



Twenty-year Trends of Cancer Incidence in Omanis, 1996–2015

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The Sultanate of Oman is located in the Southeastern corner of the Arabian Peninsula. It has a coastal line extending almost 1700 km from the Strait of Hormuz in the north to the borders of Yemen, overlooking three seas; the Arabian Gulf, Gulf of Oman, and the Arabian Sea. The country borders Saudi Arabia and the UAE in the west, Yemen in the south, the Strait of Hormuz in the north, and the Arabian Sea in the east. There are a number of scattered Omani islands in the Arabian Sea; the most important are Masirah and Al Halaniyat.

The total area of Oman is approximately 309 500 km² and it is the second largest country in the Arabian Peninsula. Oman is composed of varying topographic areas consisting of plains, wadis (dry river beds), and mountains. The most important area is the plain overlooking the Gulf of Oman and the Arabian Sea with an area of about 3% of the total area. The mountain ranges occupy almost 15% of the total land of Oman and are inhabited by about 5% of the population. The remaining area is mainly sand, wadis, and desert (about 82% of the total area). The climate differs from one area to another; it is hot and humid in the coastal areas in summer, hot and dry in the interior with the exception of higher mountains and Dhofar governorate, which enjoy a moderate climate throughout the year.

Oman is administratively divided into 11 governorates with 62 Wilayats. These are Muscat, Dhofar, Musandam, A'Dakhiliyah, Al Buraymi, A'Sharqiyah South and North, Al Batinah South and North, A'Dhahirah, and Al Wasta [Figure 1].

Population structure

The estimated mid-year population in 1996 was 2 135 853 of which 1 593 769 were Omanis and 542 084 were Non-Omanis. The Omani population shows a sex ratio of 963 females per 1000 males. About 16.0% of the population is under-5 years

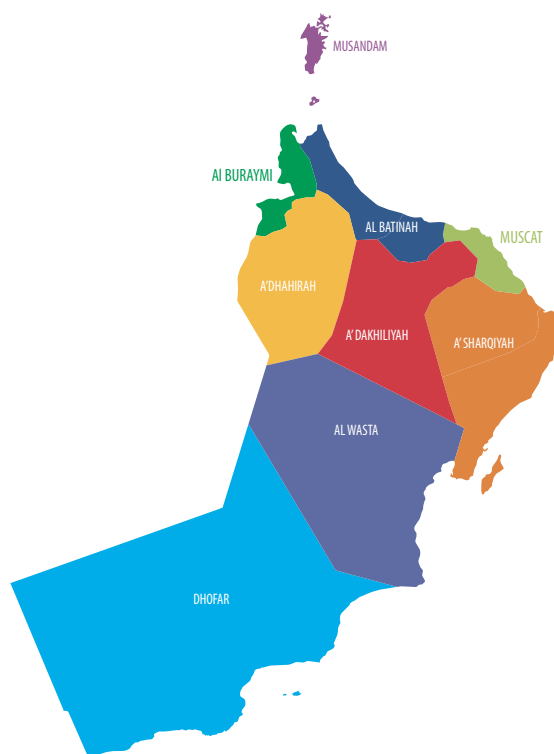


Figure 1: Diagrammatic map of the Sultanate of Oman.

and 45.0% is under-15 years. Only 3.0% of the total Omani population is above the age of 65 years. While, the estimated mid-year population in 2015 was 4 159 102 of which 2 344 946 were Omanis and 1 814 156 were Non-Omanis. The Omani population showed a sex ratio of 979 females per 1000 males. About 14.9% of the population were under-5 years and 35.7% were under-15 years. The population above 65 years increased to 4.3% [Figure 2].

Oman national cancer registry

The Oman National Cancer Registry was established in 1985 as a hospital-based registry. Only cases treated in tertiary hospitals were registered. In 1996, with the establishment of the department of Non-Communicable Diseases Surveillance and

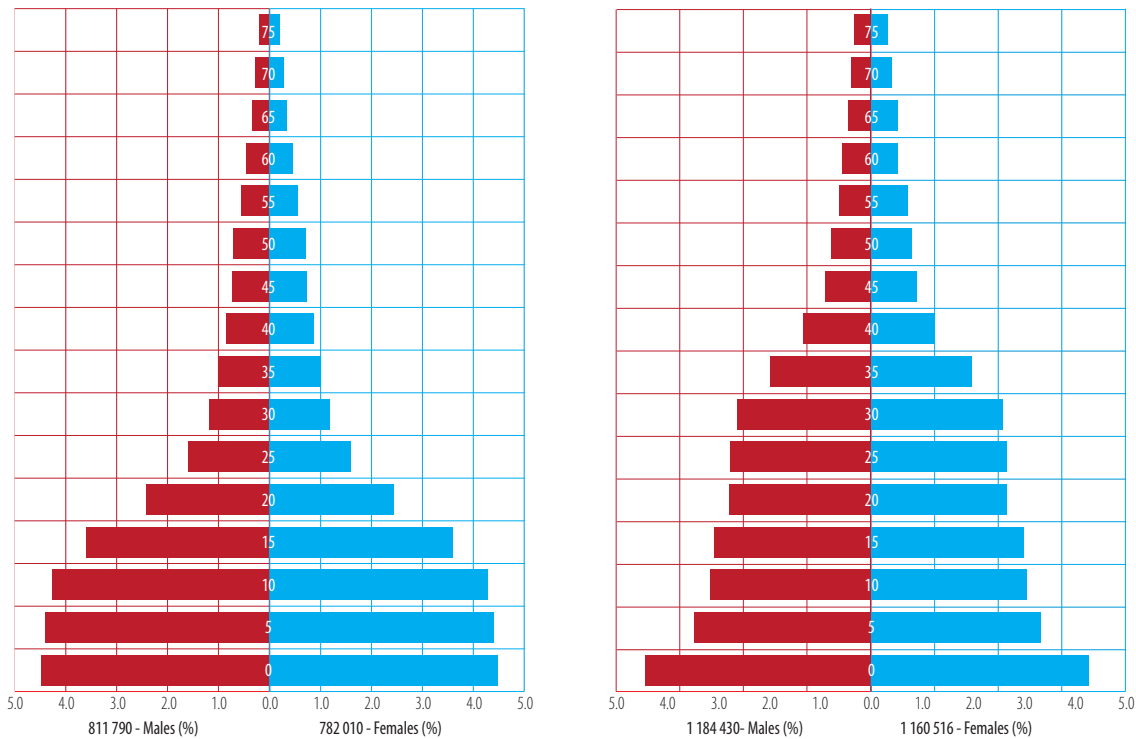


Figure 2: Population pyramid, Oman, 1996 and 2015.

Control, the cancer registry was transferred and started functioning under the Directorate General of Primary Health Care. New cancer notification forms were developed and distributed to all regional hospitals and institutions. In 2000, the registration form was simplified, printed, and distributed to all institutions that could potentially report cancer cases. Three trained cancer registrars are responsible for data collection, coding, and data entry of all reported cases.

METHODS

1. Data collection

A) ACTIVE COLLECTION

Active collection involves the registry personnel visiting different sources and abstracting data on cancer registry forms. Being the largest tertiary center for diagnosis and treatment of cancer, registrars visit the Royal Hospital twice a week and abstract data on the notification forms. Similarly, other tertiary hospitals like Khoula Hospital and Al-Nahdha Hospital are visited once a month.

Data on patients undergoing chemotherapy and radiotherapy treatments are also collected from the National Oncology Centre which was established

within the Royal Hospital in November 2004. Data of patients diagnosed with cancer abroad are traced through oncology out-patient registers at the Royal Hospital, and subsequently, data are extracted from their case notes. Detailed list of patients sent abroad for cancer treatment through the Ministry of Health system are obtained from the department of Treatment Abroad.

B) PASSIVE REPORTING

Cancer notification was made mandatory in 2001 through a Ministerial Decision (4/2001). When a case of cancer is diagnosed, the attending physician of the relevant specialty or the medical records department at the regional hospital completes the notification forms and sends them to the registry. Other institutions like the Armed Forces Hospital and Sultan Qaboos University Hospital have similar passive reporting. In 2017, the above Ministerial Decision was updated (222/2017) to include all health (Civil or Military) institutions in Oman including private hospitals. These institutions are frequently visited by the cancer registrars for data extraction of patients diagnosed in them.

2. Data-coding, entry, and validity checks

Until 2001, all cancer cases were coded using

International Classification of Diseases for Oncology (ICDO-2) with topography 'C' and morphology 'M' codes. Initially, data were entered using *CanReg3* software, (International Agency for Research on Cancer (IARC), Lyon, France). Subsequently, *CanReg4* software and ICDO-3 were used in 2003. Duplicate entries were checked by this software to avoid the same case being registered more than once. In 2016, the registry software was upgraded to *CanReg5* (version 00.40).¹ For this report, we used *CanReg5* (version 00.42). Validity checks were performed for consistency between site/histology, gender/site, and age/site/histology combinations using the same version.

3. Completeness of data reporting

Data are obtained from all hospitals with histopathology/cytology and hematology laboratories (Royal, Al-Nahdha, Khoula, Sultan Qaboos University, and Sohar Hospitals) from copies of patients' reports diagnosed with cancer to the registry. Since the mid of 2001, Sultan Qaboos University and Armed Forces Hospitals histopathology laboratories have also started sending reports.

Since the establishment of the new National Oncology Centre, chemotherapy and radiotherapy weekly logs are included in data collection of all patients attending these two modalities of treatments. Monthly hospital admission and discharge lists sent from all tertiary and regional hospitals to the Registry office to extract data of patients admitted for or discharged with a diagnosis of cancer and patients status are updated in the Registry (alive/dead).

A list of all cancer patients attending for chemotherapy sessions in all tertiary hospitals is also obtained. Details of missing data are sought from all of the above sources so that the registry can be updated.

4. Data analysis

The analysis below is limited to Omani nationals in the ONCR database. Non-Omanis working in Oman represent a skewed population from a wide range countries from all over the world, making determination of denominator for the calculation of incidence rates among them a complex exercise.

The data was first checked for consistency and validity using *CanReg5* (version 00.42, build1566 (IARC 2008)).¹ Frequency distribution and incidence tables were generated for Omani subjects, using this

software. Data for individual cancers were then exported to CSV format to *Stata* software (version 14.2, Stata Corporation, TX, USA) for analysis of incidence by region, gender and morphology, and topography. Bar diagrams and graphs are generated using Excel version 2013 (Microsoft Corporation).

The average annual incidence and crude rates for the entire 20 years period were generated using *CanReg5*. The total average incidence and crude rates were calculated manually using Excel. Average of mid-year population of the years 2005 and 2006 were used to estimate crude rates and age-standardized rates were calculated using the *World Standard Population of Segi*.²

Population denominators used for the calculations of incidence rates (by 5-year age group, gender, and region) were obtained from the Ministry of Health's Annual Health Reports.³

5. Age-standardized rate (ASR)

Age-standardized rates (ASRs) were obtained using the *World Standard Population of Segi*² to adjust the crude incidence rates (CRs) and to remove the confounding effect of age [Table 1]. These rates could be used for comparison purposes with other rates where the same Segi population was used such as the World Health Organization's agency, IARC, in its periodic publication *Cancer Incidence in Five Continents*.⁴

Table 1: Age structure of the World Standard Population of Segi.²

Age structure	Population
0-4	12 000
5-9	10 000
10-14	9 000
15-19	9 000
20-24	8 000
25-29	8 000
30-34	6 000
35-39	6 000
40-44	6 000
45-49	6 000
50-54	5 000
55-59	4 000
60-64	4 000
65-69	3 000
70-74	2 000
75+	2 000
Total	100 000

Comparison between the cancer incidence in 1996 and 2015

In 1996, the total registered cases among Omanis were 787 (445 males and 342 females), and the CR for all cancer among Omanis was 49.4 per 100 000 (54.8 per 100 000 for males and 43.7 per 100 000 for females). The ASR was 95.0 per 100 000 (106.1 per 100 000 for males and 82.8 per 100 000 for females). While in 2015, the total registered cases among Omanis were 1632 (760 males and 872 females) and the CR for all cancer among Omanis was 69.7 per 100 000 (64.2 per 100 000 for males and 75.1 per 100 000 for females). The ASR was 105.0 per

100 000 (101.0 per 100 000 for males and 109.0 per 100 000 for females) [Table 2 and Figure 3].

If we consider the CR of 49.4 per 100 000 people for 1996 to continue at same rate then it would be expected that the total cases in 2015 would be 1158 cases. However, the total cases were 1632 cases which means that the incidence rate has increased. There was a rise in the CR by 41% between 1996 and 2015. This increase was higher (37.9%) between 2010 and 2015 compared to 2.3% 1996–2010.

There appears to be a true increase in the incidence of cancer in Oman which may be attributed to population aging. In 1996, about

Table 2: Comparison of frequency, crude and age-standardized rates of cancer cases by gender, Oman, 1996–2015.

Gender	Frequency	Percentage (%)	Crude rates	Age-standardized rates
1996				
Male	445	56.5	54.8	106.1
Female	342	43.5	43.7	82.8
Total	787	100	49.4	95.0
2015				
Male	760	46.6	64.2	101.0
Female	872	53.4	75.1	109.0
Total	1632	100	69.7	105.0
1996-2015				
Male	10 723	51.1	55.1	105.2
Female	10 279	48.9	54.2	96.3
Total	21 002	100	56.4	125.7

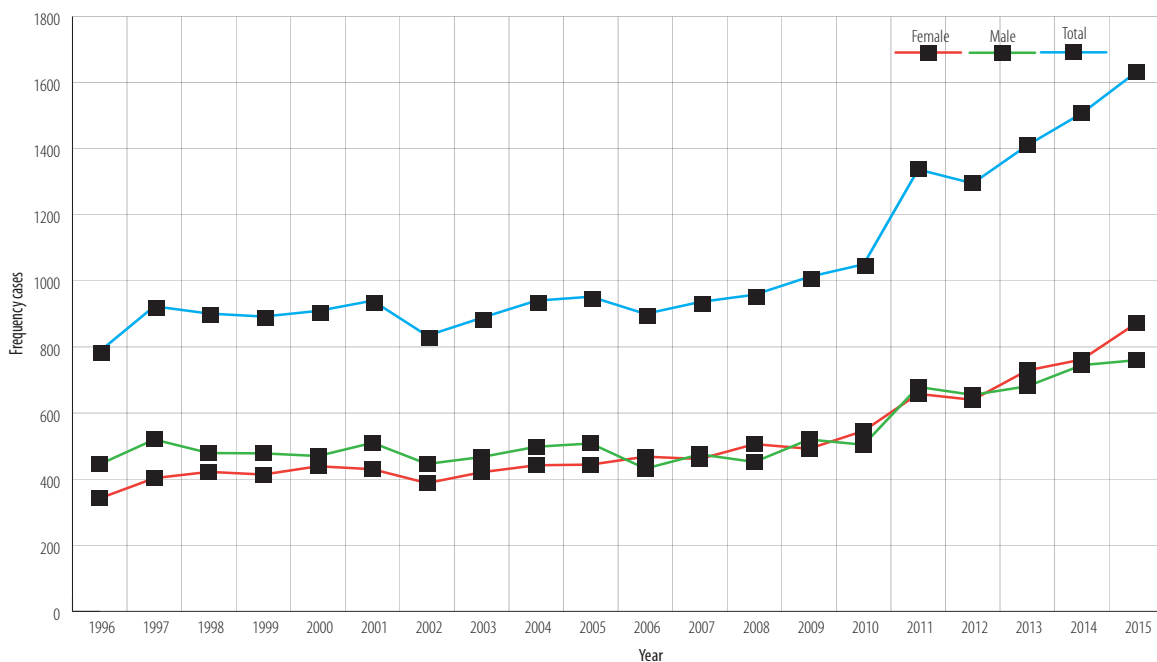


Figure 3: Frequency of cancer cases by gender, Oman, 1996–2015.

