

**NAMIBIA NATIONAL CANCER REGISTRY (NNCR)
CANCER INCIDENCES IN NAMIBIA 2010 - 2014**

Data collected and entered by the Namibia National Cancer Registry (NNCR)

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FOREWORD

NAMIBIA NATIONAL CANCER REGISTRY REPORT 2010 - 2014

The Namibia National Cancer Registry is a combined project between the Ministry of Health and Social Services (MOHSS) and the Cancer Association of Namibia (CAN) with data analysis done by IARC.

This collaboration started in 1995 and this report is the fifth published report.

I would like to congratulate and thank everyone involved in this project - the doctors and nurses from MOHSS collecting data; the CAN staff doing data entry and follow-up; IARC doing data-analysis and the sponsors involved in producing the report. Without the hard work of each individual this very important research project would not be possible.

This information is essential for the action that must be taken by the Namibian National Cancer Control Program – another collaborative program to start soon.

In our collective battle against cancer our vision and mission is to:

1. Prevent cancers - create awareness, provide education about healthy lifestyle, promote HPV vaccination
2. Promote early detection - screening
3. Provide information about the most common cancers in Namibia
4. Provide adequate medical treatment for all Namibian cancer patients
5. Provide palliative and supportive care for all Namibians

This battle can only be fought by a multidisciplinary team which include MOHSS, CAN, all healthcare professionals, the government of Namibia, the media, churches, NGOs and every Namibian citizen.

With sincere gratitude

Annelle Zietsman

Dr. A.B. May Cancer Care Centre – Windhoek Central Hospital

MOHSS

A SPECIAL THANK YOU

A special word of thanks to Morten Ervik of IARC for help answering many questions relating to CanReg5 software.

The Cancer Association of Namibia would like to thank all medical practitioners, medical and treatment establishments and volunteers who have supported data collection.

We would also like to thank the African Cancer Registry Network (AFCRN) for their continued support on cancer reporting in not only Namibia, but Africa as a whole.

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MESSAGE FROM THE CANCER ASSOCIATION OF NAMIBIA (CAN) AND NAMIBIA NATIONAL CANCER REGISTRY (NNCR)

Founded in 1968 by the late Dr A Bernard May, the Cancer Association of Namibia (WO30), an incorporated association not for gain registered with the Ministry of Health and Social Services and Ministry of Trade and Industry, has continuously strived to better the conditions related to the fight against, and support of those afflicted by, cancer in our country.

The Association remains actively engaged in creating awareness, educating and supporting Namibians in the fight against cancer. A key element of the war on cancer is supporting data collection and presentation of a cancer incidence report in Namibia.

Commitment on all levels and from all stakeholders remains pivotal in making an impact on this journey of change.

Change plays a cardinal role, because a change in attitude, breaking the stigma and developing better national plans to combat diseases, is part of our mission to rid our communities of non-communicable diseases like cancer.

How do we eradicate it, if we do not know what we are up against?

The Cancer Association of Namibia, as administrator of the Namibia National Cancer Registry, is therefore proud to present the fifth 'Cancer Incidence in Namibia Report (2010 – 2014)'. This document should ideally be read along with the previous published reports (1995 – 1998; 2000 – 2005; and 2006 – 2009). From commentary, you will quickly realize that there is still much work to be done to ensure we provide data of a world-class standard from Namibia in terms of cancer reporting. It is also evident that as time goes by, case reporting, active case finding and case updating does enjoy more attention.

Data collection is a very time-consuming and a costly process and, as a welfare organisation, we underscore the urgency of public and stakeholder engagement – not only in data support, but for funding as well. Since the Association remains committed to fighting cancer and to making an impact on our communities, the national cancer registry must remain a priority at all costs!

I would like to thank my predecessors for establishing a strong foundation to develop the NNCR further, while the staff of the NNCR – in particular, Ms Lizette Horn – deserves applause for her dedication and commitment to the cause. We acknowledge and thank the staff of the Dr AB May Cancer Care Centre – Dr Anelle Zietsman and her team; as well as all other data collection stakeholders nationwide. A special word of thanks to Prof Max Parkin of the African Cancer Registry Network (AFCRN) for their commitment to data collection not only in Namibia, but Africa as a whole.

In conclusion, I trust that this publication will serve as a guide to all parties involved in decision-making, advocacy and responsible citizenry (both private and corporate) to support the advocacy on cancer and in so doing, reduce the incidence of this disease that remains the leading cause of death worldwide.

Rolf-Jürgen Hansen
Chief Executive Officer
Cancer Association of Namibia

SUMMARY

This report summarises the results of an analysis of cancers reported to the Namibia National Cancer Registry from 2010 to 2014.

A total of 11 248 malignant neoplasms were recorded among the Namibian population during this five-year period, of which 5 125 were in males (45.6%) and 6 123 in females (54.4%). With 'other skin' neoplasms excluded, there were 10 559 people with malignant neoplasms; 4 787 males (45.3%) and 5 772 females (54.7%). Of this number, 353 (3.3%) were in children below the age of 15.

Overall, the incidence of all cancers including non-melanoma skin in males was 153.8 per 100 000 and 146.3 per 100 000 in females. Excluding non-melanoma skin cancers, the incidence of cancer overall in males was 144.2 per 100 000 and was 138.7 per 100 000 in females. This represents an increase in incidence in both sexes compared to the previous reporting period (2005-2009) while the ranking of the most common types of cancer remained similar with the exception of a notable increase in the HIV-associated cancers (Kaposi sarcoma, Non-Hodgkin lymphoma and Eye cancer).

The most common cancers in Namibia by gender: 2010-2014

Cancer in males	Proportion of all cancers (%)	ASR / 100 000	Cancer in females	Proportion of all cancers (%)	ASR / 100 000
Prostate	23.6	37.6	Breast	27.4	40.2
Kaposi sarcoma	18.4	22.0	Cervix	19.4	27.2
Non-Hodgkin lymphoma	4.8	6.3	Kaposi sarcoma	8.8	10.1
Eye	5.0	6.2	Eye	4.0	4.8
Lung/trachea/bronchus	3.4	5.9	Ovary	3.0	4.3
Larynx	3.1	5.3	Non-Hodgkin lymphoma	2.8	3.4
Colon	2.7	4.2	Corpus uteri	2.1	3.3
Liver	2.6	4.0	Lung/trachea/bronchus	1.8	2.9

This report describes the overall occurrence of cancer and the leading cancers in Namibia. This data continues to form a basis for future research into risk factors for cancers in the Namibian population and for program planning and advocacy. It is recommended that cancer be made a reportable condition in Namibia to improve these cancer statistics.

INTRODUCTION

The World Health Organisation (WHO) estimates that more than 14.1 million new cases of cancer occur annually and that more than half of these occur in developing countries (GLOBOCAN 2012, IARC). Cancer is the most common cause of death in developed countries. It is difficult to precisely estimate the burden of cancer mortality in developing countries due to lack of and/or the poor quality of available data. However, it is estimated that 10% of deaths in developing countries are due to cancer and given the aging of these populations, cancer incidence is increasing (WHO, 2002).

A cancer registry provides a framework for assessing and measuring the impact of cancer in communities and is important in the allocation of health resources. It is an essential surveillance device for measuring the effectiveness of any cancer control program. The data produced furthermore provides a starting point for research into cancer causes and prevention.

BACKGROUND OF THE NAMIBIA NATIONAL CANCER REGISTRY

History of the registry

The Namibia National Cancer Registry (NNCR) was started in 1995, when Rössing Uranium mine, in co-operation with the Namibian Ministry of Health (Oncology clinic) and the Cancer Association of Namibia, collected all cancer cases reported to the Windhoek state pathology laboratory and the single existing private pathology laboratory from 1979 to 1994. From 1995 onwards, the Namibia National Cancer Registry commenced active registration of both pathology-based and clinical cases for four sentinel regions (Erongo, Oranjemund, Oshakati and Khomas). Cases that are diagnosed in South Africa are re-routed to the Namibian registry via a network of registries, which are technically supported by the International Agency for Research on Cancer (IARC). The Namibia National Cancer Registry aims to provide a database of information that will ultimately lead to improved cancer prevention and control among the Namibian population.

The Namibia National Cancer Registry is a population-based registry.

Location of registry

The registry is based at the premises of the Cancer Association of Namibia (90 John Meinert Street, Windhoek-West, WINDHOEK). There is a separate office with one computer linked to a server; this is used for data entry. Transport, technical and administration support are provided by the Association, as required.

The registry is co-managed by Mr R. Hansen, CEO of the Cancer Association of Namibia. The Technical Leader is Ms L. Horn (Cancer Association of Namibia) and Dr. A. Zietsman and the staff of the Dr A.B. May Cancer Care Centre guide with data input and patient identification.

The registry covers the entire population of Namibia enumerated as 2,104,900 persons at the 2011 census. The map of Namibia (Figure 1) shows the 13 regions and the population of each.

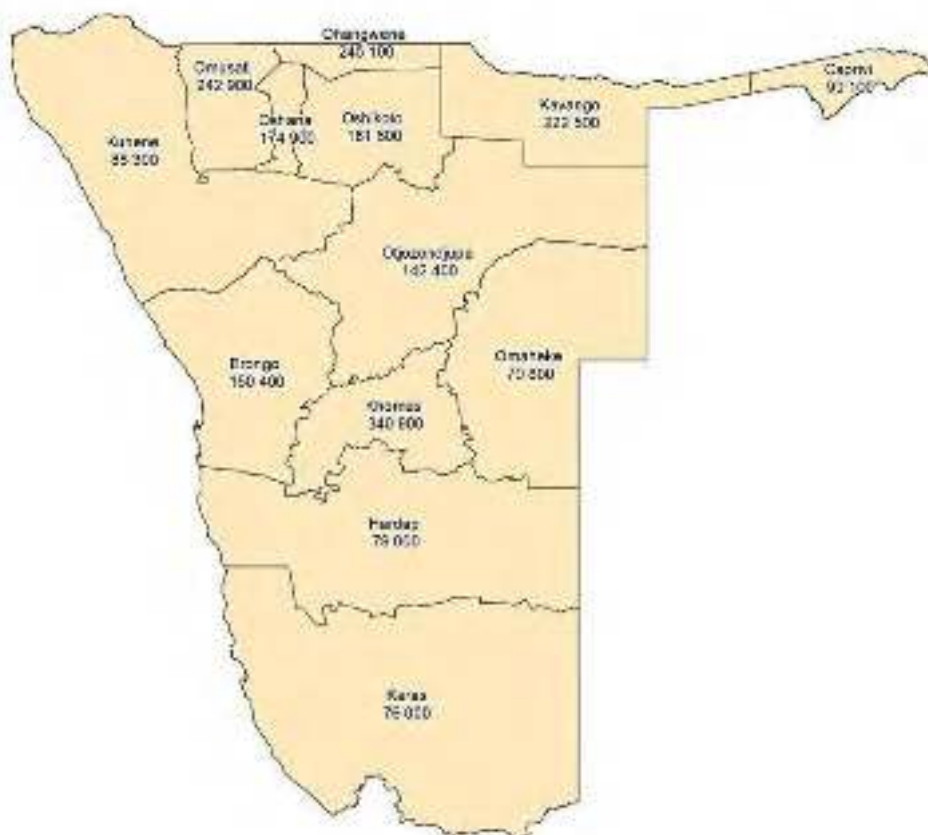


Figure 1: Map of Namibia: regions and population

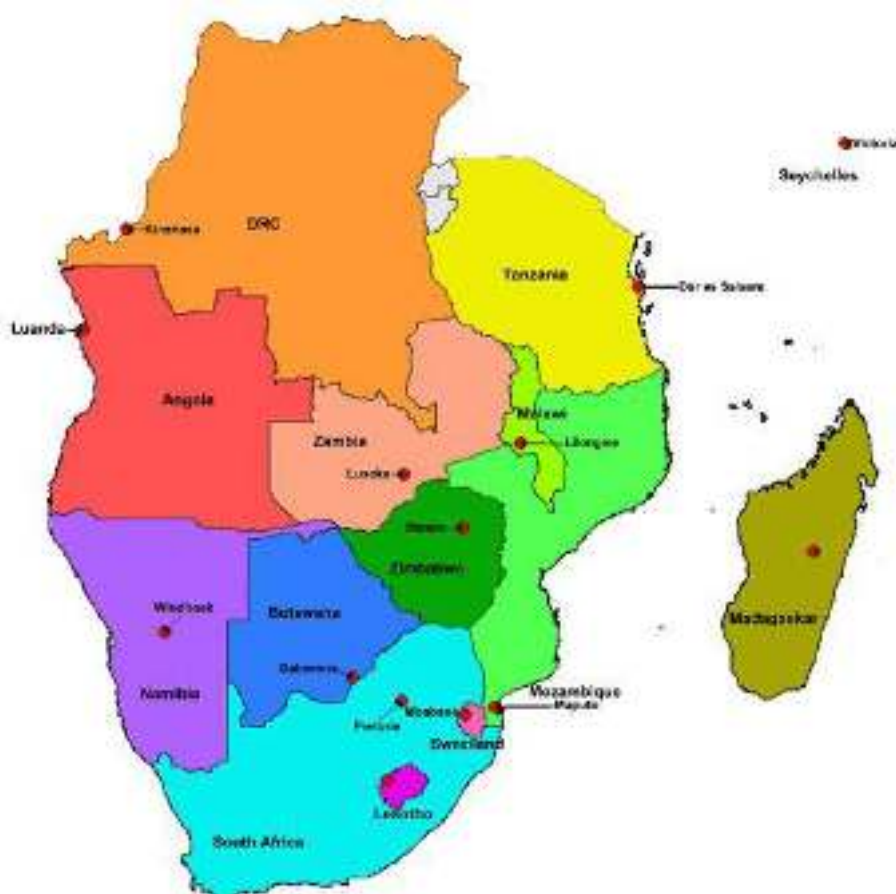


Figure 2: Map of Namibia: regional in SADC situation



Figure 3: NAMIBIA: Namib Desert



Figure 4: NAMIBIA: Key Towns



Figure 5: CANCER ASSOCIATION OF NAMIBIA



Figure 6: DR A.B. MAY CANCER CARE CENTRE - State cancer care



Figure 7: NAMIBIA ONCOLOGY CENTRE – Private cancer care

Source of finance

The International Association of Cancer Registries (IARC) and African Cancer Registry Network (ACFRN) cover some costs pertaining to the registry. The Cancer Association of Namibia (WO30) funds all other registry activities.

