

# CANCER REGISTRATION IN SAUDI ARABIA

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## History of Cancer Registration in the Country

Saudi Arabia is a vast country and extends over four-fifths of the Arabian Peninsula, stretching from the Arabian Gulf in the East to the Red Sea in the West. It is approximately 1,500,000 square miles in area. It is divided into 13 Administrative Regions (Figure 1). The estimated Saudi population in 1996 is 14,089,156, of these 7,097,782 are males and 6,991,334 females. The estimated non-Saudi population in 1995 was 4,624,734.

Until recently, knowledge of the cancer pattern in Saudi Arabia had to be deduced from data on cancer cases treated in the various major hospitals in the country, and especially in the main teaching hospital, King Faisal Specialist Hospital and Research Center (KFS&RC). The National Cancer Registry (NCR) in Saudi Arabia is a population-based registry developed in 1992 (1412H). It was established under the jurisdiction of the Ministry of Health (MOH) by the Order of His Excellency the Minister of Health. The NCR commenced reporting cancer cases from 1 January 1994. The primary goal of the NCR is to define the population-based incidence of cancer in Saudi Arabia. Future propositions include supporting early detection and cancer screening programs and supporting cancer research projects.

## Present Status

*Asian Pacific J Cancer Prev*, 2, IACR Supplement, 61-64

A Board of Directors was appointed to include representatives from MOH, King Faisal Specialist Hospital and Research Center (KFS&RC), the Medical Services Departments of the Ministry of Defense and Aviation, Ministry of Interior, the National Guard, King Saud University, King Faisal University and King Abdulaziz University.

The Board is charged with the responsibility of overseeing the NCR's establishment, defining demographic and cancer-related data to be collected, approving research requests, and reporting findings, and dissemination of information collected while ensuring the confidentiality of compiled data. The Main Office with its administrative and technical staff is located on the premises of KFSH&RC in Riyadh.

Apart from the Main Office, five regional branches and three hospital offices were set up to ensure comprehensive data collection from all over the Kingdom. These offices are:

Central Regions Branch: at King Khalid University Hospital in Riyadh. It covers Riyadh, Qassim, and Hail Health Regions.

Eastern Regions Branch: at King Fahad University Hospital in Khobar. It covers Eastern, Hasa, and Hafr Al-Batin Health Regions.

Western Regions Branch: at King Abdulaziz Hospital and Cancer Center in Jeddah. It covers Jeddah, Makkah,



**Figure 1. Administrative Regions of Saudi Arabia**

*1* Chairman of the National Cancer Registry, Ministry of Health, *2* King Faisal Specialist Hospital & Research Center, *3* King Saud University, Riyadh, *4* King Faisal University, Khobar, *5* King Abdulaziz Hospital and Cancer Center, Jeddah, *6* King Saud University, Abha, *7* King Abdulaziz University, Jeddah, *8* Armed Forces Hospital, Riyadh, *9* National Guard Hospital, Riyadh, *10* Security Forces Hospital, Riyadh

Taif and Gunfudah Health Regions.  
 Southern Regions Branch: at the Medical College in Abha. It covers Asir, Baha, Najran, Jazan and Bisha Health Regions.

Madinah Branch: (established June 1998) at King Fahad Hospital in Madinah. It covers Madinah, Tabuk, Jouf and Northern Health Regions.

Offices at the Medical Services Oncology Departments of the following establishments:

- Ministry of Defense and Aviation, with an office at the Armed Forces Hospital in Riyadh
- National Guard, with an office at King Fahad Hospital in Riyadh.
- Ministry of Interior, with an office at the Security Forces Hospital in Riyadh.

Figure 2 presents the organization chart for the NCR. Each of these branches and offices is under the supervision of a member of the Board of Directors, who is responsible for the daily management of the office and ensuring the accuracy of information reported. In addition to tumour registrars and secretarial staff, each office is provided with the necessary computer facilities, printers, and a fax.

The functions of the Central office include:

- collation of data collected from all the regions and offices
- assurance of no case duplication, verification of the diagnosis
- cleaning and validating the data and preparation of regular reports for dissemination to the medical community, government establishment, international organizations and the media.

**Data Management**

For comprehensive data collection, a Ministerial Decree has rendered cancer a mandatory notifiable disease. The NCR has the full accessibility to all MOH, Governmental and Private hospitals, clinics and laboratories throughout the Kingdom. Data are extracted by NCR trained registrars



**Figure 2. Organization Chart for the National Cancer Registry**

from the patients’ medical records based on clinical and histo-pathological diagnosis.

