

**KINGDOM OF BAHRAIN
MINISTRY OF HEALTH**

**CANCER
INCIDENCE & MORTALITY
IN THE KINGDOM OF BAHRAIN**

STATISTICS AND TRENDS 2014

**MEDICAL REVIEW OFFICE
FEBRUARY 2016**



His Royal Highness
Prince Khalifa bin Salman Al Khalifa
The Prime Minister of the Kingdom of Bahrain



His Majesty
King Hamad bin Isa Al Khalifa
The King of the Kingdom of Bahrain



His Royal Highness
Prince Salman bin Hamad Al Khalifa
The Crown Prince, Deputy Supreme Commander of
Bahrain Defence Force and
First Deputy Prime Minister

CANCER

INCIDENCE & MORTALITY

IN THE KINGDOM OF BAHRAIN

STATISTICS AND TRENDS 2014

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This report is printed annually.

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PREFACE

According to figures from the World Health Organization, cancer is a leading cause of death worldwide. The disease has accounted for 8.2 million deaths in 2012 (around 13% of all deaths) and this rate is projected to exceed 13 million a year by 2030.¹ It can be reduced and controlled by implementing evidence-based strategies for cancer prevention, early detection of cancer and management of patients with cancer.

In the Kingdom of Bahrain, cancer is the fourth leading cause of death in both sexes combined following cardiovascular disease, endocrine disease, and other ill-defined causes. Compared to other Gulf countries, Bahrain has a higher incidence of cancers of the breast, lung, bladder, thyroid, uterus, and ovary. A rising trend in cancer incidence is likely to continue for years or even decades to come. In Bahraini males, lung cancer was observed to be the leading malignancy, followed by cancers of the colorectal, bladder, prostate, and leukemia. In Bahraini females, breast cancer remains the leading type followed by cancers of the colorectal, lung, thyroid, and uterus.

Between the years 1998 and 2014, there were a total of 8,013 incident cases of cancer (3,717 male and 4,296 female) among the Bahraini population in the Kingdom of Bahrain, averaging at approximately 471 new cases per year. In the year 2014 alone, 746 new cases of cancer (309 male and 437 female) were registered with the Bahrain Cancer Registry. Cancers of the breast (178), colorectum (72), lung (59), Non-Hodgkin's lymphoma [NHL] (41), and thyroid (36) constituted over half of the total cancer burden in that year (51.7%, 386 new cases).

I am delighted to introduce this comprehensive report on cancer incidence in the Kingdom of Bahrain for the year 2014. I hope this report will be able to stimulate the reading of clinicians, researchers, administrators, policy makers, and those interested in this field.

We welcome your constructive feedback to undertake the appropriate improvements to cancer registration in Bahrain, and to achieve our goal of better understanding cancer occurrence in the country, in order to provide health policy makers with reliable information for assessing and controlling the impact of cancer on the people of Bahrain.

Dr. Mohammed Amin Al Awadhi

Assistant Undersecretary, Directorate of Training & Planning

ACKNOWLEDGMENTS

This report is the result of years of data collection and months of planning and work to present this data in what we hope is an informative summary.

We give special thanks to **Her Excellency Faeqa bint Saeed Al Saleh**, Minister of Health, Bahrain, for her support without which this work would not have been possible.

Gratitude is felt toward **Dr. Mohammed Amin Al Awadhi**, Assistant Undersecretary for Training & Planning, for his continuous encouragement, support, and valuable criticism.

We would like to acknowledge and appreciate all staff of the Medical Review Office for their dedication, enthusiasm, and technical expertise in producing this report.

I express my deepest gratitude to all colleagues working in various institutions for their cooperation in notifying cancer cases to the Bahrain Cancer Registry.

The production of this report has been made possible by the active cooperation of consultants, general practitioners, pathology laboratories, medical records staff, information specialists, medical secretaries, clinical coders, and managers in the different Bahraini health facilities.

The Bahrain Cancer Registry is indebted to all those who have submitted data and whose support has been given over many years.

Finally yet importantly, this work is aimed only at the wellbeing of our patients and their better health.

Dr. Najat Abulfateh Ali
Chief, Medical Review Office

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INTRODUCTION

Cancer is a major health problem in both developed and developing countries. The estimated number of new cases of cancer each year is expected to rise from 10 million in 2000 to 16 million by 2020.¹ This number continues to grow every year by 3 to 4%. Nearly 60% of the increase will occur in developing countries where healthcare facilities and patients care are limited. In the Eastern Mediterranean Region (EMR) cancer incidence is predicted to rise by 1.8-fold during the next decade.¹

Rapid improvements in the healthcare, together with the control of communicable diseases, increased life expectancy at birth, and rapid socioeconomic changes resulting in modified lifestyles such as the increased prevalence of tobacco use, decrease in physical activity, and rapid uptake of unhealthy food habits, has resulted in an increased incidence of cancer in the developing countries.¹

Every year cancer kills more than 6 million people worldwide. Cancer is the second most frequent cause of death in the majority of developed countries and is the fourth leading cause of death in the EMR after cardiovascular diseases, infectious diseases, and injuries.¹ The causes and types of cancer vary in different regions of the world but in most countries, there is hardly a family without a cancer victim.¹

Cancer involves more than 100 diseases with different etiologic factors, preventive approaches, and treatment modalities. However, 40% of all cancers are preventable, another 40% are curable if diagnosed early and treated promptly. The remaining 20% can be treated with palliative therapy to reduce suffering of cancer patients. Therefore, fighting against cancer necessitates integration between primary, secondary and tertiary medical care in any country.²

From January 1998 to December 2009, there were 119,288 newly diagnosed cancer cases among Gulf Cooperation Council (GCC) States' nationals, reported by the 6 National Cancer Registries (United Arab Emirates [UAE], Bahrain, Saudi Arabia, Oman, Qatar, and Kuwait); 58,629 cases (49.1%) were male and 60,659 (50.8%) were female.²

The average annual world age-standardized cancer incidence rates (ASR) during the 12-year period from 1998 to 2009 were found to be similar between GCC males and females (82.9 per 100,000 in males and 83.7 per 100,000 in females). In males, the ASRs per 100,000 people ranged between 75.7 in the Kingdom of Saudi Arabia (KSA) and 155.2 in Qatar, whereas in females, the ASRs per 100,000 people ranged between 75.2 in KSA and 180.3 in Qatar. The average annual age-specific incidence rates increase dramatically with advancing age in both genders.²

In the 6 GCC countries, breast cancer is the most common female cancer.^{2,3} Compared to all female cancers, the proportion of breast cancer ranged from 18.2% in Oman to 45.6% in Qatar and 37.1% in Bahrain. Bahrain and Qatar can be classified as medium breast cancer incidence areas whereas the UAE, KSA, and Oman are considered low incidence areas. A comparison of the ASRs of breast cancer from medium-incidence GCC countries with other countries showed that the GCC rates are about half those of the high-risk area countries like the United Kingdom, and similar to the rates in medium-risk countries such as the Philippines and Singapore.³

Bahrain has a higher incidence of cancers of the breast, lung, bladder, thyroid, uterus, and ovary. A rising trend in cancer incidence is likely to continue for years or even decades to come. In Bahraini males, lung cancer was observed to be the leading malignancy, followed by cancers of the large bowel, bladder, prostate, and leukemia. In Bahraini females, breast cancer remains the leading type followed by cancers of the large bowel, lung, thyroid, and uterus.^{4,5}

Between the years 1998 and 2014, there were a total of 8,013 incident cases of cancer (3,717 male and 4,296 female) among the Bahraini population in the Kingdom of Bahrain, averaging at approximately 471 new cases per year. In the year 2014 alone, 746 new cases of cancer (309 male and 437 female) were registered with the Bahrain Cancer Registry. Cancers of the breast (178), colorectum (72), lung (59), Non-Hodgkin's lymphoma [NHL] (41), and thyroid (36) constituted over half of the total cancer burden in that year (51.7%, 386 new cases).

In the Gulf Region, the Gulf Center for Cancer Registration (GCCR) was established in 1997 to provide reliable cancer incidence data for the Nationals of the GCC States. GCCR works under the jurisdiction of the Executive Office of the Health Ministers' Council for GCC States. The main office is located in the premises of the Research Center at the King Faisal Specialist Hospital and Research Center, KSA. The aggregated data from the 6 national cancer registries representing the 6 Gulf countries: UAE, Kingdom of Bahrain, KSA, Oman, Qatar, and Kuwait is considered to be the largest in Asia. The primary objective of the GCCR is to collect and classify information on all cancer cases in order to produce statistics on the occurrence of cancer in a defined population, to provide technical support for early detection and screening programs, and to facilitate epidemiological studies on cancer to provide a framework for assessing and controlling the impact of cancer on the GCC states' communities.

This initiative was the groundwork for the strategic plans (2004-2009 and 2010-2020) for Cancer Prevention and Control in the GCC states. Furthermore, a framework comprising 7 approaches and strategic actions has been developed to support Member States in developing national action plans and in the implementation of cancer control activities.

These strategies are in line with the World Health Organization (WHO) Global Strategy for the Prevention and Control of Non-communicable Diseases (2008-2013) and the WHO strategy against cancer through effective integration between primary, secondary, and tertiary prevention programs aiming to reduce preventable cancers, to treat curable cancers through early detection and management, and to relieve pain and improve quality of life through palliative care services.

BACKGROUND ON THE KINGDOM OF BAHRAIN

The **Kingdom of Bahrain** is a small island country and comprises of an archipelago of 33 islands situated near the western shores of the Arabian Gulf. The largest, accounting for 83% of the area, is the Bahrain Island and is 55 km (34 miles) long by 18 km (11 miles) wide.

Saudi Arabia lies to the west and is connected to Bahrain by the King Fahd Causeway. The peninsula of Qatar is to the southeast across the Gulf of Bahrain. The planned Qatar Bahrain Causeway will link Bahrain and Qatar and become the world's longest marine causeway.

The Kingdom of Bahrain is administratively divided into 4 Governorates/Regions. These are the Capital, Muharraq, Northern, and Southern Governorates

Bahrain today has a very high Human Development Index (44th highest in the world) and World Bank has identified it as a high-income economy. Bahrain is also a member of the United Nations, World Trade Organization, the Arab League, the Non-Aligned Movement, and the Organization of the Islamic Conference, as well as being a founding member of the Cooperation Council for the Arab States of the Gulf.

POPULATION STRUCTURE

According to Central Informatics Organization statistics (Table 1), the population of the Kingdom of Bahrain was 1,314,562 in 2014, of which 630,744 were Bahrainis. Of these, 320,839 were males and 309,905 were females. The non-Bahraini population in 2014 was 683,818; of these, 485,648 were males and 198,170 were females.

POPULATION CHANGE

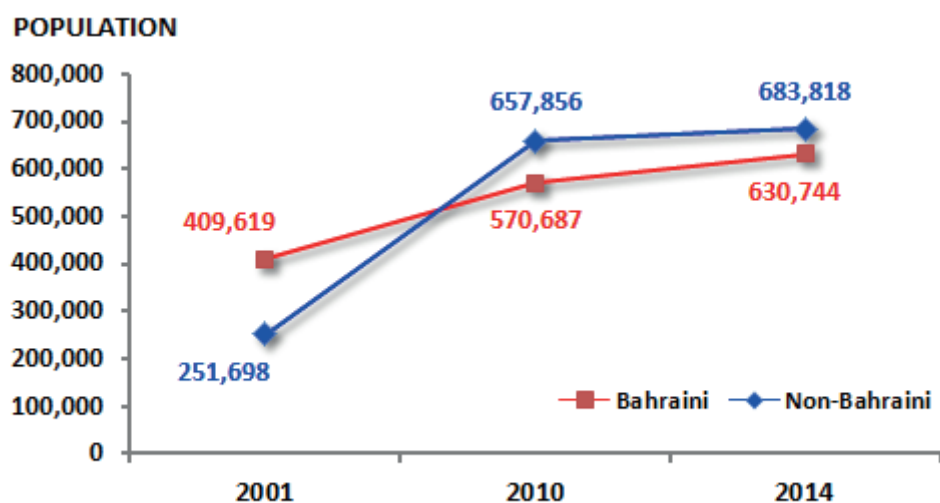
The population at the last census in 2010 was 1,228,543, indicating a growth of 7% from 2010 to 2014 (Figure 1).⁶

Of the total population, the proportion of Bahrainis increased from 46% in 2010 to 48% in 2014. The percentage of non-Bahrainis decreased from 54% in 2010 to 52% in 2014 (Figure 2).

Table 1 Distribution of Population by Nationality, Age and Gender, 2014

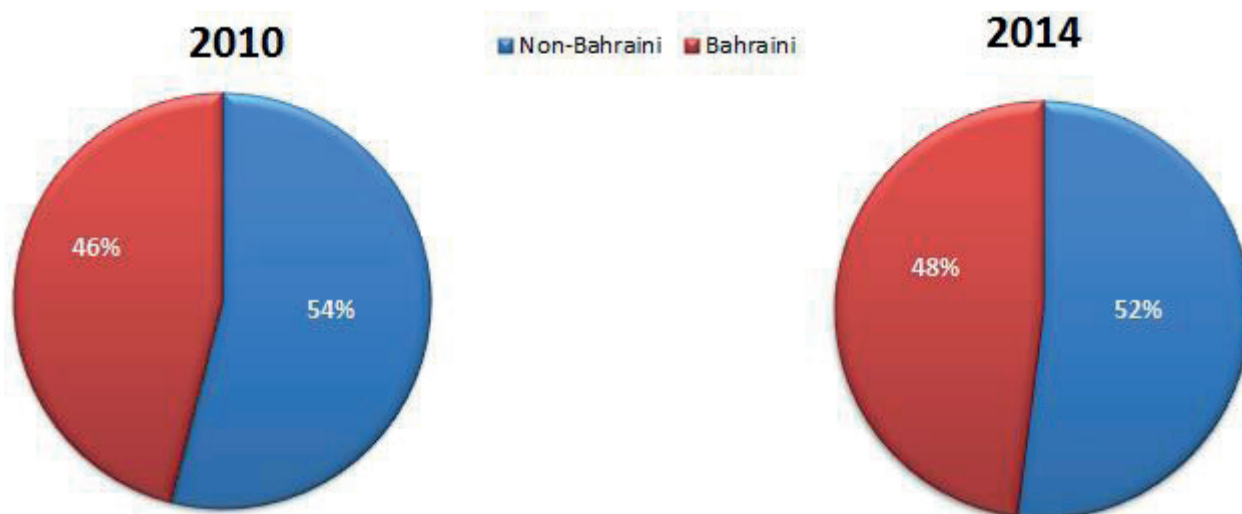
Age Groups	النوعية / الجنسية								
	الجملة			Nationality/Sex					
	النوعين كلا	إناث	Total ذكور	بحريني غير			بحريني		
				النوعين كلا	إناث	ذكور	النوعين كلا	إناث	ذكور
Both sexes	Females	Males	Both sexes	Females	Males	Both sexes	Females	Males	
0 - 4	100,596	49,196	51,400	27,644	13,547	14,097	72,952	35,649	37,303
5 - 9	89,812	43,976	45,836	22,748	11,139	11,609	67,064	32,837	34,227
10 - 14	79,179	38,476	40,703	17,740	8,586	9,154	61,439	29,890	31,549
15 - 19	73,589	35,441	38,148	13,255	6,183	7,072	60,334	29,258	31,076
20 - 24	105,972	43,485	62,487	47,406	14,822	32,584	58,566	28,663	29,903
25 - 29	177,999	56,994	121,005	124,681	30,941	93,740	53,318	26,053	27,265
30 - 34	170,791	53,844	116,947	124,195	30,997	93,198	46,596	22,847	23,749
35 - 39	135,098	45,877	89,221	93,897	25,729	68,168	41,201	20,148	21,053
40 - 44	106,200	34,875	71,325	73,325	18,513	54,812	32,875	16,362	16,513
45 - 49	87,287	31,707	55,580	52,399	13,851	38,548	34,888	17,856	17,032
50 - 54	69,440	26,644	42,796	37,554	10,475	27,079	31,886	16,169	15,717
55 - 59	51,854	19,288	32,566	26,285	6,523	19,762	25,569	12,765	12,804
60 - 64	29,136	11,219	17,917	11,591	3,286	8,305	17,545	7,933	9,612
65 - 69	14,889	6,306	8,583	4,981	1,545	3,436	9,908	4,761	5,147
70 - 74	9,878	4,593	5,285	2,597	829	1,768	7,281	3,764	3,517
75 - 79	6,366	3,063	3,303	1,603	521	1,082	4,763	2,542	2,221
80 - 84	3,757	1,788	1,969	1,008	321	687	2,749	1,467	1,282
85+	2,719	1,303	1,416	909	362	547	1,810	941	869
Total	1,314,562	508,075	806,487	683,818	198,170	485,648	630,744	309,905	320,839

Figure 1 Population Growth by Nationality, 2014



Source: Central Informatics Organization

Figure 2 Proportion of Population by Nationality, 2014



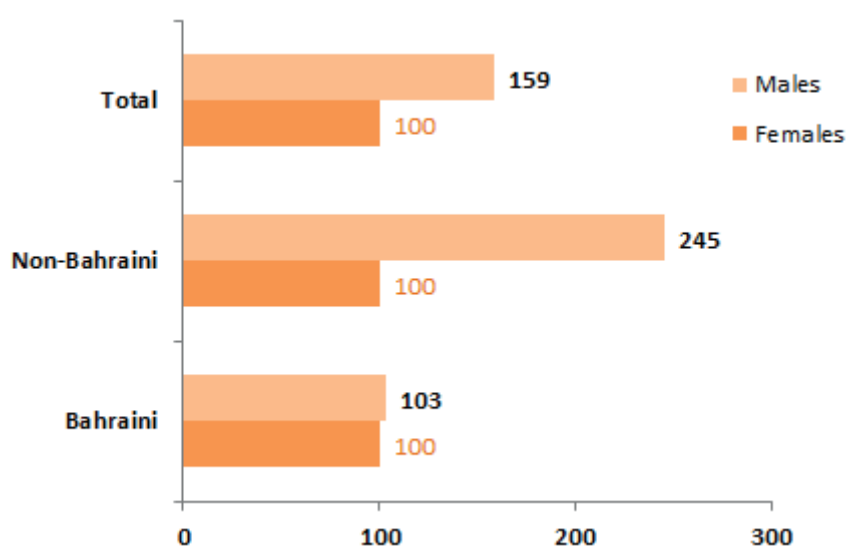
POPULATION GROWTH RATE

The average annual growth rate from the last census in 2010 to 2014 was 1.3% for the total population, 2.2% for Bahrainis and 0.5% for non-Bahrainis.

GENDER RATIO

In 2014, there were 103 Bahraini males per 100 Bahraini females (Figure 3). This indicates that the Bahraini society was homogeneous in term of gender, whereas the non-Bahraini community had a higher proportion of males among its members (gender ratio of 245 males per 100 females). This is due to the fact that foreign jobs usually attract more males than females.⁶

Figure 3 Gender Ratio by Nationality in 2014

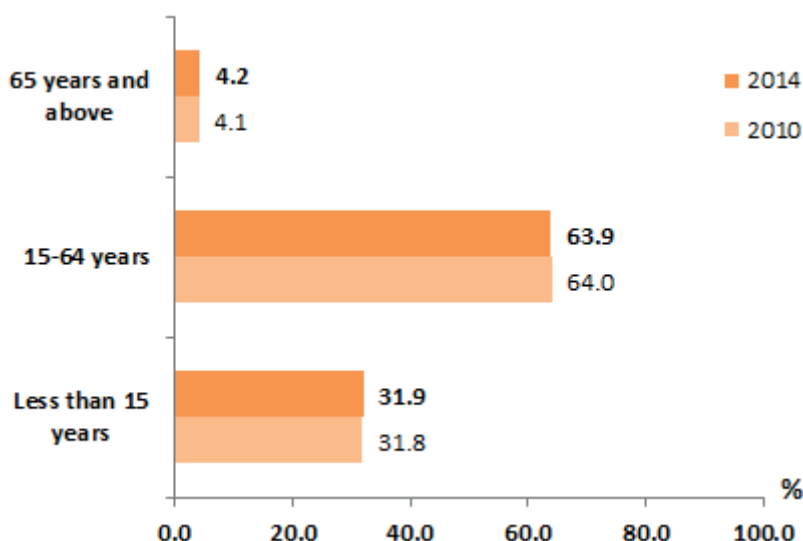


Source: Central Informatics Organization

AGE COMPOSITION

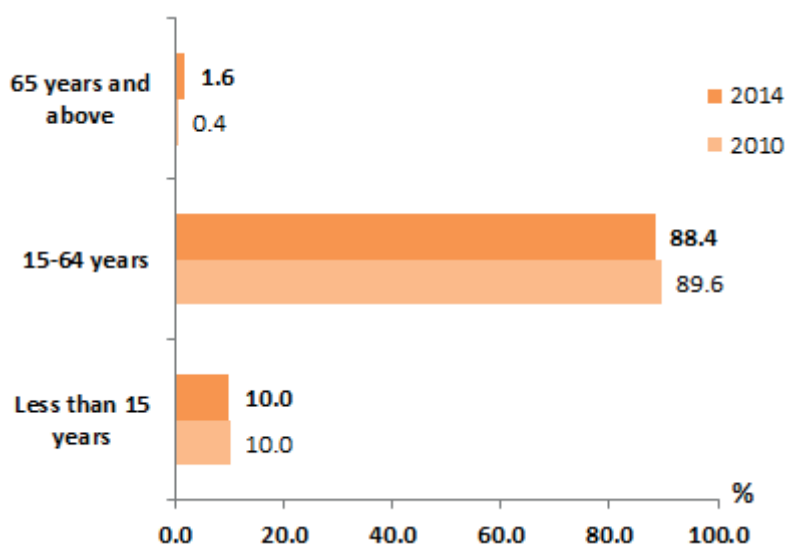
Among the Bahraini population (Figure 4), the age composition was relatively the same as that observed during the last census in 2010. In 2014, the percentage of children aged less than 15 years was approximately 31.9% (vs. 31.8% in 2010), while the proportion of senior citizens aged 65 years old and above was 4.2% (vs. 4.1% in 2010). The majority of the Bahraini population was of working age (15-64 years old), the proportion was 63.9% in 2014 (vs. 64% in 2010). These figures demonstrate that the Bahraini community is beginning to enter a new phase of demographic transition, where the working-age population is the largest in number.⁶

Figure 4 Proportion of Bahraini Population by Broad Age Groups, 2014



Among the non-Bahrainis (Figure 5), the proportion of children aged less than 15 years was 10% in 2014 (the same as in 2010), while the proportion of the elderly (65 years old and above) rose to 1.6% in 2014 from 0.4% in 2010. Similar to the trend observed in the Bahraini population, the population of working age (15-64 years) constituted the majority and accounted for 88.4% of the total population in 2014, and appeared to have decreased slightly from 89.6% in 2010.⁶

Figure 5 Proportion of Non-Bahraini Population by Broad Age Groups, 2014



POPULATION PYRAMIDS IN 2014

The 2014 population pyramids for the Bahraini and non-Bahraini populations presented in Figure 6 and Figure 7, respectively, show the population-age structure by gender. Table 1 presents the age and gender distribution of the population by nationality.

The widening base of the Bahraini population pyramid indicates the larger proportion of younger age groups, while the narrowing at the top of the pyramid indicates the small proportion of the elderly. The distribution is seen to be similar for both male and female populations.

The pyramid for the non-Bahraini population, however, is different from its Bahraini counterpart. The base and apex of the pyramid are narrow indicating the small number of younger and elderly age groups, while the broad middle corresponds to the larger working-age population constituting of mostly males.⁶

Figure 6 Bahraini Population Pyramid, 2014

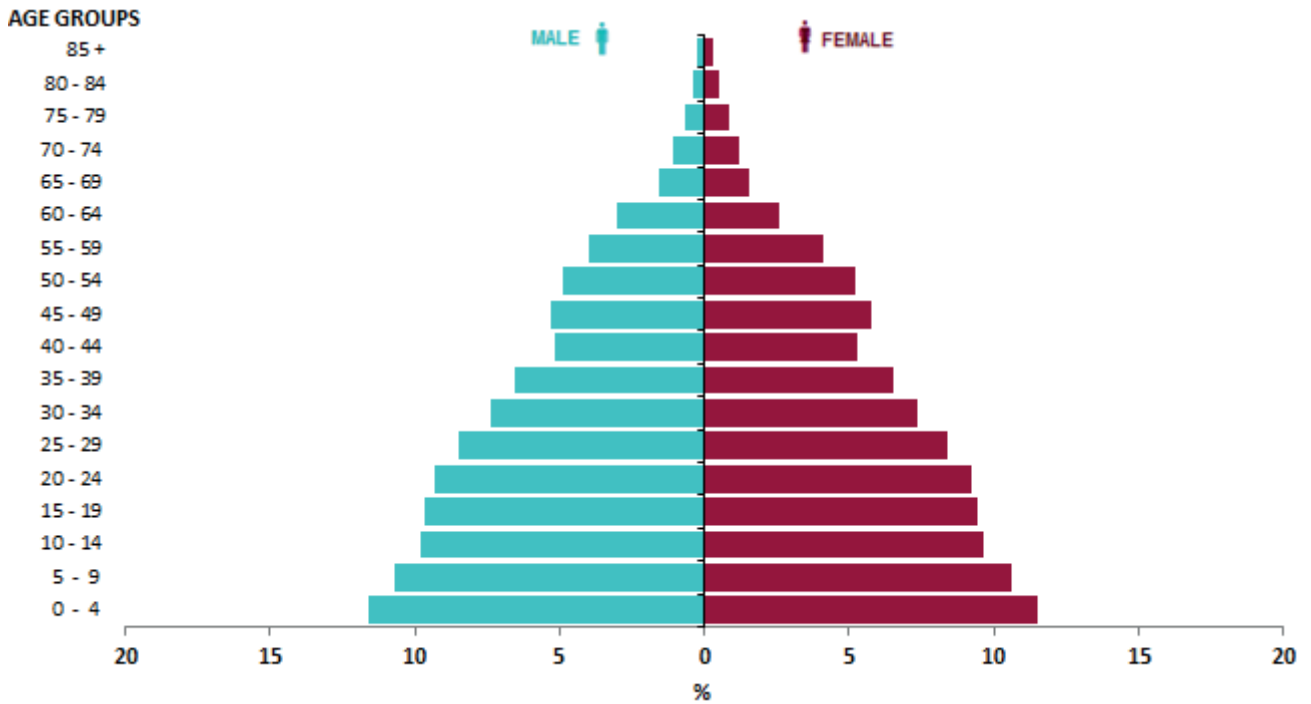
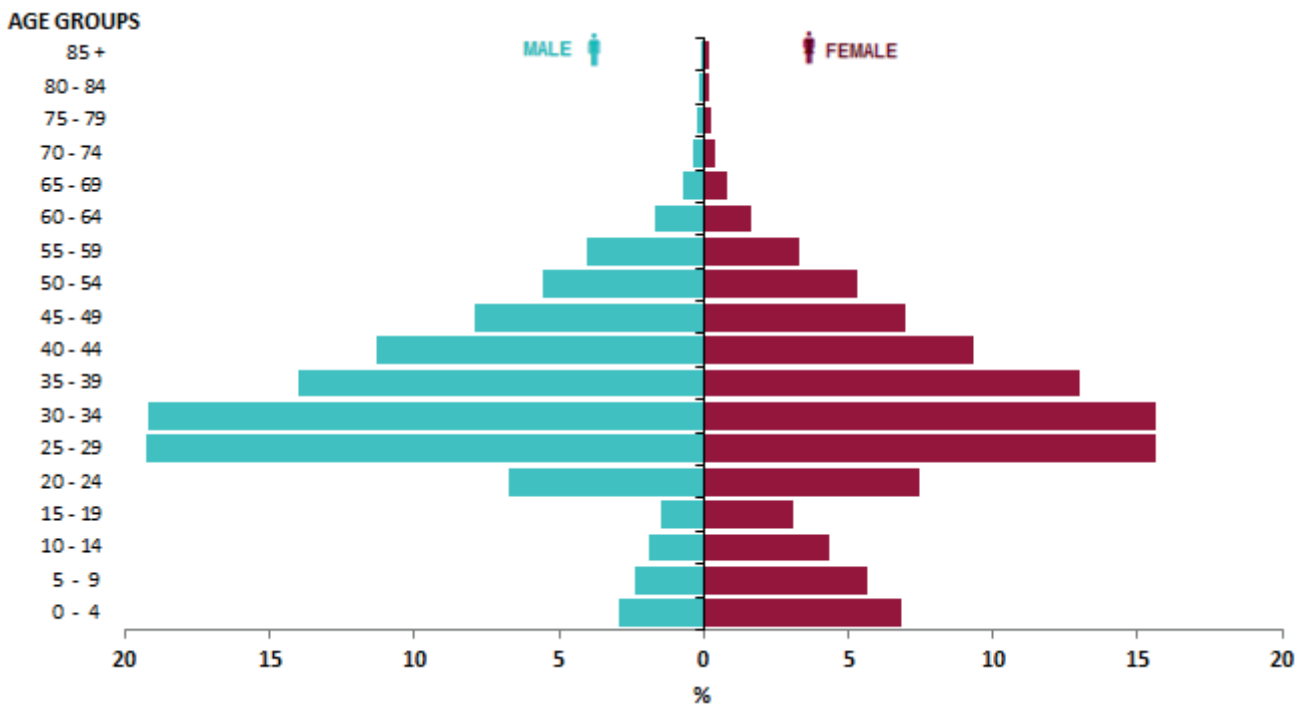


Figure 7 Non-Bahraini Population Pyramid, 2014



Source: Central Informatics Organization

GEOGRAPHIC DISTRIBUTION

In 2014, the majority of the total population (Bahrainis and non-Bahrainis) (63.4%) was concentrated within the Capital and Northern Governorate, where the percentages of population were 39.3% and 24.1%, respectively (Figure 8).⁵

Similar to the total population, over 61% of the Bahraini population was concentrated in the Northern and Capital governorates (35.3% and 26.4% respectively) (Figure 9).

Figure 8 Proportion of the Total Population in Bahrain by Governorate, 2014

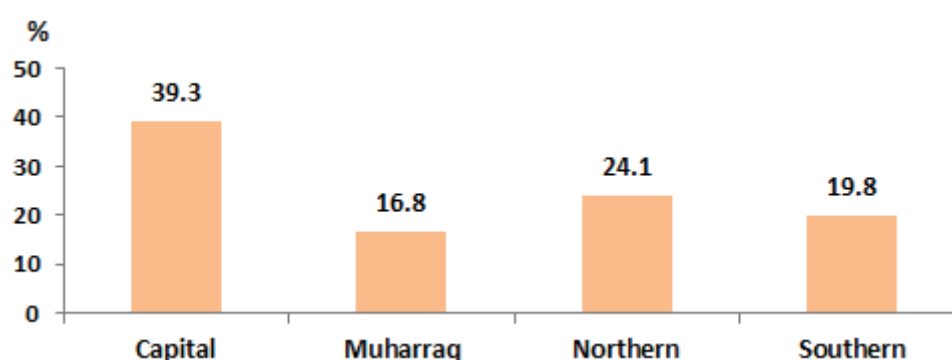
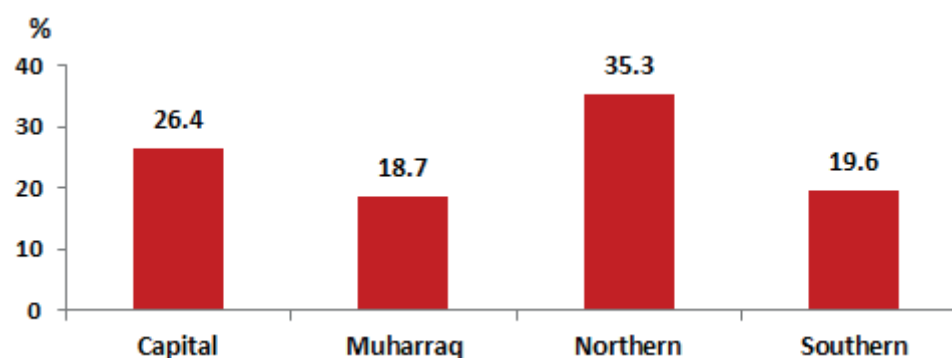


Figure 9 Proportion of Bahrainis by Governorate, 2014



BAHRAIN CANCER REGISTRY

BACKGROUND AND STRUCTURE

According to the Ministerial Decree 5/1994, cancer notification became mandatory and all physicians in the Kingdom are obliged to report all cancer cases to the Bahrain Cancer Registry at the Medical Review Office, Ministry of Health (MOH). Due to technical difficulties, it was not until 1998 that comprehensive and reliable data complying with international standards became available at the registry. In 2006, the Civil Service Bureau (CSB) approved a position for Tumor Registrar within the organizational chart of the Medical Review Office (MRO), now occupied by a trained senior nurse who is responsible for data collection, coding and data entry.

OBJECTIVES OF BAHRAIN CANCER REGISTRY

1. To compile an accurate database on the incident cases of cancer in of Kingdom of Bahrain.
2. To monitor the trends of cancer, to guide policy makers in setting priorities for control and management of cancer.
3. To provide researchers and clinicians with population-based information on the number and types of cancer cases.

METHODS

A. DATA COLLECTION

Initially, cancer cases were notified using a paper-based notification form which collected only limited information on each case. In 2010, an electronic notification form was designed and made accessible to clinical staff via the intranet of the Ministry of Health. Another electronic form with more detailed information was designed and has been made accessible to private health care facilities through a password-secured access on the Ministry of Health webpage.

Cases are registered as having a malignant disease in the Bahrain Cancer Registry whether it was pathologically or clinically diagnosed.

Personal, clinical and tumor details are collected by the registry using a specially-designed registration form. Unlike the hospital-based cancer registry which collects detailed clinical information on treatment of cancer patients, the Bahrain Cancer Registry is a national population-based registry covering all residents in the country and collects information on epidemiological, clinical and pathological aspects of the disease. This includes personal data, type, anatomical site and histological data of the tumor. It also includes information on the tumor stage, basis of diagnosis and hospital of treatment and referral. Information is then entered into the registry database and checked for duplication and consistency using the CanReg4 software.

a) Active Collection

Active collection involves the Tumor Registrar visiting different sources and abstracting data on Cancer Registry Forms. Being the largest tertiary center for diagnosis and treatment of cancer, registrars visit the Salmaniya Medical Complex (SMC) 4 times a week and extract data to the notification forms. Similarly, other tertiary hospitals like Bahrain Defense Force (BDF) Hospital and King Hamad Hospital (KHUH) are visited once a month. Patients diagnosed abroad are traced through the Oncology Outpatient Register at the SMC and subsequently data are extracted from their medical records.

b) Passive Reporting

When a case of cancer is diagnosed, the attending staff of the relevant specialty or the medical records department at all governmental , private hospital , clinics and laboratories completes the notification forms and sends them to the registry.

c) Other Reporting Methods

In addition to passive notification, case finding and registration is enhanced by several approaches. Clinical records of patients admitted with cancer to the SMC, the main source of most cancer cases, are sorted out at the Medical Record Department (MRD) upon discharge and checked for their registration status. Unregistered cases are registered and information for registered cases is updated.

The registry also receives an annual list of cancer deaths from the Health Information Directorate (HID). Death cases are cross-matched with the registered cases in order to sort out the unmatched cases (Death Certificate Notifications - DCN) which are then followed-up for any clinical information on their malignancy and date of diagnosis. Also lists for cancer patients who are treated outside Bahrain are annually checked through contacting Health Information Directorate.

B. DATA CODING, ENTRY AND VALIDITY

The CanReg4 software program and International Classification of Diseases for Oncology ICDO-3 began to be used from 1998. This program has a duplicate entry checking facility, which avoids the same case being registered more than once. For this report, we used CanReg4. Validity checks are performed for consistency between items: site/histology, gender/site and age/site/histology combinations by CanReg4.

C. DATA ANALYSIS

Data is first checked for consistency and validity using the International Agency for Research on Cancer (IARC), 1998 software (CanReg4). Frequency distribution and incidence tables are generated using the CanReg4 program. Bar diagrams and graphs were made using Microsoft Excel.

The registry produces statistical reports that show the distribution of different types of cancer according to age, gender and nationality. These reports are being utilized by government health planners and policy makers to address the importance of the cancer problem, allocate resources and to evaluate cancer prevention and control activities.

Several GCC reports have been produced with statistics on cancer in GCC countries, the most recent of which is the report on Cancer Incidence among Nationals of the GCC States, 1998-2009.² Bahrain cancer statistics have also appeared in some international publications and journals.^{4,5} Available statistical reports on cancer incidence have been made accessible on the MOH intranet and internet webpage.

D. DEFINITIONS

Incidence

The number of new cancer cases in a defined population within a specific period.

Date of Diagnosis

The date documented on the histopathology report. For clinical cases, the date of diagnosis is the date stated in patient's case notes to have cancer.

Population at Risk

The part of the Bahraini population that is susceptible to have a specific cancer.

Crude Incidence Rate

The number of new cancer cases in the Bahraini population occurring within a Gregorian calendar year (1st January to 31st December) divided by the population at risk in the same period expressed per 100,000.

Age-specific Incidence Rate

The incidence rate in a specific age group.

Crude Mortality Rate

The number of deaths, with cancer as the underlying cause of death, occurring in a specified population during a year. Cancer mortality is usually expressed as the number of deaths due to cancer per 100,000 population. That is, **Mortality Rate = (Cancer Deaths / Population) × 100,000**

Multiple Primaries

Two or more abnormal growths of tissue occurring simultaneously. The neoplasms are histologically different and may be found in the same or different sites.

Unspecified tumors

Include unknown primaries.

Metastasis

The distant spread of cancer from its original site to other organs of the body, including lymph nodes, skeletal and or visceral organs.

World Age-standardized Rate (ASR)

Age standardization is necessary when comparing several populations that differ with respect to age. Hence, the World Standard Population Table proposed by Segi (1960)⁸ and modified by Doll *et al* (1966)⁹, (Table 2) was used to adjust the crude incidence rates and to remove the confounding effect

of age. Therefore, the ASR could be used for comparison purposes with other rates where the same world standard population was used, especially those issued by the WHO's agency, and the IARC, in its periodic publication Cancer Incidence in Five Continents.

Truncated rates refer to age-standardized rates for a specific age range, such as 0-14 years in children.

