

ANNUAL CANCER REGISTRY REPORT-2012

CANCER STATISTICS

Distribution of neoplasms

Of a total of 5,144 new neoplasms diagnosed or treated at the Hospital from January 01, 2012 to December 31, 2012, 2,492 were seen in male (48.44%) and 2,652 (51.56%) in female patients. Four thousand, six hundred and thirty six (4,636 ((90.07%)) neoplasms were found in adults, whereas, 508 (9.93%) were seen in children. Children were classified as those 18 years or less in age and adults as more than 18 years of age. Table 1 shows the stratification of cases by behavior and age-group.

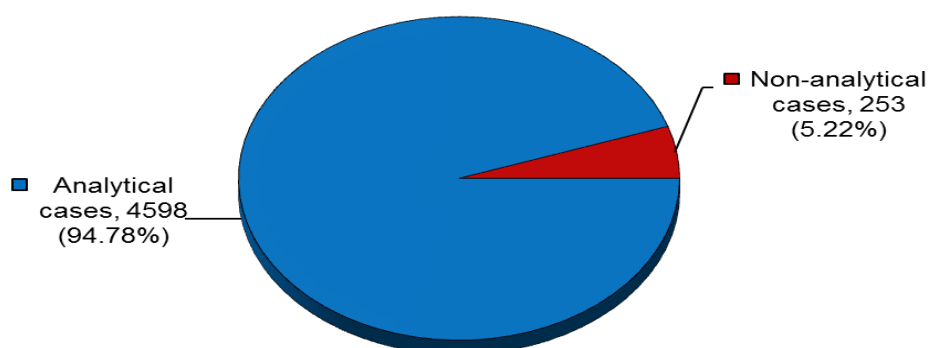
Table 1. Distribution of neoplasms by behavior and age-group.

| Behavior | Age Group | Registered patients (5,080) | Reported neoplasm* (5144) |
|--|------------------|------------------------------------|----------------------------------|
| Malignant[†] | Adults | 4,305 | 4,357 |
| | Pediatrics | 491 | 494 |
| | Total | 4,796 | 4,851 |
| Benign[‡] & Uncertain Behavior | Adults | 270 | 279 |
| | Pediatrics | 14 | 14 |
| | Total | 284 | 293 |

Class of Case

Of a total of 4,851 malignant cases registered at the Hospital from January 2012 to December 2012, 4,598 (94.78%) were analytical cases and 253 (5.22%) were found to be non-analytical. Figure 1 shows the stratification of analytical and non-analytical cases[§].

Fig. 1. Stratification of analytical and non-analytical cases



Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

* The difference in the number of registered patients and reported neoplasms is attributed to multiple malignancies and benign neoplasms diagnosed in 55 and 9 patients respectively. Also 65 patients have both malignant and benign neoplasm simultaneously.

† Cases with behavior code /3 and /2 are considered as malignant cases.

‡ Cases with behavior code /0 and /1 are considered as benign and uncertain, respectively.

§ Class of case 0 to 2 and 3 to 9 are considered analytical cases and non-analytical cases respectively according to the Facility Oncology Revised Data Standards (FORDS) Revised for 2004.