Previous publications

There are four previously published reports in this series (1989-1994, 1995-1998, 2000-2005; and 2006-2009).

- Koehler S. Namibia's cancer atlas: 1989-1994. Namibia National Cancer Registry 1997.
- Stein L, Sitas F, Zietsman A, Gariseb B, Rautenbach N, Pontac J and Johannesson I. Cancer in Namibia 1995 - 1998, Namibia Cancer Registry, Windhoek 1999.
- Carrara H, Stein L, Sitas F, Zietsman A, Gariseb B, Rautenbach N, Pontac J, Johannesson I and Ferlay J. Cancer in Namibia 2000-2005, Namibia Cancer Registry, Windhoek 2009.
- Carrara H, Stein L, Sitas F, Zietsman A, Gariseb B, Rautenbach N, Pontac J, Rooi T, and Taapopi L. Cancer in Namibia 2006-2009, Namibia Cancer Registry, Windhoek 2011.

A number of other publications and conference abstracts have been prepared.

- The NNCR has already contributed to the body of literature on Cancer in Africa (Parkin et al., 2003; Parkin et al., 2008; Sitas et al., 2008, Ferlay et al, 2010 – the WHO/IARC database GLOBOCAN 2012).
- ASB van Dyk, RN, LF Small, A Zietsman, The Pain Experience and its management in cancer patients during hospitalization (in Namibia) Health SA Gesondheid Vol.5 No.4 – 2000.

Aims of the Namibia National Cancer Registry

The NNCR aims to provide a database of information that will ultimately lead to improved cancer prevention and control among the Namibian population. The main goals of the NNCR are:

- To monitor the incidence of cancer among the Namibian population on an ongoing basis;
- To use observed cancer trends to predict future cancer patterns in Namibia;
- To provide information on the burden of cancer in different regions and among different ethnic groups in Namibia;
- To monitor the effects of cancer prevention programs, early detection or screening, treatment and palliative care;

- To provide information that will serve as a basis for research into cancer causes specific to the Namibian population.

Namibia: A brief introduction

Namibia, a southern African country shares borders with Angola and Zambia to the north, Botswana to the east, and South Africa to the south. It gained independence from South Africa in 1990 and its capital city is Windhoek. With only 2.5 inhabitants per square kilometre it is one of the most sparsely populated countries in the world.

Namibia is one of Africa's most developed and stable countries. Tourism and mining form the backbone of Namibia's economy.

The majority of the Namibian population is Black African — mostly of Ovambo ethnicity, which forms about half of the population — and is concentrated in the north of the country. There are also the Herero and Himba people who speak a similar language. In addition to the Black African majority, there are large groups of Khoisan (the Nama and San). Other Black Africans are descendants of refugees from Angola. There are also two smaller groups of people with mixed racial origins, called "Coloureds" and "Basters", who together make up 6% of the population. Whites of Portuguese, Dutch, German, British and French ancestry also make up about 6% of the population. Most of Namibian Whites and nearly all those of mixed race are Afrikaans speakers and share similar origins, culture, religion and genealogy as the White and Coloured populations of neighbouring South Africa. A smaller proportion of Whites, approximately 30 000, trace their origins directly back to German settlers and maintain German cultural and educational institutions. Figure 1 shows the map of Namibia and the geographic regions used in this report.

MATERIALS AND METHODS

Data collection by the Namibia National Cancer Registry

The NNCR attempts to record for each cancer patient, first name and surname, date of birth or approximate age, I.D. number, gender, marital status, ethnic origin, current residential address, place of birth, tobacco and alcohol use, reproductive history (for females), date of cancer diagnosis, histology number, tumour site and histology, clinical stage of disease, basis of diagnosis, treatment given, vital status, and date and cause of death.

Until late 2010 data from the cancer registration form were entered into CanReg4 Software (Cooke et al., 2001; Cook et al., 2005). The data were migrated to CanReg5 (<http://canreg.iarc.fr>) in late 2010 and the data were validated and duplicates were identified using check and conversion programs for cancer registries (Ferlay et al., 2005). Tumour site and histology were coded using ICD-O-3 (2) (Fitz et al., 2001) at the time of data entry, but were converted to ICD-10 for the tabulation of cases. Since 2010 ICD-10 has been used to code cancer sites.

Sources of information for the registry

There are two large state hospitals in Windhoek: Central Hospital (which includes the Dr A.B. May Cancer Care Centre) and Katutura Hospital, and a referral hospital in each region of the country. A cancer centre recently opened at Oshakati Intermediate Hospital. In addition, there are five private hospitals in Windhoek (Roman Catholic, Rhino Park, Medi-Clinic, Paramount and Lady Pohamba).

During 2015 the Namibia Oncology Centre (NOC) – a specialized private cancer treatment facility – opened its doors; the first of its kind for Namibia.

At present, primary data collection takes place at the Dr A.B. May Cancer Care Centre and the Namibia Oncology Centre to which all cancer patients are supposed to be sent for assessment and possible treatment if private or state. Paramount Hospital and GVI Oncology in Namibia also serve as data collection and patient referral points.

There are two pathology laboratories in the country: the state run National Institute of Pathology (NIP) and the private run, PathCare. Some information on cases from Namibia is also received from a laboratory in Cape Town (Dr Holm).

The pathology reports from NIP include demographic data, but place of residence is noted in less than one third of these. The print-out received from PathCare does not include personal details, only the age and sex of the subject. For this reason, completeness of data remains a great concern, and the registry and Cancer Association of Namibia have been actively engaged with the Ministry of Health and Social Services to have cancer declared a reportable disease. In addition, active case finding throughout the vast country should be urgently implemented.

There is no service for clinical haematology.

Death registry

Civil registration of deaths, by cause, is the responsibility of the Ministry of Home Affairs. Permission to access to copies of certificates for cancer cases was granted from 2016 only. This is because a new electronic registry and databank is finally in place. The quality of information as to cause of death is not known.

Methods of registration

Case finding relies upon receipt of registration forms, completed by nursing staff in the admissions unit of the Dr A.B. May Cancer Centre, NOC and copies of pathology reports, as described above. Currently, there is no active case finding and minimal follow-up in Namibia, unless conducted by staff of the Cancer Association of Namibia on an ad-hoc basis. Lack of funding in this regard hampers this part of the project, as only the Cancer Association of Namibia and some donors who agree on the urgency of data pertaining to incidence reports cover costs relating to the NNCR.

Data management

The registry is housed at the Cancer Association of Namibia in a dedicated office. A desktop computer is used for data entry employing the specialised cancer registration software running in a Microsoft Windows environment. CanReg5 is employed.

Prior to data analysis, the data were exported as a comma-separated-values dataset and these data were checked using the IARC check and conversion programs. This generated a set of data that were manually checked by registry staff who updated the data in CanReg5 for analysis.

Data analysed in this report

Years analysed

The data collected by the NNCR consists of 31 788 cancer cases recorded from 1969 to 2014. Between 1969 and 1994, the number of cases recorded per year ranged from 1 to 402. Data from 1989 to 1994 was analysed in the first report (Koehler, 1997). Active registration of both pathology-based and clinical cases was only started in 1995. A total of 5 141 cases¹ were recorded in the period from 1995 to 1998, approximately 1 285 cases per year. In 1999 only 534 cases were recorded, thus these data were not included in any of the reports. The subsequent report covered the period from 2000 to 2005 and included 5 009 cases, an average of approximately 834 cases per year (Carrara et al, 2009). This was followed by a report covering the period 2006 to 2009 during which a total of 6 363 cases, an average of 1 591 cases each year, was analysed (Carrara et al, 2011). The current report represents the most complete and reliable reflection of cancer incidence in the Namibian population between 2010 and 2014. A total of 11 248 malignant neoplasms were recorded among the Namibian population during this five-year period, an average of 2 250 cancers per year, an increase of almost 40% on the previous reporting period.

Variables examined

Variables used in the analysis of the data from 2010 to 2014 included age (calculated from date of birth), gender, current region of residence, ethnicity, date of cancer diagnosis, tumour site and histology, and basis of diagnosis. The variables describing tobacco and alcohol use, as well as female reproductive history, have improved since the previous report and will be examined further in another publication.

Population denominators

The population at risk for the period 2010-2014 used for incidence calculations was the mid-period data for 2012. This was provided by the Namibian Central Bureau of Statistics based on projected population estimates modelled on the census data of 2011 (Republic of Namibia, Central Bureau of Statistics, 2014). The annual population at risk for the whole of Namibia for the period 2012 is shown in Figure 8.

¹ Previous reports in this series may contain minor differences in numbers resulting from ongoing correction of the dataset.

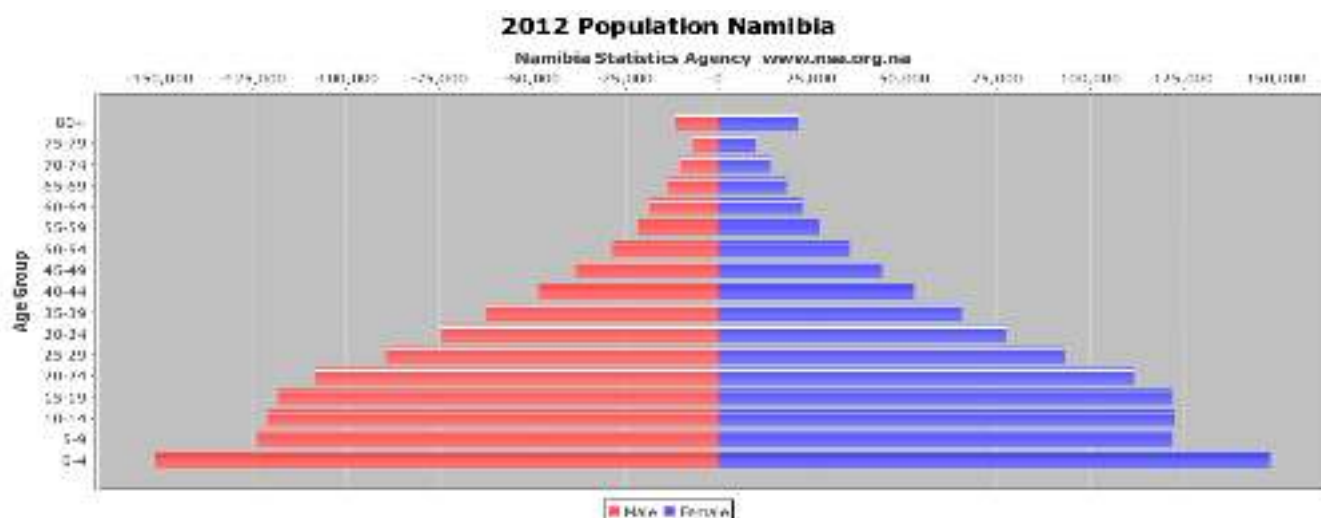


Figure 8: Population of Namibia (2012, middle of analysis period)

Data analysis and presentation

The data were analysed in Cape Town, South Africa, employing CanReg5 software running on Mackintosh IOS platform. Incidence rates were calculated for the whole of the Namibian population in 5-year age groups. The upper age group was set at 80 and above. Age standardisation was performed by the direct method, using the world standard population (Parkin et al., 1997).

Cancer incidence by sex and 5-year age group (Tables 1 and 2) were generated using CanReg5, IARC. These data are disaggregated by year and shown in the appendix. Frequencies of cancer by ethnic group (Tables 3 and 4) and region (Tables 5 and 6) were generated manually in CanReg5 and collated into tabular format using Microsoft Excel.

Occurrence rates could only be calculated for males and females for the whole of Namibia, as population denominators in 5-year age groups were not available for different ethnic groups, or geographic regions by sex. Consequently only frequency tables are presented to summarise the available results for ethnic group and geographic region. Rate calculations for 'all cancers' and ranking of cancers exclude 'other skin' (ICD10-C44), which is standard practice in cancer registry reports, and allows for international comparisons.

The appendix also contains a copy of the Cancer Incidence in Five Continents editorial tables for major diagnosis groups for the readers' further information and to allow international comparisons.

The appendix further contains a table of data quality indicators, also utilising the major diagnosis groupings by sex, here %MV represents the proportion of cases that are microscopically verified.

RESULTS

A total of 11 248 malignant neoplasms were recorded among the Namibian population during this five-year period under review, of which 5 125 occurred in males (45.6%) and 6 123 occurred in females (54.4%). The corresponding average number of cases reported annually was 2 250 overall, 1 025 in males and 1 226 in females. With 'other skin' excluded, the data set consisted of 10559 malignant neoplasms, 4 787 occurred in males (45.3%) and 5 772 occurred in females (54.7%). Of this number, 353 (3.3%) recorded cases were in children below the age of 15. Thus an average of 71 cases was reported annually in children. Ninety-five percent of all cases were verified histologically.