16.0% of the population were under-5 years, 45.0% were under-15 years, and only 3.0% were above the age of 65 years. In 2015, the proportion of under-5 years were 14.9%, under-15 years reached 37.5% while the proportion of people aged 65 and above increased to 4.3%.

Life expectancy in Oman has also increased from 72.0 years at birth in 1996 to 76.4 years in 2015. This rise in cancer incidence cases may be attributed to a number of factors, mainly the improvement in health care services over the past five decades including the introduction of an early detection program for breast cancer, the advanced in diagnostic and treatment modalities, and better public awareness about the cancer by non-governmental associations (introduced mammogram mobile unit as an outreach program into various regions of Oman). Other factors that might explain the increase in the incidence rates is the epidemiologic transition due to the rapid socioeconomic changes resulting in an increase in unhealthy lifestyles (tobacco use and its easy availability, physical inactivity, and unhealthy food habits).

Cancer incidence in Oman, 1996–2015

Between January 1996 and December 2015, there were 21 002 newly diagnosed cases of cancer among Omanis, of which 10 723 (55.1%) were in men

and 10 279 (48.9%) in women. On average, 1050 cases were reported annually in Oman. The average annual crude incidence rate was 55.1 per 100 000 males versus 54.2 per 100 000 females. The average annual ASRs were 105.2 and 96.3 per 100 000 males and females, respectively. The average annual CRs were 55.1 per 100 000 Omani males and 54.2 per 100 000 Omani females. The average annual world ASRs were 105.2 and 96.3 per 100 000 Omani males and females, respectively [Table 2].

Overall, there was an observed gradual decline in the trend of average annual ASR for Omani male over the 20-year period. On the other hand, the trend of average annual ASR for Omani females increased gradually over the same period [Figure 4]. The average annual age-specific incidence rates were observed to increase dramatically with advancing age in both sexes [Figure 5].

Tables 3 and 4 illustrate the frequency of incidence cases by age group and gender in Omanis for the period 1996–2015. While, tables 5 and 6 demonstrate ASRs in Omani males and females for the same period. Additionally, tables 7 and 8 show ASR by year, from 1996 to 2015, respectively.

Common cancer among Omanis

Over the 20-year period (1996–2015), breast cancer

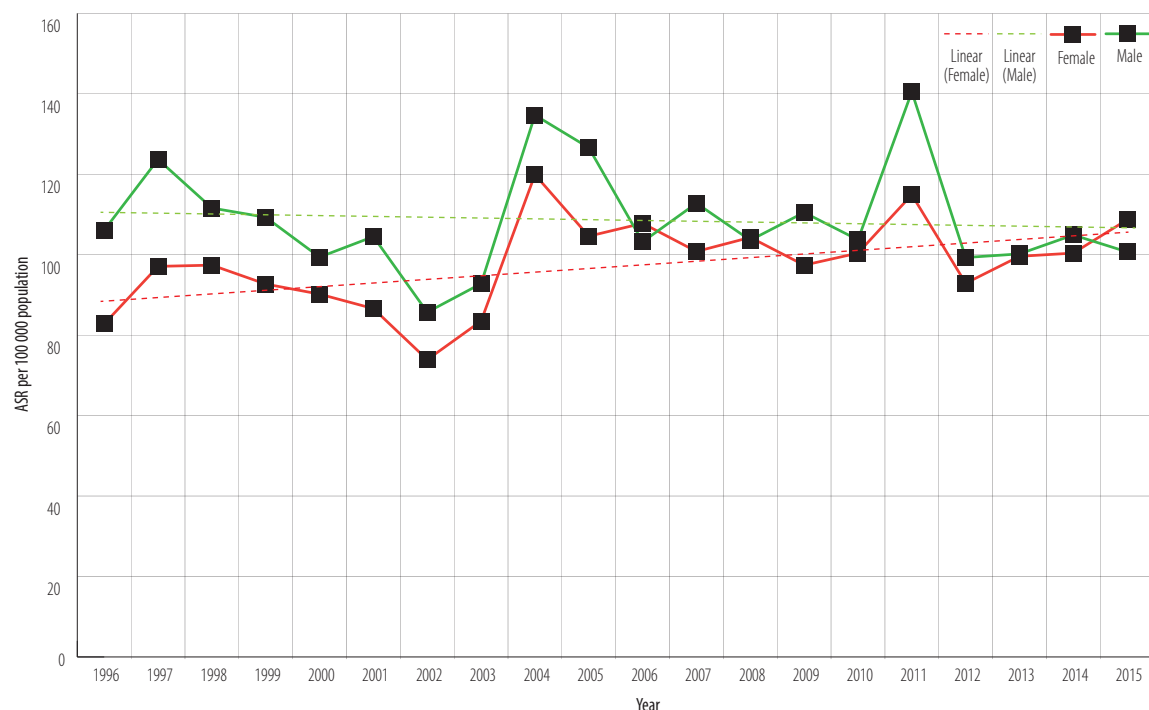


Figure 4: Age-standardized incidence rates (ASRs) of cancers among Omanis by year, 1996–2015.

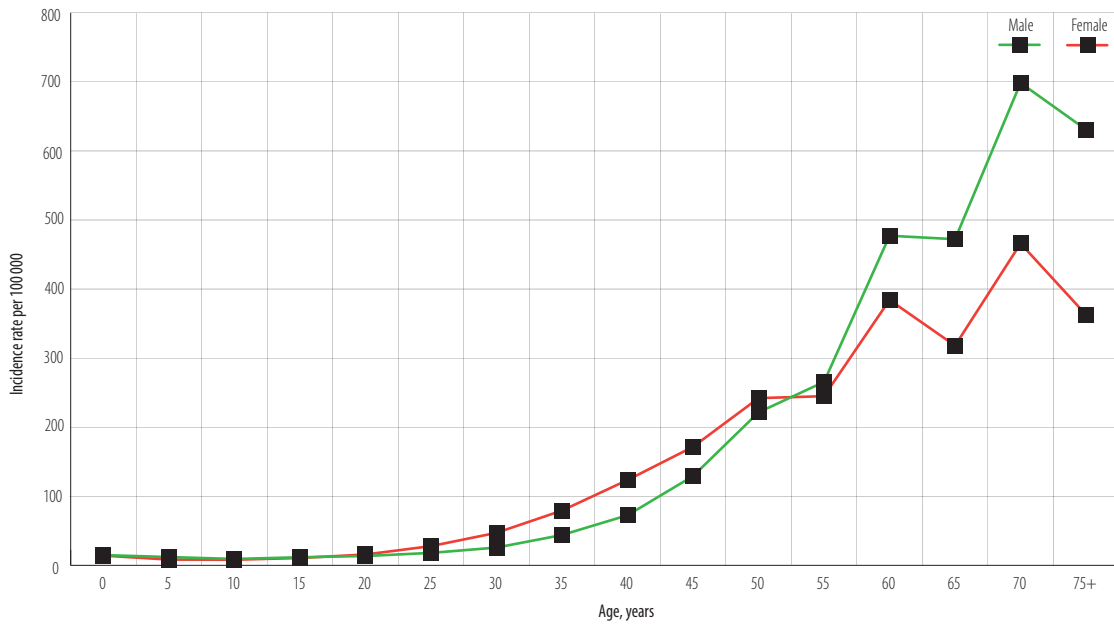


Figure 5: Average annual age-specific incidence rates of cancers by gender and age among Omanis, 1996–2015.

was the leading cancer among Omanis followed by non-Hodgkin's lymphoma, leukemia, colorectal, and thyroid [Table 9].

1) Breast cancer

Breast Cancer was the leading cancer among males and females in Oman and accounted for 10.9% of

total malignancies [Table 9]. This malignancy has quadrupled in Oman in 2015 (n = 217) compared to 1996 (n = 53) [Figure 6].

Between 1996 and 2015, there were 2280 cases of breast cancer reported in Oman: 2181 in women and only 99 in men. The ASR for breast cancer in Omani women was 20.8 per 100 000 females with

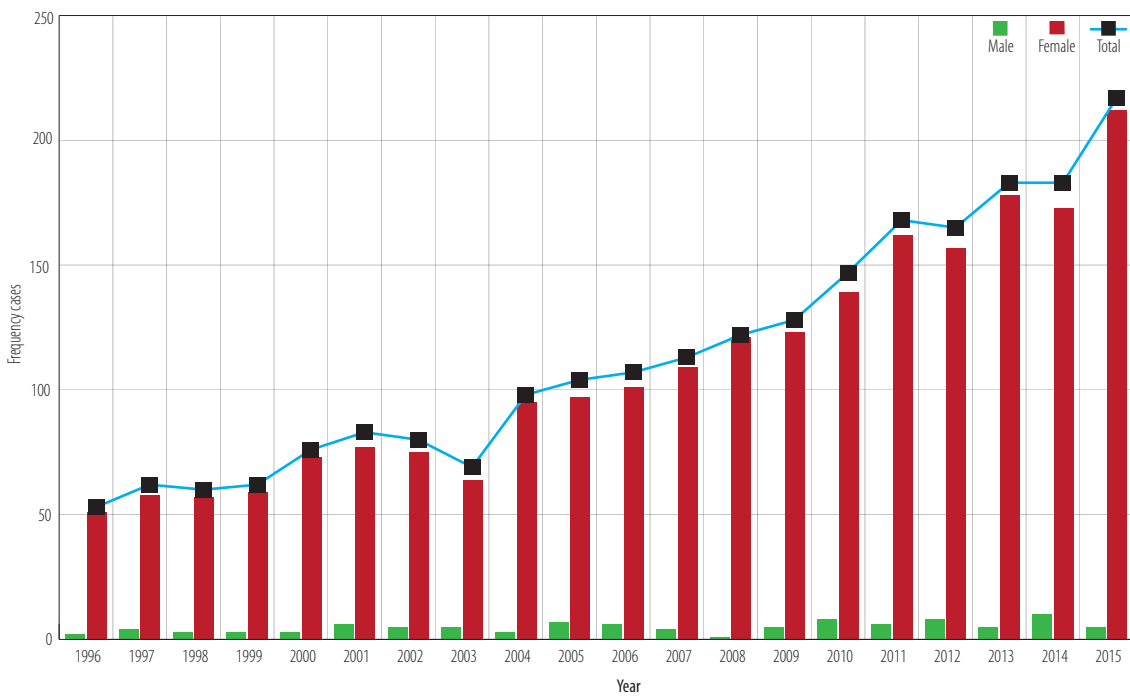


Figure 6: Trends of breast cancer in both genders by year.

Table 3: Frequency of incident cases of cancer in males by topography/morphology and age group, Oman, 1996–2015.

Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	(%)	ICD (10th)
Lip	24	0	0	0	0	0	0	0	0	2	0	2	2	3	2	2	5	6	0.2	C00
Tongue	101	0	0	0	0	0	3	0	5	2	10	19	20	12	15	3	3	9	1.0	C01-02
Mouth	114	0	0	0	1	3	2	2	4	9	12	12	13	11	17	10	10	10	1.1	C03-06
Salivary glands	36	0	0	2	0	4	1	1	1	4	2	1	3	3	8	1	3	3	0.3	C07-08
Tonsil	13	0	0	0	0	0	0	0	1	1	2	1	2	2	3	0	0	1	0.1	C09
Other oropharynx	22	0	1	0	0	0	0	1	0	0	3	1	3	4	2	3	2	2	0.2	C10
Nasopharynx	101	0	2	2	7	9	7	7	3	7	11	18	8	10	5	8	3	1	1.0	C11
Hypopharynx	28	0	2	1	1	0	2	2	1	1	0	4	4	4	4	2	1	1	0.3	C12-13
Pharynx unspecified	10	0	0	0	0	0	0	0	0	0	1	2	2	1	0	1	2	1	0.1	C14
Oesophagus	209	0	0	0	0	0	0	2	0	1	7	13	19	15	43	32	35	42	2.0	C15
Stomach	960	0	0	0	2	4	2	2	18	21	37	52	84	100	190	126	156	168	9.3	C16
Small intestine	43	0	0	0	0	0	0	0	2	2	4	1	4	5	11	4	7	3	0.4	C17
Colon	473	0	1	1	3	7	18	25	25	36	42	53	65	51	58	49	28	36	4.6	C18
Rectum	301	0	0	0	1	10	9	15	15	12	18	24	40	32	48	36	27	29	2.9	C19-20
Anus	45	0	0	0	0	0	0	0	1	1	4	7	5	7	7	1	4	8	0.4	C21
Liver	544	0	10	3	2	1	4	6	6	10	26	32	60	85	102	69	66	62	5.3	C22
Gallbladder etc.	76	0	0	0	0	0	0	0	1	3	3	7	9	12	10	8	11	12	0.7	C23-24
Pancreas	209	0	0	0	0	0	0	2	1	4	11	14	30	24	34	33	24	32	2.0	C25
Nose, sinuses etc.	31	0	0	1	2	2	2	0	2	0	2	4	6	1	2	3	2	4	0.3	C30-31
Larynx	130	0	0	0	0	0	0	0	3	5	11	14	22	12	19	14	13	17	1.3	C32
Trachea, bronchus, and lung	720	0	0	2	0	3	7	7	5	14	28	44	81	81	149	101	108	97	7.0	C33-34
Other thoracic organs	39	0	1	1	1	3	3	3	0	4	0	1	4	2	6	1	4	8	0.4	C37-38
Bone	147	0	5	14	27	26	18	12	7	9	3	3	5	2	9	3	2	2	1.4	C40-41
Melanoma of skin	42	0	0	2	1	0	0	1	1	1	1	4	5	4	7	5	5	5	0.4	C43
Other skin	434	0	3	4	4	3	8	12	10	12	15	23	31	43	63	60	66	77	4.2	C44
Mesothelioma	18	0	0	0	0	0	0	0	0	0	1	0	3	3	1	3	3	4	0.2	C45
Kaposi sarcoma	57	0	0	1	0	2	3	5	5	6	2	4	6	5	6	4	5	3	0.6	C46
Connective and soft tissue	175	0	17	14	12	18	20	14	7	10	7	8	12	11	8	6	2	9	1.7	C47,C49
Breast	99	0	0	0	0	0	0	2	1	7	7	13	12	15	15	7	7	13	1.0	C50

Table 3: Frequency of incident cases of cancer in males by topography/morphology and age group, Oman, 1996–2015.