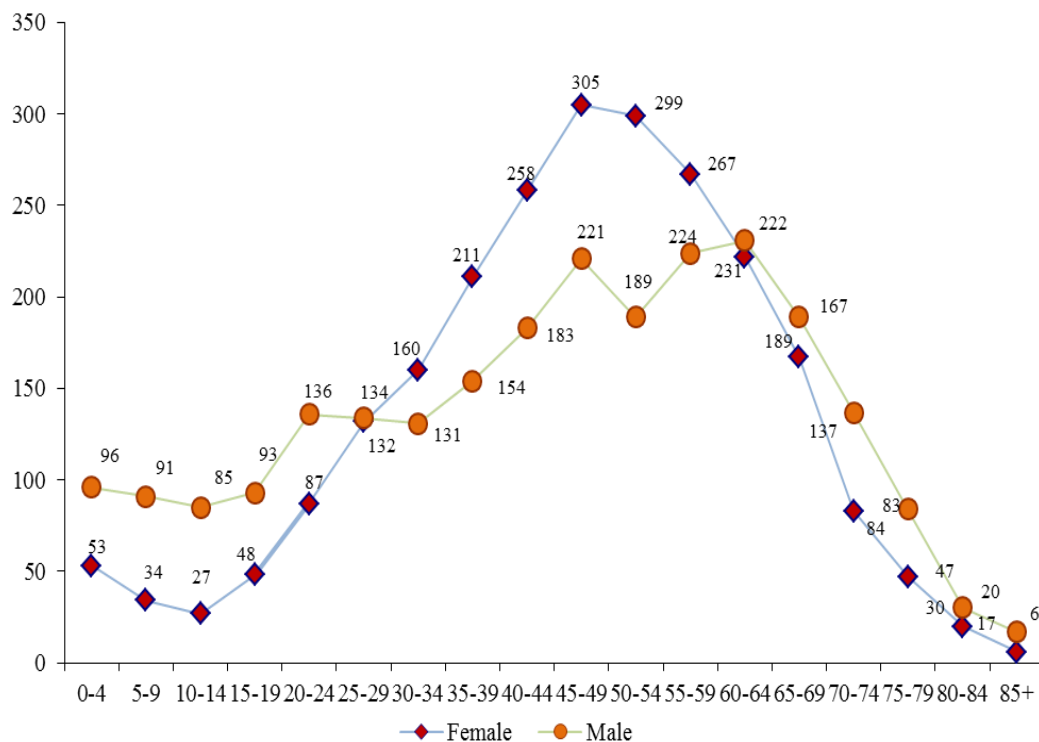
Distribution of malignancies

In the year 2012, 4,851 malignant cases were diagnosed at the Hospital with 2,426 seen amongst females and 2,425 amongst males. Table 2 displays the distributions of female and male patients according to age-groups and gender.

Table 2. Distribution of cancer cases by sex and age-group

| Age range | Female | Male | Total |
|--------------|-------------|-------------|-------------|
| 0-4 | 53 | 96 | 149 |
| 5-9 | 34 | 91 | 125 |
| 10-14 | 27 | 85 | 112 |
| 15-19 | 48 | 93 | 141 |
| 20-24 | 87 | 136 | 223 |
| 25-29 | 132 | 134 | 266 |
| 30-34 | 160 | 131 | 291 |
| 35-39 | 211 | 154 | 365 |
| 40-44 | 258 | 183 | 441 |
| 45-49 | 305 | 221 | 526 |
| 50-54 | 299 | 189 | 488 |
| 55-59 | 267 | 224 | 491 |
| 60-64 | 222 | 231 | 453 |
| 65-69 | 167 | 189 | 356 |
| 70-74 | 83 | 137 | 220 |
| 75-79 | 47 | 84 | 131 |
| 80-84 | 20 | 30 | 50 |
| 85+ | 6 | 17 | 23 |
| Total | 2426 | 2425 | 4851 |

Fig. 2. Distribution of malignancies by age-groups and sex



Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

Demographics

Of the 4,851 patients diagnosed with malignant cancers, nearly 64.42% (3,125) belonged to the province of Punjab and approximately 19.48% (945) to the Khyber Pakhtoonkhwa (Table 3). The fact that the geographic area of residence of a vast majority of patients was Punjab can be explained in light of the information that the Hospital is situated in the provincial capital of Punjab and that, this province accounts for almost 60% of the total population of the country.

Table 3. Province-wise distribution of patients

| Province/Region | Malignancies | Percentage |
|--------------------------------|--------------|---------------|
| Punjab | 3,125 | 64.42 |
| Khyber Pakhtoonkhwa[1] | 945 | 19.48 |
| Sindh | 264 | 5.44 |
| F.A.T.A | 127 | 2.62 |
| Balochistan | 78 | 1.61 |
| Federal Capital | 46 | 0.95 |
| Azad Jammu & Kashmir | 42 | 0.87 |
| Afghanistan & others countries | 224 | 4.61 |
| Total | 4,851 | 100.00 |

