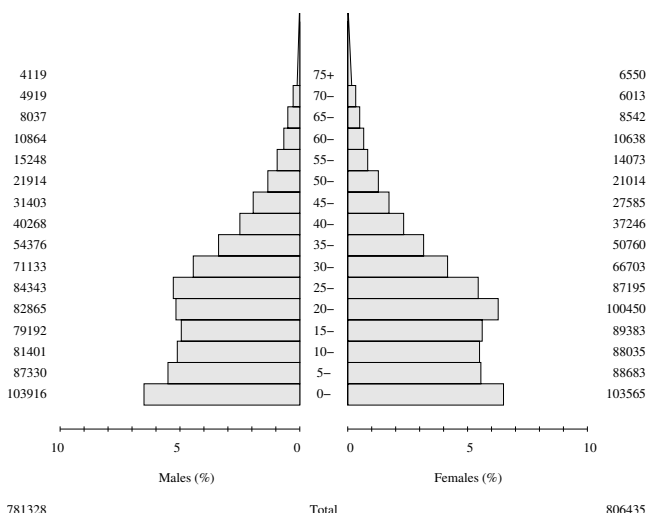
The Registre des Cancers de Brazzaville was created in 1995 under an agreement between Marien Ngouabi University and IARC. The registry is located in the records section of the oncology and radiotherapy service of the University Hospital Centre (CHU) of Brazzaville, the largest hospital in the capital. Before 1995, a register of cases in patients visiting the medical oncology service had been maintained. The outbreak of civil war in 1997 caused major disruption to medical and laboratory services. Registry activity was temporarily suspended but resumed towards the end of that year.

The registry is led by a management committee and has one full-time cancer registrar. It is financed by the Congolese Ministry of Public Health; Marien Ngouabi University; and a generous donation from the First Lady of the Congo, Antoinette Sassou Nguesso.

The Registre des Cancers de Brazzaville data presented in this volume cover the entire city of Brazzaville. The city has nine districts (Makélékélé, Baongo, Poto-Poto, Moungali, Ouenzé, Talangaï, Mfilou, Madibou, and Djiri). Cases in non-residents are registered separately.

The population of Brazzaville is estimated to have been 1 376 382 in 2007 (at the most recent census) and 1 549 693 in 2011. The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

Congo, Brazzaville (2009–2013)
Population pyramid (average annual person-years by sex and age group)



Source: Centre National de la Statistique et des Etudes Economiques (CNSEE) of the Congo, Recensement Général de la Population et de l'Habitat (RGPH), 2007 (Brazzaville, July 2010), with support from the United Nations Population Fund (UNFPA)

The CHU of Brazzaville's oncology and radiotherapy service, together with the hospital's histopathology

laboratory and other radiotherapy services, is the most important source of information for the registry (accounting for 43% of all registrations in 2011). The CHU's other clinical departments (medicine, surgery, maternity, paediatrics, and medical analysis) provide most of the remaining cases. Only 7% of cases were provided by the registry's other sources (the Makélékélé Hospital, the Pierre Mobengo Central Military Hospital, the Talangaï Hospital, and four private clinics where patients can be hospitalized).

Registration is active. Cases are identified in the records of the oncology and radiotherapy service or by visits to the other departments of the CHU, where cases are traced from admission and discharge records. The other hospitals are also visited periodically, and all pathology reports mentioning cancer are collected. Information on deaths is obtained from a hospital registry and from municipal services. Death certification is available, but the quality of information is poor, so death certificates are not used for regular registration.

The registry uses IARC's CanReg5 software for data entry, management, and duplication checks.

YEARS PRESENTED

2009–2013 (a 5-year period)

NOTES

The rate of registration has remained relatively constant over the past 10 years, at 41–53 cases per month. The most recent complete 5-year period (2009–2013) was selected for analysis.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 73.2 cases per 100 000 person-years in males and 68.5 cases per 100 000 person-years in females. These values are somewhat lower than the values for central Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of 0.80 for males and 0.60 for females. The incidence of cancer at most anatomical sites is low, with the exception of cancer of the prostate.

The percentage of microscopically verified cases (MV%) is somewhat low (54% in males and 68% in females).

SUMMARY

The overall pattern of cancer occurrence (i.e. the relative distribution by anatomical site, sex, and age) in this population was recently reported for the 12-year period of 1998–2009 (Nsondé Malanda et al., 2013). The results for 2009–2013 are similar, except that prostate cancer appears to be much more frequent in the more recent data. The incidence rates remain relatively low. This probably reflects some degree of underascertainment.

PUBLICATIONS AND ACHIEVEMENTS

The Registre des Cancers de Brazzaville became a member of the African Cancer Registry Network

- (AFCRN) in 2012. It hosted the 2016 Fourth AFCRN Annual Review Meeting.
- Gombé Mbalawa C, Diouf D, Nkoua Mbon JB, Minga B, Makouanzi Nsimba S, Nsondé Malanda J (2013). Arrival of patients at advanced stage: tempting to identify responsibility. *Bull Cancer*. 100(2):167–72. [French] [PMID:23392547](#)
- Gombe Mbalawa C, Ekoundzola JR, Nkoua Mbon JB, Paraiso DI, Chali V (1987). Pathology of breast tumors occurring before the age of 30 in Brazzaville. *Rev Fr Gynecol Obstet*. 82(2):85–8. [French] [PMID:3563290](#)
- N’koua-M’bon JB, Bambara AT, Moukassa D, Gombé-Mbalawa C (2013). Clinical and outcome characteristics of inflammatory breast cancers in Brazzaville. *Bull Cancer*. 100(2):147–53. [French] [PMID:23392567](#)
- Nkoua-Mbon JB, Ibara G, Moyen G, Gombe-Mbalawa C (2005). Cancer incidence in children from the cancer registry in Brazzaville. *Arch Pediatr*. 12(1):83–4. [French] <http://dx.doi.org/10.1016/j.arcped.2004.10.021> [PMID:15653060](#)
- Nsondé Malanda J, Nkoua Mbon JB, Bambara AT, Ibara G, Minga B, Nkoua Epala B, et al. (2013). Twelve years of working of Brazzaville cancer registry. *Bull Cancer*. 100(2):135–9. [French] [PMID:23406573](#)

Congo, Brazzaville (2009–2013)

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

Site	All ages	Age unk	MVD		DCO		Age group (years)											Crude rate	%	CR	ASR (W)	ICD-10			
			%	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-						65-	70-	75+
Mouth	9	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.5	C00-06	
Salivary gland	10	0	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.8	0.5	C07-08	
Nasopharynx	6	0	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.04	C03	
Other pharynx	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	C09-10, C12-14	
Oesophagus	7	0	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.6	0.06	C15	
Stomach	39	0	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	3.2	0.22	C16	
Colon	33	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	2.7	0.21	C18	
Rectum	35	0	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	2.9	0.19	C19-20	
Anus	6	0	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.03	C21	
Liver	165	0	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2	13.6	0.75	C22	
Gallbladder etc.	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.01	C23-24	
Pancreas	18	0	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.5	0.10	C25	
Larynx	21	0	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.7	0.16	C32	
Trachea, bronchus, and lung	14	0	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.2	0.14	C33-34	
Bone	13	0	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.1	0.03	C40-41	
Melanoma of skin	21	0	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.7	0.23	C43	
Non-melanoma skin	18	0	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	2.3	0.07	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45	
Kaposi sarcoma	14	0	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.2	0.06	C46	
Connective and soft tissue	24	0	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	2.0	0.12	C47, C49	
Breast	22	0	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.8	0.16	C50	
Penis	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	C60	
Prostate	527	0	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.5	43.6	5.19	C61	
Testis	5	0	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	0.01	C62	
Kidney and renal pelvis	29	0	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	2.4	0.10	C64-65	
Bladder	12	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.08	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C66, C68	
Eye	14	0	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.2	0.02	C69	
Brain and nervous system	7	0	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.6	0.02	C70-72	
Thyroid	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.02	C73	
Hodgkin lymphoma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	C81	
Non-Hodgkin lymphoma	31	0	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	2.6	0.17	C82-85, C96	
Multiple myeloma	24	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	2.0	0.24	C90	
Lymphoid leukaemia	32	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	2.6	0.10	C91	
Myeloid leukaemia	20	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.7	0.05	C92-94	
Leukaemia, unspecified	21	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.7	0.05	C95	
Other and unspecified	22	0	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	1.8	0.13	O&U
All sites	1227	0	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31.4	8.91	73.9	C00-96	
All sites except C44	1209	0	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30.9	100.0	8.84	C00-96 exc. C44	
Average annual population	103916	87330	81401	79192	82865	84343	71133	54376	40268	31403	21914	15248	10864	8037	4919	4119	781329								

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Congo, Brazzaville (2009–2013)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)										Crude rate %	CR 74	ASR (W)	ICD-10				
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-
Mouth	9	0	89	-	-	-	-	1	3	2	-	1	2	-	-	-	-	0.2	0.6	0.4	C00-06	
Salivary gland	5	0	60	-	-	-	1	1	-	-	-	1	2	-	-	-	0.1	0.3	0.04	0.3	C07-08	
Nasopharynx	4	0	75	-	-	-	1	1	-	-	-	1	1	-	-	-	0.1	0.3	0.01	0.1	C11	
Other pharynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C09-10, C12-14	
Oesophagus	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.02	0.1	C15	
Stomach	28	0	50	-	-	-	-	2	1	4	1	6	2	4	5	1	0.7	1.9	0.22	1.5	C16	
Colon	27	0	63	-	-	-	-	3	3	2	4	2	4	3	3	3	0.7	1.8	0.15	1.3	C18	
Rectum	32	0	59	-	-	-	-	1	3	2	7	2	5	4	3	1	0.8	2.1	0.21	1.7	C19-20	
Anus	13	0	62	-	-	-	-	1	1	1	-	4	2	1	1	2	0.3	0.9	0.08	0.7	C21	
Liver	70	0	33	-	-	-	2	1	8	13	5	3	3	4	4	4	1.7	4.7	0.28	2.6	C22	
Gallbladder etc.	6	0	17	-	-	-	-	1	1	1	-	1	2	1	1	-	0.1	0.4	0.06	0.4	C23-24	
Pancreas	22	0	18	-	-	-	-	1	1	3	3	3	4	2	-	4	0.5	1.5	0.11	1.2	C25	
Larynx	5	0	80	-	-	-	-	-	-	-	1	1	1	-	1	1	0.1	0.3	0.04	0.3	C32	
Trachea, bronchus, and lung	17	0	53	-	-	-	-	-	-	-	1	2	2	2	3	5	0.4	1.1	0.12	1.0	C33-34	
Bone	25	0	60	-	-	1	11	2	3	1	-	2	1	-	-	-	0.6	1.7	0.04	0.7	C40-41	
Melanoma of skin	23	0	43	-	-	-	-	-	-	-	1	5	1	3	4	2	6	0.6	1.5	0.15	1.4	C43
Non-melanoma skin	12	0	58	-	-	-	-	1	1	1	-	-	-	-	1	-	0.3	-	0.06	0.4	C44	
Mesothelioma	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.02	0.1	C45	
Kaposi sarcoma	13	0	38	-	-	-	-	1	1	1	-	4	1	-	-	-	0.3	0.9	0.04	0.4	C46	
Connective and soft tissue	24	0	50	1	-	-	-	2	3	2	2	-	3	2	1	-	0.6	1.6	0.10	0.9	C47, C49	
Breast	491	0	86	-	-	-	1	10	26	36	59	70	84	67	26	14	12.2	32.9	2.21	20.7	C50	
Vulva	6	0	67	-	-	-	-	-	-	2	-	-	-	1	2	1	0.1	0.4	0.05	0.3	C51	
Vagina	4	0	100	-	-	-	-	-	-	-	-	1	-	-	-	2	0.1	0.3	0.01	0.2	C52	
Cervix uteri	331	0	70	-	-	-	-	3	4	7	23	31	44	41	50	48	8.2	22.2	2.05	17.4	C53	
Uterus	40	0	48	-	-	-	-	1	3	4	6	4	7	2	4	8	1.0	2.7	0.24	2.2	C54-55	
Ovary	88	0	42	-	-	-	4	1	5	7	8	15	13	11	8	6	2.2	5.9	0.46	4.1	C56	
Placenta	7	0	57	-	-	-	-	1	1	1	-	2	1	-	-	-	0.2	0.5	0.01	0.2	C58	
Kidney and renal pelvis	10	0	10	3	1	1	-	1	-	1	-	2	-	-	-	-	0.2	0.7	0.02	0.3	C64-65	
Bladder	21	0	48	-	-	-	-	-	-	2	1	1	5	2	4	-	0.5	1.4	0.14	1.1	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	19	0	21	13	-	-	-	-	-	2	1	1	-	-	-	-	0.5	1.3	0.03	0.5	C69	
Brain and nervous system	10	0	20	-	-	-	-	-	-	1	1	1	2	1	2	-	0.2	0.7	0.04	0.5	C70-72	
Thyroid	10	0	60	-	-	-	-	1	1	2	-	1	1	2	1	-	0.2	0.7	0.05	0.4	C73	
Hodgkin lymphoma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C81	
Non-Hodgkin lymphoma	35	0	83	-	-	1	1	4	1	3	2	3	1	5	2	1	0.9	2.3	0.18	1.5	C82-85, C96	
Multiple myeloma	21	0	100	-	-	-	-	-	-	-	1	2	3	4	3	4	0.5	1.4	0.18	1.3	C90	
Lymphoid leukaemia	22	0	100	3	1	3	2	1	-	-	-	1	3	5	1	-	0.5	1.5	0.10	1.0	C91	
Myeloid leukaemia	24	0	100	-	-	2	4	3	4	1	1	2	1	-	1	3	0.6	1.6	0.10	0.8	C92-94	
Leukaemia, unspecified	11	0	100	-	-	1	1	1	1	1	-	1	-	-	-	-	0.3	0.7	0.03	0.3	C95	
Other and unspecified	14	0	64	-	-	-	-	1	3	-	2	2	-	-	2	1	0.3	0.9	0.07	0.6	O&U	
All sites	1505	0	68	20	7	17	23	34	61	88	129	157	187	186	168	141	37.3	77.6	68.9	68.5	C00-96	
All sites except C44	1493	0	68	20	6	17	23	33	60	86	129	156	184	186	167	141	37.0	77.0	68.5	68.5	C00-96 exc. C44	
Average annual population					103565	88683	88035	89383	100450	87195	66703	50760	37246	27585	21014	14073	10638	8542	6013	6550	806436	

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

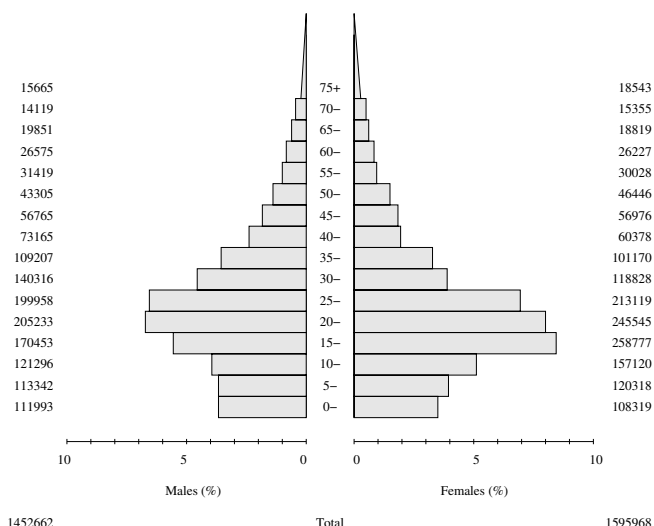
Ethiopia, Addis Ababa

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

The AACCR data presented in this volume are for the registry's entire covered population: the residents of Addis Ababa (as defined by ≥ 6 months of residence in the city). Administratively, Addis Ababa is divided into 10 subcities: Addis Ketema, Akaky Kaliti, Arada, Bole, Gullele, Kirkos, Kolfe Keranio, Lideta, Nifas Silk-Lafto, and Yeka.

The population of Addis Ababa was projected by the Central Statistics Office (CSA) to be 3.05 million in 2012. The average annual population-at-risk estimates corresponding to the AACCR data presented in this volume are shown in the population pyramid.

**Ethiopia, Addis Ababa (2012–2013)
Population pyramid (average annual
person-years by sex and age group)**



Estimates for 2012 and 2013 based on population census of 2007

The main sources of registry information are Tikur Anbessa Specialized Hospital, the United Vision Higher Clinic, and the Hallelujah Higher Medical Clinic (together accounting for 57% of 2014 registrations). The new St. Paul's Hospital will become another significant source of data, due to its specializations in cancer diagnosis and treatment. The city's two major teaching

hospitals, Tikur Anbessa Specialized Hospital and St. Paul's Hospital, offer specialized medical services such as computed tomography (CT), radiotherapy, histopathology, and magnetic resonance imaging (MRI) services.

Given the large registration area of Addis Ababa, the AACCR aims to eventually use both active and passive data collection mechanisms; currently, only active procedures are in use. The 22 staff members at selected hospitals register all new cases from their respective institutions, and AACCR staff members pay scheduled visits to these focal-point personnel on a regular basis. The major items of information are collected using the standard cancer registry data formats. Most vital statistics records for the population contain inadequate information. Death certificate information is collected for deaths caused by cancer.

The registry uses IARC's CanReg5 software for data entry, analysis, and management.

YEARS PRESENTED

2012–2013 (a 2-year period)

NOTES

The registry started activity during the fourth quarter of 2011. By 2012, the number of cases registered per month was already fairly consistent.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 64.7 cases per 100 000 person-years in males and 123.8 cases per 100 000 person-years in females. These values are somewhat lower than the values for eastern Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of about 0.53 for males and 0.79 for females.

In males, it is notable that the ASR of prostate cancer is low, as are – relative to the estimates for eastern Africa – the ASRs of oesophageal cancer. In contrast, the most common cancers registered (leukaemia, lymphoma, and colorectal cancer) have relatively high ASRs in males, which is a very unusual pattern. In females, the ASR of breast cancer (39.1 cases per 100 000 person-years) is about 140% of the estimate for eastern Africa; as in males, the ASRs of leukaemia, lymphoma, and colorectal cancer are relatively high.

SUMMARY

This relatively new registry covers a very large population, with many hospitals and clinics in the catchment area. The registry was unable to collect data from all possible sources of information in these early years of operation, so there is likely a moderate level of underregistration. However, it is unclear whether this underregistration has resulted in any significant bias of the overall profile (i.e. the relative frequencies) of the various cancer types, which could possibly have contributed to the somewhat unusual observed cancer patterns.

PUBLICATIONS AND ACHIEVEMENTS

The AACCR became a member of the African Cancer Registry Network (AFCRN) in 2012.

Kantelhardt EJ, Mathewos A, Aynalem A, Wondemagegnehu T, Jemal A, Vetter M, et al. (2014). The prevalence of estrogen receptor-negative breast cancer in Ethiopia. *BMC Cancer*. 14:895. <http://dx.doi.org/10.1186/1471-2407-14-895> PMID:25433805

Kantelhardt EJ, Moelle U, Begoihn M, Addissie A, Trocchi P, Yonas B, et al. (2014). Cervical cancer in Ethiopia: survival of 1,059 patients who received oncologic therapy. *Oncologist*. 19(7):727–34. <http://dx.doi.org/10.1634/theoncologist.2013-0326> PMID:24951611

Kantelhardt EJ, Zerche P, Mathewos A, Trocchi P, Addissie A, Aynalem A, et al. (2014). Breast cancer survival in Ethiopia: a cohort study of 1,070 women. *Int J Cancer*. 135(3):702–9. <http://dx.doi.org/10.1002/ijc.28691> PMID:24375396

Ethiopia, Addis Ababa (2012–2013)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)										Crude rate	%	CR	ASR (W)	ICD-10				
					0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49						50-54	55-59	60-64	65-69
Mouth	24	0	92	1	-	1	1	4	2	2	1	5	2	2	2	2	0.8	1.9	1.3	C00-06			
Salivary gland	11	0	91	-	-	1	1	-	3	1	1	-	2	-	1	1	0.4	0.9	0.6	C07-08			
Nasopharynx	23	0	96	-	4	2	1	-	2	1	3	2	2	2	2	0.8	1.9	1.1	C11				
Other pharynx	3	0	100	-	-	-	-	1	1	1	-	1	-	-	-	0.1	0.2	0.1	C09-10, C12-14				
Oesophagus	39	0	87	-	-	-	-	2	6	3	2	6	9	2	2	3	1.3	3.1	2.2	C15			
Stomach	51	0	69	-	-	-	-	2	2	4	7	5	4	8	6	7	1.8	4.1	3.0	C16			
Colon	83	0	82	-	-	2	5	4	7	4	7	12	11	7	7	2.9	6.7	5.8	C18				
Rectum	54	1	89	-	-	7	4	6	2	3	8	7	3	5	4	1.9	4.4	2.7	C19-20				
Anus	6	0	83	-	-	-	-	1	1	2	-	-	-	1	1	0.2	0.5	0.3	C21				
Liver	46	0	54	-	-	1	1	3	4	3	2	7	3	3	3	1.6	3.7	2.5	C22				
Gallbladder etc.	8	0	38	-	-	-	-	-	2	1	1	1	1	-	1	0.3	0.6	0.4	C23-24				
Pancreas	13	0	38	-	-	-	-	-	2	1	2	5	-	-	2	0.4	1.0	0.8	C25				
Larynx	9	0	89	-	-	-	-	-	1	1	-	-	-	1	2	0.3	0.7	0.8	C32				
Trachea, bronchus, and lung	59	0	63	-	-	1	2	4	5	7	6	7	10	8	5	4	2.0	4.8	3.5	C33-34			
Bone	21	0	86	-	-	3	3	1	2	2	-	1	-	-	1	0.7	1.7	0.6	C40-41				
Melanoma of skin	9	0	100	-	-	1	1	2	8	3	3	5	-	5	3	1.4	0.7	0.7	C43				
Non-melanoma skin	42	0	100	-	-	1	1	1	1	1	1	1	-	-	3	0.7	0.6	0.5	C44				
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.0	C45				
Kaposi sarcoma	17	0	82	-	-	1	1	7	-	-	-	-	-	2	-	0.6	1.4	0.6	C46				
Connective and soft tissue	56	0	88	-	3	4	2	4	10	7	2	3	4	7	4	1.9	4.5	2.2	C47, C49				
Breast	49	0	92	-	-	-	-	4	1	3	6	7	10	4	6	1.7	4.0	2.8	C50				
Penis	1	0	100	-	-	-	-	-	-	-	1	-	-	-	-	0.0	0.1	0.0	C60				
Prostate	84	1	77	-	-	-	-	1	1	1	2	4	10	11	28	2.9	6.8	5.7	C61				
Testis	10	0	90	-	-	-	-	1	6	-	-	-	-	-	-	0.3	0.8	0.3	C62				
Kidney and renal pelvis	26	0	81	6	1	-	-	2	3	2	2	-	4	3	1	2	0.9	2.1	1.4	C64-65			
Bladder	57	0	77	-	-	-	-	1	3	1	6	8	11	3	7	9	2.0	4.6	3.5	C67			
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	C66, C68				
Eye	18	0	94	1	1	-	-	3	2	4	2	1	-	-	-	0.6	1.5	0.6	C69				
Brain and nervous system	29	1	69	2	1	1	2	3	1	5	2	2	3	2	1	1.0	2.3	1.4	C70-72				
Thyroid	37	0	86	-	1	1	2	1	4	7	2	4	3	4	2	1.3	3.0	2.0	C73				
Hodgkin lymphoma	26	0	100	1	2	4	2	6	1	3	1	2	1	-	-	0.9	2.1	0.6	C81				
Non-Hodgkin lymphoma	121	0	89	5	3	2	8	3	2	6	14	11	20	8	8	4.2	9.8	5.9	C82-85, C96				
Multiple myeloma	16	0	94	-	-	2	-	-	1	2	-	1	3	6	1	0.6	1.3	1.4	C90				
Lymphoid leukaemia	67	0	93	5	12	2	6	2	5	-	2	3	9	5	3	2.3	5.4	3.2	C91				
Myeloid leukaemia	59	0	98	2	-	2	3	7	8	6	8	7	3	4	3	2.0	4.8	2.0	C92-94				
Leukaemia, unspecified	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.0	C95				
Other and unspecified	106	0	93	2	4	-	3	2	1	10	6	13	19	4	9	6	3.6	8.5	5.7	O&U			
All sites	1282	3	84	25	27	21	36	40	74	62	111	102	96	105	125	132	114	100	109	44.1	7.56	66.9	C00-96
All sites except C44	1240	3	84	25	27	21	35	39	73	60	103	99	93	100	125	109	97	104	100	42.7	7.31	64.7	C00-96 exc. C44

Average annual population 111993 113342 121296 170453 205233 199958 140316 109207 73165 56765 43305 31419 26575 19851 14119 15665 1452662

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Ethiopia, Addis Ababa (2012–2013)

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

Site	All ages	Age unkn	MV %	DCO %	Age group (years)											Crude rate	%	CR	ASR (W)	ICD-10		
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-						55-	60-
Mouth	27	0	96						1	8	5	1	1	2	3	1	2	3	0.8	1.1	1.4	C00-06
Salivary gland	8	0	100					1	2	1	1								0.3	0.3	0.4	C07-08
Nasopharynx	16	0	88					1	3					3					0.5	0.6	0.7	C11
Other pharynx	3	0	67																0.1	0.1	0.2	C09-10, C12-14
Oesophagus	61	0	75					2	1	1	5	2	7	10	12	7	8	6	1.9	2.4	3.8	C15
Stomach	38	1	79					2	1	5	1	4	5	6	6	6	3	2	2.2	1.5	2.8	C16
Colon	92	0	70					7	9	10	5	13	10	11	7	13	3	3	2.9	3.6	5.6	C18
Rectum	46	0	83					1	6	1	4	8	4	7	5	3	3	1	1.4	1.8	2.3	C19-20
Anus	8	0	100					2	2		3	1						0.3	0.3	0.3	C21	
Liver	47	0	43					4	1	5	5	4	1	13	7	3	4		1.5	1.8	3.4	C22
Gallbladder etc.	26	0	81					1	3	2	3	2	3	4	3	5	1	1	0.8	1.0	1.5	C23-24
Pancreas	18	0	61					2	2	2						2	1	3	0.6	0.7	1.0	C25
Larynx	1	0	100																0.0	0.0	0.0	C32
Trachea, bronchus, and lung	43	0	70					1	1	2	3	5	8	7	5	3	5	2	1.3	1.7	3.1	C33-34
Bone	32	0	88					4	6	2	2	2	3	3	2	2	1	1	1.0	1.3	1.4	C40-41
Melanoma of skin	2	0	100					1	1										0.1	0.1	0.1	C43
Non-melanoma skin	81	0	98					1	1	6	10	7	9	6	11	5	10	7	3	4	4.5	C44
Mesothelioma	2	0	100																0.1	0.1	0.1	C45
Kaposi sarcoma	9	0	67					2	1	2	2	1							0.3	0.4	0.2	C46
Connective and soft tissue	53	0	89					2	10	3	7	5	1	4	2	4		3	1.7	2.1	2.2	C47, C49
Breast	849	1	92					7	61	116	136	126	82	110	69	58	27	17	26.6	33.4	39.1	C50
Vulva	28	0	100					2	3	6	2	1	3	2	2	4	1	2	0.9	1.1	1.6	C51
Vagina	13	0	100							1	2	1	1	3					0.4	0.5	0.8	C52
Cervix uteri	340	0	94					3	10	21	38	36	35	74	34	33	24	10	10.7	13.4	2.13	C53
Uterus	56	0	88					3	4	8	4	6	1	6	6	2	5	5	1.8	2.2	3.1	C54-55
Ovary	166	0	69					2	7	9	23	15	16	21	13	15	10	9	5.2	6.5	8.7	C56
Placenta	0	0	-																0.0	0.0	0.0	C58
Kidney and renal pelvis	35	0	71					2	1	2	3	3	1	8	2	4	1	1	1.1	1.4	1.8	C64-65
Bladder	23	0	74							1				3	5	2	6	4	0.7	0.9	1.5	C67
Ureter and other urinary	2	0	100																0.1	0.1	0.01	C66, C68
Eye	20	0	90							3	1	3	1	2			1	1	0.6	0.8	0.08	C69
Brain and nervous system	20	0	30					1	1	5	3	2	1	1	1	1	1	2	0.6	0.8	0.10	C70-72
Thyroid	92	0	91					4	10	10	11	5	6	8	10	6	12	6	2.9	3.6	4.4	C73
Hodgkin lymphoma	20	0	100					3	2	3	3	2	1	1					0.6	0.8	0.05	C81
Non-Hodgkin lymphoma	80	0	92					1	1	3	4	6	5	13	12	8	9	6	2.5	3.1	3.7	C82-85, C96
Multiple myeloma	6	0	50																0.2	0.2	0.05	C90
Lymphoid leukaemia	53	0	98					2	3	5		1	5	2	6	3	5	5	1.7	2.1	2.8	C91
Myeloid leukaemia	72	0	94					3	4	8	9	6	9	2	3	4	4	4	2.3	2.8	3.0	C92-94
Leukaemia, unspecified	1	0	100																0.0	0.0	0.0	C95
Other and unspecified	133	0	88					1	3	1	5	8	15	13	14	8	10	15	4.2	5.2	6.7	O&U
All sites	2622	2	87					11	24	32	72	181	246	316	290	227	324	236	158	121	125	82.1
All sites except C44	2541	2	86					11	23	31	71	175	236	309	281	221	313	229	151	118	121	79.6

Average annual population 108319 120318 157120 258777 245545 213119 118828 101170 60378 56976 46446 30028 26227 18819 15355 18543 1595968

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

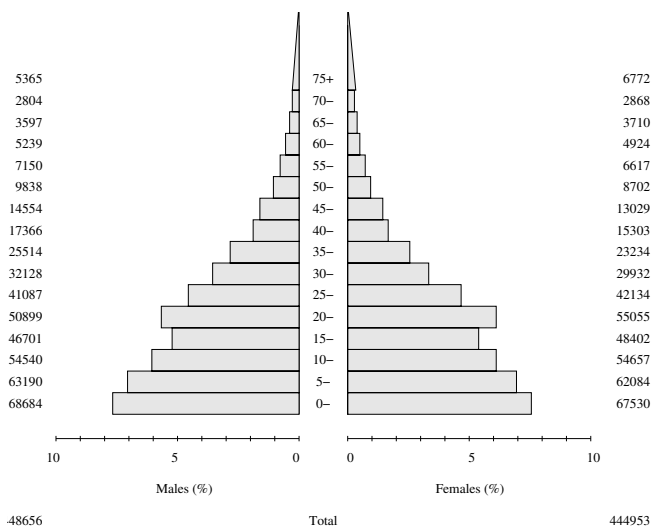
Kenya, Eldoret

The Eldoret Cancer Registry (ECR) was established in 1999. It is located within the Department of Haematology and Blood Transfusion of the Moi University School of Medicine. The registry has largely relied on donor support since it was founded in 1999. The main contributors have been IARC and Brown University in the USA. The Moi University School of Medicine supports the registry by providing a work space and general office supplies. The Haemato-Oncology Department of the Moi Teaching and Referral Hospital (MTRH) provides salaries for one full-time and one part-time registrar and has equipped the registry with a computer and other office supplies. The African Cancer Registry Network (AFCRN) has provided financial support for staff training and research projects. The ECR is headed by a director and staffed by three trained cancer registrars (2 full-time equivalents) and three volunteers (2.1 full-time equivalents). Medical students on placement occasionally help with data collection.

The ECR covers Uasin Gishu County and its neighbouring districts in the western region of Kenya.

The population of Uasin Gishu County is estimated to have been 894 179 in 2009 (at the national census). The average annual population-at-risk estimates corresponding to the ECR data presented in this volume are shown in the population pyramid.

Kenya, Uasin Gishu County (2008–2011)
Population pyramid (average annual person-years by sex and age group)



Source: 2009 national census

The ECR collects data on all cancer cases diagnosed at, or referred to, MTRH, regardless of whether the patients reside in Uasin Gishu. MTRH is the second largest hospital in Kenya and sees patients from all of the western part of the country and beyond.

The ECR also collects data from other public and private hospitals and cancer centres, as well as from

Eldoret Hospice, the registrar of births and deaths, and private physicians' clinics.

Public and private hospitals and cancer centres: The registrars collect data from various units within the collaborating hospitals. The sources in these hospitals include medical records departments, radiotherapy units, haematology and histopathology laboratories, outpatient clinics, medical wards, imaging units, and autopsy reports. In the medical records departments, disease index cards and patient-care registers are used to identify cancer cases. Each facility has its own filing system, as well as specific procedures for the diagnosis and management of cancer patients; the registrars must thoroughly understand these procedures in order to perform effective case finding. Most of the filing systems are completely paper-based, although a few are partly digital. Hospital staff members are actively involved in case finding by providing file numbers and case files.

Eldoret Hospice: Data are also captured at Eldoret Hospice. Often, these cases have already been captured from hospital sources, but the hospice provides updated information on patient status. Checks are performed to prevent duplicate registration.

Registrar of births and deaths (death certificates office) – vital statistics: The ECR has access to cancer-specific mortality data from death certificates via the civil registration office. These data are not entered as primary data but are used to update patient status. Death certificates listing cancer as the cause of death are compared against the registry database. For cases that are already registered, the status at last contact is updated and the cause of death specified. Unmatched cases are traced back to the hospital where the death occurred, and an attempt is made to trace the patient record to confirm that the individual had cancer. Cases that cannot be traced back are registered as death-certificate-only (DCO) cases.

Private physicians' clinics: The ECR liaises with private clinics to collect cases that may have been missed at the hospital level. Physicians in private practice keep most of their patients' records on site at their clinics, to facilitate follow-up. Although a corresponding patient file also exists at the hospital, the information there is often limited. To date, the ECR has not been able to take full advantage of private physicians' clinics as a data source, due to staffing limitations at the registry.

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

The registry uses IARC's CanReg5 software for data management and analysis.

YEARS PRESENTED

2008–2011 (a 4-year period)

NOTES

During the 4-year period analysed, the rate of registration was relatively constant, increasing from an average of 58 cases per month in 2008 to 73 cases per month in 2011.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is higher than the values for eastern Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of about 1.25 for both sexes. The ASRs of cancers of the lung, prostate, cervix, and breast are lower than the estimates for eastern Africa. This is also the case for Kaposi sarcoma, although the ASR of this cancer within the registry's covered population (7.0 and 4.7 cases per 100 000 person-years in males and females, respectively) is relatively high by global standards. The ASRs of cancers of the oesophagus and nasopharynx, of leukaemia, and of non-Hodgkin lymphoma are also high.

DCO cases account for about 13% and 16% of the registered cases in males and females, respectively. The percentage of DCO cases (DCO%) is particularly high for cancers of the lung and cancers coded as occurring at "other and unspecified" anatomical sites. DCO cases are identified from death certificates issued

for deaths occurring outside of hospital; the validity of the cause-of-death statements included on such certificates is questionable, especially when the cause of death is recorded simply as "cancer".

SUMMARY

The percentage of cases diagnosed by clinical/radiological means is slightly less than 10%, which is lower than in the Nairobi Cancer Registry data and may suggest slight underregistration. However, the overall results seem convincing.

PUBLICATIONS AND ACHIEVEMENTS

The ECR is a founding member of the AFCRN. The registry regularly hosts CanReg training courses.

Tenge CN, Kuremu RT, Buziba NG, Patel K, Were PA (2009). Burden and pattern of cancer in Western Kenya. *East Afr Med J.* 86(1):7–10. <http://dx.doi.org/10.4314/eamj.v86i1.46921> PMID:19530542

Were EO, Buziba NG (2001). Presentation and health care seeking behaviour of patients with cervical cancer seen at Moi Teaching and Referral Hospital, Eldoret, Kenya. *East Afr Med J.* 78(2):55–9. <http://dx.doi.org/10.4314/eamj.v78i2.9088> PMID:11682945

Kenya, Eldoret (2008–2011)

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

Site	All ages	Age unk	MV DCO %	Age group (years)											Crude rate	CR %	ASR (W)	ICD-10				
				0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55					55-60	60-65	65-70	70-75+
Mouth	20	1	95	5	-	-	-	1	1	1	4	1	2	3	-	2	3	1.1	1.4	2.4	C00-06	
Salivary gland	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.4	C07-08	
Nasopharynx	62	2	90	6	1	2	11	5	3	2	7	6	4	4	1	-	4	3.5	4.4	4.6	C11	
Other pharynx	13	0	85	15	-	-	-	1	1	1	2	2	1	4	2	1	1	0.7	0.9	1.9	C09-10, C12-14	
Oesophagus	223	3	81	9	1	2	1	5	7	15	11	18	27	33	29	16	21	12.4	15.8	3.51	28.7	C15
Stomach	74	0	88	5	-	-	-	1	3	1	2	1	7	6	8	11	7	4.1	5.2	1.12	9.8	C16
Colon	31	0	74	6	-	-	-	1	1	1	1	1	4	5	5	2	3	1.7	2.2	0.50	3.9	C18
Rectum	21	0	86	0	-	-	-	1	2	1	4	3	1	1	2	2	3	1.2	1.5	0.35	2.6	C19-20
Anus	3	0	100	0	-	-	-	1	1	1	-	-	-	-	-	-	-	0.2	0.2	0.01	0.2	C21
Liver	52	0	67	21	1	-	-	1	4	2	5	4	3	4	6	5	4	2.9	3.7	0.75	5.9	C22
Gallbladder etc.	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.06	0.3	C23-24
Pancreas	17	0	65	6	-	-	-	1	1	1	2	1	1	3	3	4	1	0.9	1.2	0.41	2.6	C25
Larynx	13	0	92	0	-	-	-	-	-	-	-	-	-	1	3	2	2	0.7	0.9	0.32	2.1	C32
Trachea, bronchus, and lung	21	0	48	43	-	-	-	2	1	1	3	1	3	2	2	2	6	1.2	1.5	0.24	2.3	C33-34
Bone	36	0	86	0	-	2	3	7	4	3	3	1	-	2	1	1	2	2.0	2.5	0.27	2.7	C40-41
Melanoma of skin	5	0	100	0	-	1	1	1	-	-	1	1	1	1	1	-	-	0.3	0.4	0.04	0.4	C43
Non-melanoma skin	25	0	100	0	-	2	1	1	-	-	2	2	3	2	-	2	1	1.4	0.23	0.23	2.5	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.03	0.2	C45
Kaposi sarcoma	98	0	82	8	1	4	4	1	4	5	19	28	9	5	4	1	2	5.5	6.9	0.63	7.0	C46
Connective and soft tissue	36	0	92	6	2	3	5	6	4	1	3	2	3	2	2	1	2	2.0	2.5	0.28	2.6	C47, C49
Breast	13	0	85	0	-	-	-	1	1	1	1	1	1	3	-	2	2	0.7	0.9	0.21	1.8	C50
Penis	4	0	100	0	-	-	-	-	-	-	-	-	-	-	2	-	-	0.2	0.3	0.06	0.5	C60
Prostate	114	2	73	15	-	-	-	1	1	-	-	-	2	3	3	11	15	6.4	8.1	2.05	15.8	C61
Testis	4	0	100	0	-	-	-	-	-	-	-	-	-	1	1	1	-	0.2	0.3	0.06	0.6	C62
Kidney and renal pelvis	16	1	94	0	3	8	-	1	-	-	-	-	-	-	-	2	-	0.9	1.1	0.10	1.1	C64-65
Bladder	16	0	100	0	1	-	-	-	-	-	-	-	3	3	2	-	2	0.9	1.1	0.22	1.8	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	0.0	C66, C68
Eye	35	1	91	3	10	2	1	-	-	3	2	5	4	2	2	1	-	2.0	2.5	0.20	2.4	C69
Brain and nervous system	28	2	82	7	2	1	1	2	2	2	2	1	2	3	3	2	1	1.6	2.0	0.34	2.8	C70-72
Thyroid	8	0	75	12	-	-	-	-	-	-	-	-	-	1	1	1	-	0.4	0.6	0.11	1.0	C73
Hodgkin lymphoma	27	2	96	4	-	1	5	1	8	2	-	2	1	2	-	1	-	1.5	1.9	0.16	1.7	C81
Non-Hodgkin lymphoma	100	0	86	4	14	17	10	7	4	4	2	4	6	8	4	5	2	5.6	7.1	0.76	7.7	C82-85, C96
Multiple myeloma	20	0	75	25	1	1	-	-	-	-	-	2	1	4	2	1	-	1.1	1.4	0.31	2.4	C90
Lymphoid leukaemia	46	0	93	7	8	7	6	2	3	2	1	1	-	3	1	2	-	2.6	3.3	0.36	3.4	C91
Myeloid leukaemia	38	0	92	5	1	1	2	3	6	9	2	1	2	3	-	3	-	2.1	2.7	0.26	2.8	C92-94
Leukaemia, unspecified	4	0	50	1	1	-	-	-	-	1	-	-	-	-	-	-	-	0.2	0.3	0.02	0.2	C95
Other and unspecified	207	2	33	63	6	2	3	6	6	1	6	6	11	14	9	22	23	11.5	14.7	2.91	25.2	O&U
All sites	1437	16	76	16	53	55	41	54	55	44	76	92	75	89	114	105	122	80.1	17.93	15.49	154.9	C00-96
All sites except C44	1412	16	76	16	53	53	41	53	55	44	74	90	72	89	111	103	122	78.7	100.0	17.70	152.4	C00-96 exc. C44
Average annual population					68684	63190	54540	46701	50899	41087	32128	25514	17366	14554	9838	7150	5259	3597	2804	5365	448656	

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Kenya, Eldoret (2008–2011)

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

Site	All ages	Age unk	MV	DCO	Age group (years)													Crude rate	CR	ASR (W)	ICD-10				
					%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-					60-	65-	70-	75+
Mouth	14	0	86	14	-	-	-	-	-	1	-	-	-	1	1	3	1	3	1	3	3	0.8	1.0	2.0	C00-06
Salivary gland	2	0	0	0	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	C07-08
Nasopharynx	28	0	96	0	-	1	4	1	4	7	1	1	1	4	-	-	3	-	3	-	1.6	1.9	2.3	C11	
Other pharynx	4	0	100	0	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	0.2	0.3	0.09	C09-10, C12-14	
Oesophagus	123	3	87	7	-	-	1	3	4	5	11	6	11	12	15	18	16	17	17	17	6.9	8.4	2.33	C15	
Stomach	59	0	80	7	-	-	1	4	2	1	4	8	6	4	10	6	14	3.3	4.1	1.00	7.9	3.3	4.1	1.00	C16
Colon	23	0	78	17	-	-	2	1	-	2	3	2	3	2	1	2	5	1.3	1.6	0.30	2.7	1.3	1.6	0.30	C18
Rectum	12	0	75	8	-	-	4	-	-	4	-	2	1	-	1	1	-	0.7	0.8	0.14	1.3	0.7	0.8	0.14	C19-20
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	0.0	0.0	0.00	C21
Liver	32	1	78	6	-	-	-	3	4	2	4	2	4	4	4	1	4	1.8	2.2	0.50	4.0	2.2	0.50	4.0	C22
Gallbladder etc.	8	0	50	12	-	-	-	1	1	1	1	-	2	-	2	-	1	0.4	0.5	0.12	1.0	0.4	0.5	0.12	C23-24
Pancreas	21	2	29	33	-	-	-	-	-	-	3	3	1	3	3	-	4	1.2	1.4	0.30	2.8	1.2	1.4	0.30	C25
Larynx	4	1	100	0	-	-	-	-	-	-	-	-	1	1	1	-	1	0.2	0.3	0.09	0.7	0.2	0.3	0.09	C32
Trachea, bronchus, and lung	6	0	33	67	-	-	-	-	-	7	3	-	3	-	1	2	1	0.3	0.4	0.14	1.0	0.3	0.4	0.14	C33-34
Bone	22	0	82	0	-	-	4	1	1	1	4	2	5	2	2	4	-	1.2	1.5	0.14	1.6	1.2	1.5	0.14	C40-41
Melanoma of skin	16	0	100	0	-	-	-	-	-	-	-	-	-	-	2	1	3	0.9	1.1	0.31	2.3	0.9	1.1	0.31	C43
Non-melanoma skin	30	0	100	0	-	-	1	1	1	4	2	5	2	2	4	-	4	1.7	0.44	0.44	3.5	1.7	0.44	3.5	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	65	0	71	8	-	1	2	3	5	6	9	12	15	8	5	2	2	3.7	4.5	0.43	4.7	3.7	4.5	0.43	C46
Connective and soft tissue	34	1	91	3	7	1	2	3	4	1	5	2	2	1	1	1	1	1.9	2.3	0.23	2.6	1.9	2.3	0.23	C47, C49
Breast	187	11	87	5	-	-	1	1	4	6	14	20	15	33	26	13	18	10.5	12.8	2.34	21.8	10.5	12.8	2.34	C50
Vulva	4	0	100	0	-	-	-	-	2	1	-	-	-	-	1	-	-	0.2	0.3	0.04	0.4	0.2	0.3	0.04	C51
Vagina	4	0	100	0	-	-	-	-	2	1	-	-	-	-	-	-	-	0.2	0.3	0.04	0.4	0.2	0.3	0.04	C52
Cervix uteri	237	8	84	3	-	-	2	3	7	21	27	35	36	27	21	15	11	13.3	16.3	2.92	26.8	13.3	16.3	2.92	C53
Uterus	36	0	86	6	-	-	-	3	1	1	2	3	-	6	4	8	3	2.0	2.5	0.68	5.0	2.0	2.5	0.68	C54-55
Ovary	41	2	73	10	-	-	3	2	5	7	5	4	3	4	-	1	1	2.3	2.8	0.37	3.8	2.3	2.8	0.37	C56
Placenta	4	0	0	25	-	-	-	-	1	1	-	2	-	-	-	-	-	0.2	0.3	0.02	0.3	0.2	0.3	0.02	C58
Kidney and renal pelvis	13	0	92	0	2	4	1	1	-	-	-	-	3	-	-	1	-	0.7	0.9	0.07	1.0	0.7	0.9	0.07	C64-65
Bladder	11	1	91	0	-	-	-	-	-	-	1	1	1	1	2	-	-	0.6	0.8	0.23	1.4	0.6	0.8	0.23	C66
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.03	0.2	0.1	0.1	0.03	C66, C68
Eye	35	1	100	0	13	-	-	-	1	2	6	4	2	2	2	-	1	2.0	2.4	0.18	2.3	2.0	2.4	0.18	C69
Brain and nervous system	18	0	72	17	2	5	2	1	-	1	-	-	1	-	2	-	2	1.0	1.2	0.23	1.6	1.0	1.2	0.23	C70-72
Thyroid	19	1	95	0	-	-	2	1	3	1	4	2	4	-	3	-	1	1.1	1.3	0.22	1.9	1.1	1.3	0.22	C73
Hodgkin lymphoma	11	0	82	3	4	4	1	1	10	7	6	5	5	3	4	3	1	0.6	0.8	0.09	1.0	0.6	0.8	0.09	C81
Non-Hodgkin lymphoma	68	1	88	3	4	4	8	1	10	7	6	5	5	3	4	3	1	3.8	4.7	0.52	5.2	3.8	4.7	0.52	C82-85, C96
Multiple myeloma	16	1	100	0	-	-	-	-	1	1	-	3	4	1	2	1	1	0.9	1.1	0.26	2.2	0.9	1.1	0.26	C90
Lymphoid leukaemia	24	0	100	0	1	2	2	2	3	2	3	-	2	2	3	-	2	1.3	1.6	0.26	2.2	1.3	1.6	0.26	C91
Myceloid leukaemia	37	0	97	0	1	3	2	4	2	4	6	2	1	3	1	1	1	2.1	2.5	0.36	3.0	2.1	2.5	0.36	C92-94
Leukaemia, unspecified	7	0	57	43	1	-	3	1	-	-	1	-	-	-	-	-	-	0.4	0.5	0.02	0.3	0.4	0.5	0.02	C95
Other and unspecified	210	5	39	58	4	3	4	4	6	5	13	19	14	10	15	19	18	11.8	14.4	2.91	24.2	11.8	14.4	2.91	O&U
All sites	1486	39	78	13	36	23	37	40	54	54	114	132	136	141	127	119	110	83.5	100.0	18.84	162.8	83.5	100.0	18.84	C00-96
All sites except C44	1456	39	77	13	35	23	36	39	54	53	113	128	134	136	125	117	106	81.8	100.0	18.40	159.3	81.8	100.0	18.40	C00-96 exc. C44
Average annual population	67530	62084	54657	48402	55055	42134	29932	23234	15303	13029	8702	6617	4924	3710	2868	6772	444953								

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Kenya, Nairobi

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

Since the NCR's inception, data collection has included all cases, irrespective of place of residence, diagnosed in the hospitals within the registration area. The volume of data to be processed is high, and the associated workload is heavy.

In 2009, recognizing the problems of recording large numbers of cases with a limited staff, a grant was received from the International Network for Cancer Treatment and Research to support case finding for Nairobi residents only. There is currently provision for one full-time staff member and three full-time contractual registrars supported by the institute. There are six data collectors undertaking case finding and abstraction in six major hospitals and more than 10 smaller facilities. Two of the three full-time contractual staff undertake data entry, checks for consistency and accuracy, analysis, and report generation. Funding is sourced from partners and collaborators to support staffing needs of the registry.

The NCR data presented in this volume are for the registry's catchment area, which comprises the city of Nairobi, a large cosmopolitan centre located in Kenya's Central Highlands. Although the region is predominantly occupied by Bantu peoples, the city's population is diverse, with residents from most of the ethnic groups found across the country. Nairobi has eight main administrative divisions: Central, Dagoretti,

Embakasi, Kasarani, Kibera, Makadara, Pumwani, and Westlands.

