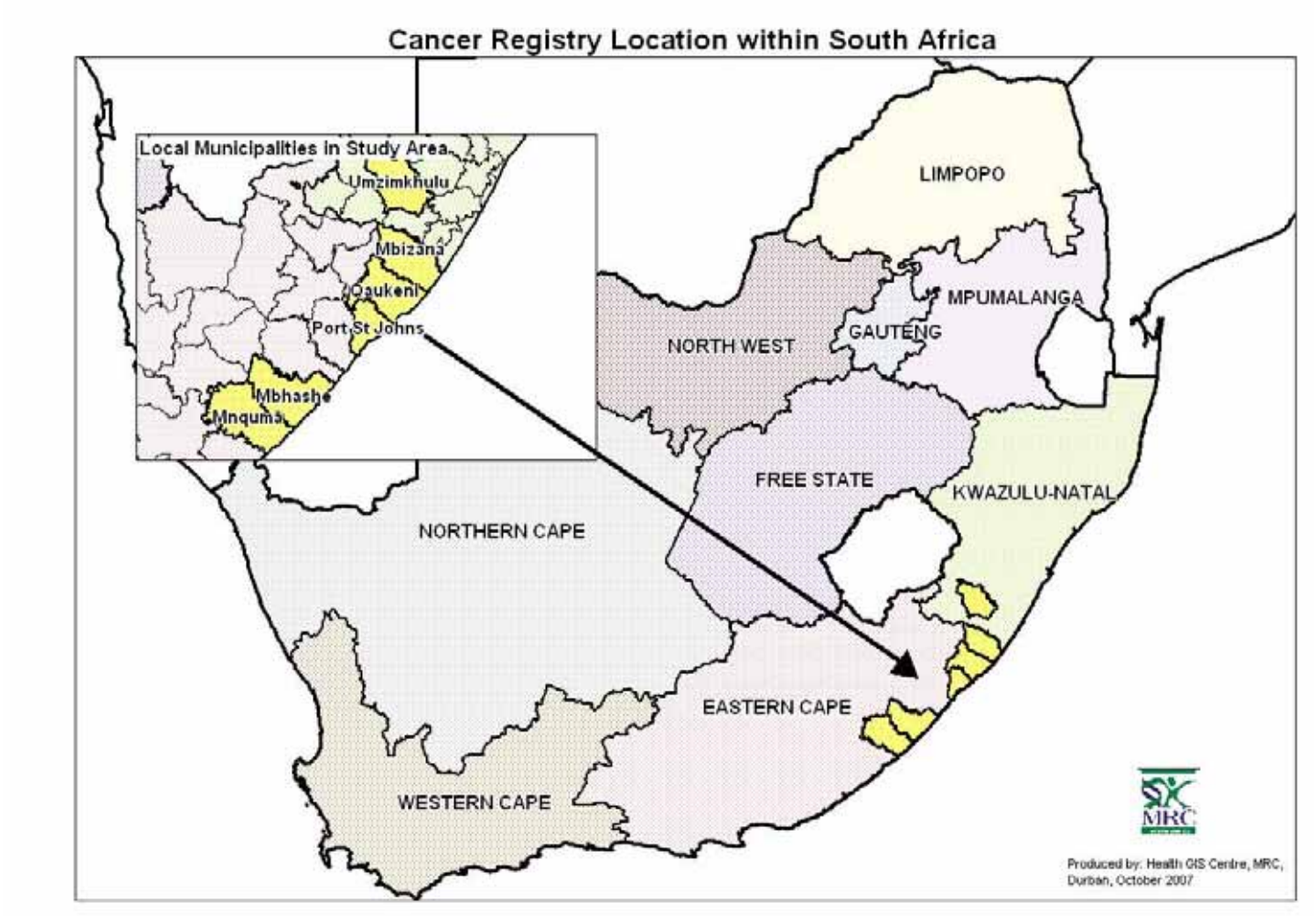
# Cancer Incidence in Selected Municipalities of the Eastern Cape Province, 1998-2002

## PROMEC Cancer Registry Technical Report

**October 2007**



**CANCER INCIDENCE IN SELECTED MUNICIPALITIES OF THE EASTERN CAPE PROVINCE, 1998-2002**

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**ISBN- 978-1-920014-42-X**



**Citation**
Somdyala NIM, Bradshaw D, Curtis B, Gelderblom WCA. Cancer incidence in selected municipalities of the Eastern Cape Province, 1998-2002: PROMEC Cancer Registry Technical Report. Cape Town: South African Medical Research Council, 2007.

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## Acknowledgements

We are thankful to the medical superintendents, doctors and nursing personnel for their contribution and co-operation during cancer data collection. We are greatly indebted to the following hospitals:

**Umzimkhulu Magisterial Area**
Rietvlei Hospital

**Bizana Magisterial Area**
St Patrick's Hospital
Greenville Hospital

**Lusikisiki Magisterial Area**
St Elizabeth Hospital
Holy Cross Hospital
Bambisana Hospital

**Port St Johns Magisterial Area**
Port St Johns Health Day Centre
Isilimela Hospital

**Butterworth Magisterial Area**
Butterworth Hospital

**Centane Magisterial Area**
Tafalofefe Hospital

**Other referral hospitals in surrounding areas:**
**East London**
Frere Hospital Oncology and Radiotherapy Department
Frere Hospital Paediatric Unit
Frere Hospital Haematology Clinic
Cecilia Makiwane Hospital

**Durban**
Inkosi Albert Luthuli Comprehensive Hospital
King George V Hospital Cardio-Thoracic
Surgery Unit
Addington Hospital Oncology and Radiotherapy
Department

**Kokstad**
Usher Memorial Hospital

**Mthatha**
Mthatha General Hospital Oncology Unit
Nelson Mandela Medical School
Nelson Mandela Pathology Laboratory

**Data Collectors**

The following professional nurses who are trained in oncology nursing or working in wards/units which are rendering care to cancer patients are thanked for their contribution by voluntarily collecting and sending cancer data to the registry on a monthly basis during this period (1998-2002). They are:

Olga N Yaphi (Rietvlei)
Zoleka R Mavukwana (St Patrick's)
Francis N Mlenzana (Greenville)
Sindiswa S Grootboom (St Elizabeth)
Nokuzola Dinga/Nombuyiselo Lwana (Butterworth)
Nombuso Ndandani/Celiwe Fadana (Tafalofefe)

**Financial and technical support**

PROMEC Cancer Registry receives financial support from the Medical Research Council (MRC) of South Africa and the Cancer Association of South Africa (CANSA).

The International Union Against Cancer (UICC) and International Agency for Research on Cancer (IARC) are acknowledged for technical skills and training on cancer registration to both the project manager (Ms NIM Somdyala) and data collectors (Ms C Fadana and Ms SS Grootboom).

Dr DM Parkin of the Clinical Trials Service and Epidemiological Unit based at Oxford University is acknowledged for his review of the data and the report.

The registry is an associate member of the International Association for Cancer Registries (IACR).

**Technical support**

Mrs Elize de Kock and Ms Karin Barnard are thanked for editing the report and technical support.

## Abbreviations and Acronyms

| | |
|---|---|
| **AIDS** | Acquired Immune Deficiency Syndrome |
| **ASR** | Age standardised rate |
| **CANREG** | Computerised database for cancer registration |
| **CANSA** | Cancer Association of South Africa |
| **CI5** | Cancer Incidence in Five Continents |
| **HIV** | Human immunodeficiency virus |
| **IACR** | International Association of Cancer Registries |
| **IARC** | International Agency for Research on Cancer |
| **ICD-O** | International Classification of Diseases for Oncology |
| **MRC** | Medical Research Council |
| **NCR** | National Cancer Registry |
| **NHLS** | National Health Laboratory Services |
| **NGO** | Non-governmental Organization |
| **OC** | Oesophageal cancer |
| **PBCR** | Population-based cancer registry |
| **PROMEC** | Programme on Mycotoxins and Experimental Carcinogenesis |
| **SEER** | Surveillance Epidemiology and End Results |
| **Stats SA** | Statistics of South Africa |
| **UICC** | International Union Against cancer |
| **WHO** | World Health Organization |

## Executive summary

Cancer incidence rates and patterns in ten magisterial areas of the former Transkei region of the Eastern Cape Province for the period 1998-2002 are reported. These rates are the result of the ongoing descriptive observational study based on the rural population-based cancer register of the Programme on Mycotoxin and Experimental Carcinogenesis (PROMEC) of the Medical Research Council (MRC) of South Africa. For this period, the area under surveillance was extended from 4 magisterial areas to 10, covering a population of about 1.4 million in a northern region and a southern region. Both active and passive methods were used to collect data from collaborating hospitals and pathology laboratory.

During the period 1998-2002, a total of 2 829 new cancer cases were reported, of which 1 184 (41.8%) were males and 1 645 (58.2%) females. The annual average number of cases observed during this period was 566. Data were coded according to the 10$^{th}$ edition of the International Classification of Diseases for Oncology (ICD-O) and captured using CanReg, a customized cancer registration database developed by IARC. Only residents in the registration area were included and benign cases or uncertain tumours were excluded from analysis. The 2001 census was used for the population estimates to calculate the incidence rates. No adjustments were made for population growth during the period as projections indicate that the population growth during this period was close to zero as a result of the impact of HIV/AIDS epidemic. A direct method of age standardization was used using the World Standard Population to allow for differing population age structures between the magisterial areas as well as comparison with other studies.

Table S1 shows the number of reported cancers and the percent distribution of the ten leading cancers for males and females. Among males, oesophagus cancer is leading and accounts for 42.2% of the total cancers, followed by lung cancer. Surprisingly, there were relatively few Kaposi sarcoma cases in spite of the HIV/AIDS epidemic. Among females, cervix and oesophagus cancers are leading and account for 33.8% and 31.5%, respectively of the total cancers observed during this period. Kaposi sarcoma did not feature among the leading cancers for females.

**Table S1. Percentage distribution of leading cancers by sex, 1998-2002**

| Males | | | Females | | |
|---|---|---|---|---|---|
| **Site (ICD-O)** | **Numbers** | **%** | **Site (ICD-O)** | **Numbers** | **%** |
| Oesophagus (C15) | 496 | 42.2 | Cervix (C53) | 552 | 33.8 |
| Lung (C33-34) | 92 | 7.9 | Oesophagus (C15) | 514 | 31.5 |
| Prostate (C61) | 81 | 6.9 | Breast (C61) | 186 | 11.4 |
| Liver (C22) | 68 | 5.8 | Ovary (C56) | 24 | 1.5 |
| Larynx (C32) | 42 | 3.6 | Liver (C22) | 23 | 1.2 |
| Mouth (C03-C06) | 38 | 3.2 | Lung (C33-34) | 20 | 3.2 |
| Tongue (C01-C02) | 36 | 3.1 | Melanoma of skn (C43) | 19 | 1.2 |
| Kaposi sarcoma (C46) | 25 | 1.3 | Thyroid (C73) | 15 | 0.9 |
| Stomach (C16) | 23 | 2.0 | Pancreas (C25) | 14 | 0.9 |
| Colon (C18) | 21 | 1.8 | Bone (C40-C41) | 12 | 0.7 |
| Leading 10 sites | 922 | 77.9 | Leading 10 sites | 1 379 | 86.3 |

The age standardised rates (Table S2) for all cancers were 72.8 per 100 000 in males and 59.1 per 100 000 in females. The leading top five cancers for males were oesophagus (31.3 per 100 000), lung (6.0 per 100 000), prostate (4.5 per 100 000), liver (4.2 per 100 000) and larynx (2.7 per 100 000). The top five cancers for females were cervix (20.2 per 100 000), oesophagus (18.0 per 100

000), breast (7.1 per 100 000), ovary (0.9 per 100 000) and liver (0.8 per 100 000). The rate for Kaposi sarcoma was higher for males (2.2 per 100 000) than females (0.8 per 100 000). Lung cancer in both males and females was relatively low compared to the high incidence of oesophagus cancer.

The rates for the most common cancers are shown by magisterial area in Table S2. Oesophagus cancer had the highest incidence rates in males across the region. In females, cervix cancer had the highest incidence rates except for the three magisterial areas where oesphagus cancer dominated. These are Centane (40.2 per 100 000), Bizana (19.4 per 100 000) and Willowvale (18.7 per 100 000). Breast and prostate cancers exhibited higher rates in Butterworth compared with other magisterial areas. Other important cancers including Kaposi sarcoma, haematological malignancies and lymphomas were particularly low in this region and require further verification.

**Table S2. Age standardised rates for most common cancers by magisterial area and sex, 1998-2002**

| Males | | | | | |
|---|---|---|---|---|---|
| **Magisterial Area** | **OC** | **Lung** | **Prostate** | **Liver** | **KS** |
| Umzimkhulu | 21.1 | 6.9 | 4.3 | 1.6 | 1.3 |
| Bizana | 37.2 | 9.6 | 2.1 | 4.9 | 3.3 |
| Flagstaff | 17.2 | 3.9 | 1.4 | 4.0 | 2.2 |
| Lusikisiki | 43.2 | 3.8 | 2.5 | 7.8 | 2.0 |
| Port St Johns | 19.7 | 7.6 | 6.0 | 4.9 | 1.0 |
| Idutywa | 18.5 | 4.5 | 3.2 | 1.0 | 1.6 |
| Willowvale | 19.9 | 3.4 | 3.4 | 1.7 | 0.0 |
| Centane | 48.3 | 4.5 | 5.4 | 5.3 | 0.0 |
| Butterworth | 32.1 | 8.7 | 14.6 | 1.9 | 1.1 |
| Ngqamakhwe | 26.6 | 8.0 | 5.6 | 4.6 | 1.0 |
| Total area | 31.3 | 6.0 | 4.5 | 4.2 | 2.2 |
| **Females** | | | | | |
| **Magisterial Area** | **Cervix** | **OC** | **Breast** | **Lung** | **KS** |
| Umzimkhulu | 12.3 | 7.8 | 5.1 | 0.2 | 0.5 |
| Bizana | 14.4 | 19.4 | 4.3 | 1.3 | 0.4 |
| Flagstaff | 26.4 | 17.2 | 4.8 | 0.0 | 0.9 |
| Lusikisiki | 29.6 | 19.9 | 10.0 | 0.2 | 0.5 |
| Port St Johns | 10.8 | 4.3 | 2.7 | 0.6 | 0.0 |
| Idutywa | 21.2 | 7.4 | 3.9 | 1.1 | 0.5 |
| Willowvale | 17.0 | 18.7 | 6.4 | 0.3 | 0.0 |
| Centane | 19.2 | 40.2 | 6.9 | 1.1 | 0.0 |
| Butterworth | 22.6 | 23.2 | 15.2 | 2.3 | 0.0 |
| Ngqamakhwe | 14.2 | 12.7 | 5.9 | 1.2 | 0.0 |
| Total area | 20.2 | 18.0 | 7.1 | 0.9 | 0.8 |

OC = oesophagus cancer
KS = Kaposi sarcoma

There were 79 childhood cancers which accounted for 2.8% of the total cancers reported during 1998-2002 period (Table S3). The most common childhood cancers observed were brain tumours, nephroblastoma, leukemia, retinoblastoma and neuroblastoma. Cancers with genetic predisposition (retinoblastoma and nephroblastoma) constitute 32.9% of the childhood cancers when combined. Childhood cases are spread across the region excepting for nephroblastoma. A single area, Butterworth, accounted for 50% of the reported cases of nephroblastoma. Genetic counsellingand support is important for families of these children.

**Table S3. Cancers aged 0-14 years by site and sex, 1998-2002**

| Site | Males | Females | Total cancers |
|---|---|---|---|
| Brain tumours | 6 | 9 | 15 |
| Nephroblastoma | 12 | 3 | 15 |
| Leukemia | 9 | 5 | 14 |
| Retinoblastoma | 3 | 8 | 11 |
| Neuroblastoma | 4 | 6 | 10 |
| Other + unspecified | 8 | 6 | 14 |
| **Total** | **42** | **37** | **79** |

The PROMEC Cancer Registry has expanded to cover a larger area. It is the only functional population-based registry in the country and has an important role to play not only in the context of the community it represents but also for understanding the disease burden in the province and nationally. The observed rates, however, need to be considered minimum cancer incidence rates for the area, particularly as it would appear that some cases were missed in 1999 and 2000 while hospitals were being refurbished. The low incidence of haematological malignancies and lymphomas as well as the relatively high numbers of cases reported by the laboratory without a clinical record need investigation and indicate that the register needs further strengthening. The low proportion of laboratory confirmation of the oesophageal cancer cases indicate a need for more systematic pathology testing of clinically diagnosed cases if the register is to function properly.

The register indicates that oesophagus and cervix cancers remain the leading cancers in the region. Breast cancer in women and lung cancer, prostate and liver cancer in men are the next most common cancers in the area. The overall cancer rate was higher for males than females. The common cancers (oesophagus, cervix, lung, prostate, breast and liver) reported in the region are preventable or potentially curable if diagnosed early. This will require appropriate strengthening of the clinical services in the area and the implementation of prevention interventions. Dissemination of the findings from the register can play an important part in raising the awareness of the community around cancer prevention.