[1] Khyber Pakhtoonkhwa formerly known as N.W.F.P

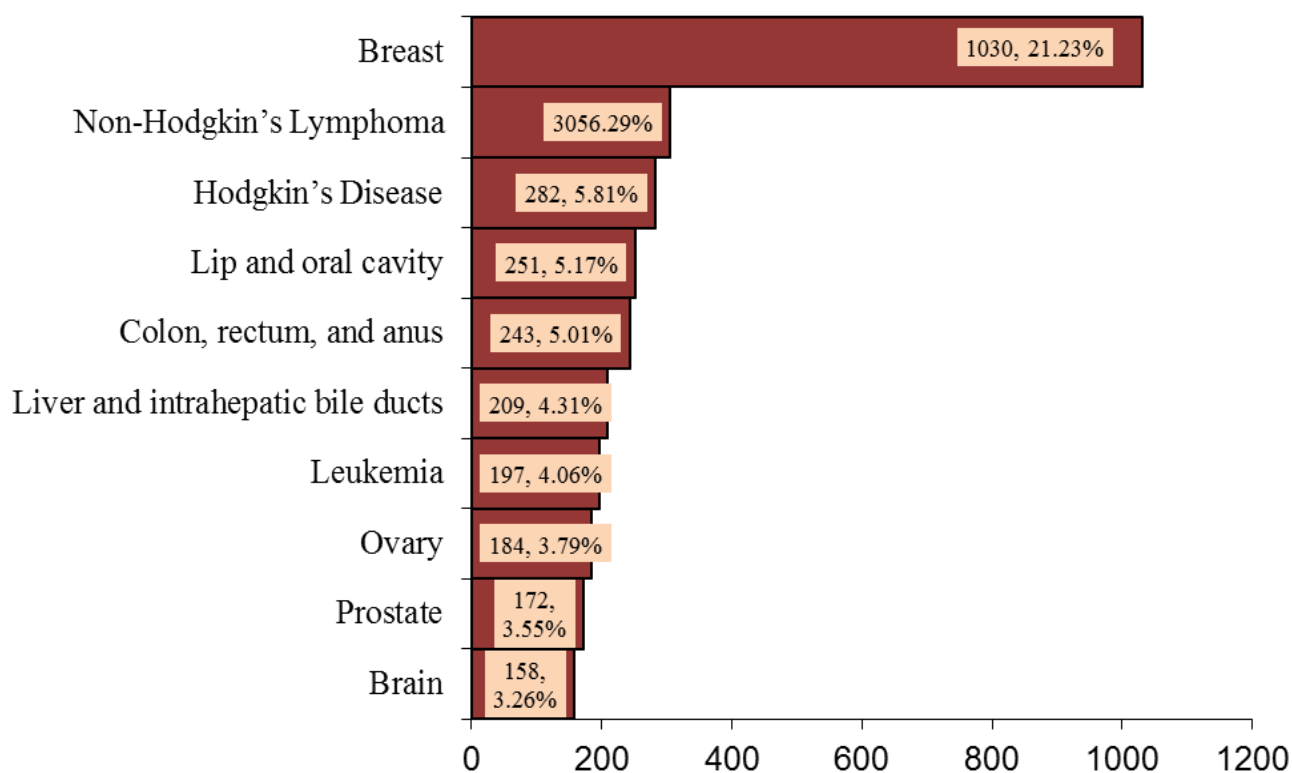
Top Ten Cancers

Tables 4 to 8 show the list of the ten commonest malignancies seen at SKMCH & RC during the year 2012. Breast cancer was the leading malignancy with 1030 cases accessioned into the Registry. Non-Hodgkin's Lymphoma and Hodgkin's Disease were the second and third most frequently seen cancers, respectively.

Table 4. Top 10 malignancies seen amongst all age-groups & both sexes combined, from Jan. 2012 to Dec. 2012.

| Sr. No. | ICD-O-3 Category | Count | Percentage | ICD-O-3 Code |
|---------|-----------------------------------|-------|------------|--------------------|
| 1 | Breast | 1030 | 21.23 | C50.0 - C50.9 |
| 2 | Non-Hodgkin's Lymphoma | 305 | 6.29 | M9590-91, M967-972 |
| 3 | Hodgkin's Disease | 282 | 5.81 | M9650 - M9667 |
| 4 | Lip and oral cavity | 251 | 5.17 | C00.0 - C08.9 |
| 5 | Colon, rectum, and anus | 243 | 5.01 | C18.0 - C21.8 |
| 6 | Liver and intrahepatic bile ducts | 209 | 4.31 | C22.0 – C22.1 |
| 7 | Leukemia | 197 | 4.06 | M9800 - M9948 |
| 8 | Ovary | 184 | 3.79 | C56.9 |
| 9 | Prostate | 172 | 3.55 | C61.9 |
| 10 | Brain | 158 | 3.26 | C71.0 – C71.9 |

Fig. 3. Top 10 malignancies seen amongst all age-groups & both sexes combined, from Jan. 2012 to Dec. 2012.



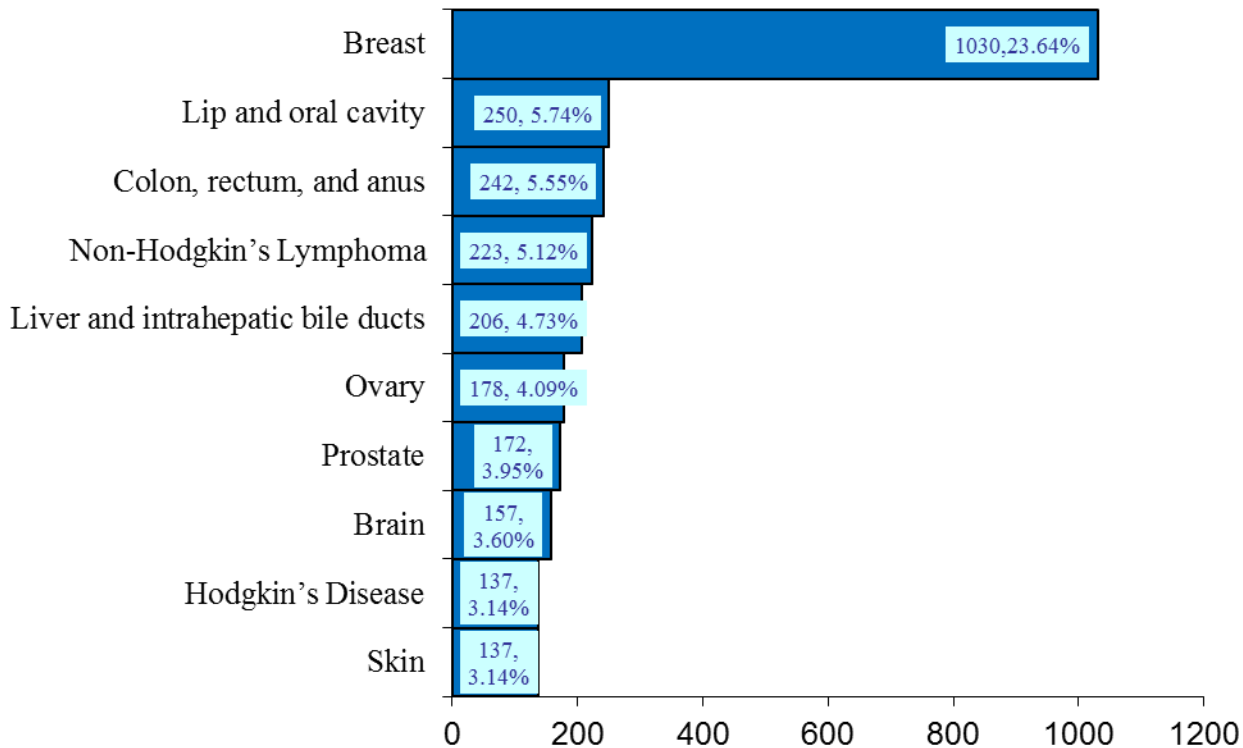
Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