Tables 1 and 2 show the frequencies, incidence rate per 100 000 in 5-year age groups, crude rate, proportions of all cancers, cumulative rates (0-64), cumulative rates (0-74) and age standardised rates (ASR) by site and gender for the period 2010 to 2014. Tables 3 and 4 show cancer frequencies and proportions by ethnic group for males and females respectively. Tables 5 and 6 show cancer frequencies and proportions by geographic region of residence for males and females, respectively. Tables 7 and 8 show the number and proportions for the basis of cancer diagnosis by sex. Appendix 1 shows the cancer frequencies by site and gender in single calendar years of observation for 2010, 2011, 2012, 2013 and 2014. This shows less variation in this 5-year reporting period compared to the previous 4-year reporting period (2005-2009), but the incidence of cancer was still substantially higher in 2014 than in each of the years from 2010-2013. Of all the data collected thus far, the numbers reported here are likely to be the most accurate reflection of the annual burden of cancer in Namibia.

Overall burden of cancer in Namibia 2010-2014

A total of 11 248 malignant neoplasms were recorded among the Namibian population during this five-year period, of which 5 125 were in males (45.6%), and 6 123 in females (54.4%). With 'other skin' neoplasms excluded, there were 10 559 people with malignant neoplasms; 4 787 males (45.3%) and 5 772 females (54.7%). Of this number, 353 (3.3%) were in children below the age of 15.

Overall, the incidence of all cancers including non-melanoma skin in males was 153.8 per 100 000 and in females it was 146.3 per 100 000. Excluding non-melanoma skin cancers, the incidence of cancer overall in males was 144.2 per 100 000 and in females it was 138.7 per 100 000. This represents an increase in incidence in both sexes compared to the previous reporting period (2005-2009) when the ASR in males and females excluding non-melanoma skin was 90.2 per 100 000 and 100.7 per 100 000 respectively.

The ranking of the most common types of cancer remained similar with the exception of a notable increase in the HIV-associated cancers (Kaposi sarcoma, Non-Hodgkin lymphoma and Eye cancer).

Leading cancers among males

The most frequent cancer among men between 2010 and 2014 was prostate cancer (23.6%, ASR 37.6), followed by Kaposi sarcoma (18.4%, ASR 22.0), Non-Hodgkin lymphoma (4.8%, ASR 6.3), cancers of the eye (5.0%, ASR 6.2), lung / trachea / bronchus (3.4%, ASR 5.9), larynx (3.1%, ASR 5.3), colon (2.7%, ASR 4.2), liver (2.6%, ASR 4.0), mouth (2.4%, ASR 3.9) and oesophagus (2.3%, ASR 3.9).²

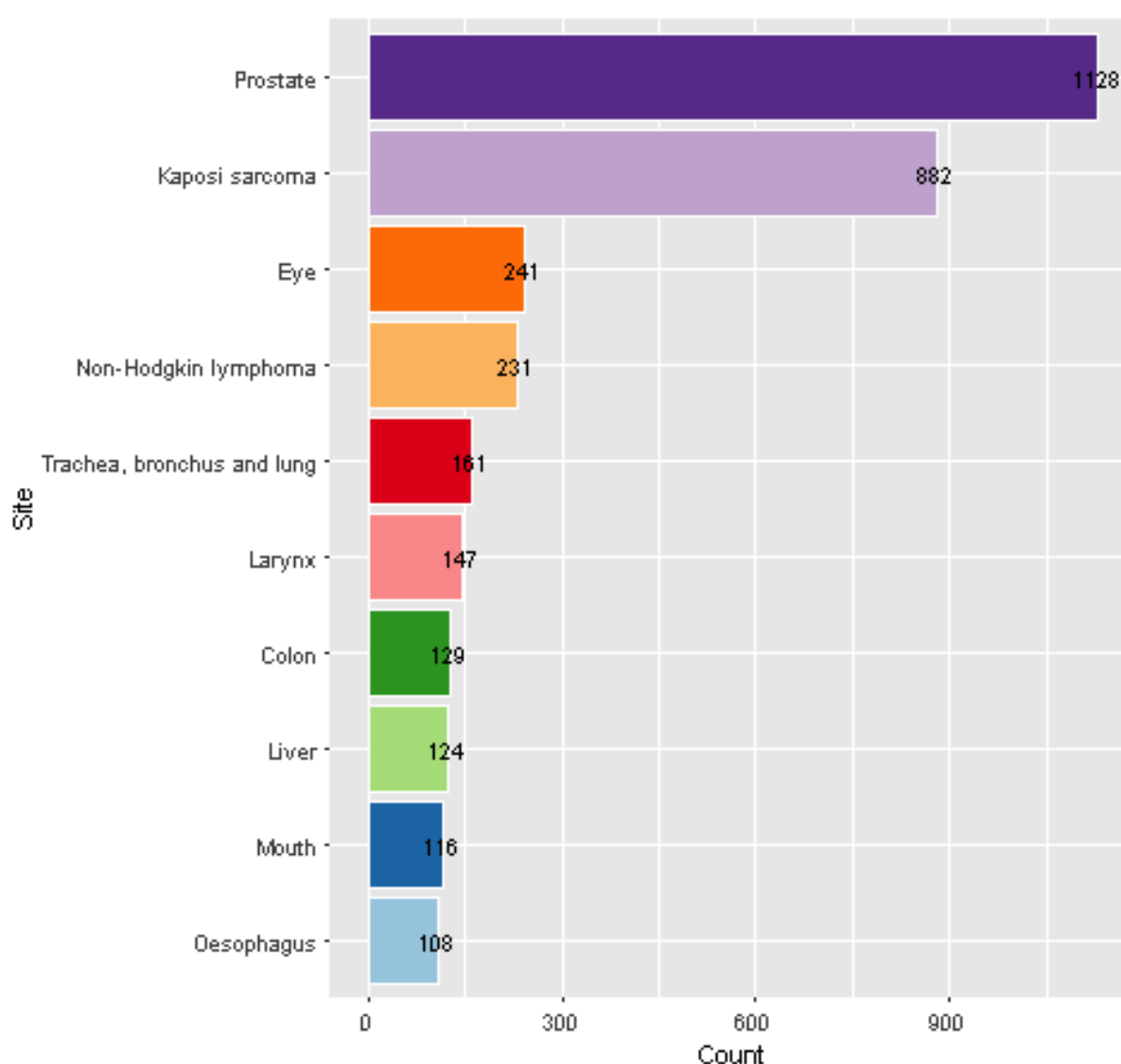


Figure 9: Bar Chart showing Top 10 Cancers in Namibia (2010-2014), excluding C44, Male

² The ranking of top cancers in the report is based on age standardized rates, while the ranking depicted in the bar chart is on absolute numbers.

Prostate cancer

Cancer of the prostate was the most common cancer among males during the period beginning in 2010 and ending in 2014. A total of 1 128 cases were reported, comprising 23.6% of all male cancers. The annual ASR for prostate cancer was 37.6 per 100 000, an almost two-fold increase compared to the previous reporting period (ASR 23.5). Incidence increased with age from 1.6 per 100 000 at age 30-34 to 546.5 per 100 000 for men aged 75-79.

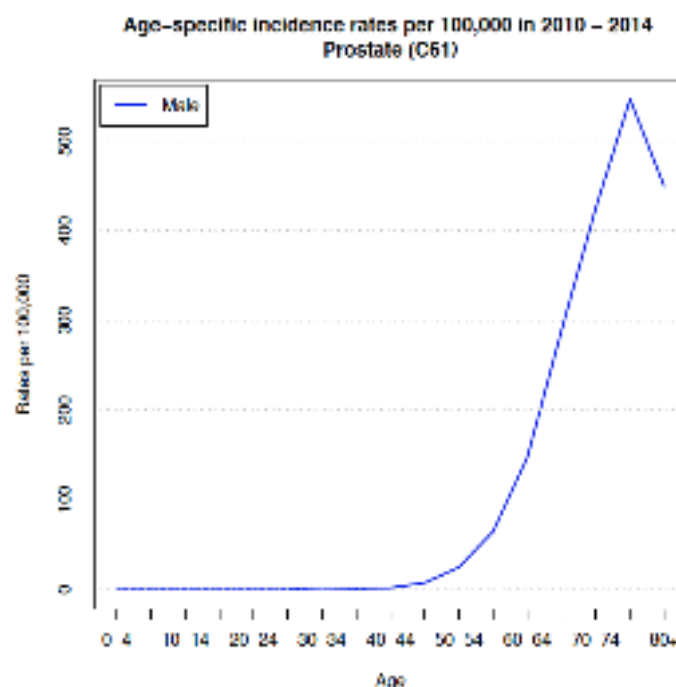


Figure 10: Age-specific Incidence rates per 100 000 in 2010-2014, Prostate (C51)

Cancer of the prostate was the leading cancer for the Tswana (35.0%), Baster (33.9%), Herero (29.1%), Coloured (22.1%), White (19.9%), Nama (15.5%) and San/Bushman (11.8%) ethnic groups.

This cancer was among the five leading male cancers in almost all regions and was the most frequent cancer in males in the Oshana (32.2%), Khomas (31.4%), Kunene (25.9%), Omaheke (25.0%), Hardap (19.0%), Ohangwena (18.1%) and Kharas (18.0%) regions.

Kaposi sarcoma

A total of 882 cases of Kaposi sarcoma (KS) were reported from 2010 to 2014, comprising 18.4% of all cancer cases in males during this five-year period. The overall ASR for KS was 22.0 per 100 000, having increased from 16.3 per 100 000 in the previous reporting period. The highest incidence occurred among males aged between 40 and 44 years (ASR 62.4 per 100 000).

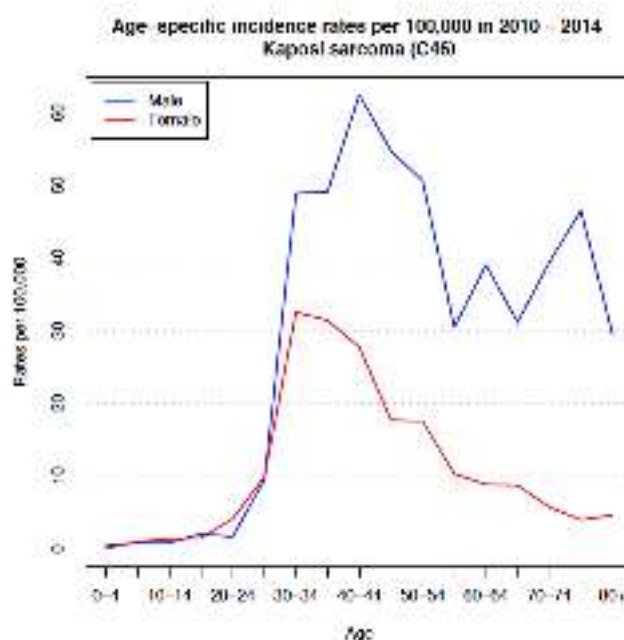


Figure 11: Age-specific Incidence rates per 100 000 in 2010-2014, Kaposi sarcoma (C46)

On average, during this five-year period, KS was the leading cancer among males in the Ovambo (24.1%), Caprivi (19.8%) and Kavango (10.1%) ethnic groups. KS was furthermore among the five leading cancers in males in all ethnic groups examined, except for the White, Baster, Coloured, San / Bushman and Nama ethnic groups. It should be noted that very few cancers were recorded in the San / Bushman and Tswana ethnic groups overall.

KS was the leading cancer in males in almost all regions of Namibia; Kavango (34.3%), Caprivi (31.6%), Oshikoto (26.1%), Omusati (23.9%), Otjozondjupa (23.7%), Ohangwena (18.1%), Erongo (14.2%) and Hardap (9.8%) regions, and among the five leading cancers in other regions.

Non-Hodgkin lymphoma

Non-Hodgkin lymphoma (NHL) ranked third among cancers in Namibian males for the period 2010 to 2014 (231 cases reported, comprising 4.8% of all cancers). The ASR for NHL in males was 6.3 per 100 000, having almost doubled since the previous reporting period. Within age groups, the annual incidence per 100 000 tended to increase with age from 1.5 in males aged 0-4, up to 23.6 in males aged 70-74 years.

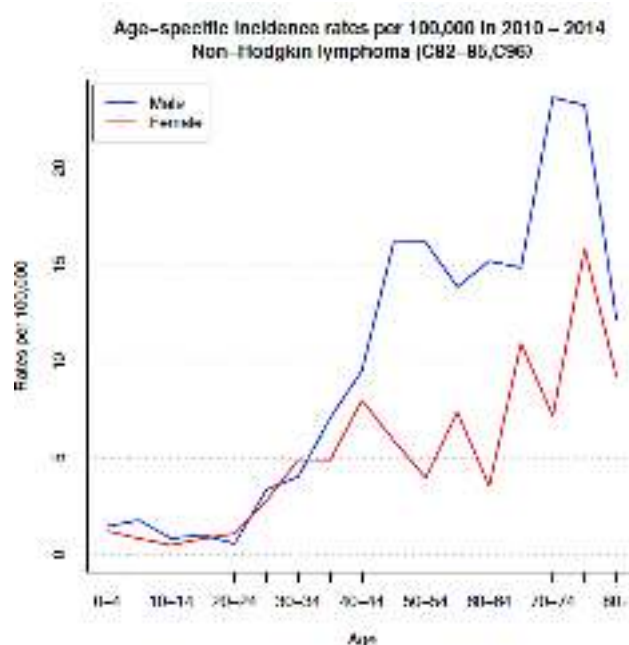


Figure 12: Age-specific Incidence rates per 100 000 in 2010-2014, Non-Hodgkin lymphoma (C82-85, C96)

NHL was among the top five cancers in males of the Caprivi (7.4%), White (6.0), San (5.9%), Herero (5.5%), Kavango (4.8%) and Ovambo (4.8%) ethnic groups.

