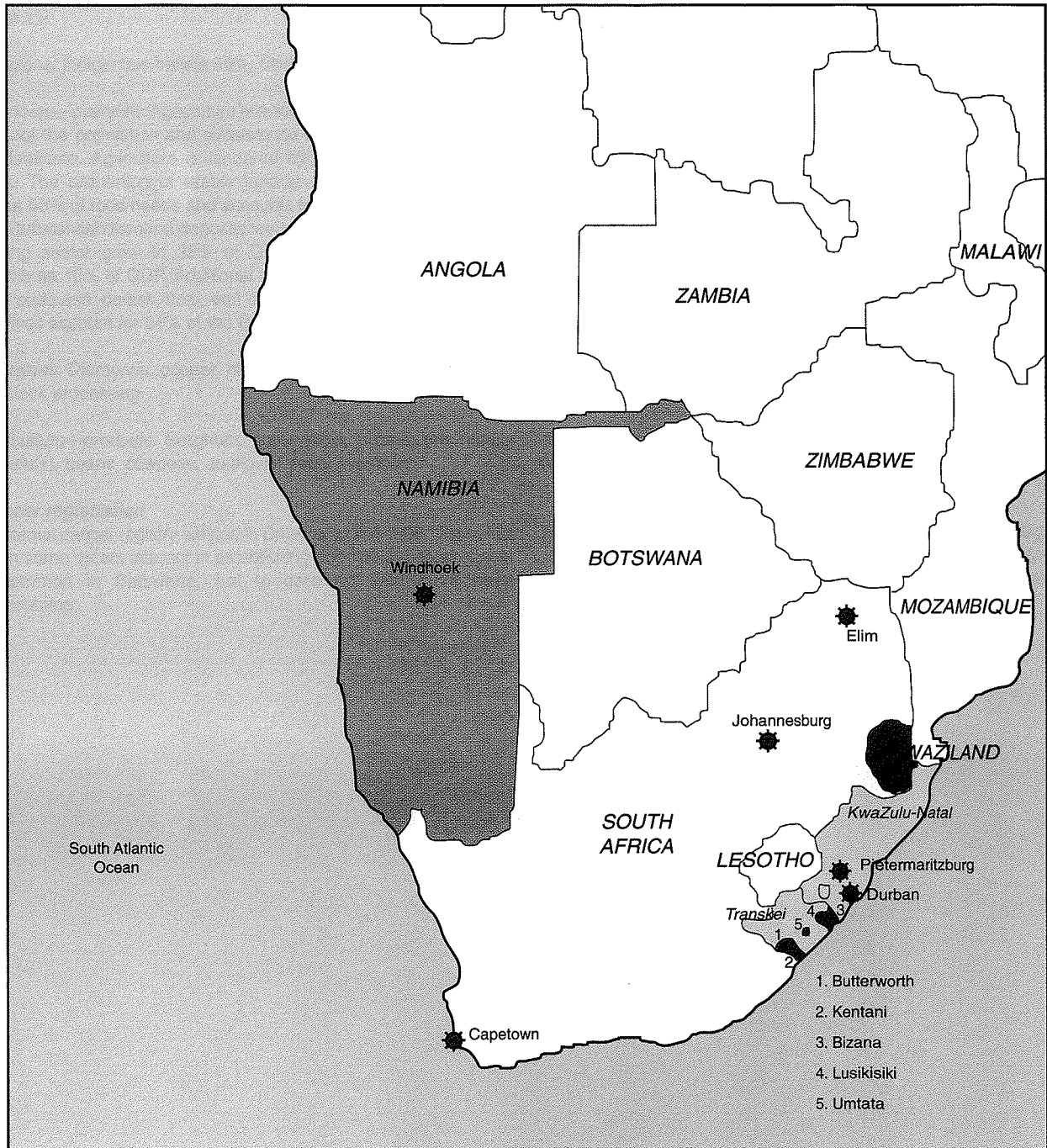


3.5 Southern Africa



3.5.1 Botswana

Background

Climate: Semi-arid with rainfall ranging from 63 cm in the north-east to 13 cm per year in the south-west.

Terrain: Predominantly flat to gently rolling. The Kalahari desert in the south-west is the largest land area. The lowest altitude is 513 m and the highest 1489 m.

Ethnic groups: Batswana (Bantu) 95%, Khoisan and other 4%, white 1%

Religions: Indigenous beliefs 50%, Christian 50%

Economy—overview: Agriculture provides a livelihood for more than 80% of the population and subsistence farming and cattle-raising predominate. Agriculture is hindered by erratic rainfall and poor soils. The proportion of arable land is 1%. Agriculture supplies about 50% of food needs and accounts for 4% of GDP.

Substantial diamond deposits were found in the 1970s and the mining sector grew to 35% of GDP in 1997. Other industries contribute 10% of GDP. Additional minerals include copper, nickel, salt, soda ash, potash, coal, iron ore and silver. Tourism and other services account for 51% of the GDP (1997 est.).

Industries: Diamonds, copper, nickel, coal, salt, soda ash, potash; livestock processing

Agriculture—products: Sorghum, corn, millet, pulses, groundnuts (peanuts), beans, cowpeas, sunflower seed; livestock

Cancer registration

No formal cancer registry existed in Botswana until 1999. There has been some recent interest in establishing population-based cancer registration in Botswana, but to date no data have been forthcoming.

Review of data

Macrae and Cook (1975) reviewed about 330 000 records of all 10 hospitals in Botswana between 1960 and 1972 and recorded 1445 patients admitted with a cancer. About 40% of the cases were confirmed by microscopy (Table 1). In men, the leading cancers were liver (comprising 16.5% of all male cancers), oesophagus (10.3%), non-melanoma skin cancers (8.1%) and prostate cancer (7.4%). In women, cervix cancer (35.4%) and breast cancer (11.4%) were dominant. Kaposi sarcoma was rare.

Numbers are small but certain contrasting patterns by area and ethnic group were observed; for instance oesophageal cancer was common in the Barolong tribe (5/9 cancers) but rare (1/45) in the Bamangwato tribe. Skin cancer appears more common in people from the Kalahari desert and penile cancers more common in Ngamiland. By contrast, cancer of the cervix appears less common in the same district. The authors noted a decline in connective tissue cancers in males, but not in females between the periods 1964–66 and 1970–72.

Mohapatra and Vyas (1982) reviewed the records of the public pathology laboratory in Gaborone from 1978–82 and documented the distribution of 703 cancers. No breakdown by sex was given. The most common cancers reported were cervix uteri (26.7%), skin (21.6%), breast (8.1%), liver (5.5%) and oesophagus (5.5%). No cases of Kaposi sarcoma were mentioned; they were probably included under connective tissue cancers. Notably, 13/15 eye cancers were of the conjunctiva, and three were retinoblastomas.

References

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- Mohapatra, K.C. & Vyas, P.R. (1982) Incidence of malignant tumours in Botswana. (Paper read at the A.G.M. of the Medical and Dental Association of Botswana 30 July 1982). *Botshelo*, **13**(4), 48–50

Table 1. Botswana: case series

Site	10 Hospitals 1960-72 (Macrae & Cook, 1975)			Pathology laboratory, Gaborone, 1978-82 (Mohapatra & Vyas, 1982)				
	Male		Female		%HV	Both sexes		%HV
	No.	%	No.	%		No.	%	
Oral cavity ¹	16	2.5%	11	1.4%	63	} 27	} 3.8	
Nasopharynx	5	0.8%	3	0.4%	50			
Other pharynx	10	1.5%	3	0.4%	69.2			
Oesophagus	67	10.3%	11	1.4%	29.5	39	5.5%	
Stomach	36	5.5%	18	2.3%	5.6	2	0.3%	
Colon/rectum	17	2.6%	12	1.5%	34.5	16	2.3%	
Liver	108	16.5%	35	4.5%	14	39	5.5%	
Pancreas	7	1.1%	5	0.6%	0	2	0.3%	
Lung	17	2.6%	4	0.5%	38.1	26	3.7%	
Melanoma	23	3.5%	24	3.1%	61.7			
Other skin	53	8.1%	32	4.1%	69.4	152	21.6%	
Kaposi sarcoma	6	0.9%	2	0.3%	75			
Breast	7	1.1%	89	11.4%	46.9	57	8.1%	
Cervix uteri			277	35.4%	6.1	188	26.7%	
Corpus uteri			49	6.3%	34.7	9	1.3%	
Ovary etc.			37	4.7%	45.9	12	1.7%	
Prostate	48	7.4%			35.4	6	0.9%	
Penis	26	4.0%			65.4	4	0.6%	
Bladder	14	2.1%	6	0.8%	25	3	0.4%	
Kidney etc.	7	1.1%	6	0.8%	53.8	12	1.7%	
Eye	15	2.3%	16	2.0%	54.8	15	2.1%	
Brain, nervous system	2	0.3%	0	0.0%	100			
Thyroid	2	0.3%	7	0.9%	55.6			
Non-Hodgkin lymphoma	17	2.6%	10	1.3%	63	16	2.3%	
Hodgkin disease			-			13	1.8%	
Myeloma	1	0.2%	1	0.1%	50	0	0.0%	
Leukaemia	27	4.1%	22	2.8%	32.7	30	4.3%	
ALL SITES	653	100.0%	783	100.0%	39.6	703	100.0%	

¹ Includes salivary gland

3.5.2 Lesotho

Background

Climate: Temperate; cool to cold dry winters; hot, wet summers

Terrain: Mostly highland with plateau, hills and mountains, the lowest point being 1400 m and the highest 3482 m.

Ethnic groups: Sotho 99.7%, Europeans 1600, Asians 800

Religions: Christian 80%, rest indigenous beliefs

Economy—overview: Small, landlocked and mountainous, Lesotho has no important natural resources other than water. Its economy is based on agriculture, light manufacturing, and remittances from miners employed in South Africa. The number of such mine workers has declined steadily in recent years; in 1996 their remittances added about 33% to GDP compared with about 67% in 1990. Manufacturing depends largely on farm products which support the milling, canning, leather, and jute industries. Sale of water to South Africa generates some income. Civil disorder and a South African incursion to restore order in 1998 destroyed 80% of the commercial infrastructure in Maseru and two other major towns.

Industries: Food, beverages, textiles, handicrafts construction and tourism.

Agriculture—products: corn, wheat, pulses, sorghum, barley; livestock.

Cancer registration

There has been no systematic cancer registration in Lesotho.

Review of data

Martin *et al.* (1976) described cancer patterns in Lesotho between 1950 and 1969, by scrutinizing the record books of 16 hospitals and one clinic. A total of 586 males and 1281 females with cancer were recorded (Table 1). The proportion of histologically verified cancers was 10%. The leading five cancers in males were: liver (24.6%), stomach (9.0%), oesophagus (7.3%), unspecified sarcomas (6.1%) and lung cancer (5.6%). In females the five leading cancers were cervix (54.9%), breast (14.3%), liver (5.5%), stomach (2.8%) and unspecified sarcomas (2.7%).

MacCormick (1989) attempted to measure the occurrence of oesophageal cancer in Lesotho, after gastroscopy was introduced in the main hospital of the capital city, Maseru. Forty-two carcinomas of the oesophagus were diagnosed in a year, versus 52 cases reported by Martin *et al.* over a 20-year period (1950–69, see Table 1).

References

- MacCormick, R.E. (1989) The changing incidence of cancer of the oesophagus in Lesotho. Real, or improved diagnostic ability. *E. Afr. Med. J.*, **65**, 27–30
- Martin, P.M.D., Perry, J.W.B. & Keen, P. (1976) The cancer spectrum in Lesotho. *S. Afr. J. Sci.*, **72**, 168–175

Table 1. Lesotho: case series

Site	Hospital records 1950-69 (Martin <i>et al.</i> , 1976)				%HV
	Male		Female		
	No.	%	No.	%	
Oral cavity					
Nasopharynx					
Other pharynx					
Oesophagus	43	7.3%	9	0.7%	
Stomach	53	9.0%	36	2.8%	
Colon/rectum	17	2.9%	22	1.7%	
Liver	144	24.6%	71	5.5%	
Pancreas					
Lung	33	5.6%	9	0.7%	
Melanoma	14	2.4%	14	1.1%	
Other skin	15	2.6%	6	0.5%	
Kaposi sarcoma					
Breast	6	1.0%	183	14.3%	
Cervix uteri			703	54.9%	
Corpus uteri			0	0.0%	
Ovary etc.			0	0.0%	
Prostate				0.0%	
Penis	20	3.4%		0.0%	
Bladder	11	1.9%	5	0.4%	
Kidney etc.	5	0.9%	5	0.4%	
Eye					
Brain, nervous system					
Thyroid					
Non-Hodgkin lymphoma					
Hodgkin disease					
Myeloma					
Leukaemia	11	1.9%	5	0.4%	
ALL SITES	586	100.0%	1281	100.0%	10%

3.5.3 Namibia

Background

Climate: Hot and dry with sparse and erratic rainfall.

Terrain: Mainly high plateau with the Namib Desert along the entire Atlantic coast and the Kalahari Desert bordering Botswana and South Africa in the east. The highest point is 2606 m. There are no significant water bodies.

Ethnic groups: Black 86%, white 6.6% and mixed race 7.4%. About 50% of the black population belong to the Ovambo and 9% to the Kavango tribe; other ethnic groups are: Herero 7%, Damara 7%, Nama 5%, Caprivian 4%, Bushmen (San) 3%, Baster 2% and Tswana 0.5%

Religions: Christian (80–90%), about half Lutheran. Other indigenous beliefs comprise 10–20%.

Economy—overview: closely linked to South Africa. Extraction and processing of minerals account for 20% of GDP. Namibia is the fourth largest exporter of non-fuel minerals in Africa and the world's fifth-largest producer of uranium. Half of the population depends on agriculture (largely subsistence agriculture) for its livelihood. Services comprise 55% of GDP. The majority of the people live in poverty because of the inequality of income distribution, with foreigners taking a large share.

Industries: Meat packing, fish processing, dairy products; mining (diamonds, lead, zinc, tin, silver, tungsten, uranium, copper)

Agriculture—products: millet, sorghum, peanuts; livestock; fish

Cancer registration

In 1994, concern about potential cancer risks in a uranium mine led to the registration of all cancers diagnosed by the only central pathology service in Namibia. Cancers diagnosed between 1978 and 1995 were recorded. Data quality was poor and most records had no information on race or ethnic origin. The data are now maintained by the National Cancer Registry in Windhoek, under the auspices of the Cancer Society. In addition to some cases diagnosed in the pathology service, cases attending the oncology services (radiotherapy) in Windhoek are registered.

Review of data

Data from the National Cancer Registry for the period 1995–98 are shown (Table 1). Because the registry is situated in Windhoek, it is likely that registration is most complete for the central districts of the country. However, it has proved difficult to accurately record place of residence of cancer cases, so that data for the whole country are shown. In addition, the registry relies heavily upon histologically diagnosed cases (96% of the cases were registered with a diagnosis confirmed by histology or cytology), so that the more affluent white population is likely to

be over-represented. Calculated incidence rates therefore represent minimum, and possibly somewhat biased, estimates of the true values.

The age-adjusted incidence rate was 141.9 per 100 000 in males and 120.2 per 100 000 in females (including skin cancer). Overall, the most commonly diagnosed malignancy was non-melanoma skin cancer and these basal and squamous cell skin cancers are disproportionately found among whites. Excluding these, the most common cancers in men are prostate (17.6%, ASR 21.8), mouth, including lip (13.3%, ASR 15.4), Kaposi sarcoma (7.9%, ASR 6.8), larynx (5.7%, ASR 6.8), oesophagus (5.4%, ASR 6.3) and lung (5.2%, ASR 6.1). In females, the leading cancers (excluding non-melanoma skin cancers) were breast (25.1%, ASR 25.6) (again probably distorted by greater access of whites to histopathology), cervix uteri (22.1%, ASR 22.2), and mouth (6.2%, ASR 6.5). Kaposi sarcoma is rather less frequent in women than in men (sex ratio 3:1); it accounted for 2.6% of cancers, with an ASR of 1.9.

Childhood cancer

Wessels and Hesselning (1996) reported data on the frequency of childhood cancers in Namibia from 1983 to 1988. Data were drawn from Tygerberg Hospital's Tumour Registry in the Western Cape, South Africa (the hospital of choice for most Namibian public sector patients), and from scrutiny of the records of all Namibian District, central and referral hospitals and death certificates. Of these tumours, 91% were histologically verified. Wessels *et al.* (1998) updated these results with a further four years' data, collected for Windhoek Central Hospital, where all children with cancer in Namibia have been treated since 1989. 93.4% of the 241 cases were histologically verified. The pattern is similar to that for the earlier period (Table 2). Incidence rates for the 10-year period 1983–92 were calculated, but they are low, suggesting a fair degree of underdiagnosis of childhood cancer in this widely dispersed population.

The results from the cancer registry for the period 1995–98 are shown in Table 3. The cases are virtually all histologically confirmed and rates are very low. Clearly childhood cancer diagnoses are not being found by the registry.

The results in Table 3, where brain cancer in children comprises only 1% of childhood cancers, contrast with those from the histopathology register (Table 2), with over 16%. Notably, four cases of Kaposi sarcoma and ten of Burkitt lymphoma were recorded in the later pathology series (versus none mentioned in the first).

References

- Wessels, G. & Hesselning, P.B. (1996) Unusual distribution of childhood cancer in Namibia. *Pediat. Hematol. Oncol.*, **13**, 9–20
- Wessels, G., Hesselning, P.B. & Kuit, S.B. (1998) Namibia. The Namibian Children's Tumour Registry, 1983–1992. In: Parkin, D.M., Kramárová, E., Draper, G.J., Masuyer, E., Michaelis, J., Neglia, J., Qureshi, S. & Stiller, C.A., eds, *International Incidence of Childhood Cancer*, vol. II (IARC Scientific Publications No. 144), Lyon, IARC, pp. 39–41

Table 1. Namibia (1995-1998)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	265	0	93	-	2	1	19	68	76	99	8.3	13.3	0.97	15.4	C00-06
Salivary gland	18	0	94	-	1	2	1	2	7	5	0.6	0.9	0.07	0.9	C07-08
Nasopharynx	22	0	100	1	-	-	5	4	2	8	0.7	1.1	0.06	1.1	C11
Other pharynx	74	0	99	-	-	-	4	19	23	28	2.3	3.7	0.28	4.4	C09-10,C12-14
Oesophagus	107	0	98	-	-	-	6	21	32	48	3.4	5.4	0.36	6.3	C15
Stomach	49	0	96	-	-	2	9	8	11	19	1.5	2.5	0.15	2.7	C16
Colon, rectum and anus	85	0	96	-	9	3	14	16	21	22	2.7	4.3	0.30	4.4	C18-21
Liver	59	0	85	-	1	3	9	11	16	19	1.9	3.0	0.21	3.2	C22
Gallbladder etc.	6	0	67	-	-	-	2	1	2	1	0.2	0.3	0.02	0.3	C23-24
Pancreas	21	0	76	-	-	-	1	5	7	8	0.7	1.1	0.09	1.3	C25
Larynx	114	0	99	-	-	-	3	32	34	45	3.6	5.7	0.43	6.8	C32
Trachea, bronchus and lung	104	0	87	-	-	-	6	20	38	40	3.3	5.2	0.40	6.1	C33-34
Bone	26	0	100	4	10	-	2	2	3	5	0.8	1.3	0.06	1.0	C40-41
Melanoma of skin	65	0	98	-	-	7	10	6	23	19	2.0	3.3	0.24	3.5	C43
Other skin	588	0	100	4	14	23	80	107	159	201	18.5	2.05	32.5	32.5	C44
Mesothelioma	4	0	100	-	-	-	-	1	1	2	0.1	0.2	0.01	0.2	C45
Kaposi sarcoma	158	0	94	6	6	43	42	25	21	15	5.0	7.9	0.53	6.8	C46
Peripheral nerves	2	0	100	1	-	1	-	-	-	-	0.1	0.1	0.00	0.1	C47
Connective and soft tissue	42	0	98	5	6	7	4	4	12	4	1.3	2.1	0.15	1.8	C49
Breast	20	0	95	-	1	1	2	1	4	11	0.6	1.0	0.05	1.1	C50
Penis	14	0	100	-	-	-	-	6	4	4	0.4	0.7	0.06	0.8	C60
Prostate	352	0	97	1	1	-	5	31	90	224	11.1	17.6	0.87	21.8	C61
Testis	23	0	91	-	7	6	3	4	2	1	0.7	1.2	0.07	0.9	C62
Kidney	32	0	94	3	-	4	5	3	11	6	1.0	1.6	0.12	1.6	C64
Renal pelvis, ureter and other urinary	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C65-66,C68
Bladder	60	0	98	-	1	3	5	9	16	26	1.9	3.0	0.18	3.4	C67
Eye	45	0	98	5	3	14	9	3	7	4	1.4	2.3	0.14	1.8	C69
Brain, nervous system	3	0	67	-	-	-	1	1	1	-	0.1	0.2	0.01	0.1	C70-72
Thyroid	9	0	100	1	1	-	2	3	-	2	0.3	0.5	0.02	0.4	C73
Hodgkin disease	15	0	100	2	5	2	-	2	2	2	0.5	0.8	0.04	0.6	C81
Non-Hodgkin lymphoma	54	0	96	7	4	10	8	7	9	9	1.7	2.7	0.17	2.4	C82-85,C96
Multiple myeloma	12	0	92	-	-	-	1	3	2	6	0.4	0.6	0.03	0.7	C90
Lymphoid leukaemia	20	0	100	-	1	2	3	4	3	7	0.6	1.0	0.06	1.0	C91
Myeloid leukaemia	21	0	100	3	3	4	-	3	4	4	0.7	1.1	0.06	0.9	C92-94
Leukaemia, unspecified	1	0	100	1	-	-	-	-	-	-	0.0	0.1	0.00	0.0	C95
Other and unspecified	95	0	97	3	7	3	6	13	23	40	3.0	4.8	0.28	5.3	O&U
All sites	2585	0	96	47	85	141	267	445	666	934	81.3	100.0	8.56	141.9	ALL
All sites but C44	1997	0	95	43	71	118	187	338	507	733	62.8	100.0	6.51	109.4	ALLbC44
Average annual population				338924	155556	110514	76641	51770	34199	27161					