Amongst adults, during the year 2012, a total of 4,357 malignancies were diagnosed or treated at the Hospital. Breast cancer, lip & oral cavity and, liver & intra-hepatic bile ducts were registered as the most frequently seen cancers.

Table 5. Top 10 malignancies seen amongst adults (> 18 years), from Jan. 2012 to Dec. 2012.

| Sr. No. | ICD-O-3 Category | Count | Percentage | ICD-O-3 Code |
|---------|-----------------------------------|-------|------------|--------------------|
| 1 | Breast | 1030 | 23.64 | C50 - C50.9 |
| 2 | Lip and oral cavity | 250 | 5.74 | C00.0 - C08.9 |
| 3 | Colon, rectum, and anus | 242 | 5.55 | C18.0 – C21.8 |
| 4 | Non-Hodgkin’s Lymphoma | 223 | 5.12 | M9590-91, M967-972 |
| 5 | Liver and intrahepatic bile ducts | 206 | 4.73 | C22.0 – C22.1 |
| 6 | Ovary | 178 | 4.09 | C56.9 |
| 7 | Prostate | 172 | 3.95 | C61.9 |
| 8 | Brain | 157 | 3.60 | C71.0 – C71.9 |
| 9 | Hodgkin’s Disease | 137 | 3.14 | M9650 - M9667 |
| 10 | Skin | 137 | 3.14 | C44.0 – C44.9 |

Fig. 4. Top 10 malignancies seen amongst adults (> 18 years), from Jan. 2012 to Dec. 2012.



Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

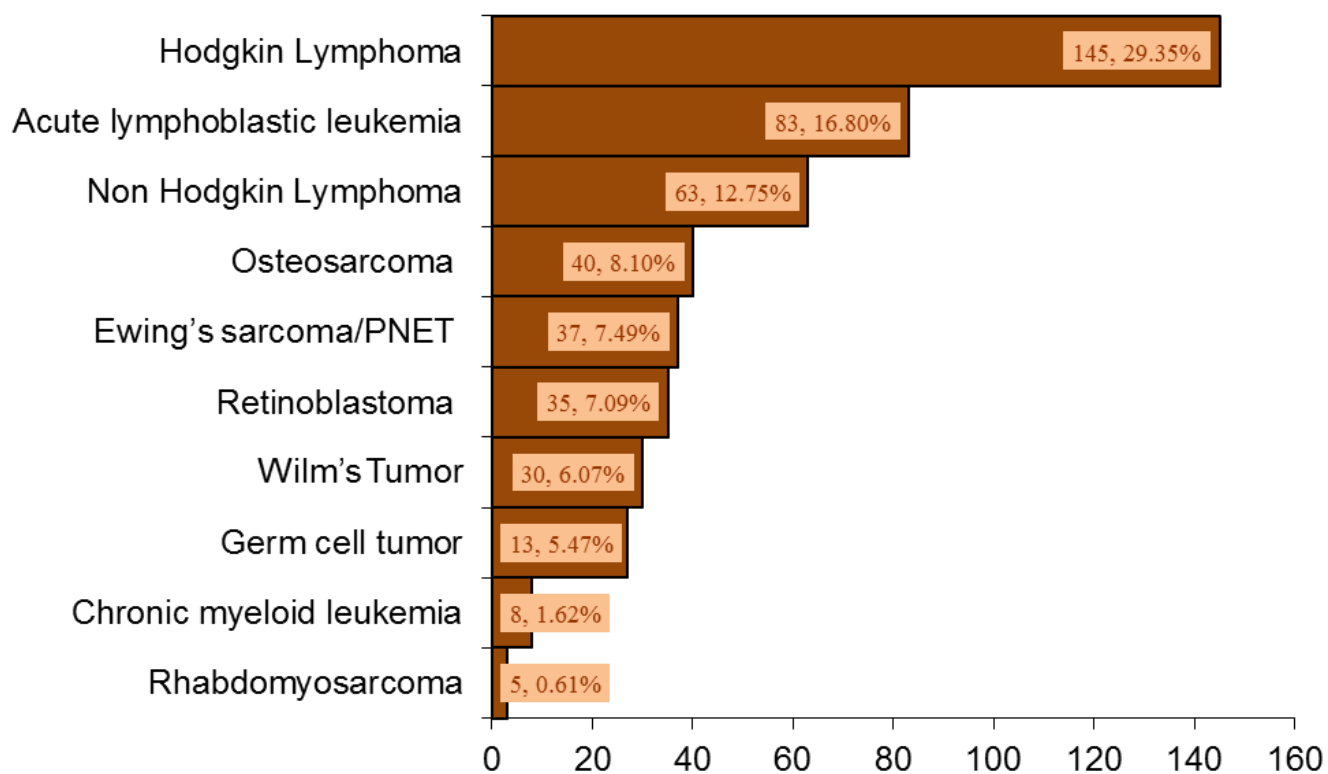
In children, using the classification based on tumor morphology, Hodgkin lymphoma, Acute lymphoblastic leukemia, and Non-Hodgkin Lymphoma were identified as the three most common malignancies