## Introduction

The Medical Research Council (MRC) of South Africa set up a population-based cancer registry (PBCR) in four magisterial areas (Butterworth, Centane, Bizana and Lusikisiki) of the former Transkei region of the Eastern Cape Province more than 20 years ago. The aim of the registry was to provide basic data on spatial and temporal variations in cancer patterns in the region with particular respect to oesophageal cancer which was rated amongst the highest in the world. Several reports for the periods 1981-1984 (Jaskiewicz *et al*., 1987), 1985-1990 (Makaula *et al.,* 1996), 1991-1995 and 1996-2000 (Somdyala *et al.,* 2003) have been compiled.

Recently, the registry was extended to ten magisterial areas of Umzimkulu, Bizana, Flagstaff, Lusikisiki, Port St Johns, Idutywa, Willowvale, Centane, Butterworth and Nqamakwe so as to have a larger population under surveillance. These areas are in the municipalities of Umzimkhulu, Tabankulu, Mbizana, Qaukeni and Port St Johns in the north-eastern part of the former Transkei region and Mnquma and Mbashe in the south-western part of the region. According to the 2001 population census, these areas have a population of 1.4 million people (Statistics South Africa, 2003).

The registry has achieved some important developmental milestones. An advisory committee comprising of oncologists, pathologists, nurses and scientists has been established to provide input on the development of the register and also monitor data quality as the registry aims to comply with the international standards as set by the International Agency for Research on Cancer (IARC). IARC has provided guidelines on the procedures for cancer registers as well as a computer programme that has been designed for the capture and basic analysis of cancer data.

The major challenge in running the registry has been to maximize the completeness of registration and ensure the quality of data. Means to deal with general problems experienced in a resource poor setting as well as specific problems related to a cancer registry had to be devised. These include dedication in active case finding and checking of records using various sources of information available, even if it means traveling a long distance within and outside of the surveillance area. Special efforts to develop collaborative networks within the health facilities have been essential for the ongoing success of the registry.

The main objective of a cancer registry is to provide timely, complete, comparable and high quality cancer data. We regret the late publication of this technical report that for the first time includes ten magisterial areas. Limited personnel hampered the ability to provide a more timely report. However, efforts to address this problem are underway and regular reporting is envisaged in the future. Nonetheless, it is anticipated that this report will provide researchers, policy makers, Non-governmental Organizations (NGOs) such as the Cancer Association of South Africa (CANSA) and communities in the former Transkei region of the Eastern Cape Province better insight on cancer burden for better planning.

## Methods

The registry is collaborating with 19 hospitals that serve the area including the pathology laboratory under the National Health Laboratory Services (NHLS) situated in Nelson Mandela Medical School, Mthatha (Appendix I). Both active and passive case finding methods are used. The active case finding system was set up by the registry manager utilising multiple sources. The collaborating hospitals located in ten magisterial areas are visited twice a year. These are shown in Figure 1. During these visits records are examined for all cancer patients treated in the facility and their details are abstracted for inclusion in the registry. The records perused include in-patients' admission, treatment, transfer, discharge and death registers, midnight census records and pathology reports. Case finding also extends to hospitals outside the registration area to which cancer cases may have been referred or presented themselves. These include Mthatha General Hospital, the regional referral centre, Frere Hospital in East London which is the regional radiotherapy referral centre, Cecilia Makiwane and five hospitals in KwaZulu-Natal Province; Usher Memorial in Kokstad, King Edward VIII, Inkosi Albert Luthuli, King George V and Addington in Durban.

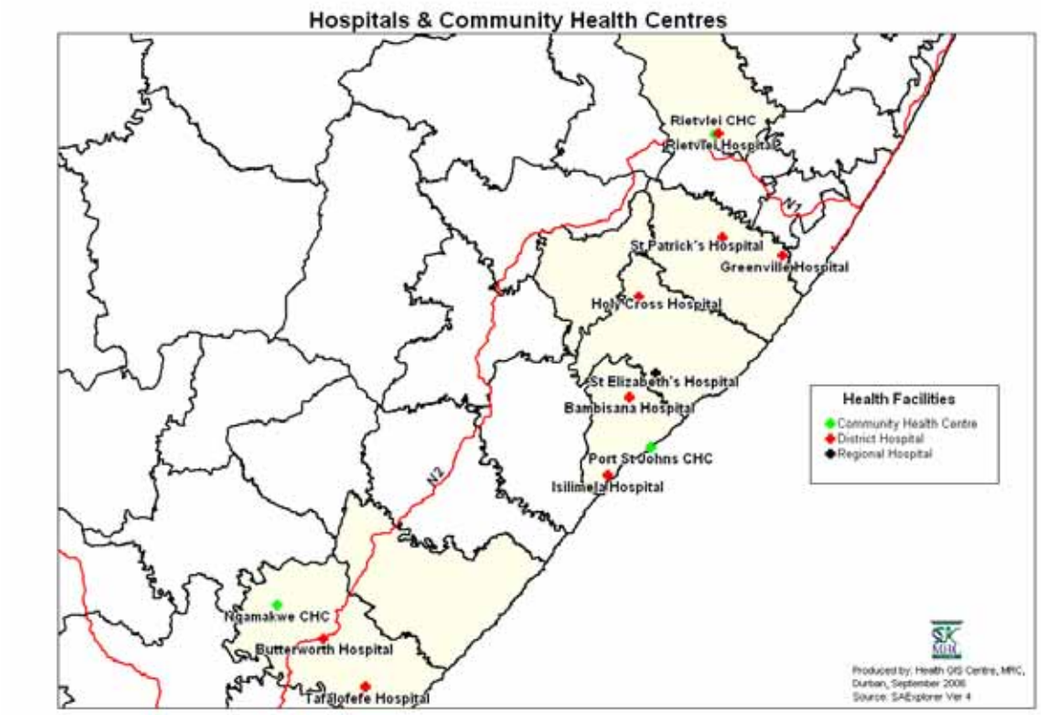



**Figure 1: Health Facilities in the cancer registration area**

Passive case finding supplements the active method. The former involves part-time nurses trained in oncology or working in oncology units of the registration area major hospitals completing specially designed cancer notification forms and sending them to the registry on a monthly basis. These nurses are trained in cancer data abstraction and notification by the registry manager.

(i) Data abstraction and coding:

Details on malignant cases including those from which the primary site is unknown are abstracted from various hospitals and pathology laboratory records. Information on the abstracts is used to update computer records of known cases. For cases that are new, a specially designed notification form is completed and coded according to the International Classification of Diseases on Oncology (ICD-O). Variables considered very important for each case are demographic data (name, sex, age, ethnic group and usual place of residence), tumour characterization (incidence date, most valid diagnosis, primary site, morphology type and behaviour) and vital status (alive or dead).

(ii) Data capture process and data cleaning:

After manual coding, data are entered into a computerized database using CanReg. This is a software program designed by the Unit of Descriptive Epidemiology of the IARC (Cooke, 2002). The program features include a search for duplicate records and multiple primaries using a probability matching, consistency checking for impossible or rare cases.

**Data analysis**

This report presents new cancer cases reported during the period 1998-2002; only registration area residents are included. Benign cases or uncertain tumours are excluded from the analysis. The 2001 census was used as a base for the population estimates to calculate the incidence rates for each magisterial area. Estimates of the population growth in this region for this period are all close to zero as a result of the AIDS epidemic (Statistics South Africa, 2003). For this reason, the 2001 census population is used, without adjusting for any change. It is known that there are errors in the census but there are no alternative population figures. Children are undercounted in the census. However, it should be noted that there may be other distortions in the smaller area numbers that may arise from the poor enumeration or the post-enumeration adjustment.

Comparison of simple crude rates can give a false picture because of differences in the age structure of the populations to be compared (Boyle and Parkin, 1991). Since cancer is more common in older ages, crude rates are higher in older populations than younger ones. Thus, when comparing cancer levels between two or more areas, or when investigating the pattern of cancer over time for the same area, it is important to allow for the changing or differing population age structure. This is accomplished by age standardisation. A direct method has been used in this analysis where the standard population used was the World Standard Population (Parkin, *et al*., 1997).

**Population under surveillance**

The area under surveillance comprises three non-adjacent regions in the northern part of the Eastern Cape Province. The five magisterial areas in the northern region fall in five municipal districts: **Umzimkhulu** (Umzimkhulu), **Tabankulu** (Flagstaff), **Mbizana** (Bizana), **Qaukeni** (Lusikisiki), **Port St Johns** (Port St Johns). These northern region districts are on the border between the Eastern Cape and KwaZulu-Natal with Umzimkulu being non-contiguous as an island situated in the province of KwaZulu-Natal (Figure 2a). The total population of the Northern region, including Umzimkhulu, is 957 313. The five magisterial areas in the south are in two municipal districts: **Mnquma** (Butterworth, Centane and Nqamakwe), **Mbashe** (Idutywa and Willowvale). These account for a population of 483 823.

For the purposes of mapping the population density to provide a detailed distribution of the population in the region, the “main places” from the 2001 census have been used. A main place is a geographic boundary similar to a “suburb” in an urban area and is defined as level 5 in the second tree of the geographical hierarchy structure in the census metadata. (South Africa has 2674 unique main places that are coded to 3031 as a result of some cross-boundary borders).

Figure 2a shows the population density (people per square kilometer) according to main places in the Umzimkhulu Local Municipality and reveals that the highest densities can be found in the south east area of Rietvlei (Part 1:1 117 & Part 2: 1 648) followed by Clydesdale (726) and Umzimkhulu (518). These are considerably higher than the average for the entire Municipality which is 72 per $km^2$, indicating a predominately rural area.

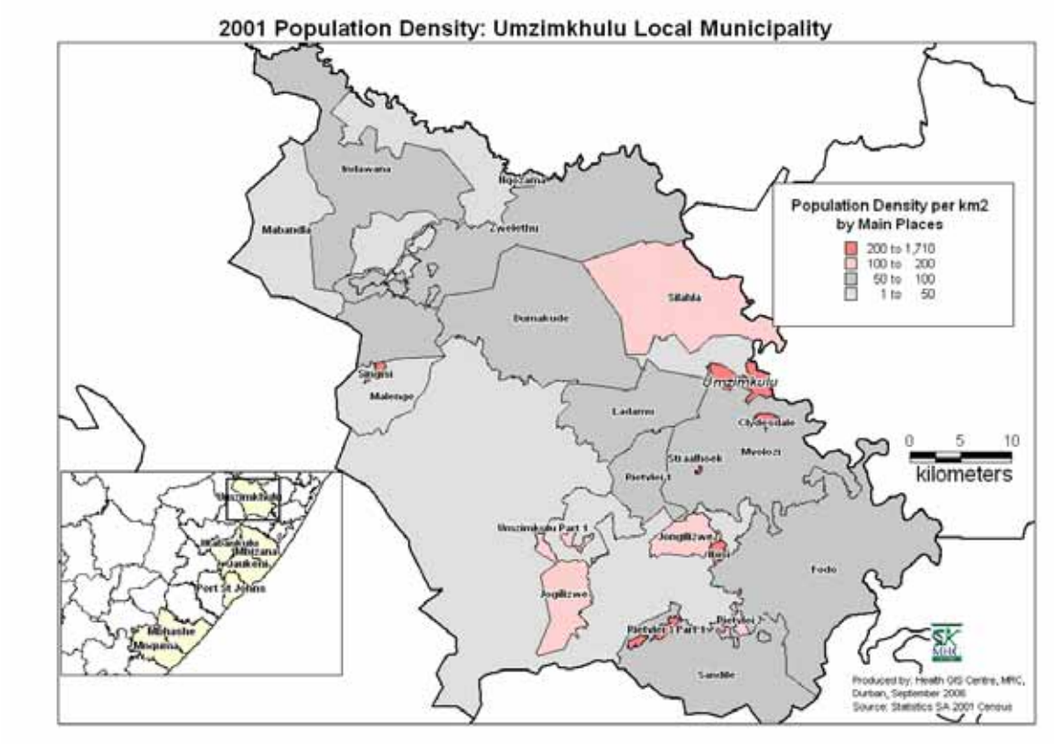



**Figure 2a: Population distribution, Umzimkhulu**

The N2 route that passes around the Northern region is shown in Figure 2b. The population density of Port St Johns is 102 per $km^2$ which has a higher number of places with a density greater than 100 per $km^2$ (shaded as light red on the map). The highest densities in this region can be found in the towns of Port St Johns (588) and Lusikisiki (430).

Figure 2c shows the N2 route passes through the Southern region and has densely populated areas of Butterworth (1 706 per $km^2$), Idutywa (524 per $km^2$) and Willowvale (459 per $km^2$).

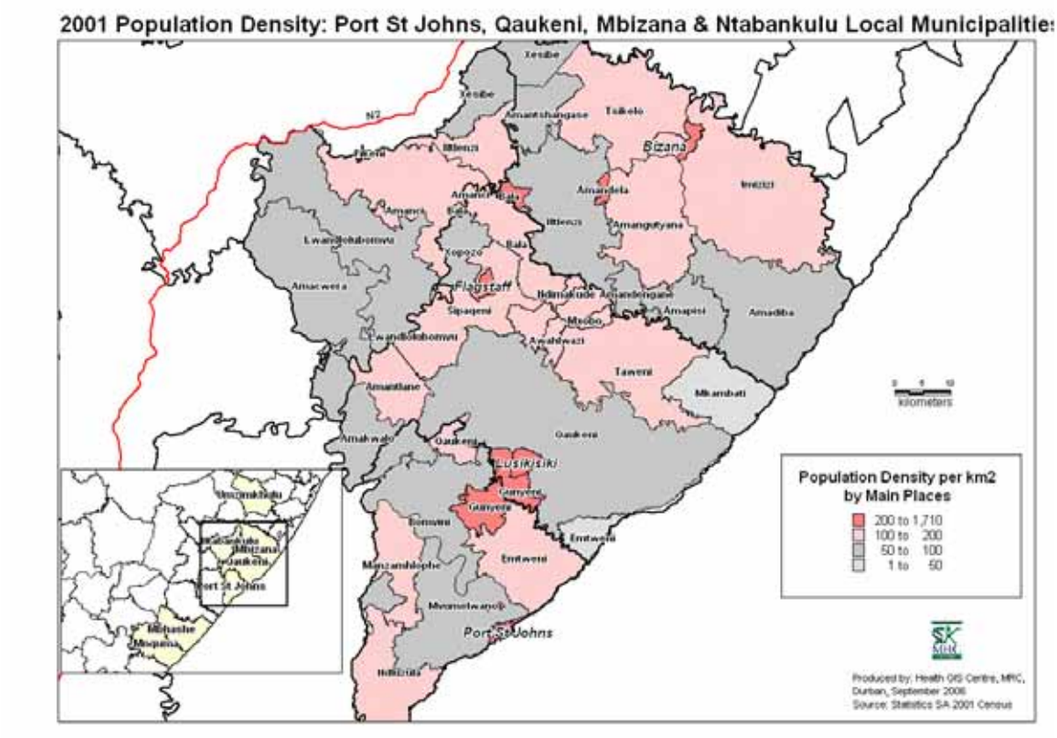



**Figure 2b: Population distribution, Northern region**

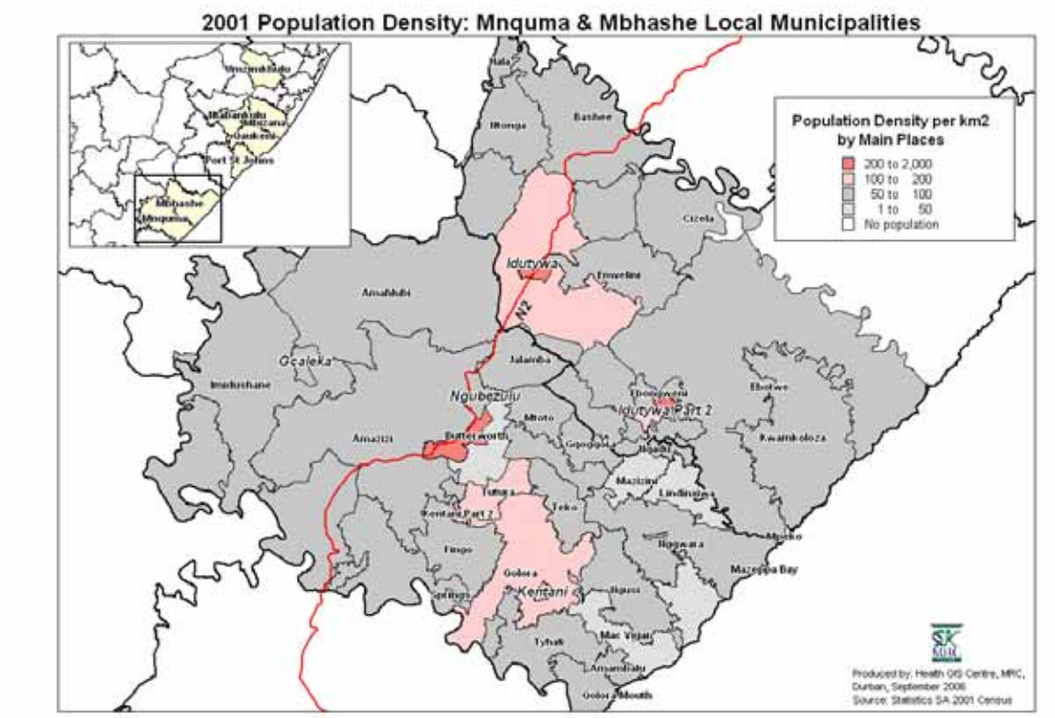



**Figure 2c: Population distribution, Southern region**

The age and sex distribution of the population shown in Figure 3 is typical of a South African rural population. It reflects that the area is a labour reservoir with lower numbers of working age adults than might be expected accompanied by higher proportions of children and older persons, particularly women. Migration, related to work has a long history in South Africa as well as

circulatory movement of people between an urban and a rural based home. Such a migratory pattern may result in a lower cancer incidence being experienced in the area as it is possible that people from this area who develop a cancer while working in an urban area do not return to their rural home. The number of children under-5 years of age is markedly smaller than the next age group. This is likely to be a result of declining fertility on the one hand and under-enumeration of young children on the other. The population pyramids for each magisterial area follow similar patterns and are shown in Appendix II.