Table 1. Namibia (1995-1998)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	130	0	96	-	1	5	7	21	44	52	4.1	6.2	0.42	6.5	C00-06
Salivary gland	16	0	94	-	1	2	1	3	5	4	0.5	0.8	0.06	0.8	C07-08
Nasopharynx	14	0	100	-	6	1	1	1	2	3	0.4	0.7	0.03	0.5	C11
Other pharynx	26	0	96	-	-	1	1	5	10	9	0.8	1.2	0.10	1.3	C09-10,C12-14
Oesophagus	33	0	100	-	-	1	2	2	7	21	1.0	1.6	0.07	1.7	C15
Stomach	37	0	97	-	-	3	7	4	5	18	1.2	1.8	0.08	1.8	C16
Colon, rectum and anus	67	0	99	2	1	2	7	11	19	25	2.1	3.2	0.21	3.3	C18-21
Liver	37	0	89	-	1	1	6	5	9	15	1.2	1.8	0.11	1.8	C22
Gallbladder etc.	15	0	93	-	-	-	3	1	6	5	0.5	0.7	0.05	0.7	C23-24
Pancreas	19	0	79	-	-	2	2	3	5	7	0.6	0.9	0.06	0.9	C25
Larynx	22	0	100	-	-	-	-	7	10	5	0.7	1.0	0.10	1.1	C32
Trachea, bronchus and lung	45	0	96	-	1	1	2	13	18	10	1.4	2.1	0.19	2.3	C33-34
Bone	17	0	88	3	7	3	-	-	3	1	0.5	0.8	0.04	0.6	C40-41
Melanoma of skin	53	0	100	-	1	5	9	12	12	14	1.7	2.5	0.17	2.4	C43
Other skin	438	0	100	5	13	33	43	57	116	171	13.7	0.0	0.00	21.1	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	54	0	98	4	8	23	10	3	2	4	1.7	2.6	0.13	1.9	C46
Peripheral nerves	2	0	100	-	-	-	1	-	-	1	0.1	0.1	0.00	0.1	C47
Connective and soft tissue	42	0	100	4	8	6	10	5	6	3	1.3	2.0	0.13	1.6	C49
Breast	531	0	95	-	3	31	97	119	119	162	16.6	25.1	1.73	25.6	C50
Vulva	19	0	100	-	-	3	7	-	5	4	0.6	0.9	0.06	0.8	C51
Vagina	5	0	100	-	1	1	2	-	-	1	0.2	0.2	0.01	0.2	C52
Cervix uteri	468	0	98	-	2	26	96	121	106	117	14.6	22.1	1.60	22.2	C53
Uterus	67	0	96	-	3	4	5	13	23	19	2.1	3.2	0.25	3.3	C54-55
Ovary	74	0	86	1	5	7	8	10	22	21	2.3	3.5	0.25	3.5	C56
Placenta	11	0	91	-	4	5	1	1	-	-	0.3	0.5	0.03	0.4	C58
Kidney	26	0	88	4	-	3	5	4	5	5	0.8	1.2	0.08	1.1	C64
Renal pelvis, ureter and other urinary	3	0	100	-	-	1	-	1	1	-	0.1	0.1	0.01	0.1	C65-66,C68
Bladder	20	0	100	1	2	2	1	3	4	7	0.6	0.9	0.05	0.9	C67
Eye	42	0	98	8	1	13	9	5	5	1	1.3	2.0	0.13	1.6	C69
Brain, nervous system	7	0	43	1	-	1	2	2	1	-	0.2	0.3	0.03	0.3	C70-72
Thyroid	37	0	95	-	-	5	11	1	7	13	1.2	1.8	0.10	1.7	C73
Hodgkin disease	9	0	100	-	-	2	2	5	-	-	0.3	0.4	0.03	0.4	C81
Non-Hodgkin lymphoma	36	0	100	1	-	7	4	5	6	13	1.1	1.7	0.09	1.7	C82-85,C96
Multiple myeloma	16	0	94	-	1	-	1	2	6	6	0.5	0.8	0.05	0.8	C90
Lymphoid leukaemia	9	0	100	-	2	-	2	1	2	2	0.3	0.4	0.03	0.4	C91
Myeloid leukaemia	19	0	95	1	3	1	5	3	5	1	0.6	0.9	0.07	0.8	C92-94
Leukaemia, unspecified	1	0	100	-	-	-	-	-	-	1	0.0	0.0	0.00	0.1	C95
Other and unspecified	84	0	98	1	1	6	7	15	23	31	2.6	4.0	0.26	4.1	O&U
All sites	2551	0	97	36	76	207	377	464	619	772	79.6	8.08		120.2	ALL
All sites but C44	2113	0	96	31	63	174	334	407	503	601	65.9	100.0	6.80	99.1	ALLbC44
Average annual population				332033	153823	110578	77794	55746	38289	33379					

Table 2. Namibia: childhood cancer

Cancer	1983-88 (Wessels & Hesselting, 1996)		1983-92 (Wessels <i>et al.</i> , 1998)		
	No.	%	No.	%	ASR per 10 ⁵
Leukaemia	19	11.5%	33	13.7%	6.2
Acute lymphocytic leukaemia			24	10.0%	4.5
Lymphoma	19	11.5%	31	12.9%	5.8
Burkitt lymphoma			10	4.1%	1.9
Hodgkin disease			11	4.6%	2
Brain and spinal neoplasms	28	17.0%	39	16.2%	7.3
Neuroblastoma	14	8.5%	18	7.5%	3.6
Retinoblastoma	16	9.7%	22	9.1%	4.5
Wilms tumour	21	12.7%	30	12.4%	6
Bone tumours	15	9.1%	19	7.9%	3.4
Soft-tissue sarcomas	16	9.7%	25	10.4%	4.6
Kaposi sarcoma	0	0.0%	4	1.7%	0.7
Other	17	10.3%	24	10.0%	4.5
Total	165	100.0%	241	100.0%	45.9

Table 3. Childhood cancer, Namibia (1995-1998)

	NUMBER OF CASES				REL. FREQ.(%)		RATES PER MILLION					
	0-4	5-9	10-14	All	M/F	Overall	0-4	5-9	10-14	Crude	ASR	%MV
Leukaemia	1	0	4	5	4.0	6.0	1.0	-	5.2	1.9	1.9	100.0
Acute lymphoid leukaemia	0	0	0	0	-	-	-	-	-	-	-	-
Lymphoma	0	1	9	10	9.0	12.0	-	1.1	11.6	3.7	3.7	80.0
Hodgkin disease	0	0	2	2	-	2.4	-	-	2.6	0.7	0.7	100.0
Burkitt lymphoma	0	1	2	3	2.0	3.6	-	1.1	2.6	1.1	1.1	100.0
Brain and spinal neoplasms	0	1	0	1	-	1.2	-	1.1	-	0.4	0.4	100.0
Neuroblastoma	1	0	0	1	-	1.2	1.0	-	-	0.4	0.4	100.0
Retinoblastoma	8	2	1	11	0.6	13.3	7.9	2.2	1.3	4.1	4.1	100.0
Wilms tumour	6	0	1	7	0.8	8.4	5.9	-	1.3	2.6	2.7	100.0
Bone tumours	0	1	6	7	1.3	8.4	-	1.1	7.7	2.6	2.6	85.7
Soft tissue sarcomas	8	5	5	18	1.6	21.7	7.9	5.6	6.4	6.7	6.7	100.0
Kaposi sarcoma	7	2	1	10	1.5	12.0	6.9	2.2	1.3	3.7	3.8	100.0
Germ cell tumours	1	0	2	3	-	3.6	1.0	-	2.6	1.1	1.1	100.0
Other	6	5	9	20	1.2	24.1	5.9	5.6	11.6	7.5	7.5	100.0
All	31	15	37	83	1.3	100.0	30.5	16.8	47.7	30.9	31.1	97.6

3.5.4 South Africa

South Africa has nine provinces: Northern Province, Mpumalanga, Gauteng, North West Province, KwaZulu-Natal, Free State, Eastern Cape (comprising the former Transkei 'homeland', an area of high oesophageal cancer rates) and the Western Cape. Provinces are divided into magisterial districts.

Climate: Mostly semi-arid; subtropical along the east coast and Mediterranean along the south-western coast

Terrain: An interior plateau, rugged hills and a narrow coastal plain

Ethnic groups: Black (African) 75.2%, white (mainly of European descent) 13.6%, coloured (mixed race) 8.6%, and of Indian/East Asian descent, 2.6%

Religions: Christian 68% (includes most whites and coloureds, about 60% of blacks and about 40% of Indians), Muslim 2%, Hindu 1.5% (60% of Indians), indigenous beliefs and animist 28.5%

Economy—overview: A middle-income developing country with abundant resources, South Africa has well developed financial, legal, information technology, communications, energy and transport sectors.

Industries: Mining of gold, chromium, antimony, coal, iron ore, manganese, nickel, phosphates, tin, uranium, gem diamonds, platinum, copper and vanadium. South Africa was a main producer of all the main types of asbestos, but most operations have now ceased.

Cancer registration

Early attempts to describe the occurrence of cancer in the then Natal and Zululand were made by Watkins Pitchford (1925). These early attempts were reviewed by Oettlé (1960).

Population-based cancer registries using standardized methodology were established in Johannesburg in 1953–55 (Higginson & Oettlé, 1966), in the Cape Peninsula 1956–58 (Muir Grieve, 1967) and in Natal (Schonland & Bradshaw, 1968).

Johannesburg

The Johannesburg Cancer Survey was conducted in 1953–55 by the South African Institute for Medical Research. Cases were registered by medical staff from hospital inpatients, and all case histories were reviewed by the survey directors. Records from radiotherapy and pathology departments and death certificates were also screened. Hospital outpatients were not registered except at a single large clinic at Alexandra Township, where registrations were made by doctors. Doctors attending cases at home were paid for each registration made. Pathologists in medico-legal departments also registered cases.

The Registry covered the metropolitan area of Johannesburg, consisting of the municipal area, and the peri-urban townships, notably Alexandra township in the north-east and a cluster of townships in the south-west. (total populated area 280 km²); the population at the time was 800 000.

Cape Province

The Registry was a project of the Cancer Research Unit of Groote Schuur Hospital Observatory, and was mainly supported by the National Cancer Association of South Africa. The records of major hospitals were scrutinized at weekly intervals and those of minor hospitals every fourth week. Liaison was continuously maintained

with all health centres, dispensaries, old-age homes and allied institutions. Every medical practitioner was approached by personal visit or by post, and all pathology slides from cancer cases were made available for review. Very strict criteria of diagnosis were established and maintained.

The records of the Registrars of Death were routinely abstracted, a particularly useful source of information, since burial was not permitted without a death certificate issued by a registered medical practitioner. It was estimated that at least 95% of all cases were registered.

The registration area was Cape Division, a small and relatively narrow tract of land some 1887 km² in extent. The urban area, in which over 95% of the population resided, occupied the middle third of this area. The estimated population in 1956–59 was 741 000 (293 000 white, 378 000 mixed race ("coloured") and 70 000 black ("Bantu"). For the calculation of rates, the age/sex/race breakdown was based on the censuses of 1951 and 1960; for the latter, age was available only for a 10% sample. It was considered that the estimated population at risk for the black population was uncertain, because of internal migrations and uncertainty as to the age of older persons.

Natal

The Natal Cancer Morbidity Survey registered all new cases of cancer occurring between 1 January 1964 and 31 December 1966. African and Indian cases were filed separately. The populations covered were the Indian community of the Metropolitan Area of Durban, and Africans resident in the same area and in the Magisterial District of Pietermaritzburg. Some 28% of the Indian population were Muslim, the remainder Hindu. Over 90% of Africans in Durban and Pietermaritzburg were Zulus. Residential criteria for inclusion in the survey area were strictly applied.

Histology, haematology, cytology and post mortem reports, case-notes, radiotherapy records and death certificates were scrutinized and used as sources. Some cases were notified by private practitioners. Histological confirmation of the diagnosis was obtained in 68.5% of all Indian cases and in 82.2% of all African cases. No cases were followed up.

Metropolitan Durban covers an area of 1402 km² and the District of Pietermaritzburg 1078 km². Both had good hospital and diagnostic facilities. Population at risk was estimated from the 1960 census. For the African population, an annual growth rate of 2.65% was assumed for Pietermaritzburg, while an estimate prepared by the Institute of Social Research, incorporating some data on migration, was used for Durban. It was considered that the population at risk for Durban Indians was probably correct, while the 1965 urban African population was "a knowledgeable guess".

Transkei

Ad hoc cancer surveys were also conducted in areas where there was some suspicion of unusual cancer patterns. For example, Burrell (1957, 1962) and Oettlé (1963) described a high occurrence of oesophageal cancer in the Transkei (Eastern Cape), Transkei became the focus of cancer registration and study since these early reports (Rose 1973), and numerous results from cancer registration efforts have been published since then. Between 1964 and 1969, all hospitals in the Transkei and three major referral hospitals in the Natal (now KwaZulu-Natal) Province and from East London, the major radiotherapy centre just outside the Transkei in the Eastern Cape provided cancer data (Rose and Fellingham 1981). A total of 4247 cases of cancer were recorded.

Umtata Cancer Registry: The cancer registry is operated by the department of oncology/thoracic surgery, and is located in Umtata General Hospital, the main referral hospital for the Transkei region of Eastern Cape Province. Oncology nurses are responsible for recording information on all cancer cases diagnosed or treated in the hospital, using ward registers, the department of pathology register, and diagnostic ultrasound as sources of information. Cases resident in Umtata district have been entered into a computerized database (using CANREG-3) since 1996. Case-finding does not include, therefore, those residents of the district who go elsewhere for diagnosis and treatment (e.g., to East London or Durban), although the follow-up of all local patients treated in the radiotherapy service in East London is carried out in Umtata General Hospital.

The PROMEC registry: Cancer registration was established by the Medical Research Council in the Transkei in two low-risk (Bizana and Lusikisiki) and two high-risk districts (Butterworth and Kentani) in 1981. Case-finding is based upon notifications by a designated nurse in each of the major hospitals in the districts. This is supplemented by active case-finding by the cancer registrar. This component involves annual visits to eight hospitals located in the four districts and in certain neighbouring districts, including Umtata Hospital (the regional referral centre). During these visits, ward registers are scrutinized to check completeness of notification, and missing or incomplete records are updated. Case-finding also extends to hospitals outside Transkei, to which cases may have been referred (or presented themselves). These include the regional radiotherapy referral centre in East London and (since 2000) three referral hospitals for surgery, gynaecology and radiotherapy cases in Durban (Kwa-Zulu Natal Province). Details on malignant cancers (excluding cases for which primary site is uncertain or unknown) are abstracted and data entered into a computerized database, using CANREG-3.

National Cancer Registry

In 1986, a national pathology-based cancer registry was established at the South African Institute for Medical Research (now the National Health Laboratory Service) as a collaborative venture with the Cancer Association of South Africa and the Department of Health. All pathology laboratories began submitting data in 1986. Since 1988, all cytology laboratories were included and all of about 85 private and public laboratories submit data (approximately 50 000 new cases per annum) to the NCR. Laboratories are reminded on a monthly basis to submit data or a 'null' return. Pathology reports are screened manually upon receipt and queries about missing information are sent (once) to the referring doctor. Data once coded and entered are checked automatically for further inconsistencies and unlikely combinations. From 1993 onwards, the proportion of cases with unknown race characteristics increased dramatically, making it difficult to establish minimal incidence rates by these groups.

Review of data

Johannesburg, 1953–55

The results are shown in Table 1. In black males, there were moderately elevated rates of liver cancer (ASR 19.3 per 100 000) and oesophageal cancer (ASR 12.4), while the incidence of lung cancer was low (ASR 7.5). In females, the most striking feature is the very high incidence of cervix cancer (ASR 51.0). The rate for breast cancer is much lower (ASR 14.9) and oesophageal cancer is much less frequent than in males (sex ratio, M:F, 10:1).

Cape Province, 1956–59

The results for the black population are shown in Table 2, for the coloured (mixed race) population in Table 3, and for the white population in Table 4.

The numbers of cases registered in the black population are few, but the incidence of cancers of the oesophagus (ASR 35.6), stomach (ASR 26.9), liver (ASR 26.5) and lung (ASR 25.6) appear quite high. In females, the cervix (15 cases, ASR 24.8) is the principal cancer site.

In the coloured (mixed race) population, there are high rates for cancers of the oesophagus (ASR 53.4) and lung (ASR 42.7) in men and for cancers of the cervix (ASR 34.4), breast (ASR 25.8) and oesophagus (ASR 25.5) in women.

In the white population, excluding the very common non-melanoma skin cancers, the highest rates in men are for lung (ASR 44.8), stomach (ASR 32.9) and prostate cancers (ASR 24.2). Oesophageal cancer is not common, the incidence of large bowel cancer being three times higher. In women, breast cancer ranks first (ASR 57.6), followed by stomach (ASR 22.9) and cervix cancers (ASR 22.6).

Natal, 1964–66

The data for 1964–66 are shown in Tables 5 and 6. For the Indian community, this period was considered to be not long enough, as only 496 new cancer cases were registered. The case-finding programme for the Indian group was extended for a further two years (Schonland and Bradshaw, 1970).

With respect to the black population (mainly Zulu) of the Pietermaritzburg District (Table 6), a bias towards cases with histological confirmation of diagnosis was considered probable, as case-finding was mainly based on pathology records, and scrutiny of death certificates of Africans was not possible there. In men, there was very high incidence of lung cancer (ASR 43.4), oesophageal cancer (ASR 40.1), liver cancer (ASR 27.6) and prostate cancer (ASR 21.8). In Black females, the highest incidence rate was for cervix cancer (ASR 48.5); the rates for oesophageal cancer (ASR 12.0) and lung cancer (ASR 10.1) were about one quarter those in men.

In the Durban Indian group (Table 5), 7.3% of male cancers and 13.8% of female cancers were found by scrutiny of death certificates only. The low overall cancer incidence in Indian males was possibly due in part to mis-certification of cause of death (as non-cancerous conditions) by private practitioners. However, it was noted that in Durban, Indian males did not smoke heavily and chewed betel nut only occasionally. Nevertheless, it is remarkable that, for all cancers of the gastrointestinal tract (oral cavity and pharynx, oesophagus, stomach, colon, rectum), incidence in Indian females exceeded that in males. In males, only gastric cancer (ASR 20.9) occurred at all frequently, while in women, the highest rates were for cervix uteri (ASR 34.7) stomach (ASR 29.1), breast (ASR 19.4), oesophagus (ASR 12.7) and corpus uteri (ASR 12.8).

Transkei

Several publications have described the results of past cancer registration efforts in the Transkei, mainly the Xhosa population, in particular with respect to geographical variation and temporal trends in the incidence of oesophageal cancer (see chapter on Oesophagus cancer). Here we present recent data from the two cancer registries in the Transkei district, Umtata registry and the PROMEC rural districts registry.

Umtata: Results for the period 1996–98 are shown (Table 7). Since the registry almost certainly includes a large majority of cases diagnosed among the residents of Umtata district (see above), incidence rates have been calculated using the census data for 1996. 593 cases are included. The overall (all sites) incidence is 141.3 in men and 105.8 in women. In men the principal cancers are oesophagus (ASR 62.5), lung (ASR 15.7) and liver (ASR 16.0); in women, the main cancers are oesophagus (ASR 34.5), cervix uteri (ASR 26.3) and breast (ASR 14.9). Kaposi sarcoma was clearly rare at this time (only one case in a male); the lack of

haematological malignancies suggests some under-diagnosis or under-registration.

PROMEC (Bizana, Butterworth, Kentani and Lusikisiki districts): Results for the period 1996–98 are shown (Table 8). The incidence rates have been calculated using an estimate of the population, based upon the census data for 1996. Because of incomplete registration, cases (and population at risk) from Butterworth are omitted for two years (1996, 1997) and from Kentani for one year (1996). 663 cases are included. The overall (all sites) incidence is low – 68.5 in men and 65.4 in women. In men the principal cancers are oesophagus (ASR 37.5), liver (ASR 5.5), lung (ASR 4.9) and prostate (ASR 2.9); in women, the main cancers are oesophagus (ASR 26.5), cervix uteri (ASR 21.7) and breast (ASR 6.1). Only three cases of Kaposi sarcoma were recorded and three cases of leukaemia. The low overall rates and some irregularity in numbers of cases registered by year and district suggest some under-diagnosis and/or under-registration at this time; the small numbers of 'other & unspecified' cancers may partly reflect the exclusion of metastatic cancers from the database.

Early data: Between 1964 and 1969, a total of 4247 cases of cancer were recorded from all hospitals in the Transkei, and three major referral hospitals in the Natal (now KwaZulu-Natal) Province and East London (Rose, 1973).

Overall, the age-standardized cancer incidence rate per 100 000 using the world population standard in males was 102 in the high-risk districts, 59.5 in the moderate-risk districts and 22.4 in the low-risk districts. The rates in moderate-risk districts were similar to those observed in Durban in 1964–66 (ASR 40.7) (Schonland & Bradshaw, 1968) and in Cape Town (ASR 37.5) (Muir Grieve, 1967). Rates for oesophageal cancer in Johannesburg black males were lower (ASR 12.9). Records from Umtata hospital also show a dramatic increase in the relative frequency of oesophageal cancer over all other major cancer types (liver, cervix and breast); in 1925 oesophageal cancer comprised less than 10% of all these cancers, but by 1969 this proportion had increased to just under 60% (Rose & Fellingham, 1981).

In subsequent reports from the Transkei concerning cases diagnosed in 1981–84 (Jaskiewicz *et al.*, 1987) and 1985–90 (Makaula *et al.*, 1996), it appears that the incidence of oesophageal cancer has been declining in the high-risk districts and increasing in the low-risk districts. The reasons for this 'equalization' of oesophageal cancer rates in the Transkei are unclear.

Johannesburg/Soweto

In a study at Baragwanath Hospital, which serves the black population of Johannesburg and Soweto, Robertson (1969) abstracted all the clinical records of 4093 male and 3724 female patients clinically diagnosed with a cancer during 1948–64. Of these cancers, 84% were confirmed by microscopy. An increase in the relative frequency of oesophageal cancer was observed, from 4.8% of all cancers in 1948 to 14.8% in 1964. In females there was little change in relative frequency, which ranged from 2.4% in 1948 to 1.9% in 1964. Between 1966 and 1975, all histologically diagnosed cancers diagnosed at Baragwanath Hospital were recorded but all haematological, eye and pancreatic cancers were omitted (Isaacson *et al.*, 1978). Attempts were made to estimate minimal incidence rates by using the population at risk of Johannesburg and Soweto (Isaacson *et al.*, 1978) or the whole of the Transvaal (Robertson, 1969), but in both studies there was no clear definition of residential status. These differences in methodology limit the comparability of the two studies.

Northern and Eastern Transvaal (Northern Province, Mpumalanga) Higginson and Oettlé (1960) reported the cancer patterns of 174 black male and 250 female cancer patients attending four rural

hospitals in the North-Eastern Transvaal (now the Northern Province and Mpumalanga): Jane Furse, Elim, Pietersburg and Groothoek. The leading cancers in males were liver (primary), comprising 20.7% of all cancers, lung (7.5%), colon/rectum (7.5%) and prostate (4.6%). In females, the leading cancers were cervix (27.2%), breast (11.2%), liver (6.0%) and melanoma (5.6%). Kaposi sarcoma comprised 2.9% of male and 0.4% of female cancers.

Table 9 shows data collected at Elim Hospital in Northern Province during 1991–94. 567 cases were recorded. In males, the leading cancers were oesophagus (17.7%), mouth (16.5%) and liver (15.6%), while in females, the principal cancers were cervix (39.8%) and breast (12.9%), while oesophagus cancers comprised just 5% of the total. One case of Kaposi sarcoma was recorded among the males (0.4%) and two in females (0.6%).

