



مستشفى الملك فيصل التخصصي ومركز الأبحاث  
King Faisal Specialist Hospital & Research Centre  
Gen. Org. مؤسسة عامة

**Oncology Centre  
Research Unit**

# TUMOR REGISTRY

## Annual Report

# 2013





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مؤسسة عامة. Gen. Org.

Oncology Centre  
Research Unit

# TUMOR REGISTRY ANNUAL REPORT 2013

2013 Tumor Registry Annual Report

Annual Report Prepared by the Staff of the Tumor Registry  
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## INTRODUCTION

On behalf of the KFSH&RC Oncology Centre, we are pleased to present the 2013 Annual Tumor Registry Report. During 2013, the Tumor Registry abstracted 2,691 new cancer cases; 2,425 were analytic and 266 were non analytic. The highest incidence of cancer among males by site was Leukemia, Colorectal, and NHL and among females was carcinoma of Breast, Thyroid, and Leukemia. This year's retrospective outcome study is focused on 2,643 Liver cancer cases treated at the Oncology Center since 1978. The Tumor Registry database includes over 80,000 cases and reports to the Saudi Cancer Registry (SCR).

KFSH&RC enjoys the recognition of being the most advanced cancer facility in the MENA region. Established with a mission of providing excellent cancer treatment, education and research, the Oncology Centre evolved over the years towards its vision of becoming one of the best international center for cancer research, prevention, and treatment. Accredited by the World Health Organization (WHO) as a Collaborating Centre for Cancer Prevention and Control, cancer patients are assessed in multidisciplinary approach and treated with most advanced modalities. Our oncologists continue to optimize the cancer care through actively pursuing local, national, and international research protocols with the invaluable support of Oncology Research Unit (ORU), which also serves as the hospital hub for cancer and bone marrow transplantation registries. Major achievements for the last year include fully operational Intra-Operative Radiation Therapy (IORT), Tomotherapy, Cyberknife and operational Brachytherapy Suite for HDR imaging. Radiation Oncology has also introduced Deep Inspiration Breath Hold (DIBH) cardiac sparing technique to treat left-sided breast cancers and Gold plaque Iodine<sup>125</sup> brachytherapy for ophthalmic tumors. Society of Clinical Research Associates (SOCRA) Saudi Arabia chapter was established to meet the educational and training needs of clinical research professionals of the entire MENA region: First SOCRA Certification exam was conducted in KFSH&RC in Sept 2014.

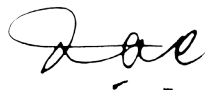
Oncology Centre continues to provide evidence based comprehensive cancer care by multidisciplinary approach. Our center offers latest advances in radiation therapy, chemotherapy, hematopoietic stem cell transplantation and palliative care. We continue to serve as the center of excellence in clinical research by advancing innovative cancer treatments and providing most promising treatment options for cancer patients. We have maintained our international cooperative group affiliations as member of Southwest Oncology Group (SWOG), NRG Oncology, Canadian Blood & Marrow Transplantation Group (CBMTG), Center for International Blood and Marrow Transplant Research (CIBMTR) and European Group for Blood and Marrow Transplantation (EBMT). KFSH&RC has spearheaded the local and regional research consortiums as well, notably, Gulf Oncology Regional Group (GORG) and Eastern Mediterranean Blood and Marrow Transplantation (EMBMT) Group.

We gratefully acknowledge the work and support of our dedicated physicians, nurses, hospital staff and the Department of Medical Records. Special gratitude to the Tumor Registry staff for their tireless effort, commitment and invaluable assistance. It is only through this continued caring, dedication and team work that KFSH&RC will continue to provide world class cancer care and the most remarkable patient experience in every dimension, every time.

This report can also be accessed online via Oncology Centre's website at <http://www.kfshrc.edu.sa>. Your comments and suggestions are welcome to improve our future reports and can be sent to [chaudhri@kfshrc.edu.sa](mailto:chaudhri@kfshrc.edu.sa).



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## I. KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTRE TUMOR REGISTRY

The Research Unit encompasses Tumor Registry & Clinical Research sections. The King Faisal Specialist Hospital and Research Centre (KFSH&RC) opened in June 1975 to provide specialized medical treatment to the people of Saudi Arabia and to promote the prevention of disease through research and education. It is a national and international tertiary care hospital for Oncology and the principal center for cancer therapy in Saudi Arabia.

The mission of the Tumor Registry, a hospital-wide data system, is to describe the burden of cancer in KFSH&RC by collecting complete and high quality cancer data and compiling timely statistics so that data-driven, evidence-based cancer prevention and control programs can be implemented to reduce cancer morbidity and mortality.

The Registry was established to meet one of the requirements for an Approved Cancer Program of the American College of Surgeons (ACoS). The database now includes 78,045 malignant cases seen at KFSH&RC from June 1975 through December 31, 2013, as well as cases seen at the Children's Cancer Centre since its opening in March 1997.

The Registry is primarily staffed with certified tumor registrars who support the database in case ascertainment, abstracting, follow up and statistical analyses. The basic source document is the patient's medical record from which pertinent information is abstracted for use in the Registry. The electronic data system used was the Cansur 3.0 designed by the ACoS, for cases seen from 1975 to 2007. Starting with 2008 cases, the software being used is CNExT, developed by C/NET Solutions which is part of the U.S. Public Health Institute.

The data maintained in the Tumor Registry provides the statistics for the publication of the KFSH&RC Annual Report which summarizes the hospital's cancer experience. The data also supports a wide variety of reports at the request of physicians, researchers and ancillary personnel. These reports support patient management and outcome, basic and clinical research investigations, educational publications and presentations, and resource utilization. In 2013, the Tumor Registry supported myriad of data requests (see Appendix for a listing of requests for Tumor Registry data). It also identified and reported to the Saudi Cancer Registry 2,691 new cases seen in 2013.

## II. ACKNOWLEDGEMENTS

The cancer program is a combined effort of the extraordinary team of professionals at the King Faisal Specialist Hospital and Research Centre. It is not possible to enumerate all those involved in providing hope and healing to cancer patients and their families. The Tumor Registry staff greatly appreciates the tireless efforts of all the caring professionals from all disciplines for their dedication, commitment and collaboration to ensure highest standards in community outreach, clinical trials, staff education, patient care improvement, outcome analysis and tumor registry quality.

The clinical expertise and proficiency demonstrated by our team, coupled with an incredible dedication to patient care and service excellence, allows the Oncology Centre to achieve remarkable outcomes and to consistently exceed the needs and expectations of patients and their families.

The information in this report includes cancer incidence, site, and extent of disease at diagnosis, treatment, cancer trends, and outcomes to better understand the changing patterns of cancer.

The following departments have assisted throughout the year and without their support this report would not have been possible. The Tumor Registry staff takes pride in acknowledging these departments:

- Department of Pathology and Laboratory Medicine
- Medical Records Services
- Information Technology Affairs
- Department of Pediatric Hematology/Oncology
- Central Data Unit, Dept of Ped Hem/Onc
- Saudi Cancer Registry
- Home Health Care
- Oncology Centre

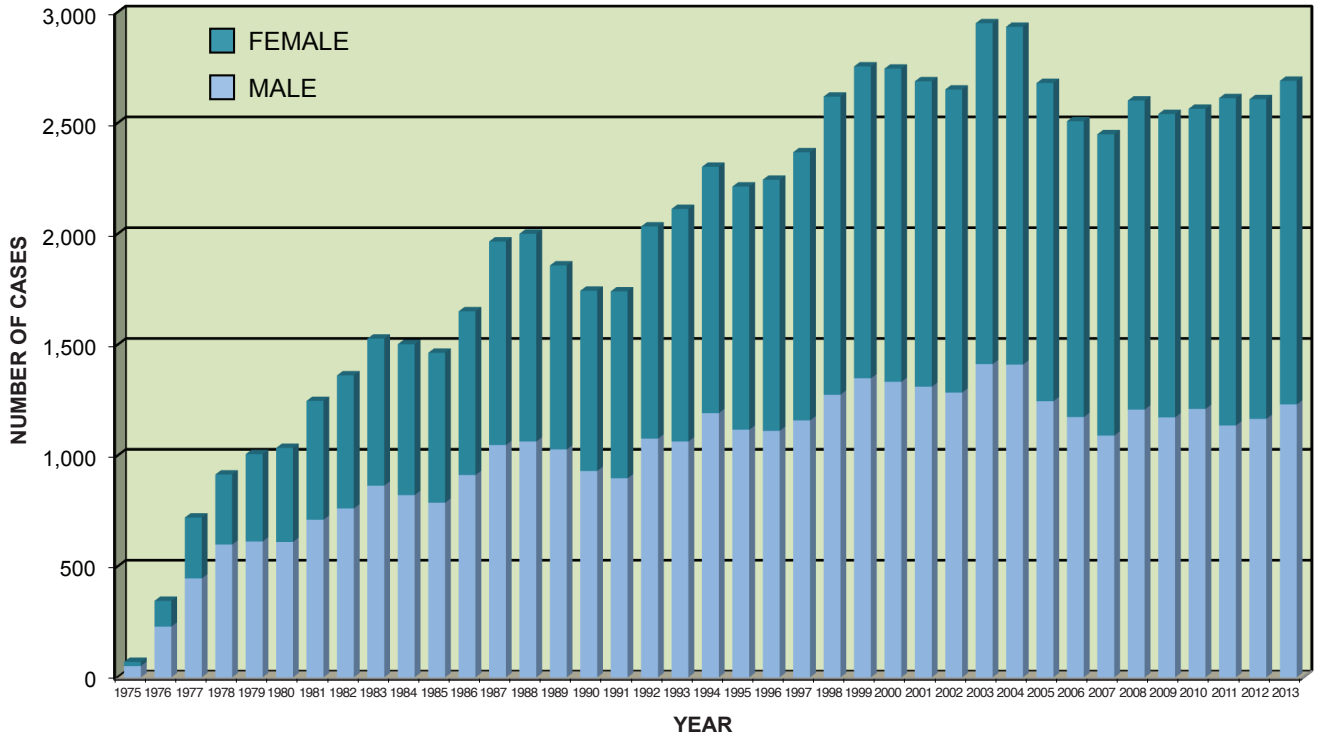


### III. KFSH&RC CANCER PATIENT POPULATION

A total of 2,691 cases were accessioned in 2013, with 1,231 males and 1,460 females or a male/female ratio of 0.8:1. This represents a 0.9% increase from 2012.

**FIGURE 1**

**DISTRIBUTION OF CASES ACCESSIONED BY YEAR  
1975 - 2013 (TOTAL CASES = 78,045)**



From the opening of the hospital (mid 1975) until December 2013, 78,045 cancer cases were registered (39,113 males and 38,932 females) with a male/female ratio of 1.005:1. There were 10,113 (13.1%) pediatric cases (0 to 14 years of age) and 67,932 (87.0%) adults (15 years old and above). In 2013, the proportions were 10.6% (285) for pediatrics and 89.4% (2,406) for adults.

TABLE 1

**CASES SEEN AT KFSH&RC (MALE/FEMALE & PEDIATRICS/ADULTS) BY 5-YEAR PERIOD 1975 - 2013**

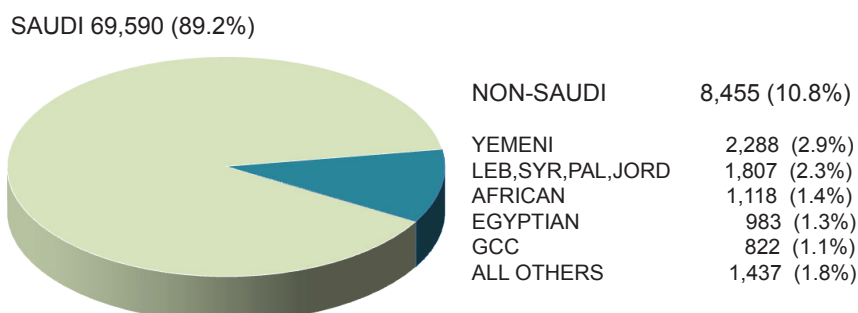
	1975-1976*	1977-1981	1982-1986	1987-1991	1992-1996	1997-2001	2002-2006	2007-2011	2012-2013	TOTAL
<b>MALE</b>	280	2,980	4,150	4,969	5,562	6,427	6,529	5,819	2,397	39,113
<b>FEMALE</b>	135	1,945	3,358	4,341	5,347	6,753	7,199	6,952	2,902	38,932
<b>TOTAL</b>	415	4,925	7,508	9,310	10,909	13,180	13,728	12,771	5,299	78,045
<b>M/F RATIO</b>	2.1:1	1.5:1	1.2:1	1.1:1	1.0:1	1.0:1	0.9:1	0.8:1	0.8:1	1.0:1
<b>PEDIATRICS**</b>	55	593	985	1164	1397	1892	1893	1566	568	10,113
(%)	13.3%	12.0%	13.1%	12.5%	12.8%	14.4%	13.8%	12.3%	10.7%	13.0%
<b>ADULTS</b>	360	4,332	6,523	8,146	9,512	11,288	11,835	11,205	4,731	67,932
(%)	86.7%	88.0%	86.9%	87.5%	87.2%	85.6%	86.2%	87.7%	89.3%	87.0%
<b>TOTAL</b>	415	4,925	7,508	9,310	10,909	13,180	13,728	12,771	5,299	78,045

\* First two years of KFSH&RC partial operation.

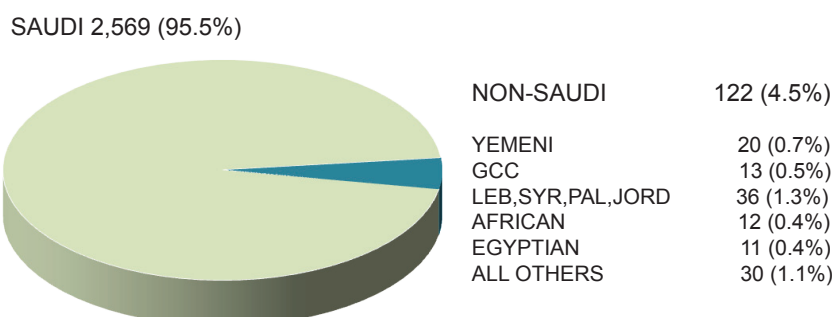
\*\* Pediatrics = 0 to 14 years of age; Adults = 15 years and above.

FIGURE 2

**DISTRIBUTION OF CASES BY NATIONALITY 1975 - 2013 (TOTAL CASES = 78,045)**



**2013 (TOTAL CASES = 2,691)**



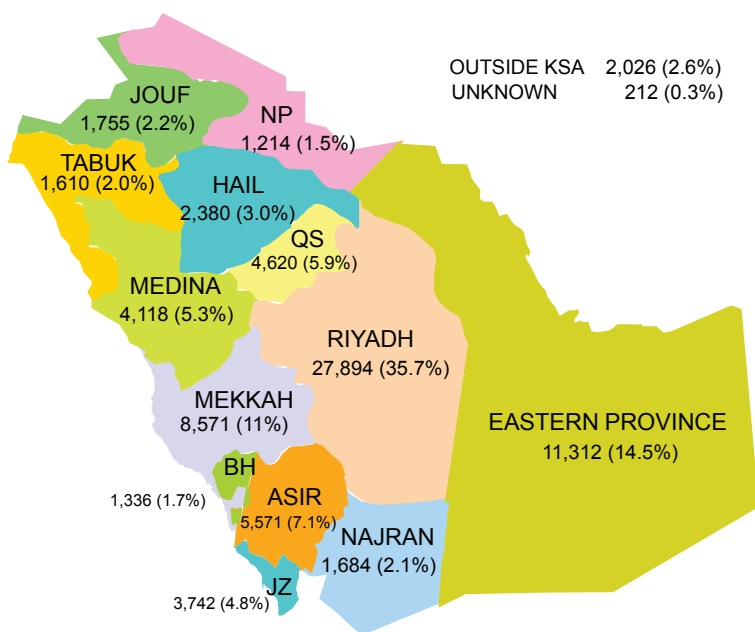
Saudi nationals totaled 2,569 (95.5%) in 2013 and the non-Saudi, 122 (4.5%). During the period 1975 to 2013, the former accounted for 89.2% (69,590) while the latter, 10.8% (8,455).