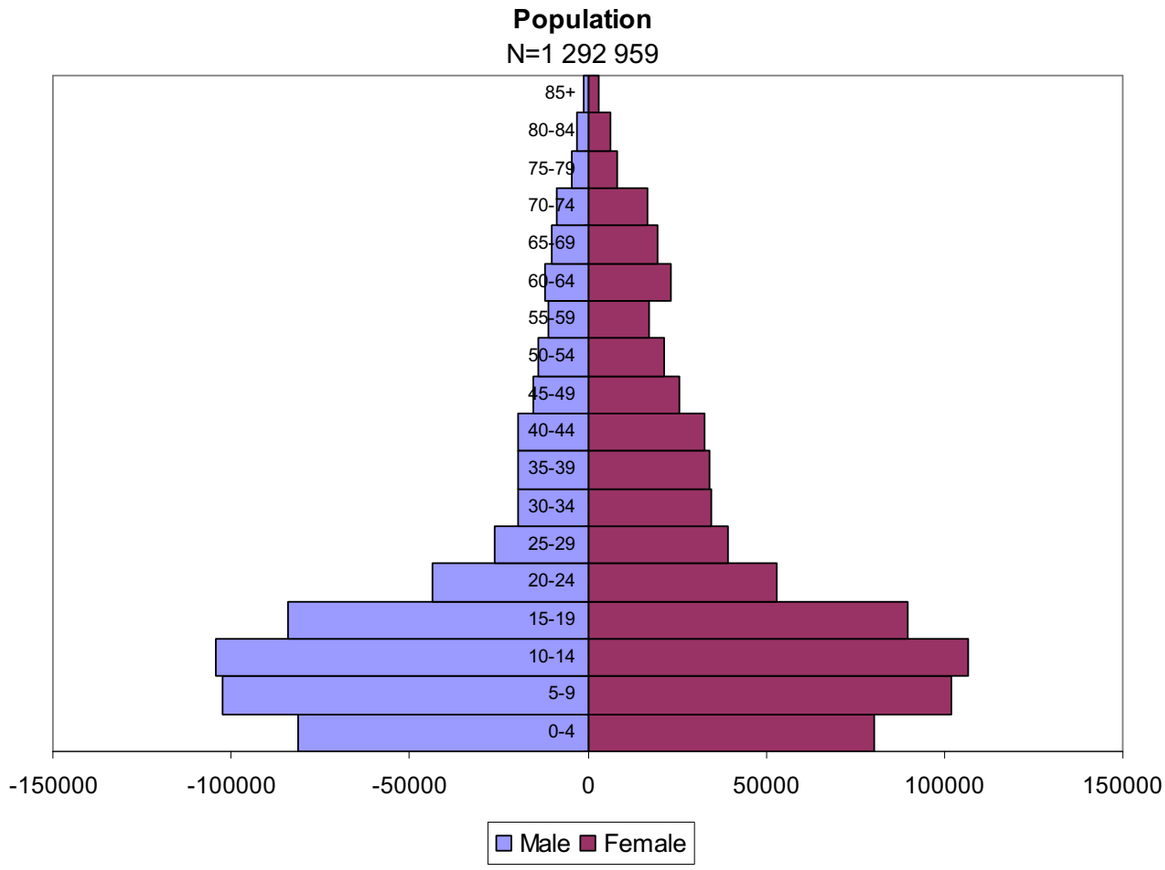



**Figure 3: Population pyramid, 2001**

The characteristics of the 311 716 households are briefly summarized in Table 1. Detailed maps of the variations in selected household characteristics from the 2001 census are shown in Appendix III. Most of the households in the area do no have access to piped water and a large proportion does not have any toilet (51%). Across the surveillance area, 79% of the population is unemployed with the population living on subsistence farming, remittances and government grants. The lowest level of unemployment is in the district of Mnquma, including the town of Butterworth, where the level is 73%. The unemployment figures are based on the narrow definition and exclude people who are not actively seeking work. Nearly two thirds of the households in the area are headed by women.

**Table 1: Characteristics of households and population in cancer register region**

| Region | Number of households | % with water | % with flush toilet | % with no toilet | % with electricity | % women headed | % adults 15-59 years unemployed |
|---|---|---|---|---|---|---|---|
| Northern | 190685 | 22.8 | 6.9 | 43.8 | 20.4 | 63.5 | 80.1 |
| Southern | 121031 | 26.3 | 12.0 | 62.4 | 25.7 | 59.4 | 76.3 |
| Total | 311716 | 24.2 | 8.9 | 51.0 | 22.5 | 61.9 | 78.8 |

### Risk factor profile

There is no reported data on the risk factor profile of the community. The 1998 South African Demographic Survey (SADHS) conducted by the Department of Health provides limited information on risk factors based on a nationally representative sample (DOH, 2001). The profile of rural African is likely to give some indication of the trends in the risk factors in this area. For example, the 1998 SADHS found that smoking was 10 times higher for men than women (32% men and 3% women). It found that alcohol consumption was just over 3 times higher for men than women (39% men and 12% women). The survey also found that obesity was much more common among women than men (6% men and 25% women) and that about half of rural women are overweight or obese. A provincial household survey was conducted in 2002 by the Eastern Cape Department of Health and the Equity Project (Bradshaw *et al.*, 2004). Results from the former Transkei region of the province indicated that 16% of men drink alcohol regularly and a further 13% partake in communal drinking. The prevalence is much lower among women with only 4% drinking regularly and another 4% partaking in communal drinking. This survey found that 31% of men in the former Transkei smoke tobacco and only 5% of women. This survey also indicated that only 10% of households use electricity for cooking or heating while wood and paraffin are the most commonly used energy sources. Multiple energy sources are used and 80% of households use wood and 68% used paraffin.

## Results

### Total number of new cases

During the period 1998-2002, a total of 2 829 new malignant cases were recorded of which 1 184 (41.8%) were males and 1 645 (58.2%) females (Table 2). The annual number of cases was fairly consistent during this period with an annual average of 566 per annum (237 males and 329 females).

**Table 2: Number of cases recorded each year by sex, 1998-2002**

| Year | Male | Female | Total |
|---|---|---|---|
| 1998 | 234 | 389 | 623 |
| 1999 | 201 | 308 | 509 |
| 2000 | 216 | 262 | 478 |
| 2001 | 272 | 328 | 600 |
| 2002 | 261 | 358 | 619 |
| 1998-2002 | 1 184 | 1 645 | 2 829 |

**Source of information of cancers reported during 1998-2002**

The number of cases from each of the participating hospitals during the period 1998-2002 is shown in Figure 4. Hospitals in the registration area (the ten magisterial areas) contributed 1633 cases (57.2%) whereas the referral hospitals, including the state pathology laboratory (Nelson Mandela Pathology Laboratory), contributed 1196 cases (42.3%). A larger percentage of cases (52.1%) from referral hospitals was contributed by Frere while Mthatha regional referral hospital only 14.1% (169 cases) was contributed.

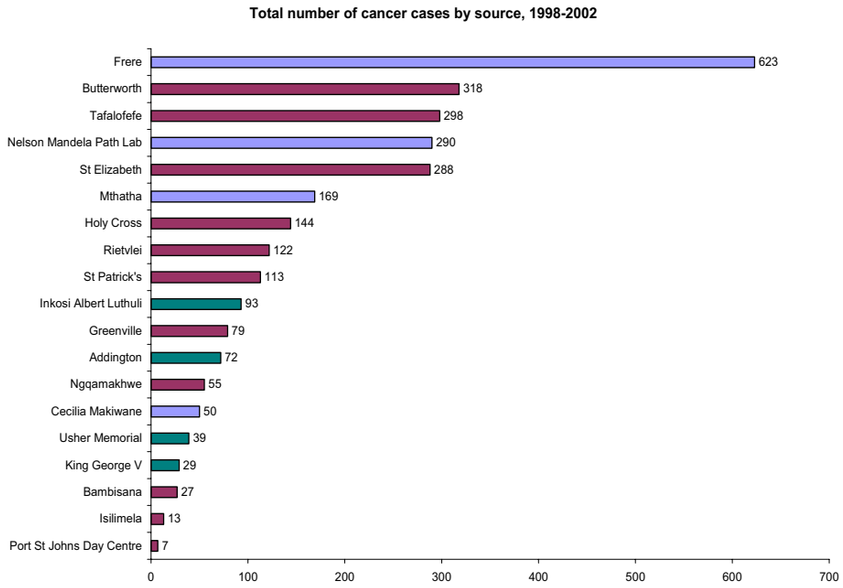



**Figure 4: Total number of cancer cases by source, 1998-2002**

On average there were 566 cases captured each year. It can be seen from Table 3 that there were lower numbers in 1999 and 2000, a stage when some of the hospitals in the area were being refurbished making it very difficult to retrieve some of the folders. The dip in these years occurred across all sites.

**Table 3: Number of cases reported each year by district, 1998-2002**

| Magisterial area | 1998 | 1999 | 2000 | 2001 | 2002 | Total 1998-2002 |
|---|---|---|---|---|---|---|
| Bizana | 97 | 81 | 63 | 64 | 65 | 370 |
| Butterworth | 83 | 67 | 63 | 52 | 72 | 337 |
| Centane | 87 | 70 | 57 | 72 | 77 | 363 |
| Flagstaff | 38 | 41 | 38 | 44 | 42 | 203 |
| Idutywa | 44 | 33 | 42 | 41 | 38 | 198 |
| Lusikisiki | 138 | 111 | 101 | 134 | 117 | 601 |
| Ngqamakhwe | 36 | 20 | 30 | 63 | 55 | 204 |
| Port St Johns | 12 | 14 | 13 | 20 | 20 | 79 |
| Willowvale | 44 | 27 | 34 | 65 | 60 | 230 |
| Umzimkhulu | 44 | 45 | 36 | 45 | 73 | 244 |
| **Total area** | **623** | **509** | **478** | **600** | **619** | **2 829** |

From the most valid basis of diagnosis (Table 4) for all cancer cases recorded during 1998-2002, it can be seen that 52.3% of cancer sites were histologically confirmed whereas 47.6% were clinically

diagnosed. The percentage of clinically diagnosed cancer sites is high. However, this is not uncommon in a rural setting where there is scarcity of specialists such as oncologists. In addition, the most common cancers in the former Transkei include cancer of the oesophagus (73.7% of total cancers) which can be diagnosed clinically. Histological confirmation of diagnosis is slightly higher for females (51.3%) than males (42.3%). The site with the highest histology verification in males was larynx (90.5%) whereas in females, it was for the bone (91.5%). Oesophagus had the lowest histological verification rates for both males and female (15.7 % and 8.6% respectively).

**Table 4: Most valid basis of diagnosis, 1998-2005**

| Method of diagnosis | No. of cases | Percentage |
|---|---|---|
| Clinical* | 1 349 | 47.6 |
| Histology# | 1 480 | 52.3 |
| Death certificate only | - | - |
| Total | 2 829 | 100.0 |

* Clinical = clinically only, x-rays, scans, surgery
\# Histology = histology of primary site/metastasis, haematology and cytology

The pathology laboratory in Nelson Mandela Medical School, Mthatha is visited once a year and copies of histology reports for all cancer patients sent/referred by hospitals in the registration area are retrieved. The registry matches these reports with cases in the database. Follow-ups are made of those cases that are not in the database to obtain full information including address, date of admission, etc. from clinical records. The database indicates that for 1998-2002 there were 273 cases obtained through pathology records only. Until recently, the database only indicated the first source of information and not the subsequent sources of information. The database has not been upgraded to allow for a maximum of 3 different sources. Manually checking of the records identified that clinical records were not provided for 171 cases. Table 5 shows the distribution of those cases according to hospital of origin. Umzimkulu stands out with a very high number of cases that had only a laboratory report, indicating the need to strengthen the capture of clinical information from this area.

**Table 5: Pathology only cases, by district, 1998-2002**

| District | Lab report only | Hospital submitted | Collected from hosp | Number |
|---|---|---|---|---|
| Umzimkulu | 70 | 2 | 2 | 74 |
| Butterworth | 3 | 0 | 0 | 3 |
| Idutywa | 6 | 0 | 4 | 10 |
| Centane/Kentani | 5 | 0 | 0 | 5 |
| Ngqamakhwe | 1 | 0 | 2 | 3 |
| Willowvale | 8 | 0 | 0 | 8 |
| Bizana | 15 | 10 | 0 | 25 |
| Flagstaff | 10 | 20 | 0 | 30 |
| Lusikisiki | 43 | 62 | 0 | 105 |
| Port St Johns | 10 | 0 | 0 | 10 |
| Total | 171 | 94 | 8 | 273 |

**Age standardised incidence rates (ASR)**

The overall ASR for all cancers were 72.8 per 100 000 in males and 59.1 per 100 000 in females (Table 6). The southern region had the highest rates for both males and females; 74.1 per 100 000 and 65.1 per 100 000, respectively followed by the northern region with 64.0 per 100 000 males and 52.6 per 100 000 females, which was the lowest rate.

## Table 6: Incidence of common cancers by age and annual age standardised rate per 100 000 population by sex, 1998-2002

| Age group | 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 | 75-79 | 80-84 | 85+ | Total | HV % | ASR /100 000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Male** | | | | | | | | | | | | | | | | | | | | | |
| Oesophagus | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 9 | 21 | 36 | 60 | 58 | 86 | 112 | 64 | 24 | 16 | 7 | 496 | 15.7 | 31.3 |
| Trachea,Bronchus,Lung | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 5 | 8 | 15 | 20 | 13 | 15 | 8 | 4 | 0 | 0 | 92 | 73.9 | 6 |
| Prostate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 18 | 15 | 17 | 8 | 13 | 4 | 81 | 27.2 | 4.5 |
| Liver | 0 | 2 | 0 | 1 | 2 | 5 | 1 | 4 | 3 | 10 | 12 | 4 | 2 | 9 | 5 | 6 | 2 | 0 | 68 | 7.4 | 4.2 |
| Larynx | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 4 | 10 | 5 | 4 | 7 | 2 | 2 | 2 | 42 | 90.5 | 2.7 |
| Mouth | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 4 | 6 | 5 | 6 | 6 | 3 | 4 | 0 | 0 | 38 | 86.8 | 2.5 |
| Tongue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 3 | 6 | 7 | 5 | 4 | 3 | 1 | 0 | 36 | 83.3 | 2.3 |
| Kaposi sarcoma | 0 | 0 | 0 | 0 | 2 | 3 | 2 | 7 | 4 | 4 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 26 | 52.0 | 1.6 |
| Stomach | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 5 | 2 | 1 | 4 | 2 | 2 | 0 | 0 | 23 | 34.8 | 1.5 |
| Colon | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 0 | 1 | 0 | 21 | 71.4 | 1.3 |
| Multiple Myeloma | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 0 | 0 | 0 | 16 | 50.0 | 1.1 |
| All sites Total | 15 | 17 | 7 | 9 | 13 | 15 | 14 | 31 | 63 | 94 | 138 | 139 | 173 | 201 | 142 | 59 | 41 | 15 | 1186 | 42.3 | 72.8 |
| **Female** | | | | | | | | | | | | | | | | | | | | | |
| Cervix* | 0 | 0 | 0 | 0 | 3 | 8 | 24 | 25 | 59 | 52 | 78 | 48 | 117 | 78 | 57 | 22 | 16 | 5 | 592 | 73.6 | 20.2 |
| Oesophagus | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 12 | 16 | 23 | 54 | 63 | 121 | 105 | 70 | 17 | 20 | 8 | 514 | 8.6 | 18.0 |
| Breast | 0 | 0 | 0 | 0 | 1 | 5 | 4 | 17 | 28 | 25 | 23 | 13 | 25 | 26 | 8 | 8 | 1 | 2 | 186 | 74.7 | 7.1 |
| Ovary | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 3 | 2 | 6 | 5 | 0 | 3 | 0 | 0 | 0 | 24 | 79.2 | 19.7 |
| Liver | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 3 | 0 | 4 | 2 | 3 | 3 | 2 | 1 | 1 | 0 | 23 | 8.7 | 6.9 |
| Trachea,Bronchus,Lung | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 4 | 2 | 5 | 2 | 4 | 0 | 0 | 0 | 20 | 90.0 | 0.3 |
| Melanoma of Skin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 4 | 3 | 1 | 4 | 1 | 1 | 1 | 19 | 89.5 | 0.7 |
| Thyroid | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 2 | 3 | 1 | 3 | 0 | 0 | 1 | 0 | 0 | 15 | 46.7 | 0.6 |
| Pancreas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 3 | 3 | 1 | 1 | 0 | 1 | 0 | 14 | 7.1 | 0.5 |
| Bone | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 12 | 91.7 | 0.4 |
| All sites Total | 17 | 16 | 6 | 8 | 15 | 26 | 45 | 74 | 126 | 124 | 187 | 160 | 312 | 243 | 164 | 55 | 47 | 18 | 1643 | 51.3 | 59.1 |

* includes cervix uteri, corpus uteri and uterus unspec
HV – histological verification

The overall annual cancer incidence rate is shown for each magisterial area in Figure 5. The highest rates were recorded in Butterworth magisterial area for both males and females. For all areas with the exception of Flagstaff and Willowvale the rates were higher for males than for females and for Centane almost identical.