Sutherland (1968) described high occurrences of cervical, liver and bladder cancers between 1957 and 1966 in Acornhoek, Eastern Transvaal (Mpumalanga Province, near Mozambique) and Berman (1935) described the unusually high occurrence of liver cancer among the black residents of Johannesburg and gold miners.

Studies among miners

Information on patterns of cancer in young black males coming from several areas of the country was derived from studies on a large cohort of miners (5.8 million person-years) in two eight-year periods, 1964–71 (Harington *et al.*, 1975) and 1972–79 (Bradshaw *et al.*, 1982). Overall, the most common cancer in this population was liver cancer, with, among miners from South Africa, the highest incidence in those from Natal. A decline in incidence over time was observed for most groups. Oesophageal cancer was second in importance. The highest rates were in miners from Transkei and Ciskei. In the first period (1964–71), there were wide variations in incidence between miners from different districts in the Transkei (based on a crude person-years calculation of expected values), concurring with the observations of Rose and McGlashan (1975). In the second period, these differences were much less marked, in agreement with the observations of Jaskiewicz *et al.* (1987) and Makaula *et al.* (1996). It also appears that the crude incidence rate of oesophageal cancer was declining gradually among miners from Transkei.

National data

Various publications have presented the results of the National Cancer Registry, including estimates of 'minimum incidence', based on histopathologically diagnosed cancers alone. (National Cancer Registry, 1987, 1988; Sitas *et al.*, 1992, 1994, 1996, 1998). Data from 1989–92 are presented in this report (Tables 10–13).

In blacks, 38 115 in males and 41 691 cancers in females were reported. The ASR per 100 000 for all cancers was 123.7 in males and 109.8 in females. In black males, the leading cancers were oesophagus (ASR 23.1, 19.1%), prostate (ASR 14.3, 9.4%), lung (ASR 11.2, 9.1%), mouth (ASR 8.7, 6.9%) and liver (ASR 5.6, 5.1%); since liver cancer is not often histologically confirmed, many cases are missed. In black females, the leading cancers were cervix (ASR 40.3, 38.1%), breast (ASR 13.6, 12.6%), oesophagus (ASR 9.1, 7.9%) and colorectal and lung cancers (both ASR 2.3, 2.1%).

In whites, 50 815 cancers were recorded in males and 42 767 in females (Table 11). The large number of squamous and basal-cell skin cancers (24 620 in males and 16 448 in females) dominated the picture. Excluding non-melanoma skin cancers, the leading cancers in males were prostate (ASR 41.1, 17% of all cancers), bladder (ASR 25.8, 10.7%), colorectal (ASR 22.0, 9.2%) and lung (ASR 20.3, 8.3%). In white females, the leading cancers were breast (ASR 62.8, 29.6%), colorectal (ASR 17.1, 8.7%), melanoma (ASR 14.2, 6.7%) and cervix (ASR 11.9, 5.6%).

In the mixed race ('coloured'), 5984 cancers in males and 6304 in females were reported (Table 12). Age-standardized incidence rates for all cancer per 100 000 were 177.9 for males and 136.7 for

females. In males, the leading sites were prostate (ASR 25.4, 11.8%), lung (ASR 19.2, 10.9%), stomach (ASR 16.1, 9.3%) and oesophagus (ASR 16.0, 9.0%). In females, the leading cancer sites were the cervix (ASR 31.6, 25.5% of all cancers), breast (ASR 28.1, 21.2%), colorectum (ASR 6.4, 4.6%) and stomach (ASR 6.4, 4.6%).

In the Asian (Indian) population (Table 13), 2185 male cancers and 2542 female cancers were reported. The overall age-standardized cancer incidence rates per 100 000 were 172.5 for males and 164.3 for females. In males, the leading cancers were lung (ASR 22.5, 13.6%), colorectum (ASR 14.2, 7.6%), oesophagus (ASR 13.1, 8.4%) and prostate (ASR 13.0, 5.7%). In females the leading cancers were breast (ASR 42.5, 27.9% of all cancers), cervix (ASR 20.2, 13.3%), colorectum (ASR 9.4, 5.3%) and stomach (ASR 6.4, 3.7%).

Mortality studies

Before the 1992 elections, there was almost complete national ascertainment of deaths for the white, coloured and Indian populations (about 98% of the events of death recorded), with less than 10% of deaths recorded with an 'ill-defined' underlying cause of death. Among the black population, about 50% of deaths were recorded, but, of these, 25% were classified as 'ill-defined'. There was, however, wide variation in the proportion of ill-defined conditions and especially in some black urban magisterial districts, the data were of better quality than in the rest of the country (McGlashan, 1985). However valuable these data may be, they tell little of the mortality patterns in the poorer rural areas. Bourne (1995) compiled a list of all available mortality statistics.

In 1990, the former government removed racial categorization from the death notification forms. A new death notification form was introduced in 1998 which again includes the racial category of the deceased, as well as their 'usual' address, main occupation and smoking and pregnancy status, to allow better epidemiological use of death statistics. With the re-incorporation of the former 'homelands' back into South Africa, ascertainment of the event of death has now risen to over 98% in adults, but only about 60% of death notifications have information on the race/population group of the deceased individual.

Bradshaw and Harington (1985) reviewed the available mortality data for South Africa from 1949–79 for whites, coloureds

and Asians and from 1968–77 for blacks residing in 33 selected magisterial areas where mortality statistics were considered more reliable. In the black population, the proportions of deaths in 1977 were 21% due to infectious and parasitic diseases, 14% circulatory disorders and 12% respiratory disease. In contrast, among whites in 1979, only 2% were due to infectious and parasitic diseases, with circulatory disorders accounting for 48% and cancer 17%. In black males, the leading causes of cancer death were oesophageal cancer (29%), lung and liver cancers (both 15%), stomach (7%) and prostate and oral cancer (both 4%). In black females, cancer of the cervix was the leading cancer death (24%), followed by oesophageal (16%), breast (9%) and liver cancer (8%). The main causes of cancer death in white males were lung (29%), prostate, stomach and colorectal (each 9%) and urinary tract cancers (6%). In white females they were breast (20%), colorectal (14%), lung (12%) and stomach cancer (10%).

Over the period 1968–77, age-standardized mortality rates per 100 000 (world standard) for all cancers among males increased in blacks from about 90 to 125, in whites from 120 to 160, in coloureds from 130 to 220 and in Asian/Indians from 105 to 95 (these figures have been read off graphs; actual data were not published). In females, the rates among blacks remained stable at about 100 per 100 000, in whites declined from 118 to 105, in coloureds stable at 110, and in Asian/Indians stable at 80.

Figures 1–5 (from Bradshaw & Harington, 1985) show time trends in mortality rates (cumulative rate, per cent) for five cancer sites.

In black males, there were increases in oesophageal and lung cancer mortality between 1967 and 1977. In females there was a small increase mortality from cancer of the cervix, breast and lung, while stomach cancer mortality declined slightly.

In coloured males, there were dramatic increases in mortality from lung cancer and oesophageal cancer over the period 1949–79, while stomach cancer mortality declined after 1969. In females, mortality from stomach cancer declined throughout the 30-year period, while the rates for both cervix and breast cancer increased.

In white males, lung cancer mortality increased markedly (almost three-fold), while there was a decrease of about the same magnitude in stomach cancer. Mortality from prostate and colorectal

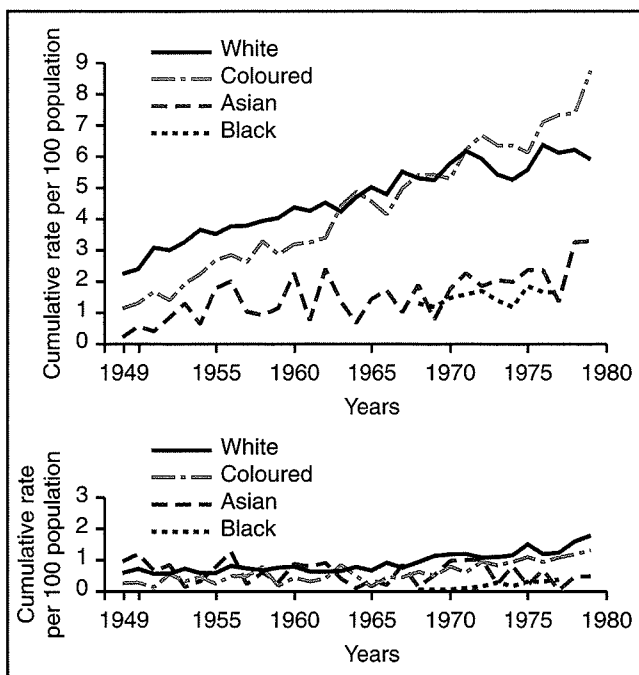


Figure 1. Lung cancer, males (above) and females (below).

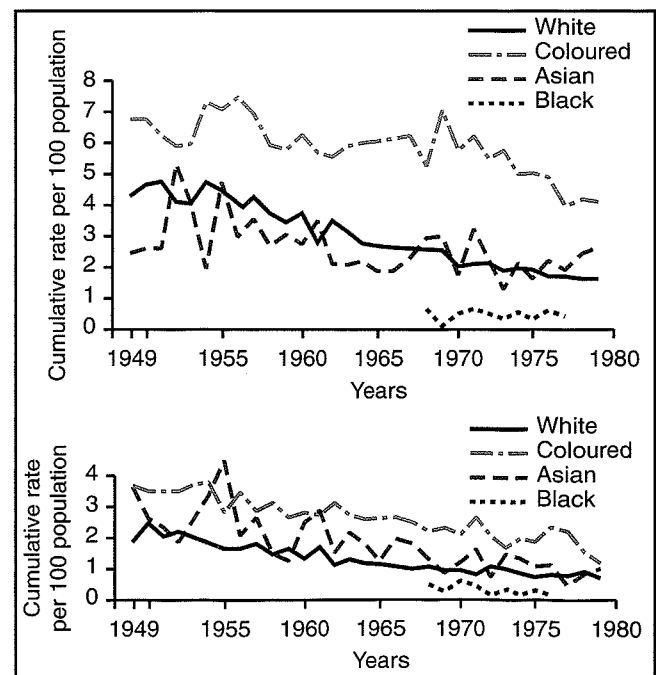


Figure 2. Stomach cancer, males (above) and females (below).

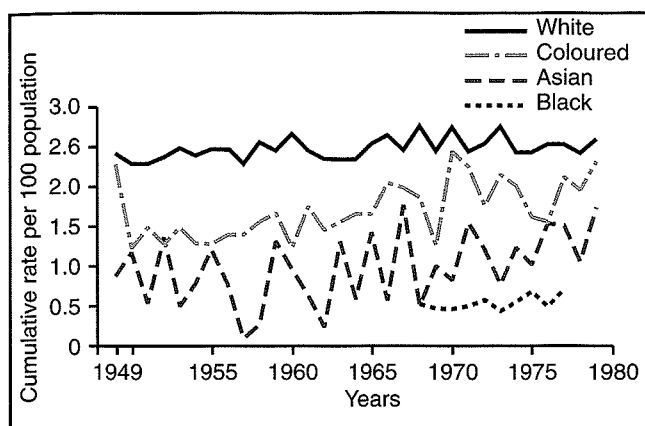


Figure 3. Cancer of the female breast.

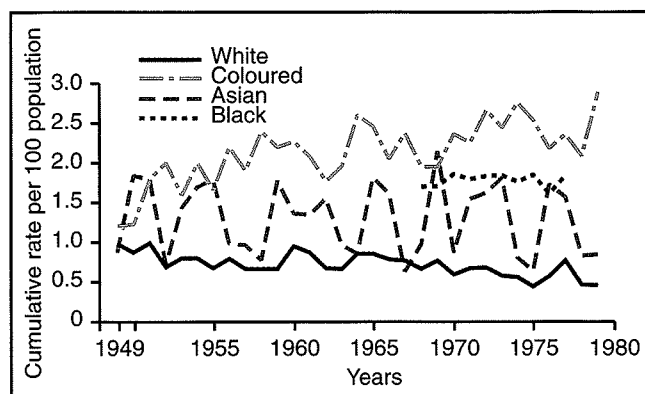


Figure 4. Cancer of the uterine cervix.

cancers remained stable. In white females, breast cancer mortality increased slightly, while mortality from lung cancer, although low, more than doubled. Mortality from stomach cancer and from cervix cancer declined. Colorectal cancer mortality remained stable.

The mortality rates in the Asian population show a lot of fluctuation from year to year, because of small numbers of deaths, but there has been an increase in lung cancer mortality in males and breast cancer in females, and decreases in stomach cancer mortality in both sexes.

Other studies

South Africa has one of the highest rates of mesothelioma in the world, because of its long involvement in asbestos mining and processing. A nationwide survey conducted for the period 1976–84 (Zwi *et al.*, 1989) identified 1347 histologically confirmed cases, corresponding to incidence rates per million in those aged 15 years and over for white, coloured, and black males 32.9, 24.8 and 7.6 per million, and in females 8.9, 13.9 and 3.0 respectively. The reasons for the low rates among blacks were thought to be underreporting in this group due to lack of access to diagnostic services. By comparison, mortality for pleural mesothelioma in the United Kingdom was 5 per million in men and 2 per million in women (Gardner *et al.*, 1982). In the Northern Cape, the incidence of mesothelioma among 'white' residents in one town (Prieska), where death certification was relatively complete, was high: 348 and 172 per million for males and females, respectively, and similar to rates in the the Wittenboom district in Australia (267 per million) where asbestos was also mined (Kielkowski *et al.*, 2000).

Kaposi sarcoma (reviewed in Chapter 4.6) was also a relatively rare cancer, although in the northern Transvaal in the 1950s and 1960s it comprised about 2% of all cancers. In the

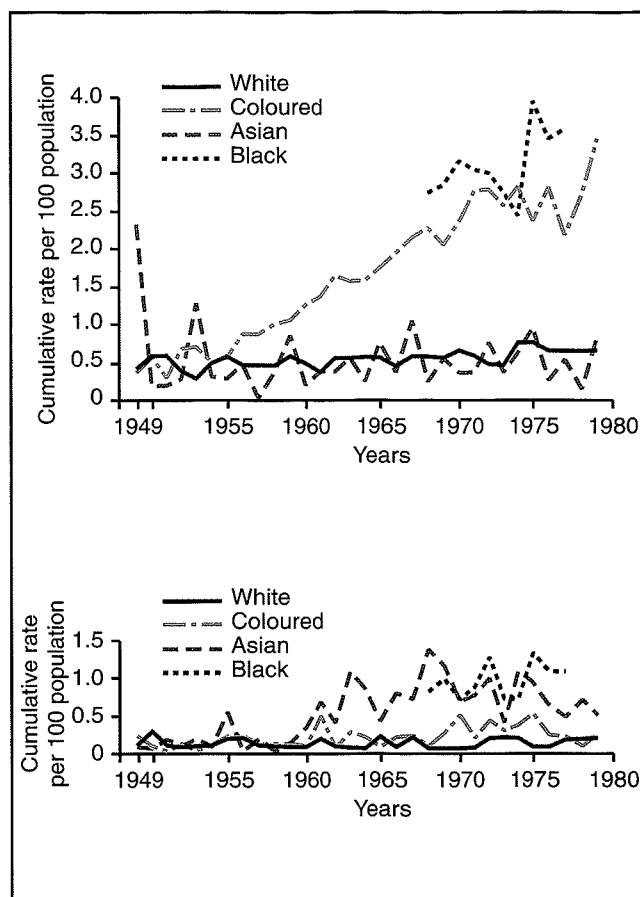


Figure 5. Cancer of the oesophagus, males (above) and females (below).

National Cancer Registry data, Kaposi sarcoma comprised only 0.6% of all cancers in black males and 0.2% in black females in 1989–92 (Table 10), suggesting some reduction in its occurrence between the 1960s and the 1980s. However, increases in incidence have been noted since 1992, in keeping with the development of the HIV epidemic (Sitas *et al.*, 1998, Sitas & Newton, 2000).

Summary

In summary, in South Africa a number of attempts have been made to estimate the burden of cancer and its heterogeneity. The methodologies used in these different attempts have differed significantly (for example, haematological and eye cancers in the Johannesburg survey of 1966–75 were excluded; the National Cancer Registry is only pathology-based) and with regard to the methods of analyses employed. Some of the Transkei age-standardized rates have been published using the 'African' population standard. While fashionable at the time, most registries have now moved to using the World standard in order to promote international comparability. Unfortunately, the raw data from some of the earlier surveys are not available, making it difficult to use these data for comparative purposes.

Despite these limitations, it is clear that South Africa experienced an enormous increase in the incidence of oesophageal cancer, and since the mid-1980s a decrease, as shown in the declining proportion of oesophageal cancers over time in the National Cancer Registry. Similar increases have occurred in oral cancers. Some of the contrasts in oesophageal cancer noted in the Transkei have become less significant over time. The reasons for these secular trends with regard to oesophageal cancer remain elusive. Data from over a decade ago suggest that liver cancer is also declining, but lung cancer appears to be slowly increasing.

Colorectal cancer is one of the leading cancers among whites, but 10 times rarer in the black than the white population. However, although there is an eight-fold difference in incidence in the older groups (e.g., males 55–64 years: 276.3 vs 33/100 000), there is no difference in incidence in the younger age groups (e.g., 15–24 years: 1.6 vs 1.6 per 100 000), suggesting that the lifestyle of the younger black generation is coming to resemble that of the younger white generation.

The incidence of melanoma and non-melanoma skin cancers in whites is high and similar to that observed in Caucasians in Australia. Incidence rates for mesothelioma (at least in whites) are similar to those in other countries where asbestos was formerly mined, such as Australia. Cancer of the cervix is the leading cancer in black females, and the rates are similar to those observed in the rest of Africa.

Childhood cancers

The data on childhood cancer from the National Cancer Registry are shown in Tables 14–17. The cases are histologically diagnosed cancers, recorded in 1989–1992; the rates therefore represent minimum incidence and cannot be compared directly with those from population-based series.

In black children (Table 14), 2295 cancers were recorded, with an overall incidence (ASR) of 53.5 per million and sex ratio (boys:girls) of 1.3. Burkitt lymphoma is relatively rare (10% of lymphomas, 1.3% of all cancers). Neuroblastomas comprised 4.1% of childhood cancers, considerably less than Wilms tumour (9.7%) and retinoblastoma (5.3%).

In white children (Table 15), a total of 819 cases were recorded with an estimated ASR of 192.2 per million. The leading cancers were leukaemias (23.8%, ASR 46.5 per million) and lymphomas (12.3%, ASR 22.2 per million). Neuroblastoma (6%, ASR 12.2 per million) was the most common solid tumour.

297 cases were recorded in mixed race children (Table 16), an overall ASR of 70.5 per million, while there were 157 cases among Indian children (Table 17), an ASR of 131.8 per million.

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Table 1. South Africa, Johannesburg: Bantu (1953-1955)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

SITE	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	21	0	1	-	1	5	5	4	5	2.6	4.3	5.6	C00-C08
Nasopharynx	6	0	-	2	2	1	-	1	-	0.8	1.2	0.8	C11
Other pharynx	1	0	-	-	1	-	-	-	-	0.1	0.2	0.1	C09-C10,C12-C14
Oesophagus	54	1	-	-	-	12	25	6	10	6.8	11.0	12.4	C15
Stomach	41	0	-	1	1	9	14	9	7	5.1	8.4	10.0	C16
Colon, rectum and anus	12	0	-	-	1	1	3	4	3	1.5	2.5	3.7	C18-C21
Liver	113	0	1	3	22	34	31	10	12	14.2	23.1	19.3	C22
Pancreas	10	0	-	-	3	-	3	3	1	1.3	2.0	2.3	C25
Larynx	8	0	-	-	-	-	5	1	2	1.0	1.6	2.2	C32
Trachea, bronchus and lung	40	0	-	-	2	7	22	6	3	5.0	8.2	7.5	C33-C34
Melanoma of skin	5	1	-	-	1	1	1	-	1	0.6	1.0	1.1	C43
Other skin	9	0	-	-	3	2	2	1	1	1.1	-	1.6	C44
Kaposi sarcoma													C46
Breast	3	0	-	-	-	1	1	-	1	0.4	0.6	0.8	C50
Penis	8	0	-	-	1	3	2	1	1	1.0	1.6	1.5	C60
Prostate	21	0	-	-	-	-	3	7	11	2.6	4.3	9.3	C61
Kidney etc.	5	0	-	-	-	1	2	2	-	0.6	1.0	1.1	C64-C66,C68
Bladder	17	0	-	1	2	3	6	3	2	2.1	3.5	3.5	C67
Eye	5	0	2	-	-	1	2	-	-	0.6	1.0	0.7	C69
Brain, nervous system	14	0	3	3	4	4	-	-	-	1.8	2.9	1.5	C70-C72
Thyroid	1	0	-	-	-	1	-	-	-	0.1	0.2	0.1	C73
Hodgkin disease	10	0	1	3	2	3	1	-	-	1.3	2.0	1.0	C81
Non-Hodgkin lymphoma	11	0	2	1	3	3	1	1	-	1.4	2.2	1.4	C82-C85,C96
Multiple myeloma	6	0	-	1	-	1	3	1	-	0.8	1.2	1.0	C90
Leukaemia	18	0	4	2	4	5	1	1	1	2.3	3.7	2.7	C91-C95
Other and unspecified	50	0	2	4	7	8	12	8	9	6.3	10.2	11.6	O&U
All sites	489	2	16	21	60	106	145	69	70	61.3	100.0	102.6	ALL
All sites but C44	480	2	16	21	57	104	143	68	69	60.2	98.2	101.0	ALLbC44
Average annual population			56160	48060	69690	52880	27710	7400	4020				

Source: Cancer Incidence in Five Continents volume 1

Table 1. South Africa, Johannesburg: Bantu (1953-1955)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	5	0	-	-	1	1	1	-	2	0.8	1.1	1.7	C00-C08
Nasopharynx	2	0	-	-	-	-	-	1	1	0.3	0.4	1.1	C11
Other pharynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C09-C10,C12-C14
Oesophagus	2	0	-	-	-	-	-	1	1	0.3	0.4	1.1	C15
Stomach	18	0	-	-	2	3	5	6	2	2.8	4.0	6.4	C16
Colon, rectum and anus	15	0	-	-	2	3	-	9	1	2.4	3.3	6.1	C18-C21
Liver	25	0	-	1	4	2	3	10	5	3.9	5.5	9.9	C22
Pancreas	4	0	-	-	-	1	-	1	2	0.6	0.9	1.8	C25
Larynx	2	0	-	-	1	1	-	-	-	0.3	0.4	0.2	C32
Trachea, bronchus and lung	8	0	-	-	3	-	-	2	3	1.3	1.8	3.1	C33-C34
Melanoma of skin	6	0	-	-	-	2	2	1	1	0.9	1.3	1.9	C43
Other skin	7	0	-	-	2	-	1	3	1	1.1	1.3	2.7	C44
Kaposi sarcoma													C46
Breast	49	0	-	2	8	8	16	4	11	7.7	10.9	14.9	C50
Cervix uteri	189	0	-	2	29	59	53	24	22	29.8	41.9	51.0	C53
Uterus	1	0	-	-	-	1	-	-	-	0.2	0.2	0.1	C54-C55
Ovary etc.	19	0	-	3	5	6	3	1	1	3.0	4.2	3.6	C56-C57
Kidney etc.	3	0	2	-	-	1	-	-	-	0.5	0.7	0.5	C64-C66,C68
Bladder	3	0	-	-	-	1	1	-	1	0.5	0.7	1.0	C67
Eye	2	0	1	-	-	1	-	-	-	0.3	0.4	0.3	C69
Brain, nervous system	10	0	2	1	-	1	2	3	1	1.6	2.2	3.3	C70-C72
Thyroid	7	0	-	-	3	2	-	1	1	1.1	1.6	1.7	C73
Hodgkin disease	5	0	-	1	2	-	-	2	-	0.8	1.1	1.4	C81
Non-Hodgkin lymphoma	7	0	2	1	-	1	1	1	1	1.1	1.6	2.0	C82-C85,C96
Multiple myeloma	4	0	-	-	-	-	-	1	3	0.6	0.9	2.3	C90
Leukaemia	16	0	5	1	3	3	-	3	1	2.5	3.5	3.9	C91-C95
Other and unspecified	42	0	1	5	5	8	8	8	7	6.6	9.3	12.9	O&U
All sites	451	0	13	17	70	105	96	82	68	71.2	100.0	134.9	ALL
All sites but C44	444	0	13	17	68	105	95	79	67	70.0	98.4	132.3	ALLbC44
Average annual population			62930	44630	52070	28950	13810	4860	4030				