The population of Nairobi County is estimated to have been 3 138 369 in 2009 (at the national census). The average annual population-at-risk estimates corresponding to the NCR data presented in this volume are shown in the population pyramid.

The NCR collects data from public and private hospitals, as well as from medical laboratories, radiotherapy treatment centres, Nairobi Hospice, and the registrar of births and deaths.

Public and private hospitals: The registrars collect data from medical records departments. They use disease index cards and patient-care registers to identify cancer cases in both inpatient and outpatient facilities. A few hospitals have established digital disease indices, which can also be used to identify cancer cases.

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

Radiotherapy treatment centres: NCR registrars regularly visit the radiotherapy units at Kenyatta National Hospital (KNH) and the Nairobi Hospital to carry out active case abstraction.

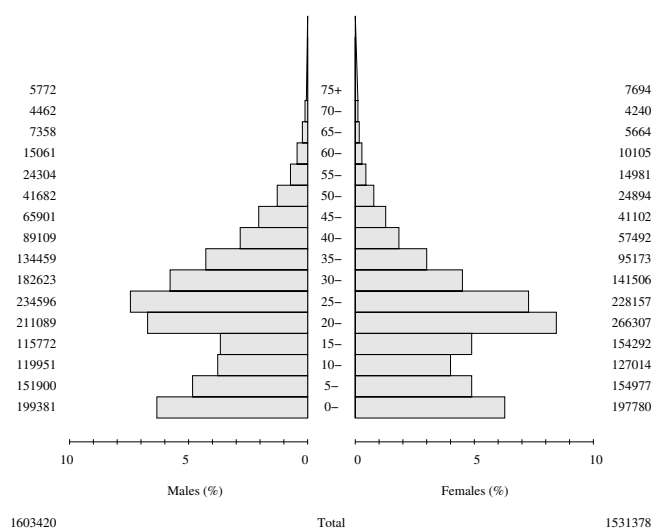
Nairobi Hospice: The hospice submits data to NCR; most patients have been referred to the hospice from KNH or other health care facilities within or outside of Nairobi. The hospice provides updated information on patient status, which is important for follow-up and case assessment.

Registrar of births and deaths (death certificates office) – vital statistics: The NCR established a link with the vital statistics system in 2006, to access cancer-specific mortality data from the registrar of births and deaths office. Trace-back of cancer deaths to obtain the corresponding hospital records has shown that the quality of diagnostic information on cancer cases is poor. Deaths due to cancer that occurred during the 3-year period of 2009–2011, and that could not be matched with the registry database or traced back to hospital records, were registered as death-certificate-only cases in the NCR database if the patient had a confirmed Nairobi address.

Private stand-alone pathology laboratories were not used as primary sources, because the demographic information on cancer cases that is available from such laboratories is limited.

For case finding, the NCR initially attempted to enlist the help of employees of medical records services, including at hospitals, oncology clinics, laboratories, death registers, and clinical services. Unfortunately, this strategy proved ineffective, because the employees were too busy with their primary duties to give the necessary attention to cancer registry activities. The registry therefore recruited its own staff, with the basic qualification of a diploma in health information management or any health-related

Kenya, Nairobi (2007–2011)
Population pyramid (average annual person-years by sex and age group)



Source: 2009 national census

field. The staff members were trained at KEMRI and then deployed to various hospitals to perform case finding, abstraction, and coding. The registrars work full-time on site from Monday to Thursday; on Friday they submit the week's identified cases to the registry supervisor and a meeting is held to consider each case and take note of any issues or difficulties faced. After physical checks are carried out, the data are entered into the registry database.

The registry uses IARC's CanReg5 software for data management and analysis.

YEARS PRESENTED

2007–2011 (a 5-year period)

NOTES

The registry was founded in 2001 and has published results for 2000–2002 and 2004–2008. The results presented here are for a slightly more recent period (2007–2011). The rate of registration during the period analysed was relatively constant, at 156–163 cases per month.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is higher than the values for eastern Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of 1.31 for males and 1.41 for females. The ASRs recorded for 2007–2011 are very similar to those recorded for 2004–2008 (Korir et al., 2015), with a small increase in the ASR of breast cancer in females (from 51.7 to 59.7 cases per 100 000 person-years) and a decrease for cancer of the cervix (from 46.1 to 43.3 cases per 100 000 person-years).

Compared with the Eldoret Cancer Registry, whose data are also presented in this volume, the ASR of leukaemia is fairly low, and the ASRs of nasopharyngeal cancer are relatively high in both populations. Also of note are the relatively high rates of cancers of the oral cavity and pharynx, colorectum, and breast. The

ASR of breast cancer in females, at 59.7 cases per 100 000 person-years, is the highest recorded in sub-Saharan Africa.

The percentage of cases with a non-morphological diagnosis is about 21%, with 6.3% of cases registered as death-certificate-only (DCO) cases.

SUMMARY

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

PUBLICATIONS AND ACHIEVEMENTS

The NCR is a founding member of the African Cancer Registry Network (AFCRN). It hosted the 2013 First AFCRN Annual Review Meeting.

Cheng ML, Zhang L, Borok M, Chokunonga E, Dzamamala C, Korir A, et al. (2015). The incidence of oesophageal cancer in Eastern Africa: identification of a new geographic hot spot? *Cancer Epidemiol.* 39(2):143–9. <http://dx.doi.org/10.1016/j.canep.2015.01.001> PMID:25662402

Gathere S, Mutuma G, Korir A, Musibi A (2011). Head and neck cancers four year trend at the Nairobi Cancer Registry. *Afr J Health Sci.* 19:30–5.

Korir A, Mauti N, Moats P, Gurka MJ, Mutuma G, Metheny C, et al. (2014). Developing clinical strength-of-evidence approach to define HIV-associated malignancies for cancer registration in Kenya. *PLoS One.* 9(1):e85881. <http://dx.doi.org/10.1371/journal.pone.0085881> PMID:24465764

Korir A, Okerosi N, Ronoh V, Mutuma G, Parkin M (2015). Incidence of cancer in Nairobi, Kenya (2004–2008). *Int J Cancer.* 137(9):2053–9. <http://dx.doi.org/10.1002/ijc.29674> PMID:26139540

Nairobi Cancer Registry (2006). *Cancer Incidence Report Nairobi 2000–2002*. Nairobi: Nairobi Cancer Registry and Kenya Medical Research Institute. Available from: <https://www.healthresearchweb.org/files/CancerIncidenceReportKEMRI.pdf>.

Kenya, Nairobi (2007–2011)

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

Site	All ages	Age unk	MV DCO %	Age group (years)											Crude rate %	CR (W)	ASR (W)	ICD-10				
				0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-					55-	60-	65-	70-
Mouth	212	0	89	0	9	4	6	6	11	15	22	29	27	26	15	12	16	2.6	0.91	7.5	C00-06	
Salivary gland	25	0	80	4	-	1	-	1	3	2	5	2	-	2	2	4	2	0.3	0.15	1.0	C07-08	
Nasopharynx	203	0	91	1	-	13	17	24	21	21	32	16	11	11	9	2	1	2.5	5.0	4.6	C42 C11	
Other pharynx	53	0	57	26	-	-	2	1	5	3	5	6	3	11	4	3	7	0.7	1.3	0.24	C09-10, C12-14	
Oesophagus	319	0	77	7	-	-	3	2	22	30	18	44	34	31	39	28	50	4.0	7.9	1.70	C15	
Stomach	225	0	71	12	1	1	2	1	6	27	28	30	24	23	28	19	20	2.8	5.6	1.22	C16	
Colon	223	0	68	9	1	1	1	4	18	33	18	31	18	26	20	13	22	2.8	5.5	1.00	C18	
Rectum	136	0	79	1	-	1	1	1	6	4	19	8	15	16	12	11	10	1.7	3.4	0.68	C19-20	
Anus	7	0	100	0	-	-	-	-	1	1	1	-	-	2	1	-	2	0.1	0.2	0.03	C21	
Liver	196	0	72	17	1	3	6	1	15	15	25	18	22	23	13	16	18	2.4	4.8	0.91	C22	
Gallbladder etc.	35	0	77	9	-	-	-	-	1	2	1	6	2	5	6	7	5	0.4	0.9	0.30	C23-24	
Pancreas	85	0	55	9	-	1	-	-	3	3	9	7	15	12	7	8	17	1.1	2.1	0.45	C25	
Larynx	81	0	83	1	-	-	-	-	3	4	10	8	14	11	10	8	13	1.0	2.0	0.49	C32	
Trachea, bronchus, and lung	116	0	72	9	-	-	-	1	3	2	6	14	11	16	17	16	12	1.4	2.9	0.72	C33-34	
Bone	123	0	73	2	2	5	12	22	16	11	5	6	5	10	4	3	2	1.5	3.0	0.30	C40-41	
Melanoma of skin	18	0	94	6	-	-	-	1	3	5	6	11	11	10	9	14	8	0.2	0.4	0.12	C43	
Non-melanoma skin	112	0	90	4	1	2	1	3	5	6	11	10	8	10	6	8	7	1.4	0.44	3.5	C44	
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	1	-	-	-	-	-	0.0	0.00	0.00	C45	
Kaposi sarcoma	175	0	85	15	1	5	2	2	15	27	31	24	9	7	4	4	2	2.2	4.3	0.30	C46	
Connective and soft tissue	83	0	82	5	6	10	6	5	11	8	5	5	3	3	6	1	3	1.0	2.0	0.19	C47, C49	
Breast	72	0	74	8	-	1	-	2	-	4	2	8	12	6	5	5	7	0.9	1.8	0.35	C50	
Penis	11	0	91	0	-	1	-	1	1	2	2	-	-	1	-	-	3	0.1	0.3	0.01	C60	
Prostate	683	0	75	6	-	-	1	1	5	15	15	44	66	101	111	133	202	8.5	16.8	5.57	C61	
Testis	10	0	80	0	1	1	-	1	1	1	-	-	1	-	-	-	1	0.1	0.2	0.01	C62	
Kidney and renal pelvis	43	0	84	7	8	2	-	3	-	2	2	3	5	4	11	9	7	0.5	1.1	0.21	C64-65	
Bladder	70	0	79	9	1	1	-	-	-	-	-	-	-	-	-	-	12	0.9	1.7	0.60	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.00	C66, C68	
Eye	136	0	90	1	28	7	3	7	7	10	7	23	14	6	4	4	5	1.7	3.4	0.29	C69	
Brain and nervous system	94	0	66	7	7	3	5	7	3	5	8	6	5	8	9	4	8	1.2	2.3	0.35	C70-72	
Thyroid	20	0	85	0	-	-	-	-	4	1	3	2	1	2	1	2	1	0.2	0.5	0.10	C73	
Hodgkin lymphoma	56	0	100	0	2	15	6	8	2	4	3	2	6	2	1	-	1	0.7	1.4	0.07	C81	
Non-Hodgkin lymphoma	208	0	94	4	7	14	13	5	10	16	18	20	21	20	9	16	10	2.6	5.1	0.63	C82-85, C96	
Multiple myeloma	54	0	93	7	-	-	1	-	4	3	9	10	5	10	4	4	3	0.7	1.3	0.28	C90	
Lymphoid leukaemia	65	0	100	0	12	17	11	2	1	2	3	2	2	1	8	2	1	0.8	1.6	0.15	C91	
Myeloid leukaemia	43	0	98	2	3	5	4	2	3	2	4	5	3	3	2	1	2	0.5	1.1	0.11	C92-94	
Leukaemia, unspecified	29	0	69	31	1	1	4	1	3	2	2	-	1	3	-	-	3	0.4	0.7	0.07	C95	
Other and unspecified	144	0	56	17	4	5	7	3	7	1	4	12	10	6	14	23	11	1.8	3.6	0.66	O&U	
All sites	4166	0	78	7	86	105	104	113	112	125	199	237	305	374	440	366	362	52.0	20.05	162.6	C00-96	
All sites except C44	4054	0	78	7	85	103	103	110	107	119	188	226	295	365	361	366	354	482	50.6	100.0	19.60	C00-96 exc. C44
Average annual population						199381	151900	119951	115772	211089	234596	182623	134459	89109	65901	41682	24304	15061	7358	4462	5772	1603420

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Kenya, Nairobi (2007–2011)

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

Site	All ages	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Crude rate	%	CR	ASR (W)	ICD-10	
Mouth	125	0	92	2	2	3	7	5	9	7	12	13	11	14	8	17	13	1.6	2.3	0.87	6.1	C00-06	
Salivary gland	26	0	96	0	2	1	5	1	2	2	2	3	2	2	3	3	1	0.3	0.5	0.11	1.0	C07-08	
Nasopharynx	62	0	85	3	3	6	6	6	2	2	8	6	5	2	2	3	5	0.8	1.1	0.22	2.0	C11	
Other pharynx	41	0	63	27	3	1	1	3	4	5	4	10	5	1	2	3	2	0.5	0.7	0.22	1.7	C09-10, C12-14	
Oesophagus	250	0	73	6	6	6	6	6	15	33	29	31	19	33	30	36	36	3.3	4.5	1.92	14.0	C15	
Stomach	174	0	69	13	6	3	3	4	11	8	18	16	22	20	18	31	31	2.3	3.1	1.26	9.7	C16	
Colon	158	0	77	7	7	4	8	14	8	19	14	23	22	16	6	7	17	2.1	2.9	0.76	6.7	C18	
Rectum	96	0	82	5	1	1	5	4	13	10	9	15	12	7	7	6	1	1.3	1.7	0.60	4.5	C19-20	
Anus	22	0	91	0	1	1	2	3	3	5	3	5	1	1	2	1	1	0.3	0.4	0.11	0.9	C21	
Liver	106	0	64	20	1	1	4	6	10	10	9	16	9	10	9	8	14	1.4	1.9	0.63	5.0	C22	
Gallbladder etc.	36	0	78	3	1	2	2	1	6	1	6	1	8	2	6	4	5	0.5	0.6	0.30	2.1	C23-24	
Pancreas	78	0	47	6	1	2	2	2	3	7	9	13	9	10	10	5	6	1.0	1.4	0.55	4.1	C25	
Larynx	25	0	80	16	1	1	2	1	1	3	5	2	2	3	3	2	3	0.3	0.5	0.17	1.3	C32	
Trachea, bronchus, and lung	74	0	70	11	1	1	2	3	3	5	8	9	4	15	5	8	11	1.0	1.3	0.52	4.0	C33-34	
Bone	93	0	70	3	1	9	5	6	14	3	1	5	4	4	4	1	5	1.2	1.7	0.23	2.3	C40-41	
Melanoma of skin	19	0	95	5	1	1	1	1	2	2	4	2	1	1	1	4	2	0.2	0.3	0.12	1.0	C43	
Non-melanoma skin	117	0	93	0	2	4	1	6	9	8	14	13	15	6	7	9	14	1.5	0.62	0.62	5.0	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45	
Kaposi sarcoma	102	0	81	17	2	9	20	17	21	16	8	3	1	1	1	3	1	1.3	1.8	0.19	1.8	C46	
Connective and soft tissue	69	0	86	3	6	6	6	9	5	2	8	2	1	2	1	1	3	0.9	1.2	0.13	1.4	C47, C49	
Breast	1529	0	82	4	5	27	51	132	194	191	237	185	166	125	86	62	68	20.0	27.6	7.31	59.7	C50	
Vulva	31	0	81	3	2	2	2	2	1	8	3	1	5	2	2	2	2	0.4	0.6	0.14	1.2	C51	
Vagina	1139	0	62	15	1	1	1	1	3	1	1	2	2	2	2	2	2	0.2	0.2	0.06	0.5	C52	
Cervix uteri	154	0	86	2	1	12	34	86	156	187	163	144	120	90	57	40	48	14.9	20.5	5.19	43.3	C53	
Uterus	195	0	65	7	1	1	4	5	14	12	19	18	20	19	20	10	11	2.0	2.8	1.07	8.0	C54-55	
Ovary	6	0	83	0	1	3	1	1	1	1	2	2	2	1	1	1	1	2.5	3.5	1.13	8.8	C56	
Placenta	58	0	69	7	2	4	3	1	3	1	2	5	1	4	4	3	2	0.8	1.0	0.24	1.9	C64-65	
Kidney and renal pelvis	35	0	83	11	1	1	1	2	1	3	6	9	1	6	2	1	3	0.5	0.6	0.22	1.8	C67	
Bladder	1	0	100	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.0	0.0	0.01	0.1	C66, C68	
Ureter and other urinary	144	0	94	1	2	2	12	16	26	27	11	9	7	3	3	2	4	1.9	2.6	0.29	3.1	C69	
Brain and nervous system	110	0	71	5	4	12	9	6	8	9	12	11	4	6	6	3	3	1.4	2.0	0.39	3.4	C70-72	
Thyroid	84	0	87	2	2	7	5	4	9	12	7	11	11	3	8	2	3	1.1	1.5	0.39	3.2	C73	
Hodgkin lymphoma	49	0	100	0	1	4	4	9	1	5	4	1	1	1	1	1	7	0.6	0.9	0.07	0.7	C81	
Non-Hodgkin lymphoma	158	0	93	3	4	4	14	17	22	13	15	12	13	5	3	1	7	2.1	2.9	0.61	4.8	C82-85, C96	
Multiple myeloma	41	0	100	0	1	1	1	2	2	5	5	10	5	4	4	5	3	0.5	0.7	0.34	2.4	C90	
Lymphoid leukaemia	41	0	98	2	13	7	4	2	2	3	1	3	2	2	2	2	2	0.5	0.7	0.11	1.1	C91	
Myeloid leukaemia	41	0	95	5	2	4	5	3	2	4	2	4	2	3	2	3	3	0.5	0.7	0.11	1.1	C92-94	
Leukaemia, unspecified	23	0	52	48	1	3	2	1	2	3	1	2	2	3	1	1	1	0.3	0.4	0.06	0.8	C95	
Other and unspecified	135	0	61	16	1	2	6	4	5	8	11	17	13	15	9	14	11	1.8	2.4	0.72	5.7	O&U	
All sites	5660	0	80	5	80	46	63	81	133	253	405	590	645	696	445	357	292	73.9	100.0	27.99	226.3	C00-96	
All sites except C44	5543	0	80	6	80	46	61	77	132	247	396	582	631	683	438	348	283	72.4	100.0	27.37	221.3	C00-96 exc. C44	
Average annual population	197780	154977	127014	154292	266307	228157	141506	95173	57492	41102	24894	14981	10105	5664	4240	4240	7694	1531378					

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Malawi, Blantyre

The Malawi National Cancer Registry (MCR) was established in 1989. It was initially a histopathology-based registry, recording data on cancer cases diagnosed in the pathology laboratory of Queen Elizabeth Central Hospital in Blantyre, which received specimens from hospitals throughout the country. In 1993, the registry began to record cases from all hospitals and clinics serving the population of Blantyre District (urban and rural), regardless of the basis of diagnosis. The MCR is a founding member of the Malawi Cancer Consortium, and the core activities of the registry are currently funded through the programme. The registry is staffed by a pathologist (the registry director), an oncologist (the deputy director), a cancer registrar, a data manager/analyst, and four data collection clerks.

The MCR data presented in this volume are for the registry's entire covered population: the residents of Blantyre District (as defined by ≥ 6 months of residence in the area). The population of Blantyre is diverse, with residents from various ethnic groups from across the country and no one tribe predominating. There is a substantial population of immigrants from neighbouring countries (the United Republic of Tanzania, Zambia, and Mozambique), as well as small numbers of Zimbabweans, Asians (predominantly Indians), and Europeans.

Population estimates for Blantyre District for 1999–2005 were available by sex and age from the tables of national population projections for 1999–2025 produced by the National Statistical Office (NSO) of Malawi. The population of Blantyre District (which includes the city of Blantyre and some adjacent rural areas) is estimated to have been slightly more than 1 million in 2008. The average annual population-at-risk

estimates corresponding to the MCR data presented in this volume are shown in the population pyramid.

Registration is carried out through regular visits by the cancer registrars and data clerks to all hospitals in Blantyre District, with data recorded from hospital records departments and from clinical services where cancer cases are diagnosed or treated. Queen Elizabeth Central Hospital is by far the most important source of data for the registry. Other sources include Blantyre Adventist Hospital, Mwaiwathu Private Hospital, Chitawira Private Hospital, Mtengo Umodzi Private Hospital, Mlambe Mission Hospital, Malamulo Hospital, Welmatt Private Hospital, Malmmed Private Clinic and Laboratory, MASM Medi Clinic Kanjedza (formerly Admarc Clinic), Nguludi Mission Hospital, Chiradzulu District Hospital, Malamulo Adventist Hospital, Thyolo District Hospital, and Zomba Central Hospital.

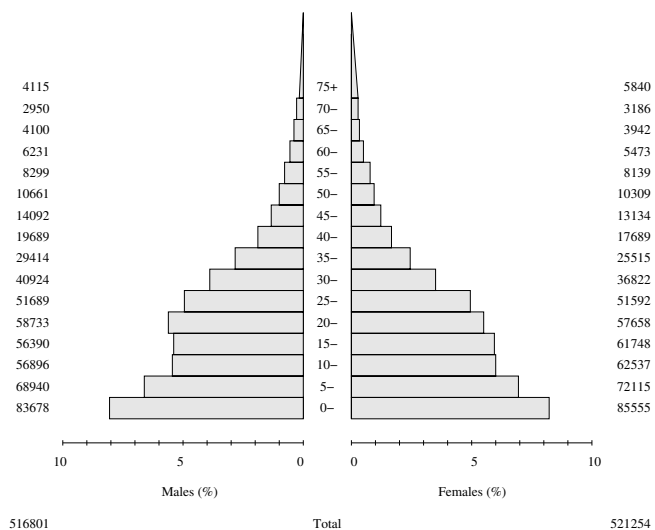
There is no comprehensive system of death registration in Malawi, so death certificates are not routinely used as a source of information.

A recent completeness/validity study conducted by a researcher from the University of Michigan estimated the completeness of registration to be 86%.

The MCR adheres to the confidentiality guidelines of the African Cancer Registry Network (AFCRN), which are adapted from the IARC/IACR guidelines (IARC, 2004a). Only registry personnel have access to electronic data (through the use of passwords). Physical access to records is limited (the office is locked), and cancer notification forms are safely disposed of (incinerated). Institutional review board approval must be granted before any data are released to researchers.

Cases are coded according to ICD-O-3. The registry uses IARC's CanReg software for case recording; this includes checks at the time of data entry for potential duplicates and for impossible or unlikely codes and combinations of codes. CanReg also provides automatic code conversion to ICD-10.

Malawi, Blantyre (2009–2010)
Population pyramid (average annual person-years by sex and age group)



Estimates based on the population and housing censuses of 1998 and 2008

YEARS PRESENTED

2009–2010 (a 2-year period)

NOTES

During the decade from 2001 to 2010, there were large fluctuations in the monthly and annual numbers of registrations, with the highest rate of registration (an average of 113 cases per month) in 2003–2007; results for this period were published in Volume X of *Cancer Incidence in Five Continents*. The number of registrations in 2008 was somewhat low. During 2009–2010, the period analysed here, there was an average of 98 registrations per month.

The incidence rate of cancer at all sites is relatively high, although lower than the published figures for 2003–2007. This is due to the very high rates of oesophageal cancer (30.3 per 100 000 in males and 19.4 per 100 000 in females), Kaposi sarcoma (55.5 per 100 000 in males and 28.9 per 100 000 in females), and cervical cancer (89.3 per 100 000 in

females). In contrast, the rates of leukaemia (1.0 cases per 100 000 person-years in males and 0.4 cases per 100 000 person-years in females) and cancers of the nervous system are very low. The incidence of Kaposi sarcoma is 35% less than that reported for 2003–2007, whereas the incidence of cervical cancer is 17% higher.

The overall percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer) is low (34% in males and 47% in females), but this is in large part due to the high incidence of oesophageal cancer and Kaposi sarcoma, most cases of which are diagnosed clinically or radiologically. There are no death-certificate-only registrations.

SUMMARY

There is probably some degree of underregistration, as suggested by the annual fluctuation in the number of registrations, and possibly some misallocation of cases by place of residence, as suggested by rapid changes in the calculated incidence rates. However, the most striking findings within the registry data (i.e. the high rates of oesophageal cancer, Kaposi sarcoma, and cervical cancer) are unlikely to be artefactual.

PUBLICATIONS AND ACHIEVEMENTS

The MCR is a founding member of AFCRN. It hosted the first AFCRN advanced training course, in 2012.

Banda LT, Parkin DM, Dzamalala CP, Liomba NG (2001). Cancer incidence in Blantyre, Malawi 1994–1998. *Trop Med Int Health*. 6(4):296–304. <http://dx.doi.org/10.1046/j.1365-3156.2001.00707.x> PMID:11348520

Mlombe Y, Dzamalala C, Chisi J, Othieno-Abinya N (2009). Oesophageal cancer and Kaposi's sarcoma in Malawi: a comparative analysis. *Malawi Med J*. 21(2):66–8. <http://dx.doi.org/10.4314/mmj.v21i2.44562> PMID:20345007

Mlombe Y, Othieno-Abinya N, Dzamalala C, Chisi J (2008). The need for a national cancer policy in Malawi. *Malawi Med J*. 20(4):124–7. <http://dx.doi.org/10.4314/mmj.v20i4.10976> PMID:19537394

Msyamboza KP, Dzamalala C, Mdokwe C, Kamiza S, Lemerani M, Dzowela T, et al. (2012). Burden of cancer in Malawi; common types, incidence and trends: national population-based cancer registry. *BMC Res Notes*. 5:149. <http://dx.doi.org/10.1186/1756-0500-5-149> PMID:22424105

Malawi, Blantyre (2009–2010)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)										Crude rate	CR %	ASR (W)	ICD-10				
					0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50					50-55	55-60	60-65	65-70
Mouth	6	0	100	-	1	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.12	1.3	C00-06	
Salivary gland	6	0	67	1	-	1	-	-	-	-	-	-	-	-	-	-	-	0.6	0.04	0.6	C07-08	
Nasopharynx	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.05	0.6	C11	
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C09-10, C12-14	
Oesophagus	153	10	19	-	-	-	1	5	26	15	16	10	16	9	17	10	5	14.8	3.27	30.3	C15	
Stomach	18	0	78	-	-	-	-	2	-	1	-	-	2	3	5	-	1	1.7	1.7	4.4	C16	
Colon	14	0	64	-	-	-	-	1	2	1	1	-	2	1	3	2	1	1.4	1.4	3.6	C18	
Rectum	8	0	50	-	-	-	-	1	1	-	-	-	2	1	1	2	-	0.8	0.8	3.2	C19-20	
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C21	
Liver	18	0	56	1	4	1	-	2	1	3	1	2	-	-	-	-	1	1.7	1.7	0.13	C22	
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C23-24	
Pancreas	3	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.3	0.3	0.15	C25	
Larynx	6	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.26	1.7	C32	
Trachea, bronchus, and lung	8	0	38	-	-	-	-	-	-	-	-	-	1	2	2	1	-	0.8	0.8	0.20	C33-34	
Bone	20	0	55	2	1	1	2	1	3	4	3	-	-	-	1	1	1	1.9	1.9	0.28	C40-41	
Melanoma of skin	5	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	1.1	C43	
Non-melanoma skin	16	1	88	-	-	-	-	2	2	2	1	2	1	2	1	1	1	1.5	0.32	2.9	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C45	
Kaposi sarcoma	453	10	12	2	3	5	9	27	74	109	82	44	27	10	11	7	2	43.8	44.0	5.08	C46	
Connective and soft tissue	17	2	94	2	4	3	2	-	-	1	-	-	-	-	1	1	-	1.6	1.7	0.18	C47, C49	
Breast	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.08	C50	
Penis	17	1	71	-	-	-	-	-	-	2	2	3	3	2	1	-	3	1.6	1.7	0.49	C60	
Prostate	41	1	41	-	-	-	-	1	1	2	-	2	-	1	2	6	4	4.0	4.0	1.75	C61	
Testis	4	0	75	2	-	-	-	-	1	-	-	-	-	-	-	-	-	0.4	0.4	0.10	C62	
Kidney and renal pelvis	8	0	88	5	1	1	-	-	-	-	1	-	-	-	-	-	-	0.8	0.8	0.03	C64-65	
Bladder	35	2	23	-	-	-	-	1	2	2	4	5	4	1	2	1	5	3.4	3.4	0.94	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C66, C68	
Eye	31	1	81	3	1	-	-	6	3	8	5	3	-	-	1	-	-	3.0	3.0	0.29	C69	
Brain and nervous system	2	0	100	1	1	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	C70-72	
Thyroid	1	0	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	C73	
Hodgkin lymphoma	8	0	88	-	2	3	1	-	1	1	-	-	-	-	-	-	-	0.8	0.8	0.04	C81	
Non-Hodgkin lymphoma	93	3	85	7	31	17	2	1	5	8	5	3	3	4	1	3	-	9.0	9.0	0.69	C82-85, C96	
Multiple myeloma	1	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	C90	
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.00	C91	
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.00	C92-94	
Leukaemia, unspecified	5	1	40	1	-	-	-	-	-	-	1	-	-	-	2	-	-	0.5	0.5	0.11	C95	
Other and unspecified	42	2	43	2	3	1	1	-	4	6	2	6	3	2	2	3	-	4.1	4.1	0.65	O&U	
All sites	1045	36	35	29	53	34	19	36	109	172	127	92	62	71	34	59	36	40	101.1	16.46	158.1	C00-96
All sites except C44	1029	35	34	29	53	34	19	36	107	170	126	90	60	70	32	58	36	35	99.6	100.0	16.14	C00-96 exc. C44
Average annual population					83678	68940	56896	56390	58733	51689	40924	29414	19688	14092	10660	8298	6231	4100	2950	4114	516796	

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Malawi, Blantyre (2009–2010)

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

Site	All ages	Age group (years)	MV	DCO	Age group (years)												Crude rate	CR %	ASR (W)	ICD-10					
					unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-
Mouth	3	1	100	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.3	0.2	0.3	C00-06		
Salivary gland	7	0	57	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	0.7	0.5	1.7	C07-08		
Nasopharynx	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.05	C11		
Other pharynx	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C09-10, C12-14		
Oesophagus	91	2	16	-	-	-	-	-	-	8	9	6	8	14	4	6	11	5	8	8.7	6.9	2.33	C15		
Stomach	15	0	53	-	-	-	-	-	-	1	2	2	2	1	2	2	1	1	2	1.4	1.1	0.48	C16		
Colon	10	0	60	-	-	-	-	-	-	2	2	2	2	1	1	1	1	1	2	1.0	0.8	0.34	C18		
Rectum	7	0	57	-	-	-	-	-	-	1	1	2	1	1	1	1	1	1	1	0.5	0.5	0.14	C19-20		
Anus	3	0	100	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	-	0.3	0.2	0.05	C21		
Liver	18	0	44	-	2	-	1	1	1	3	2	1	1	1	1	1	1	1	2	1.7	1.4	0.28	C22		
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C23-24		
Pancreas	1	0	100	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	C25		
Larynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.02	C32		
Trachea, bronchus, and lung	4	0	25	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.4	0.3	0.19	C33-34		
Bone	24	0	46	-	1	2	6	-	3	2	1	4	1	1	-	-	-	1	1	2.3	1.8	0.29	C40-41		
Melanoma of skin	6	0	100	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	1	0.6	0.5	0.15	C43		
Non-melanoma skin	27	1	89	-	3	-	1	-	2	4	2	3	3	3	2	-	-	-	2	2.6	2.6	0.32	C44		
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45		
Kaposi sarcoma	223	5	13	-	2	4	4	24	47	34	37	27	11	14	4	4	9	1	21.4	16.9	2.55	C46			
Connective and soft tissue	17	0	100	-	3	2	1	2	1	2	1	2	1	1	1	1	1	1	1.6	1.3	0.12	C47, C49			
Breast	96	1	42	-	-	-	1	2	4	12	12	14	15	9	4	4	8	5	9.2	7.3	2.07	C50			
Vulva	2	0	100	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	0.2	0.2	0.03	C51			
Vagina	4	0	100	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	0.4	0.3	0.12	C52			
Cervix uteri	489	8	45	-	-	-	-	10	40	67	85	75	42	64	26	37	15	12	46.9	37.0	9.47	C53			
Uterus	19	0	89	-	-	-	-	-	-	1	5	6	2	1	-	3	-	1	1.8	1.4	0.42	C54-55			
Ovary	22	0	91	-	1	2	1	2	2	1	3	3	2	2	2	-	-	1	2.1	1.7	0.34	C56			
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C58			
Kidney and renal pelvis	13	0	92	-	4	6	-	-	-	-	-	3	-	-	-	-	-	-	1.2	1.0	0.07	C64-65			
Bladder	37	3	68	-	-	-	1	1	4	3	4	7	4	3	-	-	2	2	3.5	2.8	0.77	C67			
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C66, C68			
Eye	48	0	90	-	3	-	-	1	2	11	6	7	7	4	3	2	-	1	4.6	3.6	0.64	C69			
Brain and nervous system	3	0	100	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	0.3	0.2	0.03	C70-72			
Thyroid	8	1	88	-	-	-	-	-	-	-	-	-	1	5	-	-	1	-	0.8	0.6	0.21	C73			
Hodgkin lymphoma	9	1	89	-	1	1	1	1	1	1	1	2	6	5	1	-	-	-	0.9	0.7	0.08	C81			
Non-Hodgkin lymphoma	68	0	76	-	3	15	16	2	7	4	5	2	6	5	-	-	-	1	6.5	5.1	0.59	C82-85, C96			
Multiple myeloma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	0.1	0.1	0.03	C90			
Lymphoid leukaemia	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.02	C91			
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C92-94			
Leukaemia, unspecified	3	0	0	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	0.3	0.2	0.02	C95			
Other and unspecified	67	2	63	-	3	3	5	-	2	4	7	5	8	1	11	2	3	5	6.4	5.1	1.52	O&U			
All sites	1348	25	47	-	23	36	32	20	53	140	164	182	177	114	134	52	82	40	45	29	129.3	23.98	227.0	C00-96	
All sites except C44	1321	24	47	-	20	36	31	20	52	138	160	180	174	111	131	50	82	40	45	27	126.7	100.0	23.66	223.0	C00-96 exc. C44
Average annual population					85555	72114	62536	61748	57658	51592	36822	25515	17688	13134	10309	8139	5473	3942	3186	5840	521250				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Mozambique, Beira

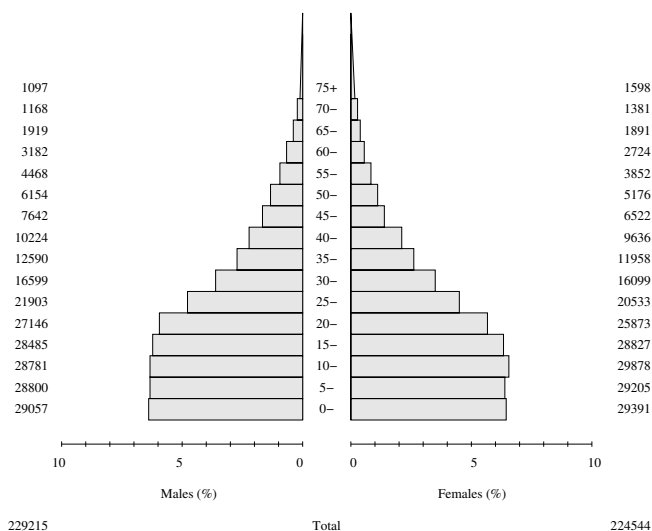
The Registro de Cancro de Beira was founded in 2005 by a pathologist based in Beira since 2003. The purpose was to record the incidence of cancer in the city and to provide information to the Ministry of Health and for research and teaching.

The registry is located in the pathology department of the Hospital Central da Beira (HCB); the pathologist directs the registry activities. There is currently only one full-time registrar. In the past, the registry has benefited from staff positions funded by the HCB. In 2008, an IARC grant provided funds for the registry salaries and operational expenses. There have also been some government contributions to cover indirect costs, office supplies, and Internet access.

The registry covers all 23 barrios of the district of Beira in the Sofala Province of Mozambique. The predominant ethnic group is the Bangwe, who originated from the Machanga, Matewe, and Podzo peoples of the Zambezi Valley. The majority of the population is Christian, with a minority of Muslim and Hindu residents.

The population of Beira is estimated to have been 443 369 in 2007 (at the most recent census) and 457 799 in 2013. The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

Mozambique, Beira (2009–2013)
Population pyramid (average annual person-years by sex and age group)



Source: National Institute of Statistics of Mozambique, annual population projections for the districts of Sofala Province, 2007–2040

The 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 733 beds and offers services in a wide range of specialties, but there is no specialist oncology service. The HCB's pathology laboratory is the only one in Beira. Its three pathologists evaluate about 2500 biopsies and 2200

cytology specimens per year. The hospital has one non-permanent haematologist, although blood smears and bone marrow biopsies are not done; diagnoses of leukaemia and other haematological neoplasms are made only on a clinical basis.

The hospital's archive service 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 the patients to recall when they were last at the hospital. The HCB's statistics department compiles only the numbers of admissions and deaths, by department.

The cancer registrar makes daily visits to the HCB's various services (all clinical services, the pathology department, and the mortuary), according to case yield, and completes a registration form for each case collected.

Death registration is mandatory. The body of anyone who dies in the Beira District is brought to the mortuary at the HCB. For deaths that occur in hospital, a physician at the hospital completes the death certificate, which is submitted to the mortuary and contains all relevant details about the deceased, including the direct and underlying causes of death. For non-suspicious/non-violent deaths that occur at home, the certificate is completed by the statistical office in the mortuary; details about the cause of death are obtained from documentation provided by the family and/or by interviewing family members (a verbal autopsy). Violent deaths are investigated by autopsy, and the forensic pathologist completes the death certificate. In all cases, the original copy of the death certificate is submitted to the national vital statistics office; a copy is sent to the statistics department of the HCB, and another copy is retained by the issuing hospital department, the mortuary, or the legal medicine (forensic medicine) department.

The HCB's statistics department maintains an electronic record of all deaths that have occurred at the hospital since 2011. The department can produce some standard tables and a spreadsheet file of all variables, including patient names, but access is limited (coded). In terms of geographical information, the statistics department database records only the province of residence.

The cancer registrar visits the mortuary registry and the vital statistics office to check for death certificates that mention 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.

For cancer registration, the registrar uses the printed report forms on cancer cases, sorted by the pathologists. Unfortunately, the request/report forms do not include information about place of residence. The registrar must therefore collect additional biographical information, including the place and duration of residence.

At the time of analysis, the registry had no procedures in place to trace back deaths registered as being caused by cancer, or to identify any cases that may have been missed by the registration

process; therefore, there are no death-certificate-only registrations.

Cases are coded according to ICD-O-3. The data were originally recorded using simple Excel spreadsheets, one for each year. Since 2014, the registry has used IARC's CanReg5 software to perform quality control and duplication checks. Access to registry data is limited to registry staff; confidential materials are stored in locked cabinets, and electronic records are password-protected.

YEARS PRESENTED

2009–2013 (a 5-year period)

NOTES

The average rate of registration is 30–40 cases per month, but the number of registrations per month varies widely, from 3 to 100.

The age-standardized incidence rate (ASR) of cancer at all sites is low compared with the values for eastern Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of 0.25 for males and 0.35 for females, and this is despite the very high ASRs of Kaposi sarcoma, which accounts for 66% of all registered cases in males and 26% in females. Incidence rates for almost all other cancers (except for cervical cancer and lymphoma) are low. Only 2 cases of leukaemia, 3 cases of central nervous system cancer, and 8 cases of prostate cancer were registered during the period analysed.

The overall percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer) is very high: 98% in males and 97% in females – higher than the values reported by almost all centres in Europe.

SUMMARY

The calculated incidence rates are almost certainly too low due to underregistration, which is likely to be more marked for cancers not usually diagnosed by pathology.

PUBLICATIONS AND ACHIEVEMENTS

The Registro de Cancro de Beira became a member of the African Cancer Registry Network (AFCRN) in 2013.

Carreira H, Lorenzoni C, Carrilho C, Ferro J, Sultane T, Garcia C, et al. (2014). Spectrum of pediatric cancers in Mozambique: an analysis of hospital and population-based data. *Pediatr Hematol Oncol.* 31(6):498–508. <http://dx.doi.org/10.3109/08880018.2014.909547> PMID:24852201

Carrilho C, Ferro J, Lorenzoni C, Sultane T, Silva-Matos C, Lunet N (2013). A contribution for a more accurate estimation of the incidence of Kaposi sarcoma in Mozambique. *Int J Cancer.* 132(4):988–9. <http://dx.doi.org/10.1002/ijc.27714> PMID:22777539

Carrilho C, Gouveia P, Yokohama H, Lopes JM, Lunet N, Ferro J, et al. (2013). Human papillomaviruses in intraepithelial neoplasia and squamous cell carcinoma of the conjunctiva: a study from Mozambique. *Eur J Cancer Prev.* 22(6):566–8. <http://dx.doi.org/10.1097/CEJ.0b013e328363005d> PMID:23752127

Meireles P, Albuquerque G, Vieira M, Foia S, Ferro J, Carrilho C, et al. (2015). Kaposi sarcoma incidence in Mozambique: national and regional estimates. *Eur J Cancer Prev.* 24(6):529–34. <http://dx.doi.org/10.1097/CEJ.000000000000108> PMID:25494288

Mozambique, Beira (2009–2013)

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

Site	All ages	Age unk	MV DCO %	Age group (years)											Crude rate	CR %	ASR (W)	ICD-10				
				0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55					55-60	60-65	65-70	70-75
Mouth	12	0	100	-	-	-	-	-	-	-	-	2	2	1	1	1	1	1.0	1.3	0.27	2.7	C00-06
Salivary gland	11	0	100	-	-	-	-	-	-	-	-	2	2	1	1	1	1.0	1.2	0.28	2.1	C07-08	
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	3	3	1	1	1	0.0	0.0	0.00	0.0	C11	
Other pharynx	5	0	100	-	-	-	-	-	-	-	-	1	1	-	-	2	0.4	0.5	0.09	0.8	C09-10, C12-14	
Oesophagus	28	0	86	-	-	-	-	-	-	-	-	1	3	4	4	2	2.4	3.0	0.56	5.5	C15	
Stomach	4	0	100	-	-	-	-	-	-	-	-	1	1	1	2	-	0.3	0.4	0.10	0.8	C16	
Colon	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C18	
Rectum	3	0	100	-	-	-	-	-	-	-	-	-	-	1	2	-	0.3	0.3	0.14	0.9	C19-20	
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C21	
Liver	17	0	94	-	-	-	-	-	-	-	-	3	2	1	3	1	1.5	1.8	0.36	2.8	C22	
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24	
Pancreas	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.03	0.3	C25	
Larynx	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.14	0.8	C32	
Trachea, bronchus, and lung	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.02	0.2	C33-34	
Bone	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	0.02	0.3	C40-41	
Melanoma of skin	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.10	0.8	C43	
Non-melanoma skin	49	0	100	1	1	3	2	4	4	4	4	2	9	6	4	4	4.3	7.5	0.74	7.5	C44	
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	1	-	-	-	-	0.1	0.1	0.02	0.2	C45	
Kaposi sarcoma	613	0	100	9	4	11	8	50	127	125	97	51	49	35	21	12	53.5	66.5	5.35	63.6	C46	
Connective and soft tissue	12	0	100	-	-	-	-	-	-	-	-	1	2	1	2	-	1.0	1.3	0.15	1.5	C47, C49	
Breast	6	0	100	-	-	-	-	-	-	-	-	2	-	-	-	-	0.5	0.7	0.13	1.1	C50	
Penis	5	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.5	0.09	1.0	C60	
Prostate	8	0	75	-	-	-	-	-	-	-	-	-	-	-	2	2	0.7	0.9	0.42	2.5	C61	
Testis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C62	
Kidney and renal pelvis	2	0	100	2	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	0.2	C64-65	
Bladder	15	0	73	-	-	-	-	-	-	-	-	-	-	-	-	3	1.3	1.6	0.40	2.8	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	43	0	98	4	1	3	-	-	-	3	12	3	5	4	4	3	3.8	4.7	0.42	4.7	C69	
Brain and nervous system	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	0.1	C70-72	
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C73	
Hodgkin lymphoma	16	0	100	1	2	6	-	-	-	1	3	-	1	1	-	-	1.4	1.7	0.12	1.5	C81	
Non-Hodgkin lymphoma	63	0	100	2	12	5	4	4	4	4	6	5	4	5	4	1	5.5	6.8	0.63	7.0	C82-85, 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	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C92-94	
Leukaemia, unspecified	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	0.1	C95	
Other and unspecified	42	0	90	1	4	1	3	-	-	7	4	2	2	4	4	7	3.7	4.6	0.66	6.2	O&U	
All sites	971	0	98	21	26	30	22	60	150	159	119	77	78	72	50	51	84.7	112.4	11.77	117.7	C00-96	
All sites except C44	922	0	98	20	25	30	19	58	146	155	115	75	69	66	46	47	80.4	100.0	10.50	110.3	C00-96 exc. C44	
Average annual population				29057	28800	28781	28485	27146	21903	16599	12590	10224	7642	6154	4468	3182	1919	1168	1097	229214		

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Mozambique, Beira (2009–2013)

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

Site	All ages	Age unk	MV DCO %	Age group (years)											Crude rate	CR %	ASR (W)	ICD-10					
				0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-					55-	60-	65-	70-	75+
Mouth	7	0	100	-	-	-	-	1	-	1	-	1	3	1	-	-	1	-	-	0.6	0.7	1.0	C00-06
Salivary gland	6	0	100	-	-	-	2	1	-	-	-	1	-	-	-	-	-	-	0.5	0.6	0.4	C07-08	
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	C11	
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	C09-10, C12-14	
Oesophagus	16	0	56	-	-	-	-	1	1	1	1	1	4	-	-	3	-	2	1.4	1.7	0.34	C15	
Stomach	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.05	C16	
Colon	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.02	C18	
Rectum	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.05	C19-20	
Anus	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	C21	
Liver	13	0	85	-	-	-	-	1	2	1	-	2	4	1	-	-	-	-	1.2	1.4	0.15	C22	
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C23-24	
Pancreas	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.02	C25	
Larynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.07	C32	
Trachea, bronchus, and lung	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	C33-34	
Bone	4	0	100	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.13	C40-41	
Melanoma of skin	10	0	100	-	-	1	2	-	1	1	1	1	1	1	1	1	1	1	0.9	1.1	0.18	C43	
Non-melanoma skin	52	0	92	-	-	2	-	5	3	-	8	8	8	2	2	6	4	4	4.6	0.9	1.1	0.18	C44
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	C45	
Kaposi sarcoma	293	0	100	3	1	5	14	46	71	64	40	21	9	8	2	6	2	-	26.1	30.8	2.22	C46	
Connective and soft tissue	10	0	100	-	-	-	-	-	-	2	2	1	2	-	-	-	-	-	0.9	1.1	0.18	C47, C49	
Breast	81	0	98	-	-	-	2	-	6	8	7	5	17	9	7	12	5	1	2	7.2	8.5	1.59	C50
Vulva	21	0	100	-	-	-	-	-	2	1	10	4	1	-	-	-	3	-	1.9	2.2	0.32	C51	
Vagina	3	0	100	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	0.3	0.3	0.02	C52	
Cervix uteri	302	0	96	-	-	1	-	8	33	39	41	46	30	25	28	21	12	5	26.9	31.7	4.69	C53	
Uterus	10	0	100	-	-	-	-	-	-	2	-	2	1	-	-	2	-	-	0.9	1.1	0.17	C54-55	
Ovary	10	0	100	-	-	1	-	4	1	1	1	1	-	-	-	2	-	-	0.9	1.1	0.11	C56	
Placenta	6	0	100	-	-	1	1	2	1	1	1	1	-	-	-	-	-	-	0.5	0.6	0.04	C58	
Kidney and renal pelvis	1	0	100	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	C64-65	
Bladder	14	0	100	-	-	-	-	-	-	1	4	1	2	3	1	-	-	-	1.2	1.5	0.24	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C66, C68	
Eye	48	0	94	3	-	-	4	5	9	13	9	1	2	2	-	-	-	-	4.3	5.0	0.32	C69	
Brain and nervous system	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.04	C70-72	
Thyroid	7	0	86	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	0.6	0.7	0.15	C73	
Hodgkin lymphoma	6	0	100	4	1	1	2	1	2	1	1	1	1	1	1	1	1	1	0.5	0.6	0.04	C81	
Non-Hodgkin lymphoma	40	0	100	4	6	6	2	4	5	4	4	4	2	1	-	-	-	-	3.6	4.2	0.22	C82-85, C96	
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C90	
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C91	
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C92-94	
Leukaemia, unspecified	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	C95	
Other and unspecified	32	0	84	-	4	3	-	1	2	-	2	4	3	2	2	2	6	2	2.9	3.4	0.63	O&U	
All sites	1004	0	96	11	13	22	28	79	142	140	134	106	87	57	52	59	31	16	27	89.4	100.0	13.09	C00-96
All sites except C44	952	0	97	11	13	20	28	74	139	140	126	98	79	55	46	55	27	15	26	84.8	100.0	12.15	C00-96 exc. C44
Average annual population				29391	29205	29878	28827	25873	20533	16099	11958	9636	6522	5176	3852	2724	1891	1381	1598	224545			

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

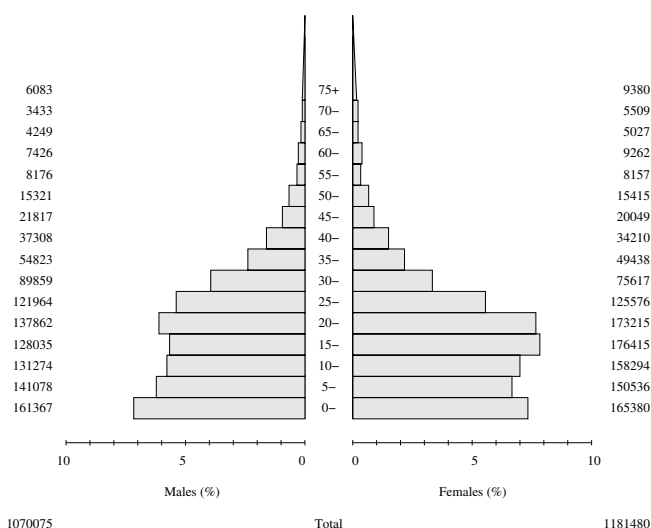
Uganda, Kampala

The Kampala Cancer Registry was established in 1951 as a population-based cancer registry with the aim of determining cancer incidence in the population of Kyadondo County. The registry is located in the Department of Pathology of the College of Health Sciences at Makerere University. It is staffed by a pathologist (the registry director), a cancer registrar, and an assistant cancer registrar, all of whom are employees of Makerere University.

