

# Cancer Patterns in Quetta (1998-1999)

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## Abstract

**Introduction:** Quetta, the capital of Baluchistan, is located at latitude 30,25; longitude 67.00. It has a population of 759,245; 425,474 males (56%) and 333,771 females (44%); Census 1998. The majority of residents are Persian or Baluchi speaking Baluchs.

**Methodology:** The cancer cases from Quetta reported to the Karachi Cancer Registry were reviewed. The data included cases from the Aga Khan University Hospital (AKUH), Pathology Department (Quetta collection point) and health care facilities in Karachi. The residents of Baluchistan were ascertained and cancer cases residents of Quetta identified with the help of recorded addresses and retraceable telephone numbers.

**Results:** During a 2-year period, 1st January 1998 to 31st December 1999 the Karachi Cancer Registry received 1077 cancer notifications from Quetta. Approximately half the cases were registered from the AKUH Quetta collection point. Others were the referral patterns in Karachi. The age-standardized incidence rate (ASR) of cancer, all sites (1998-99) was 137.0 for males and 92.8/100,000 for females. The commonest cancer in the males and females was cancer of the esophagus (ICD10 categories C15; males- ASR 25.5, 17.2 %; females- ASR 23.4, 23.1%). One of the highest in the world, for both genders. Incidence of cancer breast in the females (ICD-10 categories C50; ASR 11.8, 13.3%) was low,

**Conclusion:** The cancer data from Quetta is quite distinct from the cancer pattern of Karachi. It represents only a part of the cancer burden of Quetta; nonetheless it gives a glimpse into the cancer profile of Baluchistan. The high incidence of esophageal cancer indicates an extension of the geographical limits of the esophageal cancer belt (JPMA 52:560; 2002).

## Introduction

Quetta is the capital of the Baluchistan, the Northwest Province of Pakistan. Baluchistan shares the 800 kilometers in length international border of Pakistan with Iran on the west, and part of the 2500 kilometers border with Afghanistan on the northwest<sup>1</sup>. The provincial boundaries are shared with Sindh, Punjab and the North West Frontier Provinces (NWFP). The city of Quetta, location, latitude 30.25; longitude 67.00 is approximately 720 kilometers from Karachi, the largest city of the country. It has a population of 759,245; 425,474 males (56%) and 333,771 females (44%); Census 1998<sup>2</sup>. The district of Quetta is divided into an urban and a rural population. The urban population of Quetta comprises 40% of the total population whereas 60% of the population resides in the rural areas. The majority of residents are Persian or Baluchi speaking Baluchs. Over 70 percent of the Baluchs live in Pakistan, with the remainder in Iran and Afghanistan<sup>1</sup>. The Baluch trace their roots to either tribes migrating eastward from around Aleppo, in Syria' or a Caspian descent. The ethnicity therefore differs from the southeastern provinces of Pakistan with ethnic similarities to the Indo-Pak Subcontinent. The pattern of cancer reflects the Caspian heritage of the population and differs considerably from the only

available population data for Pakistan i.e. Karachi<sup>3-5</sup>. The latter being more reflective of the pattern of the Indian region as the migrant population from India forms the predominant ethnic group in the city, and the effect of Westernization.

The objective of this study is to bring forth the cancer profile of Quetta, which is of interest in the context that there is no published data for comparison. The present data despite an emerging, distinctive cancer pattern, is not complete and may suffer from the biases associated from databases of selected medical institutions. It represents only a proportion of all those cancers, which may be occurring in the population; therefore conclusions drawn from this database must be interpreted in the light of information on selective factors that may be operating<sup>6</sup>.

## **Methodology**

The cancer cases diagnosed on the basis of clinical, biochemical, histological and hematological basis, and recorded at the Karachi Cancer Registry during a 2-year period (1st January 1998 to 31st December 1999) were reviewed and studied. The data included cases from the Aga Khan University Hospital (AKUH), Pathology Department (Queua collection point) and all primary health care facilities, diagnostic and treatment centers and hospices in Karachi. The residents of Baluchistan were ascertained and cancer cases residents of Quetta were identified with the help of recorded addresses and retraceable telephone numbers. The referral cancer cases in Karachi were mainly retrieved from the AKUH, Pathology Department (Karachi), Civil Hospital Karachi, Dow Medical College, Jinnah Hospital, Liaquat National Hospital, Edhi Cancer Center, and Ziauddin Cancer Hospital. However many other hospitals and laboratories contributed fewer numbers of cases. The AKUH pathology department has a collection point at Quetta that provides a major diagnostic service to the city. The demographic details of the registered AKUH pathology data were precise and complete. Items such as age, sex, name, address, telephone numbers and nature of surgery were well recorded at the reception counter. Awareness of the legal and academic requirements of such accurate demographic data was a part training of the collection staff. Validity checks and random retrace of cases was conducted for follow-up and for confirmation of the information recorded. The second category of cancer data was the cancer referrals to the diagnostic and treatment facilities of Karachi. The demographic details and retraceable telephone numbers had been recorded for outside-Karachi patients, as an exercise to improve the quality control of the Karachi data.