Source: Cancer Incidence in Five Continents volume 1

Table 2. South Africa, Cape Province: Bantu (1956-1959)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

SITE	ALL AGES	AGE UNK	0-	10-	20-	30-	40-	50-	60+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	14	0	-	-	-	3	4	5	2	7.6	7.0	12.3	C00-C08
Nasopharynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C11
Other pharynx	6	0	-	-	-	-	1	2	3	3.3	3.0	10.3	C09-C10,C12-C14
Oesophagus	35	1	-	-	-	3	10	15	6	19.0	17.6	35.6	C15
Stomach	19	0	-	-	2	2	4	3	8	10.3	9.5	26.9	C16
Colon, rectum and anus	8	0	-	-	3	2	2	-	1	4.3	4.0	5.0	C18-C21
Liver	38	0	-	-	6	14	8	5	5	20.6	19.1	26.5	C22
Pancreas	3	0	-	-	-	2	-	-	1	1.6	1.5	3.1	C25
Larynx	1	0	-	-	-	-	1	-	-	0.5	0.5	0.4	C32
Trachea, bronchus and lung	19	0	-	-	-	3	4	5	7	10.3	9.5	25.6	C33-C34
Melanoma of skin	3	0	-	-	-	3	-	-	-	1.6	1.5	0.7	C43
Other skin	1	0	-	-	-	-	-	1	-	0.5	-	0.9	C44
Kaposi sarcoma													C46
Breast	1	0	-	-	-	-	1	-	-	0.5	0.5	0.4	C50
Penis	1	0	-	-	-	-	-	-	1	0.5	0.5	2.7	C60
Prostate	8	0	-	-	-	-	1	1	6	4.3	4.0	17.4	C61
Kidney etc.	2	0	1	-	-	-	1	-	-	1.1	1.0	1.3	C64-C66,C68
Bladder	4	0	-	-	-	-	-	2	2	2.2	2.0	7.2	C67
Eye	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C69
Brain, nervous system	1	0	-	-	-	1	-	-	-	0.5	0.5	0.2	C70-C72
Thyroid	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C73
Hodgkin disease	2	0	-	-	-	-	2	-	-	1.1	1.0	0.9	C81
Non-Hodgkin lymphoma	5	0	-	1	-	1	-	3	-	2.7	2.5	4.1	C82-C85,C96
Multiple myeloma	2	0	-	-	-	-	-	1	1	1.1	1.0	3.6	C90
Leukaemia	6	0	2	-	-	1	1	1	1	3.3	3.0	6.0	C91-C95
Other and unspecified	20	1	-	-	5	3	3	6	2	10.9	10.1	15.1	O&U
All sites	199	2	3	1	16	38	43	50	46	108.0	100.0	206.4	ALL
All sites but C44	198	2	3	1	16	38	43	49	46	107.5	99.5	205.5	ALLbC44
Average annual population			6262	3785	12343	13189	6978	2477	1030				

Source: Cancer Incidence in Five Continents volume 2

Table 2. South Africa, Cape Province: Bantu (1956-1959)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	0-	10-	20-	30-	40-	50-	60+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	4	0	-	-	1	2	1	-	-	4.2	4.4	3.5	C00-C08
Nasopharynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C11
Other pharynx	1	0	-	-	-	-	1	-	-	1.0	1.1	1.3	C09-C10,C12-C14
Oesophagus	6	0	-	-	-	-	3	1	2	6.3	6.6	14.1	C15
Stomach	8	0	-	-	-	-	3	3	2	8.3	8.8	18.2	C16
Colon, rectum and anus	3	0	-	-	-	1	-	-	2	3.1	3.3	8.9	C18-C21
Liver	2	0	-	-	-	-	-	-	2	2.1	2.2	8.1	C22
Pancreas	1	0	-	-	-	-	-	-	1	1.0	1.1	4.1	C25
Larynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C32
Trachea, bronchus and lung	2	0	-	-	-	1	-	-	1	2.1	2.2	4.8	C33-C34
Melanoma of skin	2	0	-	-	-	-	1	1	-	2.1	2.2	3.3	C43
Other skin	1	0	-	-	1	-	-	-	-	1.0	-	0.8	C44
Kaposi sarcoma													C46
Breast	11	0	-	-	-	5	3	3	-	11.5	12.1	13.6	C50
Cervix uteri	15	0	-	-	-	2	7	5	1	15.7	16.5	24.8	C53
Uterus	4	1	-	-	1	-	1	1	-	4.2	4.4	5.5	C54-C55
Ovary etc.	7	0	2	-	-	2	1	2	-	7.3	7.7	8.4	C56-C57
Kidney etc.	2	0	-	-	1	-	-	1	-	2.1	2.2	2.8	C64-C66,C68
Bladder	2	0	-	-	-	1	1	-	-	2.1	2.2	2.0	C67
Eye	2	0	1	-	-	1	-	-	-	2.1	2.2	1.5	C69
Brain, nervous system	2	0	-	-	-	-	1	1	-	2.1	2.2	3.3	C70-C72
Thyroid	3	0	-	-	-	2	1	-	-	3.1	3.3	2.7	C73
Hodgkin disease	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C81
Non-Hodgkin lymphoma	1	0	-	-	1	-	-	-	-	1.0	1.1	0.8	C82-C85,C96
Multiple myeloma	2	0	-	-	-	-	1	1	-	2.1	2.2	3.3	C90
Leukaemia	1	0	-	-	-	1	-	-	-	1.0	1.1	0.7	C91-C95
Other and unspecified	9	0	1	-	1	-	2	3	2	9.4	9.9	18.5	O&U
All sites	91	1	4	-	6	18	27	22	13	95.0	100.0	155.5	ALL
All sites but C44	90	1	4	-	5	18	27	22	13	93.9	98.9	154.7	ALLbC44
Average annual population			6824	3779	5084	4171	2324	1099	675				

Source: Cancer Incidence in Five Continents volume 2

Table 3. South Africa, Cape Province: Coloured (1956-1959)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	35	0	-	1	2	9	7	4	12	4.8	4.8	10.2	C00-C08
Nasopharynx	4	0	1	2	-	-	1	-	-	0.6	0.5	0.6	C11
Other pharynx	17	0	-	-	-	3	4	4	6	2.3	2.3	5.4	C09-C10,C12-C14
Oesophagus	34	0	-	-	2	2	9	14	7	4.7	4.7	10.1	C15
Stomach	176	0	-	-	6	23	39	62	46	24.3	24.2	53.4	C16
Colon, rectum and anus	28	0	-	2	2	5	8	2	9	3.9	3.8	7.9	C18-C21
Liver	6	0	-	-	-	-	4	2	-	0.8	0.8	1.5	C22
Pancreas	19	0	-	-	1	3	2	6	7	2.6	2.6	6.1	C25
Larynx	8	0	-	-	-	1	3	2	2	1.1	1.1	2.4	C32
Trachea, bronchus and lung	129	0	-	-	-	12	27	43	47	17.8	17.7	42.7	C33-C34
Melanoma of skin	1	0	-	-	-	1	-	-	-	0.1	0.1	0.2	C43
Other skin	12	0	-	1	-	2	1	1	7	1.7	-	4.2	C44
Kaposi sarcoma													C46
Breast	3	0	-	-	-	1	1	-	1	0.4	0.4	0.9	C50
Penis	8	0	-	-	-	-	3	3	2	1.1	1.1	2.5	C60
Prostate	51	0	-	-	-	-	-	19	32	7.0	7.0	20.5	C61
Kidney etc.	15	0	2	-	-	2	3	5	3	2.1	2.1	4.1	C64-C66,C68
Bladder	19	0	-	-	-	3	3	4	9	2.6	2.6	6.5	C67
Eye	2	0	2	-	-	-	-	-	-	0.3	0.3	0.2	C69
Brain, nervous system	9	1	2	2	1	-	-	1	2	1.2	1.2	2.0	C70-C72
Thyroid	2	0	-	1	-	-	-	-	1	0.3	0.3	0.6	C73
Hodgkin disease	14	0	2	3	2	2	2	1	2	1.9	1.9	2.8	C81
Non-Hodgkin lymphoma	24	0	8	3	3	2	5	1	2	3.3	3.3	4.2	C82-C85,C96
Multiple myeloma	7	0	-	1	-	3	-	2	1	1.0	1.0	1.7	C90
Leukaemia	31	0	12	6	2	3	3	2	3	4.3	4.3	5.3	C91-C95
Other and unspecified	74	0	2	4	9	8	11	20	20	10.2	10.2	21.0	O&U
All sites	728	1	31	26	30	85	136	198	221	100.6	100.0	217.1	ALL
All sites but C44	716	1	31	25	30	83	135	197	214	99.0	98.4	212.9	ALLbC44
Average annual population			78195	36190	26230	17686	12145	6615	3808				

Source: Cancer Incidence in Five Continents volume 2

Table 3. South Africa, Cape Province: Coloured (1956-1959)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	22	0	-	3	3	7	6	1	2	2.8	2.8	3.8	C00-C08
Nasopharynx	1	0	-	-	1	-	-	-	-	0.1	0.1	0.1	C11
Other pharynx	1	0	-	-	-	-	1	-	-	0.1	0.1	0.2	C09-C10,C12-C14
Oesophagus	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C15
Stomach	104	1	-	-	4	12	16	24	47	13.2	13.4	25.5	C16
Colon, rectum and anus	48	0	-	-	5	5	10	8	20	6.1	6.2	11.2	C18-C21
Liver	4	0	1	-	1	-	-	2	-	0.5	0.5	0.7	C22
Pancreas	9	0	-	-	-	2	-	3	4	1.1	1.2	2.2	C25
Larynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C32
Trachea, bronchus and lung	19	0	-	-	2	3	5	3	6	2.4	2.4	4.2	C33-C34
Melanoma of skin	6	0	1	1	-	2	1	1	-	0.8	0.8	1.0	C43
Other skin	13	0	-	-	-	5	2	3	3	1.6	-	2.8	C44
Kaposi sarcoma													C46
Breast	117	0	-	-	5	26	28	31	27	14.8	15.1	25.8	C50
Cervix uteri	173	0	-	2	21	51	37	39	23	21.9	22.3	34.4	C53
Uterus	48	0	-	-	1	7	12	15	13	6.1	6.2	11.1	C54-C55
Ovary etc.	45	0	-	2	8	11	11	8	5	5.7	5.8	8.5	C56-C57
Kidney etc.	9	0	2	-	1	-	3	1	2	1.1	1.2	1.7	C64-C66,C68
Bladder	10	0	-	-	-	-	2	2	6	1.3	1.3	2.7	C67
Eye	4	0	1	-	1	1	-	1	-	0.5	0.5	0.6	C69
Brain, nervous system	13	0	4	1	-	-	3	4	1	1.6	1.7	2.4	C70-C72
Thyroid	7	0	-	2	1	2	1	-	1	0.9	0.9	1.1	C73
Hodgkin disease	7	0	2	3	1	1	-	-	-	0.9	0.9	0.8	C81
Non-Hodgkin lymphoma	15	0	1	2	1	2	3	5	1	1.9	1.9	2.9	C82-C85,C96
Multiple myeloma	3	0	-	-	-	-	1	1	1	0.4	0.4	0.7	C90
Leukaemia	23	0	6	4	5	2	2	3	1	2.9	3.0	3.3	C91-C95
Other and unspecified	76	1	4	3	4	10	14	12	28	9.6	9.8	16.9	O&U
All sites	777	2	22	23	65	149	158	167	191	98.6	100.0	164.7	ALL
All sites but C44	764	2	22	23	65	144	156	164	188	96.9	98.3	161.9	ALLbC44
Average annual population			79305	40879	29445	19431	14166	7865	5987				

Source: Cancer Incidence in Five Continents volume 2

Table 4. South Africa, Cape Province: White (1956-1959)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	173	31	-	1	11	25	37	29	39	30.6	8.6	30.8	C00-C08
Nasopharynx	2	0	-	-	-	-	-	1	1	0.4	0.1	0.4	C11
Other pharynx	37	0	-	-	-	-	10	18	9	6.6	1.8	6.9	C09-C10,C12-C14
Oesophagus	33	0	-	-	-	-	3	12	18	5.8	1.6	6.4	C15
Stomach	174	0	-	-	3	9	27	42	93	30.8	8.6	32.9	C16
Colon, rectum and anus	98	4	-	3	1	2	14	27	47	17.4	4.9	18.6	C18-C21
Liver	6	0	-	-	-	-	-	5	1	1.1	0.3	1.2	C22
Pancreas	33	1	-	-	-	2	6	11	13	5.8	1.6	6.2	C25
Larynx	19	0	-	-	-	2	5	5	7	3.4	0.9	3.5	C32
Trachea, bronchus and lung	237	2	-	1	1	7	40	86	100	42.0	11.8	44.8	C33-C34
Melanoma of skin	18	2	-	-	2	5	5	2	2	3.2	0.9	3.1	C43
Other skin	730	165	-	-	7	55	145	111	247	129.2		134.1	C44
Kaposi sarcoma													C46
Breast	8	0	-	-	-	1	-	2	5	1.4	0.4	1.5	C50
Penis	4	0	-	-	-	1	-	-	3	0.7	0.2	0.8	C60
Prostate	122	2	-	-	-	-	1	14	105	21.6	6.1	24.2	C61
Kidney etc.	24	0	2	-	-	3	2	9	8	4.2	1.2	4.5	C64-C66,C68
Bladder	51	1	-	-	-	1	8	16	25	9.0	2.5	9.7	C67
Eye	8	0	-	1	-	-	1	3	3	1.4	0.4	1.5	C69
Brain, nervous system	20	0	4	-	3	3	3	5	2	3.5	1.0	3.6	C70-C72
Thyroid	6	1	-	-	-	-	1	-	4	1.1	0.3	1.2	C73
Hodgkin disease	15	1	-	-	2	3	3	2	4	2.7	0.7	2.7	C81
Non-Hodgkin lymphoma	39	1	-	-	1	5	12	12	8	6.9	1.9	7.0	C82-C85,C96
Multiple myeloma	12	0	-	-	-	-	3	4	5	2.1	0.6	2.2	C90
Leukaemia	34	1	8	1	-	1	4	7	12	6.0	1.7	6.4	C91-C95
Other and unspecified	109	4	6	2	5	12	20	21	39	19.3	5.4	20.0	O&U
All sites	2012	216	20	9	36	137	350	444	800	356.2	100.0	374.7	ALL
All sites but C44	1282	51	20	9	29	82	205	333	553	227.0	63.7	240.2	ALLbC44
Average annual population			41369	24335	20070	19109	17175	10395	8757				

Source: Cancer Incidence in Five Continents volume 2

Table 4. South Africa, Cape Province: White (1956-1959)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	51	2	1	2	5	4	10	7	20	8.4	2.6	7.5	C00-C08
Nasopharynx	3	0	-	-	-	-	1	-	2	0.5	0.2	0.4	C11
Other pharynx	6	0	-	-	-	-	-	3	3	1.0	0.3	0.9	C09-C10,C12-C14
Oesophagus	7	0	-	-	-	-	-	3	4	1.2	0.4	1.0	C15
Stomach	103	3	-	-	-	-	8	19	73	17.0	5.3	14.4	C16
Colon, rectum and anus	160	5	1	3	5	8	15	33	90	26.4	8.3	22.9	C18-C21
Liver	4	0	1	-	-	-	-	-	3	0.7	0.2	0.6	C22
Pancreas	24	0	-	-	-	2	4	4	14	4.0	1.2	3.4	C25
Larynx	3	0	-	-	-	-	-	1	2	0.5	0.2	0.4	C32
Trachea, bronchus and lung	37	0	-	-	-	2	8	8	19	6.1	1.9	5.3	C33-C34
Melanoma of skin	34	1	1	3	3	9	5	3	9	5.6	1.8	5.1	C43
Other skin	511	106	-	4	12	29	78	87	195	84.4		73.2	C44
Kaposi sarcoma													C46
Breast	398	24	-	1	10	55	106	83	119	65.8	20.6	57.6	C50
Cervix uteri	154	2	-	1	7	34	41	44	25	25.4	8.0	22.6	C53
Uterus	99	1	-	3	1	6	25	33	30	16.4	5.1	14.4	C54-C55
Ovary etc.	71	1	-	2	1	11	23	12	21	11.7	3.7	10.3	C56-C57
Kidney etc.	16	1	1	-	-	-	1	5	8	2.6	0.8	2.3	C64-C66,C68
Bladder	22	0	-	-	-	-	3	2	17	3.6	1.1	3.1	C67
Eye	4	0	-	-	-	1	1	1	1	0.7	0.2	0.6	C69
Brain, nervous system	19	0	2	1	1	4	3	6	2	3.1	1.0	2.9	C70-C72
Thyroid	20	1	-	1	4	3	2	5	4	3.3	1.0	3.0	C73
Hodgkin disease	8	0	-	3	1	-	1	2	1	1.3	0.4	1.2	C81
Non-Hodgkin lymphoma	34	1	3	1	-	5	4	6	14	5.6	1.8	5.0	C82-C85,C96
Multiple myeloma	4	0	-	-	-	-	-	2	2	0.7	0.2	0.6	C90
Leukaemia	33	0	7	1	-	4	9	4	8	5.5	1.7	5.1	C91-C95
Other and unspecified	109	3	3	-	6	4	10	21	62	18.0	5.6	15.7	O&U
All sites	1934	151	20	26	56	181	358	394	748	319.5	100.0	279.6	ALL
All sites but C44	1423	45	20	22	44	152	280	307	553	235.1	73.6	206.3	ALLbC44
Average annual population			39699	25336	21129	20038	18842	13515	12759				

Source: Cancer Incidence in Five Continents volume 2

Table 5. South Africa, Natal: Indian (1964-1966)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	10	0	-	-	1	-	-	4	5	2.4	4.5	7.5	C00-C08
Nasopharynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C11
Other pharynx	2	0	-	-	-	-	-	2	-	0.5	0.9	1.2	C09-C10,C12-C14
Oesophagus	8	0	-	-	-	-	1	6	1	1.9	3.6	5.0	C15
Stomach	32	0	-	1	1	4	6	7	13	7.7	14.5	20.9	C16
Colon, rectum and anus	9	0	-	-	-	1	3	1	4	2.2	4.1	6.0	C18-C21
Liver	13	0	-	-	-	1	3	3	6	3.1	5.9	9.1	C22
Pancreas	6	0	-	-	1	3	1	1	-	1.5	2.7	2.2	C25
Larynx	4	0	-	-	-	-	-	2	2	1.0	1.8	3.1	C32
Trachea, bronchus and lung	30	0	-	-	-	4	9	5	12	7.3	13.6	19.5	C33-C34
Melanoma of skin	1	0	-	-	-	-	-	-	1	0.2	0.5	1.0	C43
Other skin	5	0	-	-	-	2	2	-	1	1.2	-	2.4	C44
Kaposi sarcoma													C46
Breast	2	0	-	-	-	-	-	1	1	0.5	0.9	1.6	C50
Penis	4	0	-	-	-	1	-	1	2	1.0	1.8	2.8	C60
Prostate	10	0	-	-	-	-	-	1	9	2.4	4.5	9.2	C61
Kidney etc.	3	0	-	-	-	-	3	-	-	0.7	1.4	1.3	C64-C66,C68
Bladder	12	0	-	-	1	1	4	2	4	2.9	5.5	7.3	C67
Eye	3	0	2	-	-	-	-	-	1	0.7	1.4	1.3	C69
Brain, nervous system	9	0	6	-	-	2	-	-	1	2.2	4.1	2.6	C70-C72
Thyroid	1	0	-	-	-	-	-	-	1	0.2	0.5	1.0	C73
Hodgkin disease	4	0	3	-	1	-	-	-	-	1.0	1.8	0.8	C81
Non-Hodgkin lymphoma	5	0	1	1	1	1	-	-	1	1.2	2.3	1.9	C82-C85,C96
Multiple myeloma	2	0	-	-	-	-	1	1	-	0.5	0.9	1.0	C90
Leukaemia	17	0	11	1	1	1	-	3	-	4.1	7.7	4.4	C91-C95
Other and unspecified	28	0	2	6	5	2	4	5	4	6.8	12.7	11.9	O&U
All sites	220	0	25	9	12	23	37	45	69	53.2	100.0	124.9	ALL
All sites but C44	215	0	25	9	12	21	35	45	68	52.0	97.7	122.5	ALLbC44
Average annual population			60415	29148	19499	13343	8708	4360	2439				

Source: Cancer Incidence in Five Continents volume 2

Table 5. South Africa, Natal: Indian (1964-1966)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