Table 2 Age Structure of the World Standard Population used for Age Adjustment

Age Group	Population
00-04	12,000
05-09	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
75-79	1,000
80-84	500
85+	500
Total	100,000

E. COLLABORATION WITH REGIONAL AND INTERNATIONAL AGENCIES

a) GCC Cancer Control Committee

Bahrain is represented in this committee. The committee produces statistical reports and gives recommendations and advice to countries on issues of cancer control. It also monitors some performance indicators of national cancer control programs in each country.

b) IARC:

This is a branch of the WHO specialized in cancer research and control. It provides its member countries with technical support on cancer registration and provides evidence on cancer causes, efficacy of screening and treatment modalities. It also gathers the countries' data, checks its quality and publishes it if it fulfills the quality criteria. Bahrain cancer data for 1998-2002 has been published by the IARC along with the data from Kuwait and Oman. Last publication for Bahrain cancer data for the years 2003-2007 had been issued in volume X.

c) International Agency of Cancer Registries (IACR):

This is an NGO affiliated with IARC and jointly they provide technical support and training in cancer registration techniques, manuals and tools to the members. In this respect, they also provide the software for cancer data entry, validation and analysis, which is free of charge to members. Bahrain Cancer Registry is a voting and associate member in this organization.

TRENDS OF CANCER INCIDENCE 1998 – 2014

CANCER INCIDENCE, 1998-2014

Between January 1998 and December 2014, there were 8,013 newly diagnosed cases of cancer among the Bahraini population in the Kingdom of Bahrain with an average of 471 cases per year, of which 3,717 (46.4%) were males and 4,296 (53.6%) were females.

The average annual crude incidence cancer rate was 88.0 per 100,000 Bahraini males and 102.6 per 100,000 Bahraini females. The average annual world ASRs were 135.1 and 138.5 per 100,000 Bahraini males and females, respectively (Table 3).

The frequencies and incidence rates of cancers in Bahraini males and females are presented in Table 4 to Table 7.

Overall, there was an observed decline in the trend of average annual ASRs for Bahraini males over the 17-year period. On the other hand, the trend of average annual ASRs for Bahraini females did not change significantly over the same period (Figure 10).

The average annual age-specific incidence rates were observed to increase dramatically with advancing age in both sexes (Figure 11).

During the 17-year period, breast cancer (1,680 cases), lung cancer (803 cases), colorectal cancer (750 cases), NHL (400 cases) and leukemia (386 cases) constituted half of the total cancer burden (50.2%; 4,019 new cases).

Table 3 Distribution of Incident Cancer Cases among Bahrainis, 1998-2014

GENDER	FREQUENCY	PERCENTAGE (%)	AVERAGE ANNUAL CRUDE INCIDENCE RATE	AVERAGE ANNUAL ASR (WORLD)
Male	3,717	46.4	88.0	135.1
Female	4,296	53.6	102.6	138.5
TOTAL	8,013	100		

TRENDS OF CANCER INCIDENCE – 1998-2014

Table 4 Frequency of Incident Cancer Cases among Bahraini Males, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Lip	2	0	1	0	1	1	0	1	0	1	1	1	0	0	0	0	0	C00
Tongue	2	0	3	2	2	2	0	0	1	1	0	1	2	4	1	2	6	C01-C02
Mouth	2	1	4	1	1	2	1	0	2	2	1	2	2	4	4	5	1	C03-C06
Salivary glands	1	0	1	1	0	0	0	1	3	2	0	0	0	2	0	1	2	C07-C08
Tonsil	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0	C09
Other oropharynx	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	C10
Nasopharynx	1	3	2	4	3	5	2	3	0	0	2	5	1	1	6	8	0	C11
Hypopharynx	0	2	0	0	1	1	0	2	0	1	0	0	0	0	1	0	0	C12-C13
Pharynx unspecified	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	C14
Esophagus	4	4	3	4	9	4	5	3	4	3	4	1	1	4	4	2	5	C15
Stomach	6	10	12	11	9	7	8	6	6	6	14	8	4	8	7	12	13	C16
Small intestine	1	0	2	0	0	1	1	1	1	0	2	2	1	1	2	1	2	C17
Colorectum	15	21	15	15	17	20	21	20	22	21	24	35	23	34	47	43	34	C18-C21
Liver	4	3	8	7	7	6	12	3	6	6	6	6	9	14	6	8	11	C22
Gallbladder etc.	2	1	0	0	1	0	1	2	2	1	2	4	0	2	5	4	1	C23-C24
Pancreas	4	6	4	3	11	6	5	9	5	8	6	9	8	6	13	6	16	C25
Nose, sinuses etc.	0	2	0	1	0	1	1	1	0	1	0	1	0	1	0	2	0	C30-C31
Larynx	5	5	3	6	7	5	4	1	6	6	6	4	3	4	4	5	5	C32
Trachea, bronchus, lung	38	38	35	44	36	33	29	28	35	35	30	22	41	31	28	34	45	C33-C34
Other thoracic organs	1	1	0	2	1	1	0	1	1	3	1	1	1	1	1	2	2	C37-C38
Bone	1	1	5	4	1	3	2	5	4	4	3	2	3	3	2	2	7	C40-C41
Melanoma of skin	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	1	1	C43
Other skin	2	6	7	4	3	5	2	6	3	3	7	1	3	6	3	3	4	C44
Mesothelioma	1	0	0	0	1	2	2	1	2	4	4	1	2	2	1	2	1	C45
Kaposi sarcoma	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	C46
Connective, soft tissue	3	0	1	2	3	4	1	3	2	3	1	1	6	1	3	3	3	C47-C49
Breast	1	0	0	0	0	2	1	0	3	3	0	3	4	1	2	1	3	C50
Penis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C60
Prostate	10	20	21	15	12	12	13	16	13	26	19	8	15	14	32	33	29	C61
Testis	2	2	0	5	2	1	3	3	3	7	2	1	4	2	1	6	2	C62
Other male genital organs	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	C63
Kidney, ureters etc	8	5	7	4	6	7	8	7	7	3	5	8	5	9	10	10	14	C64-C66; C68
Bladder	13	25	17	13	11	13	17	11	16	16	16	11	22	19	25	22	22	C67
Eye	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0	0	0	C69
Brain, nervous system	4	4	5	4	7	7	6	6	6	13	11	8	9	11	10	10	14	C70-C72
Thyroid	2	2	2	2	0	5	5	6	1	2	3	1	5	4	4	10	4	C73
Adrenal gland	0	1	1	2	0	0	1	1	1	0	0	0	1	0	1	2	1	C74
Other Endocrine	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	C75
Hodgkin's disease	2	5	7	0	2	3	7	7	2	6	4	5	7	4	10	10	7	C81
Non-Hodgkin lymphoma	8	10	8	12	10	10	13	10	12	11	12	14	19	21	22	14	23	C82-C85;C96
Immunoproliferative disease	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	C88
Multiple myeloma	3	4	4	1	2	1	1	2	2	2	3	4	4	2	1	4	5	C90
Lymphoid leukemia	9	3	6	4	5	3	5	6	1	3	2	4	5	7	5	11	9	C91
Myeloid leukemia	12	7	4	5	7	4	4	2	4	6	5	4	3	6	12	10	6	C92-C94
Leukemia unspecified	2	1	0	1	0	3	1	4	3	8	4	2	8	7	3	3	1	C95
Other & unspecified	11	10	6	8	9	9	6	6	8	10	5	10	6	5	14	8	10	Other
TOTAL	183	203	196	188	190	189	189	186	188	234	205	194	228	242	292	301	309	

TRENDS OF CANCER INCIDENCE – 1998-2014

Table 5 Frequency of Incident Cancer Cases among Bahraini Females, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Lip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C00
Tongue	3	2	0	2	0	0	1	0	0	0	0	4	1	0	2	2	1	C01-C02
Mouth	2	1	0	0	0	0	0	2	1	0	0	0	0	1	0	1	1	C03-C06
Salivary glands	0	0	1	1	0	0	1	0	2	1	1	1	1	0	1	2	3	C07-C08
Tonsil	1	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	1	1	1	C10
Nasopharynx	1	1	0	0	0	4	1	1	0	0	0	1	0	1	1	0	1	C11
Hypopharynx	1	1	1	0	0	0	0	0	0	0	0	1	0	0	2	0	0	C12-C13
Pharynx unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C14
Esophagus	1	1	1	4	3	1	2	4	3	0	1	1	1	4	1	1	3	C15
Stomach	7	6	7	7	4	8	6	5	5	5	4	7	8	6	10	6	4	C16
Small intestine	0	2	1	0	0	0	1	0	1	0	1	0	0	0	2	1	2	C17
Colorectum	10	7	11	8	11	12	15	13	20	25	22	16	23	30	33	29	38	C18-C21
Liver	1	5	8	1	4	5	2	5	4	5	8	4	2	6	12	5	9	C22
Gallbladder etc.	1	0	2	1	2	0	0	2	2	2	3	2	2	5	1	5	3	C23-C24
Pancreas	3	5	3	4	2	1	5	6	6	4	7	4	7	7	5	9	5	C25
Nose, sinuses etc.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	C30-C31
Larynx	2	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1	1	C32
Trachea, bronchus, lung	19	12	14	8	13	12	17	13	11	6	21	11	17	9	12	12	14	C33-C34
Other thoracic organs	0	1	0	0	0	0	1	0	0	1	1	0	1	1	0	0	0	C37-C38
Bone	2	2	1	0	0	2	0	1	1	0	3	2	0	3	0	1	5	C40-C41
Melanoma of skin	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	C43
Other skin	3	4	2	3	0	2	2	3	4	2	1	0	1	1	0	5	3	C44
Mesothelioma	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	C45
Kaposi sarcoma	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	C46
Connective, soft tissue	0	1	0	0	2	1	0	2	2	0	1	2	2	2	3	7	1	C47;C49
Breast	43	68	82	91	54	73	73	89	84	120	93	86	107	110	135	173	175	C50
Cervix Uteri	12	9	6	6	6	9	5	10	6	11	13	5	6	7	7	10	9	C53
Corpus Uteri	7	5	3	8	11	7	12	5	5	14	4	9	16	15	10	17	17	C54
Uterus unspecified	1	0	3	2	3	0	2	3	3	11	4	4	2	4	5	2	5	C55
Ovary	13	7	13	13	5	12	10	10	13	6	10	8	9	18	23	14	27	C56
Other female genital organs	0	2	1	2	0	0	0	0	1	0	3	3	2	1	3	1	6	C51-C52; C57
Placenta	1	0	0	1	0	0	1	1	1	1	0	0	1	0	1	0	0	C58
Kidney, ureters etc.	2	6	8	5	4	5	4	4	3	6	7	0	0	3	5	2	4	C64-C66; C68
Bladder	4	6	3	6	2	2	2	3	3	7	1	2	6	9	4	2	8	C67
Eye	0	1	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	C69
Brain, nervous system	0	3	1	1	3	4	4	3	7	1	5	4	9	9	4	8	8	C70-C72
Thyroid	7	16	12	11	11	11	13	18	8	11	11	5	10	11	12	14	32	C73
Adrenal gland	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	1	C74
Other endocrine glands	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0	1	1	C75
Hodgkin's disease	1	4	3	7	0	2	1	5	2	3	2	5	2	2	5	10	7	C81
Non-Hodgkin lymphoma	6	7	8	6	9	5	10	11	6	9	8	6	14	18	12	18	18	C82-C85;C96
Immunoproliferative disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C88
Multiple Myeloma	2	1	2	1	2	0	1	3	1	5	3	4	4	5	2	5	2	C90
Lymphoid leukemia	5	2	4	2	2	0	5	2	2	1	4	2	1	3	3	1	2	C91
Myeloid leukemia	7	4	1	3	4	4	4	4	3	2	7	5	4	5	4	1	8	C92-C94
Leukemia unspecified	1	0	1	2	1	0	1	1	7	3	1	3	2	7	1	3	1	C95
Other & unspecified	3	8	8	3	4	4	7	8	10	5	7	3	8	7	5	9	10	Other
TOTAL	173	204	212	210	163	190	213	238	228	269	257	212	269	313	327	381	437	

TRENDS OF CANCER INCIDENCE – 1998-2014

Table 6 World Age-Standardized Incidence Rates of Cancers in Bahraini Males, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Lip	1.7	0.0	1.1	0.0	1.0	0.0	0.0	1.0	0.0	0.9	0.4	0.4	0.0	0.0	0.0	0.0	0.0	C00
Tongue	1.8	0.0	2.8	1.8	1.7	1.8	0.0	0.0	0.7	0.8	0.0	0.4	1.0	2.0	0.3	0.8	2.3	C01-C02
Mouth	2.1	2.5	2.5	0.0	0.9	0.7	0.0	0.0	1.6	0.9	0.5	1.1	0.7	1.7	2.4	2.2	0.3	C03-C06
Salivary glands	0.6	0.8	2.8	0.8	0.0	0.0	0.0	0.9	1.8	0.8	0.0	0.0	0.0	1.2	0.0	0.4	0.7	C07-C08
Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.3	0.0	C09
Other oropharynx	1.1	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	0.0	0.0	C10
Nasopharynx	0.5	2.2	1.8	1.9	2.7	3.5	1.8	2.0	0.0	0.0	0.7	2.4	0.4	0.3	2.4	2.9	0.0	C11
Hypopharynx	0.0	2.0	0.0	0.0	0.8	1.0	0.0	1.5	0.0	0.4	0.0	0.0	0.0	0.0	0.4	0.0	0.0	C12-C13
Pharynx unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	C14
Esophagus	3.7	2.6	2.5	3.6	8.5	3.7	4.9	2.3	2.9	2.0	2.4	0.7	0.4	2.0	1.5	0.9	2.3	C15
Stomach	5.9	10.0	11.2	8.6	7.6	5.8	6.7	4.9	4.1	2.9	7.9	4.6	2.1	4.2	3.6	5.4	5.8	C16
Small intestine	0.9	0.0	1.8	0.0	0.0	0.8	0.7	0.7	1.0	0.0	1.5	1.1	0.6	0.6	1.0	0.4	0.6	C17
Colorectum	14.6	17.3	12.5	11.7	12.5	13.5	16.8	15.5	15.9	10.7	13.0	18.8	11.6	16.0	21.9	18.9	13.3	C18-21
Liver	4.2	2.4	7.4	6.4	5.4	4.2	9.7	2.1	4.1	2.7	3.4	3.4	4.1	6.2	2.5	3.2	4.1	C22
Gallbladder etc.	2.2	1.1	0.0	0.0	0.7	0.0	0.9	1.3	1.4	0.9	1.2	2.1	0.0	1.3	2.1	1.6	0.6	C23-C24
Pancreas	3.5	5.4	4.1	2.6	8.6	5.2	4.5	6.2	4.1	4.6	3.1	4.8	4.7	2.7	6.2	2.8	7.1	C25
Nose, sinuses etc.	0.0	1.6	0.0	0.4	0.0	0.4	0.5	0.6	0.0	0.4	0.0	0.4	0.0	0.4	0.0	1.1	0.0	C30-C31
Larynx	3.9	5.3	2.4	5.3	4.5	4.1	3.4	0.7	4.8	4.3	3.3	2.6	1.6	1.7	1.7	2.1	2.0	C32
Trachea, bronchus, lung	36.7	34.1	33.5	36.0	31.4	27.9	25.2	21.9	27.6	22.6	17.8	12.9	21.7	15.8	14.1	15.8	20.0	C33-C34
Other thoracic organs	0.5	1.0	0.0	1.3	1.0	0.8	0.5	0.7	0.4	1.5	0.4	0.4	0.3	0.3	0.3	0.9	0.6	C37-C38
Bone	1.0	0.7	3.5	3.7	0.3	3.3	1.3	2.2	1.4	1.3	1.3	0.7	0.9	0.9	0.6	0.6	2.4	C40-C41
Melanoma of skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.3	0.5	C43
Other skin	1.6	6.4	5.8	4.4	2.2	4.6	1.3	4.2	2.0	1.9	3.2	0.3	1.4	3.0	1.6	1.0	1.5	C44
Mesothelioma	1.0	0.0	0.0	0.0	1.0	1.6	1.9	0.8	1.5	3.1	2.4	0.5	1.0	1.4	0.3	0.9	0.5	C45
Kaposi sarcoma	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C46
Connective, soft tissue	2.5	0.0	1.0	1.2	1.6	2.8	0.4	1.8	1.4	1.5	0.4	0.4	2.2	0.4	0.9	1.3	1.6	C47-C49
Breast	0.9	0.0	0.0	0.0	0.0	1.9	0.7	0.0	1.9	1.6	0.0	1.8	1.9	0.4	1.3	0.3	1.1	C50
Penis	0.0	0.0	0.8	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	C60
Prostate	9.6	19.1	19.3	11.8	9.4	9.2	10.0	13.2	10.4	15.1	11.4	4.6	8.0	7.4	17.0	16.8	14.2	C61
Testis	1.0	0.9	0.0	2.5	0.8	0.4	1.9	1.4	1.8	3.0	0.7	0.4	1.3	0.7	0.3	1.8	0.6	C62
Other male genital organs	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0	C63
Kidney, ureter etc.	5.9	4.8	6.5	3.3	5.0	6.0	5.0	5.0	4.6	1.5	2.9	3.7	2.6	3.8	3.5	4.9	4.7	C64-C66; C68
Bladder	12.6	23.6	14.5	10.3	9.0	11.7	14.6	8.0	12.8	9.5	9.3	6.4	11.5	9.8	12.6	10.5	10.1	C67
Eye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	C69
Brain, nervous system	2.3	3.4	3.2	2.1	4.4	4.5	3.4	3.5	3.1	6.1	4.7	4.0	3.9	4.0	4.0	3.4	4.9	C70-C72
Thyroid	1.3	1.2	1.6	1.7	0.0	2.4	3.4	3.7	0.7	1.2	2.1	0.4	2.2	1.5	1.9	4.0	1.3	C73
Adrenal gland	0.0	0.5	0.7	0.5	0.0	0.0	5.0	0.5	0.5	0.0	0.0	0.0	0.6	0.0	0.3	1.0	0.3	C74
Other Endocrine glands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.3	0.0	0.0	C74
Hodgkin's disease	0.8	2.8	3.5	0.0	0.7	1.2	3.5	2.9	0.8	2.5	1.4	1.7	2.4	1.4	3.1	3.2	2.1	C81
Non-Hodgkin lymphoma	6.3	12.0	5.6	6.9	7.7	6.6	8.5	5.0	6.5	4.6	5.2	6.2	8.5	9.7	8.8	4.9	8.5	C82-C85;C96
Immunoproliferative dis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C88
Multiple myeloma	3.2	3.8	3.2	1.0	1.7	0.9	0.7	1.4	1.5	0.9	1.6	2.2	1.4	0.9	0.6	1.6	2.1	C90
Lymphoid leukemia	6.6	1.8	2.9	2.3	3.1	1.7	2.9	2.9	0.8	1.6	0.9	1.8	1.7	2.5	2.1	4.0	2.7	C91
Myeloid leukemia	9.1	5.1	4.2	3.1	3.4	2.4	2.7	1.6	2.4	2.8	1.9	1.4	1.0	2.3	5.0	3.9	1.9	C92-C94
Leukemia unspecified	1.8	0.5	0.0	0.9	0.0	0.8	0.4	2.3	1.4	3.2	1.6	0.7	3.9	2.5	1.2	1.0	0.3	C95
Other & unspecified	9.5	7.8	5.6	5.7	7.2	7.7	4.2	4.0	6.1	5.5	2.7	5.4	3.5	1.9	6.3	3.9	4.7	Other
TOTAL	160.9	182.7	168.3	142.9	145.3	143.1	147.4	128.3	133.0	126.7	109.3	100.9	109.8	111.2	132.7	128.9	125.9	

TRENDS OF CANCER INCIDENCE – 1998-2014

Table 7 World Age-Standardized Incidence Rates of Cancers in Bahraini Females, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Lip	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	C00
Tongue	2.4	0.9	0.0	1.3	0.0	0.0	0.9	0.0	0.0	0.0	0.0	2.2	0.7	0.0	0.6	1.0	0.3	C01-C02
Mouth	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.6	0.4	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.3	C03-C06
Salivary glands	0.0	0.0	0.5	0.4	0.0	0.0	0.4	0.0	1.2	0.3	0.4	0.4	0.3	0.0	0.3	1.2	1.2	C07-C08
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	C09
Other oropharynx	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	0.3	0.6	0.3	C10
Nasopharynx	0.6	1.1	0.0	0.0	0.0	2.9	0.0	0.9	0.0	0.0	0.0	0.4	0.0	0.3	0.3	0.0	0.4	C11
Hypopharynx	1.0	1.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.9	0.0	0.0	C12-C13
Pharynx unspecified	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	C14
Esophagus	1.1	1.0	1.0	3.1	1.8	0.9	1.2	3.3	2.5	0.0	0.7	0.5	0.4	1.9	0.3	0.3	1.7	C15
Stomach	6.5	5.4	6.5	4.1	3.0	5.2	4.0	3.8	3.3	2.5	2.0	4.1	3.3	2.5	3.3	2.4	1.8	C16
Small intestine	0.0	2.0	1.0	0.0	0.0	0.0	0.6	0.0	0.8	0.0	0.6	0.0	0.0	0.0	1.0	0.3	0.9	C17
Colorectum	6.3	6.4	9.0	5.3	6.5	8.7	10.3	8.5	13.4	13.3	10.4	7.2	11.0	13.6	13.3	12.6	14.7	C18-C21
Liver	1.1	4.9	7.3	0.5	3.5	3.4	1.4	3.8	3.3	2.9	4.0	2.4	0.8	3.0	5.5	2.2	3.8	C22
Gallbladder etc.	1.1	0.0	1.4	0.9	1.9	0.0	0.0	1.1	1.6	1.0	1.7	1.4	1.2	2.0	0.4	2.6	1.2	C23-C24
Pancreas	3.0	4.8	2.1	2.8	1.3	0.8	3.4	5.0	4.0	2.5	3.6	1.6	3.8	3.2	2.5	4.0	1.9	C25
Nose, sinuses etc.	0.0	0.0	1.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	C30-C31
Larynx	1.8	1.0	0.0	1.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	C32
Trachea, bronchus, lung	19.0	11.8	12.3	7.2	11.4	10.2	13.5	10.4	8.5	3.4	12.1	6.9	8.6	4.5	5.2	5.9	6.1	C33-C34
Other thoracic organs	0.0	1.1	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.5	0.5	0.0	0.4	0.3	0.0	0.0	0.0	C37-C38
Bone	0.8	1.4	1.4	0.0	0.0	0.8	0.0	0.4	0.4	0.0	1.0	0.8	0.0	1.2	0.0	0.3	1.7	C40-C41
Melanoma of skin	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C43
Other skin	2.4	4.5	1.9	2.6	0.0	1.5	1.3	2.0	3.2	1.0	0.8	0.0	0.7	0.4	0.0	1.8	1.0	C44
Mesothelioma	0.0	0.7	0.0	0.0	0.0	0.0	0.6	0.0	0.8	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.5	C45
Kaposi sarcoma	0.0	0.9	0.0	0.0	0.0	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	C46
Connective, soft tissue	0.0	0.5	0.0	0.0	1.3	0.4	0.0	1.0	1.1	0.0	0.3	0.7	0.7	0.6	1.3	2.8	0.3	C47;C49
Breast	30.8	48.4	57.2	56.9	34.6	44.8	45.8	59.1	56.4	58.1	43.6	37.7	43.7	45.8	53.9	67.7	65.6	C50
Other female genital organs	0.0	1.9	0.9	1.8	0.0	0.0	0.0	0.0	0.8	0.0	1.1	1.6	1.0	0.3	1.3	0.4	2.4	C51-C52; C57
Cervix Uteri	9.9	6.3	4.4	4.6	4.9	6.7	3.8	7.1	4.1	4.7	6.6	2.7	2.7	3.5	2.9	3.7	3.1	C53
Corpus Uteri	5.1	4.3	2.5	5.2	8.2	5.7	9.4	4.0	3.8	8.1	2.0	4.4	6.7	6.8	4.1	8.0	6.7	C54
Uterus unspecified	0.6	0.0	3.0	1.6	2.5	0.0	1.7	2.0	2.3	6.7	2.4	1.9	0.7	1.6	1.8	0.9	2.2	C55
Ovary	10.6	6.4	8.2	8.3	3.7	9.0	7.8	5.7	8.0	3.0	5.2	3.0	3.5	8.6	9.9	4.7	9.7	C56
Placenta	0.4	0.0	0.0	0.4	0.0	0.0	0.4	0.4	0.4	0.3	0.0	0.0	0.3	0.0	0.4	0.0	0.0	C58
Kidney, ureter, pelvis etc.	2.0	4.2	5.6	4.2	1.3	4.2	2.0	2.5	1.9	3.3	2.8	0.0	0.0	1.1	1.9	0.7	1.6	C64-C66; C68
Bladder	3.1	5.4	3.7	5.0	1.7	1.6	1.7	2.4	1.7	2.7	0.3	1.4	2.5	4.7	1.7	1.0	3.7	C67
Eye	0.0	0.4	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	C69
Brain, nervous system	0.0	1.0	0.9	0.0	2.2	2.6	1.7	2.0	3.8	0.9	2.1	1.5	4.1	3.7	1.8	3.0	3.0	C70-C72
Thyroid	3.7	10.7	8.1	7.7	6.4	7.1	6.4	10.8	3.5	4.9	4.2	2.2	3.5	5.0	4.1	4.8	11.2	C73
Adrenal gland	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	0.3	0.0	0.0	0.3	C74
Other endocrine glands	0.0	0.4	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.3	0.0	0.3	0.3	C75
Hodgkin's disease	1.0	2.9	1.8	3.5	0.0	1.3	0.4	2.5	0.8	1.5	0.6	2.5	1.0	0.6	1.9	3.3	2.2	C81
Non-Hodgkin lymphoma	4.4	8.3	5.1	4.3	7.8	3.7	5.8	7.7	4.9	3.5	3.9	2.6	6.0	7.8	5.5	7.6	6.2	C82-C85;C96
Immunoproliferative dis	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	C88
Multiple Myeloma	2.0	1.0	1.9	1.0	1.9	0.0	0.8	2.5	0.8	2.7	1.2	1.6	2.2	2.1	0.9	2.3	0.8	C88; C90
Lymphoid leukemia	2.7	0.8	1.7	0.8	0.9	0.0	2.5	1.3	1.4	0.4	1.6	0.8	0.3	1.3	1.4	0.3	0.6	C91
Myeloid leukemia	3.7	3.3	0.0	0.9	2.6	1.6	2.5	2.7	1.8	1.1	3.0	2.6	1.4	1.9	1.5	0.3	2.8	C92-C94
Leukemia unspecified	1.0	0.0	0.9	1.4	0.7	0.0	0.9	0.5	2.9	1.3	0.4	1.4	0.7	3.2	0.3	1.0	0.5	C95
Other & unspecified	2.9	6.8	8.1	3.4	3.5	4.4	5.9	6.2	7.6	2.5	3.2	1.6	4.0	3.2	2.6	4.5	4.6	Other
TOTAL	134.0	162.9	160.3	140.2	114.1	128.9	140.0	161.6	151.4	133.9	122.3	99.9	116.2	136.0	133.4	154.0	166.2	

Figure 10 Age-Standardized Incidence Rates of Cancers among Bahrainis by Year, 1998-2014

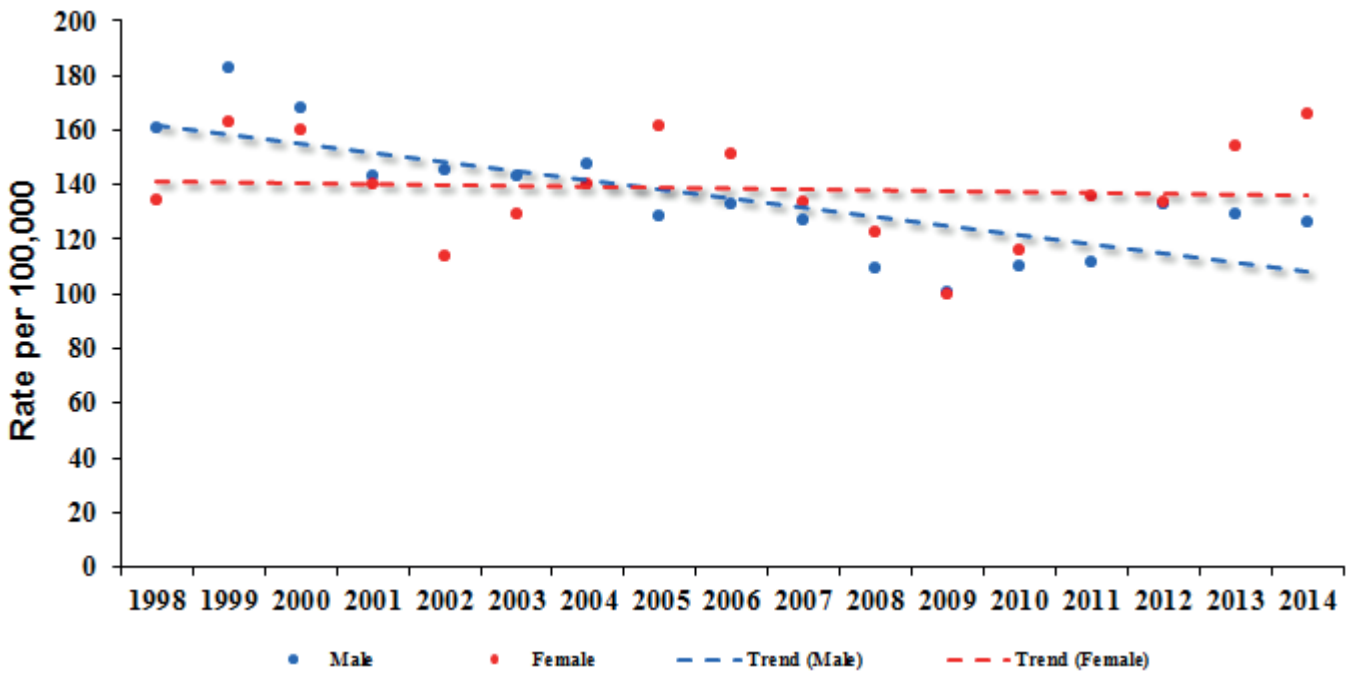
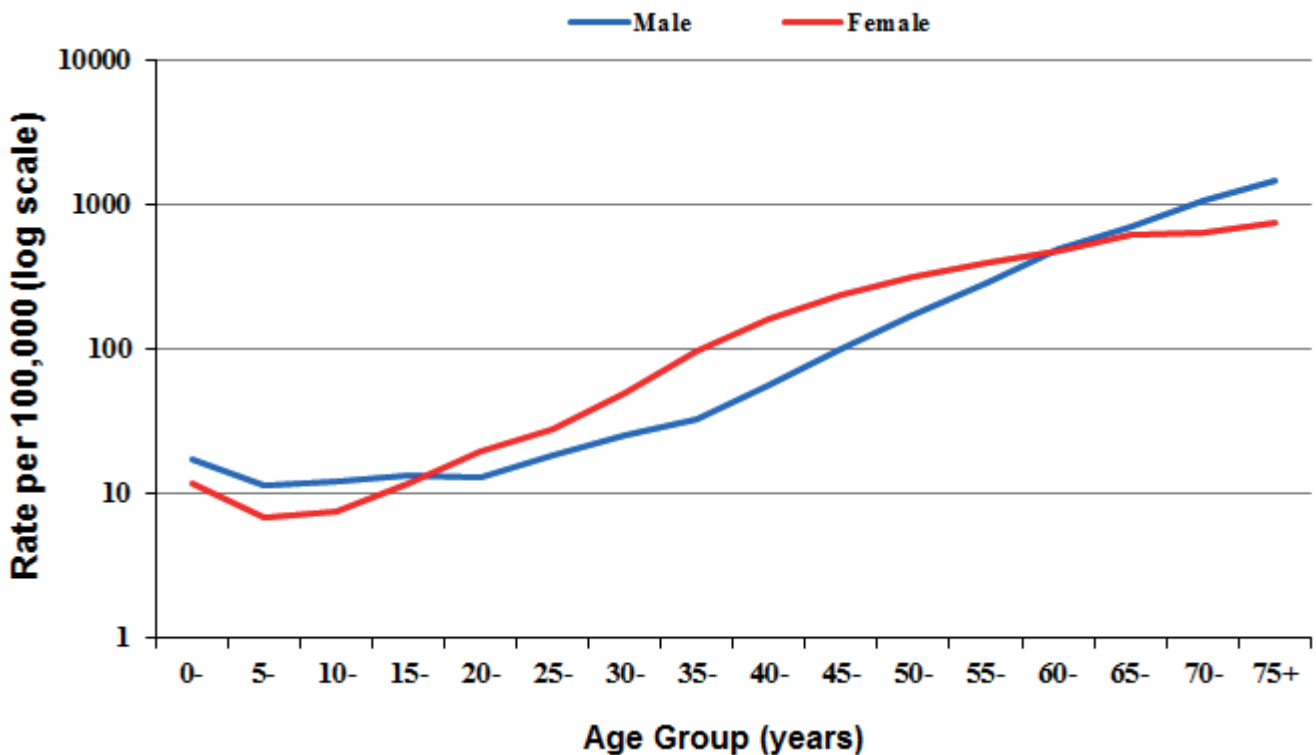


Figure 11 Average Annual Age-Specific Incidence Rates of Cancers among Bahrainis, 1998-2014



MOST COMMON CANCERS IN BAHRAINIS, 1998-2014

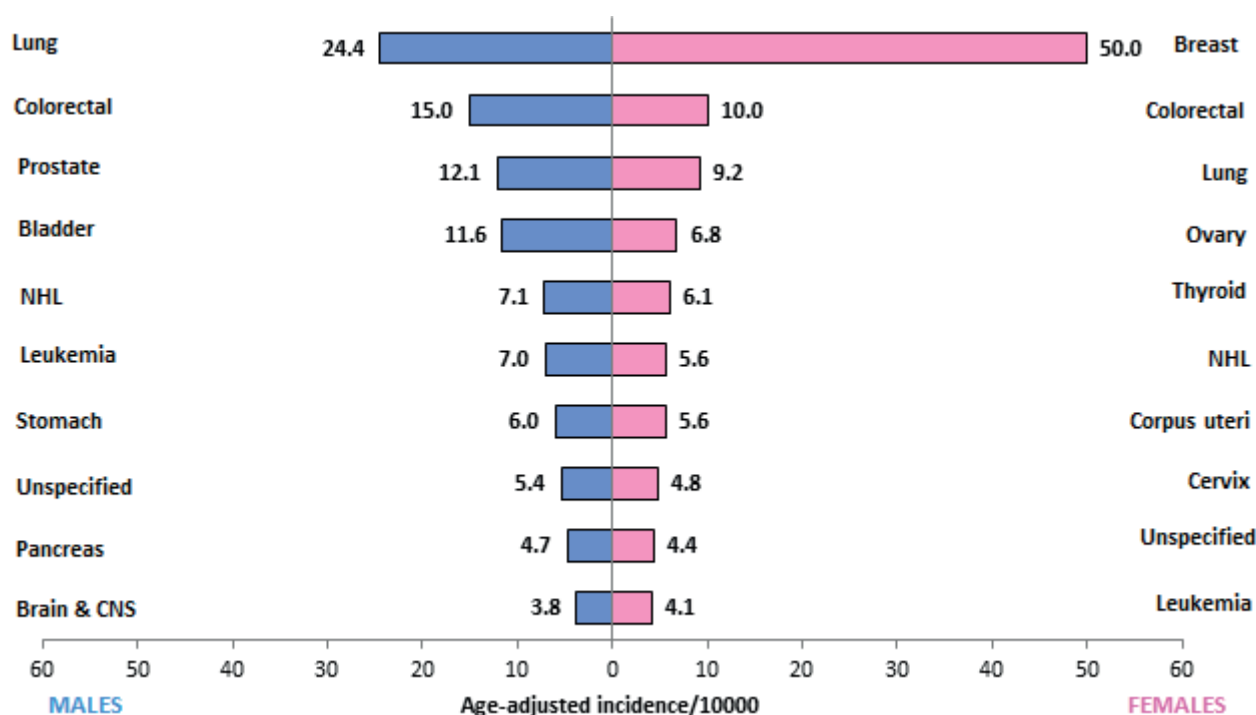
Between 1998 and 2014, lung cancer was observed to be the leading malignancy in Bahraini males (582 new cases), followed by cancers of the colorectal, prostate, bladder, and leukemia. Breast cancer was the leading malignancy in Bahraini females with 1,656 new cases, followed by cancers of the colorectal, lung, thyroid, and ovary (Table 8 and Figure 12).

Trends of average annual ASRs and age-specific incidence rates of the 5 common cancers among Bahraini males and females are presented in Figure 13 to Figure 16.

Table 8 Most Common Cancers among Bahraini Nationals, 1998-2014

MALES (N = 3,717)				FEMALES (N = 4,296)			
Site	No.	%	ASR	Site	No.	%	ASR
Lung	582	15.7	24.4	Breast	1656	38.5	50.0
Colorectal	427	11.5	15.0	Colorectal	323	7.5	10.0
Prostate	308	8.3	12.1	Lung	221	5.1	9.2
Bladder	289	7.8	11.6	Thyroid	213	5.0	6.1
Leukemia	240	6.5	7.0	Ovary	211	4.9	6.8
NHL	229	6.2	7.1	NHL	171	4.0	5.6
Stomach	147	4.0	6.0	Corpus Uteri	165	3.8	5.6
Unspecified	141	3.8	5.4	Leukemia	146	3.4	4.1
Brain & CNS	135	3.6	3.8	Cervix Uteri	137	3.2	4.8
Pancreas	125	3.4	4.7	Unspecified	109	2.5	4.4

Figure 12 Most Common Cancers among Bahraini Nationals by ASR, 1998-2014



MOST COMMON CANCERS IN MALES

LUNG CANCER

During the 17-year period, lung cancer accounted for 15.7% of all incident cancers in males with an average annual ASR of 24.4/100,000 people. The incidence of lung cancer was observed to dramatically decline from 1998 to 2014. The lowest ASR (12.9/100,000) was reported in 2009 and the highest (36.7/100,000) in 1998. This could be due to the stringent tobacco control and preventive anti-smoking measures led by government and non-government bodies during this period.⁵ On an average, incidence begins at 30 years of age and was found to increase sharply with age, with the highest rates observed in males over 75 years of age (Figure 13 and Figure 14).

COLORECTAL CANCER

Colorectal cancer accounted for 11.5% of all incident cancers in males with an average annual ASR of 15.0/100,000 people. The trend of colorectal cancer incidence continued to rise steadily over the years; the lowest ASR (10.7/100,000) was reported in 2007 and the highest (21.9/100,000) in 2012. Age-specific incidence among males begins in the 20-25-year age group and steadily rises to peak in the 70-74-year age group (Figure 13 and Figure 14).