The Kampala Cancer Registry data presented in this volume cover Kyadondo County, which comprises Kampala District (including the city of Kampala, Uganda's capital) and part of Wakiso District. About 50% of the county's residents are members of the Ganda ethnic group, but the population is diverse, with residents from all 31 of the ethnic groups found in Uganda. There are also many immigrants from neighbouring countries (in particular Kenya, Sudan, and Rwanda), and 1% of the residents are of European or Asian descent. About 50% of residents are Catholic, 30% are Anglican, and 15% are Muslim.

The population of Kyadondo County is estimated to have been 2 010 000 in 2009. The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

Uganda, Kyadondo County (2008–2012)
Population pyramid (average annual person-years by sex and age group)



Source: Uganda Bureau of Statistics, estimates based on the censuses of 2002 and 2014 (preliminary results)

The main sources of information are health care facilities and medical laboratories.

Health care facilities: The registry collects information from Mulago National Referral Hospital (including its radiotherapy and haematology departments), the Uganda Cancer Institute, Mengo Hospital, Rubaga Hospital, St. Francis Hospital Nsambya, private clinics and nursing homes, and Hospice Africa Uganda.

Medical laboratories: Data are also collected from the Makerere University histopathology laboratory, Multisystem Clinical Laboratories, the Metromed Medical Centre histopathology laboratory, the Kampala International University Teaching Hospital pathology laboratory, the Mengo Hospital histopathology laboratory, the St. Francis Hospital Nsambya histopathology laboratory, and public and private haematology laboratories.

Certification of death is carried out only when required for specific legal reasons and is very incomplete; therefore, the registry does not use death certificates as a source of information.

The registry has recruited staff from the information services of some hospitals and medical units to assist in data collection. To collect data from other hospitals, hospices, and histopathology laboratories, the registrars carry out visits at least once a month, depending on the anticipated number of cases to be registered. During these visits, designated staff members in the records departments assist in retrieving the records of patients diagnosed with cancer, including admission and discharge registers, clinical notes, and pathology reports. For each case, demographic and cancer diagnostic data are abstracted onto a registration form. The pathology laboratories actively assist in the registration process, either by allowing the registrars access to their pathology logs and report forms or by sending copies of reports on diagnosed cancer cases directly to the registry. Almost all of the required information is provided, although information on place of residence is missing in some cases and must be traced via the referring hospital.

Patients are not interviewed in person. The place of residence is considered to be that listed on the medical record. In Kampala, specific home addresses are not used; addresses are listed simply as the district/neighbourhood of the city (or as the village, in the periurban parts of Kyadondo County) where the individual resides.

There is no system for civil registration of deaths by cause in Uganda. However, death certificates are issued for all deaths occurring in hospital and are copied into a death register in the hospital mortuary. This source of information is used by the registry.

The registry uses IARC's CanReg4 software for data management, consistency and validity checks, and duplicate registration checks. In 2001, the completeness of registration of adult cancer cases was estimated to be about 90%. Confidentiality is maintained by using registration numbers (no patient names) during data analysis. The registry is accessible only to authorized personnel.

YEARS PRESENTED

2008–2012 (a 5-year period)

NOTES

The rate of registration has been relatively constant (with a slow increase) for the past 20 years. During the 5-year period analysed, the average rate of registration was 131 cases per month.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 183.9 cases per 100 000 person-years in males and 188.6 cases per 100 000 person-years in females. These values are higher than the values for eastern Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of 1.50 for males and 1.20 for females. The rates of several cancers are relatively high: cancer of the oesophagus, cancer of the liver, Kaposi sarcoma, and cancer of the prostate.

The overall percentage of microscopically verified cases (MV%) is relatively low (54% in males and 55% in females), but this is due to the large numbers of oesophageal and liver cancers, most of which are diagnosed without histology; similarly, only half of the reported prostate cancers were microscopically verified.

SUMMARY

The incidence rates are plausible and consistent with the results published for 2003–2007 in Volume X of *Cancer Incidence in Five Continents*.

PUBLICATIONS AND ACHIEVEMENTS

The Kampala Cancer Registry is one of the oldest cancer registries in sub-Saharan Africa. It is a founding member of the African Cancer Registry Network (AFCRN).

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Wabinga HR, Owor R, Nambooze S (1998). Kampala Cancer Registry 1992–1995. In: Parkin DM, Kramárová E, Draper GJ, Masuyer E, Michaelis J, Neglia J, et al., editors. *International incidence of childhood cancer, Vol. II*. Lyon: International Agency for Research on Cancer. IARC Scientific Publication No. 144; pp. 31–4. Available from: <http://publications.iarc.fr/299>.

Uganda, Kampala (2008–2012)

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

Site	All ages	Age unk	MV DCO		Age group (years)										Crude rate	CR %	ASR (W)	ICD-10			
			%	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-
Mouth	69	2	64	-	1	2	3	3	6	6	8	11	3	6	4	6	2	1.3	2.0	4.1	C00-06
Salivary gland	21	0	81	2	1	2	2	2	1	3	2	1	1	2	1	1	1	0.4	0.6	1.0	C07-08
Nasopharynx	62	0	63	-	1	3	9	8	6	6	4	9	1	6	6	-	1.2	1.8	2.8	C11	
Other pharynx	21	0	38	-	-	-	-	-	1	1	3	3	5	3	-	-	0.4	0.6	1.4	C09-10, C12-14	
Oesophagus	284	3	35	-	-	-	-	-	1	11	29	43	38	38	26	34	5.3	8.1	22.9	C15	
Stomach	81	0	38	-	-	-	-	-	2	6	4	12	9	8	9	3	1.5	2.3	0.96	C16	
Colon	62	0	47	-	-	-	-	-	2	3	3	6	6	8	2	7	1.2	1.8	0.50	C18	
Rectum	60	1	45	-	-	-	-	-	3	3	4	7	6	5	3	3	1.1	1.7	0.52	C19-20	
Anus	4	1	25	-	-	-	-	-	1	1	-	-	1	1	-	-	0.1	0.1	0.04	C21	
Liver	201	2	39	1	-	2	4	15	24	25	18	12	15	7	13	10	3.8	5.7	1.19	C22	
Gallbladder etc.	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.1	C23-24	
Pancreas	35	0	29	-	-	-	-	-	-	5	3	4	4	5	3	3	0.7	1.0	0.27	C25	
Larynx	34	0	56	-	-	-	-	-	-	1	1	2	8	5	6	2	0.6	1.0	0.34	C32	
Trachea, bronchus, and lung	43	0	19	1	-	1	2	-	3	2	7	6	4	4	5	3	0.8	1.2	0.39	C33-34	
Bone	59	1	51	-	3	9	9	7	4	6	3	2	1	2	1	-	1.1	1.7	0.17	C40-41	
Melanoma of skin	16	0	69	-	1	1	-	-	1	1	2	1	1	4	3	1	0.3	0.5	0.17	C43	
Non-melanoma skin	61	1	69	2	2	4	-	6	7	4	3	7	3	2	5	6	0.38	0.3	3.1	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45	
Kaposi sarcoma	911	24	72	13	16	12	15	58	169	182	167	106	35	21	13	9	17.0	25.8	2.38	C46	
Connective and soft tissue	64	0	61	4	7	5	8	5	3	9	8	4	2	1	1	2	1.2	1.8	0.18	C47, C49	
Breast	30	0	43	-	-	-	-	-	1	2	3	3	3	3	5	3	0.6	0.9	0.31	C50	
Penis	39	1	56	1	-	-	-	-	2	2	7	3	3	5	2	3	0.7	1.1	0.26	C60	
Prostate	515	12	50	-	-	-	-	-	2	2	3	5	25	33	93	71	9.6	14.6	6.87	C61	
Testis	12	0	58	-	-	1	2	2	3	1	1	1	1	-	-	-	0.2	0.3	0.02	C62	
Kidney and renal pelvis	48	0	71	22	3	2	-	-	1	4	1	3	-	1	5	2	0.9	1.4	0.17	C64-65	
Bladder	32	0	41	-	-	-	-	-	4	1	3	2	-	7	5	1	0.6	0.9	0.22	C67	
Ureter and other urinary	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	C66, C68	
Eye	108	5	82	15	4	3	3	1	9	13	14	21	8	3	3	4	2.0	3.1	0.32	C69	
Brain and nervous system	55	0	29	4	1	3	3	5	2	7	4	4	3	6	3	5	1.0	1.6	0.25	C70-72	
Thyroid	16	0	38	-	1	-	-	-	2	1	2	1	2	2	1	2	0.3	0.5	0.14	C73	
Hodgkin lymphoma	67	0	75	2	6	10	11	7	4	4	8	5	3	-	1	3	1.3	1.9	0.23	C81	
Non-Hodgkin lymphoma	255	1	53	23	45	29	12	17	20	19	24	16	15	5	4	6	4.8	7.2	0.73	C82-85, C96	
Multiple myeloma	22	0	45	-	-	1	-	-	1	-	1	4	1	3	3	3	0.4	0.6	0.26	C90	
Lymphoid leukaemia	31	0	35	5	7	4	2	3	2	1	1	3	-	-	-	1	0.6	0.9	0.10	C91	
Myeloid leukaemia	33	0	42	-	6	2	2	2	5	2	4	4	-	1	4	-	0.6	0.9	0.15	C92-94	
Leukaemia, unspecified	49	1	10	4	3	9	6	3	4	5	6	2	3	1	1	-	0.9	1.4	0.10	C95	
Other and unspecified	180	2	37	3	1	6	7	9	13	15	21	22	16	15	8	12	3.4	5.1	1.08	C91 O&U	
All sites	3586	57	54	102	108	104	96	168	305	343	349	304	231	242	206	253	67.0	100.0	187.0	C00-96	
All sites except C44	3525	56	54	100	106	100	96	162	298	339	346	297	228	240	201	247	65.9	100.0	183.9	C00-96 exc. C44	

Average annual population 161367 141078 131274 128035 137862 121964 89859 54823 37308 21817 15321 8176 7426 4249 3433 6083 1070075

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Uganda, Kampala (2008–2012)

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

Site	All ages	Age unk	MV DCO		Age group (years)										Crude rate %	CR	ASR (W)	ICD-10								
			%	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-	75+		
Mouth	33	0	67	-	-	-	-	1	5	1	4	2	2	2	1	3	4	3	4	0.6	0.8	0.22	1.7	C00-06		
Salivary gland	12	0	58	-	-	-	2	1	3	-	3	1	-	1	-	1	-	-	-	0.2	0.3	0.03	0.3	C07-08		
Nasopharynx	39	0	54	1	-	2	4	3	1	2	3	2	2	4	6	4	1	1	3	0.7	0.9	0.21	1.9	C11		
Other pharynx	14	0	50	-	-	-	1	-	2	5	1	1	-	1	-	1	1	1	1	0.2	0.3	0.07	0.5	C09-10, C12-14		
Oesophagus	176	4	40	-	-	-	1	-	3	2	3	8	11	16	25	22	16	23	42	3.0	4.1	1.51	12.1	C15		
Stomach	48	0	35	-	-	-	-	1	1	1	1	4	3	5	2	8	6	8	9	0.8	1.1	0.44	3.3	C16		
Colon	62	0	47	-	-	-	1	2	3	2	2	4	8	3	5	14	7	9	2	1.0	1.4	0.60	4.2	C18		
Rectum	69	0	54	-	-	-	1	-	7	6	6	7	8	9	4	6	3	8	4	1.2	1.6	0.46	3.7	C19-20		
Anus	6	0	83	-	-	-	-	-	1	1	2	-	-	1	-	-	-	-	1	0.1	0.1	0.01	0.2	C21		
Liver	163	1	34	-	-	1	2	4	16	17	12	13	24	10	11	17	10	7	18	2.8	3.8	0.94	8.4	C22		
Gallbladder etc.	3	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.1	0.1	0.00	0.1	C23-24		
Pancreas	35	1	26	-	-	-	-	-	1	1	1	6	5	1	5	3	1	5	2	0.6	0.8	0.27	2.1	C25		
Larynx	9	0	33	-	-	-	-	1	-	-	-	-	1	-	-	-	2	2	2	0.2	0.2	0.08	0.5	C32		
Trachea, bronchus, and lung	50	0	28	-	-	-	1	-	2	2	2	3	6	5	5	6	5	7	6	0.8	1.2	0.43	3.3	C33-34		
Bone	49	1	71	1	4	11	10	6	6	3	3	1	2	-	1	-	-	-	-	0.8	1.1	0.06	0.8	C40-41		
Melanoma of skin	29	2	55	-	-	-	1	1	-	-	2	2	2	3	6	2	4	2	4	0.5	0.7	0.18	1.7	C43		
Non-melanoma skin	52	5	67	2	-	-	2	4	6	6	2	9	6	6	2	3	-	-	1	0.9	0.0	0.00	1.9	C44		
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45		
Kaposi sarcoma	651	8	71	-	-	8	10	15	26	99	159	73	44	32	16	9	9	6	2	11.0	15.1	1.31	14.8	C46		
Connective and soft tissue	60	1	57	2	6	5	7	6	6	5	9	2	1	6	2	2	-	-	-	1.0	1.4	0.14	1.6	C47, C49		
Breast	619	7	53	-	-	-	1	15	45	66	86	71	91	79	39	48	23	18	30	10.5	14.4	3.30	30.6	C50		
Vulva	28	1	57	-	-	-	-	1	4	3	2	6	1	4	-	3	-	2	1	0.5	0.6	0.13	1.2	C51		
Vagina	11	0	82	-	-	-	-	1	-	1	1	2	5	-	-	-	-	-	-	0.2	0.3	0.05	0.5	C52		
Cervix uteri	1057	9	55	-	-	-	1	10	62	111	176	172	132	135	56	75	35	46	37	17.9	24.5	5.67	51.1	C53		
Uterus	87	0	66	-	-	-	1	1	1	5	10	5	9	17	4	11	7	10	6	1.5	2.0	0.69	5.3	C54-55		
Ovary	143	4	47	-	-	2	3	10	6	11	18	10	12	18	8	17	3	14	7	2.4	3.3	0.89	7.2	C56		
Placenta	27	0	59	-	-	-	-	1	9	9	4	-	2	1	1	-	-	-	-	0.5	0.6	0.04	0.5	C58		
Kidney and renal pelvis	46	0	50	17	4	-	3	1	4	3	2	3	1	1	2	1	-	-	4	0.8	1.1	0.08	1.2	C64-65		
Bladder	27	0	56	-	-	-	-	1	2	-	-	-	2	3	1	3	3	2	9	0.5	0.6	0.17	1.6	C67		
Ureter and other urinary	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.2	C66, C68		
Eye	125	4	76	22	5	3	8	10	8	12	27	10	8	4	1	3	-	-	-	2.1	2.9	0.25	3.1	C69		
Brain and nervous system	54	1	17	7	3	5	3	6	2	1	1	7	3	2	3	4	-	2	4	0.9	1.3	0.19	1.9	C70-72		
Thyroid	44	0	75	1	-	1	1	1	1	3	6	8	3	7	2	6	3	-	1	0.7	1.0	0.21	2.0	C73		
Hodgkin lymphoma	53	3	81	4	1	3	2	7	11	9	3	2	2	2	2	2	-	2	1	0.9	1.2	0.14	1.4	C81		
Non-Hodgkin lymphoma	201	3	61	14	27	19	10	14	18	23	17	13	7	13	4	6	3	2	8	3.4	4.7	0.51	5.6	C82-85, C96		
Multiple myeloma	21	0	52	-	-	-	-	-	-	-	2	-	4	3	1	2	3	2	1	0.4	0.5	0.15	1.3	C90		
Lymphoid leukaemia	24	0	29	5	-	3	2	3	3	-	-	-	-	-	2	3	1	2	-	0.4	0.6	0.12	0.9	C91		
Myeloid leukaemia	32	0	34	2	-	4	6	2	2	2	2	3	2	3	2	-	-	2	2	0.5	0.7	0.11	1.1	C92-94		
Leukaemia, unspecified	36	0	11	1	3	1	4	-	3	4	5	1	1	3	4	1	-	3	2	0.6	0.8	0.16	1.4	C95		
Other and unspecified	165	1	45	5	4	1	3	11	6	18	12	13	5	17	13	14	21	9	12	2.8	3.8	1.14	9.0	O&U		
All sites	4362	56	55	92	68	75	107	235	409	465	505	432	406	391	229	299	166	193	234	73.8	100.0	21.25	190.6	C00-96		
All sites except C44	4310	51	55	90	68	75	105	231	403	463	496	426	400	389	227	296	166	191	233	73.0	100.0	21.04	188.6	C00-96 exc. C44		
Average annual population																										

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Zimbabwe, Bulawayo: Black population

The Bulawayo Cancer Registry was founded in 1963 and functioned continuously for 15 years before ceasing activity in 1978. It was located in an office in the Department of Radiotherapy at Mpilo Central Hospital, which provided the only hospital services available to the Black population of the city of Bulawayo during that period. The hospital also acted as the referral centre for cancer cases from the south-western part of the country, including the provinces of Matabeleland North, Matabeleland South, Victoria (now Masvingo), and Midlands. New cancer cases were reported 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 in 2013 by the Zimbabwean Ministry of Health and Child Care (MoHCC) in order to support the Zimbabwe National Cancer Registry (ZNCR) as it moves towards becoming a national population-based cancer registry, in line with the MoHCC's National Cancer Prevention and Control Strategy for Zimbabwe 2014–2018.

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 its two full-time staff members are employees of the ZNCR. Their salaries are paid by the MoHCC. The running costs of the registry (including transport) are covered by Mpilo Central Hospital.

The Bulawayo Cancer Registry covers the entire population of the city of Bulawayo, but the subset of registry data presented in this volume is specifically for the city's Black population.

The total population of Bulawayo is estimated to have been 653 000 in 2012 (at the census), with the Black population estimated to have been 640 490. The average annual population-at-risk estimates corresponding to the

registry data presented in this volume are shown in the population pyramid.

The main sources of information are Mpilo Central Hospital (including the radiotherapy and oncology departments), the United Bulawayo Hospitals, Mater Dei Hospital, oncology and haematology clinics that provide outpatient services within the registration area, the government pathology laboratory at Mpilo Central Hospital, the Diagnostic Pathology Centre, Bulawayo Island Hospice, and the Death Registry Unit of the Department of the Registrar General within the Zimbabwean Ministry of Home Affairs.

Data collection is mainly active. In Mpilo Central Hospital, the main source is the hospital records department. A department staff member sets aside the files of discharged patients with a diagnosis of cancer, and a registry staff member visits weekly to abstract the case notes onto registration forms. Visits to other key hospital departments (gynaecology, medical, paediatrics, and the surgical ward) are also carried out, to check the discharge registers. The radiotherapy department maintains its own case records, which are abstracted directly because almost all cases are cancers. Registry staff members also carry out weekly visits to the medical records department of the United Bulawayo Hospitals; the files of recently discharged patients are examined to identify cancer cases, which are then abstracted. During their weekly visits to the two private oncology clinics in the city, registry staff members have direct access to the clinics' case records, in order to abstract all cancer cases onto forms.

Almost all deaths are registered, and death notifications (including those for deaths that occurred at home) usually come from the hospital mortuary. All deaths are medically certified, although the information recorded after deaths occurring at home is sometimes by interviewing relatives (verbal autopsy). Information from death certificates mentioning cancer is used to update the registry database. Cases that are not already recorded in the registry and that cannot be traced back via the hospitals are registered as death-certificate-only (DCO) cases.

The Bulawayo Cancer Registry uses IARC's CanReg4 software for data entry and management.

YEARS PRESENTED

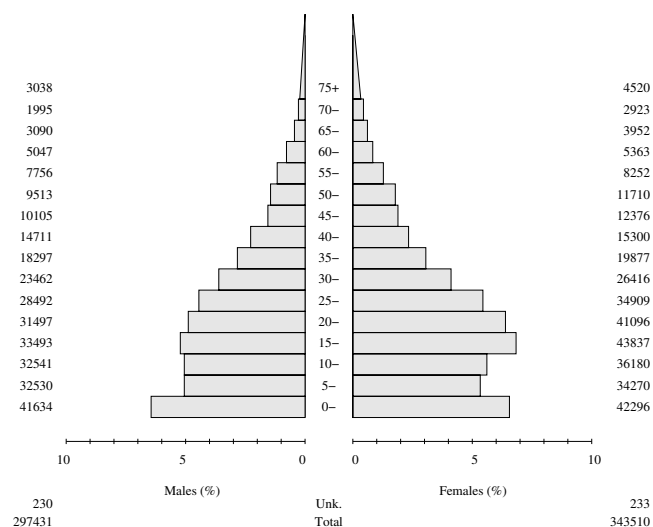
2011–2013 (a 3-year period)

NOTES

The Bulawayo Cancer Registry results presented in this volume are based on data collected since the registry resumed activity in 2013, with some cases being traced retrospectively. The data presented are for the Black African population only (which accounts for 93% of the registrations).

The incidence rates are very high. The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 221.9 cases per 100 000 person-years in males and 270.9 cases per 100 000 person-years in females.

**Zimbabwe, Bulawayo: Black (2011–2013)
Population pyramid (average annual
person-years by sex and age group)**



Source: The Zimbabwe National Statistics Agency (ZIMSTAT), Bulawayo Province, 2012 census

These values are slightly lower than the corresponding values reported for the Black population of Harare during a similar period (2010–2012): 265.3 and 290.5 cases per 100 000 person-years in males and females, respectively. Although there are some broad similarities between the cancer patterns in Bulawayo and Harare, there are also some striking differences. In Bulawayo, the ASRs of two major cancers are lower: prostate cancer (51.5 cases per 100 000 person-years) and breast cancer in females (37.3 cases per 100 000 person-years). But the ASRs

Table 4.01. Cumulative incidence rates (for ages 0–59 years^a), per 1000, of cancer in Black males (M) and Black females (F) in Bulawayo, Zimbabwe, in 1963–1972 (Parkin et al., 1994) and in 2011–2013, by anatomical site

Anatomical site (ICD-10 code)	Sex	1963–1972	2011–2013
Oesophagus (C15)	M	16.0	5.4
	F	2.3	1.9
Stomach (C16)	M	3.9	1.7
	F	1.2	2.0
Colorectum (C18–20)	M	2.5	4.7
	F	2.5	3.2
Liver (C22)	M	26.2	5.5
	F	6.7	4.9
Trachea, bronchus, and lung (C33–34)	M	12.0	1.5
Kaposi sarcoma (C46)	M	0.13	16.1
	F	0.02	8.4
Breast (C50)	F	7.3	16.3
Cervix uteri (C53)	F	13.9	63.2
Corpus uteri (C54)	F	3.3	8.0
Ovary (C56)	F	1.8	0.9
Prostate (C61)	M	0.27	2.5
Bladder (C67)	M	5.0	0.1
Non-Hodgkin lymphoma (C82–85, C96)	M	1.0	12.4
	F	0.4	11.6
All sites (C00–96)	M	90.2	75.5
	F	59.5	140.8

^aThe age range of 0–59 years was chosen for this comparison due to uncertainty of the population denominator in older age groups in 1963–1972.

of Kaposi sarcoma and non-Hodgkin lymphoma are considerably higher in Bulawayo than in Harare, and the ASR of cervical cancer in Bulawayo (102.4 cases per 100 000 person-years) must be one of the highest ever reported.

The percentage of death-certificate-only cases (DCO%) is 16% in males and 12% in females.

Table 4.01 shows cumulative incidence rates in 1963–1972 compared with the current data (2011–2013). There have been marked declines in the incidence of cancers of the oesophagus and liver, as well as (surprisingly) in the incidence of lung cancer in males. There have been increases in the incidence of cancers of the prostate, breast, and cervix, as well as in the incidence of cancers related to HIV/AIDS (Kaposi sarcoma and non-Hodgkin lymphoma).

SUMMARY

The incidence rates of cancer in the Black population of Bulawayo are high, similar to those in Harare. Due to the relatively high DCO%, and possibly due to misrecording of residency (resulting in the inclusion of non-residents in the database), there may be some inaccuracy in the results. But the changes in incidence rates from those 40–50 years earlier are striking, especially with respect to the very high recorded rates of cancer of the cervix.

PUBLICATIONS AND ACHIEVEMENTS

The Bulawayo Cancer Registry became a member of the African Cancer Registry Network (AFCRN) in 2015.

Parkin DM, Vizcaino AP, Skinner ME, Ndhlovu A (1994).

Cancer patterns and risk factors in the African population of southwestern Zimbabwe, 1963–1977. *Cancer Epidemiol Biomarkers Prev.* 3(7):537–47. PMID:7827583

Skinner ME (1967). Malignant disease of the gastrointestinal tract in the Rhodesian African, with special reference to the urban population of Bulawayo. A preliminary report. *Natl Cancer Inst Monogr.* 25:57–71. PMID:6033061

Vizcaino AP, Parkin DM, Boffetta P, Skinner ME (1994). Bladder cancer: epidemiology and risk factors in Bulawayo, Zimbabwe. *Cancer Causes Control.* 5(6):517–22. <http://dx.doi.org/10.1007/BF01831379> PMID:7827238

Vizcaino AP, Parkin DM, Skinner ME (1995). Risk factors associated with oesophageal cancer in Bulawayo, Zimbabwe. *Br J Cancer.* 72(3):769–73. <http://dx.doi.org/10.1038/bjc.1995.408> PMID:7669592

Zimbabwe, Bulawayo: Black (2011–2013)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)											Crude rate	%	CR	ASR (W)	ICD-10			
					0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55						55-60	60-65	65-70
Mouth	9	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	0.8	2.0	C00-06
Salivary gland	7	0	86	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.6	1.5	C07-08
Nasopharynx	5	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.5	0.9	C11
Other pharynx	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.07	0.5	C09-10, C12-14
Oesophagus	104	0	44	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.7	9.5	23.8	C15
Stomach	21	0	81	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	1.9	5.6	C16
Colon	33	0	85	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7	3.0	6.8	C18
Rectum	21	0	86	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	1.9	7.2	C19-20
Anus	7	0	86	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.6	2.8	C21
Liver	67	0	60	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5	6.1	13.9	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	C23-24
Pancreas	12	0	17	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.1	0.45	C25
Larynx	9	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	0.8	2.9	C32
Trachea, bronchus, and lung	22	0	59	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	2.0	0.49	C33-34
Bone	8	0	75	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	0.7	0.13	C40-41
Melanoma of skin	9	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0	1.0	0.8	C43
Non-melanoma skin	29	0	97	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	1.2	4.0	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	C45
Kaposi sarcoma	184	0	21	15	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.6	16.8	2.76	C46
Connective and soft tissue	15	0	80	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.4	0.39	C47, C49
Breast	7	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.6	0.14	C50
Penis	20	0	90	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	1.8	0.44	C60
Prostate	204	0	45	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.9	18.6	5.00	C61
Testis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C62
Kidney and renal pelvis	17	0	65	18	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	1.5	0.53	C64-65
Bladder	10	0	40	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	0.9	0.15	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C66, C68
Eye	33	0	94	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7	3.0	0.51	C69
Brain and nervous system	2	0	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.04	C70-72
Thyroid	4	0	75	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.17	C73
Hodgkin lymphoma	16	0	100	0	1	1	2	1	3	2	1	1	1	1	1	1	1	1	1	1.8	1.5	0.17	C81
Non-Hodgkin lymphoma	120	0	96	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.4	10.9	2.28	C82-85, C96
Multiple myeloma	15	0	80	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.4	0.53	C90
Lymphoid leukaemia	11	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.0	0.17	C91
Myeloid leukaemia	11	0	91	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.0	0.08	C92-94
Leukaemia, unspecified	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.01	C95
Other and unspecified	91	0	75	18	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	10.2	8.3	2.83	O&U
All sites	1127	0	62	16	9	8	12	18	31	33	52	80	84	57	86	115	101	109	105	126.3	25.54	227.7	C00-96
All sites except C44	1098	0	61	16	9	8	12	16	28	33	52	80	83	55	84	107	100	107	101	123.1	100.0	24.79	C00-96 exc. C44
Average annual population	230		41634	32530	32541	33493	31497	28492	23462	18297	14711	10105	9513	7756	5047	3090	1995	3038	297431				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Zimbabwe, Bulawayo: Black (2011–2013)

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

Site	All ages	Age unk	MV DCO		Age group (years)										Crude rate %	CR	ASR (W)	ICD-10					
			%	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-
Mouth	6	0	100	0	-	-	-	-	-	1	-	-	-	1	-	1	-	1	0.6	0.3	0.11	C00-06	
Salivary gland	2	0	100	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.2	0.1	0.01	C07-08	
Nasopharynx	2	0	100	0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.2	0.1	0.01	C11	
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C09-10, C12-14	
Oesophagus	56	0	45	36	-	-	-	-	2	4	1	4	10	8	6	19	5.4	3.2	1.16	10.3	C15		
Stomach	29	0	62	21	-	-	-	-	1	1	1	4	8	3	9	2.8	1.7	0.70	5.7	C16			
Colon	27	0	78	7	-	-	-	-	1	1	3	4	4	3	3	2.6	1.5	0.63	4.9	C18			
Rectum	14	0	64	7	-	-	-	-	1	1	2	2	2	2	3	1.4	0.8	0.29	2.3	C19-20			
Anus	6	0	83	17	-	-	-	-	1	-	2	1	-	-	1	0.6	0.3	0.10	0.9	C21			
Liver	46	0	50	39	-	-	-	-	2	2	2	7	6	3	5	4.5	2.6	0.86	7.7	C22			
Gallbladder etc.	4	0	75	25	-	-	-	-	2	-	2	-	-	1	1	0.4	0.2	0.12	0.7	C23-24			
Pancreas	17	0	18	41	-	-	-	-	-	-	1	2	3	2	5	1.6	1.0	0.52	3.4	C25			
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C32	
Trachea, bronchus, and lung	9	0	33	22	-	-	-	-	2	-	1	1	-	-	2	2	0.9	0.5	0.20	1.6	C33-34		
Bone	8	0	62	25	-	-	-	-	1	3	1	1	-	-	-	1	0.8	0.5	0.06	0.9	C40-41		
Melanoma of skin	7	0	100	0	-	-	-	-	-	-	1	2	1	-	-	2	1	0.7	0.4	0.17	C43		
Non-melanoma skin	38	0	95	0	-	-	-	-	2	1	2	4	2	3	1	5	3	3	0.63	6.1	C44		
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45	
Kaposi sarcoma	100	0	28	15	-	-	-	-	5	17	15	14	14	7	7	5	8	2	1	9.7	12.0	C46	
Connective and soft tissue	16	0	69	31	1	1	-	-	1	2	1	2	1	3	-	-	1	1	1.6	0.9	0.19	C47, C49	
Breast	231	0	74	12	-	-	-	-	1	5	14	19	28	27	36	23	16	18	21	22.4	13.2	4.34	C50
Vulva	25	0	84	4	-	-	-	-	1	3	6	7	2	1	-	1	-	1	2.4	1.4	0.28	C51	
Vagina	17	0	88	0	-	-	-	-	4	1	2	4	1	-	-	-	-	1	1.6	1.0	0.18	C52	
Cervix uteri	657	0	70	6	-	-	-	-	5	18	43	78	86	77	79	70	54	48	63.8	37.6	11.53	C53	
Uterus	64	0	58	11	-	-	-	-	2	4	2	4	7	6	6	11	6	12	6.2	3.7	1.64	C54-55	
Ovary	49	0	59	18	-	-	-	-	2	2	4	2	4	3	8	6	3	5	4.8	2.8	0.81	C56	
Placenta	7	0	43	43	-	-	-	-	1	2	2	-	-	1	-	1	-	-	0.7	0.4	0.07	C58	
Kidney and renal pelvis	13	0	69	15	4	2	1	-	-	1	-	-	1	1	-	1	-	2	1.3	0.7	0.16	C64-65	
Bladder	6	0	33	17	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	0.3	0.16	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C66, C68	
Eye	37	0	95	3	3	1	-	-	3	3	3	9	4	7	1	1	2	2	3.6	2.1	0.38	C69	
Brain and nervous system	6	0	17	67	-	-	-	-	1	1	-	-	-	-	-	-	-	1	0.6	0.3	0.09	C70-72	
Thyroid	23	0	65	22	-	-	-	-	-	-	-	1	1	3	4	6	-	2	2.2	1.3	0.45	C73	
Hodgkin lymphoma	9	0	100	0	-	-	-	-	2	2	3	1	2	1	-	-	-	-	0.9	0.5	0.07	C81	
Non-Hodgkin lymphoma	137	0	95	4	1	-	-	-	8	10	12	27	19	16	10	8	7	6	13.3	7.8	1.88	C82-85, C96	
Multiple myeloma	36	0	78	19	-	-	-	-	-	-	-	1	2	4	4	3	8	4	3.5	2.1	0.83	C90	
Lymphoid leukaemia	2	0	50	50	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1	0.01	C91	
Myceloid leukaemia	13	0	92	8	-	-	-	-	4	-	2	-	-	-	-	1	1	1	1.3	0.7	0.14	C92-94	
Leukaemia, unspecified	3	0	100	0	-	-	-	-	-	1	1	1	-	-	-	-	-	-	0.3	0.2	0.02	C95	
Other and unspecified	62	0	61	27	-	-	-	-	1	2	2	1	5	12	6	4	5	9	6.0	3.6	1.30	O&U	
All sites	1784	0	68	12	10	5	9	10	37	70	117	177	200	180	189	154	135	131	173.1	31.20	277.0	C00-96	
All sites except C44	1746	0	68	12	10	5	8	8	37	68	116	175	196	178	186	153	149	132	169.4	100.0	30.57	C00-96 exc. C44	
Average annual population			233	42296	34270	36180	43837	41096	34909	26416	19877	15300	12376	11710	8252	5363	3952	2923	4520	343510			

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Zimbabwe, Harare: Black population

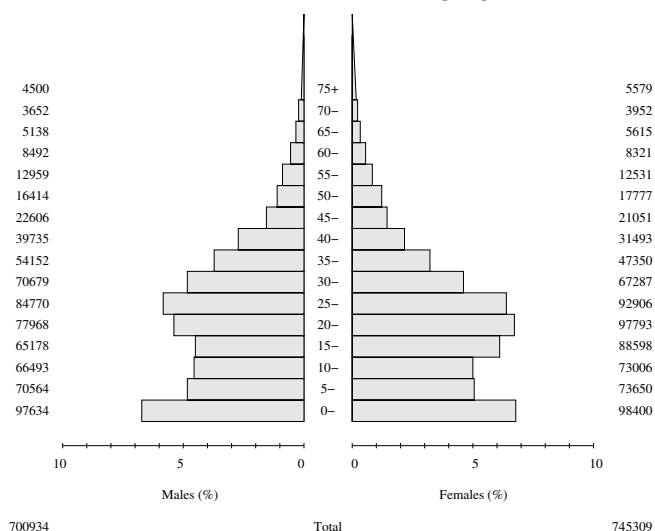
The Zimbabwe National Cancer Registry (ZNCR), formerly named the Harare Cancer Registry, was established in 1985 as a result of a collaborative research agreement between the Zimbabwe Ministry of Health and Child Care (MoHCC) and IARC. The registry initially targeted the population of the capital city of Harare but did not exclude cancer cases from other parts of the country. Since achieving complete reporting and coverage of Harare in 1990, the ZNCR has aimed to achieve complete reporting for the entire population of Zimbabwe. Great strides have been made towards this goal after the successful revival of the Bulawayo Cancer Registry in 2011. The National Cancer Prevention and Control Strategy 2014–2018 unveiled by the MoHCC in February 2014 envisages strengthening the ZNCR by extending registration to other parts of the country.

The ZNCR is located in the Parirenyatwa Group of Hospitals complex, a large public tertiary referral centre that 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's College of Health Sciences. The registry activities are overseen by a multidisciplinary advisory committee. The registry manager, supported by five health information assistants, is responsible for the day-to-day management of the registry under the guidance of the medical director. The ZNCR is financially supported by the MoHCC and other organizations.

The ZNCR covers the entire population of Zimbabwe, but the subset of registry data presented in this volume is specifically for the Black population of the city of Harare.

The average annual population-at-risk estimates corresponding to the ZNCR data presented in this volume are shown in the population pyramid.

**Zimbabwe, Harare: Black (2010–2012)
Population pyramid (average annual
person-years by sex and age group)**



700934
Source: The Zimbabwe National Statistics Agency (ZIMSTAT); 2003–2012 estimates assume a constant rate of growth within the age groups between census counts (performed in 2002 and 2012)

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

Other important sources of information are the public and private pathology laboratories in the city; the radiotherapy centre, radiology department, and haematology department of the Parirenyatwa Group of Hospitals; the University of Zimbabwe Oral Health Centre; and the Harare death registry.

Cancer notification forms are completed for each case identified at the various sources. To prevent duplicate registrations, the abstract forms are manually and electronically matched with the existing records in the database.

The death certificates for deaths occurring in greater Harare and the dormitory town of Chitungwiza are reviewed weekly to identify deaths caused by cancer.

Cases are coded according to ICD-O-3. The ZNCR follows the IARC/IACR rules on multiple primary cancers (IARC, 2004b). The registry currently uses IARC's CanReg4 software for data processing; plans are under way to migrate to CanReg5.

The ZNCR strictly follows the IARC/IACR guidelines on confidentiality (IARC, 2004a). Written requests for data must be approved by the medical director and by the data release subcommittee of the advisory committee.

YEARS PRESENTED

2010–2012 (a 3-year period)

NOTES

Results for 2003–2006 were reported in Volume X of *Cancer Incidence in Five Continents*. In the subsequent 3 years, registration was deficient due to the country's severe economic problems, which led to reduced clinical and diagnostic services (Chokunonga et al., 2013). The ZNCR results presented in this volume are for the Black African population of Harare only. The population-at-risk estimate was derived from the total population (by sex) at the census of 2012; estimates of the age distribution and the size of the White population were based on data from 2002.

The observed incidence rates are very high. The age-standardized incidence rate (ASR) of cancer at all

anatomical sites combined (excluding non-melanoma skin cancer) is 265.3 cases per 100 000 person-years in males and 290.5 cases per 100 000 person-years in females. The incidence of cervical cancer is especially high; the ASR, at 85.9 cases per 100 000 person-years, is one of the highest ever reported. The incidence rates of cancers of the stomach, pancreas, and corpus uteri; of myeloma; of non-Hodgkin lymphoma; and of cancers of the lung and prostate are also high; the rates of lung and prostate cancers are the highest reported in this volume.

The overall percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer) is 68% in males and 77% in females. These average values are lowered by the inclusion of cases of oesophageal cancer

Table 4.02. World age-standardized incidence rates (ASRs), expressed as cases per 100 000 person-years, of the 16 most common cancers in Black males (M) and Black females (F) in Harare, Zimbabwe, in 2003–2006 (Forman et al., 2014) and in 2010–2012, by anatomical site

Anatomical site (ICD-10 code)	Sex	2003–2006	2010–2012
Lip, oral cavity, and pharynx (C00–14)	M	4.3	6.5
	F	3.3	3.9
Oesophagus (C15)	M	22.2	16.4
	F	15.3	13.1
Stomach (C16)	M	11.7	18.7
	F	14.2	16.3
Colorectum and anus (C18–21)	M	13.0	15.1
	F	11.1	12.6
Liver (C22)	M	16.7	12.6
	F	13.9	9.7
Trachea, bronchus, and lung (C33–34)	M	10.1	13.4
	F	6.4	4.6
Kaposi sarcoma (C46)	M	37.3	20.1
	F	23.5	9.7
Breast (C50)	F	33.9	42.3
Cervix uteri (C53)	F	86.7	85.9
Corpus uteri (C54)	F	10.0	10.3
Ovary (C56)	F	10.9	6.8
Prostate (C61)	M	62.4	86.0
Bladder (C67)	M	9.4	5.7
	F	6.2	4.9
Eye (C69)	M	5.5	3.9
	F	3.2	4.9
Non-Hodgkin lymphoma (C82–85, C96)	M	8.8	16.7
	F	10.0	13.0
Leukaemia (C91–95)	M	2.6	3.4
	F	3.1	2.8
All sites except C44 (C00–96 exc. C44)	M	244.5	265.3
	F	299.5	290.5

and Kaposi sarcoma, which are typically diagnosed clinically or radiologically, and by the inclusion of death-certificate-only cases, which account for 14% and 11% of the registered cases in males and females, respectively. The percentage of death-certificate-only cases (DCO%) is particularly high for cancers of the liver, lung, and central nervous system, and cancers coded as occurring at “other and unspecified” anatomical sites.

Table 4.02 shows the ASRs of the 16 most common cancers in males and females in 2003–2006 (reported in Volume X of *Cancer Incidence in Five Continents*) compared with the current data. The most striking changes are the increases in the incidence of breast cancer in females, prostate cancer, and non-Hodgkin lymphoma in both sexes. There have been decreases in the incidence of Kaposi sarcoma and cancers of the oesophagus and liver.

SUMMARY

The incidence rates are very high. Some distortion may be due to the relatively high DCO%; the anatomical sites of the death-certificate-only cases suggest metastases. Some of the changes since 2003–2006 may be due to changes in the estimation of the population denominators since the 2012 census results became available.

PUBLICATIONS AND ACHIEVEMENTS

The registry is a founding member of the African Cancer Registry Network (AFCRN). It hosted the 2014 Second AFCRN Annual Review Meeting.

Bassett MT, Chokunonga E, Mauchaza B, Levy L, Ferlay J, Parkin DM (1995). Cancer in the African population of Harare, Zimbabwe, 1990–1992. *Int J Cancer*. 63(1):29–36. <http://dx.doi.org/10.1002/ijc.2910630107> PMID:7558448

Bassett MT, Levy L, Chokunonga E, Mauchaza B, Ferlay J, Parkin DM (1995). Cancer in the European population of Harare, Zimbabwe, 1990–1992. *Int J Cancer*. 63(1):24–8. <http://dx.doi.org/10.1002/ijc.2910630106> PMID:7558447

Chokunonga E, Borok MZ, Chirenje ZM, Nyakabau AM, Parkin DM (2013). Trends in the incidence of cancer in the Black population of Harare, Zimbabwe 1991–2010. *Int J Cancer*. 133(3):721–9. <http://dx.doi.org/10.1002/ijc.28063> PMID:23364833

Chokunonga E, Levy LM, Bassett MT, Borok MZ, Mauchaza BG, Chirenje MZ, et al. (1999). AIDS and cancer in Africa: the evolving epidemic in Zimbabwe. *AIDS*. 13(18):2583–8. <http://dx.doi.org/10.1097/00002030-199912240-00012> PMID:10630528

Chokunonga E, Windridge P, Sasiemi P, Borok M, Parkin DM (2016). Black-White differences in cancer risk in Harare, Zimbabwe, during 1991–2010. *Int J Cancer*. 138(6):1416–21. <http://dx.doi.org/10.1002/ijc.29883> PMID:26437451

Zimbabwe, Harare: Black (2010–2012)

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

Site	All ages	Age group (years)	Age group (years)																Crude rate %	CR %	ASR (W)	ICD-10	
			0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75+						
Mouth	23	1	100	0	-	-	-	1	1	1	2	3	5	1	1	3	4	1.1	1.0	0.29	2.6	C00-06	
Salivary gland	14	0	93	7	-	-	1	1	1	1	-	2	-	1	1	1	2	0.7	0.6	0.14	1.3	C07-08	
Nasopharynx	17	1	94	6	-	-	1	1	1	1	1	3	1	1	1	1	1	0.8	0.7	0.18	1.4	C11	
Other pharynx	10	1	90	0	-	-	1	1	1	1	2	1	1	1	1	2	-	0.5	0.4	0.22	1.3	C09-10, C12-14	
Oesophagus	126	2	58	15	-	-	1	8	10	5	8	10	13	14	19	33	6.0	5.5	1.91	16.4	C15		
Stomach	136	0	69	18	-	-	1	3	7	10	13	14	15	18	24	29	6.5	6.0	2.40	18.7	C16		
Colon	60	2	82	10	-	-	2	3	3	2	2	4	5	6	12	5	2.9	2.6	0.92	7.6	C18		
Rectum	47	1	66	17	-	-	2	3	2	2	4	3	8	6	8	8	2.2	2.1	0.80	6.0	C19-20		
Anus	13	1	100	0	-	-	-	1	2	1	3	3	-	-	1	3	0.6	0.6	0.23	1.5	C21		
Liver	119	0	18	31	-	-	3	2	11	7	7	13	4	7	14	26	5.7	5.2	1.36	12.6	C22		
Gallbladder etc.	14	0	93	7	-	-	-	1	1	1	1	2	2	2	2	8	0.7	0.6	0.13	1.9	C23-24		
Pancreas	32	0	19	53	-	-	-	-	2	2	2	2	4	5	6	10	1.5	1.4	0.58	4.8	C25		
Larynx	39	2	92	3	-	-	-	-	2	1	5	4	4	8	6	5	1.9	1.7	0.74	5.6	C32		
Trachea, bronchus, and lung	95	0	41	32	-	-	1	1	3	7	6	11	12	10	14	30	4.5	4.2	1.47	13.4	C33-34		
Bone	28	0	93	4	2	2	3	1	3	6	3	1	1	1	1	1	1.3	1.2	0.12	1.5	C40-41		
Melanoma of skin	18	0	100	0	-	-	-	-	5	1	2	1	2	1	1	2	0.9	0.8	0.22	1.9	C43		
Non-melanoma skin	65	2	100	0	-	-	1	2	4	3	4	6	4	3	5	4	3.1	3.1	0.66	6.9	C44		
Mesothelioma	3	0	100	0	-	-	-	-	25	41	53	46	28	14	19	7	12	13.9	12.9	1.93	20.1	C45	
Kaposi sarcoma	293	5	46	7	2	3	7	7	7	25	3	2	2	2	1	1	3	1.3	1.2	0.13	1.9	C47, C49	
Connective and soft tissue	28	1	96	4	4	1	1	3	2	2	2	2	2	2	1	1	0.7	0.6	0.19	1.7	C50		
Breast	14	0	86	0	-	-	-	-	-	-	1	2	2	3	2	3	0.7	0.6	0.19	1.7	C50		
Penis	23	2	96	0	-	-	1	1	1	1	8	4	2	2	2	2	1.1	1.0	0.17	1.8	C60		
Prostate	533	14	68	21	-	-	-	-	-	2	-	3	2	3	19	55	25.3	23.4	9.83	86.0	C61		
Testis	3	0	33	0	-	-	-	1	1	-	-	-	-	2	-	-	0.1	0.1	0.07	0.4	C62		
Kidney and renal pelvis	29	1	90	7	5	2	1	1	1	1	2	2	2	3	1	4	1.4	1.3	0.37	3.0	C64-65		
Bladder	40	0	42	25	-	-	-	-	-	1	2	1	1	5	3	7	1.9	1.8	0.57	5.7	C67		
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.0	0.00	0.1	C66, C68		
Eye	61	2	100	0	6	1	-	1	6	6	8	10	6	8	4	1	1	2.9	2.7	0.39	3.9	C69	
Brain and nervous system	40	0	38	32	4	3	1	5	1	3	8	2	2	3	1	2	1.9	1.8	0.29	2.7	C70-72		
Thyroid	5	0	80	0	-	-	-	-	-	2	-	-	1	-	-	2	0.2	0.2	0.01	0.5	C73		
Hodgkin lymphoma	15	0	100	0	-	-	1	2	3	2	1	2	-	-	-	-	0.7	0.7	0.04	0.6	C81		
Non-Hodgkin lymphoma	201	2	99	0	2	4	2	9	4	6	11	24	44	23	17	14	10	9.6	8.8	1.92	16.7	C82-85, C96	
Multiple myeloma	28	0	96	4	-	-	-	-	-	-	4	3	1	1	3	3	1.3	1.2	0.33	3.4	C90		
Lymphoid leukaemia	10	1	100	0	3	2	1	1	1	-	-	-	-	1	-	1	0.5	0.4	0.04	0.7	C91		
Myeloid leukaemia	16	0	94	6	2	-	2	1	2	-	1	2	1	2	1	1	0.8	0.7	0.17	1.5	C92-94		
Leukaemia, unspecified	21	0	86	14	5	1	2	3	-	1	1	3	1	1	1	-	1.0	0.9	0.10	1.2	C95		
Other and unspecified	124	2	80	13	1	1	2	2	5	1	6	16	7	12	11	15	9	5.4	5.4	1.63	14.1	O&U	
All sites	2344	43	69	14	36	26	18	43	36	69	107	154	190	134	133	169	182	222	279	503	30.59	272.2	C00-96
All sites except C44	2279	41	68	14	36	24	18	42	34	65	104	150	184	128	129	166	177	218	274	489	108.4	265.3	C00-96 exc. C44

Average annual population 97634 70564 66493 65178 77968 84770 70679 54152 39735 22606 16414 12959 8492 5138 3652 4500 700933

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Zimbabwe, Harare: Black (2010–2012)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)													Crude rate	CR %	ASR (W)	ICD-10				
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-					65-	70-	75+	
Mouth	15	0	93	0	-	-	-	-	1	3	1	-	2	2	3	-	3	0.7	0.5	1.8	C00-06				
Salivary gland	11	0	91	0	-	-	-	-	1	1	1	1	3	1	-	1	-	0.5	0.4	1.3	C07-08				
Nasopharynx	8	0	75	12	-	-	-	-	1	1	1	1	1	1	-	1	-	0.4	0.3	0.8	C07-C11				
Other pharynx	6	0	67	33	-	-	-	-	1	1	1	1	1	-	-	-	1	0.3	0.2	0.07	C09-10, C12-14				
Oesophagus	108	0	43	28	-	-	-	-	3	3	5	17	15	10	10	13	29	4.8	3.6	1.48	C15				
Stomach	128	0	70	17	-	-	-	-	6	9	5	12	10	13	16	27	27	5.7	4.3	2.23	C16				
Colon	56	1	75	14	-	-	-	-	1	4	11	9	8	8	2	9	2	2.5	1.9	0.76	C18				
Rectum	47	0	68	19	-	-	-	-	2	4	8	2	1	7	4	3	5	2.1	1.6	0.53	C19-20				
Anus	12	0	83	8	-	-	-	-	3	3	1	5	1	1	-	-	2	0.5	0.4	0.08	C21				
Liver	82	0	18	24	-	-	-	-	3	5	6	3	5	14	8	7	23	3.7	2.8	1.02	C22				
Gallbladder etc.	13	0	77	23	-	-	-	-	1	1	1	1	1	1	1	2	7	0.6	0.4	0.13	C23-24				
Pancreas	40	0	30	42	-	-	-	-	1	1	3	2	3	7	9	4	10	1.8	1.3	0.67	C25				
Larynx	2	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	C32				
Trachea, bronchus, and lung	37	0	46	32	1	-	-	-	1	1	1	2	3	4	3	4	8	1.7	1.2	0.62	C33-34				
Bone	25	0	92	8	2	-	-	-	3	1	1	1	2	4	-	1	2	3	1.1	0.8	0.21	C40-41			
Melanoma of skin	41	0	98	2	1	-	-	-	2	3	1	1	4	4	5	5	14	1.8	1.4	0.53	C43				
Non-melanoma skin	72	1	99	1	1	-	-	-	2	5	11	3	7	3	4	2	4	3.2	0.75	0.66	C44				
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45				
Kaposi sarcoma	182	6	47	7	3	7	2	-	24	39	36	11	5	3	3	4	4	8.1	6.1	0.84	C46				
Connective and soft tissue	42	1	100	0	1	1	1	1	5	3	1	4	6	5	6	3	2	1.9	1.4	0.41	C47, C49				
Breast	427	11	87	8	-	-	-	-	1	8	18	46	70	54	45	35	33	26	25	19.1	14.4	5.07	C50		
Vulva	40	1	98	0	-	-	-	-	1	3	7	6	5	3	-	2	1	4	1.8	1.3	0.31	C51			
Vagina	7	0	100	0	-	-	-	-	1	1	1	2	2	1	1	-	-	0.3	0.2	0.07	C52				
Cervix uteri	862	18	86	7	-	-	-	-	3	16	50	86	102	113	86	76	59	48	79	38.6	29.0	9.70	C53		
Uterus	77	1	79	12	-	-	-	-	2	2	11	5	2	1	8	16	14	8	19	3.4	2.6	1.25	C54-55		
Ovary	72	3	61	17	-	-	-	-	2	7	2	11	3	4	7	6	8	3.2	2.4	0.79	C56				
Placenta	21	1	100	0	-	-	-	-	6	4	3	4	1	1	-	-	-	0.9	0.7	0.10	C58				
Kidney and renal pelvis	22	0	86	9	7	3	-	-	4	-	4	1	1	3	-	-	3	1.0	0.7	0.09	C64-65				
Bladder	44	0	57	27	-	-	-	-	1	1	3	1	3	9	6	4	4	2.0	1.5	0.53	C67				
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.01	C66, C68				
Eye	74	0	97	0	4	-	-	-	6	14	8	14	9	10	2	2	2	3.3	2.5	0.45	C69				
Brain and nervous system	45	0	40	33	4	4	-	-	3	4	3	3	1	5	7	2	-	4	2.0	1.5	0.26	C70-72			
Thyroid	43	0	72	21	-	-	-	-	3	2	1	3	6	7	4	4	8	5	1.9	1.4	0.73	C73			
Hodgkin lymphoma	9	1	100	0	-	-	-	-	1	1	2	2	2	2	1	1	1	0.4	0.3	0.07	C81				
Non-Hodgkin lymphoma	197	3	96	3	4	1	7	6	12	16	23	32	25	15	11	6	4	8.8	6.6	1.20	C82-85, C96				
Multiple myeloma	30	0	97	0	-	-	-	-	1	1	1	1	3	2	7	3	5	1.3	1.0	0.61	C90				
Lymphoid leukaemia	16	0	100	0	1	3	4	-	1	-	-	-	-	2	-	-	2	0.7	0.5	0.14	C91				
Myeloid leukaemia	14	0	100	0	2	1	1	-	1	-	-	-	2	3	1	-	-	0.6	0.5	0.10	C92-94				
Leukaemia, unspecified	9	0	89	11	2	-	-	-	2	-	-	1	1	1	-	-	-	0.4	0.3	0.06	C95				
Other and unspecified	110	0	65	22	-	1	-	-	2	5	5	3	8	5	7	9	12	11	12	7	23	4.9	3.7	1.26	O&U
All sites	3047	48	77	11	33	22	26	21	52	109	204	289	297	299	312	294	248	224	205	364	136.3	33.58	297.1	C00-96	
All sites except C44	2975	47	77	11	32	22	24	21	50	104	193	286	290	296	309	290	246	220	196	349	133.1	100.0	32.83	C00-96 exc. C44	
Average annual population	98400	73650	73006	88598	97793	92906	67287	47350	31493	21051	17777	12531	8321	5615	3952	5579	745308								

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

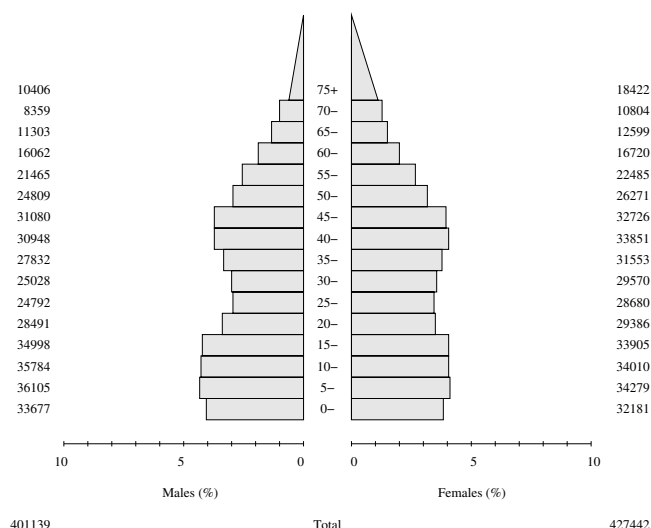
France, Réunion

The Registre des Cancers de la Réunion was founded in 1988. Since 2010, it has been managed by the public health department of the University Hospital Centre (CHU) of Réunion. The registry is run by a public health specialist and staffed by two full-time registrars. It is based in the clinical research and epidemiology unit of CHU Félix Guyon and is financed by the French Regional Health Agency for the Indian Ocean (ARS OI).