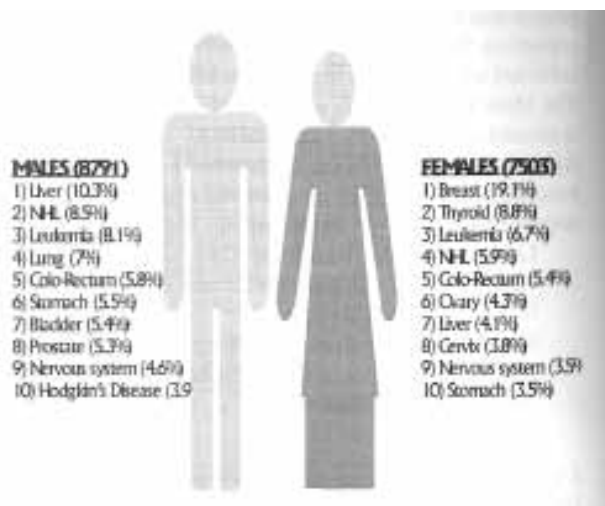
The computer software used for data entry is Epi Info version 5.01b, and for analysis is CanReg 2 (cancer registration software developed by the International Agency for Research on Cancer).

**Incidence Data**

Between January 1994 and December 1996, the total number of cancer cases reported among Saudis was 16,294 (8791 males and 7503 females). The crude incidence rate for all cancers in the Saudi population was 39/100,000 (42.3/100,000 for males and 36.8/100,000 for females). The overall age-standardized incidence rate (world standard) was 71.7/100,000 (72.2/100,000 for males and 70.1/100,000 for females). Histological and/or cytological diagnosis of malignancy was confirmed in 95% of cases. The remaining diagnosis was made on clinical and radiological grounds in 4.4% and the method of diagnosis was not known for 0.6% of all cases reported.

In the Kingdom, taking into consideration the population structure and the fact that cancer is primarily a disease of the old, the pattern of cancer had some significant differences. During the period of reporting, between 1994 and 1996, just over 10.2% of all cancers occurred before the age of 15, and 29.8% occurred after the age of 64 years. For the total Saudi population the most common ten cancers are female breast cancer (8.8%), leukaemia (7.5%), liver cancer (7.4%), non-Hodgkin lymphoma (7.3%), colo-rectal cancer (5.5%), and thyroid cancer (5.2%). Fig 3 shows the most commonly registered cancers, by sex.

The number of patients registered declined during the period between 1994-1996. This is probably related to registration of some prevalent cases in the first year of reporting, and/or some delay in reporting, rather than clinical or epidemiological factors.



**Figure 3. The Ten Most Common Cancers for Saudis by Sex, 1994-1996**

Regional Variation

The four regions with the highest ASR were Riyadh at 106/100,000, Najran at 99.7/100,000, Eastern Province at 89.3/100,000 and Makkah at 80.2/100,000. Fig 4 shows the ASR by sex for all the 13 administrative regions of the Kingdom. The number of patients presenting with malignant disease from the Riyadh region exceeds the anticipated number per population. This can be explained by the presence of many major referral hospitals for cancer diagnosis and therapy in Riyadh. Many patients residing in Riyadh for treatment purposes manage to produce a permanent address. It is anticipated that this situation will be resolved as soon as computerization of Identification Documents is completed.

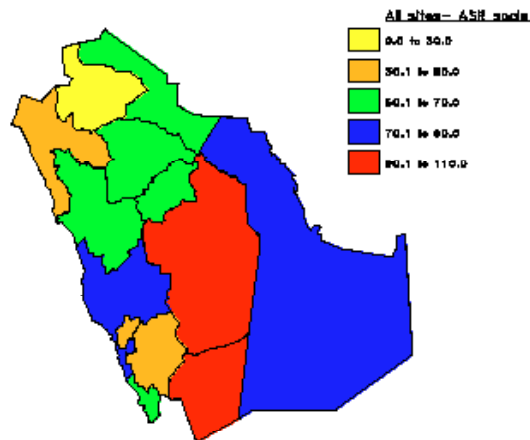


Figure 4. ASR Regional Distribution of all Sites of Cancer in Saudi Arabia 1994-1996

Epidemiology of the Principal Cancers

Female breast cancer

Breast cancer was the most common cancer of females (19.1% of all newly diagnosed cases), with an ASR of 14/100,000. The incidence by age, is shown in Fig 5, and the stage distribution in Fig 6.

