PAEC Cancer Registry Report

2015-2017

Atomic Energy Cancer Hospitals

Nuclear Medicine & Oncology Division
Pakistan Atomic Energy Commision

Volume 1

PAEC's Annual Cancer Registry Report
2015-2017

VOLUME-I
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NORIN	Mr. Jahanzaib Khan

Message from Chairman PAEC

Pakistan Atomic Energy Commission (PAEC) has given high priority to application of nuclear technology in health sector since 1960. It is pioneer in the fields of nuclear medicine and radiotherapy in Pakistan. In country's fight against cancer, PAEC is at the forefront in providing nuclear medicine and radiotherapy facilities at 18 Atomic Energy Cancer Hospitals (AECHs) throughout the country while one more is under-construction at Gilgit. These facilities are testimonial to PAEC unwavering support for cancer care services and are catering major cancer burden of the country.

To counter increasing cancer incidence worldwide and at national level, establishment of National Cancer Control Programme (NCCP) is the need of the hour and cancer registries are the valuable source of information required for planning of these strategies. Pakistan still lacks in cancer research at international level because of its deficient cancer registry programme. In line with our mission to combat cancer, PAEC has taken the initiative to present first edition of Pakistan Atomic Energy Cancer Registry (PAECR) Report for year 2015-2017 comprising more than one hundred thousand cancer patients.

In the modern era of medical research and development, I am certain that the registry will aid in estimating actual cancer burden of the country. It will further provide cancer care status and will help to determine probable causes and treatment outcomes. Health departments and institutes will be able to evaluate and execute appropriate measures for prevention & control of cancer and to conduct further comprehensive epidemiological surveys of cancer related deaths. I hope this would lead the way to establish central population based cancer registry programme in the country.

PAEC acknowledges the uninterrupted administrative and financial support of the Government of Pakistan in establishing and running these cancer hospitals. I would like to congratulate PAEC team of dedicated doctors, scientists, engineers, nursing staff and technicians, affiliated with all AECHs for their selfless efforts and determination in serving the ailing humanity. I also commend Nuclear Medicine and Oncology (NM&O) Division at PAEC, HQs for their efforts in compilation of PAEC's first Cancer Registry.

Mr. Muhammad Naeem

Chairman,
Pakistan Atomic Energy Commission

CONTENTS

1 PAEC in Health Sector

Pakistan Atomic Energy Commission (PAEC) was established in 1956. It became the member of International Atomic Energy Agency (IAEA) in 1957 which had the objective "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world". PAEC developed the expertise in application of nuclear technology in health and established its first nuclear medicine facility at Jinnah Postgraduate Medical Centre (then Jinnah Central Hospital) in Karachi in 1960. The second nuclear medicine facility was established in Mayo Hospital Lahore as CENUM (Centre for Nuclear Medicine) in 1963. The third facility NIMRA (Nuclear Institute of Medicine and Radiotherapy, Jamshoro) established in 1965 was the first one with additional radiotherapy facility.

PAEC now has 18 such institutes throughout Pakistan. Most of the facilities are located near or within a tertiary care facility.

Primarily the institutes were established under the mandate of PAEC i.e. applications of nuclear energy in health sector. However, the radiation oncologist and nuclear medicine physicians in these facilities not only utilized radiation for diagnosis and treatment, they also provided comprehensive cancer care to the patients utilizing the facilities of surgery, radiology and pathology in the adjacent hospitals or scattered in the city. As a result, these institutes were soon recognized as cancer care facilities in the general public and hence titled as Atomic Energy Cancer Hospitals (AECHs). During all these years PAEC has been persistent to add, update and replace the equipment in these facilities from time to time so that the patients get the best of the care against cancer. These hospitals today have state-of-the-art nuclear medicine & oncology facilities. The modern hybrid imaging has now been launched in several hospitals while Stereotactic Radio Surgery (SRS) is also being introduced. They are also provided with up-to-date hematology, chemical and pathology laboratories and radiology departments to give diagnostic services along with the treatment under one roof.

"PAEC is sharing the major cancer burden of the country"
Muhammad Naeem
Chairman PAEC

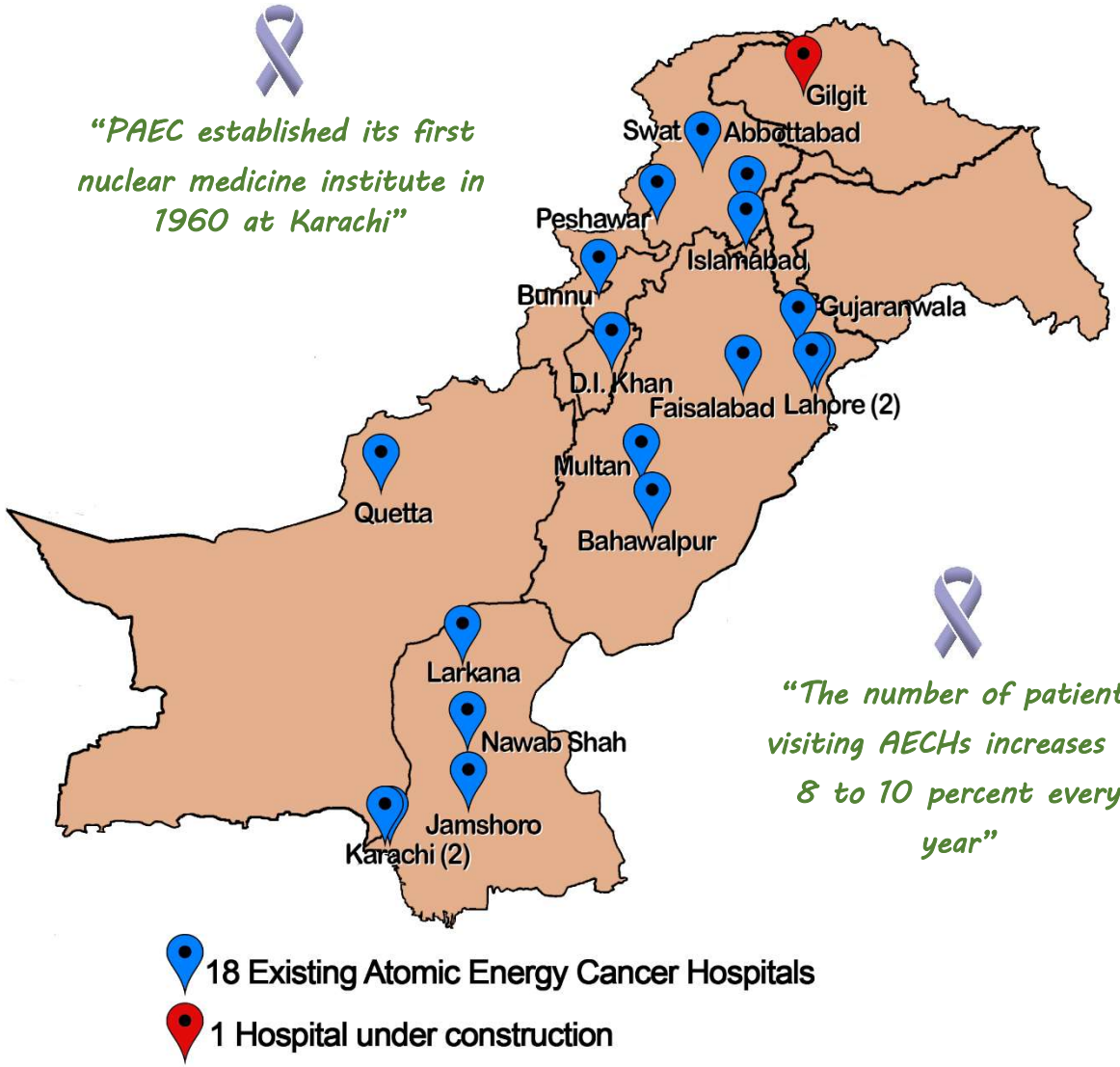
Locations of AECHs

On an average PAEC has established one cancer hospital every three years not only in the big cities but also in the small cities like Swat, Bannu, and DI Khan etc. to cater the patients of remote areas. Currently 18 Atomic Energy Cancer Hospitals are functioning while one is under construction and another two have been proposed.

Eighteen cancer hospitals of PAEC

AEMC, Karachi-1960	1996-PINUM, Faisalabad
CENUM, Lahore-1963	1999-BINO, Bahawalpur
NIMRA, Jamshoro-1965	2001-KIRAN, Karachi
MINAR, Multan-1968	2004-INOR, Abbottabad
IRNUM, Peshawar-1975	2010-GINUM, Gujranwala
LINAR, Larkana-1978	2012-NORIN, Nawabshah
NORI, Islamabad-1983	2013-DINAR, D I Khan
INMOL, Lahore-1984	2014-SINOR, Swat
CENAR, Quetta-1987	2014 BINOR, Bannu

"Pakistan (PAEC) has well equipped (cancer) hospitals, pool of experts on this disease and has much more facilities as compare to its neighboring and regional countries but still it needs to do more"
Yukiya Amano (DG IAEA)



The Facilities

The cancer hospitals of PAEC are equipped with modern state of the art cancer diagnostic and treatment facilities to provide high quality healthcare to patients suffering from cancer and allied diseases.

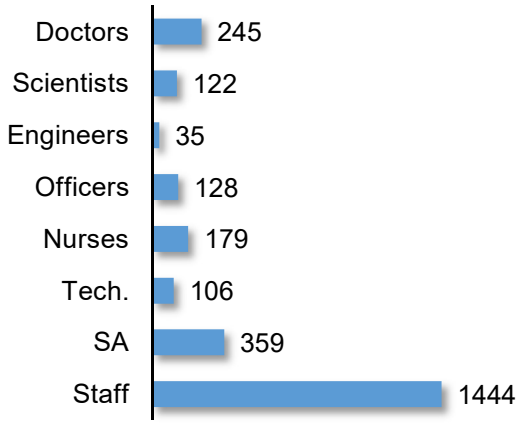
Nuclear Medicine
Gamma Camera (SPECT, SPECT-CT)
PET-CT
Cyclotron
Radiopharmacy
Nuclear Cardiology
Radiation Oncology
Linear Accelerators
Cobalt-60 machines
Treatment Planning System(2D&3D)
Simulator (Digital and CT)
Brachytherapy(2D,3D& IGBT)
Radiology
Conventional/digital X-rays
Mammography
CT Scan
Ultrasonography
DEXA
MRI
Clinical Laboratory

Human Resource

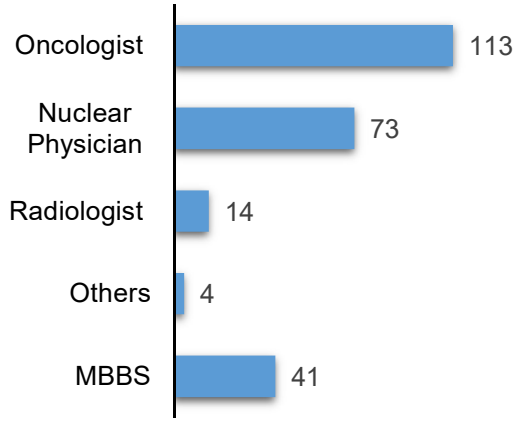
Highly specialized trainings are required to handle radiation and to use it on the human beings. PAEC provide such trainings itself to the doctors, scientists and the technical staff. Currently there are 2,618 personnel

employed in these hospitals including 245 doctors.

Pakistan Institute of Engineering and Applied Sciences (PIEAS) play a major role in training the manpower for AECHs. The MS level programmes at PIEAS train doctors in the field of nuclear medicine and oncology, as well as scientists and engineers in the fields of medical physics and biomedical engineering. The clinical trainings of these specialists are carried out in various AECHs. Several hospitals are recognized as teaching institutes by CPSP and others in the fields of nuclear medicine, radiotherapy and radiology for the students of FCPS, DMRT and DMRD to complete their trainings and research work.



Manpower in AECHs (n=2618)



Doctors in AECHs (n-245)

Patient Turnout

Nearly one million patients visit AECHs every year. It is anticipated that these cancer hospitals cater 80% of the total cancer patient burden of Pakistan. There is a trend of approximately 8-10% increase in patient turnout each year.

PAEC is doing utmost to cope with the ever increasing patient burden. This requires more space, equipment and manpower. Therefore, hospitals are regularly upgraded with the addition of new equipment and replacement of the old ones. Simultaneously we also keep on introducing the new technologies into the system like PET/CT, stereotactic radiosurgery, VMAT, IGRT and IMRT. Continuous induction of trained manpower and construction of new building blocks is the part of efforts of PAEC to provide services to Pakistani population. Apart from this we also keep on adding new institutes to the areas where adequate cancer management is not available.

Finances and Resources

Management of cancer is an expensive affair. Diagnostic, surgical, radiotherapy and chemotherapy procedures require

hundreds of thousands of rupees for every patient. Patients frequently are financially exhausted during the course of treatment even in the developed nations. Therefore, financial support is needed to cater the patients who are not able to afford the treatment.

The total regular budget received from PAEC, allocated by Ministry of Finance, Government of Pakistan is approximately Rs 3 Billion that merely covers salaries and utility expenditures. Poor non-affording patients termed as "entitled" are provided free diagnostic and treatment services available at the hospital. Chemotherapy and other drugs are however managed through Cancer Patients Welfare Societies (CPWSs) of the hospitals. These societies are non-profit organizations registered with social welfare or Zakat & Ushr departments of provincial or federal governments working autonomously. The financial resources of these societies are Zakat, Bait ul Mal funds, and donations by philanthropists. The chemotherapy drugs are provided through pharmacies run by CPWSs free of charge to the entitled and at cost to cost basis to the non-entitled (affording) patients. CPWSs also contribute in up-gradation of hospitals by helping in purchase of equipment, civil work and hiring manpower. In some hospitals they also provide free meals, wheel chairs etc. to the patients. The societies are annually monitored via well reputed audit agencies. Since 2009 PAEC cancer hospitals have spent nearly Rs. 5 Billion for deserving patients with the help of CPWSs.

"Cancer didn't bring me to my knees, it brought me to my feet"

Michael Douglas, Actor

The funds to establish a new AECH are acquired via the Public Sector Development Programmes (PSDP) of Planning Commission of Pakistan. Regular upgradation of the existing hospitals is also carried out from various sources to provide up-to-date services to the cancer population.