Computerized and manual validity checks for the cancer data were performed as per recommendations of International Agency for Research on Cancer (IARC) and International Association of Cancer Registries (IACR)<sup>7,8</sup>. This involved factors influencing comparability were classification and coding. The data was classified using the International Classification of Diseases-Oncology (ICD-O) (2nd ed.)<sup>9</sup> and computerized using a customized version of Canreg-3, with internal checks on the validity of the entered data. Variables recorded were the hospital patient-number date of incidence, name, age, sex, address, topography, morphology, grading and staging.

Standardized incidence rate was calculated with an external reference population, the 'world'<sup>10</sup> population with a given 'standard' age distribution. The standardized rate is the incidence rate that, theoretically, would have been observed if the population had a standard age distribution. The methodology applied was direct standardization. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented. Logarithmic scaling, also called ratio scaling is used for the figures. This scaling is preferred to measure changes in value, rather than absolute prices; to compare two bits of unlike data; to analyze exposures over a long term; to compare trends and rates in different populations over different time periods. When values move in large percentages, trend line construction can be subjective and analysis unreliable. Logarithmic (Log) scaling overcomes this problem, rather than simply plotting values on the vertical axis in a linear

fashion. These are plotted to indicate percentage or rate changes.

## Results

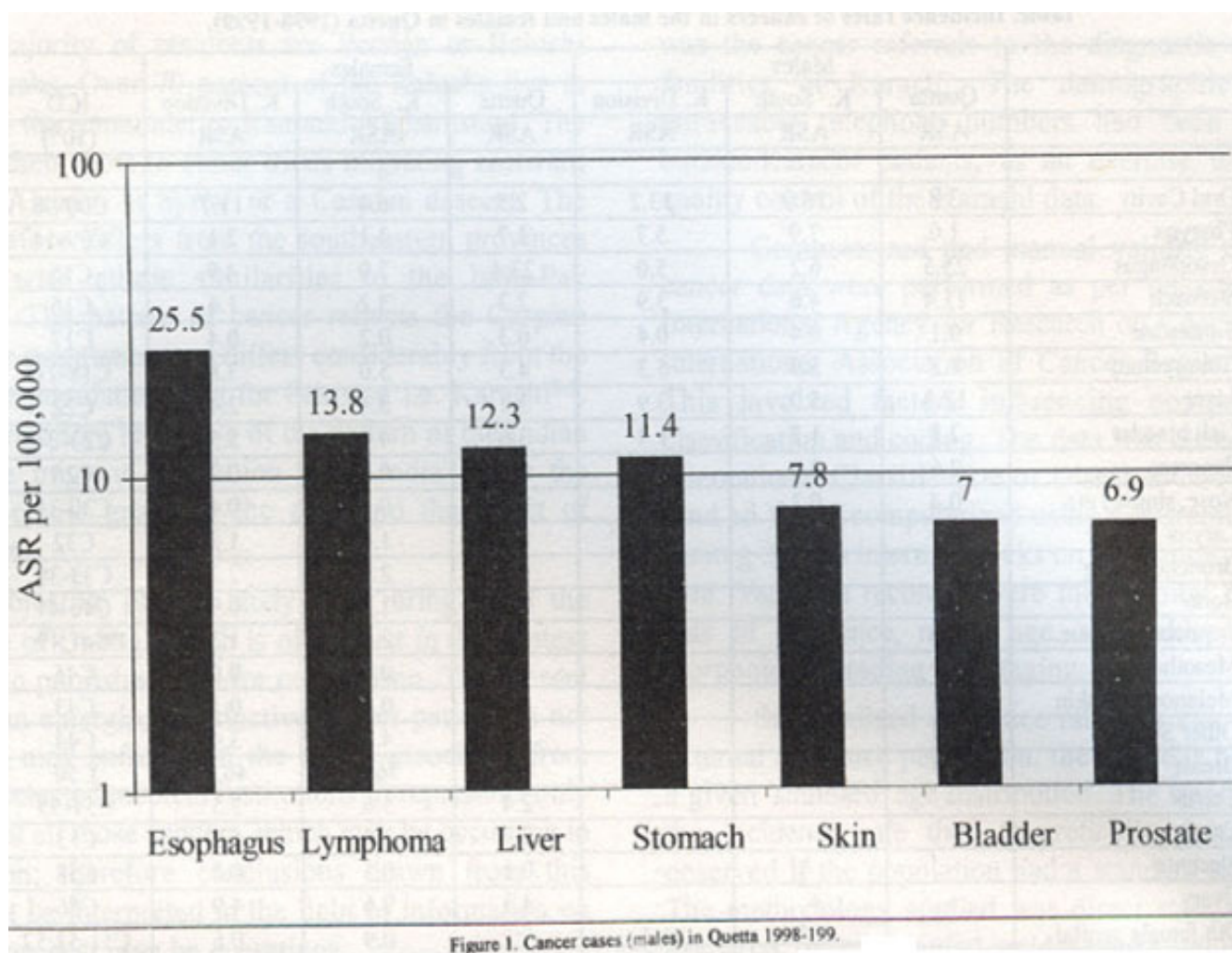
During a 2-year period between 1st January 1998 to 31st December 1999 the Karachi Cancer Registry received 1288 notifications from Quetta.