Geographically, the referral pattern in 2013 was mainly from the Riyadh region with 39.2% of all cases, followed by the Asir region and the Eastern Province with 10.4% and 10.0%, respectively. During the 39 years in review, 35.7% were referred from Riyadh, 14.5% from the Eastern Province and 11.0% from Mekkah.

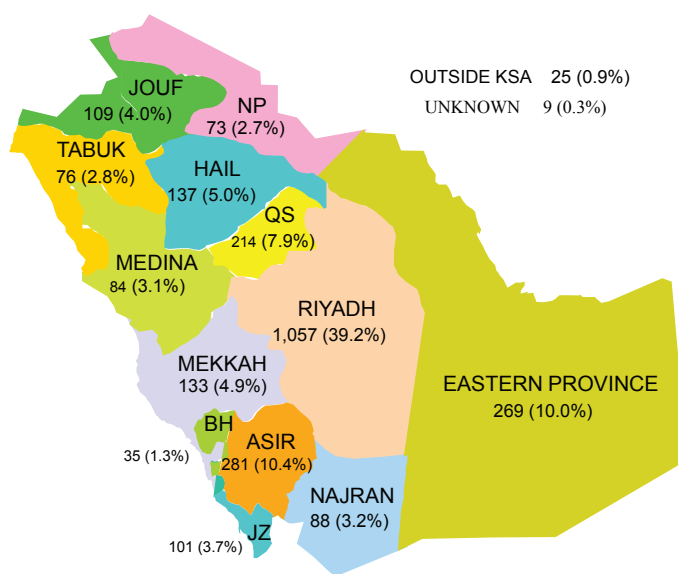
These percentages reflect the KFSH&RC actual experience rather than adjusted to reflect the population of those regions.

**FIGURE 3**

**DISTRIBUTION OF CASES BY REGION  
(Based on Given Address at Time of Diagnosis)  
1975 - 2013 (TOTAL CASES = 78,045)**



**2013 (TOTAL CASES = 2,691)**



BH - AL BAHA  
 JZ - JIZAN  
 NP - NORTHERN PROVINCE  
 QS - QASSIM

## TRENDS IN RELATIVE FREQUENCY OF CANCER AT KFSH&RC

The crude relative frequency is the proportion of a given cancer in relation to all cases in a clinical or pathological series. Although such frequencies are subject to many biases, historically many elevated frequencies have been confirmed when complete cancer registration was introduced.

Acceptance of cases to KFSH&RC is based on eligibility criteria, considering the nature of disease and availability of services.

Breast cancer led the list of total cancer cases seen from 1975 to 2013 with 11.8%, followed by leukemia (8.6%), non-hodgkin's lymphoma (7.3%), thyroid (6.9%) and colon, rectum (5.1%).

**FIGURE 4**  
**DISTRIBUTION OF 20 MOST COMMON MALIGNANCIES**  
**1975 - 2013 (TOTAL CASES = 78,045)**

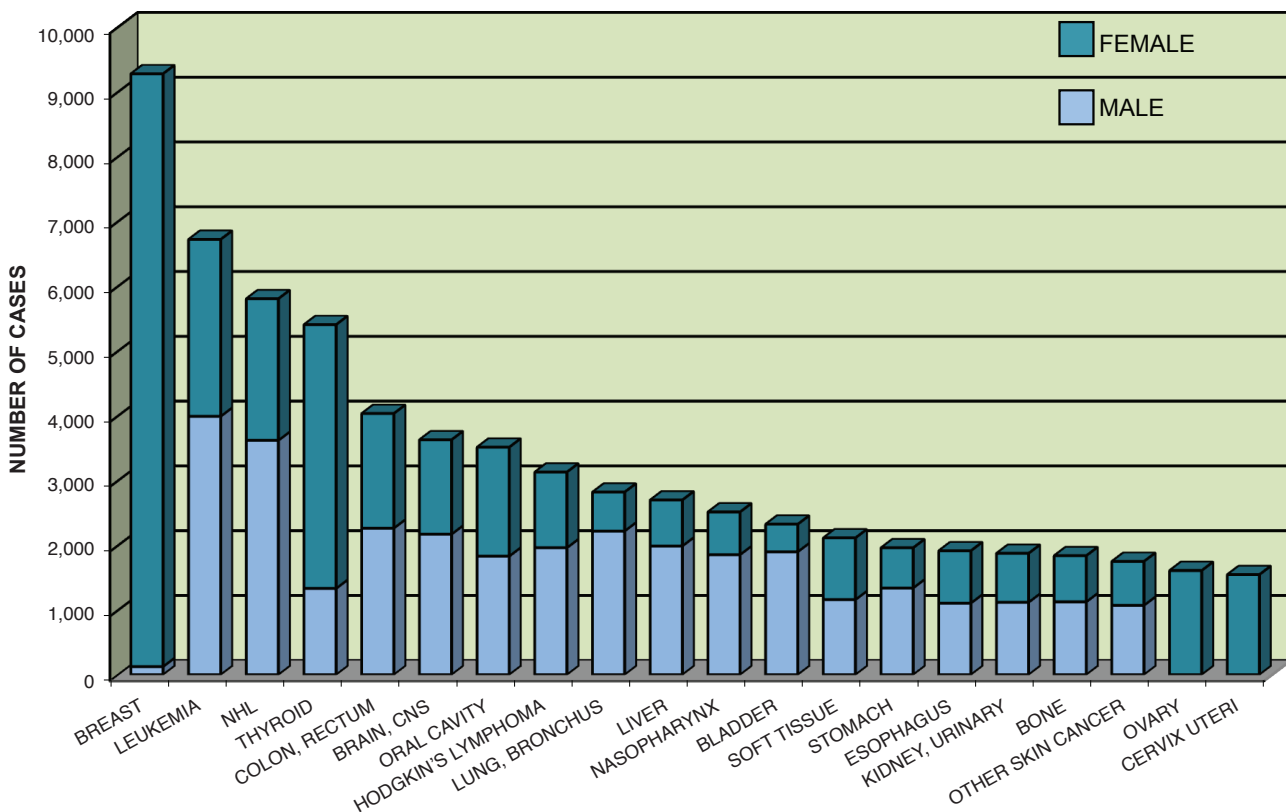
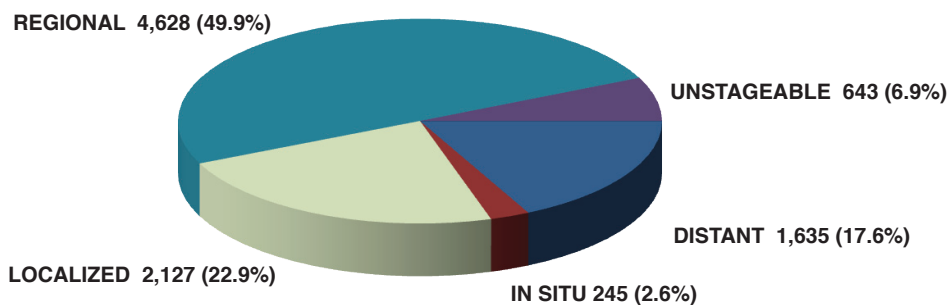
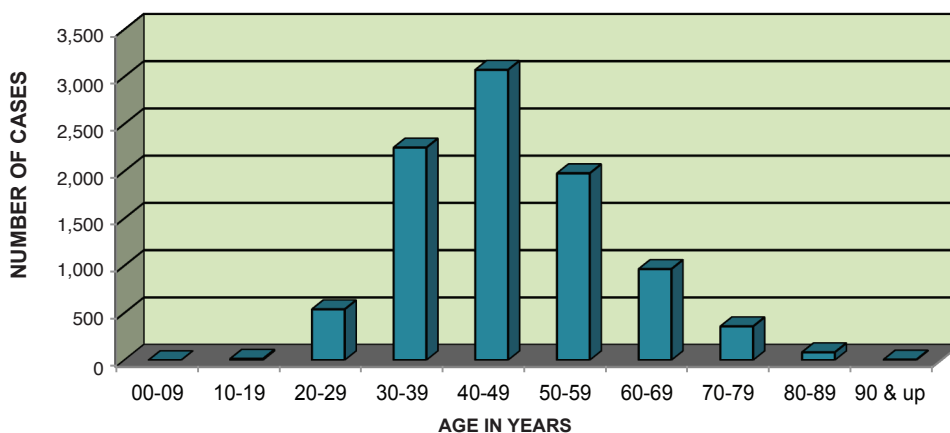


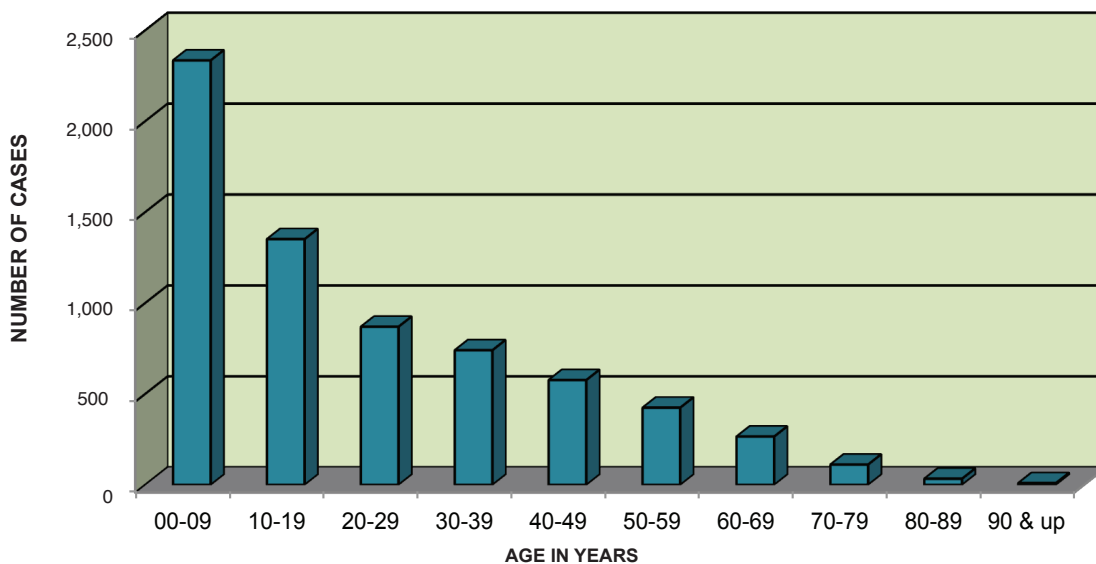
FIGURE 5

DISTRIBUTION OF 5 MOST COMMON MALIGNANCIES BY AGE AT DIAGNOSIS AND SEER SUMMARY STAGE (1975 - 2013)

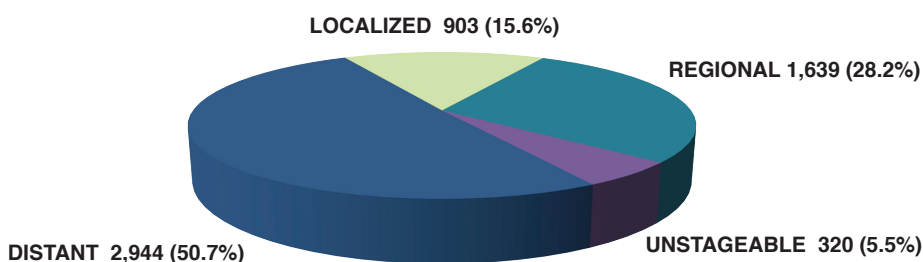
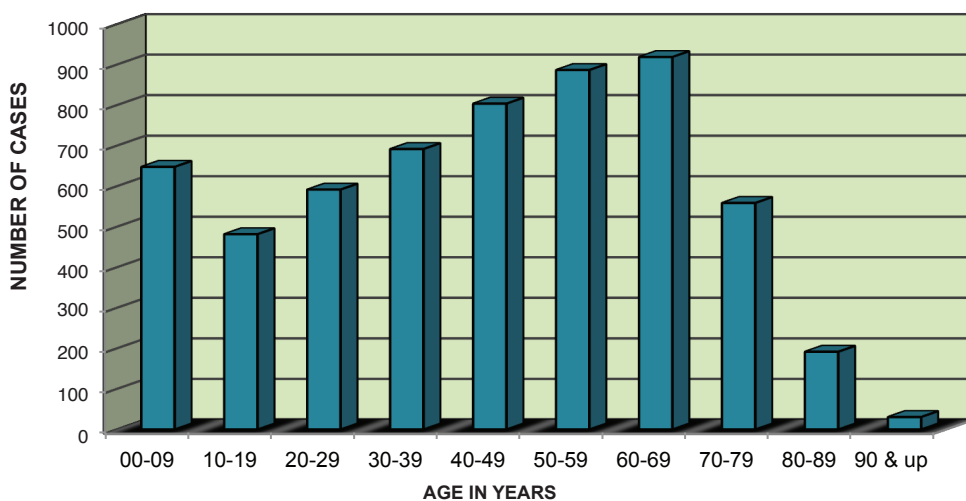
BREAST CANCER CASES



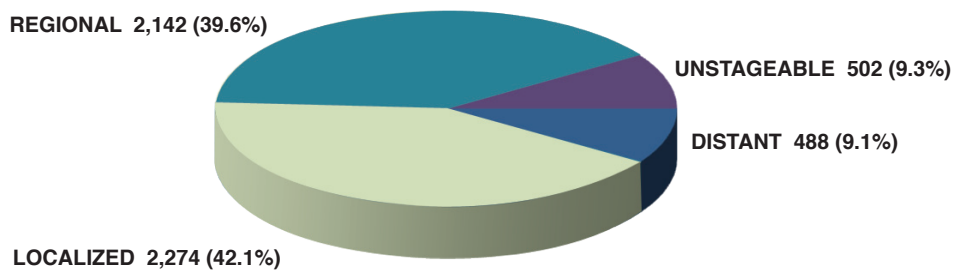
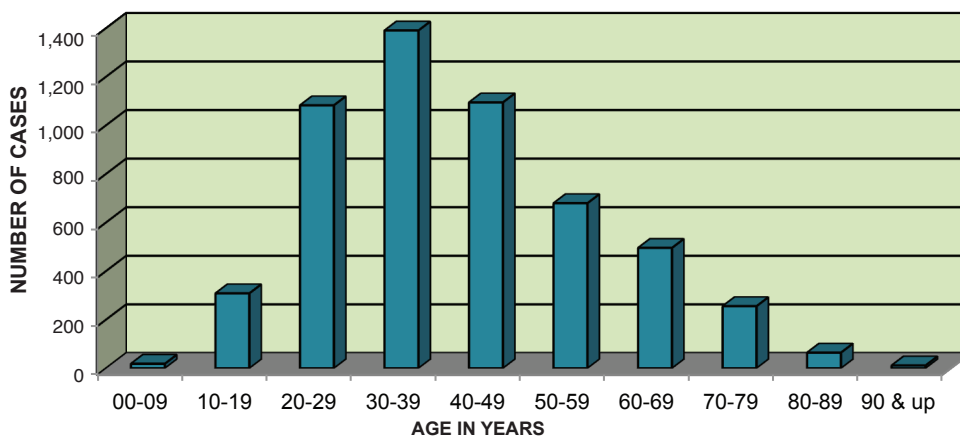
LEUKEMIA CASES