PROSTATE CANCER

Prostate cancer was the third most common cancer in Bahraini males and accounted for 8.3% of all incident cancers in Bahraini males, with an average annual ASR of 12.1/100,000 people. Incidence was observed to decline slowly over time. The lowest ASR (4.6/100,000) was reported in 2009 and the highest (19.3/100,000) in 2000. Age-specific incidence of prostate cancer follows a pattern of sharp incline similar to that of lung cancer, but with a delayed start during late adulthood (Figure 13 and Figure 14).

BLADDER CANCER

Bladder cancer accounted for 7.8% of all incident cancers in men, with an average annual ASR of 11.6/100,000 people. Incidence had a tendency to decline during the 17-year period; the lowest ASR (6.4/100,000) was reported in 2009 and the highest (23.6/100,000) in 1999. Although a few childhood cases were reported in 2012, bladder cancer generally appears in early adulthood and directly increases with age after the age of 50 years (Figure 13 and Figure 14).

LEUKEMIA

Leukemia was the fifth most common male cancer and accounted for 6.5% of all incident cancer cases in Bahraini males. The average annual ASR was 7.0/100,000 people. A decreasing ASR trend is observed from 1998 to 2014; the lowest ASR (3.9/100,000) was reported in 2009 and the highest (17.5/100,000) in 1998. Leukemia incidence has an initial peak at infancy and then increases with advancing age after 40 years to reach its highest peak at age 75 and above (Figure 13 and Figure 14).

MOST COMMON CANCERS – 1998-2014

Figure 13 Age-Standardized Incidence Rates of Most Common Cancers among Bahraini Males, 1998-2014

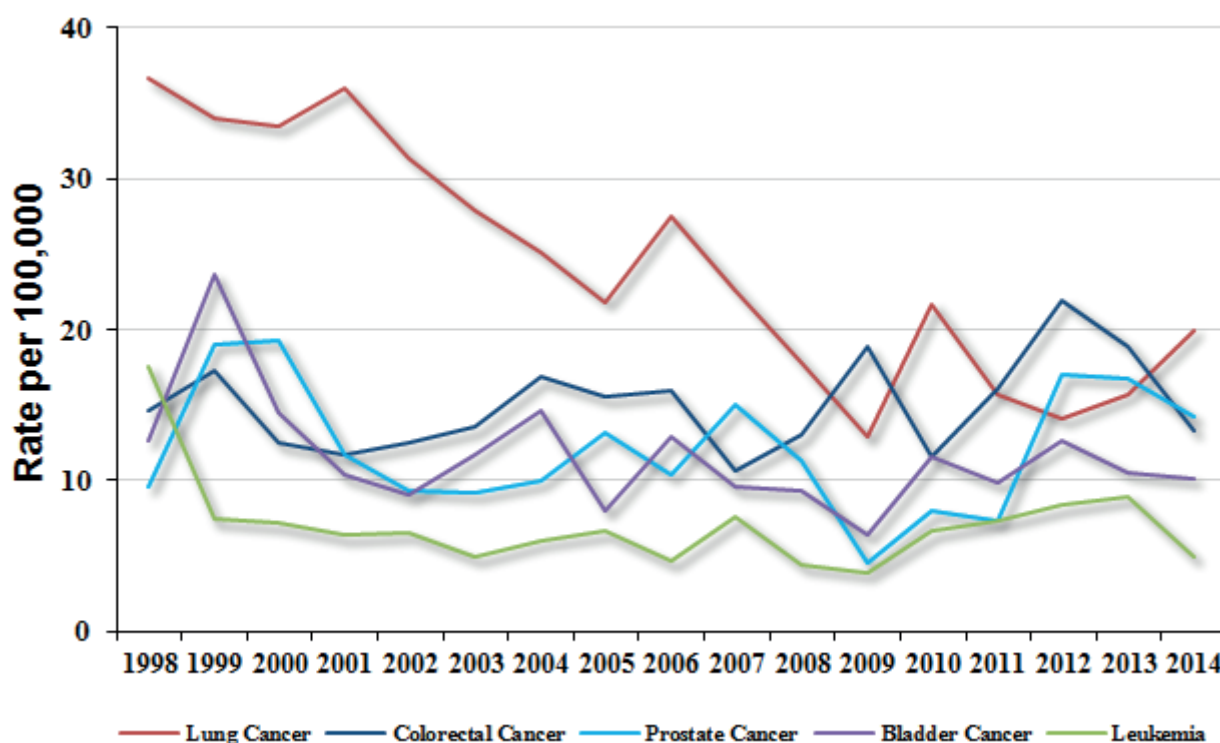
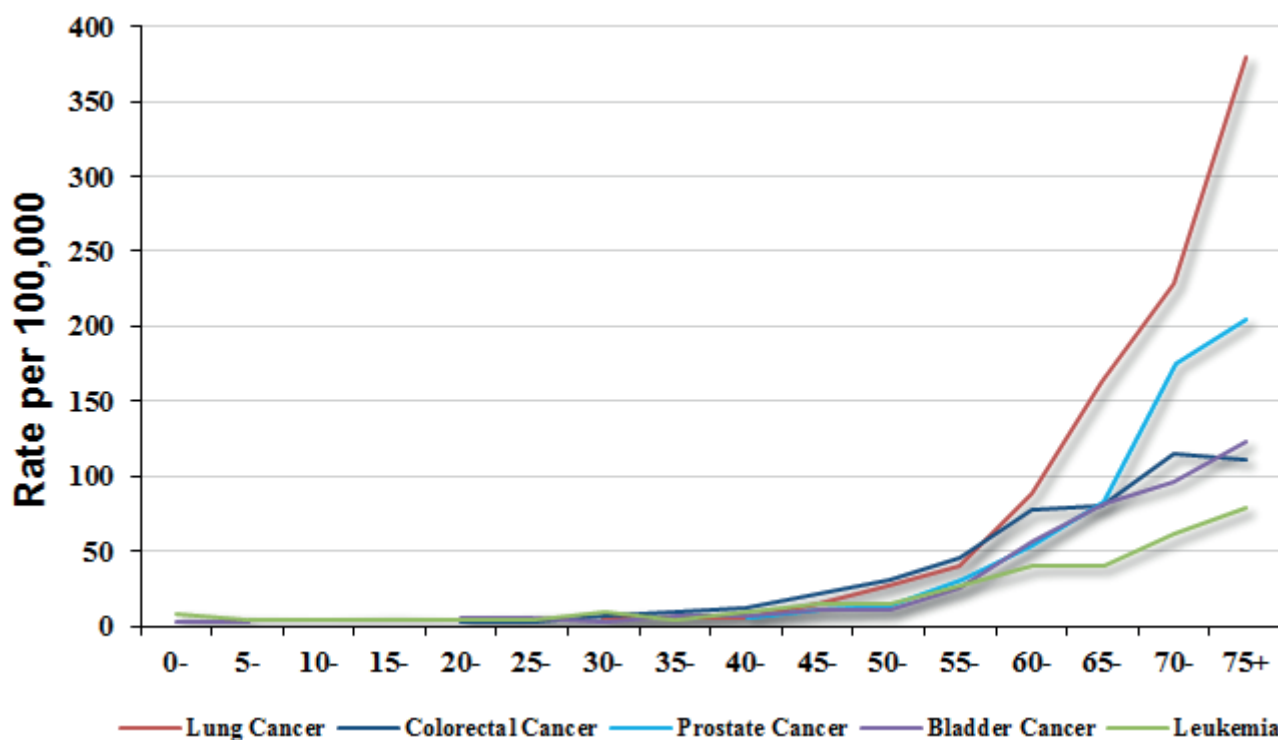


Figure 14 Average Annual Age-Specific Incidence Rates of Most Common Cancers among Bahraini Males, 1998-2014



MOST COMMON CANCERS IN FEMALES

BREAST CANCER

Breast cancer is by far the most common female cancer and accounted for 38.5% of all incident cancer cases in Bahraini women between 1998 and 2014, with an average annual ASR of 50.0/100,000 people. Breast cancer incidence was observed to have an increasing trend over the 17-year period with a dramatic incline after 2009; the lowest ASR (30.8/100,000) was noted in 1998 and the highest (67.7/100,000) in 2013. The implementation of the mammography-based mass breast screening program in 2005 could account for the rise in incidence during 2005-2009.⁵ The age-specific incidence follows a bimodal distribution among Bahraini females with the 1st peak at 45-50 years and the second peak in the 65-69-year age group (Figure 15 and Figure 16).

COLORECTAL CANCER

Colorectal cancer accounted for 7.5% of all incident cancers in females with an average annual ASR of 10.0/100,000 people. Female incidence rates demonstrated a steady increase over the years. The ASR was lowest (5.3/100,000) in 2001 and highest (14.7/100,000) in 2014. Age-specific incidence rates indicate a slow and gradual increase with age, with a peak in the 50-55-year and 70-75-year age groups (Figure 15 and Figure 16).

LUNG CANCER

During the 17-year period, lung cancer accounted for 5.1% of all new female cancers, with an average annual ASR of 9.2/100,000 people. Lung cancer incidence in females also showed a decline, though less dramatic than that in males. The lowest ASR (3.4/100,000) was reported in 2007 and the highest (19.0/100,000) in 1998. As with Bahraini males, lung cancer incidence was found to steadily increase with age, with a sharper incline from 60 years of age (Figure 15 and Figure 16).

THYROID CANCER

Thyroid cancer was the 4th most common female cancer between 1998 and 2014 and accounted for 5% of all incident cancer cases in Bahraini women, with an average annual ASR of 6.1/100,000 people. Incidence of thyroid cancer appeared to decline slowly across the years; the ASR was lowest (2.2/100,000) in 2009 and highest (11.2/100,000) in 2014. Cases were seen in females as young as 15 years of age, and incidence was found to increase with age, with peaks at 60-64 years and at 75 years and over (Figure 15 and Figure 16).

OVARIAN CANCER

Ovarian cancer accounted for 4.9% of all incident cases in females, with an average annual ASR of 6.8/100,000 people. Incidence decreased from 1998 to 2014; the lowest ASR (3.0/100,000) was reported in 2009 and 2007 and the highest (10.6/100,000) in 1998. Ovarian cancer begins in childhood at 5 years of age and incidence was observed to rise at 35-39 years to peak at 70-75 years (Figure 15 and Figure 16).

MOST COMMON CANCERS – 1998-2014

Figure 15 Age-Standardized Incidence Rates of Most Common Cancers among Bahraini Females, 1998-2014

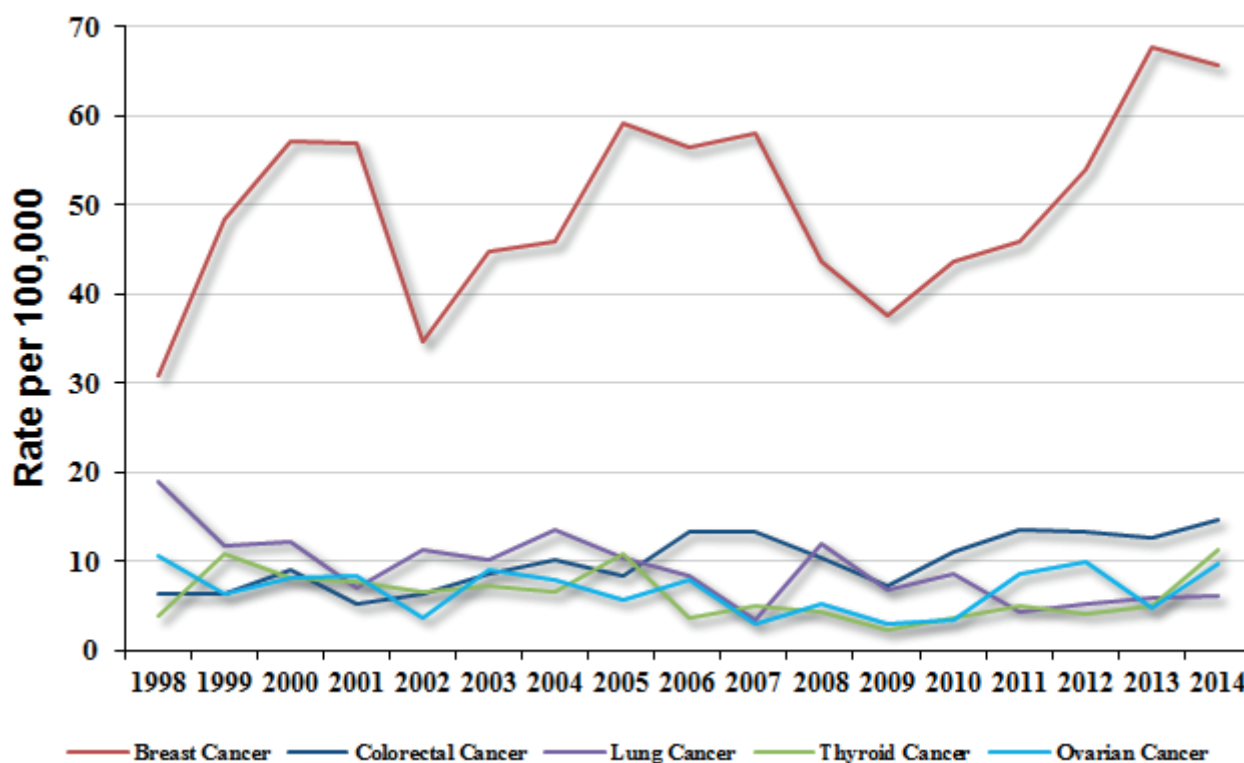
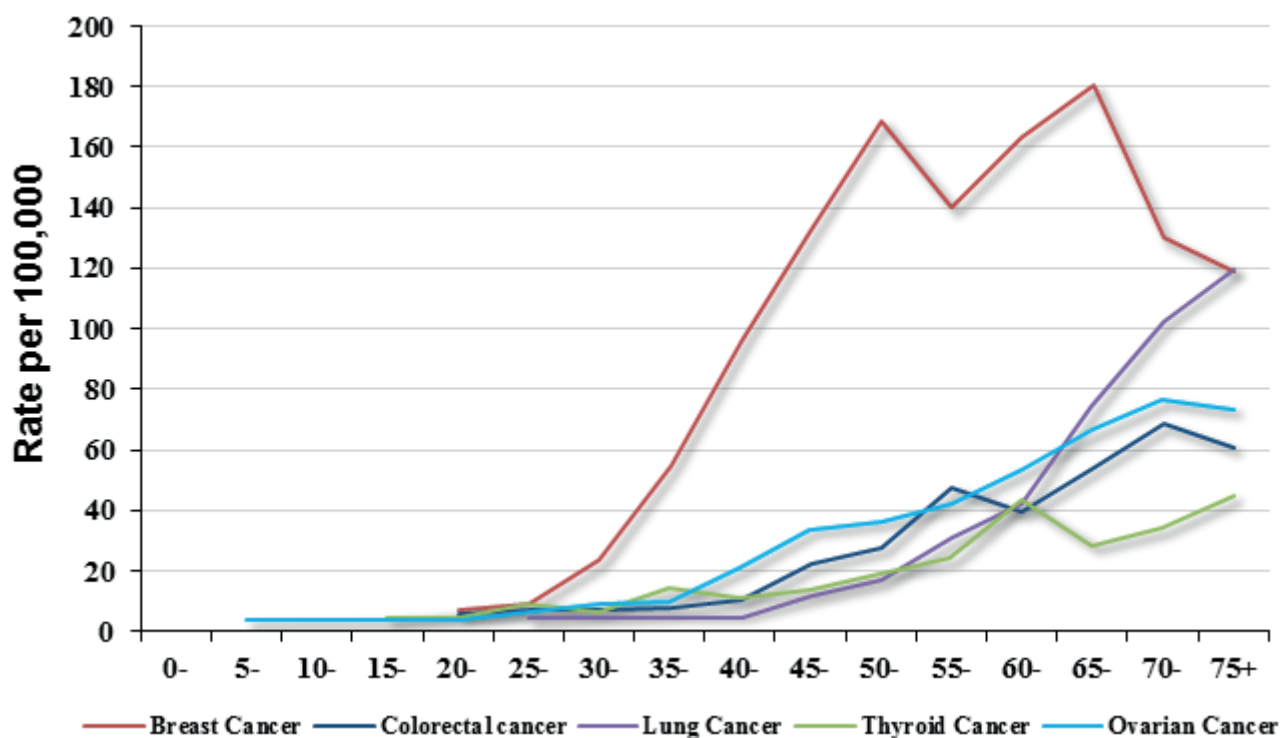


Figure 16 Average Annual Age-Specific Incidence Rates of Most Common Cancers among Bahraini Females, 1998-2014