-continued

Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	(%)	ICD (10th)
Penis	6	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	2	0.1	C60
Prostate	998	0	1	0	2	2	0	0	1	4	7	17	52	94	196	182	199	241	9.7	C61
Testis	120	0	13	2	0	10	25	23	15	11	9	3	2	3	0	1	1	2	1.2	C62
Other male genital organs	5	0	0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	1	0	C63
Kidney	236	0	27	6	3	1	3	9	7	14	18	20	30	15	25	23	15	20	2.3	C64
Renal pelvis	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	0	C65
Ureter	4	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	C66
Bladder	590	0	3	1	1	1	2	6	10	24	19	35	62	61	89	83	79	114	5.7	C67
Other urinary organs	6	0	1	0	0	0	0	0	0	0	0	0	2	0	1	1	1	0	0.1	C68
Eye	52	0	15	1	0	2	2	0	1	2	2	1	2	5	7	2	7	3	0.5	C69
Brain, nervous system	404	0	51	42	31	26	21	19	23	24	18	26	32	25	21	18	17	10	3.9	C70-72
Thyroid	242	0	0	0	2	9	21	29	30	20	22	22	18	17	25	12	7	8	2.4	C73
Adrenal gland	46	0	30	3	3	0	1	2	0	0	0	0	3	2	0	1	1	0	0.4	C74
Other endocrine	10	0	1	1	0	1	1	0	0	2	1	1	1	0	0	0	1	0	0.1	C75
Hodgkin disease	384	0	11	43	39	39	42	30	34	28	14	27	26	14	11	10	4	12	3.7	C81
Non-Hodgkin's lymphoma	932	0	28	42	25	48	37	53	44	52	64	67	80	78	87	74	80	73	9.1	C82-85,C96
Immunoproliferative diseases	5	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	2	0	C88
Multiple myeloma	177	0	0	0	0	1	1	4	2	0	6	12	23	28	33	22	20	25	1.7	C90
Lymphoid leukaemia	443	0	104	88	49	52	24	9	12	4	10	13	17	5	19	13	13	11	4.3	C91
Myeloid leukaemia	320	0	38	13	10	18	19	24	19	25	18	18	21	12	23	20	16	26	3.1	C92-94
Leukaemia unspecified	80	0	9	7	9	12	8	2	5	2	2	2	5	8	4	2	2	1	0.8	C95
Myeloproliferative disorders (MPD)	15	0	0	1	0	0	0	1	1	1	0	2	1	3	1	1	1	2	0.1	MPD
Myelodysplastic syndromes (MDS)	5	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	1	0	MDS
Other and unspecified (O&U)	438	0	16	3	3	6	2	12	9	14	22	26	46	49	73	47	63	47	4.3	O&U
All sites (All)	10723	0	388	296	231	296	312	331	339	413	502	674	986	982	1465	1110	1131	1267	104	All
All sites but C44 (AllbC44)	10289	0	385	292	227	293	304	319	329	401	487	651	955	939	1402	1050	1065	1190	100	AllbC44

UNK: unknown. ICD: International Classification of Diseases, 10th revision.

Table 4: Frequency of incident cases of cancer in females by topography/morphology and age group, Oman, 1996–2015.

Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	(%)	ICD (10th)
Lip	12	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	1	2	0.1	C00
Tongue	50	0	0	1	0	0	1	1	3	4	4	9	6	7	5	4	3	2	0.5	C01-02
Mouth	64	0	0	0	1	1	0	1	2	3	3	3	13	5	14	7	4	8	0.6	C03-06
Salivary glands	43	0	1	1	0	3	6	3	3	4	4	2	8	3	2	1	1	1	0.4	C07-08
Tonsil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C09
Other oropharynx	7	0	0	0	0	0	0	0	1	0	0	1	1	1	0	2	0	1	0.1	C10
Nasopharynx	48	0	0	0	5	4	2	2	4	7	8	6	5	2	1	1	2	1	0.5	C11
Hypopharynx	17	0	0	0	0	0	0	0	0	2	4	1	0	1	3	0	4	2	0.2	C12-13
Pharynx unspecified	5	0	0	0	0	0	0	0	0	2	0	1	0	0	1	0	0	1	0.1	C14
Oesophagus	134	0	0	0	0	0	0	1	1	2	3	4	13	11	30	16	23	30	1.3	C15
Stomach	512	0	0	1	1	1	10	3	13	20	37	40	71	62	88	50	62	53	5.1	C16
Small intestine	28	0	0	0	0	0	0	1	0	0	3	4	2	2	3	2	7	4	0.3	C17
Colon	376	0	0	0	4	4	8	12	19	23	28	38	51	40	57	28	24	41	3.8	C18
Rectum	232	0	0	0	1	1	3	5	12	21	27	15	31	34	25	21	23	14	2.3	C19-20
Anus	23	0	0	0	0	0	0	1	0	2	1	0	5	3	2	1	5	3	0.2	C21
Liver	245	0	8	0	1	1	4	3	5	7	9	18	39	32	41	29	25	23	2.5	C22
Gallbladder etc.	90	0	0	0	0	0	0	0	2	4	11	8	9	10	17	11	10	8	0.9	C23-24
Pancreas	126	0	0	0	0	0	1	1	2	3	6	10	19	18	31	8	13	14	1.3	C25
Nose, sinuses etc.	23	0	1	0	1	0	0	0	2	1	0	4	1	3	3	1	3	2	0.2	C30-31
Larynx	29	0	0	0	0	0	0	1	1	1	6	0	2	5	3	4	3	3	0.3	C32
Trachea, bronchus, and lung	229	0	1	0	1	1	1	3	4	9	8	13	32	29	39	29	27	33	2.3	C33-34
Other thoracic organs	18	0	8	0	0	1	0	1	1	0	2	0	1	1	1	0	0	2	0.2	C37-38
Bone	94	0	2	7	23	18	10	10	3	3	3	2	8	1	1	0	0	3	0.9	C40-41
Melanoma of skin	34	0	0	0	1	0	0	4	2	1	3	4	6	1	3	2	4	3	0.3	C43
Other skin	332	0	1	3	1	6	2	10	7	11	20	29	32	40	42	36	38	54	3.3	C44
Mesothelioma	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0.0	C45
Kaposi sarcoma	17	0	0	0	0	0	0	0	0	1	6	0	0	3	3	2	1	1	0.2	C46
Connective and soft tissue	120	0	27	4	9	7	7	10	7	6	9	12	4	5	2	1	3	7	1.2	C47-49
Breast	2181	0	0	0	0	2	25	95	184	275	290	297	309	229	175	109	89	102	21.9	C50
Vulva	24	0	0	0	0	0	1	0	0	1	2	2	1	3	4	1	5	4	0.2	C51
Vagina	30	0	1	0	0	1	0	2	0	1	1	2	5	1	5	7	1	3	0.3	C52

Table 4: Frequency of incident cases of cancer in females by topography/morphology and age group, Oman, 1996–2015.
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Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	(%)	ICD (10th)
Cervix uteri	550	0	0	0	0	0	1	10	28	53	68	71	73	61	64	32	52	37	5.5	C53
Corpus uteri	206	0	0	0	1	0	1	3	7	9	15	18	24	27	45	24	18	14	2.1	C54
Uterus unspecified	86	0	1	0	0	0	0	2	4	8	8	13	10	8	11	6	8	7	0.9	C55
Ovary	463	0	1	4	15	27	35	33	27	15	36	40	44	37	48	28	40	33	4.7	C56
Other female genital organs	10	0	0	0	1	1	0	1	0	1	1	3	0	1	0	1	1	0	0.1	C57
Placenta	23	0	0	0	1	1	2	6	3	1	3	4	2	1	0	0	0	0	0.2	C58
Kidney	204	0	40	7	3	2	4	7	10	11	9	12	28	16	20	18	8	9	2.1	C64
Renal pelvis	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	C65
Ureter	4	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0.0	C66
Bladder	204	0	2	0	0	1	2	6	6	1	11	16	12	21	27	28	24	47	2.1	C67
Other urinary organs	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0.0	C68
Eye	45	0	20	4	1	2	0	0	1	1	2	1	2	0	4	0	3	4	0.5	C69
Brain, nervous system	281	0	36	34	28	24	18	16	14	14	16	19	17	13	16	6	4	6	2.8	C70-72
Thyroid	1035	0	0	3	7	47	106	145	150	133	113	108	74	40	45	19	30	15	10.4	C73
Adrenal gland	42	0	24	5	0	1	2	2	1	2	1	1	1	1	0	1	0	0	0.4	C74
Other endocrine	3	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0.0	C75
Hodgkin disease	225	0	4	17	21	22	30	23	15	7	13	16	7	18	13	7	7	5	2.3	C81
Non-Hodgkin's lymphoma	601	0	27	27	16	23	32	40	28	29	33	43	64	48	83	35	30	43	6.0	C82-85, C96
Immunoproliferative diseases	3	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0.0	C88
Multiple myeloma	123	0	0	0	0	0	0	0	1	3	4	6	22	14	25	18	13	17	1.2	C90
Lymphoid leukaemia	275	0	101	53	27	13	9	9	7	1	6	7	6	4	10	6	9	7	2.8	C91
Myeloid leukaemia	244	0	16	11	18	24	17	15	18	16	16	15	16	12	18	10	13	9	2.5	C92-94
Leukaemia unspecified	77	0	14	10	14	5	4	2	1	2	4	1	1	3	5	4	2	5	0.8	C95
Myeloproliferative disorders (MPD)	7	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	4	0	0.1	MPD
Myelodysplastic syndromes (MDS)	5	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0.1	MDS
Other and unspecified (O&U)	410	0	17	3	2	9	4	9	13	22	30	32	50	29	53	42	54	41	4.1	O&U
All sites (All)	10279	0	354	196	195	258	350	500	613	745	890	956	1130	907	1090	662	703	730	103	All
All sites but C44 (AllbC44)	9947	0	353	193	194	252	348	490	606	734	870	927	1098	867	1048	626	665	676	100	AllbC44

UNK: unknown; ICD: International Classification of Diseases, 10th revision.

Table 5: Age-standardized incidence rates (ASRs) per 100000 population of cancer in males by topography/morphology and age group, Oman, 1996–2015.

Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	(%)	CUM 0-74	ASR	ICD (10th)
Lip	24	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.4	0.8	0.7	0.9	3.1	3.0	0.1	0.2	0.03	0.3	C00
Tongue	101	0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.2	1.4	3.6	4.5	3.2	4.9	1.3	1.9	4.5	0.5	1.0	0.1	1.1	C01-02
Mouth	114	0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	1.0	1.7	2.3	2.9	3.0	5.5	4.3	6.2	5.0	0.6	1.1	0.1	1.2	C03-06
Salivary glands	36	0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.4	0.3	0.2	0.7	0.8	2.6	0.4	1.9	1.5	0.2	0.3	0.04	0.3	C07-08
Tonsil	13	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.4	0.5	1.0	0.0	0.0	0.5	0.1	0.1	0.01	0.1	C09
Other oropharynx	22	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.2	0.7	1.1	0.7	1.3	1.2	1.0	0.1	0.2	0.03	0.2	C10
Nasopharynx	101	0	0.0	0.1	0.1	0.3	0.4	0.4	0.2	0.7	1.6	3.4	1.8	2.7	1.6	3.4	1.9	0.5	0.5	1.0	0.09	0.9	C11
Hypopharynx	28	0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.8	0.9	1.1	1.3	0.9	0.6	0.5	0.1	0.3	0.03	0.3	C12-13
Pharynx unspecified	10	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.3	0.0	0.4	1.2	0.5	0.1	0.1	0.01	0.1	C14
Oesophagus	209	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	1.0	2.5	4.3	4.1	14.0	13.6	21.6	20.9	1.1	2.0	0.3	2.4	C15
Stomach	960	0	0.0	0.0	0.0	0.1	0.2	0.1	1.4	2.2	5.3	10.0	18.9	27	61.9	53.7	96.3	83.6	4.9	9.3	1.4	10.9	C16
Small intestine	43	0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.6	0.2	0.9	1.4	3.6	1.7	4.3	1.5	0.2	0.4	0.1	0.5	C17
Colon	473	0	0.0	0.0	0.0	0.1	0.3	1.0	1.9	3.8	6.1	10.2	14.6	13.8	18.9	20.9	17.3	17.9	2.4	4.6	0.5	4.8	C18
Rectum	301	0	0.0	0.0	0.0	0.0	0.4	0.5	1.1	1.3	2.6	4.6	9.0	8.7	15.6	15.3	16.7	14.4	1.6	2.9	0.4	3.2	C19-20
Anus	45	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	1.3	1.1	1.9	2.3	0.4	2.5	4.0	0.2	0.4	0.1	0.5	C21
Liver	544	0	0.4	0.1	0.1	0.0	0.2	0.3	0.5	1.1	3.8	6.1	13.5	23	33.2	29.4	40.8	30.9	2.8	5.3	0.8	6.0	C22
Gallbladder etc.	76	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	1.3	2.0	3.2	3.3	3.4	6.8	6.0	0.4	0.7	0.1	0.8	C23-24
Pancreas	209	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	1.6	2.7	6.7	6.5	11.1	14.1	14.8	15.9	1.1	2.0	0.3	2.4	C25
Nose, sinuses etc.	31	0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.3	0.8	1.3	0.3	0.7	1.3	1.2	2.0	0.2	0.3	0.03	0.3	C30-31
Larynx	130	0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.6	2.7	4.9	3.2	6.2	6.0	8.0	8.5	0.7	1.3	0.2	1.4	C32
Trachea, bronchus, and lung	720	0	0.0	0.0	0.1	0.0	0.1	0.4	0.4	1.5	4.0	8.4	18.2	21.9	48.5	43.0	66.7	48.3	3.7	7.0	1.1	8.2	C33-34
Other thoracic organs	39	0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.4	0.0	0.2	0.9	0.5	2.0	0.4	2.5	4.0	0.2	0.4	0.04	0.4	C37-38
Bone	147	0	0.2	0.6	1.1	1.0	0.8	0.7	0.5	1.0	0.4	0.6	1.1	0.5	2.9	1.3	1.2	1.0	0.8	1.4	0.07	0.8	C40-41
Melanoma of skin	42	0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.8	1.1	1.1	2.3	2.1	3.1	2.5	0.2	0.4	0.1	0.4	C43
Other skin	434	0	0.1	0.2	0.2	0.1	0.3	0.7	0.8	1.3	2.2	4.4	7.0	11.6	20.5	25.6	40.8	38.3	2.2	4.2	0.6	4.6	C44
Mesothelioma	18	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.8	0.3	1.3	1.9	2.0	0.1	0.2	0.03	0.2	C45
Kaposi sarcoma	57	0	0.0	0.0	0.0	0.1	0.1	0.3	0.4	0.6	0.3	0.8	1.3	1.4	2.0	1.7	3.1	1.5	0.3	0.6	0.1	0.5	C46

Table 5: Age-standardized incidence rates (ASRs) per 100,000 population of cancer in males by topography/morphology and age group, Oman, 1996–2015.