### NON-HODGKIN'S LYMPHOMA CASES



### THYROID CANCER CASES



**COLON, RECTUM CANCER CASES**

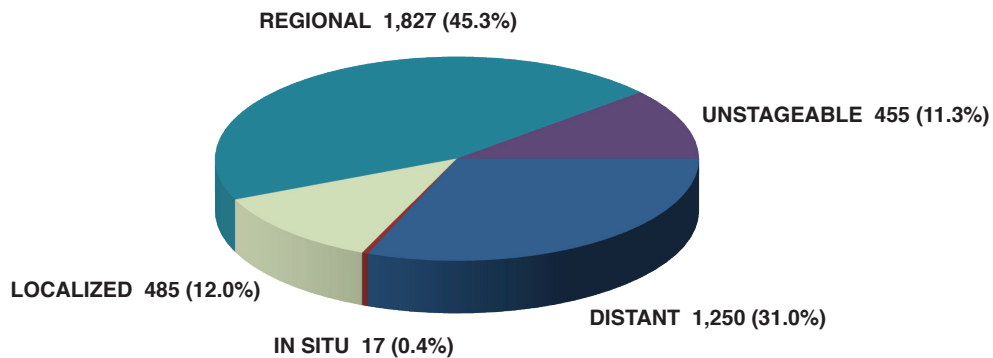
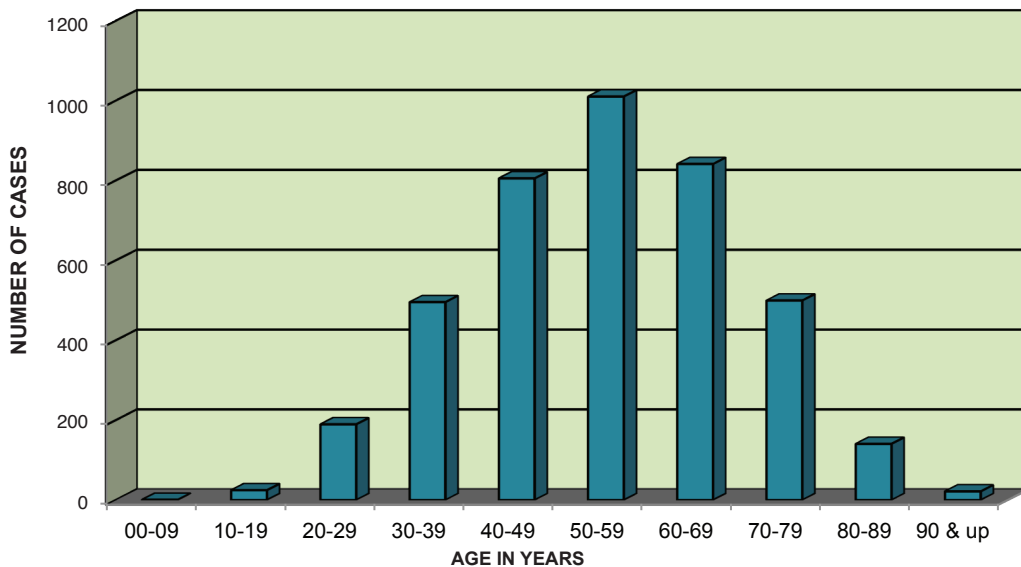


TABLE 2

TEN MOST COMMON MALIGNANCIES BY AGE GROUP AT DIAGNOSIS  
1975 - 2013

SITE	AGE GROUP	No	%
BREAST	00 - 14	2	0.0
	15 - 39	2,805	30.2
	40 - 60	5,259	56.7
	>60	1,212	13.1

SITE	AGE GROUP	No	%
BRAIN, CNS	00 - 14	1,667	45.9
	15 - 39	969	26.7
	40 - 60	681	18.8
	>60	311	8.6

SITE	AGE GROUP	No	%
LEUKEMIA	00 - 14	2,983	44.4
	15 - 39	2,315	34.4
	40 - 60	1,070	15.9
	>60	353	5.3

SITE	AGE GROUP	No	%
ORAL CAVITY	00 - 14	44	1.2
	15 - 39	498	14.0
	40 - 60	1,465	41.3
	>60	1,543	43.5

SITE	AGE GROUP	No	%
NON-HODGKIN'S LYMPHOMA	00 - 14	861	14.8
	15 - 39	1,553	26.7
	40 - 60	1,877	32.3
	>60	1,515	26.1

SITE	AGE GROUP	No	%
HODGKIN'S LYMPHOMA	00 - 14	921	29.4
	15 - 39	1,669	53.3
	40 - 60	410	13.1
	>60	138	4.4

SITE	AGE GROUP	No	%
THYROID	00 - 14	108	2.0
	15 - 39	2,694	49.8
	40 - 60	1,868	34.6
	>60	736	13.6

SITE	AGE GROUP	No	%
LUNG	00 - 14	11	0.4
	15 - 39	175	6.2
	40 - 60	1,242	44.0
	>60	1,393	49.4

SITE	AGE GROUP	No	%
COLON, RECTUM	00 - 14	13	0.3
	15 - 39	699	17.3
	40 - 60	1,955	48.5
	>60	1,367	33.9

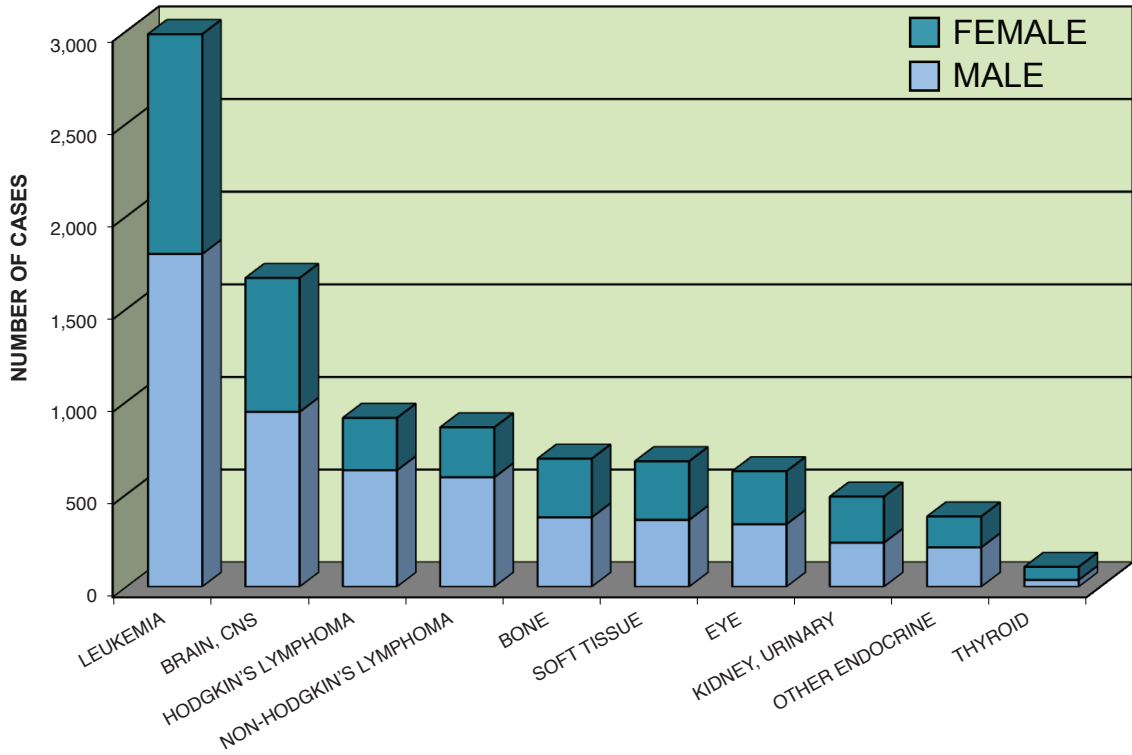
SITE	AGE GROUP	No	%
LIVER	00 - 14	95	3.5
	15 - 39	150	5.6
	40 - 60	1,145	42.4
	>60	1,309	48.5



Pediatric Cancers (under the age of 15) accounted for 13.1% of all cases from 1975 to 2013. The five most common pediatric malignancies were leukemia (29.5%), brain/CNS (16.5%), hodgkin's lymphoma (9.0%), non-hodgkin's lymphoma (8.8%) and bone (6.8%).

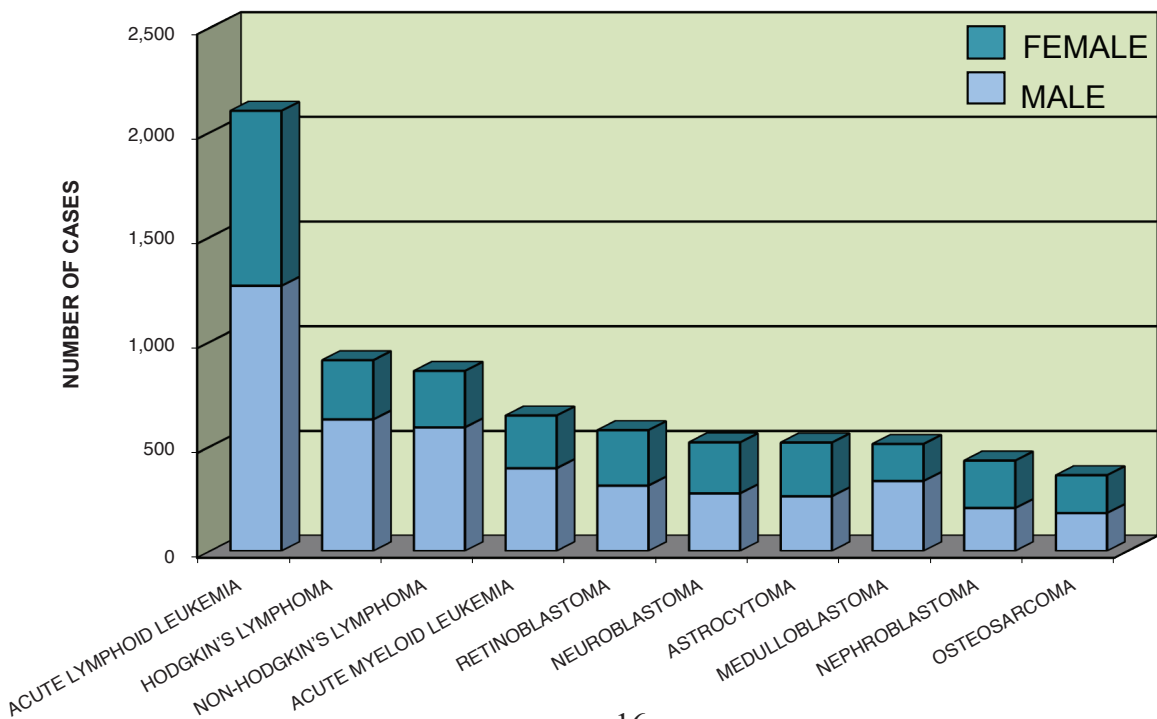
**FIGURE 6**

**DISTRIBUTION OF 10 MOST COMMON PEDIATRIC MALIGNANCIES  
1975 - 2013 (TOTAL CASES = 10,113)**



**FIGURE 7**

**DISTRIBUTION OF 10 MOST COMMON PEDIATRIC MALIGNANCIES BY HISTOLOGY  
1975 - 2013 (TOTAL CASES = 10,113)**



**TABLE 3**  
**CASES SEEN AT KFHS&RC BY SITE AND YEAR**  
**1975 - 2013**

SITE GROUP	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Oral Cavity	1	14	33	79	69	71	58	80	100	76	104	76	96	129	104	103	103	112	98	97	121
Nasopharynx	3	11	38	34	37	35	48	46	65	46	44	49	80	65	62	62	60	53	59	58	62
Esophagus	1	15	51	62	67	67	57	62	77	78	56	69	76	66	68	72	66	69	47	50	50
Stomach	2	15	32	35	50	37	50	51	64	60	49	64	61	47	52	53	36	48	42	68	61
Small Intestine	0	0	4	0	2	2	2	2	0	5	3	5	1	1	6	4	1	5	4	4	6
Colon	1	10	10	12	12	16	20	19	16	24	13	24	35	35	30	25	39	33	25	33	37
Rectum & Rectosigmoid	0	3	11	8	16	21	24	16	20	26	26	20	31	43	26	31	35	48	46	52	48
Anus, Anal Canal, Anorectum	0	0	1	4	3	1	7	4	7	9	6	7	4	4	5	8	6	7	12	10	5
Liver	7	15	33	44	49	33	41	54	53	64	57	84	78	71	68	55	66	76	82	103	102
Gallbladder	0	2	3	4	2	2	4	6	4	4	6	7	14	9	5	9	9	13	19	21	9
Bile Ducts	1	1	0	2	2	4	1	2	3	4	6	6	6	6	2	4	2	7	2	7	3
Pancreas	1	5	7	11	15	14	20	22	14	20	16	28	20	16	27	12	13	27	21	22	25
Retropertitoneum, Peritoneum	0	0	2	1	2	1	0	0	2	1	0	1	0	1	1	1	0	2	1	0	1
Other Digestive	0	0	0	2	2	5	4	1	1	0	3	1	4	3	6	2	1	2	4	0	3
Nasal Cavity, Sinus, Ear	1	3	9	7	5	7	9	10	10	5	7	5	16	14	7	13	12	8	9	11	10
Larynx	1	5	12	12	12	14	20	13	23	22	25	16	23	33	21	26	34	27	31	35	37
Lung / Bronchus	3	11	23	34	45	40	56	63	74	74	87	84	83	106	90	74	85	79	85	89	87
Pleura	0	0	1	0	0	0	3	0	1	1	0	1	0	1	2	2	0	3	4	3	1
Other Respiratory & Thoracic	0	0	0	1	1	1	3	1	1	0	4	0	6	1	1	2	7	3	7	8	4
Leukemia	7	28	40	87	90	83	121	125	117	127	121	159	185	157	155	132	158	145	192	169	209
Myeloma	1	5	6	11	9	11	8	13	13	12	19	13	29	22	33	15	28	26	25	40	30
Other Hematopoietic	0	1	0	1	2	2	2	2	3	1	2	9	5	3	3	2	0	1	0	2	2
Bone	1	6	13	25	20	20	22	42	31	40	19	31	35	44	41	37	40	52	54	56	56
Soft Tissue	1	16	29	29	31	23	29	40	32	35	38	47	48	49	59	59	61	47	50	72	81
Melanoma of Skin	0	4	4	8	8	6	2	4	11	12	7	8	11	12	6	5	9	15	9	7	7
Kaposi's Sarcoma	0	1	1	0	6	4	2	2	5	4	5	9	5	9	5	4	5	14	2	3	6
Other Skin Cancer	2	13	26	32	41	35	48	54	51	52	62	60	43	43	53	41	47	47	51	61	44
Breast	3	24	53	46	57	65	101	111	111	153	131	127	174	194	137	168	169	188	251	241	232
Cervix Uteri	0	10	18	18	25	18	26	25	33	33	41	55	51	50	33	44	35	52	50	52	49
Corpus Uteri	1	1	2	5	6	4	8	8	11	14	10	10	16	21	21	18	13	27	20	26	22
Ovary	2	6	10	10	17	21	20	35	31	26	24	34	41	47	52	46	36	44	55	50	54
Vagina	0	0	5	2	0	1	2	0	2	2	3	1	2	1	2	2	3	2	0	5	5
Vulva	0	0	0	1	1	0	2	1	3	2	5	5	1	2	1	4	3	1	4	5	5
Other Female Genital	0	1	5	4	6	7	5	7	19	5	4	13	19	14	10	9	13	12	12	19	7
Prostate	0	7	5	4	5	10	11	18	28	19	19	17	22	27	27	24	16	41	27	45	37
Testis	0	3	9	8	10	11	15	11	8	12	14	14	17	17	9	14	14	21	25	21	14
Penis	0	1	1	0	1	0	2	2	3	4	0	0	0	2	2	5	2	0	1	3	0
Other Male Genital	0	0	0	0	2	0	1	0	1	0	3	0	3	0	2	0	0	0	1	1	0
Bladder	4	7	12	24	29	39	37	23	41	35	46	51	79	74	73	60	44	65	88	72	60
Kidney & Renal Pelvis	0	9	18	18	18	15	18	30	23	20	24	41	31	58	31	35	33	52	51	65	48
Ureter	0	0	0	0	0	0	0	0	0	1	1	0	3	1	1	0	1	1	1	1	1
Other Urinary	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Eye	0	6	11	19	12	24	29	34	25	17	30	24	35	44	26	30	9	15	39	27	15
Brain, CNS	3	24	27	40	26	31	31	77	53	59	49	71	88	91	98	81	84	112	88	116	128
Thyroid	2	8	17	28	33	44	57	51	66	71	63	82	119	112	110	94	110	141	135	158	134
Other Endocrine	1	1	3	3	2	9	10	8	14	12	17	10	11	13	2	2	10	14	15	15	14
Hodgkin's Lymphoma	13	19	40	41	36	42	47	42	54	50	49	45	65	57	76	56	57	75	73	78	88
Non-Hodgkin's Lymphoma	4	23	73	75	103	112	128	116	172	139	124	142	157	153	165	154	123	150	154	160	158
Unknown or ill-Defined	3	11	23	24	20	27	34	30	33	26	25	25	37	32	42	39	40	51	42	62	36
<b>TOTAL</b>	<b>70</b>	<b>345</b>	<b>721</b>	<b>915</b>	<b>1,007</b>	<b>1,035</b>	<b>1,247</b>	<b>1,362</b>	<b>1,528</b>	<b>1,503</b>	<b>1,464</b>	<b>1,651</b>	<b>1,966</b>	<b>2,001</b>	<b>1,858</b>	<b>1,744</b>	<b>1,741</b>	<b>2,034</b>	<b>2,113</b>	<b>2,303</b>	<b>2,214</b>