S I T E	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	14	0	-	-	1	1	3	6	3	3.5	5.1	11.4	C00-C08
Nasopharynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C11
Other pharynx	2	0	-	-	-	-	-	1	1	0.5	0.7	2.3	C09-C10,C12-C14
Oesophagus	17	0	-	-	1	4	2	7	3	4.2	6.2	12.7	C15
Stomach	32	0	-	-	2	7	5	5	13	7.9	11.6	29.1	C16
Colon, rectum and anus	20	0	-	-	-	4	4	6	6	4.9	7.2	17.2	C18-C21
Liver	5	0	-	-	-	-	3	1	1	1.2	1.8	3.8	C22
Pancreas	2	0	-	-	-	-	-	1	1	0.5	0.7	2.3	C25
Larynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C32
Trachea, bronchus and lung	4	0	-	-	-	1	-	2	1	1.0	1.4	3.4	C33-C34
Melanoma of skin	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C43
Other skin	6	0	-	1	-	2	2	-	1	1.5		3.4	C44
Kaposi sarcoma													C46
Breast	31	0	-	-	5	7	7	8	4	7.6	11.2	19.4	C50
Cervix uteri	62	0	-	-	8	18	18	13	5	15.3	22.5	34.7	C53
Uterus	19	0	-	-	-	5	7	4	3	4.7	6.9	12.8	C54-C55
Ovary etc.	6	0	-	1	1	-	3	-	1	1.5	2.2	3.4	C56-C57
Kidney etc.	2	0	1	-	-	-	1	-	-	0.5	0.7	0.7	C64-C66,C68
Bladder	5	0	-	-	-	-	1	2	2	1.2	1.8	5.1	C67
Eye	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C69
Brain, nervous system	2	0	2	-	-	-	-	-	-	0.5	0.7	0.3	C70-C72
Thyroid	7	0	-	2	2	-	1	2	-	1.7	2.5	2.9	C73
Hodgkin disease	2	0	-	-	2	-	-	-	-	0.5	0.7	0.5	C81
Non-Hodgkin lymphoma	3	0	-	1	1	1	-	-	-	0.7	1.1	0.8	C82-C85,C96
Multiple myeloma	1	0	-	-	-	-	-	-	1	0.2	0.4	1.5	C90
Leukaemia	8	0	3	1	-	1	1	1	1	2.0	2.9	3.8	C91-C95
Other and unspecified	26	0	1	5	-	4	8	5	3	6.4	9.4	14.9	O&U
All sites	276	0	7	11	23	55	66	64	50	68.0	100.0	186.8	ALL
All sites but C44	270	0	7	10	23	53	64	64	49	66.5	97.8	183.4	ALLbC44
Average annual population			61919	29854	19013	12101	7489	3365	1522				

Source: Cancer Incidence in Five Continents volume 2

Table 6. South Africa, Natal: African (1964-1966)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

SITE	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	26	0	-	-	1	6	7	8	4	3.7	2.9	6.4	C00-C08
Nasopharynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C11
Other pharynx	15	0	-	-	-	1	7	5	2	2.2	1.7	3.9	C09-C10,C12-C14
Oesophagus	169	0	-	-	9	30	54	57	19	24.3	19.2	40.1	C15
Stomach	46	0	-	2	3	13	10	9	9	6.6	5.2	11.1	C16
Colon, rectum and anus	14	0	-	-	-	4	4	5	1	2.0	1.6	3.1	C18-C21
Liver	140	0	-	9	20	26	49	25	11	20.1	15.9	27.6	C22
Pancreas	10	0	-	-	1	1	2	5	1	1.4	1.1	2.5	C25
Larynx	19	0	-	-	1	5	5	5	3	2.7	2.2	4.6	C32
Trachea, bronchus and lung	183	0	-	2	5	49	61	36	30	26.3	20.7	43.4	C33-C34
Melanoma of skin	6	0	-	1	1	3	-	1	-	0.9	0.7	0.8	C43
Other skin	16	0	-	1	5	2	5	2	1	2.3	-	2.8	C44
Kaposi sarcoma													C46
Breast	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C50
Penis	27	0	-	-	2	5	9	7	4	3.9	3.1	6.5	C60
Prostate	54	0	-	-	-	1	11	12	30	7.8	6.1	21.8	C61
Kidney etc.	8	0	1	-	-	-	2	5	-	1.1	0.9	1.9	C64-C66,C68
Bladder	15	0	-	-	2	3	5	1	4	2.2	1.7	3.9	C67
Eye	4	0	3	-	-	-	-	1	-	0.6	0.5	0.8	C69
Brain, nervous system	10	0	5	-	-	-	4	1	-	1.4	1.1	1.8	C70-C72
Thyroid	1	0	-	-	-	-	1	-	-	0.1	0.1	0.2	C73
Hodgkin disease	17	0	-	6	2	3	4	1	1	2.4	1.9	2.7	C81
Non-Hodgkin lymphoma	17	0	3	2	2	4	3	1	2	2.4	1.9	3.3	C82-C85,C96
Multiple myeloma	11	0	-	-	1	3	2	4	1	1.6	1.2	2.5	C90
Leukaemia	25	0	10	2	5	4	1	2	1	3.6	2.8	4.1	C91-C95
Other and unspecified	49	0	2	5	5	12	11	9	5	7.0	5.6	9.9	O&U
All sites	882	0	24	30	65	175	257	202	129	126.8	100.0	205.7	ALL
All sites but C44	866	0	24	29	60	173	252	200	128	124.5	98.2	202.9	ALLbC44
Average annual population			61713	52635	46291	36899	20562	9515	4271				

Source: Cancer Incidence in Five Continents volume 2

Table 6. South Africa, Natal: African (1964-1966)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

S I T E	ALL AGES	AGE UNK	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	ASR (W)	ICD (10th)
Mouth	6	0	-	1	1	-	1	1	2	1.2	1.2	2.3	C00-C08
Nasopharynx	1	0	-	-	-	1	-	-	-	0.2	0.2	0.2	C11
Other pharynx	0	0	-	-	-	-	-	-	-	0.0	0.0	0.0	C09-C10,C12-C14
Oesophagus	32	0	-	1	-	6	10	8	7	6.4	6.3	12.0	C15
Stomach	18	0	-	-	-	3	2	6	7	3.6	3.5	7.9	C16
Colon, rectum and anus	15	0	-	-	-	4	4	2	5	3.0	3.0	5.7	C18-C21
Liver	21	0	-	1	6	2	3	6	3	4.2	4.1	6.8	C22
Pancreas	10	0	-	-	-	3	2	4	1	2.0	2.0	3.5	C25
Larynx	1	0	-	-	-	-	-	-	1	0.2	0.2	0.6	C32
Trachea, bronchus and lung	25	0	-	-	1	3	8	3	10	5.0	4.9	10.1	C33-C34
Melanoma of skin	6	0	-	-	1	1	-	2	2	1.2	1.2	2.4	C43
Other skin	6	0	-	1	2	1	2	-	-	1.2	-	1.3	C44
Kaposi sarcoma													C46
Breast	36	0	-	2	6	6	7	9	6	7.2	7.1	12.0	C50
Cervix uteri	176	0	-	3	32	63	35	24	19	35.2	34.6	48.5	C53
Uterus	14	0	-	-	-	4	5	2	3	2.8	2.8	4.8	C54-C55
Ovary etc.	23	0	2	1	4	6	5	1	4	4.6	4.5	6.4	C56-C57
Kidney etc.	7	0	5	-	-	-	1	1	-	1.4	1.4	1.6	C64-C66,C68
Bladder	7	0	-	1	-	2	1	-	3	1.4	1.4	2.6	C67
Eye	3	0	1	1	-	-	-	-	1	0.6	0.6	1.0	C69
Brain, nervous system	6	0	2	1	1	-	2	-	-	1.2	1.2	1.3	C70-C72
Thyroid	9	0	-	1	1	2	1	1	3	1.8	1.8	3.2	C73
Hodgkin disease	3	0	-	-	2	1	-	-	-	0.6	0.6	0.5	C81
Non-Hodgkin lymphoma	8	0	1	2	3	-	1	-	1	1.6	1.6	1.9	C82-C85,C96
Multiple myeloma	8	0	-	-	-	-	-	4	4	1.6	1.6	4.2	C90
Leukaemia	12	0	3	1	4	2	1	1	-	2.4	2.4	2.4	C91-C95
Other and unspecified	55	0	2	5	12	7	11	11	7	11.0	10.8	16.7	O&U
All sites	508	0	16	22	76	117	102	86	89	101.7	100.0	159.7	ALL
All sites but C44	502	0	16	21	74	116	100	86	89	100.5	98.8	158.5	ALLbC44
Average annual population			63322	23995	34274	22498	12561	5765	4055				

Source: Cancer Incidence in Five Continents volume 2

Table 7. South Africa, Transkei, Umtata District (1996-1998)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	14	0	93	-	-	-	-	6	3	5	3.9	5.0	0.64	7.9	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C07-08
Nasopharynx	4	0	25	-	-	-	1	-	2	1	1.1	1.4	0.20	2.1	C11
Other pharynx	10	0	80	1	-	-	1	1	3	4	2.8	3.5	0.36	4.6	C09-10, C12-14
Oesophagus	117	0	38	-	1	2	10	31	35	38	32.7	41.5	5.30	62.5	C15
Stomach	5	0	40	-	-	-	-	1	-	4	1.4	1.8	0.05	2.0	C16
Colon, rectum and anus	10	0	50	-	-	2	-	2	2	4	2.8	3.5	0.37	4.9	C18-21
Liver	35	0	20	-	3	2	3	4	8	15	9.8	12.4	1.16	16.0	C22
Gallbladder etc.	4	0	25	-	-	-	-	1	1	2	1.1	1.4	0.16	2.1	C23-24
Pancreas	3	0	0	-	-	-	-	-	2	1	0.8	1.1	0.15	1.5	C25
Larynx	6	0	67	-	-	-	-	1	3	2	1.7	2.1	0.33	3.5	C32
Trachea, bronchus and lung	33	0	45	-	-	-	1	7	7	18	9.2	11.7	1.03	15.7	C33-34
Bone	1	0	100	1	-	-	-	-	-	-	0.3	0.4	0.01	0.2	C40-41
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C43
Other skin	4	0	100	-	-	-	3	1	-	-	1.1	0.0	0.16	1.9	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	1	0	100	-	-	1	-	-	-	-	0.3	0.4	0.02	0.3	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C49
Breast	4	0	25	-	-	1	-	-	1	2	1.1	1.4	0.10	1.6	C50
Penis	1	0	100	-	-	-	-	1	-	-	0.3	0.4	0.07	0.7	C60
Prostate	11	0	0	-	-	-	-	-	-	11	3.1	3.9	0.00	3.7	C61
Testis	1	0	100	-	1	-	-	-	-	-	0.3	0.4	0.01	0.2	C62
Kidney	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C64
Renal pelvis, ureter and other urinary	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C65-66, C68
Bladder	2	0	0	-	-	-	-	-	1	1	0.6	0.7	0.07	0.9	C67
Eye	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C69
Brain, nervous system	1	0	100	-	-	-	-	1	-	-	0.3	0.4	0.05	0.6	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C73
Hodgkin disease	1	0	100	-	1	-	-	-	-	-	0.3	0.4	0.01	0.2	C81
Non-Hodgkin lymphoma	6	0	17	1	2	-	-	1	-	2	1.7	2.1	0.09	1.9	C82-85, C96
Multiple myeloma	5	0	60	-	-	-	-	3	1	1	1.4	1.8	0.28	3.1	C90
Lymphoid leukaemia	1	0	100	1	-	-	-	-	-	-	0.3	0.4	0.01	0.2	C91
Myeloid leukaemia	1	0	0	-	-	-	-	-	-	1	0.3	0.4	0.00	0.3	C92-94
Leukaemia, unspecified	1	0	0	-	-	-	-	-	-	1	0.3	0.4	0.00	0.3	C95
Other and unspecified	4	0	25	-	-	-	-	2	1	1	1.1	1.4	0.18	2.2	O&U
All sites	286	0	41	4	8	8	19	63	70	114	79.9	108.2	10.82	141.3	ALL
All sites but C44	282	0	40	4	8	8	16	62	70	114	78.8	100.0	10.66	139.3	ALLbC44
Average annual population				53610	24958	14315	9871	5558	4119	6894					

Table 7. South Africa, Transkei, Umtata District (1996-1998)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	2	0	100	-	-	-	-	-	-	2	0.5	0.7	0.00	0.6	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C11
Other pharynx	5	0	40	-	-	-	-	1	2	2	1.2	1.6	0.14	1.8	C09-10,C12-14
Oesophagus	97	0	21	-	-	4	13	16	30	34	22.9	31.9	2.57	34.5	C15
Stomach	4	0	50	-	-	-	-	-	1	3	0.9	1.3	0.05	1.3	C16
Colon, rectum and anus	5	0	60	-	-	-	2	-	-	3	1.2	1.6	0.05	1.5	C18-21
Liver	15	0	40	-	3	3	2	2	3	2	3.5	4.9	0.35	4.5	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24
Pancreas	3	0	33	-	-	-	-	1	1	1	0.7	1.0	0.10	1.2	C25
Larynx	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C32
Trachea, bronchus and lung	10	0	30	-	-	-	1	2	4	3	2.4	3.3	0.30	3.6	C33-34
Bone	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C40-41
Melanoma of skin	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C43
Other skin	3	0	33	1	-	-	1	1	-	-	0.7	-	0.08	1.0	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	3	0	67	-	1	-	-	-	1	1	0.7	1.0	0.06	0.9	C49
Breast	42	0	76	-	-	4	9	9	13	7	9.9	13.8	1.30	14.9	C50
Vulva	4	0	75	-	-	-	-	-	1	3	0.9	1.3	0.05	1.3	C51
Vagina	2	0	50	-	-	-	-	-	-	2	0.5	0.7	0.00	0.6	C52
Cervix uteri	75	0	79	-	-	11	10	13	28	13	17.7	24.7	2.35	26.3	C53
Uterus	2	0	100	-	-	-	-	1	-	1	0.5	0.7	0.04	0.8	C54-55
Ovary	9	0	56	-	-	-	2	1	4	2	2.1	3.0	0.30	3.3	C56
Placenta	2	0	100	-	-	-	2	-	-	-	0.5	0.7	0.05	0.6	C58
Kidney	6	0	50	2	-	1	-	1	-	2	1.4	2.0	0.08	1.6	C64
Renal pelvis, ureter and other urinary	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C65-66,C68
Bladder	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C67
Eye	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C69
Brain, nervous system	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C70-72
Thyroid	2	0	100	-	-	-	-	-	2	-	0.5	0.7	0.10	0.8	C73
Hodgkin disease	1	0	100	-	1	-	-	-	-	-	0.2	0.3	0.01	0.2	C81
Non-Hodgkin lymphoma	4	0	75	-	1	1	-	-	1	1	0.9	1.3	0.08	1.1	C82-85,C96
Multiple myeloma	3	0	67	-	-	-	1	-	-	2	0.7	1.0	0.02	0.9	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C91
Myeloid leukaemia	1	0	100	-	-	-	-	-	-	1	0.2	0.3	0.00	0.3	C92-94
Leukaemia, unspecified	1	0	0	-	-	-	-	-	-	1	0.2	0.3	0.00	0.3	C95
Other and unspecified	6	0	33	-	1	1	2	1	-	1	1.4	2.0	0.12	1.8	O&U
All sites	307	0	52	3	7	25	45	49	91	87	72.3	-	8.20	105.8	ALL
All sites but C44	304	0	52	2	7	25	44	48	91	87	71.6	100.0	8.13	104.8	ALLbC44
Average annual population				52866	31754	20797	13880	7686	6867	7646					

Table 8. South Africa, Transkei, 4 Districts (1996-1998)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	11	0	73	-	-	-	1	-	6	4	1.5	4.5	0.25	2.9	C00-06
Salivary gland	1	0	100	-	-	-	-	-	1	-	0.1	0.4	0.04	0.3	C07-08
Nasopharynx	1	0	0	-	-	-	-	-	1	-	0.1	0.4	0.04	0.3	C11
Other pharynx	2	0	100	-	-	-	-	-	1	1	0.3	0.8	0.04	0.5	C09-10, C12-14
Esophagus	134	0	10	-	-	1	13	31	38	51	18.5	54.5	2.83	37.5	C15
Stomach	7	0	14	-	-	2	1	1	1	2	1.0	2.8	0.13	1.8	C16
Colon, rectum and anus	6	0	50	-	-	2	1	-	2	1	0.8	2.4	0.14	1.6	C18-21
Liver	19	0	58	1	-	1	2	8	2	5	2.6	7.7	0.42	5.5	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24
Pancreas	3	0	33	-	-	-	1	-	2	-	0.4	1.2	0.09	0.8	C25
Larynx	5	0	60	-	-	-	-	2	1	2	0.7	2.0	0.10	1.4	C32
Trachea, bronchus and lung	15	0	33	-	-	-	2	7	4	2	2.1	6.1	0.46	4.9	C33-34
Bone	3	0	67	1	1	-	-	-	1	-	0.4	1.2	0.05	0.7	C40-41
Melanoma of skin	3	0	67	-	-	-	-	1	1	1	0.4	1.2	0.08	0.9	C43
Other skin	3	0	67	-	-	-	1	1	1	-	0.4	0.0	0.10	1.0	C44
Mesothelioma	2	0	50	-	-	-	-	2	-	-	0.3	0.8	0.08	0.8	C45
Kaposi sarcoma	2	0	100	-	-	-	-	1	1	-	0.3	0.8	0.07	0.7	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	2	0	100	-	1	-	-	-	1	-	0.3	0.8	0.04	0.4	C49
Breast	1	0	100	-	-	-	-	-	-	1	0.1	0.4	0.00	0.2	C50
Penis	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C60
Prostate	12	0	42	-	-	-	-	1	3	8	1.7	4.9	0.15	2.9	C61
Testis	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C62
Kidney	3	0	33	2	-	-	1	-	-	-	0.4	1.2	0.03	0.5	C64
Renal pelvis, ureter and other urinary	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C65-66, C68
Bladder	2	0	50	-	-	-	-	-	-	2	0.3	0.8	0.00	0.4	C67
Eye	1	0	100	1	-	-	-	-	-	-	0.1	0.4	0.00	0.1	C69
Brain, nervous system	1	0	0	1	-	-	-	-	-	-	0.1	0.4	0.00	0.1	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C73
Hodgkin disease	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C81
Non-Hodgkin lymphoma	1	0	100	-	-	-	1	-	-	-	0.1	0.4	0.03	0.3	C82-85, C96
Multiple myeloma	1	0	0	-	-	-	-	1	-	-	0.1	0.4	0.03	0.4	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C92-94
Leukaemia, unspecified	1	0	0	-	-	-	-	1	-	-	0.1	0.4	0.04	0.4	C95
Other and unspecified	7	0	86	1	1	2	-	-	2	1	1.0	2.8	0.12	1.5	O&U
All sites	249	0	31	7	3	8	24	57	69	81	34.4	100.0	5.35	68.5	ALL
All sites but C44	246	0	30	7	3	8	23	56	68	81	33.9	100.0	5.25	67.5	ALLbC44

Average annual population

127729

48959

19366

15381

9782

9125

11263

Table 8. South Africa, Transkei, 4 Districts (1996-1998)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	2	0	100	-	-	-	1	-	-	1	0.2	0.5	0.02	0.3	C00-06
Salivary gland	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C07-08
Nasopharynx	1	0	0	-	-	-	-	-	-	1	0.1	0.2	0.00	0.1	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C09-10,C12-14
Oesophagus	173	0	6	-	-	2	14	25	67	65	19.2	41.9	2.01	26.5	C15
Stomach	2	0	0	-	-	-	1	-	-	1	0.2	0.5	0.01	0.3	C16
Colon, rectum and anus	6	0	33	-	-	-	1	1	-	4	0.7	1.5	0.03	0.9	C18-21
Liver	7	0	71	-	-	-	1	2	2	2	0.8	1.7	0.09	1.2	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C23-24
Pancreas	2	0	0	-	-	-	-	1	1	-	0.2	0.5	0.04	0.4	C25
Larynx	1	0	100	-	-	-	-	1	-	-	0.1	0.2	0.02	0.2	C32
Trachea, bronchus and lung	4	0	100	-	-	-	-	2	1	1	0.4	1.0	0.06	0.7	C33-34
Bone	5	0	60	1	-	-	1	1	2	-	0.6	1.2	0.08	0.8	C40-41
Melanoma of skin	1	0	100	-	-	-	-	-	1	-	0.1	0.2	0.02	0.2	C43
Other skin	1	0	0	-	-	-	-	-	-	1	0.1	0.2	0.00	0.1	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	1	0	0	-	-	1	-	-	-	-	0.1	0.2	0.01	0.1	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	2	0	100	1	-	1	-	-	-	-	0.2	0.5	0.01	0.2	C49
Breast	36	0	64	-	-	2	6	13	6	9	4.0	8.7	0.48	6.1	C50
Vulva	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C51
Vagina	1	0	100	-	-	-	-	1	-	-	0.1	0.2	0.02	0.2	C52
Cervix uteri	134	0	78	-	-	9	28	22	45	30	14.9	32.4	1.83	21.7	C53
Uterus	8	0	88	-	-	-	3	-	3	2	0.9	1.9	0.10	1.3	C54-55
Ovary	5	0	80	-	-	-	-	-	4	1	0.6	1.2	0.08	0.8	C56
Placenta	2	0	100	-	-	1	1	-	-	-	0.2	0.5	0.02	0.3	C58
Kidney	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C64
Renal pelvis, ureter and other urinary	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C65-66,C68
Bladder	1	0	0	-	-	-	-	-	1	-	0.1	0.2	0.02	0.1	C67
Eye	4	0	100	1	-	-	1	-	-	2	0.4	1.0	0.02	0.5	C69
Brain, nervous system	2	0	100	1	-	-	1	-	-	-	0.2	0.5	0.02	0.3	C70-72
Thyroid	3	0	100	-	-	-	-	1	1	1	0.3	0.7	0.04	0.5	C73
Hodgkin disease	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C81
Non-Hodgkin lymphoma	2	0	0	-	-	1	1	-	-	-	0.2	0.5	0.02	0.3	C82-85,C96
Multiple myeloma	1	0	0	-	-	-	-	-	-	1	0.1	0.2	0.00	0.1	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C91
Myeloid leukaemia	2	0	100	-	-	1	-	1	-	-	0.2	0.5	0.03	0.3	C92-94
Leukaemia, unspecified	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C95
Other and unspecified	5	0	20	-	-	-	-	2	2	1	0.6	1.2	0.08	0.9	O&U
All sites	414	0	44	4	-	18	60	73	136	123	46.0		5.19	65.4	ALL
All sites but C44	413	0	45	4	-	18	60	73	136	122	45.9	100.0	5.19	65.3	ALLbC44
Average annual population				126832	60421	34832	25946	16179	17322	18410					

Table 9. South Africa, Elim (1991-1994)