The Registre des Cancers de la Réunion covers the entire population of Réunion (one of the five overseas regions of France); since 2005, the registry has also recorded all cancer cases diagnosed in paediatric patients (i.e. aged < 18 years) in the neighbouring French island of Mayotte. The subset of registry data presented in this volume is specifically for the population of Réunion, which is cosmopolitan and diverse, with residents of mainly European, African, Malagasy, and Indian descent. The population is relatively young for a developed country.

The population of Réunion is estimated by the French National Institute of Statistics and Economic Studies (INSEE) to have been about 850 000 in 2014. The total population of Mayotte is estimated to have been about 215 000 in 2012 (at the most recent census), with an estimated 108 000 inhabitants (about 50%) aged < 18 years. The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

France, Réunion (2011)
Population pyramid (average annual person-years by sex and age group)



Source: Institut National de la Statistique et des Etudes Economiques (INSEE) of France; estimates based on the censuses of 1999, 2006, and 2012; intercensal estimates taking into account the births–deaths balance and net migration

There are two public hospitals and one private clinic that provide cancer care in Réunion; within these three facilities there are a total of three oncology/haematology units, two radiotherapy centres, one

paediatric oncology unit, and one nuclear medicine unit providing scintigraphy and positron emission tomography (PET) scans. There are six pathology units, located in the cities of Saint-Denis and Saint-Pierre. There is no histopathology laboratory in Mayotte; all analyses are performed in Réunion, and all paediatric cancers that are diagnosed in Mayotte are treated in Réunion.

The registry collects cases from four public hospitals: the CHU of Réunion (which has two facilities: CHU Félix Guyon in Saint-Denis and CHU Sud Réunion in Saint-Pierre), the Centre Hospitalier Gabriel Martin in Saint-Paul, the Groupe Hospitalier Est Réunion (GHER) in Saint-Benoît, and the Centre Hospitalier de Mayotte in Mamoudzou. The registry also collects cases from five private clinics: Clinique Sainte-Clotilde in Saint-Denis, Clinique Saint-Vincent in Saint-Denis, Clinique des Orchidées in Le Port, Clinique Jeanne d'Arc in Le Port, and Clinique Durieux in Le Tampon. The other sources of information are five of the six histopathology laboratories in Réunion, the CHU of Réunion's two haematology laboratories, the regional cancer network (ONCORUN), and the social security system. Cases from the public hospitals and private clinics are registered using the Programme de Médicalisation des Systèmes d'Information (PMSI), the French equivalent of the Diagnosis-Related Groups (DRGs) used in the USA.

In France, the cause of death is not indicated on individual death certificates, so French death certificates are not useful sources of information for cancer registration.

Registration is active and is facilitated by the fact that most of the requested data are digitized at all levels. Comprehensive patient identifiers are included in all databases, facilitating record linkages.

For each case, inclusion criteria are assessed and data are collected from medical records. Cases are coded according to IARC, European Network of Cancer Registries (ENCR), and the French Network of Cancer Registries (FRANCIM) guidelines, and entered into a database. The database management software, which is customized locally, is used for all registry activities; it is installed on a server that is hosted, fully secured, and maintained by the CHU.

YEARS PRESENTED

2011 (a 1-year period)

NOTES

The registry was inactive for several years after 2006, and although retrospective data collection has since taken place, it was incomplete for the years 2009 and 2010. Therefore, only results for 2011 are presented.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 257.4 cases per 100 000 person-years in males and 178.5 cases per 100 000 person-years in females. These values are relatively high compared with the reference values for eastern Africa reported in GLOBOCAN 2012. The

patterns of cancer incidence by anatomical site are also substantially different from those seen in the

Table 4.03. The number of deaths due to cancer, as reported in the WHO Mortality Database (WHO, 2017), and the corresponding mortality-to-incidence (M:I) ratios in males (M) and females (F) in Réunion, France, in 2005–2008 and 2011, by anatomical site

Anatomical site (ICD-10 code)	Sex	Deaths	M:I (%)
Lip, oral cavity, and pharynx (C00–14)	M	189	44
	F	30	35
Oesophagus (C15)	M	170	80
	F	19	68
Stomach (C16)	M	232	71
	F	139	75
Colorectum and anus (C18–21)	M	230	44
	F	196	42
Liver (C22)	M	141	121
	F	79	130
Pancreas (C25)	M	109	123
	F	101	105
Trachea, bronchus, and lung (C33–34)	M	624	92
	F	149	84
Breast (C50)	F	254	20
Cervix uteri (C53)	F	62	24
Uterus, other and unspecified (C54–55)	F	86	60
Prostate (C61)	M	288	20
Bladder (C67)	M	69	43
	F	21	52
Kidney, renal pelvis, ureter, and other urinary (C64–66, C68)	M	40	34
	F	22	33
Lymphoma (C81–88, C90)	M	103	41
	F	89	42
Leukaemia (C91–95)	M	84	45
	F	72	61
All sites (C00–97)	M	2825	53
	F	1782	45

mainland countries of eastern Africa, with relatively high incidence of cancers of the prostate and lung (the highest reported in this volume), oral cavity and pharynx, colorectum, and breast, as well as of leukaemia, and with relatively low rates of cancers of the oesophagus and cervix, as well as of Kaposi sarcoma (with only 1 case recorded in 2011). This is not surprising given the very different populations (in terms of ethnicity and lifestyle); indeed, the patterns of cancer incidence in Réunion more closely resemble those of metropolitan France than those of mainland eastern Africa.

The percentage of microscopically verified cases (MV%) is 93% in males and 96% in females. As explained above, cases are not registered on the basis of death certificate information only.

Because registration of death by cause is comprehensive in Réunion (as it is in all of France), the number of deaths due to cancer can be compared with the number of cancer cases registered for the same time period. The reported numbers of deaths due to cancer and the calculated mortality-to-incidence (M:I) ratios for the 5 years of 2005–2008 and 2011 are shown in Table 4.03.

The overall M:I ratio is reasonable, at 53.3% in males and 44.8% in females; the equivalent figures for Europe reported in GLOBOCAN 2012 are 54% in males and 49% in females. The M:I ratios for cancers at individual anatomical sites are also what would be expected (i.e. about 100% minus the survival rate), although the ratios are > 100% for cancers of the liver and pancreas. This is a typical finding in French cancer registries, due to peculiarities of the death certification practices.

SUMMARY

The incidence rates are closer to those of metropolitan France than to those of mainland eastern Africa, and the M:I ratios are consistent with accurate registration practices.

PUBLICATIONS AND ACHIEVEMENTS

The Registre des Cancers de la Réunion became a member of the African Cancer Registry Network (AFCRN) in 2015.

Caliez F, Chirpaz E, Ravault M-C (2013). Le cancer, évolution à la Réunion jusqu'en 2011. Plateforme d'Information des Etudes en Santé. Available from: <http://www.arsoi-notresante.fr/actualite/le-cancer-evolution-la-reunion-jusquen-2011>.

France, Réunion (2011)

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

Site	All ages	Age untk	MV %	DCO %	Age group (years)											Crude rate %	CR %	ASR (W)	ICD-10		
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-					55-	60-
Mouth	42	0	98	-	-	-	-	-	2	2	8	2	9	9	3	2	5	10.5	0.98	8.9	C00-06
Salivary gland	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.03	0.4	C07-08	
Nasopharynx	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	0.3	0.10	C09-C11	
Other pharynx	50	0	98	-	-	-	-	-	2	3	10	9	8	8	8	2	12.5	4.3	11.1	C09-10, C12-14	
Oesophagus	32	0	97	-	-	-	-	-	-	2	2	3	7	8	3	4	8.0	0.91	7.0	C15	
Stomach	77	0	96	-	-	-	-	1	-	-	2	7	13	12	9	14	19.2	6.6	21.0	C16	
Colon	79	0	100	-	-	-	-	-	1	4	14	11	12	13	9	15	19.7	6.8	21.1	C18	
Rectum	51	0	96	-	-	-	-	-	2	5	5	11	10	8	10	12.7	4.4	15.1	C19-20		
Anus	2	0	100	-	-	-	-	-	-	-	-	1	1	1	-	-	0.5	0.2	0.05	C21	
Liver	35	0	57	-	-	-	-	-	1	3	1	2	5	6	6	4	8.7	3.0	0.93	C22	
Gallbladder etc.	9	0	88	-	-	-	-	-	-	-	-	2	2	3	2	2	2.2	0.8	0.30	C23-24	
Pancreas	24	0	89	-	-	-	-	-	1	-	4	2	4	-	3	4	6.0	2.1	0.61	C25	
Larynx	23	0	100	-	-	-	-	-	-	1	1	6	2	8	2	3	5.7	2.0	0.72	C32	
Trachea, bronchus, and lung	167	0	86	-	-	-	-	-	2	4	10	15	29	19	24	29	41.6	14.4	46.3	C33-34	
Bone	5	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	0.4	0.08	C40-41	
Melanoma of skin	15	0	100	-	-	-	-	-	2	1	2	3	1	2	2	1	3.7	1.3	0.36	C43	
Non-melanoma skin	40	0	100	-	-	-	-	-	1	-	-	4	2	6	2	3	10.0	0.63	8.5	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C45	
Kaposi sarcoma	1	0	100	-	-	-	-	-	1	-	-	-	-	-	-	-	0.2	0.1	0.02	C46	
Connective and soft tissue	5	0	100	1	-	-	-	-	-	1	-	-	-	1	1	-	1.2	0.4	0.13	C47, C49	
Breast	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	1	3	1.0	0.3	0.06	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.00	C60	
Prostate	289	0	97	-	-	-	-	-	-	3	1	2	5	23	36	45	72.0	24.9	86.8	C61	
Testis	12	0	83	-	-	-	-	-	2	2	3	-	-	1	-	-	3.0	1.0	0.23	C62	
Kidney and renal pelvis	34	0	82	-	-	-	-	-	-	-	2	5	2	7	5	4	8.5	2.9	0.90	C64-65	
Bladder	42	0	83	-	-	-	-	-	1	1	1	2	4	3	3	12	15	10.5	3.6	1.13	C67
Ureter and other urinary	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1	0.00	C66, C68	
Eye	2	0	100	1	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.2	0.07	C69	
Brain and nervous system	11	0	73	1	-	-	-	-	-	-	1	1	2	2	1	2	2.7	0.9	0.33	C70-72	
Thyroid	7	0	86	-	-	-	-	-	-	1	-	-	-	-	-	-	1.7	0.6	0.18	C73	
Hodgkin lymphoma	8	0	100	-	-	-	-	-	2	1	1	-	2	-	-	-	2.0	0.7	0.15	C81	
Non-Hodgkin lymphoma	30	0	97	-	-	-	-	-	-	1	-	3	4	7	3	4	7.5	2.6	0.78	C82-85, C96	
Multiple myeloma	15	0	100	-	-	-	-	-	-	-	-	1	3	2	2	-	3.7	1.3	0.24	C90	
Lymphoid leukaemia	19	0	100	1	4	-	-	-	1	1	3	-	-	-	1	4	4.7	1.6	0.38	C91	
Myeloid leukaemia	26	0	100	-	-	-	-	-	-	-	-	3	2	5	3	4	6.5	2.2	0.68	C92-94	
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.00	C95	
Other and unspecified	36	0	83	-	-	-	-	-	-	-	1	1	3	2	10	3	9.0	3.1	0.84	O&U	
All sites	1199	0	93	4	5	3	7	5	5	11	15	29	66	113	163	176	298.9	32.42	265.8	C00-96	
All sites except C44	1159	0	93	4	5	3	7	5	4	11	15	29	62	111	161	170	288.9	31.79	257.4	C00-96 exc. C44	
Average annual population					33677	36105	35784	34998	28491	24792	25028	27832	30948	31080	24809	21465	16062	11303	8359	10406	401139

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

France, Réunion (2011)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)											Crude rate	%	CR	ASR (W)	ICD-10		
					0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55						55-60	60-65
Mouth	15	0	100	-	-	-	-	-	1	-	-	-	2	1	3	1	6	3.5	1.5	2.5	C00-06	
Salivary gland	4	0	100	-	1	-	-	-	-	-	-	-	-	-	-	1	1	0.9	0.4	0.08	C07-08	
Nasopharynx	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.2	0.05	C11	
Other pharynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1	0.02	C09-10, C12-14	
Oesophagus	7	0	100	-	-	-	-	-	1	-	-	2	-	-	-	1	2	1.6	0.7	0.12	C15	
Stomach	37	0	97	-	-	-	-	1	2	1	4	3	2	5	5	13	8.7	3.8	0.71	C16		
Colon	75	0	96	-	-	-	-	2	1	7	12	8	10	8	14	13	17.5	7.7	1.82	C18		
Rectum	48	0	98	-	-	-	-	1	3	2	5	9	7	9	3	9	11.2	4.9	1.09	C19-20		
Anus	9	0	89	-	-	-	-	-	1	2	2	2	1	2	1	1	2.1	0.9	0.20	C21		
Liver	13	0	69	-	-	-	-	-	1	1	1	1	1	3	3	3	3.0	1.3	0.34	C22		
Gallbladder etc.	24	0	92	-	-	-	-	-	-	1	4	4	4	2	5	10	5.6	2.5	0.53	C23-24		
Pancreas	24	0	96	-	-	-	-	-	-	1	7	4	2	8	2	2	5.6	2.5	0.74	C25		
Larynx	3	0	100	-	-	-	-	-	1	3	-	-	-	-	1	1	0.7	0.3	0.10	C32		
Trachea, bronchus, and lung	42	0	93	-	-	-	-	-	1	3	-	5	4	7	5	17	9.8	4.3	0.80	C33-34		
Bone	2	0	100	-	-	-	-	-	-	1	-	-	-	-	-	-	0.5	0.2	0.05	C40-41		
Melanoma of skin	21	0	95	-	-	-	-	3	2	2	1	3	-	1	-	6	4.9	2.2	0.30	C43		
Non-melanoma skin	36	0	100	-	-	-	-	-	-	-	1	5	2	3	2	21	8.4	0.39	5.3	C44		
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45		
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C46		
Connective and soft tissue	3	0	100	1	-	-	-	-	-	-	-	-	-	-	-	-	0.7	0.3	0.03	C47, C49		
Breast	332	0	99	-	-	-	-	5	11	26	41	51	49	38	28	21	22	40	77.7	34.2	61.4	C50
Vulva	6	0	100	-	-	-	-	-	-	-	-	2	-	1	-	1	1.4	0.6	0.14	C51		
Vagina	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C52		
Cervix uteri	60	0	100	-	-	-	-	2	5	7	8	6	8	3	6	12	14.0	6.2	1.10	C53		
Uterus	34	0	100	-	-	-	-	2	1	1	4	7	5	8	6	6	8.0	3.5	0.93	C54-55		
Ovary	36	0	97	-	2	-	-	-	2	4	2	4	2	4	8	4	8.4	3.7	0.89	C56		
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C58		
Kidney and renal pelvis	20	0	75	1	-	-	-	2	-	1	1	1	1	3	4	2	5	4.7	2.1	0.44	C59	
Bladder	16	0	94	-	-	-	-	-	-	-	-	3	6	-	-	5	3.7	1.6	0.34	C60		
Ureter and other urinary	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1	0.00	C61, C66, C68		
Eye	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C69		
Brain and nervous system	9	0	56	-	1	1	-	-	-	-	2	-	-	-	1	1	2.1	0.9	0.18	C70-72		
Thyroid	9	0	100	-	-	-	-	-	2	4	-	-	-	-	-	2	2.1	0.9	0.11	C73		
Hodgkin lymphoma	13	0	100	-	-	-	-	2	3	1	1	1	1	1	1	1	3.0	1.3	0.24	C81		
Non-Hodgkin lymphoma	28	0	100	-	-	-	-	-	1	-	-	-	2	4	6	4	6.6	2.9	0.68	C82-85, C96		
Multiple myeloma	14	0	79	-	-	-	-	-	-	-	-	-	1	-	2	4	3.3	1.4	0.30	C90		
Lymphoid leukaemia	6	0	100	-	1	-	-	-	2	1	-	-	-	-	-	1	1.4	0.6	0.11	C91		
Myeloid leukaemia	22	0	100	-	-	-	-	1	1	2	-	2	3	4	-	5	5.1	2.3	0.43	C92-94		
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C95		
Other and unspecified	35	0	83	-	-	-	-	2	-	1	3	1	4	2	5	3	14	8.2	3.6	0.60	O&U	
All sites	1007	0	96	2	3	3	4	15	18	51	77	96	98	108	106	104	213	235.6	20.68	183.8	C00-96	
All sites except C44	971	0	96	2	3	3	4	15	18	51	76	91	96	108	103	102	104	192	227.2	100.0	20.29	C00-96 exc. C44
Average annual population	32181	34279	34010	33905	29386	28680	29570	31553	33851	32726	26271	22485	16720	12599	10804	18422	427442					

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Mauritius

The Mauritius National Cancer Registry (MNCR) was established in 1993 after a field study by a pathologist from the University of Bordeaux II, with financial assistance from the French Cooperation. The MNCR became population-based in 2000 (and has since maintained that status with assistance from WHO/IARC) but has collected data on cancer incidence and mortality throughout Mauritius on a continuous basis since 1993, and retrospectively from 1989. All registry activities, salaries, equipment, and expenses are financed by the Ministry of Health and Quality of Life of Mauritius and by WHO. The MNCR is led by a steering committee and a coordinator. It is based in the Central Health Laboratory of Victoria Hospital in the town of Quatre Bornes. The registry is staffed by two data collection officers, one officer specializing in IARC's CanReg software, and oncology specialists.

The MNCR data presented in this volume are for the registry's coverage area of the entire country of Mauritius. About 68% of the country's residents are Indo-Mauritian (i.e. of Indian descent), 27% are Creole (of African descent), 3% are Sino-Mauritian (of Chinese descent), and 2% are Franco-Mauritian (of French descent). The population density was 673 people/km² in 2012, and the population growth rate was 0.4%.

The population of Mauritius is estimated to have been 1 291 167 on 31 December 2012, according to a 2012 health statistics report based on 2000 census data. The average annual population-at-risk estimates corresponding to the MNCR data presented in this volume are shown in the population pyramid.

The entire health care delivery system in Mauritius is served by a single radiotherapy centre and a centralized pathology laboratory.

The MNCR collects data, both retrospectively and semi-actively, from a variety of information sources, including the radiotherapy register, medical records offices, the centralized pathology laboratory register, the Overseas Treatment Unit, the civil status office, and private clinics and pathology practices.

Radiotherapy register: Valuable information on cancer cases is obtained from the country's single radiotherapy centre at Victoria Hospital in Candos.

Medical records offices: Up-to-date data on patients' cancer status are obtained from the medical records offices of the country's five regional hospitals.

Pathology laboratory register: The centralized pathology laboratory at the Central Health Laboratory in Candos enters all diagnosed cancer cases into an electronic database, from which the information can be retrieved by the MNCR and used for registration.

Overseas Treatment Unit: The MNCR collects information on brain neoplasm cases in residents of Mauritius who receive treatment abroad through the Overseas Treatment Scheme.

Civil status office: The registry has access to cancer-specific mortality data from death certificates via the civil status office. These data are not entered as primary data but are used to update patient status.

Private clinics and pathology practices: In 2001, the MNCR began reaching out to pathologists in private practice, in order to identify cases that have not been followed in a hospital.

Computerized listings of cases coded according to ICD-10 are submitted to the registry from multiple sources twice per year.

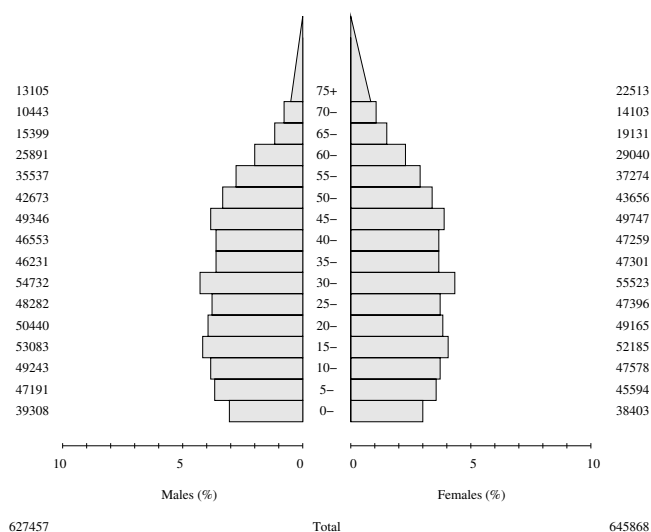
The registry uses IARC's CanReg4 software for data entry and processing, which generates standard tables. Further analysis for publications and presentations is carried out using the Epi Info set of software tools.

Great care is taken to avoid duplicate registration, by comparing the characteristics of each case with the master index in order to identify cases diagnosed in previous years, recurrences, or metastases from an already registered cancer.

The statistics department of the Ministry of Health and Quality of Life provides the MNCR with annual listings (from all regional hospitals) of the summary discharge sheets with cancer mentioned as the diagnosis. Comparing this list with the existing registry database allows MNCR personnel to identify any omissions from the registry.

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

Mauritius (2010–2012)
Population pyramid (average annual person-years by sex and age group)



Source: Health Statistics Unit, Ministry of Health and Quality of Life of Mauritius, *Health Statistics Report 2012*; estimates based on 2000 census data

YEARS PRESENTED

2010–2012 (a 3-year period)

NOTES

In the decade leading up to 2012, there was a slow and steady increase in the annual number of registrations. During the 3-year period reported here, the average rate of registration was 150 cases per month.

It is not surprising that the cancer profile in Mauritius is substantially different from that seen in the mainland countries of eastern Africa, given the very different populations (in terms of ethnicity and lifestyle).

Table 4.04. The number of deaths due to cancer, as reported in the WHO Mortality Database (WHO, 2017), and the corresponding mortality-to-incidence (M:I) ratios in males (M) and females (F) in Mauritius in 2010–2012, by anatomical site

Anatomical site (ICD-10 code)	Sex	Deaths	M:I (%)
Lip, oral cavity, and pharynx (C00–14)	M	114	63
	F	39	51
Oesophagus (C15)	M	63	102
	F	33	118
Stomach (C16)	M	158	114
	F	83	108
Colorectum and anus (C18–21)	M	160	52
	F	137	49
Liver (C22)	M	77	248
	F	54	300
Pancreas (C25)	M	91	186
	F	66	236
Trachea, bronchus, and lung (C33–34)	M	285	133
	F	114	165
Breast (C50)	F	374	30
Cervix uteri (C53)	F	70	27
Uterus, other and unspecified (C54–55)	F	105	51
Prostate (C61)	M	184	62
Bladder (C67)	M	37	35
	F	13	42
Kidney, renal pelvis, ureter, and other urinary (C64–66, C68)	M	33	52
	F	10	36
Lymphoma (C81–88, C90)	M	51	46
	F	34	37
Leukaemia (C91–95)	M	53	84
	F	56	110
All sites (C00–97)	M	1546	65
	F	1490	44

Compared with the reference values for eastern Africa reported in GLOBOCAN 2012, the incidence rates of cancers of the oesophagus, liver, and cervix, and of Kaposi sarcoma, are low, whereas the rates of cancers at other sites (notably the colorectum and breast) are relatively high. Incidence rates of upper gastrointestinal cancers (i.e. of the oral cavity and pharynx, and of the oesophagus) are considerably lower than the corresponding estimates for India.

The percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer) is 91% in males and 92% in females. As explained above, cases are not registered on the basis of death certificate information only.

Because registration of death by cause is comprehensive in Mauritius, the number of deaths due to cancer can be compared with the number of cancer cases registered for the same time period. The reported numbers of deaths due to cancer and the calculated mortality-to-incidence (M:I) ratios for the period of 2010–2012 are shown in Table 4.04.

The overall M:I ratio is reasonable, at 65% in males and 44% in females; the equivalent figures for Europe reported in GLOBOCAN 2012 are 54% in males and 49% in females. The M:I ratios are > 100% for cancers at several anatomical sites that are associated with poor prognosis and/or are difficult to biopsy for diagnostic purposes (oesophagus, stomach, liver, pancreas, and lung).

SUMMARY

The high M:I ratios for cancers at internal anatomical sites may be due to inaccurate certification of cause of death, but given the relatively high MV% (e.g. 98% for oesophageal cancers), it is possible that there is a modest degree of underascertainment of cases not detected by histology.

PUBLICATIONS AND ACHIEVEMENTS

The MNCR became affiliated with IACR in 1997; its first report, pertaining to the 8-year period of 1989–1996, was published in 1999. The most recent report published by the registry pertains to the period of 2009–2013. The MNCR hosted the 33rd Annual Meeting of IACR, in Ukraine in 2011, and became a member of the African Cancer Registry Network (AFCRN) in 2013.

Manraj SS, Fauzee NJS, Mohith A, Adebamowo C (2014). Trends in female breast cancer in the Republic of Mauritius over past two decades. *J Clin Oncol*. 32(15 Suppl):e1156.

Manraj SS, Mustun H, Ghurhurrun P, Laniece C, Salamon R (1997). Cancer incidence in Mauritius (1989-1993). *Rev Epidemiol Sante Publique*. 45(3):257–9. [French] PMID:9280989

Manraj SS, Poorun SB, Eddoo MR, Jeebun N, Moussa L, Burhoo P (2006). Cancer incidence in the Republic of Mauritius - 5 years review 1997 to 2001. *Internet J Med Update*. 1(1):7–12. <http://dx.doi.org/10.4314/ijmu.v1i1.39828>

Mauritius (2010–2012)

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

Site	All ages	Age unk	MV	DCO	Age group (years)											Crude rate	CR %	ASR (W)	ICD-10					
					%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-
Mouth	111	4	100	-	-	-	-	-	1	1	3	5	14	12	22	15	12	10	12	5.9	5.1	0.64	5.3	C00-06
Salivary gland	15	0	93	-	-	-	-	-	-	-	-	-	-	1	1	3	3	3	0.8	0.7	0.11	0.8	C07-08	
Nasopharynx	18	0	94	1	-	-	-	-	-	-	-	-	1	1	3	4	4	2	1.0	0.8	0.12	1.0	C11	
Other pharynx	37	0	100	-	-	-	-	-	-	-	-	4	7	3	7	8	-	1	2.0	1.7	0.15	1.7	C09-10, C12-14	
Oesophagus	62	1	100	-	-	-	-	-	-	-	1	1	2	8	6	10	12	7	3.3	2.9	0.39	3.2	C15	
Stomach	139	1	96	-	-	-	-	-	1	1	3	6	12	9	21	24	18	25	7.4	6.4	0.86	7.0	C16	
Colon	178	1	100	-	-	-	-	-	1	5	7	16	21	36	24	24	15	25	9.5	8.2	1.02	8.6	C18	
Rectum	123	0	100	-	-	-	-	-	1	2	2	10	16	13	20	20	16	22	6.5	5.7	0.78	6.3	C19-20	
Anus	7	0	100	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	0.4	0.3	0.05	0.4	C21	
Liver	31	0	94	-	-	-	-	-	1	-	-	-	1	5	4	4	4	7	1.6	1.4	0.23	1.6	C22	
Gallbladder etc.	15	2	93	-	-	-	-	-	-	1	3	1	1	1	2	2	1	2	0.8	0.7	0.08	0.7	C23-24	
Pancreas	49	0	71	-	-	-	-	-	1	2	-	1	5	4	11	9	4	6	2.6	2.3	0.29	2.4	C25	
Larynx	72	0	100	-	-	-	-	-	-	-	1	2	4	11	8	12	12	9	3.8	3.3	0.51	3.7	C32	
Trachea, bronchus, and lung	214	3	90	-	-	-	-	-	1	1	1	6	18	25	29	27	28	26	11.4	9.9	1.23	10.7	C33-34	
Bone	16	0	94	-	-	-	-	-	6	1	1	1	-	1	1	1	-	1	0.8	0.7	0.07	0.9	C40-41	
Melanoma of skin	5	3	100	-	-	-	-	-	-	1	2	4	5	9	15	14	17	21	1	0.3	0.2	0.03	0.3	C43
Non-melanoma skin	195	56	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10.4	-	-	1.14	C44	
Mesothelioma	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.02	0.1	C45	
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C46	
Connective and soft tissue	36	0	100	-	-	-	-	-	1	3	2	4	2	3	1	3	4	1	1.9	1.7	0.16	1.9	C47, C49	
Breast	12	0	100	-	-	-	-	-	-	-	-	-	-	-	4	1	-	4	0.6	0.6	0.09	0.6	C50	
Penis	12	0	92	-	-	-	-	-	-	-	-	-	1	4	4	1	2	-	0.6	0.6	0.07	0.5	C60	
Prostate	297	2	95	-	-	-	-	-	-	1	3	11	3	11	27	33	51	51	15.8	13.7	1.77	16.0	C61	
Testis	28	0	100	-	-	-	-	-	3	2	4	6	4	1	3	2	1	-	1.5	1.3	0.10	1.3	C62	
Kidney and renal pelvis	63	0	98	1	-	-	-	-	1	3	8	9	10	7	8	15	12	18	3.3	2.9	0.29	3.0	C64-65	
Bladder	105	1	96	-	-	-	-	-	-	-	2	7	6	13	15	12	18	31	5.6	4.8	0.63	5.4	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	3	0	100	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	0.2	0.1	0.03	0.2	C69	
Brain and nervous system	54	0	83	2	1	2	1	2	5	4	5	4	4	6	6	5	4	2	2.9	2.5	0.29	2.7	C70-72	
Thyroid	21	0	95	-	-	-	-	-	1	-	4	3	1	4	3	2	2	-	1.1	1.0	0.08	0.9	C73	
Hodgkin lymphoma	20	0	100	-	-	-	-	-	1	3	4	1	-	3	2	2	2	-	1.1	0.9	0.09	1.0	C81	
Non-Hodgkin lymphoma	70	1	100	-	-	-	-	-	3	4	3	4	9	4	8	9	9	5	3.7	3.2	0.34	3.4	C82-85, C96	
Multiple myeloma	21	0	100	-	-	-	-	-	-	-	-	1	2	1	3	4	3	4	1.1	1.0	0.13	1.1	C90	
Lymphoid leukaemia	10	1	100	-	-	-	-	-	-	-	-	-	-	-	2	1	-	3	0.5	0.5	0.08	0.6	C91	
Myeloid leukaemia	30	0	100	2	1	1	2	1	6	1	2	2	1	3	1	3	2	2	1.6	1.4	0.15	1.6	C92-94	
Leukaemia, unspecified	23	0	100	3	3	1	6	-	2	-	-	-	2	1	1	2	-	-	1.2	1.1	0.10	1.4	C95	
Other and unspecified	269	7	58	4	3	4	5	4	7	2	5	19	16	28	24	29	31	28	14.3	12.4	1.47	13.8	O&U	
All sites	2363	83	92	13	14	25	31	18	34	40	42	94	169	213	286	298	296	262	115.2	100.0	12.46	109.9	C00-96 exc. C44	
All sites except C44	2168	27	91	13	14	25	30	17	32	38	38	89	160	198	272	281	275	245	115.2	100.0	12.46	109.9	C00-96 exc. C44	

Average annual population 39308 47191 49243 53083 50440 48282 54732 46231 46553 49346 42673 35537 25891 15399 10443 13105 627457

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Mauritius (2010–2012)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)														Crude rate	CR %	ASR (W)	ICD-10		
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-					70-	75+
Mouth	55	1	98	-	-	-	-	1	-	3	3	3	6	4	4	9	8	3	10	2.8	1.7	0.25	2.3	C00-06
Salivary gland	9	1	100	-	-	-	-	-	-	-	-	-	2	1	1	1	-	1	1	0.5	0.3	0.04	0.4	C07-08
Nasopharynx	2	0	100	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	0.1	C11
Other pharynx	10	0	100	-	-	-	-	-	-	-	-	-	2	1	2	1	3	1	1	0.5	0.3	0.05	0.4	C09-10, C12-14
Oesophagus	28	0	93	-	-	-	-	-	-	-	1	-	3	2	4	1	2	2	13	1.4	0.9	0.09	1.0	C15
Stomach	77	1	97	-	-	-	-	3	-	2	4	5	10	13	7	9	10	10	13	4.0	2.4	0.39	3.2	C16
Colon	173	1	98	-	-	-	-	3	2	2	5	13	31	27	18	22	18	18	31	8.9	5.4	0.84	7.0	C18
Rectum	103	1	100	-	-	-	-	2	1	5	3	12	12	12	15	6	9	25	5.3	3.2	0.43	4.1	C19-20	
Anus	6	0	100	-	-	-	-	-	-	2	1	2	2	1	1	1	1	-	-	0.3	0.2	0.03	0.3	C21
Liver	18	0	89	-	-	-	-	-	-	1	-	2	-	1	4	5	3	2	2	0.9	0.6	0.12	0.8	C22
Gallbladder etc.	23	0	91	-	-	-	-	-	-	1	-	1	1	3	5	3	1	8	1.2	0.7	0.09	0.9	C23-24	
Pancreas	28	0	82	-	-	-	-	-	-	2	4	3	4	5	2	2	2	5	1.4	0.9	0.12	1.1	C25	
Larynx	8	0	100	-	-	-	-	-	-	1	-	1	-	2	1	1	-	1	2	0.4	0.2	0.03	0.3	C32
Trachea, bronchus, and lung	69	1	84	-	-	-	-	-	-	1	3	3	11	9	9	10	8	14	3.6	2.1	0.34	2.8	C33-34	
Bone	8	0	50	-	-	-	-	-	-	2	-	2	1	1	1	-	-	-	0.4	0.2	0.03	0.4	C40-41	
Melanoma of skin	8	0	100	-	-	-	-	-	-	-	2	-	2	-	3	-	-	1	0.4	0.2	0.03	0.3	C43	
Non-melanoma skin	160	62	100	-	-	-	-	-	-	1	3	3	7	12	10	7	12	9	11	8.3	5.7	0.71	6.4	C44
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.0	0.01	0.1	C45	
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C46	
Connective and soft tissue	26	1	96	-	-	-	-	2	-	1	2	1	1	1	4	4	2	2	1.3	0.8	0.13	1.3	C47, C49	
Breast	1266	19	100	-	-	-	-	1	2	9	39	69	126	181	183	161	116	70	121	65.3	39.4	5.77	51.7	C50
Vulva	23	0	100	-	-	-	-	-	-	-	-	1	-	2	4	1	-	2	1.2	0.7	0.07	0.8	C51	
Vagina	19	0	89	-	-	-	-	-	-	1	2	1	3	3	3	1	-	5	1.0	0.6	0.06	0.7	C52	
Cervix uteri	262	7	98	-	-	-	-	2	3	12	16	27	36	33	30	33	15	28	20	13.5	8.1	1.27	10.8	C53
Uterus	205	3	99	-	-	-	-	-	-	1	6	11	9	23	33	39	33	24	23	10.6	6.4	1.14	8.6	C54-55
Ovary	157	2	92	1	-	2	-	5	3	6	3	12	22	39	17	16	11	10	8	8.1	4.9	0.72	6.6	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C58	
Kidney and renal pelvis	26	1	96	2	-	-	-	-	-	-	1	1	2	2	2	4	5	3	5	1.3	0.8	0.14	1.2	C64-65
Bladder	31	0	100	-	-	-	-	-	-	-	2	1	6	3	1	8	2	8	1.6	1.0	0.15	1.3	C67	
Ureter and other urinary	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	0.1	C66, C68	
Eye	3	0	100	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0.2	0.1	0.01	0.2	C69	
Brain and nervous system	52	1	81	3	2	-	2	3	1	3	5	3	8	5	4	3	1	3	2.7	1.6	0.21	2.5	C70-72	
Thyroid	36	0	94	-	-	-	-	2	4	3	7	1	7	-	3	-	1	4	4	1.9	1.1	0.15	1.5	C73
Hodgkin lymphoma	13	0	100	-	-	-	-	1	2	2	1	1	2	-	2	-	2	2	0.7	0.4	0.06	0.6	C81	
Non-Hodgkin lymphoma	52	0	100	-	-	-	-	2	2	3	1	6	6	4	7	5	3	5	8	2.7	1.6	0.23	2.1	C82-85, C96
Multiple myeloma	27	0	100	-	-	-	-	-	-	-	-	3	4	2	5	4	4	6	3	1.4	0.8	0.17	1.2	C90
Lymphoid leukaemia	4	0	100	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	0.1	0.01	0.1	C91	
Myeloid leukaemia	30	2	100	1	1	-	1	1	2	-	1	2	2	6	1	3	4	3	1.5	0.9	0.16	1.5	C92-94	
Leukaemia, unspecified	17	2	100	-	-	-	-	-	-	1	2	-	1	2	1	2	2	2	1	0.9	0.5	0.07	0.8	C95
Other and unspecified	340	11	49	3	1	-	11	2	7	5	13	25	32	31	35	35	32	39	58	17.5	10.6	1.61	14.3	O&U
All sites	3377	117	93	13	7	6	19	24	44	87	146	256	361	436	421	414	322	271	433	174.3	100.0	15.76	139.8	C00-96
All sites except C44	3217	55	92	13	7	6	19	24	43	84	143	249	349	426	414	402	313	260	410	166.0	100.0	15.04	133.3	C00-96 exc. C44
Average annual population	38403	45594	47578	52185	49165	47396	55523	47301	47259	49747	43656	37274	29040	19131	14103	22513	645868							

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Seychelles

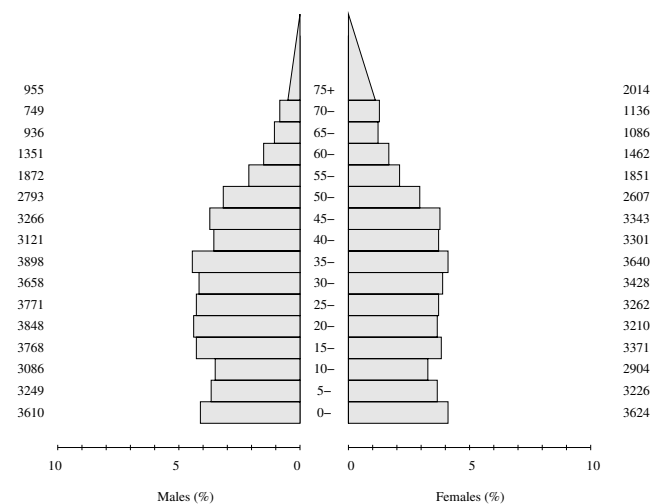
The Seychelles National Cancer Registry (SNCR) was established in 2008 under the Cancer and Mental Health Programme of the Ministry of Health within the Public Health Department, to address the burden of cancer in the country. Registration is not legally mandatory in Seychelles.

The SNCR is located within the diagnostic centre of the Seychelles Hospital. It has one full-time registrar. Five medical specialists provide assistance with stage coding, and a part-time laboratory technologist is responsible for notifying the registry of all new cancer cases recorded at the hospital's laboratory. The registry also has an advisory committee consisting of various medical and public health experts.

The SNCR data presented in this volume are for the registry's coverage area of the entire country of Seychelles. Although the country consists of more than 100 islands, only 4 are permanently inhabited: Mahé (home to almost 90% of the national population), Praslin, La Digue, and Silhouette. Administratively, Seychelles is divided into 26 districts. About 85–90% of the population is Creole, and the predominant religion is Roman Catholicism.

The population of Seychelles is estimated by the National Bureau of Statistics to have been 89 949 in 2013. The average annual population-at-risk estimates corresponding to the SNCR data presented in this volume are shown in the population pyramid.

Seychelles (2009–2012)
Population pyramid (average annual person-years by sex and age group)



Source: National Bureau of Statistics Seychelles; annual estimates, based on 2012 census

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

The 404-bed Seychelles Hospital has a variety of wards, for female health, male health, surgery, internal medicine, paediatrics, radiology, pathology and cytology, and psychiatry. The pathology laboratory is the only one in the country. It employs two pathologists and three technicians and has maintained an electronic database since 2005. However, the laboratory software is mainly used for registering and printing out pathological findings; the data to be reported to the cancer registry are saved in spreadsheet files. The haematology laboratory employs five technicians, and bone marrow examinations and immunodiagnostics are available. The diagnostics unit offers radiography, digital mammography, computed tomography (CT), magnetic resonance imaging (MRI), colonoscopy, and gastroscopy services.

All health centres and hospital wards in Seychelles record case information for the SNCR in dedicated books provided by the registry; the pertinent patient data are recorded in these books at the time of each visit and upon prescription of palliative treatment. The SNCR collects the books every 3 months and then returns them once the data have been entered into the registry database. On the islands of Praslin and La Digue, nurses have been appointed to fill in these cancer register books.

The SNCR uses a combination of active and passive case finding. Upon confirmation of diagnosis, every notification form is checked at the registry and corrected if necessary. After a patient has received treatment, the registrar collects the patient's medical record from the ward. The availability and location of the medical records can be verified in the hospital's documentation centre. The documentation centre's database contains personal identification data and the medical record number but no medical data. Based on the data from the medical record, the registrar completes the cancer notification form. Each patient's national personal identification number is always included in the patient information, because the number is required to obtain medical treatment.

The registry uses IARC's CanReg4 software. When a Seychelles resident is diagnosed and/or treated overseas, the hospital in Seychelles receives the patient's medical records from the hospital abroad, and the notification form is completed at the registry on the basis of those records.

The cancer notification data are usually checked with the respective consultant in the notifying facility. When the cancer register books are collected, every case is cross-checked with the registry database, which is then updated as necessary. For new cases, records are tracked and identified, cancer notification forms are completed, and the data are entered into the registry database. Mortality data are used to register date and cause of death.

Each time a new notification is entered, the database is checked for duplicate registrations. After the end of each data year, all registrations for that year are checked for missing data and completed if possible.

YEARS PRESENTED

2009–2012 (a 4-year period)

NOTES

A total of 613 cases were registered during the 4-year period analysed. The rate of registration was constant, at 12–13 cases per month.