SUMMARY OF COMMON CANCERS IN BAHRAINIS BY YEAR, 1998-2014

Figure 17 Ten Leading Types of Cancer among Bahrainis, 1998

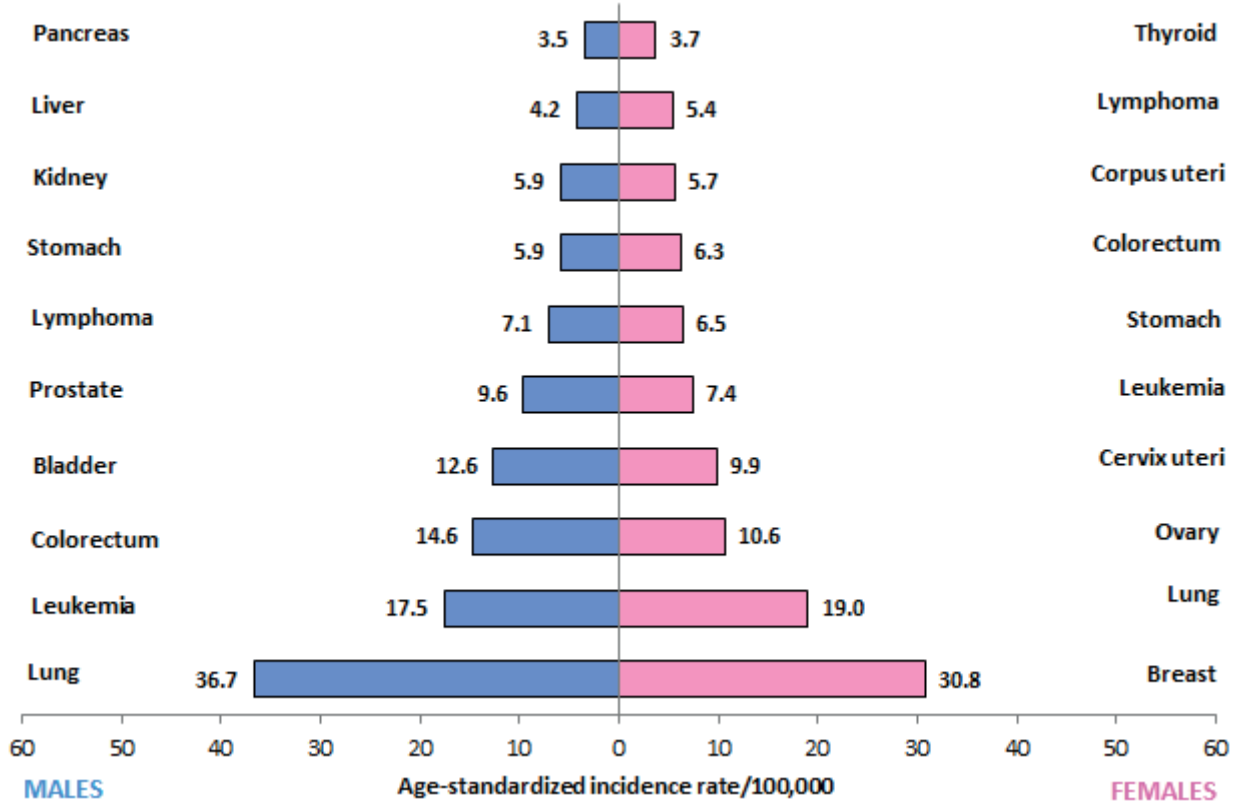


Figure 18 Ten Leading Types of Cancer among Bahrainis, 1999

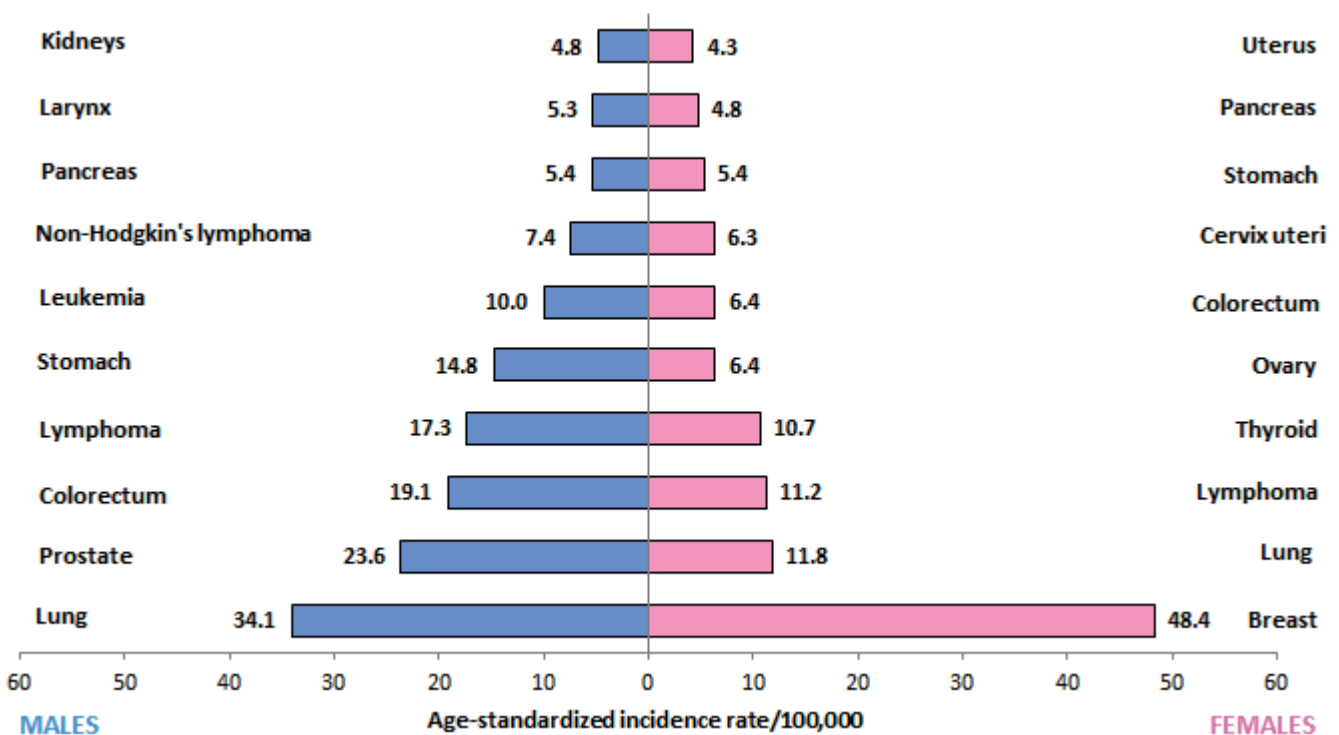


Figure 19 Ten Leading Types of Cancer among Bahrainis, 2000

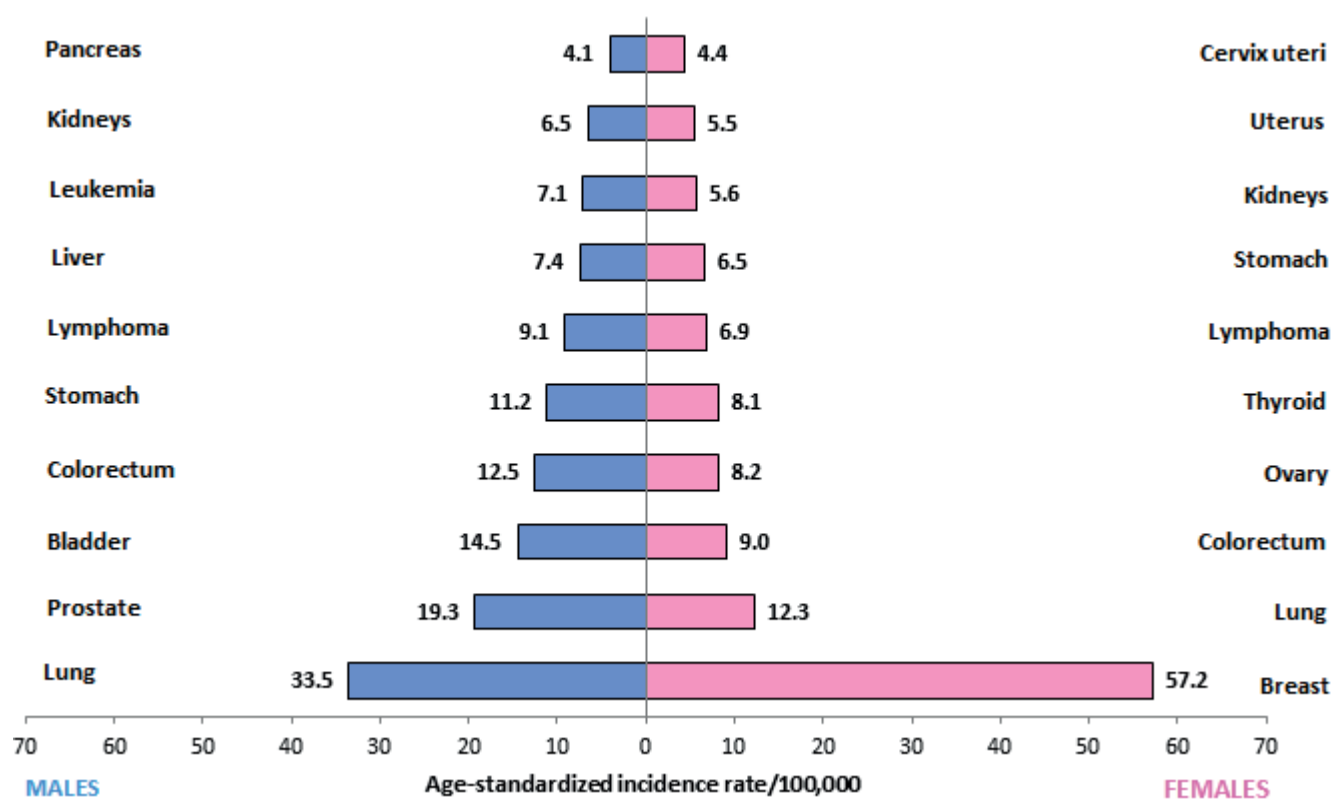


Figure 20 Ten Leading Types of Cancer among Bahrainis, 2001

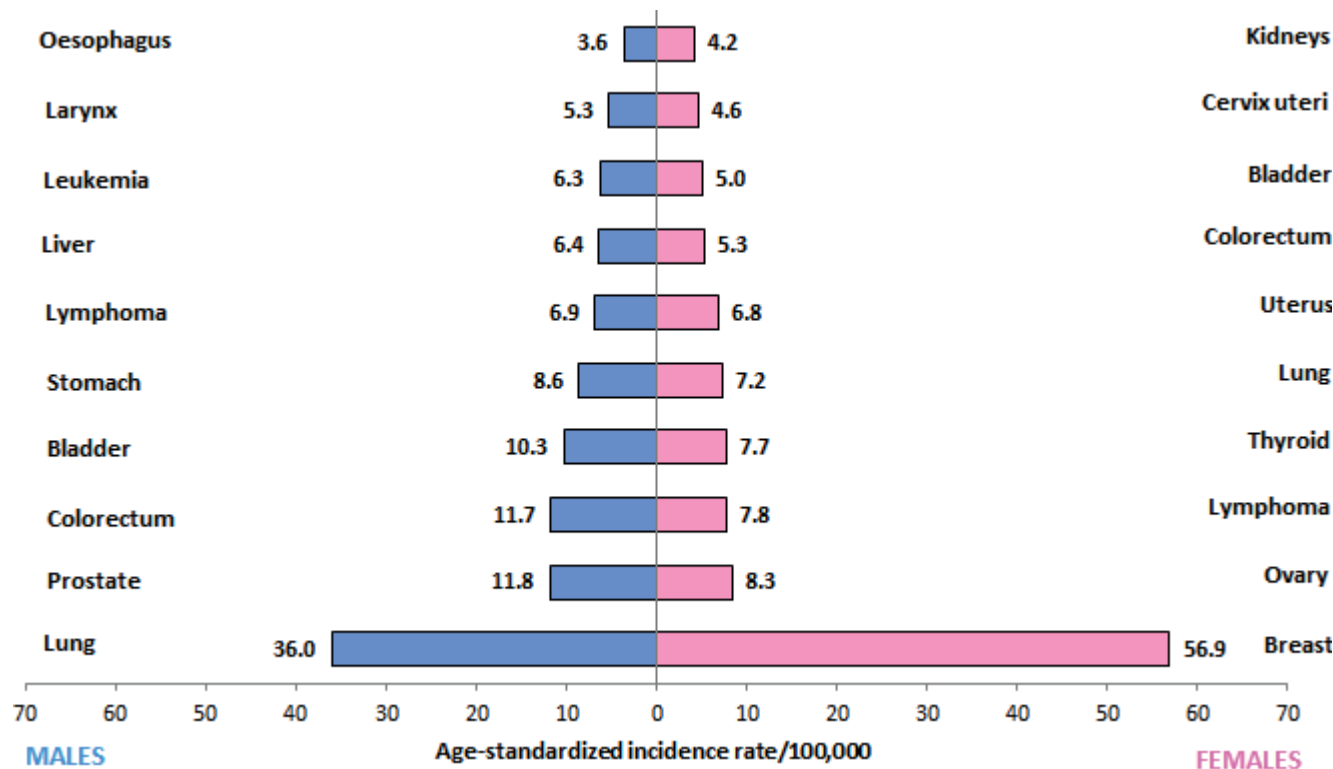


Figure 21 Ten Leading Types of Cancer among Bahrainis, 2002

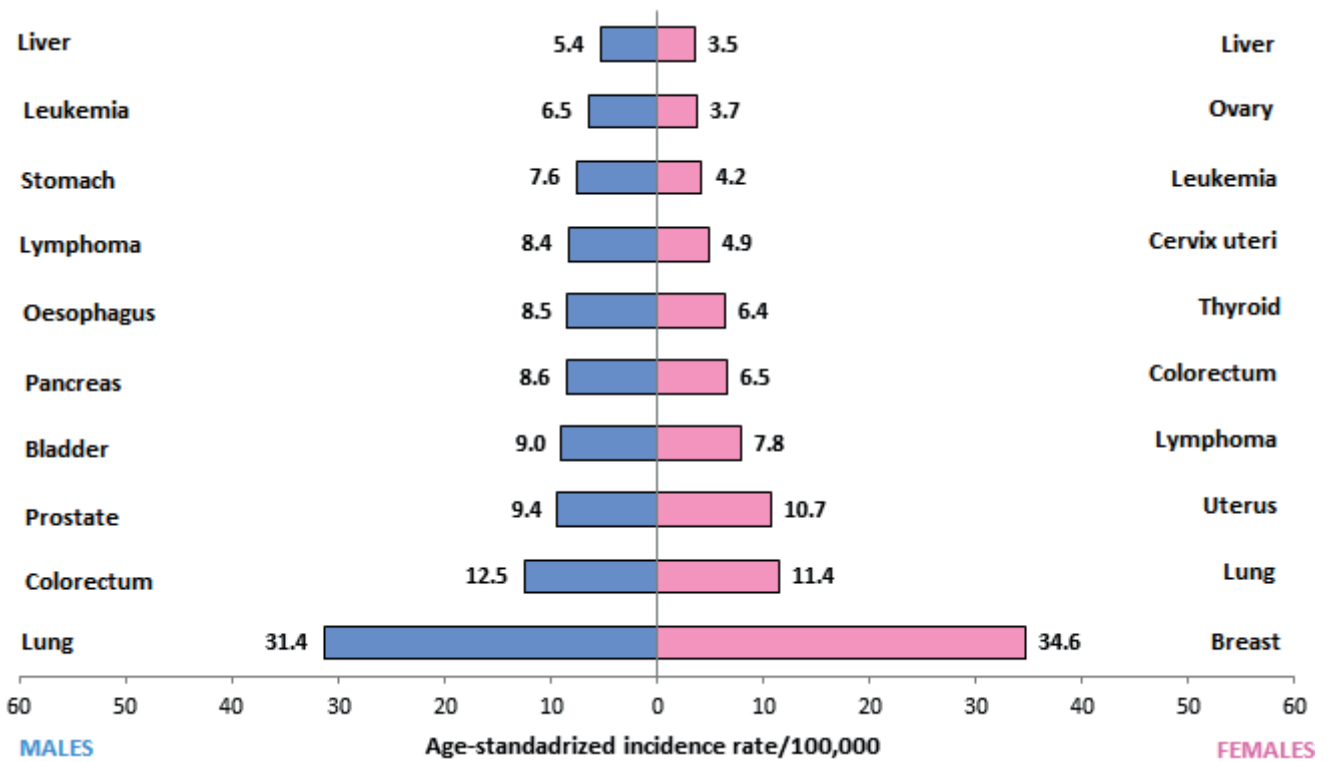


Figure 22 Ten Leading Types of Cancer among Bahrainis, 2003

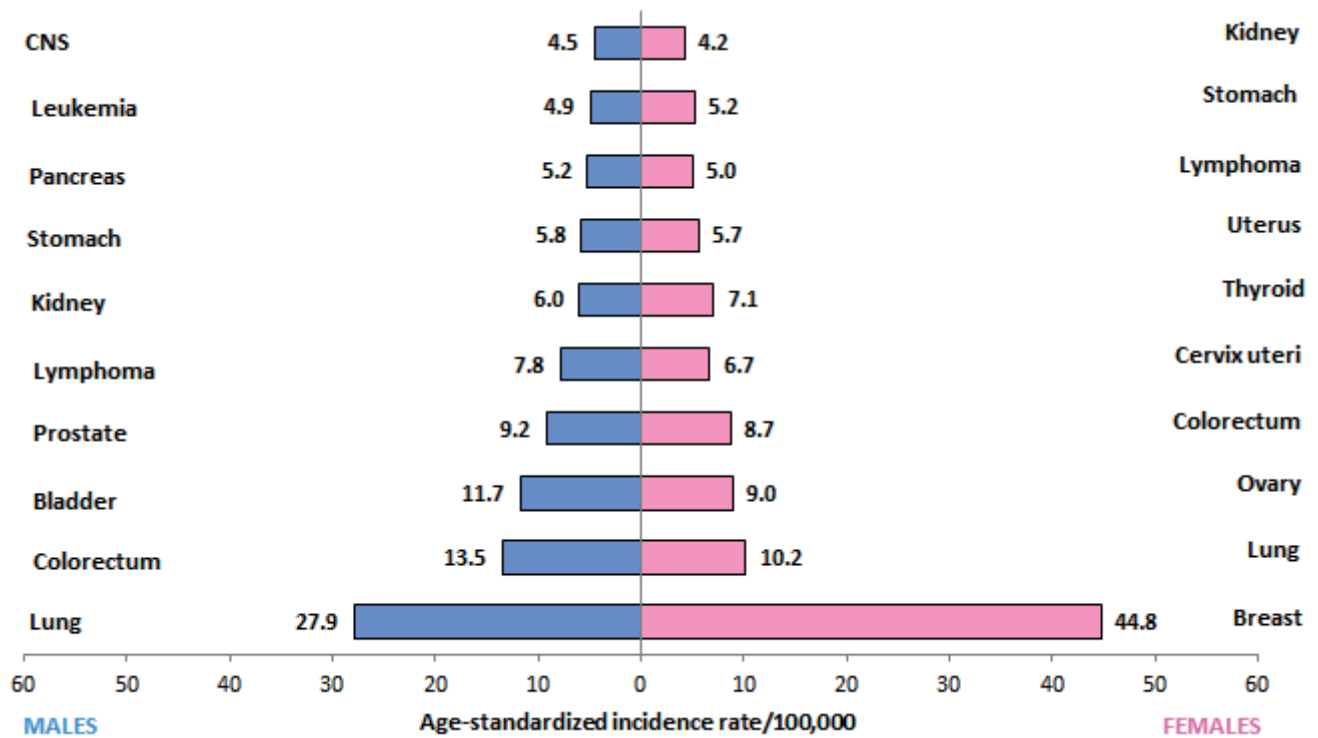


Figure 23 Ten Leading Types of Cancer among Bahrainis, 2004

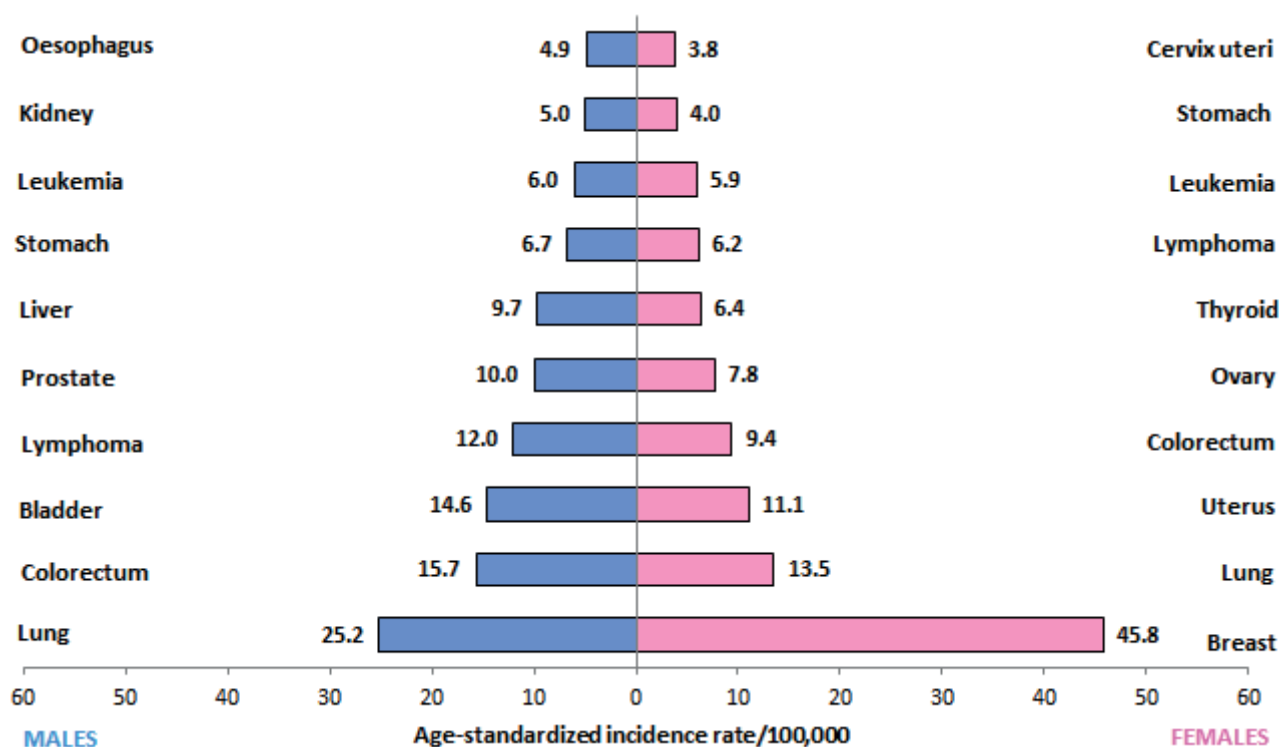


Figure 24 Ten Leading Types of Cancer among Bahrainis, 2005

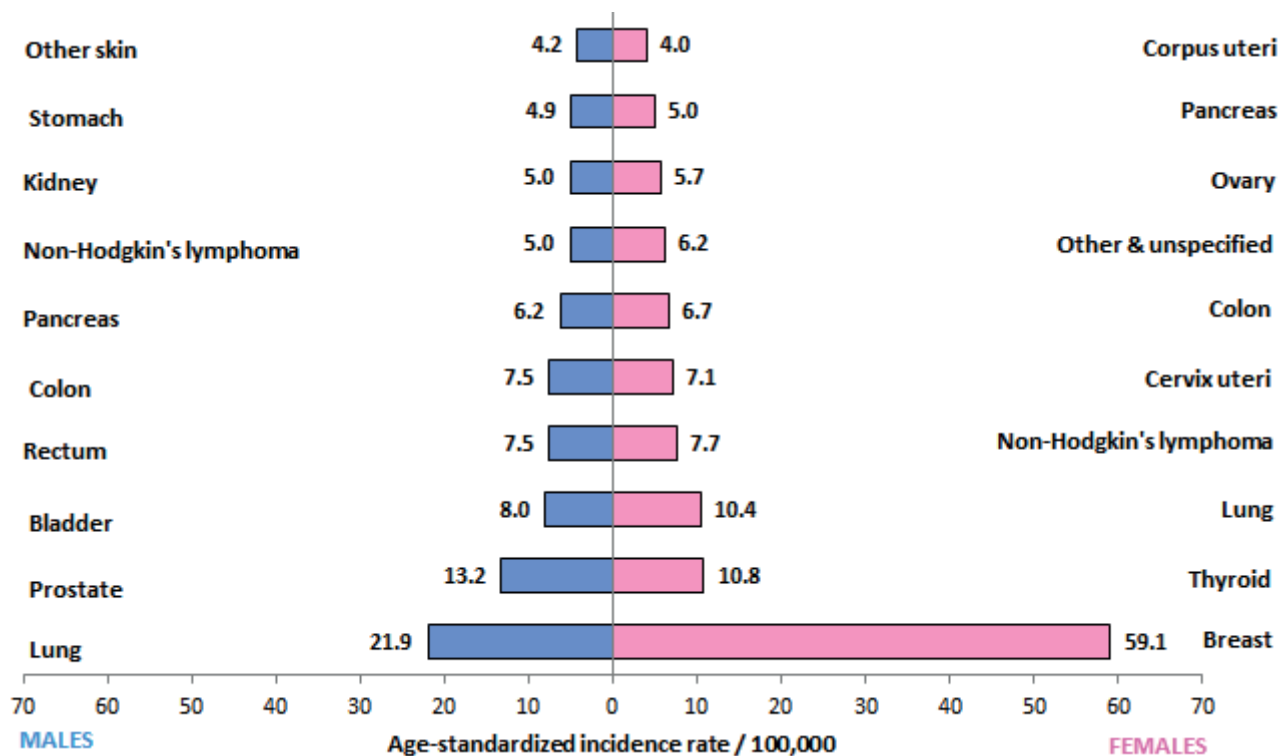


Figure 25 Ten Leading Types of Cancer among Bahrainis, 2006

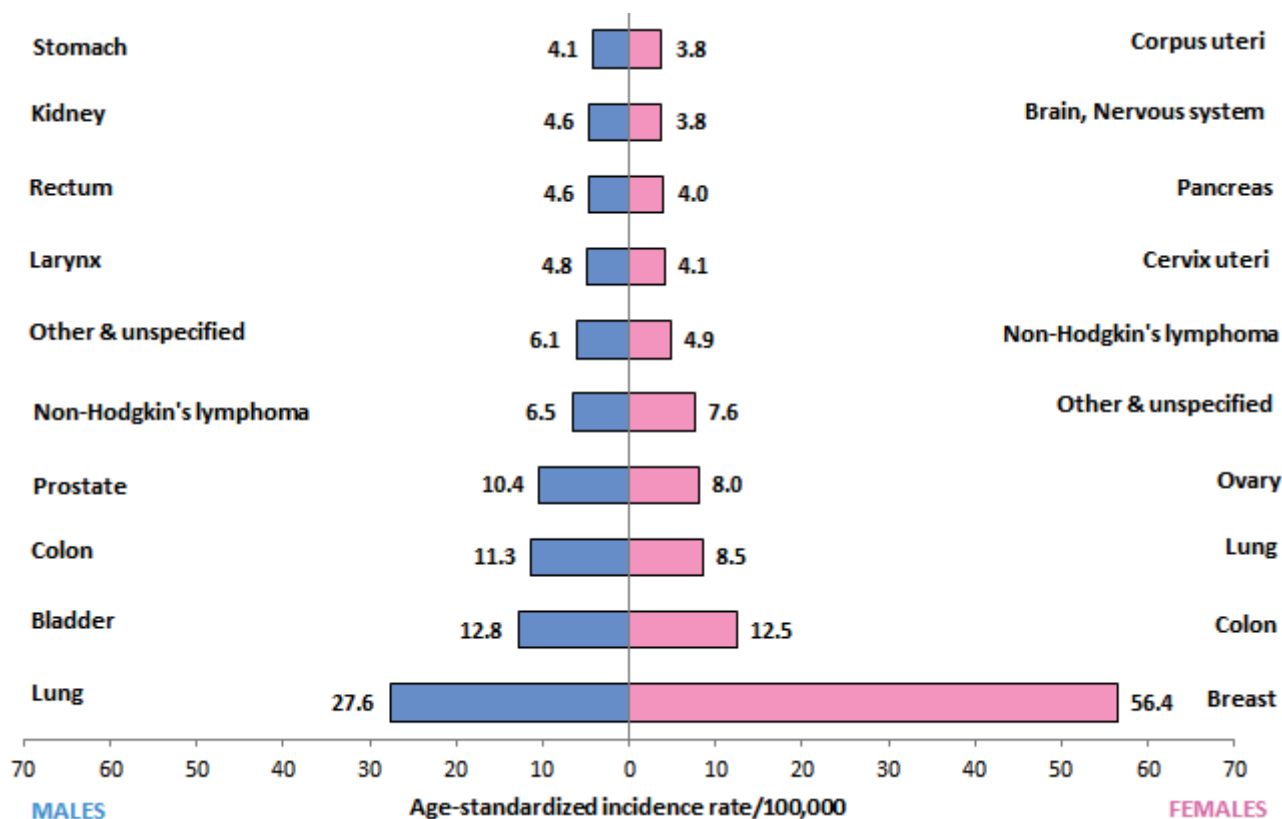


Figure 26 Ten Leading Types of Cancer among Bahrainis, 2007

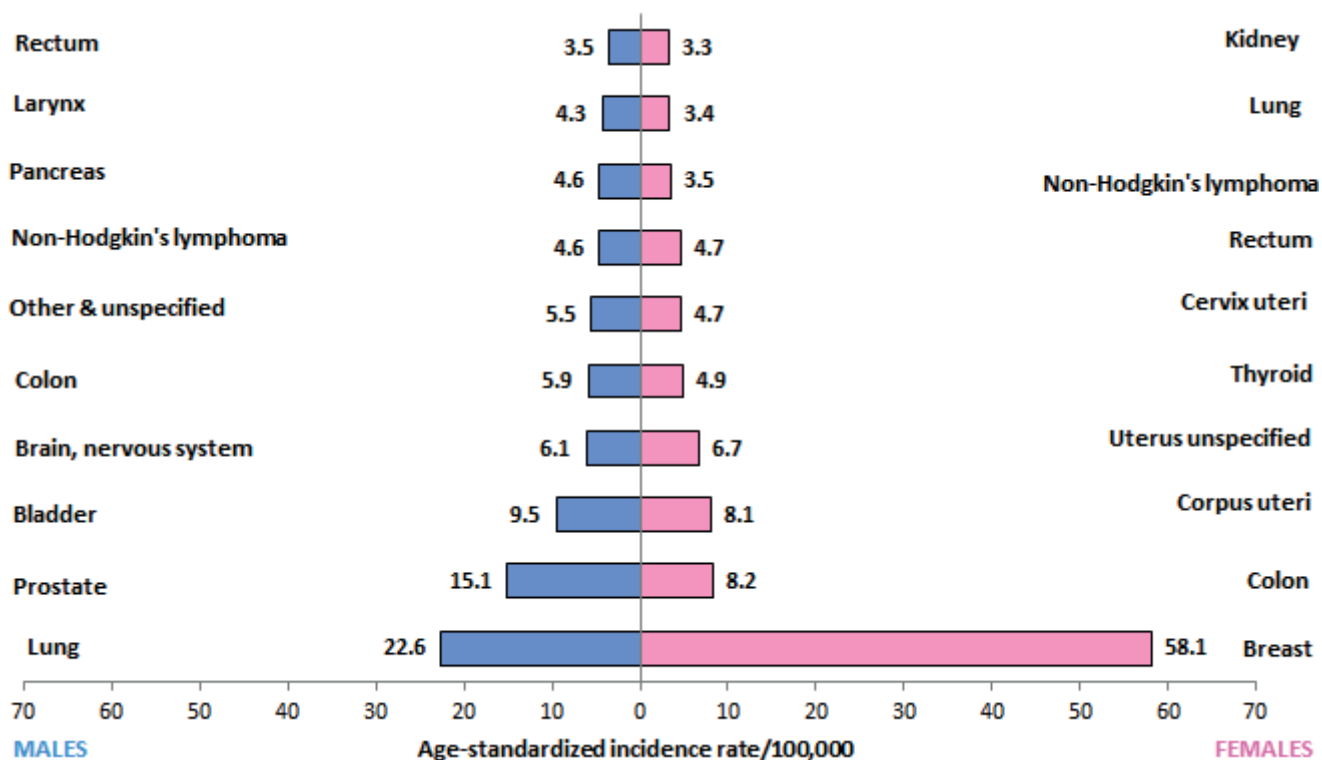


Figure 27 Ten Leading Types of Cancer among Bahrainis, 2008

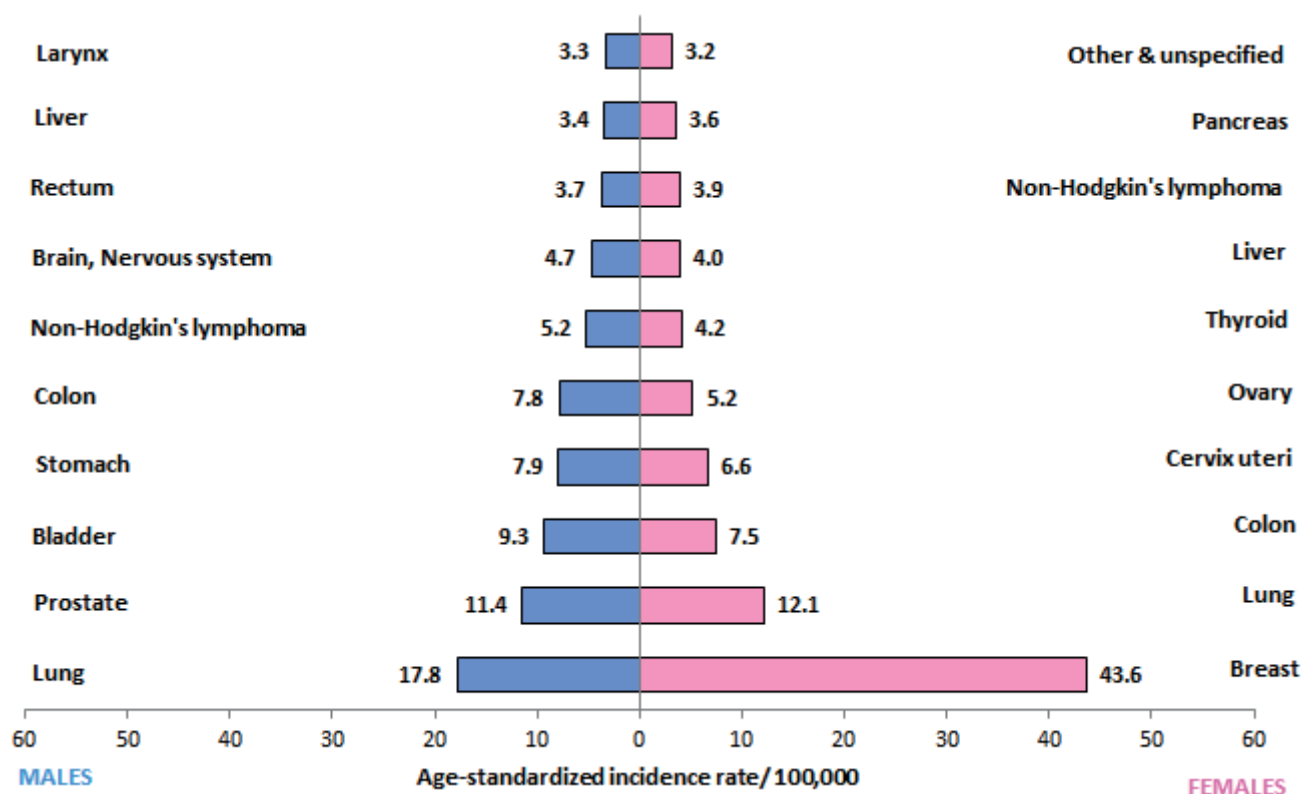


Figure 28 Ten Leading Types of Cancer among Bahrainis, 2009

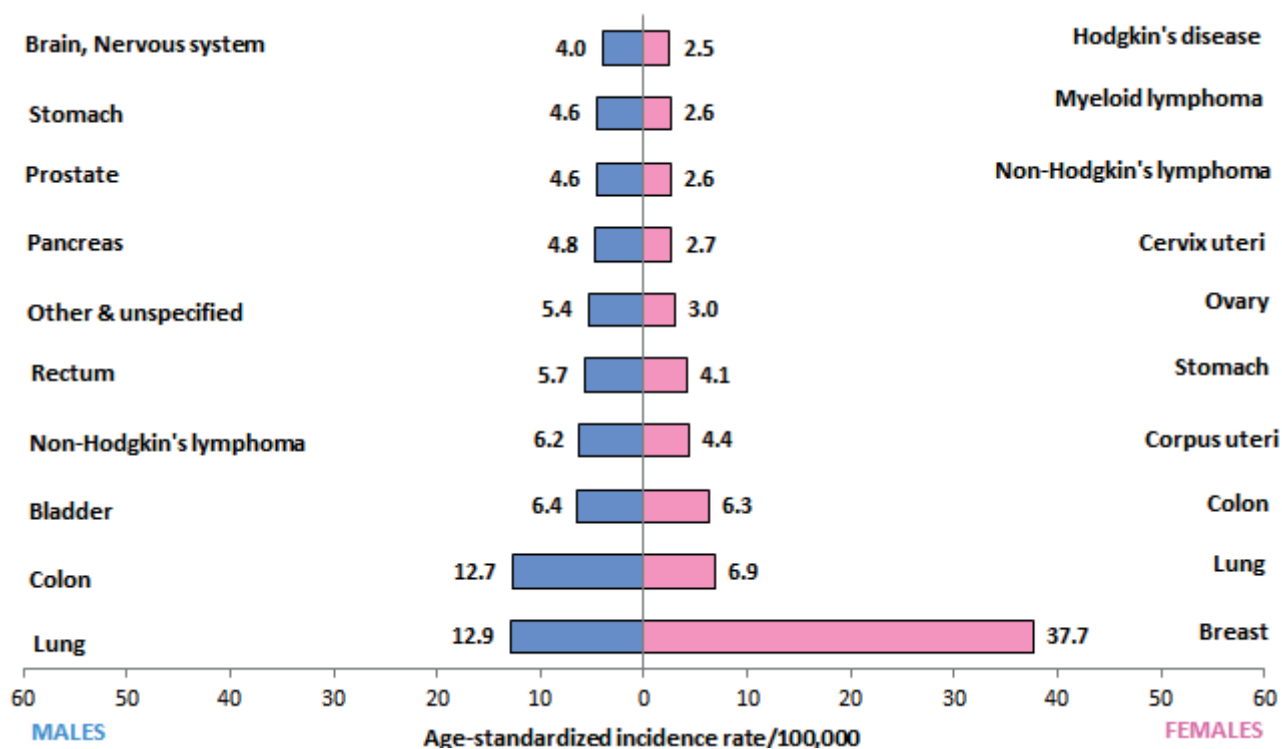


Figure 29 Ten Leading Types of Cancer among Bahrainis, 2010

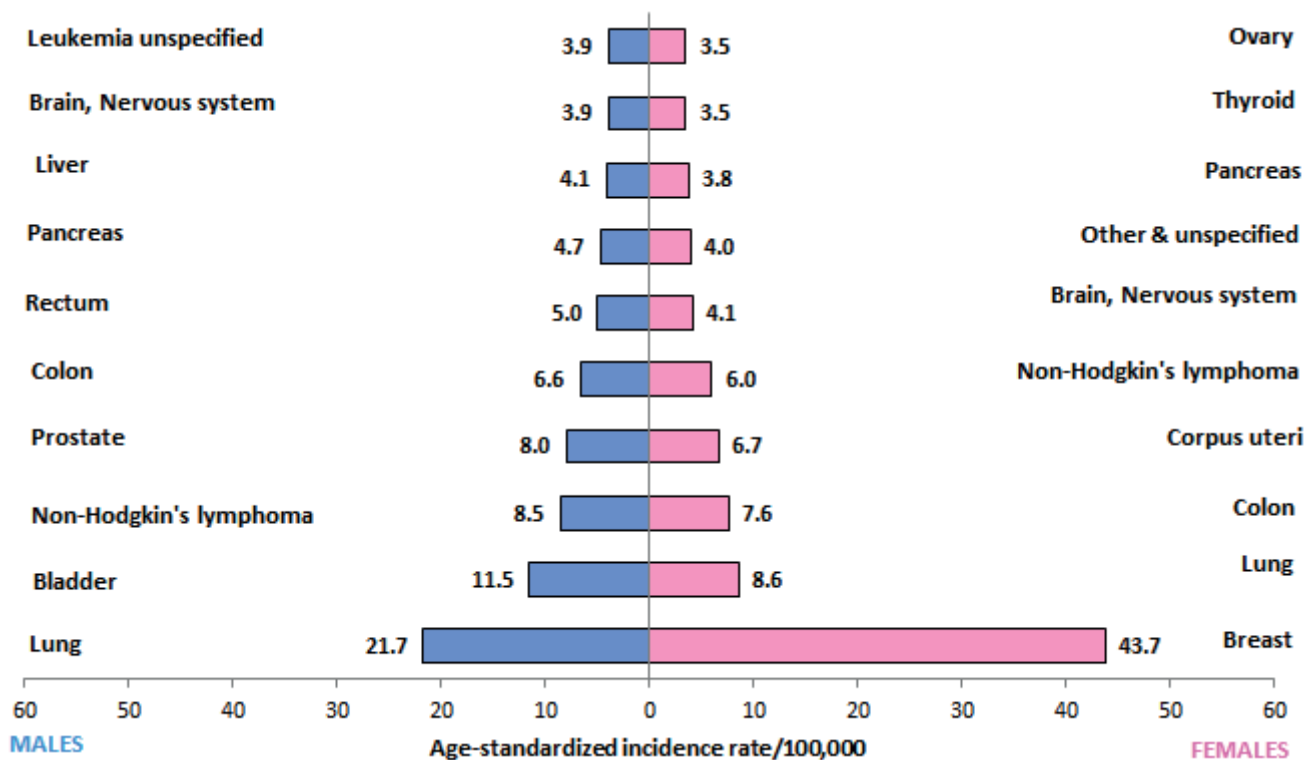


Figure 30 Ten Leading Types of Cancer among Bahrainis, 2011

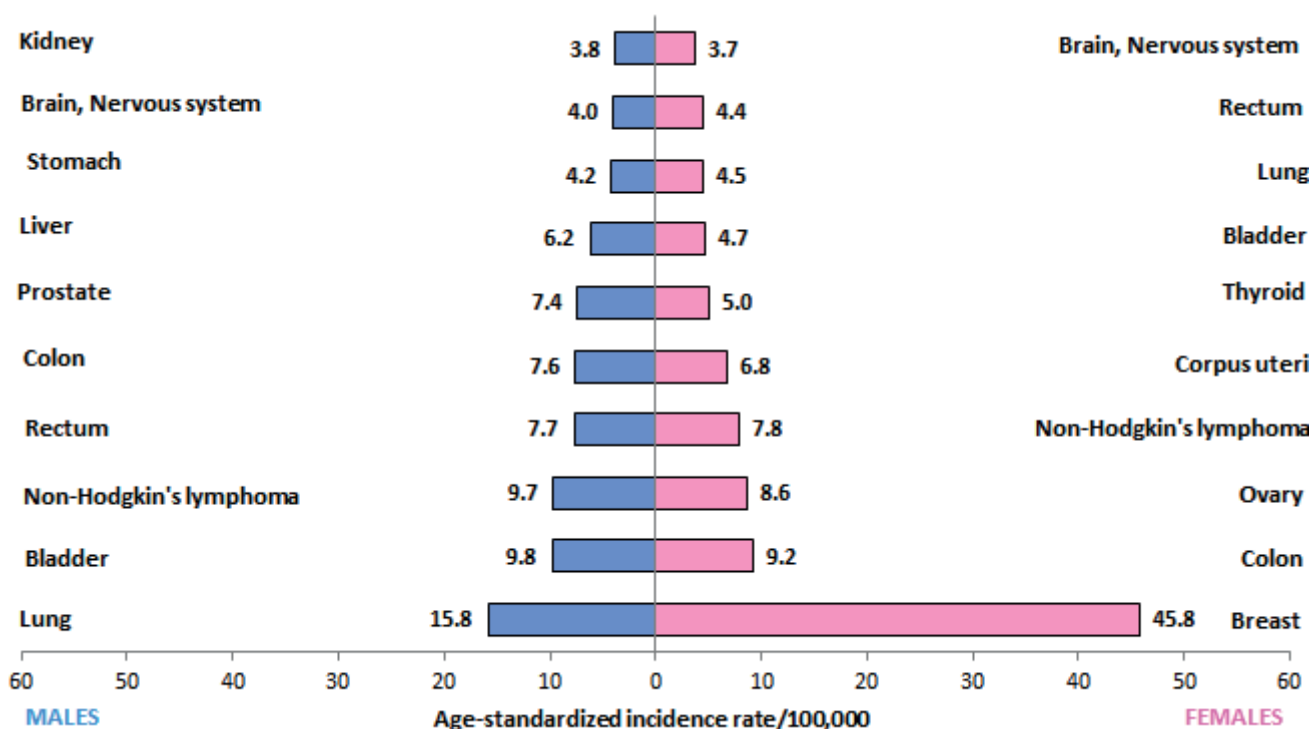


Figure 31 Ten Leading Types of Cancer among Bahrainis, 2012

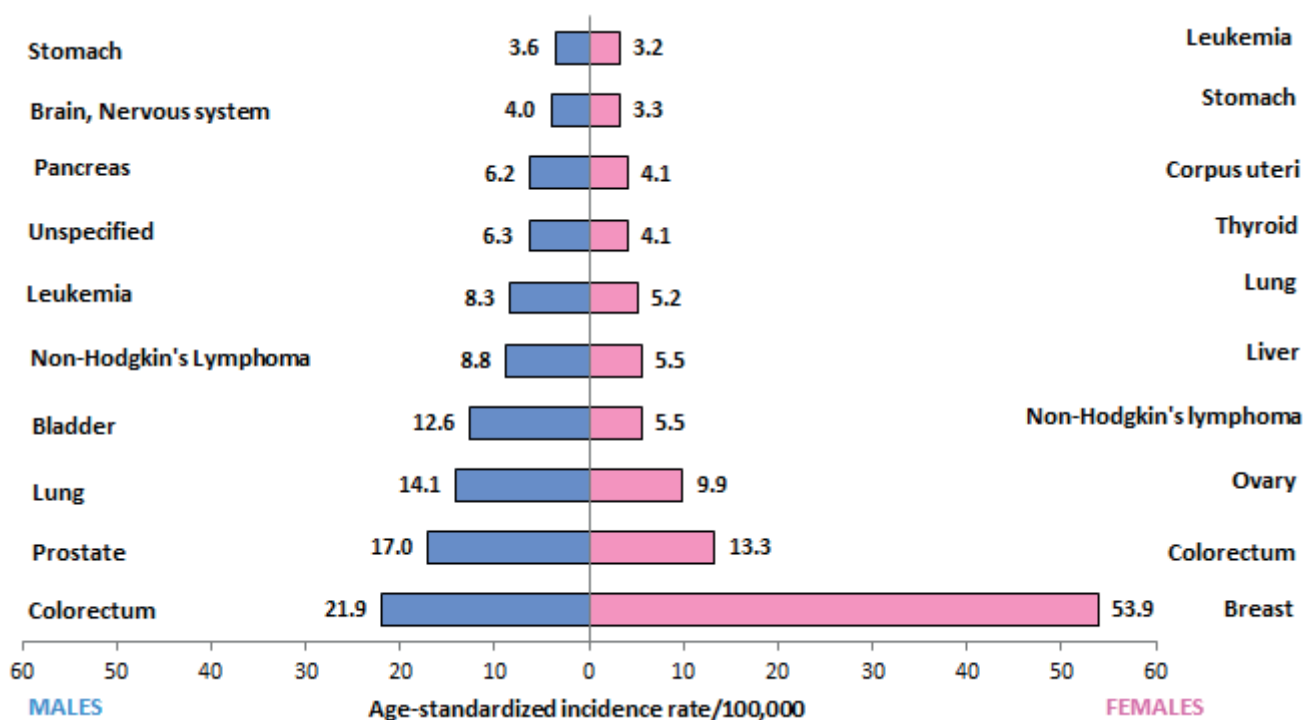
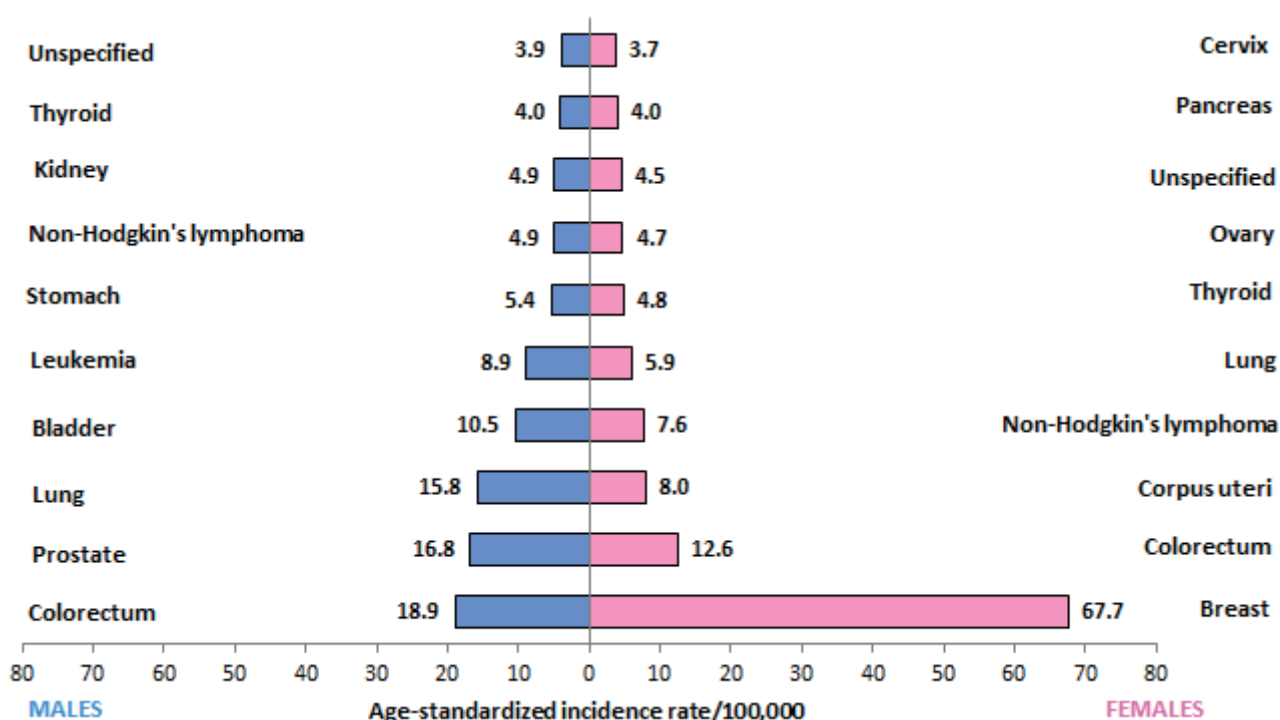


Figure 32 Ten Leading Types of Cancer among Bahrainis, 2013



The 10 leading cancer types among Bahraini males and females during the year 2014 is presented in Figure 36 in the section “Incidence of Most Common Cancers – 2014”.

COMPARISONS OF CANCER INCIDENCE WITH THE GCC STATES

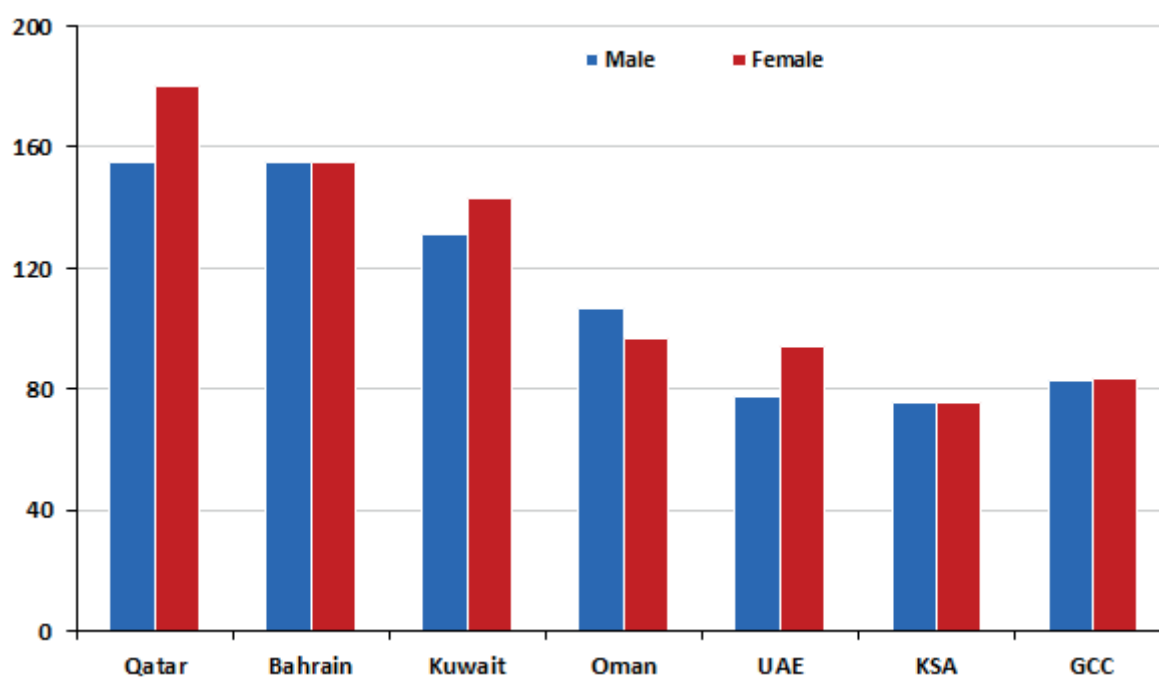
Table 9 presents the most common cancers in males and females among nationals of the GCC states. Lung, colorectal, and prostate cancers among males. Breast, colorectal, and thyroid cancers among females were the most common in almost all GCC countries. Between 1998 and 2009, Bahrain ranked second in cancer incidence after Qatar among the GCC states, with the lowest incidence rates seen in Saudi Arabia (Figure 33).

Table 9 Five Most Common Cancers among Nationals of GCC States

	Qatar	Bahrain	Kuwait	Oman	UAE	KSA
Male	Lung	Lung	Colorectal	Prostate	Lung	Colorectal
	Colorectal	Prostate	Prostate	Colorectal	Colorectal	NHL
	Prostate	Colorectal	Leukemia	Stomach	NHL	Leukemia
	Liver	Bladder	Bladder	NHL	Prostate	Lung
	NHL	NHL	NHL	Leukemia	Leukemia	Liver
Female	Breast	Breast	Breast	Breast	Breast	Breast
	Colorectal	Colorectal	Colorectal	Thyroid	Thyroid	Thyroid
	Thyroid	Thyroid	Thyroid	Colorectal	Colorectal	Colorectal
	NHL	Ovary	NHL	Leukemia	Leukemia	Leukemia
	Ovary	Corpus uteri	Corpus uteri	NHL	Cervix Uteri	Corpus uteri

Source: Cancer Incidence in the GCC states, 1998-2009, GCCCP; Bahrain, 2014; Oman 2012; Kuwait 2012; KSA 2011

Figure 33 Average Annual ASRs of all Cancers in the GCC States, 1998-2009

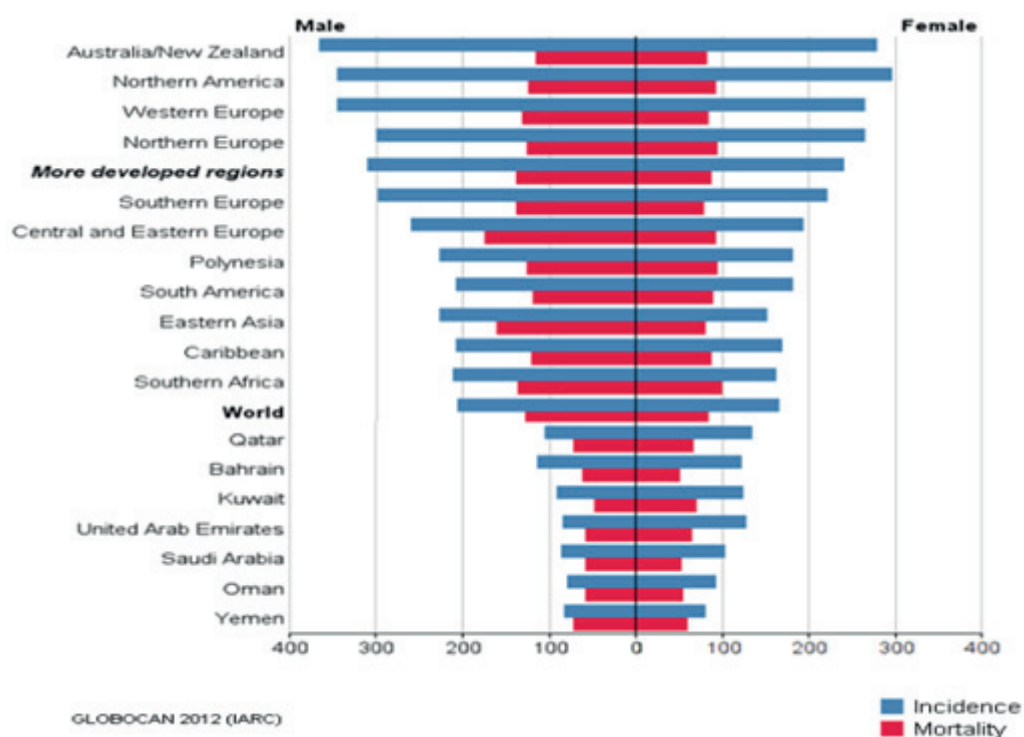


Source: Cancer Incidence in the GCC states, 1998-2009, GCCCP

INTERNATIONAL COMPARISONS OF CANCER

In 2012, Bahrain ranked second in cancer incidence after Qatar among the GCC states, but the incidence is less than the world.

Figure 34 Average Annual ASRs of all Cancers in the World



TREND OF CANCER INCIDENCE

2014

CANCER INCIDENCE, 2014

From January to December 2014, there were 746 Bahraini nationals diagnosed as cancer patients, of which 309 (41.4%) were males and 437 (58.6%) were females. The crude cancer incidence rate for the Bahraini population was 96.4 and 141.1 per 100,000 in males and females, respectively. The world ASR in the year 2014 was 125.9 and 166.2 per 100,000 in males and females, respectively (Table 10).

About half of the cases in Bahraini males occurred in those aged 60 years and above (50.5%), while only 32.7% of cases in Bahraini females occurred in this age group. Overall, 40.1% of new cases occurred in Bahrainis aged over 60 years and over.

Cancer age-specific incidence rates were observed to increase with advancing age in both genders. From early to mid-adulthood, Bahraini females had a higher incidence of cancer compared to males, while after the age of 70, males had a higher incidence of cancer compared to females (Figure 35).