TABLE 3 (cont'd)

**CASES SEEN AT KFHS&RC BY SITE AND YEAR  
1975-2013**

SITE GROUP	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL
Oral Cavity	106	111	87	108	117	97	87	117	98	122	97	121	104	99	72	108	86	89	3,551
Nasopharynx	87	90	108	102	83	119	72	101	96	81	77	71	78	60	74	68	59	71	2,514
Esophagus	52	51	62	34	52	37	42	43	37	41	36	30	31	31	28	31	30	21	1,915
Stomach	57	45	42	54	53	40	50	60	68	57	59	48	49	64	59	56	60	63	1,961
Small Intestine	6	4	4	7	9	3	3	5	9	6	4	5	5	7	7	6	8	11	167
Colon	34	34	57	48	73	72	92	104	76	80	95	88	83	96	84	103	101	118	1,907
Rectum & Rectosigmoid	54	62	59	94	75	77	106	99	113	112	93	92	82	92	83	93	99	91	2,127
Anus, Anal Canal, Anorectum	6	6	7	4	7	7	7	8	5	3	5	5	5	1	2	2	3	5	207
Liver	103	96	84	89	85	91	73	70	60	37	68	49	71	89	94	110	100	95	2,699
Gallbladder	11	11	12	15	13	11	12	15	14	8	8	11	10	6	9	11	5	11	345
Bile Ducts	9	7	10	9	8	9	10	7	4	8	6	11	7	12	13	8	10	9	225
Pancreas	21	24	34	18	38	26	31	30	34	27	41	26	32	40	36	31	46	61	952
Retropertitoneum, Peritoneum	0	0	1	2	2	1	1	1	4	3	2	2	3	1	1	2	5	8	58
Other Digestive	0	0	0	0	0	2	2	2	4	2	1	1	4	1	2	0	0	0	63
Nasal Cavity, Sinus, Ear	9	4	8	14	10	9	11	10	9	13	11	12	8	8	5	4	7	4	334
Larynx	36	31	30	35	32	33	26	47	41	36	26	32	31	26	10	17	19	21	971
Lung / Bronchus	84	88	106	108	91	80	91	86	94	84	64	60	63	61	63	73	72	81	2,821
Pleura	2	1	1	2	3	8	1	4	4	3	1	3	2	4	1	0	3	3	65
Other Respiratory & Thoracic	4	8	8	8	2	1	5	2	4	3	3	1	4	7	7	6	5	5	134
Leukemia	166	228	235	258	259	239	259	258	227	205	225	203	227	219	228	197	251	231	6,722
Myeloma	21	14	23	16	28	20	19	20	23	23	22	31	18	39	35	28	15	29	793
Other Hematopoietic	2	1	3	4	9	11	10	9	2	8	11	11	22	13	27	24	36	21	262
Bone	56	63	71	62	75	83	74	62	68	69	66	52	74	59	55	62	54	49	1,839
Soft Tissue	54	67	74	87	69	73	59	78	79	70	54	83	56	53	71	66	73	72	2,114
Melanoma of Skin	9	5	5	6	5	5	6	5	8	5	8	8	8	6	7	5	7	4	269
Kaposi's Sarcoma	11	6	8	8	4	7	9	9	6	8	9	7	7	7	10	5	3	5	221
Other Skin Cancer	57	52	35	58	52	62	38	52	49	56	66	30	41	41	38	41	35	42	1,751
Breast	281	292	336	341	383	362	377	409	431	377	326	349	356	338	373	409	373	429	9,278
Cervix Uteri	48	46	62	57	42	68	53	55	47	46	37	39	43	46	32	33	40	35	1,547
Corpus Uteri	19	26	29	33	33	35	47	59	62	48	59	68	64	74	56	73	71	62	1,182
Ovary	56	60	63	53	53	51	44	55	51	47	55	44	54	49	69	51	45	49	1,610
Vagina	2	2	1	2	1	0	1	1	2	1	0	0	0	2	0	2	0	0	58
Vulva	2	1	0	1	2	3	2	2	3	2	0	2	4	3	2	5	4	2	88
Other Female Genital	11	8	6	6	5	5	10	13	12	12	15	8	6	10	3	4	2	4	331
Prostate	49	43	44	63	47	49	49	59	59	75	46	39	60	45	47	37	36	41	1,297
Testis	14	17	16	19	20	18	28	19	20	17	11	15	28	26	27	23	14	27	625
Penis	1	3	0	0	2	0	1	1	0	0	0	0	0	1	0	0	2	0	42
Other Male Genital	0	0	1	0	0	0	2	1	2	1	2	0	0	0	0	1	1	0	26
Bladder	56	65	85	91	80	81	71	93	102	88	66	69	65	66	81	66	60	77	2,325
Kidney & Renal Pelvis	47	49	58	70	57	72	64	55	70	61	67	67	85	86	85	86	81	77	1,875
Ureter	1	0	3	1	2	3	2	2	1	2	0	1	0	2	2	2	0	0	36
Other Urinary	0	0	0	2	1	0	0	0	1	2	0	0	0	0	0	0	3	1	15
Eye	22	30	17	24	26	17	16	20	18	15	20	11	19	17	24	32	27	22	848
Brain, CNS	129	133	162	145	149	151	143	161	167	128	125	91	94	85	99	106	96	86	3,628
Thyroid	162	161	192	210	186	189	169	215	214	216	205	229	254	225	212	245	245	242	5,406
Other Endocrine	14	14	12	15	23	14	18	38	27	26	23	17	30	22	28	17	24	14	573
Hodgkin's Lymphoma	76	76	98	116	131	121	121	132	144	130	101	118	118	122	104	96	117	106	3,130
Non-Hodgkin's Lymphoma	157	193	208	207	204	175	186	206	218	181	167	178	172	148	168	144	151	158	5,806
Unknown or ill-Defined	41	35	50	50	45	49	53	45	49	32	28	19	25	31	31	24	24	39	1,332
<b>TOTAL</b>	<b>2,245</b>	<b>2,369</b>	<b>2,620</b>	<b>2,756</b>	<b>2,746</b>	<b>2,689</b>	<b>2,652</b>	<b>2,951</b>	<b>2,935</b>	<b>2,681</b>	<b>2,509</b>	<b>2,450</b>	<b>2,602</b>	<b>2,541</b>	<b>2,565</b>	<b>2,613</b>	<b>2,608</b>	<b>2,691</b>	<b>78,045</b>

TABLE 4

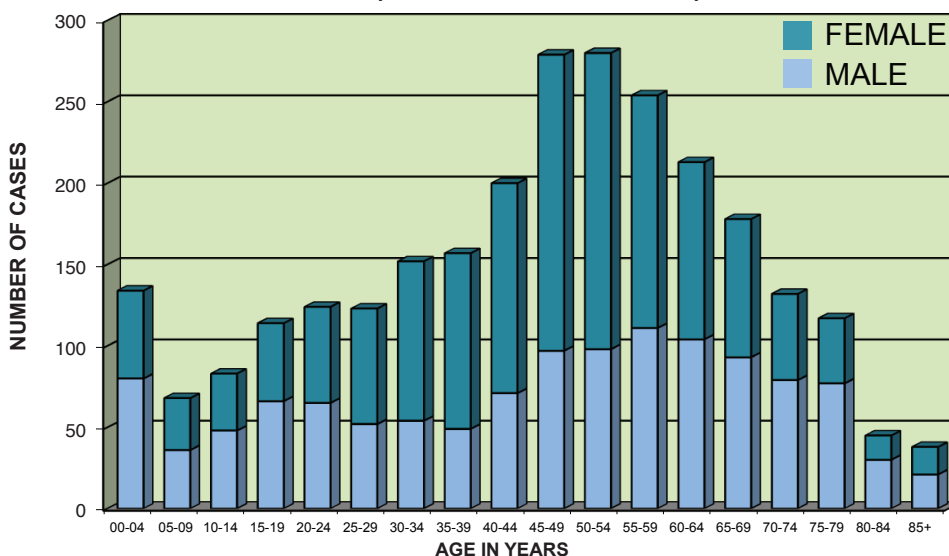
CASES SEEN AT KFSH&RC BY SITE AND 5 - YEAR PERIOD  
1975-2013