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Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	(%)	CUM 0-74	ASR	ICD (10th)
Connective and soft tissue	175	0	0.6	0.6	0.5	0.7	0.9	0.8	0.5	1.1	1.0	1.5	2.7	3.0	2.6	2.6	1.2	4.5	1.0	1.7	0.1	1.2	C47,C49
Breast	99	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	1.0	2.5	2.7	4.1	4.9	3.0	4.3	6.5	0.5	1.0	0.1	1.1	C50
Penis	6	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.0	0.0	1.0	0.03	0.1	0.01	0.1	C60
Prostate	998	0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.4	1.0	3.3	11.7	25.4	63.8	77.5	123	120	5.1	9.7	1.5	11.6	C61
Testis	120	0	0.5	0.1	0.0	0.4	1.1	1.2	1.1	1.2	1.3	0.6	0.4	0.8	0.0	0.4	0.6	1.0	0.6	1.2	0.1	0.6	C62
Other male genital organs	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.5	0.03	0.0	0.0	0.0	C63
Kidney	236	0	1.0	0.2	0.1	0.0	0.1	0.5	0.5	1.5	2.6	3.8	6.7	4.1	8.1	9.8	9.3	10.0	1.2	2.3	0.2	2.2	C64
Renal pelvis	4	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.9	0.0	0.5	0.02	0.0	0.01	0.0	C65
Ureter	4	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.7	0.4	0.0	0.0	0.02	0.0	0.01	0.1	C66
Bladder	590	0	0.1	0.0	0.0	0.0	0.1	0.3	0.8	2.6	2.7	6.7	13.9	16.5	29	35.4	48.8	56.8	3.0	5.7	0.8	6.5	C67
Other urinary organs	6	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.4	0.6	0.0	0.03	0.1	0.01	0.1	C68
Eye	52	0	0.6	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.2	0.4	1.4	2.3	0.9	4.3	1.5	0.3	0.5	0.1	0.4	C69
Brain, nervous system	404	0	1.9	1.7	1.2	1.0	0.9	1.0	1.7	2.6	2.6	5.0	7.2	6.8	6.8	7.7	10.5	5.0	2.1	3.9	0.3	2.9	C70-72
Thyroid	242	0	0.0	0.0	0.1	0.4	0.9	1.6	2.3	2.1	3.2	4.2	4.0	4.6	8.1	5.1	4.3	4.0	1.2	2.4	0.2	2.0	C73
Adrenal gland	46	0	1.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.7	0.5	0.0	0.4	0.6	0.0	0.2	0.4	0.02	0.3	C74
Other endocrine	10	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.6	0.0	0.1	0.1	0.01	0.1	C75
Hodgkin disease	384	0	0.4	1.8	1.6	1.5	1.8	1.6	2.6	3.0	2.0	5.2	5.8	3.8	3.6	4.3	2.5	6.0	2.0	3.7	0.2	2.4	C81
Non-Hodgkin's lymphoma	932	0	1.1	1.7	1.0	1.9	1.6	2.9	3.3	5.5	9.2	12.8	18.0	21.1	28.3	31.5	49.4	36.3	4.8	9.1	1.0	8.3	C82-85, C96
Immunoproliferative diseases	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.0	0.03	0.0	0.0	0.0	C88
Multiple myeloma	177	0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.9	2.3	5.2	7.6	10.7	9.4	12.4	12.4	0.9	1.7	0.2	2.0	C90
Lymphoid leukaemia	443	0	4.0	3.6	2.0	2.1	1.0	0.5	0.9	0.4	1.4	2.5	3.8	1.4	6.2	5.5	8.0	5.5	2.3	4.3	0.2	2.6	C91
Myeloid leukaemia	320	0	1.5	0.5	0.4	0.7	0.8	1.3	1.4	2.7	2.6	3.4	4.7	3.2	7.5	8.5	9.9	12.9	1.6	3.1	0.3	2.5	C92-94
Leukaemia unspecified	80	0	0.3	0.3	0.4	0.5	0.3	0.1	0.4	0.2	0.3	0.4	1.1	2.2	1.3	0.9	1.2	0.5	0.4	0.8	0.1	0.5	C95
Myeloproliferative disorders (MPD)	15	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.4	0.2	0.8	0.3	0.4	0.6	1.0	0.1	0.1	0.02	0.1	MPD

Table 5: Age-standardized incidence rates (ASRs) per 100000 population of cancer in males by topography/morphology and age group, Oman, 1996–2015. *-continued*

Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	(%)	CUM 0-74	ASR	ICD (10th)
Myelodysplastic syndromes (MDS)	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.03	0.0	0.0	0.0	MDS
Other and unspecified (O&U)	438	0	0.6	0.1	0.1	0.2	0.1	0.7	0.7	1.5	3.2	5.0	10.3	13.3	23.8	20.0	38.9	23.4	2.3	4.3	0.6	4.6	O&U
All sites (All)	10 723	0	14.8	12.0	9.2	11.7	13.5	18	25.7	43.9	72.5	129	222	266	477	473	699	631	55.1	104	12.4	105.0	All
All sites but C44 (AllbC44)	10 289	0	14.7	11.9	9.1	11.6	13.1	17.3	24.9	42.6	70.3	125	215	254	457	447	658	593	52.9	100	11.9	101.0	AllbC44

UNK: unknown; CUM: cumulative; ICD: International Classification of Diseases, 10th revision.

Table 6: Age-standardized incidence rates (ASRs) per 100000 population of cancer in females by topography/morphology and age group, Oman, 1996–2015.

Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	(%)	CUM 0-74	ASR	ICD (10th)
Lip	12	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.7	1.0	0.1	0.1	0.01	0.1	C00
Tongue	50	0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.6	1.6	1.3	1.9	1.8	1.9	2.0	1.0	0.3	0.5	0.06	0.5	C01-02
Mouth	64	0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	2.8	1.4	4.9	3.4	2.7	4.0	0.3	0.6	0.08	0.7	C03-06
Salivary glands	43	0	0.0	0.0	0.1	0.3	0.2	0.2	0.2	0.4	0.6	0.4	1.7	0.8	0.7	0.5	0.7	0.5	0.2	0.4	0.03	0.3	C07-08
Tonsil	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C09
Other oropharynx	7	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.3	0.0	1.0	0.0	0.5	0.04	0.1	0.01	0.1	C10
Nasopharynx	48	0	0.0	0.0	0.0	0.2	0.2	0.1	0.3	0.7	1.1	1.1	1.1	0.5	0.4	0.5	1.3	0.5	0.3	0.5	0.04	0.4	C11
Hypopharynx	17	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.2	0.0	0.3	1.1	0.0	2.7	1.0	0.09	0.2	0.02	0.2	C12-13
Pharynx unspecified	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.4	0.0	0.0	0.5	0.03	0.1	0.0	0.0	C14
Oesophagus	134	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.7	2.8	3.0	10.6	7.7	15.2	14.9	0.7	1.3	0.2	1.6	C15
Stomach	512	0	0.0	0.0	0.0	0.0	0.4	0.2	1.0	2.1	5.1	7.2	15.2	16.7	31.0	24.0	41.1	26.3	2.7	5.1	0.7	5.7	C16
Small intestine	28	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.7	0.4	0.5	1.1	1.0	4.6	2.0	0.2	0.3	0.04	0.3	C17
Colon	376	0	0.0	0.0	0.1	0.2	0.4	0.7	1.5	2.4	3.9	6.8	10.9	10.8	20.1	13.5	15.9	20.4	2.0	3.8	0.4	3.9	C18
Rectum	232	0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	2.2	3.7	2.7	6.6	9.2	8.8	10.1	15.2	7.0	1.2	2.3	0.3	2.4	C19-20

Table 6: Age-standardized incidence rates (ASRs) per 100,000 population of cancer in females by topography/morphology and age group, Oman, 1996–2015.

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Site	All ages	Age UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	Crude rate	(%)	CUM 0-74	ASR	ICD (10th)
Anus	23	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.0	1.1	0.8	0.7	0.5	3.3	1.5	0.1	0.2	0.03	0.3	C21
Liver	245	0	0.3	0.0	0.0	0.0	0.2	0.2	0.4	0.7	1.2	3.2	8.4	8.6	14.5	13.9	16.6	11.4	1.3	2.5	0.3	2.7	C22
Gallbladder etc.	90	0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	1.5	1.4	1.9	2.7	6.0	5.3	6.6	4.0	0.5	0.9	0.1	1.0	C23-24
Pancreas	126	0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.8	1.8	4.1	4.9	10.9	3.8	8.6	7.0	0.7	1.3	0.2	1.5	C25
Nose, sinuses etc.	23	0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.7	0.2	0.8	1.1	0.5	2.0	1.0	0.1	0.2	0.03	0.2	C30-31
Larynx	29	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.8	0.0	0.4	1.4	1.1	1.9	2.0	1.5	0.2	0.3	0.04	0.3	C32
Trachea, bronchus, and lung	229	0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	1.0	1.1	2.3	6.9	7.8	13.7	13.9	17.9	16.4	1.2	2.3	0.3	2.6	C33-34
Other thoracic organs	18	0	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.0	0.2	0.3	0.4	0.0	0.0	1.0	0.09	0.2	0.01	0.1	C37-38
Bone	94	0	0.1	0.3	1.0	0.7	0.4	0.6	0.2	0.3	0.4	0.4	1.7	0.3	0.4	0.0	0.0	1.5	0.5	0.9	0.03	0.5	C40-41
Melanoma of skin	34	0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.4	0.7	1.3	0.3	1.1	1.0	2.7	1.5	0.2	0.3	0.04	0.3	C43
Other skin	332	0	0.0	0.1	0	0.2	0.1	0.6	0.5	1.2	2.8	5.2	6.9	10.8	14.8	17.3	25.2	26.8	1.8	3.3	0.4	3.6	C44
Mesothelioma	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.5	0.0	0.5	0.02	0.0	0.0	0.0	C45
Kaposi sarcoma	17	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.0	0.0	0.8	1.1	1.0	0.7	0.5	0.09	0.2	0.02	0.2	C46
Connective and soft tissue	120	0	1.1	0.2	0.4	0.3	0.3	0.6	0.5	0.6	1.2	2.2	0.9	1.4	0.7	0.5	2.0	3.5	0.6	1.2	0.1	0.8	C47,C49
Breast	2181	0	0.0	0.0	0.0	0.1	1.1	5.3	14.1	29.3	40.2	53.3	66.2	61.8	61.7	52.4	59	50.7	11.5	21.9	2.2	20.8	C50
Vulva	24	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.2	0.8	1.4	0.5	3.3	2.0	0.1	0.2	0.04	0.3	C51
Vagina	30	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.4	1.1	0.3	1.8	3.4	0.7	1.5	0.2	0.3	0.04	0.3	C52
Cervix uteri	550	0	0.0	0.0	0.0	0.0	0.0	0.6	2.2	5.6	9.4	12.7	15.6	16.5	22.6	15.4	34.5	18.4	2.9	5.5	0.7	5.7	C53
Corpus uteri	206	0	0.0	0.0	0.0	0.0	0.2	0.5	1.0	2.1	2.1	3.2	5.1	7.3	15.9	11.5	11.9	7.0	1.1	2.1	0.3	2.3	C54
Uterus unspecified	86	0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	1.1	2.3	2.1	2.2	3.9	2.9	5.3	3.5	0.5	0.9	0.1	0.9	C55
Ovary	463	0	0.0	0.2	0.6	1.1	1.6	1.8	2.1	1.6	5.0	7.2	9.4	10	16.9	13.5	26.5	16.4	2.4	4.7	0.5	4.2	C56
Other female genital organs	10	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.5	0.0	0.3	0.0	0.5	0.7	0.0	0.1	0.1	0.01	0.1	C57
Placenta	23	0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.1	0.4	0.7	0.4	0.3	0.0	0.0	0.0	0.0	0.1	0.2	0.01	0.2	C58
Kidney	204	0	1.6	0.3	0.1	0.1	0.2	0.4	0.8	1.2	1.2	2.2	6.0	4.3	7.0	8.6	5.3	4.5	1.1	2.1	0.2	1.8	C64
Renal pelvis	1	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.01	0.0	0.0	0.0	C65
Ureter	4	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.7	0.5	0.02	0.0	0.01	0.0	C66

Table 6: Age-standardized incidence rates (ASRs) per 100000 population of cancer in females by topography/morphology and age group, Oman, 1996–2015.
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Site	All ages	Age UNK	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75+	Crude rate	(%)	CUM 0-74	ASR	ICD (10th)
Bladder	204	0	0.1	0.0	0.0	0.0	0.1	0.3	0.5	0.1	1.5	2.9	2.6	5.7	9.5	13.5	15.9	23.3	1.1	2.1	0.3	2.3	C67
Other urinary organs	2	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.7	0.0	0.01	0.0	0.0	0.0	C68
Eye	45	0	0.8	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.4	0.0	1.4	0.0	2.0	2.0	0.2	0.5	0.03	0.3	C69
Brain, nervous system	281	0	1.4	1.4	1.2	1.0	0.8	0.9	1.1	1.5	2.2	3.4	3.6	3.5	5.6	2.9	2.7	3.0	1.5	2.8	0.2	1.9	C70-72
Thyroid	1035	0	0.0	0.1	0.3	1.9	4.8	8.1	11.5	14.2	15.7	19.4	15.9	10.8	15.9	9.1	19.9	7.5	5.5	10.4	0.7	7.6	C73
Adrenal gland	42	0	1.0	0.2	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.0	0.5	0.0	0.0	0.2	0.4	0.01	0.2	C74
Other endocrine	3	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.0	0.0	0.0	C75
Hodgkin disease	225	0	0.2	0.7	0.9	0.9	1.3	1.3	1.2	0.7	1.8	2.9	1.5	4.9	4.6	3.4	4.6	2.5	1.2	2.3	0.2	1.6	C81
Non-Hodgkin's lymphoma	601	0	1.1	1.1	0.7	0.9	1.4	2.2	2.2	3.1	4.6	7.7	13.7	13.0	29.3	16.8	19.9	21.4	3.2	6.0	0.6	5.4	C82-85, C96
Immunoproliferative diseases	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.5	0.02	0.0	0.0	0.0	C88
Multiple myeloma	123	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	1.1	4.7	3.8	8.8	8.6	8.6	8.4	0.7	1.2	0.2	1.5	C90
Lymphoid leukaemia	275	0	4.0	2.2	1.1	0.5	0.4	0.5	0.5	0.1	0.8	1.3	1.3	1.1	3.5	2.9	6.0	3.5	1.5	2.8	0.1	1.6	C91
Myeloid leukaemia	244	0	0.6	0.5	0.7	1.0	0.8	0.8	1.4	1.7	2.2	2.7	3.4	3.2	6.3	4.8	8.6	4.5	1.3	2.5	0.2	1.8	C92-94
Leukaemia unspecified	77	0	0.6	0.4	0.6	0.2	0.2	0.1	0.1	0.2	0.6	0.2	0.2	0.8	1.8	1.9	1.3	2.5	0.4	0.8	0.1	0.5	C95
Myeloproliferative disorders (MPD)	7	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	2.7	0.0	0.04	0.1	0.02	0.1	MPD
Myelodysplastic syndromes (MDS)	5	0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.03	0.1	0.0	0.0	MDS
Other and unspecified (O&U)	410	0	0.7	0.1	0.1	0.4	0.2	0.5	1.0	2.3	4.2	5.7	10.7	7.8	18.7	20.2	35.8	20.4	2.2	4.1	0.5	4.3	O&U
All sites (All)	10279	0	14.1	8.3	8.1	10.6	15.7	27.8	47.1	79.3	124	172	242	245	384	318	466	363	54.2	103	10.8	96.3	All
All sites but C44 (AllbC44)	9947	0	14.0	8.1	8	10.4	15.6	27.3	46.5	78.1	121	166	235	234	369	301	441	336	52.5	100	10.4	92.7	AllbC44

UNK: unknown; CUM: cumulative; ICD: International Classification of Diseases, 10th revision.