Table 10 Distribution of Incident Cancer Cases among Bahrainis, 2014

GENDER	FREQUENCY	PERCENTAGE (%)	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	309	41.4	96.4	125.9
Female	437	58.6	141.1	166.2
TOTAL	746	100		

Figure 35 Frequency and Age-Specific Incidence Rates of Cancer in Bahrainis, 2014

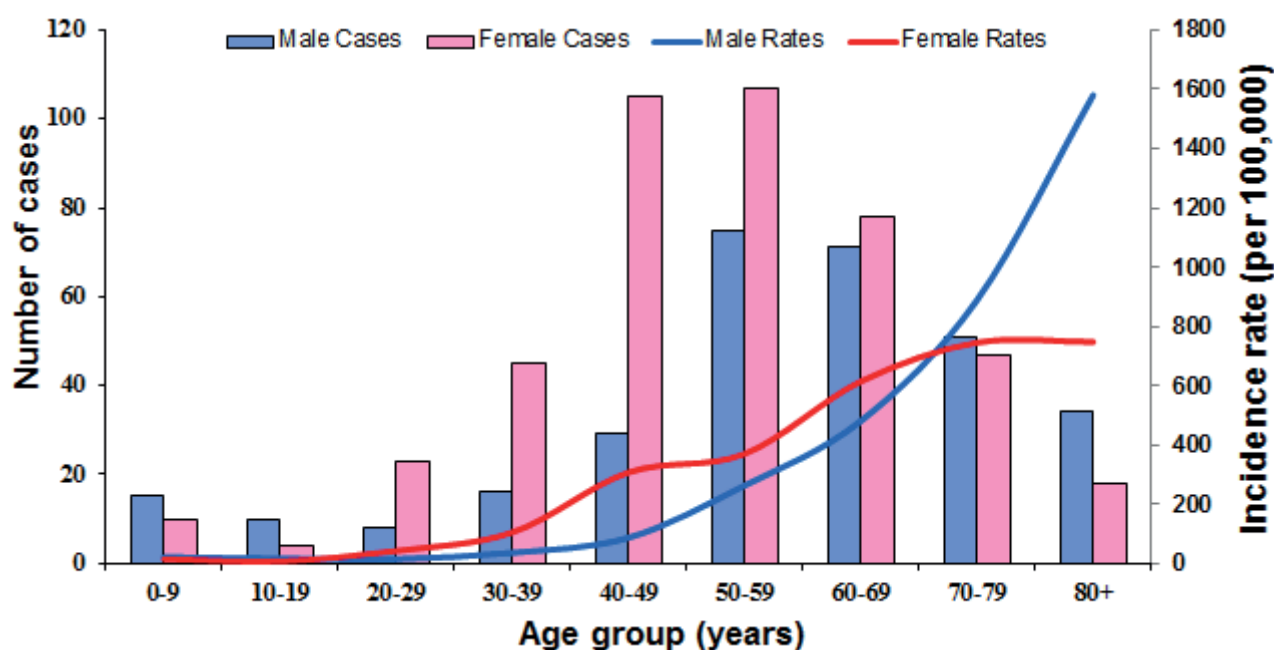


Table 11 Frequency of Incident Cancer Cases among Bahraini Males, 2014

SITE	ALL AGES	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	% OF TOTAL	ICD (10TH)
Lip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C00
Tongue	6	0	0	0	0	0	0	0	0	0	0	2	1	1	1	0	0	1	0	1.9	C01-C02
Mouth	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	C03-C06
Salivary glands	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.6	C07-C08
Tonsil	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	0	0	0	0	0.0	C10
Nasopharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C11
Hypopharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C12-C13
Pharynx unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C14
Esophagus	5	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	1	0	0	1.6	C15
Stomach	13	0	0	0	0	0	0	0	1	0	2	3	0	0	3	1	0	1	2	4.2	C16
Small intestine	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0.6	C17
Colorectum	34	0	0	0	0	1	1	2	1	2	2	4	6	5	3	4	2	1	0	11.0	C18-C21
Liver	11	0	0	0	0	0	0	0	0	0	3	4	2	0	2	0	0	0	0	3.6	C22
Gallbladder etc.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	C23-C24
Pancreas	16	0	0	0	0	0	0	0	0	0	0	2	2	1	0	3	7	0	1	5.2	C25
Nose, sinuses etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C30-C31
Larynx	5	0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	1	0	0	1.6	C32
Trachea, bronchus, lung	45	1	0	0	0	0	0	1	0	0	1	4	4	3	7	5	7	9	3	14.6	C33-C34
Other thoracic organs	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0.6	C37-C38
Bone	7	1	0	1	1	0	0	0	0	0	0	2	0	1	0	0	1	0	0	2.3	C40-C41
Melanoma of skin	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	C43
Other skin	4	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	1.3	C44
Mesothelioma	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	C45
Kaposi sarcoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C46
Connective, soft tissue	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1.0	C47-C49
Breast	3	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1.0	C50
Penis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C60
Prostate	29	0	0	0	0	0	0	0	0	0	0	1	4	7	7	5	1	0	4	9.4	C61
Testis	2	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0.6	C62
Other male genital organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C63
Kidney, ureters etc.	14	0	0	0	0	0	0	1	1	4	0	1	5	2	0	0	0	0	0	4.5	C64-C66;C68
Bladder	22	0	0	0	0	0	0	1	0	1	1	1	1	3	3	1	2	3	5	7.1	C67
Eye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C69
Brain, nervous system	14	2	0	0	1	0	0	1	0	0	1	4	1	2	1	0	0	1	0	4.5	C70-C72
Thyroid	4	0	0	0	1	0	0	0	0	0	2	1	0	0	0	0	0	0	0	1.3	C73
Adrenal gland	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	C74
Other Endocrine glands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C75
Hodgkin's disease	7	0	2	1	0	0	0	2	0	1	1	0	0	0	0	0	0	0	0	2.3	C81
Non-Hodgkin's lymphoma	23	1	0	2	0	1	0	1	1	0	1	3	5	2	1	2	1	1	1	7.4	C82-C85;C96
Immunoproliferative disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C88
Multiple Myeloma	5	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	1.6	C90
Lymphoid leukemia	9	4	1	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2.9	C91
Myeloid leukemia	6	1	0	0	1	0	1	0	1	0	1	1	0	0	0	0	0	0	0	1.9	C92-C94
Leukemia unspecified	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	C95
Other & unspecified	10	0	0	0	0	0	0	0	0	0	0	0	2	2	3	2	0	1	0	3.2	Other
TOTAL	309	11	4	4	6	4	4	9	7	10	19	37	38	34	37	24	27	18	16	100	

Table 12 Frequency of Incident Cancer Cases among Bahraini Females, 2014

SITE	ALL AGES	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	% OF TOTAL	ICD (10TH)
Lip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C00
Tongue	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.2	C01-C02
Mouth	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.2	C03-C06
Salivary glands	3	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0.7	C07-C08
Tonsil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C09
Other oropharynx	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.2	C10
Nasopharynx	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	C11
Hypopharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C12-C13
Pharynx unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C14
Esophagus	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0.7	C15
Stomach	4	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0.9	C16
Small intestine	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0.5	C17
Colorectum	38	0	0	0	0	0	0	2	1	3	6	5	8	5	3	2	3	0	0	8.7	C18-C21
Liver	9	0	0	0	0	0	0	0	1	0	1	0	0	2	0	1	2	1	1	2.1	C22
Gallbladder etc.	3	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0.7	C23-C24
Pancreas	5	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	0	1.1	C25
Nose, sinuses etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C30-C31
Larynx	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	C32
Trachea, bronchus, lung	14	0	0	0	0	0	0	0	0	1	1	2	1	3	0	2	2	0	2	3.2	C33-C34
Other thoracic organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C37-C38
Bone	5	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	1	0	0	1.1	C40-C41
Melanoma of skin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C43
Other skin	3	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0.7	C44
Mesothelioma	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.2	C45
Kaposi sarcoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C46
Connective, soft tissue	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.2	C47;C49
Breast	175	0	0	0	0	1	2	7	11	17	42	28	20	19	13	4	8	2	1	40.0	C50
Cervix Uteri	9	0	0	0	0	0	0	0	3	2	2	1	0	1	0	0	0	0	0	2.1	C53
Corpus Uteri	17	0	0	0	0	0	0	0	2	0	3	4	3	0	3	2	0	0	0	3.9	C54
Uterus unspecified	5	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	1	0	0	1.1	C55
Ovary	27	0	0	1	0	0	3	1	1	0	5	4	5	2	0	3	0	1	1	6.2	C56
Other female genital organs	6	0	0	0	0	0	0	0	0	0	2	0	1	3	0	0	0	0	0	1.4	C51-C52; C57
Placenta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C58
Kidney, ureters etc.	4	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0.9	C64-C66;C68
Bladder	8	0	0	0	0	0	0	0	0	0	0	1	1	0	2	1	1	1	1	1.8	C67
Eye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C69
Brain, nervous system	8	1	1	1	0	0	0	1	0	1	0	1	0	1	1	0	0	0	0	1.8	C70-C72
Thyroid	32	0	0	0	0	2	4	1	5	3	6	3	2	2	1	1	2	0	0	7.3	C73
Adrenal gland	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	C74
Other endocrine glands	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.2	C75
Hodgkin's disease	7	0	0	1	0	3	0	2	0	0	0	0	0	1	0	0	0	0	0	1.6	C81
Non-Hodgkin's lymphoma	18	0	0	0	0	2	3	0	2	1	0	1	4	1	0	0	3	0	1	4.1	C82-C85;C96
Immunoproliferative disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	C88
Multiple Myeloma	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0.5	C90
Lymphoid leukemia	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	C91
Myeloid leukemia	8	0	2	1	0	1	0	0	0	2	0	1	0	0	0	1	0	0	0	1.8	C92-C94
Leukemia unspecified	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.2	C95
Other & unspecified	10	0	0	0	0	0	0	0	0	0	0	2	2	2	2	0	0	0	2	2.3	Other
TOTAL	437	4	6	4	0	10	13	17	28	33	72	57	50	48	30	21	26	8	10	100.0	

Table 13 Incidence Rates of Cancers in Bahraini Males, 2014

SITE	ALL AGES	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	CRUDE RATE	ASR World	ICD (10TH)
Lip	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C00
Tongue	6	-	-	-	-	-	-	-	-	-	-	12.7	7.8	10.4	19.4	-	-	78.1	-	1.9	2.3	C01-C02
Mouth	1	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	-	-	-	-	0.3	0.3	C03-C06
Salivary glands	2	-	-	-	-	-	-	-	-	-	5.9	6.4	-	-	-	-	-	-	-	0.6	0.7	C07-C08
Tonsil	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C09
Other oropharynx	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C10
Nasopharynx	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C11
Hypopharynx	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C12-C13
Pharynx unspecified	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C14
Esophagus	5	-	-	-	-	-	-	-	-	-	5.9	-	7.8	-	38.9	-	45.1	-	-	1.6	2.3	C15
Stomach	13	-	-	-	-	-	-	-	4.8	-	11.8	19.1	-	-	58.3	28.5	-	78.1	230.3	4.1	5.8	C16
Small intestine	2	-	-	-	-	-	-	-	4.8	-	5.9	-	-	-	-	-	-	-	-	0.6	0.6	C17
Colorectum	34	-	-	-	-	3.3	3.7	8.4	4.8	12.2	11.8	25.4	46.9	52	58.3	113.9	90.1	78.1	-	10.5	13.3	C18-C21
Liver	11	-	-	-	-	-	-	-	-	-	17.6	25.5	15.6	-	38.9	-	-	-	-	3.4	4.1	C22
Gallbladder etc.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	19.4	-	-	-	-	0.3	0.6	C23-C24
Pancreas	16	-	-	-	-	-	-	-	-	-	-	12.7	15.6	10.4	-	85.4	315.4	-	115.2	5	7.1	C25
Nose, sinuses etc.	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C30-C31
Larynx	5	-	-	-	-	-	-	-	-	-	-	6.4	15.6	-	19.4	-	45.1	-	-	1.6	2	C32
Trachea, bronchus, lung	45	2.7	-	-	-	-	-	4.2	-	-	5.9	25.5	31.3	31.2	136.1	142.3	315.4	702.5	345.5	14	20	C33-C34
Other thoracic organs	2	-	-	-	-	-	-	-	-	-	-	12.7	-	-	-	-	-	-	-	0.6	0.6	C37-C38
Bone	7	2.7	-	3.2	3.2	-	-	-	-	-	-	12.7	-	10.4	-	-	45.1	-	-	2.2	2.4	C40-C41
Melanoma of skin	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.1	-	-	0.3	0.5	C43
Other skin	4	-	-	-	-	-	3.7	-	-	-	5.9	-	-	10.4	-	-	45.1	-	-	1.2	1.5	C44
Mesothelioma	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.1	-	-	0.3	0.5	C45
Kaposi sarcoma	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C46
Connective, soft tissue	3	-	-	-	-	-	-	-	-	-	-	-	-	10.4	19.4	28.5	-	-	-	0.9	1.6	C47-C49
Breast	3	-	-	-	-	-	-	-	4.8	6.1	-	-	-	-	-	-	45.1	-	-	0.9	1.1	C50
Penis	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C60
Prostate	29	-	-	-	-	-	-	-	-	-	-	6.4	31.3	72.9	136.1	142.3	45.1	-	460.6	9	14.2	C61
Testis	2	-	-	-	-	3.3	-	-	-	6.1	-	-	-	-	-	-	-	-	-	0.6	0.6	C62
Other male genital organs	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C63
Kidney, ureters etc.	14	-	-	-	-	-	-	4.2	4.8	24.2	-	6.4	39.1	20.8	-	-	-	-	-	4.4	4.7	C64-C66;C68
Bladder	22	-	-	-	-	-	-	4.2	-	6.1	5.9	6.4	7.8	31.2	58.3	28.5	90.1	234.2	575.8	6.9	10.1	C67
Eye	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C69
Brain, nervous system	14	5.4	-	-	3.2	-	-	4.2	-	-	5.9	25.5	7.8	20.8	19.4	-	-	78.1	-	4.4	4.9	C70-C72
Thyroid	4	-	-	-	3.2	-	-	-	-	-	11.8	6.4	-	-	-	-	-	-	-	1.2	1.3	C73
Adrenal gland	1	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	C74
Other endocrine glands	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C75
Hodgkin's disease	7	-	5.8	3.2	-	-	-	8.4	-	6.1	5.9	-	-	-	-	-	-	-	-	2.2	2.1	C81
Non-Hodgkin's lymphoma	23	2.7	-	6.3	-	3.3	-	4.2	4.8	-	5.9	19.1	39.1	20.8	19.4	56.9	45.1	78.1	115.2	7.2	8.5	C82-C85;C96
Immunoproliferative disease	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C88
Multiple myeloma	5	-	-	-	-	-	-	-	-	-	-	-	7.8	31.2	19.4	-	-	-	-	1.6	2.1	C90
Lymphoid leukemia	9	10.7	2.9	-	6.4	3.3	3.7	-	-	-	-	-	-	-	-	-	-	-	-	2.8	2.7	C91
Myeloid leukemia	6	2.7	-	-	3.2	-	3.7	-	4.8	-	5.9	6.4	-	-	-	-	-	-	-	1.9	1.9	C92-C94
Leukemia unspecified	1	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	C95
Other & unspecified	10	-	-	-	-	-	-	-	-	-	-	-	15.6	20.8	58.3	56.9	-	78.1	-	3.1	4.7	Other
TOTAL	309		12	13	19	13	15	38	33	61	112	236	297	354	719	683	1217	1405	1842	96.4	125.9	

Table 14 Incidence Rates of Cancer in Bahraini Females, 2014

SITE	ALL AGES	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Crude Rate	ASR Rate	ICD (10TH)
Lip	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C00
Tongue	1	-	-	-	-	-	-	-	-	-	-	6.2	-	-	-	-	-	-	-	0.3	0.3	C01-C02
Mouth	1	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	-	-	-	-	0.3	0.3	C03-C06
Salivary glands	3	-	-	-	-	3.5	3.8	-	-	-	-	-	-	-	21	-	-	-	-	1	1.2	C07-C08
Tonsil	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C09
Other oropharynx	1	-	-	-	-	-	-	4.4	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	C10
Nasopharynx	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39.4	-	-	0.3	0.4	C11
Hypopharynx	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C12-C13
Pharynx unspecified	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C14
Esophagus	3	-	-	-	-	-	-	-	-	-	-	-	-	12.6	21	26.6	-	-	-	1	1.7	C15
Stomach	4	-	-	-	-	-	-	4.4	-	-	5.6	-	-	-	21	26.6	-	-	-	1.3	1.8	C16
Small intestine	2	-	-	-	-	-	-	-	-	-	-	-	7.8	-	21	-	-	-	-	0.6	0.9	C17
Colorectum	38	-	-	-	-	-	-	8.8	5	18.3	33.6	31	62.7	63.1	63	53.2	118.1	-	-	12.2	14.7	C18
Liver	9	-	-	-	-	-	-	-	5	-	5.6	-	-	25.2	-	26.6	78.7	68.2	106.3	2.9	3.8	C22
Gallbladder etc.	3	-	-	-	-	-	-	-	-	-	5.6	-	-	12.6	-	-	-	68.2	-	1	1.2	C23-C24
Pancreas	5	-	-	-	-	-	-	-	-	-	-	6.2	7.8	12.6	-	-	39.4	68.2	-	1.6	1.9	C25
Nose, sinuses etc.	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C30-C31
Larynx	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	106.3	0.3	0.5	C32
Trachea, bronchus, lung	14	-	-	-	-	-	-	-	6.1	5.6	12.4	7.8	37.8	-	53.2	78.7	-	212.7	4.5	6.1	C33-C34	
Other Thoracic organs	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C37-C38
Bone	5	-	3	-	-	-	-	4.4	-	6.1	5.6	-	-	-	-	-	39.4	-	-	1.6	1.7	C40-C41
Melanoma of skin	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C43
Other skin	3	-	-	-	-	-	-	-	5	6.1	-	-	-	-	-	-	-	68.2	-	1	1	C44
Mesothelioma	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.6	-	-	-	0.3	0.5	C45
Kaposi sarcoma	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C46
Connective, soft tissue	1	-	-	-	-	-	-	-	-	-	5.6	-	-	-	-	-	-	-	-	0.3	0.3	C47-C49
Breast	175	-	-	-	3.5	7.7	30.7	54.6	104	235.4	173.3	156.8	239.7	273.2	106.3	314.9	136.4	106.3	56.5	65.6	C50	
Cervix Uteri	9	-	-	-	-	-	-	-	14.9	12.2	11.2	6.2	-	12.6	-	-	-	-	-	2.9	3.1	C53
Corpus Uteri	17	-	-	-	-	-	-	-	9.9	-	16.8	24.8	23.5	-	63.1	53.2	-	-	-	5.5	6.7	C54
Uterus unspecified	5	-	-	-	-	-	-	-	-	-	-	6.2	-	37.8	-	-	39.4	-	-	1.6	2.2	C55
Ovary	27	-	-	3.3	-	-	11.5	4.4	5	-	28	24.8	39.2	25.2	-	79.8	-	68.2	106.3	8.7	9.7	C56
Other female genital organs	6	-	-	-	-	-	-	-	-	-	11.2	-	7.8	37.8	-	-	-	-	-	1.9	2.4	C51-C52;C57
Placenta	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C58
Kidney, ureters etc.	4	2.8	3	-	-	-	-	-	-	-	-	6.2	-	-	21	-	-	-	-	1.3	1.6	C64-C66;C68
Bladder	8	-	-	-	-	-	-	-	-	-	-	6.2	7.8	-	42	26.6	39.4	68.2	106.3	2.6	3.7	C67
Eye	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C69
Brain, nervous system	8	2.8	3	3.3	-	-	-	4.4	-	6.1	-	6.2	-	12.6	21	-	-	-	-	2.6	3	C70-C72
Thyroid	32	-	-	-	-	7	15.4	4.4	24.8	18.3	33.6	18.6	15.7	25.2	21	26.6	78.7	-	-	10.3	11.2	C73
Adrenal gland	1	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	C74
Other endocrine glands	1	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	0.3	0.3	C75
Hodgkin's disease	7	-	-	3.3	-	10.5	-	8.8	-	-	-	-	-	12.6	-	-	-	-	-	2.3	2.2	C81
Non-Hodgkin's lymphoma	18	-	-	-	-	7	11.5	-	9.9	6.1	-	6.2	31.4	12.6	-	-	118.1	-	106.3	5.8	6.2	C82-C85;C96
Immunoproliferative disease	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	C88
Multiple myeloma	2	-	-	-	-	-	-	-	-	6.1	-	-	-	-	-	-	39.4	-	-	0.6	0.8	C90
Lymphoid leukemia	2	2.8	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6	C91
Myeloid leukemia	8	-	6.1	3.3	-	3.5	-	-	-	12.2	-	6.2	-	-	-	26.6	-	-	-	2.6	2.8	C92-C94
Leukemia unspecified	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.6	-	-	-	0.3	0.5	C95
Other & unspecified	10	-	-	-	-	-	-	-	-	-	-	12.4	15.7	25.2	42	-	-	-	212.7	3.2	4.6	Other
Total	437	11	18	13	0	35	50	74	139	202	404	353	392	605	631	558	1024	546	1063	141.1	166.2	

INCIDENCE OF MOST COMMON CANCERS 2014

MOST COMMON CANCERS IN BAHRAINIS, 2014

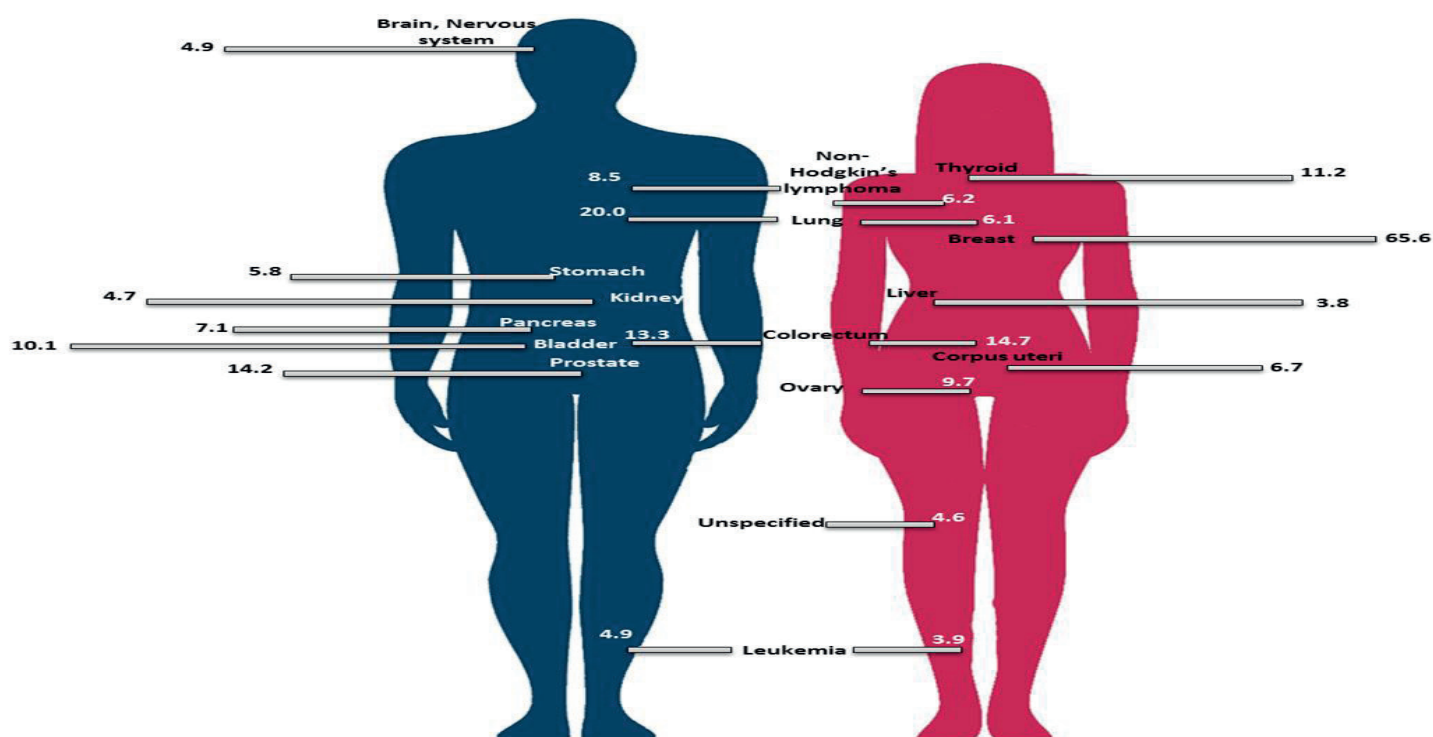
In the year 2014, cancers of the breast (178), colorectal (72), lung (59), NHL (41), and thyroid (36) constituted over half of the total cancer burden (51.7%, 386 new cases).

In line with previous years, lung cancer was noted to be the leading malignancy among Bahraini males (45 new cases), followed by cancers of the colorectal (34), prostate (29), NHL (23), and bladder (22). Breast cancer continues to be the most frequent neoplasm in Bahraini women, with 175 new cases reported in 2014, followed by cancers of the colorectal (38), thyroid (32), ovary (27), and NHL (18) (Table 15). Figure 36 presents the 10 leading cancers in Bahraini males and females by ASR.

Table 15 Most Common Cancers among Bahraini Nationals, 2014

MALES (N = 309)				FEMALES (N = 437)			
Site	No.	%	ASR	Site	No.	%	ASR
Lung	45	14.6	20.0	Breast	175	40.0	65.6
Colorectal	34	11.0	13.3	Colorectal	38	8.7	14.7
Prostate	29	9.4	14.2	Thyroid	32	7.3	11.2
NHL	23	7.4	8.5	Ovary	27	6.2	9.7
Bladder	22	7.1	10.1	NHL	18	4.1	6.2
Leukemia	16	5.2	4.9	Corpus uteri	17	3.9	6.7
Pancreas	16	5.2	7.1	Lung	14	3.2	6.1
Kidney	14	4.5	4.7	Leukemia	11	2.5	3.9
Brain & CNS	14	4.5	4.9	Unspecified	10	2.3	4.6
Stomach	13	4.2	5.8	Liver	9	2.1	3.8

Figure 36 Ten Leading Types of Cancer among Bahrainis by ASR, 2014



Trends of age-specific incidence rates for the 5 common cancers indicate wide gaps between the leading cancer and other cancers at 70 years and above in Bahraini males and from early adulthood in females (Figure 37 and Figure 38).

Figure 37 Age-Specific Incidence of Common Cancers in Bahraini Males, 2014

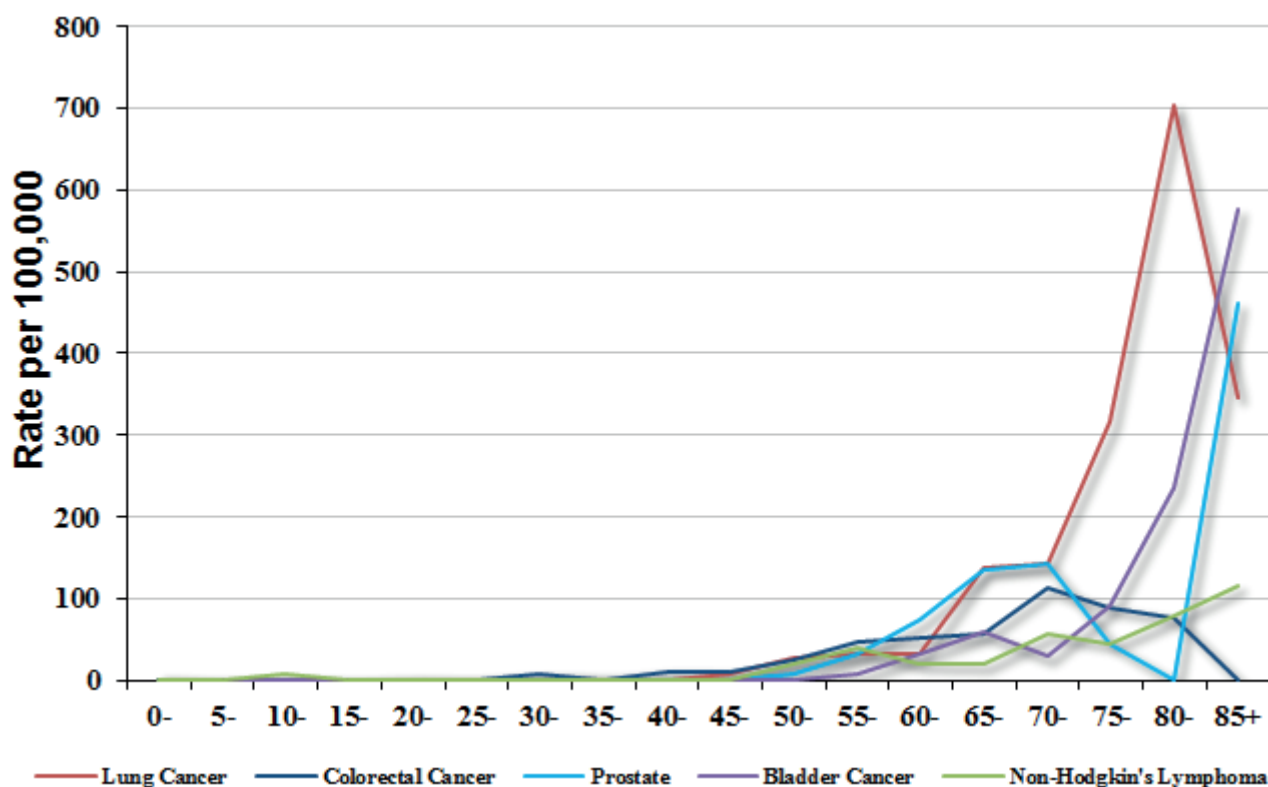
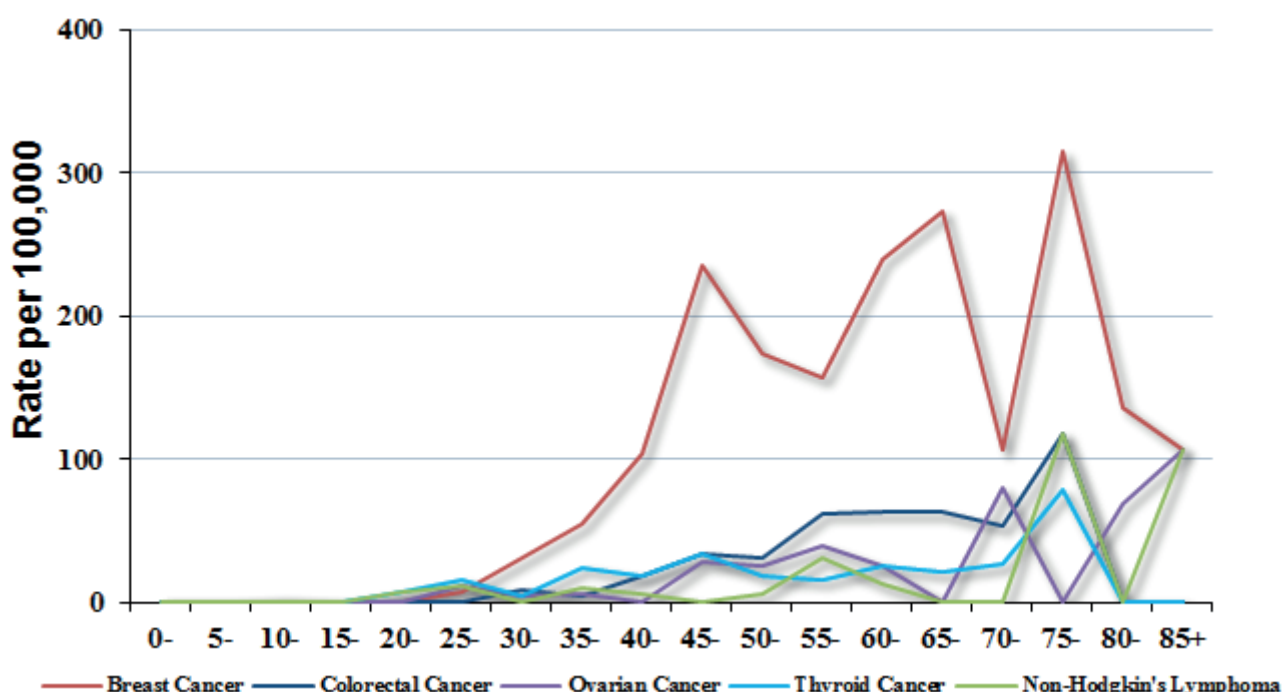


Figure 38 Age-Specific Incidence of Common Cancers in Bahraini Females, 2014



BREAST

Breast cancer was by far the most common cancer among Bahrainis in 2014, accounting for 40.0% of all new cases of cancer in females and 23.9% of all new cancer cases overall.

Between January and December 2014, there were 178 new cases of breast cancer reported in Bahrain: 175 in women and only 3 in men. The world ASR for breast cancer in Bahraini women was 65.6 per 100,000 females (Table 15 and Figure 36).

Female breast cancer incidence is strongly related to age, with the highest incidence rates being observed in older women. The trend of age-specific incidence rates follows a multimodal distribution, with the highest peaks observed at 45-49, 65-69, and 75-79-year age groups (Figure 39). The peaks may be partly explained by the impact of screening for breast cancer in women aged 40 and over.

Infiltrating ductal carcinoma was the most frequent histopathological type accounting for 78% of all breast cancers, Figure 40.

Figure 39 Age-Specific Incidence Rates for Breast Cancer in Bahraini Females, 2014

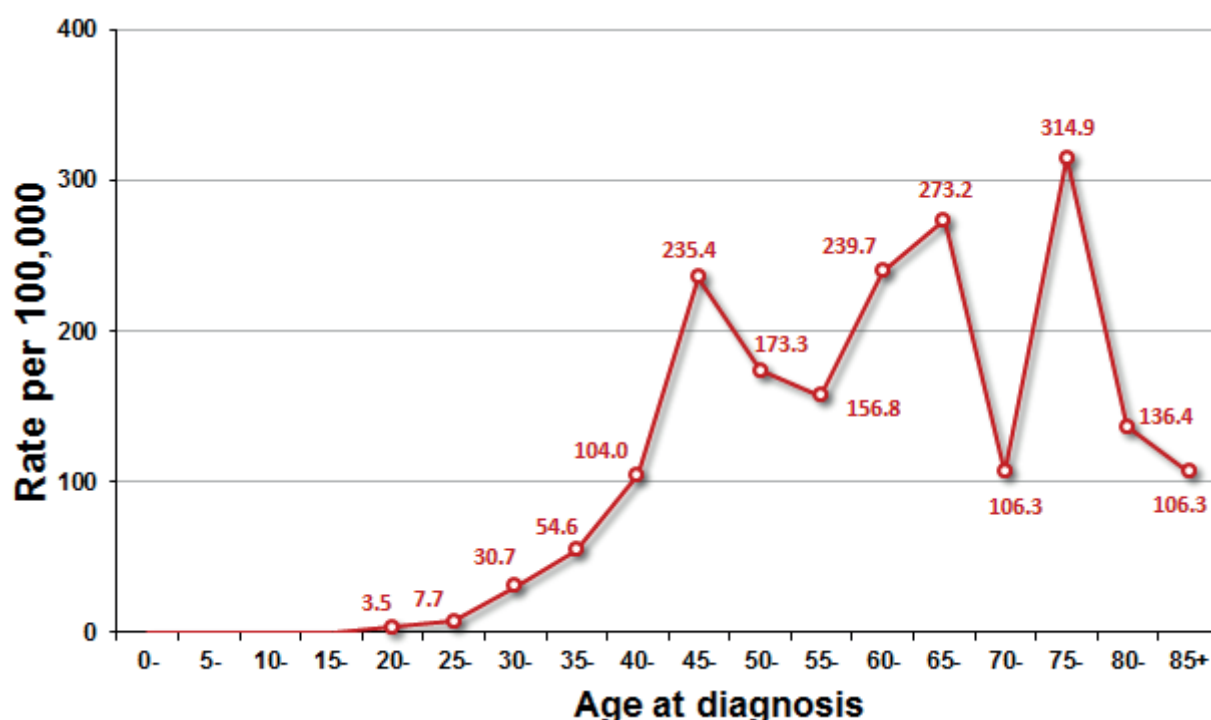
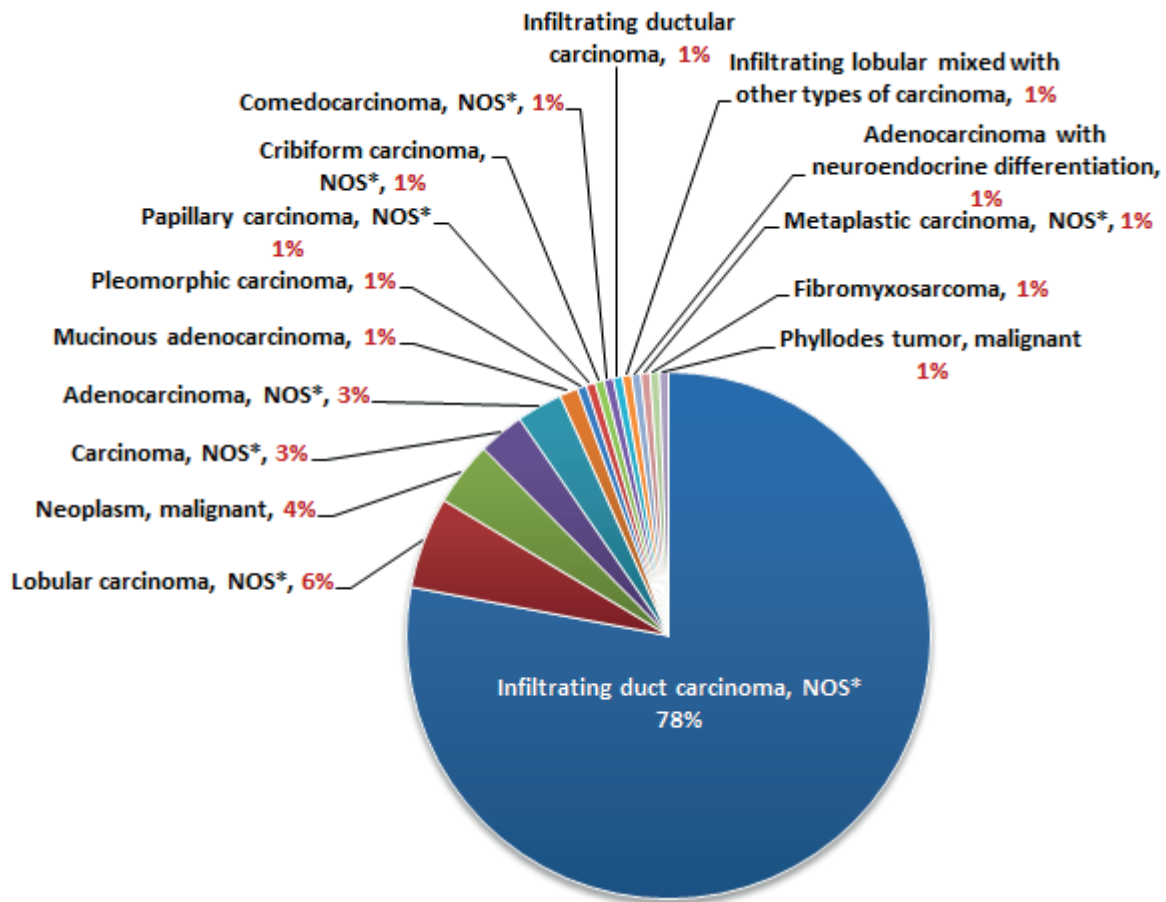


Figure 40 Morphology of Breast Cancer in Bahraini Females, 2014



*Not otherwise specified

COLORECTUM

Colorectal cancer is the 2nd most common cancer in Bahrain in 2014, accounting for 9.7% of all new cases (11% of all male cases and 8.7% of all female cases).

Between January and December 2014, there were 72 new cases of colorectal cancer collected by the Bahrain Cancer Registry: 34 (47.2%) in men and 38 (52.8%) in women. The total world ASR for colorectal cancer in the Bahraini population was 14.0 per 100,000 people. The world ASRs by gender were 13.3 cases/100,000 Bahraini males and 14.7 cases/100,000 Bahraini females (Table 16).