SITE GROUP	1975-1976*		1977-1981		1982-1986		1987-1991		1992-1996		1997-2001		2002-2006		2007-2011		2012		2013		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Oral Cavity	15	3.6	310	6.3	436	5.8	535	5.7	534	4.9	520	3.9	521	3.8	505	4.0	86	3.3	89	3.3	3,551	4.5
Nasopharynx	14	3.4	192	3.9	250	3.3	329	3.5	319	2.9	502	3.8	427	3.1	351	2.7	59	2.3	71	2.6	2,514	3.2
Esophagus	16	3.9	304	6.2	342	4.6	348	3.7	268	2.5	236	1.8	199	1.5	151	1.2	30	1.2	21	0.8	1,915	2.5
Stomach	17	4.1	204	4.1	288	3.8	249	2.7	276	2.5	234	1.8	294	2.1	276	2.2	60	2.3	63	2.3	1,961	2.5
Small Intestine	0	0.0	10	0.2	14	0.2	13	0.1	25	0.2	32	0.2	27	0.2	27	0.2	8	0.3	11	0.4	167	0.2
Colon	11	2.7	70	1.4	96	1.3	164	1.8	162	1.5	284	2.2	447	3.3	454	3.6	101	3.9	118	4.4	1,907	2.4
Rectum & Rectosigmoid	3	0.7	80	1.6	108	1.4	166	1.8	248	2.3	367	2.8	523	3.8	442	3.5	99	3.8	91	3.4	2,127	2.7
Anus, Anal Canal, Anorectum	0	0.0	16	0.3	33	0.4	27	0.3	40	0.4	31	0.2	35	0.3	17	0.1	3	0.1	5	0.2	207	0.3
Liver	22	5.3	200	4.1	312	4.2	338	3.6	466	4.3	445	3.4	308	2.2	413	3.2	100	3.8	95	3.5	2,699	3.5
Gallbladder	2	0.5	15	0.3	27	0.4	46	0.5	73	0.7	62	0.5	57	0.4	47	0.4	5	0.2	11	0.4	345	0.4
Bile Ducts	2	0.5	9	0.2	18	0.2	20	0.2	28	0.3	43	0.3	35	0.3	51	0.4	10	0.4	9	0.3	225	0.3
Pancreas	6	1.4	67	1.4	100	1.3	88	0.9	116	1.1	140	1.1	163	1.2	165	1.3	46	5.3	61	2.3	952	1.2
Retropitoneum, Peritoneum	0	0.0	6	0.1	4	0.1	3	0.0	4	0.0	6	0.0	11	0.1	11	0.1	5	0.2	8	0.3	58	0.1
Other Digestive	0	0.0	13	0.3	6	0.1	16	0.2	9	0.1	2	0.0	9	0.1	8	0.1	0	0.0	0	0.0	63	0.1
Nasal Cavity, Sinus, Ear	4	1.0	37	0.8	37	0.5	62	0.7	47	0.4	45	0.3	54	0.4	37	0.3	7	0.3	4	0.1	334	0.4
Larynx	6	1.4	70	1.4	99	1.3	137	1.5	166	1.5	161	1.2	176	1.3	116	0.9	19	0.7	21	0.8	971	1.2
Lung / Bronchus	14	3.4	198	4.0	382	5.1	438	4.7	424	3.9	473	3.6	419	3.1	320	2.5	72	2.8	81	3.0	2,821	3.6
Pleura	0	0.0	1	0.0	3	0.0	5	0.1	13	0.1	15	0.1	12	0.1	10	0.1	3	0.1	3	0.1	65	0.1
Other Respiratory & Thoracic	0	0.0	6	0.1	6	0.1	17	0.2	26	0.2	27	0.2	27	0.2	25	0.2	5	0.2	5	0.2	134	0.2
Leukemia	35	8.4	421	8.5	649	8.6	787	8.5	881	8.1	1,219	9.2	1,174	8.6	1,074	8.4	251	9.8	231	8.6	6,722	8.6
Myeloma	6	1.4	45	0.9	70	0.9	127	1.4	142	1.3	101	0.8	107	0.8	151	1.2	15	0.6	29	1.0	793	1.0
Other Hematopoietic	1	0.2	7	0.1	17	0.2	12	0.1	7	0.1	28	0.2	40	0.3	93	0.7	36	1.2	21	0.8	262	0.3
Bone	7	1.7	100	2.0	163	2.2	197	2.1	274	2.5	354	2.7	339	2.5	302	2.4	54	2.1	49	1.8	1,839	2.4
Soft tissue	17	4.1	141	2.9	192	2.6	276	3.0	304	2.8	370	2.8	340	2.5	329	2.6	73	2.8	72	2.7	2,114	2.7
Melanoma of skin	4	1.0	33	0.7	42	0.6	43	0.5	47	0.4	26	0.2	32	0.2	31	0.2	7	0.3	4	0.1	269	0.3
Kaposi's Sarcoma	1	0.2	13	0.3	25	0.3	28	0.3	36	0.3	33	0.3	41	0.3	36	0.3	3	0.1	5	0.2	221	0.3
Other Skin Cancer	15	3.6	182	3.7	279	3.7	227	2.4	260	2.4	259	2.0	261	1.9	191	1.5	35	1.3	42	1.6	1,751	2.2
Breast	27	6.5	322	6.5	633	8.4	842	9.0	1,193	10.9	1,714	13.0	1,920	14.0	1,825	14.3	373	14.3	429	16.0	9,278	11.9
Cervix Uteri	10	2.4	105	2.1	187	2.5	213	2.3	251	2.3	275	2.1	238	1.7	193	1.5	40	1.5	35	1.3	1,547	2.1
Corpus Uteri	2	0.5	25	0.5	53	0.7	89	1.0	114	1.0	156	1.2	275	2.0	335	2.6	71	2.7	62	2.3	1,182	1.5
Ovary	8	1.9	78	1.6	150	2.1	222	2.4	259	2.4	280	2.1	252	1.8	267	2.1	45	1.7	49	1.8	1,610	2.1
Vagina	0	0.0	10	0.2	8	0.1	11	0.1	14	0.1	6	0.0	5	0.0	4	0.0	0	0.0	0	0.0	58	0.1
Vulva	0	0.0	4	0.1	16	0.2	13	0.1	17	0.2	7	0.1	9	0.1	16	0.1	4	0.2	2	0.0	88	0.1
Other Female Genital	1	0.2	27	0.5	48	0.6	65	0.7	61	0.6	30	0.2	62	0.5	31	0.2	2	0.1	4	0.1	331	0.4
Prostate	7	1.7	35	0.7	101	1.3	116	1.2	199	1.8	246	1.9	288	2.1	228	1.8	36	1.4	41	1.5	1,297	1.6
Testis	3	0.7	53	1.1	58	0.8	71	0.8	95	0.9	90	0.7	95	0.7	119	0.9	14	0.5	27	1.0	625	0.8
Penis	1	0.2	4	0.1	9	0.1	11	0.1	5	0.0	5	0.0	4	0.0	1	0.0	2	0.1	0	0.0	42	0.1
Other Male Genital	0	0.0	3	0.1	4	0.1	5	0.1	2	0.0	2	0.0	8	0.1	1	0.0	1	0.0	0	0.0	26	0.0
Bladder	11	2.7	141	2.9	196	2.6	330	3.5	341	3.1	402	3.1	420	3.1	347	2.7	60	2.3	77	2.9	2,325	3.1
Kidney & Renal Pelvis	9	2.2	87	1.8	138	1.8	188	2.0	263	2.4	306	2.3	317	2.3	409	3.2	81	3.1	77	2.9	1,875	2.4
Ureter	0	0.0	0	0.0	2	0.0	6	0.1	5	0.0	9	0.1	7	0.1	7	0.1	0	0.0	0	0.0	36	0.0
Other Urinary	0	0.0	0	0.0	2	0.0	2	0.0	1	0.0	3	0.0	3	0.0	0	0.0	3	0.1	1	0.0	15	0.0
Eye	6	1.4	95	1.9	130	1.7	144	1.5	118	1.1	114	0.9	89	0.6	103	0.8	27	1.0	22	0.8	848	1.1
Brain, CNS	27	6.5	155	3.1	309	4.1	443	4.7	573	5.3	740	5.6	724	5.2	475	3.7	96	3.7	86	3.2	3,628	4.6
Thyroid	10	2.4	179	3.6	333	4.4	545	5.9	730	6.7	938	7.1	1,019	7.4	1,165	9.1	245	9.4	242	9.0	5,406	7.0
Other Endocrine	2	0.5	27	0.5	61	0.8	43	0.5	72	0.7	84	0.6	132	1.0	114	0.9	24	0.9	14	0.5	573	0.7
Hodgkin's Lymphoma	32	7.7	206	4.2	240	3.2	311	3.3	390	3.6	542	4.1	628	4.6	558	4.4	117	4.5	106	3.9	3,130	4.0
Non-Hodgkin's Lymphoma	27	6.5	491	10.0	693	9.2	752	8.1	779	7.1	987	7.5	958	7.0	810	6.4	151	5.8	158	5.9	5,806	7.4
Unknown or ill-Defined	14	3.4	128	2.6	139	1.9	190	2.0	232	2.1	229	1.7	207	1.5	130	1.0	24	0.9	39	1.4	1,332	1.7
<b>TOTAL</b>	<b>415</b>	<b>100.0</b>	<b>4,925</b>	<b>100.0</b>	<b>7,508</b>	<b>100.0</b>	<b>9,310</b>	<b>100.0</b>	<b>10,909</b>	<b>100.0</b>	<b>13,180</b>	<b>100.0</b>	<b>13,728</b>	<b>100.0</b>	<b>12,771</b>	<b>100.0</b>	<b>2,608</b>	<b>100.0</b>	<b>2,691</b>	<b>100.0</b>	<b>78,045</b>	<b>100.0</b>

The largest number of cases in 2013 were noted in the 5<sup>th</sup> and 6<sup>th</sup> decades of life in males and in the 4<sup>th</sup> and 5<sup>th</sup> in females. The mean age was 45.2, the median was 48.0 and the mode was at 54. Pediatric malignancies were most common among children at one year of age and at three year of age.

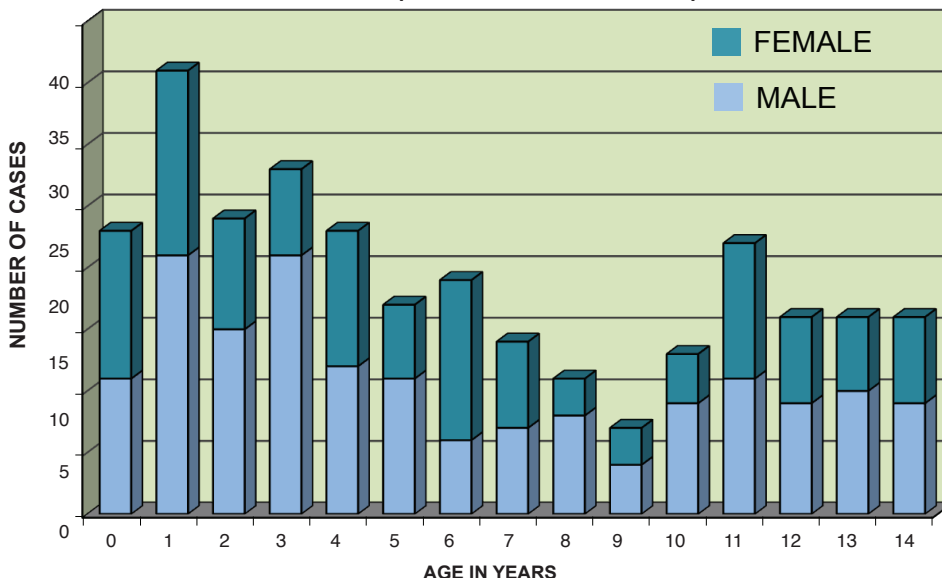
**FIGURE 8**

**DISTRIBUTION OF ALL CASES BY AGE AT DIAGNOSIS  
2013 (TOTAL CASES = 2,691)**



**FIGURE 9**

**DISTRIBUTION OF PEDIATRIC CASES BY AGE AT DIAGNOSIS  
2013 (TOTAL CASES = 285)**



Of the 2,691 cases in 2013, 2,425 (90.1%) were analytic (defined as cases which were first diagnosed and/or received all or part of their first course of treatment at KFSH&RC). The remaining 266 cases (9.8%) were non-analytic (defined as cases diagnosed elsewhere and received all of their first course of treatment elsewhere). Out of the 2,425 analytic cases, pediatric cases totaled 242, with 135 males and 107 females.

See Table 5 for the distribution of cases by site, sex, class of case, and stage at diagnosis and Tables 6, 7 and 8 for the distributions of analytic cases by site, sex and age at diagnosis.

TABLE 5

CASES SEEN AT KFSH&RC BY SITE, SEX, CLASS OF CASE AND SEER SUMMARY STAGE  
2013

SITE GROUP	TOTAL		GENDER		CLASS OF CASE Analytic Non-Analytic	SEER GENERAL SUMMARY STAGE			ANALYTIC CASES		
	Number	%	Male	Female		In Situ	Localized	Regional	Distant	Unstageable	
Oral Cavity	89	3.3	49	40	85	0	25	37	23	0	
Nasopharynx	71	2.6	59	12	65	0	4	21	40	0	
Esophagus	21	0.8	11	10	20	0	6	4	7	3	
Stomach	63	2.3	40	23	57	2	10	15	24	6	
Small Intestine	11	0.4	7	4	9	0	0	5	4	0	
Colon	118	4.4	70	48	96	0	13	33	48	2	
Rectum & Rectosigmoid	91	3.4	50	41	81	0	4	45	29	3	
Anus, Anal Canal, Anorectum	5	0.2	2	3	5	0	0	2	3	0	
Liver	95	3.5	59	36	92	0	46	18	18	10	
Gallbladder	11	0.4	6	5	9	0	2	1	5	1	
Bile Ducts	9	0.3	2	7	9	0	0	4	3	2	
Pancreas	61	2.3	34	27	59	0	7	18	34	0	
Retroperitoneum, Peritoneum	8	0.3	5	3	6	0	0	3	3	0	
Nasal Cavity, Sinus, Ear	4	0.1	1	3	4	0	0	4	0	0	
Larynx	21	0.8	19	2	21	0	11	6	4	0	
Lung / Bronchus	81	3.0	62	19	71	0	7	14	48	2	
Pleura	3	0.1	2	1	3	0	1	0	2	0	
Other Respiratory & Thoracic	5	0.2	1	4	5	0	1	3	1	0	
Leukemia	231	8.6	142	89	190	0	0	1	189	0	
Myeloma	29	1.1	13	16	28	1	0	0	28	0	
Other Hematopoietic	21	0.8	12	9	20	1	2	0	18	0	
Bone	49	1.8	25	24	45	4	18	16	11	0	
Soft Tissue	72	2.7	41	31	60	12	18	18	18	6	
Melanoma of Skin	4	0.1	2	2	3	1	0	1	1	1	
Kaposi's Sarcoma	5	0.2	5	0	5	0	5	0	0	0	
Other Skin Cancer	42	1.6	26	16	38	4	21	8	1	6	
Breast	429	16.0	5	424	399	14	108	208	66	3	
Cervix Uteri	35	1.3	0	35	32	4	6	16	6	0	
Corpus Uteri	62	2.3	0	62	59	0	29	15	15	0	
Ovary	49	1.8	0	49	42	0	10	7	24	1	
Vulva	2	0.0	0	2	2	0	0	2	0	0	
Other Female Genital	4	0.1	0	4	4	0	1	1	2	0	
Prostate	41	1.5	41	0	37	4	24	1	10	2	
Testis	27	1.0	27	0	23	4	15	5	3	0	
Bladder	77	2.9	64	13	64	13	29	13	6	1	
Kidney & Renal Pelvis	77	2.9	53	24	74	3	40	15	17	0	
Other Urinary	1	0.0	1	0	1	0	0	0	0	0	
Eye	22	0.8	11	11	20	2	8	10	1	1	
Brain, CNS	86	3.2	51	35	78	8	62	14	2	0	
Thyroid	242	9.0	45	197	233	9	109	107	13	4	
Other Endocrine	14	0.5	6	8	12	2	4	1	7	0	
Hodgkin's Lymphoma	106	4.0	67	39	85	0	8	24	53	0	
Non-Hodgkin's Lymphoma	158	5.9	93	65	140	18	24	26	89	1	
Unknown or ill-Defined	39	1.4	22	17	34	5	0	1	0	33	
<b>TOTAL</b>	<b>2,691</b>	<b>100.0</b>	<b>1,231</b>	<b>1,460</b>	<b>2,425</b>	<b>266</b>	<b>678</b>	<b>743</b>	<b>876</b>	<b>88</b>	

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TABLE 6

ANALYTIC CASES SEEN AT KFSH&RC BY SITE AND AGE  
2013

SITE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
Oral Cavity	0	1	1	2	3	5	1	4	5	7	6	5	14	10	6	5	3	7	85
Nasopharynx	1	0	1	6	2	2	5	6	8	10	9	4	5	2	2	2	0	0	65
Esophagus	0	0	0	0	0	0	0	0	1	1	0	3	1	3	3	3	1	4	20
Stomach	0	0	0	0	0	0	4	2	2	6	10	6	8	7	6	4	0	2	57
Small Intestine	0	0	0	1	0	0	0	0	0	0	4	0	1	0	1	1	0	0	9
Colon	0	0	1	0	0	1	4	3	6	16	11	15	13	9	10	6	0	1	96
Rectum & Rectosigmoid	0	0	0	0	0	1	2	5	3	6	14	13	11	9	7	3	5	2	81
Anus, Anal Canal, Anorectum	0	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0	5
Liver	2	2	1	0	2	1	0	2	1	9	4	17	6	18	9	10	5	1	92
Gallbladder	0	0	0	0	0	0	0	0	1	0	3	1	1	1	1	0	0	1	9
Bile Ducts	0	0	0	0	0	0	0	0	1	2	1	3	1	0	0	1	0	0	9
Pancreas	0	1	0	0	0	1	1	1	2	5	7	8	5	10	10	5	3	0	59
Retropertoneum, Peritoneum	0	0	0	0	0	1	0	0	0	2	2	1	0	0	0	0	0	0	6
Nasal Cavity, Sinus, Ear	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	4
Larynx	0	0	0	0	0	0	0	0	1	3	2	1	7	3	2	1	0	0	21
Lungi/Bronchus	0	0	1	0	1	0	2	2	5	4	6	8	9	10	9	8	4	2	71
Pleura	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3
Other Respiratory & Thoracic	2	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	5
Leukemia	40	28	15	27	22	19	4	8	3	5	7	5	4	3	0	0	0	0	190
Myeloma	0	0	0	0	0	1	1	1	4	6	5	6	1	2	0	1	0	0	28
Other Hematopoietic	1	1	0	1	4	1	1	1	1	2	1	1	1	2	0	1	1	0	20
Bone	0	9	15	9	7	3	2	2	0	0	0	0	0	0	0	0	0	0	45
Soft Tissue	8	1	2	7	6	6	6	0	5	4	3	6	3	1	3	0	2	0	60
Melanoma of Skin	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3
Kaposi's Sarcoma	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	1	0	5
Other Skin CA	0	0	1	0	3	0	2	1	5	2	1	1	4	3	3	5	1	6	38
Breast	0	0	0	0	2	13	28	39	50	79	64	51	31	20	10	9	3	0	399
Cervix Uteri	0	0	0	0	0	0	6	4	5	8	2	3	2	1	1	0	0	0	32
Corpus Uteri	0	0	0	0	1	0	0	1	1	4	10	9	15	9	3	3	0	0	56
Uterus NOS	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
Ovary	0	0	2	0	2	3	2	3	2	2	8	8	3	3	1	1	1	1	42
Vulva	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Other Female Genital	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	4
Prostate	1	0	0	0	0	0	0	0	0	0	2	4	7	5	7	5	3	3	37
Testis	0	0	0	2	6	5	2	3	1	3	1	0	0	0	0	0	0	0	23
Bladder	1	0	0	1	0	0	2	5	3	6	6	6	13	6	10	5	4	1	64
Kidney and Renal Pelvis	10	0	0	3	0	5	0	5	7	5	9	5	9	3	3	6	3	0	74
Other Urinary	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Eye	17	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	20
Brain, CNS	19	9	6	2	4	6	2	5	7	4	6	6	2	2	0	2	0	0	78
Thyroid	0	0	4	12	16	27	28	34	33	26	19	15	6	6	5	2	0	0	233
Other Endocrine	8	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	12
Hodgkin's Lymphoma	0	3	14	17	19	9	10	3	2	2	2	1	0	0	2	1	0	0	85
Non-Hodgkin's Lymphoma	3	4	2	9	4	7	10	7	11	14	17	10	7	13	9	9	1	3	140
Unknown or ill-Defined	0	0	0	0	1	1	1	0	3	7	5	3	3	1	3	4	2	0	34
<b>TOTAL</b>	<b>113</b>	<b>61</b>	<b>68</b>	<b>100</b>	<b>107</b>	<b>113</b>	<b>129</b>	<b>145</b>	<b>184</b>	<b>254</b>	<b>254</b>	<b>227</b>	<b>195</b>	<b>164</b>	<b>126</b>	<b>104</b>	<b>44</b>	<b>37</b>	<b>2,425</b>