Research & Publications

Pakistan Atomic Energy Commission has a strong tradition of Research & Development (R&D) activities and cancer hospitals are no exception. The major fields of R&D in the hospitals are Radiation and Medical Oncology, Nuclear Medicine, Radiology, Medical Imaging, Dosimetry and Radiation Protection. The hospitals are actively involved in various projects

including International Atomic Energy Agency's Technical Cooperation projects and the Regional Cooperative Agreement (RCA) for Research, Development and Training Related to Nuclear Science and Technology for Asia. The hospitals are also promoting research through collaboration with different local universities.

The new technologies are adopted with the obligations of fulfilling international standards as well as the regulatory body requirements. In addition, workshops, seminars, conferences and symposia for "continuing medical education" are arranged regularly by these centers. They also facilitate students engaged in research & clinical work and other laboratories to perform their research work in various departments.

Awareness Campaigns

Atomic Energy Cancer Hospitals are highly committed for disseminating information to general public regarding awareness about cancer that it is curable if diagnosed at an early stage.

In this regard, a number of events like seminars, symposia, conferences, workshops etc. are organized by these centers in collaboration with Cancer Patients Welfare Societies and other medical colleges, universities, hospitals and NGOs for cancer awareness by observing World Cancer Day, Breast Cancer Awareness Month, Mammogram Day, No Tobacco Day etc. A total of 67 events including awareness programmes were organized by AECHs during the year 2017-18.

"90-95% of cancer cases are due to genetic mutations from environmental factors like tobacco (25-30%), diet and obesity (30-35%), infections (15-20%), radiation (10%), stress, lack of physical activity and pollution"

"Breast cancer remains at the top of the list of cancers diagnosed in

2 Cancer Registry 2015-2017

The Nuclear Medicine and Oncology (NM&O) Division presents it first cancer registry report of AECHs. It includes seventeen of the eighteen institutes as CENUM in Lahore is a nuclear medicine facility with no cancer therapy services.

PINUM, Lahore though is also a nuclear medicine facility but offers chemotherapy services and register the cancer patients. GINUM, Gujranwala is being upgraded from nuclear medicine only facility to cancer diagnostic and therapeutic facility. This report therefore includes the cancer patients registered in these two institutes as well. The registries of three years i.e. 2015 to 2017 were acquired from the respective hospitals. They were compiled according to 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10, blocks C00–C-97). A total number of 102,022 new cancer patients were registered during these 3 years.

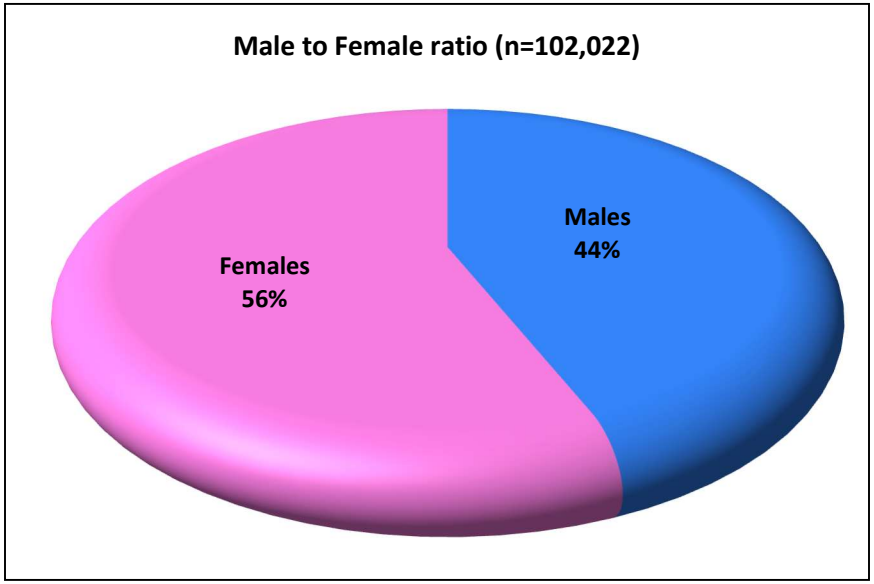
This report comprises of the already diagnosed cancer patients or those who were diagnosed in our hospitals. Therefore, the report may not truly represent the population statistics. The cases were segregated according to the type of cancers; gender and age of the patients; and the region of the country to which they belong. In this section we present top ten cancers in these various categories. The numbers of cases registered in each type of cancer according to ICD-10, are given in the tables in the next section.

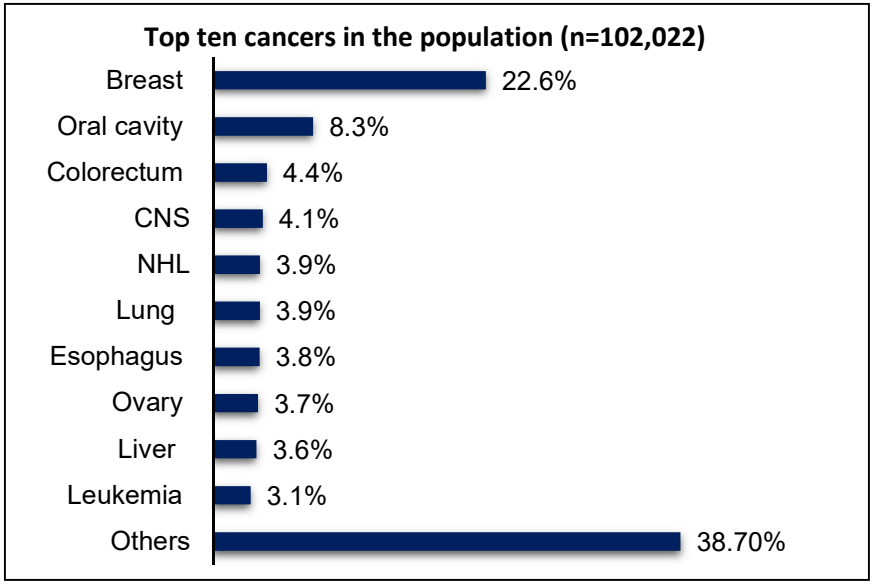
- Age groups
  - Children (0-9 years)
  - Adolescents (10-19 years)
  - Adults (20-39 years)
  - Middle aged (40-59 years)
  - Senior citizen (>60 years)
- Various regions
  - Islamabad
  - Punjab
  - Sindh
  - Khyber Pakhtunkhwa (KP)
  - Balochistan
  - Azad Jammu and Kashmir (AJK)
  - Federally Administered Tribal Areas (FATA)
  - Gilgit-Baltistan (GB)
  - Afghanistan

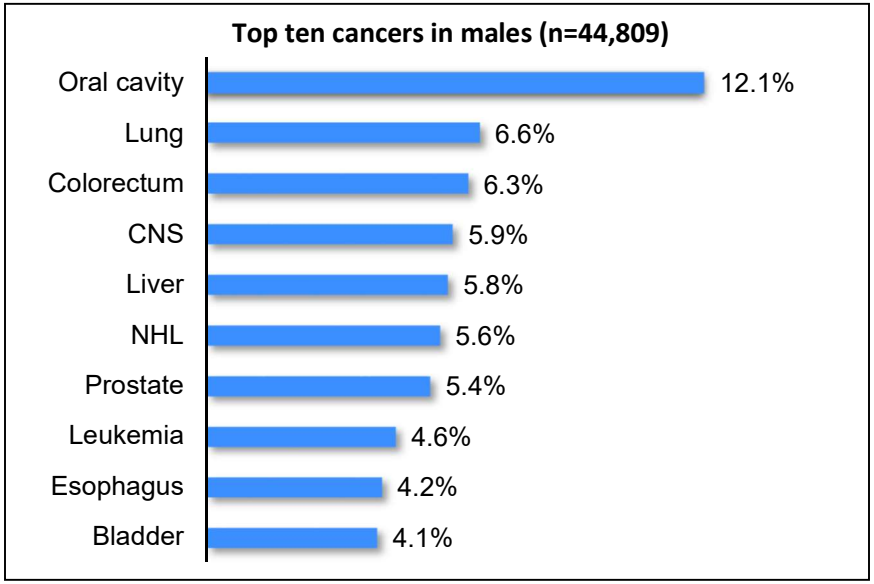
Limitations

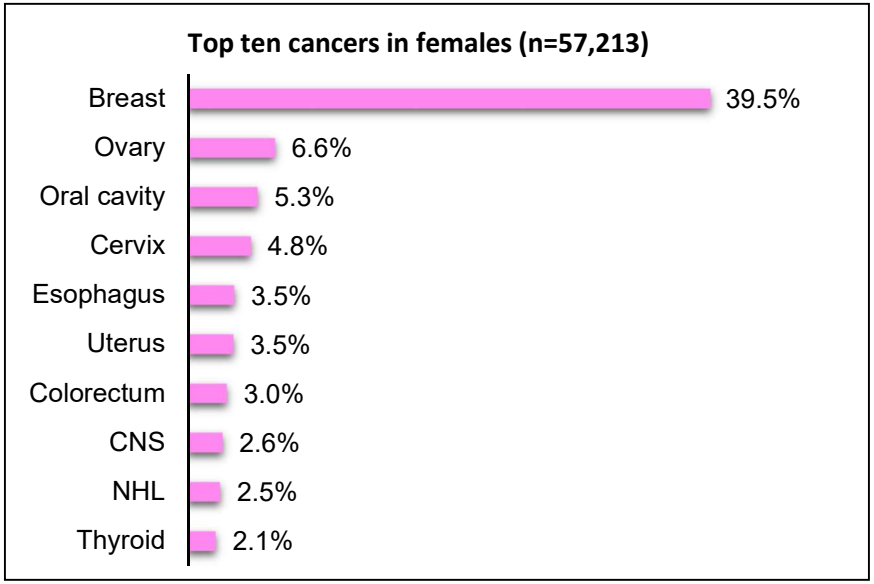
Though the 18 cancer hospitals of PAEC cater vast majority of cancer patient throughout Pakistan, however this report is not population based due to the lack of data-entries from pathology labs, discharge abstracts of other hospitals and death certificates. Moreover, there was no mechanism to correct the possible duplication of a case in more than one hospital. Other inadequacies in the data entries were substantially rectified in NM&O division with the assistance of the respective hospital. A significant number of cases were entered as ill-defined, secondary and unspecified sites (code C76-C80). These patients are mostly those who are lost early in the follow-ups. This may be attributed to factors like non-supporting family, financial constraints, fear or denial factor. Many patients were drawn to quacks, hakeems and homeopaths. Other reasons could be misdiagnosed referrals. NM&O division and its AECHs are devising mechanism to eliminate such errors in future reports.