Table 7: Age-standardized incidence rates per 100,000 population in males by topography/morphology and year, Oman, 1996–2015.

Site	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	ICD (10th)
Lip	0.2	0.5	0.7	0.7	0.5	0.4	0.2	0.0	0.8	0.3	0.5	0.0	0.1	0.0	0.3	0.4	0.1	0.2	0.0	0.0	C00
Tongue	1.3	0.9	0.3	1.2	1.3	0.7	0.7	0.9	0.8	1.0	1.5	1.3	1.2	0.7	0.8	0.9	0.7	2.1	0.8	2.1	C01-02
Mouth	1.6	1.1	1.6	1.0	0.8	0.6	1.5	0.9	3.0	1.9	0.3	1.1	1.3	1.7	0.7	1.7	1.2	0.6	1.3	0.6	C03-06
Salivary glands	0.3	0.3	1.3	0.0	0.2	0.3	0.5	0.1	1.8	0.0	0.0	0.1	0.3	0.2	0.5	0.0	0.3	0.4	0.2	0.5	C07-08
Tonsil	0.0	0.2	0.0	0.2	0.0	0.3	0.0	0.0	0.3	0.2	0.5	0.6	0.2	0.0	0.2	0.0	0.0	0.1	0.0	0.2	C09
Other oropharynx	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.7	0.8	0.8	0.4	0.0	0.3	0.2	0.2	0.4	0.0	0.2	0.2	0.4	C10
Nasopharynx	0.9	1.7	0.8	0.4	1.5	1.3	0.3	0.4	0.7	1.0	0.6	0.9	1.5	1.1	0.8	0.8	0.3	0.3	1.3	1.4	C11
Hypopharynx	0.6	0.3	0.2	0.4	0.2	0.1	0.7	0.2	2.3	0.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0	0.0	0.1	0.3	C12-13
Pharynx unspecified	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.3	0.0	0.2	0.0	0.2	0.0	0.1	0.1	0.2	C14
Oesophagus	3.7	2.9	2.6	2.6	2.4	2.6	2.8	2.1	3.7	3.5	3.2	2.6	1.3	2.1	4.0	2.3	1.8	1.5	2.2	1.3	C15
Stomach	11.7	14.6	13.5	13.9	13	13.4	11.9	7.8	11.9	16.2	13	10.1	8.8	13.1	7.5	13.9	11.3	8.1	9.0	5.7	C16
Small intestine	0.2	0.2	0.2	0.3	0.2	0.4	0.6	0.0	0.0	0.4	0.0	0.5	0.0	0.5	0.4	1.1	0.4	0.6	0.7	1.6	C17
Colon	2.7	2.8	3.5	1.5	3.0	2.4	3.1	3.2	4.7	5.8	5.8	5.1	4.4	4.9	6.3	6.8	7.3	6.7	6.3	7.0	C18
Rectum	1.5	3.4	2.5	1.8	1.1	3	1.6	3.1	1.6	4.5	3.7	3.0	2.4	4.8	2.1	5.5	4.1	4.4	3.1	5.0	C19-20
Anus	0.8	0.0	0.2	0.6	0.3	1.2	0.8	0.7	0.9	0.3	0.3	0.5	0.5	0.2	0.3	0.7	0.6	0.6	0.3	0.3	C21
Liver	5.9	4.1	7.8	9.5	6.1	6.8	3.0	5.0	8.4	9.8	4.6	4.7	8.0	4.3	4.2	6.4	5.5	4.5	8.0	5.9	C22
Gallbladder etc.	0.0	0.9	0.5	1.0	1.2	0.5	0.7	0.7	1.7	2.3	0.5	1.8	0.9	1.0	1.3	1.9	0.3	0.8	0.5	0.9	C23-24
Pancreas	2.3	2.8	1.3	1.7	2.3	3	0.5	1.4	4.1	2.3	1.9	1.2	2.3	2.4	3.4	3.7	2.7	3.7	2.2	2.7	C25
Nose, sinuses etc.	0.2	0.6	0.2	0.7	0.5	0.0	0.0	0.3	0.8	0.6	0.4	0.9	0.1	0.2	0.2	0.7	0.0	0.0	0.0	0.2	C30-31
Larynx	1.9	1.1	2.7	1.0	1.2	0.4	0.4	1.7	3.3	2.9	2.5	1.3	1.1	0.8	2.7	1.6	1.1	1.2	1.0	1.1	C32
Trachea, bronchus, and lung	7.5	13.0	8.4	13.1	8.8	9.9	6.8	6.9	10.6	8.3	8.2	11.2	7.6	7.8	6.3	11.2	5.0	7.3	8.0	6.9	C33-34
Other thoracic organs	1.0	0.8	0.2	0.2	0.6	0.5	0.2	0.1	0.7	0.1	0.6	0.3	0.1	0.7	0.0	1.2	0.0	0.2	0.4	0.1	C37-38
Bone	0.7	1.3	1.1	0.8	0.7	0.2	0.7	0.9	1.6	0.9	0.3	0.5	0.3	1.0	1.4	1.8	0.7	0.7	0.8	0.6	C40-41
Melanoma of skin	0.5	0.9	0.3	0.0	0.2	1.0	0.4	0.3	1.1	0.3	0.0	0.3	0.5	0.8	0.6	0.7	0.4	0.7	0.2	0.3	C43
Other skin	7.7	6.9	5.8	3.1	3.4	3.8	5.4	4.1	5.0	5.4	5.1	5.9	5.7	6.2	5.2	4.8	3.7	4.5	3.2	3.1	C44
Mesothelioma	0.0	0.0	0.4	0.4	0.2	0.2	0.0	0.3	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.9	0.1	0.2	0.3	0.2	C45
Kaposi sarcoma	0.6	1.7	0.0	1.3	0.2	0.5	0.8	0.7	0.0	0.5	0.7	0.5	0.5	0.5	0.3	1.4	0.1	0.6	0.0	0.1	C46
Connective and soft tissue	1.4	2.0	1.6	1.0	2.0	1.3	0.9	1.5	2.0	0.8	0.6	0.4	1.2	0.5	1.4	0.9	0.7	0.9	1.0	1.9	C47,C49
Breast	0.5	1.0	0.6	0.7	0.7	1.4	0.8	1.1	1.0	1.7	1.8	0.9	0.1	1.4	2.0	1.3	1.4	0.8	1.8	0.9	C50

Table 7: Age-standardized incidence rates per 100 000 population in males by topography/morphology and year, Oman, 1996–2015.
-continued

Site	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	ICD (10th)
Penis	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.1	0.1	C60
Prostate	10.8	12.9	11.4	12	9.0	10.6	7.3	6.9	11.2	12.3	8.7	16.1	12.3	13.1	12.8	17.0	13.5	13.7	12.7	13.3	C61
Testis	0.6	0.5	0.5	0.5	0.2	0.7	0.9	0.7	1.0	0.5	0.7	0.5	0.7	0.5	0.5	0.7	0.4	0.6	0.8	0.9	C62
Other male genital organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	C63
Kidney	1.6	1.9	1.3	1.6	2.6	1.2	1.2	2.9	1.7	2.5	1.2	1.4	2	3.9	4.1	2.6	2.2	2.2	3.6	2.7	C64
Renal pelvis	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	C65
Ureter	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	C66
Bladder	8.3	7.5	5.8	6.6	3.8	4.4	4.1	4.8	5.9	7.7	7.5	8.8	6.9	6.7	8.9	8.7	6	7.8	8.3	6.6	C67
Other urinary organs	0.0	0.0	0.2	0.3	0.1	0.0	0.2	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C68
Eye	1.5	1.0	0.8	0.6	0.3	0.3	0.0	0.8	0.9	1.1	0.5	1.1	0.3	0.1	0.0	0.2	0.1	0.2	0.0	0.2	C69
Brain, nervous system	2.4	4.0	3.8	2.9	3.0	4.4	3.2	3.2	4.1	2.8	1.5	2.4	1.8	3.4	2.6	2.8	3.5	2.3	3.2	2.1	C70-72
Thyroid	1.9	2.2	1.3	1.7	1.1	2.8	1.6	3.2	1.6	2.0	0.9	1.1	2.0	1.7	0.6	2.4	2.0	2.4	3.2	2.7	C73
Adrenal gland	0.0	0.1	0.0	0.1	0.2	0.1	0.0	0.3	0.2	0.2	0.4	0.1	0.0	0.3	0.7	0.3	0.7	0.3	0.4	0.3	C74
Other endocrine	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.0	0.3	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.0	C75
Hodgkin disease	1.9	2.2	3.4	2.2	2.7	3.0	2.4	2.4	3.5	2.3	2.2	1.6	3.0	1.7	1.8	3.5	3.0	2.2	2.6	2.3	C81
Non-Hodgkin's lymphoma	8.9	8.6	9.5	9.0	7.9	7.3	7.1	9.9	11.3	9.4	7.8	7.4	9.7	7.5	7.6	10.9	7.5	7.2	8.3	8.6	C82-85, C96
Immunoproliferative diseases	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.1	C88
Multiple myeloma	1.3	3.8	2.0	1.6	2.4	2.1	1.4	0.8	3.1	3.5	1.2	2.9	2.5	2.2	1.8	1.8	2.2	2.1	1.5	1.4	C90
Lymphoid leukaemia	1.6	2.4	1.9	2.5	2.5	2.6	2.4	3.3	3.8	2.3	2.5	1.7	2.5	3.6	2.6	5.3	1.7	1.6	3.3	2.3	C91
Myeloid leukaemia	1.0	2.0	2.9	1.9	2.9	1.8	1.9	3.1	1.9	2.6	3.5	3.8	3.3	1.9	2.0	4.3	2.4	2.0	2.4	2.7	C92-94
Leukaemia unspecified	1.3	0.5	0.6	0.8	0.6	1.2	1.2	1.1	0.6	0.4	0.1	0.4	0.2	0.3	0.2	0.3	0.2	0.7	0.1	0.0	C95
Myeloproliferative disorders (MPD)	0.0	0.0	0.3	0.2	0.0	0.0	0.2	0.1	0.0	0.1	0.2	0.7	0.3	0.3	0.5	0.1	0.0	0.0	0.0	0.1	MPD
Myelodysplastic syndromes (MDS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.1	0.1	MDS
Other and unspecified (O&U)	6.3	7.4	7.2	5.2	6.8	5.3	5.3	4.1	9.0	4.6	5.8	5.4	4.1	5.0	3.1	5.9	4.0	2.7	1.1	2.2	O&U
All sites (All)	106	124	112	109	99.4	105	85.7	92.8	135	127	103	113	104	111	104	141	99.3	100	105	101	All
All sites but C44 (AllbC44)	98.4	117	106	106	96	101	80.3	88.7	130	121	98	107	97.9	104	98.5	136	95.6	95.7	102	97.7	AllbC44

ICD: International Classification of Diseases, 10th revision.

Table 8: Age-standardized incidence rates per 100 000 population in females by topography/morphology and year, Oman, 1996–2015.

Site	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	ICD (10th)
Lip	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.3	0.4	0.5	0.0	0.0	0.0	0.3	0.0	0.0	0.2	C00
Tongue	1.7	0.2	0.0	0.9	0.5	0.0	0.1	0.4	0.3	0.2	0.4	0.5	0.3	0.3	0.8	1.0	0.5	0.2	1.0	0.7	C01-02
Mouth	0.4	2.0	0.2	1.0	0.4	0.4	0.1	0.7	0.6	0.6	0.3	1.3	0.8	1.5	0.9	0.7	0.5	0.9	1.1	0.4	C03-06
Salivary glands	0.0	0.1	0.5	0.4	0.2	0.3	0.0	1.2	0.8	0.4	0.7	0.4	0.2	0.3	0.2	0.6	0.1	0.2	0.2	0.4	C07-08
Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C09
Other oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.7	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	C10
Nasopharynx	0.3	0.4	0.2	0.8	0.2	0.0	0.6	0.7	0.1	0.0	0.2	0.2	1.0	0.6	0.4	0.6	0.3	0.1	0.3	0.6	C11
Hypopharynx	0.0	0.4	0.4	0.4	0.2	0.4	0.2	0.5	0.5	0.0	0.7	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	C12-13
Pharynx unspecified	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.2	0.0	0.1	0.0	0.0	C14
Oesophagus	2.2	3.0	4.4	3.3	2.1	1.7	1.1	0.9	2.1	1.9	2	3.1	1.7	2.4	1.1	1.2	1.6	0.4	0.5	0.6	C15
Stomach	7.2	7.1	8.2	7.0	5.7	4.4	6.8	4.3	10.6	10.1	7.1	5.1	4.1	6.0	5.5	5.1	4.8	4.5	5.5	2.9	C16
Small intestine	0.5	0.3	0.3	0.0	0.0	0.7	0.5	0.0	0.6	0.4	0.3	0.0	0.6	0.3	0.2	0.5	0.5	0.5	0.0	0.2	C17
Colon	2.1	1.6	3.1	1.0	2.4	2.4	2.1	2.4	4.0	3.5	3.0	4.6	4.3	4.8	2.8	4.6	7.2	4.1	7.0	6.2	C18
Rectum	1.1	1.6	2.1	0.0	2.0	1.5	2.2	2.6	2.0	1.2	2.7	2.5	1.9	2.6	4.1	3.2	2.5	3.7	3.4	3.0	C19-20
Anus	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.5	0.4	0.7	0.5	0.6	0.3	0.3	0.6	0.6	0.0	0.0	0.3	0.2	C21
Liver	0.6	3.6	3.2	4.1	3.1	2.5	1.7	1.9	1.9	2.2	2.5	1.2	1.7	3.8	3.6	2.0	2.2	2.7	4.8	3.7	C22
Gallbladder etc.	1.3	1.2	1.1	1.4	0.8	1.4	0.3	0.5	1.2	1.1	1.8	1.3	1.5	1.4	0.6	1.1	1.3	0.7	1.0	0.7	C23-24
Pancreas	0.8	0.8	2.4	1.2	1.3	1.8	0.7	0.8	3.0	2.0	1.0	0.3	1.6	1.0	1.3	1.9	1.5	2.6	1.8	1.5	C25
Nose, sinuses etc.	0.0	0.2	0.5	0.0	0.3	0.1	0.8	0.3	0.0	0.4	0.0	0.3	0.0	1.1	0.3	0.2	0.0	0.0	0.1	0.3	C30-31
Larynx	0.5	0.2	0.4	0.0	0.4	0.5	0.4	0.3	0.2	0.2	0.8	0.3	0.0	0.8	0.1	0.0	0.2	0.4	0.2	0.5	C32
Trachea, bronchus, and lung	4.1	2.8	1.6	2.1	2.0	3.2	1.0	2.2	3.5	2.4	3.6	1.6	3.0	3.4	1.8	3.6	3.6	2.7	2.5	2.7	C33-34
Other thoracic organs	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.4	0.5	0.0	0.1	0.1	0.4	0.0	0.1	0.1	C37-38
Bone	0.4	1.1	0.2	0.6	0.4	0.4	0.2	0.3	0.8	0.7	0.8	0.1	0.1	0.1	0.3	0.9	1.0	1.3	0.5	0.0	C40-41
Melanoma of skin	0.4	1.2	0.2	0.1	0.9	0.0	0.1	0.2	0.5	0.0	0.1	0.5	0.5	0.4	0.4	0.6	0.2	0.2	0.0	0.5	C43
Other skin	3.4	2.6	2.9	5.4	4.8	3.3	1.5	2.5	4.0	4.0	4.1	2.1	5.0	4.8	5.2	3.9	3.4	3.9	3.0	4.3	C44
Mesothelioma	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	C45
Kaposi sarcoma	0.0	0.0	0.2	0.9	0.4	0.0	0.2	0.6	0.0	0.0	0.0	0.2	0.7	0.4	0.3	0.0	0.0	0.2	0.0	0.0	C46