**TABLE 7  
ANALYTIC MALE CASES SEEN AT KFHS&RC BY SITE AND AGE  
2013**

SITE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
Oral Cavity	0	1	1	2	1	2	1	3	1	4	4	3	7	5	3	4	1	3	46
Nasopharynx	1	0	1	2	1	2	5	4	8	10	7	4	3	2	1	2	0	0	53
Esophagus	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	1	1	2	10
Stomach	0	0	0	0	0	0	2	1	2	3	3	5	7	5	2	0	0	1	36
Small Intestine	0	0	0	1	0	0	0	0	0	1	2	0	0	0	1	1	0	0	6
Colon	0	0	0	0	0	1	2	2	4	9	4	10	8	7	10	5	0	0	62
Rectum & Rectosigmoid	0	0	0	0	0	0	1	3	2	3	6	7	8	6	3	0	4	0	43
Anus, Anal Canal, Anorectum	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
Liver	2	1	0	0	0	0	1	0	2	3	2	11	5	12	6	8	4	0	57
Gallbladder	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	4
Bile Ducts	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
Pancreas	0	0	0	0	0	0	0	0	2	1	4	6	3	6	5	4	2	0	33
Retroperitoneum, Peritoneum	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	3
Nasal Cavity, Sinus, Ear	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Nasal Cavity, Sinus, Ear	0	0	0	0	0	0	0	0	1	3	2	0	7	3	1	1	1	0	19
Larynx	0	0	0	0	0	0	0	0	4	4	4	7	4	6	7	8	4	2	55
Lung / Bronchus	0	0	1	0	0	0	2	2	4	0	4	1	0	0	0	0	0	0	2
Pleura	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Other Respiratory & Thoracic	20	14	11	19	14	12	3	5	2	4	4	4	2	2	0	0	0	0	116
Leukemia	0	0	0	0	0	1	1	1	1	3	2	2	1	0	0	1	0	0	13
Myeloma	0	1	0	1	3	0	0	1	0	1	1	1	1	1	0	0	0	0	11
Other Hematopoietic	0	4	6	6	4	0	2	0	0	0	0	0	0	0	0	0	0	0	22
Bone	5	0	1	2	3	1	3	0	3	2	2	4	2	0	3	0	2	0	33
Soft Tissue	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2
Melanoma of Skin	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	1	0	5
Kaposi's Sarcoma	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	5
Breast	0	0	0	0	0	0	1	0	1	0	0	0	0	1	2	0	0	0	23
Other Skin Cancer	0	0	1	0	1	0	0	0	4	1	0	4	7	5	5	5	1	4	37
Prostate	1	0	0	0	0	0	0	0	0	0	2	4	7	5	7	5	3	3	23
Testis	0	0	0	2	6	5	2	3	1	3	1	0	0	0	0	0	0	0	0
Penis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Male Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bladder	1	0	0	0	0	0	2	0	1	3	6	6	11	6	9	5	2	1	53
Kidney & Renal Pelvis	8	0	0	1	0	4	1	3	2	5	5	5	6	3	2	5	2	0	52
Other Urinary	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Eye	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Brain, CNS	14	4	2	2	1	4	1	3	3	2	4	1	2	1	0	2	0	0	46
Thyroid	0	0	1	2	2	6	4	6	7	3	4	3	2	1	1	1	0	0	43
Other Endocrine	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Hodgkin's Lymphoma	0	2	11	11	11	5	5	1	1	1	2	1	0	0	2	1	0	0	54
Non-Hodgkin's Lymphoma	3	4	0	6	3	4	5	4	8	8	10	7	3	5	4	7	1	2	84
Unknown or ill-Defined	0	0	0	0	1	0	1	0	2	4	3	2	2	1	0	2	1	0	19
<b>TOTAL</b>	<b>67</b>	<b>31</b>	<b>37</b>	<b>57</b>	<b>53</b>	<b>48</b>	<b>45</b>	<b>44</b>	<b>64</b>	<b>84</b>	<b>87</b>	<b>100</b>	<b>96</b>	<b>83</b>	<b>75</b>	<b>70</b>	<b>30</b>	<b>20</b>	<b>1,091</b>



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TABLE 8  
ANALYTIC FEMALE CASES SEEN AT KFSSH&RC BY SITE AND AGE  
2013

SITE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
Oral cavity	0	0	0	0	2	3	0	1	4	3	2	2	7	5	3	1	2	4	39
Nasopharynx	0	0	0	4	1	0	0	2	0	0	2	0	2	0	1	0	0	0	12
Esophagus	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	0	2	10
Stomach	0	0	0	0	0	0	2	1	0	3	7	1	1	2	1	2	0	1	21
Small Intestine	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3
Colon	0	0	1	0	0	0	2	1	2	7	7	5	5	2	0	1	0	1	34
Rectum & Rectosigmoid	0	0	0	0	0	1	1	2	1	3	8	6	3	3	4	3	1	2	38
Anus, Anal Canal, Anorectum	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3
Liver	0	1	1	0	2	1	0	0	0	6	2	6	1	6	3	2	1	1	35
Gallbladder	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	0	0	5
Bile Ducts	0	0	0	0	0	0	0	0	1	1	1	2	1	0	0	1	0	0	7
Pancreas	0	1	0	0	0	1	1	1	0	4	3	2	2	4	5	1	1	0	26
Retropitoneum, Peritoneum	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	3
Nasal Cavity, Sinus, Ear	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Larynx	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Lung / Bronchus	0	0	0	0	1	0	0	0	1	0	2	1	5	4	2	0	0	0	16
Pleura	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Other Respiratory & Thoracic	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Leukemia	20	14	4	8	8	6	1	3	2	1	3	1	2	1	0	0	0	0	74
Myeloma	0	0	0	0	0	0	0	0	3	3	3	4	0	2	0	0	0	0	15
Other Hematopoietic	1	0	0	0	1	2	1	0	0	1	0	0	0	1	0	1	0	0	9
Bone	0	5	9	3	3	0	0	2	0	0	0	0	1	0	0	0	0	0	23
Soft Tissue	3	1	1	5	3	2	3	0	2	0	1	2	1	1	0	0	0	0	25
Melanoma of Skin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Kaposi's Sarcoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Skin cancer	0	0	0	0	2	0	2	0	1	1	1	1	2	1	2	0	0	2	15
Breast	0	0	0	0	2	13	27	39	49	79	64	51	31	19	8	9	3	0	394
Cervix Uteri	0	0	0	0	0	0	6	4	5	8	2	3	2	1	1	1	0	0	32
Corpus Uteri	0	0	0	0	1	0	0	1	1	4	10	9	15	9	3	3	0	0	56
Uterus, NOS	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
Ovary	0	0	2	0	2	3	2	3	2	2	8	8	3	3	1	1	1	1	42
Vulva	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Other Female Genital	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	4
Bladder	0	0	0	0	0	0	0	0	2	3	0	0	2	0	1	0	2	0	11
Kidney & Renal Pelvis	2	0	0	2	0	1	0	0	5	0	4	0	3	0	1	1	1	0	22
Other Urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eye	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Brain, CNS	5	5	4	0	3	2	1	2	4	1	2	1	0	1	0	0	0	1	32
Thyroid	0	0	3	10	14	21	24	28	26	23	15	12	4	5	4	1	0	0	190
Other Endocrine	5	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	8
Hodgkin's Lymphoma	0	1	3	6	8	4	5	2	1	1	0	0	0	0	0	0	0	0	31
Non-Hodgkin's Lymphoma	0	0	2	3	1	3	5	3	3	6	7	3	4	8	5	2	0	1	56
Unknown or ill-Defined	0	0	0	0	0	1	0	0	1	3	2	1	1	0	3	2	1	0	15
<b>TOTAL</b>	<b>46</b>	<b>30</b>	<b>31</b>	<b>43</b>	<b>54</b>	<b>65</b>	<b>84</b>	<b>101</b>	<b>120</b>	<b>170</b>	<b>167</b>	<b>127</b>	<b>99</b>	<b>81</b>	<b>51</b>	<b>34</b>	<b>14</b>	<b>17</b>	<b>1,334</b>

## TRENDS IN RELATIVE FREQUENCY OF CANCER AT KFSH&RC (cont'd)

The crude relative frequencies of primary cancers seen at KFSH&RC are very different from the Western world. Common tumors of the West (Lung, Colon, and Prostate) are much less frequent here while Leukemia, Lymphoma and Thyroid cancers are more common. The following 2013 analytic cases, which show a quite similar pattern with the data from the Saudi Cancer Registry (SCR), exhibit significant differences in trends from those of the U.S.A when compared to the data published in Cancer Facts & Figures - 2013, by the American Cancer Society:

**TABLE 9**  
**COMPARATIVE DATA - KFSH&RC vs SCR vs USA**  
**(% TO TOTAL CANCER CASES)**

SITE	KFSH&RC 2013 Analytics	SCR 2010 Saudis	USA 2013 Estimates
Breast	16.5%	15.0%	14.1%
Thyroid	9.6%	7.0%	3.6%
Leukemia	7.8%	6.2%	3.0%
Colon, Rectum	7.3%	10.4%	8.6%
Non-Hodgkin's Lymphoma	5.8%	7.1%	4.2%
Liver	3.8%	4.8%	1.8%
Hodgkin's Lymphoma	3.5%	3.4%	0.6%
Oral Cavity	3.5%	2.9%	2.5%
Brain	3.2%	3.2%	1.4%
Kidney & Renal Pelvis	3.0%	2.8%	4.0%
Lung/Bronchus	2.9%	4.0%	13.7%
Prostate	1.5%	6.1%	14%

**Breast** - The most common malignancy seen at KFSH&RC is breast cancer, comprising 16.5% of all cases, as compared to 14.1% of all neoplasms diagnosed in the U.S.A. It affects mostly women under the age of 50, while in the U.S.A., those more than 50 years of age are most frequently affected. As in the Western countries, it is the number one cancer among women.

**Thyroid** – 9.6% of all malignancies in KFSH&RC are thyroid cancer, much higher than in the West. It represents 13.4% of female malignant neoplasms, second to breast cancer. The male/female ratio is 0.23:1. Thyroid cancer accounts for only 3.6% of all cases in the U.S.A., and 2.7% of female malignancies.

**Leukemia** - The most striking feature is the high crude relative frequency of leukemia cases, constituting 7.8% of all cases seen at KFSH&RC, as compared to 3.0% of all neoplasms diagnosed in the U.S.A. The male/female ratio is 1.56:1. It is the second most common malignancy seen in males and third most common malignancy in females. It is also the most common malignancy among pediatric cases.

**Colon, Rectum** - Less common than in the West, this disease represents only 7.3% of all cancer cases. In the U.S.A., it constitutes 8.6% of newly diagnosed cancer cases. Dietary factors, particularly lower animal fat intake, may play a role. The male/female ratio at KFSH&RC is 1.45:1

**Non-Hodgkin's Lymphoma** - Cases of Non-Hodgkin's lymphoma account for 5.8% of all cases. The male/female ratio is 1.5:1. In the U.S.A., NHL accounts for only 4.2% of all cancers.

**Liver** – The relative frequency of Liver cases at KFSH&RC (3.8%) is about three times higher than that of the West 1.8%. The male/female ratio is 1.62:1 at KFSH&RC and 2.89:1 in the West.

**Hodgkin’s Lymphoma** - The incidence of Hodgkin’s lymphoma is comparatively more frequent at KFSH&RC than in Western countries. In the U.S.A., it constitutes 0.6% of all cancers, compared to 3.5% at KFSH&RC. The male/female ratio is 1.7:1.

**Oral Cavity** – A crude relative frequency rate was also noted in cancer of Oral Cavity. In Western countries, oral cancer accounts 2.5% of all cancers, whereas at KFSH&RC represents 3.5% of the cases. The male/female ratio is 1.18:1.

**Brain, CNS** - Primary malignant neoplasms of the brain and CNS account for 3.2% of all malignancies and rank second most common pediatric malignancies. The male/female ratio is 1.4:1. This is much higher than in the U.S.A., with only 1.4% of all cases.

**Kidney & Renal Pelvis** – Western countries cases show higher rate of Kidney & Renal Pelvis malignancies than that of KFSH&RC cases, with 4.0% against 3.0%. The female/male ratio is 2.36:1 at KFSH&RC and male/female ratio is 1.63:1 in the West.

**Lung** - Frequency of lung cancer at KFSH&RC is much lower than in Western countries, most likely reflecting the significantly lower levels of smoking and industrial pollution. In the U.S.A., primary lung cancer represents 13.7% of all cancer cases (7.1% in males, and 6.6% in females). At KFSH&RC, 2.9% of all cancer diagnoses are lung cancers, 5.0% of male malignancies and 1.2% of females. The male/female ratio is 3.4:1 compared to 1.07:1 in the U.S.A.