Top Ten Cancers Gender Wise

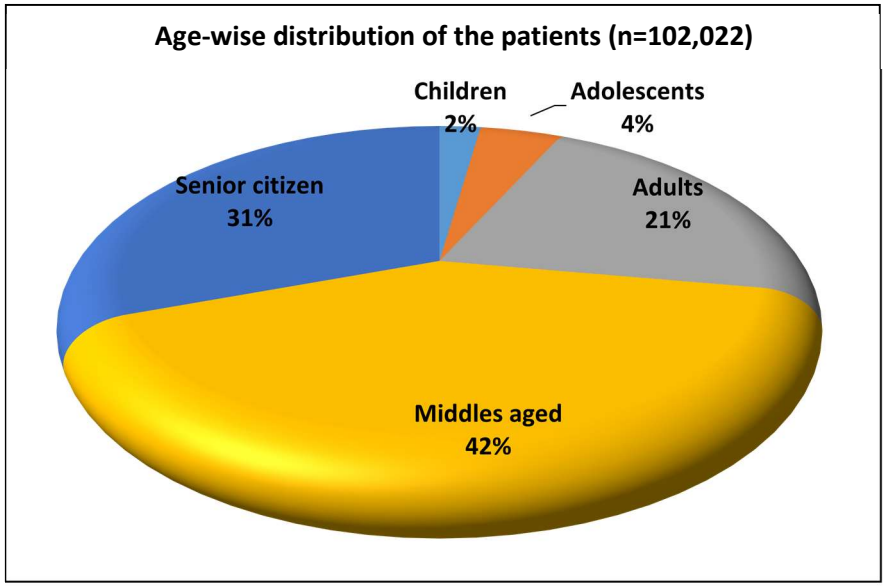


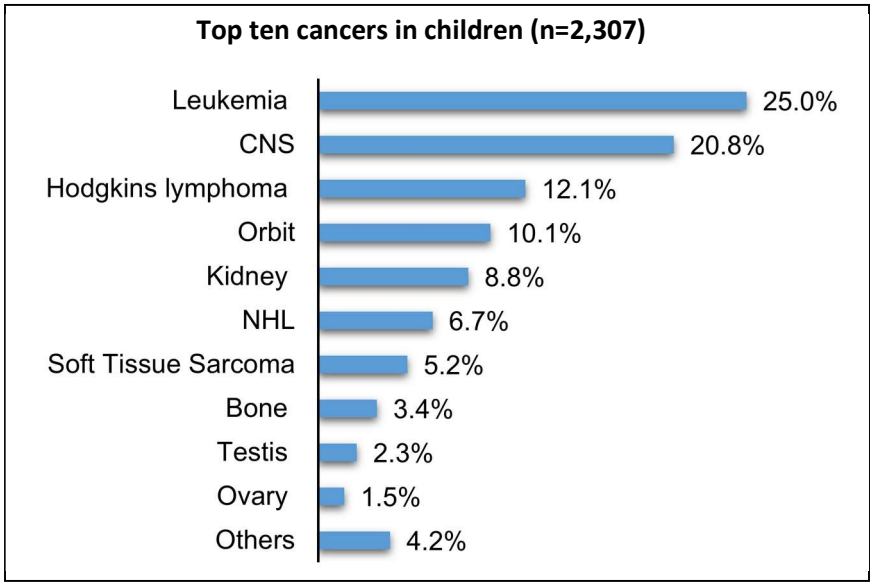


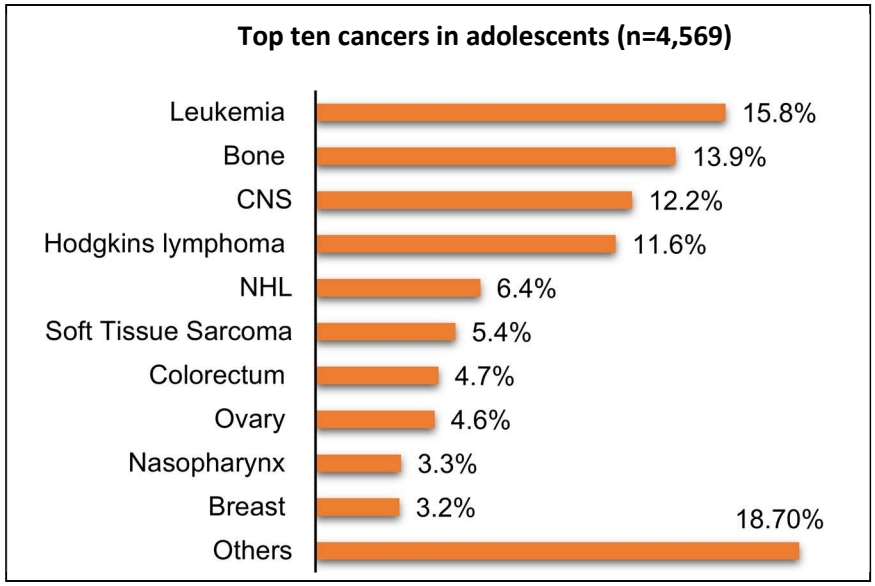


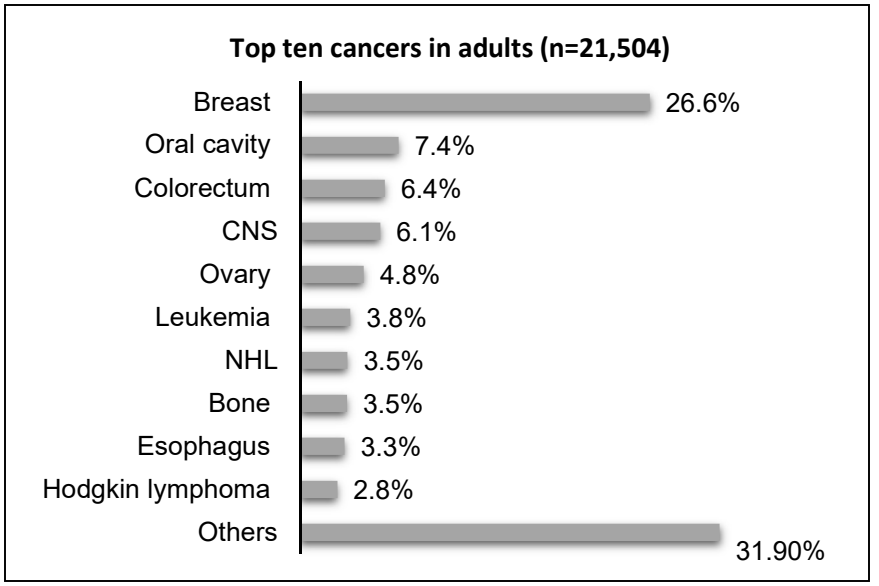


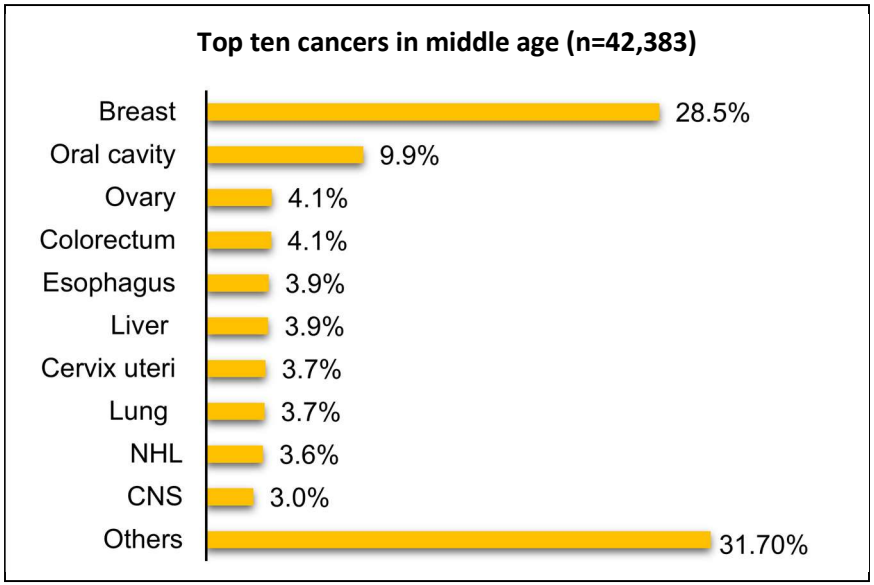
Top Ten Cancers Age Wise

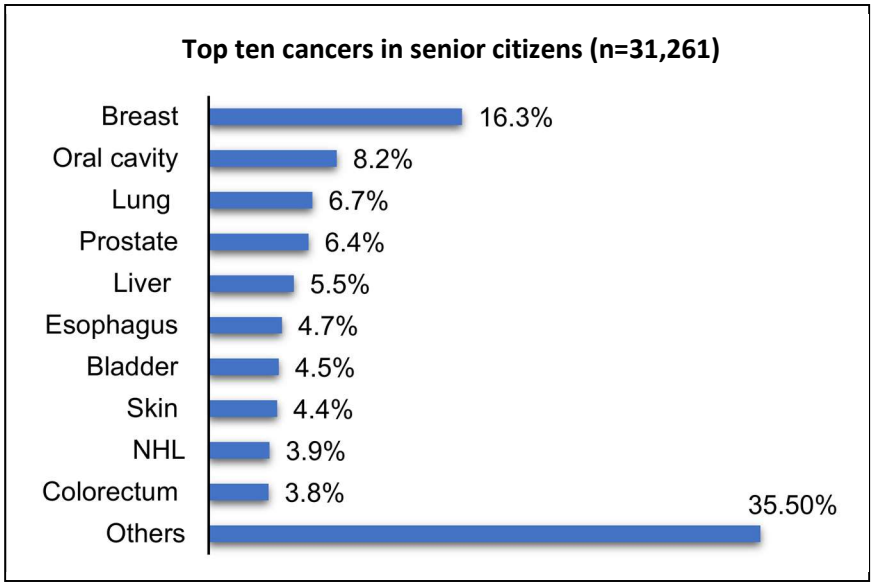






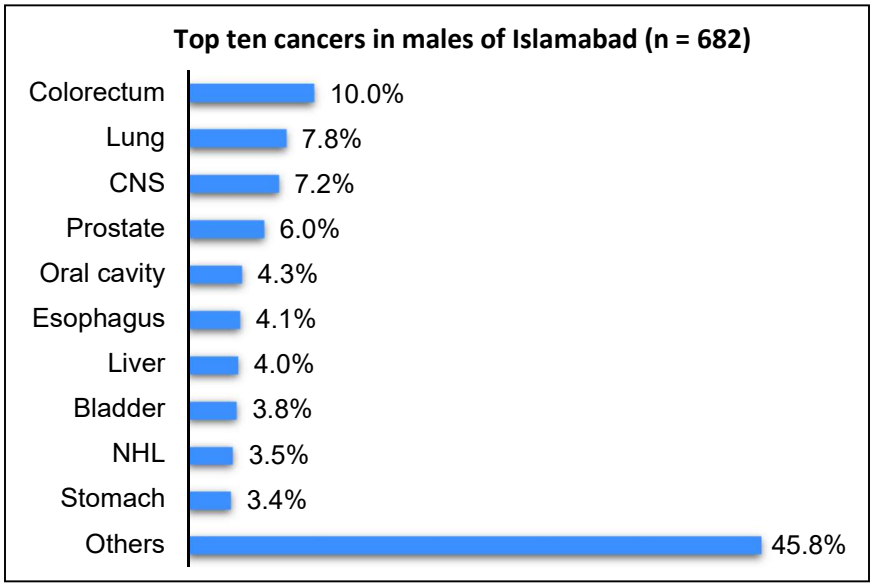


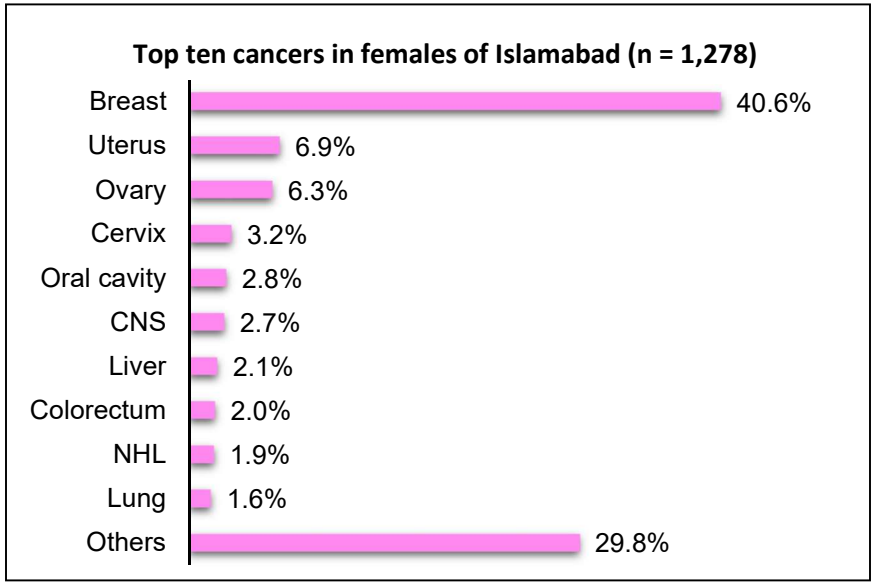




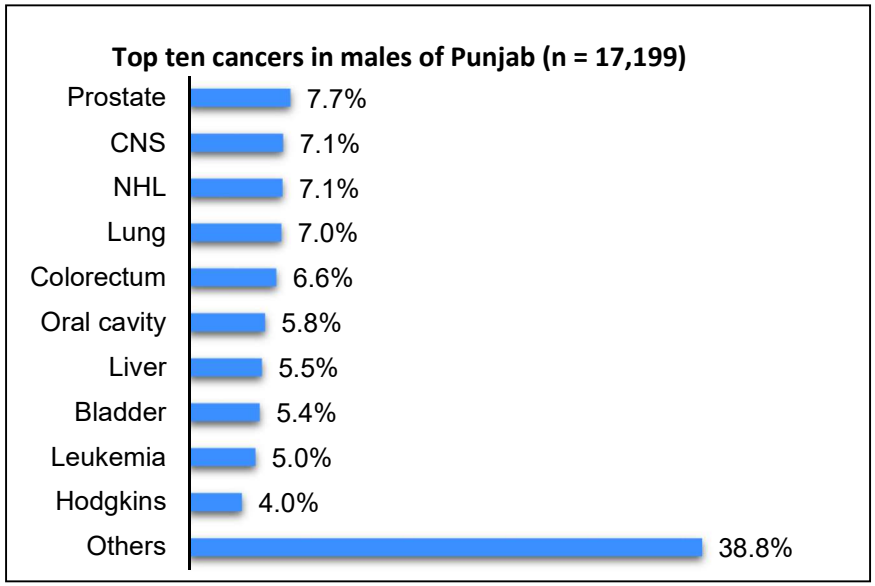
Top Ten Cancers Region Wise

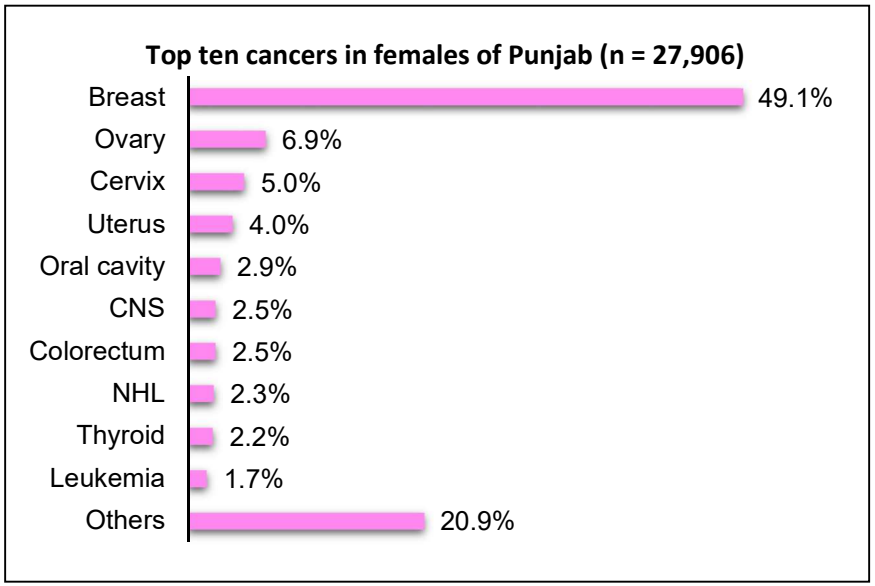
Islamabad (n=1,960)