NHL was the third most common cancer among males living in the Oshikoto (9.0%), Otjozondjupa (8.1%), Omusuti (6.1%) and Caprivi (3.9%) regions and among the top ten cancers in all the other regions except the Ohangwena Region.

Eye cancer

Cancer of the eye was the fourth most common cancer in this reporting period, 2010 to 2014. A total of 241 cases were reported, comprising 5.0% of all male cancers. The ASR for cancer of the eye was 6.3 per 100 000; up from 2.3 in the previous reporting period. The incidence increased with age, from 2.4 per 100 000 in those younger than 5 years, up to 19.3 per 100 000 in those aged 65-69 years.

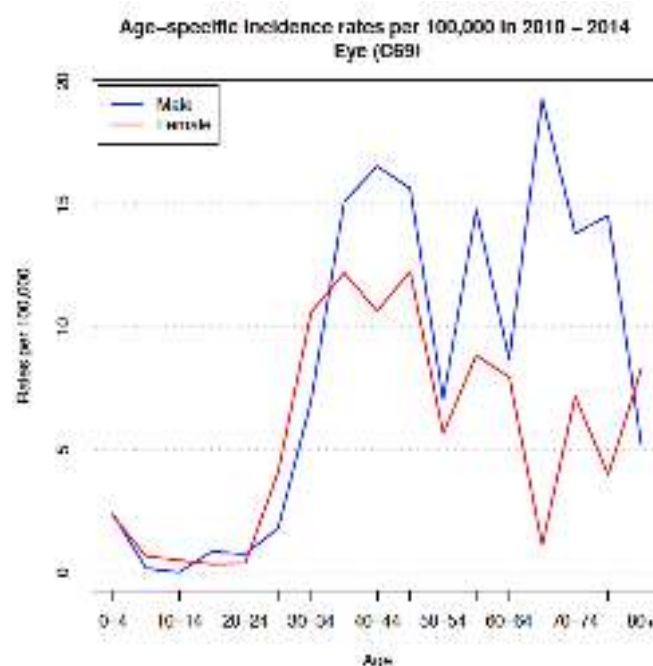


Figure 13: Age-specific Incidence rates per 100 000 in 2010-2014, Eye (C69)

Cancer of the eye was among the five most common cancers among the Damara (7.3%), Ovambo (6.1%), Herero (5.8%) and Baster (5.3%) ethnic groups.

Cancer of the eye was the third most frequent cancer in males living Oshana (8.2%), Khomas (6.7%) and the Kavango (4.3%) regions, and the fifth most common cancer in the Omasuti (4.5%) Region.

Lung/trachea/bronchus cancer

Cancer of the lung/trachea/bronchus was the fifth most common cancer in Namibia in this reporting period. A total of 161 cases were reported, comprising 3.4% of all male cancers. The ASR for cancer of the lung/trachea/bronchus was 5.9 per 100 000, up from 5.1 in the previous reporting period. The incidence increased with increasing age, from 1.9 per 100 000 in those aged 35-39 years, up to 46.0 per 100 000 in those aged 65-69 years.

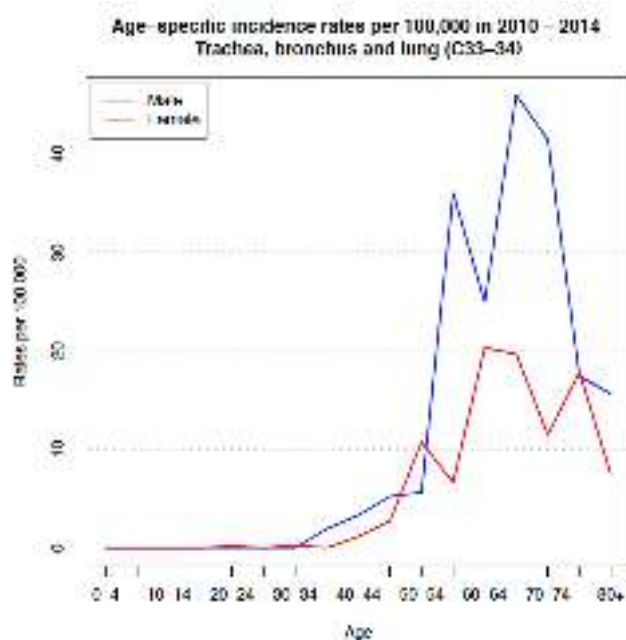


Figure 14: Age-specific Incidence rates per 100 000 in 2010-2014, Trachea, bronchus and lung (C33-34)

Cancer of the lung/trachea/bronchus was the second most frequent cancer in White males (10.6%), and in the top five cancers among Coloured (9.8%), Nama (8.4%) and Baster (6.0%) ethnic groups.

Cancer of the lung/trachea/bronchus was the second most common cancer in Kharas (11.6%) and among the five most common cancers in the Hardap (8.2%), Erongo (7.5%) and Otjozondjupa (6.0%) regions.

Other notable cancers in males

Cancer of the larynx appeared as the sixth most common cancer among males in Namibia with a total of 147 cases reported during the period 2010 to 2014 (3.1% of all male cancers; ASR 5.3 per 100 000). The incidence of laryngeal cancer increased with age and was highest in those aged 75-79 years, with an ASR of 49.4 per 100 000. Although laryngeal cancer ranked as the sixth most common cancer overall among males, it appeared among the five leading cancers among the Nama (7.7%), Damara (7.0%) and Baster (3.9%) ethnic groups.

Colon cancer was the third most common cancer among White males (9.5%) and fifth most common among Coloured males (4.9%). Colon cancer was the seventh most common cancer among male Namibians with a total of 129 cases and an ASR of 4.2 per 100 000.

Liver cancer was the eighth most common cancer among males in Namibia comprising 2.6% of male cancers with an ASR of 4.0 per 100 000. Liver cancer was among the top five cancers among the Kavango (5.3%), Coloured (4.9%) and Ovambo (2.9%) ethnic groups.

Among the Ovambo Kaposi sarcoma, prostate, eye, Non-Hodgkin lymphoma (ASR 3.1) and liver cancers were the five leading cancers in males, accounting for 28.6%, 24.1%, 6.1%, 4.8% and 2.9% of all cancers respectively.

Among White males, cancers of the prostate, lung/trachea/bronchus, colon, Non-Hodgkin lymphoma and melanoma of the skin were ranked the leading cancers, accounting for 19.9%, 10.6%, 9.5%, 6.0% and 5.0% of all male cancers respectively.

Leading cancers among females

The predominant cancer in women was breast cancer (27.3%, ASR 40.2), followed by cancers of the cervix (19.4%, ASR 27.2), Kaposi sarcoma (8.8%, ASR 10.1), eye (4.0%, ASR 4.8), ovary (3.0%, ASR 4.3), colon, Non-Hodgkin lymphoma (2.8%, ASR 3.4), corpus uteri (2.1%, ASR 3.3) and lung / trachea / bronchus (1.8%, ASR 2.9) cancers.³

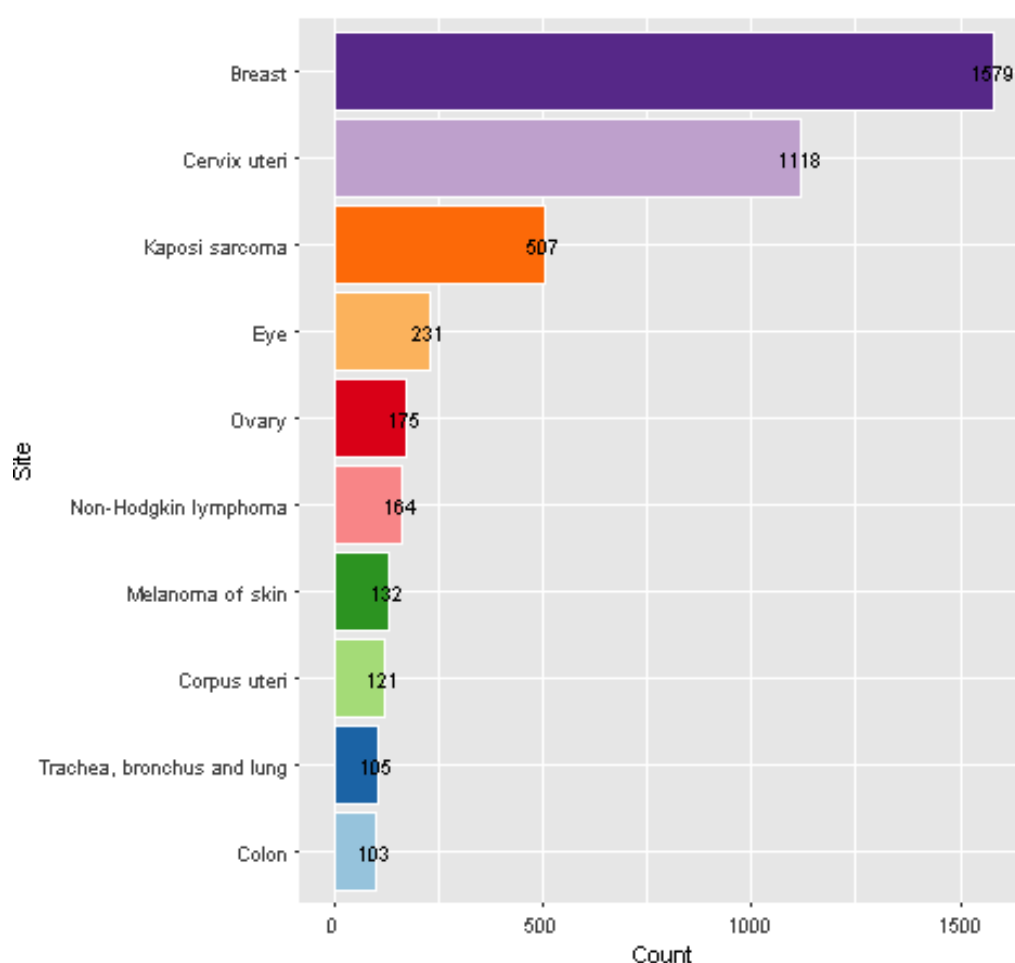


Figure 15: Bar Chart showing Top 10 Cancers in Namibia (2010-2014), excluding C44, Female

³ The ranking of top cancers in the report is based on age standardized rates, while the ranking depicted in the bar chart is on absolute numbers.

Breast cancer

Breast cancer was the most common cancer among Namibian women between 2010 and 2014. A total of 1 579 cases were reported, comprising 27.4% of all female cancers. The ASR for female breast cancer was 40.2 per 100 000; a significant increase from 26.1 in the previous reporting period. The annual incidence increased with increasing age, peaking at 189.1 per 100 000 in women 70-74 years of age.

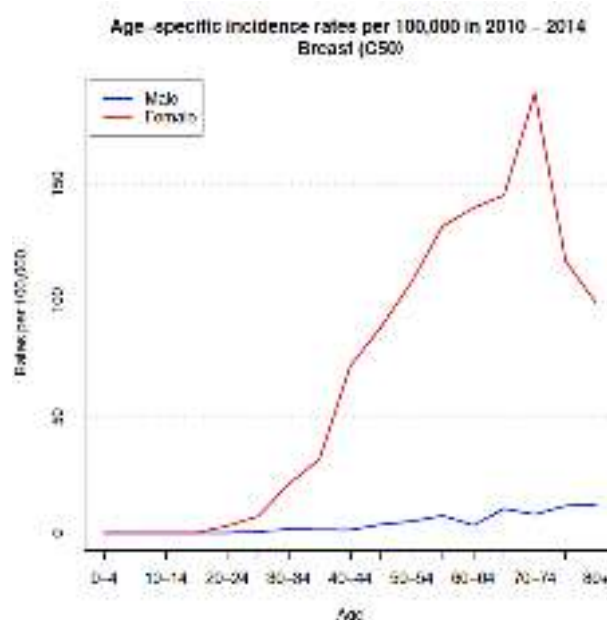


Figure 16: Age-specific Incidence rates per 100 000 in 2010-2014, Breast (C50)

Breast cancer was the most common cancer in most ethnic groups; White (44.7%), Coloured (38.3%), Nama (35.7%), Baster (31.4%), Damara (29.5%), Nama (28.7%), Herero (26.5%), Ovambo (24.5%), Kavango (21.5%), Tswana (17.6%) and Caprivian (11.8%) women.

Breast cancer was the most common cancer in most regions in Namibia, Omaheke (39.0%), Hardap (37.2%), Erongo (35.8%), Otjozondjupa (34.4%), Kharas (32.6%), Khomas (30.2%), Omasuti (25.7%), Oshana (24.9%) and Kavango (22.1%) regions, and the second most common cancer in Oshikoto (24.4%), Kunene (21.4%), Ohangwena (21.0%) and Caprivi (12.7%) regions.

Cervix cancer

Cervical cancer was the second most common cancer among women with 1 118 diagnoses (19.4% of all cancers in females) in the period beginning in 2010 and ending in 2014. The ASR for cervical cancer was 27.2 per 100 000 representing an almost two-fold increase since the previous reporting period when the ASR was 15.6 per 100 000. The annual incidence of cervical cancer increased with increasing age, from 0.2 per 100 000 in women aged 20-24 peaking at 122.8 per 100 000 in women aged 75-79 years.