diagnosed or treated at SKMCH & RC. Table 6 shows the distributions of the top ten malignancies seen in children at SKMCH & RC.

Table 6. Top 10 malignancies seen in children (<= 18 years), from Jan. 2012 to Dec. 2012.

| Sr. No. | ICD-O-3 Category | Count | Percentage | ICD-O-3 Morphology Code |
|---------|------------------------------|-------|------------|-------------------------|
| 1 | Hodgkin Lymphoma | 145 | 29.35 | M9650 - M9667 |
| 2 | Acute lymphoblastic leukemia | 83 | 16.80 | M982- M983 |
| 3 | Non Hodgkin Lymphoma | 63 | 12.75 | M9590, 91- M967-972 |
| 4 | Osteosarcoma | 40 | 8.10 | M9180 - M9195 |
| 5 | Ewing's sarcoma/PNET | 37 | 7.49 | M9260 |
| 6 | Retinoblastoma | 35 | 7.09 | M9510-M9512 |
| 7 | Wilm's Tumor | 30 | 6.07 | M8960 |
| 8 | Germ cell tumor | 27 | 5.47 | M906 - M909 |
| 9 | Chronic myeloid leukemia | 8 | 1.62 | M9863 |
| 10 | Rhabdomyosarcoma | 3 | 0.61 | M890 – M892 |

Fig. 5. Top 10 malignancies seen in children (<= 18 years), from Jan. 2012 to Dec. 2012.



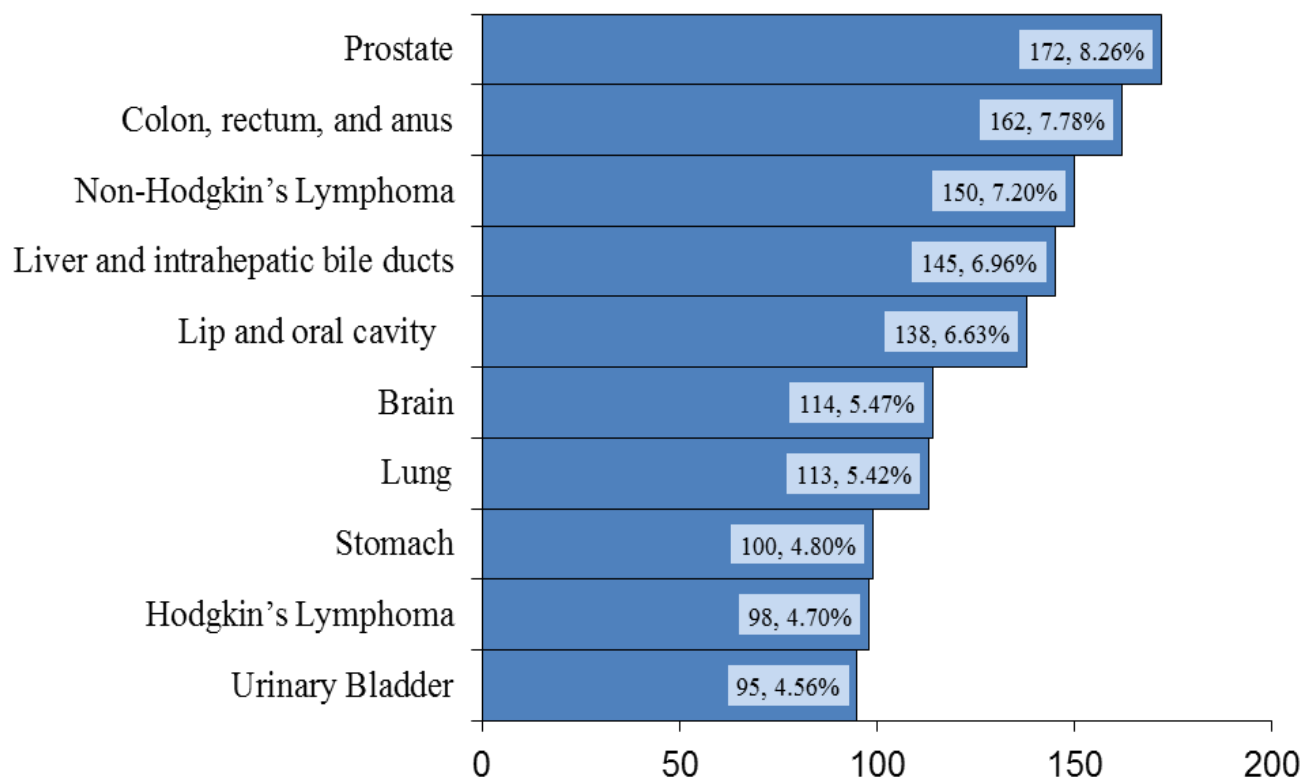
Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