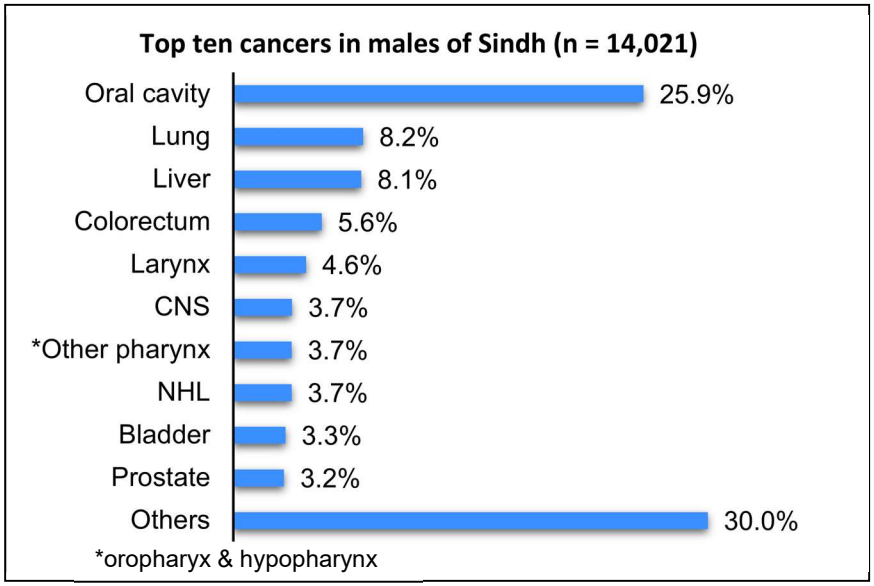


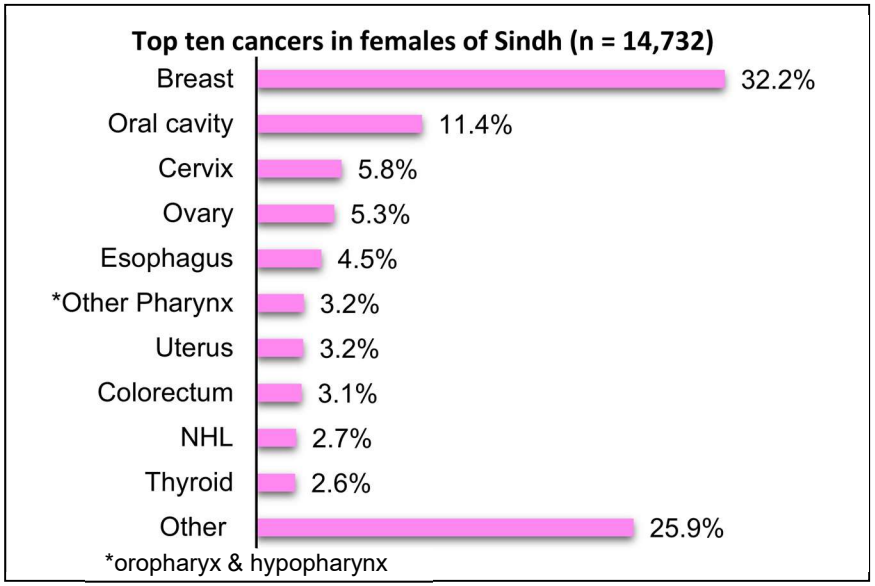
Punjab (n=45,105)



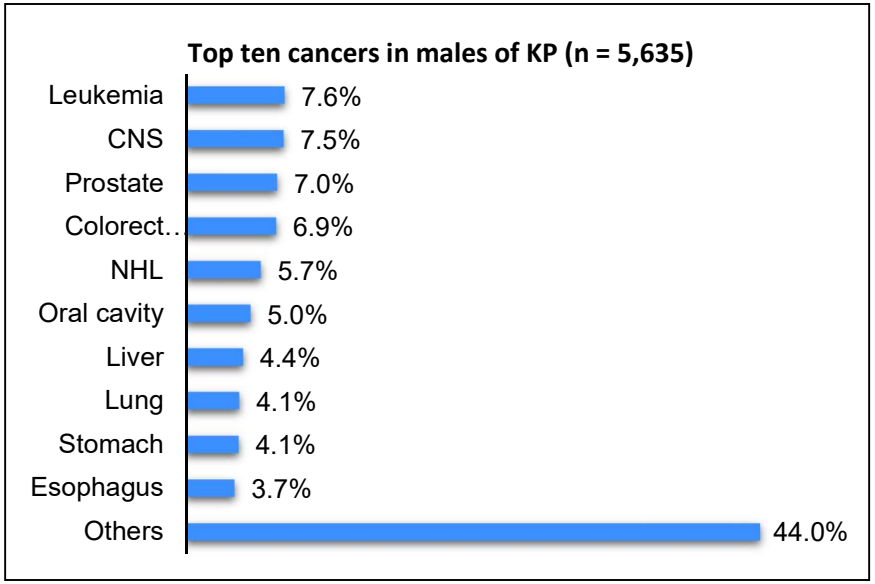


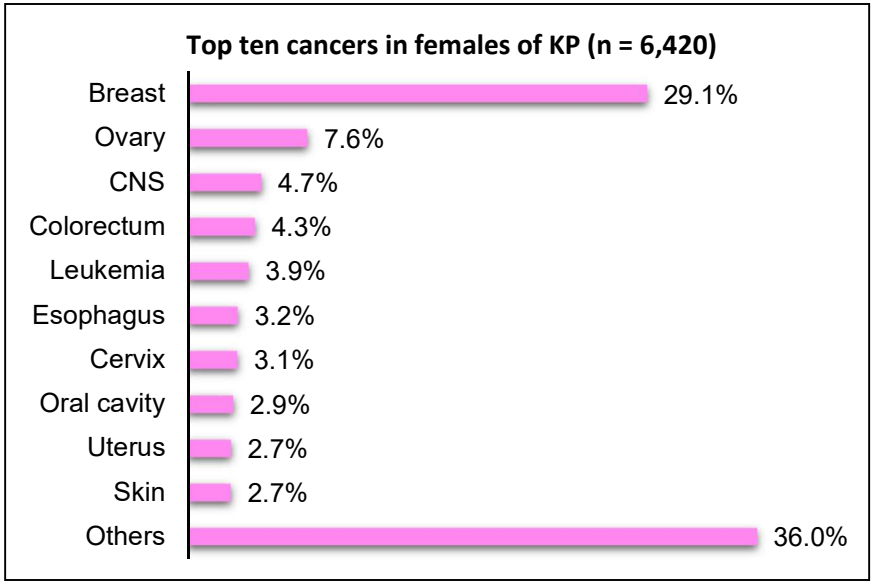
Sindh (n=28,753)



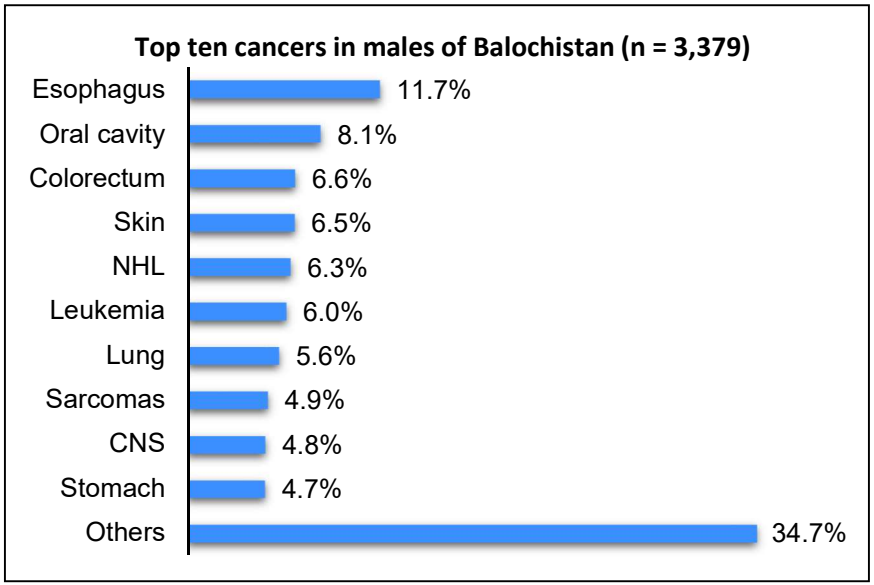


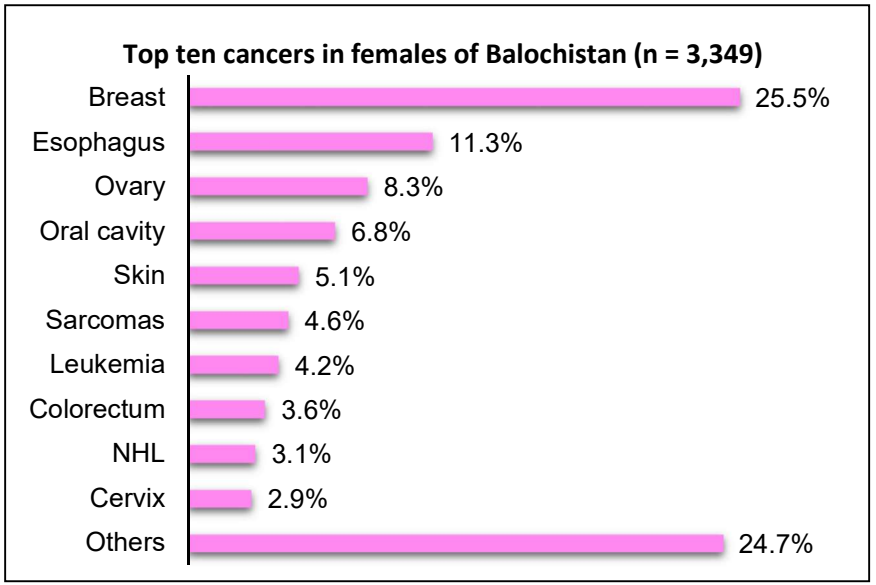
Khyber Pakhtunkhwa (n=12,055)



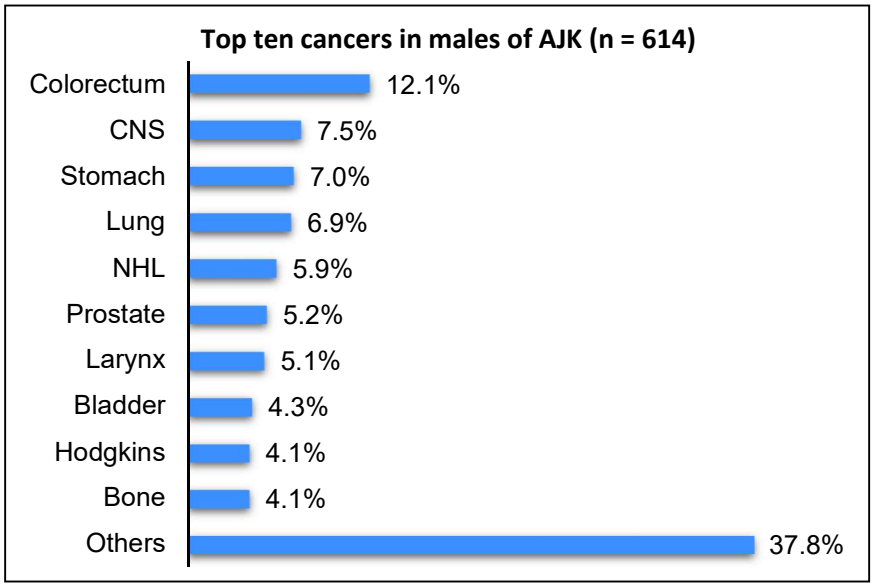


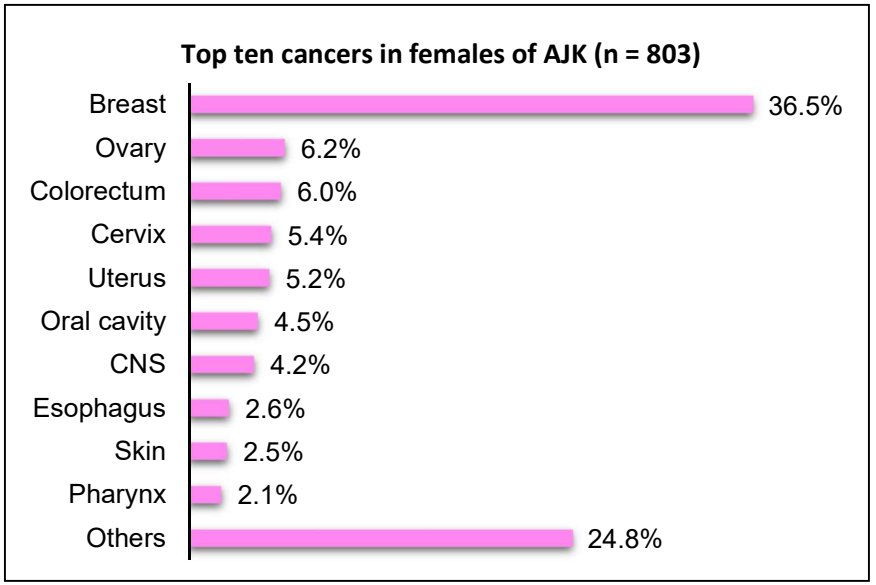
Balochistan (n=6,728)



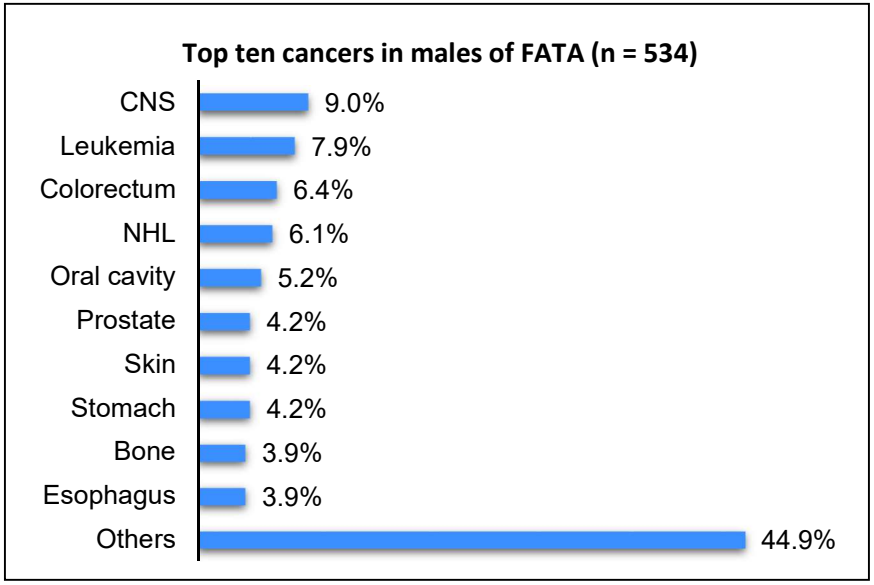


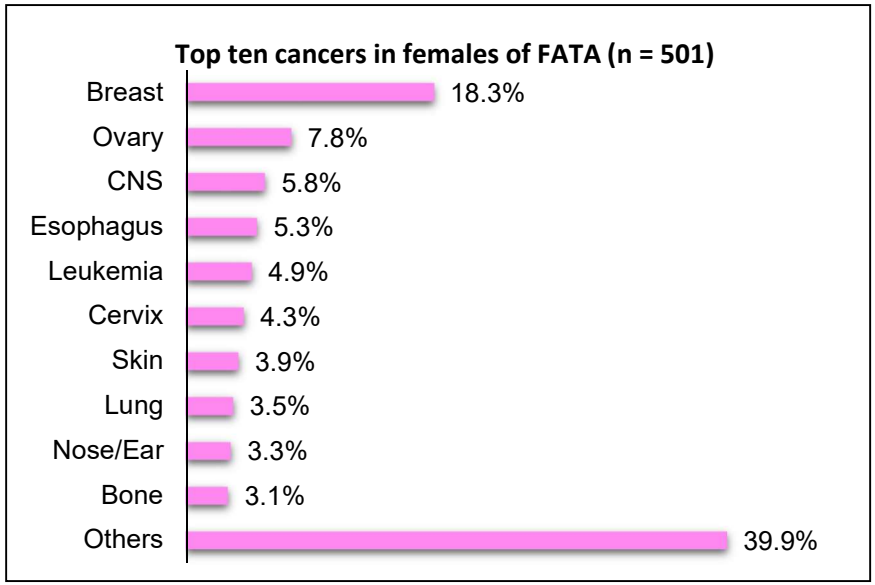
Azad Jammu & Kashmir (n=1,417)