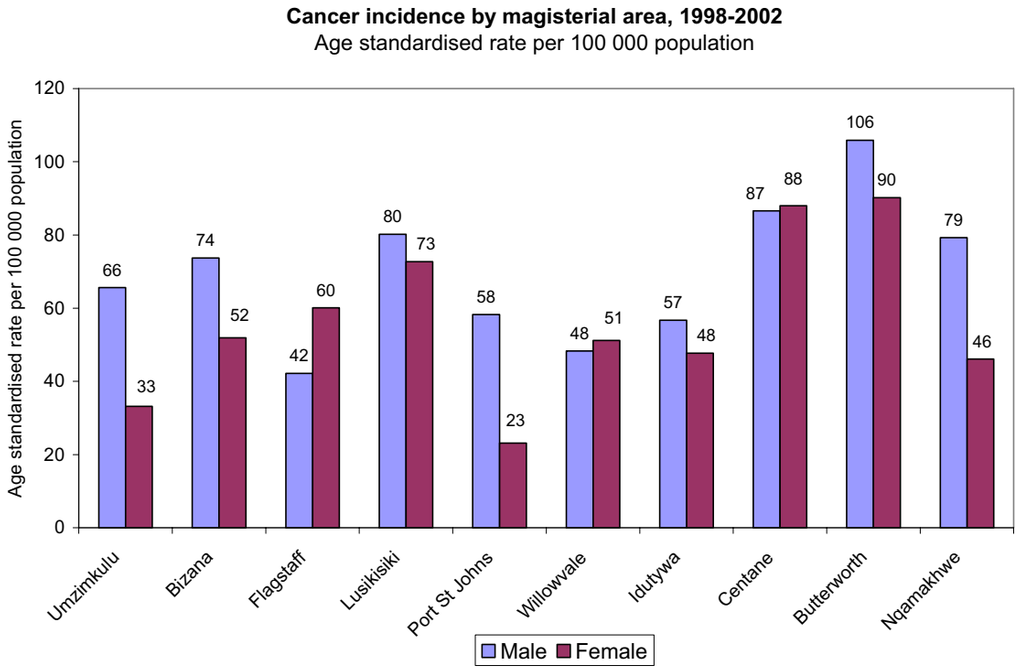



**Figure 5: Annual age standardised cancer incidence rates (per 100 000 population) by magisterial area and sex, 1998-2002**

**Common cancers**

The most common cancers in males include oesophagus, lung, prostate, liver and Kaposi sarcoma whereas in females are cervix, oesophagus, breast, lung and Kaposi sarcoma (Figure 5). Oesophageal cancer in the case of both males and females and cervical cancer in the case of females had the highest rates across the region. Table 6 shows the incidence cases during the period 1998-2002 for these common cancers as well as Kaposi sarcoma by age group. The age standardised rate per 100 000 are also shown in the Table 6.

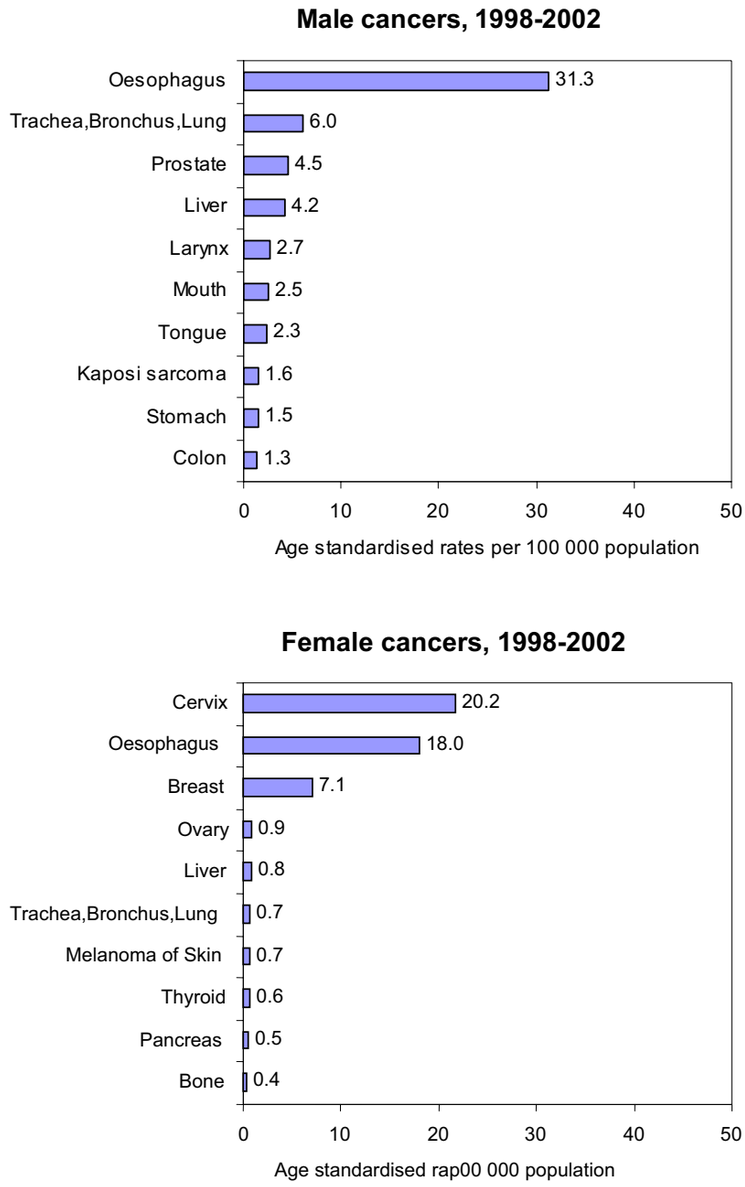



**Figure 6: Annual age standardised rates (per 100 000 population) of leading cancers by sex, 1998-2002**

**Oesophagus cancer (OC)**

OC had the overall highest rates in males but the second highest in females across the region (Table 6). The age specific incidence rates per 100 000 population are shown in Figure 7 (including a log scale.) The incidence peaks in the age range 65-69 years is consistently higher for males than females.

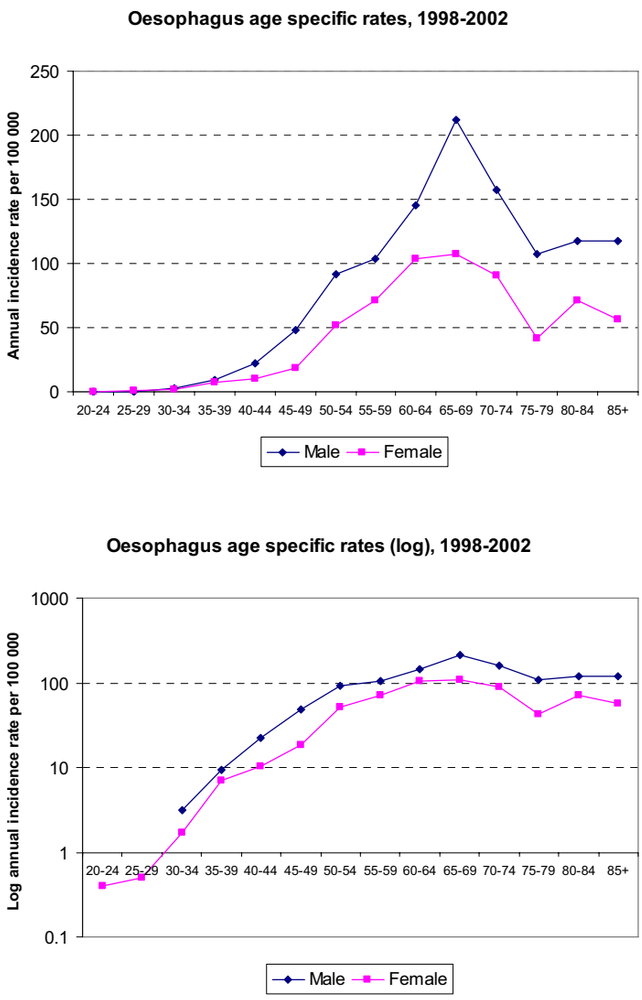



**Figure 7: Annual age specific rates (per 100 000 population) for oesophagus cancer by sex, 1998-2002**

Out of the total 1 010 cases of oesophageal cancer, 121 (25.3%) had histological confirmation of diagnosis. Of these, 86 (7.3%) were squamous cell carcinomas only 2 cases (1.9%) were adenocarcinoma and 12 cases (9.9%) had a non-specific histological diagnosis (e.g. carcinoma NOS).

The ASR for oesophagus cancer by magisterial area are shown in Figure 8. In males the highest rates were observed in Centane (48.3 per 100 000) and the second highest were in Lusikisiki (43.4 per 100 000), the third highest rate was observed in Bizana (37.2 per 100 000) followed by Butterworth (32.1 per 100 000) (Figure ?). The lowest rates for males were recorded in Idutywa (18.5 per 100 000) whereas in females it was in Port St Johns (4.3 per 100 000). Similar rates were observed for both males and females in Flagstaff (17.2 per 100 000).

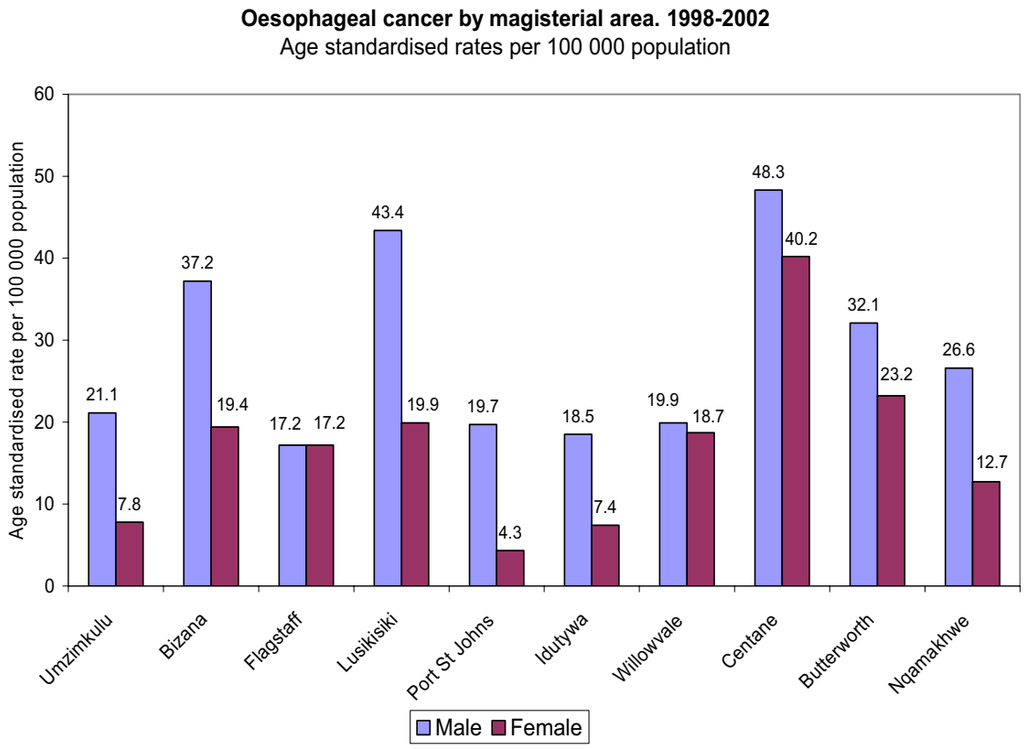



**Figure 8: Oesophagus cancer age standardised rates (per 100 000 population) by magisterial area, 1998-2002**

**Cervical and breast cancer**

Cervical cancer was the most common cancer among women, and about 3 times higher than breast cancer. A total of 552 cases (33.6%) were observed during this period out of which 406 cases (73.6%) had histological confirmation of the diagnosis. Of these cases 322 (79.3%) were squamous cell carcinoma, and 3.6% adenocarcinomas; 7.4% had a non-specific histological diagnosis (e.g. carcinoma NOS). The age specific incidence rates for cancer of the cervix and cancer of the breast are shown in Figure 9.

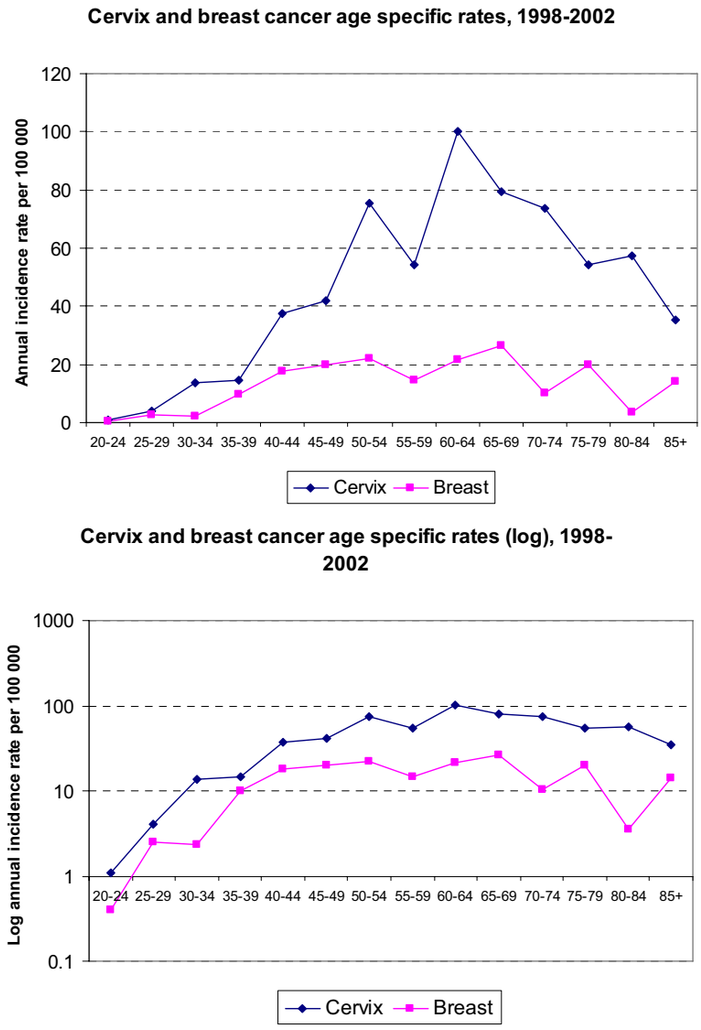



**Figure 9: Annual age specific rates (per 100 000 population) for cervix and breast cancer, 1998-2002**

The ASR for cervix cancer ranged from about 10 to 30 per 100 000 population (Figure 10). The highest rates for cervical cancer was observed in Lusikisiki (29.6 per 100 000) and the second highest was in Flagstaff (26.4 per 100 000). The third and fourth highest rates were in Butterworth (22.6 per 100 000) and Idutywa (21.2 per 100 000), respectively. Almost the same rates were observed in Bizana (14.4 per 100 000) and Ngqamakhwe (14.2 per 100 000). The least rate was observed in Port St Johns (10.8 per 100 000).

The rates of breast cancer are much lower across all ages as can be seen in Figure 9. 186 (11.3%) cases were observed during this period of which 139 cases (74.7%) had histological confirmation of the diagnosis. Of these cases 112 (80.5%) were infiltrating ductal carcinomas, and 6 (4.3%) adenocarcinomas; 14 (10.1%) had a non-specific histological diagnosis (e.g. carcinoma NOS).

Breast cancer was the third most common cancer among women and the ASR varied from just over 15 to just under 3 per 100 000 population (Figure 10). The highest breast cancer rates in females were observed in Butterworth (15.2 per 100 000) followed by Lusikisiki (10.0 per 100 000). Centane (6.9 per 100 000) and Willowvale (6.4 per 100 000) had almost similar rates. The lowest rates were in Port St Johns (2.7 per 100 000).