In males, the age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is somewhat higher than

Table 4.05. The number of deaths due to cancer, as reported in the WHO Mortality Database (WHO, 2017), and the corresponding mortality-to-incidence (M:I) ratios in males (M) and females (F) in Seychelles in 2009–2012, by anatomical site

Anatomical site (ICD-10 code)	Sex	Deaths	M:I (%)
Lip, oral cavity, and pharynx (C00–14)	M	44	78
	F	1	14
Oesophagus (C15)	M	13	108
	F	4	133
Stomach (C16)	M	7	116
	F	2	40
Colorectum and anus (C18–21)	M	25	45
	F	24	68
Liver (C22)	M	16	228
	F	2	100
Trachea, bronchus, and lung (C33–34)	M	21	161
	F	6	60
Breast (C50)	F	43	58
	F	70	27
Uterus, other and unspecified (C54–55)	F	30	107
	F	30	107
Prostate (C61)	M	73	71
Non-Hodgkin lymphoma (C82–85, C96)	M	8	46
	F	4	28
Leukaemia (C91–95)	M	14	127
	F	4	57
All sites (C00–97)	M	282	80
	F	176	57

the value for eastern Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of 1.67. In females, the ASR is lower than the estimate for eastern Africa, with an O/E of 0.78, due mainly to the low incidence of cancer of the cervix; at 12.7 cases per 100 000 person-years, the ASR of cervical cancer in Seychelles is less than one third of the estimate for eastern Africa. In males, the incidence rates of cancers of the oral cavity and prostate are high. In both sexes, the ASRs of colorectal cancers are the highest reported in this volume, at 32.4 cases per 100 000 person-years in males and 14.2 cases per 100 000 person-years in females.

The overall percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer) is reasonable: 82% in males and 86% in females. A total of 22 cases (excluding non-melanoma skin cancer) were registered on the basis of death certificate information only.

Because registration of death by cause is comprehensive in Seychelles, the number of deaths due to cancer can be compared with the number of cancer cases registered for the same time period. The reported numbers of deaths due to cancer and the calculated mortality-to-incidence (M:I) ratios for 2009–2012 are shown in Table 4.05.

The numbers of deaths due to cancers at individual anatomical sites are small, which gives rise to some uncertainty in the M:I ratios, but the overall ratio is reasonable, at 80% in males and 57% in females; the equivalent figures for eastern Africa reported in GLOBOCAN 2012 are 79% in males and 68% in females. The M:I ratios are > 100% for cancers at several anatomical sites that are associated with poor prognosis and/or relatively high levels of inaccuracy in the specification of cause of death (e.g. the oesophagus, stomach, liver, and lung).

SUMMARY

Although the numbers of registrations are relatively small, resulting in some variability in the calculated rates, the results appear to be a reasonably accurate reflection of the country's true cancer profile.

PUBLICATIONS AND ACHIEVEMENTS

The SNCR became a member of the African Cancer Registry Network (AFCRN) in 2012.

Parkin DM, Finesse A (2014). Seychelles National Cancer Registry Report for 2009–2011. Available from: <https://afcrn.org/attachments/article/96/SNCR%20Triennial%20Report%202009-2011.pdf>.

Seychelles (2009–2012)

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

Site	All ages	Age group (years)	Age group (years)													Crude rate %	CR %	ASR (W)	ICD-10							
			0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-					65-	70-	75+				
Mouth	27	0	100	0	-	-	-	-	-	-	2	-	-	6	2	9	4	-	-	-	4	15.4	7.9	1.36	14.3	C00-06
Salivary gland	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.6	0.3	0.07	0.5	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C11
Other pharynx	28	0	89	4	-	-	-	-	-	-	2	4	4	4	4	7	1	3	3	3	3	15.9	8.2	1.96	16.3	C09-10, C12-14
Oesophagus	12	0	92	0	-	-	-	-	-	-	-	-	-	-	1	1	1	1	5	4	4	6.8	3.5	1.13	7.5	C15
Stomach	34	0	83	0	-	-	-	-	-	-	-	-	-	-	1	2	1	2	1	1	1	3.4	1.8	0.46	3.7	C16
Colon	6	0	82	9	-	-	-	-	-	-	-	-	-	-	5	4	8	5	8	5	8	19.3	10.0	2.54	20.1	C18
Rectum	21	0	95	0	-	-	-	-	-	-	-	-	-	-	2	4	2	2	4	3	3	12.0	6.2	1.63	12.3	C19-20
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C21
Liver	7	0	43	29	-	-	-	-	-	-	-	-	-	-	3	-	2	1	-	1	1	4.0	2.1	0.45	4.1	C22
Gallbladder etc.	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.6	0.3	0.07	0.5	C23-24
Pancreas	5	0	60	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2.8	1.5	0.28	2.8	C25
Larynx	16	0	94	6	-	-	-	-	-	-	-	-	-	-	5	2	2	4	2	2	5	9.1	4.7	1.45	9.8	C32
Trachea, bronchus, and lung	13	0	23	8	-	-	-	-	-	-	-	-	-	-	1	2	1	1	2	5	7.4	3.8	0.78	7.5	C33-34	
Bone	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	0.6	0.07	1.1	C40-41
Melanoma of skin	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.6	0.3	0.04	0.4	C43
Non-melanoma skin	11	0	91	9	-	-	-	-	-	-	-	-	-	-	3	-	1	1	1	4	4	6.3	0.57	6.1	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	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.3	0.09	0.7	C47, C49
Breast	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.3	0.04	0.4	C50
Penis	2	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	1.1	0.6	0.20	1.3	C60
Prostate	103	0	75	6	-	-	-	-	-	-	-	-	-	-	2	7	11	12	25	45	58.6	30.2	7.39	63.1	C61	
Testis	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	0.6	0.10	1.1	C62
Kidney and renal pelvis	4	0	75	25	-	-	-	-	-	-	1	-	-	-	-	-	1	1	1	1	1	2.3	1.2	0.43	2.6	C64-65
Bladder	9	0	78	0	-	-	-	-	-	-	-	-	-	-	1	-	1	1	1	4	5.1	2.6	0.48	5.2	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.3	0.17	0.7	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C73
Hodgkin lymphoma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0.6	0.3	0.04	0.4	C81
Non-Hodgkin lymphoma	13	0	100	0	-	-	-	-	-	-	-	-	-	-	2	4	4	2	2	2	7.4	3.8	1.03	7.6	C82-85, C96	
Multiple myeloma	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	0.6	0.23	1.5	C90
Lymphoid leukaemia	7	0	100	0	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	4.0	2.1	0.44	4.2	C91
Myeloid leukaemia	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	0.6	0.09	1.3	C92-94
Leukaemia, unspecified	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	0.6	0.09	1.3	C95
Other and unspecified	17	0	94	0	-	-	-	-	-	-	-	-	-	-	1	3	7	2	2	2	2	9.7	5.0	1.09	9.7	O&U
All sites	352	0	82	5	-	1	1	-	-	3	3	10	20	36	49	46	38	54	88	84	200.3	24.77	208.4	208.4	C00-96	
All sites except C44	341	0	82	4	-	1	1	-	-	3	3	10	19	33	49	45	37	53	84	84	194.1	100.0	24.21	202.3	C00-96 exc. C44	
Average annual population			3610	3249	3086	3768	3848	3770	3658	3898	3121	3266	2793	1872	1350	936	749	955	43929							

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Seychelles (2009–2012)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)										Crude rate	CR %	ASR (W)	ICD-10					
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-
Mouth	5	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	1.9	0.26	2.5	C00-06
Salivary gland	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.04	0.4	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C11
Other pharynx	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.07	0.5	C09-10, C12-14
Oesophagus	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.2	0.27	1.9	C15
Stomach	5	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	1.9	0.44	3.2	C16
Colon	15	0	67	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.6	5.8	0.77	6.6	C18
Rectum	19	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.9	7.3	0.79	7.6	C19-20
Anus	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.05	0.5	C21
Liver	2	0	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	0.8	0.08	0.9	C22
Gallbladder etc.	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	0.8	0.15	0.9	C23-24
Pancreas	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.03	0.4	C25
Larynx	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.2	0.19	1.7	C32
Trachea, bronchus, and lung	10	0	40	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8	3.9	0.28	3.8	C33-34
Bone	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C40-41
Melanoma of skin	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.11	0.4	C43
Non-melanoma skin	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.15	1.1	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	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	0.8	0.23	1.1	C47, C49
Breast	74	0	88	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42.6	28.6	3.82	33.8	C50
Vulva	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	0.8	0.07	0.8	C51
Vagina	6	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.5	2.3	0.43	3.1	C52
Cervix uteri	28	0	96	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.1	10.8	1.29	12.7	C53
Uterus	13	0	85	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5	5.0	0.67	6.1	C54-55
Ovary	9	0	78	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.2	3.5	0.46	4.5	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C58
Kidney and renal pelvis	3	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.2	0.12	1.3	C64-65
Bladder	4	0	75	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	1.5	0.18	1.5	C67
Ureter and other urinary	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.03	0.4	C66, C68
Eye	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.04	0.4	C69
Brain and nervous system	2	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	0.8	0.14	1.3	C70-72
Thyroid	7	0	86	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0	2.7	0.33	3.8	C73
Hodgkin lymphoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C81
Non-Hodgkin lymphoma	14	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	5.4	0.94	7.4	C82-85, C96
Multiple myeloma	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	0.8	0.13	1.2	C90
Lymphoid leukaemia	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.11	0.4	C91
Myeloid leukaemia	5	0	100	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	1.9	0.21	3.0	C92-94
Leukaemia, unspecified	1	0	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.4	0.09	0.7	C95
Other and unspecified	15	0	73	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.6	5.8	0.79	6.6	O&U
All sites	261	0	87	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	150.1	13.75	12.27	121.6	C00-96
All sites except C44	259	0	86	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	149.0	10.0	13.60	121.6	C00-96 exc. C44
Average annual population					3624	3226	2904	3371	3210	3262	3428	3640	3301	3342	2607	1851	1462	1086	1136	2014	43463		

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

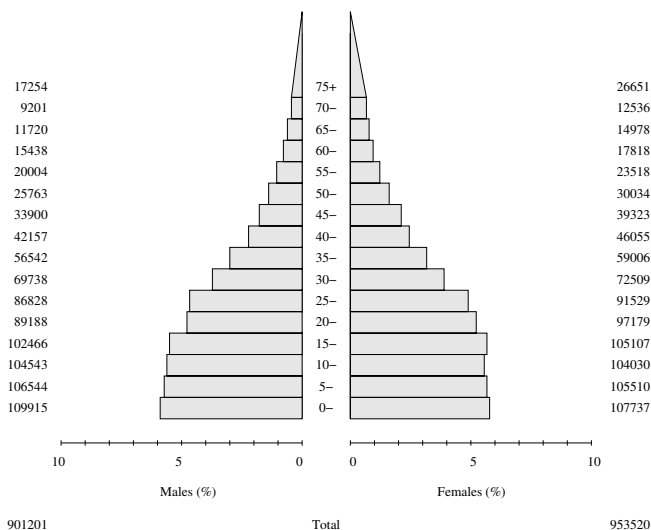
Botswana

The Botswana National Cancer Registry (BNCR) was founded in 1999 as a population-based cancer registry. After a period of inactivity, registry activity was resumed in 2003–2004 with assistance from IARC. The BNCR is located in the Department of Public Health and funded by the Ministry of Health and Wellness. The registry is staffed by a registry manager and two registrars. Cancer registration is one of the activities of Botswana's Non Communicable Disease (NCD) Programme.

The BNCR data presented in this volume are for the registry's coverage area, which comprises all cancer patients diagnosed and managed in Botswana. The Tswana are the majority ethnic group in the country, accounting for 79% of the population. It has been estimated that 70% of Botswana's citizens would identify themselves as Christian: predominantly Anglican, Methodist, or belonging to the United Congregational Church of Southern Africa.

The population of Botswana is estimated to have been 2 024 787 in 2011 (at the census). The average annual population-at-risk estimates corresponding to the BNCR data presented in this volume are shown in the population pyramid.

Botswana (2005–2008)
Population pyramid (average annual person-years by sex and age group)



Annual estimates, based on Botswana population and housing censuses of 2001 and 2011

The BNCR collects cancer cases from four public facilities, which offer basic diagnostic and treatment services, and one private hospital, which offers radiation therapy services that are available to public patients through government subsidy. Health care, including oncology care, is free in Botswana.

Data collection is active. The registrars periodically visit the information sources to carry out case finding and abstraction. The registry collects information from two public referral hospitals (Princess Marina Hospital

and Nyangabgwe Referral Hospital) and two district oncology centres (Letsholathebe II Memorial Hospital and Sekgoma Memorial Hospital), as well as from the radiotherapy department of Gaborone Private Hospital. The registry also collects information from pathology laboratories and the Integrated Patient Management System (IPMS).

Information on in-hospital deaths due to cancer is obtained from the Health Statistics Unit of the Ministry of Health's Department of Policy, Planning, Monitoring and Evaluation (DPPME).

The registry uses IARC's CanReg4 software for data entry and management.

YEARS PRESENTED

2005–2008 (a 4-year period)

NOTES

The most complete 4-year period in the years leading up to 2010 was selected for analysis. During this period, the average rate of registration was 129 cases per month.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 111.5 cases per 100 000 person-years in males and 107.8 cases per 100 000 person-years in females. These values are about one half to two thirds of the values for southern Africa reported in GLOBOCAN 2012. The rates of cancers at most of the individual anatomical sites are also comparatively low, in particular the ASR of prostate cancer, at 9.2 cases per 100 000 person-years. The only ASRs that are relatively high are those of Kaposi sarcoma (at 24.3 cases per 100 000 person-years in males and 15.4 cases per 100 000 person-years in females) and those of cancers of the eye, with both findings presumably related to the prevalence of HIV/AIDS in Botswana, which was the highest in the world in 2014 (UNAIDS, 2017).

The percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer), which is influenced by the large number of Kaposi sarcoma cases, is reasonable: 74% in males and 84% in females. The MV% is relatively high for cases at some anatomical sites (e.g. the cervix, at 97%).

SUMMARY

The registry has a moderate degree of underregistration, which may be explained by inconsistencies in data collection and lack of reporting by diagnosing clinicians.

PUBLICATIONS AND ACHIEVEMENTS

The BNCR became a member of the African Cancer Registry Network (AFCRN) in 2013.

- Efstathiou JA, Bvochora-Nsingo M, Gierga DP, Alphonse Kayembe MK, Mmalane M, Russell AH, et al. (2014). Addressing the growing cancer burden in the wake of the AIDS epidemic in Botswana: the BOTSOGO collaborative partnership. *Int J Radiat Oncol Biol Phys.* 89(3):468–75. <http://dx.doi.org/10.1016/j.ijrobp.2014.03.033> PMID:24929156
- Lazenby M, Sebegu M, Swart NC, Lopez L, Peterson K (2016). Symptom burden and functional dependencies among cancer patients in Botswana suggest a need for palliative care nursing. *Cancer Nurs.* 39(1):E29–38. <https://doi.org/10.1097/NCC.0000000000000249> PMID:25881812

Botswana (2005–2008)

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

Site	All ages		Age group (years)										Crude rate	%	CR	ASR (W)	ICD-10							
	unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-						50-	55-	60-	65-	70-	75+	
Mouth	135	0	100	-	-	-	1	2	-	4	6	15	23	15	19	20	9	21	3.7	4.8	0.78	6.5	C00-06	
Salivary gland	24	0	100	-	-	-	1	1	1	3	3	4	1	2	2	3	2	6	0.7	0.9	0.11	1.0	C07-08	
Nasopharynx	31	0	97	-	3	2	3	1	4	1	1	4	4	1	-	3	2	2	0.9	1.1	0.12	1.1	C11	
Other pharynx	67	0	97	-	-	1	-	1	2	-	6	5	17	9	12	5	9	9	1.9	2.4	0.43	3.3	C09-10, C12-14	
Oesophagus	243	0	88	-	-	-	-	1	5	7	21	27	32	36	26	24	64	6.7	8.7	1.34	11.4	C15		
Stomach	24	0	79	-	-	-	-	-	-	2	1	4	5	3	3	3	5	5	0.7	0.9	0.13	1.1	C16	
Colon	39	0	97	-	-	-	1	2	2	-	4	3	5	6	7	2	3	3	1.1	1.4	0.23	1.9	C18	
Rectum	37	0	92	-	-	-	1	1	1	3	3	3	4	7	2	5	7	1.0	1.3	0.20	1.6	C19-20		
Anus	9	0	89	-	-	-	-	1	2	1	2	-	2	1	-	-	1	1	0.2	0.3	0.03	0.4	C21	
Liver	152	0	67	3	-	1	1	2	2	4	9	11	18	21	13	19	15	31	4.2	5.4	0.82	6.9	C22	
Gallbladder etc.	4	0	100	-	-	-	-	-	-	-	-	1	-	1	1	-	-	1	0.1	0.1	0.02	0.2	C23-24	
Pancreas	29	0	76	-	-	-	-	-	2	1	1	5	5	2	1	-	4	8	0.8	1.0	0.15	1.3	C25	
Larynx	82	0	96	2	-	-	-	-	1	1	2	6	10	13	15	15	5	12	2.3	2.9	0.51	4.1	C32	
Trachea, bronchus, and lung	149	0	85	-	-	-	-	-	1	1	4	8	23	17	21	22	19	33	4.1	5.3	0.93	7.3	C33-34	
Bone	27	0	96	-	1	2	5	3	1	1	2	1	1	1	-	1	-	3	0.7	1.0	0.06	0.8	C40-41	
Melanoma of skin	31	0	100	1	-	-	-	-	-	1	2	5	2	1	1	4	1	13	0.9	1.1	0.11	1.2	C43	
Non-melanoma skin	112	0	100	-	1	2	3	3	1	9	8	5	13	9	10	9	10	7	3.1	4.6	0.52	4.6	C44	
Mesothelioma	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.00	0.1	C45		
Kaposi sarcoma	773	0	26	2	6	5	6	16	83	182	168	107	71	46	43	12	7	6	21.4	27.5	2.19	24.3	C46	
Connective and soft tissue	42	0	100	2	-	-	1	6	2	3	2	3	4	7	1	3	4	1	1.2	1.5	0.20	1.7	C47, C49	
Breast	21	0	100	-	-	-	-	1	-	-	-	-	1	3	2	2	3	8	0.6	0.7	0.11	0.9	C50	
Penis	55	0	100	1	-	-	-	1	1	7	2	3	8	2	3	5	7	12	1.5	2.0	0.26	2.2	C60	
Prostate	210	0	95	-	-	-	-	-	2	1	2	8	11	17	28	42	102	5.8	7.5	1.12	9.2	C61		
Testis	12	0	92	-	-	-	-	2	1	2	1	-	1	1	1	-	1	2	0.3	0.4	0.04	0.4	C62	
Kidney and renal pelvis	25	0	88	1	3	1	-	-	-	1	4	-	3	2	-	2	3	5	0.7	0.9	0.11	1.0	C64-65	
Bladder	18	0	78	-	-	-	-	-	-	-	-	-	1	2	5	3	2	5	0.5	0.6	0.12	0.9	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	134	0	99	12	1	1	1	9	18	29	23	15	9	8	1	3	-	5	3.7	4.8	0.38	4.5	C69	
Brain and nervous system	22	0	82	1	4	5	2	1	2	-	1	-	2	1	1	1	-	-	0.6	0.8	0.06	0.7	C70-72	
Thyroid	9	0	89	-	-	-	-	-	-	-	-	1	1	2	-	2	-	1	0.2	0.3	0.04	0.4	C73	
Hodgkin lymphoma	34	0	100	1	2	2	4	2	6	5	2	1	-	1	-	1	1	2	0.9	1.2	0.08	0.9	C81	
Non-Hodgkin lymphoma	179	0	98	6	4	4	7	6	12	18	30	25	18	9	6	8	1	2	5.0	6.4	0.60	6.3	C82-85, C96	
Multiple myeloma	17	0	94	-	-	-	-	-	-	-	-	3	1	2	1	3	2	5	0.5	0.6	0.10	0.8	C90	
Lymphoid leukaemia	25	0	100	4	8	2	1	2	-	2	1	2	-	1	1	1	-	-	0.7	0.9	0.06	0.8	C91	
Myeloid leukaemia	24	0	100	-	2	1	1	3	1	3	1	2	2	-	2	1	-	-	0.7	0.9	0.09	0.9	C92-94	
Leukaemia, unspecified	6	0	83	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	0.2	0.2	0.04	0.3	C95	
Other and unspecified	118	0	89	4	2	1	1	1	5	4	7	8	18	11	7	10	18	9	3.3	4.2	0.66	5.3	O&U	
All sites	2921	0	75	40	36	29	38	56	140	266	286	230	255	246	259	210	233	189	81.0	100.0	12.75	116.1	C00-96	
All sites except C44	2809	0	74	40	35	27	35	53	139	257	278	225	242	237	245	201	223	182	77.9	100.0	12.23	111.5	C00-96 exc. C44	
Average annual population				109915	106544	104543	102466	89188	86828	69738	56542	42157	33900	25763	20004	15438	11720	9201	17254	901200				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Botswana (2005–2008)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)											Crude rate	%	CR	ASR (W)	ICD-10						
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-						55-	60-	65-	70-	75+	
Mouth	40	0	98	1	-	-	-	-	1	-	2	2	3	3	4	1	4	4	6	9	1.0	1.2	0.17	1.4	C00-06	
Salivary gland	18	0	100	-	-	-	-	2	2	1	-	-	-	-	-	2	1	3	1	4	0.5	0.5	0.07	0.6	C07-08	
Nasopharynx	16	0	94	-	-	1	2	1	2	1	-	-	-	-	-	-	1	1	1	2	0.4	0.5	0.05	0.5	C11	
Other pharynx	8	0	88	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	1	2	0.2	0.2	0.04	0.3	C09-10, C12-14	
Oesophagus	112	0	89	-	-	-	-	-	-	1	-	1	3	5	8	10	13	11	20	40	2.9	3.3	0.50	3.9	C15	
Stomach	13	0	85	-	-	-	-	-	-	-	1	1	1	1	-	1	1	1	3	3	0.3	0.4	0.06	0.4	C16	
Colon	42	0	93	-	-	2	2	1	1	4	3	4	3	4	9	3	3	3	1	9	1.1	1.3	0.15	1.5	C18	
Rectum	24	0	100	-	-	1	1	5	3	1	4	2	1	4	2	1	1	2	3	3	0.6	0.7	0.09	0.8	C19-20	
Anus	8	0	100	-	-	-	-	-	-	-	2	2	1	1	-	-	-	-	-	1	0.2	0.2	0.03	0.3	C21	
Liver	82	0	62	-	-	1	1	-	-	2	2	7	7	6	7	6	2	11	6	24	2.1	2.4	0.29	2.7	C22	
Gallbladder etc.	9	0	89	-	-	-	-	-	-	-	-	1	2	-	-	-	-	1	2	3	0.2	0.3	0.04	0.3	C23-24	
Pancreas	35	0	74	-	-	-	-	-	-	-	-	1	2	1	2	6	2	6	3	12	0.9	1.0	0.14	1.2	C25	
Larynx	8	0	100	-	2	1	-	-	-	-	2	-	1	-	-	1	1	-	-	-	0.2	0.2	0.02	0.2	C32	
Trachea, bronchus, and lung	42	0	76	-	-	-	-	-	-	2	2	-	2	2	3	6	4	6	4	13	1.1	1.3	0.18	1.5	C33-34	
Bone	27	0	100	-	-	5	9	2	2	2	2	-	1	1	1	2	1	1	-	1	0.7	0.8	0.06	0.7	C40-41	
Melanoma of skin	39	0	100	-	-	-	-	-	-	1	-	1	8	6	4	5	3	4	7	7	1.0	1.2	0.18	1.5	C43	
Non-melanoma skin	98	0	99	-	-	2	3	4	9	7	13	7	7	6	5	8	7	5	8	20	2.6	-	0.33	3.1	C44	
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45	
Kaposi sarcoma	595	0	52	1	11	4	3	53	126	159	93	62	31	24	15	5	4	4	1	3	15.6	17.8	1.26	15.4	C46	
Connective and soft tissue	49	0	100	2	1	-	3	2	6	1	6	2	4	2	6	2	2	2	4	6	1.3	1.5	0.16	1.5	C47, C49	
Breast	510	0	98	-	-	-	-	3	17	31	30	54	72	62	45	43	43	43	36	74	13.4	15.2	2.04	18.2	C50	
Vulva	47	0	100	-	-	-	1	1	6	9	6	5	5	5	2	3	1	1	1	3	1.2	1.4	0.14	1.5	C51	
Vagina	6	0	100	-	-	-	-	-	-	1	1	2	-	-	-	-	-	-	1	1	0.2	0.2	0.03	0.2	C52	
Cervix uteri	795	0	97	-	-	-	6	26	77	117	117	86	90	89	61	57	48	54	84	84	20.8	23.7	2.98	27.1	C53	
Uterus	101	0	97	-	-	-	-	-	4	1	7	8	7	8	7	8	14	14	16	22	2.6	3.0	0.50	3.8	C54-55	
Ovary	76	0	91	1	2	3	1	2	8	3	4	8	4	8	4	8	9	6	4	13	2.0	2.3	0.28	2.6	C56	
Placenta	13	0	100	-	-	-	1	1	4	3	2	2	2	-	-	-	-	-	-	-	0.3	0.4	0.02	0.3	C58	
Kidney and renal pelvis	21	0	95	4	1	-	2	1	3	-	-	1	1	1	1	-	-	3	3	1	0.6	0.6	0.08	0.7	C64-65	
Bladder	15	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	0.4	0.4	0.07	0.5	C67	
Ureter and other urinary	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	0.1	C66, C68	
Eye	170	0	99	2	2	-	2	5	17	39	34	24	13	8	7	4	3	7	3	3	4.5	5.1	0.48	4.9	C69	
Brain and nervous system	21	0	95	4	1	1	3	2	1	2	1	2	-	1	1	1	-	-	-	-	0.6	0.6	0.04	0.6	C70-72	
Thyroid	23	0	96	-	-	-	-	1	2	1	-	4	-	2	2	3	2	2	2	2	0.6	0.7	0.09	0.8	C73	
Hodgkin lymphoma	37	0	100	-	-	2	1	4	8	5	6	3	2	2	1	1	1	-	-	2	1.0	1.1	0.08	1.0	C81	
Non-Hodgkin lymphoma	172	0	97	-	3	2	4	6	19	29	26	27	12	11	11	6	4	4	4	8	4.5	5.1	0.48	5.1	C82-85, C96	
Multiple myeloma	21	0	100	-	-	-	-	-	-	1	-	1	-	3	4	4	4	-	-	4	0.6	0.6	0.10	0.8	C90	
Lymphoid leukaemia	22	0	100	3	1	1	4	-	1	1	1	-	1	1	1	1	-	-	2	3	0.6	0.7	0.06	0.6	C91	
Myeloid leukaemia	52	0	100	1	2	1	4	3	1	1	1	3	2	-	3	4	2	3	1	1	0.8	1.0	0.12	1.1	C92-94	
Leukaemia, unspecified	7	0	100	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	2	0.2	0.2	0.01	0.2	C95	
Other and unspecified	92	0	90	2	1	1	2	4	3	4	2	6	6	8	10	4	5	12	22	22	2.4	2.7	0.34	3.0	O&U	
All sites	3449	0	84	21	26	23	46	107	257	402	361	339	301	282	246	207	205	215	215	411	90.4	11.75	110.9	110.9	C00-96	
All sites except C44	3351	0	84	21	26	23	44	104	253	393	354	326	294	275	240	202	197	208	208	391	87.9	100.0	11.42	107.8	C00-96 exc. C44	
Average annual population	107736	105510	104030	105107	97178	91529	72509	59006	46055	39323	30034	23518	17818	14978	12536	26650	953516									

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Namibia

The Namibian National Cancer Registry (NNCR) was established in 1995 as a joint project of Rössing Uranium Ltd, the Namibian Ministry of Health and Social Services (the Oncology Clinic), and the Cancer Association of Namibia. To investigate concerns about the potential risks associated with uranium mining in the country, the registry retrospectively collected all cancer cases reported in 1979–1994 to the Windhoek state pathology laboratory and to Namibia’s only existing private pathology laboratory. Since 1995, the NNCR has actively registered both pathology-based and clinical cases diagnosed among residents of all 13 regions of Namibia. Resident cases diagnosed in South Africa are rerouted to the NNCR via a network of South African registries that receive technical support from IARC. The NNCR aims to provide information that will ultimately lead to improved cancer prevention and control in Namibia.

The NNCR is located on the premises of the Cancer Association of Namibia, which facilitates registry activities and provides staff support for the registry. Registry activities are overseen by the chief executive officer of the association. At present, the registry has no independent budget or resources.

The NNCR data presented in this volume are for the registry’s catchment population, which comprises all residents of Namibia. About 87.5% of residents are Black. The Ovambo tribe accounts for about 50% of the population and the Kavango tribe for about 9%. Approximately 80–90% of the population is Christian.

The population of Namibia is estimated to have been 2 104 900 in 2011 (at the census). The average annual population-at-risk estimates corresponding to the NNCR data presented in this volume are shown in the population pyramid.

In 2009, data collection took place only at the Dr A.B. May Cancer Care Centre, to which all cancer patients should have been referred for assessment and possible treatment. There are two pathology laboratories in the country: the state-owned Namibia Institute of Pathology (NIP) and the private PathCare laboratory. Although the pathology reports received from NIP include demographic data, place of residence is noted in less than one third of cases. The printouts received from PathCare note only patient age and sex. Some case information is received from the laboratory in Cape Town, South Africa. There is no clinical haematology service in the catchment area.

Civil registration of deaths by cause is carried out by the Namibia Ministry of Home Affairs and Immigration, but the registry does not have access to death certificates. The quality of cause-of-death information is unknown.

In addition to the pathology reports described above, case finding relies on the receipt of registration forms, which are completed by registered nurses employed by the Cancer Association of Namibia in the admissions unit of the Dr A.B. May Cancer Care Centre. There is currently no active case finding.

The registry uses IARC’s CanReg5 software for data entry and checks. There has been no formal evaluation of registry quality.

Cases are coded by Cancer Association of Namibia staff according to ICD-O-3. Only authorized personnel can access registry data; the CanReg file is password-protected, and the registry office is kept locked.

YEARS PRESENTED

2009 (a 1-year period)

NOTES

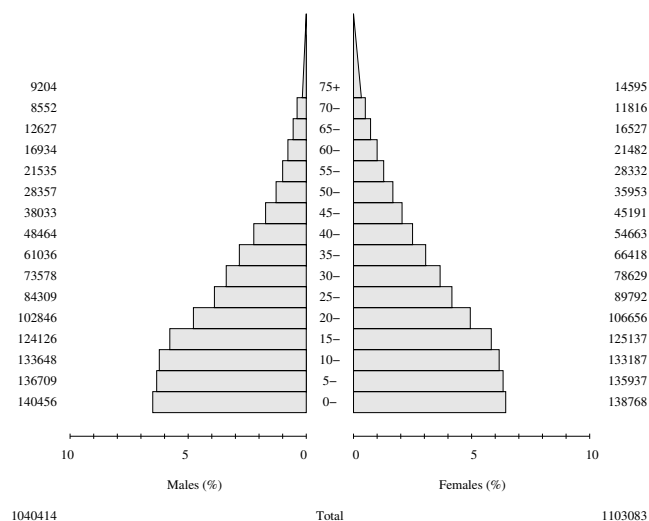
Of the registry data available in 2014, only the data for 2009 were relatively complete; the average rate of registration for that year (156 cases per month) was double the average for the preceding 3 years.

A total of 1878 cases were registered in 2009. The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 166.9 cases per 100 000 person-years in males and 120.9 cases per 100 000 person-years in females. These values are somewhat lower than the values for southern Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of 0.75–0.80. The incidence rates are low for cancers at most individual anatomical sites, with the exception of Kaposi sarcoma and cancers of the oral cavity and pharynx. The incidence rates of childhood cancers are very low, with no cases of leukaemia and only 1 case of non-Hodgkin lymphoma recorded in patients aged 0–14 years.

SUMMARY

The registry relies on data capture primarily from the oncology service in the capital city of Windhoek, so the moderate degree of underregistration (as suggested by the variability in registration rates and the low

Namibia (2009)
Population pyramid (average annual person-years by sex and age group)



Estimates based on the Namibian 2011 population and housing census

incidence rates of cancers at some anatomical sites and in some age groups) is not surprising.

PUBLICATIONS AND ACHIEVEMENTS

The NNCR became a member of the African Cancer Registry Network (AFCRN) in 2013. There are three published reports of the registry's results, pertaining to the periods of 1995–1998, 2000–2005, and 2006–2009.

Stefan DC, Baadjies B, Kruger M (2014). Incidence of childhood cancer in Namibia: the need for registries in Africa. *Pan Afr Med J.* 17:191. <http://dx.doi.org/10.11604/pamj.2014.17.191.3830> PMID:25396017

Namibia (2009)

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

Site	All ages	Age group (years)	Age group (years)										Crude rate	CR	ASR	ICD-10						
			0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50					50-55	55-60	60-65	65-70	70-75	75+
Mouth	55	0 98	-	-	-	2	1	1	6	13	11	4	5	4	6	5.3	1.16	10.2	C00-06			
Salivary gland	15	0 100	-	-	1	-	-	2	1	4	2	2	-	1	2	1.4	0.27	2.7	C07-08			
Nasopharynx	8	0 100	-	-	-	2	-	-	-	-	1	-	-	-	1	0.8	0.08	1.0	C11			
Other pharynx	24	0 96	-	-	-	-	2	-	1	3	7	2	6	3	2.3	2.5	0.54	4.7	C09-10, C12-14			
Oesophagus	11	0 91	-	-	-	-	-	-	-	1	1	2	3	1	3	1.1	0.28	2.4	C15			
Stomach	25	0 100	-	-	-	1	1	2	4	2	6	6	6	3	6	2.4	2.6	0.51	5.0	C16		
Colon	27	0 100	-	-	-	1	4	1	3	6	1	2	2	5	2.6	2.8	0.48	4.7	C18			
Rectum	17	0 100	-	-	-	2	-	-	1	4	5	1	2	2	1.6	1.8	0.43	3.4	C19-20			
Anus	4	0 100	-	-	-	1	-	-	-	1	-	1	-	-	0.4	0.4	0.07	0.6	C21			
Liver	29	0 55	-	2	-	1	2	1	2	5	5	-	4	4	2	2.8	3.1	0.67	5.1	C22		
Gallbladder etc.	2	0 100	-	-	-	-	-	-	-	2	-	-	-	-	0.2	0.2	0.04	0.4	C23-24			
Pancreas	14	0 79	-	-	-	-	-	-	-	2	2	2	-	3	1.3	1.5	0.33	2.8	C25			
Larynx	21	0 100	-	-	-	-	-	-	2	3	1	4	8	3	2.0	2.2	0.54	4.5	C32			
Trachea, bronchus, and lung	24	0 50	-	-	-	-	1	1	2	1	2	1	6	5	2.3	2.5	0.67	5.0	C33-34			
Bone	13	0 100	-	1	8	1	-	-	1	1	-	-	-	-	1.2	1.4	0.07	1.3	C40-41			
Melanoma of skin	25	0 100	-	-	-	1	1	2	3	1	4	-	6	3	4	2.4	2.6	0.59	4.8	C43		
Non-melanoma skin	569	0 100	-	-	1	1	9	24	18	21	37	52	61	64	69	84	128	12.94	112.6	C44		
Mesothelioma	0	0 -	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45		
Kaposi sarcoma	185	0 50	1	3	1	6	8	40	34	31	24	12	7	5	5	17.8	19.5	2.06	23.2	C46		
Connective and soft tissue	15	0 100	-	-	-	3	2	-	-	2	2	-	1	4	1	1.4	1.6	0.28	2.5	C47, C49		
Breast	9	0 100	-	-	-	-	-	-	2	-	2	-	2	-	1	0.9	0.9	0.17	1.5	C50		
Penis	3	0 100	-	-	-	-	-	-	1	-	2	-	-	-	-	0.3	0.3	0.04	0.5	C60		
Prostate	222	0 95	-	-	-	-	-	2	-	4	3	10	18	16	39	21.3	23.4	5.49	47.9	C61		
Testis	7	0 100	-	-	-	-	-	-	-	-	-	-	-	2	-	0.7	0.7	0.13	1.0	C62		
Kidney and renal pelvis	12	0 83	-	1	-	-	-	-	1	-	-	-	3	1	1	1.2	1.3	0.16	2.2	C64-65		
Bladder	31	0 100	-	-	-	-	-	-	3	-	2	2	4	5	4	3.0	3.3	0.68	6.4	C67		
Ureter and other urinary	0	0 -	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68		
Eye	43	0 100	-	-	-	-	-	-	-	-	-	-	-	-	4	4.1	4.5	0.58	5.9	C69		
Brain and nervous system	14	0 57	-	2	-	3	1	2	-	1	2	3	2	1	-	1.3	1.5	0.22	2.0	C70-72		
Thyroid	2	0 100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.07	0.4	C73		
Hodgkin lymphoma	10	0 100	-	-	4	1	1	1	2	-	-	-	-	-	-	1.0	1.1	0.07	0.9	C81		
Non-Hodgkin lymphoma	24	0 100	-	1	-	3	-	2	2	7	2	2	2	2	2	2.3	2.5	0.32	3.6	C82-85, C96		
Multiple myeloma	9	0 33	-	-	-	-	-	1	1	1	2	1	1	1	-	0.9	0.9	0.16	1.6	C90		
Lymphoid leukaemia	3	0 100	-	1	-	-	-	-	-	-	-	-	1	1	-	0.3	0.3	0.07	0.5	C91		
Myeloid leukaemia	10	0 100	-	-	1	1	2	2	-	-	2	-	-	-	2	1.0	1.1	0.08	1.3	C92-94		
Leukaemia, unspecified	0	0 -	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C95		
Other and unspecified	36	0 100	-	1	1	-	-	2	1	2	2	2	7	1	3	3.5	3.8	0.58	6.9	O&U		
All sites	1518	0 90	1	2	8	20	18	36	91	94	76	117	137	151	159	174	157	277	145.9	30.82	279.6	C00-96
All sites except C44	949	0 84	1	2	8	19	17	27	67	76	55	80	85	90	95	105	73	149	91.2	17.88	166.9	C00-96 exc. C44
Average annual population	140456	136709	133648	124126	102846	84309	73578	61036	48464	38033	28337	21535	16934	12627	8552	9204	1040414					

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Namibia (2009)

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

Site	All ages	Age unk	MV DCO		Age group (years)										Crude rate	CR %	ASR (W)	ICD-10					
			%	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-
Mouth	28	0	96	-	-	-	-	-	1	3	-	2	3	3	3	4	3	3	2.5	3.0	0.49	C00-06	
Salivary gland	9	0	100	-	-	-	-	1	-	2	-	1	2	-	2	1	1	-	0.8	1.0	0.16	C07-08	
Nasopharynx	4	0	100	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.04	C11	
Other pharynx	7	0	100	-	-	-	-	-	-	-	-	1	-	-	1	-	2	2	0.6	0.8	0.14	C09-10, C12-14	
Oesophagus	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.1	0.00	C15	
Stomach	15	0	100	-	-	-	-	1	1	1	-	4	1	3	1	1	1	1	1.4	1.6	0.23	C16	
Colon	34	0	100	-	-	-	-	1	1	1	3	4	8	1	3	1	9	2	3.1	3.7	0.70	C18	
Rectum	17	0	100	-	-	-	-	-	-	-	4	-	2	1	1	2	4	3	1.5	1.8	0.33	C19-20	
Anus	7	0	100	-	-	-	-	-	-	-	1	1	-	-	1	1	3	-	0.6	0.8	0.20	C21	
Liver	19	0	84	-	-	-	-	-	-	3	1	-	4	3	2	3	-	1	1.7	2.0	0.30	C22	
Gallbladder etc.	2	0	100	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	0.2	0.05	C23-24	
Pancreas	2	0	50	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.2	0.2	0.05	C25	
Larynx	8	0	100	-	-	-	-	-	-	-	-	-	4	-	4	-	1	-	0.7	0.9	0.09	C32	
Trachea, bronchus, and lung	20	0	65	-	-	-	-	2	1	1	-	3	4	3	2	4	-	2	1.8	2.2	0.32	C33-34	
Bone	6	0	83	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	0.5	0.6	0.08	C40-41	
Melanoma of skin	20	0	100	-	-	-	-	2	2	1	3	2	2	2	5	2	1	3	1.8	2.2	0.29	C43	
Non-melanoma skin	327	0	100	-	-	-	-	7	2	8	9	15	25	24	39	26	36	46	29.6	5.75	47.2	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45	
Kaposi sarcoma	78	0	73	-	1	3	1	4	14	13	18	9	7	3	1	1	-	-	7.1	8.4	0.66	C46	
Connective and soft tissue	13	0	100	-	1	-	1	1	1	1	1	1	3	2	-	-	1	-	1.2	1.4	0.15	C47, C49	
Breast	272	0	98	-	-	-	-	5	5	15	22	42	37	31	30	26	30	12	24.7	29.3	4.09	C50	
Vulva	12	0	100	-	-	-	-	1	1	2	1	1	1	1	2	1	2	-	1.1	1.3	0.16	C51	
Vagina	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.09	C52	
Cervix uteri	162	0	92	-	-	-	-	1	5	13	24	22	18	15	22	10	7	10	14.7	17.4	2.16	C53	
Uterus	32	0	100	-	-	-	-	1	1	1	-	4	2	3	6	3	6	5	2.9	3.4	0.63	C54-55	
Ovary	26	0	77	-	-	-	-	1	1	1	2	2	4	3	1	3	4	5	2.4	2.8	0.34	C56	
Placenta	5	0	80	-	-	-	-	3	1	-	-	-	1	-	-	-	-	-	0.5	0.5	0.03	C58	
Kidney and renal pelvis	8	0	62	-	-	-	-	-	-	-	-	-	2	2	2	1	-	-	0.7	0.9	0.11	C64-65	
Bladder	14	0	100	-	-	-	-	-	-	-	-	-	1	2	-	3	-	2	1.3	1.5	0.19	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C66, C68	
Eye	26	0	96	-	-	-	-	-	4	3	9	4	-	2	2	-	1	1	2.4	2.8	0.28	C69	
Brain and nervous system	11	0	64	-	-	-	-	2	4	2	-	2	-	1	2	-	-	-	1.0	1.2	0.10	C70-72	
Thyroid	13	0	100	-	-	-	-	-	2	2	2	2	3	1	-	1	-	-	1.2	1.4	0.13	C73	
Hodgkin lymphoma	2	0	100	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	0.2	0.2	0.01	C81	
Non-Hodgkin lymphoma	25	0	96	-	-	-	-	1	1	5	3	1	3	-	1	5	2	1	2.3	2.7	0.34	C82-85, C96	
Multiple myeloma	1	0	0	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.1	0.1	0.01	C90	
Lymphoid leukaemia	3	0	100	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.3	0.3	0.03	C91	
Myeloid leukaemia	7	0	100	-	-	-	-	1	1	1	-	-	-	-	2	-	-	-	0.6	0.8	0.06	C92-94	
Leukaemia, unspecified	1	0	100	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	C95	
Other and unspecified	15	0	93	-	-	-	-	-	-	-	1	1	3	1	2	1	1	3	2	1.4	1.6	0.28	O&U
All sites	1256	0	94	-	2	4	13	24	50	82	109	121	137	133	114	115	118	107	113.9	130.7	16.1	C00-96	
All sites except C44	929	0	92	-	1	2	4	6	22	42	73	94	96	113	94	88	79	72	84.2	100.0	13.31	C00-96 exc. C44	

Average annual population 138768 135937 133187 125137 106656 89792 78629 66418 54663 45191 35953 28332 21482 16527 11816 14595 1103083

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

South Africa: National Cancer Registry of South Africa

The National Cancer Registry of South Africa (NCR-SA) was established as a pathology-based cancer registry in 1986 by the pathology division of the former South African Institute for Medical Research and the National Department of Health. Recognized methods of analysis and routine reporting were introduced in 1990, and a cancer research unit funded by the South African Medical Research Council (SAMRC) was established. Between 2002 and 2009, due to competing public health priorities in South Africa, chronic diseases (and cancers in particular) were perceived to be of relatively low priority. As a result, the progress and development of the NCR-SA was hampered by a lack of funding and human resources, which resulted in a lag in registration and a drop in publications.

In 2009, the NCR-SA was transferred to new management. With renewed managerial and financial support, the momentum of the registry was restored. The NCR-SA now has 12 staff members, including cancer coders, data capturers, a quality assurance manager, and an operations manager. The lag in data capture and analysis is being addressed with the recruitment of additional staff members and the automation of data-capture processes, with the goal of bringing data capture up to date within 3 years.

The NCR-SA data presented in this volume are specifically for histologically confirmed cancer cases.

The average annual population-at-risk estimates corresponding to the NCR-SA data presented in this volume are shown in the population pyramid.

The registry obtains 100% notification from the public-sector laboratories, via data download directly from the public laboratory archives. Reporting to the NCR-SA by private laboratories has decreased by 28% due to unfounded concerns about the release of patient information to an external organization. The registry receives 90 000–100 000 cancer notifications each year, of which 50 000–60 000 are new cases.

In April 2011, Regulation 380 of the National Health Act made cancer a notifiable disease in South Africa, so the NCR-SA will receive 100% notification from both public and private laboratories as of 2012.

Regulation 380 also tasks the NCR-SA with the development of a population-based cancer registry. The project will begin with the piloting of a population-based registry in the Ekurhuleni Health District in the province of Gauteng. The district has a population of approximately 3 million, served by five regional hospitals and one district hospital in the public health sector. In the private health sector, there are eight cancer treatment centres and one hospice. A system for health care professionals to report every newly diagnosed cancer case to the NCR-SA is being established in both the private and public hospitals in the district. This will provide valuable information about the status of cancer management services in South Africa to policy-makers and public health managers.

The registry uses IARC's CanReg5 software for data registration and management.

YEARS PRESENTED

2007 (a 1-year period)

NOTES

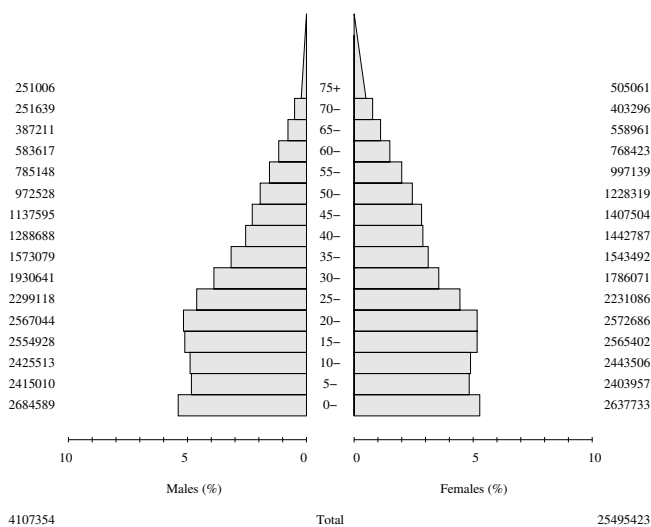
As described above, the registered cancer cases are those reported by pathology laboratories across the country. The results for 2007 are presented, with incidence rates calculated using national population estimates for that year.

As would be expected given that registration is limited to cases diagnosed by pathology – i.e. the percentage of microscopically verified cases (MV%) is 100% – the age-standardized incidence rates (ASRs) are relatively low. At 111.2 cases per 100 000 person-years in males and 95.2 cases per 100 000 person-years in females, the ASRs of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) are only slightly more than half of the values for southern Africa reported in GLOBOCAN 2012.

The number of cases registered in 2007 can be compared with the number of deaths registered for the same year. The numbers of deaths due to cancer and the calculated mortality-to-incidence (M:I) ratios are shown in Table 4.06.

Even allowing for a considerable degree of misclassification of cause of death as liver or lung cancer (i.e. metastases coded as primary site), there is likely underrecording of cancers of the oesophagus,

South Africa (2007)
Population pyramid (average annual person-years by sex and age group)



Source: Statistics South Africa, mid-year population estimates for 2001

liver, pancreas, and lung (all of which are difficult to biopsy), as well as of leukaemia (which is diagnosed by haematology rather than pathology).

Table 4.06. The number of deaths due to cancer, as reported in the WHO Mortality Database (WHO, 2017), and the corresponding mortality-to-incidence (M:I) ratios in males (M) and females (F) in South Africa in 2007, by anatomical site

Anatomical site (ICD-10 code)	Sex	Deaths	M:I (%)
Lip, oral cavity, and pharynx (C00–14)	M	749	65
	F	295	59
Oesophagus (C15)	M	1879	189
	F	1197	176
Stomach (C16)	M	719	115
	F	483	122
Colorectum and anus (C18–21)	M	1180	98
	F	992	94
Liver (C22)	M	998	577
	F	651	880
Pancreas (C25)	M	641	745
	F	603	628
Trachea, bronchus, and lung (C33–34)	M	3201	227
	F	1484	227
Kaposi sarcoma (C46)	M	504	37
	F	432	40
Breast (C50)	F	2691	48
Cervix uteri (C53)	F	2586	53
Uterus, other and unspecified (C54–55)	F	444	47
Prostate (C61)	M	2208	51
Bladder (C67)	M	358	54
	F	151	67
Kidney, renal pelvis, ureter, and other urinary (C64–66, C68)	M	171	63
	F	104	57
Lymphoma (C81–88, C90)	M	828	72
	F	693	70
Leukaemia (C91–95)	M	461	129
	F	407	141
All sites (C00–97)	M	17 239	68
	F	16 644	62
All sites except C44 (C00–97 exc. C44)	M	17 102	94
	F	16 562	75

As a consequence, the incidence rates are all lower than the corresponding regional estimates for southern Africa, except for the rate of cancers coded as occurring at “other and unspecified” anatomical sites, which account for 9% of the registrations among males and 6.7% among females; this high reported rate is due to the fact that anatomical site is not always specified on request forms.

SUMMARY

The data have the advantage of being fairly comprehensive (because the great majority of pathology diagnoses are reported), although some of the registrations are for non-residents, because specimens are sent to South African laboratories from several neighbouring countries. Good national incidence estimates could be calculated if there were data available on the MV% within the South African population by sex, anatomical site, and (ideally) age, so that the recorded data could be appropriately scaled.

PUBLICATIONS AND ACHIEVEMENTS

The NCR-SA became a member of the African Cancer Registry Network (AFCRN) in 2012.