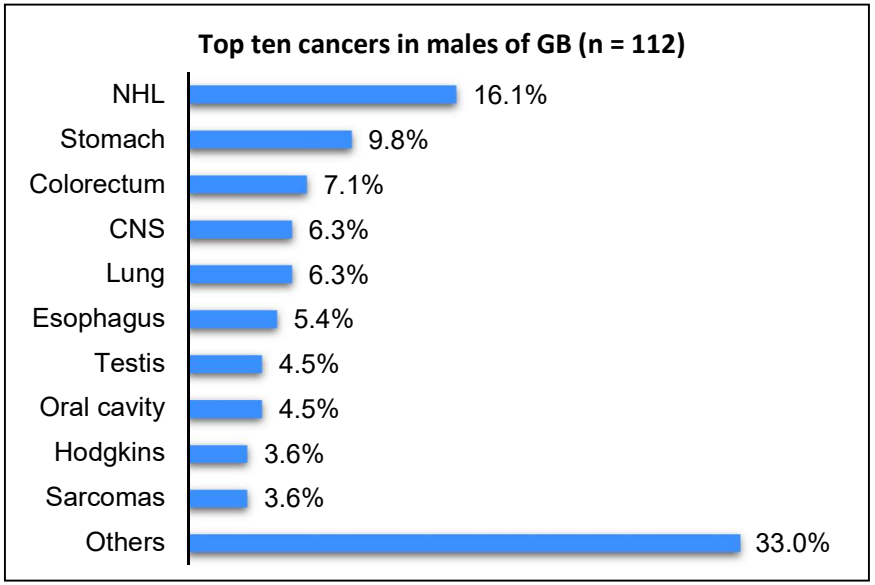


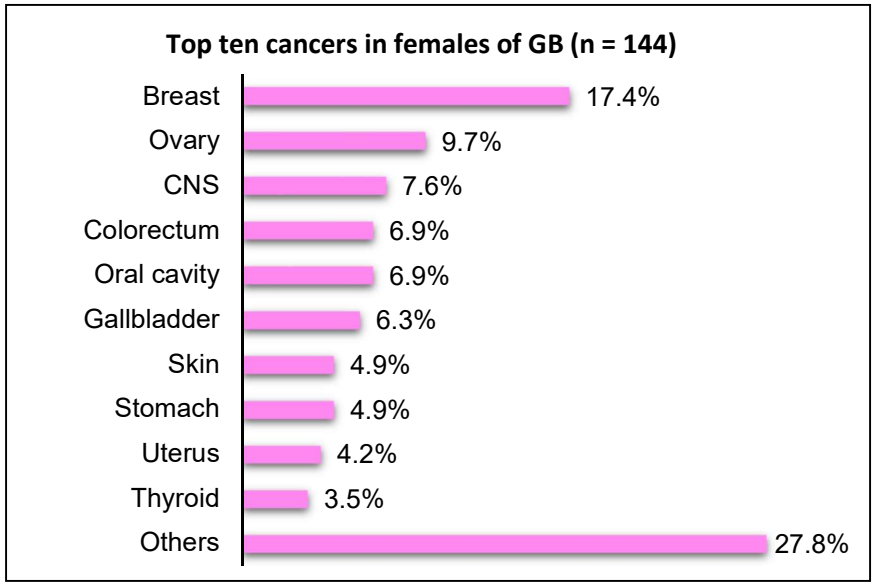
Federally Administered Tribal Areas (n=1,035)



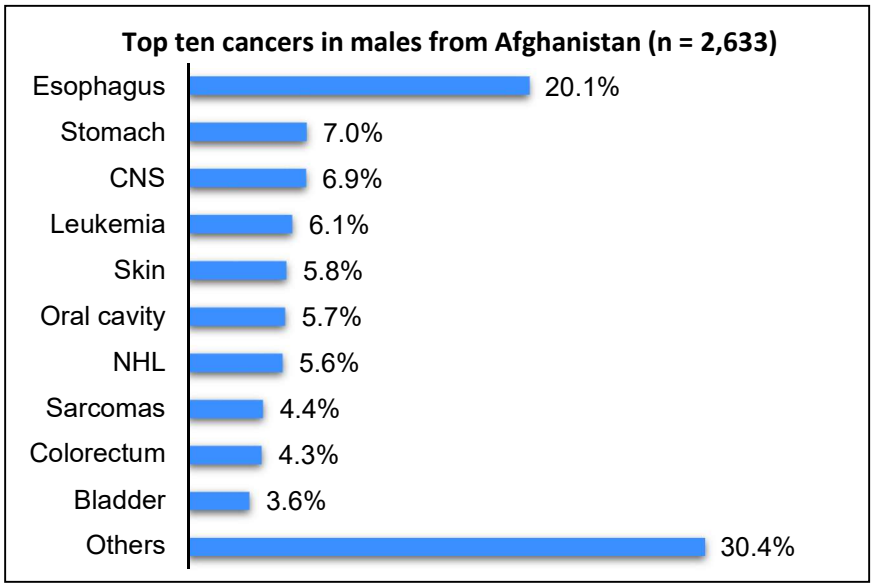


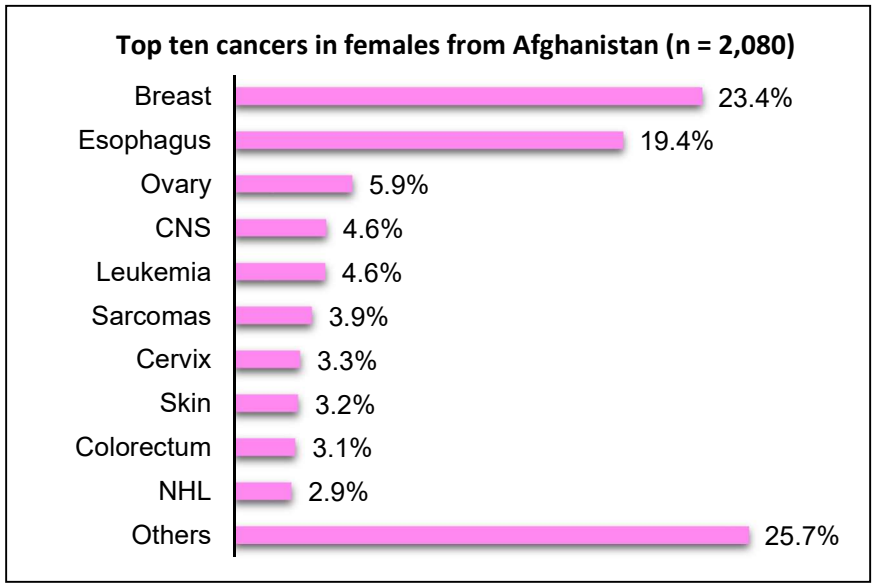
Gilgit-Baltistan (n=256)



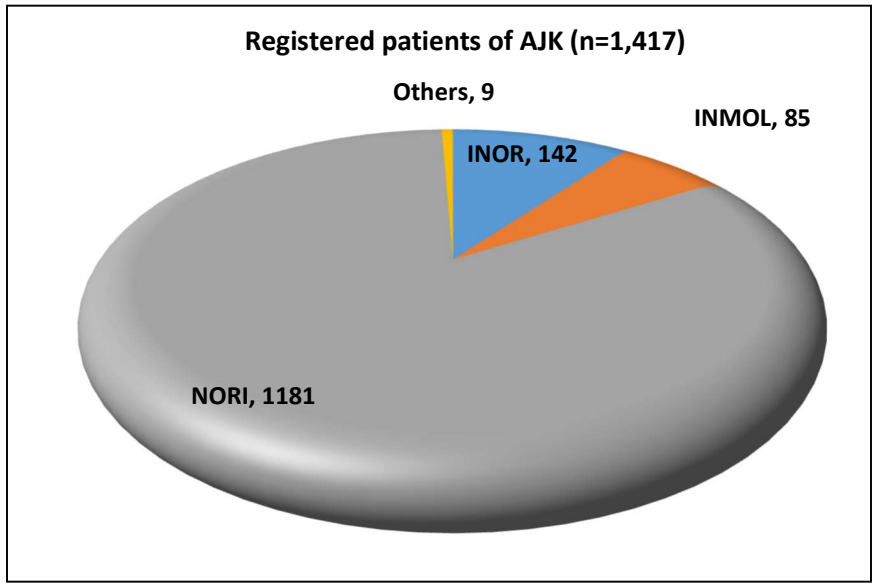


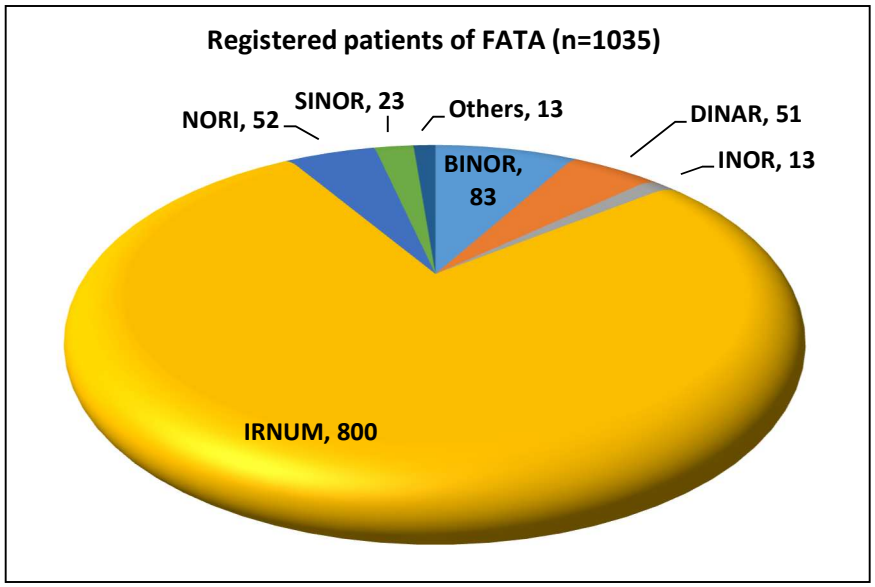
Afghanistan (n=4,713)

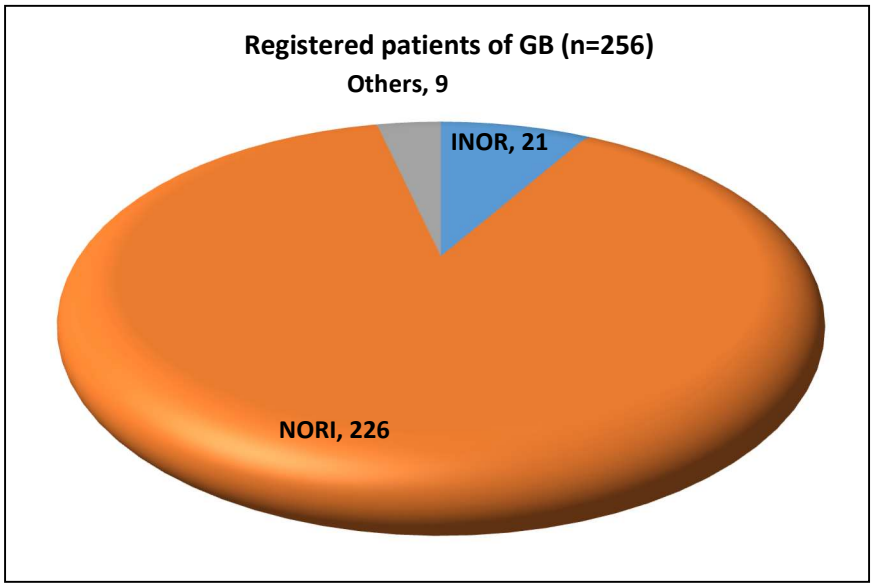


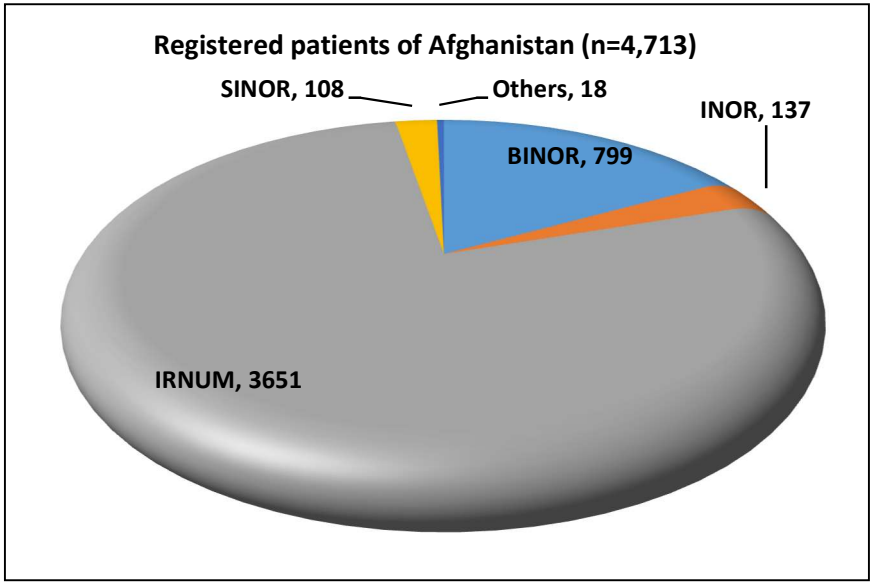


Registration of patients from the regions without established AECHs









3 Appraisal

Cancer is ranked as the second leading cause of mortality, worldwide. It occurs after a multi-step process of transformation of normal tissues into malignant cells. Malignant cells can potentially invade locally to the normal tissue and organs around it and eventually spread to the distant sites (local and distant metastasis respectively). The critical event of carcinogenesis is the damage to genetic material of DNA, causing distortion of cell's regulatory mechanisms and eventually resulting in accelerated and uncontrolled growth of abnormal cells clusters. In this phase, cells grow abnormally faster than normal cells, and hardly respond to suppressive signals of cell proliferation. Generally, it is at this time when the cancerous lesion is identifiable in the body either due to abnormal symptoms or distortion in function of the organ primarily affected. Symptoms can be very different from organ to organ, that is the reason often cancer are mis-interpreted for other diseases, especially when awareness for cancer-associated symptoms is low. Although individual may be inherently susceptible to develop some cancer because of genetic alterations, external modifiable risk factors play a critical role for its development. Risk factors can be related to human behaviors (like alcoholism and smoking), environmental exposures (like asbestos or aflatoxins) and living habitats (like indoor pollution and radon) which can cause damage to genetic material, increasing the risk to develop cancer.