**Table. Incidence rates of cancers in the males and females in Quetta (1998-1999).**

	Males			Females			ICD (10 <sup>th</sup> )
	Quetta ASR	K. South ASR	K. Division ASR	Quetta ASR	K. South ASR	K. Division ASR	
Oral Cavity	3.8	18.0	13.2	2.5	6.4	11.7	C00-08
Pharynx	1.0	7.9	5.7	1.7	3.1	2.1	C09-14
Oesophagus	25.5	6.2	5.0	23.4	7.0	4.9	C15
Stomach	11.4	4.6	3.9	2.2	3.2	1.6	C16
S.Intestine	0.1	0.4	0.4	0.3	0.2	0.4	C17
Colo-rectum	8.2	5.9	5.3	4.3	5.0	3.8	C18-21
Liver	12.3	5.0	3.9	3.1	3.4	2.4	C22
Gali bladder	2.1	1.3	1.4	3.6	4.9	5.5	C23-24
Pancreas	0.6	0.9	0.6	0.1	0.6	0.7	C25
Nose, sinuses etc.	0.4	0.3	0.5	0.0	0.5	0.4	C30-31
Larynx	0.9	9.4	7.4	0.3	1.6	1.3	C32
Bronchus, lung	4.0	20.4	17.3	0.0	2.9	2.2	C33-38
Bone	2.1	1.6	1.1	0.7	1.3	0.9	C40-41
Connective tissue	3.0	2.8	2.0	2.6	2.2	1.3	C47;49
Mesothelioma	0.0	0.1	0.1	0.0	0.0	0.0	C45
Melanoma of skin	0.3	0.4	0.4	0.5	0.5	0.1	C43
Other Skin	7.5	4.6	4.7	4.0	4.8	3.4	C44
Breast	0.9	0.8	0.9	11.8	56.6	40.7	C50
Uterus	-	-	-	2.4	5.6	3.5	C54-55
Cervix	-	-	-	2.7	7.4	5.2	C53
Placenta	-	-	-	0.1	0.5	0.2	C58
Ovary	-	-	-	4.3	9.6	4.9	C56
Oth.female genital	-	-	-	0.6	0.9	0.6	C51-52;57
Prostate	6.9	7.6	7.3	-	-	-	C61
Testis	1.6	0.9	0.8	-	-	-	C62
Penis	0.0	0.2	0.1	-	-	-	C60
Other male genital	0.0	0.0	0.1	-	-	-	C63
Bladder	7.0	9.4	7.3	2.3	3.1	1.8	C67
Kidney	3.6	1.7	2.1	1.4	1.0	1.1	C64-66;68
Eye	0.6	0.4	0.4	0.0	0.4	0.3	C69
Brain, N. system	2.4	3.5	3.0	0.4	2.1	1.6	C70-72
Thyroid	1.8	1.1	0.7	2.5	4.0	2.4	C73
Other endocrine	0.3	0.3	0.1	0.0	0.1	0.1	C74-75
Hodgkin's disease	2.4	2.3	1.4	0.9	0.9	0.7	C81
NHL	11.4	5.6	5.8	4.7	4.8	4.0	C82-85;96
Multiple myeloma	0.4	1.3	1.1	0.0	0.8	0.6	C88;90
Leukemia	1.0	4.0	3.7	0.2	4.0	2.9	C91-95
Unspecified	13.4	19.4	24.5	8.9	16.2	19.6	
All sites	137.0	148.1	132.4	92.8	175.5	133.0	

ASR- Age Standardized Rates; K-Karachi; ICD-International Classification of Cancers, NHL-Non Hodgkins Lymphoma

Approximately half the cases were notifications from the AKUH Quetta collection point. The others were the referral patterns in Karachi.