- Dickens C, Joffe M, Jacobson J, Venter F, Schüz J, Cubasch H, et al. (2014). Stage at breast cancer diagnosis and distance from diagnostic hospital in a periurban setting: a South African public hospital case series of over 1,000 women. *Int J Cancer*. 135(9):2173–82. <https://doi.org/10.1002/ijc.28861> PMID:24658866
- Erdmann F, Kielkowski D, Schonfeld SJ, Kellett P, Stanulla M, Dickens C, et al. (2015). Childhood cancer incidence patterns by race, sex and age for 2000–2006: a report from the South African National Cancer Registry. *Int J Cancer*. 136(11):2628–39. <http://dx.doi.org/10.1002/ijc.29308> PMID:25363616
- Sengayi M, Babb C, Egger M, Urban MI (2015). HIV testing and burden of HIV infection in black cancer patients in Johannesburg, South Africa: a cross-sectional study. *BMC Cancer*. 15:144. <http://dx.doi.org/10.1186/s12885-015-1171-7> PMID:25884599
- Singh E, Ruff P, Babb C, Sengayi M, Beery M, Khoali L, et al. (2015). Establishment of a cancer surveillance programme: the South African experience. *Lancet Oncol*. 16(8):e414–21. [http://dx.doi.org/10.1016/S1470-2045\(15\)00162-X](http://dx.doi.org/10.1016/S1470-2045(15)00162-X) PMID:26248849
- Singh E, Underwood JM, Nattey C, Babb C, Sengayi M, Kellett P (2015). South African National Cancer Registry: effect of withheld data from private health systems on cancer incidence estimates. *S Afr Med J*. 105(2):107–9. <http://dx.doi.org/10.7196/SAMJ.8858> PMID:26242527

South Africa (2007)

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

Site	All ages	Age group (years)	Age group (years)										Crude rate	% CR	ASR (W)	ICD-10								
			0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49					50-54	55-59	60-64	65-69	70-74	75+		
Mouth	812	23	100	2	1	3	7	5	21	48	86	120	139	125	112	54	65	3.4	4.5	0.59	5.0	C00-06		
Salivary gland	89	2	100	-	1	2	1	3	5	7	10	8	10	9	9	14	14	0.4	0.5	0.06	0.5	C07-08		
Nasopharynx	43	2	100	-	1	1	3	3	2	5	8	4	3	3	-	-	-	0.2	0.2	0.02	0.2	C11		
Other pharynx	218	6	100	1	-	-	-	-	1	1	25	34	43	36	31	15	11	0.9	1.2	0.17	1.3	C09-10, C12-14		
Oesophagus	993	60	100	-	-	1	2	3	8	15	56	144	173	135	117	95	94	4.1	5.5	0.75	6.2	C15		
Stomach	626	20	100	-	2	3	2	8	15	46	52	65	91	73	74	64	111	2.6	3.4	0.44	4.0	C16		
Colon	722	9	100	-	1	1	5	10	20	32	40	65	70	100	108	102	141	3.0	4.0	0.56	4.8	C18		
Rectum	417	6	100	1	-	3	9	10	5	14	22	28	36	58	53	54	17	2.3	3.2	0.32	2.6	C19-20		
Anus	62	2	100	-	-	2	1	3	4	5	8	9	10	6	5	4	3	0.3	0.3	0.04	0.3	C21		
Liver	173	4	100	7	3	2	-	3	14	18	21	22	14	16	21	8	13	7	0.7	0.9	0.10	0.9	C22	
Gallbladder etc.	86	0	100	-	-	-	-	-	-	-	3	3	7	9	10	7	12	6	0.3	0.3	0.05	0.4	C23-24	
Pancreas	82	2	100	-	-	-	-	-	-	3	7	4	10	12	18	11	6	0.4	0.5	0.08	0.6	C25		
Larynx	458	14	100	-	-	-	-	1	4	5	20	39	58	108	86	58	32	1.9	2.5	0.35	2.8	C32		
Trachea, bronchus, and lung	1409	38	100	-	-	-	-	2	11	18	70	114	199	242	216	202	145	5.8	7.7	1.11	8.9	C33-34		
Bone	113	4	100	3	3	17	20	19	4	9	4	2	7	6	3	1	-	2	0.5	0.6	0.03	0.5	C40-41	
Melanoma of skin	638	5	100	-	1	4	7	26	31	32	48	57	69	77	77	55	82	2.6	3.5	0.43	3.8	C43		
Non-melanoma skin	7123	55	100	1	2	4	9	24	50	121	249	345	500	648	813	932	998	851	1521	29.5	5.15	46.7	C44	
Mesothelioma	102	0	100	-	-	-	-	1	-	1	7	7	9	12	17	22	14	0.4	0.6	0.09	0.7	C45		
Kaposi sarcoma	1365	50	100	5	11	6	5	36	148	284	301	199	141	78	40	20	23	8	5.7	7.5	0.50	5.7	C46	
Connective and soft tissue	294	3	100	11	11	4	11	18	10	17	23	18	27	31	23	22	14	1.2	1.6	0.16	1.5	C47, C49		
Breast	121	5	100	-	-	-	-	1	3	1	4	14	17	15	16	15	14	0.5	0.7	0.09	0.8	C50		
Penis	109	2	100	-	-	-	-	5	1	5	8	8	6	10	15	12	9	0.6	0.6	0.07	0.6	C60		
Prostate	4293	90	100	-	-	-	-	1	1	2	4	20	75	234	513	758	858	767	17.8	23.6	3.85	30.6	C61	
Testis	151	2	100	4	1	12	18	22	32	18	13	9	5	6	4	3	-	0.6	0.8	0.05	0.6	C62		
Kidney and renal pelvis	239	2	100	26	7	3	1	1	4	6	8	12	24	24	32	27	23	9	1.0	1.3	0.17	1.4	C64-65	
Bladder	666	3	100	2	2	-	-	-	1	5	9	13	39	71	77	99	111	78	154	2.8	3.7	0.50	4.5	C67
Ureter and other urinary	32	2	100	-	-	-	-	1	-	-	-	3	2	-	6	4	5	0.1	0.2	0.03	0.2	C66, C68		
Eye	246	11	100	19	4	-	-	1	10	43	47	39	23	14	12	4	7	6	6	1.0	1.4	0.10	1.1	C69
Brain and nervous system	158	0	100	7	8	8	6	7	15	5	15	7	15	17	19	13	7	5	4	0.7	0.9	0.08	0.8	C70-72
Thyroid	79	1	100	-	-	-	-	6	7	11	5	6	7	4	11	8	2	0.3	0.4	0.04	0.4	C73		
Hodgkin lymphoma	190	4	100	2	12	19	14	20	22	18	25	17	12	6	6	5	2	4	2	0.8	1.0	0.07	0.8	C81
Non-Hodgkin lymphoma	815	17	100	15	23	13	13	27	32	77	97	82	72	76	76	56	49	3.4	4.5	0.43	4.2	C82-85, C96		
Multiple myeloma	141	1	100	-	1	-	-	-	-	6	7	18	22	22	26	14	14	0.6	0.8	0.11	0.9	C90		
Lymphoid leukaemia	136	1	100	16	13	7	9	11	4	5	3	4	8	13	9	10	11	0.6	0.7	0.07	0.7	C91		
Myeloid leukaemia	154	1	100	5	6	8	9	14	13	10	10	8	14	9	10	11	9	0.6	0.8	0.08	0.8	C92-94		
Leukaemia, unspecified	68	0	100	2	2	5	3	7	3	2	2	3	6	5	4	6	7	0.3	0.4	0.04	0.4	C95		
Other and unspecified	1932	64	100	16	4	2	12	20	14	44	65	109	182	274	271	255	232	168	200	8.0	10.6	1.38	11.8	O&U
All sites	25335	511	100	145	115	102	141	273	442	811	1081	1329	1789	2415	3049	3283	3322	2715	3812	105.1	18.15	158.0	C00-96	
All sites except C44	18212	456	100	144	113	98	132	249	392	690	832	984	1289	1767	2236	2351	2324	1864	2291	75.5	100.0	13.00	111.2	C00-96 exc. C44
Average annual population (thousands)	2684.6	2415.0	2425.5	2554.9	2567.0	2299.1	1930.6	1573.1	1288.7	1137.6	972.5	785.1	583.6	387.2	251.6	251.024107.4								

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

South Africa: Eastern Cape

The population-based Eastern Cape Province Cancer Registry was established in the 1980s by the Programme on Mycotoxin and Experimental Carcinogenesis (PROMEC) Unit of the South African Medical Research Council (SAMRC). The registry was initially set up to monitor trends in the incidence and geographical variation of oesophageal cancer within four magisterial areas of the former Transkei region in the province of Eastern Cape. In 1998, the scope of the registry expanded to the collection of data on all cancers, and its geographical coverage expanded to include the populations of an addition four magisterial areas: Idutyua, Nqamakwe, Willowvale, and Flagstaff.

The registry is funded mainly by the SAMRC. It is staffed full-time by a senior scientist (who manages and oversees all registry activities), a junior scientist, and two research assistants (who help with data management). Three oncology nurses from collaborating hospitals work part-time as trained data collectors.

The Eastern Cape Province Cancer Registry data presented in this volume are for the registry's catchment population of eight magisterial areas in the province of Eastern Cape. These areas are located within the municipalities of Ntabankulu, Mbizana, and Ingquza Hill (formerly Qaukeni) in the north-eastern part of the former Transkei region, and Mnquma and Mbhashe in the south-western part of the region. About 99% of residents are Black Africans who speak Xhosa and support both Christian and traditional norms and values.

The population of the registry's area of coverage is estimated to have been 1.1 million in 2011 (at the most recent census). The average annual population-

at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

The registry collaborates with 15 facilities that serve the registration area. The facilities within the area are St Patrick's Hospital and Greenville Hospital in Bizana; Butterworth Hospital in Butterworth; Tafalofefe Hospital in Centane; Holy Cross Hospital, St Elizabeth's Mission Hospital, and Bambisana Hospital in Lusikisiki; and the Nqamakwe Community Health Centre in Nqamakwe. The facilities, including referral centres, outside the registration area are Mthatha General Hospital and the National Health Laboratory Service (NHLS) pathology laboratory located in the Nelson Mandela Academic Hospital in Mthatha; the oncology and radiation unit of Frere Hospital in East London; and East Griqualand and Usher Memorial Hospital, Inkosi Albert Luthuli Central Hospital, Addington Hospital, and King Dinuzulu Hospital in the province of KwaZulu-Natal.

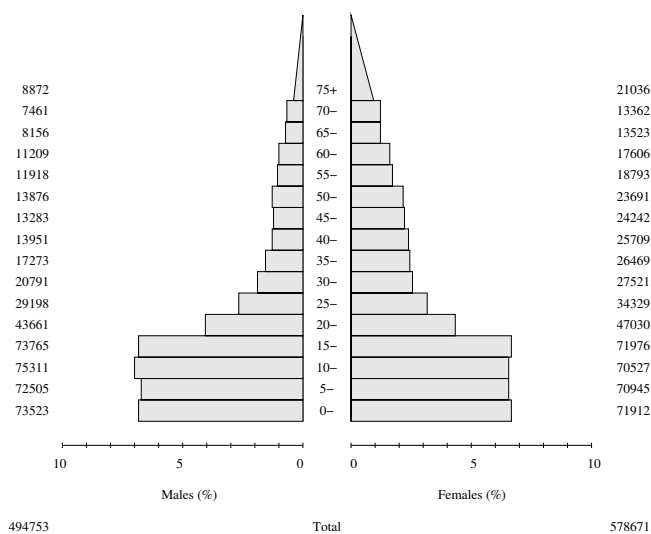
The registry uses both active and passive case finding methods. The active case finding system, set up by the registry manager, uses multiple sources. The collaborating hospitals located in the eight covered magisterial areas are visited twice a year. During these visits, the data collectors examine the records to identify all cancer cases treated in the facility, and abstract the case information for inclusion in the registry. The records examined include inpatient admission, treatment, transfer, discharge, and death registers, as well as midnight census records and pathology reports.

As mentioned above, case finding also extends to hospitals located outside the registration area that may serve residents of the registration area. Part-time data collectors have been employed since 2015 to collect data from two major sources outside the registration area: the Mthatha Hospital Complex (which includes the Nelson Mandela Academic Hospital) and Frere Hospital; this ensures timely collection of data to minimize case loss. Part-time staff members receive special training on cancer registration from IARC and receive in-service training from the registry manager at least once a year.

The Department of Home Affairs, which maintains the national death register, is also used as an information source. However, the information contained in the death register is very limited: cause of death is recorded only as either natural or unnatural. Death register information is used to update vital status for registered cases; records that include the patient's South African Identity Number can easily be linked.

Cases are manually coded according to ICD-O-3 and registered using IARC's CanReg4 software. Only malignant cases are included in analysis. Potential duplicate registrations are carefully assessed to determine whether they represent new malignancies, secondary cancers, or duplicate information. Geographical location is coded according to a list of village codes created on the basis of information from the 1985 census and amended as new residential areas form.

**South Africa, Eastern Cape (2008–2012)
Population pyramid (average annual
person-years by sex and age group)**



Source: Statistics South Africa; estimates based on 2001 and 2011 census counts by geography (magisterial district)

The confidentiality of registry data is carefully maintained. Data access is controlled using personal identification numbers, and staff members are granted varying levels of data access according to their roles. Only the registry manager is authorized to make changes to the dataset. Registry information is backed up to a shared drive weekly, and backup memory sticks are stored in a locked, fireproof location. Papers containing confidential information are shredded before disposal.

There are standard procedures for the release of confidential data, and requests for data are handled by the head of the registry. Registry information is never provided to insurance companies, medical funds, pension schemes, etc. Registry data released for the purpose of publication or inclusion in collaborative studies do not include any personally identifiable information. In annual reports, registry data are presented only in aggregate, making individual identification impossible.

YEARS PRESENTED

2008–2012 (a 5-year period)

NOTES

The registry has previously reported results for the 15-year period of 1998–2012 (Somdyala et al., 2015). The most recent complete 5-year period (2008–2012) was selected for analysis in the current volume.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is relatively low compared with the values for southern Africa reported in GLOBOCAN 2012. However, the ASRs of cancers of the oesophagus (23.8 cases per 100 000 person-years in males and 14.6 cases per 100 000 person-years in females) and the cervix (29.5 cases per 100 000 person-years) are higher than the estimates for southern Africa.

The percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer) is relatively low (54% in males and 66% in females), in part due to the large number of oesophageal cancers, for which the MV% is only 36.5%.

Changes since the preceding 5-year period of 2003–2007 (for which data were published in Volume X of *Cancer Incidence in Five Continents*) are examined in the paper by Somdyala et al. (2015). The main changes were significant increases in the incidence of cancers of the prostate, cervix, and breast and of Kaposi sarcoma (in both sexes), and a significant

decrease in the incidence of cancer of the oesophagus in both sexes.

SUMMARY

The changes observed since the preceding 5-year period seem to be consistent with expected trends, and the current data seem to be of comparable quality to those published in Volume X of *Cancer Incidence in Five Continents*. The low observed rates are probably due to the rural lifestyle of the population, as well as to some level of underdiagnosis of cancer in these relatively remote communities.

PUBLICATIONS AND ACHIEVEMENTS

The Eastern Cape Province Cancer Registry became a member of the African Cancer Registry Network (AFCRN) in 2012.

Somdyala NI, Bradshaw D, Gelderblom WC, Parkin DM (2010). Cancer incidence in a rural population of South Africa, 1998-2002. *Int J Cancer*. 127(10):2420–9. <http://dx.doi.org/10.1002/ijc.25246> PMID:20162610

Somdyala NI, Marasas WF, Venter FS, Vismer HF, Gelderblom WC, Swanevelder SA (2003). Cancer patterns in four districts of the Transkei region--1991-1995. *S Afr Med J*. 93(2):144–8. PMID:12640888

Somdyala NI, Parkin DM, Sithole N, Bradshaw D (2015). Trends in cancer incidence in rural Eastern Cape Province; South Africa, 1998-2012. *Int J Cancer*. 136(5):E470–4. <http://dx.doi.org/10.1002/ijc.29224> PMID:25236502

Somdyala NIM, Bradshaw D, Gelderblom WCA (2013). Cancer incidence in selected municipalities of the Eastern Cape Province, 2003–2007. Eastern Cape Province Cancer Registry Technical Report. Cape Town: South African Medical Research Council. Available from: <http://afcrn.org/membership/members/84-easterncape>.

Somdyala NIM, Gelderblom WCA, Bradshaw D, Marasas WFO, Vismer HF (2014). Cancer incidence in South Africa, PROMEC (2003–2007). In: Forman D, Bray F, Brewster DH, Gombe Mbalawa C, Kohler B, Piñeros M, et al., editors. *Cancer incidence in five continents*, Vol. X. Lyon: International Agency for Research on Cancer. IARC Scientific Publication No. 164. Available from: <http://publications.iarc.fr/319>.

South Africa, Eastern Cape (2008–2012)

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

Site	All ages	Age group (years)	Age group (years)											Crude rate	CR %	ASR (W)	ICD-10									
			0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54					55-59	60-64	65-69	70-74	75+				
Mouth	74	0	88	-	-	-	-	-	-	-	-	4	3	6	11	11	9	14	6	9	3.0	6.1	0.60	5.0	C00-06	
Salivary gland	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.2	0.00	0.1	C07-08	
Nasopharynx	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.02	0.1	C11	
Other pharynx	20	0	75	-	-	-	-	-	-	-	-	-	1	4	5	6	1	1	1	2	0.8	1.6	0.16	1.4	C09-10, C12-14	
Oesophagus	370	0	38	-	-	-	-	-	2	2	4	9	19	38	44	64	55	54	79	15.0	30.4	2.86	23.8	C15		
Stomach	21	0	52	-	-	-	-	-	1	1	1	1	3	4	1	4	4	2	4	0.8	1.7	0.15	1.4	C16		
Colon	21	0	52	-	-	-	-	-	1	1	2	2	3	1	4	3	1	4	3	0.8	1.7	0.14	1.4	C18		
Rectum	15	0	73	-	-	-	-	-	1	1	1	3	1	3	1	3	1	1	5	0.6	1.2	0.08	1.0	C19-20		
Anus	5	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.04	0.3	C21		
Liver	62	0	45	1	-	-	-	-	8	8	8	6	7	1	6	8	8	4	11	2.5	5.1	0.40	3.9	C22		
Gallbladder etc.	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24		
Pancreas	11	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.9	0.11	0.7	C25		
Larynx	51	0	86	-	-	-	-	-	-	-	-	2	5	3	7	10	6	8	10	2.1	4.2	0.40	3.3	C32		
Trachea, bronchus, and lung	66	0	64	-	-	-	-	-	-	-	-	2	2	8	5	14	10	9	15	2.7	5.4	0.50	4.2	C33-34		
Bone	16	0	81	-	-	-	-	-	1	2	1	1	1	1	1	1	1	2	-	0.6	1.3	0.10	1.0	C40-41		
Melanoma of skin	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.2	0.5	0.05	0.4	C43
Non-melanoma skin	12	0	83	-	-	-	-	-	-	-	-	-	4	1	3	1	-	-	-	-	0.5	0.8	0.08	0.8	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45	
Kaposi sarcoma	85	0	47	-	-	-	-	-	15	14	15	7	4	4	2	5	-	-	-	2	3.4	7.0	0.51	5.8	C46	
Connective and soft tissue	14	0	100	3	-	-	-	-	3	1	3	1	-	-	-	-	-	-	-	2	0.6	1.1	0.08	0.8	C47, C49	
Breast	17	0	82	-	-	-	-	-	2	1	3	2	2	3	2	3	1	3	2	0.7	1.4	0.14	1.2	C50		
Penis	15	0	67	-	-	-	-	-	1	5	1	1	1	1	2	1	2	1	1	0.6	1.2	0.11	1.0	C60		
Prostate	182	0	31	-	-	-	-	-	-	-	-	-	-	5	13	25	24	40	74	7.4	14.9	1.21	10.3	C61		
Testis	7	0	86	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	0.3	0.6	0.03	0.4	C62		
Kidney and renal pelvis	8	0	75	5	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.01	0.2	C64-65		
Bladder	9	0	67	-	-	-	-	-	-	-	-	-	-	2	2	1	2	-	2	0.4	0.7	0.06	0.6	C67		
Ureter and other urinary	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.01	0.1	C66, C68		
Eye	13	0	85	6	2	-	-	-	2	-	2	-	-	-	-	-	-	-	-	0.5	1.1	0.04	0.6	C69		
Brain and nervous system	4	0	75	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	0.2	0.3	0.01	0.2	C70-72		
Thyroid	3	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.02	0.2	C73		
Hodgkin lymphoma	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.02	0.2	C81		
Non-Hodgkin lymphoma	23	0	78	1	-	-	-	-	3	2	2	4	1	1	2	2	3	1	-	0.9	1.9	0.15	1.5	C82-85, C96		
Multiple myeloma	7	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	0.3	0.6	0.06	0.4	C90	
Lymphoid leukaemia	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	0.2	0.5	0.04	0.4	C91	
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C92-94		
Leukaemia, unspecified	5	0	80	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.01	0.2	C95		
Other and unspecified	73	0	84	1	1	2	-	-	3	4	5	5	9	6	10	9	12	9	12	3.0	6.0	0.59	4.8	O&U		
All sites	1230	0	55	18	9	6	9	11	28	43	47	60	73	112	117	166	151	152	228	49.7	8.80	77.9	77.9	C00-96		
All sites except C44	1218	0	54	18	9	6	9	28	42	47	56	72	109	116	166	151	152	228	228	49.2	100.0	8.72	77.1	C00-96 exc. C44		

Average annual population

73523 72505 75311 73765 43661 29198 20791 17273 13951 13283 13876 11918 11209 8156 7461 8872 494754

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

South Africa, Eastern Cape (2008–2012)

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

Site	All ages	MV DCO		Age group (years)																Crude rate	CR %	ASR (W)	ICD-10		
		unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+						
Mouth	26	0	69	-	-	-	-	-	1	1	-	2	-	-	1	3	3	1	8	6	0.9	1.2	0.12	0.9	C00-06
Salivary gland	5	0	40	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	2	0.2	0.2	0.02	0.2	C07-08
Nasopharynx	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	0.1	C11
Other pharynx	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.1	0.1	0.01	0.1	C09-10, C12-14
Oesophagus	413	0	35	-	-	-	-	1	4	3	3	11	23	31	34	65	56	72	110	143	14.3	19.6	1.81	14.6	C15
Stomach	24	0	42	-	-	-	-	1	1	1	1	1	1	2	2	3	-	5	7	0.8	1.1	0.09	0.8	C16	
Colon	30	0	50	-	-	-	-	2	1	2	1	1	2	3	3	5	4	6	6	1.0	1.4	0.13	1.1	C18	
Rectum	19	0	89	-	-	-	-	3	1	1	1	-	2	1	2	1	3	3	6	0.7	0.9	0.07	0.7	C19-20	
Anus	2	0	100	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	0.1	0.1	0.01	0.1	C21	
Liver	42	0	64	-	-	-	-	2	-	-	4	2	2	3	5	3	8	6	7	1.5	2.0	0.20	1.6	C22	
Gallbladder etc.	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.1	0.1	0.00	0.1	C23-24	
Pancreas	10	0	0	-	-	-	-	-	-	-	-	-	2	1	3	-	-	1	2	1	0.3	0.5	0.05	0.4	C25
Larynx	9	0	89	-	-	-	-	-	1	-	-	-	1	1	-	5	-	-	1	0.3	0.4	0.04	0.4	C32	
Trachea, bronchus, and lung	28	0	57	-	-	-	-	-	-	1	-	1	3	3	5	5	4	6	6	1.0	1.3	0.13	1.0	C33-34	
Bone	11	0	100	-	-	-	-	-	-	-	-	-	1	2	2	2	1	-	3	0.4	0.5	0.03	0.4	C40-41	
Melanoma of skin	14	0	79	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2	5	0.5	0.7	0.06	0.5	C43	
Non-melanoma skin	11	0	82	-	-	-	-	-	-	-	-	-	-	1	2	3	1	2	-	0.4	0.6	0.06	0.4	C44	
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.01	0.0	C45	
Kaposi sarcoma	81	0	44	-	-	-	-	5	18	17	14	9	9	1	3	2	-	-	-	2.8	3.9	0.29	3.6	C46	
Connective and soft tissue	14	0	79	-	-	-	-	1	1	2	-	1	1	2	1	-	-	-	1	0.5	0.7	0.04	0.5	C47, C49	
Breast	306	0	82	-	-	-	-	1	3	11	16	14	32	30	38	47	20	23	39	10.6	14.6	1.32	12.4	C50	
Vulva	22	0	86	-	-	-	-	2	4	3	1	-	2	3	-	2	2	1	2	0.8	1.0	0.09	0.9	C51	
Vagina	5	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0.2	0.2	0.02	0.2	C52	
Cervix uteri	734	0	78	-	-	-	-	2	13	41	51	65	69	81	110	69	80	88	25.4	34.9	3.36	29.5	C53		
Uterus	67	0	60	-	-	-	-	1	1	1	4	5	5	6	12	12	11	10	2.3	3.2	0.34	2.6	C54-55		
Ovary	58	0	64	-	-	-	-	2	3	3	4	2	6	6	8	3	7	3	8	2.0	2.8	0.23	2.3	C56	
Placenta	11	0	82	-	-	-	-	1	1	2	3	2	1	-	1	-	-	-	-	0.4	0.5	0.04	0.5	C58	
Kidney and renal pelvis	10	0	80	-	-	-	-	1	-	-	-	-	-	1	-	1	-	1	-	0.3	0.5	0.03	0.4	C64-65	
Bladder	7	0	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	0.2	0.3	0.03	0.2	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	20	0	75	2	-	-	-	1	3	1	4	2	2	1	2	1	1	-	-	0.7	1.0	0.08	0.9	C69	
Brain and nervous system	9	0	33	2	-	-	-	1	1	-	1	-	1	-	-	2	-	-	-	0.3	0.4	0.03	0.3	C70-72	
Thyroid	15	0	67	-	-	-	-	-	1	-	2	-	3	3	2	1	-	3	-	0.5	0.7	0.07	0.6	C73	
Hodgkin lymphoma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C81	
Non-Hodgkin lymphoma	30	0	73	-	-	-	-	1	3	1	5	1	4	1	-	1	1	6	2	1.0	1.4	0.12	1.2	C82-85, C96	
Multiple myeloma	6	0	83	-	-	-	-	-	-	-	-	-	-	1	2	1	-	1	1	0.2	0.3	0.03	0.2	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	6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3	0.01	0.2	C95	
Other and unspecified	58	0	67	3	-	-	-	1	2	6	1	2	4	7	2	3	11	3	2	11	2.0	2.8	0.21	2.3	O&U
All sites	2113	0	66	14	8	10	9	26	76	97	114	143	170	174	207	292	204	240	329	73.0	91.7	82.0	81.6	C00-96	
All sites except C44	2102	0	66	14	8	10	9	25	76	97	113	143	170	173	205	289	203	238	329	72.6	100.0	9.11	81.6	C00-96 exc. C44	
Average annual population					71912	70945	70527	71976	47030	34329	27521	26469	25709	24242	23691	18793	17606	13523	13362	21036	578670				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Benin, Cotonou

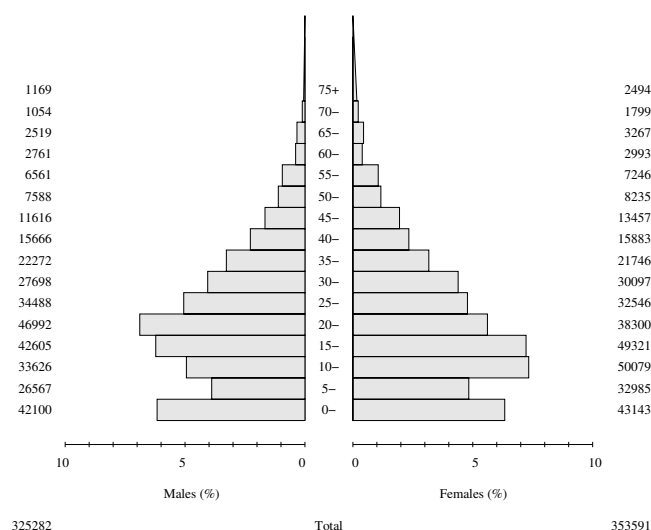
The Cotonou Cancer Registry, established by the Benin Ministry of Health in 2014, is a population-based cancer registry under the control of the National Program for the Fight against Noncommunicable Diseases (PNLMNT). Cancer registration in Benin first started in 2013, in the pathology department of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

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

The Cotonou Cancer Registry data presented in this volume are for the registry's catchment area of the city of Cotonou, which is subdivided into 13 arrondissements. The largest ethnic group in the city is the Fon, followed by the Yoruba, Goun, Mina, Xueda, Aja, and many others. The most common religion in Benin is Roman Catholicism, followed closely by Islam, Vodun, and Protestantism.

The population of Cotonou is estimated to have been 678 874 in 2013 (at the census). The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

Benin, Cotonou (2013–2015)
Population pyramid (average annual person-years by sex and age group)



Estimates based on the general population and housing census, February 2013

The registry collects information from 28 sources that diagnose, treat, and/or hospitalize patients: 9 hospitals, 14 private clinics, and 5 private pathology laboratories. The most important source is the Centre National Hospitalier Universitaire (CNHU), which is by far the largest hospital in Benin and is the only centre with specialist services, although there is no separate oncology department and no radiotherapy service.

Case finding in hospitals is carried out through visits by the cancer registrar to all services where cancer patients are treated. The Hôpital de Menontin has a computerized central records system with a full index of patients (both inpatient and outpatient) that includes demographic and diagnostic details. At the other hospitals, case finding is carried out through regular examination of ward registers. These registers generally list diagnosis, but finding other information (e.g. personal data – especially address – and details such as histological type) requires tracing the clinical records to wherever they have been stored in each service.

A focal-point staff member, generally the head nurse, has been identified in each service, and these focal-point personnel receive special training in the principles and methods of cancer registration.

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

The registry uses IARC's CanReg5 software for data entry, management, and quality control. The registry has well-developed security procedures to preserve the confidentiality of documents and computer files.

YEARS PRESENTED

Mid-2013–mid-2015 (a 2-year period)

NOTES

The registry is very new; the calculated rates presented in this volume are based on the first 24 months of activity.

The age-standardized incidence rates (ASRs) are reasonably similar to the values for western Africa reported in GLOBOCAN 2012. The ASR of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 128.0 cases per 100 000 person-years in males and 115.0 cases per 100 000 person-years in females.

In males, prostate cancer predominates (accounting for 28% of registered cases) and, perhaps surprisingly, stomach cancer is apparently more common than liver cancer. In females, the ASR of breast cancer (40.2 cases per 100 000 person-years) is higher than that of cervical cancer (23.1 cases per 100 000 person-years).

SUMMARY

The data are still sparse and may be influenced by registration of prevalent cases in the early months of registry operation. The relatively low frequency of liver cancer may be due to problems with identifying clinically diagnosed cases.

PUBLICATIONS AND ACHIEVEMENTS

The Cotonou Cancer Registry became a member of the African Cancer Registry Network (AFCRN) in 2015.

Benin, Cotonou (2013–2015)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)											Crude rate	%	CR	ASR (W)	ICD-10					
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-						55-	60-	65-	70-	75+
Mouth	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.05	0.5	C00-06	
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C07-08	
Nasopharynx	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.5	0.05	0.7	C11	
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C09-10, C12-14	
Oesophagus	15	0	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	5.5	0.92	6.9	C15	
Stomach	24	0	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7	8.9	1.51	11.3	C16	
Colon	10	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	3.7	0.61	3.9	C18	
Rectum	11	0	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	4.1	0.62	4.9	C19-20	
Anus	5	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.8	0.08	0.9	C21	
Liver	16	0	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	5.9	0.47	7.4	C22	
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24	
Pancreas	6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	2.2	0.37	2.8	C25	
Larynx	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.12	1.1	C32	
Trachea, bronchus, and lung	3	0	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.1	0.09	0.9	C33-34	
Bone	7	0	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	2.6	0.15	1.5	C40-41	
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C43	
Non-melanoma skin	5	0	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.0	0.05	1.5	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	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.5	0.12	1.1	C47, C49	
Breast	6	0	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	2.2	0.45	2.9	C50	
Penis	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.00	0.9	C60	
Prostate	75	0	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.5	27.7	7.06	55.6	C61	
Testis	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.04	0.4	C62	
Kidney and renal pelvis	12	0	50	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	4.4	0.59	4.0	C64-65	
Bladder	7	0	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	2.6	0.23	2.0	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	2	0	100	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.01	0.3	C69	
Brain and nervous system	2	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.25	1.1	C70-72	
Thyroid	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.10	0.7	C73	
Hodgkin lymphoma	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.5	0.04	0.5	C81	
Non-Hodgkin lymphoma	5	0	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.8	0.15	1.5	C82-85, C96	
Multiple myeloma	9	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	3.3	0.22	2.3	C90	
Lymphoid leukaemia	11	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.7	4.1	0.30	4.5	C91
Myeloid leukaemia	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.5	0.27	1.4	C92-94	
Leukaemia, unspecified	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.04	0.3	C95	
Other and unspecified	19	0	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	1	O&U	
All sites	276	0	60	4	4	4	6	5	9	10	19	16	16	37	21	28	37	26	34	42.4	15.52	129.5	129.5	C00-96	
All sites except C44	271	0	59	4	4	4	6	4	9	10	18	15	15	37	21	28	37	26	33	41.7	100.0	15.46	128.0	C00-96 exc. C44	
Average annual population	42100	26566	33626	42604	46992	34488	27698	22272	15666	11616	7588	6560	2760	2518	1054	1168	325279								

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Benin, Cotonou (2013–2015)

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

Site	All ages		MV		DCO		Age group (years)												Crude rate	CR %	ASR (W)	ICD-10				
	unk	%	unk	%	0-	%	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-					65-	70-	75+	
Mouth	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	-	0.6	1.1	0.38	2.1	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C07-08
Nasopharynx	2	0	100	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.5	0.03	0.3	C11
Other pharynx	2	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.5	0.05	0.5	C09-10, C12-14
Oesophagus	8	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.1	2.1	0.29	3.6	C15
Stomach	6	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.8	1.6	0.29	2.4	C16
Colon	10	0	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.4	2.7	0.32	3.0	C18
Rectum	4	0	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.6	1.1	0.07	0.8	C19-20
Anus	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	0.5	0.10	0.9	C21
Liver	5	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.7	1.3	0.25	2.1	C22
Gallbladder etc.	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.3	0.5	0.15	0.9	C23-24
Pancreas	8	0	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1.1	2.1	0.43	3.3	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C32
Trachea, bronchus, and lung	3	0	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.4	0.8	0.18	1.0	C33-34
Bone	5	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.7	1.3	0.08	0.9	C40-41
Melanoma of skin	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.1	0.3	0.01	0.2	C43
Non-melanoma skin	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.8	0.23	2.1	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	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	0.5	0.06	0.6	C47, C49
Breast	153	0	67	-	-	-	-	3	3	3	19	14	22	26	26	14	10	8	3	5	5	21.6	40.8	4.33	40.2	C50
Vulva	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.3	0.03	0.3	C51
Vagina	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	0.5	0.04	0.4	C52
Cervix uteri	63	0	86	-	-	-	-	2	1	1	1	3	5	5	9	7	10	6	5	8	8.9	16.8	2.74	23.1	C53	
Uterus	12	0	92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1.7	3.2	0.83	5.7	C54-55
Ovary	12	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.7	3.2	0.28	2.6	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0	0.0	0.00	0.0	C58
Kidney and renal pelvis	11	0	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.6	2.9	0.33	3.5	C64-65
Bladder	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	0.5	0.05	0.5	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68
Eye	6	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.6	0.04	0.8	C69
Brain and nervous system	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.3	0.14	0.6	C70-72
Thyroid	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.4	0.8	0.02	0.7	C73
Hodgkin lymphoma	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	0.5	0.02	0.2	C81
Non-Hodgkin lymphoma	6	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.8	1.6	0.26	1.8	C82-85, C96
Multiple myeloma	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.8	1.6	0.21	1.7	C90
Lymphoid leukaemia	8	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.1	2.1	0.50	3.6	C91
Myeloid leukaemia	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.8	1.6	0.17	1.6	C92-94
Leukaemia, unspecified	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0.3	0.01	0.1	C95
Other and unspecified	16	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2.3	4.3	0.57	4.9	O&U
All sites	381	0	71	6	3	3	5	7	7	7	28	28	47	45	57	35	48	26	16	20	53.9	100.0	13.49	117.1	C00-96	
All sites except C44	375	0	71	6	2	3	5	7	7	7	28	27	46	45	56	35	46	26	16	20	53.0	100.0	13.26	115.0	C00-96 exc. C44	
Average annual population	43142	32984	50078	49320	38300	32546	30096	21746	15882	13456	8234	7246	2992	3266	1798	2494	353586									

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

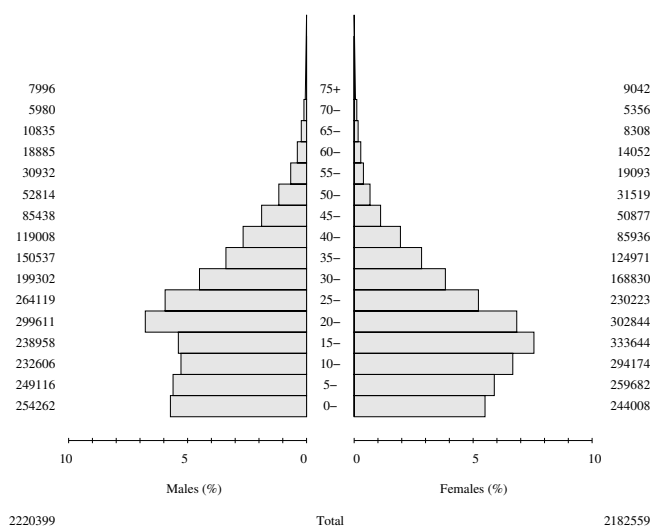
Côte d'Ivoire, Abidjan

The Registre du Cancer 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 was re-established in late 2011 as an initiative of the National Programme for the Fight against Cancer (PNLCA). The registry is located in the oncology department of the University Hospital Centre (CHU) of Treichville, and the head of the department oversees the registry activities. The registry coordinator, who manages the day-to-day work of the registry, is assisted by a full-time data clerk and two data collectors. An archivist/secretary from the oncology department provides support to the registry. The staff members' salaries are generally paid from the budget of the oncology department. The registry receives technical and financial support from the PNLCA, F. Hoffmann-La Roche Ltd, and IARC. Travel expenses are covered by the budget of the PNLCA.

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 registry 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 population of the city of Abidjan is estimated by the Institut National de la Statistique (INS) to have been 4 402 949 in 2012, based on data from the 1998 census. The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

Côte d'Ivoire, Abidjan (2012–2013)
Population pyramid (average annual person-years by sex and age group)



Source: Institut National de la Statistique (INS) of Côte d'Ivoire, 2012 and 2013 estimates

The main sources of information are the three major teaching hospitals serving the city (the CHUs of Treichville, Cocody, and Yopougon), each of which offers a full range of diagnostic and therapeutic services. The other public hospitals in the area are relatively small. Other sources of information are the Abidjan Military Hospital and a number of small private clinics, such as the Polyclinique Internationale Sainte Anne-Marie (PISAM).

The CHU of Treichville has the area's only oncology service. Patients requiring radiotherapy have to go to France, Ghana, Morocco, or Tunisia. The paediatrics department at the CHU of Cocody provides paediatric oncology services. The haematology clinic at the CHU of Yopougon sees a large number of cases of lymphoma and haematological malignancies.

None of the hospitals has a centralized record system. In general, each service maintains its own register of admissions and discharges, which include the patient's hospital number, name, age, sex, diagnosis, and condition at time of discharge. The patient's residential address is not included. A few of the non-oncological services in the area (e.g. the otorhinolaryngology unit at the CHU of Treichville) keep registers of patients with cancer.

There are three major pathology institutes: at the CHU of Treichville, the CHU of Cocody, and the private Centre Wilic. All three provide only basic histopathology examinations; for specialized diagnostic procedures (e.g. immunohistochemical analysis), specimens must be sent to collaborating centres in Europe or the USA.

Case finding is fully active, carried out through visits to each service and private clinic. A focal-point staff member has been identified in each of the key services and clinics.

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

The registry has used IARC's CanReg5 software since 2012. The database from the initial registration period (1994–2002), which was created using CanReg4, has been merged with the more recent records.

YEARS PRESENTED

2012–2013 (a 2-year period)

NOTES

The registry resumed activity only recently, after a lapse of several years. Therefore, relatively complete data were available only for the 2-year period of 2012–2013, and there was an obvious decline in the rate of registration during the final 4 months of that period.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 68.8 cases per 100 000 person-years in males and 111.5 cases per 100 000 person-years in females, values similar to

those for western Africa reported in GLOBOCAN 2012. The ASRs for lymphomas and, in particular, leukaemias are low. Kaposi sarcoma appears to be relatively rare, and there were more cases of lung cancer reported in females than in males.

The overall percentage of microscopically verified cases (MV%) is relatively low: 53% in males and 65% in females.

SUMMARY

The rates are relatively low, which may reflect difficulties in case finding in this large city with three large teaching hospitals and several smaller institutions. The population denominators are based on projections from the census of 1998 and therefore may also be relatively inaccurate. Interestingly, the proportional distribution of various cancers has changed little since the first report from the registry (for 1995–1997), with the exception of the reversal in the relative frequency of breast and cervical cancers in females (Echimane et al., 2000).

PUBLICATIONS AND ACHIEVEMENTS

The Registre du Cancer d'Abidjan became a member of the African Cancer Registry Network (AFCRN) in 2013. It hosted the 2015 Third AFCRN Annual Meeting.

Echimane AK, Ahnoux AA, Adoubi I, Hien S, M'Bra K, D'Horpock A, et al. (2000). Cancer incidence in Abidjan, Ivory Coast: first results from the cancer registry, 1995–1997. *Cancer*. 89(3):653–63. [http://dx.doi.org/10.1002/1097-0142\(20000801\)89:3<653::AID-CNCR22>3.0.CO;2-Z](http://dx.doi.org/10.1002/1097-0142(20000801)89:3<653::AID-CNCR22>3.0.CO;2-Z) PMID:10931466

N'da GG, Ayemou A, Adoubi I, et al. Registre du Cancer d'Abidjan rapport biennal: 2012–2013.

Tanon A, Jaquet A, Ekouevi DK, Akakpo J, Adoubi I, Diomande I, et al.; leDEA West Africa Collaboration (2012). The spectrum of cancers in West Africa: associations with human immunodeficiency virus. *PLoS One*. 7(10):e48108. <http://dx.doi.org/10.1371/journal.pone.0048108> PMID:23144732

Toure M, Nguessan E, Bambara AT, Kouassi YK, Dia JM, Adoubi I (2013). Factors linked to late diagnosis in breast cancer in sub-Saharan Africa: case of Côte d'Ivoire. *Gynecol Obstet Fertil*. 41(12):696–700. [French] <http://dx.doi.org/10.1016/j.gyobfe.2013.08.019> PMID:24210776

Côte d'Ivoire, Abidjan (2012–2013)

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

Site	All ages		Age group (years)													Crude rate	%	CR	ASR (W)	ICD-10				
	unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-						65-	70-	75+	
Mouth	14	0	79	-	-	1	-	2	1	1	2	1	1	2	1	2	1	2	1	0.3	1.5	0.10	0.7	C00-06
Salivary gland	12	0	25	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.3	0.08	0.7	C07-08
Nasopharynx	7	0	71	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.02	0.3	C11
Other pharynx	5	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.5	0.05	0.4	C09-10, C12-14
Oesophagus	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.2	C15
Stomach	36	0	64	-	-	-	1	4	1	2	8	6	5	6	2	1	0.8	3.8	0.39	0.1	0.8	2.8	C16	
Colon	40	0	68	-	-	1	5	2	2	7	11	2	3	2	3	0.9	4.3	0.31	0.1	0.9	3.3	2.4	C18	
Rectum	11	0	45	-	-	-	1	1	1	2	1	1	2	2	1	0.2	1.2	0.09	0.1	0.2	1.2	0.8	C19-20	
Anus	3	0	33	-	-	-	1	1	1	-	-	-	-	-	-	0.1	0.3	0.00	0.1	0.1	0.3	0.00	0.0	C21
Liver	179	0	14	-	2	2	3	7	9	26	20	18	24	27	21	7	4	9	4	19.1	11.0	9.9	9.9	C22
Gallbladder etc.	3	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.04	0.3	C23-24
Pancreas	34	0	21	-	-	-	1	1	2	1	3	5	5	3	4	3	4	2	0.8	3.6	0.36	2.5	C25	
Larynx	19	0	79	-	-	-	-	1	3	-	1	1	3	5	2	1	2	0.4	2.0	0.19	1.6	1.6	C32	
Trachea, bronchus, and lung	29	0	31	-	-	-	1	1	1	4	3	2	6	3	1	4	4	4	3.1	3.1	0.31	2.3	C33-34	
Bone	39	0	46	-	1	1	4	5	5	4	-	1	4	4	1	1	2	1	0.9	4.2	0.20	1.6	C40-41	
Melanoma of skin	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.02	0.2	C43
Non-melanoma skin	20	0	35	-	-	-	1	3	4	1	4	-	1	-	2	1	2	1	0.5	0.1	0.00	1.1	C44	
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C45
Kaposi sarcoma	16	0	94	-	-	-	1	1	2	3	2	1	3	2	1	1	1	1	0.4	1.7	0.08	0.7	C46	
Connective and soft tissue	25	0	64	2	-	2	4	2	1	2	2	3	3	3	-	3	-	1	0.6	2.7	0.13	1.2	C47, C49	
Breast	12	0	83	-	-	-	-	-	-	-	1	1	2	2	3	2	1	1	0.3	1.3	0.12	1.0	C50	
Penis	3	0	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.05	0.3	C60	
Prostate	251	0	67	-	-	-	-	-	1	1	2	4	13	31	53	44	43	60	5.7	26.8	3.84	29.2	C61	
Testis	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.00	0.0	C62	
Kidney and renal pelvis	15	0	67	4	-	-	1	1	1	2	1	2	1	1	1	1	1	1	0.3	1.6	0.07	0.6	C64-65	
Bladder	16	0	25	-	-	-	1	-	-	1	2	-	2	4	2	2	1	1	0.4	1.7	0.16	1.2	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	15	0	87	4	-	1	2	1	-	2	1	1	2	-	1	-	-	-	0.3	1.6	0.04	0.5	C69	
Brain and nervous system	8	0	50	-	-	-	1	1	1	1	-	-	-	3	-	-	-	1	0.2	0.9	0.03	0.4	C70-72	
Thyroid	2	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.03	0.2	C73	
Hodgkin lymphoma	8	0	100	1	1	1	1	1	1	2	2	6	4	5	6	2	1	2	0.2	0.9	0.01	0.2	C81	
Non-Hodgkin lymphoma	63	0	90	4	18	4	3	1	3	2	2	6	4	5	6	2	1	2	1.4	6.7	0.18	2.2	C82-85, C96	
Multiple myeloma	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.01	0.1	C90	
Lymphoid leukaemia	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.06	0.3	C91	
Myeloid leukaemia	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C92-94	
Leukaemia, unspecified	9	0	56	1	1	-	2	-	-	1	-	1	-	-	-	-	-	-	0.2	1.0	0.07	0.5	C95	
Other and unspecified	49	0	47	-	1	1	-	2	5	6	2	1	5	3	1	9	6	3	4	1.1	5.2	0.44	3.5	O&U
All sites	957	0	53	16	27	9	18	26	39	49	57	61	59	91	119	130	88	73	21.6	8.78	69.9	69.9	C00-96	
All sites except C44	937	0	53	16	27	9	18	25	36	45	56	57	59	90	119	128	87	71	21.1	100.0	8.63	68.8	C00-96 exc. C44	

Average annual population

254262 249116 232606 238958 299611 264119 199302 150536 119008 85438 52814 30932 18885 10834 5980 7996 2220395

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Côte d'Ivoire, Abidjan (2012–2013)

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

Site	All ages	MV DCO		Age group (years)													Crude rate	CR %	ASR (W)	ICD-10				
		unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-					65-	70-	75+	
Mouth	22	0	59	-	-	-	-	1	2	1	4	3	2	1	2	3	-	2	0.5	1.5	0.19	1.7	C00-06	
Salivary gland	9	0	78	-	-	-	-	2	2	1	1	1	-	-	-	2	-	-	0.2	0.6	0.08	0.6	C07-08	
Nasopharynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C11	
Other pharynx	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.1	C09-10, C12-14	
Oesophagus	3	0	33	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	0.1	0.2	0.03	0.3	C15	
Stomach	23	0	61	-	-	-	-	-	3	-	1	3	2	4	7	1	-	2	0.5	1.5	0.39	2.8	C16	
Colon	26	0	65	-	-	-	-	1	2	1	5	6	3	3	1	-	-	2	0.6	1.7	0.20	2.0	C18	
Rectum	28	0	61	-	-	-	-	1	2	1	3	3	10	1	2	1	-	1	0.6	1.9	0.31	2.4	C19-20	
Anus	15	0	80	-	-	-	-	-	5	2	1	1	1	1	2	1	-	-	0.3	1.0	0.16	1.1	C21	
Liver	84	0	15	-	-	2	1	3	7	5	10	10	8	10	7	10	5	6	1.9	5.6	0.96	7.4	C22	
Gallbladder etc.	10	0	30	-	-	-	-	-	1	-	1	-	4	1	1	1	1	2	0.2	0.7	0.10	1.0	C23-24	
Pancreas	20	0	20	-	-	-	-	-	2	1	1	3	3	5	3	1	1	1	0.5	1.3	0.30	2.2	C25	
Larynx	4	0	0	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-	0.1	0.3	0.01	0.1	C32	
Trachea, bronchus, and lung	25	0	48	-	-	-	-	-	2	3	1	4	3	4	3	3	3	6	0.6	1.7	0.36	2.9	C33-34	
Bone	32	0	41	-	-	1	3	2	3	3	1	4	3	-	4	1	1	1	0.7	2.1	0.22	1.8	C40-41	
Melanoma of skin	7	0	86	-	-	-	-	-	-	-	1	1	1	1	1	1	2	1	0.2	0.5	0.08	0.6	C43	
Non-melanoma skin	26	0	58	-	-	-	-	5	-	-	3	4	3	2	1	1	2	1	0.6	1.9	0.24	1.9	C44	
Mesothelioma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.01	0.1	C45	
Kaposi sarcoma	22	0	91	-	-	1	3	7	7	2	-	1	-	-	-	-	-	-	0.5	1.5	0.04	0.5	C46	
Connective and soft tissue	28	0	46	-	-	2	1	1	5	-	1	3	4	2	3	-	-	2	0.6	1.9	0.24	1.9	C47, C49	
Breast	536	0	79	-	-	5	5	16	50	72	88	70	85	60	36	26	12	11	12.3	35.8	4.29	36.5	C50	
Vulva	14	0	64	-	-	-	1	-	-	2	-	2	3	4	1	-	1	-	0.3	0.9	0.16	1.2	C51	
Vagina	8	0	75	-	-	-	1	-	-	2	-	1	-	2	1	-	1	1	0.2	0.5	0.05	0.6	C52	
Cervix uteri	276	0	67	-	-	1	4	12	33	25	49	40	36	31	13	19	13	6.3	18.4	3.02	23.5	C53		
Uterus	43	0	60	-	-	-	-	-	1	4	3	7	11	6	5	5	1	1.0	2.9	0.72	4.8	C54-55		
Ovary	68	0	51	-	-	1	3	6	10	8	7	10	8	4	3	2	2	2	1.6	4.5	0.53	4.5	C56	
Placenta	10	0	40	-	-	-	1	1	3	2	1	-	-	-	-	-	-	1	0.2	0.7	0.01	0.3	C58	
Kidney and renal pelvis	13	0	46	-	-	1	1	-	1	3	2	1	2	-	-	1	-	-	0.3	0.9	0.07	0.6	C64-65	
Bladder	9	0	22	-	-	-	-	-	-	2	2	-	-	1	-	1	-	3	0.2	0.6	0.06	0.8	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	23	0	87	6	1	1	-	2	3	1	2	-	3	3	1	-	-	-	0.5	1.5	0.12	1.1	C69	
Brain and nervous system	7	0	43	-	-	-	-	1	1	-	1	-	-	-	1	-	-	-	0.2	0.5	0.03	0.3	C70-72	
Thyroid	19	0	53	-	-	-	-	-	1	3	3	4	1	2	2	-	2	1	0.4	1.3	0.20	1.5	C73	
Hodgkin lymphoma	6	0	100	5	6	7	1	-	1	-	2	1	1	-	1	-	-	-	0.1	0.4	0.03	0.3	C81	
Non-Hodgkin lymphoma	36	0	86	-	-	1	1	-	4	-	1	5	1	2	1	1	2	-	0.8	2.4	0.18	1.5	C82-85, C96	
Multiple myeloma	1	0	100	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C90	
Lymphoid leukaemia	1	0	100	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	0.0	0.1	0.01	0.1	C91	
Myeloid leukaemia	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C92-94	
Leukaemia, unspecified	8	0	100	2	3	-	-	-	-	-	-	-	1	1	1	-	-	-	0.2	0.5	0.04	0.4	C95	
Other and unspecified	57	0	58	-	1	1	1	3	2	4	7	6	7	5	9	4	-	2	5	1.3	3.8	0.40	3.8	O&U
All sites	1524	0	65	15	17	14	16	26	57	118	166	187	187	200	182	124	87	62	34.9	13.80	113.3	113.3	C00-96	
All sites except C44	1498	0	65	15	17	14	16	21	57	117	163	183	184	198	181	123	85	61	34.3	100.0	13.60	111.5	C00-96 exc. C44	
Average annual population				244008	259682	294174	333644	302844	230222	168830	124970	85936	50876	31519	19093	14052	8308	5356	9042	2182554				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

The Gambia

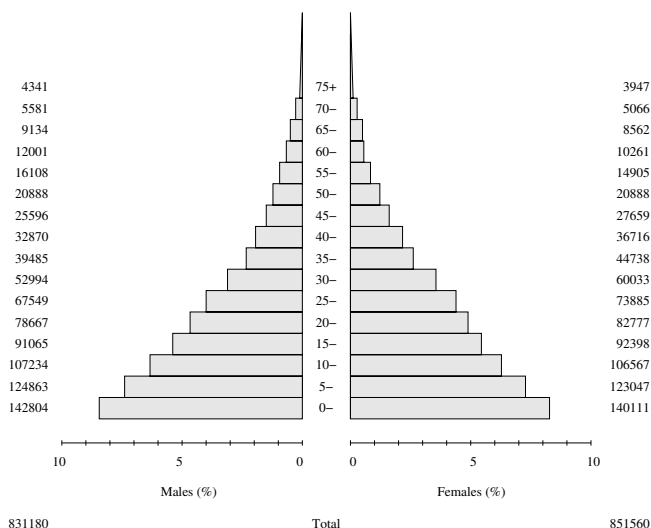
The Gambia National Cancer Registry (GNCR) was established in 1986 as part of The Gambia Hepatitis Intervention Study (GHIS), to record data on the pattern of cancer occurrence in The Gambia. This collaborative project involving IARC, the Gambian government, and the UK Medical Research Council (MRC) was initially also supported by the Italian Ministry of Foreign Affairs and the Swedish Medical Research Council. The GNCR is wholly funded by IARC through the GHIS. The registry is based at the MRC Unit The Gambia and employs 10 staff members.