Cancer risk factors can be roughly divided into the following categories:

- **Non modifiable factors:** such as age, sex, skin phenotype (skin pigmentation and susceptibility to sunburn), metabolism of substances foreign to the body, inherited and non- inherited genetic defects or disorders.
- **Modifiable external factors:** lifestyle related factors e.g. smoking, Alcohol, occupational/environmental exposures, e.g. chemicals, radioactive materials and asbestos, Radon and UV radiations.

Analysis of Cancers Cases in Various Regions

PAEC cancer institutes are distributed according to the population density in various regions of the country. Five institutes are in KP, six in Punjab, five in Sindh and one in Islamabad and Balochistan each. The patients are registered in all the hospitals irrespective of age, financial status, stage of the disease and the region they belong.

Highest number of patients were registered in AECHs of Punjab followed by Sindh and KP. Four regions i.e. AJK, FATA, GB and Afghanistan do not have PAEC cancer institute. From AJK and GB patients primarily visited NORI and INOR, while from FATA and Afghanistan most of them were registered at IRNUM and BINOR. A cancer hospital in Gilgit therefore was planned and is under construction.

Points to Focus

Cancer prevention and control is an area of vast interest and research, internationally. It requires thorough knowledge about health determinants and understanding of their mechanisms via behavioral, biological and molecular pathways.

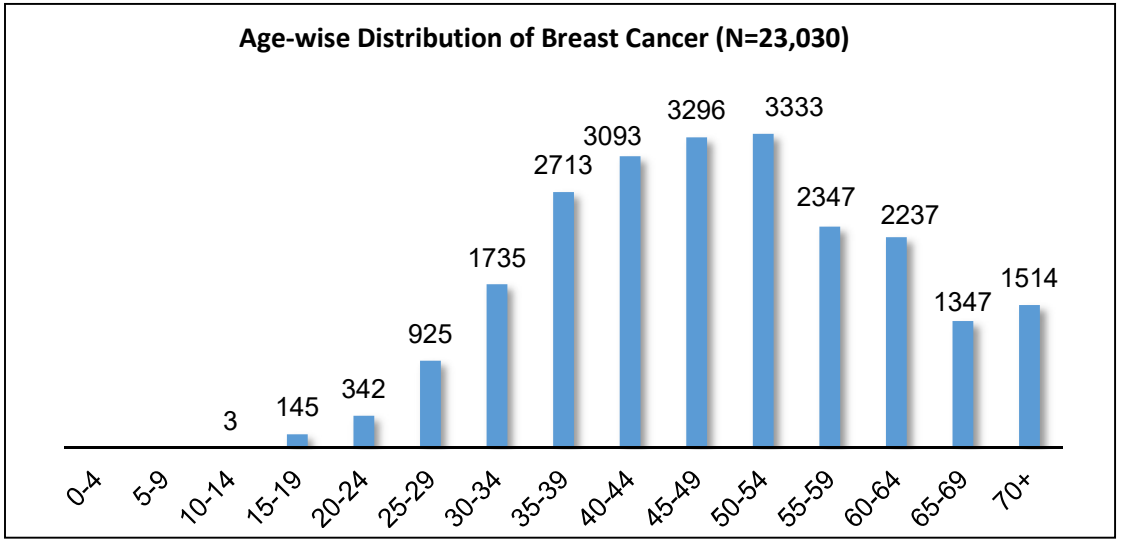
Cancer registries are essential to track the burden of the disease. They are imperative for cancer control planning as they are the reliable source of data that in turn provides valuable insight into cancer care status, actual burden of disease, and identification of high risk susceptible population groups or clusters. Thus cancer registration is critical in planning high quality targeted cancer prevention and control strategies and monitoring of their effectiveness.

Breast Cancer

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death among females worldwide. Breast cancer alone accounts for 25% of all cancer cases and 15% of all cancer deaths among females [1]. According to American Cancer Society, one in eight women in the United States will develop breast cancer in her lifetime estimated 80 years [2]. Breast cancer is also the leading cause of cancer death in women (15.0%), followed by lung cancer (13.8%) and colorectal cancer (9.5%) [3].

In total of 102,022 cases of cancers during the period from 2015 to 2017, more than half patients were females. Breast cancer (C50) invariably dominated all the other types in females i.e. 23,030 cases out of 57,213 females. It was the top female cancer in all the regions and over 20 years of age. The highest number of breast cancer was in middle aged women (52.4%). Region-wise the highest frequency was seen in the Punjab where nearly 50% of females were diagnosed with breast cancer. It also topped in female patients in all the other regions too with 39.5% in all female cancer patients.

Furthermore, breast cancer in our population trended more towards younger population having median age of 49 years



as compared with the study by American Cancer Society which showed median age of 62 in U.S. population [4]. Exact etiology and risk factors established for breast cancer include hereditary (BRCA1, BRCA 2 and p53 gene mutations), increasing age, gender, high estrogen exposure (endogenous or exogenous) e.g. oral contraceptives use, nulliparity, lack of breastfeeding, hormone replacement therapy etc. Higher percentage of breast cancer compared with the rest of the world and even higher in the regions like Punjab, Islamabad and Sindh on the basis of this report need to be explored. The question of the trend of involvement of younger population also need to be investigated. Genetic testing like BRCA 1, BRCA 2 and p53 is required to investigate breast cancer within the families and at early stage. Currently there is no facility within the country to assess such parameters, however it will be available soon in NORI, Islamabad. This will help in designing targeted cancer control strategies to combat this problem. Early cancer detection by creating breast cancer awareness and screening is already an important part of services at all AECHs, thus contributing to decreasing the mortality and morbidity associated with breast cancer.

Tobacco

Tobacco is considered to be the most important preventable causative agent for cancer. Studies have proved its association

in pathogenesis/ etiology of at least 15 different cancers. World Health Organization (WHO) has listed malignancies which are caused by tobacco that include lung, esophagus, larynx, mouth, throat, kidney, bladder, pancreas, stomach and cervix [5]. Tobacco is harmful in any forms of consumption, either smoked or smokeless tobacco. Smokeless tobacco (oral tobacco, chewing tobacco or snuff) causes oral, hypopharyngeal, esophageal and pancreatic cancer.

The cancers of oral cavity (C00-C06 + C14) were among the major top ten malignancies in Pakistani adult

populations. They peaked in males and females after breast cancer, in the province of Sindh. The top ten cancers in the population of Sindh also included oropharynx and hypopharynx (C10 & C13 respectively) not seen in any other regions studied in this report. The etiological factors of these cancers are similar to those of oral cavity.

Nearly twenty-six percent of male patients from Sindh had oral cavity cancers and another 3.7% had oropharynx and hypopharynx (C10 & C13 respectively). The chewing forms of tobacco and other psychoactive agents have been considered as a great risk factors of oral cancers in South Asian ethnic population [6]. There is excessive use of *paan* (betel quid) in Karachi and Hyderabad, the two largest cities of Sindh. *Paan* is the betel leaf painted with slaked lime wrapping the *chaalia* (areca nut) and may or may not contain tobacco. *Chaalia* has a hard wood like consistency also chewed alone. Apart from tobacco, slaked lime and *chaalia* are also associated with oral cancer. Another form is chewing *Gutka*, also common in this part of the region, which is crushed areca nut, tobacco, catechu, paraffin wax, slaked lime and sweet or savory flavorings. Same trend was also reflected in females where oral cavity cancers ranked second, just after breast cancer burden. This means that in Sindh, oral cancer is of great epidemiological interest, regardless of the sex, and is a major cause of morbidity and disability for people. Cancers of pharynx (oropharynx and hypopharynx) are similarly related to these chewing substances and were also found to be quite common in Sindh region. Similar trend was also observed in KP, where oral cavity cancer is ranked at 5th and 7th place among top ten cancers of males and females, respectively. These may be related to another form of oral tobacco called *niswar*, consumed in KP region where this is part of a radical and ancient cultural/social practice.

Mazahir et al. reported that 40% of population of Karachi, Pakistan use *paan*, *chaalia, gutka* or other forms of smokeless tobacco in their daily lives. The study reported high prevalence these chewable psychoactive agents in younger age groups of Karachi [7]. These products can lead to precancerous lesion like Oral Sub Mucosal Fibrosis (OSMF), leucoplakia and ultimately result in malignancies of oral cavity [8]. They are also associated with pharyngeal and esophageal cancer development. Another study stated that out of the total cancer cases nearly 45% in males and 20% in females are due to tobacco use in Indian

population [9]. It may explain high rates of oral and esophageal cancer in KP where *niswar* is a cultural habit. Various researches have established increased risk of cancers of the oral cavity, pharynx and esophagus in individuals using smokeless tobacco and high incidence in Southeast Asia including Pakistan, Sri Lanka, India and Taiwan) [10, 11].

Hepatitis related cancer

Liver cancer is the third most common malignancy of males in Sindh and it is among the top ten cancers of Islamabad and Punjab region in our data. This high incidence may be attributable to a major risk factor for liver cancer i.e. the huge burden of hepatitis B and C infection in these areas, especially southern provinces. Hepatocellular Carcinoma (HCC) is the most common subtype of liver cancer; it usually develops in background of chronic hepatitis B and C infections or non-infectious chronic liver disease like alcohol related cirrhosis. Hepatitis C infection has high prevalence in Pakistan, that is almost comparable in magnitude to one of an epidemic, as evidenced by WHO Regional office survey that listed Pakistan at second place among Southeast Asian countries having high chronic infection rate of Hepatitis B and C (4.8%) - after Egypt (22%) [12]. One in every 20 Pakistanis has been infected with HCV infection which is playing a major role in liver disease burden in this country [13]. According to a survey conducted by the Pakistan Health Research Council (PHRC), it is estimated that in Pakistan about 12 million individuals are affected by hepatitis B and C. These make up 7.4% of the total population, 2.4% of which are HBV infected and 4.9% are Hepatitis C - related [14].

HCC is a preventable cancer, when controllable risk factors are addressed through population level hepatitis B vaccination along with hygienic safe medical practices like screening and safe transfusion of blood and blood products, disposable syringe use, management of drug abuse to prevent its dissemination [15]. However, there is a need to further evaluate probable causes and study the associated risk factors to help the cancer control and prevention programme.

Esophageal cancer

Our data also shows that Esophageal cancer is one of the most common malignancy in males and second common cancer among females of Balochistan and Afghanistan. It also appears among top ten cancers list of FATA and KP province. Risk factors for esophageal cancer are related to its histological type and may differ with respect to geographical distribution. The Balochistan and Afghanistan is part of Asian cancer belt region that extend from China to middle east and has high incidence rates for esophageal squamous cell carcinoma (100 cases per 100000 annually) [16]. Esophageal malignancy risk, particularly squamous cell carcinoma, is found to be increased with the consumption of hot and smoked food and beverages [17, 18]. High consumption of smoked meat and hot *qawa* is cultural habit in the regions of KP, FATA, Balochistan and Afghanistan region. Oral Tobacco consumption in form of *niswar* may be another reason of high incidence of esophageal cancer in FATA and KP region.

Colorectal cancer

Colorectal cancers (C18-21) were also the common cancers seen among the top ten list in all the regions. They were at the top

of the list of males in Islamabad and AJ&K. Higher incidence of colorectal cancer was observed in adults, middle age and senior citizens irrespective of gender, along multi ethnic lines that needs further evaluation of genetic and lifestyle factors. Dietary factors like intake of smoked red meat in large quantities may be accounted as one important risk factor for colorectal cancer in Balochistan, Afghanistan and KP [19].