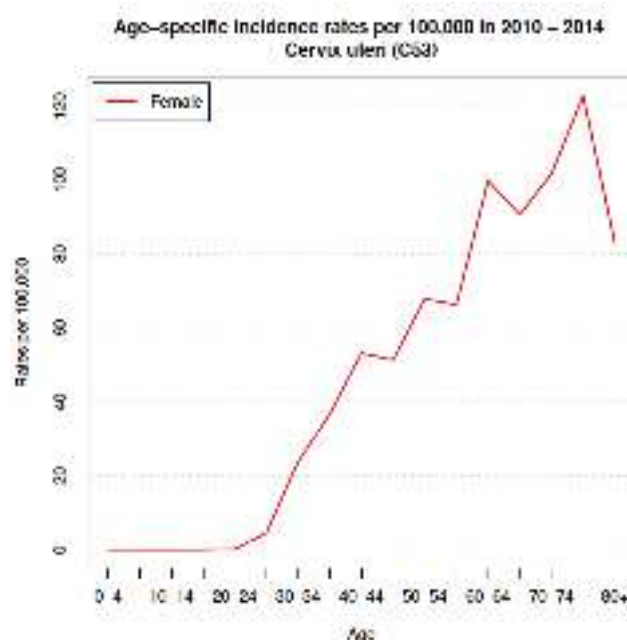


Figure 17: Age-specific Incidence rates per 100 000 in 2010-2014, Cervix uteri (C53)

Cervical cancer was either the leading cancer or in the top three cancers in all ethnic groups, ranging from 4.8% of female cancers in White women to 33.1% among Caprivian women.

Cervical cancer was among the top two cancers in each region comprising between 9.9% of cancers in the Erongo Region and 38.7% of all cancers in the Caprivi Region.

Kaposi sarcoma

Kaposi sarcoma (KS) was the third most common cancer among women in this five-year reporting period. A total of 507 cases were reported, comprising 8.8% of all female cancers. The ASR was 10.1 per 100 000 up from 6.8 per 100 000 in the previous reporting period (2006-2009) and 4.1 in the prior reporting period (2000-2005). Annual incidence according to age showed a bell-shaped curve, increasing with age and peaking at 32.5 per 100 000 women among those who were aged 30 to 34 years and then decreasing in older women.

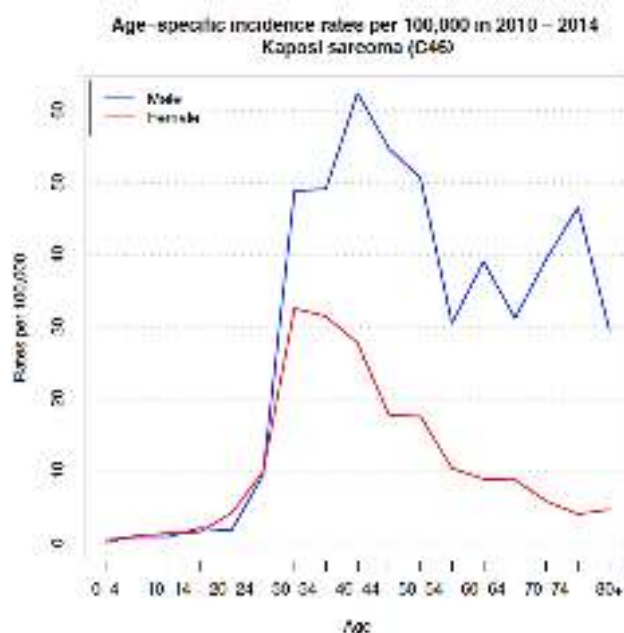


Figure 18: Age-specific Incidence rates per 100 000 in 2010-2014, Kaposi sarcoma (C46)

KS was in the top five most common female cancers in the Tswana (17.6%), Caprivian (13.2%), Ovambo (12.1%), Kavango (10.8%), Herero (5.1%), Baster (4.4%), Damara (3.2%) and Coloured (2.0%) ethnic groups.

It was also among the three most common cancers in all of the regions of Namibia, ranging between 4.5% (Erongo) and 14.5% (Kavango) of all cancers. In the Khomas and Kavango regions it ranked fourth most common cancer among Namibian women.

Eye cancer

Cancer of the eye was the fourth most common cancer among Namibian women during the period under review. A total of 232 cases were reported, comprising 4.0% of all female cancers. The ASR for ovarian cancer was 4.8 per 100 000 compared to an ASR of 1.3 in the previous reporting period. Annual incidence also showed an approximately bell-shaped curve with age, peaking at 12.3 per 100 000 in women aged 45-49 years.

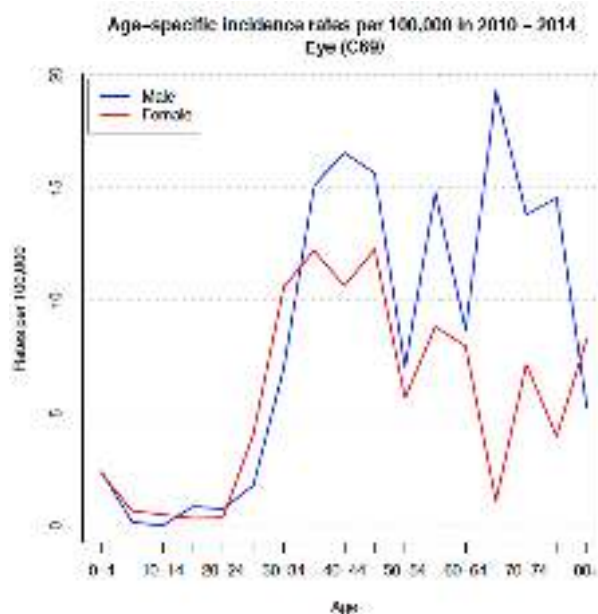


Figure 19: Age-specific Incidence rates per 100 000 in 2010-2014, Eye (C69)

Eye cancer was among the third most common cancer among Herero (5.3%) and Damara (4.5%) women, and fourth most common cancer among Tswana (8.8%) and Ovambo (5.1%) women.

Regionally, eye cancer appeared among the five leading cancers in Oshana (7.6%), Khomas (6.0%), Kunene (5.4%) and White (3.3%) females.

Ovarian cancer

Cancer of the ovary was the fifth most common cancer among Namibian women during the period 2010 to 2014. A total of 175 cases were reported, comprising 3.0% of all female cancers. The ASR for ovarian cancer was 4.3 per 100 000, having increased from an ASR of 2.9 in the previous reporting period. Annual incidence increased with age, peaking at 20.1 per 100 000 in women aged 70-74 years.

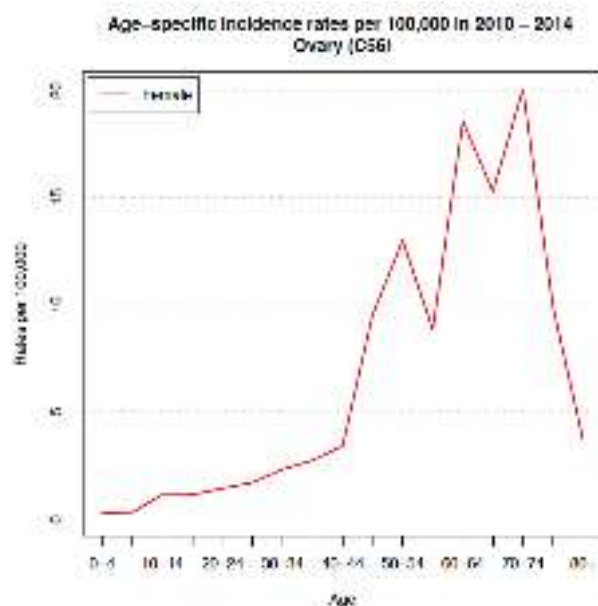


Figure 20: Age-specific Incidence rates per 100 000 in 2010-2014, Ovary (C56)

Ovarian cancer was among the five most common cancers among Herero (5.1%), Coloured (4.8%), Damara (3.6%) and Caprivian (3.2%) women.

Regionally, ovarian cancer appeared among the five leading cancers in Otjozondjupa (6.6%), Kunene (5.4%), Omaheke (4.8%), Karas (4.3%), Erongo (4.1%), Oshana (3.3%) and Oshikoto (2.7%) women.

Other notable cancers in females

Non-Hodgkin lymphoma was the sixth most common cancer among females between 2010 and 2014, comprising 2.8% of all cancers in women, ASR 3.4 per 100 000 – up from 2.3 in 2006-2009, and showed an increasing incidence according to age group. The peak incidence occurred in women aged 75-79 years of age (ASR 15.8 per 100 000).

Corpus uteri cancer was the seventh most common cancer among women overall (2.1% of all cancer in women, ASR 3.3 per 100 000 – up from 2.2 per 100 000 in 2006-2009) and showed an increasing incidence with increasing age, peaking in women aged 65-69 years old (ASR 28.4 per 100 000).

Cancer of the lung/trachea/bronchus was the eighth most common cancer among women accounting for 1.8% of all cancers and ASR of 2.9 per 100 000 women, compared to 2.3 per 100 000 in 2006-2009. Lung cancer was the fourth most common cancer among White and Coloured women accounting for 4.4 and 4.0% of all cancers in these women.

Melanoma of the skin was the fourth most common cancer among Kavango women comprising 5.5% of cancers. Melanoma of the skin was also the fifth most common cancer among White women, comprising 4.4% of all cancers.

Colon cancer was the second most common cancer among White women comprising 5.9% of cancers in this group. Cancer of the mouth was the fifth most common cancer among Ovambo women, comprising 1.3% of cancers.

Childhood cancers

A total of 357 cancer cases were recorded in children (defined as a person below the age of 15) during the five-year period from 2010 to 2014, of which 52.1% were male. Excluding other skin cancers, 353 cases were recorded among children (ages 0-14). The joint most common cancer in male children was kidney cancer and Non-Hodgkin lymphoma (27 cases in each, 14.8% of the total in each), followed by eye cancer (19 cases, 10.4%), brain cancer (16 cases, 8.7%), lymphoid leukemia (15 cases, 8.2%) and Kaposi sarcoma (13 cases, 7.1%).

Among female children there were 24 cases (14.2%) of eye cancer, 18 cases (10.7%) of kidney cancer, 17 cases (10.1%) of Non-Hodgkin lymphoma, 16 cases (9.5%) of brain cancer and 13 cases (7.7%) of Kaposi sarcoma. (These data are not tabulated, but the ASR's are included in Tables 1 and 2 and for each of the years separately in the appendix tables.)

Basis of diagnosis of cancers

The proportion of all cancers that were histologically verified between 2010 and 2014 was 94.8%. When (other skin) was excluded this dropped to 94.5%. This represents a substantial increase compared to the previous reporting period when these proportions were 86.4% and 82.6% respectively.

The cancer most likely to be diagnosed on death certificate only was Kaposi sarcoma: 16.1% in males and 15.4% in females. The most common cancers diagnosed by only clinical means were brain cancer (31.9% in males and 22.1% in females), pancreatic cancer (17.9% in males and 23.1% in females) and lung/trachea/bronchus cancers (21.1% in males and 16.2% in females). The data for basis of diagnosis are shown in Tables 7 and 8). Also see appendix for data quality indicators.

DISCUSSION

Limitations

The annual number of cancer cases reported between 2010 and 2014 appears to have stabilised between 1 900 and 2 600 cases. While this still shows substantial variability, there is less variability than in the previous reporting period when the annual number of cases varied between 1 100 and 2 800. This suggests that vigilance in standardising cancer registration procedures are paying dividends and the data reported here for 2010 to 2014 more likely reflect the true annual burden of cancer in Namibia. Stability in reported numbers and estimated ASRs is imperative for clear interpretation of cancer trends over time.

Increasing burden of cancer in Namibia

The significant increase in the overall incidence of cancer (excluding non-melanoma skin cancers) in both males and females in Namibia from 100.7 per 100 000 to 144.2 per 100 000 in males, and from 90.2 per 100 000 to 138.7 per 100 000 in females from the previous reporting period needs to be explored carefully. It is likely that the NNCR is now better collating all the cancer data in the country having been running the registry since 1995.

The tripling in the rate of eye cancer in females and a doubling of the rate of prostate, Non-Hodgkin lymphoma and eye cancer in males, and breast and cervical cancer and Kaposi sarcoma in females is a major concern.

Cancers associated with Human Immunodeficiency Virus infection

The prevalence of Human Immunodeficiency Virus (HIV) among pregnant women in Namibia reached its peak of approximately 22.0% in 2002 and has since appeared to steadily decline to 17.8% in 2008 and 16.9% in 2015 (Ministry of Health and Social Services Surveillance Report of the 2012 National HIV Sentinel Survey, Republic of Namibia, November 2014). The occurrence of HIV associated cancers has, as in many other high HIV prevalence African countries, increased over time. Declining incidence of HIV associated cancers is likely to lag behind declining HIV prevalence and incidence estimates, and the impact of improving access to HIV treatment on cancer patterns is yet to be noted in Namibia. Kaposi sarcoma dropped from most common to the second most common cancer among males and remained the third most common in females in 2010 to 2014 compared to 2006-2009. Kaposi sarcoma, as a proportion of all cancers, has shown small decreases in both sexes in the most recent reporting period, but in both cases the ASR has increased. Non-Hodgkin lymphoma was the fifth most common cancer in males and the sixth most common in females in 2006 to 2009, and in 2010 to 2014 was the third most common cancer in males and remained the sixth most common cancer in females, but the proportion of all cancers and the ASR that NHL represents has increased. Eye cancer increased its ranking and is now the fourth most common cancer among males and females in Namibia. The proportion of HIV associated cancers has unsurprisingly shown a trend of increase over time.