In 2014, over 70% of colorectal cancer cases were diagnosed in people over 50 years and incidence rates were higher in females. Age-specific incidence begin between 15-25 years and the rates increase sharply from around age 35 to peak at 70-74 years in males and at 75-79 years in females. (Figure 41).

Adenocarcinomas were the most frequent histopathological type, accounting for 83% of all colorectal cancers (Figure 42).

Table 16 Gender Distribution of Colorectal Cancer in Bahrainis, 2014

GENDER	FREQUENCY	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	34	10.5	13.3
Female	38	12.2	14.7

Figure 41 Age-Specific Incidence Rates for Colorectal Cancer in Bahrainis, 2014

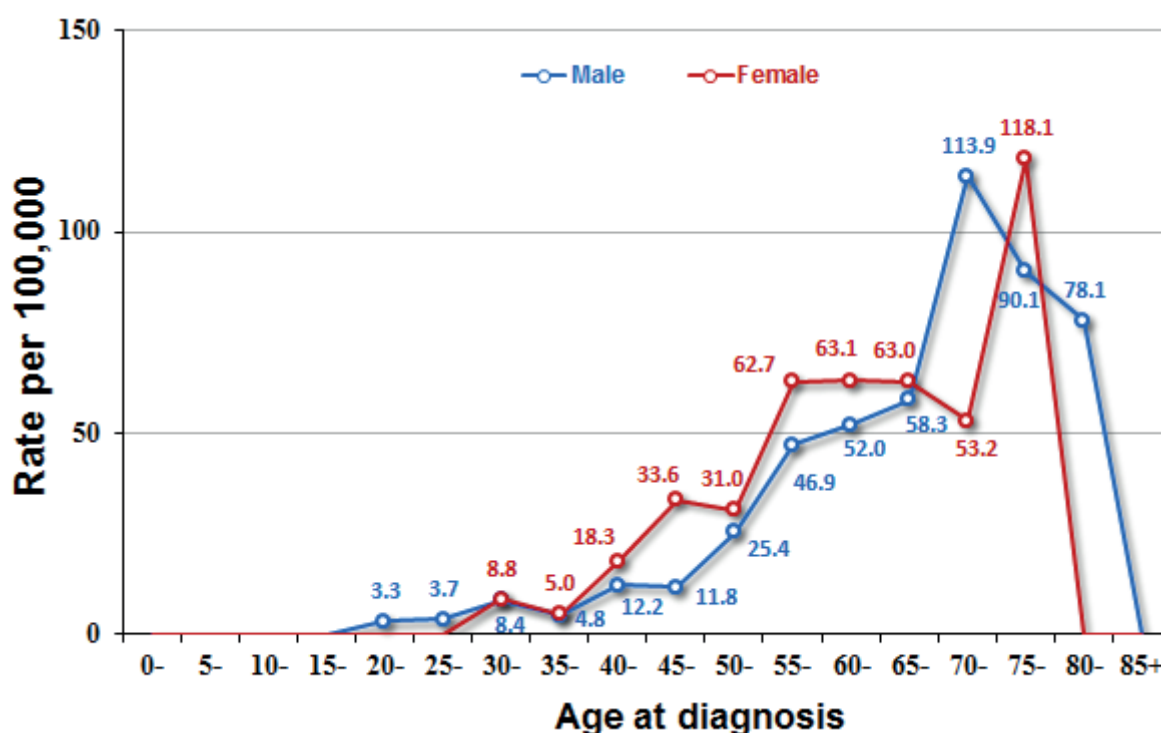
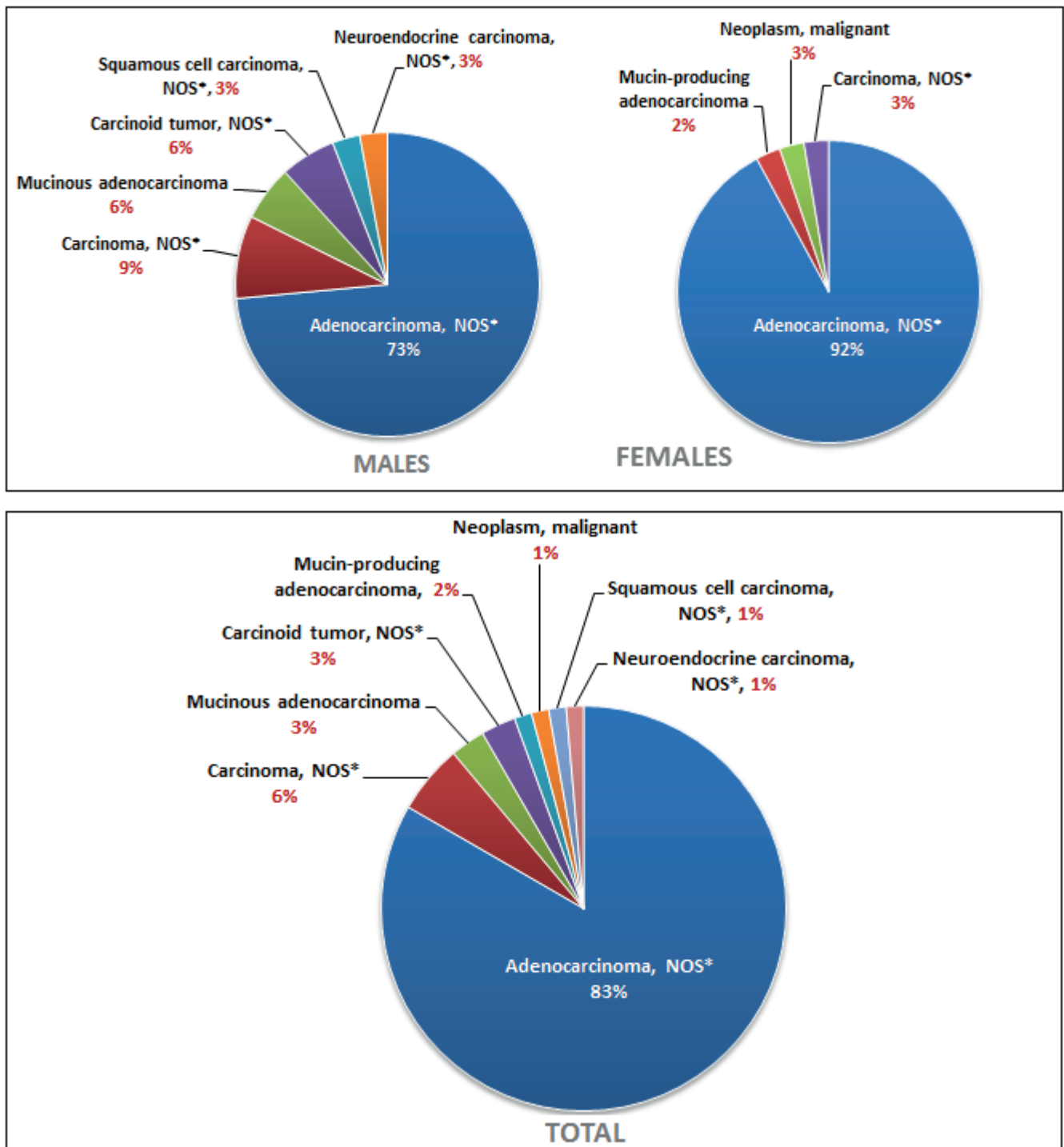


Figure 42 Morphology of Colorectal Cancer in Bahrainis, 2014



*Not otherwise specified

LUNG

Lung cancer is the 3rd most common cancer in Bahrain in 2014, accounting for 7.9% of all new cancer cases. It is also the most common cancer in males (14.6% of all male cases).

Between January and December 2014, there were 59 new cases of lung cancer reported in Bahrain: 45 (76.3%) in men and 14 (23.7%) in women. The total world ASR in the Bahraini population was 12.9 per 100,000 people. The world ASRs by gender were 20.0 cases/100,000 Bahraini males and 6.1 cases/100,000 Bahraini females (Table 17).

In males, age-specific incidence rates rose steadily from around age 45 to age 65-79, followed by a steep incline to peak in the 80-84-year age group, and then fall sharply from age 85 onwards. The female incidence rates, on the other hand, show a gradual rise to peak in the 85+ age group. Incidence rates are similar for Bahraini men and women until their 60s, but thereafter, the male rates are significantly higher than those in females, and this gap widens with increasing age (Figure 43).

Adenocarcinomas and squamous cell carcinomas were the most frequent histopathological types, accounting for 41% and 25% of all lung cancers, respectively (Figure 44).

Table 17 Gender Distribution of Lung Cancer in Bahrainis, 2014

GENDER	FREQUENCY	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	45	14.0	20.0
Female	14	4.5	6.1

Figure 43 Age-Specific Incidence Rates for Lung Cancer in Bahrainis, 2014

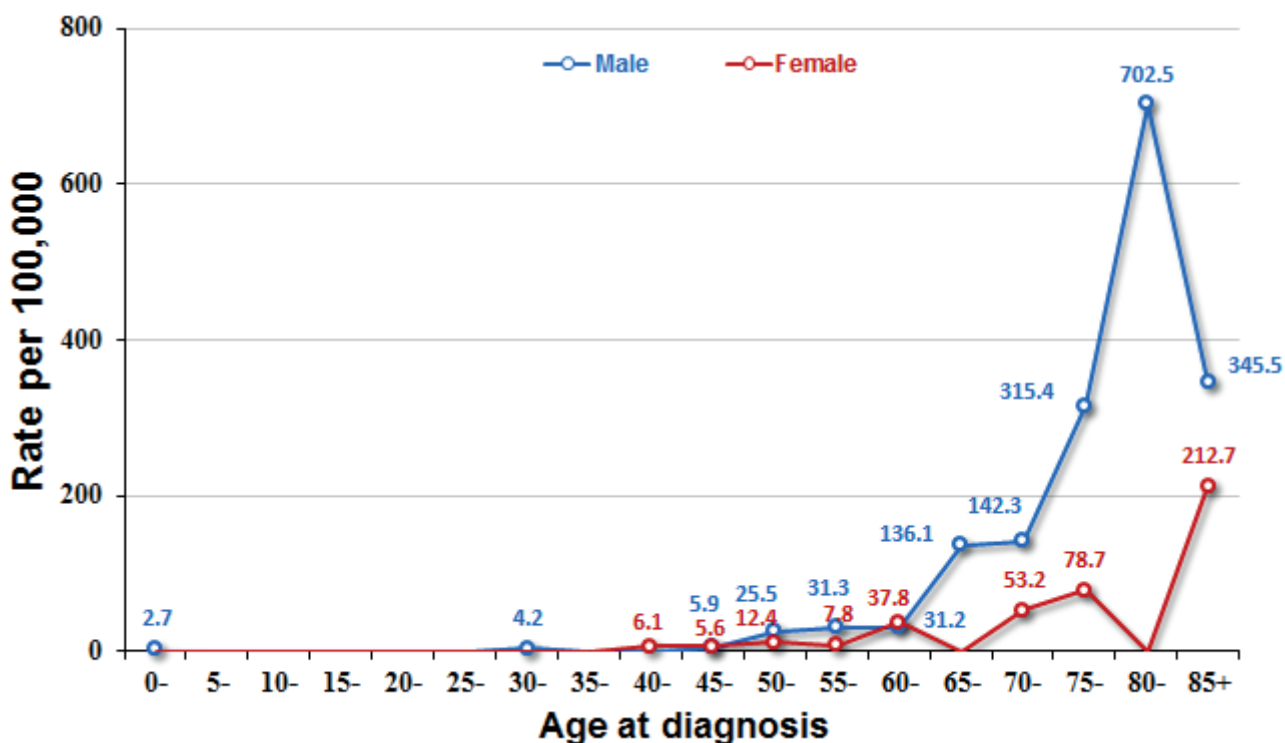
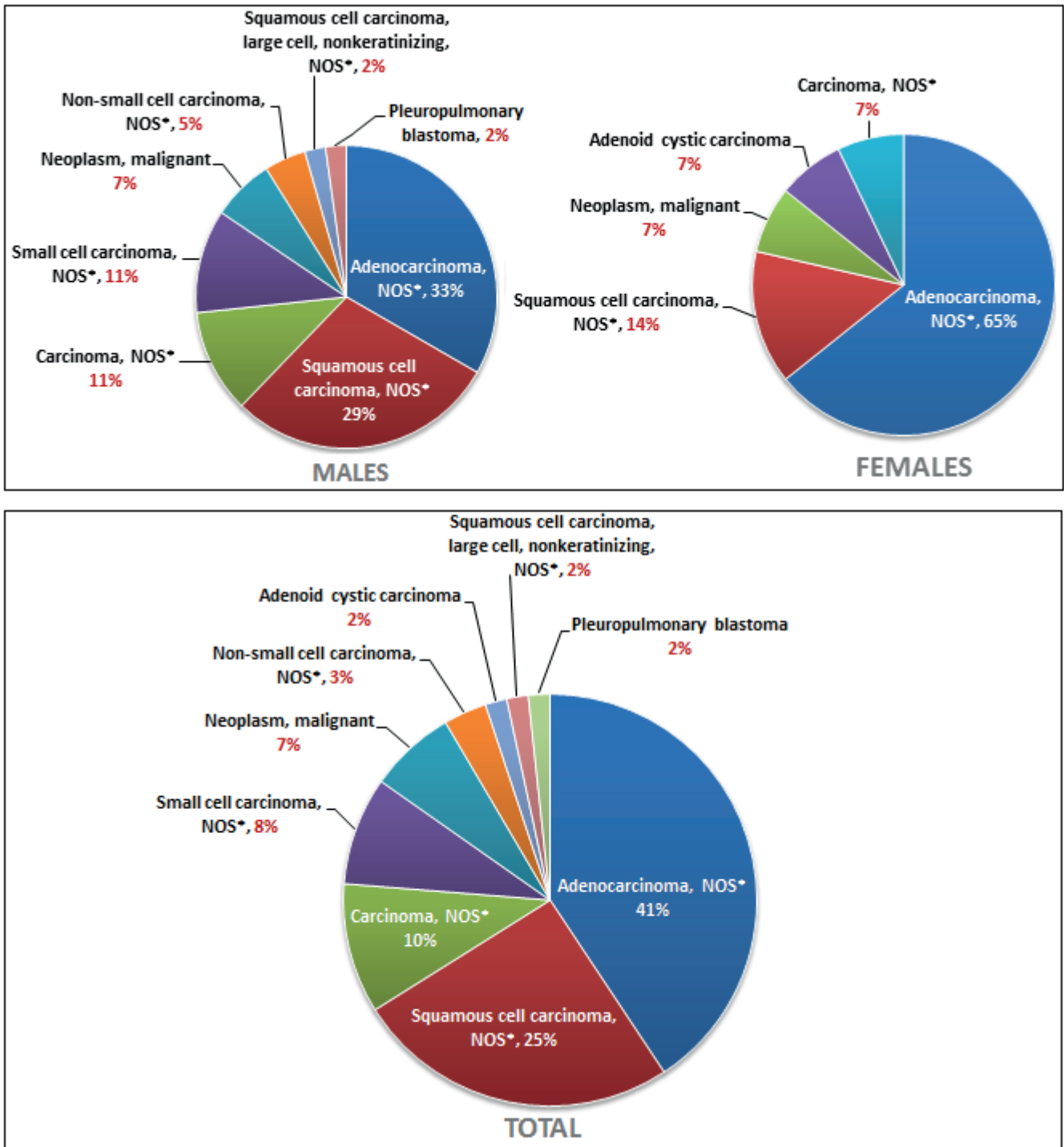


Figure 44 Morphology of Lung Cancer in Bahrainis, 2014



*Not otherwise specified

NON-HODGKIN'S LYMPHOMA

Non-Hodgkin's Lymphoma is the 4th most common cancer in Bahrain (2014), accounting for 5.5% of all new cancer cases. NHL is also the 4th most common cancer among Bahraini men, accounting for 7.4% of all new cases in males. Among Bahraini women, NHL is the 5th most common, accounting for 4.1% of all new cases in females.

Between January and December 2014, 41 cases of NHL were registered in Bahrain: 23 (56.1%) in men and 18 (43.9%) in women. The total world ASR in the Bahraini population was 7.4 per 100,000 people. The world ASRs by gender were 8.5 cases/100,000 Bahraini males and 6.2 cases/100,000 Bahraini females (Table 18).

While the majority of NHL cases were diagnosed in older men and women, around 32% of cases were diagnosed in ages under 40. Age-specific incidence rates begin to rise sharply in both sexes from around age 45 to 50 years, and reach their highest peak in the 85+ age group for men and 75-79-year age group for women, Figure 45.

Malignant lymphomas were the most frequent histopathological type, accounting to 78% of all NHL cases (Figure 46).

Table 18 Gender Distribution of NHL in Bahrainis, 2014

GENDER	FREQUENCY	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	23	7.2	8.5
Female	18	5.8	6.2

Figure 45 Age-Specific Incidence Rates for NHL in Bahrainis, 2014

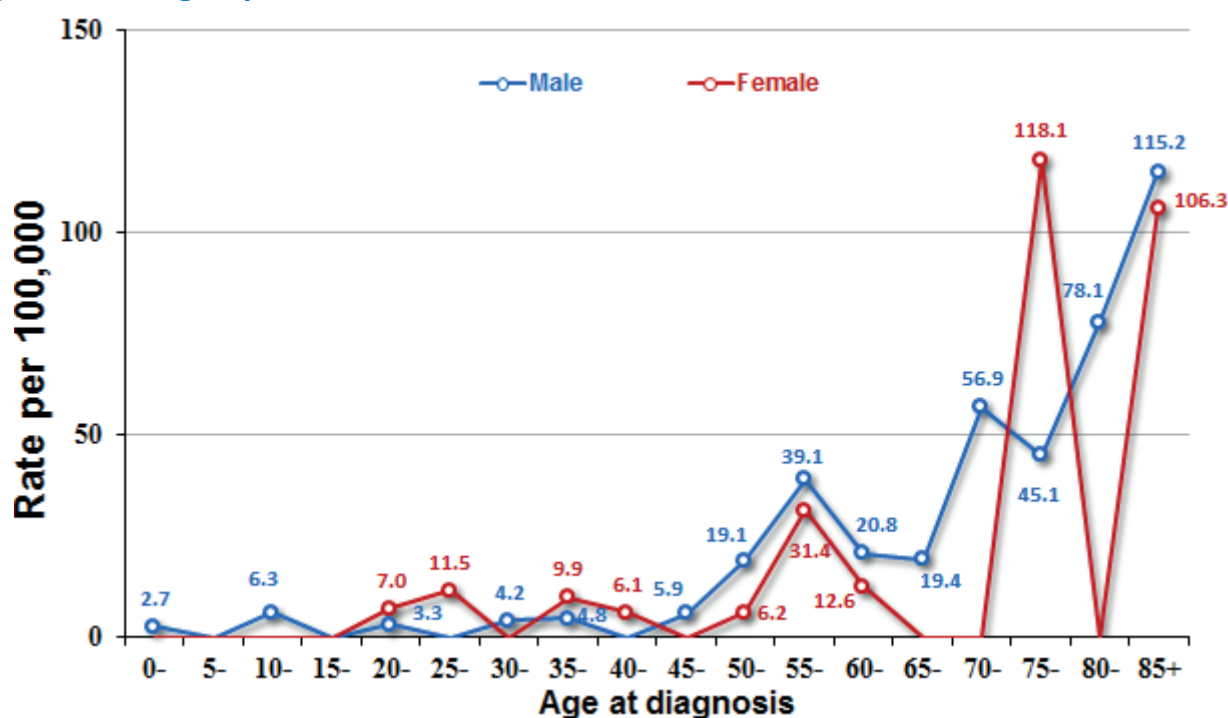
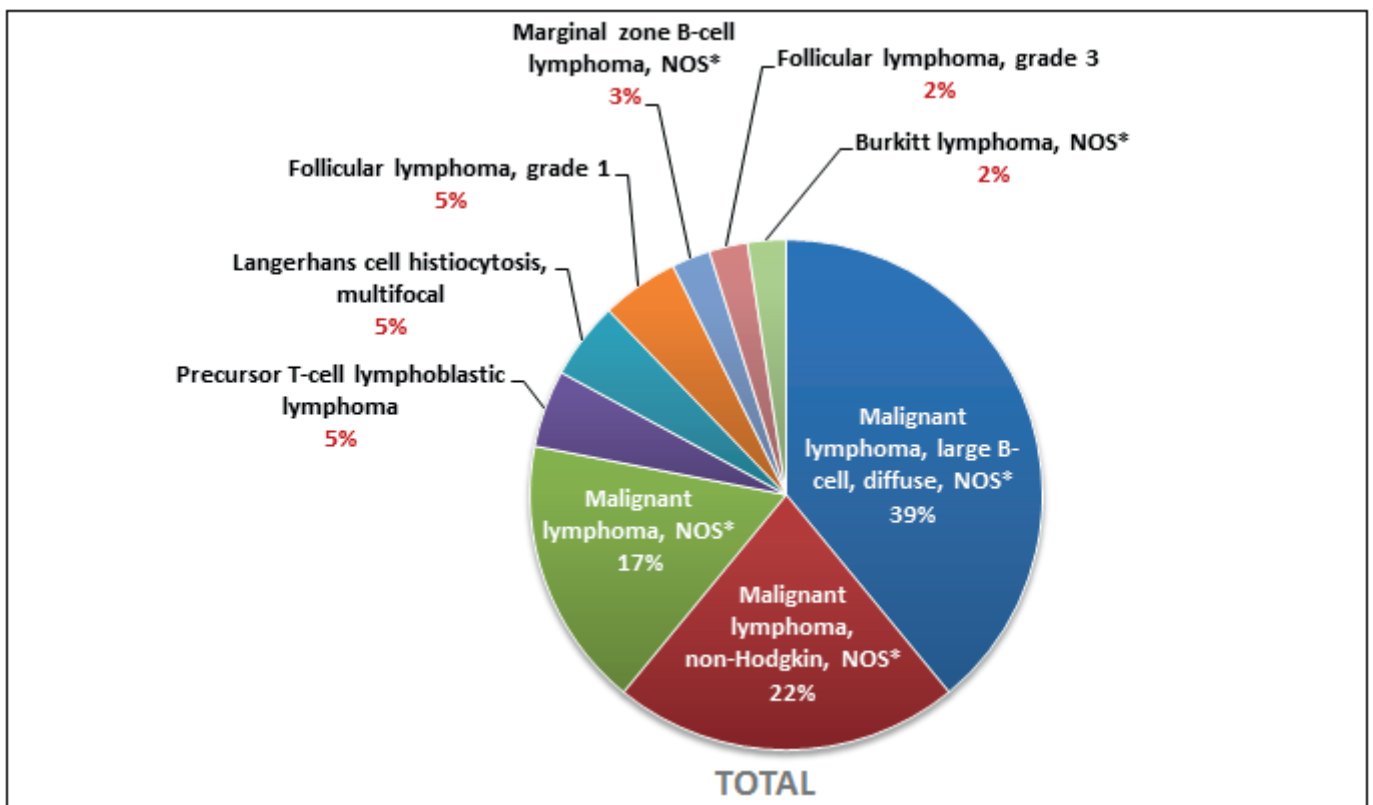
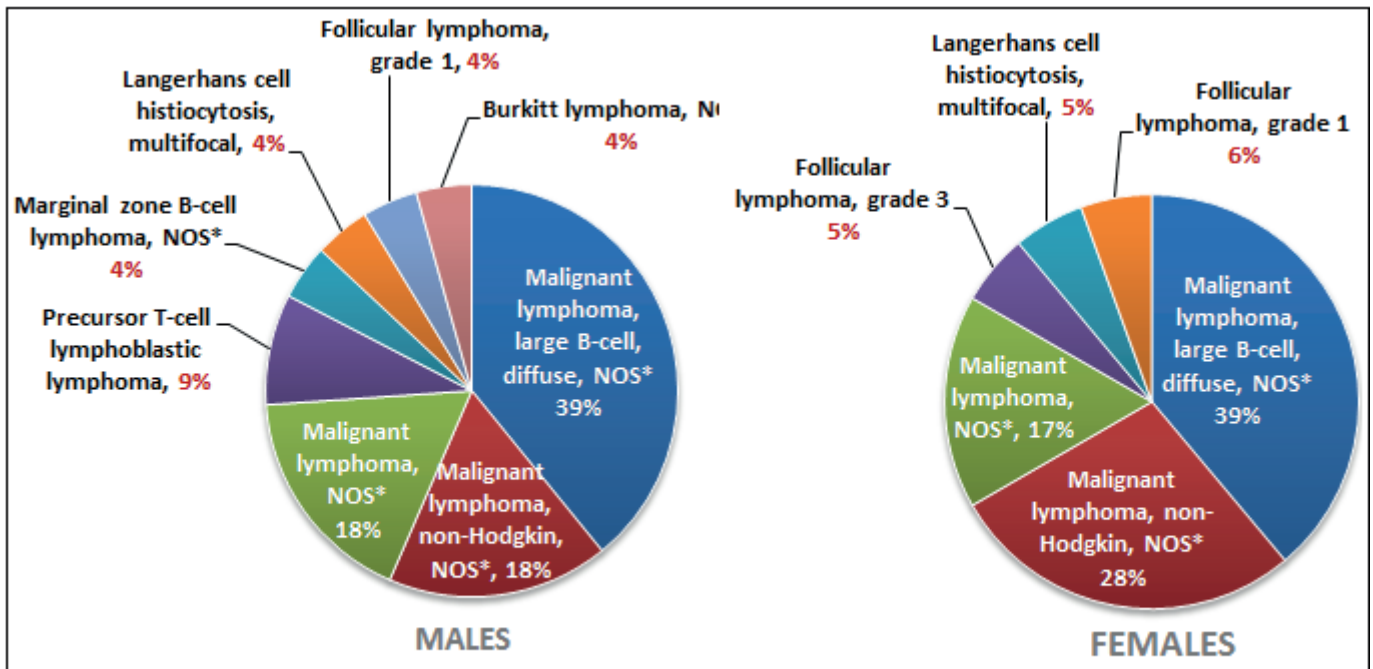


Figure 46 Morphology of NHL in Bahrainis, 2014



*Not otherwise specified

THYROID

Thyroid cancer is the 5th most common cancer in Bahrain (2014), accounting for 4.8% of all new cancer cases. Among Bahraini women, it is the 3rd most common cancer (7.3% of all female cases).

Between January and December 2014, there were 36 cases of thyroid cancer registered in Bahrain: 32 (88.9%) in women and only 4 (11.1%) in men, with a female to male ratio of 8:1. The total world ASR in the Bahraini population was 6.2 per 100,000 people. The world ASRs by gender were 1.3 cases/100,000 Bahraini males and 11.2 cases/100,000 Bahraini females (Table 19).

In Bahraini females, age-specific rates rise steadily from around age 30 with a sharp peak at 80-84 years and then fall at 85 years and above (Figure 47).

Papillary carcinomas were the most frequent histopathological type, accounting for 77.8% of all thyroid cancers (75% in females, 100% in males) (Figure 48).

Table 19 Gender Distribution of Thyroid Cancer in Bahrainis, 2014

GENDER	FREQUENCY	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	4	1.2	1.3
Female	32	10.3	11.2

Figure 47 Age-Specific Incidence Rates for Thyroid Cancer in Bahrainis, 2014

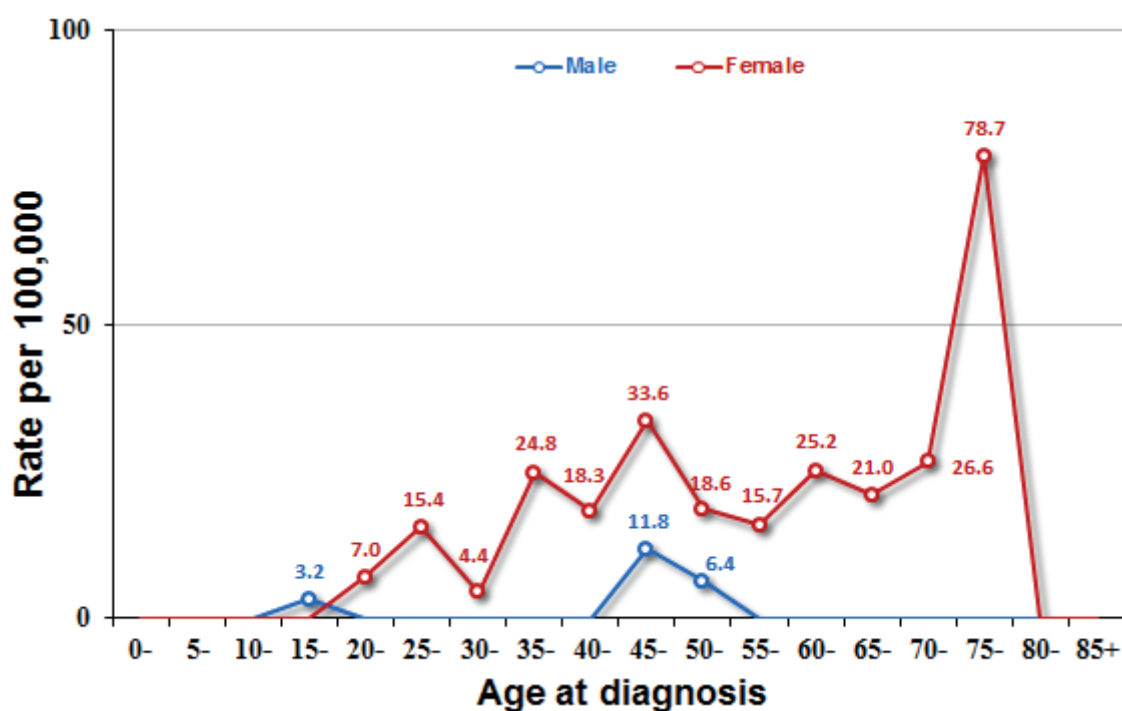
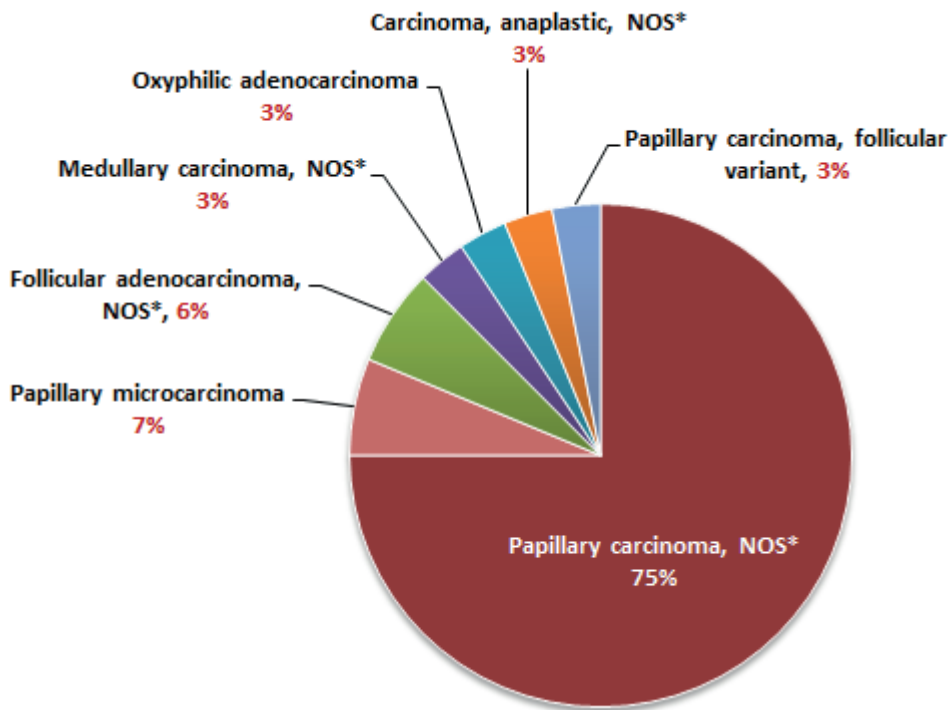


Figure 48 Morphology of Thyroid Cancer in Bahraini Females, 2014



*Not otherwise specified

BLADDER

Bladder cancer is the 6th most common cancer in Bahrain (2014), accounting for 4% of all new cancer cases. Among Bahraini men, it is the 5th most common cancer (7.1% of all male cases).

Between January and December 2014, 30 cases of bladder cancer were reported: 22 (73.3%) in men and 8 (26.7%) in women. The total world ASR in the Bahraini population was 6.9 per 100,000 people. The world ASRs by gender were 10.1 cases/100,000 Bahraini males and 3.7 cases/100,000 Bahraini females (Table 20).

In the year 2014, about 67% of bladder cancer cases were diagnosed in men and women aged 65 years and above, and 83% were diagnosed in ages 55 years and above.

Age-specific incidence rates begin to rise from around age 55-65 years in both males and females. However, from age 70 until 85+, male incidence rates rise more sharply than female rates. For both sexes, incidence rates reach their highest peak in the 85+ age group.

Transitional cell carcinomas and papillary transitional cell carcinomas were the most frequent histopathological types, accounting for 57% and 30% of all bladder cancers, respectively (Figure 50).

Table 20 Gender Distribution of Bladder Cancer in Bahrainis, 2014

GENDER	FREQUENCY	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	22	6.9	10.1
Female	8	2.6	3.7

Figure 49 Age-Specific Incidence Rates of Bladder Cancer in Bahrainis, 2014

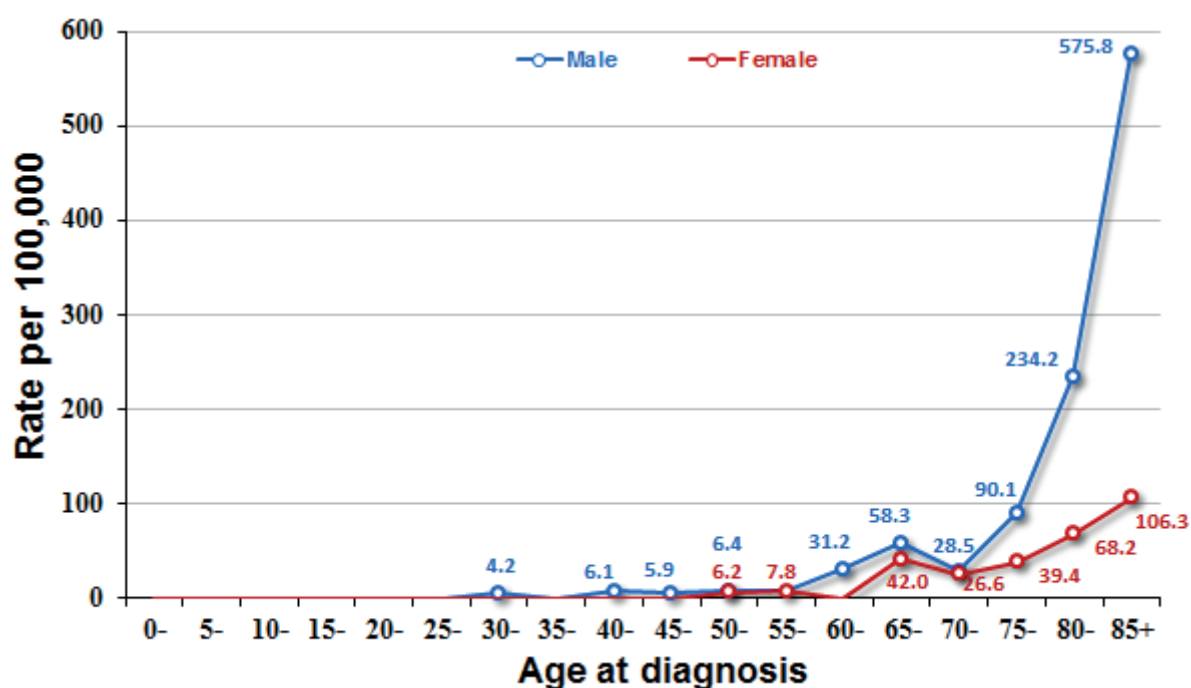
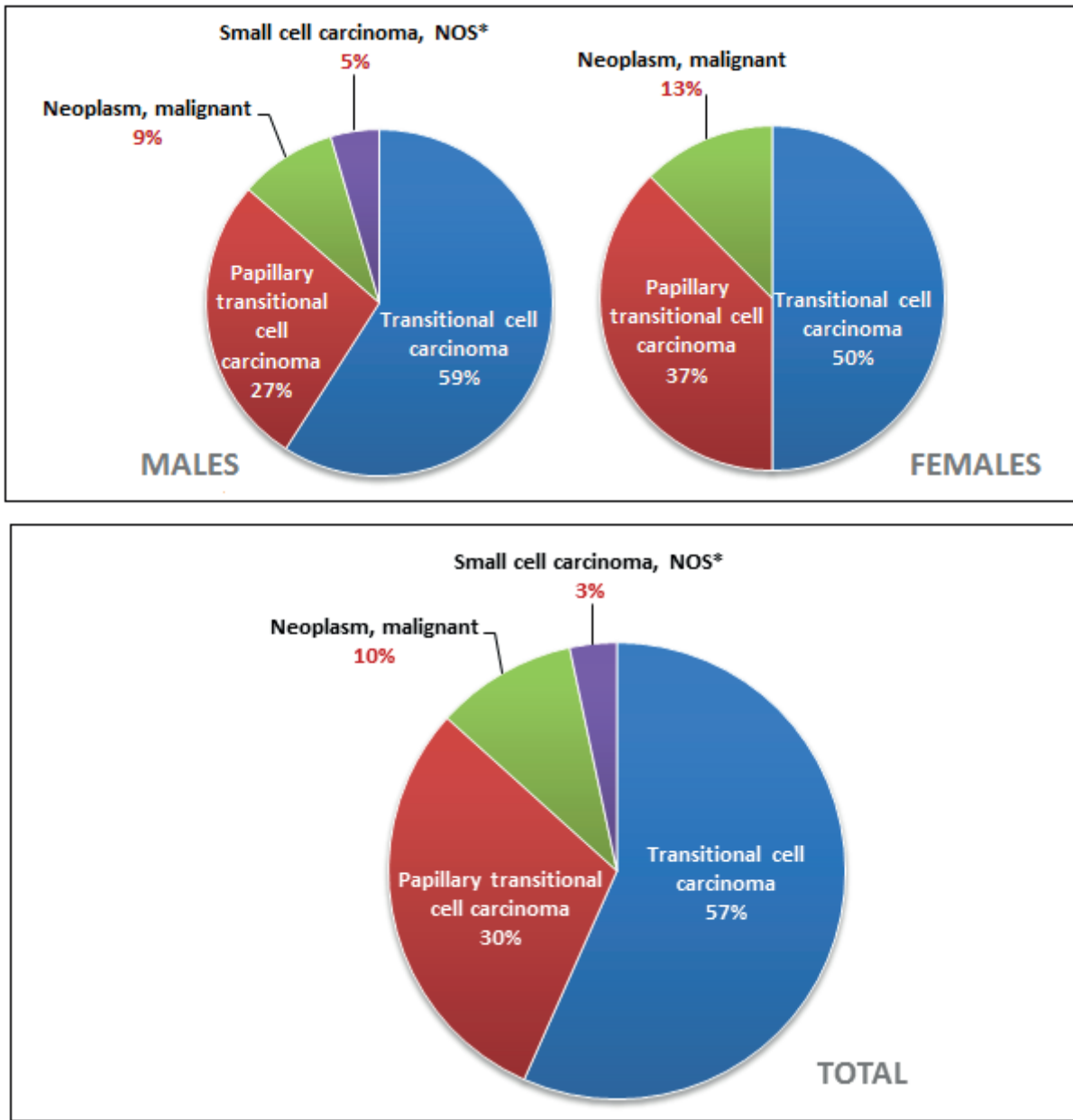


Figure 50 Morphology of Bladder Cancer in Bahrainis, 2014



*Not otherwise specified

PROSTATE

Prostate cancer is the 7th most common cancer in Bahrain (2014), accounting for 3.9% of all new cancer cases. It is also the 3rd most common cancer among Bahraini men (9.4% of all male cases).