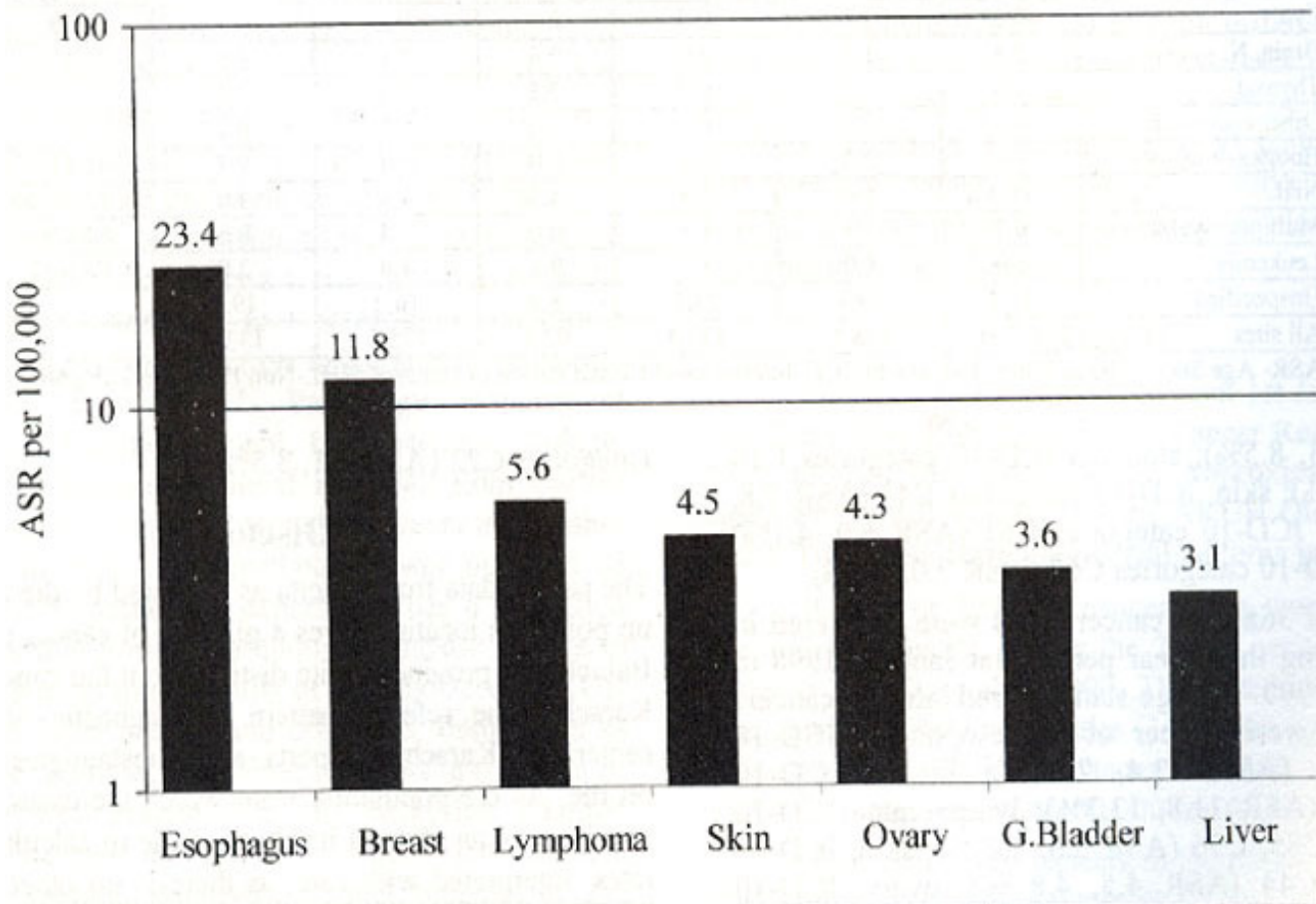


Figure 2. Cancer cases (females) in Quetta 1998-1999.