Table 8: Age-standardized incidence rates per 100 000 population in females by topography/morphology and year, Oman, 1996–2015.
-continued

Site	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	ICD (10th)
Connective and soft tissue	1.0	1.9	0.3	1.1	1.5	0.6	1.0	0.3	1.9	0.7	0.8	0.7	0.7	0.2	0.3	0.2	1.2	0.7	0.5	1.1	C47,C49
Breast	13.6	13.8	13.2	13.9	15.4	16.0	15.0	13.6	25.6	22.3	23.5	23.2	25.0	23.3	25.0	28.1	24.2	25.1	22.2	26.9	C50
Vulva	0.2	0.7	0.0	0.4	0.3	0.3	0.2	0.8	1.0	0.0	1.0	0.3	0.0	0.0	0.2	0.0	0.3	0.3	0.0	0.0	C51
Vagina	0.0	0.4	0.6	0.0	0.6	0.2	0.5	0.0	0.4	0.1	1.5	0.0	0.8	0.0	0.0	0.1	0.7	0.1	0.7	0.2	C52
Cervix uteri	6.6	6.6	7.2	6.3	7.3	5.7	3.8	7.5	8.0	7.4	6.8	6.0	7.1	2.8	7.4	6.1	4.2	4.0	4.8	4.7	C53
Corpus uteri	0.5	0.2	0.9	0.2	0.8	1.5	1.8	1.7	3.4	2.2	2.3	2.8	3.2	3.5	3.2	6.0	2.2	2.8	2.9	3.6	C54
Uterus unspecified	2.3	1.8	1.0	1.1	0.0	1.4	0.7	0.6	0.6	0.4	0.5	0.8	1.4	0.4	0.7	1.2	0.7	0.7	1.1	1.1	C55
Ovary	1.9	3.8	7.8	7.0	5.8	4.5	3.7	3.6	3.1	5.3	5.0	5.6	3.4	2.6	3.7	3.7	3.0	3.7	4.6	4.3	C56
Other female genital organs	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.5	0.8	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	C57
Placenta	0.0	0.1	0.3	0.6	0.8	0.3	0.0	0.1	0.1	0.0	0.2	0.1	0.0	0.2	0.0	0.4	0.1	0.0	0.0	0.2	C58
Kidney	2.3	1.2	1.7	1.0	1.8	2.2	0.7	2.2	0.6	2.0	0.8	1.2	4.0	1.7	1.5	3.1	1.2	2.3	2.0	2.3	C64
Renal pelvis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C65
Ureter	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	C66
Bladder	2.4	2.9	1.6	3.4	1.5	2.3	2.8	2.0	4.8	2.9	4.8	2.7	2.8	2.0	1.8	2.0	1.5	1.4	2.0	1.6	C67
Other urinary organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	C68
Eye	0.7	0.4	0.7	0.9	0.2	0.2	0.3	0.2	0.7	0.5	0.3	0.4	0.2	0.3	0.4	0.4	0.2	0.2	0.1	0.0	C69
Brain, nervous system	1.3	2.7	3.0	2.4	1.9	3.2	1.1	1.2	2.5	1.4	2.2	1.7	1.9	1.4	3.0	2.2	0.9	1.2	2.0	1.8	C70-72
Thyroid	7.0	7.4	6.8	5.9	4.3	7.0	6.3	5.9	4.8	6.6	6.9	5.7	5	6.7	5.2	9.1	7.7	12.2	10.3	14.3	C73
Adrenal gland	0.0	0.7	0.3	0.2	0.5	0.3	0.1	0.3	0.1	0.0	0.3	0.0	0.4	0.1	0.0	0.4	0.3	0.2	0.1	0.3	C74
Other endocrine	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	C75
Hodgkin disease	2.1	0.7	0.5	2.0	1.9	0.8	1.2	1.6	0.6	1.7	0.7	1.5	2.6	1.8	1.4	3.3	1.0	2.2	1.5	1.6	C81
Non-Hodgkin's lymphoma	3.1	6.4	3.9	3.3	5.4	5.1	4.5	5.4	10.0	6.0	4.5	6.0	5.8	5.7	7.9	7.4	4.5	5.4	4.0	7.1	C82-85,C96
Immunoproliferative diseases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	C88
Multiple myeloma	1.2	2.7	1.9	2.5	2.7	0.5	0.2	1.5	1.7	1.5	2.3	0.8	0.9	1.6	1.5	1.0	1.6	1.4	1.0	1.5	C90
Lymphoid leukaemia	1.0	1.3	2.0	1.0	1.3	1.7	1.3	1.7	2.3	1.8	2	1.5	2.4	1.1	1.7	1.5	1.9	1.6	2.1	1.9	C91
Myeloid leukaemia	1.5	1.9	1.0	1.9	2.5	1.8	0.9	2.1	2.1	1.3	1.3	1.7	2.1	2.1	2.9	2	1.7	1.7	2.3	2.2	C92-94

Table 8: Age-standardized incidence rates per 100 000 population in females by topography/morphology and year, Oman, 1996–2015.

Site	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	ICD (10th)
Myeloproliferative disorders (MPD)	0.4	0.0	0.5	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	MPD
Myelodysplastic syndromes (MDS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	MDS
Other and unspecified (O&U)	6.7	8.7	8.9	6.6	4.5	3.8	5.4	4.4	7.1	6.5	6.6	7.3	2.6	2.9	2.0	3.7	1.5	2.6	2.2	2.0	O&U
All sites (All)	82.8	97.1	97.4	92.7	90.2	86.6	73.9	83.5	120	105	108	101	104	97.4	100	115	92.9	99.6	100	109	All
All sites but C44 (AllbC44)	79.4	94.5	94.6	87.3	85.4	83.3	72.4	81.1	116	101	104	98.8	99.4	92.6	95.2	111	89.5	95.7	97.4	104	AllbC44

ICD: International Classification of Diseases, 10th revision.

Table 9: Five most common cancer among Omanis (males and females), 1996–2015.

Topography	Frequency	Percentage (%)
Breast	2280	10.9
Non-Hodgkin's lymphoma	1533	7.3
Leukemia	1439	6.8
Colorectal	1382	6.6
Thyroid	1277	6.1

infiltrating ductal carcinoma as the most frequent histopathological type accounting for 73.9% of all breast cancer [Figure 7].

2) Non-Hodgkin's lymphoma

Non-Hodgkin's lymphoma (NHL) is the second most common malignancy among Omanis and accounted for 7.3% of total malignancies. There was an increase of 96.8% in the total of NHL cases reported in Oman in 2015 (n = 122) compared to 1996 (n = 62) [Figure 8].

Between 1996 and 2015, there were 1533 cases of NHL reported in Oman: 932 in men and 601 in women [Table 9]. The world ASR by gender were 8.3 cases per 100 000 Omani males and 5.4 cases per 100 000 females. Figure 9 shows the morphology of NHL reported over past 20 years in both genders.

3) Leukemia

Leukemia is the third most common malignancy among Omanis and accounted for 6.8% of total malignancies in both genders [Table 9]. The total number of leukaemia cases reported in Oman was more than doubled in 2015 (n = 97) compared to 1996 (n = 43) [Figure 10].

Between 1996 and 2015, there were 1439 cases of leukemia reported in Oman: 843 in men and 596 in women [Table 5 and 6]. The ASR by gender were 5.6 cases per 100 000 Omani males and 3.9 cases per 100 000 females. Lymphoid leukaemia accounted for 50% of all leukaemia followed by myeloid leukaemia 39.0% and unspecified leukaemia 11.0%.

4) Colorectal cancer

Colorectal cancer is the fourth most common malignancy among Omanis and accounted for 6.6% of total malignancies [Table 9]. There was an increase of more than four folds in the total cases of colorectal cancer reported in Oman in 2015 (n = 148) compared to 1996 (n = 28) [Figure 11].

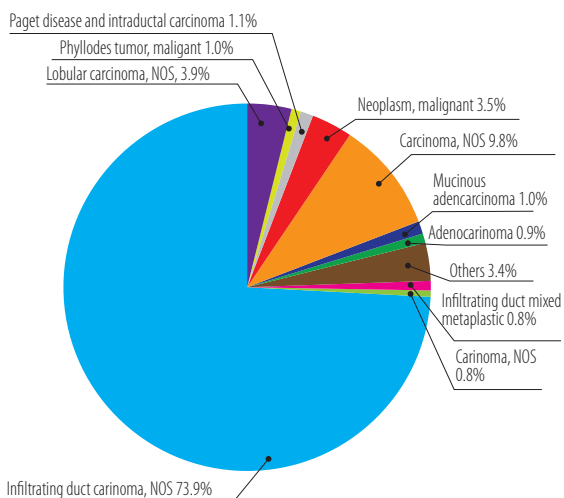


Figure 7: Morphology of breast cancer in Omani males and females, 1996–2015.

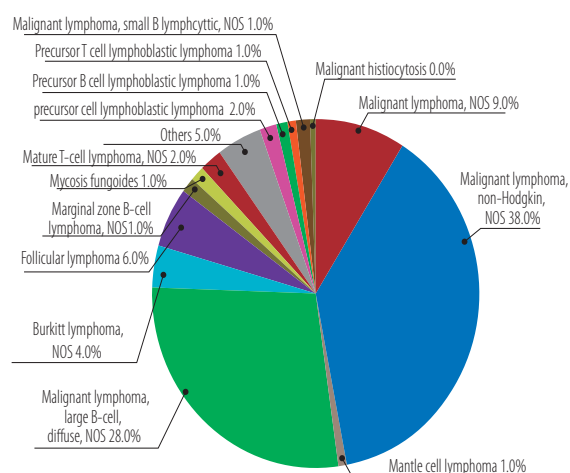


Figure 9: Morphology of non-Hodgkin's lymphoma in Omanis, 1996–2015.

Between 1996 and 2015, there were 1382 cases of colorectal cancer reported in Oman: 774 in men and 608 in women. The ASR by was 8 per 100 000 and 6.3 cases per 100 000 males and females, respectively [Table 5 and 6]. Adenocarcinoma was the most frequent histopathological type accounting for 77% of all colorectal cancer [Figure 12].

5) Thyroid cancer

Thyroid cancer is the fifth most common malignancy

among Omanis and accounted for 6.1% of all malignancies [Table 9]. There was a four-fold increase in the total cases of thyroid cancer reported in Oman in 2015 (n = 164) compared to 1996 (n = 39) [Figure 13].

Between 1996 and 2015, there were 1277 cases of thyroid cancer reported in Oman: 242 in men and 1035 in women. The ASR by gender were 2.0 cases per 100 000 Omani males and 7.6 cases per 100 000 females [Tables 5 and 6]. Papillary carcinoma was the

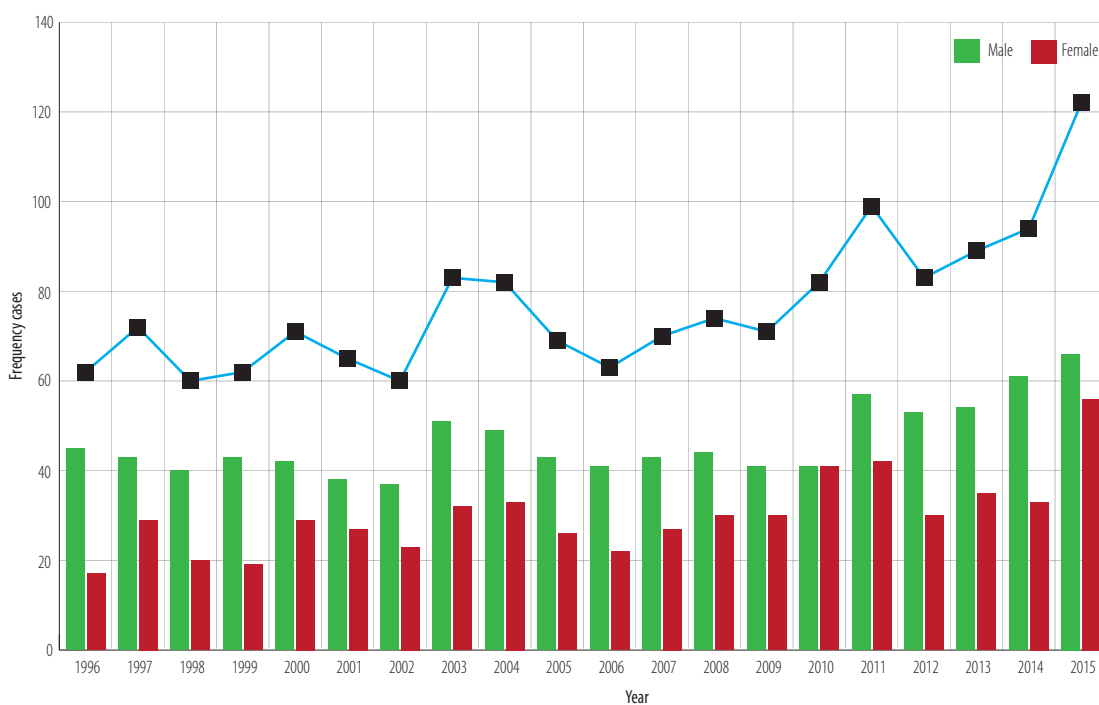


Figure 8: Trends of non-Hodgkin's lymphoma among Omanis, 1996–2015.