Between January and December 2014, there were 29 cases of prostate cancer registered in Bahrain. The world ASR in Bahraini men was 14.2 cases/100,000 (Table 15 and Figure 36).

In 2014, nearly 83% of prostate cancer cases were diagnosed in Bahraini men aged 60 years and older. Age-specific incidence was observed to rise from around age 50-54, with the highest rates in those aged over 85 years. (Figure 51).

Adenocarcinomas were the most frequent histopathological type, accounting for 80% of all prostate cancers (Figure 52).

Figure 51 Age-Specific Incidence Rates for Prostate Cancer in Bahraini Males, 2014

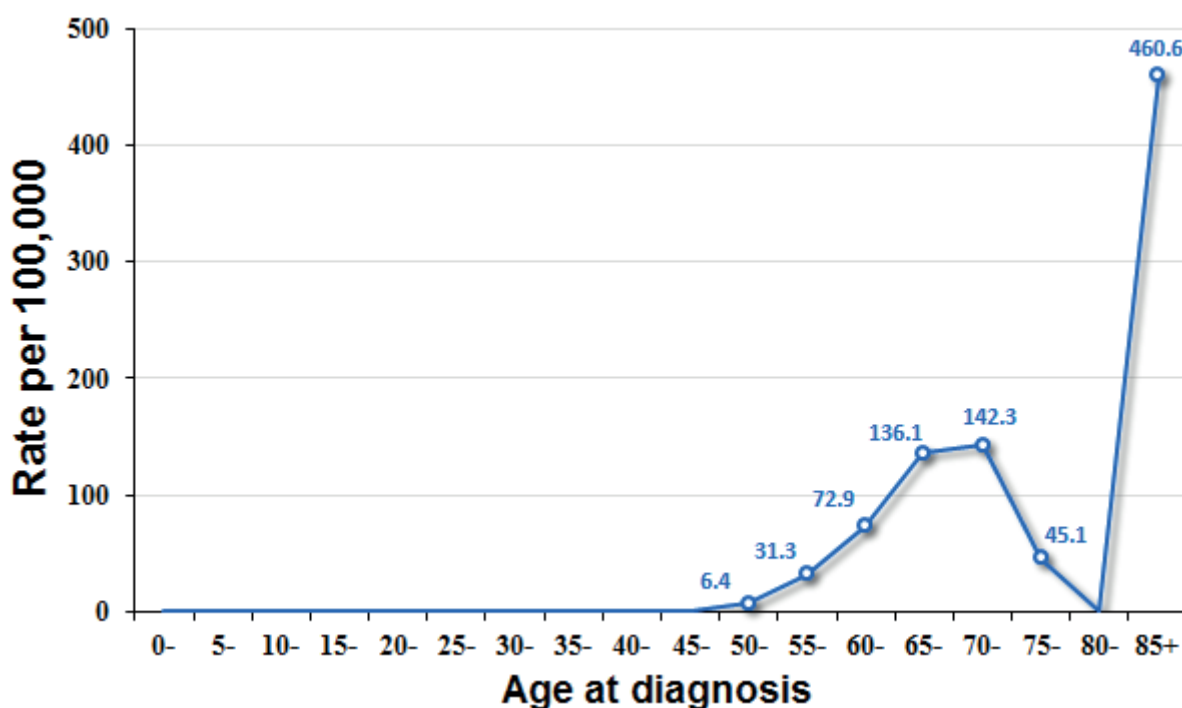
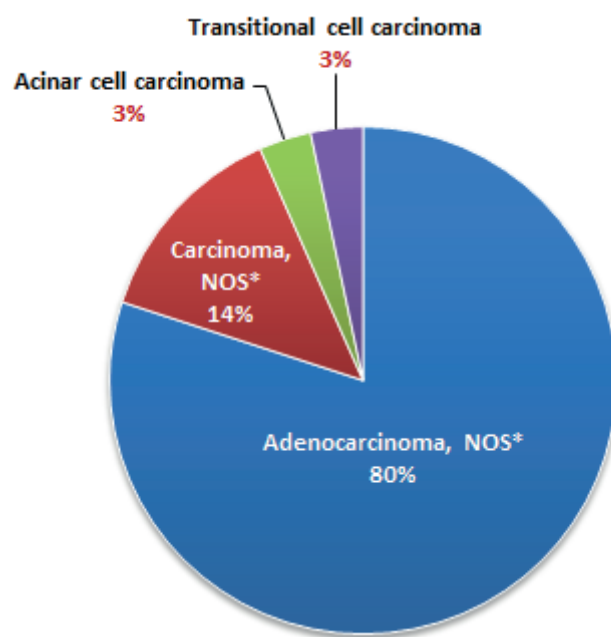


Figure 52 Morphology of Prostate Cancer in Bahraini Males, 2014



*Not otherwise specified

OVARY

Ovarian cancer is the 8th most common cancer in Bahrain (2014), accounting for 3.6% of all new cancer cases, and the 4th most common cancer in Bahraini females (6.2% of the female total).

Between January and December 2014, there were 27 new cases of ovarian cancer reported in Bahrain, with a world ASR of 9.7 per 100,000 Bahraini females (Table 15 and Figure 36).

Ovarian cancer incidence is strongly related to age, with the highest incidence being in older women. In 2014, over 77% of cases were diagnosed in females aged over 40 years. Incidence is observed at as early as 10 years of age. Age-specific incidence rates rise sharply at around age 40-44 years to reach their highest peak at 85 years and above (Figure 53).

Adenocarcinomas were the most frequent histopathological types accounting for 30% of all ovarian cancers, followed by mucinous cystadenocarcinomas (11%) and unspecified carcinomas (11%) (Figure 54).

Figure 53 Age-Specific Incidence Rates for Ovarian Cancer in Bahraini Females, 2014

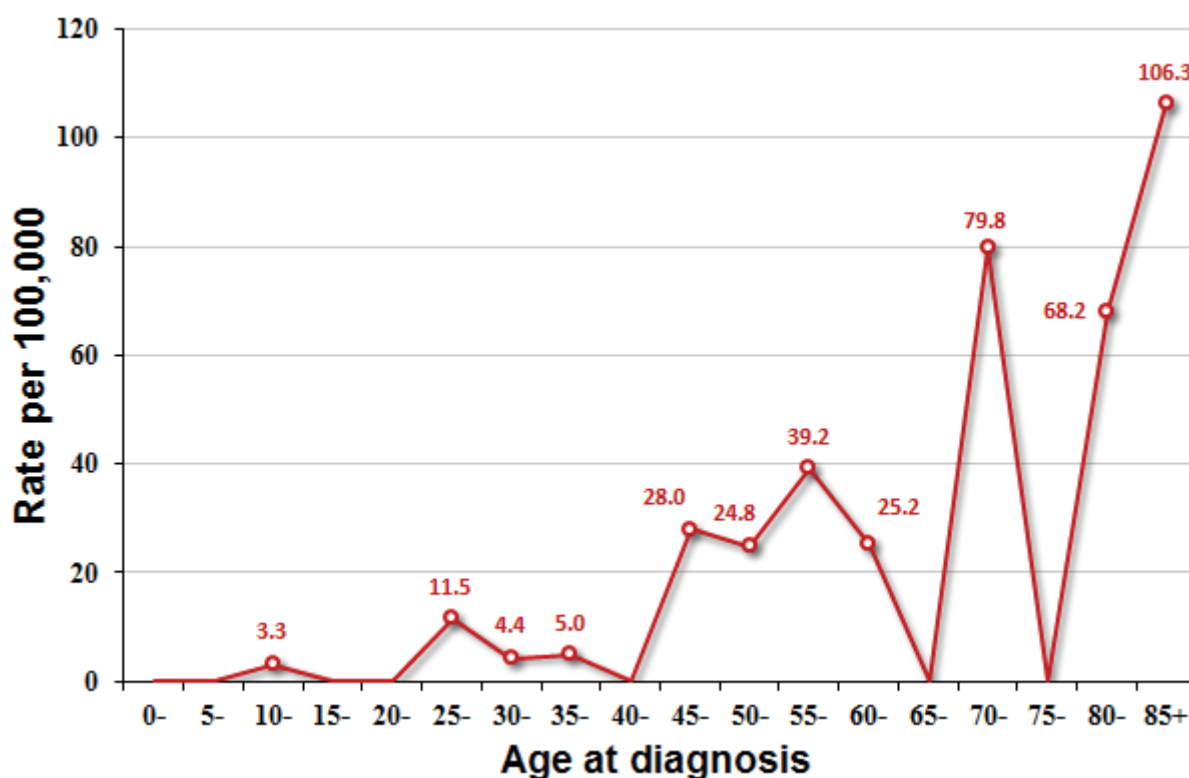
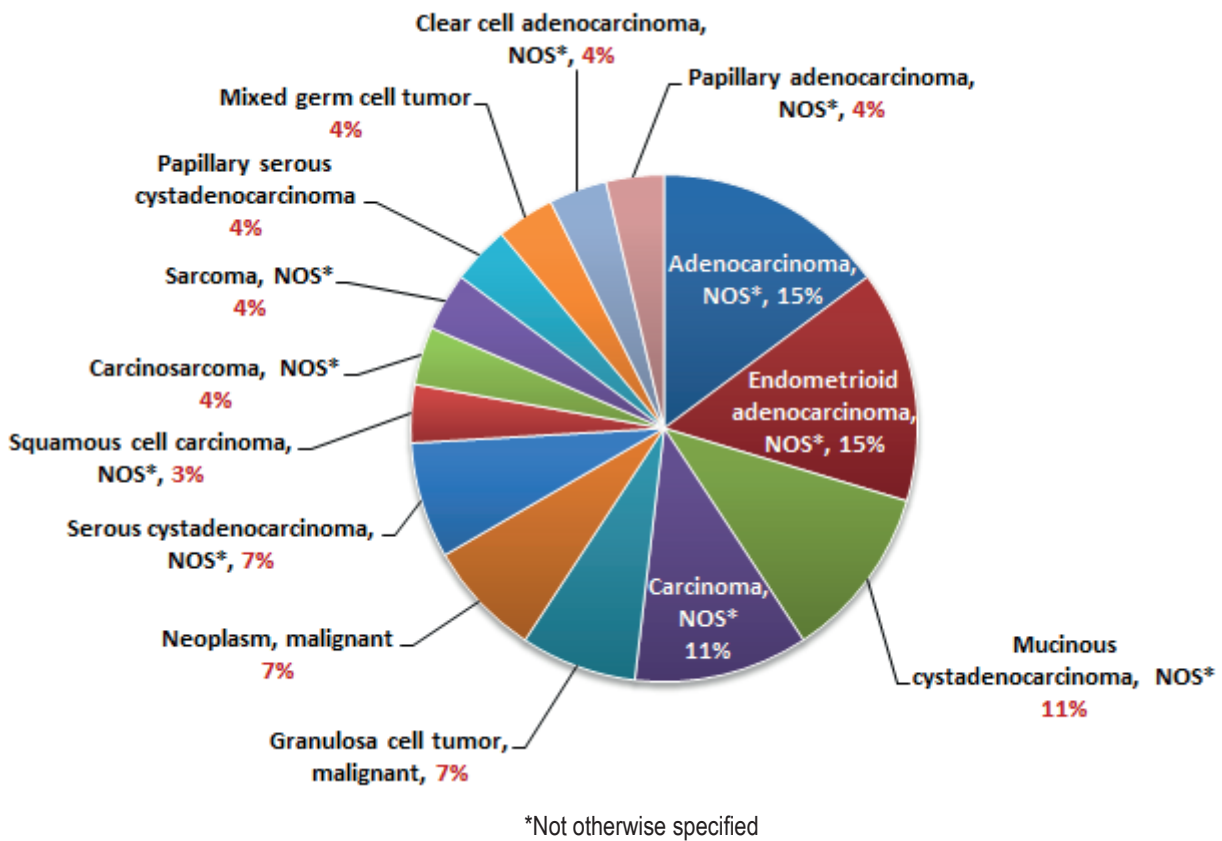


Figure 54 Morphology of Ovarian Cancer in Bahraini Females, 2014



BRAIN AND CENTRAL NERVOUS SYSTEM

Brain and CNS tumors are the 9th most common cancer in Bahrain (2014), and account for 2.9% of all new cases. They are also the 8th most common cancer in Bahraini males (4.5% of the male total).

In 2014, 22 new cases of brain tumors were reported: 14 (63.6%) male and 8 (36.4%) female. The total world ASR in the Bahraini population was 4.0 per 100,000 people. The world ASRs by gender were 4.9 cases/100,000 Bahraini males and 3.0 cases/100,000 Bahraini females (Table 21).

In contrast to most cancer types, these tumors occur relatively frequently across all age groups, including children and teenagers and young adults. In 2014, incidence rates remain relatively stable from infancy to around age 40, before increasing more sharply (particularly in males) to peak at 80-84 years in males and 65-69 years in females (Figure 55).

Glioblastomas were the most frequent histopathological type, accounting for 33% of all brain and CNS tumors, followed by astrocytomas (14% of the total) (Figure 56).

Table 21 Gender Distribution of Brain and CNS Tumors in Bahrainis, 2014

GENDER	FREQUENCY	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	14	4.4	4.9
Female	8	2.6	3.0

Figure 55 Age-Specific Incidence Rates for Brain and CNS tumors in Bahrainis, 2014

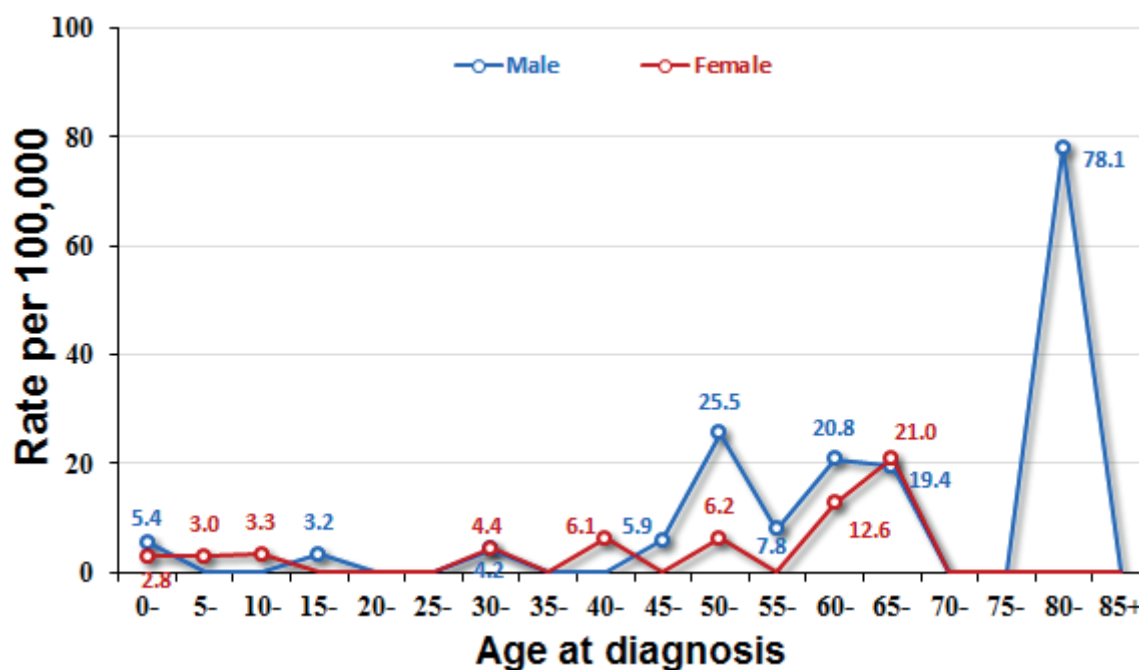
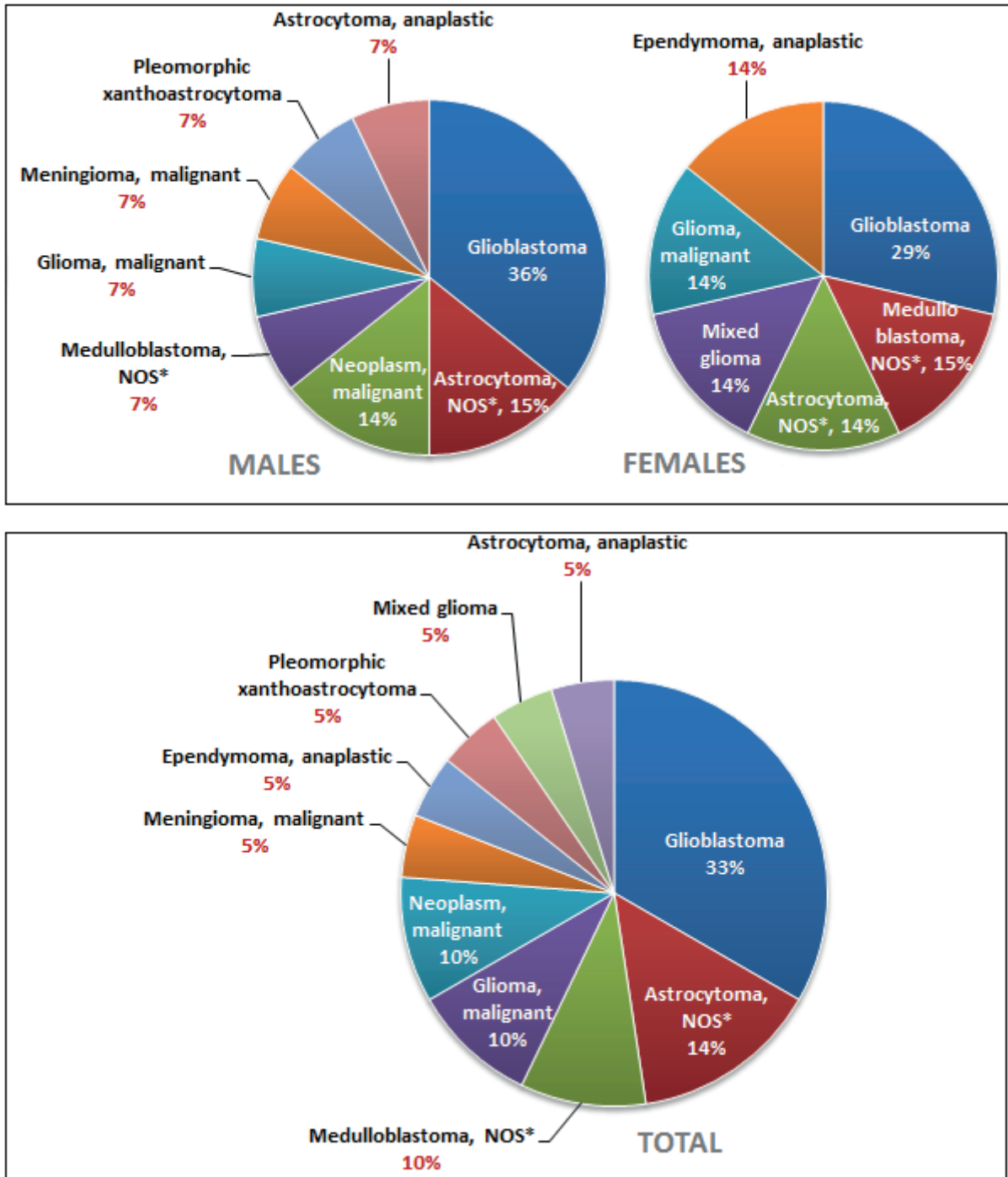


Figure 56 Morphology of Brain and CNS Tumors in Bahrain, 2014



*Not otherwise specified

PANCREAS

Pancreatic cancer is the 10th most common cancer in Bahrain (2014), accounting for 2.8% of all new cancer cases, and the 6th most common cancer in Bahraini men (5.2% of the male total).

In 2014, 21 Bahraini people had a diagnosis of pancreatic cancer: 16 were male (76.2%) and 5 female (23.8%). The total world ASR in the Bahraini population was 4.4 per 100,000 people. The world ASRs by gender were 7.1 cases/100,000 Bahraini males and 1.9 cases/100,000 Bahraini females (Table 22).

The incidence of pancreatic cancer is strongly related to age, with the highest incidence rates being in older men and women. In 2014, over 47% of cases were diagnosed in men and women aged 75 and above, and 100% were diagnosed in those aged 50 and above. Age-specific incidence rates in men rise from around age 50-54, peak sharply in the 75-79 age group, then decline, and subsequently rise again to peak in the 85+ age group. In women, incidence also begins at 50-54 years and peak at 80-84 years. Incidence rates are higher for men than for women, and this gap is widest at ages 75-79 (Figure 57).

Adenocarcinomas were the most frequent histopathological type, accounting for 52% of all pancreatic cancer cases (Figure 58).

Table 22 Gender Distribution of Pancreatic Cancer in Bahrainis, 2014

GENDER	FREQUENCY	CRUDE INCIDENCE RATE	AGE-STANDARDIZED RATE (WORLD)
Male	16	5.0	7.1
Female	5	1.6	1.9

Figure 57 Age-Specific Incidence Rates for Pancreatic Cancer in Bahrainis, 2014

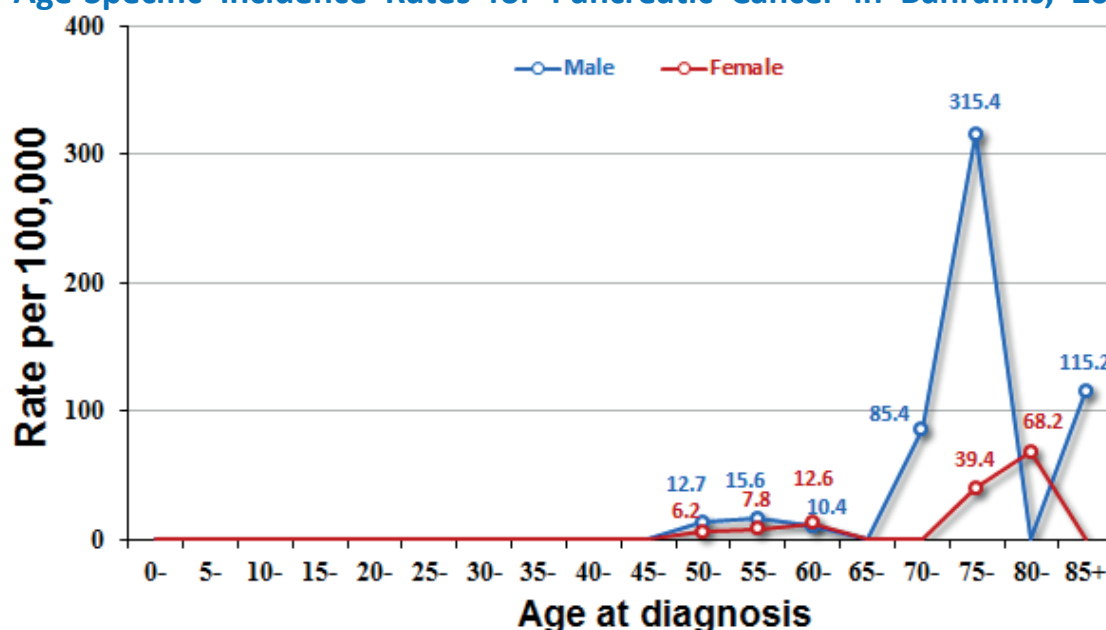
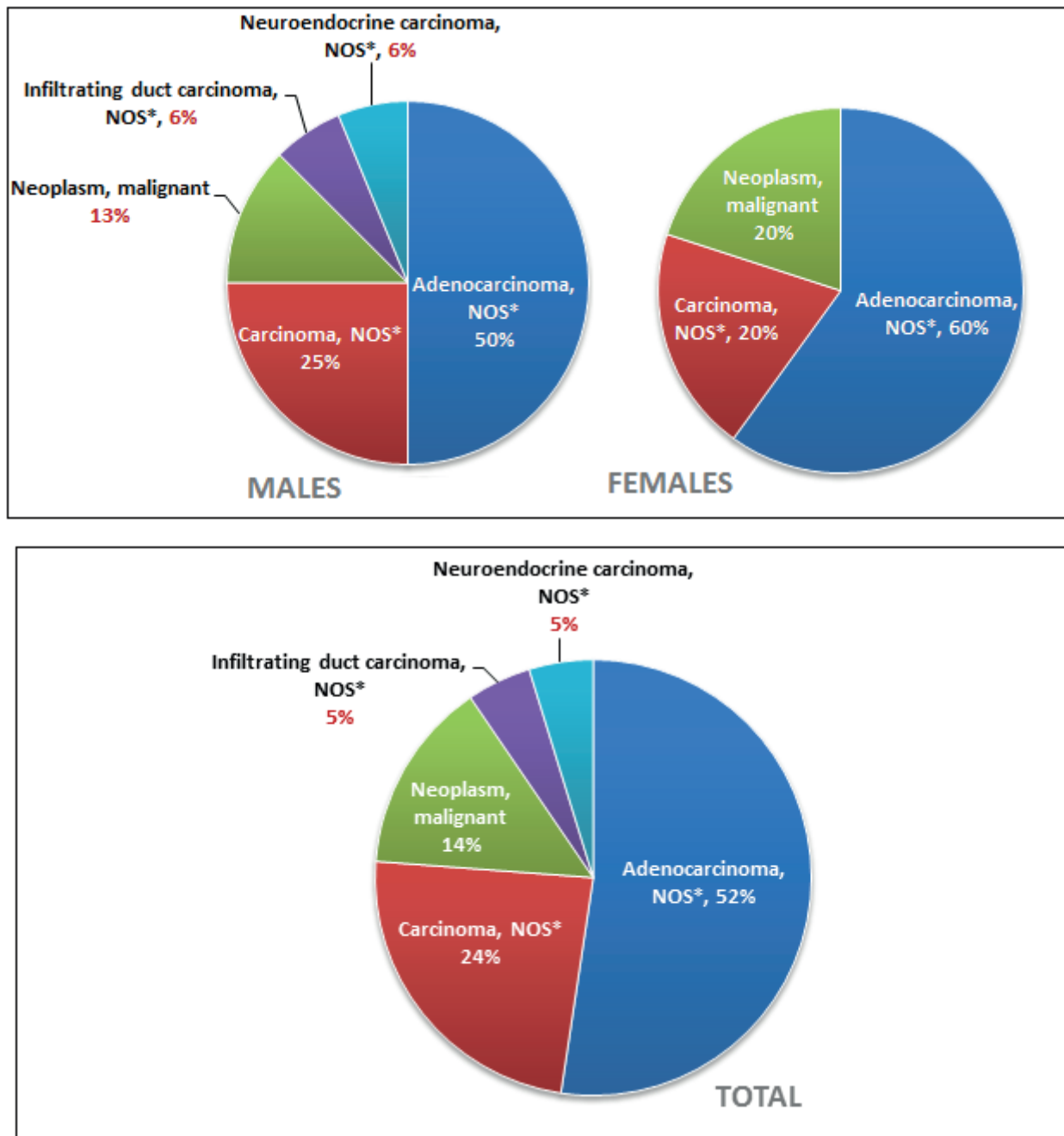


Figure 58 Morphology of Pancreatic Cancer in Bahrainis, 2014



*Not otherwise specified

CHILDHOOD CANCER

1998 – 2014

TRENDS OF CHILDHOOD CANCER INCIDENCE, 1998-2014

Of the 8,013 cases of cancer registered between January 1998 and December 2014, 358 cases were reported in children aged 0-14 years, constituting approximately 4.5% of the total cancers reported. The average annual frequency of childhood cancers was 21 cases per year. Of these 358 cases in children, 216 (60.3%) were boys and 142 (39.7%) were girls.

The average annual truncated crude incidence cancer rate was higher among Bahraini boys at 14.2 per 100,000 compared to 9.6 per 100,000 in Bahraini girls. The average annual truncated world ASRs were 14.6 and 9.9 per 100,000 Bahraini boys and girls, respectively (Table 23).

The frequencies and incidence rates of cancers in Bahraini males and females are presented in Table 24 to Table 27.

Overall, leukemia (128 cases), and cancers of the brain and CNS (57 cases), Hodgkin's disease (32 cases), kidney (26 cases), and NHL (26 cases) constituted over 75% of the total childhood cancer burden (269 new cases) during the 17-year period.

Table 23 Distribution of Incident Cancer Cases among Bahraini Children, 1998-2014

GENDER	FREQUENCY	PERCENTAGE (%)	AVERAGE ANNUAL CRUDE INCIDENCE RATE	AVERAGE ANNUAL ASR (WORLD)
Male	216	60.3	14.2	14.6
Female	142	39.7	9.6	9.9
TOTAL	358	100		

Over the 17-year period, while the average annual world ASRs for all childhood cancers combined demonstrated a steadily inclining trend in Bahraini boys, the rates appear to be decreasing in girls. For both sexes, the rates dropped significantly in 2007, but began to rise again over the next 7 years. (Figure 59).

Girls had generally lower incidence rates than boys throughout ages 0-14. The average annual age-specific incidence rates indicated a tendency to decline from childhood to pre-adolescence in both sexes. Incidence of cancer was highest among children under the age of 5, with age-specific rates of 17.8 and 13.2 cases per 100,000 boys and girls, respectively (Figure 60).

Table 24 Frequency of Incident Cancer Cases among Bahraini Boys, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Liver	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	C22
Nose, sinuses etc.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	C30-C31
Trachea, bronchus, lung	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	C33-C34
Other thoracic organs	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	C37-C38
Bone	0	0	2	1	1	2	0	2	3	1	0	0	1	1	0	0	2	C40-C41
Connective, soft tissue	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	C47-C49
Testis	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	C62
Kidney, ureters etc	3	0	1	1	1	0	1	0	1	1	2	1	0	1	0	0	0	C64-C66; C68
Bladder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	C67
Eye	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	C69
Brain, nervous system	1	1	3	3	3	1	4	0	2	2	3	0	2	3	2	3	2	C70-C72
Adrenal gland	0	1	0	2	0	0	1	0	1	0	0	0	0	0	1	0	1	C74
Other Endocrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	C75
Hodgkin's disease	1	0	1	0	1	2	2	3	0	1	2	2	1	0	3	2	3	C81
Non-Hodgkin lymphoma	0	1	0	0	0	2	1	4	0	0	1	1	1	1	1	0	3	C82-C85;C96
Multiple myeloma	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	C90
Lymphoid leukemia	3	2	3	3	2	2	2	2	1	0	3	1	3	4	3	3	5	C91
Myeloid leukemia	1	1	0	1	1	0	0	0	2	1	2	2	1	0	2	2	1	C92-C94
Leukemia unspecified	0	0	1	0	0	1	0	1	2	1	3	0	2	3	1	1	1	C95
Other & unspecified	2	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	Other
TOTAL	11	8	12	14	11	12	13	12	14	8	16	9	13	14	17	13	19	

Table 25 Frequency of Incident Cancer Cases among Bahraini Girls, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Colorectum	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	C18-C21
Trachea, bronchus, lung	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C33-C34
Bone	2	1	0	0	0	0	0	0	1	0	1	1	0	1	0	0	1	C40-C41
Connective, soft tissue	0	1	0	0	0	0	1	2	1	0	0	0	0	0	2	3	0	C47;C49
Ovary	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	1	C56
Kidney, ureters etc.	0	2	1	0	0	0	1	1	4	0	2	0	0	0	0	0	2	C64-C66; C68
Bladder	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	C67
Eye	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	C69
Brain, nervous system	0	1	1	0	0	1	2	0	3	0	1	1	3	3	1	2	3	C70-C72
Adrenal gland	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	1	C74
Other endocrine glands	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	C75
Hodgkin's disease	0	1	1	2	0	0	0	0	0	0	0	0	0	0	1	2	1	C81
Non-Hodgkin lymphoma	0	0	0	1	0	2	2	0	0	1	1	0	0	2	0	1	0	C82-C85;C96
Lymphoid leukemia	3	2	5	2	2	0	3	1	0	1	2	2	1	0	0	1	2	C91
Myeloid leukemia	1	1	0	0	0	0	0	0	1	0	2	1	1	0	0	1	3	C92-C94
Leukemia unspecified	0	0	0	0	0	0	1	1	6	1	1	1	1	1	1	0	0	C95
Other & unspecified	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	Other
TOTAL	6	10	10	7	3	5	11	7	18	3	11	7	7	8	5	10	14	

Table 26 World Age-Standardized Incidence Rates of Cancers in Bahraini Boys, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Liver	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	C22
Nose, sinuses etc.	0.0	0.0	0.0	1.3	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C30-C31
Trachea, bronchus, lung	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	1.1	0.0	1.0	C33-C34
Other thoracic organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	C37-C38
Bone	0.0	0.0	2.3	1.3	1.1	2.6	0.0	3.4	2.6	1.0	0.0	0.0	1.0	1.0	0.0	0.0	2.0	C40-C41
Other skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C44
Connective, soft tissue	0.0	0.0	0.0	1.5	0.0	1.5	0.0	0.0	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	C47-C49
Testis	0.0	2.8	0.0	1.1	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C62
Kidney, ureter etc.	4.5	0.0	1.0	1.5	1.5	0.0	1.2	0.0	1.2	1.4	1.8	1.2	0.0	1.2	0.0	0.0	0.0	C64-C66; C68
Bladder	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	2.1	0.0	0.0	C67
Eye	0.0	0.0	1.3	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	C69
Brain, nervous system	1.3	1.6	2.9	3.8	3.7	1.2	5.2	1.1	2.1	2.1	2.6	0.0	2.2	3.0	2.0	3.2	2.1	C70-C72
Adrenal gland	0.0	1.6	0.0	2.8	0.0	0.0	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.9	C74
Other Endocrine glands	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	1.0	0.0	0.0	C74
Hodgkin's disease	1.3	0.0	1.3	0.0	1.1	2.3	2.1	5.0	0.0	1.4	1.7	2.1	1.0	0.0	3.0	1.9	2.8	C81
Non-Hodgkin lymphoma	0.0	1.3	0.0	0.0	0.0	2.3	1.2	3.6	0.0	0.0	1.0	1.2	1.2	1.0	1.1	0.0	2.9	C82-C85;C96
Multiple myeloma	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	0.0	0.0	0.0	0.0	C90
Lymphoid leukemia	3.8	2.9	3.3	4.4	2.7	2.2	2.3	2.5	0.8	0.0	2.9	1.2	3.5	4.3	3.2	3.1	5.1	C91
Myeloid leukemia	1.6	1.2	0.0	1.3	1.5	0.0	0.0	0.0	2.0	1.0	1.7	2.2	1.0	0.0	2.2	2.1	1.0	C92-C94
Leukemia unspecified	0.0	0.0	1.3	0.0	0.0	1.2	0.0	1.4	1.8	1.1	2.6	0.0	2.3	3.3	1.1	1.1	1.0	C95
Other & unspecified	2.9	0.0	0.0	0.0	1.2	1.2	0.0	0.0	0.0	1.4	0.0	1.2	0.0	0.0	0.0	0.0	0.0	Other
TOTAL	15.0	11.1	13.1	18.9	14.7	14.4	16.7	18.2	14.1	9.0	13.9	10.4	14.2	14.8	17.9	13.4	19.3	

Table 27 World Age-Standardized Incidence Rates of Cancers in Bahraini Girls, 1998-2014

CANCER SITE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	ICD (10TH)
Colorectum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	C18-C21
Trachea, bronchus, lung	0.0	1.3	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	C33-C34
Other thoracic organs	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	C37-C38
Bone	2.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.9	1.3	0.0	1.0	0.0	0.0	1.0	C40-C41
Connective, soft tissue	0.0	1.7	0.0	0.0	0.0	0.0	1.1	3.3	0.9	0.0	0.0	0.0	0.0	0.0	2.1	3.2	0.0	C47;C49
Ovary	0.0	0.0	1.0	1.2	0.0	0.0	0.0	1.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	C56
Kidney, ureter, pelvis etc.	0.0	3.0	1.3	0.0	0.0	0.0	1.6	1.6	5.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	2.1	C64-C66; C68
Bladder	0.0	0.0	0.0	1.6	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	C67
Eye	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	C69
Brain, nervous system	0.0	1.3	1.3	0.0	0.0	1.2	3.2	0.0	3.0	0.0	1.0	1.0	3.4	3.3	1.2	2.1	3.0	C70-C72
Adrenal gland	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1	C74
Other endocrine glands	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C75
Hodgkin's disease	0.0	1.3	1.1	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.0	1.0	C81
Non-Hodgkin lymphoma	0.0	0.0	0.0	1.2	0.0	2.9	2.8	0.0	0.0	1.0	0.9	0.0	0.0	2.3	0.0	1.1	0.0	C82-C85;C96
Lymphoid leukemia	4.6	2.5	5.8	2.5	3.2	0.0	3.4	1.6	0.0	1.2	1.9	2.5	1.1	0.0	0.0	1.1	2.1	C91
Myeloid leukemia	1.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	1.9	1.3	1.2	0.0	0.0	1.1	2.9	C92-C94
Leukemia unspecified	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	6.1	1.0	1.0	1.0	1.2	1.2	1.1	0.0	0.0	C95
Other & unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.9	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	Other
TOTAL	8.5	14.0	11.8	9.0	4.6	7.6	14.8	10.8	18.8	3.3	10.4	8.2	8.5	8.7	5.5	10.5	13.8	

Figure 59 Truncated Age-Standardized Incidence Rates of Cancers among Bahraini Children by Year, 1998-2014