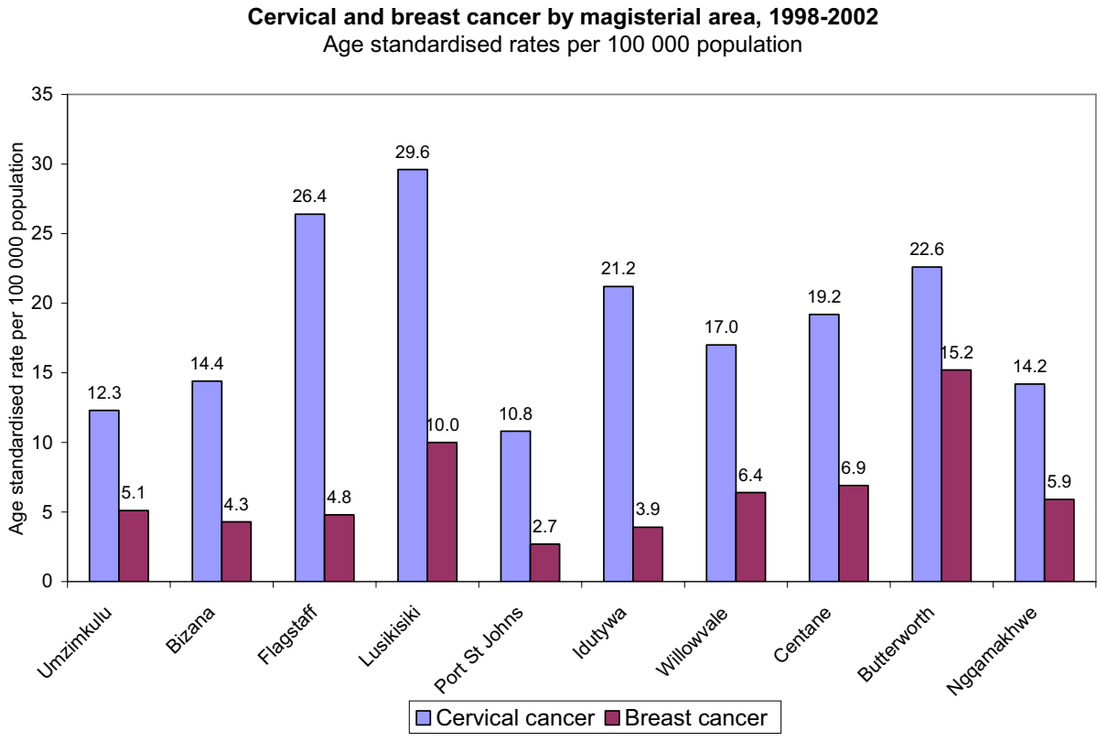



**Figure 10: Cervix and breast cancers age standardised rates (per 100 000 population) by magisterial area, 1998-2002**

**Lung cancer**

Lung cancer is more common in males than in females across the region. A total of 112 male and female cases both males and females were observed during this period of which 88 cases (78.5%) had histological confirmation of the diagnosis. Of these cases 32 (36.4%) were squamous cell carcinomas, and 16 (18.1%) adenocarcinomas; 12 (18.1%) had a non-specific histological diagnosis (e.g. carcinoma NOS).

The age specific incidence rates per 100 000 population for lung cancer are shown in Figure 11.

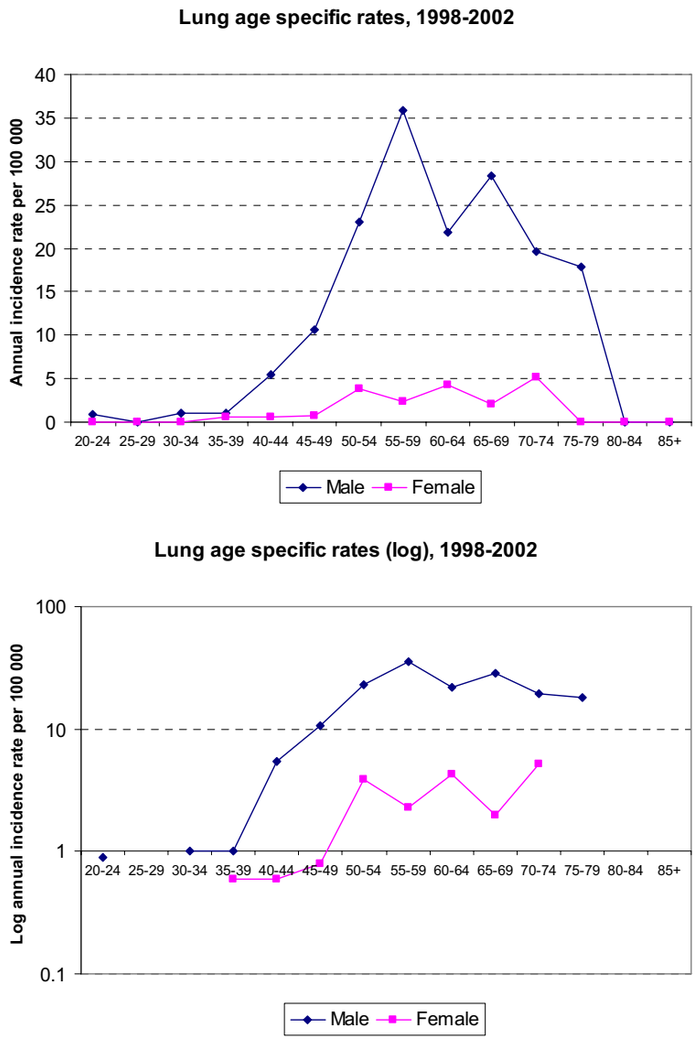



**Figure 11: Annual age specific rates (per 100 000 population) for lung cancer by sex, 1998-2002**

The highest incidence rates in men were observed in Bizana (9.6 per 100 000) followed by Butterworth (8.7 per 100 000) and Ngqamakhwe (8.0 per 100 000). Figure 12 shows that the lowest rates were observed in Willowvale (3.4 per 100 000). The highest rates in females were recorded in Butterworth (2.3 per 100 000). The lowest rates observed ranged between 0.2 per 100 000 (Lusikisiki) and 1.2 (Ngqamakhwe) per 100 000. Flagstaff had no cases.

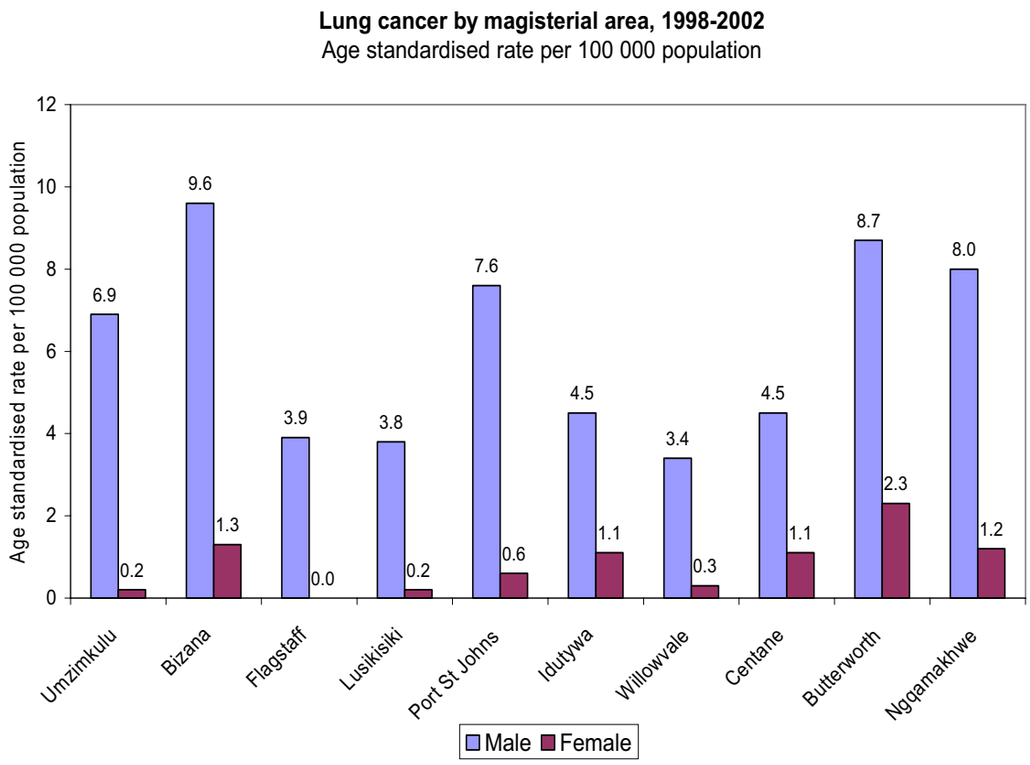



**Figure 12: Lung cancer age standardised rates (per 100 000 population) by magisterial area, 1998-2002**

**Prostate cancer**

The incidence of prostate cancer increases steadily with age from very low rates below 50 years of age (Figure 13). Out of the 81 cases observed during this period, 22 cases (25%) had histological confirmation of the diagnosis.

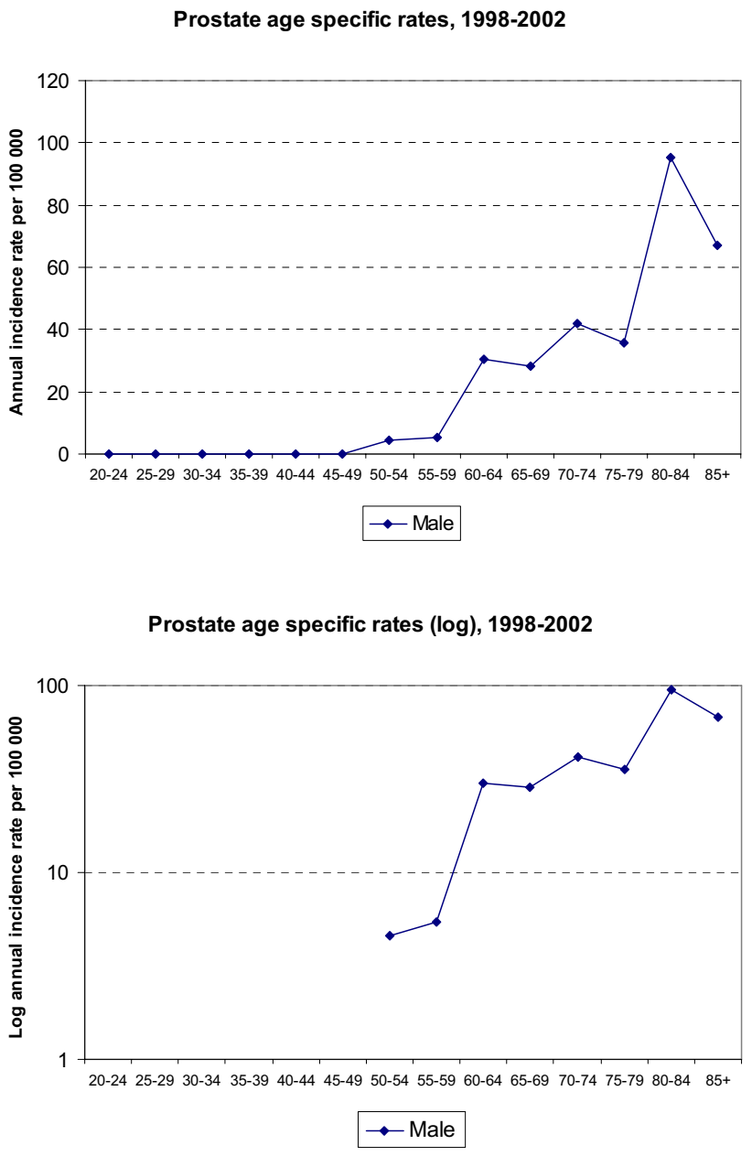



**Figure 13: Annual age specific rates (per 100 000 population) for prostate cancer by sex, 1998-2002**

Prostate cancer had generally, very low incidence rates across the region (Figure 14). The lowest rates were observed in the northern region with the exception of Port St Johns (6.0 per 100 000) which rated the second highest. Prostate cancer was the third most common cancer in males with the highest incidence rates observed in Butterworth (14.6 per 100 000) Ngqamakhwe and Centane had almost the same rates (5.6 and 5.4, respectively. The lowest rates were observed in Flagstaff.

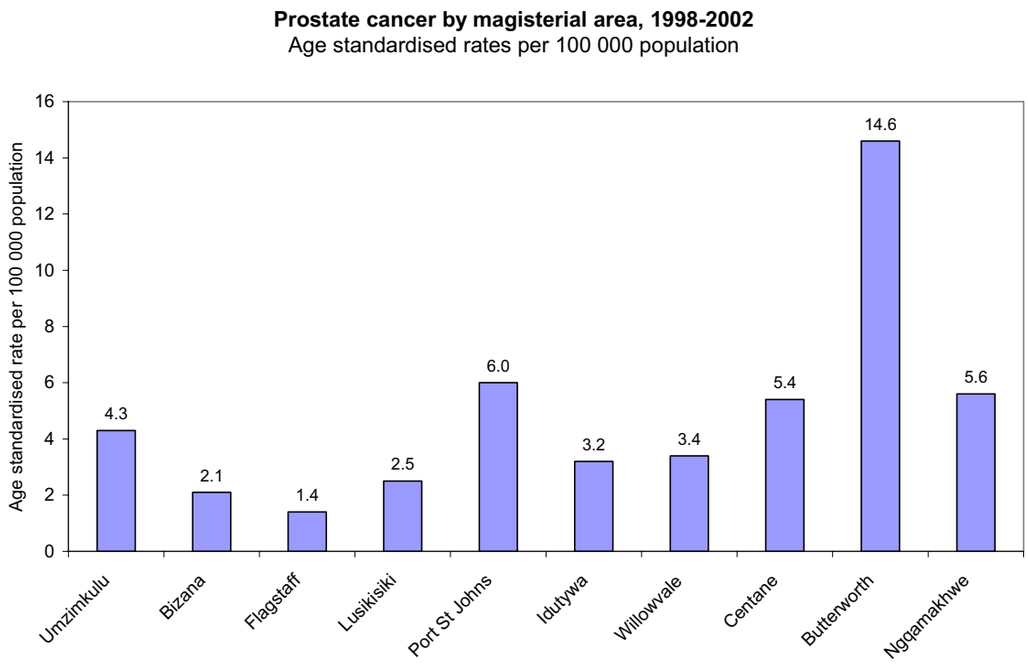
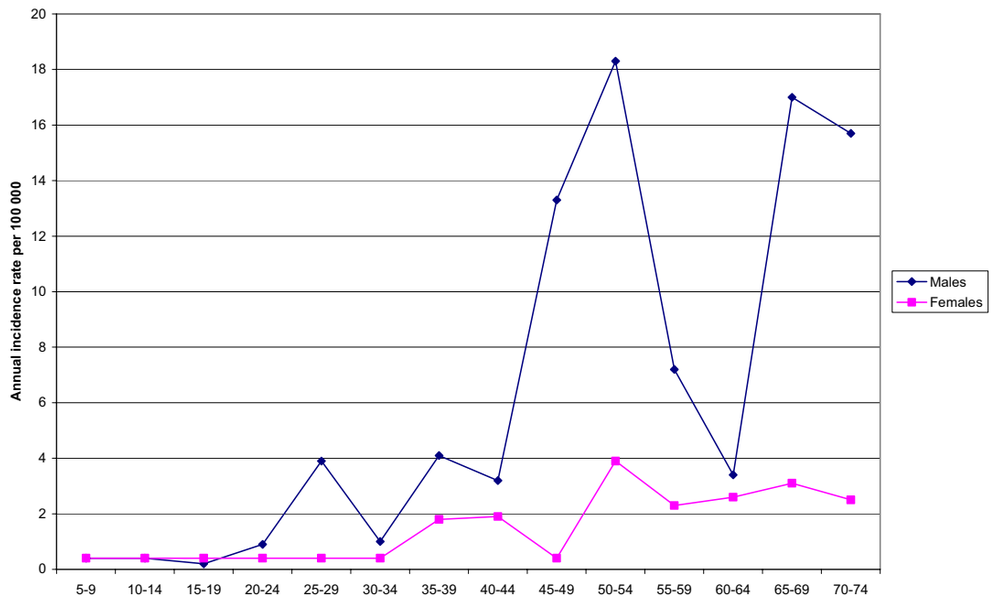



**Figure 14: Prostate cancer age standardised rates (per 100 000 population) by magisterial area, 1998-2002**

**Liver cancer**

Liver cancer was observed in 68 males and 23 females during this period, accounting for 5.7% of male cancers and 1.4% of female cancers. Only 7.4% and 8.7% of liver cancer cases for males and females respectively, had histological confirmation of the diagnosis. Histological confirmation is generally low for liver cancer because clinicians may not be keen to do biopsies at an advanced stage of the disease as no treatment is available. The alpha fetoprotein (AFP) test is the commonly used method of diagnosis. Figure 15 shows that the liver cancer incidence increases with age. The highest incidence was observed at age 50-54 in both males and female. However, the age pattern is a little erratic as a result of the relatively small numbers of cases.