NUMBER OF CASES BY AGE GROUP - MALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	%	ICD (10th)
Mouth	38	1	82	-	-	1	4	2	10	20	16.5	C00-06
Salivary gland	19	2	53	1	-	2	1	2	2	9	8.2	C07-08
Nasopharynx	2	0	100	-	-	-	-	1	-	1	0.9	C11
Other pharynx	4	0	100	-	-	-	-	-	2	2	1.7	C09-10,C12-14
Oesophagus	41	0	78	-	1	2	5	9	8	16	17.7	C15
Stomach	3	0	100	-	-	1	-	-	1	1	1.3	C16
Colon, rectum and anus	4	0	100	-	-	2	-	1	1	-	1.7	C18-21
Liver	36	1	100	-	-	4	7	7	5	12	15.6	C22
Gallbladder etc.	0	0	-	-	-	-	-	-	-	-	0.0	C23-24
Pancreas	4	0	50	-	-	-	-	1	1	2	1.7	C25
Larynx	9	0	100	-	-	-	-	-	3	6	3.9	C32
Trachea, bronchus and lung	16	0	81	-	1	-	1	7	4	3	6.9	C33-34
Bone	2	0	100	-	1	1	-	-	-	-	0.9	C40-41
Melanoma of skin	2	0	100	-	-	-	-	-	1	1	0.9	C43
Other skin	10	0	100	-	1	-	2	2	-	5	8.2	C44
Mesothelioma	1	0	100	-	-	-	-	-	1	-	0.4	C45
Kaposi sarcoma	1	0	100	-	-	-	-	-	-	1	0.4	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	C47
Connective and soft tissue	4	0	100	-	-	1	-	1	1	1	1.7	C49
Breast	2	0	50	-	-	-	1	-	-	1	0.9	C50
Penis	0	0	-	-	-	-	-	-	-	-	0.0	C60
Prostate	0	0	-	-	-	-	-	-	-	-	0.0	C61
Testis	0	0	-	-	-	-	-	-	-	-	0.0	C62
Kidney	0	0	-	-	-	-	-	-	-	-	0.0	C64
Renal pelvis, ureter and other urinary	0	0	-	-	-	-	-	-	-	-	0.0	C65-66,C68
Bladder	6	0	83	-	-	-	-	1	-	5	2.6	C67
Eye	5	0	80	1	-	-	-	1	1	2	2.2	C69
Brain, nervous system	2	0	50	2	-	-	-	-	-	-	0.9	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	0.0	C73
Hodgkin disease	4	0	100	-	1	2	-	-	-	1	1.7	C81
Non-Hodgkin lymphoma	6	1	100	-	-	-	-	1	1	3	2.6	C82-85,C96
Multiple myeloma	1	0	100	-	-	-	-	1	-	-	0.4	C90
Lymphoid leukaemia	2	0	100	-	-	-	1	-	1	-	0.9	C91
Myeloid leukaemia	1	0	100	-	-	-	-	-	-	1	0.4	C92-94
Leukaemia, unspecified	1	0	100	1	-	-	-	-	-	-	0.4	C95
Other and unspecified	15	1	73	-	-	1	-	2	7	4	6.5	O&U
All sites	241	6	84	5	5	17	22	39	50	97		ALL
All sites but C44	231	6	84	5	4	17	20	37	50	92	100.0	ALL&C44

Table 9. South Africa, Elim (1991-1994)

NUMBER OF CASES BY AGE GROUP - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	%	ICD (10th)
Mouth	14	0	79	1	-	-	2	2	4	5	4.4	C00-06
Salivary gland	18	0	72	-	-	-	4	2	4	8	5.6	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	0.0	C11
Other pharynx	0	0	-	-	-	-	-	-	-	-	0.0	C09-10,C12-14
Oesophagus	16	0	63	-	-	2	3	-	3	8	5.0	C15
Stomach	1	0	100	-	-	-	-	1	-	-	0.3	C16
Colon, rectum and anus	2	0	100	-	-	-	-	-	1	1	0.6	C18-21
Liver	12	0	92	-	1	1	1	1	4	4	3.8	C22
Gallbladder etc.	1	0	100	-	-	-	-	-	-	1	0.3	C23-24
Pancreas	1	0	0	-	-	-	-	-	-	1	0.3	C25
Larynx	2	0	50	-	-	-	-	-	1	1	0.6	C32
Trachea, bronchus and lung	1	0	100	-	-	-	-	-	1	-	0.3	C33-34
Bone	0	0	-	-	-	-	-	-	-	-	0.0	C40-41
Melanoma of skin	11	0	100	-	-	-	-	2	1	8	3.4	C43
Other skin	7	0	100	-	1	-	-	1	3	2	0.6	C44
Mesothelioma	1	0	100	-	-	-	-	-	-	1	0.3	C45
Kaposi sarcoma	2	0	100	-	1	-	1	-	-	-	0.6	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	C47
Connective and soft tissue	3	1	100	-	1	-	-	-	-	1	0.9	C49
Breast	41	2	83	1	-	2	7	2	17	10	12.9	C50
Vulva	2	0	100	-	-	-	-	1	-	1	0.6	C51
Vagina	0	0	-	-	-	-	-	-	-	-	0.0	C52
Cervix uteri	127	1	88	-	-	7	12	34	39	34	39.8	C53
Uterus	15	1	100	-	1	2	-	1	1	9	4.7	C54-55
Ovary	0	0	-	-	-	-	-	-	-	-	0.0	C56
Placenta	0	0	-	-	-	-	-	-	-	-	0.0	C58
Kidney	0	0	-	-	-	-	-	-	-	-	0.0	C64
Renal pelvis, ureter and other urinary	1	0	100	-	-	-	-	-	-	1	0.3	C65-66,C68
Bladder	11	0	45	-	1	1	1	1	3	4	3.4	C67
Eye	16	0	94	7	-	1	-	4	1	3	5.0	C69
Brain, nervous system	1	0	0	1	-	-	-	-	-	-	0.3	C70-72
Thyroid	0	0	-	-	-	-	-	-	-	-	0.0	C73
Hodgkin disease	1	0	100	-	-	-	1	-	-	-	0.3	C81
Non-Hodgkin lymphoma	4	0	100	-	1	-	-	1	1	1	1.3	C82-85,C96
Multiple myeloma	2	0	100	-	1	-	-	1	-	-	0.6	C90
Lymphoid leukaemia	0	0	-	-	-	-	-	-	-	-	0.0	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	0.0	C92-94
Leukaemia, unspecified	2	0	100	1	-	-	-	-	-	1	0.6	C95
Other and unspecified	11	2	82	-	-	-	2	-	2	5	3.4	O&U
All sites	326	7	85	11	8	16	34	54	86	110		ALL
All sites but C44	319	7	85	11	7	16	34	53	83	108	100.0	ALLbC44

Table 10. South Africa: Black (1989-1992)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	2545	194	100	21	25	52	256	562	742	693	4.5	6.9	0.58	8.7	C00-06
Salivary gland	149	10	100	5	10	13	26	24	32	29	0.3	0.4	0.03	0.4	C07-08
Nasopharynx	445	25	100	6	21	16	53	102	117	105	0.8	1.2	0.10	1.4	C11
Other pharynx	361	27	100	2	7	7	35	94	111	78	0.6	1.0	0.09	1.2	C09-10, C12-14
Oesophagus	7009	402	100	15	33	211	879	1785	1993	1691	12.3	19.1	1.61	23.1	C15
Stomach	1085	72	100	6	9	43	123	246	269	317	1.9	3.0	0.22	3.6	C16
Colon, rectum and anus	981	72	100	9	47	114	143	170	194	232	1.7	2.7	0.18	3.0	C18-21
Liver	1863	155	100	32	63	168	292	343	411	399	3.3	5.1	0.38	5.6	C22
Gallbladder etc.	89	7	100	-	1	6	8	17	16	34	0.2	0.2	0.01	0.3	C23-24
Pancreas	189	15	100	1	2	2	12	41	57	59	0.3	0.5	0.04	0.7	C25
Larynx	1516	120	100	7	11	26	132	380	475	365	2.7	4.1	0.37	5.1	C32
Trachea, bronchus and lung	3347	298	100	8	19	60	371	854	969	768	5.9	9.1	0.79	11.2	C33-34
Bone	577	51	100	55	112	45	63	93	83	75	1.0	1.6	0.10	1.5	C40-41
Melanoma of skin	349	26	100	3	9	22	39	64	87	99	0.6	1.0	0.07	1.2	C43
Other skin	1446	115	100	21	50	117	173	247	271	452	2.5	4.0	0.25	4.7	C44
Mesothelioma	205	16	100	2	1	6	28	58	54	40	0.4	0.6	0.05	0.6	C45
Kaposi sarcoma	232	19	100	3	7	32	40	39	32	60	0.4	0.6	0.04	0.7	C46
Peripheral nerves	39	6	100	5	5	9	9	2	3	-	0.1	0.1	0.01	0.1	C47
Connective and soft tissue	843	69	100	81	57	76	100	136	168	156	1.5	2.3	0.16	2.4	C49
Breast	299	26	100	2	5	10	20	72	82	82	0.5	0.8	0.07	1.0	C50
Penis	404	27	100	5	5	21	77	94	81	94	0.7	1.1	0.08	1.3	C60
Prostate	3432	236	100	16	9	19	47	213	714	2178	6.0	9.4	0.44	14.3	C61
Testis	111	10	100	15	22	15	14	15	8	12	0.2	0.3	0.02	0.3	C62
Kidney	327	34	100	140	10	5	27	31	41	39	0.6	0.9	0.05	0.8	C64
Renal pelvis, ureter and other urinary	54	4	100	1	1	-	7	7	10	24	0.1	0.1	0.01	0.2	C65-66, C68
Bladder	545	39	100	13	6	28	63	89	116	191	1.0	1.5	0.10	1.8	C67
Eye	271	30	100	98	12	21	20	29	27	34	0.5	0.7	0.04	0.6	C69
Brain, nervous system	298	16	100	116	33	32	25	38	24	14	0.5	0.8	0.04	0.6	C70-72
Thyroid	171	17	100	4	11	15	22	37	26	39	0.3	0.5	0.03	0.5	C73
Hodgkin disease	390	52	100	86	57	66	45	42	27	15	0.7	1.1	0.05	0.8	C81
Non-Hodgkin lymphoma	974	79	100	109	110	100	122	168	145	141	1.7	2.7	0.17	2.5	C82-85, C96
Multiple myeloma	450	52	100	5	2	13	51	106	118	103	0.8	1.2	0.10	1.5	C90
Lymphoid leukaemia	449	23	100	129	55	16	20	47	67	92	0.8	1.2	0.07	1.2	C91
Myeloid leukaemia	504	31	100	90	87	85	67	61	42	41	0.9	1.4	0.07	1.1	C92-94
Leukaemia, unspecified	319	74	100	38	30	40	41	38	29	29	0.6	0.9	0.05	0.8	C95
Other and unspecified	5847	541	100	136	127	231	605	1278	1498	1431	10.3	15.9	1.26	19.0	O&U
All sites	38115	2990	100	1285	1071	1742	4055	7622	9139	10211	67.0		7.72	123.7	ALL
All sites but C44	36669	2875	100	1264	1021	1625	3882	7375	8868	9759	64.5	100.0	7.47	119.1	ALLbC44
Average annual population				5404020	2848118	2382196	1608623	995154	586000	387310					

Table 10. South Africa: Black (1989-1992)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	598	46	100	11	12	22	55	118	141	193	1.1	1.5	0.11	1.7	C00-06
Salivary gland	124	11	100	8	11	7	15	26	19	27	0.2	0.3	0.02	0.3	C07-08
Nasopharynx	111	6	100	5	15	9	15	22	19	20	0.2	0.3	0.02	0.3	C11
Other pharynx	64	2	100	5	3	2	9	8	20	15	0.1	0.2	0.01	0.2	C09-10, C12-14
Oesophagus	3220	220	100	10	24	142	400	692	926	806	5.7	7.9	0.68	9.1	C15
Stomach	702	55	100	6	15	48	90	107	166	215	1.2	1.7	0.13	2.0	C16
Colon, rectum and anus	870	53	100	8	29	70	144	161	165	240	1.5	2.1	0.15	2.3	C18-21
Liver	736	55	100	24	42	66	97	123	153	176	1.3	1.8	0.13	1.9	C22
Gallbladder etc.	122	10	100	-	1	2	11	27	38	33	0.2	0.3	0.03	0.4	C23-24
Pancreas	161	17	100	3	5	2	15	31	28	60	0.3	0.4	0.03	0.5	C25
Larynx	182	14	100	2	2	1	26	46	46	45	0.3	0.4	0.04	0.5	C32
Trachea, bronchus and lung	841	72	100	6	9	44	109	160	215	226	1.5	2.1	0.16	2.3	C33-34
Bone	397	31	100	61	94	43	31	44	36	57	0.7	1.0	0.05	0.8	C40-41
Melanoma of skin	475	38	100	3	12	21	33	78	106	184	0.8	1.2	0.08	1.4	C43
Other skin	1174	93	100	17	55	86	168	183	229	343	2.1	2.1	0.20	3.2	C44
Mesothelioma	86	6	100	-	2	3	18	25	20	12	0.2	0.2	0.02	0.2	C45
Kaposi sarcoma	69	5	100	6	9	10	3	14	10	12	0.1	0.2	0.01	0.2	C46
Peripheral nerves	31	4	100	3	6	7	1	6	2	2	0.1	0.1	0.00	0.1	C47
Connective and soft tissue	721	68	100	69	74	99	101	98	95	117	1.3	1.8	0.11	1.7	C49
Breast	5117	392	100	12	51	413	1015	1096	1093	1045	9.1	12.6	1.00	13.6	C50
Vulva	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C51
Vagina	166	25	100	2	4	16	31	34	35	19	0.3	0.4	0.04	0.4	C52
Cervix uteri	15450	1193	100	29	164	1348	3423	3514	3243	2536	27.4	38.1	3.15	40.3	C53
Uterus	1349	97	100	3	26	41	106	196	381	499	2.4	3.3	0.24	4.0	C54-55
Ovary	892	88	100	29	46	105	133	144	206	141	1.6	2.2	0.18	2.3	C56
Placenta	92	15	100	1	13	32	13	14	-	4	0.2	0.2	0.01	0.2	C58
Kidney	320	20	100	137	10	19	35	30	39	30	0.6	0.8	0.04	0.7	C64
Renal pelvis, ureter and other urinary	92	7	100	-	1	7	18	18	26	15	0.2	0.2	0.02	0.3	C65-66, C68
Bladder	509	54	100	6	18	32	93	101	106	99	0.9	1.3	0.10	1.3	C67
Eye	206	24	100	79	8	28	12	13	13	29	0.4	0.5	0.02	0.4	C69
Brain, nervous system	213	16	100	76	31	25	23	19	16	7	0.4	0.5	0.03	0.4	C70-72
Thyroid	476	43	100	6	25	79	72	79	110	62	0.8	1.2	0.10	1.2	C73
Hodgkin disease	213	17	100	24	41	47	40	17	14	13	0.4	0.5	0.03	0.4	C81
Non-Hodgkin lymphoma	635	60	100	66	58	69	66	92	101	123	1.1	1.6	0.10	1.5	C82-85, C96
Multiple myeloma	418	53	100	-	3	15	43	97	103	104	0.7	1.0	0.09	1.2	C90
Lymphoid leukaemia	302	15	100	108	35	15	14	26	46	43	0.5	0.7	0.04	0.7	C91
Myeloid leukaemia	388	14	100	57	57	79	54	51	45	31	0.7	1.0	0.06	0.8	C92-94
Leukaemia, unspecified	263	62	100	26	29	31	22	34	31	28	0.5	0.6	0.04	0.6	C95
Other and unspecified	3906	335	100	102	116	249	505	747	881	971	6.9	9.6	0.73	10.6	O&U
All sites	41691	3336	100	1010	1156	3334	7059	8291	8923	8582	73.9	100.0	7.99	109.8	ALL
All sites but C44	40517	3243	100	993	1101	3248	6891	8108	8694	8239	71.8	100.0	7.80	106.7	ALLbC44
Average annual population				5331163	2810970	2236349	1515883	1004179	660820	542967					

Table 11. South Africa: White (1989-1992)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	1294	56	100	3	9	38	110	288	318	472	12.9	4.9	0.77	11.8	C00-06
Salivary gland	132	7	100	1	5	5	6	24	29	55	1.3	0.5	0.07	1.2	C07-08
Nasopharynx	123	6	100	-	-	2	12	31	37	35	1.2	0.5	0.08	1.1	C11
Other pharynx	84	2	100	-	-	1	3	19	26	33	0.8	0.3	0.05	0.8	C09-10,C12-14
Oesophagus	597	23	100	2	2	8	30	101	177	254	5.9	2.3	0.35	5.5	C15
Stomach	1110	49	100	3	4	18	72	150	254	560	11.0	4.2	0.53	10.1	C16
Colon, rectum and anus	2414	69	100	8	7	37	104	267	563	1359	24.0	9.2	1.06	22.2	C18-21
Liver	353	15	100	5	3	25	36	58	93	118	3.5	1.3	0.22	3.2	C22
Gallbladder etc.	67	1	100	-	-	-	2	9	14	41	0.7	0.3	0.03	0.6	C23-24
Pancreas	201	6	100	-	-	2	10	27	63	93	2.0	0.8	0.11	1.9	C25
Larynx	641	18	100	-	4	2	28	105	220	264	6.4	2.4	0.39	5.9	C32
Trachea, bronchus and lung	2187	63	100	5	15	16	80	278	714	1016	21.7	8.3	1.23	20.3	C33-34
Bone	224	9	100	15	40	21	18	36	46	39	2.2	0.9	0.15	2.1	C40-41
Melanoma of skin	1718	150	100	8	57	156	272	296	328	451	17.1	6.6	1.05	15.3	C43
Other skin	24620	2175	100	64	147	524	1834	3887	5277	10712	244.6	12.58		224.3	C44
Mesothelioma	299	12	100	-	1	9	22	53	82	120	3.0	1.1	0.17	2.7	C45
Kaposi sarcoma	68	12	100	1	3	14	10	4	3	21	0.7	0.3	0.03	0.6	C46
Peripheral nerves	14	2	100	2	2	-	3	2	-	3	0.1	0.1	0.01	0.1	C47
Connective and soft tissue	543	27	100	18	31	35	50	77	109	196	5.4	2.1	0.30	5.0	C49
Breast	206	17	100	1	1	7	13	40	50	77	2.0	0.8	0.12	1.9	C50
Penis	75	5	100	-	-	4	3	8	24	31	0.7	0.3	0.04	0.7	C60
Prostate	4455	114	100	10	7	13	27	150	890	3244	44.3	17.0	1.33	41.1	C61
Testis	292	11	100	5	54	101	73	25	12	11	2.9	1.1	0.19	2.5	C62
Kidney	378	15	100	20	1	7	21	77	108	129	3.8	1.4	0.24	3.6	C64
Renal pelvis, ureter and other urinary	213	9	100	-	1	2	3	20	53	125	2.1	0.8	0.09	2.0	C65-66,C68
Bladder	2810	57	100	6	12	44	88	313	642	1648	27.9	10.7	1.19	25.8	C67
Eye	102	4	100	7	2	7	14	14	15	39	1.0	0.4	0.05	1.0	C69
Brain, nervous system	328	11	100	42	21	26	51	50	65	62	3.3	1.3	0.22	3.1	C70-72
Thyroid	177	7	100	4	6	14	25	40	28	53	1.8	0.7	0.10	1.6	C73
Hodgkin disease	215	17	100	18	37	38	36	31	21	17	2.1	0.8	0.14	2.0	C81
Non-Hodgkin lymphoma	1143	91	100	49	59	62	104	158	228	392	11.4	4.4	0.64	10.6	C82-85,C96
Multiple myeloma	146	13	100	-	-	4	5	31	31	62	1.5	0.6	0.08	1.3	C90
Lymphoid leukaemia	347	11	100	73	25	14	11	36	60	117	3.4	1.3	0.19	3.6	C91
Myeloid leukaemia	329	21	100	21	25	29	32	51	47	103	3.3	1.3	0.18	3.1	C92-94
Leukaemia, unspecified	126	17	100	17	9	12	8	15	13	35	1.3	0.5	0.07	1.2	C95
Other and unspecified	2784	145	100	37	55	67	162	374	696	1248	27.7	10.6	1.47	25.8	O&U
All sites	50815	3267	100	445	645	1364	3378	7145	11336	23235	504.8	25.48		465.7	ALL
All sites but C44	26195	1092	100	381	498	840	1544	3258	6059	12523	260.2	100.0	12.91	241.3	ALLbC44
Average annual population				572487	444607	413159	378575	308289	203799	195430					

Warning, percentages will be distorted because of the high rates for 'Other skin cancer'

Table 11. South Africa: White (1989-1992)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	559	17	100	4	4	17	31	79	128	279	5.5	2.1	0.26	4.3	C00-06
Salivary gland	60	3	100	-	2	4	2	9	10	30	0.6	0.2	0.03	0.5	C07-08
Nasopharynx	42	3	100	-	-	1	6	5	7	20	0.4	0.2	0.02	0.3	C11
Other pharynx	26	1	100	1	-	-	1	5	5	13	0.3	0.1	0.01	0.2	C09-10, C12-14
Oesophagus	208	8	100	-	-	4	9	33	42	112	2.0	0.8	0.09	1.6	C15
Stomach	638	25	100	1	1	19	59	71	116	346	6.3	2.4	0.26	4.8	C16
Colon, rectum and anus	2295	74	100	4	11	37	132	272	441	1324	22.5	8.7	0.91	17.1	C18-21
Liver	210	6	100	4	-	8	12	41	38	101	2.1	0.8	0.10	1.6	C22
Gallbladder etc.	106	2	100	1	-	-	7	9	25	62	1.0	0.4	0.04	0.8	C23-24
Pancreas	211	1	100	-	-	3	14	24	46	123	2.1	0.8	0.09	1.6	C25
Larynx	131	5	100	1	1	1	8	27	40	48	1.3	0.5	0.08	1.1	C32
Trachea, bronchus and lung	1120	32	100	3	6	23	64	170	319	503	11.0	4.3	0.60	8.8	C33-34
Bone	201	3	100	31	23	24	12	26	29	53	2.0	0.8	0.12	1.8	C40-41
Melanoma of skin	1762	130	100	10	72	180	326	280	258	506	17.3	6.7	0.99	14.2	C43
Other skin	16448	1380	100	33	109	465	1453	2389	2759	7860	161.6		7.27	125.1	C44
Mesothelioma	131	9	100	1	2	3	13	27	32	44	1.3	0.5	0.08	1.1	C45
Kaposi sarcoma	17	4	100	-	2	-	1	1	2	7	0.2	0.1	0.01	0.1	C46
Peripheral nerves	15	1	100	5	3	2	1	1	1	1	0.1	0.1	0.01	0.2	C47
Connective and soft tissue	388	28	100	9	13	34	30	65	69	140	3.8	1.5	0.21	3.2	C49
Breast	7801	190	100	6	20	271	1198	1746	1765	2605	76.6	29.6	4.67	62.8	C50
Vulva	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C51
Vagina	65	5	100	2	2	-	9	10	12	25	0.6	0.2	0.03	0.5	C52
Cervix uteri	1465	64	100	-	30	182	302	267	258	362	14.4	5.6	0.91	11.9	C53
Uterus	1052	26	100	1	6	13	61	170	281	494	10.3	4.0	0.55	8.2	C54-55
Ovary	893	27	100	6	27	44	98	221	220	250	8.8	3.4	0.58	7.4	C56
Placenta	2	0	100	-	2	-	-	-	-	-	0.0	0.0	0.00	0.0	C58
Kidney	258	8	100	19	4	7	16	40	53	111	2.5	1.0	0.13	2.2	C64
Renal pelvis, ureter and other urinary	98	2	100	-	1	2	3	8	13	69	1.0	0.4	0.03	0.7	C65-66, C68
Bladder	870	21	100	7	4	14	35	101	175	513	8.5	3.3	0.34	6.5	C67
Eye	77	3	100	10	4	5	5	10	10	30	0.8	0.3	0.04	0.7	C69
Brain, nervous system	287	7	100	53	31	22	29	48	44	53	2.8	1.1	0.18	2.7	C70-72
Thyroid	560	9	100	10	38	110	132	92	69	100	5.5	2.1	0.35	4.7	C73
Hodgkin disease	181	13	100	6	37	41	19	18	12	35	1.8	0.7	0.10	1.6	C81
Non-Hodgkin lymphoma	1023	70	100	28	27	45	72	168	208	405	10.0	3.9	0.54	8.2	C82-85, C96
Multiple myeloma	103	1	100	-	-	-	3	23	18	58	1.0	0.4	0.04	0.8	C90
Lymphoid leukaemia	225	9	100	55	19	7	17	18	29	71	2.2	0.9	0.12	2.2	C91
Myeloid leukaemia	275	12	100	16	14	22	31	51	45	84	2.7	1.0	0.16	2.3	C92-94
Leukaemia, unspecified	124	16	100	13	10	10	16	21	16	22	1.2	0.5	0.08	1.2	C95
Other and unspecified	2840	114	100	34	36	88	244	415	609	1300	27.9	10.8	1.40	22.2	O&U
All sites	42767	2329	100	374	561	1708	4471	6961	8204	18159	420.1		21.47	335.3	ALL
All sites but C44	26319	949	100	341	452	1243	3018	4572	5445	10299	258.5	100.0	14.15	210.0	ALLbC44
Average annual population				548928	429377	406348	369657	298402	212906	279288					