The appearance of cancers with an infectious aetiology, such as KS, NHL and eye cancers among the leading cancer sites, is undoubtedly linked to the HIV/AIDS epidemic. Since the advent of HIV, KS has become the leading cancer in men, and the second leading cancer in women in Zimbabwe and most central and east African countries. Those aged 15 to 44 (the most sexually active age group) are most affected. The human herpes virus 8 (HHV-8) / Kaposi sarcoma associated herpes virus (KSHV), is the necessary causal agent in the development of KS. The relationship between HIV and HHV8 in causing Kaposi sarcoma has now been well described. Other known risk factors for KS include increasing age and male sex.

The current incidence rates for KS in Namibia are still likely to be an underestimation of the true rates. Firstly, biopsies are usually only performed for patients with a single lesion or very early lesions, or if the doctor is inexperienced in recognising KS. Many KS patients are already so ill that they are treated supportively and no biopsies are performed. In addition, patients from peripheral areas with advanced illness are treated supportively and are unlikely to be referred to the sentinel areas. The registry would therefore not record these cases. It should however be noted that the histological verification of KS has increased substantially from below 40% in the previous reporting period to approximately 84% in the current reporting period, with concomitant declines in clinical diagnosis from approximately 60% to less than 1% in 2010-2014.

If the HIV epidemic progresses in Namibia as it has in other African countries, then the incidence of KS will increase dramatically in coming years. Other cancers that are likely to increase because of HIV immunosuppression include non-Hodgkin lymphoma and, possibly, conjunctival (eye) cancers (Newton et al. 2002). It is unclear whether cervical cancer and other female genital cancers, which also have a viral aetiology, will increase in incidence as a result of HIV. However, an HIV prevention program, if effectively implemented, should ultimately reduce the incidence of HIV-related cancers in men, women and children (International Collaborative Group on HIV and Cancer, 2000). Effective rollout of antiretroviral treatment for HIV will also likely reduce the incidence of HIV-associated cancers. The surveillance of cancer patterns in Namibia, particularly within different regions and ethnic groups, would form an essential part of such a program.

Prostate cancer

Prostate cancer has replaced Kaposi sarcoma as the most common cancer among males overall in the period 2010 to 2014, and the incidence has increased from 23.5 per 100 000 in the previous reporting period (2005-2009) to 37.6 per 100 000 in 2010 - 2014. Prostate cancer was among the five most frequent cancers in almost all ethnic groups and regions examined. Prostate cancer is one of the leading cancers in men worldwide. Incidence rates vary from 1 to 100 per 100 000 in different areas of the world, suggesting that regional factors play a role in its aetiology. Risk factors for prostate cancer include a diet high in fat and low in vegetables. There is suspicion that infections may play a role, but the agent(s) responsible have not been identified. In many western countries, the incidence of prostate cancer is increasing, possibly due to the increasing use of prostate specific antigen (PSA) as a screening tool. Further investigation is warranted to explore reasons for the recent increase in incidence of prostate cancer, and to determine risk factors for prostate cancer specific to Namibia.

Tobacco and alcohol related cancers

Cancers of the oral cavity, larynx and oesophagus were among the leading cancers in Namibian males and females. Internationally, tobacco smoking and alcohol consumption are the main risk factors for these cancers, with the two factors combined having a multiplicative effect on risk. Lung cancer was also among the five leading cancers in certain ethnic groups (Coloured, Baster and Nama). The main cause of lung cancer is tobacco smoking, for which there is a clear dose-response effect, related to both duration of smoking and amount smoked.

Tobacco is a risk factor for cancer both in its smoked and chewed form, and in the form of oral snuff. Chewing the areca (betel) nut is a dominant risk factor for oral cancer in certain communities worldwide, including in Southern Africa. Pipe-smoking is a risk factor for lip cancers. It is essential to monitor amounts and types of alcohol and tobacco consumption by Namibians with particular cancers, so that risk factors specific to this population can be determined, and preventative programs instituted.

Oral cancers and oesophageal cancer tended to decline during the period covered by this report. The declines may be due to as yet undefined changes in alcohol use or smoking habits. The male to female ratios for tobacco and alcohol related cancers in Namibia were 5.3, 3.0, 3.0 and 2.0 for cancers of the larynx, oesophagus, tongue and lung respectively. These ratios may reflect different patterns of tobacco and alcohol use among males and females, however further study is required to clarify the risk factors.

Additional risk factors exist for these cancers in different ethnic / regional groups, e.g. exposure to fungal toxins (oesophageal cancer), domestic and industrial pollution (larynx and lung) and ultra-violet radiation (lip). The relative importance of different risk factors for alcohol and tobacco related cancers needs to be determined for each population group in Namibia. Given the prominence of cancers of the upper aero digestive tract among certain ethnic groups, it would be important to investigate the existence of unusual risk factors for these cancers among Namibians.

Female-specific cancers

Breast cancer and cervical cancer were the two most common cancers among women in all ethnic and regional groups in Namibia. The ASR of both these cancers increased significantly in this reporting period relative to 2006 - 2009.

Risk factors for female breast cancer include early menarche, late age at first childbirth, a high-fat diet and certain genetic mutations, including BRCA1/2. Other possible risk factors include high alcohol consumption and the use of certain post-menopausal hormone replacement therapies. Public health campaigns that encourage women to present early to hospital for a breast exam could reduce mortality from this disease.

Risk factors for cervical cancer include infection with certain types of human papillomaviruses (HPV), early initiation of sexual intercourse, a history of multiple sexual partners (or a partner with multiple sexual partners), a history of sexually transmitted infections, cigarette smoking and long-term use of oral contraception. Lower socio-economic status has been associated with a higher risk of developing cervical cancer, possibly due to lack of access to good health care and Papanicolaou ('Pap-smear') tests. Although only a small proportion of women infected with HPV develop cervical cancer, recent studies have shown that women who have used hormonal contraceptives on a long-term basis (more than five years) are more likely to develop cancer of the cervix than those with less contraceptive use. HPV vaccination and annual cervical cancer screening programs have been demonstrated to reduce the incidence of this cancer, and it is recommended that such a program be implemented in Namibia on a national level by the Ministry of Health and Social Services. Cervical cancer rates among all race groups should be closely monitored as the HIV epidemic progresses. Furthermore, rollout of the HPV vaccine is likely to lead to significant reductions in cervical cancer.

Ovarian cancer was the fifth most common cancer among Namibian women. Risk factors for ovarian cancer include certain genetic mutations (BRCA1/2), delayed age at first pregnancy, lower parity, and a high-fat diet. Current users of oral contraceptives appear to be protected, although post-menopausal women who are on long-term hormone replacement therapy may be at increased risk. No cost-effective screening methods are currently available. As with the other cancers discussed, it would be important to obtain detailed information on these patterns of use that are specific to subgroups within Namibia that are associated with these female cancers.

Colon cancer

Colon cancer was the seventh most common cancer among Namibian men, and the tenth most common cancer among women. Risk factors for colorectal cancer include high-fat/low-fibre diets, inflammatory bowel disease, and a family history of colon cancer (particularly among first-degree relatives). High dietary folate has been shown to be protective. Rates of colorectal cancer are higher in western countries than in developing countries.

Basal and squamous cell skin cancers

For the purposes of this report, basal and squamous cell carcinomas of the skin (BCC and SCC; categorised as 'other skin') were excluded from rate calculations for 'all cancers', as well as frequency rankings of cancers. This is standard practice in cancer registry reports, thus this format allows international comparisons to be made. These lesions are often treated at outpatient facilities or doctors' rooms without histological confirmation, and rates are therefore underestimated. Despite these limitations, these non-melanoma skin cancers were the third most common cancer overall among males (27.1%, ASR 9.6 per 100 000) and the fourth most common among females (6.1%, ASR 7.6) in Namibia, a dramatic decrease in both sexes compared to the previous reporting period (2006-2009). Risk factors for these cancers include fair skin, albinism, and short, intense sun exposure. These cancers are therefore, as anticipated, most common among Whites. Given the high incidence and known risk factors, it is important to highlight these cancers in preventative and educational public health programs.

Cancers among children

It is uncertain whether the data used for this report were complete with respect to childhood cancers, despite the large increases noted compared to the previous reporting period. In addition to typical childhood cancers such as kidney cancer and eye cancer, HIV associated cancers such as eye, Non Hodgkin lymphoma and Kaposi sarcoma were among the top six cancers in both males and females aged less than 15 years. These together accounted for 32.3% and 32.0% of cancers among males and female children respectively.

RECOMMENDATIONS

This report has highlighted the leading cancers in Namibian males and females overall, and examined cancer frequencies in the different ethnic groups and geographic regions.

Calculation of incidence rates by gender, population group, ethnic group and region is important, as disease patterns differ due to differences in susceptibilities and exposures in different groups (e.g. genetic susceptibilities, socio-economic status, diet, alcohol and tobacco use). In addition, differences between groups help to identify inequalities in service delivery or utilisation. However, for this report, it was only possible to calculate incidence rates for the whole of Namibia (males and females), as population size estimates by 5-year age groups were not available for the different ethnic groups, or for regions.

The annual number of cases of cancer reported to the NNCR requires careful monitoring to examine peaks and troughs and to ensure that good quality cancer statistics can be provided and trends in cancer incidence be meaningfully interpreted.

Since these data are required for the development of cancer control program and advocacy, and to improve the cancer statistics for Namibia, it is recommended that cancer be made a reportable condition.

It is furthermore recommended that this report be used to guide the investigation of risk factors for the leading cancers in Namibia since key risk factor data is available on the NNCR database.

Accurate collection of regional data

During the analysis of the data it became apparent, as it had in the previous report, that cancer occurrence appeared to be much higher in Khomas than in other regions. It was ascertained that, if no address was stated on the histology report, the address was taken to be Windhoek, and coded as Khomas Region because of the treatment centre being in this city. We strongly recommend that in the future, missing data be recorded as such, and that efforts are made to accurately record region of residence. This would most likely be better achievable when cancer is made a reportable disease and full case data can be obtained.

If this is done and population denominators become available in 5-year age groups by sex, incidence rates can be calculated accurately for regions. Collecting such data correctly will in future highlight regional differences in cancers, which will help in determining risk factors and inform prevention program.

Provision of population statistics by ethnic group

Examining cancer incidence by ethnic group is extremely important in cancer epidemiology, as different ethnic groups have different genetic susceptibilities to cancer, and are exposed to different environmental and behavioural risk factors. They therefore display different cancer patterns, which require public health interventions tailored to specific ethnic groups.

Patterns such as these can only be accurately determined if age standardised incidence rates are calculated; however estimates of the numbers of people in each grouping are required for such calculations. It is therefore strongly recommended that such figures be obtained for future cancer registry reports and that the NNCR advocate the Namibian Central Bureau of Statistics to collect and provide these data in the next census. A minimal requirement would be population estimates for 'white', 'black' and 'mixed' ethnic groupings.

CONCLUSION

The NNCR has been successful in producing a data set that indicates the overall occurrence of cancer in Namibia. This data has highlighted the increasing burden of cancer in Namibia as well as the leading cancers, which should form a basis for research into risk factors for cancer specific to the Namibian population. Refinement of the data collection process and access to more detailed population statistics will hopefully allow more detailed reports to be produced in the future. Nevertheless, the current report indicates that the NNCR is an essential resource and an asset to the public health system.