**Liver age specific rates, 1998-2002**




**Liver age specific rates (log), 1998-2002**

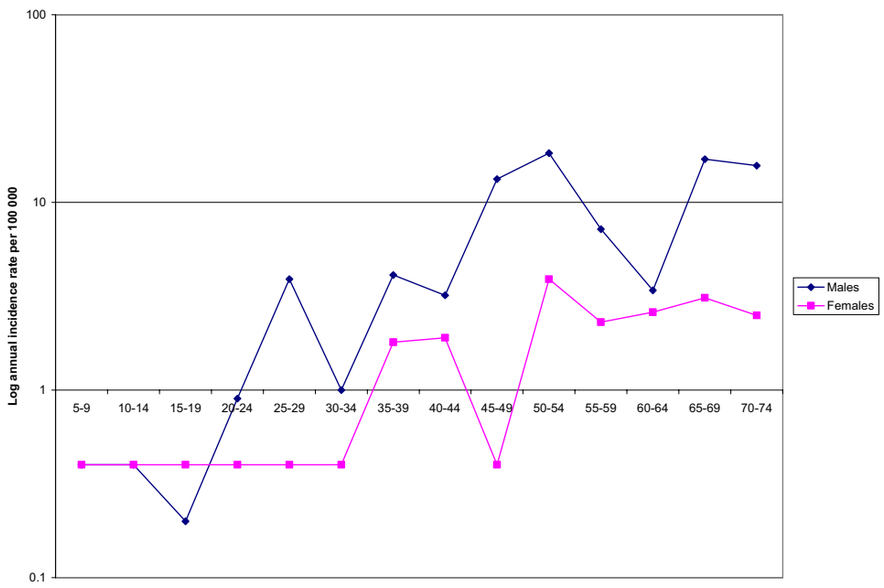



**Figure 15: Annual age specific rates (per 100 000 population) for liver cancer by sex, 1998-2002**

The overall ASR for liver cancer in males was 4.2 per 100 000 whereas in females it was 0.8 per 100 000. The ASR for liver cancer by magisterial area are shown in

Figure 15. In males, the highest rate was observed in Lusikisiki (7.8 per 100 000). Second highest rates were in Centane (5.3 per 100 000), followed by Bizana and Port St Johns (both with 4.9 per 100 000). The lowest rates were observed in Idutywa (1.0 per 100 000). Highest rates in females were observed in Ngqamakhwe (1.9 per 100 000) followed by Bizana and Willowvale (both with 1.4 per 100 000). No cases were observed in four magisterial areas which included Butterworth, Centane, Idutywa and Umzimkhulu.

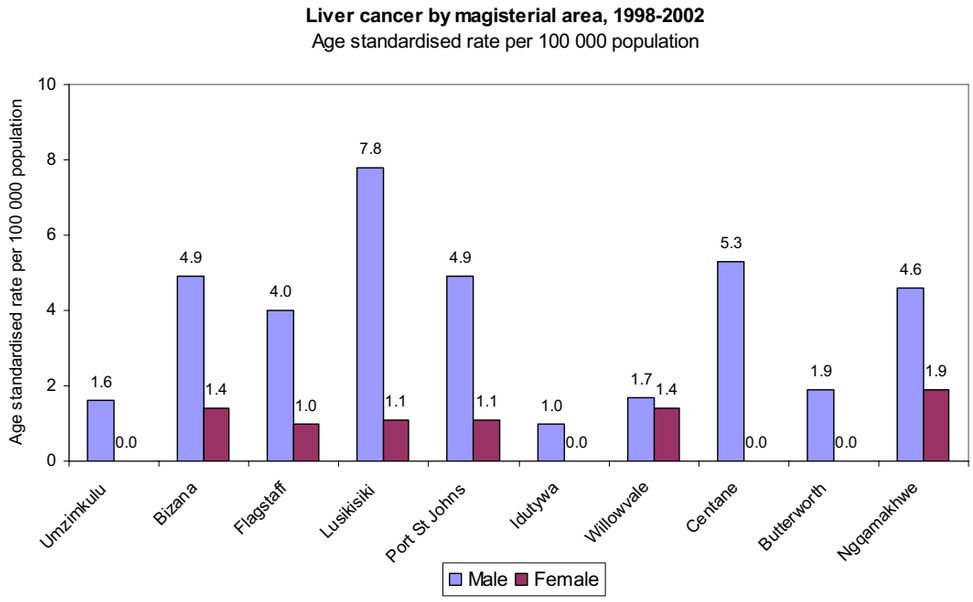



**Figure 16: Liver cancer age standardised rates per 100 000 by magisterial area, 1998-2002**

**Kaposi sarcoma**

In many regions of the world, especially in Africa the incidence of Kaposi sarcoma has increased with the spread of the epidemic of HIV/AIDS. Thus, although, it was not a leading cancer site, given the rapid spread of HIV in South Africa, it is important to monitor this cancer. More cases of Kaposi sarcoma were reported in males. Figure 17 shows that Bizana had the highest rates (3.3 per 100 000) followed by Lusikisiki and Flagstaff with almost similar rates: 2.2 per 100 000 and 2.0 per 100 000, respectively. In the southern region rates were quite low with the highest observed in Idutywa (1.6 per 100 0000 for males) and females (0.5 per 100 000 for females). This was followed by Butterworth and Ngqamakhwe with almost similar rates: 1.1 per 100 000 and 1.0 per 100 000, respectively for males while no female cases were reported. Willowvale and Centane had no cases for either males or females.

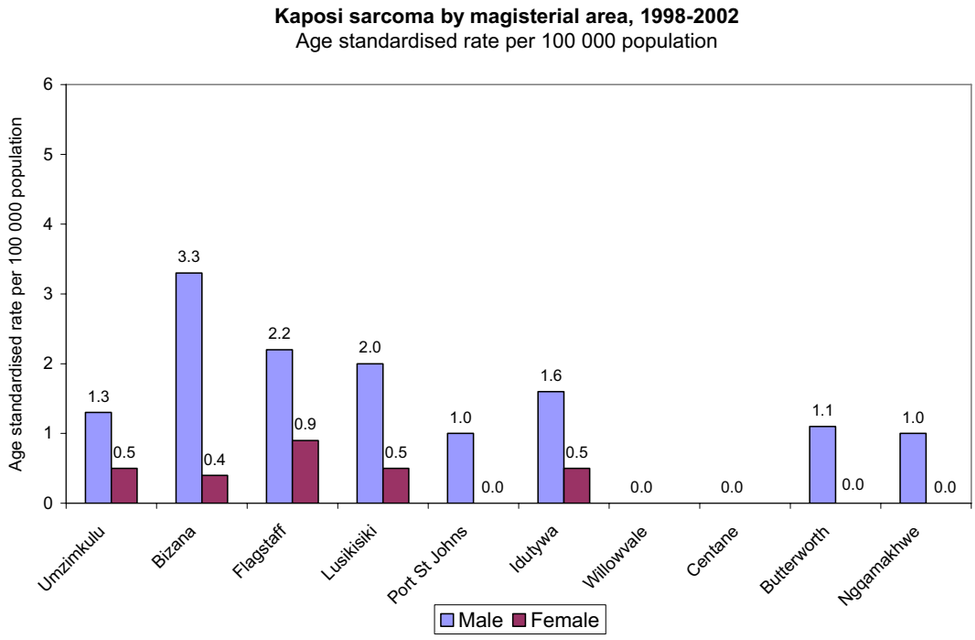
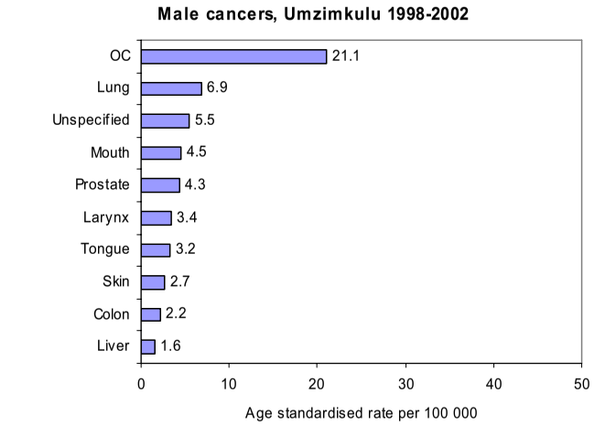


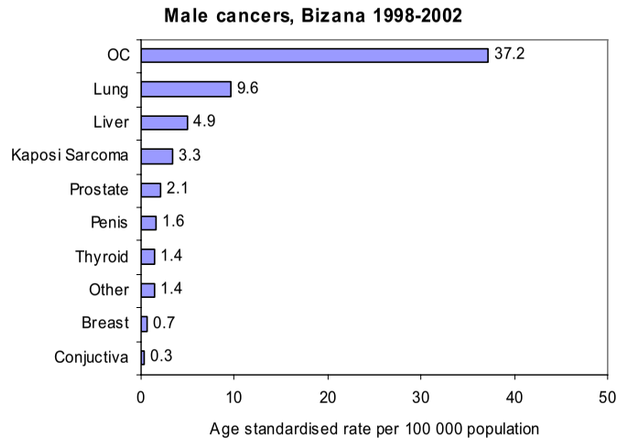

**Figure 17: Kaposi sarcoma cancer age standardised rates (per 100 000 population) by magisterial area, 1998-2002**

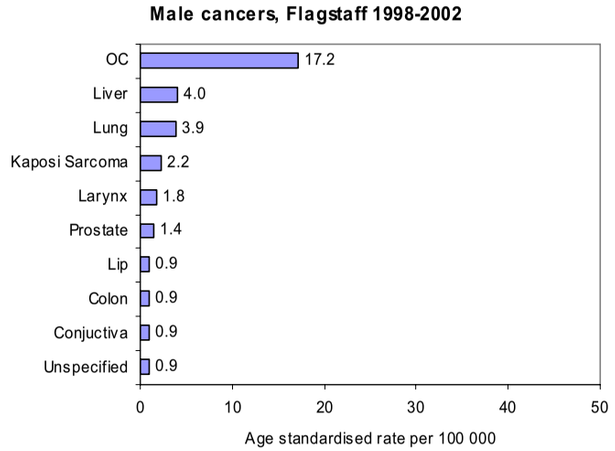
**Cancer profile by magisterial area**

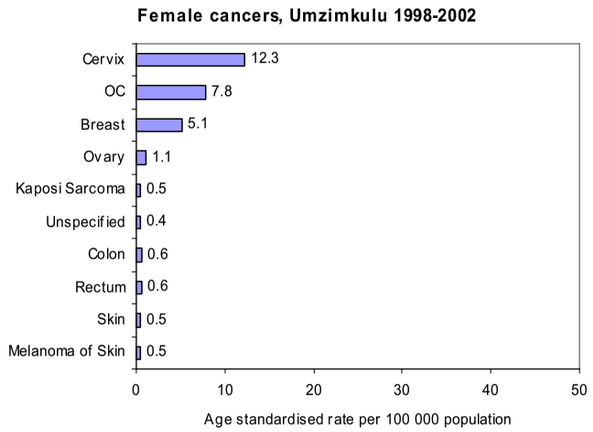
The graphs in Figures 18 and 19 show the top 10 cancers for each magisterial area by sex. All areas show the predominance of oesophagus cancer and additionally cervical cancer in women.

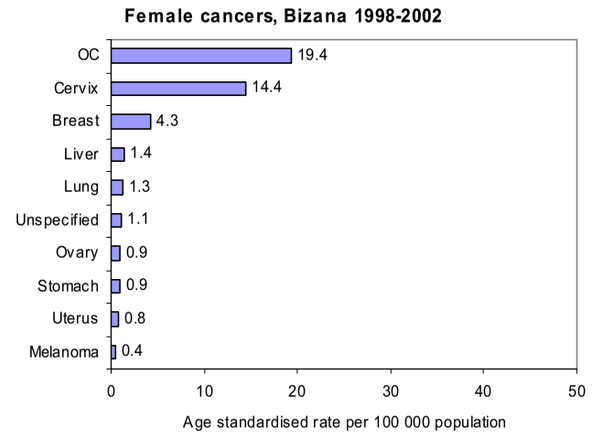
**Umzimkhulu** (Umzimkhulu) **Mbizana** (Bizana) **Tabankulu** (Flagstaff)



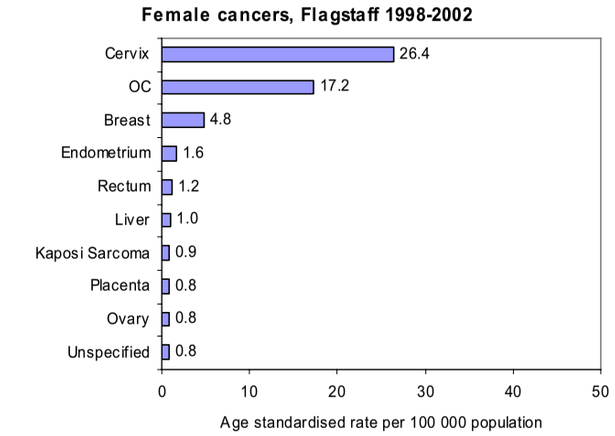




**Figure 18a: Leading cancers annual age standardised rates (per 100 000 population) by magisterial area and sex, Northern region 1998-2002**

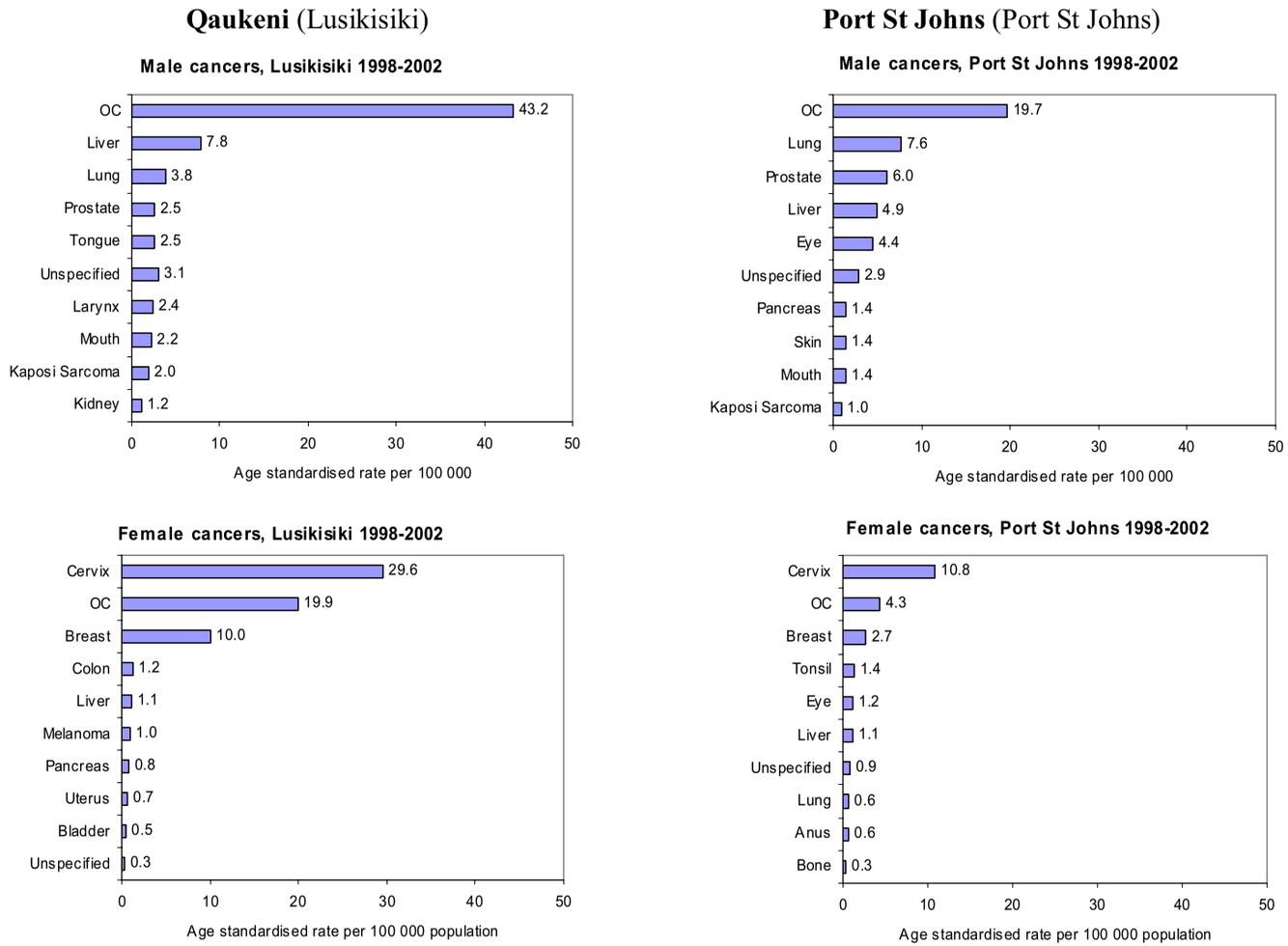
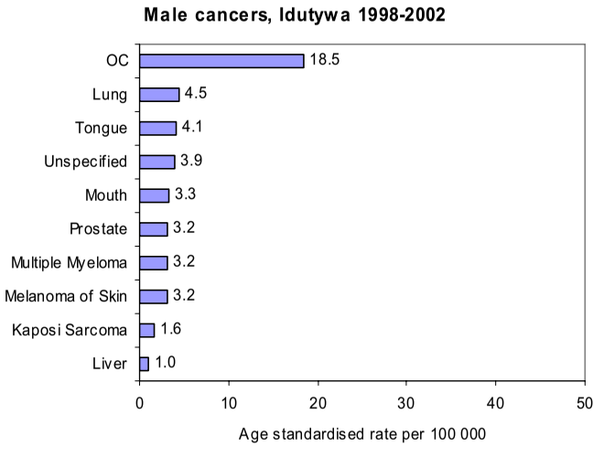
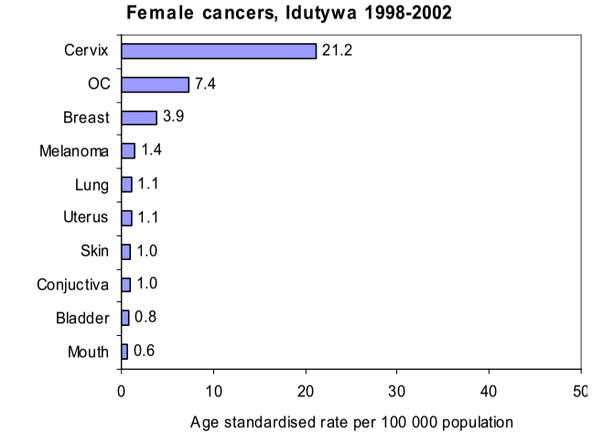