Warning, percentages will be distorted because of the high rates for 'Other skin cancer'

Table 12. South Africa: Mixed Race (1989-1992)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	449	6	100	2	4	9	43	115	135	135	7.0	7.8	0.87	13.5	C00-06
Salivary gland	19	0	100	-	-	2	3	2	4	8	0.3	0.3	0.02	0.5	C07-08
Nasopharynx	97	2	100	4	3	3	18	25	25	17	1.5	1.7	0.18	2.5	C11
Other pharynx	64	1	100	-	1	3	8	14	22	15	1.0	1.1	0.13	1.8	C09-10, C12-14
Oesophagus	520	11	100	1	1	6	34	134	190	143	8.1	9.0	1.13	16.0	C15
Stomach	534	21	100	1	2	22	55	111	146	176	8.3	9.3	0.95	16.1	C16
Colon, rectum and anus	252	1	100	-	10	15	25	45	75	81	3.9	4.4	0.46	7.5	C18-21
Liver	124	1	100	6	8	8	12	23	36	30	1.9	2.2	0.24	3.5	C22
Gallbladder etc.	19	0	100	-	-	-	2	6	3	8	0.3	0.3	0.03	0.6	C23-24
Pancreas	46	1	100	1	3	-	4	7	19	11	0.7	0.8	0.10	1.4	C25
Larynx	311	8	100	-	-	-	24	82	125	72	4.9	5.4	0.73	9.4	C32
Trachea, bronchus and lung	627	14	100	-	-	13	47	143	251	159	9.8	10.9	1.43	19.2	C33-34
Bone	51	2	100	2	19	5	6	7	5	5	0.8	0.9	0.06	1.0	C40-41
Melanoma of skin	27	0	100	-	-	1	7	5	6	8	0.4	0.5	0.05	0.8	C43
Other skin	227	7	100	4	7	9	31	40	44	85	3.5	-	0.34	6.8	C44
Mesothelioma	39	2	100	-	-	-	6	11	11	9	0.6	0.7	0.08	1.2	C45
Kaposi sarcoma	23	0	100	2	1	3	3	3	3	8	0.4	0.4	0.03	0.6	C46
Peripheral nerves	4	0	100	2	-	1	1	-	-	-	0.1	0.1	0.00	0.1	C47
Connective and soft tissue	97	5	100	6	6	9	12	25	20	14	1.5	1.7	0.17	2.4	C49
Breast	30	1	100	-	-	1	3	4	5	16	0.5	0.5	0.03	1.0	C50
Penis	43	1	100	-	1	4	5	4	13	15	0.7	0.7	0.07	1.2	C60
Prostate	681	15	100	3	2	2	5	35	133	486	10.6	11.8	0.67	25.4	C61
Testis	21	0	100	1	7	4	2	4	3	-	0.3	0.4	0.03	0.4	C62
Kidney	62	0	100	11	3	4	7	8	15	14	1.0	1.1	0.10	1.6	C64
Renal pelvis, ureter and other urinary	18	0	100	-	-	-	1	5	5	7	0.3	0.3	0.03	0.6	C65-66, C68
Bladder	245	2	100	-	1	4	19	40	59	120	3.8	4.3	0.37	8.1	C67
Eye	12	0	100	9	-	-	1	-	-	2	0.2	0.2	0.01	0.2	C69
Brain, nervous system	67	0	100	19	10	8	8	13	7	2	1.0	1.2	0.10	1.3	C70-72
Thyroid	19	0	100	2	1	-	4	4	2	6	0.3	0.3	0.03	0.5	C73
Hodgkin disease	74	1	100	17	14	18	11	8	5	-	1.2	1.3	0.09	1.2	C81
Non-Hodgkin lymphoma	180	1	100	12	23	36	23	33	25	27	2.8	3.1	0.26	4.0	C82-85, C96
Multiple myeloma	53	0	100	-	-	-	7	10	17	19	0.8	0.9	0.10	1.7	C90
Lymphoid leukaemia	70	1	100	29	13	6	4	5	3	9	1.1	1.2	0.07	1.3	C91
Myeloid leukaemia	86	1	100	9	17	9	14	13	10	13	1.3	1.5	0.11	1.8	C92-94
Leukaemia, unspecified	12	1	100	2	2	3	2	1	-	1	0.2	0.2	0.01	0.2	C95
Other and unspecified	781	35	100	19	11	36	67	165	244	204	12.2	13.6	1.56	22.9	O&U
All sites	5984	141	100	164	170	244	524	1150	1666	1925	93.4	-	10.65	177.9	ALL
All sites but C44	5757	134	100	160	163	235	493	1110	1622	1840	89.9	100.0	10.32	171.2	ALLbC44
Average annual population				548187	360858	287096	183680	110196	67033	44040					

Table 12. South Africa: Mixed Race (1989-1992)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	143	9	100	-	-	7	17	35	32	43	2.1	2.4	0.22	3.3	C00-06
Salivary gland	12	2	100	-	-	1	2	2	2	3	0.2	0.2	0.02	0.3	C07-08
Nasopharynx	24	0	100	1	2	2	2	5	8	4	0.4	0.4	0.04	0.5	C11
Other pharynx	18	3	100	-	-	-	3	7	4	1	0.3	0.3	0.04	0.4	C09-10, C12-14
Oesophagus	178	6	100	-	-	2	20	38	59	53	2.7	2.9	0.31	4.2	C15
Stomach	281	7	100	3	3	17	39	49	69	94	4.2	4.6	0.40	6.4	C16
Colon, rectum and anus	280	7	100	2	5	21	33	36	55	121	4.2	4.6	0.33	6.4	C18-21
Liver	52	0	100	2	4	5	3	8	13	17	0.8	0.9	0.07	1.1	C22
Gallbladder etc.	30	2	100	-	-	-	2	5	9	12	0.4	0.5	0.05	0.8	C23-24
Pancreas	33	0	100	-	-	-	4	8	10	11	0.5	0.5	0.05	0.8	C25
Larynx	81	1	100	-	-	3	13	20	34	10	1.2	1.3	0.17	1.8	C32
Trachea, bronchus and lung	220	5	100	-	4	9	25	68	62	47	3.3	3.6	0.40	5.1	C33-34
Bone	47	1	100	5	11	2	7	3	11	7	0.7	0.8	0.06	0.9	C40-41
Melanoma of skin	45	3	100	1	2	-	4	7	13	15	0.7	0.7	0.07	1.1	C43
Other skin	256	8	100	4	3	16	23	51	46	105	3.8	4.6	0.31	5.9	C44
Mesothelioma	18	0	100	-	-	1	3	1	4	9	0.3	0.3	0.02	0.4	C45
Kaposi sarcoma	5	0	100	-	2	-	1	1	-	1	0.1	0.1	0.00	0.1	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	88	7	100	8	5	13	12	18	15	10	1.3	1.5	0.13	1.7	C49
Breast	1285	15	100	7	2	87	253	344	288	289	19.2	21.2	2.07	28.1	C50
Vulva	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C51
Vagina	10	1	100	-	-	1	3	2	1	2	0.1	0.2	0.01	0.2	C52
Cervix uteri	1541	35	100	4	14	150	421	404	287	226	23.0	25.5	2.50	31.6	C53
Uterus	200	5	100	-	1	3	20	32	56	83	3.0	3.3	0.28	4.8	C54-55
Ovary	196	3	100	6	13	13	38	38	48	37	2.9	3.2	0.31	4.0	C56
Placenta	9	0	100	-	2	4	2	-	-	1	0.1	0.1	0.01	0.1	C58
Kidney	30	0	100	9	3	2	2	5	7	2	0.4	0.5	0.04	0.6	C64
Renal pelvis, ureter and other urinary	17	0	100	-	-	3	2	3	7	2	0.3	0.3	0.04	0.4	C65-66, C68
Bladder	69	0	100	-	2	-	6	8	23	30	1.0	1.1	0.10	1.7	C67
Eye	23	1	100	9	1	5	1	3	-	3	0.3	0.4	0.02	0.4	C69
Brain, nervous system	56	2	100	21	7	5	3	5	10	3	0.8	0.9	0.07	1.0	C70-72
Thyroid	38	1	100	-	2	11	8	7	4	5	0.6	0.6	0.05	0.7	C73
Hodgkin disease	38	1	100	2	2	10	11	3	6	3	0.6	0.6	0.05	0.7	C81
Non-Hodgkin lymphoma	158	5	100	8	7	18	21	24	35	40	2.4	2.6	0.22	3.3	C82-85, C96
Multiple myeloma	44	0	100	-	-	-	4	7	16	17	0.7	0.7	0.07	1.1	C90
Lymphoid leukaemia	39	0	100	15	4	2	2	6	5	5	0.6	0.6	0.04	0.7	C91
Myeloid leukaemia	71	0	100	7	9	14	6	6	14	15	1.1	1.2	0.09	1.3	C92-94
Leukaemia, unspecified	10	0	100	3	2	1	1	-	-	3	0.1	0.2	0.01	0.2	C95
Other and unspecified	659	21	100	16	11	37	110	106	165	193	9.8	10.9	0.98	14.7	O&U
All sites	6304	151	100	133	123	465	1127	1365	1418	1522	94.1		9.68	136.7	ALL
All sites but C44	6048	143	100	129	120	449	1104	1314	1372	1417	90.3	100.0	9.37	130.8	ALLbC44
Average annual population				544737	363740	299908	198008	122021	79656	66843					

Table 13. South Africa: Indian (1989-1992)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	65	0	100	-	1	2	2	26	23	11	3.3	3.1	0.38	4.8	C00-06
Salivary gland	10	0	100	-	-	1	-	2	4	3	0.5	0.5	0.05	0.8	C07-08
Nasopharynx	7	0	100	-	1	-	-	3	-	3	0.4	0.3	0.02	0.6	C11
Other pharynx	14	2	100	-	-	-	2	1	4	5	0.7	0.7	0.06	1.2	C09-10,C12-14
Oesophagus	179	16	100	-	1	7	26	50	52	27	9.2	8.4	1.04	13.1	C15
Stomach	140	9	100	3	-	2	16	32	36	42	7.2	6.6	0.68	11.7	C16
Colon, rectum and anus	161	9	100	1	-	8	12	25	41	65	8.3	7.6	0.66	14.2	C18-21
Liver	47	2	100	1	2	-	5	13	9	15	2.4	2.2	0.20	3.8	C22
Gallbladder etc.	6	0	100	-	-	-	-	1	2	3	0.3	0.3	0.03	0.6	C23-24
Pancreas	16	0	100	-	-	3	3	1	5	4	0.8	0.8	0.07	1.2	C25
Larynx	52	3	100	-	-	1	4	12	18	14	2.7	2.5	0.30	4.4	C32
Trachea, bronchus and lung	288	7	100	1	2	9	25	82	104	58	14.8	13.6	1.69	22.5	C33-34
Bone	35	4	100	5	9	1	1	6	7	2	1.8	1.7	0.16	2.1	C40-41
Melanoma of skin	13	2	100	-	-	2	2	5	2	-	0.7	0.6	0.07	0.7	C43
Other skin	65	3	100	-	2	5	7	11	13	24	3.3	3.3	0.25	5.4	C44
Mesothelioma	4	0	100	-	-	-	-	-	-	4	0.2	0.2	0.00	0.5	C45
Kaposi sarcoma	2	0	100	-	-	-	-	1	-	1	0.1	0.1	0.00	0.2	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	47	2	100	8	5	3	3	10	8	8	2.4	2.2	0.21	3.3	C49
Breast	20	3	100	1	-	-	4	4	4	4	1.0	0.9	0.10	1.6	C50
Penis	23	1	100	-	-	-	1	5	5	10	1.2	1.1	0.09	2.1	C60
Prostate	121	3	100	-	2	-	-	8	23	85	6.2	5.7	0.31	13.0	C61
Testis	30	1	100	9	6	8	4	1	-	1	1.5	1.4	0.08	1.5	C62
Kidney	26	0	100	5	1	2	1	5	6	6	1.3	1.2	0.11	1.9	C64
Renal pelvis, ureter and other urinary bladder	11	0	100	-	-	-	1	2	5	3	0.6	0.5	0.07	0.9	C65-66,C68
Bladder	88	4	100	-	1	2	6	18	27	30	4.5	4.2	0.44	7.7	C67
Eye	7	0	100	5	-	-	-	-	1	1	0.4	0.3	0.02	0.5	C69
Brain, nervous system	24	2	100	7	-	1	3	3	4	4	1.2	1.1	0.09	1.6	C70-72
Thyroid	21	4	100	-	2	1	3	2	5	4	1.1	1.0	0.10	1.5	C73
Hodgkin disease	22	0	100	3	3	6	4	4	1	1	1.1	1.0	0.08	1.1	C81
Non-Hodgkin lymphoma	106	4	100	7	5	9	22	17	20	22	5.4	5.0	0.45	7.4	C82-85,C96
Multiple myeloma	22	0	100	-	-	1	1	5	6	9	1.1	1.0	0.09	1.9	C90
Lymphoid leukaemia	37	2	100	24	3	-	1	1	4	2	1.9	1.7	0.13	2.2	C91
Myeloid leukaemia	28	0	100	9	4	3	7	5	-	-	1.4	1.3	0.09	1.4	C92-94
Leukaemia, unspecified	30	3	100	8	5	3	3	5	2	1	1.5	1.4	0.11	1.6	C95
Other and unspecified	418	20	100	9	8	14	41	99	125	102	21.4	19.7	2.21	33.3	O&U
All sites	2185	106	100	106	63	95	210	465	566	574	112.1	104.4	10.44	172.5	ALL
All sites but C44	2120	103	100	106	61	90	203	454	553	550	108.7	100.0	10.18	167.1	ALLbC44
Average annual population				151764	98737	81849	68799	46298	25173	14765					

Table 13. South Africa: Indian (1989-1992)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	83	5	100	-	2	2	8	20	32	14	4.2	3.3	0.45	5.5	C00-06
Salivary gland	8	0	100	-	-	-	-	3	4	1	0.4	0.3	0.05	0.5	C07-08
Nasopharynx	6	0	100	-	-	1	2	1	1	1	0.3	0.2	0.02	0.4	C11
Other pharynx	7	0	100	1	-	1	1	2	-	2	0.4	0.3	0.02	0.4	C09-10,C12-14
Oesophagus	102	7	100	1	1	1	10	16	34	32	5.1	4.1	0.46	7.3	C15
Stomach	91	6	100	-	-	6	14	15	16	34	4.6	3.7	0.31	6.4	C16
Colon, rectum and anus	132	5	100	-	-	5	15	25	38	44	6.7	5.3	0.56	9.4	C18-21
Liver	16	0	100	-	1	-	-	2	7	6	0.8	0.6	0.07	1.2	C22
Gallbladder etc.	12	0	100	-	-	-	-	1	4	7	0.6	0.5	0.04	1.0	C23-24
Pancreas	17	1	100	-	-	-	-	2	5	9	0.9	0.7	0.06	1.4	C25
Larynx	9	3	100	-	1	1	1	1	1	1	0.5	0.4	0.04	0.5	C32
Trachea, bronchus and lung	50	0	100	1	-	2	8	13	15	11	2.5	2.0	0.24	3.3	C33-34
Bone	26	0	100	3	-	-	4	5	6	8	1.3	1.0	0.10	1.8	C40-41
Melanoma of skin	13	1	100	-	-	-	2	4	3	3	0.7	0.5	0.06	0.9	C43
Other skin	60	2	100	-	7	4	6	8	9	24	3.0	0.19	4.2	C44	
Mesothelioma	1	0	100	-	-	-	-	-	1	-	0.1	0.0	0.01	0.1	C45
Kaposi sarcoma	2	0	100	-	1	-	-	-	-	1	0.1	0.1	0.00	0.1	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	32	3	100	2	1	1	2	6	11	6	1.6	1.3	0.16	2.1	C49
Breast	693	46	100	1	3	36	150	182	167	108	34.9	27.9	3.24	42.5	C50
Vulva	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C51
Vagina	8	2	100	-	-	-	1	1	3	1	0.4	0.3	0.05	0.5	C52
Cervix uteri	330	25	100	1	-	21	69	88	68	58	16.6	13.3	1.45	20.2	C53
Uterus	127	6	100	-	-	2	13	30	43	33	6.4	5.1	0.62	8.9	C54-55
Ovary	94	11	100	1	1	4	18	15	26	18	4.7	3.8	0.44	6.1	C56
Placenta	2	1	100	-	-	1	-	-	-	-	0.1	0.1	0.01	0.1	C58
Kidney	12	1	100	2	-	1	2	2	2	2	0.6	0.5	0.05	0.7	C64
Renal pelvis, ureter and other urinary	8	0	100	-	-	-	1	2	2	3	0.4	0.3	0.03	0.6	C65-66,C68
Bladder	37	1	100	1	-	-	3	7	14	11	1.9	1.5	0.18	2.7	C67
Eye	3	1	100	1	-	-	-	1	-	-	0.2	0.1	0.01	0.2	C69
Brain, nervous system	10	0	100	4	-	-	2	4	-	-	0.5	0.4	0.04	0.5	C70-72
Thyroid	53	1	100	1	6	9	14	8	9	5	2.7	2.1	0.22	2.9	C73
Hodgkin disease	9	0	100	1	1	3	-	3	1	-	0.5	0.4	0.04	0.4	C81
Non-Hodgkin lymphoma	66	5	100	5	4	4	3	13	19	13	3.3	2.7	0.31	4.4	C82-85,C96
Multiple myeloma	19	3	100	-	-	-	2	6	6	2	1.0	0.8	0.11	1.2	C90
Lymphoid leukaemia	21	0	100	13	2	-	2	1	1	2	1.1	0.8	0.06	1.1	C91
Myeloid leukaemia	21	2	100	3	2	3	2	4	2	3	1.1	0.8	0.07	1.2	C92-94
Leukaemia, unspecified	23	2	100	5	3	3	2	5	1	2	1.2	0.9	0.08	1.2	C95
Other and unspecified	339	20	100	4	5	22	35	88	93	72	17.1	13.7	1.57	22.1	O&U
All sites	2542	160	100	51	41	133	392	584	644	537	128.1		11.42	164.3	ALL
All sites but C44	2482	158	100	51	34	129	386	576	635	513	125.1	100.0	11.23	160.1	ALLbC44
Average annual population				148195	98169	82547	70205	48651	29350	19001					

Table 14. Childhood cancer, South Africa: Black (1989-1992)

	NUMBER OF CASES				M/F	REL. FREQ.(%)	RATES PER MILLION					
	0-4	5-9	10-14	All		Overall	0-4	5-9	10-14	Crude	ASR	%MV
Leukaemia	112	190	148	450	1.4	19.6	7.1	13.4	11.3	10.5	10.4	100.0
Acute lymphoid leukaemia	62	104	65	231	1.2	10.1	3.9	7.3	5.0	5.4	5.3	100.0
Lymphoma	42	123	123	288	2.2	12.5	2.7	8.7	9.4	6.7	6.6	100.0
Hodgkin disease	7	51	52	110	3.6	4.8	0.4	3.6	4.0	2.6	2.5	100.0
Burkitt lymphoma	12	13	4	29	1.6	1.3	0.8	0.9	0.3	0.7	0.7	100.0
Brain and spinal neoplasms	43	75	64	182	1.6	7.9	2.7	5.3	4.9	4.2	4.2	100.0
Neuroblastoma	49	26	19	94	1.6	4.1	3.1	1.8	1.5	2.2	2.2	100.0
Retinoblastoma	109	12	1	122	1.2	5.3	6.9	0.8	0.1	2.8	3.0	100.0
Wilms tumour	132	70	20	222	1.0	9.7	8.4	4.9	1.5	5.2	5.3	100.0
Bone tumours	7	22	78	107	0.9	4.7	0.4	1.6	6.0	2.5	2.4	100.0
Soft tissue sarcomas	59	41	45	145	1.1	6.3	3.8	2.9	3.4	3.4	3.4	100.0
Kaposi sarcoma	2	3	4	9	0.5	0.4	0.1	0.2	0.3	0.2	0.2	100.0
Germ cell tumours	36	10	10	56	0.3	2.4	2.3	0.7	0.8	1.3	1.3	100.0
Other	259	181	189	629	1.2	27.4	16.5	12.8	14.5	14.6	14.7	100.0
All	848	750	697	2295	1.3	100.0	54.0	52.9	53.4	53.4	53.5	100.0

Table 15. Childhood cancer, South Africa: White (1989-1992)

	NUMBER OF CASES				M/F	REL. FREQ.(%)	RATES PER MILLION					
	0-4	5-9	10-14	All		Overall	0-4	5-9	10-14	Crude	ASR	%MV
Leukaemia	97	60	38	195	1.3	23.8	69.9	37.5	25.4	43.5	46.5	100.0
Acute lymphoid leukaemia	62	42	21	125	1.3	15.3	44.7	26.3	14.0	27.9	29.8	100.0
Lymphoma	28	33	40	101	2.0	12.3	20.2	20.6	26.7	22.5	22.2	100.0
Hodgkin disease	3	10	11	24	3.0	2.9	2.2	6.3	7.3	5.4	5.0	100.0
Burkitt lymphoma	3	6	1	10	4.0	1.2	2.2	3.8	0.7	2.2	2.2	100.0
Brain and spinal neoplasms	24	32	32	88	0.8	10.7	17.3	20.0	21.3	19.6	19.3	100.0
Neuroblastoma	31	14	4	49	1.1	6.0	22.3	8.8	2.7	10.9	12.2	100.0
Retinoblastoma	11	1	0	12	1.0	1.5	7.9	0.6	-	2.7	3.3	100.0
Wilms tumour	22	14	1	37	1.2	4.5	15.9	8.8	0.7	8.2	9.2	100.0
Bone tumours	5	13	28	46	0.5	5.6	3.6	8.1	18.7	10.3	9.4	100.0
Soft tissue sarcomas	9	8	7	24	2.0	2.9	6.5	5.0	4.7	5.4	5.5	100.0
Kaposi sarcoma	0	0	1	1	-	0.1	-	-	0.7	0.2	0.2	100.0
Germ cell tumours	5	3	5	13	0.6	1.6	3.6	1.9	3.3	2.9	3.0	100.0
Other	139	58	57	254	1.2	31.0	100.2	36.3	38.0	56.6	61.5	100.0
All	371	236	212	819	1.2	100.0	267.4	147.6	141.4	182.6	192.2	100.0