A total of 709 new cancer cases were registered in the males in Quetta, during the 2-year period, 1st January 1998 to 31st December 1999. The distribution of cancers was - males (66%) and females (34%) The age-standardized incidence rate (ASR) of cancer, all sites (1998-99) was 137.0 for males and 92.8/1 00,000 for females.

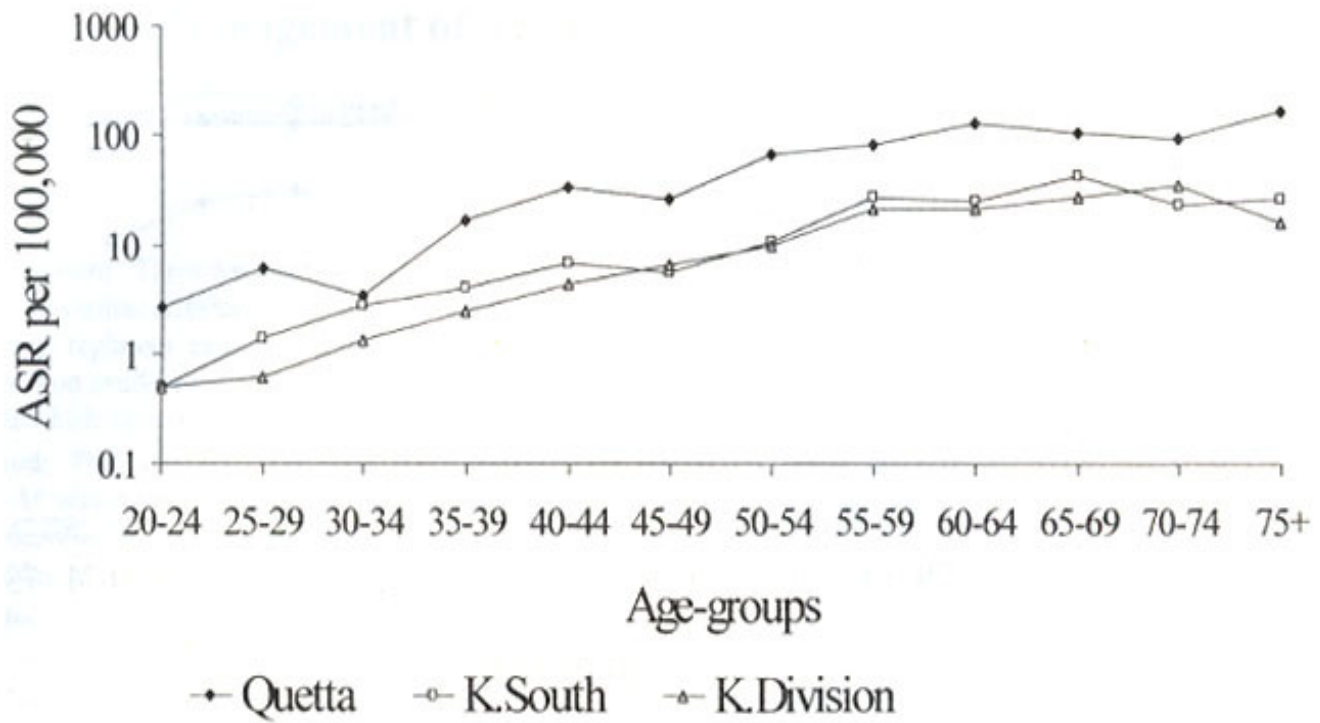


Figure 3. Cancer oesophagus - Males  
 Quetta 1998-99, Karachi South 1995-99, Karachi Division 1998-99.