Leukemia

Between January 1994 and December 1996 there were 1216 cases of leukemia among Saudis. These cases accounted for 7.5% of all newly diagnosed cases. The overall ASR was 3.5/100,000 population ( 3.9/100,000 for males and 3.0/100,000 for females). This cancer ranked third for both

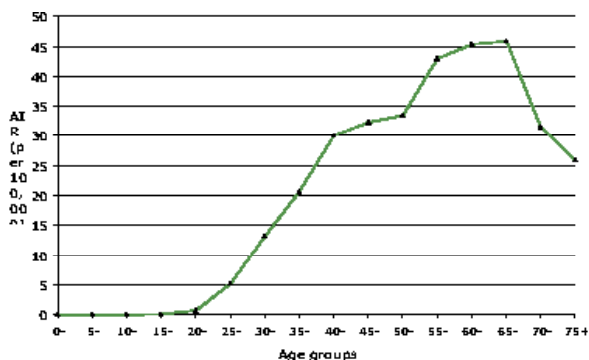


Figure 5. Average Age-specific Incidence Rate (AIR) for Cancer in Saudi Arabia

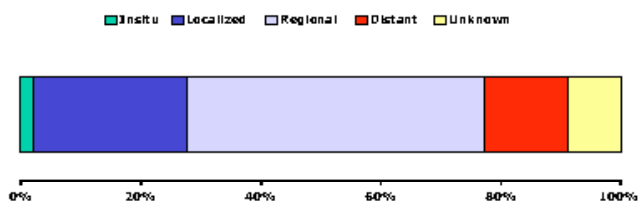


Figure 6. Stage Distribution of Female Breast Cancer, 1994-1996

Table 1. Histology of Leukemia, 1994-1996

ICD-O code	Histology	%
982139	Acute lymphoblastic leukemia, NOS	47.4
986139	Acute myeloid leukemia	20.7
986339	Chronic myeloid leukemia	12.6
982339	Chronic lymphocytic leukemia	7.6
980139	Acute leukemia, NOS	2.1
	Other	9.7

Table 2. Histology of Liver Cancer, 1994-1996

ICD-O code	Histology	%
817039	Hepatocellular carcinoma, NOS	88.8
816039	Cholangiocarcinoma	3.2
814039	Adenocarcinoma, NOS	2.2
800039	Malignant tumour, NOS	1.7
801039	Carcinoma, NOS	1.5
	Other	2.6

males and females.

Liver Cancer

Between January 1994 and December 1996 there were 1216 cases of liver cancer among Saudis. These cases accounted for 7.4% of all newly diagnosed cases. The overall ASR was 6.3/100,000 population ( 8.5/100,000 for males and 3.5/100,000 for females). This cancer ranked first for males, and fifth for females, with a sex ratio of 2.9:1.

Non-Hodgkin Lymphoma

Between January 1994 and December 1996 there were 1197 cases of non-Hodgkin's lymphoma among Saudis. These cases accounted for 7.4% of all newly diagnosed cases. The overall ASR was 5.2/100,000 population ( 6.0/100,000 for males and 4.3/100,000 for females). This cancer ranked second for the male, and fourth for the female population.

*Colorectal cancer*

Between January 1994 and December 1996 there were 915 cases of colo-rectum cancer among Saudis. These cases accounted for 5.6% of all newly diagnosed cases. The overall ASR was 4.5/100,000 population ( 4.6/100,000 for males and 4.4/100,000 for females). This cancer ranked fifth for both males and females.

*Thyroid cancer*

Between January 1994 and December 1996 there were 883 cases of thyroid cancer among Saudis. These cases accounted for 5.4% of all newly diagnosed cases. The overall ASR was 3.5/100,000 population (1.9/100,000 for males and 5.3/100,000 for females). This cancer ranked 14th for males, and second for females.

*Lung Cancer*

Between January 1994 and December 1996 there were 779 cases of lung cancer among Saudis. These cases accounted for 4.8% of all newly diagnosed cases. The overall ASR was 4.1/100,000 population. The ASR was 5.8/100,000 males and 1.9/100,000 for females

**Contact**

**National Cancer Registry**

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**Table 3. Histology of Thyroid Cancer, 1994-1996**

ICD-O code	Histology	%
805039	Papillary carcinoma, NOS	64.3
834039	Papillary and follicular carcinoma	11.9
833039	Follicular adenocarcinoma, NOS	7.1
801039	Carcinoma, NO 5	3.3
826039	Papillary adenocarcinoma, NOS	2.8
	Other	10.5

**Table 4. Histology of Lung Cancer, 1994-1996**

ICD-O code	Histology	%
80703	Squamous cell carcinoma, NOS	30.5
81403	Adenocarcinoma, NOS	23.5
80103	Carcinoma, NOS	12.1
80413	Small cell carcinoma, NOS	9.7
80123	Large cell carcinoma, NOS	6.9
	Other	17.4