Table 16. Childhood cancer, South Africa: Mixed Race (1989-1992)

	NUMBER OF CASES				M/F	REL. FREQ.(%)	RATES PER MILLION					ASR	%MV
	0-4	5-9	10-14	All		Overall	0-4	5-9	10-14	Crude			
Leukaemia	28	20	17	65	1.6	21.9	19.0	13.0	12.5	14.9	15.2	100.0	
Acute lymphoid leukaemia	21	12	11	44	1.9	14.8	14.3	7.8	8.1	10.1	10.4	100.0	
Lymphoma	12	14	13	39	2.9	13.1	8.1	9.1	9.5	8.9	8.9	100.0	
Hodgkin disease	2	7	10	19	8.5	6.4	1.4	4.6	7.3	4.3	4.1	100.0	
Burkitt lymphoma	5	1	0	6	5.0	2.0	3.4	0.7	-	1.4	1.5	100.0	
Brain and spinal neoplasms	15	7	15	37	0.9	12.5	10.2	4.6	11.0	8.5	8.6	100.0	
Neuroblastoma	20	3	2	25	1.1	8.4	13.6	2.0	1.5	5.7	6.3	100.0	
Retinoblastoma	15	2	0	17	0.9	5.7	10.2	1.3	-	3.9	4.4	100.0	
Wilms tumour	14	4	0	18	1.3	6.1	9.5	2.6	-	4.1	4.5	100.0	
Bone tumours	1	4	1	6	0.5	2.0	0.7	2.6	0.7	1.4	1.3	100.0	
Soft tissue sarcomas	6	3	5	14	1.0	4.7	4.1	2.0	3.7	3.2	3.3	100.0	
Kaposi sarcoma	1	0	1	2	-	0.7	0.7	-	0.7	0.5	0.5	100.0	
Germ cell tumours	5	1	5	11	0.4	3.7	3.4	0.7	3.7	2.5	2.6	100.0	
Other	34	16	15	65	1.1	21.9	23.1	10.4	11.0	14.9	15.5	100.0	
All	150	74	73	297	1.2	100.0	101.8	48.2	53.6	67.9	70.5	100.0	

Table 17. Childhood cancer, South Africa: Indian (1989-1992)

	NUMBER OF CASES				M/F	REL. FREQ.(%)	RATES PER MILLION					ASR	%MV
	0-4	5-9	10-14	All		Overall	0-4	5-9	10-14	Crude			
Leukaemia	17	28	17	62	2.0	39.5	43.4	66.6	43.9	51.7	51.0	100.0	
Acute lymphoid leukaemia	8	15	13	36	2.0	22.9	20.4	35.7	33.6	30.0	29.1	100.0	
Lymphoma	2	6	8	16	1.7	10.2	5.1	14.3	20.6	13.3	12.6	100.0	
Hodgkin disease	0	3	1	4	3.0	2.5	-	7.1	2.6	3.3	3.1	100.0	
Burkitt lymphoma	0	0	0	0	-	-	-	-	-	-	-	-	
Brain and spinal neoplasms	2	4	5	11	1.8	7.0	5.1	9.5	12.9	9.2	8.8	100.0	
Neuroblastoma	0	0	0	0	-	-	-	-	-	-	-	-	
Retinoblastoma	3	2	0	5	4.0	3.2	7.7	4.8	-	4.2	4.5	100.0	
Wilms tumour	3	1	0	4	3.0	2.5	7.7	2.4	-	3.3	3.7	100.0	
Bone tumours	1	3	4	8	1.7	5.1	2.6	7.1	10.3	6.7	6.3	100.0	
Soft tissue sarcomas	5	1	3	9	3.5	5.7	12.8	2.4	7.7	7.5	8.0	100.0	
Kaposi sarcoma	0	0	0	0	-	-	-	-	-	-	-	-	
Germ cell tumours	6	1	1	8	-	5.1	15.3	2.4	2.6	6.7	7.4	100.0	
Other	16	11	7	34	1.6	21.7	40.8	26.2	18.1	28.3	29.5	100.0	
All	55	57	45	157	2.1	100.0	140.4	135.5	116.1	130.9	131.8	100.0	

3.5.5 Swaziland

Background

Climate: Varies from subtropical in the plains to near temperate in the mountains and hills.

Terrain: A high-veld region along the western border with South Africa, a middle-veld a low-veld region and the Lubombo mountain range (the end of the Rift Valley) to the east along the border with Mozambique. The lowest point is the Great Usutu River, 21 m, and the highest Emlembe Mountain, 1862 m.

Ethnic groups: African 97%, European 3%

Religions: Christian 60%, indigenous beliefs 40%

Economy—overview: Subsistence agriculture occupies more than 60% of the population, but overgrazing, soil depletion, drought and sometimes floods are recurrent problems. Manufacturing features a number of agro-processing factories. Despite its deposits of minerals, there is little mining activity at present. Nearly 90% of imports come from South Africa. Remittances from Swazi workers in South African mines contribute significantly to the economy.

Industries: Mining (coal and asbestos), wood pulp, sugar, soft drink concentrates

Agriculture—products: Sugar-cane, cotton, maize, tobacco, rice, citrus, pineapples, corn, sorghum, peanuts; cattle, goats, sheep

Cancer registration

A cancer registry operated during 1979–83, as part of a research project to investigate the relationships between aflatoxin contamination of foodstuffs, hepatitis B virus and primary liver cancer. The registry attempted to collect information on all cases of clinical cancer that were diagnosed within the country. Initially, this was done by regular visits of clerical workers to all of the main cancer referral centres. For the final two years, this system was replaced by scrutiny of all hospital discharge abstracts for cases in which a diagnosis of cancer had been recorded, followed by letters or visits to the hospitals concerned to collect detailed data for registration. All of the 13 hospitals in Swaziland contributed cases. At the same time (1982), a local histopathology service became available for the first time in Swaziland, so that histopathology reports acted as an independent source of notification of cancer cases. Although the completeness of registration increased over the five-year period, it is probable that the system of inpatient discharge returns was incomplete and up to one half of hospital discharges were not so recorded.

Cancer registration recommenced in 1995. The registry is located in the Department of Pathology of the Central Laboratory Service, Ministry of Health (Manzini). It has access to all cancer diagnoses based on pathology or cytology, since there is only one laboratory in the country. In addition, a schedule of visits is carried out twice yearly to all hospitals and clinics in the country. There are about 20, including government referral hospitals in each of the four regions, as well as hospitals belonging to missionary groups, mining companies, or privately owned. The main sources of information are the hospital admission and discharge registers; case notes may be consulted for supplementary information. The registry also has access to death certificates from the seven civil registrars' offices throughout the country. Death certification is fairly universal, although cause of death is not accurate for deaths occurring at home. Place of residence is not well recorded in any of

these data sources; however, few non-residents are likely to be treated within the country. Information on residents treated (or diagnosed) in South Africa is forwarded by the South African National (pathology-based) Cancer Register (see Chapter 3.5.4).

Review of data

The Swaziland Cancer Registry, 1979–83

A total of 308 male and 390 female cases were reported by Peers and Keen (1986) (Table 1); the leading cancers in males were cancers of the liver (20.8% of all cancers), oesophagus (17.5%) and the lung and respiratory organs (4.5%). In females the leading cancers were cervix (51.5%), breast (8.7%) and liver cancer (5.6%). Minimum incidence rates were calculated, based on estimates of the population for mid-1981: for cervix cancer, the estimated ASR was 28.2 per 100 000.

Research on liver cancer in Swaziland contributed to the understanding of the carcinogenic effects of aflatoxin exposure. Substantial differences in the incidence of liver cancer between and within a number of African and other regions – including Swaziland (Keen & Martin, 1971; Peers *et al.*, 1976) have been correlated with differences in the estimated intake of aflatoxin B1 (IARC, 1993).

The most detailed study in Swaziland (Peers *et al.*, 1987) attempted to evaluate differences in liver cancer incidence, as recorded by the cancer registry, in sub-regions of the country in relation to exposure to aflatoxins and hepatitis B infection. Aflatoxin consumption was estimated from a defined sampling of foods in 11 areas, analysed for aflatoxin content, and surveys of locally grown crops between harvesting and consumption. Hepatitis B virus markers were measured in blood donors. A statistical correlation model incorporating daily consumption of total aflatoxins (not just aflatoxin B1) and the proportion of people positive for HBsAg provided the best fit to the variation in liver cancer incidence. Thus, at an area or ecological level, aflatoxin exposure appeared to be more important in explaining the variation in liver cancer incidence. However the prevalence of HBsAg was quite uniform (23–35%) and markers of past infection with HBV over 74–91% in both sexes, so it is unlikely that there was sufficient contrast between regions to demonstrate the true effect of hepatitis B infection on liver cancer. Hepatitis C levels were not measured.

Swaziland Cancer Registry, 1996–99

The cases registered in this period include cancers diagnosed clinically or detected via a death certificate. 1293 males and 1607 females were registered in the four-year period 1996–99 (Table 2). The percentage with diagnosis based on pathology or cytology was 29%. The relatively low rates for haematological malignancies, and the fact that 81% of leukaemia cases were recorded as 'unspecified subtype' reflects the absence of haematology services in the country.

It is difficult to make comparisons with the earlier data because of the differences in case ascertainment. Nevertheless, many of the changes reflect the epidemic of AIDS, which is severe in Swaziland: prevalence of HIV infection in adults was estimated to be 25.3% at the end of 1999 (see chapter on AIDS and Cancer). Thus, the frequency of Kaposi sarcoma has increased enormously, to reach 16.8% of all cancers in males (ASR 17.2 per 100 000) and 10.4% in females (ASR 9.5 per 100 000). In males, the incidence of liver cancer is high (ASR 22.0) and so is that of prostate cancer (ASR 21.5) and cancer of the oesophagus (ASR 14.0). In females, the picture is dominated by the extraordinarily high rate of cervix cancer—41.7% of all cancer (ASR 59.3); breast cancer is much less common (8.9%, ASR 12.9) and liver cancer and oesophageal

cancers are considerably less frequent than in males (M:F ratios in the range 3-4:1).

Childhood cancers

Table 3 shows the 93 childhood cancers registered in 1996-99. The incidence is low and the principal cancer recorded was Burkitt lymphoma (ASR 7.6 per million). There were seven cases of Kaposi sarcoma (7.5%, ASR 4.4 per million).

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Table 1. Swaziland: case series

Site	Swaziland Cancer Registry, 1979-83 (Peers & Keen 1986)				%HV
	Male		Female		
	No.	%	No.	%	
Oral cavity	4	1.3%	9	2.3%	
Nasopharynx	3	1.0%	0	0.0%	
Other pharynx	3	1.0%	1	0.3%	
Oesophagus	54	17.5%	15	3.8%	
Stomach	7	2.3%	1	0.3%	
Colon/rectum	8	2.6%	3	0.8%	
Liver	64	20.8%	22	5.6%	
Pancreas	4	1.3%	1	0.3%	
Lung	14	4.5%	3	0.8%	
Melanoma	3	1.0%	10	2.6%	
Other skin	17	5.5%	6	1.5%	
Kaposi sarcoma	6	1.9%	0	0.0%	
Breast	2	0.6%	34	8.7%	
Cervix uteri		0.0%	201	51.5%	
Corpus uteri		0.0%	2	0.5%	
Ovary etc.		0.0%	0	0.0%	
Prostate	11	3.6%		0.0%	
Penis	0	0.0%		0.0%	
Bladder	11	3.6%	6	1.5%	
Kidney etc.	3	1.0%	5	1.3%	
Eye	0	0.0%	5	1.3%	
Brain, nervous system	2	0.6%	0	0.0%	
Thyroid	5	1.6%	3	0.8%	
Non-Hodgkin lymphoma	13	4.2%	5	1.3%	
Hodgkin disease	6	1.9%	3	0.8%	
Myeloma	1	0.3%	0	0.0%	
Leukaemia	4	1.3%	8	2.1%	
ALL SITES	308	100.0%	390	100.0%	

Table 2. Swaziland (1996-1999)
 NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	18	3	56	1	-	-	1	3	5	5	1.0	1.4	0.15	2.2	C00-06
Salivary gland	2	0	50	-	-	-	-	1	1	-	0.1	0.2	0.03	0.3	C07-08
Nasopharynx	2	0	50	-	-	-	-	2	-	-	0.1	0.2	0.02	0.2	C11
Other pharynx	24	1	25	-	-	1	1	5	11	5	1.4	1.9	0.26	3.0	C09-10, C12-14
Oesophagus	113	7	7	-	-	2	5	39	30	30	6.4	9.1	1.01	14.0	C15
Stomach	36	2	11	-	-	2	4	6	10	12	2.0	2.9	0.29	4.5	C16
Colon, rectum and anus	39	3	41	-	3	5	6	8	3	11	2.2	3.1	0.22	4.2	C18-21
Liver	193	36	7	2	7	11	28	35	40	34	11.0	15.5	1.65	22.0	C22
Gallbladder etc.	2	0	50	-	-	-	-	2	-	-	0.1	0.2	0.02	0.2	C23-24
Pancreas	9	0	11	-	-	2	-	3	3	1	0.5	0.7	0.10	1.1	C25
Larynx	37	2	38	-	-	-	5	8	10	12	2.1	3.0	0.29	4.5	C32
Trachea, bronchus and lung	81	9	10	-	-	4	8	16	20	24	4.6	6.5	0.68	10.1	C33-34
Bone	20	0	40	3	3	1	1	3	4	5	1.1	1.6	0.13	2.0	C40-41
Melanoma of skin	6	1	83	-	-	-	2	2	-	1	0.3	0.5	0.04	0.6	C43
Other skin	46	5	63	2	1	2	5	5	14	12	2.6		0.39	5.5	C44
Mesothelioma	2	0	50	-	-	-	-	-	-	2	0.1	0.2	0.00	0.3	C45
Kaposi sarcoma	209	37	19	5	9	69	46	30	8	5	11.9	16.8	1.37	17.2	C46
Peripheral nerves	1	0	100	-	-	-	-	1	-	-	0.1	0.1	0.01	0.1	C47
Connective and soft tissue	15	4	73	4	-	2	2	-	1	2	0.9	1.2	0.07	1.2	C49
Breast	5	1	40	-	-	-	-	2	1	1	0.3	0.4	0.05	0.7	C50
Penis	31	5	32	-	-	4	7	6	4	5	1.8	2.5	0.22	3.2	C60
Prostate	153	13	24	-	-	2	4	9	45	80	8.7	12.3	1.07	21.5	C61
Testis	6	0	17	-	-	2	1	-	1	2	0.3	0.5	0.04	0.7	C62
Kidney	14	0	21	3	-	1	1	4	4	1	0.8	1.1	0.13	1.5	C64
Renal pelvis, ureter and other urinary	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C65-66, C68
Bladder	44	2	16	1	1	-	5	4	10	21	2.5	3.5	0.28	5.7	C67
Eye	16	3	100	1	-	3	5	2	1	1	0.9	1.3	0.11	1.4	C69
Brain, nervous system	9	0	11	-	3	1	1	1	1	2	0.5	0.7	0.05	0.8	C70-72
Thyroid	9	0	44	-	1	-	3	3	2	-	0.5	0.7	0.09	0.9	C73
Hodgkin disease	8	0	75	4	2	1	-	1	-	-	0.5	0.6	0.03	0.4	C81
Non-Hodgkin lymphoma	40	5	73	8	1	6	9	6	3	2	2.3	3.2	0.25	3.3	C82-85, C96
Multiple myeloma	3	1	33	-	-	-	-	1	1	-	0.2	0.2	0.05	0.4	C90
Lymphoid leukaemia	5	1	80	2	1	1	-	-	-	-	0.3	0.4	0.02	0.2	C91
Myeloid leukaemia	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C92-94
Leukaemia, unspecified	19	1	53	4	4	2	1	1	-	6	1.1	1.5	0.05	1.6	C95
Other and unspecified	76	6	26	4	1	5	3	18	14	25	4.3	6.1	0.52	9.0	O&U
All sites	1293	148	25	44	37	129	154	227	247	307	73.4		9.67	145.3	ALL
All sites but C44	1247	143	24	42	36	127	149	222	233	295	70.8	100.0	9.29	139.9	ALLbC44
Average annual population				204705	93582	52135	35810	25260	15083	12247					

Table 2.. Swaziland (1996-1999)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

S I T E	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	12	1	17	1	-	-	1	1	3	5	0.6	0.8	0.07	1.2	C00-06
Salivary gland	4	0	75	-	2	-	1	1	-	-	0.2	0.3	0.02	0.3	C07-08
Nasopharynx	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C11
Other pharynx	5	0	60	-	-	-	3	1	-	1	0.3	0.3	0.03	0.4	C09-10,C12-14
Oesophagus	41	3	15	-	-	1	6	12	9	10	2.1	2.6	0.32	4.1	C15
Stomach	24	0	17	-	1	4	5	3	7	4	1.2	1.5	0.19	2.2	C16
Colon, rectum and anus	26	3	31	-	2	2	2	7	6	4	1.3	1.7	0.20	2.4	C18-21
Liver	63	8	6	2	6	6	10	14	7	10	3.2	4.0	0.37	5.2	C22
Gallbladder etc.	1	0	0	-	-	-	-	-	1	-	0.1	0.1	0.02	0.1	C23-24
Pancreas	7	3	14	-	-	-	1	1	2	-	0.4	0.4	0.08	0.7	C25
Larynx	8	0	63	-	2	1	1	2	-	2	0.4	0.5	0.03	0.6	C32
Trachea, bronchus and lung	15	2	20	-	-	1	1	5	2	4	0.8	1.0	0.10	1.4	C33-34
Bone	33	0	33	9	7	3	1	2	2	9	1.7	2.1	0.09	2.2	C40-41
Melanoma of skin	10	2	50	-	1	1	1	3	1	1	0.5	0.6	0.07	0.9	C43
Other skin	37	3	65	-	3	8	3	7	8	5	1.9	0.27	0.27	3.2	C44
Mesothelioma	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C45
Kaposi sarcoma	164	24	18	2	37	51	34	8	4	4	8.4	10.4	0.70	9.5	C46
Peripheral nerves	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C47
Connective and soft tissue	17	4	65	3	2	2	-	3	3	-	0.9	1.1	0.12	1.2	C49
Breast	139	21	35	-	5	11	23	27	31	21	7.1	8.9	1.07	12.9	C50
Vulva	10	2	80	-	1	2	1	3	1	-	0.5	0.6	0.08	0.8	C51
Vagina	5	0	60	3	-	-	1	-	1	-	0.3	0.3	0.03	0.3	C52
Cervix uteri	655	107	33	-	7	63	122	163	115	78	33.4	41.7	4.96	59.3	C53
Uterus	58	10	38	-	-	3	9	13	12	11	3.0	3.7	0.44	5.6	C54-55
Ovary	43	7	44	2	6	8	6	2	7	5	2.2	2.7	0.25	3.2	C56
Placenta	9	0	89	-	1	7	1	-	-	-	0.5	0.6	0.03	0.5	C58
Kidney	14	2	43	6	1	1	-	3	-	1	0.7	0.9	0.05	0.9	C64
Renal pelvis, ureter and other urinary	1	0	100	1	-	-	-	-	-	-	0.1	0.1	0.00	0.0	C65-66,C68
Bladder	18	2	11	-	1	3	4	4	2	2	0.9	1.1	0.12	1.5	C67
Eye	13	2	77	2	-	4	2	1	1	1	0.7	0.8	0.06	0.9	C69
Brain, nervous system	6	0	33	-	-	2	-	-	4	-	0.3	0.4	0.07	0.6	C70-72
Thyroid	17	3	53	-	2	4	1	2	1	4	0.9	1.1	0.07	1.3	C73
Hodgkin disease	8	1	75	1	1	2	1	1	-	1	0.4	0.5	0.03	0.5	C81
Non-Hodgkin lymphoma	30	2	70	9	5	6	2	3	1	2	1.5	1.9	0.11	1.7	C82-85,C96
Multiple myeloma	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C90
Lymphoid leukaemia	2	0	100	2	-	-	-	-	-	-	0.1	0.1	0.00	0.1	C91
Myeloid leukaemia	4	2	50	-	1	-	-	1	-	-	0.2	0.3	0.02	0.3	C92-94
Leukaemia, unspecified	15	2	60	3	2	1	2	1	2	2	0.8	1.0	0.07	1.1	C95
Other and unspecified	93	10	10	3	3	14	15	13	16	19	4.7	5.9	0.56	7.9	O&U
All sites	1607	226	33	49	99	211	260	307	249	206	82.1		10.66	134.8	ALL
All sites but C44	1570	223	32	49	96	203	257	300	241	201	80.2	100.0	10.39	131.6	ALLbC44
Average annual population				208424	103868	68064	45497	28427	16703	17015					

Table 3. Childhood cancer, Swaziland (1989-1999)

	NUMBER OF CASES				REL. FREQ.(%)		RATES PER MILLION					
	0-4	5-9	10-14	All	M/F	Overall	0-4	5-9	10-14	Crude	ASR	%MV
Leukaemia	3	5	3	11	1.2	11.8	5.5	9.0	5.5	6.7	6.6	75.0
Acute lymphoid leukaemia	1	2	0	3	0.5	3.2	1.8	3.6	-	1.8	1.9	100.0
Lymphoma	12	4	6	22	1.2	23.7	22.0	7.2	10.9	13.3	14.0	80.0
Hodgkin disease	1	0	4	5	4.0	5.4	1.8	-	7.3	3.0	2.8	80.0
Burkitt lymphoma	6	4	2	12	1.0	12.9	11.0	7.2	3.6	7.3	7.6	83.3
Brain and spinal neoplasms	0	0	0	0	-	-	-	-	-	-	-	-
Neuroblastoma	2	0	0	2	1.0	2.2	3.7	-	-	1.2	1.4	100.0
Retinoblastoma	2	1	0	3	0.5	3.2	3.7	1.8	-	1.8	2.0	66.7
Wilms tumour	9	0	0	9	0.5	9.7	16.5	-	-	5.4	6.4	44.4
Bone tumours	1	4	7	12	0.3	12.9	1.8	7.2	12.7	7.3	6.7	50.0
Soft tissue sarcomas	5	7	1	13	2.3	14.0	9.2	12.6	1.8	7.9	8.1	100.0
Kaposi sarcoma	3	4	0	7	2.5	7.5	5.5	7.2	-	4.2	4.4	28.6
Germ cell tumours	1	0	1	2	-	2.2	1.8	-	1.8	1.2	1.2	100.0
Other	6	10	3	19	0.9	20.4	11.0	18.0	5.5	11.5	11.6	42.1
All	41	31	21	93	0.9	100.0	75.1	55.7	38.2	56.3	58.1	63.4