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The following summary measures have been used in tables:

- *Site* – a shortened version of the full ICD-10 title describes each site or site grouping
- *All ages* – the total number of cases by site and for all sites
- *Age unk* – the number of cases of unknown age by site
- *0-, 5-, 10-...* – the age groups for which incidence data is presented
- *Crude rate* – the crude average annual incidence rate, based on the total number of registrations by site
- *%* - The proportional frequency of each site to the total of all sites excluding ICD10 C44 (Other skin)
- *CUM 0-64* – the sum over each year of age of the age-specific incidence rates, taken from birth to age 64
- *CUM 0-74* – the sum over each year of age of the age-specific incidence rates, taken from birth to age 74
- *ASR(W)* – the world age-standardized incidence rate by site
- *ICD(10th)* – the ICD-10 code(s) corresponding to the site or group of sites given in the left hand column

Table 1: NAMBIA (2010-2014) Annual incidence per 100 000 by age group - Male

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Table 2: NAMIBIA (2010-2014) Annual incidence per 100 000 by age group – Female

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Table 5: NAMIBIA (2010-2014) Cancer frequencies by region – Males

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Table 6: NAMIBIA (2010-2014) Cancer frequencies by region – Females

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Table 7: NAMIBIA (2010-2014) Basis of diagnosis of cancers – Males

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Table 8: NAMIBIA (2010-2014) Basis of diagnosis of cancers – Females

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Incidence per 100,000 by age group (Period) - Period

Table 10.10.11 Nov 12 (25M - 9345) 2064 by Cms (kg)

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Incidence per 100,000 by age group (Period - Male)

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Incidence per 100,000 by age-group (Period) - Farm

Entity	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000
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Habitat use, population, and reproduction

Table 1. *Mean and SD for PAKS and MTHFR Genotypes*

Central Cancer Registry, NAMIBIA (2014)

2014 Population (Female)

Incidence per 100,000 by age group (Period) - Data

STTP	ALL AGES AGES 0-14	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80+	CRUDE Rate	C.M. (95% CI)	ASR (95% CI)			
Lip	1	-	-	-	-	2.4	-	-	1.8	-	-	2.6	10.8	27.7	25.1	7.4	29.4	14.3	54.7	0.1	1.1	0.08	0.4	2.0
Larynx	11	-	-	-	-	-	-	-	-	-	-	2.6	10.8	27.7	25.1	7.4	29.4	14.3	54.7	1.3	1.1	0.08	0.4	2.0
Nasopharynx	1	-	-	-	-	-	2.2	-	-	15.6	10.2	4.6	27.1	14.5	29.6	-	-	-	7.5	2.3	1.1	0.2	0.1	0.1
Salivary glands	11	-	-	1.8	1.9	-	2.9	-	-	1.6	8.3	-	-	-	-	-	-	-	17.5	1.1	1.1	0.2	0.1	0.1
Total	2	-	-	-	-	0.8	-	-	-	-	-	5.2	4.6	5.4	-	9.0	-	-	-	0.2	0.8	0.07	0.1	0.1
Oropharynx	2	-	-	-	-	-	-	-	-	-	-	5.2	4.6	5.4	-	9.0	-	-	-	0.2	0.8	0.07	0.1	0.1
Nasopharynx	1	-	-	-	3.5	-	3.9	-	-	1.6	-	-	-	-	-	-	-	-	3.7	0.6	1.6	0.27	0.07	0.1
Pharynx (unspecified)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.6	0.27	0.07	0.1
Pharynx (unspecified)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.6	0.27	0.07	0.1
Oesophagus	11	-	-	-	-	-	-	-	-	-	-	3.2	1.4	3.2	3.2	1.3	9.6	-	41.5	1.0	1.1	0.1	0.1	0.1
Gastric	16	-	-	-	-	-	2.2	1.3	1.6	-	-	2.5	3.1	15.5	1.4	7.4	9.6	14.3	12.8	1.7	1.1	0.1	0.1	0.1
Small intestine	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.1	0.09	0.04	0.1
Colon	21	-	-	-	-	-	4.1	1.2	1.6	-	-	13.4	17.8	18.5	10.8	14.5	9.0	9.1	17.3	2.6	2.3	0.21	0.42	0.3
Rectum	12	-	-	-	-	-	3.9	2.2	1.2	1.6	-	7.5	7.1	4.6	10.8	7.4	-	14.5	-	1.4	1.4	0.18	0.22	0.1
Anus	6	-	-	-	-	-	-	-	-	-	-	2.6	1.1	-	-	-	-	-	-	0.6	1.6	0.27	0.07	0.1
Cervix	11	-	-	-	-	-	4.1	-	-	-	-	2.1	2.9	14.1	9.2	-	28.7	9.0	14.5	1.6	1.6	0.27	0.07	0.1
Cervix (unspecified)	11	-	-	-	-	-	4.1	-	-	-	-	2.1	2.9	14.1	9.2	-	28.7	9.0	14.5	1.6	1.6	0.27	0.07	0.1
Bladder	2	-	-	-	-	-	-	-	-	-	-	2.2	3.6	5.4	11.3	-	-	-	-	0.2	0.8	0.07	0.1	0.1
Prostate	1	-	-	-	-	1.5	1.1	-	-	-	-	3.2	3.6	5.4	11.3	-	-	-	-	0.2	0.8	0.07	0.1	0.1
Uterus	36	-	-	-	-	-	-	-	-	-	-	3.2	10.1	18.1	21.1	7.4	9.6	29.6	4.5	2.7	1.4	0.1	0.1	0.1
Vagina	40	-	-	-	-	-	-	-	-	2.1	-	3.2	3.2	41.3	30.0	61.8	58.3	28.7	44.5	2.8	3.3	0.32	1.17	0.77
Ovaries (unspecified)	2	-	-	-	-	-	-	-	1.6	-	-	2.5	-	-	-	-	-	-	-	0.2	1.1	0.1	0.09	0.1
Testis	10	-	-	-	3.9	5.2	5.8	1.1	1.3	-	-	3.1	-	-	-	7.4	9.6	-	26.0	1.5	1.8	0.17	0.22	0.1
Malanoma of skin	16	-	-	-	-	-	-	-	-	-	-	3.2	4.1	2.6	2.5	4.6	7.4	9.6	23.1	1.2	1.1	0.12	0.21	0.1
Other skin	32	-	-	2.7	-	3.7	2.2	12.7	6.0	2.3	5.2	26.7	3.2	27.7	25.3	126.1	155.3	121.2	91.2	3.3	3.3	0.30	1.25	0.77
Melanoma	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Basal cell carcinoma	126	-	0.7	-	-	4.2	3.9	12	32.9	8	4.7	2.1	23.1	9.2	23.5	49.8	22.2	79.2	79.0	2.2	2.2	0.21	0.28	0.1
Carcinoma of unknown origin	27	-	0.7	2.4	-	1.3	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	2.2	2.2	0.21	0.28	0.1
Brain	12	-	-	-	-	-	-	-	-	-	-	2.1	3.2	-	-	9.2	-	14.5	15.1	1.2	1.2	0.1	0.1	0.1
Stomach	10	-	-	-	-	-	-	-	-	-	-	4.1	5.2	7.4	-	-	-	-	-	1.0	1.8	0.22	0.09	0.1
Intestine	246	-	-	-	-	-	-	-	-	-	-	2.5	31.8	15.1	12.3	34.5	44.5	152.8	50.7	2.5	2.5	0.24	0.31	0.1
Testis	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	1.1	0.1	0.09	0.1
Ovaries (unspecified)	1	-	0.7	-	-	-	-	-	-	-	-	4.1	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Spine	36	-	4.6	2.4	-	2.9	-	-	1.3	-	-	10.3	2.6	3.2	9.2	-	14.5	9.6	-	2.7	1.4	0.1	0.1	0.1
Brain (unspecified)	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Uterus	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Bladder	20	-	-	-	-	-	-	-	-	2.2	2.2	5.2	24.2	9.2	20.3	22.2	29.6	14.5	-	1.9	1.8	0.22	0.45	0.1
Other urinary organs	1	-	-	-	-	-	-	-	-	-	-	2.5	-	-	-	-	-	-	-	0.1	1.1	0.09	0.04	0.1
Eye	6	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.1	0.09	0.04	0.1
Acute myeloid leukaemia	14	-	0.8	2.7	0.8	-	-	1.1	2.7	3.0	6.2	7.8	-	-	-	-	-	-	-	1.7	1.7	0.17	0.17	0.1
Chronic myeloid leukaemia	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Acute lymphoid leukaemia	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Chronic lymphoid leukaemia	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Myeloid leukaemia	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Non-Hodgkin lymphoma	6	-	1.8	3.3	0.8	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.6	0.27	0.07	0.1
Hodgkin lymphoma	39	-	2.6	4.2	3.5	2.4	2.9	5.7	8.4	9.8	6.2	13.0	7.8	9.2	32.2	37.1	20.4	14.5	24.0	6.6	6.8	0.69	0.97	0.6
Unspecified lymphoma	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	1.2	0.21	0.09	0.1
Lymphoid leukaemia	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.1	0.09	0.04	0.1
Myeloid leukaemia	12	-	0.7	1.8	-	1.3	-	-	-	-	-	6.2	2.6	3.5	4.6	16.7	7.4	-	-	1.5	1.5	0.15	0.24	0.1
Chronic myeloid leukaemia	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.1	0.09	0.04	0.1
Acute myeloid leukaemia	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.1	0.09	0.04	0.1
Myeloid leukaemia (unspecified)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	1.2	0.21	0.09	0.1
Other unspecified	57	-	0.7	-	3.3	0.8	-	-	2.7	3.2	6.2	7.8	30.4	26.9	21.7	5.8	46.1	71.7	31.7	5.1	5.1	0.51	0.99	0.6
All sites	1197	-	12.6	12.3	8.1	21.8	19.7	40.5	37.3	53.1	38.0	159.4	78.4	49.8	47.8	82.5	102.4	142.9	123.6	11.8	9.8	0.93	1.74	1.1
All sites (CI)	1197	-	12.6	12.3	8.1	21.8	19.7	40.5	37.3	53.1	38.0	159.4	78.4	49.8	47.8	82.5	102.4	142.9	123.6	11.8	9.8	0.93	1.74	1.1

Reference population: World Standard Population

Crude rate: Age-standardized rate (ASR)

Central Cancer Registry, NAMIBIA (2014)

2014 Population (Male)

Incidence per 100,000 by age group (Period) - Female

STTP	ALL AGES AGES 0-14	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80+	CRUDE Rate	C.M. (95% CI)	ASR (95% CI)			
Lip	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Larynx	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Nasopharynx	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Salivary glands	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Total	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Oropharynx	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Nasopharynx	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Pharynx (unspecified)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Oesophagus	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Gastric	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Small intestine	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Colon	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Rectum	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Total	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Proctitis	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal canal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal sphincter	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.1	0.0	0.02	0.1	0.1
Anal	1																							

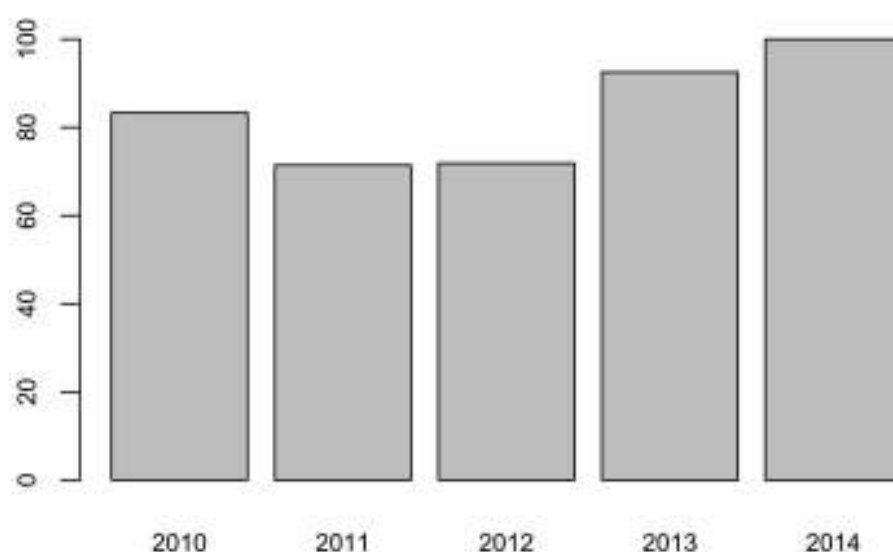
Central Cancer Registry, NAMIBIA (2010-2014)

CI5 Editorial Table 1
Number of cases in major diagnosis groups in single calendar years of observation

MALES					
SITE	2010	2011	2012	2013	2014
Lip, oral cavity and pharynx (C00-14)	70 (7.1)	50 (5.8)	62 (7.3)	66 (6.4)	87 (8.2)
Digestive organs (C15-26)	128 (13)	100 (11.7)	94 (11.1)	132 (12.8)	121 (11.4)
Respiratory organs (C30-39)	91 (9.2)	50 (5.8)	57 (6.7)	62 (6)	76 (7.1)
Bone, cartilage, melanoma (C40-43)	30 (3)	28 (3.3)	23 (2.7)	44 (4.3)	35 (3.3)
Male genital (C60-63)	247 (25.1)	231 (27)	205 (24.1)	250 (24.2)	286 (26.9)
Urinary organs (C64-68)	24 (2.4)	25 (2.9)	31 (3.6)	36 (3.5)	44 (4.1)
Eye, brain, thyroid etc. (C69-75)	91 (9.2)	64 (7.5)	60 (7.1)	73 (7.1)	51 (4.8)
Haematopoietic (C81-96)	59 (6)	49 (5.7)	71 (8.4)	108 (10.5)	109 (10.3)
Other and unspecified (O&U)	227 (23.1)	242 (28.3)	238 (28)	253 (24.5)	241 (22.7)
All sites but C44 (ALLbC44)	984 (100)	855 (100)	850 (100)	1031 (100)	1063 (100)
FEMALES					
SITE	2010	2011	2012	2013	2014
Lip, oral cavity and pharynx (C00-14)	50 (4.5)	30 (3.2)	34 (3.5)	44 (3.4)	50 (3.5)
Digestive organs (C15-26)	99 (8.9)	68 (7.2)	68 (7.1)	111 (8.5)	105 (7.2)
Respiratory organs (C30-39)	42 (3.8)	24 (2.5)	27 (2.8)	32 (2.5)	32 (2.2)
Bone, cartilage, melanoma (C40-43)	39 (3.5)	38 (4)	32 (3.3)	39 (3)	48 (3.3)
Breast (C50)	292 (26.2)	265 (28)	274 (28.5)	302 (23.2)	445 (30.7)
Female genital (C51-58)	296 (26.6)	230 (24.3)	230 (24)	389 (29.9)	410 (28.3)
Urinary organs (C64-68)	24 (2.2)	18 (1.9)	27 (2.8)	35 (2.7)	34 (2.3)
Eye, brain, thyroid etc. (C69-75)	64 (5.7)	71 (7.5)	85 (8.9)	77 (5.9)	75 (5.2)
Haematopoietic (C81-96)	43 (3.9)	50 (5.3)	54 (5.6)	81 (6.2)	85 (5.9)
Other and unspecified (O&U)	165 (14.8)	151 (16)	129 (13.4)	189 (14.5)	165 (11.4)
All sites but C44 (ALLbC44)	1114 (100)	945 (100)	960 (100)	1299 (100)	1449 (100)
BOTH SEXES					