**FIGURE 10**  
**DISTRIBUTION OF 20 MOST COMMON MALIGNANCIES**  
**2013 ANALYTIC CASES (TOTAL CASES = 2,425)**

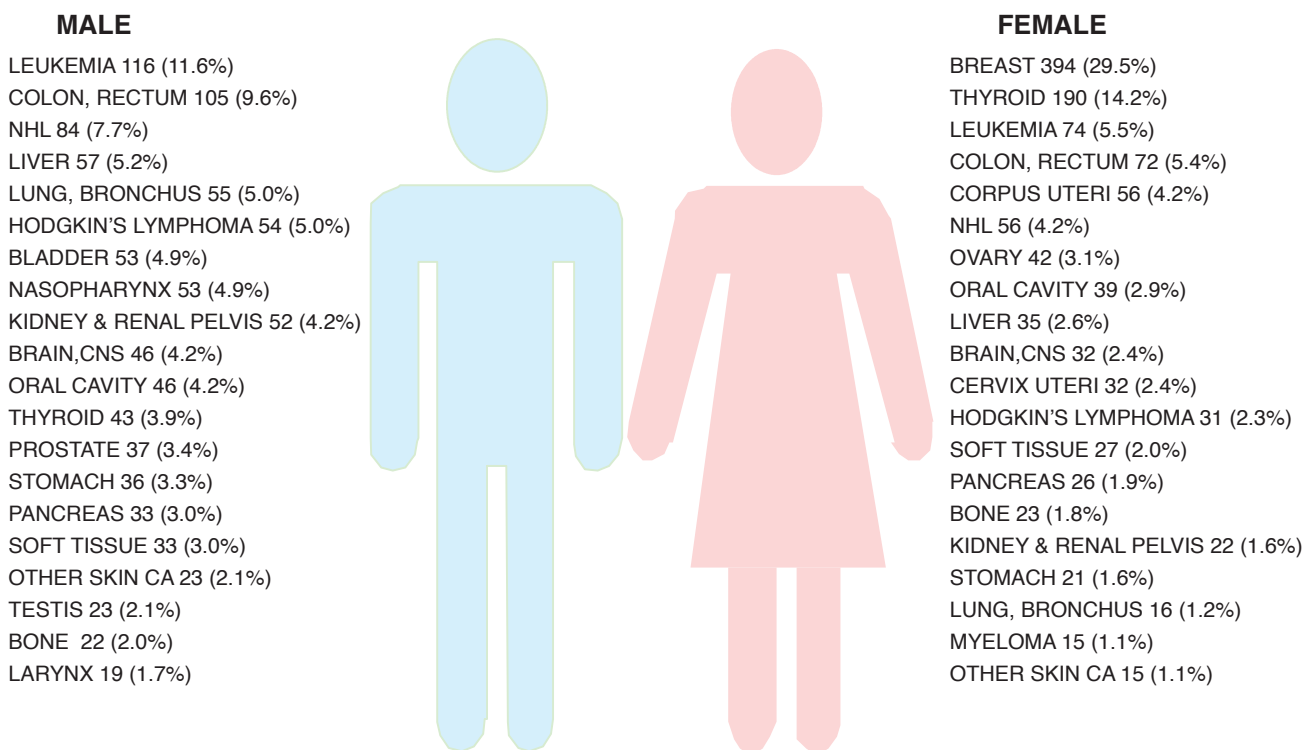


FIGURE 11

**DISTRIBUTION OF PEDIATRIC MALIGNANCIES  
2013 ANALYTIC CASES (TOTAL CASES = 242)**

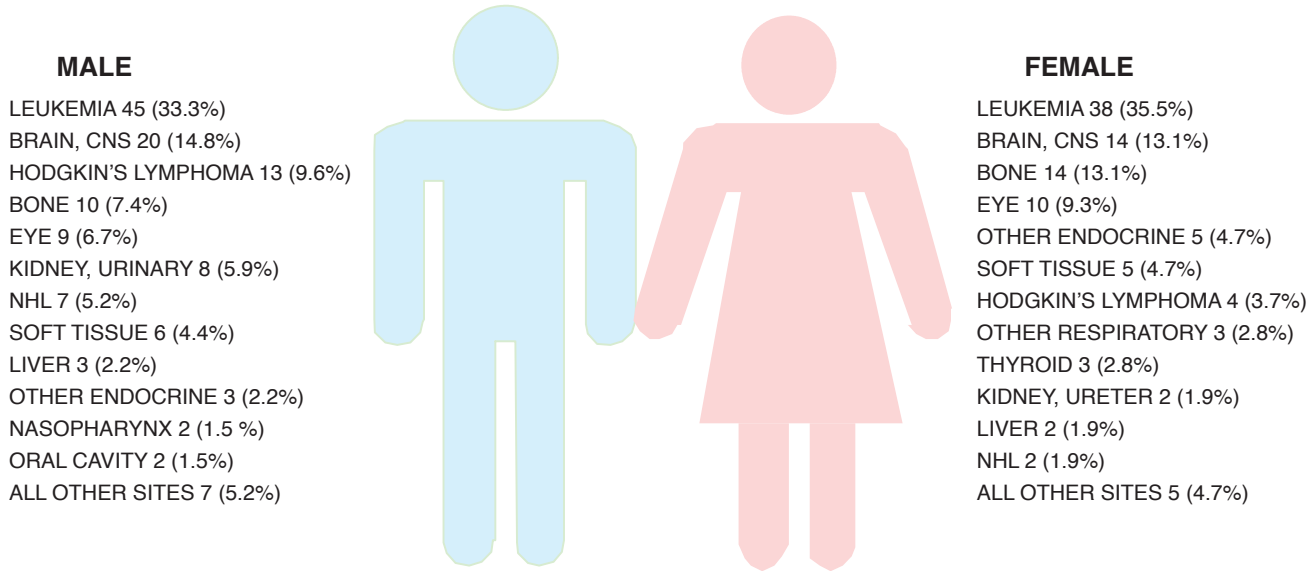
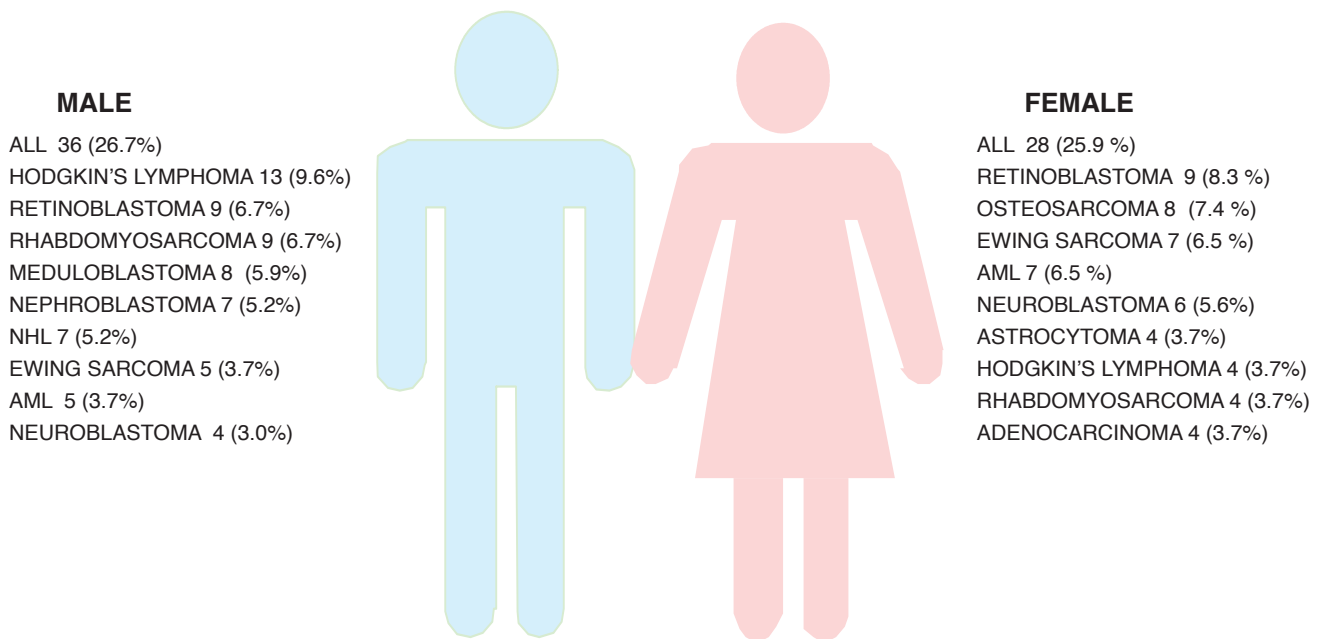


FIGURE 12

**DISTRIBUTION OF 10 MOST COMMON PEDIATRIC MALIGNANCIES BY HISTOLOGY  
2013 ANALYTIC CASES (TOTAL CASES = 242)**



**TABLE 10**  
**PRIMARY SITE TABLE**  
**(INCLUDES MULTIPLE PRIMARIES)**  
**2 0 1 3**

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES 2,691	ADULTS		PEDIATRICS	
			MALE 1,067	FEMALE 1,339	MALE 164	FEMALE 121
<b>LIP</b>		<b>8</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	7	4	3	0	0
	Squamous Cell Carcinoma Microinvasive	1	1	0	0	0
<b>TONGUE</b>		<b>24</b>	<b>15</b>	<b>9</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	23	15	8	0	0
	Squamous Cell Carcinoma Microinvasive	1	0	1	0	0
<b>GUM</b>		<b>10</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	10	5	5	0	0
<b>FLOOR OF MOUTH</b>		<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	2	2	0	0	0
	Squamous Cell Carcinoma In Situ	1	1	0	0	0
<b>OTHER PARTS OF MOUTH</b>		<b>21</b>	<b>9</b>	<b>11</b>	<b>1</b>	<b>0</b>
	Squamous Cell Carcinoma	14	8	6	0	0
	Squamous Cell Carcinoma Keratinizing	1	0	1	0	0
	Adenosquamous Carcinoma	1	1	0	0	0
	Verrucous Carcinoma	1	0	1	0	0
	Adenoid Cystic Carcinoma	1	0	1	0	0
	Carcinoma Undifferentiated	1	0	0	1	0
	Secretory Carcinoma of Breast	1	0	1	0	0
	Polymorphous Low Grade Adenocarcinoma	1	0	1	0	0
<b>SALIVARY GLANDS, MAJOR</b>		<b>12</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>0</b>
	Mucoepidermoid Carcinoma	3	1	2	0	0
	Acinar Cell Carcinoma	2	1	1	0	0
	Adenoid Cystic Carcinoma	1	1	0	0	0
	Carcinoma NOS	1	0	1	0	0
	Carcinoma in Pleomorphic Adenoma	1	1	0	0	0
	Small Cell Carcinoma	1	1	0	0	0
	Secretory Carcinoma of Breast	1	1	0	0	0
	Oxyphilic Adenocarcinoma	1	1	0	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	1	0
<b>TONSIL</b>		<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	2	1	1	0	0
<b>NASOPHARYNX</b>		<b>71</b>	<b>56</b>	<b>12</b>	<b>3</b>	<b>0</b>
	Non-Keratinizing Carcinoma	60	50	9	1	0
	Carcinoma Undifferentiated	7	5	2	0	0
	Squamous Cell Carcinoma Keratinizing	1	1	0	0	0
	Carcinoma NOS	1	0	1	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	1	0
	Squamous Cell Carcinoma	1	0	0	1	0
<b>HYPOPHARYNX</b>		<b>9</b>	<b>2</b>	<b>7</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	8	2	6	0	0
	Carcinoma NOS	1	0	1	0	0
<b>ESOPHAGUS</b>		<b>21</b>	<b>11</b>	<b>10</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	14	6	8	0	0
	Adenocarcinoma NOS	3	3	0	0	0
	Adenocarcinoma with Mixed Subtypes	1	1	0	0	0
	Carcinoma	1	1	0	0	0

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
	Squamous Cell Carcinoma Spindle Cell	1	0	1	0	0
	Small Cell Carcinoma	1	0	1	0	0
<b>STOMACH</b>		<b>63</b>	<b>40</b>	<b>23</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	22	15	7	0	0
	Signet Ring Cell Carcinoma	19	10	9	0	0
	Adenocarcinoma Intestinal Type	8	5	3	0	0
	Gastrointestinal Stromal Sarcoma	5	3	2	0	0
	Carcinoma Diffuse Type	3	3	0	0	0
	Neuroendocrine Carcinoma	2	1	1	0	0
	Adenocarcinoma with Mixed Subtypes	1	1	0	0	0
	B Lymphoblastic Leukemia/Lymphoma	1	1	0	0	0
	Carcinoma In Situ	1	0	1	0	0
	Squamous Cell Carcinoma	1	1	0	0	0
<b>SMALL INTESTINE</b>		<b>11</b>	<b>7</b>	<b>4</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	6	5	1	0	0
	Neuroendocrine Carcinoma	2	1	1	0	0
	Mucinous Adenocarcinoma	1	1	0	0	0
	Gastrointestinal Stromal Sarcoma	1	0	1	0	0
	Leiomyosarcoma	1	0	1	0	0
<b>COLON</b>		<b>118</b>	<b>70</b>	<b>46</b>	<b>0</b>	<b>2</b>
	Adenocarcinoma NOS	90	55	34	0	1
	Mucinous Adenocarcinoma	17	10	7	0	0
	Neuroendocrine Carcinoma	3	1	1	0	1
	Carcinoma NOS	2	2	0	0	0
	Signet Ring Cell Carcinoma	2	0	2	0	0
	Carcinoid Tumor NOS(Except of Appendix)	1	1	0	0	0
	Composite Carcinoid	1	1	0	0	0
	Goblet Cell Carcinoid	1	0	1	0	0
	Papillary Adenocarcinoma	1	0	1	0	0
<b>RECTOSIGMOID JUNCTION</b>		<b>21</b>	<b>10</b>	<b>11</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	17	8	9	0	0
	Mucinous Carcinoma	2	1	1	0	0
	Signet Ring Cell Carcinoma	2	1	1	0	0
<b>RECTUM</b>		<b>70</b>	<b>40</b>	<b>30</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	63	34	29	0	0
	Mucinous Adenocarcinoma	3	3	0	0	0
	Carcinoma NOS	2	2	0	0	0
	Neuroendocrine Carcinoma	2	1	1	0	0
<b>ANUS, ANAL CANAL, ANORECTUM</b>		<b>5</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	3	1	2	0	0
	Squamous Cell Carcinoma Keratinizing	1	1	0	0	0
	Mucinous Adenocarcinoma	1	0	1	0	0
<b>LIVER, INTRAHEPATIC BILE DUCT</b>		<b>95</b>	<b>56</b>	<b>34</b>	<b>3</b>	<b>2</b>
	Hepatocellular Carcinoma	71	43	27	0	1
	Cholangiocarcinoma	10	6	4	0	0
	Adenocarcinoma NOS	5	4	1	0	0
	Embryonal Sarcoma	2	0	0	1	1
	Hepatoblastoma	2	0	0	2	0
	Hepatocellular Carcinoma Clear Cell Type	1	1	0	0	0
	Combined Hepatocellular Carcinoma and Cholangiocarcinoma	1	1	0	0	0
	Hepatocellular Carcinoma Spindle Cell Variant	1	1	0	0	0
	Epithelioid Hemangioendothelioma	1	0	1	0	0
	Malignant	1	0	1	0	0
	Hepatocellular Carcinoma Fibrolamellar	1	0	1	0	0