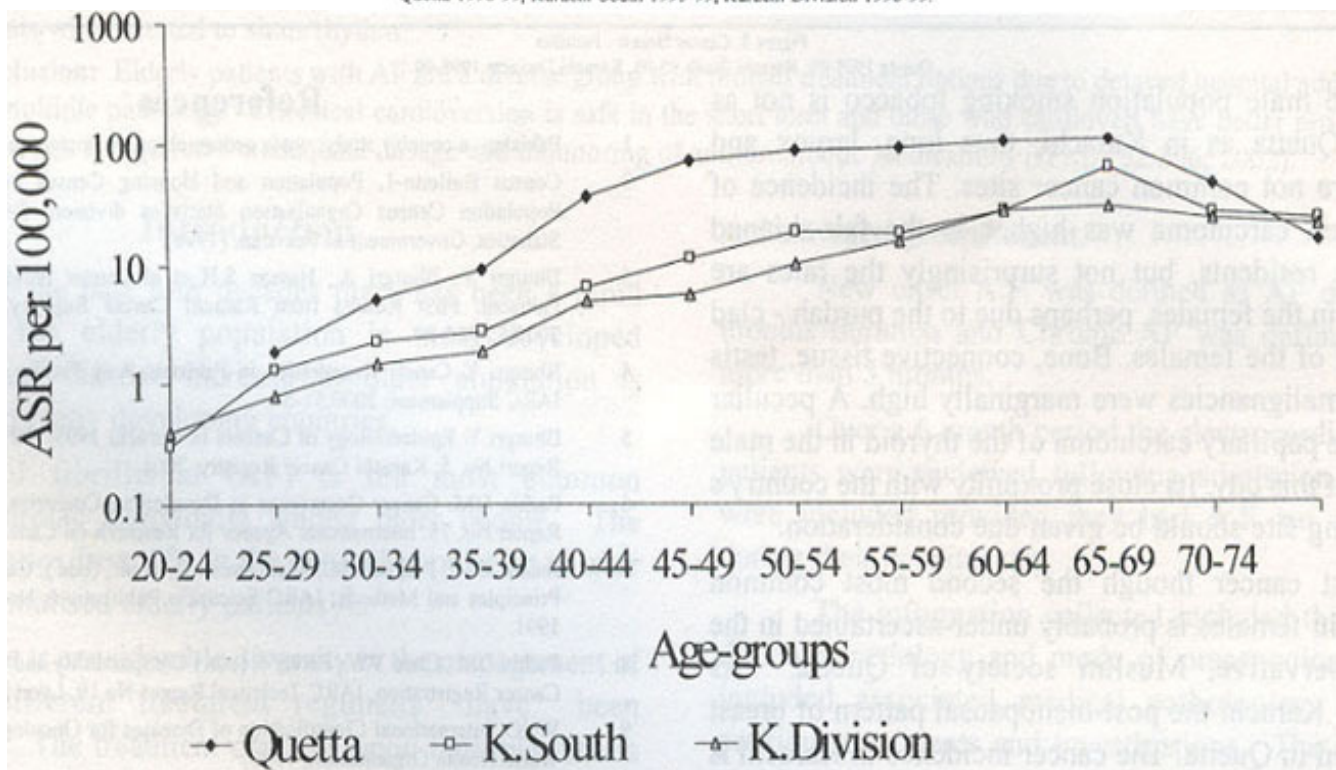


Figure 4. Cancer oesophagus - Females  
 Quetta 1998-99, Karachi South 1995-99, Karachi Division 98-99.

The commonest cancers in the males were cancer of the esophagus, ICD-10 categories C15 (ASR 25.5,

17.2%); lymphomas, non-Hodgkin's lymphoma ICD-10 categories C82-C85; C96 & Hodgkin's disease ICD-10 categories C81 (ASR 13.8, 12.3%); followed by liver, ICD-10 categories categories C22 (ASR 3.1, 3.5%).

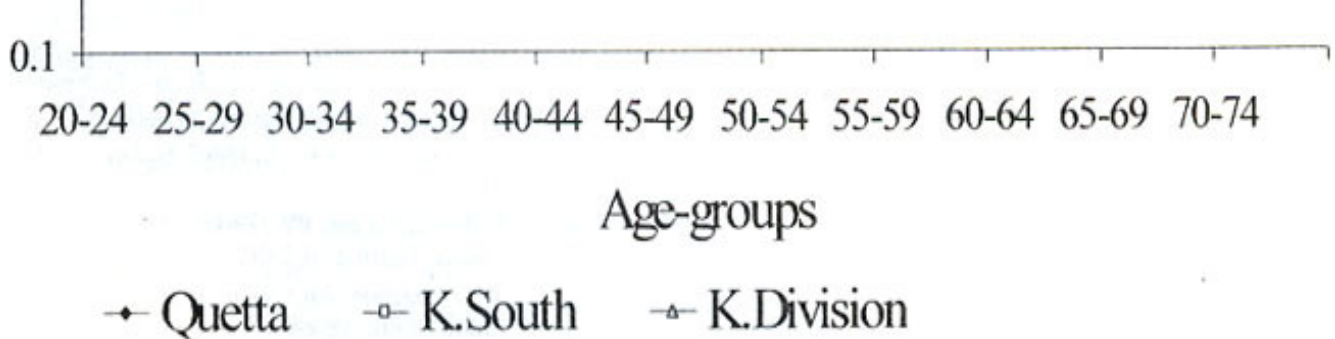


Figure 4. Cancer oesophagus - Females  
Quetta 1998-99, Karachi South 1995-99, Karachi Division 98-99.