In adult males, the commonest malignancies were Prostate cancer, Colorectal and Non-Hodgkin's Lymphoma (Table 7).

Table 7. Top 10 malignancies seen amongst adult males, from Jan. 2012 to Dec. 2012.

| Sr.No. | ICD Category | Count | Percentage | ICD-O-3 Code |
|--------|-----------------------------------|-------|------------|--------------------|
| 1 | Prostate | 172 | 8.26 | C61.9 |
| 2 | Colon, rectum, and anus | 162 | 7.78 | C18 - C21.8 |
| 3 | Non-Hodgkin's Lymphoma | 150 | 7.20 | M9590, 91-M967-972 |
| 4 | Liver and intrahepatic bile ducts | 145 | 6.96 | C22.0 – C22.1 |
| 5 | Lip and oral cavity | 138 | 6.63 | C00.0 – C08.9 |
| 6 | Brain | 114 | 5.47 | C71.0-C71.9 |
| 7 | Lung | 113 | 5.42 | C34.0 – C34.9 |
| 8 | Stomach | 100 | 4.80 | C16.1 – C16.9 |
| 9 | Hodgkin's Lymphoma | 98 | 4.70 | M9650 - M9667 |
| 10 | Urinary Bladder | 95 | 4.56 | C67.0-C67.9 |

Fig. 6. Top 10 malignancies seen amongst adult males, from Jan. 2012 to Dec. 2012.



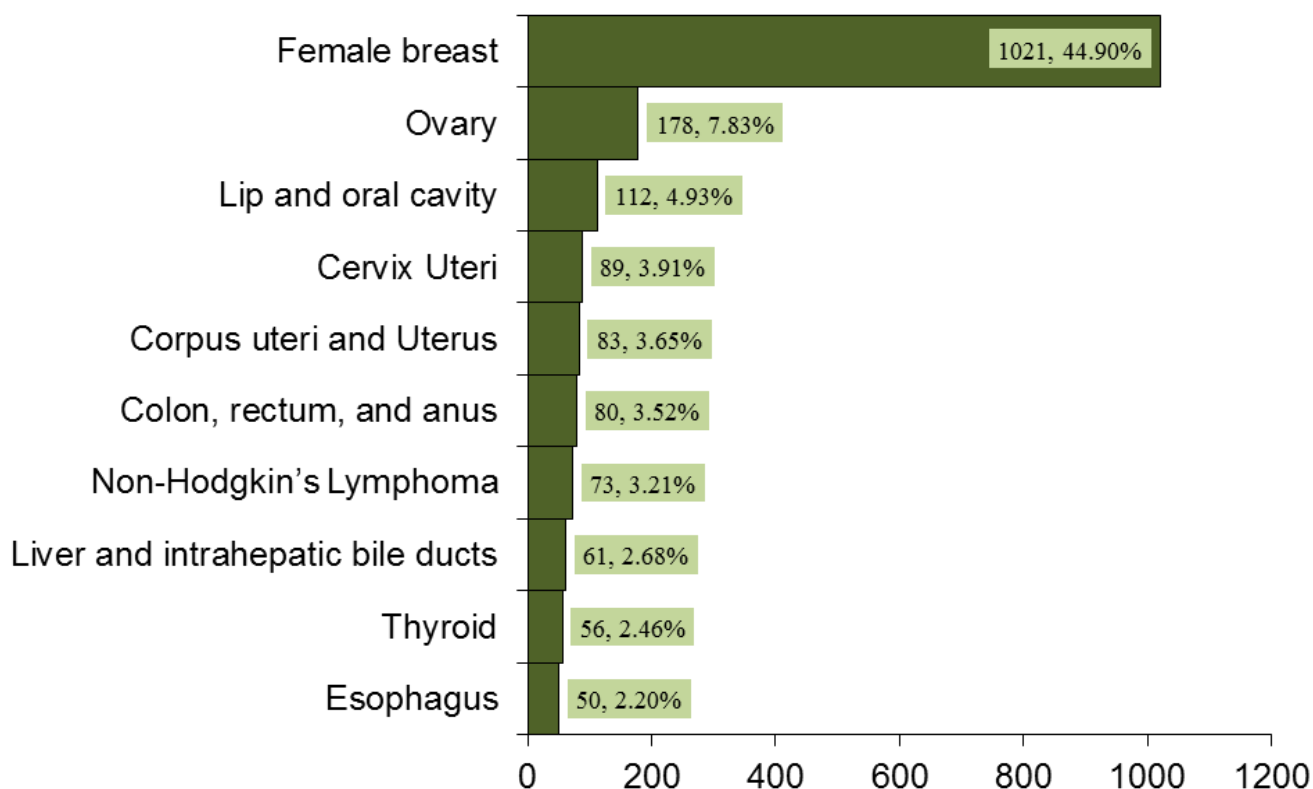
Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