SITE	2010	2011	2012	2013	2014
Lip, oral cavity and pharynx (C00-14)	120 (5.7)	80 (4.4)	96 (5.3)	110 (4.7)	137 (5.4)
Digestive organs (C15-26)	227 (10.8)	168 (9.3)	162 (9)	243 (10.4)	226 (9)
Respiratory organs (C30-39)	133 (6.3)	74 (4.1)	84 (4.6)	94 (4)	108 (4.3)
Bone, cartilage, melanoma (C40-43)	69 (3.3)	66 (3.7)	55 (3)	83 (3.6)	83 (3.3)
Breast (C50)	309 (14.7)	281 (15.6)	283 (15.6)	309 (13.3)	458 (18.2)
Female genital (C51-58)	296 (14.1)	230 (12.8)	230 (12.7)	389 (16.7)	412 (16.4)
Male genital (C60-63)	247 (11.8)	231 (12.8)	205 (11.3)	250 (10.7)	286 (11.4)
Urinary organs (C64-68)	48 (2.3)	43 (2.4)	58 (3.2)	71 (3)	78 (3.1)
Eye, brain, thyroid etc. (C69-75)	155 (7.4)	135 (7.5)	145 (8)	150 (6.4)	126 (5)
Haematopoietic (C81-96)	102 (4.9)	99 (5.5)	125 (6.9)	189 (8.1)	195 (7.7)
Other and unspecified (O&U)	392 (18.7)	393 (21.8)	367 (20.3)	442 (19)	410 (16.3)
All sites but C44 (ALLbC44)	2098 (100)	1800 (100)	1810 (100)	2330 (100)	2519 (100)

**ALL SITES BUT SKIN
(BOTH SEXES)**



Central Cancer Registry, NAMIBIA (2010-2014)

C15 Editorial Table 2

ASR in major diagnosis groups in single calendar years of observation

MALES

SITE	2010	2011	2012	2013	2014
Lip, oral cavity and pharynx (C00-14)	11.9 (7.8)	8 (6.3)	10.25 (7.9)	10.87 (7.2)	14.05 (8.8)
	22.18	15.95	15.79	21.33	19.72

Digestive organs (C15-26)	(14.4)	(12.6)	(12.2)	(14.1)	(12.3)
Respiratory organs (C30-39)	16.4 (10.7)	8.57 (6.8)	10.37 (8)	11.22 (7.4)	13.52 (8.5)
Bone, cartilage, melanoma (C40-43)	3.83 (2.5)	4.12 (3.3)	3.05 (2.4)	6.05 (4)	4.44 (2.8)
Male genital (C60-63)	41.25 (26.9)	38.22 (30.2)	35.03 (27.1)	39.42 (26.1)	46.1 (28.9)
Urinary organs (C64-68)	3.78 (2.5)	3.96 (3.1)	4.56 (3.5)	6.18 (4.1)	6.34 (4)
Eye, brain, thyroid etc. (C69-75)	11.99 (7.8)	8.02 (6.3)	7.81 (6.1)	8.99 (5.9)	6.68 (4.2)
Haematopoietic (C81-96)	8.86 (5.8)	6.73 (5.3)	9.51 (7.4)	13.56 (9)	14.18 (8.9)
Other and unspecified (O&U)	30.67 (20)	30.94 (24.4)	31.29 (24.2)	32.41 (21.4)	32.68 (20.5)
All sites but C44 (AII.bC44)	153.52 (100)	126.75 (100)	129.07 (100)	151.11 (100)	159.69 (100)

FEMALES

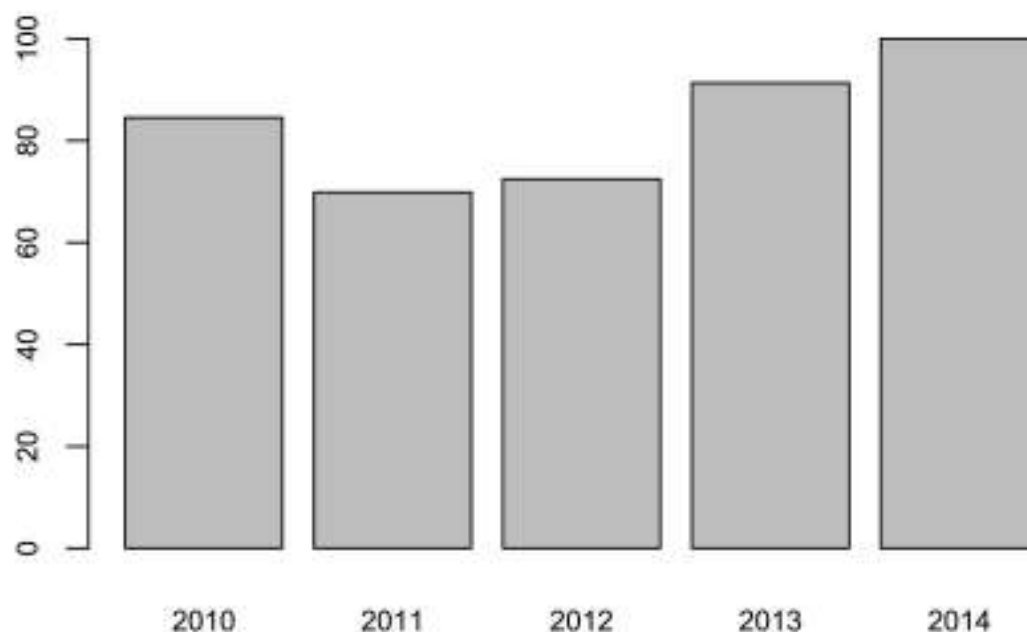
SITE	2010	2011	2012	2013	2014
Lip, oral cavity and pharynx (C00-14)	6.18 (4.6)	3.87 (3.5)	4.7 (4)	5.68 (3.6)	6.43 (3.7)
Digestive organs (C15-26)	12.88 (9.6)	8.46 (7.6)	8.43 (7.2)	13.58 (8.7)	13.75 (7.8)
Respiratory organs (C30-39)	6.05 (4.5)	3.12 (2.8)	3.58 (3.1)	4.47 (2.9)	4.48 (2.5)
Bone, cartilage, melanoma (C40-43)	4.21 (3.1)	4.04 (3.6)	3.38 (2.9)	4.6 (3)	5.55 (3.2)
Breast (C50)	37.43 (28)	33.29 (30)	35.43 (30.4)	38.66 (24.8)	55.85 (31.7)
Female genital (C51-58)	35.6 (26.6)	27.79 (25.1)	29.37 (25.2)	47.28 (30.3)	51.06 (29)
Urinary organs (C64-68)	3.02 (2.3)	1.8 (1.6)	2.97 (2.5)	4.37 (2.8)	4.42 (2.5)
Eye, brain, thyroid etc. (C69-75)	6.5 (4.9)	7.12 (6.4)	8.98 (7.7)	8.43 (5.4)	8.46 (4.8)
Haematopoietic (C81-96)	4.85 (3.6)	5.54 (5)	5.93 (5.1)	9.23 (5.9)	8.56 (4.9)
Other and unspecified (O&U)	17.07 (12.8)	15.77 (14.2)	13.71 (11.8)	19.57 (12.6)	17.41 (9.9)
All sites but C44 (AII.bC44)	133.78 (100)	110.8 (100)	116.49 (100)	155.86 (100)	175.96 (100)

BOTH SEXES

SITE	2010	2011	2012	2013	2014
Lip, oral cavity and pharynx (C00-14)	8.67 (6.1)	5.73 (4.9)	7.06 (5.8)	7.85 (5.2)	9.79 (5.9)
Digestive organs (C15-26)	16.85 (11.9)	11.71 (10)	11.61 (9.6)	16.94 (11.1)	16.22 (9.7)
Respiratory organs (C30-39)	10.57 (7.5)	5.5 (4.7)	6.5 (5.4)	7.41 (4.9)	8.37 (5)
Bone, cartilage, melanoma (C40-43)	4 (2.8)	4.04 (3.5)	3.19 (2.6)	5.25 (3.4)	5.11 (3.1)
Breast (C50)	21.83 (15.5)	19.37 (16.6)	20.18 (16.7)	21.8 (14.3)	31.7 (19)

Female genital (C51-58)	19.62 (13.9)	15.33 (13.1)	16.26 (13.4)	26.01 (17.1)	28.18 (16.9)
Male genital (C60-63)	17.43 (12.4)	15.98 (13.7)	14.78 (12.2)	16.6 (10.9)	19.24 (11.5)
Urinary organs (C64-68)	3.3 (2.3)	2.73 (2.3)	3.66 (3)	5.13 (3.4)	5.31 (3.2)
Eye, brain, thyroid etc. (C69-75)	8.96 (6.4)	7.47 (6.4)	8.41 (7)	8.68 (5.7)	7.6 (4.6)
Haematopoietic (C81-96)	6.68 (4.7)	6.09 (5.2)	7.52 (6.2)	11.28 (7.4)	11.05 (6.6)
Other and unspecified (O&U)	23.15 (16.4)	22.66 (19.4)	21.76 (18)	25.48 (16.7)	24.31 (14.6)
All sites but C44 (ALLbC44)	141.06 (100)	116.61 (100)	120.94 (100)	152.41 (100)	166.88 (100)

**ALL SITES BUT SKIN
(BOTH SEXES)**



Central Cancer Registry, NAMIBIA (2010–2014)

Data Quality Indicators

MALE

SITE	Cases	% Total	ASR(a)	MV(%)	CLIN(%)	DCO(%)	ICD10
Mouth & pharynx	335	6.54	11.01 (0.63)	99.40	0.60	0	C00–14
Oesophagus	108	2.11	3.87 (0.38)	92.59	7.41	0	C15
Stomach	72	1.41	2.32 (0.28)	100.00	0.00	0	C16
Colon, rectum, anus	221	4.32	7.05 (0.18)	98.64	1.36	0	C18–21
Liver	124	2.42	3.99 (0.37)	73.39	26.61	0	C22
Pancreas	28	0.55	1.04 (0.20)	60.71	39.29	0	C25
Larynx	147	2.87	5.30 (0.45)	100.00	0.00	0	C32
Lung, trachea, bronchus	161	3.11	5.88 (0.17)	78.88	21.12	0	C33–34
Pleura & other thoracic	8	0.16	0.22 (0.08)	100.00	0.00	0	C37–38
Melanoma of skin	88	1.72	2.62 (0.28)	100.00	0.00	0	C43
Prostate	1125	21.97	37.53 (1.17)	95.38	4.62	0	C61
Testis	32	0.62	0.70 (0.13)	96.88	3.12	0	C62
Kidney & urinary NOS	91	1.78	2.57 (0.29)	95.60	4.40	0	C64–66,68
Bladder	72	1.41	2.48 (0.31)	100.00	0.00	0	C67
Brain & nervous system	69	1.35	1.67 (0.22)	66.67	33.33	0	C70–72
Thyroid	21	0.41	0.65 (0.15)	100.00	0.00	0	C73
Ill-defined	188	3.67	6.09 (0.47)	98.40	1.60	0	C76–80
Lymphoma	289	5.64	7.85 (0.18)	97.92	2.08	0	C81–85,90,88,96
Leukaemia	107	2.09	2.71 (0.28)	100.00	0.00	0	C91–95
All sites but C44	4783	93.40	144.03 (2.20)	93.16	6.84	0	ALLbC44

FEMALE

SITE	Cases	% Total	ASR(a)	MV(%)	CLIN(%)	DCO(%)	ICD10
Mouth & pharynx	208	3.40	5.37 (0.39)	98.08	1.92	0	C00–14
Oesophagus	49	0.80	1.26 (0.19)	95.92	4.08	0	C15
Stomach	61	1.00	1.53 (0.21)	100.00	0.00	0	C16
Colon, rectum, anus	197	3.22	4.92 (0.36)	98.98	1.02	0	C18–21
Liver	81	1.32	2.04 (0.24)	86.42	13.58	0	C22
Pancreas	26	0.43	0.72 (0.15)	65.38	34.62	0	C25
Larynx	37	0.60	1.01 (0.17)	100.00	0.00	0	C32
Lung, trachea, bronchus	105	1.72	2.95 (0.30)	83.81	16.19	0	C33–34
Pleura & other thoracic	2	0.03	0.06 (0.04)	100.00	0.00	0	C37–38
Melanoma of skin	131	2.14	3.01 (0.28)	100.00	0.00	0	C43
Breast	1578	25.80	40.13 (1.05)	99.49	0.51	0	C50
Cervix	1116	18.24	27.11 (0.85)	98.84	1.16	0	C53
Corpus & Uterus NOS	153	2.50	4.12 (0.35)	99.35	0.65	0	C54–55
Ovary & adnexa	175	2.86	4.35 (0.34)	96.00	4.00	0	C56
Kidney & urinary NOS	80	1.31	1.99 (0.23)	97.50	2.50	0	C64–66,68
Bladder	60	0.98	1.40 (0.18)	100.00	0.00	0	C67
Brain & nervous system	77	1.26	1.70 (0.20)	77.92	22.08	0	C70–72
Thyroid	54	0.88	1.23 (0.17)	100.00	0.00	0	C73
Ill-defined	165	2.70	3.63 (0.30)	99.39	0.61	0	C76–80
Lymphoma	230	3.76	4.95 (0.34)	96.52	3.48	0	C81–85,90,88,96
Leukaemia	83	1.36	1.87 (0.22)	100.00	0.00	0	C91–95
All sites but C44	5767	94.28	138.58 (1.91)	96.76	3.24	0	ALLbC44

Cases of unknown age (8 M / 11 F) were excluded from these analyses

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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