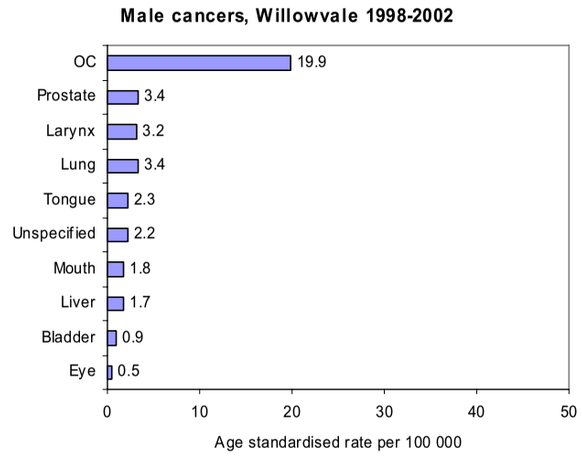

**Figure 18: Leading cancers annual age standardised rates (per 100 000 population) by magisterial area and sex, Northern region 1998-2002**

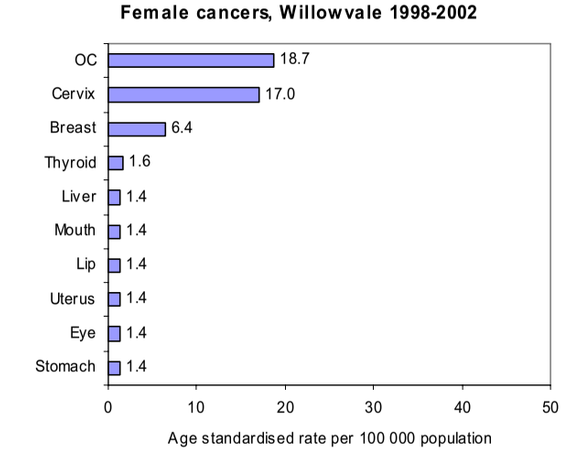
**Mbashe** (Idutywa)



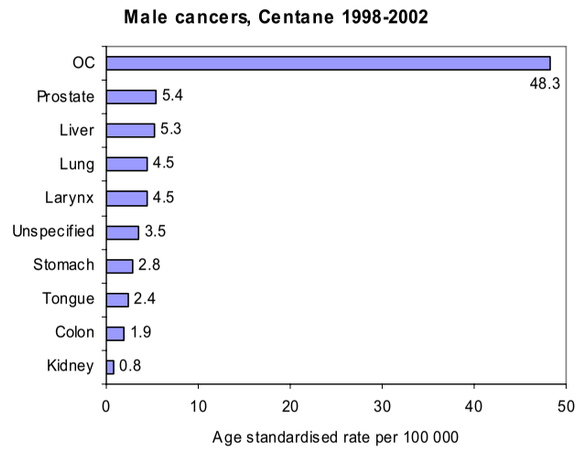




**Mbashe** (Willowvale)




**Mbashe** (Centane)



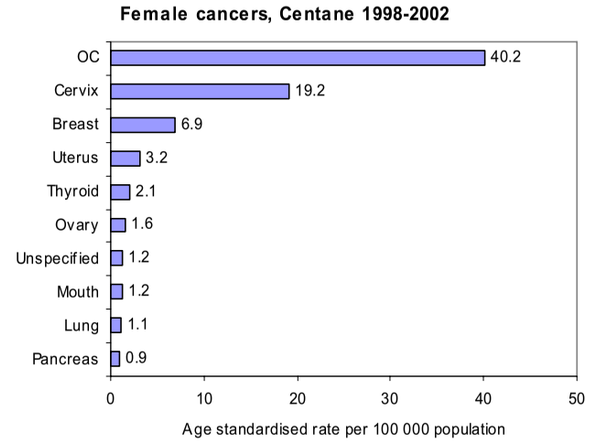
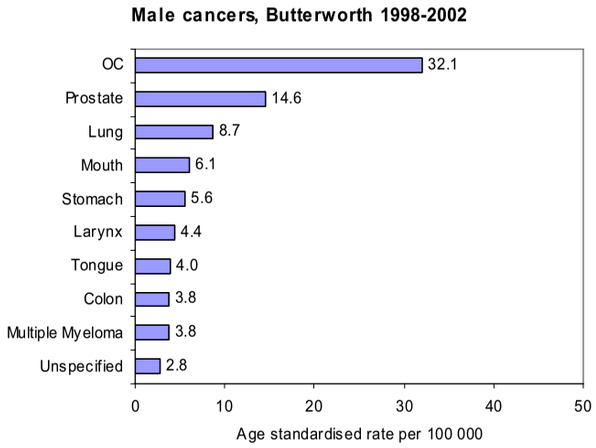
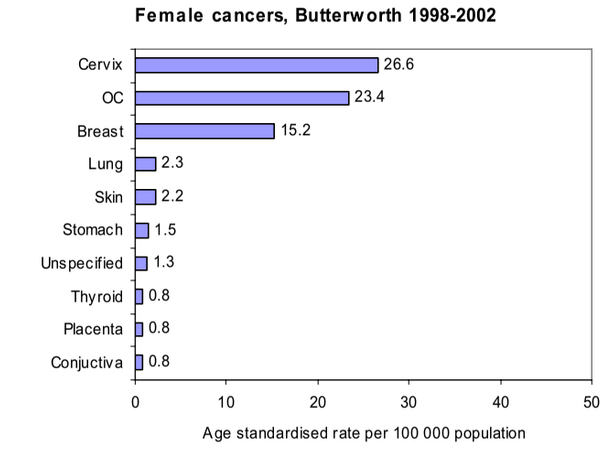



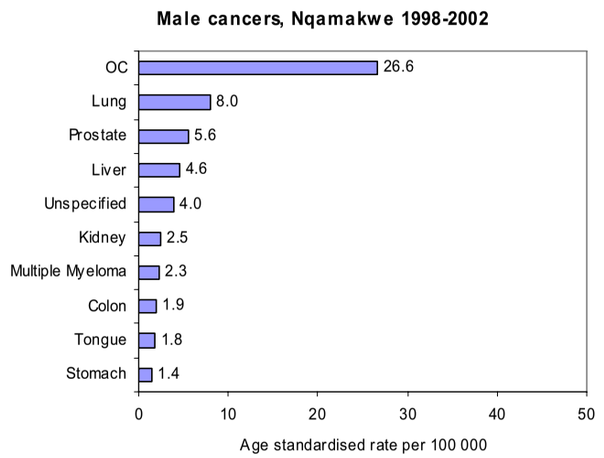

**Figure 18b: Leading cancers annual age standardised rates (per 100 000 population) by magisterial area and sex, Southern region 1998-2002**

**Mnquma** (Butterworth)




**Mnquma** (Nqamakwe)



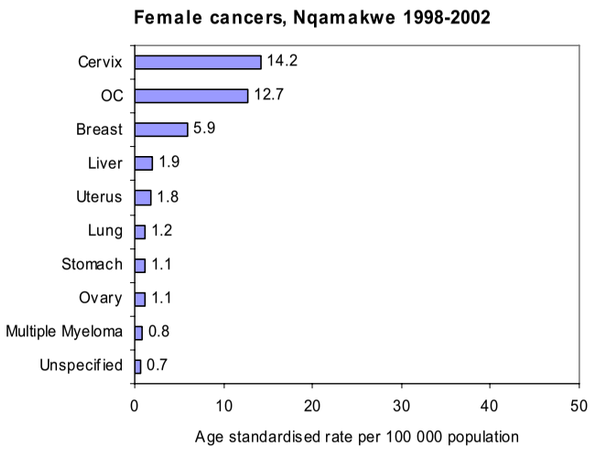




**Figure 18: Leading cancers annual age standardised rates (per 100 000 population) by magisterial area and sex, Southern region 1998-2002**

**Childhood cancers**

Childhood cases (<15 years) accounted for 2.8% (79 cases) of the total cancers during the 1998-2002 period. There has been a considerable increase on cases reported when compared with the previous report (Somdyala, *et al*., 2003). This likely indicates an improvement on childhood cancers reporting which is the result of the extension of networks that included the Western Cape Paediatric Oncology Registry as well as co-operation received from health professionals in addressing technical problems that were experienced regarding record keeping.

The most common childhood cancers observed were brain tumors, nephroblastoma, leukemia, retinoblastoma and neuroblastoma. Other cancers included lymphoma, osteosarcoma and hepatoblastoma. The number for each site is shown in Table 7. Cancers with genetic predisposition, retinoblastoma and nephroblastoma, when combined constitute 32.9% of the total. Cases are spread across the region except for nephroblastoma where 50% of cases were recorded in Butterworth. Genetic counsellingand support becomes very important to families from which these children come.

**Table 7: Cancers aged 0-14 years for males and females, 1998-2002**

| Cancer | Males | Females | Total cancers |
|---|---|---|---|
| Brain tumours | 6 | 9 | 15 |
| Nephroblastoma | 12 | 3 | 15 |
| Leukemia | 9 | 5 | 14 |
| Retinoblastoma | 3 | 8 | 11 |
| Neuroblastoma | 4 | 6 | 10 |
| Other + unspecified | 8 | 6 | 14 |
| **Total** | **42** | **37** | **79** |

Bizana and Butterworth had the highest number of childhood cancers both boys and girls (Figure 19).

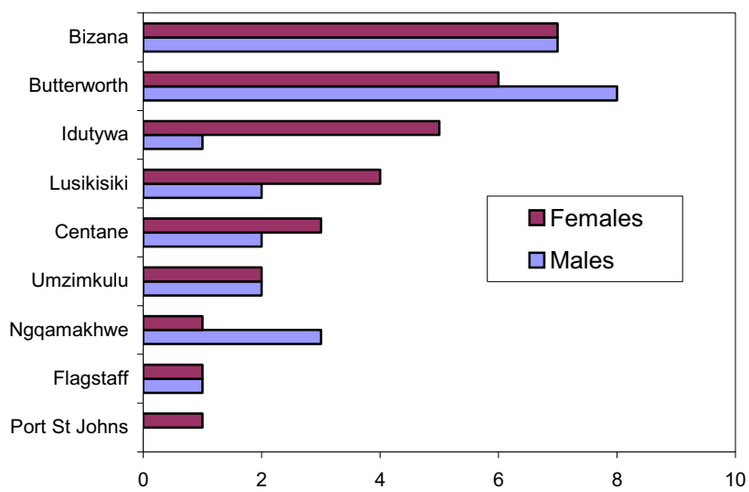



**Figure 19: Number of incident cases 0-14 years per magisterial area by sex, 1998-2002**

## Comparison with selected countries

As has been observed previously, the most common cancers reported in the former Transkei region are of the oesophagus, cervix, lung, prostate and liver (Somdyala *et al*., 2003). OC accounted for 41.8% and 31.3 % of the total cancers reported during the 1998-2002 period for males and females, respectively (Tables 1 and 2 of Appendix IV). OC was the most common cancer across the region in both males and female with rates ranging between 48.3 per 100 000 and 4.3 per 100 000. From Figure 20 it can be seen that the ASR for OC in this region (31.3 per 100 000 males and 18.0 per 100 000 females) is much higher than the national average when compared with those reported by the National Cancer Registry (NCR) during the period 1998-1999 (Mqoqi *et al*., 2004) (11.3 per 100 000 males and 4 per 100 000 females). The OC incidence rates are also higher than observed in other parts of Africa. In Zimbabwe, OC was also amongst the most common cancers (Parkin *et al*., 2002) with the ASRs of 19.3 per 100 000 males and 8.8 per 100 000 females. Other OC hotspots in the world are Iran, China and amongst Black Americans (Parkin *et al*., 1997). Smoking, alcohol consumption, dietary deficiencies and fungal toxins are some of the risk factors that have been found to be associated with the development of OC (Pacella-Norman *et al.,* 2002 and Marasas *et al.,* 1988). Nutritional deficiencies are suspected as being a major influence on the high risk in central Asia and parts of China, and this is probably an important factor underlying the high incidence in East and South-East Africa. The large sex difference may be related to the large differences in smoking (and in a lesser extent, alcohol drinking) between men and women.

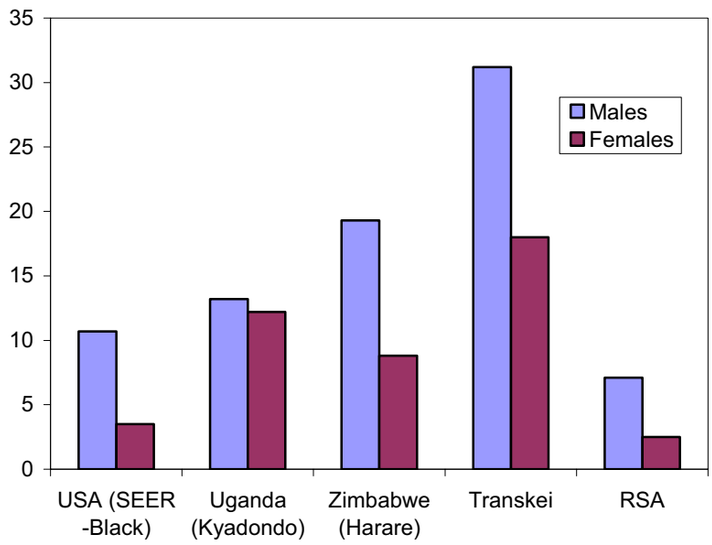



**Figure 20: Oesophagus cancer age standardised rates (per 100 000 population) for selected countries**

Source: Parkin *et al.,* 2002 and Mqoqi *et al.,* 2004

Cervical cancer accounted for 33.6% of the total cancers reported during the period 1998-2002 (Table 2 pf Appendix IV). This cancer ranked second with an ASR of 20.2 per 100 000 whereas globally, it is estimated to rank the seventh (Parkin *et al*., 1999). Cervical cancer is one of the most common cancers in developing countries such as India, Brazil and African countries (Sitas *et al*., 1998). Cervical cancer incidence rates were above 10 per 100 000 across the region. In South Africa, the incidence rates are very high in black females when compared with white females (Sitas *et al*., 1998 and Mqoqi *et al*., 2004). From Figure 21 it can be seen that although it is the most common cancer among women, the incidence in this region is lower than many other settings. This

may reflect a lower incidence in a more rural area. However, it may also reflect a lower detection rate.

Early detection is important as this cancer has a potential to be cured when diagnosed early especially in a pre-invasive phase. This can be achieved by screening, but earlier detection of cancers producing symptoms, especially in the rural setup with limited resources cannot be over-emphasized as a valuable alternative.

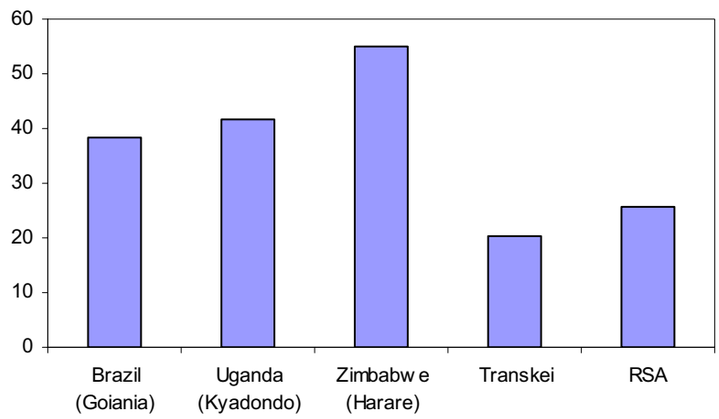



**Figure 21: Cervical cancer age standardised rates (per 100 000 population) females for selected countries**

Source: Parkin *et al*., 2002 and Mqoqi *et al*., 2004

Breast cancer accounted for 11.3% of cancers during 1998-2002 in this region. The rates peak as early as age group 40-44 and remain at a similar level across older ages (Table 4 of Appendix IV) whereas in the NCR the rates peak from age 55 and above (Mqoqi *et, al*., 2004). This may indicate an increasing trend in breast cancer among younger women. A relatively high number of cases were reported even as early as age 35-39. The overall incidence rates of 7.1 per 100 000 was quite low when compared with those of the NCR; black females (13.2 per 100 000) and elsewhere in the world (Figure 22). This is one of the less common cancers in black females in South Africa though black American females have very high incidence rates (Sitas *et al*., 1998).