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4 Age-wise distribution of various cancers (C00-C97)

Malignant Neoplasm (codes)	Total	Male	Female	Age (years)														
				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+
Lip, Oral Cavity and pharynx (C00-C14)	12594	7729	4865	2	16	94	217	262	506	818	996	1305	1538	1687	1313	1492	985	1363
Digestive organs (C15-C-26)	16094	9530	6564	4	20	58	277	403	610	824	1095	1261	1704	2055	1911	2240	1572	2060
Respiratory and intrathoracic organs (C30-C39)	6627	5023	1604	1	7	19	49	77	116	141	238	334	558	848	913	1161	923	1242
Bone and Articular cartilage (C40-C41)	2187	1332	855	12	67	236	400	274	197	144	138	108	132	97	87	105	89	101
Melanoma and other of skin (C43-C44)	2606	1483	1123	1	10	25	38	44	64	100	132	157	193	256	209	397	282	698
Mesothelial and soft tissue (C45-C49)	2029	1169	860	61	59	93	154	146	165	143	148	143	173	172	137	165	102	168
Breast (C50)	23030	457	22573	0	0	3	145	342	925	1735	2713	3093	3296	3333	2347	2237	1347	1514
Female genital organs (C51-C58)	9218	0	9218	4	31	63	183	313	468	498	754	931	1190	1292	1045	1063	675	708
Male genital organs (C60-C63)	3418	3418	0	33	19	8	78	132	144	176	138	102	102	173	226	433	468	1186
Urinary tract (C64-C68)	3741	2695	1046	108	95	17	24	32	54	77	143	181	296	480	422	597	435	780
Eye, Brain and Central nervous system (C69-C72)	4974	3126	1848	268	443	291	305	255	359	394	397	340	379	424	294	330	224	271
Thyroid and other endocrine glands (C73-C75)	1998	661	1337	0	3	20	48	105	140	144	139	199	190	241	213	216	158	182
III-defined, secondary and unspecified sites (C76-C80)	3518	1705	1813	2	31	62	117	176	205	215	303	293	335	387	334	428	246	384
Lymphoid, hematopoietic and related tissue (C81-C96)	9857	6413	3444	266	744	742	803	575	562	516	580	596	697	855	749	791	569	812
Independent (primary) multiple sites (C-97)	131	68	63	0	0	0	0	0	2	4	8	5	15	15	22	25	9	26
Total	**102022**	**44809**	**57213**	**912**	**1605**	**1764**	**2833**	**3138**	**4510**	**5915**	**7884**	**9031**	**10774**	**12305**	**10189**	**11618**	**8065**	**11479**

Lip, oral cavity and pharynx (C00-C14)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C00-Lip	568	325	243	0	3	1	1	7	7	11	31	41	67	72	69	85	50	123
C01-Base of tongue	525	300	225	0	0	1	6	7	23	31	40	51	64	69	57	73	40	63
C02-Other and unspecified parts of tongue	1528	917	611	0	0	1	7	19	58	112	150	169	192	238	146	178	118	140
C03-Gum	582	357	225	0	0	0	6	9	17	21	31	49	64	80	83	85	58	79
C04-Floor of mouth	617	359	258	0	0	5	10	8	16	30	39	46	69	62	65	84	69	114
C05-Palate	307	180	127	0	0	0	2	10	7	19	29	30	38	50	37	36	19	30
C06-Other and Unspecified parts of mouth	4046	2823	1223	0	0	1	22	46	128	308	339	528	579	598	449	457	273	318
C07-Parotid gland	658	377	281	2	8	19	35	31	34	40	65	54	63	66	50	71	35	85
C08-Other and unspecified major salivary glands	229	110	119	0	1	3	6	6	14	20	19	17	28	32	19	25	13	26
C09-Tonsil	225	130	95	0	0	2	2	4	10	9	17	18	22	22	25	34	27	33
C10-Oropharynx	448	266	182	0	0	1	3	9	17	22	37	42	49	66	37	62	47	56
C11-Nasopharynx	1010	697	313	0	3	60	91	53	69	57	65	78	95	114	88	107	58	72
C12-Piriform sinus	64	35	29	0	0	0	0	1	3	2	3	6	8	9	4	7	11	10
C13-Hypopharynx	1527	714	813	0	0	0	24	50	89	123	113	154	172	164	154	156	143	185
C14-Other and ill-defined sites in the lip, oral cavity and pharynx	260	139	121	0	0	0	2	2	14	13	18	22	28	45	30	33	24	29
Total	**12594**	**7729**	**4865**	**2**	**15**	**94**	**217**	**262**	**506**	**818**	**996**	**1305**	**1538**	**1687**	**1313**	**1493**	**985**	**1363**

Digestive organs (C15-C26)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C15-Oesophagus	3917	1898	2019	2	5	5	48	68	155	209	282	326	420	515	408	573	368	533
C16-Stomach	1744	1145	599	2	2	4	11	36	55	103	126	153	203	236	206	222	149	236
C17-Small intestine	204	118	86	0	3	0	7	10	11	10	12	22	27	22	21	26	13	20
C18-Colon	1947	1222	725	0	2	24	72	92	105	130	189	182	218	211	185	211	158	168
C19-Rectosigmoid junction	329	194	135	0	1	4	15	26	18	31	32	22	35	24	34	36	16	35
C20-Rectum	1868	1151	717	0	3	13	79	126	162	185	198	162	168	174	150	146	135	167
C21-Anus and anal canal	390	266	124	0	0	1	9	11	19	23	27	31	44	53	42	52	35	43
C22-Liver and intrahepatic bile ducts	3640	2612	1028	0	4	5	16	16	44	66	124	191	351	543	568	646	494	572
C23-Gallbladder	940	282	658	0	0	0	0	6	14	21	40	71	117	138	132	156	104	141
C24-Other and unspecified parts of billiary tract	81	45	36	0	0	0	0	1	0	1	5	16	9	16	8	12	5	8
C25-Pancreas	782	454	328	0	0	2	6	8	17	28	44	55	90	97	129	126	80	100
C26-Other and ill-defined digestive organs	252	143	109	0	0	0	14	3	10	17	16	30	22	26	28	34	15	37
Total	**16094**	**9530**	**6564**	**4**	**20**	**58**	**277**	**403**	**610**	**824**	**1095**	**1261**	**1704**	**2055**	**1911**	**2240**	**1572**	**2060**

Respiratory and intrathoracic organs (C30-C39)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C30-Nasal cavity and middle ear	381	227	154	0	1	10	12	13	16	22	17	17	39	59	42	48	27	58
C31-Accessory sinuses	222	132	90	0	0	3	5	13	14	12	24	12	19	35	39	17	10	19
C32-Larynx	1840	1543	297	0	0	0	4	12	14	29	59	105	147	244	247	371	250	358
C33-Trachea	12	8	4	0	0	0	1	1	1	0	1	1	2	0	1	1	2	1
C34-Bronchus and lung	3921	2951	970	0	0	1	18	29	49	66	124	187	326	478	559	697	608	779
C37-Thymus	32	21	11	0	1	1	1	1	8	1	1	1	4	5	2	1	1	4
C38-Heart. Mediastinum and pleura	179	106	73	1	5	4	6	8	12	10	10	11	19	21	20	19	17	16
C39-Other and ill-defined sites in the respiratory system and intrathoracic organs	40	35	5	0	0	0	2	0	2	1	2	0	2	6	3	7	8	7
Total	**6627**	**5023**	**1604**	**1**	**7**	**19**	**49**	**77**	**116**	**141**	**238**	**334**	**558**	**848**	**913**	**1161**	**923**	**1242**

Bone and articular cartilage (C40-C41)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C40-Bone and articular cartilage of limbs	1238	752	486	7	25	118	241	166	122	83	77	64	71	50	49	58	51	56
C41-Bone and articular cartilage of other and unspecified sites	949	580	369	5	42	118	159	108	75	61	61	44	61	47	38	47	38	45
Total	**2187**	**1332**	**855**	**12**	**67**	**236**	**400**	**274**	**197**	**144**	**138**	**108**	**132**	**97**	**87**	**105**	**89**	**101**

Melanoma and other malignant neoplasm of skin (C43-C44)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C43-Malignant melanoma of skin	331	203	128	0	2	4	4	11	12	14	17	24	21	37	32	47	40	66
C44-Other Malignant Neoplasm of skin	2275	1280	995	1	8	21	34	33	52	86	115	133	172	219	177	350	242	632
Total	**2606**	**1483**	**1123**	**1**	**10**	**25**	**38**	**44**	**64**	**100**	**132**	**157**	**193**	**256**	**209**	**397**	**282**	**698**

Mesothelial and soft tissue (C45-C49)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C45-Mesothelioma	73	44	29	0	0	0	0	0	4	2	6	3	13	4	14	15	4	8
C46-Kaposi's sarcoma	10	4	6	0	0	0	0	1	0	2	0	1	0	2	3	1	0	0
C47-Peripheral nerves & autonomic nervous system	34	24	10	0	1	3	4	2	1	7	4	0	3	3	2	1	2	1
C48-Retroperitoneum and peritoneum	149	81	68	0	2	3	5	8	5	8	12	15	21	15	14	18	12	11
C49-Other connective and soft tissue	1763	1016	747	61	56	87	145	135	155	124	126	124	136	148	104	130	84	148
Total	**2029**	**1169**	**860**	**61**	**59**	**93**	**154**	**146**	**165**	**143**	**148**	**143**	**173**	**172**	**137**	**165**	**102**	**168**

Breast (C50)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C50-Breast Malignant	23030	457	22573	0	0	3	145	342	925	1735	2713	3093	3296	3333	2347	2237	1347	1514

Female genital organs (C51-C58)

Malignant Neoplasm	Total	Age (years)														
		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+
C51-Vulva	231	0	0	0	0	0	2	5	9	11	17	23	27	38	34	65
C52-Vagina	144	0	0	0	0	2	6	4	10	14	10	16	13	27	15	27
C53-Cervix uteri	2738	0	0	0	2	11	41	115	207	367	464	438	311	346	203	233
C54-Corpus uteri	756	0	0	0	2	15	26	19	45	56	75	109	133	124	77	75
C55-Uterus, part unspecified	1221	0	0	0	10	51	50	48	80	78	136	175	181	198	117	97
C56-Ovary (Malignant)	3781	4	31	56	154	156	257	252	365	385	475	521	371	324	223	207
C57-Other and unspecified female genital organs	103	0	0	0	6	10	12	15	9	9	6	10	9	6	7	4
C58-Placenta	244	0	0	7	8	68	74	40	29	11	7	0	0	0	0	0
Total	**9218**	**4**	**31**	**63**	**182**	**313**	**468**	**498**	**754**	**931**	**1190**	**1292**	**1045**	**1063**	**676**	**708**

Male genital organs (C60-C63)

Malignant Neoplasm	Total	(Age (years)														
		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+
C60-Penis	23	0	0	0	0	0	0	0	0	2	1	4	1	7	4	4
C61-Prostate	2422	0	0	0	0	0	0	4	12	27	47	129	193	401	452	1157
C62-Testis	954	33	19	8	74	131	143	171	124	72	52	38	29	23	12	25
C63-Other and unspecified male genital organs	19	0	0	0	4	1	1	1	2	1	2	2	3	2	0	0
Total	**3418**	**33**	**19**	**8**	**78**	**132**	**144**	**176**	**138**	**102**	**102**	**173**	**226**	**433**	**468**	**1186**

Urinary tract (C64-C68)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C64-Kidney, except renal pelvis	1193	745	448	103	88	16	18	21	27	30	43	74	117	179	143	142	78	114
C65-Renal pelvis	103	66	37	5	5	0	3	1	4	4	7	6	9	11	17	13	6	12
C66-Ureter	13	8	5	0	1	0	0	0	0	1	2	0	1	0	0	3	1	4
C67-Bladder	2390	1846	544	0	0	1	3	10	22	42	89	99	168	289	256	435	340	636
C68-Other and unspecified urinary organs	42	30	12	0	1	0	0	0	1	0	2	2	1	1	6	4	10	14
Total	**3741**	**2695**	**1046**	**108**	**95**	**17**	**24**	**32**	**54**	**77**	**143**	**181**	**296**	**480**	**422**	**597**	**435**	**780**

Eye, brain and other parts of central nervous system (C69-C72)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C69-Eye and adnexa (Malignant)	795	462	333	135	97	24	13	22	19	24	39	37	39	52	53	81	49	111
C70-Meninges (malignant)	31	13	18	0	0	1	1	0	4	3	2	5	5	1	4	1	3	1
C71-Brain	3870	2480	1390	113	318	257	266	218	312	350	340	285	309	336	223	239	161	143
C72-Spinal Cord. Cranial and other parts of central nervous systems	278	171	107	20	28	9	25	15	24	17	16	13	26	35	14	9	11	16
Total	**4974**	**3126**	**1848**	**268**	**443**	**291**	**305**	**255**	**359**	**394**	**397**	**340**	**379**	**424**	**294**	**330**	**224**	**271**

Thyroid and other endocrine glands (C73-C75)

Code-Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C73-Thyroid glands	1761	544	1217	0	3	9	34	92	109	111	124	147	179	231	208	185	155	174
C74-Adrenal glands	109	36	73	0	0	1	6	1	13	14	3	30	5	4	1	25	1	5
C75-Other endocrine glands and related structures	128	81	47	0	0	10	8	12	18	19	12	22	6	6	4	6	2	3
Total	**1998**	**661**	**1337**	**0**	**3**	**20**	**48**	**105**	**140**	**144**	**139**	**199**	**190**	**241**	**213**	**216**	**158**	**182**

Ill-defined, secondary and unspecified sites (C76-C80)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C76-Other and ill-defined sites	1060	596	464	2	30	32	42	56	58	62	77	82	89	96	92	142	74	126
C77-Secondary and unspecified lymph nodes	203	123	80	0	0	5	11	15	13	8	27	22	22	20	19	16	12	13
C78-Secondary respiratory and digestive organs	48	39	9	0	0	0	1	3	2	2	3	0	0	10	4	5	6	12
C79-Secondary other sites	73	39	34	0	1	0	0	1	2	4	1	6	10	9	10	8	12	9
C80-Without Specification of sites	2134	908	1226	0	0	25	63	101	130	139	195	183	214	252	209	257	142	224
Total	**3518**	**1705**	**1813**	**2**	**31**	**62**	**117**	**176**	**205**	**215**	**303**	**293**	**335**	**387**	**334**	**428**	**246**	**384**

Lymphoid, hematopoietic & related tissue (C81-C96)

Malignant Neoplasm of	Total	Male	Female	Age (years)														
				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+
C81-Hodgkin's disease	2065	1389	676	32	247	264	266	167	161	135	133	109	107	115	97	90	81	61
C82-Follicular [nodular] non-Hodgkin's lymphoma	207	129	78	0	4	2	6	3	3	8	11	19	31	23	32	29	18	18
C83-Diffuse non-Hodgkin's lymphoma	2725	1754	971	6	58	66	112	114	145	121	160	191	247	327	292	311	222	353
C84-Peripheral and cutaneous T-cell lymphomas	55	33	22	0	2	1	4	9	2	2	4	7	7	7	3	4	3	0
C85-Other & unspecified types of non-Hodgkin's lymphoma	874	567	307	24	54	53	40	37	33	39	54	60	79	82	78	92	50	99
C88-Malignant immune-proliferative diseases	55	30	25	1	5	1	4	2	4	3	4	0	4	7	3	3	6	8
C90-Multiple Myeloma and malignant plasma cell Neoplasm	671	449	222	0	0	0	0	6	14	12	35	51	68	87	101	114	67	116
C91-Lymphoid leukemia	1496	996	500	153	252	210	192	96	64	48	45	41	48	79	59	70	56	83
C92-Myeloid leukemia	1029	609	420	32	66	87	101	81	89	88	87	82	61	82	47	42	39	45
C93-Monocytic leukemia	15	8	7	0	0	0	0	2	1	2	1	1	2	1	0	2	3	0
C94-Other leukemias of unspecified cell type	18	12	6	0	2	1	5	2	1	0	0	0	1	1	2	0	2	1
C95-Leukemia of unspecified cell type	622	423	199	18	54	56	72	56	44	56	45	34	38	39	33	31	21	25
C96-Other and unspecified Malignant neoplasm of lymphoid. Hematopoietic and related tissue	25	14	11	0	0	1	1	0	1	2	1	1	4	5	2	3	1	3
Total	**9857**	**6413**	**3444**	**266**	**744**	**742**	**803**	**575**	**562**	**516**	**580**	**596**	**697**	**855**	**749**	**791**	**569**	**812**