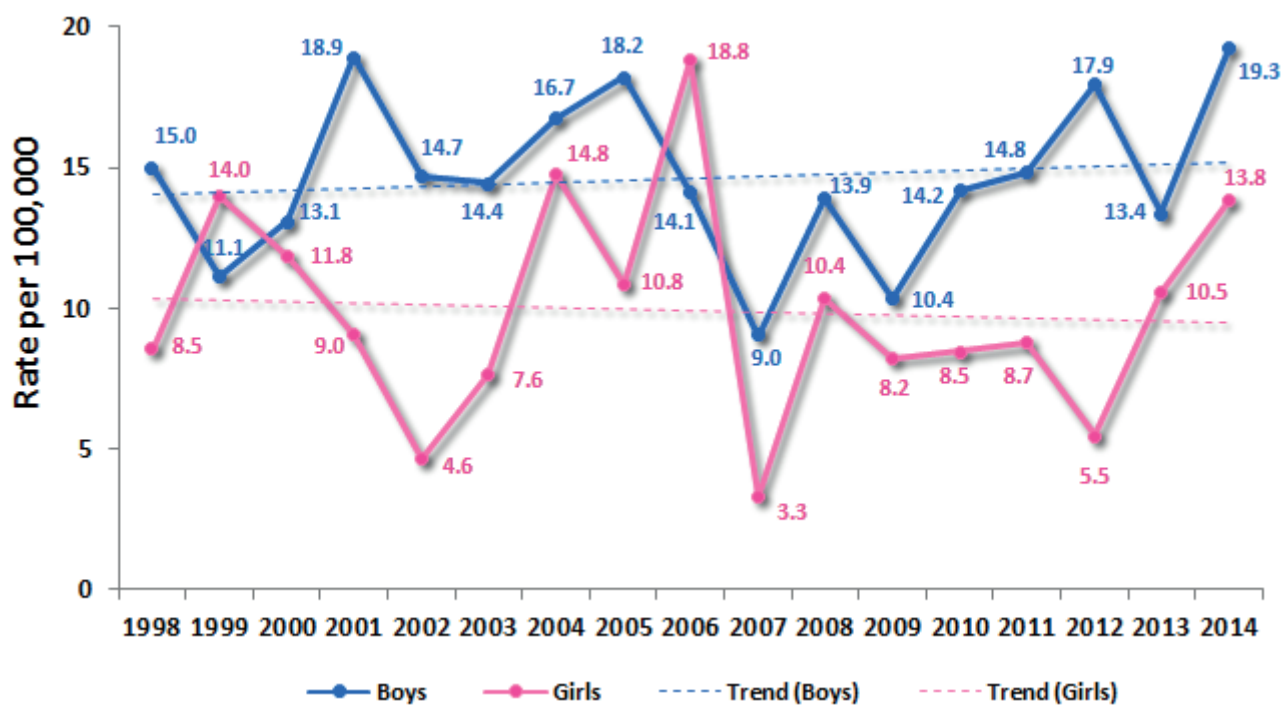
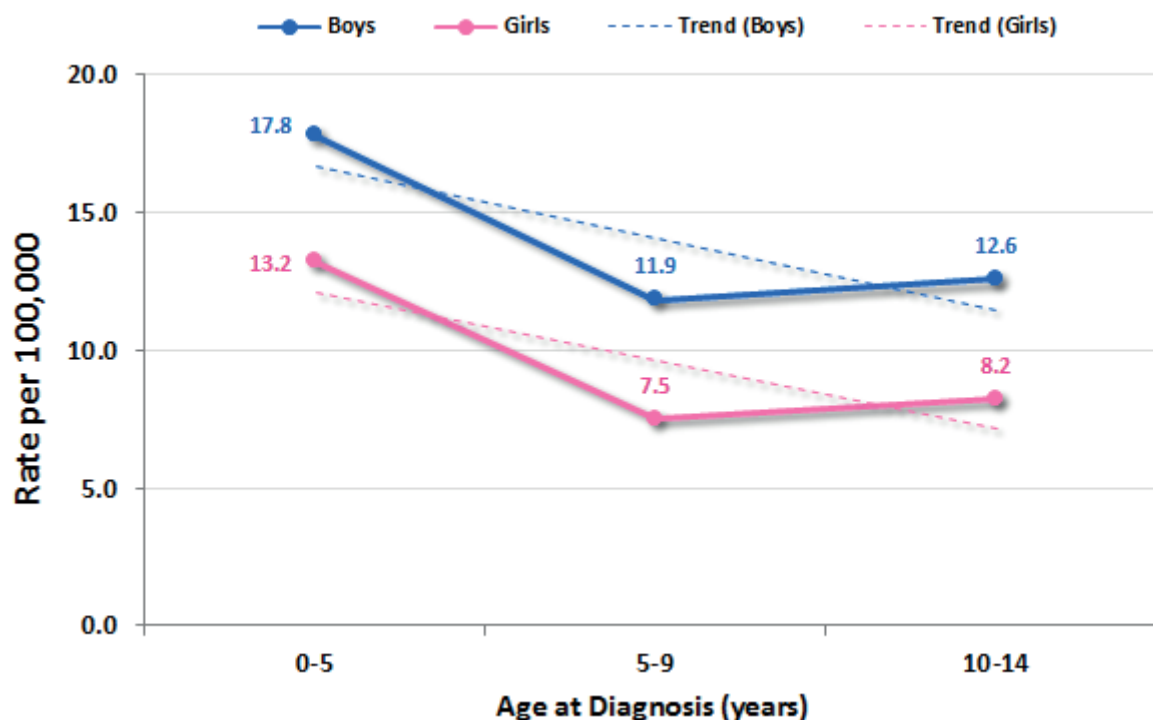


Figure 60 Average Annual Age-Specific Incidence Rates of Cancers among Bahraini Children, 1998-2014



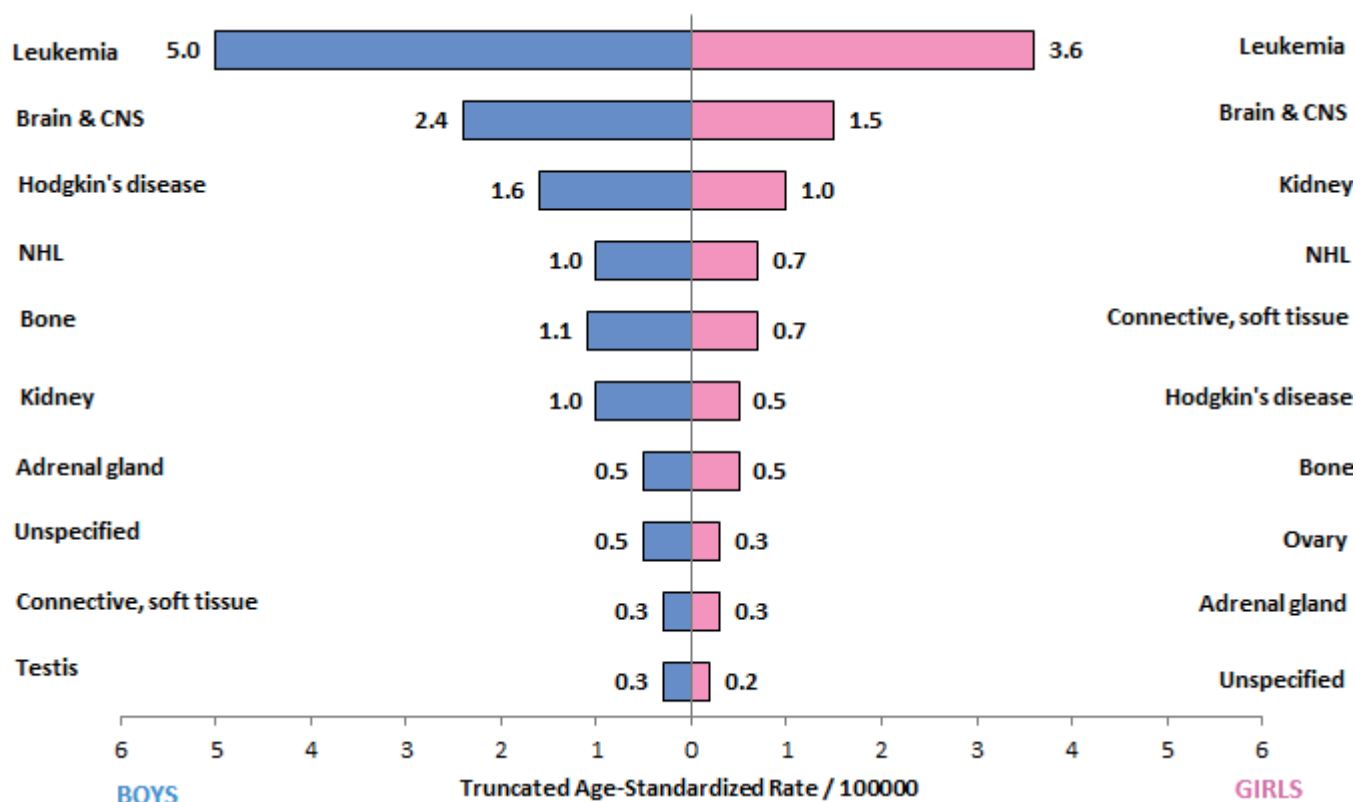
MOST COMMON CANCERS IN BAHRAINI CHILDREN, 1998-2014

Between 1998 and 2014, leukemia was observed to be the leading malignancy in Bahraini boys (76 new cases), followed by brain tumors, Hodgkin’s disease, NHL, and bone cancer. Leukemia was also the most common cancer among Bahraini girls with 52 new cases, followed by cancers of the brain, kidney, NHL, and connective tissue (Table 28 and Figure 61).

Table 28 Most Common Childhood Cancers among Bahraini Nationals, 1998-2014

MALES (N = 216)				FEMALES (N = 142)			
Site	No.	%	ASR	Site	No.	%	ASR
Leukemia	76	35.2	5.0	Leukemia	52	36.6	3.6
Brain & CNS	35	16.2	2.4	Brain & CNS	22	15.5	1.5
Hodgkin’s disease	24	11.1	1.6	Kidney	13	9.2	1.0
NHL	16	7.4	1.0	NHL	10	7.0	0.7
Bone	16	7.4	1.1	Connective, soft tissue	10	7.0	0.7
Kidney	13	6.0	1.0	Hodgkin’s disease	8	5.6	0.5
Adrenal gland	7	3.2	0.5	Bone	8	5.6	0.5
Unspecified	6	2.8	0.5	Ovary	5	3.5	0.3
Connective, soft tissue	4	1.9	0.3	Adrenal gland	4	2.8	0.3
Testis	4	1.9	0.3	Unspecified	3	2.1	0.2

Figure 61 Most Common Childhood Cancers among Bahrainis by ASR, 1998-2014



The truncated ASRs and age-specific incidence rates of the 5 common cancers among Bahraini boys and girls are presented in Figure 62 to Figure 65. For both boys and girls, clear gaps were observed between the leading cancer leukemia and other common cancers at most years and at all age groups.

Figure 62 Truncated Age-Standardized Incidence Rates of Most Common Cancers among Bahraini Boys, 1998-2014

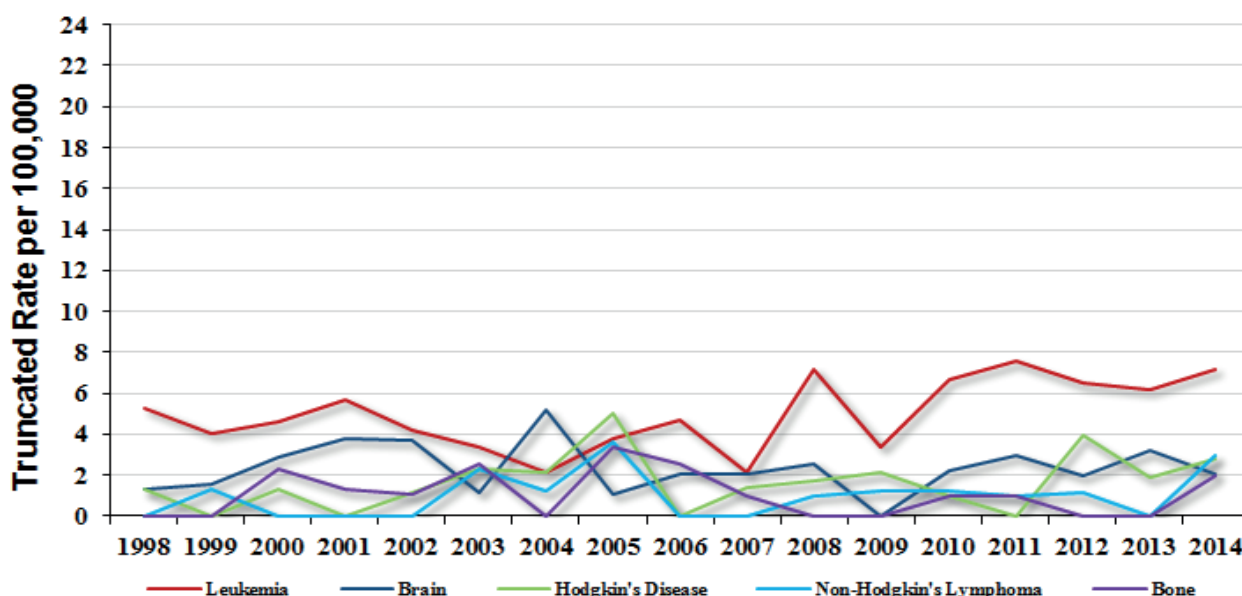


Figure 63 Average Annual Age-Specific Incidence Rates of Most Common Cancers among Bahraini Boys, 1998-2014

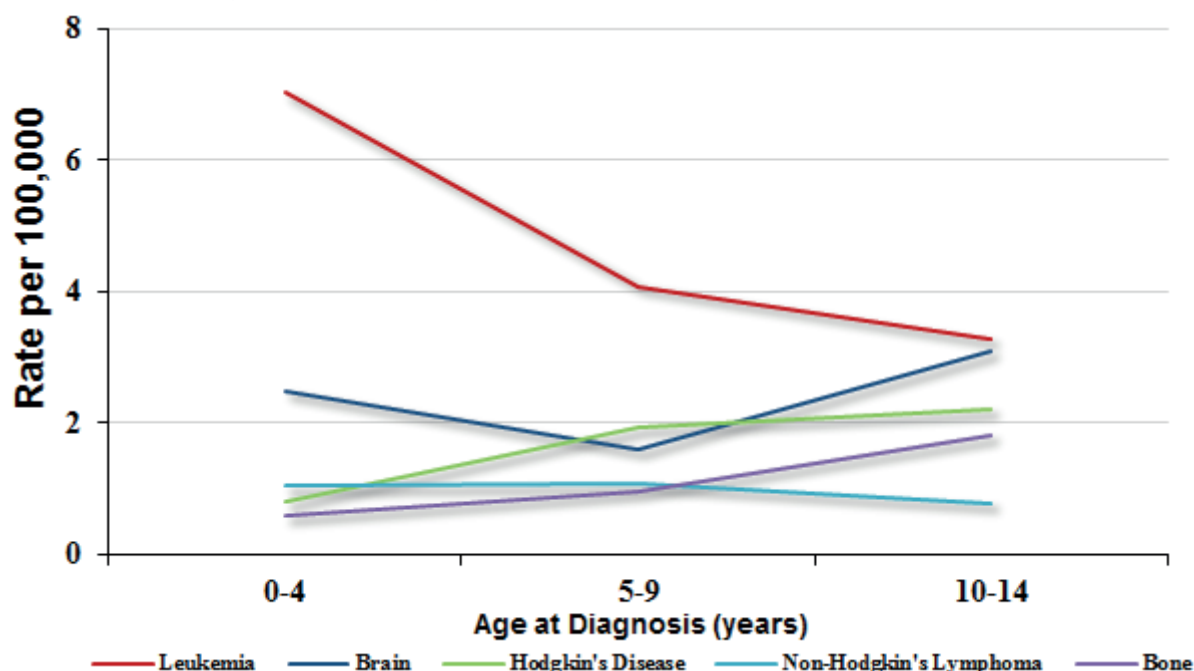


Figure 64 Truncated Age-Standardized Incidence Rates of Most Common Cancers among Bahraini Girls, 1998-2014

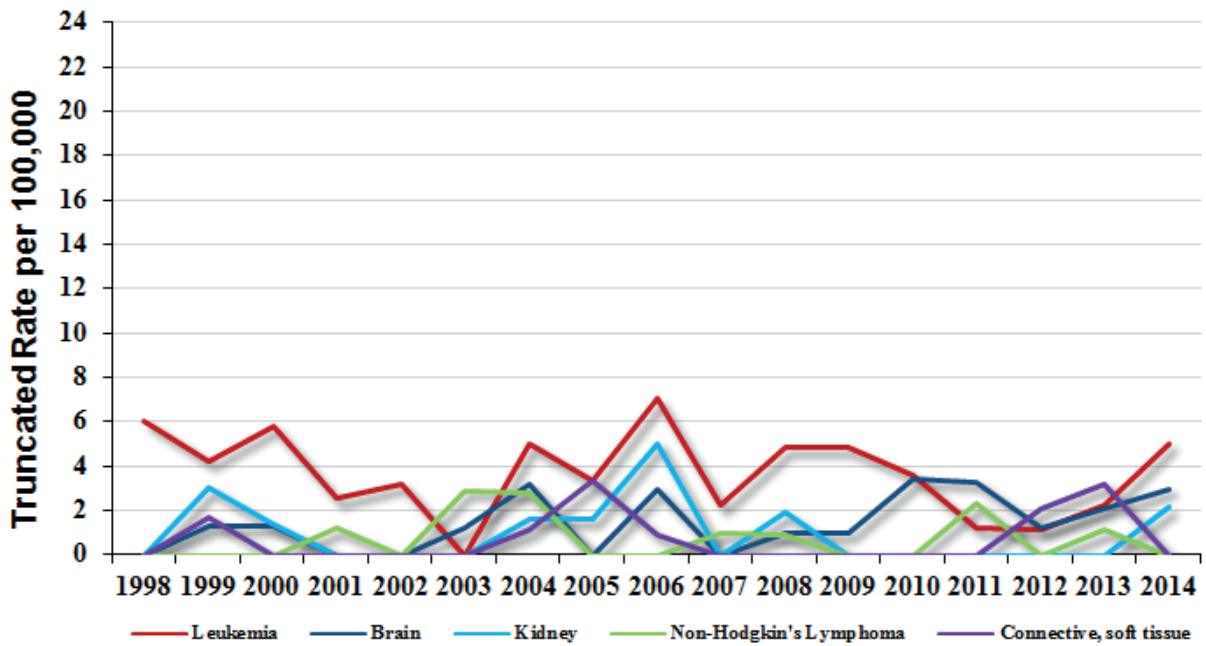
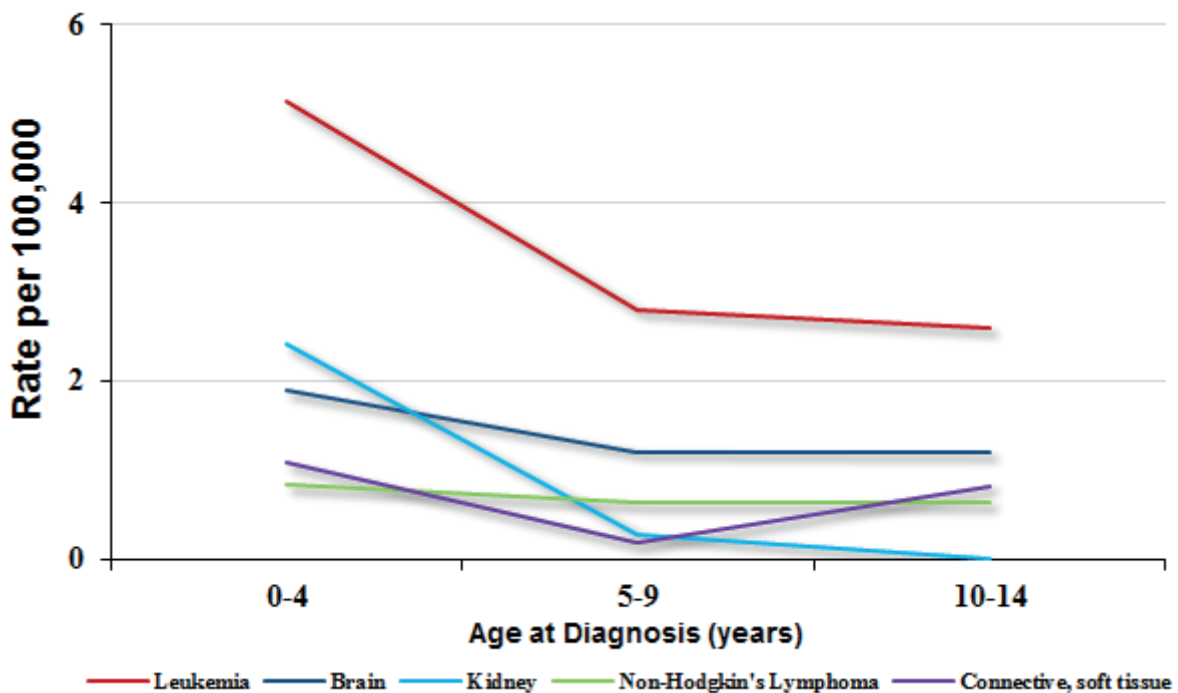


Figure 65 Average Annual Age-Specific Incidence Rates of Most Common Cancers among Bahraini Girls, 1998-2014



INCIDENCE OF CHILDHOOD CANCERS, 2014

Of the 746 new cancer cases reported in Bahrainis during 2014, 33 cases were among children aged 14 years and under (19 boys [57.6%] and 14 girls [42.4%]), constituting 4.4% of the total cancers reported.

The crude incidence rates for childhood cancer in Bahrainis in 2014 were 18.4 and 14.2 per 100,000 in boys and girls, respectively. The truncated world ASR rates for childhood cancer were 19.3 and 13.8 per 100,000 in boys and girls, respectively (Table 29).

Nearly 58% of cases in Bahraini boys occurred at infancy (0-4 years) with the highest incidence rates observed in this age group. Cancer incidence in girls was highest in the 5-9 age group (Figure 66).

Table 29 Distribution of Incident Cancers among Bahraini Children, 2014

GENDER	FREQUENCY	PERCENTAGE (%)	TRUNCATED CRUDE INCIDENCE RATE	TRUNCATED AGE-STANDARDIZED RATE (WORLD)
Male	19	57.6	18.4	19.3
Female	14	42.4	14.2	13.8
TOTAL	33	100		

Figure 66 Frequency and Age-Specific Incidence Rates of Cancer in Bahraini Children, 2014

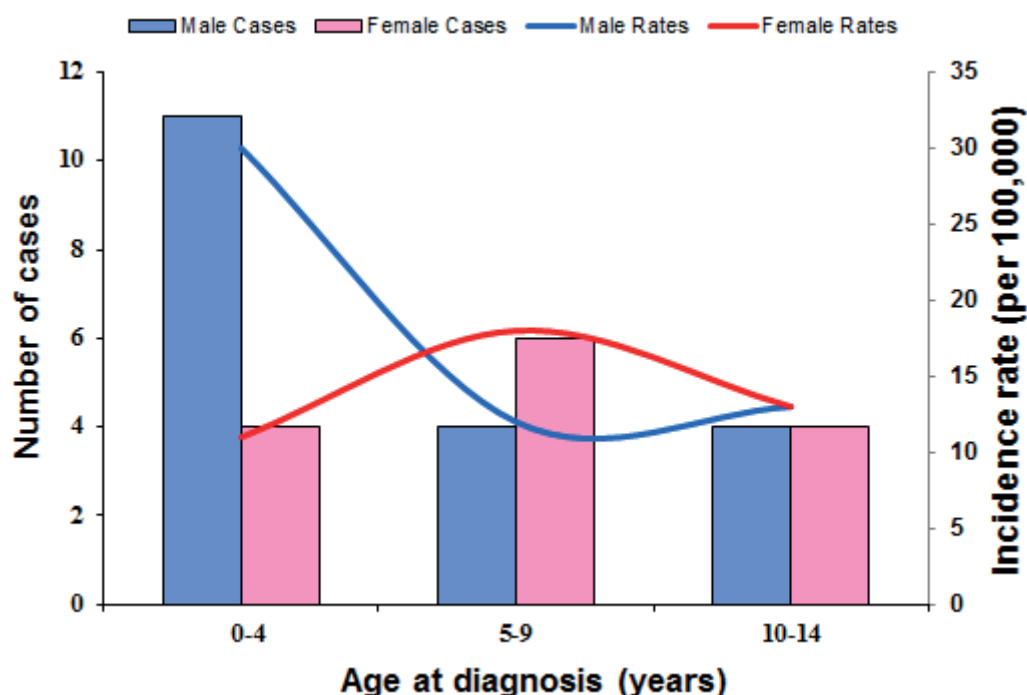


Table 30 Frequency of Incident Cancer Cases in Bahraini Boys (0-14 years), 2014

SITE	ALL AGES	0-4	5-9	10-14	% OF TOTAL	ICD (10TH)
Trachea, bronchus, lung	1	1	0	0	5.3	C33-C34
Bone	2	1	0	1	10.5	C40-C41
Brain, nervous system	2	2	0	0	10.5	C70-C72
Adrenal gland	1	0	1	0	5.3	C74
Hodgkin's disease	3	0	2	1	15.8	C81
Non-Hodgkin's lymphoma	3	1	0	2	15.8	C82-C85;C96
Lymphoid leukemia	5	4	1	0	26.3	C91
Myeloid leukemia	1	1	0	0	5.3	C92-C94
Leukemia unspecified	1	1	0	0	5.3	C95
TOTAL	19	11	4	4	100	

Table 31 Frequency of Incident Cancer Cases in Bahraini Girls (0-14 years), 2014

SITE	ALL AGES	0-4	5-9	10-14	% OF TOTAL	ICD (10TH)
Bone	1	0	1	0	7.1	C40-C41
Ovary	1	0	0	1	7.1	C56
Kidney, ureters etc.	2	1	1	0	14.3	C64-C66;C68
Brain, nervous system	3	1	1	1	21.4	C70-C72
Adrenal gland	1	1	0	0	7.1	C74
Hodgkin's disease	1	0	0	1	7.1	C81
Lymphoid leukemia	2	1	1	0	14.3	C91
Myeloid leukemia	3	0	2	1	21.4	C92-C94
TOTAL	14	4	6	4	100	

MOST COMMON CANCERS IN BAHRAINI CHILDREN, 2014

Leukemia, brain & CNS tumors, Hodgkin's disease, bone tumors, and NHL were the top 5 cancers among Bahraini children in the year 2014, accounting for 82% of childhood cancer cases. Table 32 presents the top 5 cancers in Bahraini children by gender.

Table 32 Most Common Cancers among Bahraini Children, 2014

MALES (N = 19)				FEMALES (N = 142)			
Site	No.	%	ASR	Site	No.	%	ASR
Leukemia	7	36.8	7.2	Leukemia	5	35.7	5.0
Hodgkin's disease	3	15.8	2.8	Brain & CNS	3	21.4	3.0
Non-Hodgkin lymphoma	3	15.8	2.9	Kidney	2	14.3	2.1
Bone	2	10.5	2.0	Hodgkin's disease	1	7.1	1.0
Brain & CNS	2	10.5	2.1	Bone	1	7.1	1.0

CANCER MORTALITY

2014

TRENDS OF CANCER MORTALITY, 2014

In 2014, there were a total of 265 deaths among Bahrainis with cancer as the underlying cause of death, of which 134 (50.6%) were in males and 131 (49.4%) in females (Table 33).

The crude mortality rate indicates that there were approximately 42 deaths from cancer for every 100,000 people among Bahrainis in 2014. The world ASRs by gender were observed to be slightly lower in females than in males (52.9 versus 57.1 per 100,000).

Overall, cancer age-specific mortality rates were observed to increase with advancing age in both genders. During early to mid-adulthood, Bahraini females showed a higher mortality due to cancer compared to males, while after the age of 70, males had higher mortality rates compared to females (Figure 67).

Breast cancer (44 deaths), colorectal cancer (32 deaths), unspecified cancers (26 deaths), lung cancer (24 deaths), and prostate cancer (16 deaths) were the leading cancers responsible for cancer deaths in 2014. Together, these 5 cancer sites represented 53.58% of all deaths from cancer, with breast cancer accounting for 16.6% and colorectal cancer accounting for 12.1% of the total.

Among males, colorectal and lung cancers were the leading cause of cancer mortality, with 21 and 20 deaths in 2014. Prostate cancer (16 deaths), unspecified cancers (13 deaths) and stomach cancer (10 deaths) were the next most common causes of cancer deaths. These leading cancers accounted for nearly 60% of all deaths due to cancer among Bahraini males (Figure 68).

Breast cancer was by far the most common cancer causing death in Bahraini females in 2014 (42 deaths). Unspecified cancers (13 deaths), colorectal cancer (11 deaths), ovarian cancer (10 deaths) and pancreatic cancer (5 deaths) were the next most common causes of cancer deaths. Together, these leading cancers accounted for 62% of all deaths from cancer in Bahraini females (Figure 68).

Table 33 Distribution of Cancer Deaths among Bahrainis by Gender, 2014

GENDER	FREQUENCY	PERCENTAGE (%)	CRUDE MORTALITY RATE	AGE-STANDARDIZED MORTALITY RATE (WORLD)
Male	134	50.6	41.8	57.1
Female	131	49.4	42.3	52.9
TOTAL	265	100		

Figure 67 Frequency and Age-Specific Rates of Cancer Deaths in Bahrain, 2014

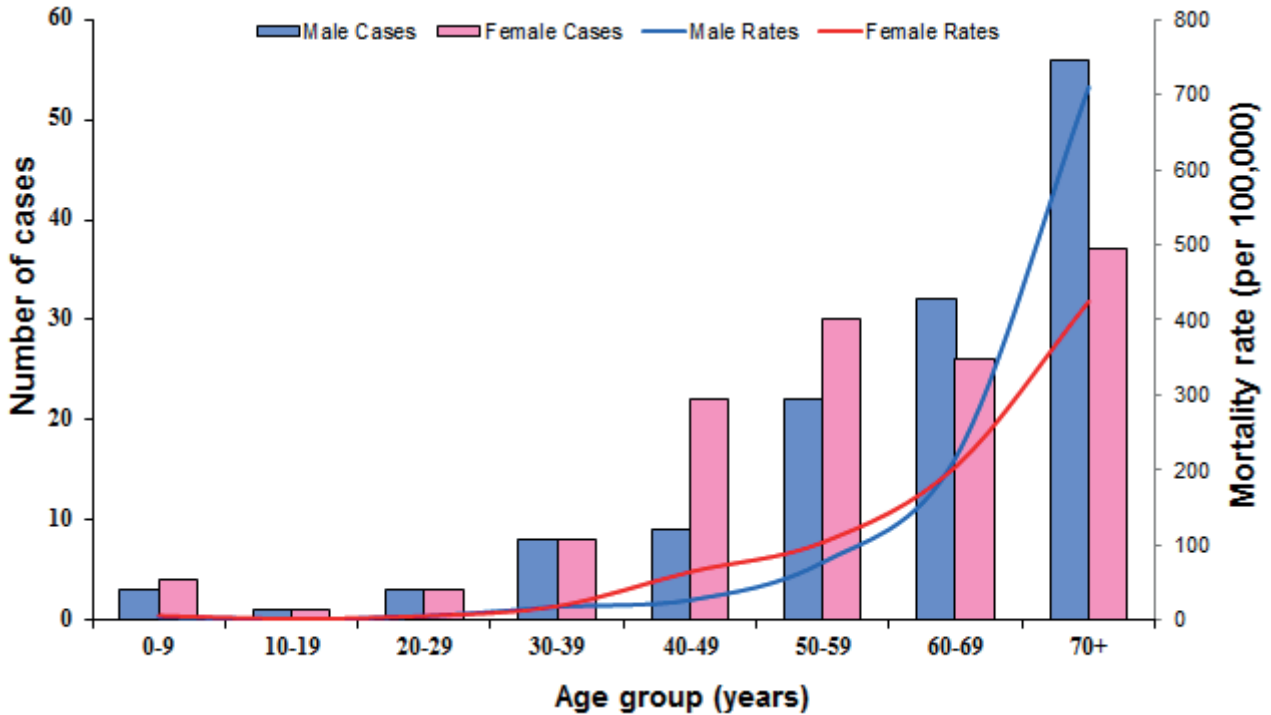
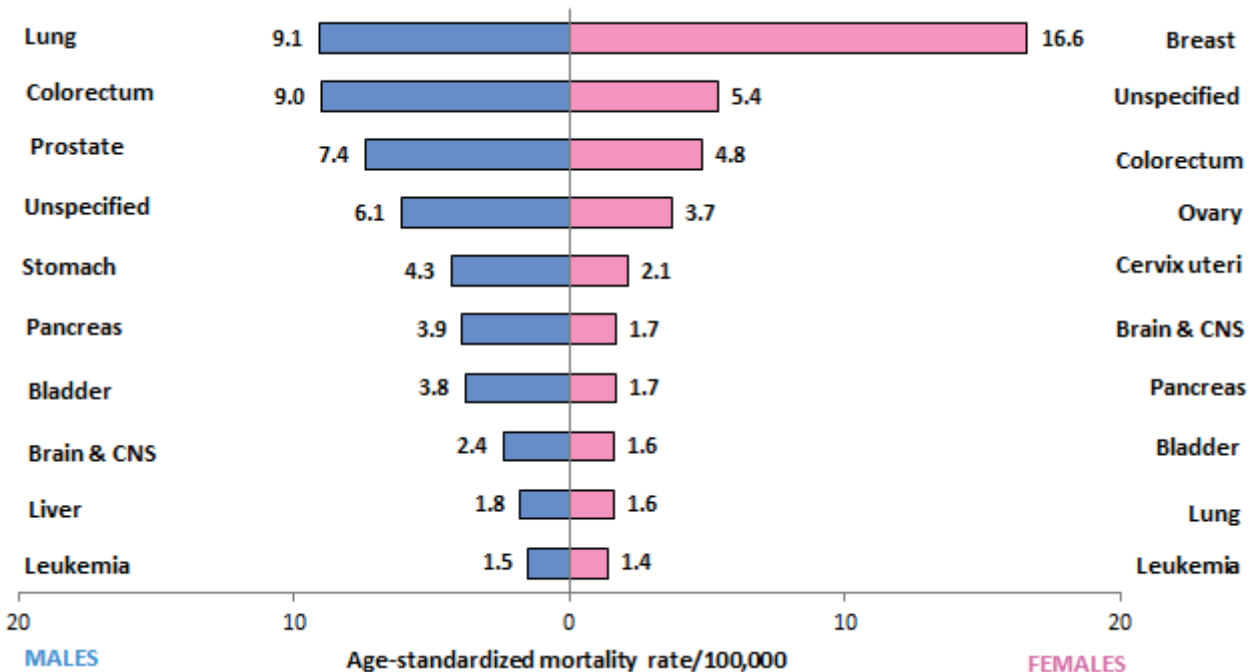


Figure 68 Top Leading Sites of Cancer Mortality among Bahrainis, 2014



CANCER MORTALITY – 2014

Table 34 Frequency of Cancer Deaths among Bahraini Males, 2014

CANCER SITE	ALL AGE AGES	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	% OF TOTAL	ICD (10TH)	
Tongue	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.7	C01-C02	
Mouth	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.7	C03-C06	
Tonsil	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.7	C09	
Esophagus	8	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1.5	C15	
Stomach	8	0	0	0	0	0	0	1	1	0	0	1	1	1	2	2	1	7.5	C16	
Colorectum	6	0	0	0	0	0	0	2	0	1	1	3	1	2	3	2	6	15.7	C18-C21	
Liver	1	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	3.7	C22	
Pancreas	3	0	0	0	0	0	0	0	0	0	1	0	2	1	0	2	3	6.7	C25	
Nose, sinuses etc.	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.7	C30-C31	
Larynx	29	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.7	C32	
Trachea, bronchus, lung	1	0	0	0	0	0	0	0	1	0	0	0	1	3	2	1	12	14.9	C33-C34	
Other thoracic organs	4	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1.5	C37-C38	
Bone	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1.5	C40-C41	
Mesothelioma	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.7	C45	
Breast	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1.5	C50	
Prostate	2	0	0	0	0	0	0	0	0	0	0	0	1	5	2	2	6	11.9	C61	
Testis	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.7	C62	
Kidney, ureters etc.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.7	C64-C66;C68	
Bladder	3	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	5	6.0	C67	
Brain, nervous system	1	0	0	1	0	0	0	1	0	0	2	0	1	1	0	0	1	5.2	C70-C72	
Hodgkin's disease	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.7	C81	
Non-Hodgkin's lymphoma	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1.5	C82-C85;C96	
Multiple Myeloma	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.7	C90	
Myeloid leukemia	7	0	0	1	0	1	0	1	0	1	0	0	1	0	0	0	0	3.7	C92-C94	
Other & unspecified	1	0	1	0	0	0	0	0	0	0	0	0	2	1	2	3	4	9.7	Other	
TOTAL	118	0	1	2	0	1	1	2	4	4	4	5	10	12	17	15	12	44	100.0	

Table 35 Frequency of Cancer Deaths among Bahraini Females, 2014

CANCER SITE	ALL AGE AGES	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	% OF TOTAL	ICD (10TH)	
Other oropharynx	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.8	C10	
Nasopharynx	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.8	C11	
Stomach	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.8	C16	
Small intestine	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.8	C17	
Colorectum	11	0	0	0	0	0	0	1	1	0	1	1	0	1	2	2	2	8.4	C18-C21	
Liver	3	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	2.3	C22	
Gallbladder etc.	4	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	3.1	C23-C24	
Pancreas	5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	3.8	C25	
Trachea, bronchus, lung	4	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	3.1	C33-C34	
Connective, soft tissue	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.8	C47;C49	
Breast	42	0	0	0	0	0	0	1	1	1	6	4	9	5	3	3	9	32.1	C50	
Cervix Uteri	5	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	3.8	C53	
Corpus Uteri	3	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	2.3	C54	
Uterus unspecified	4	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	3.1	C55	
Ovary	10	0	0	0	0	1	0	0	1	1	2	1	2	1	1	0	0	7.6	C56	
Placenta	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.8	C58	
Kidney, ureters etc.	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1.5	C64-C66;C68	
Bladder	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3.1	C67	
Brain, nervous system	4	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	0	3.1	C70-C72	
Thyroid	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1.5	C73	
Adrenal gland	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	C74	
Non-Hodgkin's lymphoma	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	2.3	C82-C85;C96	
Myeloid leukemia	3	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	2.3	C92-C94	
Leukemia unspecified	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.8	C95	
Other & unspecified	13	0	2	0	0	0	0	0	0	1	1	1	1	1	1	2	3	9.9	Other	
TOTAL	131	0	4	0	1	0	1	2	4	4	8	14	11	19	15	11	13	24	100	

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