Since the inception of the GHIS project, improvements have been made in the diagnosis of liver cancer and chronic liver disease. A Gambian hepatologist was recruited by IARC in 2011 to head the GHIS and is responsible not only for further improving the diagnosis and management of chronic liver disease but also for supervising the activities of the GNCR.

The GNCR data presented in this volume are for the entire country of The Gambia.

The population of The Gambia is estimated by the United Nations to have been 1 728 000 in 2010. The average annual population-at-risk estimates corresponding to the GNCR data presented in this volume are shown in the population pyramid.

The Gambia (2007–2011)
Population pyramid (average annual person-years by sex and age group)



Source: United Nations, Department of Economic and Social Affairs, Population Division (2013). World Population Prospects: The 2012 Revision, Highlights and Advance Tables. Working Paper No. ESA/P/WP.228

The GNCR's main information sources are four public hospitals: the Edward Francis Small Teaching Hospital (EFSTH) in Banjul, the Armed Forces Provisional Ruling Council (AFPRC) General Hospital in Farafenni, Bwiam General Hospital in the West Coast Region, and Bansang Hospital in the east of the

country (which serves a mainly rural population). These hospitals provide general medical and laboratory services and are the major referral centres for the various public dispensaries and health centres located throughout The Gambia. The MRC clinic in Fajara is also a major referral centre, with three outreach stations in rural areas; it has a broad-based laboratory research facility and has been the national referral centre for all patients with suspected liver disease since 2011. Histopathology services are offered by the EFSTH in Banjul, with support from IARC in Lyon, where tissue blocks are sent for additional staining and analysis, in particular for cases of liver cancer. The registry receives copies of all histology reports from the EFSTH and, since mid-2014, from a dedicated histopathologist at IARC.

There are also more than a dozen private clinics and hospitals in The Gambia (located mainly in and around Banjul and the coastal areas) and several mission clinics that offer general medical care in the periurban and rural areas.

The registry collects information from the following sources: medical records, log books, ward/admission books, central medical records, histology report books, ultrasonography and computed tomography (CT) reports, specific biochemistry request books, surgical operation lists, nursing report books, and death certificates. These documents are searched for diagnoses of cancer. Data are also obtained from the database of the Prevention of Liver Fibrosis and Cancer in Africa (PROLIFICA) project, a 5-year European Union-funded study involving The Gambia and two other countries in western Africa.

Case finding is entirely active. It is carried out by trained tumour registration officers, who visit the clinical services and collect information using standard registration forms. They then cross-check these forms against ward records, central medical records, and registers of admissions/discharges.

Death registration is incomplete in The Gambia. A death certificate is needed only to obtain a permit for burial within the capital city of Banjul or the Brikama Local Government Area (accounting for approximately 30% of the country's population), or for specific legal purposes. Copies of death certificates mentioning cancer are obtained from the registration office. Death-certificate-only cases are not included in the registry database.

The registry uses IARC's CanReg5 software for data entry and management. Registry data are well secured; electronic information is stored on a central server with restricted access, and paper files are stored in locked cabinets.

YEARS PRESENTED

2007–2011 (a 5-year period)

NOTES

The rate of registration has remained relatively constant over the past 10 years. The most recent complete 5-year period (2007–2011) was selected for analysis.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 59.2 cases per 100 000 person-years in males and 51.6 cases per 100 000 person-years in females. These values are substantially lower than the values for western Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of only 0.45 for females. The rates are lower than the corresponding estimates for western Africa for cancers at almost all anatomical sites, with the exception of liver cancers. The ASR of liver cancer was 32.3 cases per 100 000 person-years in males and 12.5 cases per 100 000 person-years in females, values similar to those reported in this volume for Guinea (Conakry), but considerably higher than values reported for elsewhere in Africa.

The overall percentage of microscopically verified cases (MV%) is low: 16% in males and 33% in females. This is partly due to the large number of liver cancers, which are very rarely confirmed by biopsy. Similarly, the MV% for cervical cancer cases is only 23%.

SUMMARY

The GNCR is unusual in that it serves the entire national population, most of which is rural and has a relatively traditional lifestyle compared with other registry populations in this volume. This may account in part for the very low rates of most cancers. However, the lack of diagnostic (and treatment) capacity also likely results in the underdiagnosis of cancer. The GNCR was founded to help monitor the protective effects of hepatitis B vaccination, which was added to the national immunization schedule in a controlled fashion in the late 1980s (Viviani et al., 2008); the registry therefore has a particular focus on finding and recording liver cancers. Recently, an evaluation estimated the overall completeness of the registry at 50.3%, and the authors noted that data are particularly incomplete in the rural and elderly populations, most likely due to patterns of health care use and lack of health care access (Shimakawa et al., 2013). A new tumour registration officer was recruited in September 2013 to improve the registry's coverage of the North Bank Region. The GHIS lead and the new interim head of the GNCR – who recently received training in cancer registration, epidemiology, and survival from the African Cancer Registry Network (AFCRN) and IARC – conduct monthly outreach clinics and surveys

of facilities around the country. It is anticipated that these measures will go a long way towards improving the deficiencies in case detection and registration.

PUBLICATIONS AND ACHIEVEMENTS

The GNCR became a member of the AFCRN in 2012.

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The Gambia (2007–2011)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)										Crude rate	%	CR	ASR (W)	ICD-10					
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-						50-	55-	60-	65-	70-
Mouth	10	6	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.07	0.4	C00-06
Salivary gland	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.01	0.1	C07-08
Nasopharynx	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C11
Other pharynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.01	0.0	C09-10, C12-14
Oesophagus	22	4	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.7	0.08	1.0	C15
Stomach	39	4	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	3.0	0.28	2.2	C16
Colon	4	0	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	0.2	C18
Rectum	23	3	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.7	0.13	1.0	C19-20
Anus	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.01	0.1	C21
Liver	774	72	1	5	2	6	20	27	73	99	88	57	57	62	49	35	28	36	18.6	58.8	3.24	32.3	C22	
Gallbladder etc.	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C23-24
Pancreas	13	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.09	0.7	C25
Larynx	3	0	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.02	0.2	C32
Trachea, bronchus, and lung	78	4	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	5.9	0.54	4.5	C33-34
Bone	25	7	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.9	0.08	0.9	C40-41
Melanoma of skin	5	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	0.06	0.3	C43
Non-melanoma skin	16	6	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.6	0.06	0.8	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	7	3	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	0.3	C46
Connective and soft tissue	13	2	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.05	0.6	C47, C49
Breast	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.01	0.1	C50
Penis	5	1	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	0.04	0.3	C60
Prostate	103	20	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	7.8	0.90	7.1	C61
Testis	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.04	0.2	C62
Kidney and renal pelvis	5	1	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	0.02	0.2	C64-65
Bladder	21	2	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.6	0.14	1.2	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68
Eye	9	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.02	0.3	C69
Brain and nervous system	8	6	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.6	0.05	0.3	C70-72
Thyroid	8	2	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.6	0.05	0.4	C73
Hodgkin lymphoma	6	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.5	0.02	0.2	C81
Non-Hodgkin lymphoma	71	21	49	6	6	6	5	1	6	2	2	2	2	2	1	1	1	1	1.7	5.4	0.15	1.9	C82-85, 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	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C92-94
Leukaemia, unspecified	6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.5	0.02	0.2	C95
Other and unspecified	46	10	65	1	1	3	3	2	3	3	2	1	2	7	4	1	1	1	1.1	3.5	0.15	1.7	O&U	
All sites	1332	175	16	18	14	20	35	49	84	127	110	75	93	102	95	99	82	76	32.1	63.8	6.00	60.0	C00-96	
All sites except C44	1316	169	16	18	13	20	34	49	83	126	109	75	92	102	95	98	82	75	31.7	63.1	5.92	59.2	C00-96 exc. C44	
Average annual population	142804	124863	107234	91065	78667	67549	52994	39485	32870	25596	20888	16108	12001	9134	5581	4341	831180							

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

The Gambia (2007–2011)

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

Site	All ages	Age unk	MV		DCO	Age group (years)											Crude rate	CR %	ASR (W)	ICD-10						
			%	%		0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-					55-	60-	65-	70-	75+	
Mouth	7	4	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.6	0.03	0.3	C00-06	
Salivary gland	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C07-08	
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C11	
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C09-10, C12-14	
Oesophagus	9	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.04	0.5	C15	
Stomach	12	1	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.09	0.8	C16	
Colon	3	1	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.1	C18	
Rectum	11	1	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.9	0.08	0.6	C19-20	
Anus	2	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.00	0.2	C21	
Liver	270	44	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.3	23.0	1.39	12.5	C22	
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24	
Pancreas	12	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.08	0.8	C25	
Larynx	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C32	
Trachea, bronchus, and lung	13	3	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.1	0.12	0.7	C33-34	
Bone	12	4	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.02	0.4	C40-41	
Melanoma of skin	11	2	91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.9	0.07	0.6	C43	
Non-melanoma skin	9	3	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.04	0.3	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45	
Kaposi sarcoma	3	1	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	0.1	C46	
Connective and soft tissue	15	2	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.3	0.04	0.5	C47, C49	
Breast	163	33	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	13.9	0.61	6.5	C50	
Vulva	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.2	C51	
Vagina	8	1	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.03	0.3	C52	
Cervix uteri	439	105	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.3	37.3	2.09	19.5	C53	
Uterus	29	5	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	2.5	0.16	1.4	C54-55	
Ovary	24	6	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	2.0	0.11	1.0	C56	
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C58	
Kidney and renal pelvis	1	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C64-65	
Bladder	9	2	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.05	0.7	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	13	2	85	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.1	0.01	0.2	C69	
Brain and nervous system	5	2	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	0.03	0.2	C70-72	
Thyroid	13	4	92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.1	0.02	0.4	C73	
Hodgkin lymphoma	5	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	0.01	0.2	C81	
Non-Hodgkin lymphoma	40	10	52	5	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	3.4	0.10	1.1	C82-85, 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	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C92-94	
Leukaemia, unspecified	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	0.1	C95	
Other and unspecified	37	15	68	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	3.1	0.13	1.3	O&U	
All sites	1185	255	34	15	10	11	29	28	63	93	100	108	118	77	63	77	50	45	43	27.8	5.47	51.9	51.9	C00-96		
All sites except C44	1176	252	33	15	10	11	28	26	62	93	100	108	118	76	63	77	50	44	43	27.6	100.0	5.43	51.6	C00-96 exc. C44		
Average annual population						140111	123047	106567	92398	82777	73885	60033	44738	36716	27659	20888	14905	10261	8562	5066	3947	851560				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

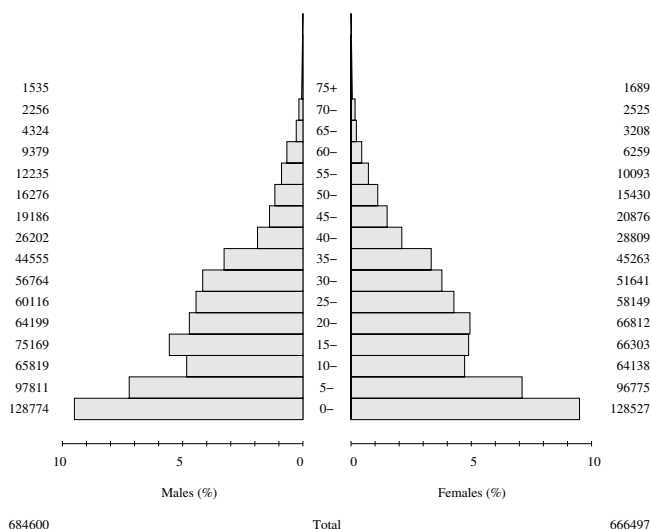
Guinea, Conakry

The Registre de Cancer de Guinée was established in 1990 with assistance from IARC. It is located in and supported by the pathology department of the Donka National Hospital in Conakry. The registry director provides overall supervision of registry activities, and the registry's single staff member carries out the day-to-day work of registration, including data collection, data entry, and data management.

The data presented in this volume are for the city of Conakry. Conakry residents (defined by ≥ 6 months of residence in the city) are distinguished from temporary visitors (such as patients staying in the city for the purpose of receiving medical care).

The population of Conakry is estimated to have been 1 667 864 in 2014 (at the most recent census). The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

Guinea, Conakry (2001–2010)
Population pyramid (average annual person-years by sex and age group)



Estimates based on the general population and housing censuses of 1996 and 2014

The main sources of information are the Hôpital National de Donka (which offers all specialities, including oncological surgery), the 471-bed Hôpital National Ignace Deen (which offers all specialities), and the 120-bed Hôpital de l'Amitié Sino-Guinéenne (which offers services such as surgery and neurosurgery). Data are also collected from four community hospitals and several private clinics. There are few specialized oncology services in Guinea, apart from the oncological surgery and gynaecological oncology departments of the Hôpital National de Donka. There is no radiotherapy service in the country; patients are sent to Dakar, Senegal, for treatment. There are two pathology laboratories in the city (at the Hôpital National Donka and the Hôpital de l'Amitié Sino-Guinéenne); the laboratory at Hôpital National Donka is a major source

of information for the registry. Information on cancer cases is retrieved and added to the database, together with the diagnosis. Civil death registration does not include certification of cause of death.

Case finding is entirely active and is carried out by medical students as part of their course work. The students visit the clinical services and collect information using registration forms. None of the hospitals in the area has a central records department. Medical records are maintained by each service, although some hospitals also have registers of admissions/discharges that include a simple diagnosis for each entry.

The registry uses IARC's CanReg4 software for data entry and management.

YEARS PRESENTED

2001–2010 (a 10-year period)

NOTES

During the 10-year period selected for analysis, there was a slow decline in the annual rate of registration, with an overall annual change of -7.2% ; this trend was seen for cancers at most major anatomical sites (including breast and cervix) but not for prostate cancer.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 87.1 cases per 100 000 person-years in males and 101.0 cases per 100 000 person-years in females. These values are similar to the values for western Africa reported in GLOBOCAN 2012. The incidence rates of cancers of the liver, prostate, and cervix are relatively high, whereas there is a marked paucity of leukaemia cases. The incidence rates of childhood cancers are low.

The overall percentage of microscopically verified cases (MV%) is low (47% in males and 64% in females), which is similar to the profile seen elsewhere in western Africa, and is in part due to the large number of liver cancers, for which the MV% is very low ($\sim 4\%$).

SUMMARY

The results are very similar to previously published findings for 1996–1999 (Parkin et al., 2003), although the more recent incidence rates are slightly lower for cancers at several anatomical sites. However, the ASR of prostate cancer has tripled since 1996–1999, and prostate cancer is now the most common cancer in males. The completeness of registration may have decreased, but it is also possible that there are errors in the population-at-risk estimates, given that only preliminary results from the 2014 census were available to construct the population estimate for 2001–2010, and the most recent complete census before that was in 1996.

PUBLICATIONS AND ACHIEVEMENTS

The Registre de Cancer de Guinée became a member of the African Cancer Registry Network (AFCRN) in 2012.

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Guinea, Conakry (2001–2010)

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

Site	All ages		Age group (years)																	Crude rate	CR %	ASR (W)	ICD-10	
	unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+						
Mouth	32	0	78	-	-	1	2	2	3	2	4	5	1	4	4	1	1	2	0.5	1.7	0.10	1.1	C00-06	
Salivary gland	8	0	88	-	-	-	1	-	-	-	1	1	-	1	2	1	-	-	0.1	0.4	0.03	0.3	C07-08	
Nasopharynx	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.03	0.2	C11	
Other pharynx	12	0	83	-	-	1	1	-	-	1	1	1	3	1	2	-	-	-	0.2	0.6	0.03	0.3	C09-10, C12-14	
Oesophagus	13	0	69	-	-	-	-	-	-	1	1	2	2	-	2	1	2	2	0.2	0.7	0.08	0.8	C15	
Stomach	114	0	39	-	-	1	5	4	6	13	22	26	15	12	6	4	4	4	1.7	6.0	0.58	4.7	C16	
Colon	27	0	81	-	-	1	1	4	1	3	7	5	1	1	1	1	1	1	0.4	1.4	0.10	0.9	C18	
Rectum	17	0	100	-	-	1	1	3	1	3	1	1	2	2	2	2	-	-	0.2	0.9	0.10	0.6	C19-20	
Anus	16	0	88	-	-	1	1	1	2	1	3	1	3	4	2	1	-	-	0.2	0.8	0.08	0.6	C21	
Liver	706	0	4	1	2	1	2	2	6	35	57	75	114	213	95	53	30	19	10.3	37.0	3.36	27.6	C22	
Gallbladder etc.	2	0	0	-	-	-	-	-	-	1	1	1	2	2	4	1	-	-	0.0	0.1	0.01	0.1	C23-24	
Pancreas	15	0	20	-	-	-	-	-	-	1	1	2	2	2	4	1	-	-	0.2	0.8	0.06	0.5	C25	
Larynx	35	0	80	1	-	1	-	1	2	1	2	7	4	7	5	2	-	-	0.5	1.8	0.19	1.3	C32	
Trachea, bronchus, and lung	99	0	13	-	-	1	-	-	3	10	14	18	32	12	7	2	-	-	1.4	5.2	0.44	3.5	C33-34	
Bone	22	0	100	-	-	1	4	5	3	1	3	-	-	1	-	1	1	1	0.3	1.2	0.05	0.5	C40-41	
Melanoma of skin	8	0	88	-	-	1	1	-	-	1	1	2	1	1	1	1	1	1	0.1	0.4	0.05	0.3	C43	
Non-melanoma skin	81	0	90	1	1	3	5	5	4	6	8	11	11	9	5	2	4	4	1.2	0.0	0.00	2.7	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45	
Kaposi sarcoma	24	0	83	-	-	1	2	1	5	1	2	1	2	3	2	2	2	1	0.4	1.3	0.11	0.9	C46	
Connective and soft tissue	32	0	97	3	3	1	3	3	5	1	2	1	3	1	-	1	1	3	0.5	1.7	0.07	1.0	C47, C49	
Breast	15	0	87	-	-	-	-	-	-	1	1	3	2	4	2	1	2	2	0.2	0.8	0.09	0.8	C50	
Penis	5	0	100	-	-	-	-	-	2	-	1	-	1	-	-	-	-	1	0.1	0.3	0.01	0.2	C60	
Prostate	357	0	81	-	-	-	-	-	-	-	-	2	9	20	51	78	89	108	5.2	18.7	3.26	30.5	C61	
Testis	3	0	67	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.00	0.0	C62	
Kidney and renal pelvis	17	0	47	4	3	1	1	-	2	1	1	1	-	2	4	1	1	1	0.2	0.9	0.05	0.4	C64-65	
Bladder	23	0	91	-	-	-	-	-	1	2	4	-	5	2	4	-	3	2	0.3	1.2	0.12	1.0	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	24	0	21	13	1	3	-	1	-	1	2	-	3	-	-	-	-	-	0.4	1.3	0.02	0.3	C69	
Brain and nervous system	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C70-72	
Thyroid	11	0	82	-	-	-	-	1	-	1	2	3	2	-	-	1	-	1	0.2	0.6	0.03	0.4	C73	
Hodgkin lymphoma	22	0	100	-	2	2	5	2	4	1	2	1	1	1	1	1	-	-	0.3	1.2	0.03	0.4	C81	
Non-Hodgkin lymphoma	112	0	90	2	19	15	7	7	6	6	7	11	2	7	11	5	2	4	1.6	5.9	0.21	2.7	C82-85, 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	8	0	100	2	-	2	-	2	-	1	1	-	-	1	-	-	-	-	0.1	0.4	0.01	0.1	C92-94	
Leukaemia, unspecified	7	0	100	-	-	1	-	-	1	1	-	2	1	-	-	-	-	-	0.1	0.4	0.02	0.2	C95	
Other and unspecified	120	0	83	2	3	-	3	5	3	3	9	6	15	21	15	11	10	6	1.8	6.3	0.51	4.8	O&U	
All sites	1989	0	48	30	39	33	34	37	35	51	89	131	158	249	359	234	191	156	29.1	100.9	10.09	89.8	C00-96	
All sites except C44	1908	0	47	29	38	32	31	32	30	47	83	123	147	238	350	229	186	154	27.9	100.0	9.82	87.1	C00-96 exc. C44	
Average annual population				128774	97810	65819	75169	64199	60116	56764	44555	26202	19186	16276	12235	9379	4324	2256	1535	684599				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Guinea, Conakry (2001–2010)

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

Site	All ages	Age unk	MV DCO		Age group (years)																	Crude rate	CR %	ASR (W)	ICD-10										
			%	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+															
Mouth	41	0	93	1	1	2	1	3	1	2	3	5	5	4	3	3	4	2	0.6	1.4	0.21	1.7	C00-06												
Salivary gland	8	0	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.3	C07-08												
Nasopharynx	6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C11												
Other pharynx	6	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	0.2	C09-10, C12-14												
Oesophagus	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.01	0.1	C15												
Stomach	61	0	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	2.2	0.37	2.8	C16												
Colon	13	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.06	0.6	C18												
Rectum	21	0	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.11	0.8	C19-20												
Anus	10	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.04	0.3	C21												
Liver	384	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8	13.5	1.84	15.6	C22												
Gallbladder etc.	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24												
Pancreas	9	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.2	C25												
Larynx	10	0	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.08	0.5	C32												
Trachea, bronchus, and lung	32	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.1	0.14	1.2	C33-34												
Bone	11	0	91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.03	0.3	C40-41												
Melanoma of skin	23	0	96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.8	0.18	1.3	C43												
Non-melanoma skin	55	0	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.1	0.14	1.2	C43-44												
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45												
Kaposi sarcoma	11	0	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.03	0.3	C46												
Connective and soft tissue	20	0	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.09	0.7	C47, C49												
Breast	446	0	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.7	15.7	1.62	14.8	C50												
Vulva	11	0	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.03	0.3	C51												
Vagina	12	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.06	0.5	C52												
Cervix uteri	1251	0	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.8	44.1	4.93	43.7	C53												
Uterus	67	0	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.4	0.42	2.9	C54-55												
Ovary	91	0	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	3.2	0.31	2.7	C56												
Placenta	15	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.02	0.2	C58												
Kidney and renal pelvis	17	0	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.6	0.02	0.3	C64-65												
Bladder	10	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.03	0.4	C67												
Ureter and other urinary	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68												
Eye	14	0	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.02	0.3	C69												
Brain and nervous system	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C70-72												
Thyroid	18	0	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.6	0.07	0.5	C73												
Hodgkin lymphoma	13	0	92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.02	0.3	C81												
Non-Hodgkin lymphoma	72	0	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	2.5	0.20	1.8	C82-85, C96												
Multiple myeloma	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C90												
Lymphoid leukaemia	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.01	0.1	C91												
Myeloid leukaemia	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	0.1	C92-94												
Leukaemia, unspecified	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C95												
Other and unspecified	129	0	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	4.5	0.62	5.4	O&U												
All sites	2892	0	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43.4	11.92	103.4	103.4	C00-96												
All sites except C44	2837	0	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42.6	10.0	11.62	101.0	C00-96 exc. C44												
Average annual population																			128527	96775	64138	66303	66812	58149	51641	45262	28809	20876	15430	10093	6259	3208	2524	1689	666494

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

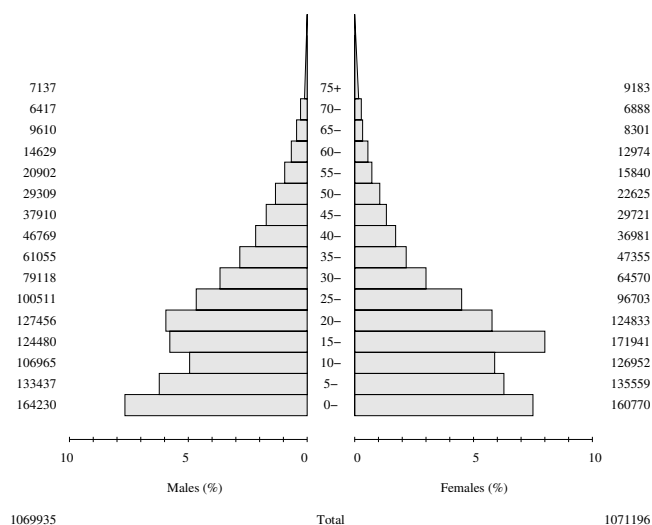
Mali, Bamako

The Registre du Cancer du Mali was established in 1986. It is based in and is entirely funded by the pathology department of the Centre Hospitalier Universitaire (CHU) du Point G, in the capital city of Bamako. The head of the pathology department oversees the activities of the registry. Two junior pathologists are responsible for data collection, and basic data collection tasks are carried out by medical students as part of their course work.

The Registre du Cancer du Mali collects information on cancer cases from all possible sources within the city of Bamako, which consists of six communes. The registry data presented in this volume pertain to the residents of the city. On average, cases in Bamako residents account for 64% of all cases registered.

The population of Bamako is estimated to have been 1 810 366 in 2009 (at the most recent census). The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

Mali, Bamako (2010–2014)
Population pyramid (average annual person-years by sex and age group)



Source: Institut National de la Statistique (INSTAT) of Mali; estimates based on the 1999 and 2009 censuses

Since its inception, the registry has aimed to be a population-based cancer registry for Bamako and has collected information on cases from all possible sources within the city. Four major hospitals serve Bamako: the CHU du Point G, the CHU Gabriel Touré, the Hôpital du Mali, and the Hôpital de Kati. There are also some specialist services for ophthalmology, dermatology, and dentistry/otolaryngology, as well as six small district hospitals. There are specialized cancer treatment services in the CHU du Point G (medical oncology and paediatric oncology) and the Hôpital du Mali (radiotherapy). The CHU du Point G also has a specialist haematology clinic.

There are four pathology laboratories in the area. The main one, located in Point G, has four pathologists and does the great majority of the laboratory analysis in Bamako (and nationally). The laboratory at the Hôpital du Mali analyses some of the hospital's specimens. Several clinicians in the area send specimens to overseas laboratories.

Once a year, the medical students working with the registry visit the clinical services that diagnose cancer cases, and record case information onto simple registration forms. The registry pathologists visit certain key services (i.e. oncology and gynaecology services) more frequently, and also collect information from the pathology department of the CHU du Point G. The data from the request/reporting forms for each case are then recorded onto a form along with the diagnosis.

All deaths must be certified by the civil registration office in order for a burial permit to be issued. The registry uses death certificates as a source of information. Death certificates listing cancer as the cause of death are compared against the registry database; cases not found in any hospital records are registered as death-certificate-only cases.

The registry uses IARC's CanReg4 software for data entry and management; the registry was one of the first to adopt this system, more than 20 years ago.

YEARS PRESENTED

2010–2014 (a 5-year period)

NOTES

The total number of cases registered annually increased from 578 in 2007 to 2855 in 2013. The most recent 5-year period (2010–2014) was selected for analysis, despite the considerable variation in the annual number of registrations during this period, from 1100 cases in 2010 to 2148 in 2013.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 121.7 cases per 100 000 person-years in males and 175.4 cases per 100 000 person-years in females. These values are higher than the values for western Africa reported in GLOBOCAN 2012, with an observed-to-expected ratio (O/E) of about 1.5 for both sexes. Incidence rates of cancers of the gastrointestinal tract are high, in particular the ASR of cancer of the stomach, at 19.1 cases per 100 000 person-years in males and 15.3 cases per 100 000 person-years in females. There are also high rates of cancers of the bladder (ASR, 10.5 cases per 100 000 person-years in males and 6.9 cases per 100 000 person-years in females) and cervix (ASR, 48.4 cases per 100 000 person-years). The incidence of leukaemias is low.

The percentage of microscopically verified cases (MV%) at all anatomical sites combined (excluding non-melanoma skin cancer) is 79% in males and 85% in females. This is a substantial increase from the early days of the registry: for the period of 1987–1989, the

Table 4.07. Age-standardized incidence rates (ASRs), expressed as cases per 100 000 person-years, of cancers in males (M) and females (F) in Bamako, Mali, reported in Volumes VI–VIII of *Cancer Incidence in Five Continents (CI5)* and in this volume, by anatomical site

Anatomical site (ICD-10 code)	Sex	CI5-VI	CI5-VII	CI5-VIII	2010–2014
		1987–1989	1988–1992	1994–1996	
Stomach (C16)	M	19.4	17.0	17.7	19.1
	F	10.3	12.7	20.8	15.3
Liver (C22)	M	47.9	43.0	31.2	11.5
	F	21.4	20.6	14.0	4.0
Colorectum and anus (C18–21)	M	5.4	5.2	5.1	9.8
	F	3.0	2.4	4.7	10.4
Prostate (C61)	M	6.3	5.2	7.6	19.8
Bladder (C67)	M	12.4	9.6	11.3	10.5
Breast (C50)	F	10.2	12.4	20.0	37.0
Cervix uteri (C53)	F	23.4	29.1	35.9	48.4

CI5-VI–III, *Cancer Incidence in Five Continents*, Volumes VI (Parkin et al., 1992), VII (Parkin et al., 1997), and VIII (Parkin et al., 2002).

figures were 20% in males and 32% in females (Parkin et al., 1992).

Table 4.07 shows the ASRs of cancers at several major anatomical sites during the periods reported in Volumes VI–VIII of *Cancer Incidence in Five Continents* compared with the current data.

SUMMARY

The variability in the number of cases registered annually suggests problems with case finding, and the incidence rates of haematological malignancies are relatively low.

Nevertheless, the incidence rates are consistent with those reported 20–30 years earlier, with relatively constant rates of cancers of the stomach and bladder, and with increases in the incidence of cancers of the large bowel, prostate, breast, and (to a lesser extent) cervix. The decrease in the incidence of liver cancer is interesting; it is accompanied by an increase in MV% (from 7% in 1987–1989 to 69% in 2010–2014), suggesting possible misclassification of some diagnoses during the earlier periods.

PUBLICATIONS AND ACHIEVEMENTS

The Registre du Cancer du Mali became a member of the African Cancer Registry Network (AFCRN) in 2015.

Bayo S, Parkin DM, Koumaré AK, Diallo AN, Ba T, Soumaré S, et al. (1990). Cancer in Mali, 1987–1988. *Int J Cancer*. 45(4):679–84. <http://dx.doi.org/10.1002/ijc.2910450418> PMID:2323845

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Mali, Bamako (2010–2014)

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

Site	All ages	Age unk	MV DCO		Age group (years)										Crude rate	%	CR	ASR (W)	ICD-10					
			%	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-						50-	55-	60-	65-	70-
Mouth	56	0	95	0	-	-	2	-	6	6	2	3	6	8	-	7	4	5	7	1.0	1.7	0.24	2.1	C00-06
Salivary gland	18	1	83	0	-	-	-	1	1	1	1	3	2	1	1	1	1	1	1	0.3	0.6	0.06	0.6	C07-08
Nasopharynx	6	1	83	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.02	0.2	C11
Other pharynx	13	0	92	0	-	-	-	1	1	1	2	-	-	-	2	2	1	-	4	0.2	0.4	0.04	0.6	C09-10, C12-14
Oesophagus	76	4	80	0	1	-	-	7	8	10	7	7	7	7	4	4	5	4	5	1.4	2.4	0.28	2.6	C15
Stomach	443	13	78	2	-	2	1	6	13	21	42	38	45	59	73	40	43	45	8.3	13.8	2.34	19.1	C16	
Colon	111	3	79	1	1	-	2	2	3	9	3	13	10	10	10	10	8	12	2.1	3.5	0.48	4.3	C18	
Rectum	135	5	87	1	1	-	4	9	10	10	8	14	15	8	11	11	6	5	2.5	4.2	0.51	4.5	C19-20	
Anus	28	0	89	0	-	-	-	1	1	2	3	4	6	2	4	1	2	1	0.5	0.9	0.12	1.0	C21	
Liver	313	3	69	4	5	2	1	5	6	11	22	28	35	40	34	27	30	18	23	5.9	9.8	1.32	11.5	C22
Gallbladder etc.	4	1	100	0	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	0.1	0.1	0.02	0.2	C23-24
Pancreas	87	1	61	5	-	1	-	1	6	5	9	4	13	14	13	11	4	5	1.6	2.7	0.43	3.5	C25	
Larynx	36	4	92	0	1	-	-	-	-	1	-	2	1	4	3	6	10	4	-	0.7	1.1	0.27	1.8	C32
Trachea, bronchus, and lung	86	2	73	3	1	-	-	1	1	5	5	5	14	12	10	16	5	9	1.6	2.7	0.46	3.8	C33-34	
Bone	108	1	84	0	6	4	6	12	5	9	6	9	11	5	7	8	6	2	5	2.0	3.4	0.30	3.0	C40-41
Melanoma of skin	21	0	95	0	-	-	-	-	1	1	4	4	1	1	3	1	2	2	2	0.4	0.7	0.09	0.8	C43
Non-melanoma skin	94	3	94	0	-	3	2	4	4	6	3	5	11	7	4	10	6	10	8	1.8	0.41	3.5	3.5	C44
Mesothelioma	2	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.02	0.1	C45	
Kaposi sarcoma	52	2	96	0	-	-	1	2	2	7	8	6	2	1	4	3	1	6	1.0	1.6	0.15	1.7	C46	
Connective and soft tissue	98	1	94	1	4	3	7	8	-	9	3	5	14	5	6	9	4	3	14	1.8	3.1	0.25	3.1	C47, C49
Breast	33	0	97	0	-	-	-	-	-	6	6	3	2	6	5	1	-	4	0.6	1.0	0.11	1.2	C50	
Penis	5	0	80	0	-	-	-	-	-	3	-	1	-	1	-	-	-	-	-	0.1	0.2	0.01	0.1	C60
Prostate	354	4	79	1	-	-	-	-	-	2	-	3	11	21	58	53	81	121	6.6	11.0	2.39	19.8	C61	
Testis	21	0	86	0	-	1	2	-	1	3	1	2	1	3	1	2	-	3	0.4	0.7	0.06	0.7	C62	
Kidney and renal pelvis	92	0	65	1	26	19	5	3	-	4	2	4	2	8	4	5	4	1	5	1.7	2.9	0.20	2.3	C64-65
Bladder	260	2	72	1	4	2	1	1	2	11	9	21	19	32	29	36	23	24	25	4.9	8.1	1.27	10.5	C67
Ureter and other urinary	2	0	50	0	-	-	-	-	-	-	-	-	-	-	1	1	-	-	0.0	0.1	0.01	0.1	C66, C68	
Eye	88	0	66	0	47	11	4	-	1	1	3	3	5	2	1	3	1	2	3	1.6	2.7	0.14	1.9	C69
Brain and nervous system	22	0	50	18	5	2	3	3	1	-	2	1	3	1	3	1	-	1	0.4	0.7	0.03	0.5	C70-72	
Thyroid	35	2	94	3	-	-	-	2	1	2	2	5	1	2	4	4	3	4	3	0.7	1.1	0.18	1.4	C73
Hodgkin lymphoma	52	1	98	0	1	7	13	8	3	5	3	4	1	-	1	3	1	1	-	1.0	1.6	0.09	1.0	C81
Non-Hodgkin lymphoma	132	4	98	0	6	17	11	19	5	7	4	5	9	6	8	6	10	4	2	2.5	4.1	0.39	3.6	C82-85, C96
Multiple myeloma	8	0	88	0	1	1	2	-	-	1	-	-	-	1	-	-	-	1	-	0.1	0.2	0.03	0.2	C90
Lymphoid leukaemia	26	0	81	0	1	13	7	1	2	-	-	-	-	-	-	-	-	1	1	0.5	0.8	0.03	0.5	C91
Myeloid leukaemia	4	0	75	0	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.01	0.1	C92-94
Leukaemia, unspecified	8	0	100	0	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.01	0.1	C95
Other and unspecified	370	12	81	5	12	12	9	20	13	20	19	31	22	29	26	46	28	23	28	6.9	11.5	1.49	13.1	O&U
All sites	3299	70	80	2	123	105	81	100	65	120	148	173	267	212	288	291	359	288	260	61.7	14.26	12.51	125.1	C00-96
All sites except C44	3205	67	79	2	123	102	79	96	61	114	145	168	256	205	284	281	353	278	252	59.9	100.0	13.85	121.7	C00-96 exc. C44

Average annual population: 164230 133437 106965 124480 127456 100511 79118 61055 46769 37910 29309 20902 14629 9610 6417 7137 1069935

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Mali, Bamako (2010–2014)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)										Crude rate	CR %	ASR (W)	ICD-10						
					0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50					50-55	55-60	60-65	65-70	70-75+	
Mouth	60	0	83	3	-	1	2	3	2	1	6	2	8	5	5	10	1	4	5	1.1	1.4	0.26	2.4	C00-06
Salivary gland	18	1	94	0	-	-	-	-	-	2	-	1	3	1	2	3	4	1	0.3	0.4	0.11	0.8	C07-08	
Nasopharynx	3	0	100	0	-	-	-	-	-	-	-	-	-	2	2	1	-	-	0.1	0.1	0.02	0.1	C11	
Other pharynx	15	1	80	7	-	-	1	-	1	-	2	2	2	2	2	2	-	-	0.3	0.3	0.04	0.5	C09-10, C12-14	
Oesophagus	66	1	77	0	-	2	2	2	7	10	10	10	10	4	8	6	6	2	1.2	1.5	0.31	2.7	C15	
Stomach	332	3	79	1	-	2	5	5	26	34	38	39	47	31	39	47	28	38	6.2	7.5	1.83	15.3	C16	
Colon	114	3	84	0	-	2	1	2	7	3	16	13	18	17	16	17	16	7	2.1	2.6	0.71	5.5	C18	
Rectum	104	2	88	1	-	1	1	5	12	9	13	16	10	11	4	3	8	8	1.9	2.4	0.43	4.2	C19-20	
Anus	18	0	72	0	-	-	1	1	1	4	2	1	4	2	2	1	1	2	4	0.3	0.4	0.08	0.7	C21
Liver	104	2	68	6	2	-	1	7	5	9	9	10	14	10	6	11	5	4	1.9	2.4	0.41	4.0	C22	
Gallbladder etc.	12	0	83	0	-	-	-	-	-	-	-	-	-	2	2	2	1	3	0.2	0.3	0.08	0.6	C23-24	
Pancreas	53	0	62	4	1	-	2	-	1	3	3	3	3	7	9	7	9	12	1.0	1.2	0.31	2.6	C25	
Larynx	10	1	100	0	-	-	-	-	-	2	1	1	1	1	1	1	1	1	0.2	0.2	0.04	0.4	C32	
Trachea, bronchus, and lung	41	1	78	2	-	3	1	1	1	1	1	6	5	3	7	4	2	4	0.8	0.9	0.21	1.8	C33-34	
Bone	114	4	82	0	8	4	13	11	4	5	9	10	8	10	6	3	8	5	3	2.1	2.6	0.35	3.4	C40-41
Melanoma of skin	27	0	100	0	-	-	-	-	1	1	2	2	1	4	2	8	2	4	2	0.5	0.6	0.18	1.4	C43
Non-melanoma skin	97	1	91	0	2	-	3	3	3	7	4	6	7	9	16	10	6	8	7	1.8	2.1	0.47	3.9	C44
Mesothelioma	1	0	100	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.01	0.1	C45	
Kaposi sarcoma	25	0	80	4	-	1	2	3	6	4	1	2	3	2	1	1	1	1	0.5	0.6	0.07	0.7	C46	
Connective and soft tissue	70	2	91	0	1	1	4	5	4	7	4	7	3	5	7	8	4	2	1.3	1.6	0.27	2.5	C47, C49	
Breast	944	13	91	1	-	-	4	26	40	87	107	132	131	126	100	72	47	37	17.6	21.4	4.13	37.0	C50	
Vulva	19	2	95	0	-	-	1	2	3	4	3	4	3	4	1	1	1	5	0.4	0.4	0.11	0.7	C51	
Vagina	19	0	100	0	1	-	1	1	4	3	3	1	1	1	1	1	1	2	0.4	0.4	0.06	0.6	C52	
Cervix uteri	1140	17	86	1	1	-	14	39	94	101	146	128	148	136	136	72	73	47	21.3	25.8	5.73	48.4	C53	
Uterus	97	2	84	1	-	1	5	4	5	4	5	8	7	10	20	7	12	7	1.8	2.2	0.58	4.4	C54-55	
Ovary	126	4	87	2	-	1	2	9	12	9	6	21	17	13	8	7	6	9	2.4	2.9	0.54	4.6	C56	
Placenta	20	0	85	0	-	-	3	1	4	4	3	4	1	1	1	1	1	1	0.4	0.5	0.03	0.4	C58	
Kidney and renal pelvis	77	2	71	0	27	13	1	3	2	5	2	5	2	7	2	3	3	1	1.4	1.7	0.15	1.8	C64-65	
Bladder	169	0	73	1	1	-	2	4	10	20	17	12	13	21	14	25	8	15	3.2	3.8	0.85	6.9	C67	
Ureter and other urinary	2	0	50	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.01	0.1	C66, C68	
Eye	85	1	84	0	44	6	2	3	5	6	6	1	5	2	1	1	1	3	1.6	1.9	0.14	1.7	C69	
Brain and nervous system	24	0	50	12	1	4	1	1	1	1	4	3	2	1	2	1	2	1	0.4	0.5	0.07	0.8	C70-72	
Thyroid	76	0	97	0	-	1	1	4	4	6	7	10	9	7	5	11	8	1	1.4	1.7	0.35	3.1	C73	
Hodgkin lymphoma	28	0	100	0	-	4	3	3	1	3	1	4	2	1	2	1	1	1	0.5	0.6	0.08	0.8	C81	
Non-Hodgkin lymphoma	67	6	97	0	4	8	7	5	2	5	6	2	6	4	2	2	2	5	1.3	1.5	0.21	1.8	C82-85, C96	
Multiple myeloma	6	0	83	0	-	2	-	-	-	3	-	-	1	-	-	-	-	-	0.1	0.1	0.01	0.1	C90	
Lymphoid leukaemia	15	0	47	0	1	6	7	-	-	1	-	-	-	-	-	-	-	-	0.3	0.3	0.01	0.2	C91	
Myeloid leukaemia	3	0	67	0	1	1	1	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	0.0	C92-94	
Leukaemia, unspecified	6	0	100	0	1	1	1	-	-	-	-	-	2	-	-	-	-	-	0.1	0.1	0.01	0.1	C95	
Other and unspecified	302	5	83	5	7	4	12	5	15	17	18	23	16	26	32	30	24	20	5.6	6.8	1.42	12.0	O&U	
All sites	4509	74	85	1	103	58	66	123	201	351	365	478	484	506	427	462	277	260	209	84.2	100.0	20.68	179.3	C00-96
All sites except C44	4412	73	85	1	101	58	62	63	120	194	347	359	471	475	490	417	456	269	204	82.4	100.0	20.22	175.4	C00-96 exc. C44
Average annual population	160770	135559	126952	171941	124833	96703	64570	47355	36981	29721	22625	15840	12974	8301	6888	9183	1071196							

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Niger, Niamey

The Registre des Cancers du Niger was founded in 1992, within the health sciences faculty of the University of Niamey. It is located in the University Hospital pathology department, which is a national referral centre for pathology services. The head of the pathology department serves as the registry director, and there is one full-time cancer registrar.

The Registre des Cancers du Niger data presented in this volume are for the registry's catchment population of Niamey, the capital city of the Niger. For the purpose of registration, a usual resident of Niamey is defined by ≥ 6 months of residence in the city.

The population of Niamey is estimated to have been 1 222 066 in 2010. The average annual population-at-risk estimates corresponding to the registry data presented in this volume are shown in the population pyramid.

is often missing from department medical records). Other sources visited include public maternal and child health clinics. Some private clinics are occasionally also visited.

An important source of information is the pathology department, which provides histopathology and cytology services for the entire country. Although some specimens are sent abroad, the registry receives reports of all cancer cases diagnosed by the pathology services in the city, including the results of biochemical tests, such as human chorionic gonadotropin (hCG), prostate-specific antigen (PSA), and alpha-fetoprotein (AFP) tests.

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

The registry uses IARC's CanReg4 software.