The most frequent diagnosis in adult women was breast cancer accounting for 44.60% of the total cancers in females. Ovary was ranked as the second highest cancer accounting for 5.88% and, Lip and oral cavity as the third most common malignancy with 4.50% of the total malignancies in females.

Table 8. Top 10 malignancies seen amongst adult females, from Jan. 2012 to Dec. 2012.

| Sr. No. | ICD Category | Count | Percentage | ICD-O 3 Code |
|---------|-----------------------------------|-------|------------|--------------------|
| 1 | Female breast | 1021 | 44.90 | C50.0 - C50.9 |
| 2 | Ovary | 178 | 7.83 | C56.9 |
| 3 | Lip and oral cavity | 112 | 4.93 | C00.0 – C08.9 |
| 4 | Cervix Uteri | 89 | 3.91 | C53.0 - C53.9 |
| 5 | Corpus uteri and Uterus | 83 | 3.65 | C54.0 – C54.9 |
| 6 | Colon, rectum, and anus | 80 | 3.52 | C18 - C21.8 |
| 7 | Non-Hodgkin’s Lymphoma | 73 | 3.21 | M9590, 91-M967-972 |
| 8 | Liver and intrahepatic bile ducts | 61 | 2.68 | C22.0 – C22.1 |
| 9 | Thyroid | 56 | 2.46 | C73.9 |
| 10 | Esophagus | 50 | 2.20 | C15.0 – C15.9 |

Fig. 7. Top 10 malignancies seen amongst adult females, from Jan. 2012 to Dec. 2012.



Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

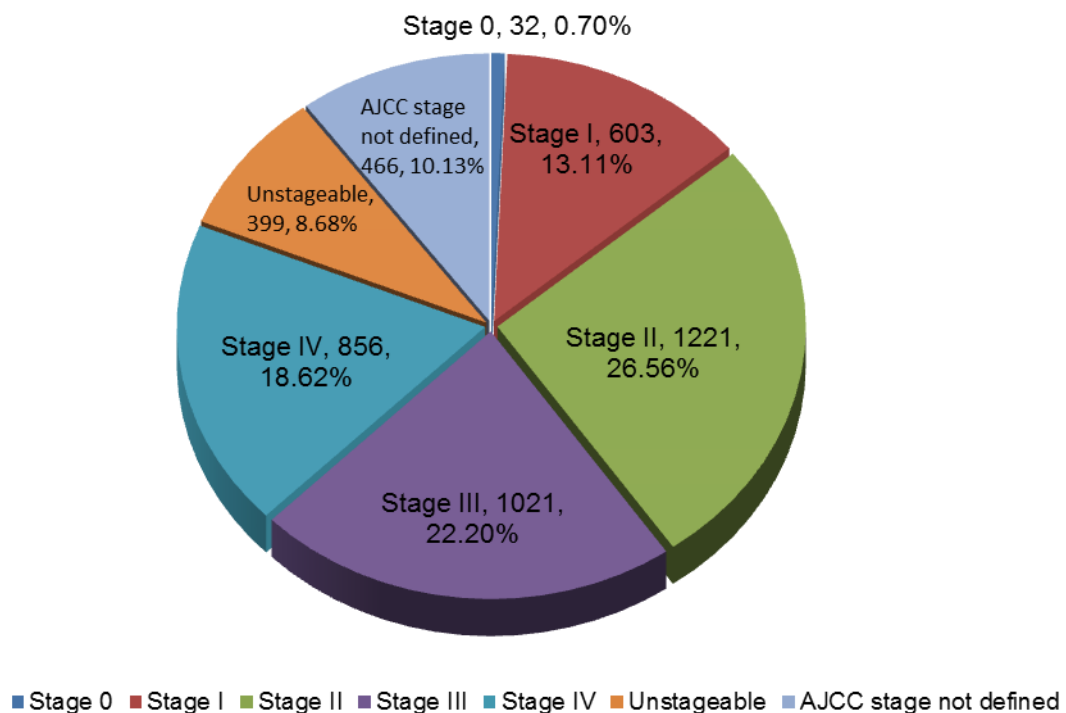
Staging

The Registry uses the American Joint Commission on Cancer TNM staging system for all analytical cancer cases. TNM categorizes cancers in stages 0, 1, 2, 3, 4, unstageable, and not applicable on all analytical cases (Class of case 0, 1, 2). Cancers are classified as being unstageable as the patients may choose not to receive any treatment or undergo further tests at the Hospital needed to establish an appropriate stage. “Not applicable” means non-availability of AJCC staging for that site. During the year 2012, cancer staging for 4,598 analytical cases (class of case 0, 1, 2) showed that 32 (0.70%) cases fell into 0 or in-situ category, 603 (13.11%) in stage I, 1,221 (26.56%) in stage II, 1021 (22.21%) cases in stage III, and 856 (18.62%) in stage IV, (table 9); 399 (8.68%) cases were Unstageable and 466 (10.13%) had no AJCC stage defined for that site.

Table 9. TNM Stage of cancer patients at SKMCH & RC during year 2012.

| AJCC Stage | No. of Patients | Percentage |
|------------------------|-----------------|---------------|
| Stage 0 | 32 | 0.70 |
| Stage I | 603 | 13.11 |
| Stage II | 1221 | 26.56 |
| Stage III | 1021 | 22.20 |
| Stage IV | 856 | 18.62 |
| Unstageable | 399 | 8.68 |
| AJCC stage not defined | 466 | 10.13 |
| Total | 4598 | 100.00 |

Fig. 8. TNM stage of cancer patients at SKMCH & RC during year 2012.



Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

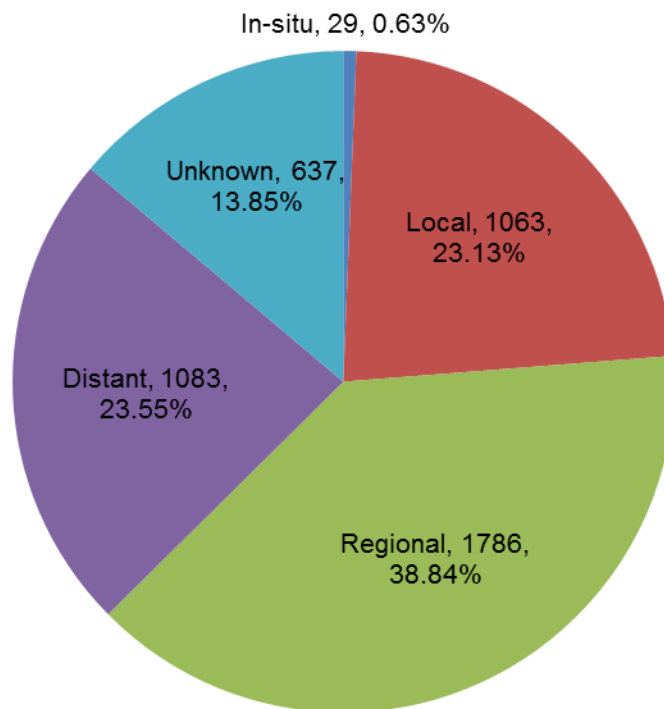
Summary Stage

The SEER Summary Staging Manual-2000 Codes and Coding Instructions were used to describe how far the tumor had spread from the organ or the site of origin. This manual consists of a one digit hierarchical code for each and every site. All analytical cases (Class of case 0, 1, 2) were included to generate results. The cancer data for the year 2012 reflects that there were 0.63% in situ cases, 23.12% localized cancers, 38.84% regional cases, 23.55% distant, and there were 13.85% cases in which the summary stage was unknown.

Table 10. Classification according to the SEER summary stage during the year 2012.

| SEER Summary Stage | No. of Patients | Percentage |
|---------------------------|------------------------|-------------------|
| In-situ | 29 | 0.63 |
| Local | 1063 | 23.13 |
| Regional | 1786 | 38.84 |
| Distant | 1083 | 23.55 |
| Unknown | 637 | 13.85 |
| Total | 4598 | 100.00 |

Fig. 9: Classification according to the SEER summary stage during the year 2012.



Data Source: Cancer Registry & Clinical Data Management, SKMCH & RC

Grading

International Classification of Diseases for Oncology, Third Edition (ICDO-3) codes and guidelines being used to categorize grades for solid malignancies. All analytical cases (Class of case 0, 1, 2) were included to generate results.

Table 11. Grade of patients during year 2012.

| Grade / Differentiation | Count | Percentage |
|--------------------------------|--------------|-------------------|
| Grade I | 312 | 6.78 |
| Grade II | 1174 | 25.53 |
| Grade III | 1063 | 23.12 |
| Grade IV | 68 | 1.48 |
| Grade not determined | 1680 | 36.54 |
| Not applicable | 301 | 6.55 |
| Total | 4598 | 100.00 |

SUPPLEMENTAL INFORMATION

Table 12 depicts the result stratified by primary sites, age-groups, and gender. According to this, cancers of the breast, oral cavity and colorectal, are the commonest systems/site(s) for malignancies seen at the Hospital.