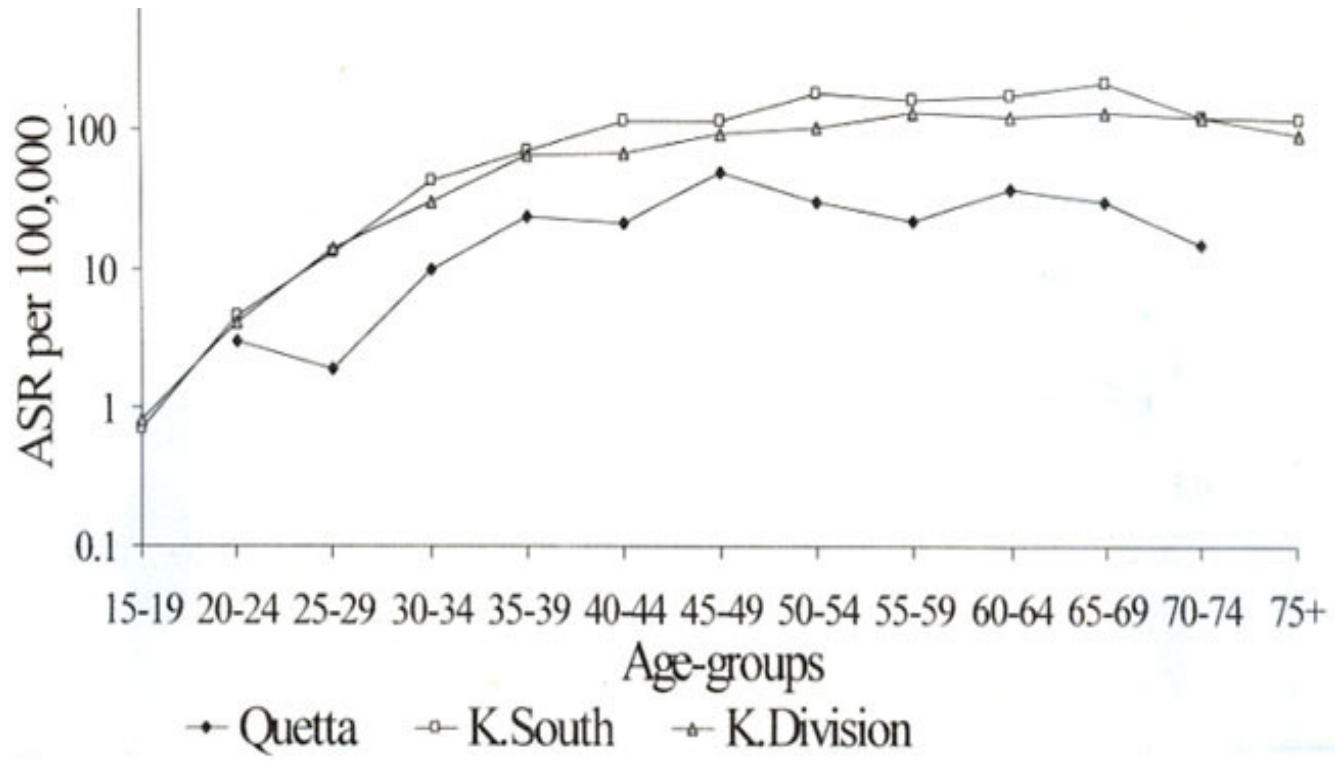


Figure 5. Cancer Breast - Females  
Quetta 1998-99, Karachi South 95-99, Karachi Division 1998-99.

A total of 368 new cancer cases were registered in the females during the 2-year period, 1st January 1998 to 31st December 1999. The age-standardized rates for cancers in the females were cancer of the esophagus, ICD-10 categories C15 (ASR 23.4, 23.1%); breast, ICD-10 categories C50 (ASR 11.8, 13.3%); lymphoma, ICD-10 categories C81-C85, C96 (ASR 5.6, 7.4 %); skin, ICD-10 categories C43-C44 (ASR 4.5, 4.8 %); ovary, ICD-10 categories C56 (ASR 4.3, 4.6%); gall bladder, ICD-10 categories C23 (ASR 3.6, 3.5%) and liver; ICD-10 categories C22 (ASR 3.1, 3.5%).

**Discussion**

The cancer data from Quetta as collected by the AKUH pickup points on location gives a glimpse of cancer pattern in the Baluchistan province, quite distinct from the cancer pattern of Karachi. The referral pattern at diagnostic and treatment centers in Karachi supports and substantiates this cancer profile. As the population from which the cases were drawn was known, an attempt has been made to calculate incidence rates. Interpreted with care, as there is no other data set for comparison, the present preliminary data, will hopefully form the basis for larger more complete population data series.