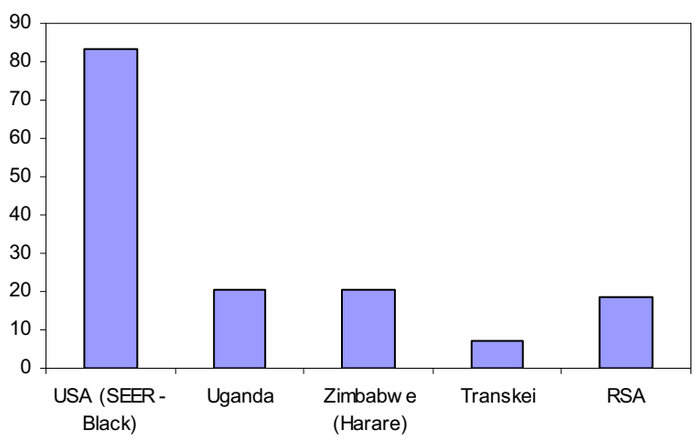



**Figure 22: Breast cancer age standardised rates (per 100 000 population) for selected countries**

Source: Parkin *et al.,* 2002 and Mqoqi *et al*., 2004

Lung cancer accounted for 7.8% for men and 1.2% for female of all cancers. Figure 23 shows that the lung cancer rates in this region were low when compared with South Africa (blacks) (15.2 per 100 000 in males and 13.6 per 100 000 in females as reported by the NCR (Mqoqi *et al*., 2004). Even Bizana which had the highest lung cancer rate (9.6 per 100 000 for males) was lower than the national average. World incidence rates are very high especially in the United Kingdom (69.7 per 100 000) (Parkin *et al.*, 2002). Moderately high incidence rates have been observed in some African settings such as Harare in Zimbabwe (17.4 per 100 000) (Ferlay *et al*., 2000). However, in registries in West African countries such as Mali (2.7 per 100 000) and Uganda (3.9 per 100 000), lung cancer incidence rates are also very low (Parkin *et al.*, 2002). Lung cancer is caused by tobacco smoking. Although the prevalence of smoking among South African men is rather higher, the amount of tobacco consumed per person, particularly in the black community, is considerably lower than in other countries with the highest lung cancer rates (Mqoqi *et al*., 2004). The marked difference in the rates in men and women is consistent with the much lower smoking rates among women. However, other known causes of lung cancer include domestic and industrial pollution. There is evidence that both of these contribute to lung cancer incidence in South Africa (Wyndham *et al.,* 1986, Mzileni *et al.,* 1999 and Pacella-Norman *et al.,* 2002*).* Indoor smoke is likely to play a role in this area.

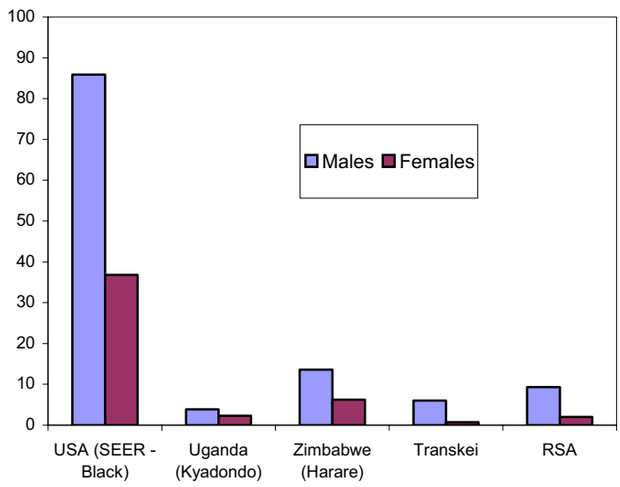



**Figure 23: Lung cancer age standardised rates (per 100 000 population) for selected countries**

Source: Parkin *et al.,* 2002 and Mqoqi, *et al.,* 2004

Cancer profile of this region differs significantly from other areas of Africa in that there is a very low incidence of liver cancer. Liver cancer in males accounted for 5.7% of all cancers, four times more than in females in whom it only provided just 1.4 % of the total. Parkin *et al.* (2002) report very high incidence rates of liver cancer in other countries in Africa such as Gambia (48.9, per 100 000) and Zimbabwe (27.9 per 100 000) and internationally in Thailand (88.0 per 100 000). As can be seen from Figure 25, the very low liver incidence cancer is also observed by the NCR for the whole of South Africa (Mqoqi *et al.,* 2004). Liver cancer is typically a problem of developing countries and it is unclear whether detection rates are systematically low or whether there is a very low incidence of this cancer in South Africa. Like other cancers, several factors are responsible for the induction of liver (hepatocellular) cancer amongst which are alcohol induced cirrhosis, hepatitis B and C viruses and the mycotoxin aflatoxin B (Sitas and Norman, 1995). The sex difference observed in the incidence in this area would be consistent with differences in alcohol consumption.

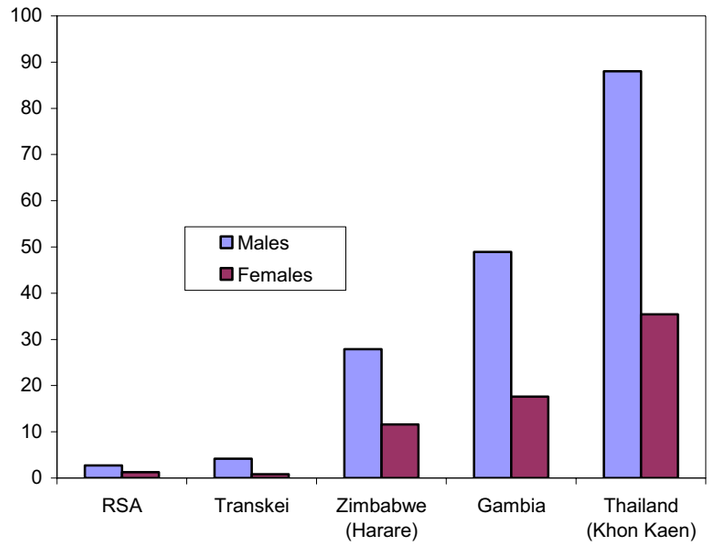



**Figure 24: Liver cancer age standardised rates (per 100 000 population) for selected countries**
Source: Parkin *et al.,* 2002 and Mqoqi *et al.,* 2004

Prostate cancer accounted for 6.8% of cancers in this region with overall ASR of 4.5 per 100 000. It was the second most common cancer in the southern region with highest incidence in Butterworth (14.6 per 100 000). However, as can be seen from Figure 26, the incidence in this region was also very low when compared to the national rate and other registries. Prostate cancer is one of the leading cancers for men worldwide. The risk factors appear to be related to dietary factors such as a high intake of fat, meat and eggs, as well as a genetic disposition. Fruit and vegetables appear to be protective (Parkin *et al.*, 2003).

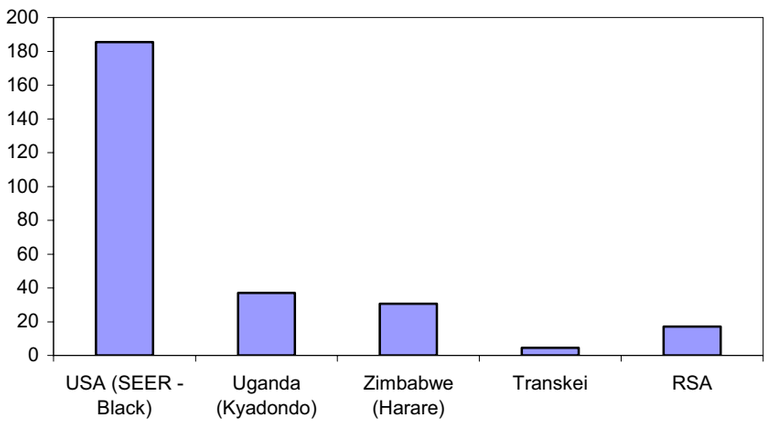



**Figure 25: Prostate cancer age standardised rates (per 100 000 population) for selected countries**
Source: Parkin *et al.,* 2002 and Mqoqi *et al*., 2004

Kaposi sarcoma has been associated with Acquired Immune Deficiency Syndrome (AIDS), particularly in the epidemics experienced in developed countries. It is therefore important to monitor this cancer in the context of the AIDS epidemic in Africa. In the former Transkei, Kaposi sarcoma accounted for 2.2% in males whereas in females 0.5% of the total cancers reported during 1998-2002 period. The ASR per 100 000 of 1.6 in males and 0.3 in females were very low when

compared with other countries in sub-Saharan Africa (Zimbabwe 50.8 and 20.3 per 100 000 males and females, respectively and Uganda 37.9 and 20.4 per 100 000 males and females, respectively). Similarly low rates are reported by the national cancer register (Figure 26). Given the high prevalence of Human immunodeficiency virus (HIV) in the region (Department of Health, 2006), these incidence rates are surprisingly low. It probably reflects low prevalence of infection by the virus that is now considered to be the causative agent of Kaposi sarcoma Human Herpes Virus 8, HHV-8, although there is no research on this so far.

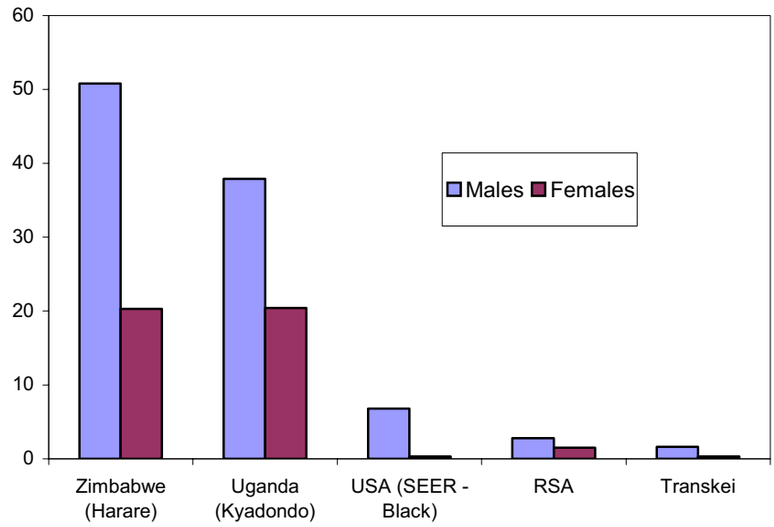



**Figure 26: Kaposi sarcoma age standardised rates (per 100 000 population) for selected countries**

Source**:** Parkin *et al.,* 2002 and Mqoqi *et al*., 2004

## Challenges of the registry

Establishing and running a PBCR is challenging in a resource poor and rural setting. Not only does it depend on a reliable system to capture and process all the cancer cases that occur in the area, it is also highly dependent on the clinical capacity and health service infrastructure on the one hand and the individual health care seeking behaviours of the community on the other. It is further complicated by the underlying migration patterns and how these relate to health services which may be better resourced in urban areas.

The registry has strived to achieve the best under these limiting factors in a rural setting. It is difficult to estimate how many cancer cases the registry misses, and no formal evaluation has been undertaken to date, which makes it important to review the challenges faced by the register and identify the possible sources of bias in the data that have been collected so that they may be interpreted in a meaningful way. It is also important to identify the challenges that need to be met so as to ensure that the registry can be a reliable resource to investigate the unique epidemiological trends in a rural setting in South Africa.

Compared to earlier years, both the active and passive surveillance for cancer cases in the region have been strengthened. Collaborative networks within health facilities inside and outside the registration area were developed to maximize the completeness of registration and ensure the quality of data. The network for capturing child cancers has also been strengthened, including links with Western Cape Paediatric Oncology Registry. Bi-annual visits to the facilities in the area have established a well-functioning registration process. However, there are concerns that nearly half of the cases are not histologically confirmed and it is necessary to investigate whether this reflects the low rates on laboratory confirmation in the area or whether laboratory records are under-recorded. The registry results for haematological malignancies and lymphomas are particularly low and require further investigation. The cancer register is integrally dependent on the capacity and stability of the health service in the region. The Eastern Cape Department of Health has confronted a range of challenges in providing health services in the province, particularly in rural areas. The recent District Health Barometer highlights that the Oliver Tambo Health District, in which the cancer register is largely based, is amongst the least resourced districts in the country and that many of the primary health care indicators rank amongst the lowest in the country (Barron *et al*., 2006). Furthermore, several hospitals in the registration area during this period were undergoing refurbishment with some being extended. This resulted in difficulties in retrieving old records when making a follow-up to queries. This was a particular problem during the years 1999 and 2000 and resulted in an overall lower number of cases being reported for these years.

Cancer registration is also dependent on the health seeking behaviour of individuals and it is probable that some people with cancer do not seek care from the health services. In particular, elderly people in the rural areas sometimes prefer traditional healers to western medicine. In some instances, the patient may eventually seek care at a health facility but they may die at home without attending a health facility. In such a case their cancer will not be included in the register as death certificates are not yet linked to the register. Furthermore, a death certificate might not be completed as death registration in rural areas is not complete.

The complex migratory patterns in South Africa also come into play. While cancer patients who are referred from the area to tertiary hospitals are likely to be included but people who have moved to urban areas specifically to access health services may indicate an urban based address when they attend these facilities and might not be picked up. The population structure reflects the fact that people of working age, particularly men are absent. It is not clear what impact this has on the incidence rates observed in the area.

## Conclusion and Recommendations

The PROMEC Cancer Registry is providing important information regarding the cancer incidence in a rural setting at a time when the cancer burden may be increasing in South Africa due to improved socio-economic status for many South Africans resulting in an increase in the behaviours and risk factors for chronic diseases such as cancer, as well as increased longevity and thus prolonged exposure to these risk factors (Steyn *et al.,* 2006). In the year 2000, cancer accounted for 7% of deaths (Bradshaw *et al*., 2003 and 2004). While the cancer burden is lower in a rural setting, it is important to monitor the trends as the health transition is underway.

Common cancers (oesophagus, cervix, lung, prostate, breast and liver) reported in the former Transkei region are preventable or potentially curable if diagnosed early. According to Mackay *et al*., 2006 research has demonstrated the possibility of reducing cancer burden by modifying risk factors such as tobacco use, unhealthy diet, infectious agents, ultra violet radiation, physical inactivity, alcohol use, occupational exposures, environmental pollution, obesity, food contaminants and ionizing radiation. However, dissemination of such information to enable the community to reduce their risk of developing cancer remains a challenge.

The Non-communicable Diseases Directorate of the Department of Health and CANSA in collaboration with the MRC are already engaged in raising public awareness about cancer and its risks, the importance of prevention and screening for cancers such as cervix, breast and prostate. There is a need to strengthen these initiatives with particular focus on the aspects that can be changed. Clear messages need to be disseminated around:

- **Diet:** one can reduce his/her risk to cancer by as much as 30% to 40% by making more healthful food choices. In fact some foods can help protect against certain types of cancer and promoting eating 5 fruit and vegetable servings a day is an important example.
- **Lifestyle:** starts with not smoking tobacco with specific emphasis to teachers (learners' role models), health professionals and parents (role models in the general community), maintain smoke free environment respecting the rights of non-smokers and maintaining a healthy weight through a balanced diet and physical activity.
- **Screening:** the earlier the cancer is diagnosed the better chances are that cancer can be cured, for example, cervical cancer.
- **Treatment:** compliance to treatment prolongs survival.

Reliable cancer data sources are essential to inform appropriate cancer control programmes. This calls for more population-based cancer registries to provide reliable information on cancer incidence in different settings. In a country such as South Africa with a diversity of cultures and living conditions, it would be useful to establish at least one population-based cancer registry in each province. However, as identified in this report, this registry needs further strengthening. Investigations are needed to assess the low rates of laboratory confirmation of cancer cases in the area, and the reasons for low incidence of haematological malignancies and lymphomas needs investigation. In addition, further analysis of the data that have been collected may provide insight into the required health service response. For example, it will be important to assess the stage at which cervical cancer cases are identified as survival is associated with early detection and treatment. A good foundation has been established and it is important that the register receives the support needed to meet its full potential.

In conclusion, the PROMEC Cancer Registry has expanded to cover a larger population and is developing as a functional population-based registry. It has an important role to play not only in the context of the community it represents but also for understanding the disease burden in the province and nationally. The register needs further strengthening but importantly, needs to be used to help

develop appropriate health services and identify intervention strategies. Appropriate dissemination of the findings from the register can play an important part in raising the awareness of the community around cancer prevention. The register indicates that oespohagus and cervix cancers remain the leading cancers in the region. Breast cancer in women and lung cancer, prostate and liver cancer in men are the next most common cancers in the area. The overall cancer rate was higher for males than females.

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