Independent (primary) multiple sites (C97)

Malignant Neoplasm	Total	Male	Female	Age (years)														
				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+
C97-Malignant Neoplasm of independent (primary) multiple sites	131	68	63	0	0	0	0	0	2	4	8	5	15	15	22	25	9	26

5 Regional distribution of various cancers

Code	Malignant Neoplasm of	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C00-C14	Lip, Oral Cavity and pharynx	104	3317	6818	967	777	113	90	17	391	**12594**
C15-C-26	Digestive organs	271	5216	4713	2191	1687	273	194	56	1493	**16094**
C30-C39	Respiratory and intrathoracic organs	106	2572	2538	637	387	97	86	11	193	**6627**
C40-C41	Bone and Articular cartilage	31	1070	513	329	79	35	37	6	87	**2187**
C43-C44	Melanoma and other of skin	25	848	681	349	391	43	43	7	219	**2606**
C45-C49	Mesothelial and soft tissue	19	756	404	276	323	19	22	9	201	**2029**
C50	Breast	536	13914	4816	1945	876	300	99	26	518	**23030**
C51-C58	Female genital organs	221	4681	2469	934	434	148	74	24	233	**9218**
C60-C63	Male genital organs	54	1728	756	491	193	46	35	8	107	**3418**
C64-C68	Urinary tract	62	1698	832	568	252	40	76	9	204	**3741**
C69-C72	Eye, Brain and Central nervous system	95	2140	987	857	340	86	97	21	351	**4974**
C73-C75	Thyroid and other Endocrine glands	25	975	640	211	45	39	17	7	39	**1998**
C76-C80	III-defined, secondary and unspecified sites	309	1535	657	775	29	77	50	20	66	**3518**
C81-C96	Lymphoid, haematopoietic and related tissue	97	4572	1869	1560	895	97	133	35	599	**9857**
C-97	Independent (primary) multiple sites	1	61	26	36	1	1	4	0	1	**131**
	Total	**1956**	**45083**	**28719**	**12126**	**6709**	**1414**	**1057**	**256**	**4702**	**102022**

Lip, oral cavity and pharynx (C00-C14)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C00	Lip	4	160	206	92	40	12	17	6	31	**568**
C01	Base of tongue	2	146	234	47	53	4	5	0	34	**525**
C02	Other and unspecified parts of tongue	16	461	980	36	25	3	5	0	2	**1528**
C03	Gum	12	192	281	41	45	5	2	2	2	**582**
C04	Floor of mouth	2	100	131	35	244	2	1	0	102	**617**
C05	Palate	5	71	206	9	9	2	0	2	3	**307**
C06	Other and unspecified parts of mouth	20	529	3197	165	81	20	4	5	25	**4046**
C07	Parotid gland	7	337	172	68	27	7	18	0	22	**658**
C08	Other and unspecified major salivary glands	2	130	69	18	6	0	2	0	2	**229**
C09	Tonsil	0	45	88	41	23	0	5	0	23	**225**
C10	Oropharynx	4	147	199	65	14	12	0	1	6	**448**
C11	Nasopharynx	16	363	283	119	108	23	22	1	75	**1010**
C12	Piriform sinus	0	11	35	15	0	3	0	0	0	**64**
C13	Hypopharynx	10	487	670	173	99	17	8	0	63	**1527**
C14	Other and ill-defined sites in the lip. oral cavity and pharynx	4	138	67	43	3	3	1	0	1	**260**
	Total	**104**	**3317**	**6818**	**967**	**777**	**113**	**90**	**17**	**391**	**12594**

Digestive organs (C15-C26)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C15	Oesophagus	46	608	1058	417	772	31	48	7	930	**3917**
C16	Stomach	31	423	372	358	233	54	34	18	221	**1744**
C17	Small intestine	3	102	45	28	21	2	0	0	3	**204**
C18	Colon	40	803	470	311	171	52	14	6	80	**1947**
C19	Rectosigmoid junction	10	153	74	41	16	22	3	6	4	**329**
C20	Rectum	37	735	545	257	133	42	31	5	83	**1868**
C21	Anus and anal canal	6	137	147	59	20	6	3	1	11	**390**
C22	Liver and intrahepatic bile ducts	54	1365	1513	371	193	28	34	2	80	**3640**
C23	Gallbladder	18	416	203	144	82	17	11	6	43	**940**
C24	Other and unspecified parts of biliary tract	0	35	30	10	0	3	0	3	0	**81**
C25	Pancreas	18	312	204	143	46	11	12	1	35	**782**
C26	Other and ill-defined digestive organs	8	127	52	52	0	5	4	1	3	**252**
	Total	**271**	**5216**	**4713**	**2191**	**1687**	**273**	**194**	**56**	**1493**	**16094**

Respiratory and intrathoracic organs (C30-C39)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C30	Nasal cavity and middle ear	6	113	109	72	13	4	25	1	38	**381**
C31	Accessory sinuses	4	113	80	12	9	2	2	0	0	**222**
C32	Larynx	22	765	772	117	76	36	7	3	42	**1840**
C33	Trachea	1	6	1	1	1	0	2	0	0	**12**
C34	Bronchus and lung	73	1498	1513	352	284	55	35	7	104	**3921**
C37	Thymus	0	19	7	4	2	0	0	0	0	**32**
C38	Heart. mediastinum and pleura	0	34	50	73	0	0	14	0	8	**179**
C39	Other and ill-defined sites in the respiratory system and intrathoracic organs	0	24	6	6	2	0	1	0	1	**40**
	Total	**106**	**2572**	**2538**	**637**	**387**	**97**	**86**	**11**	**193**	**6627**

Bone and articular cartilage (C40-C41)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C40	Bone and articular cartilage of limbs	27	597	321	126	60	18	20	4	65	1238
C41	Bone and articular cartilage of other and unspecified sites	4	473	192	203	19	17	17	2	22	949
	Total	**31**	**1070**	**513**	**329**	**79**	**35**	**37**	**6**	**87**	**2187**

Melanoma and other malignant neoplasm of skin (C43-C44)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C43	Malignant melanoma of skin	1	126	74	52	47	2	2	0	27	331
C44	Other malignant neoplasms of skin	24	722	607	297	344	41	41	7	192	2275
	Total	**25**	**848**	**681**	**349**	**391**	**43**	**43**	**7**	**219**	**2606**

Mesothelial and soft tissue (C45-C49)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C45	Mesothelioma	3	31	7	25	0	2	2	0	3	**73**
C46	Kaposis sarcoma	0	1	5	0	3	0	0	0	1	**10**
C47	Peripheral nerves and autonomic nervous system	0	21	4	6	2	1	0	0	0	**34**
C48	Retroperitoneum and peritoneum	0	86	22	22	4	0	2	2	11	**149**
C49	Other connective and soft tissue	16	617	366	223	314	16	18	7	186	**1763**
	Total	**19**	**756**	**404**	**276**	**323**	**19**	**22**	**9**	**201**	**2029**

Breast (C50)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C50	Breast (Malignant)	536	13914	4816	1945	876	300	99	26	518	**23030**

Female genital organs (C51-C58)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C51	Vulva	8	107	61	27	6	9	5	0	8	**231**
C52	Vagina	1	59	54	21	3	0	1	0	5	**144**
C53	Cervix uteri	41	1398	861	202	98	43	22	4	69	**2738**
C54	Corpus uteri	27	448	248	16	5	8	1	3	0	**756**
C55	Uterus. part unspecified	61	664	225	160	42	34	4	3	28	**1221**
C56	Ovary (Malignant)	81	1922	787	487	277	50	40	14	123	**3781**
C57	Other and unspecified female genital organs	2	47	34	16	1	2	1	0	0	**103**
C58	Placenta	0	36	199	5	2	2	0	0	0	**244**
	Total	**221**	**4681**	**2469**	**934**	**434**	**148**	**74**	**24**	**233**	**9218**

Male genital organs (C60-C63)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C60	Penis	0	5	11	2	4	1	0	0	0	**23**
C61	Prostate	41	1319	448	398	109	32	23	1	51	**2422**
C62	Testis	13	394	292	91	80	13	10	5	56	**954**
C63	Other and unspecified male genital organs	0	10	5	0	0	0	2	2	0	**19**
	Total	**54**	**1728**	**756**	**491**	**193**	**46**	**35**	**8**	**107**	**3418**

Urinary tract (C64-C68)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C64	Kidney. except renal pelvis	29	470	236	229	93	12	22	6	96	**1193**
C65	Renal pelvis	2	41	18	28	1	1	4	0	8	**103**
C66	Ureter	0	3	0	5	1	0	1	1	2	**13**
C67	Bladder	31	1058	540	196	157	27	21	2	98	**2130**
C68	Other and unspecified urinary organs	0	126	38	110	0	0	28	0	0	**302**
	Total	**62**	**1698**	**832**	**568**	**252**	**40**	**76**	**9**	**204**	**3741**

Eye, brain and other parts of central nervous system (C69-C72)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C69	Eye and adnexa (Malignant)	12	221	228	130	104	6	18	3	73	**795**
C70	Meninges (Malignant)	0	13	0	9	0	0	4	0	5	**31**
C71	Brain	75	1755	697	685	232	74	71	16	265	**3870**
C72	Spinal cord. cranial nerves and other parts of central nervous system	8	151	62	33	4	6	4	2	8	**278**
	Total	**95**	**2140**	**987**	**857**	**340**	**86**	**97**	**21**	**351**	**4974**

Thyroid and other endocrine glands (C73-C75)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C73	Thyroid gland (Malignant)	17	881	564	180	45	30	12	7	25	**1761**
C74	Adrenal gland	8	26	35	26	0	4	0	0	10	**109**
C75	Other endocrine glands and related structures	0	68	41	5	0	5	5	0	4	**128**
	Total	**25**	**975**	**640**	**211**	**45**	**39**	**17**	**7**	**39**	**1998**

Ill-defined, secondary and unspecified sites (C76-C80)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C76	Other and ill-defined sites	11	440	328	207	11	15	25	6	17	**1060**
C77	Secondary and unspecified lymph nodes	0	28	124	31	3	0	4	0	13	**203**
C78	Secondary respiratory and digestive organs	3	20	13	10	0	0	2	0	0	**48**
C79	Secondary other sites	2	41	15	12	0	1	0	1	1	**73**
C80	Without specification of site	293	1006	177	515	15	61	19	13	35	**2134**
	Total	**309**	**1535**	**657**	**775**	**29**	**77**	**50**	**20**	**66**	**3518**

Lymphoid, hematopoietic & related tissue (C81-C96)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C81	Hodgkins disease	29	998	423	244	197	34	14	8	118	**2065**
C82	Follicular [nodular] non-Hodgkins lymphoma	7	131	34	24	8	2	0	0	1	**207**
C83	Diffuse non-Hodgkins lymphoma	40	1322	420	411	259	33	41	6	193	**2725**
C84	Peripheral and cutaneous T-cell lymphomas	0	29	11	11	2	0	0	2	0	**55**
C85	Other and unspecified types of non-Hodgkins lymphoma	0	331	430	34	46	11	0	11	11	**874**
C88	Malignant immunoproliferative diseases	0	31	14	8	1	1	0	0	0	**55**
C90	Multiple myeloma and malignant plasma cell neoplasms	10	379	64	147	39	2	9	2	19	**671**
C91	Lymphoid leukaemia	8	656	218	294	147	6	40	4	123	**1496**
C92	Myeloid leukaemia	0	379	140	213	180	4	12	2	99	**1029**
C93	Monocytic leukaemia	0	3	1	8	0	0	1	0	2	**15**
C94	Other leukaemias of specified cell type	0	9	5	4	0	0	0	0	0	**18**
C95	Leukaemia of unspecified cell type	2	289	105	159	16	4	15	0	32	**622**
C96	Other and unspecified malignant neoplasms of lymphoid. haematopoietic and related tissue	1	15	4	3	0	0	1	0	1	**25**
	Total	**97**	**4572**	**1869**	**1560**	**895**	**97**	**133**	**35**	**599**	**9857**

Independent (primary) multiple sites (C97)

Code	Description	Islamabad	Punjab	Sindh	KP	Balochistan	AJK	FATA	GB	Afghanistan	Total
C97	Malignant neoplasms of independent (primary) multiple sites	1	61	26	36	1	1	4	0	1	**131**

NM&O Division with Member (Science)

Left to right

Dr Shamaraz Firdous

Dr Muhammad Sohaib (Director, NM&O)

Dr Masood ul Hasan (Member, Science)

Mr Rizwan Rafi (Head, CHEM)

Dr Aisha Shafiq (Cancer Registrar)

Nuclear Medicine and Oncology (NM&O) Division was established on 26-07-2006. It works to streamline the communication between 18 Atomic Energy Cancer Hospitals (AECHs) and Headquarter regarding administrative and human resource related matters. It also serves to enhance coordination and liaison among 18 AECHs which are scattered throughout the country. It supervises up gradation of existing hospitals and establishment of new centers. A Centralized Hospital Equipment Management (CHEM) for maintenance of hospital equipment is also working under this Division to take care of equipment related matters.

Cancer registry is one of the main tasks of NM&O Division. It has been working to emphasize and implement proper documentation and data entry of cancer patients at AECHs. This is the first compilation of Pakistan Atomic Energy Cancer Registry (PAECR) including cancer patients registered in 18 cancer hospitals during the year 2015 to 2017. We hope that this hospital based cancer registry will facilitate to compile population based cancer registries in Pakistan.