The cancer data of Quetta reflects the difference in ethnicity, genetic and environmental differences in the Northwest region of Pakistan. The most common cancers in the males were esophagus, lymphomas, liver, stomach, and skin as opposed to lung and oral cavity in Karachi. The amongst the females and males. The preponderance of esophageal cancers is unlike the patterns seen in Karachi and may be an indicator of environmental carcinogens, of probable dietary type, acting equally on both sexes. This is substantiated by.

The cancer data of Quetta reflects the difference in ethnicity, genetic and environmental differences in the Northwest region of Pakistan. The most common cancers in the males were esophagus, lymphomas, liver, stomach, and amongst the females and males. The preponderance of esophageal cancers is unlike the patterns seen in Karachi and may be an indicator of environmental carcinogens, of probable dietary type, acting equally on both sexes. This is In the male population smoking tobacco is not as popular in Quetta as in Karachi, thus lung, larynx and pharynx were not common cancer sites. The incidence of 2. squamous cell carcinoma was higher in the fair-skinned male Quetta residents, but not surprisingly the rates are much lower in the females, perhaps due to the purdah - clad environment of the females.

Bone, connective tissue, testis and kidney malignancies were marginally high. A peculiar finding is the papillary carcinoma of the thyroid in the male 5. population of this city. Its close proximity with the country's 6 nuclear testing site should be given due consideration.

Breast cancer though the second most common malignancy in females is probably under-ascertained in the highly conservative, Muslim society of Quetta. As compared to Karachi the post-menopausal pattern of breast cancer is seen in Quetta. The cancer incidence in Karachi is reflective of the Indian migrant population in Karachi and the effect of Westernization.

## **Conclusion**

The cancer data of Quetta, being reported represents only a part of the cancer burden of Quetta; nonetheless it gives a glimpse into the cancer profile of Baluchistan. The high incidence of esophageal cancer indicates an extension of the geographical limits of the esophageal cancer belt.

# **Karachi Cancer Registry**

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## **References**

1. Pakistan- a country study; [www.geosearchasia/pakistan/quetta](http://www.geosearchasia/pakistan/quetta)
2. Census Bulletin-1, Population and Housing Census of Pakistan 1998, Population Census Organisation Statistics division, Federal Bureau of Statistics, Government of Pakistan. (1998).

3. Bhurgri Y., Bhurgri A., Hassan S.H., et al Cancer Incidence in Karachi, Pakistan: First Results from Karachi Cancer Registry. *Int. J. Cancer*, 2000;85:325-29.
4. Bhurgti Y, Cancer Registration in Pakistan. *Asia Pacific J. Cancer Prey*, 2 IARC Supplement, 2000;51-54.
5. Bhurgri Y. Epidemiology of Cancers in Karachi 1995-1999, KCR Technical Report No. 5; Karachi Cancer Registry, 2001.
6. Parkin DM. Cancer Occurrence in Developing Countries. IARC Technical Report No. 75. International Agency for Research on Cancer. Lyon, 1986.
7. Jensen OM., Parkin DM., MacLennan R, et al., (eds.), *Cancer Registration: Principles and Methods*; IARC Scientific Publications No. 95 Lyon IARC., 1991.
8. Parkin DM., Chen VW., Ferley 3. (eds.) *Comparability and Quality Control in Cancer Registration*, IARC Technical Report No.19, Lyon IARC., 1994).
9. WHO, *International Classification of Diseases for Oncology*, Ed. 2, Geneva, World Health Organisation, 1990.
10. Segi M, *Cancer Mortality in Selected Sites in 24 Countries (1950-57)*, Sendai, Tohoku University School of Public Health.
11. Ghavamzadeh A, Moussavi A, Jahani M, et al. Esophageal cancer in Iran. *Semin-Oncol.*, 2001;28:153-57.
12. Siassi F, Pouransar, Z, Ghadirian P. Nutrient intake and esophageal cancer in the Caspian littoral of Iran: a case-control study. *Cancer-Detect-Pr cv.*, 2000;24 295-303.
13. Saidi F, Sepehr A, Fahimi S, et al. Oesophageal cancer among the Turkomans of Northeast Iran. *Br.J.Cancer*, 2000;83: 1249-54.
14. Biramijamal F, Allaineh A, Mirbod P, et al. Unusual profile and high prevalence of p53 mutations in esophageal squamous cell carcinomas from Northern Iran. *Cancer Res.*, 2001; 61: 3119-23.