YEARS PRESENTED

2006–2009 (a 4-year period)

NOTES

Over most of the 10-year period of 2001–2010, there was a slow increase in the annual number of cases registered, until 2009, at which point the number decreased.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 51.4 cases per 100 000 person-years in males and 72.8 cases per 100 000 person-years in females. These values are about two thirds of the values for western Africa reported in GLOBOCAN 2012. The incidence of cancer at most sites is low, with a particularly low ASR of prostate cancer (3.5 cases per 100 000 person-years). The ASR of cancer of the cervix, at 8.3 cases per 100 000 person-years, is the lowest reported in this volume, with fewer registered cases of cancer of the cervix than cancer of the ovary. The incidence of lung cancer is very low, as is the incidence of Kaposi sarcoma (with only 4 cases reported: 2 in each sex).

The percentage of microscopically verified cases (MV%) is low overall, at about 40% in both sexes, and is very low for cancers at certain anatomical sites (e.g. 0% for central nervous system cancers and 18% for cancers of the cervix).

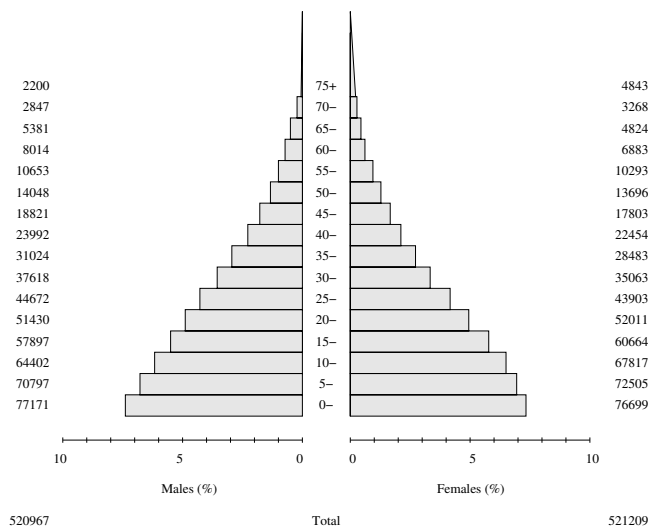
SUMMARY

The incidence rates are substantially lower than previously published findings for 1993–1999 (Parkin et al., 2003), which suggests some deterioration in the performance of the registry.

PUBLICATIONS AND ACHIEVEMENTS

The Registre des Cancers du Niger became a member of the African Cancer Registry Network (AFCRN) in 2012.

Niger, Niamey (2006–2009)
Population pyramid (average annual person-years by sex and age group)



Source: Institut National de la Statistique (INS) of the Niger, annual estimates by region; estimates based on the 2001 census

During the first 6 years of operation, case finding was carried out solely by the cancer registry clerk. Medical students now provide some assistance with this task, searching for possible cancer cases in hospital services, in particular those within the National Hospital of Niamey, the University Hospital, and the main maternity hospital. Visits to the major services (surgery, urology, medicine, gynaecology, paediatrics, and the biology laboratory) are carried out every 2 weeks; the nurses in the services are encouraged to make note of cancer cases, and these records are then collected by the registrar. To obtain details about cancer cases, including the diagnosis and the patient's place of residence, the clerk also examines sources such as ward admission books, consultation registers, and department medical records (although information

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Niger, Niamey (2006–2009)

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

Site	All ages		Age group (years)												Crude rate	%	CR	ASR (W)	ICD-10										
	unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-						60-	65-	70-	75+						
Mouth	12	0	58	-	-	-	-	-	-	-	-	-	-	-	1	2	1	2	1	2	3	-	-	1	0.6	2.0	0.15	0.6	C00-06
Salivary gland	7	0	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.2	0.10	0.3	C07-08
Nasopharynx	5	0	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.08	0.5	C11
Other pharynx	7	0	57	-	-	-	-	-	-	-	-	-	-	-	4	1	1	1	1	1	1	-	-	-	0.3	1.2	0.07	0.6	C09-10, C12-14
Oesophagus	13	0	38	-	-	-	-	-	-	-	-	-	-	-	3	1	3	3	3	3	3	-	-	1	0.6	2.2	0.10	1.2	C15
Stomach	28	0	54	-	-	-	-	-	-	-	-	-	-	-	1	1	3	3	3	3	3	-	-	-	1.3	4.7	0.24	2.2	C16
Colon	31	0	48	-	-	-	-	-	-	-	-	-	-	-	4	1	3	4	4	4	2	-	-	1	1.5	5.2	0.24	2.4	C18
Rectum	17	0	35	-	-	-	-	-	-	-	-	-	-	-	4	4	4	3	2	2	2	-	-	1	0.8	2.8	0.16	1.3	C19-20
Anus	13	0	38	-	-	-	-	-	-	-	-	-	-	-	2	4	2	4	1	1	1	-	-	1	0.6	2.2	0.16	1.4	C21
Liver	97	0	6	-	-	-	-	-	-	-	-	-	-	-	17	6	13	13	13	6	6	4	4	4	4.7	16.2	0.99	8.9	C22
Gallbladder etc.	4	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.05	0.4	C23-24
Pancreas	21	0	14	-	-	-	-	-	-	-	-	-	-	-	3	2	2	4	2	4	2	4	2	2	1.0	3.5	0.36	2.7	C25
Larynx	12	0	58	-	-	-	-	-	-	-	-	-	-	-	1	2	1	1	1	3	1	3	1	-	0.6	2.0	0.17	1.1	C32
Trachea, bronchus, and lung	4	0	0	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	1	-	-	-	-	0.2	0.7	0.05	0.4	C33-34
Bone	47	0	43	1	1	10	5	4	5	2	3	2	2	3	2	2	3	2	2	1	1	1	1	-	2.3	7.8	0.26	2.7	C40-41
Melanoma of skin	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.06	0.4	C43
Non-melanoma skin	43	0	35	-	-	-	-	-	-	-	-	-	-	-	3	4	3	5	4	4	2	1	2	1	2.1	0.0	0.00	0.0	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	0.1	C46
Connective and soft tissue	23	0	87	1	-	2	1	3	-	-	2	5	1	1	1	1	1	2	1	2	1	2	1	3	1.1	3.8	0.13	2.0	C47, C49
Breast	8	0	38	-	-	-	-	-	-	-	-	-	-	-	4	1	-	-	-	-	-	-	-	1	0.4	1.3	0.08	0.8	C50
Penis	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.02	0.1	C60
Prostate	23	0	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.1	3.8	0.51	3.5	C61
Testis	7	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	1.2	0.07	0.8	C62
Kidney and renal pelvis	17	0	35	1	4	-	-	-	-	-	-	-	-	-	3	2	3	2	2	2	2	-	-	1	0.8	2.8	0.15	1.6	C64-65
Bladder	22	0	50	-	-	-	-	-	-	-	-	-	-	-	1	1	3	5	3	2	2	2	-	4	1.1	3.7	0.19	2.6	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68
Eye	14	0	64	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.7	2.3	0.08	1.1	C69
Brain and nervous system	16	0	0	2	2	1	2	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	0.8	2.7	0.10	1.0	C70-72
Thyroid	8	0	88	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	0.4	1.3	0.06	0.6	C73
Hodgkin lymphoma	9	0	100	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	0.4	1.5	0.06	0.5	C81
Non-Hodgkin lymphoma	30	0	70	2	5	4	-	-	-	-	-	-	-	-	1	1	2	1	2	1	2	1	2	1	1.4	5.0	0.20	2.0	C82-85, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C90
Lymphoid leukaemia	6	0	33	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	0.3	1.0	0.03	0.5	C91
Myeloid leukaemia	12	0	0	-	-	-	-	-	-	-	-	-	-	-	3	1	1	1	1	1	1	1	-	-	0.6	2.0	0.06	0.7	C92-94
Leukaemia, unspecified	7	0	0	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	0.3	1.2	0.04	0.4	C95
Other and unspecified	72	0	33	2	2	4	4	8	2	7	7	8	7	4	6	4	6	4	5	1	1	1	1	1	3.5	12.0	0.52	5.0	O&U
All sites	642	0	39	12	20	27	25	42	32	34	54	50	54	60	66	62	49	62	49	26	29	26	29	29	30.8	5.86	54.8	54.8	C00-96
All sites except C44	599	0	40	12	19	25	20	35	30	33	53	47	50	57	61	58	47	58	47	25	27	25	27	27	28.7	100.0	5.53	51.4	C00-96 exc. C44

Average annual population 77171 70797 64402 57897 51430 44672 37618 31024 23992 18820 14048 10653 8014 5381 2847 2200 520966

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Nigeria, Abuja

The Abuja Cancer Registry (ABCR) is located in the National Hospital Abuja, in Nigeria's Federal Capital Territory. The ABCR was established in 2006 as a hospital-based registry, to determine the burden of cancer within the hospital. With the collaboration of the Federal Ministry of Health and the Nigerian National System of Cancer Registries, it became a population-based registry in January 2009.

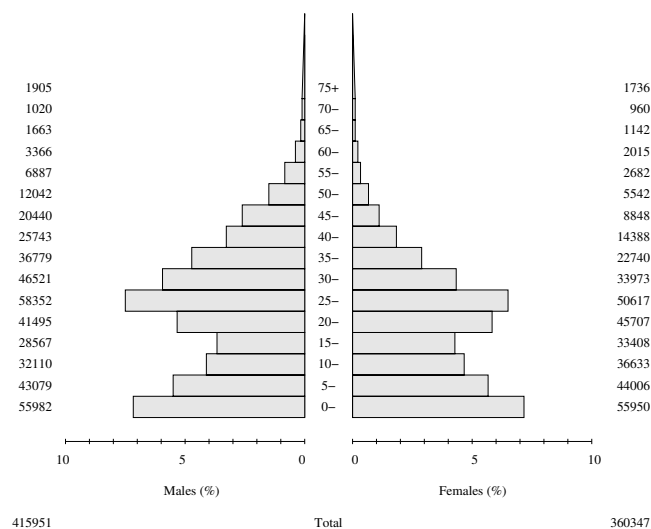
The National Hospital Abuja is one of the leading hospitals in the country, in particular with respect to cancer diagnostic and treatment services, including radiotherapy and nuclear medicine. Most cancer patients within the region (and many from elsewhere) are referred to the hospital. The Oncology Department and Medical Records Unit are important registry stakeholders.

The ABCR is staffed by 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 Medical Records Unit, and a pathologist. Equipment, transport for data collection, and salaries are financed by the hospital.

The ABCR covers the entire population of Nigeria's Federal Capital Territory, which includes the city of Abuja (the nation's capital).

The total population of the area covered by the registry is estimated to have been 1.6 million in 2006 (at the census). The average annual population-at-risk estimates corresponding to the ABCR data presented in this volume are shown in the population pyramid.

**Nigeria, Abuja Municipal Area (2013)
Population pyramid (average annual
person-years by sex and age group)**



Source: National Population Commission of Nigeria, 2006 Population and Housing Census (Abuja, April 2010), 2006 population estimates for Abuja Municipal Area

Most of the cancer management services in Abuja are located at the National Hospital Abuja. The registry uses all the information sources available at the

hospital, including the pathology laboratory, medical records department, oncology department, inpatient wards, and outpatient clinics.

Data are collected from nine hospitals (both public and private) within the Federal Capital Territory, and four pathology laboratories supply pathology reports to the registry. The ABCR uses both active and passive methods of case finding. Registry staff members register cases from the oncology departments, inpatient wards, and outpatient clinics. All cancer cases identified at the various locations are registered, but cases in non-residents are excluded from analysis. Death certificates are accessed and abstracted.

Data are recorded on the cancer registry abstract form. The ABCR uses IARC's CanReg4 software for data processing and management.

YEARS PRESENTED

2013 (a 1-year period)

NOTES

Although the registry has recorded cases since 2009, only the data for 2013 are relatively complete; the average rate of registration for that year is 30 cases per month, compared with 12 cases per month for 2009–2011.

Within the population structure, as illustrated by the population pyramid, there is an obvious bulge in the cohort of 25- to 29-year-olds; this is largely due to the phenomenon of young people migrating to the city in search of economic opportunities.

The incidence rates reported in this volume are based on a total of only 378 registered cases. The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 99.9 cases per 100 000 person-years in males and 182.5 cases per 100 000 person-years in females, values higher than the values for western Africa reported in GLOBOCAN 2012. This high overall incidence is due in large part to the very high incidence rate of prostate cancer (ASR, 61.3 cases per 100 000 person-years) and breast cancer in females (ASR, 78.4 cases per 100 000 person-years). Only 5 cases of cancer in children aged 0–14 years were recorded.

The overall percentage of microscopically verified cases (MV%) in males (98%) is rather high.

SUMMARY

The high rates of cancers at some anatomical sites may be due to the inclusion of non-resident cases, but the rates of cancers at other anatomical sites seem low. However, the small numbers (based on only 1 year of registration) make interpretation difficult.

PUBLICATIONS AND ACHIEVEMENTS

The ABCR became a member of the African Cancer Registry Network (AFCRN) in 2012.

- Akarolo-Anthony SN, Maso LD, Igbinoba F, Mbulaiteye SM, Adebamowo CA (2014). Cancer burden among HIV-positive persons in Nigeria: preliminary findings from the Nigerian AIDS-cancer match study. *Infect Agent Cancer*. 9(1):1. <http://dx.doi.org/10.1186/1750-9378-9-1> PMID:24597902
- al-Haddad BJ, Jedy-Agba E, Oga E, Ezeome ER, Obiorah CC, Okobia M, et al. (2015). Comparability, diagnostic validity and completeness of Nigerian cancer registries. *Cancer Epidemiol*. 39(3):456–64. <http://dx.doi.org/10.1016/j.canep.2015.03.010> PMID:25863982
- Jedy-Agba E, Curado MP, Ogunbiyi O, Oga E, Fabowale T, Igbinoba F, et al. (2012). Cancer incidence in Nigeria: a report from population-based cancer registries. *Cancer Epidemiol*. 36(5):e271–8. <http://dx.doi.org/10.1016/j.canep.2012.04.007> PMID:22621842

Nigeria, Abuja (2013)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)											Crude rate	%	CR	ASR (W)	ICD-10				
					0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-						55-	60-	65-	70-
Mouth	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	0.14	1.3	C00-06	
Salivary gland	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	0.01	2.2	C07-08	
Nasopharynx	4	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.0	0.04	0.6	C11	
Other pharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C09-10, C12-14	
Oesophagus	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	0.08	0.7	C15	
Stomach	8	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	6.0	2.25	4.4	C16
Colon	9	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	6.8	0.66	5.5	C18
Rectum	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.5	1.2	C19-20	
Anus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C21	
Liver	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.5	0.06	0.6	C22
Gallbladder etc.	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	1.2	C23-24	
Pancreas	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C25	
Larynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.04	0.4	C32
Trachea, bronchus, and lung	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.02	0.2	C33-34
Bone	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C40-41	
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C43	
Non-melanoma skin	10	0	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	0.25	4.5	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C45	
Kaposi sarcoma	9	2	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	6.8	0.21	3.8	C46
Connective and soft tissue	7	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	5.3	0.46	3.4	C47, C49
Breast	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	3.0	0.04	2.5	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C60	
Prostate	53	4	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.7	39.8	9.04	61.3	C61
Testis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C62	
Kidney and renal pelvis	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	2.3	0.16	1.3	C64-65
Bladder	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	3.0	0.08	0.9	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C66, C68	
Eye	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C69	
Brain and nervous system	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.30	1.8	C70-72
Thyroid	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.8	0.02	0.2	C73
Hodgkin lymphoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C81	
Non-Hodgkin lymphoma	2	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.5	0.02	0.3	C82-85, C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C90	
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C91	
Myeloid leukaemia	3	0	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	2.3	0.04	0.5	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0	C95	
Other and unspecified	10	0	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	7.5	0.63	5.1	O&U
All sites	143	9	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.4	12.81	104.2	C00-96	
All sites except C44	133	9	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32.0	100.0	12.61	99.9	C00-96 exc. C44
Average annual population	55982	43079	32110	28567	41495	58352	46521	36779	25743	20440	12042	6887	3366	1663	1020	1905	415951							

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Nigeria, Abuja (2013)

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

Site	All ages	Age unk	MV %	DCO %	Age group (years)											Crude rate	CR %	ASR (W)	ICD-10			
					0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55					55-60	60-65	65-70
Mouth	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.09	0.9	C00-06
Salivary gland	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.9	0.03	1.6	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	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	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.9	0.26	2.2	C16
Colon	3	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.3	0.39	3.2	C18
Rectum	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.3	0.10	1.3	C19-20
Anus	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.3	0.13	1.5	C21
Liver	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C22
Gallbladder etc.	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.09	0.9	C23-24
Pancreas	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C25
Larynx	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.25	2.0	C32
Trachea, bronchus, and lung	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.3	1.05	5.6	C33-34
Bone	3	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	1.3	0.05	0.7	C40-41
Melanoma of skin	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.02	0.3	C43
Non-melanoma skin	7	0	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	0.0	0.58	4.6	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.8	0.08	1.0	C46
Connective and soft tissue	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.8	0.11	1.5	C47, C49
Breast	125	3	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.7	54.8	9.22	78.4	C50
Vulva	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C51
Vagina	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C52
Cervix uteri	31	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.6	13.6	5.91	41.3	C53
Uterus	7	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	3.1	1.12	9.7	C54-55
Ovary	8	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	3.5	1.27	12.1	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C58
Kidney and renal pelvis	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.8	0.47	3.2	C64-65
Bladder	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.19	1.5	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68
Eye	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.9	0.10	1.1	C69
Brain and nervous system	2	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.9	0.12	1.3	C70-72
Thyroid	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.19	1.5	C73
Hodgkin lymphoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C81
Non-Hodgkin lymphoma	4	0	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.8	0.05	0.7	C82-85, C96
Multiple myeloma	2	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.9	0.18	1.8	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	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	0.03	0.4	C95
Other and unspecified	9	0	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	3.9	1.15	7.9	O&U
All sites	235	7	92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65.2	100.0	22.62	182.5	C00-96 exc. C44
All sites except C44	228	7	92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63.3	100.0	22.62	182.5	C00-96 exc. C44
Average annual population	55950	44006	36633	33408	45707	50617	33973	22740	14388	8848	5542	2682	2015	1142	960	1736	360347					

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Nigeria, Calabar

The Calabar Cancer Registry (CCR) started as a hospital-based registry in 1979 and became population-based in 2004. It is located in the pathology department of the University of Calabar Teaching Hospital (UCTH) in Calabar, Cross River State.

The registry received its first computer, index cards, registers, and office stationery 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 computer and accessories were donated by the Nigerian Federal Ministry of Health. Since 2007, the registry has had no sustainable source of funding.

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

The CCR covers 6 of the 18 local government areas of Cross River State: Akamkpa, Akpabuyo, Biase, Calabar Municipal, Calabar South, and Odukpani. The subset of registry data presented in this volume is for Calabar Municipal and Calabar South, for which population coverage is considered to be relatively complete.

The combined population of Calabar Municipal and Calabar South is estimated to have been 375 196 in 2006 (at the national census). The average annual population-at-risk estimates corresponding to the

CCR data presented in this volume are shown in the population pyramid.

Registration is predominantly active, involving visits to all health institutions within the covered area. Regular visits are made to hospital wards, health records departments, and laboratories, including to the haematology clinic at the UCTH. Due to logistical constraints, data collection is limited to the health facilities located in only three local government areas: Akpabuyo, Calabar Municipal, and Calabar South.

Information is abstracted from patients' health records, laboratory reports, inpatient records, and clinic attendance records. The date the patient was last seen or the date of death is also obtained.

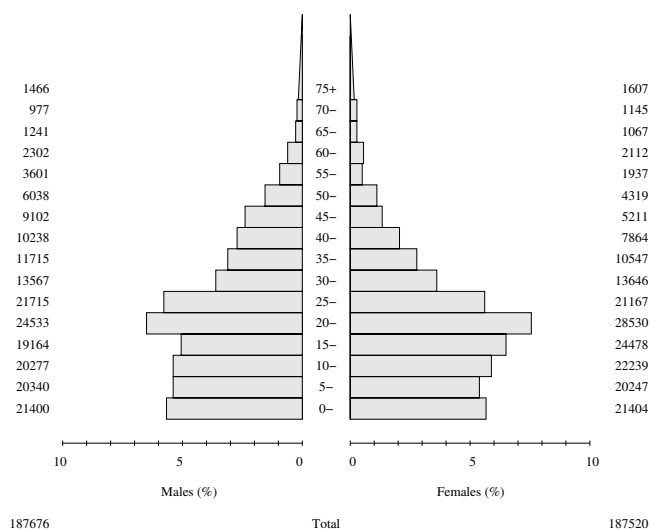
When applicable, autopsy records are also examined, for information on cancer-related deaths. Death registration is not mandatory in Nigeria; only death certificates issued by hospitals are used by the CCR to update vital status.

To maximize quality control, histological confirmation is obtained for registered cases. The registry director regularly cross-checks, validates, and updates all entries.

Cases are coded according to ICD-O-3. The registry uses IARC's CanReg4 software (and more recently, CanReg5) for data storage and management.

Access to the computerized registry data is restricted to a few authorized staff members. All paper files containing patient data are stored in locked cabinets. Strict confidentiality practices are maintained throughout the data handling process, and access to the cancer registry office and documents is restricted to CCR staff members. Requests for data must be submitted in writing and approved by the registry director.

**Nigeria, Calabar Municipal and Calabar South
(2009–2013)**
Population pyramid (average annual
person-years by sex and age group)



Source: National Population Commission of Nigeria, 2006 Population and Housing Census (Abuja, April 2010), 2006 population estimates for the local government areas of Calabar Municipal and Calabar South

YEARS PRESENTED

2009–2013 (a 5-year period)

NOTES

The rate of registration was relatively constant during the 5-year period analysed, aside from some marked monthly variation in 2009.

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 75.5 cases per 100 000 person-years in males and 85.4 cases per 100 000 person-years in females. The ASR in females is 75% of the value for western Africa reported in GLOBOCAN 2012. In males, prostate cancer predominates (accounting for almost half of registered cases), with a relatively high ASR, at 50.8 cases per 100 000 person-years. The incidence of cancers at most other anatomical sites (with the exception of Kaposi sarcoma) is low, with particularly low rates of liver and lung cancers. In females, breast cancer accounts for 42% of registered cases, with an ASR of 35.0 cases per 100 000 person-years, which is similar to the estimate for western Africa. Cervical cancer, which accounts for 20% of registered cases, has a relatively low ASR, at 21.0 cases per 100 000 person-years.

The percentage of microscopically verified cases (MV%) is high overall, at 99% in males and 94% in females. For cancers at many anatomical sites, the MV% is 100%, including prostate cancer (150 cases) and breast cancer in females (164 cases).

SUMMARY

The registry relies heavily on cases diagnosed by pathology, as evidenced by the fact that almost all cases are microscopically verified. Therefore, it is likely that the calculated rates are underestimates, in particular the rates of cancers that are typically diagnosed by other means (e.g. cancers of the lung, liver, and pancreas).

PUBLICATIONS AND ACHIEVEMENTS

The CCR became a member of the African Cancer Registry Network (AFCRN) in 2012.

Ebughe GA, Ekanem IO, Omotoso AJ, Inyama M, Agan TU, Ago BU, et al. (2012). Malignancies in AIDS patients: the experience of a tertiary hospital in a high prevalence zone. *Infect Agent Cancer*. 7 Suppl 1:17. <http://dx.doi.org/10.1186/1750-9378-7-S1-P17>

Ekanem IO, Parkin DM (2016). Five year cancer incidence in Calabar, Nigeria (2009-2013). *Cancer Epidemiol*. 42:167–72. <http://dx.doi.org/10.1016/j.canep.2016.04.014> PMID:27164305

Inyama MA, Ibanga IA, Ebughe G, Bassey I, Ekanem IO, Asuquo ME (2012). AIDS-related lymphoma at the University of Calabar Teaching Hospital (Nigeria): a seven year review. *Infect Agent Cancer*. 7 Suppl 1:1. <http://dx.doi.org/10.1186/1750-9378-7-S1-P1>

Jedy-Agba E, Oga E, Odutola M, Igbinoba F, Ekanem I, Ezeome E, et al. (2015). Cancer incidence in Nigeria from 2009 to 2013. *Ann Glob Health*. 81(1):92. <http://dx.doi.org/10.1016/j.aogh.2015.02.714>

Jedy-Agba EE, Curado MP, Oga E, Samaila MO, Ezeome ER, Obiorah C, et al. (2012). The role of hospital-based cancer registries in low and middle income countries-The Nigerian Case Study. *Cancer Epidemiol*. 36(5):430–5. <http://dx.doi.org/10.1016/j.canep.2012.05.010> PMID:22704971

Jedy-Agba EE, Oga EA, Odutola M, Abdullahi YM, Popoola A, Achara P, et al. (2015). Developing national cancer registration in developing countries - case study of the Nigerian national system of cancer registries. *Front Public Health*. 3:186. <http://dx.doi.org/10.3389/fpubh.2015.00186> PMID:26284233

Nigeria, Calabar (2009–2013)

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

Site	All ages		Age group (years)										Crude rate	CR %	ASR (W)	ICD-10						
	unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-	75+
Mouth	2	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.02	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C07-08
Nasopharynx	4	0.100	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.4	1.3	0.02	C11
Other pharynx	2	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.01	C09-10, C12-14
Oesophagus	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C15
Stomach	5	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.6	0.07	C16
Colon	11	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	3.6	0.26	C18
Rectum	3	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.12	C19-20
Anus	6	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	2.0	0.22	C21
Liver	5	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.6	0.04	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C23-24
Pancreas	1	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.08	C25
Larynx	8	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	2.6	0.18	C32
Trachea, bronchus, and lung	2	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.02	C33-34
Bone	6	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	2.0	0.04	C40-41
Melanoma of skin	3	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.10	C43
Non-melanoma skin	15	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	3.2	0.44	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C45
Kaposi sarcoma	15	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	4.9	0.31	C46
Connective and soft tissue	9	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	3.0	0.18	C47, C49
Breast	1	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.08	C50
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C60
Prostate	150	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.0	49.2	6.51	C61
Testis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C62
Kidney and renal pelvis	5	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.6	0.05	C64-65
Bladder	2	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.00	C63
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C66, C68
Eye	12	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	3.9	0.08	C69
Brain and nervous system	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C73
Hodgkin lymphoma	15	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	4.9	0.17	C81
Non-Hodgkin lymphoma	12	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	3.9	0.10	C82-85, C96
Multiple myeloma	1	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.00	C90
Lymphoid leukaemia	2	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	0.11	C91
Myeloid leukaemia	1	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	C92-94
Leukaemia, unspecified	5	0.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.6	0.03	C95
Other and unspecified	17	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	5.6	0.32	O&U
All sites	320	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.1	78.8	7.55	C00-96
All sites except C44	305	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32.5	100.0	9.14	C00-96 exc. C44
Average annual population	21400	20340	20277	19164	24533	21715	13567	11715	10238	9102	6038	3601	2302	1241	977	1466	187676					

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Nigeria, Calabar (2009–2013)

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

Site	All ages	MV DCO		Age group (years)												Crude rate	CR %	ASR (W)	ICD-10					
		unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-					60-	65-	70-	75+	
Mouth	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.04	0.4	C00-06
Salivary gland	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.2	C07-08
Nasopharynx	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.0	0.03	0.4	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	4	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.0	0.17	1.4	C16
Colon	7	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	1.8	0.16	1.5	C18
Rectum	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.2	C19-20
Anus	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.5	0.18	1.5	C21
Liver	9	0	100	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.3	0.21	2.0	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24
Pancreas	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.14	0.9	C25
Larynx	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C32
Trachea, bronchus, and lung	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.02	0.2	C33-34
Bone	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.01	0.1	C40-41
Melanoma of skin	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.00	0.3	C43
Non-melanoma skin	9	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.0	0.12	1.5	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.5	0.03	0.5	C46
Connective and soft tissue	5	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.3	0.03	0.5	C47, C49
Breast	164	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.5	42.1	3.87	35.0	C50
Vulva	5	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.3	0.20	1.4	C51
Vagina	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	0.1	C52
Cervix uteri	77	0	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.2	19.7	2.46	21.0	C53
Uterus	9	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.3	0.32	2.6	C54-55
Ovary	14	0	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	3.6	0.29	2.9	C56
Placenta	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C58
Kidney and renal pelvis	3	0	67	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.8	0.01	0.2	C64-65
Bladder	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.10	0.7	C67
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68
Eye	14	0	93	6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	3.6	0.07	1.3	C69
Brain and nervous system	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C70-72
Thyroid	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	0.1	C73
Hodgkin lymphoma	15	0	93	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	3.8	0.34	3.0	C81
Non-Hodgkin lymphoma	10	0	70	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	2.6	0.12	1.5	C82-85, C96
Multiple myeloma	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.8	0.14	1.0	C90
Lymphoid leukaemia	2	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.10	0.6	C91
Myeloid leukaemia	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.01	0.1	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C95
Other and unspecified	17	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	4.4	0.46	3.6	O&U
All sites	399	0	94	9	9	4	3	15	31	29	42	60	52	41	32	29	24	9	10	42.6	9.70	86.9	86.9	C00-96
All sites except C44	390	0	94	9	9	4	2	14	29	29	42	58	52	40	31	29	24	9	9	41.6	100.0	9.58	85.4	C00-96 exc. C44
Average annual population				21404	20247	22239	24478	28530	21167	13646	10547	7864	5211	4319	1937	2112	1067	1145	1607	187520				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

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 determining the incidence rates of various cancers in Ibadan and the surrounding area, to provide baseline data for public health planners, physicians, and researchers. The registry is located in the pathology department of the University College Hospital (UCH) in Ibadan (the capital of Oyo State). It is funded in part by the UCH and the University of Ibadan's College of Medicine, as well as by grant support from IARC. The IBCR is staffed by a consultant pathologist (the registry's principal investigator) and six other employees: a registrar, a data collection officer, a secretary, a data clerk, and two computer analysts.

The IBCR data presented in this volume are for residents of the Ibadan metropolitan area, which consists of 11 local government areas (LGAs): Akinyele, Egbeda, Ibadan North, Ibadan North-East, Ibadan North-West, Ibadan South-East, Ibadan South-West, Ido, Lagelu, Oluyole, and Ona Ara. For the purpose of registration, residents are defined by ≥ 1 year of residence in the area.

The population of Oyo State is relatively homogeneous; it is inhabited mainly by the Yoruba ethnic group, which is primarily agrarian. Ibadan, the state's capital and administrative centre, is, however, also inhabited by members of other ethnic groups, who have immigrated for business, education, or other reasons. About 10% of the city's residents are of Hausa-Fulani, Igbo, or Efik-Ibibio descent. The population is about 55% Muslim and 45% Christian.

The population of the Ibadan metropolitan area is estimated to have been 2 549 265 in 2006 (at the

census). The average annual population-at-risk estimates corresponding to the IBCR data presented in this volume are shown in the population pyramid.

The registry collects cases from the local governments of the 11 LGAs within the Ibadan metropolitan area. The registry also receives cases from facilities such as the Baptist Medical Centre and the Ladoko Akintola University of Technology teaching hospital (in the Ogbomosho North LGA), the Obafemi Awolowo University Teaching Hospitals Complex (in the Ife North LGA), and many other public and private hospitals.

Specialist cancer treatment services, including radiotherapy, are available at the UCH. The UCH pathology laboratory provides histology, fine-needle aspiration cytology (FNAC), and other diagnostic cytology services, and is a major source of information for the registry. Registry staff members regularly visit the UCH haematology department to collect information from the reports on haematological malignancies. There are two state hospitals (Adeoyo Maternity Hospital and Ring Road Hospital) and several private hospitals that provide general medical, gynaecological, and paediatric services to the population. There are also two new private pathology laboratories in the registry area.

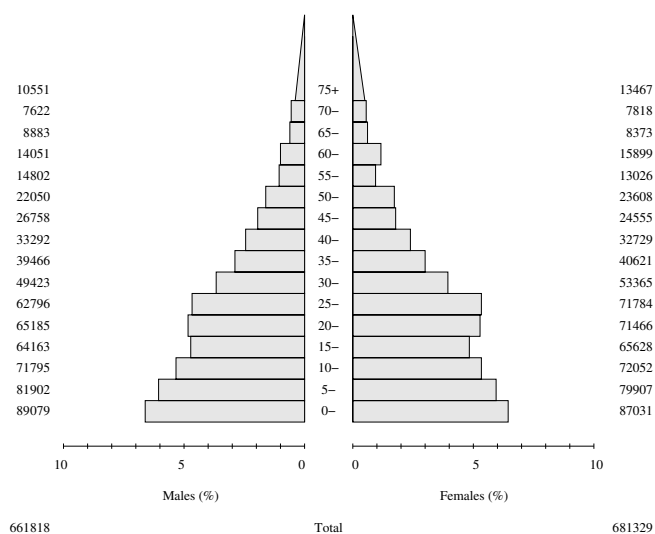
The IBCR uses active data collection. The registry collects cases from more than 30 data sources within general hospitals, teaching hospitals, pathology laboratories, and some private hospitals and clinics, as well as a hospice located within the UCH. During visits to these sources, registry staff members examine the records kept by the medical records departments and the registers of the individual departments that diagnose and treat cancer. This is done in order to identify and abstract information on cancer cases diagnosed by any method among residents of the registration area. Although cancer is not a notifiable disease in Nigeria, some registration forms are received from private practitioners. In addition to the monthly visits to hospitals outside the registration area, arrangements are being made to have the hospitals notify the registry of resident cancer cases directly. The registry is also in negotiation to obtain reports from the two new private laboratories operating within the registration area.

Death certificates are issued at UCH, but the death registration system in Oyo State is inadequate and incomplete.

The registry has used IARC's CanReg4 software for data entry and management since 1997. Cases are coded according to ICD-O-3. Ambiguous cases are clarified with the pathologists. Random checks for completeness and accuracy are performed via re-abstraction and recoding. The data are periodically reviewed to check for duplicate registrations and confirm multiple primaries. Registry staff members also review hospital mortality records to help ascertain cases.

Electronic data are password-protected, and access is restricted to authorized registry personnel.

Nigeria, Ibadan (2006–2009)
Population pyramid (average annual person-years by sex and age group)



Source: National Population Commission of Nigeria, 2006 Population and Housing Census (Abuja, April 2010), 2006 population estimates for the city of Ibadan

YEARS PRESENTED

2006–2009 (a 4-year period)

NOTES

From the 10 years of data available (2003–2012), the period of 2006–2009 was selected for analysis, because the average rate of registration during those 4 years (78 cases per month) was significantly higher than the average rates during the 3-year periods before and after (59 and 56 cases per month, respectively).

The age-standardized incidence rate (ASR) of cancer at all anatomical sites combined (excluding non-melanoma skin cancer) is 84.9 cases per 100 000 person-years in males and 115.6 cases per 100 000 person-years in females. These values are very close to the values for western Africa reported in GLOBOCAN 2012. However, there is some variability by anatomical site, with fairly low rates of liver cancer and high rates of colorectal cancer and non-Hodgkin lymphoma.

The modest overall percentage of microscopically verified cases (MV%) is plausible (67% in males and 74% in females) and is consistent with the methods typically used to diagnose cases occurring at certain internal anatomical sites (e.g. the liver and pancreas). However, the very low percentage of cases diagnosed without tissue examination among leukaemias (12.5% in males and 5.9% in females) and lymphomas (slightly more than half) seems unlikely.

SUMMARY

In a report for 2009–2012, the registry staff described problems with case finding due to financial constraints; these problems likely result in some degree of underenumeration. The relative frequency of large bowel cancers in clinical experience in Ibadan has also been described (Irabor et al., 2010).

PUBLICATIONS AND ACHIEVEMENTS

IBCR data were featured in Volumes I–III of *Cancer Incidence in Five Continents* and Volumes I and II of *International Incidence of Childhood Cancer*. The registry has also participated in a variety of research studies. Listed here are some of the landmark publications directly derived from IBCR data.

Abioye AA (1981). The Ibadan Cancer Registry, 1960–1980. In: Olatunbosun DA, editor. *Cancer in Africa. Proceedings of a workshop of the West African College of Physicians, 6–9 July 1981, Monrovia, Liberia*. Ibadan: Caxton Press (West Africa); pp. 1–32.

Akang EE (2000). Epidemiology of cancer in Ibadan: tumours in childhood. *Arch Ibadan Med.* 1(2):7–9. <http://dx.doi.org/10.4314/aim.v1i2.34537>

Attah B, Hendrickse ML (1977). Patient dynamics in cancer registration: Ibadan Cancer Registry. *Nigerian Med J.* 7(4).

Irabor DO, Arowolo A, Afolabi AA (2010). Colon and rectal cancer in Ibadan, Nigeria: an update. *Colorectal Dis.* 12(7 Online):e43–9. <http://dx.doi.org/10.1111/j.1463-1318.2009.01928.x> PMID:19438886

Ogunbiyi JO (2000). Epidemiology of cancer in Ibadan: tumours in adults. *Archives of Ibadan Medicine.* 1(2):9–12. <http://dx.doi.org/10.4314/aim.v1i2.34538>

Ogunbiyi JO, Fabowale AO, Ladipo AA (2010). Cancer incidence and top ten cancers in eleven local government areas in Ibadan and environs 2004–2008. Ibadan Cancer Registry Technical Report. October 2010.

Ojesina AI, Akang EE, Ojemakinde KO (2002). Decline in the frequency of Burkitt's lymphoma relative to other childhood malignancies in Ibadan, Nigeria. *Ann Trop Paediatr.* 22(2):159–63. <http://dx.doi.org/10.1179/027249302125000887> PMID:12070951

Thomas JO (2000). Cancer registration and diagnosis in Ibadan. *Archives of Ibadan Medicine.* 1(2):5–6. <http://dx.doi.org/10.4314/aim.v1i2.34536>

Nigeria, Ibadan (2006–2009)

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

Site	All ages		Age group (years)										Crude rate	CR %	ASR (W)	ICD-10							
	unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-					50-	55-	60-	65-	70-	75+	
Mouth	16	1	75	-	-	-	-	2	-	-	-	1	2	1	2	1	2	2	0.6	1.0	0.11	C00-06	
Salivary gland	13	0	85	-	1	-	2	1	-	-	-	1	1	1	1	3	1	-	0.5	0.8	0.10	C07-08	
Nasopharynx	37	0	86	-	1	5	4	7	2	3	5	3	3	1	4	1	-	1	1.4	2.4	0.14	C16	
Other pharynx	7	0	71	-	-	-	-	-	-	1	1	1	1	2	-	1	-	-	0.3	0.5	0.04	C09-10, C12-14	
Oesophagus	16	0	56	-	1	-	-	-	-	-	3	1	1	1	2	2	3	3	0.6	1.0	0.13	C15	
Stomach	49	0	59	-	1	1	1	3	2	4	3	8	11	2	3	7	3	5	1.9	3.2	0.32	C16	
Colon	51	0	82	-	1	1	1	3	6	3	1	2	7	2	3	13	5	4	1.9	3.3	0.40	C18	
Rectum	69	0	70	-	2	2	2	3	5	9	10	5	12	6	6	6	3	6	2.6	4.5	0.43	C19-20	
Anus	13	0	69	-	-	-	-	1	1	2	2	-	-	-	5	2	-	-	0.5	0.8	0.09	C21	
Liver	122	1	16	-	1	5	2	8	16	16	8	14	17	3	9	11	4	7	4.6	7.9	0.64	C22	
Gallbladder etc.	6	0	17	-	-	-	-	-	-	-	1	1	1	2	2	2	1	2	0.2	0.4	0.06	C23-24	
Pancreas	34	0	15	-	-	-	-	-	2	1	2	1	2	5	7	7	6	1	1.3	2.2	0.33	C25	
Larynx	39	0	87	1	-	-	-	-	1	1	3	3	9	7	4	3	6	2	1.5	2.5	0.32	C32	
Trachea, bronchus, and lung	35	1	60	-	-	-	-	-	2	1	1	1	7	6	5	3	5	3	1.3	2.3	0.28	C33-34	
Bone	61	1	80	1	7	3	4	11	2	2	3	1	7	4	2	2	5	5	2.3	3.9	0.28	C40-41	
Melanoma of skin	8	0	88	-	-	-	-	-	-	-	2	-	2	1	1	2	2	2	0.3	0.5	0.05	C43	
Non-melanoma skin	89	0	87	2	1	1	5	4	6	4	8	11	7	4	6	9	4	5	3.4	0.49	0.44	C44	
Mesothelioma	1	0	100	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.00	C45	
Kaposi sarcoma	11	0	82	1	1	1	1	1	2	3	2	-	-	-	1	-	-	-	0.4	0.7	0.04	C46	
Connective and soft tissue	64	0	66	3	1	4	4	9	3	7	3	5	3	1	3	3	2	4	2.4	4.1	0.25	C47, C49	
Breast	23	0	48	-	-	-	-	-	-	1	1	3	3	1	6	1	1	6	0.9	1.5	0.13	C50	
Penis	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	C60	
Prostate	438	0	79	-	-	2	1	1	-	-	3	5	28	36	73	65	96	132	16.5	28.3	3.64	C61	
Testis	5	0	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3	0.01	C62	
Kidney and renal pelvis	14	0	71	3	1	2	1	-	1	-	-	2	1	1	3	2	3	6	0.5	0.9	0.06	C64-65	
Bladder	31	0	84	1	-	-	-	-	-	-	3	3	1	4	2	2	3	7	1.2	2.0	0.23	C67	
Ureter and other urinary	1	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0.0	0.1	0.02	C66, C68	
Eye	30	0	83	15	6	1	1	-	1	1	1	-	2	-	1	-	-	1	1.1	1.9	0.06	C69	
Brain and nervous system	39	0	82	4	3	2	2	3	1	4	3	6	5	1	4	-	1	-	1.5	2.5	0.14	C70-72	
Thyroid	12	0	75	-	-	-	2	1	1	2	-	3	1	-	-	-	-	1	0.5	0.8	0.05	C73	
Hodgkin lymphoma	15	0	47	-	1	2	4	1	1	1	1	1	1	2	1	-	-	-	0.6	1.0	0.06	C81	
Non-Hodgkin lymphoma	130	0	59	2	18	10	9	4	5	10	12	3	12	10	4	10	13	5	3	4.9	8.4	0.66	C82-85, C96
Multiple myeloma	14	0	21	-	-	-	-	-	-	-	3	1	1	1	2	4	1	1	0.5	0.9	0.12	C90	
Lymphoid leukaemia	19	0	21	-	1	1	1	-	-	-	1	3	2	2	2	2	5	2	0.7	1.2	0.17	C91	
Myeloid leukaemia	25	0	8	-	1	1	1	1	5	1	3	4	1	1	1	2	1	-	0.9	1.6	0.13	C92-94	
Leukaemia, unspecified	4	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3	0.02	C95	
Other and unspecified	96	0	93	3	6	1	7	6	5	8	7	10	9	4	8	5	5	7	3.6	6.2	0.47	O&U	
All sites	1637	4	68	37	43	42	46	49	64	73	86	112	149	113	177	173	172	211	61.8	104.6	8.95	C00-96	
All sites except C44	1548	4	67	35	42	41	41	45	58	69	78	75	105	137	109	171	164	206	58.5	100.0	9.97	C00-96 exc. C44	

Average annual population 89079 81902 71795 64163 65185 62796 49423 39466 33292 26758 22050 14802 14051 8883 7622 10551 661818

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).

Nigeria, Ibadan (2006–2009)

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

Site	All ages	MV DCO		Age group (years)											Crude rate	CR %	ASR (W)	ICD-10						
		unk	%	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-					55-	60-	65-	70-	75+	
Mouth	19	0	100	2	-	1	-	1	-	1	-	1	-	2	4	1	1	1	4	0.7	0.10	1.0	C00-06	
Salivary gland	10	0	90	-	-	-	-	1	-	1	-	3	2	-	1	-	-	-	1	0.4	0.5	0.04	0.5	C07-08
Nasopharynx	9	0	100	-	-	3	-	1	-	1	-	1	-	-	1	-	-	-	1	0.3	0.4	0.03	0.4	C11
Other pharynx	6	0	100	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	2	0.2	0.3	0.05	0.3	C09-10, C12-14
Oesophagus	7	0	71	-	-	-	-	-	-	1	-	1	1	-	1	1	1	1	1	0.3	0.3	0.05	0.4	C15
Stomach	24	0	62	-	-	-	-	1	1	3	1	2	3	2	2	3	2	1	4	0.9	1.1	0.13	1.3	C16
Colon	49	0	78	-	-	1	2	1	1	5	6	3	3	3	11	7	6	3	1.8	2.3	0.39	2.9	C18	
Rectum	46	1	72	-	-	2	3	5	6	2	4	4	4	4	5	3	5	2	1.7	2.1	0.30	2.4	C19-20	
Anus	17	0	82	-	-	-	-	3	1	1	1	1	1	3	2	2	1	2	1	0.6	0.8	0.11	0.9	C21
Liver	47	0	30	-	-	-	2	2	2	3	7	5	5	4	7	-	6	4	1.7	2.2	0.29	2.4	C22	
Gallbladder etc.	2	0	100	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	0.1	0.1	0.02	0.1	C23-24	
Pancreas	21	0	29	-	-	-	-	-	-	1	3	2	-	3	3	6	-	2	1	0.8	1.0	0.14	1.2	C25
Larynx	7	0	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	0.3	0.06	0.5	C32	
Trachea, bronchus, and lung	23	0	74	-	-	-	2	1	1	1	1	1	5	2	2	2	3	2	0.8	1.1	0.16	1.2	C33-34	
Bone	49	0	86	1	-	3	2	6	7	3	7	3	3	2	4	2	1	3	1.8	2.3	0.20	2.1	C40-41	
Melanoma of skin	14	0	50	-	-	-	-	-	-	1	-	2	1	1	-	2	3	1	3	0.5	0.6	0.10	0.8	C43
Non-melanoma skin	57	0	88	1	-	3	2	4	8	3	1	6	7	5	5	1	4	6	2.1	2.8	0.28	2.7	C44	
Mesothelioma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45	
Kaposi sarcoma	7	0	100	-	-	-	2	2	1	-	-	-	-	-	-	-	-	-	0.3	0.3	0.02	0.3	C46	
Connective and soft tissue	47	0	72	6	-	1	-	3	3	6	1	5	3	5	4	6	-	2	1.7	2.2	0.22	2.2	C47, C49	
Breast	747	4	74	-	-	1	-	8	25	66	86	101	130	108	75	59	36	24	27.4	34.3	4.23	39.6	C50	
Vulva	5	0	100	-	-	1	-	-	-	2	-	-	-	1	-	1	-	-	0.2	0.2	0.02	0.2	C51	
Vagina	7	0	86	-	-	-	-	-	-	-	-	-	-	1	2	2	2	-	0.3	0.3	0.06	0.5	C52	
Cervix uteri	455	2	80	-	-	-	-	6	10	28	42	56	79	45	66	55	35	30	16.7	20.9	3.33	27.0	C53	
Uterus	66	0	85	-	-	-	-	1	1	2	4	6	10	5	12	10	7	8	2.4	3.0	0.51	4.0	C54-55	
Ovary	96	0	88	2	-	2	4	9	8	9	10	14	11	7	4	3	9	4	3.5	4.4	0.53	4.7	C56	
Placenta	12	0	42	-	-	-	2	5	2	1	2	-	-	-	-	-	-	-	0.4	0.6	0.03	0.4	C58	
Kidney and renal pelvis	19	0	74	4	-	1	2	1	2	2	2	1	2	1	3	-	1	1	0.7	0.9	0.09	0.9	C64-65	
Bladder	13	0	77	-	-	-	1	-	-	-	-	1	2	3	2	-	1	2	0.5	0.6	0.08	0.7	C67	
Ureter and other urinary	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C66, C68	
Eye	29	0	83	16	2	-	1	-	1	2	-	1	-	2	-	2	-	1	1.1	1.3	0.08	1.1	C69	
Brain and nervous system	35	0	83	9	1	-	3	-	3	3	3	1	4	3	1	-	1	2	1.3	1.6	0.12	1.5	C70-72	
Thyroid	46	0	78	-	1	3	1	6	-	4	6	2	4	4	7	3	2	2	1.7	2.1	0.25	2.3	C73	
Hodgkin lymphoma	9	0	56	-	-	-	-	1	1	1	2	1	2	-	1	-	1	2	0.3	0.4	0.04	0.4	C81	
Non-Hodgkin lymphoma	80	0	62	2	6	10	5	1	8	5	6	6	4	6	3	7	3	4	2.9	3.7	0.35	3.5	C82-85, C96	
Multiple myeloma	14	0	7	-	-	-	-	-	-	-	1	1	2	1	2	1	4	2	0.5	0.6	0.13	0.9	C90	
Lymphoid leukaemia	16	0	6	-	-	1	-	1	2	-	-	3	1	2	-	2	1	1	0.6	0.7	0.08	0.8	C91	
Myeloid leukaemia	14	0	7	-	-	1	1	1	1	1	1	1	1	3	1	1	1	-	0.5	0.6	0.08	0.8	C92-94	
Leukaemia, unspecified	4	0	0	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	0.1	0.2	0.01	0.2	C95	
Other and unspecified	105	1	82	2	3	3	3	4	3	10	7	6	12	12	8	7	9	5	10	3.9	4.8	0.57	5.3	O&U
All sites	2233	8	74	45	16	23	24	54	93	156	182	216	277	291	196	233	154	132	81.9	100.0	13.02	118.3	C00-96	
All sites except C44	2176	8	74	44	15	23	21	52	89	148	179	215	271	284	191	228	153	128	79.8	100.0	13.02	115.6	C00-96 exc. C44	
Average annual population				87031	79907	72052	65628	71466	71784	53365	40621	32729	24555	23608	13026	15899	8373	7818	13467	681329				

For definitions and explanations of the terms and abbreviations used in this table, see the corresponding text in Chapter 2 (Tables of incidence by registry, p. 3).