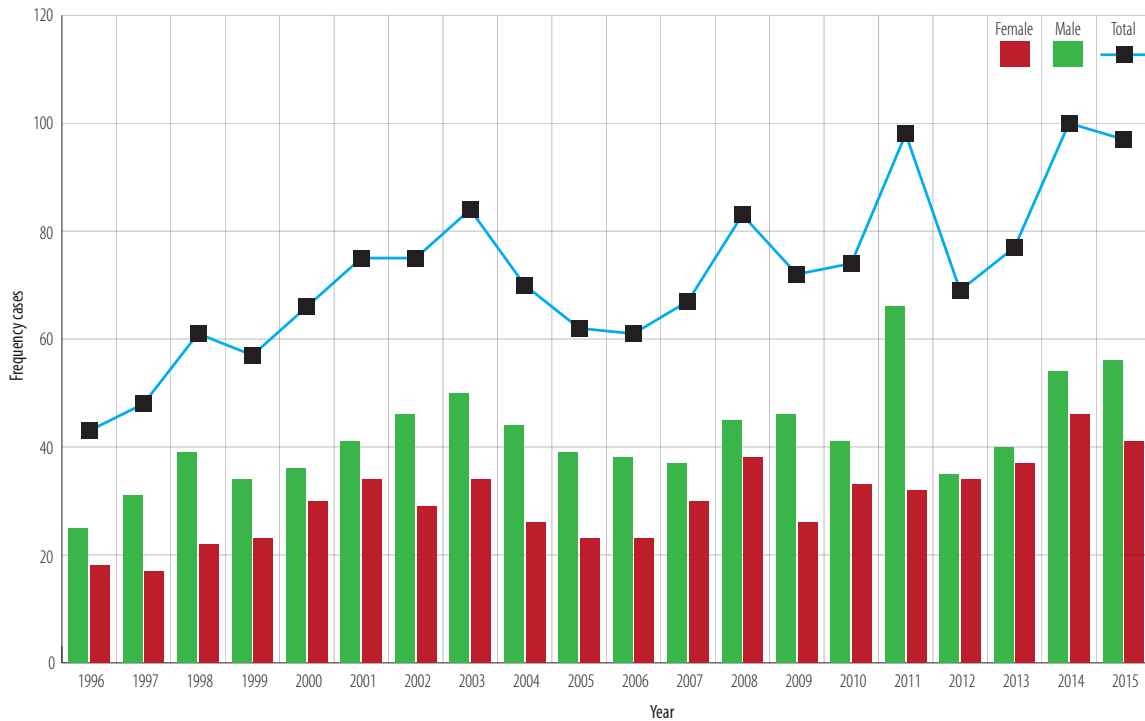


Figure 10: Trends of leukemia in both genders, Oman, 1996–2015.

most frequent histopathological type accounting for 83.0% of all thyroid cancer [Figure 14].

Five common cancer in Omani male

Between 1996 and 2015, prostate cancer was

observed to be the leading malignancy in Omani males (998 new cases), followed by cancers of the stomach, NHL, leukemia, and colorectal. Table 10 summarizes the five most common cancers in Omani male in three different periods 1996–2005, 2006–2015, and over 20 years 1996–2015.

Table 10: Frequency of the five common cancer among males in Oman.

Topography	Frequency
Years 1996–2005	
Stomach	492
Non-Hodgkin's lymphoma	431
Leukemia	385
Prostate	382
Lung	360
Years 2006–2015	
Prostate	616
Colorectal	534
Non-Hodgkin's lymphoma	501
Stomach	468
Leukemia	458
Years 1996–2015	
Prostate	998
Stomach	960
Non-Hodgkin's lymphoma	932
Leukemia	843
Colorectal	774

1) Prostate cancer

Prostate cancer was the leading cancer in Omani males between 1996 and 2015 and accounting for 9.3% of all incident cases in males with an average annual ASR of 11.6/100 000 people [Tables 5 and 10]. Prostate cancer incidence continued to rise slowly over the years; the lowest ASR (6.9/100 000) was reported in 2003 and the highest (17.0/100 000) in 2011 [Table 7]. Age-specific incidence among males begins in the age group 40–45 year and steadily rises to peak in the in the age group 70–74 year [Table 5].

2) Stomach cancer

Stomach cancer was the second most common cancer in Omani males between 1996 and 2015 and accounting for 8.9% of all incident cancers in males with an average annual ASR of 10.9 /100 000 male [Table 5]. The trend of stomach cancer incidence had declined over the years; the lowest ASR (5.7/100 000) was reported in 2015 and the highest

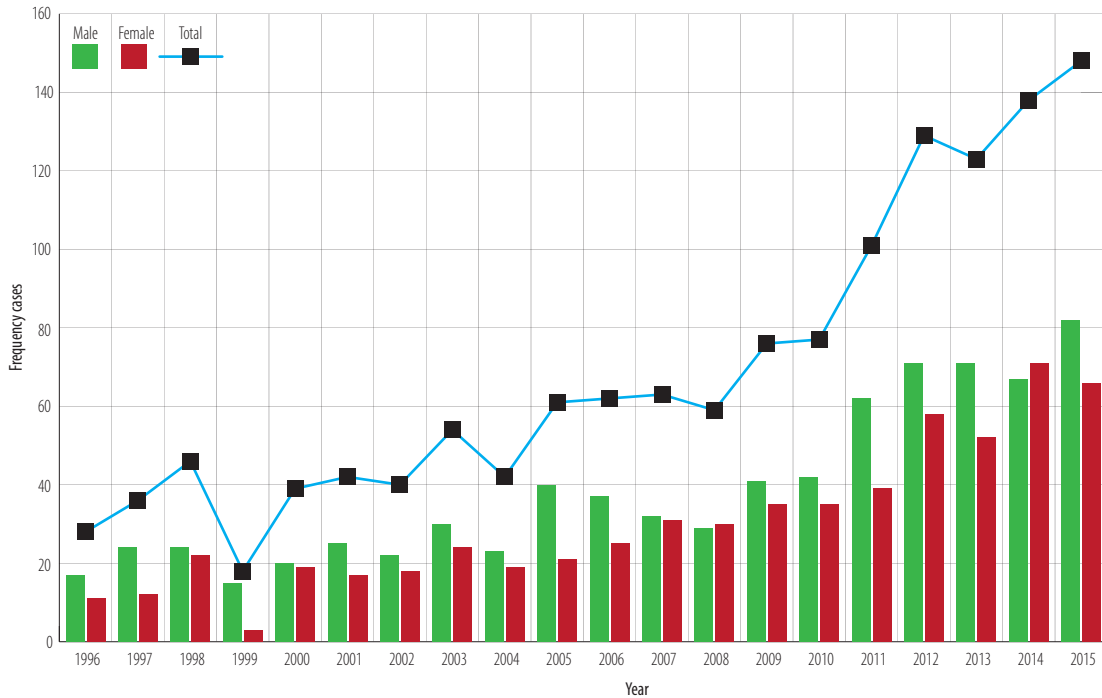


Figure 11: Trends of colorectal cancer among Omanis, 1996–2015.

(16.2/100 000) in 2005 [Table 7 and Figure 15]. Age-specific incidence among males begins in the 4th decade of life and steadily rises to a peak in the 7th decade [Table 5].

3) Non-Hodgkin's lymphoma

NHL is the third most common male cancer and accounted for 8.7% of all incident cancer cases in Omani males [Table 10]. The average annual ASR was 8.3/100 000 male [Table 5]. There was a minor

decrease in the ASR trend is observed from 1996 to 2015; the lowest ASR (7.1/100 000) was reported in 2002 and the highest (11.3/100 000) in 2004 [Table 4]. Age-specific incidence among males begins in the 30–35 year age group and gradually rises to peak in the 65–70 year age group.

4) Leukemia

Leukemia is the fourth most common cancer in males and accounted for 7.9% of all incident cancers in males with an average annual ASR of 5.6/100 000 male [Table 5]. The trend of leukaemia incidence has increased slowly over the years; the lowest ASR (3.9/100 000) was reported in 1996 and the highest (9.9/100 000) in 2011 [Table 7]. Age-specific incidence among males begins in the first decade of life and gradually rises to peak in the fifth decade [Table 5].

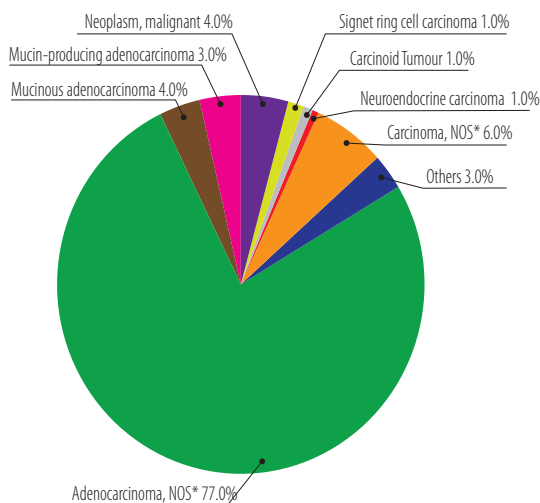


Figure 12: Morphology of colorectal cancer in Omani males, 1996–2015.

5) Colorectal cancer

Colorectal cancer is the fifth most common cancer in males and accounted for 7.2% of all incident cancers in males with an average annual ASR of 8.0/100 000 male [Figure 16]. The trend of colorectal cancer incidence continued to rise steadily over the years; the lowest ASR (3.3/100 000) was reported in 1999 and the highest (12/100 000) in 2015 [Table 7]. Age-specific incidence among males begins rising in

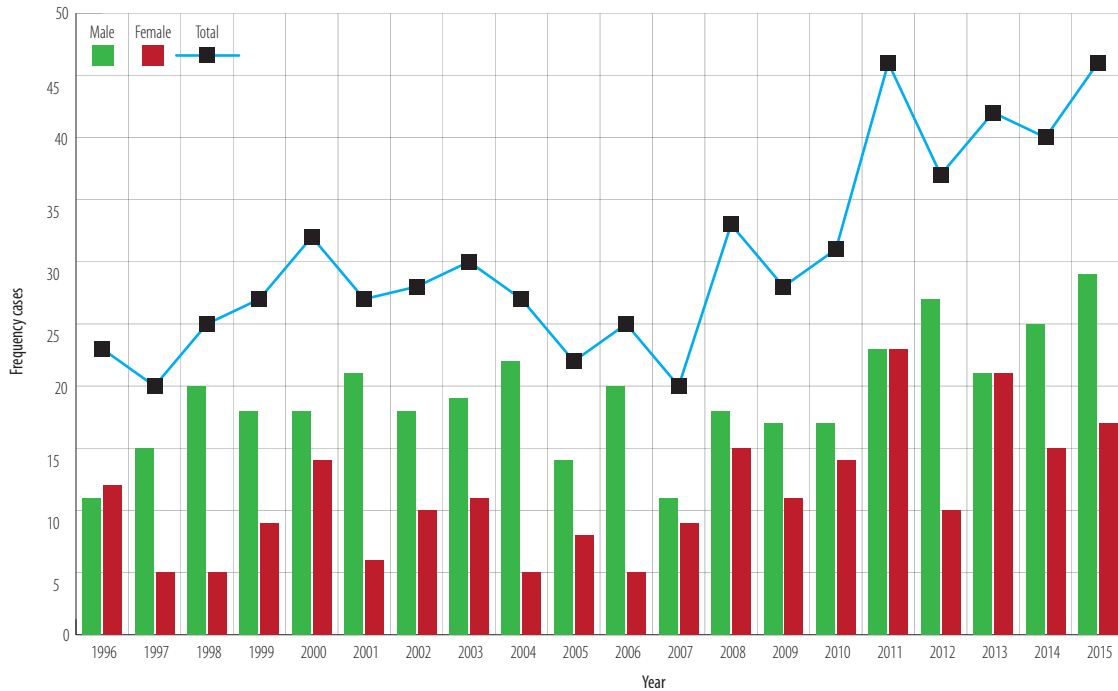


Figure 13: Trends of thyroid cancer among Omanis, 1996–2015.

in the 25–30 year age group and steadily rises to peak in the 60–65 year age group [Table 5].

Five common cancer in Omani female

Between 1996 and 2015, breast cancer was the leading malignancy in Omani females with 2181 new cases, followed by cancers of the, thyroid, colorectal, NHL, and leukemia. Table 11 summarizes the five most common cancers among Omani female in

three different periods 1996–2005, 2006–2015, and finally over 20 years 1996–2015.

1) Breast cancer

Breast cancer was by far the most common cancer among Omani females and accounted for 21.2%

Table 11: Frequency of five most common cancer among Omani females.

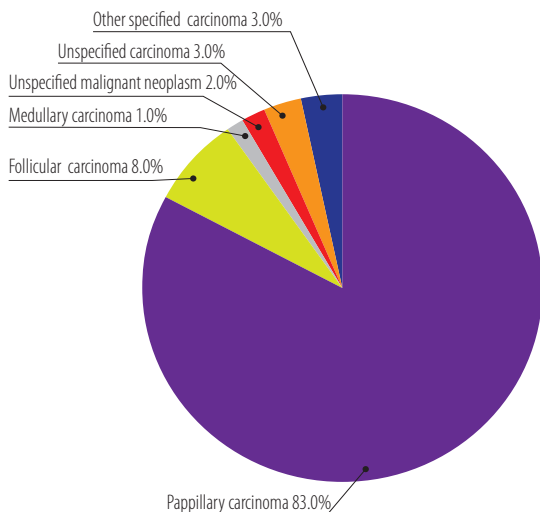


Figure 14: Morphology of thyroid cancer among Omani females, 1996–2015.

Topography	Frequency
Years 1996–2005	
Breast	706
Thyroid	339
Cervix	267
Stomach	263
Leukemia	256
Years 2006–2015	
Breast	1475
Thyroid	696
Colorectal	442
Non-Hodgkin's lymphoma	346
Leukemia	340
Years 1996–2015	
Breast	2181
Thyroid	1035
Colorectal	608
Non-Hodgkin's lymphoma	601
Leukemia	596

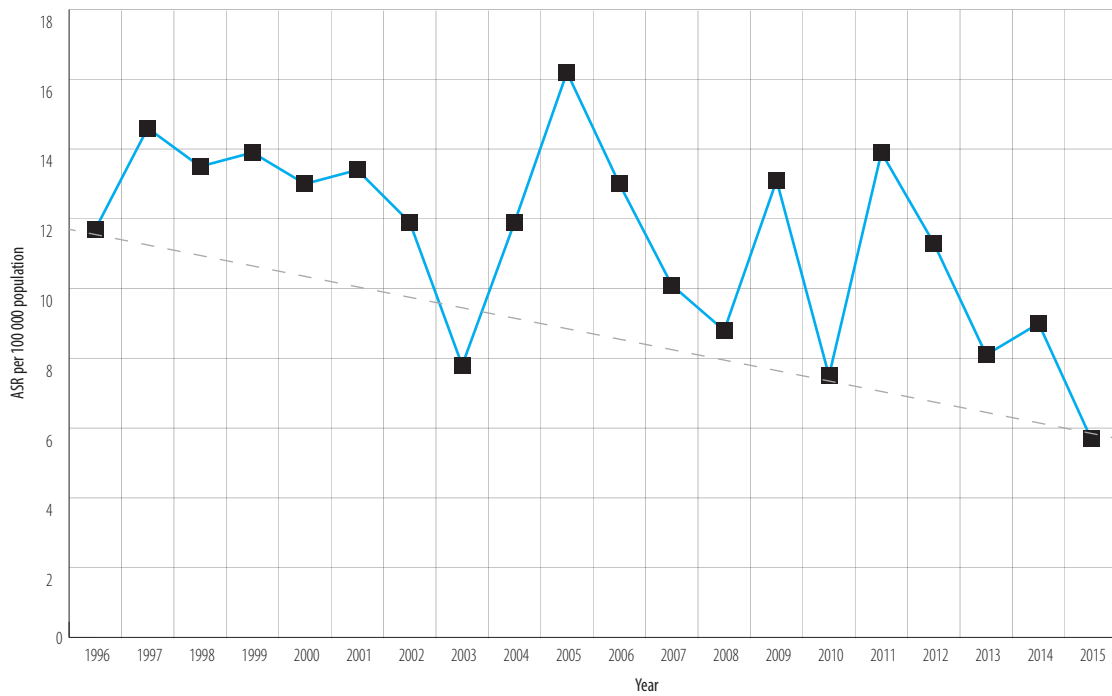


Figure 15: Age-standardized incidence rates (ASRs) for stomach cancer in Omani males.

of all incident cases between 1996 and 2015, with an average annual ASR of 20.8/100 000 women [Table 6]. Its incidence has increased over the past 20-year period [Figure 17]. The lowest ASR (13.2/100 000) was noted in 1998 and the highest (26.9/100 000) was in 2015 [Table 8]. The age-specific incidence rates among female begins to rise in

the second to third decades of life with steadily rises to peak in the fourth and fifth decade years [Table 6].

2) Thyroid cancer

Thyroid cancer was the second most common female cancer between 1996 and 2015 and accounted for 10.0% of all incident cancer cases in Omani female,

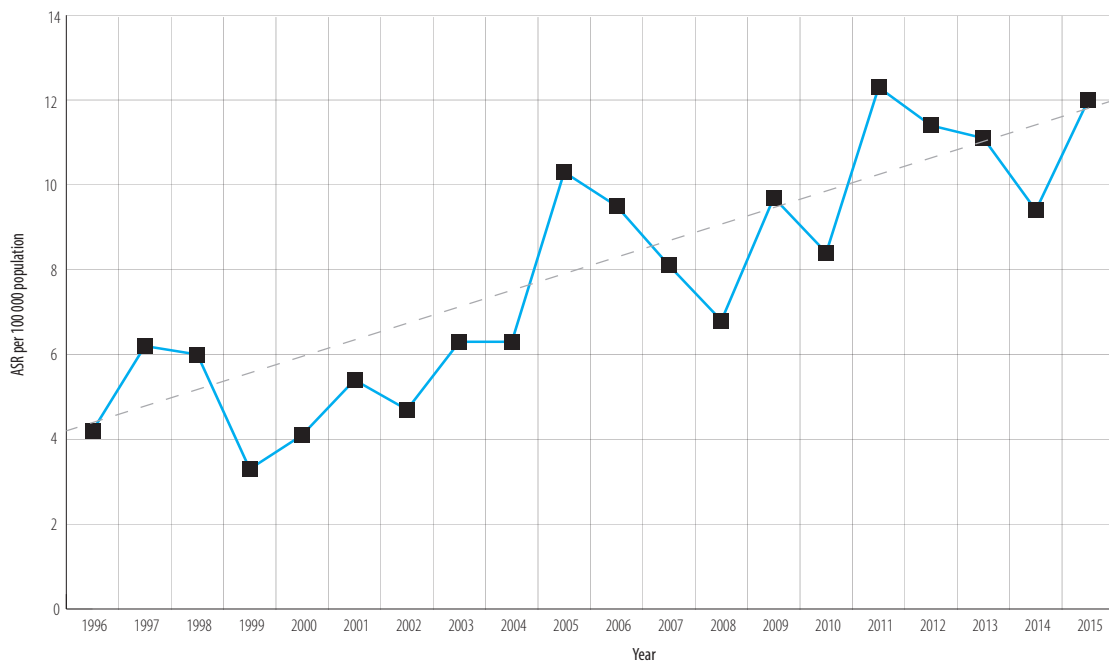


Figure 16: Age-standardized incidence rates (ASRs) for colorectal cancer in Omani males, 1996–2015.

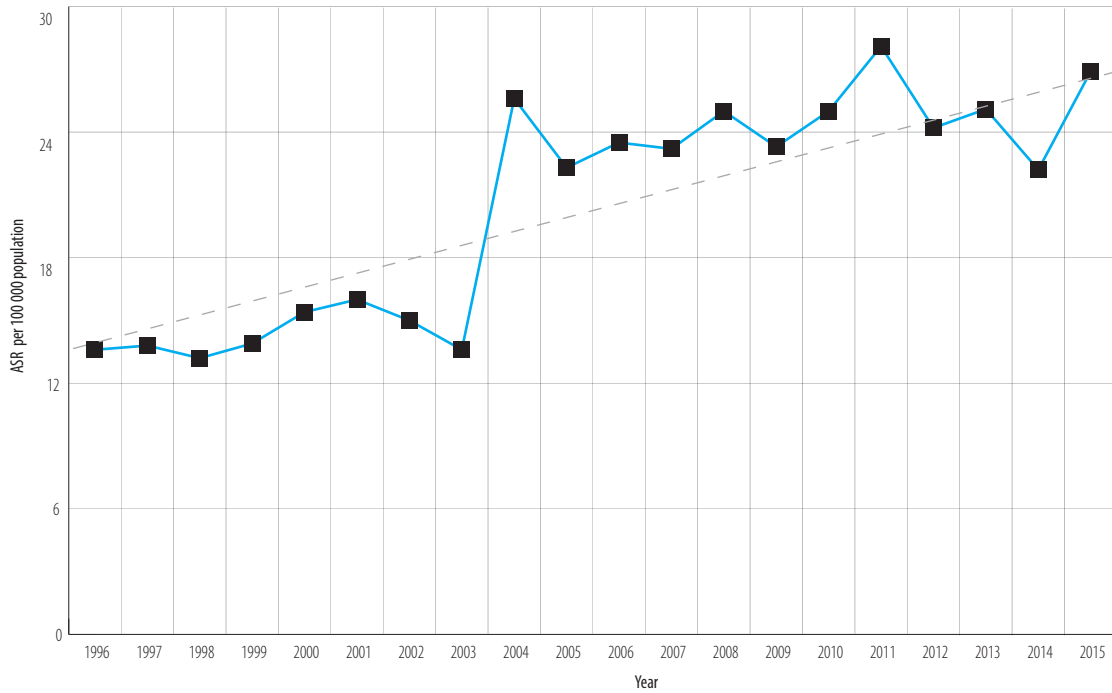


Figure 17: Age-standardized incidence rates (ASRs) for breast cancer in Omani women, 1996–2015.

with an average annual ASR of 7.6/100 000 people [Figure 18].

Thyroid cancer incidence continued to rise steadily over the years; the ASR was lowest (4.3/100 000) in 2000 and highest (14.3/100 000) in 2015 [Table 8]. Cases were seen in females as young as 15 years of age,

and incidence was found to increase with age, with peaks at 30–45 years and at 65–70 years [Table 6].

3) Colorectal cancer

Colorectal cancer is the third most common cancer in females and accounted for 5.9% of all incident

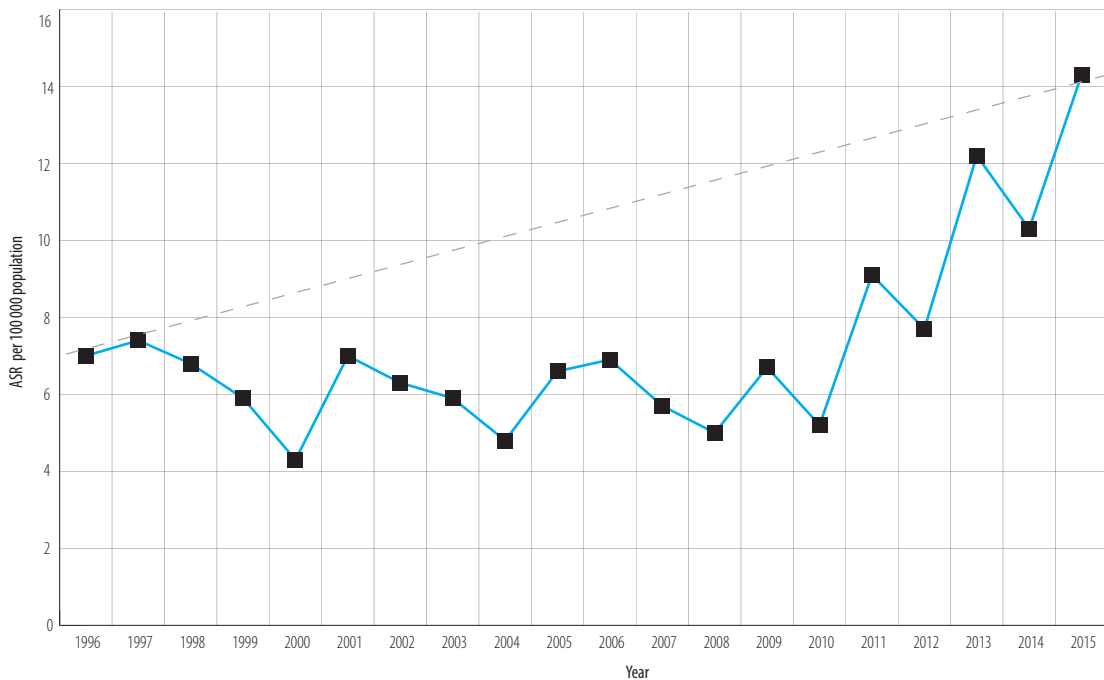


Figure 18: Age-standardized incidence rates (ASRs) for thyroid cancer in Omani females, 1996–2015.

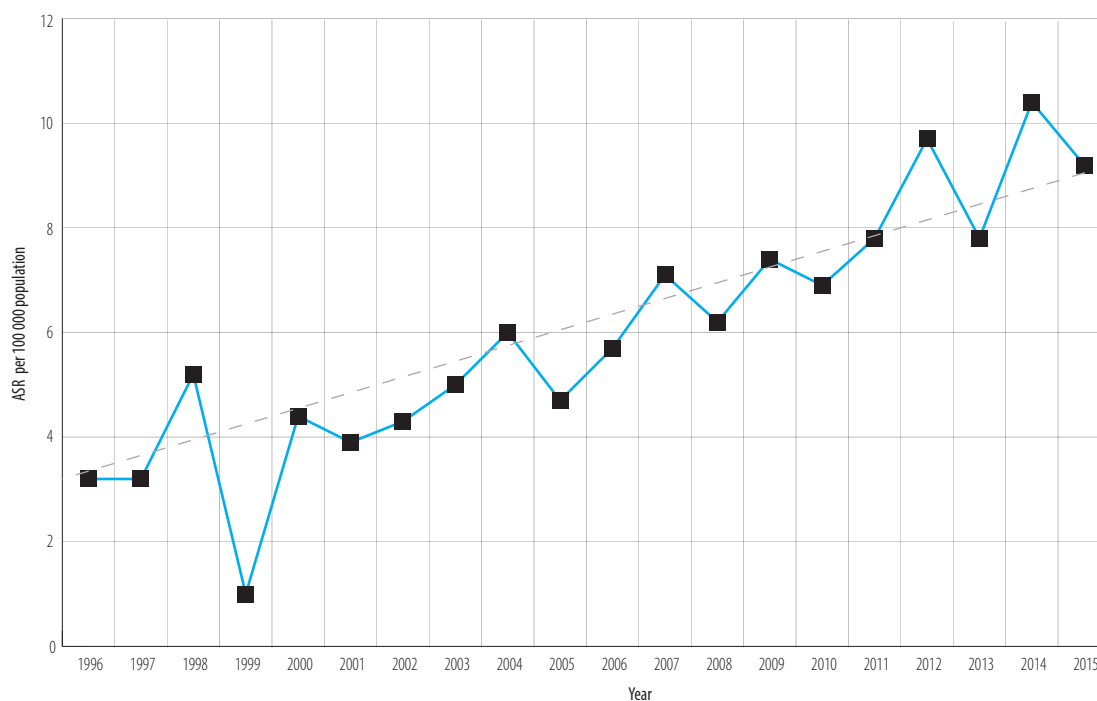


Figure 19: Age-standardized incidence rates (ASRs) for colorectal cancer in Omani females.

cancers in females with an average annual ASR of 7.3/100 000 female [Figure 19].

The trend of colorectal cancer incidence continued to rise steadily over the years; the lowest ASR (1/100 000) was reported in 1999 and the highest (10/100 000) in 2014 [Table 8]. Age-specific incidence among females begins in the 30–35 year age group and steadily rises to peak in the 50–60 year age group [Table 6].

4) *Non-Hodgkin's lymphoma*

NHL is the fourth most common female cancer and accounted for 5.8% of all incident cancer cases in Omani females [Table 11]. The average annual ASR was 5.4/100 000 female [Table 6]. There was a gradual increase in the ASR from 1996 to 2015; the lowest ASR (3.1/100 000) was reported in 1996 and the highest (7.1/100 000) in 2015 [Table 8]. Age-specific incidence among females begins in the 30–35 year age group and gradually rises to peak in the 55–60 year age group [Table 6].

5) *Leukemia*

Leukemia is the fifth most common cancer in females and accounted for 5.8% of all incident cancers in females with an average annual ASR of 3.9/100 000 female [Table 6]. The trend of leukaemia incidence

has slowly increased over the years; the lowest ASR (2.8/100 000) was reported in 1996 and the highest (5.6/100 000) in 2003 [Table 8]. Age-specific incidence among females begins in the 0–10 year age group and gradually rises to peak in the 55–60 year and 70–75 age group [Table 6].

REFERENCES

1. International Association of Cancer Registries. CanReg5: software for cancer registries [13 May 2019]. Available from: http://www.iacr.com.fr/index.php?option=com_content&view=category&layout=blog&id=68&Itemid=445.
2. Segi M. Cancer mortality for selected sites in 24 countries (1950-57). Department of Public Health, Tohoku University of Medicine. Nagoya: Japan; 1960.
3. Ministry of Health, Oman. Annual Health Reports [7 May 2019]. Available from: <https://www.moh.gov.om/en/web/statistics/annual-reports>.
4. Ferlay J, Colombet M, Bray F. Cancer Incidence in Five Continents, CI5plus: IARC CancerBase No. 9 [13 May 2019]. Available from: <http://ci5.iarc.fr/Default.aspx>.