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
<b>GALLBLADDER,EXTRAHEPATIC BILE DUCT</b>		<b>11</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	7	3	4	0	0
	Carcinoma NOS	2	2	0	0	0
	Papillary Adenocarcinoma	1	1	0	0	0
	Mucinous Adenocarcinoma	1	0	1	0	0
<b>PANCREAS</b>		<b>61</b>	<b>34</b>	<b>26</b>	<b>0</b>	<b>1</b>
	Adenocarcinoma NOS	50	29	21	0	0
	Neuroendocrine Carcinoma	4	0	4	0	0
	Carcinoma NOS	2	2	0	0	0
	Infiltrating Duct Carcinoma	3	3	0	0	0
	Pancreatoblastoma	1	0	0	0	1
	Signet Ring Cell Carcinoma	1	0	1	0	0
<b>BILE DUCTS</b>		<b>9</b>	<b>2</b>	<b>7</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	6	2	4	0	0
	Cholangiocarcinoma	3	0	3	0	0
<b>NASAL CAVITY, MIDDLE EAR</b>		<b>4</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>
	Adenoid Cystic Carcinoma	2	0	2	0	0
	Adenocarcinoma NOS	1	1	0	0	0
	Small Cell Carcinoma	1	0	1	0	0
<b>LARYNX</b>		<b>21</b>	<b>19</b>	<b>2</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	20	18	2	0	0
	Squamous Cell Carcinoma Keratinizing	1	1	0	0	0
<b>LUNG, BRONCHUS</b>		<b>81</b>	<b>61</b>	<b>19</b>	<b>1</b>	<b>0</b>
	Adenocarcinoma NOS	34	26	8	0	0
	Squamous Cell Carcinoma	16	14	2	0	0
	Small Cell Carcinoma	11	10	1	0	0
	Non-Small Cell Carcinoma	5	3	2	0	0
	Carcinoma NOS	3	1	2	0	0
	Carcinoid	2	1	1	0	0
	Neoplasm Malignant	2	1	1	0	0
	Mucinous Adenocarcinoma	2	1	1	0	0
	Giant Cell Carcinoma	2	2	0	0	0
	Adenosquamous Carcinoma	1	1	0	0	0
	Large Cell Carcinoma	1	1	0	0	0
	Solid Carcinoma	1	0	1	0	0
	Mucoepidermoid Carcinoma	1	0	0	1	0
<b>PLEURA</b>		<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>
	Epithelioid Mesothelioma Malignant	2	1	1	0	0
	Rhabdomyosarcoma	1	0	0	1	0
<b>MEDIASTINUM</b>		<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>
	Neuroblastoma	2	0	0	0	2
	Yolk Sac Tumor	1	1	0	0	0
	Ewing Sarcoma	1	0	0	0	1
<b>HEART</b>		<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
	Undifferentiated Sarcoma	1	0	1	0	0
<b>BONE, JOINTS, CARTILAGE</b>		<b>49</b>	<b>14</b>	<b>10</b>	<b>11</b>	<b>14</b>
	Osteosarcoma	15	4	4	2	5
	Ewing Sarcoma	12	3	0	5	4
	Peripheral Neuroectodermal Tumor	5	1	0	2	2
	Telangiectatic Osteosarcoma	3	1	0	1	1
	Chondrosarcoma	3	1	2	0	0
	Chondroblastic Osteosarcoma	2	0	0	0	2
	Spindle Cell Sarcoma	2	1	1	0	0
	Chordoma	1	1	0	0	0

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
	Fibroblastic Osteosarcoma	1	1	0	0	0
	Giant Cell Sarcoma	1	1	0	0	0
	Clear Cell Sarcoma	1	0	1	0	0
	Alveolar Rhabdomyosarcoma	1	0	1	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	1	0
	Giant Cell Tumor of Bone Malignant	1	0	1	0	0
<b>BONE MARROW</b>		<b>231</b>	<b>80</b>	<b>43</b>	<b>62</b>	<b>46</b>
	B Lymphoblastic Leukemia/Lymphoma	98	25	15	30	28
	Acute Myeloid Leukemia	32	14	6	6	6
	Pre T-Cell Lymphoblastic Leukemia	22	12	2	7	1
	Precursor B-Cell Lymphoblastic Leukemia	14	1	0	8	5
	Chronic Myeloid Leukemia	13	7	5	1	0
	B-Cell Chronic Lymphocytic Leukemia / SLL	11	8	3	0	0
	Acute Myelomonocytic Leukemia	5	1	2	2	0
	Mixed Phenotype Acute Leukemia T/Myeloid	5	3	1	1	0
	Acute Monocytic Leukemia	3	1	1	0	1
	Chronic Myelogenous Leukemia BCR/ABL Positive	3	2	1	0	0
	Acute Promyelocytic Leukemia t(15;17)	2	1	1	0	0
	Acute Myeloid Leukemia with Maturation	2	2	0	0	0
	Hypereosinophilic Syndrome	2	0	1	0	1
	Acute Megakaryoblastic Leukemia	2	0	0	1	1
	Acute Myeloid Leukemia with Abnormal Eosinophils	2	1	0	0	1
	B-LL / Lymphoma with t(12;21)(p13;q22); TEL-AML 1	2	0	0	2	0
	Mixed Phenotype Acute Leukemia with t(9;22) BCR-ABL 1	2	0	1	1	0
	Mixed Phenotype Acute Leukemia B / Myeloid	1	0	0	0	1
	Acute Leukemia	1	0	0	1	0
	Juvenile Myelomonocytic Leukemia	1	0	0	0	1
	Therapy-Related Acute Myeloid Leukemia	1	1	0	0	0
	Acute Myeloid Leukemia M6 Type	1	1	0	0	0
	Acute Myeloid Leukemia with Minimal Differentiation	1	0	0	1	0
	Myeloid Leukemia associated with Down Syndrome	1	0	0	1	0
	B-LL / Lymphoma with Hyperdiploidy	1	1	0	0	0
	B-LL / Lymphoma with t(9;22)(q43;q11-2); BCR-ABL 1	1	0	1	0	0
	B-LL / Lymphoma w/ t(1;19)(q23;p13.3); E2A PBX 1	1	0	1	0	0
	Hairy Cell Leukemia	1	0	1	0	0
<b>MULTIPLE MYELOMA</b>		<b>29</b>	<b>13</b>	<b>16</b>	<b>0</b>	<b>0</b>
	Multiple Myeloma	29	13	16	0	0
<b>OTHER HEMATOPOIETIC</b>		<b>21</b>	<b>10</b>	<b>8</b>	<b>2</b>	<b>1</b>
	Langerhans Cell Histiocytosis NOS	5	2	0	2	1
	Myelodysplastic Syndrome NOS	4	2	2	0	0
	Refractory Anemia with Excess Blasts	4	2	2	0	0
	Essential Thrombocytopenia	3	0	3	0	0
	Myelodysplastic / MPN Unclassifiable	2	1	1	0	0
	Myelosclerosis with Myeloid Metaplasia	2	2	0	0	0
	Polymorphic PTLD	1	1	0	0	0



SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
<b>SKIN (MELANOMA)</b>		<b>4</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>
	Malignant Melanoma (Except Juvenile Melanoma)	3	1	2	0	0
	Melanoma Nodular	1	1	0	0	0
<b>SKIN (NON MELANOMA)</b>		<b>47</b>	<b>30</b>	<b>16</b>	<b>1</b>	<b>0</b>
	Squamous Cell Carcinoma	12	8	4	0	0
	Basal Cell Carcinoma Nodular	10	4	5	1	0
	Basal Cell Carcinoma	7	5	2	0	0
	Dermatofibrosarcoma	5	2	3	0	0
	Kaposi's Sarcoma	5	5	0	0	0
	Squamous Cell Carcinoma In Situ	2	2	0	0	0
	Verrucous Carcinoma	1	1	0	0	0
	Basosquamous Carcinoma	1	1	0	0	0
	Multifocal Superficial Basal Cell Ca	1	1	0	0	0
	Basaloid Squamous Cell Carcinoma	1	0	1	0	0
	Hemangiosarcoma	1	1	0	0	0
	Infiltrating Basal Cell Carcinoma	1	0	1	0	0
<b>RETROPERITONEUM, PERITONEUM</b>		<b>8</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>0</b>
	Serous Cystadenocarcinoma	2	0	2	0	0
	Liposarcoma	1	1	0	0	0
	Gastrointestinal Stromal Sarcoma	1	1	0	0	0
	Leiomyosarcoma	1	0	1	0	0
	Sarcoma	1	1	0	0	0
	Neuroblastoma	1	1	0	0	0
	Malignant Peripheral Nerve Sheath Tumor	1	0	0	1	0
<b>CONNECTIVE, SUBCUTANEOUS, SOFT TISSUES</b>		<b>72</b>	<b>33</b>	<b>25</b>	<b>8</b>	<b>6</b>
	Ewing Sarcoma	9	1	6	0	2
	Peripheral Neuroectodermal Tumor	7	2	3	2	0
	Rhabdomyosarcoma	6	1	0	3	2
	Spindle Cell Sarcoma	5	3	2	0	0
	Dermatofibrosarcoma	5	3	2	0	0
	Myxoid Liposarcoma	4	1	3	0	0
	Giant Cell Sarcoma (Except of Bone)	4	3	1	0	0
	Synovial Sarcoma	3	3	0	0	0
	Undifferentiated Sarcoma	3	2	1	0	0
	Malignant Peripheral Nerve Sheath Tumor	3	1	1	0	1
	Sarcoma NOS	3	2	1	0	0
	Neuroblastoma	2	0	0	1	1
	Embryonal Rhabdomyosarcoma	2	0	0	1	1
	Desmoplastic Small Round Cell Tumor	2	1	1	0	0
	Clear Cell Sarcoma	2	1	1	0	0
	Alveolar Soft Part Sarcoma	1	1	0	0	0
	Epithelioid Sarcoma	1	0	1	0	0
	Fibromyxosarcoma	1	1	0	0	0
	Myxoid Chondrosarcoma	1	1	0	0	0
	Leiomyosarcoma	1	0	1	0	0
	Osteosarcoma NOS	1	1	0	0	0
	Carcinoid Tumor NOS (Except of Bone)	1	1	0	0	0
	Liposarcoma NOS	1	1	0	0	0
	Mesenchymal Malignant	1	1	0	0	0
	Round Cell Liposarcoma	1	1	0	0	0
	Chordoma	1	1	0	0	0
	Hemangiopericytoma Malignant	1	0	1	0	0
<b>BREAST</b>		<b>429</b>	<b>5</b>	<b>424</b>	<b>0</b>	<b>0</b>
	Infiltrating Duct Carcinoma	360	5	355	0	0
	Lobular Carcinoma	26	0	26	0	0

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
	Intraductal Carcinoma Noninfiltrating Carcinoma NOS	9	0	9	0	0
	Infiltrating Lobular Mixed with Other Types of Carcinoma	4	0	4	0	0
	Infiltrating Duct and Lobular Carcinoma	4	0	4	0	0
	Infiltrating Duct Mixed with Other Types of Carcinoma	4	0	4	0	0
	Metaplastic Carcinoma	2	0	2	0	0
	Phyllodes Tumor Malignant	2	0	2	0	0
	DCIS and Mixed with Other In situ	2	0	2	0	0
	Tubular Adenocarcinoma	1	0	1	0	0
	Lobular Carcinoma In Situ	1	0	1	0	0
	Paget's Disease Mammary	1	0	1	0	0
	Cribriform Carcinoma In Situ	1	0	1	0	0
	Hemangiosarcoma	1	0	1	0	0
	Secretory Carcinoma of Breast	1	0	1	0	0
	Intracystic Carcinoma	1	0	1	0	0
<b>VULVA</b>		<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
	Squamous Cell Carcinoma	1	0	1	0	0
	Squamous Cell Carcinoma Keratinizing	1	0	1	0	0
<b>CERVIX UTERI</b>		<b>35</b>	<b>0</b>	<b>35</b>	<b>0</b>	<b>0</b>
	Non-Keratinizing Carcinoma	11	0	11	0	0
	Squamous Cell Carcinoma NOS	9	0	9	0	0
	Squamous Intraepithelial Neoplasia Grade III	4	0	4	0	0
	Adenocarcinoma	2	0	2	0	0
	Adenocarcinoma Endocervical Type	1	0	1	0	0
	Small Cell Carcinoma	1	0	1	0	0
	Squamous Cell Carcinoma Keratinizing	1	0	1	0	0
	Squamous Cell Carcinoma Clear Cell Type	1	0	1	0	0
	Mucinous Adenocarcinoma	1	0	1	0	0
	Trophoblastic Tumor Epithelioid	1	0	1	0	0
	Mucinous Adenocarcinoma Endocervical	1	0	1	0	0
	Serous Cystadenocarcinoma	1	0	1	0	0
<b>CORPUS UTERI</b>		<b>58</b>	<b>0</b>	<b>58</b>	<b>0</b>	<b>0</b>
	Endometrioid Adenocarcinoma	36	0	36	0	0
	Carcinosarcoma	6	0	6	0	0
	Serous Cystadenocarcinoma	4	0	4	0	0
	Mixed Cell Adenocarcinoma	3	0	3	0	0
	Clear Cell Adenocarcinoma	2	0	2	0	0
	Endometrial Stromal Sarcoma	2	0	2	0	0
	Adenocarcinoma	1	0	1	0	0
	Adenosarcoma	1	0	1	0	0
	Carcinoma Undifferentiated	1	0	1	0	0
	Endometrioid Adenoca Secretory Variant	1	0	1	0	0
	Papillary Serous Cystadenocarcinoma	1	0	1	0	0
<b>UTERUS, NOS</b>		<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>
	Carcinosarcoma	2	0	2	0	0
	Leiomyosarcoma	2	0	2	0	0
<b>OVARY</b>		<b>49</b>	<b>0</b>	<b>47</b>	<b>0</b>	<b>2</b>
	Serous Cystadenocarcinoma	19	0	19	0	0
	Papillary Serous Cystadenocarcinoma	5	0	5	0	0
	Mucinous Adenocarcinoma	5	0	5	0	0
	Adenocarcinoma	4	0	4	0	0
	Carcinoma	2	0	2	0	0
	Clear Cell Adenocarcinoma	2	0	2	0	0

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
	Mucinous Cystadenocarcinoma	2	0	2	0	0
	Endometrioid Adenocarcinoma	2	0	2	0	0
	Neoplasm Malignant	1	0	1	0	0
	Struma Ovarii Malignant	1	0	1	0	0
	Serous Surface Papillary Carcinoma	1	0	1	0	0
	Dysgerminoma	1	0	1	0	0
	Germinoma	1	0	0	0	1
	Mullerian Mixed Tumor	1	0	1	0	0
	Yolk Sac Tumor	1	0	1	0	0
	Mixed Germ Cell Tumor	1	0	0	0	1
<b>FALLOPIAN TUBE</b>		<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
	Papillary Serous Cystadenocarcinoma	1	0	1	0	0
<b>PLACENTA</b>		<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>
	Choriocarcinoma	3	0	3	0	0
<b>PROSTATE</b>		<b>41</b>	<b>40</b>	<b>0</b>	<b>1</b>	<b>0</b>
	Adenocarcinoma NOS	34	34	0	0	0
	Carcinoma NOS	6	6	0	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	1	0
<b>TESTIS</b>		<b>27</b>	<b>26</b>	<b>0</b>	<b>1</b>	<b>0</b>
	Seminoma	15	15	0	0	0
	Mixed Germ Cell Tumor	8	8	0	0	0
	Leiomyosarcoma	1	1	0	0	0
	Rhabdomyosarcoma	1	1	0	0	0
	Teratoma Malignant	1	1	0	0	0
	Yolk Sac Tumor	1	0	0	1	0
<b>KIDNEY</b>		<b>77</b>	<b>45</b>	<b>20</b>	<b>8</b>	<b>4</b>
	Clear Cell Adenocarcinoma	29	19	10	0	0
	Renal Cell Carcinoma	15	12	3	0	0
	Nephroblastoma	11	0	0	7	4
	Renal Cell Carcinoma Chromophobe Type	8	4	4	0	0
	Papillary Adenocarcinoma	7	6	1	0	0
	Renal Cell Carcinoma Sarcomatoid	1	1	0	0	0
	Transitional Cell Carcinoma	1	1	0	0	0
	Transitional Cell Carcinoma In Situ	1	1	0	0	0
	Papillary Transitional Cell Carcinoma	1	1	0	0	0
	Peripheral Neuroectodermal Tumor	1	0	1	0	0
	Carcinoma NOS	1	0	1	0	0
	Clear Cell Sarcoma of Kidney	1	0	0	1	0
<b>URINARY BLADDER</b>		<b>77</b>	<b>63</b>	<b>13</b>	<b>1</b>	<b>0</b>
	Papillary Transitional Cell Carcinoma	40	36	4	0	0
	Transitional Cell Carcinoma Non-Invasive	20	17	3	0	0
	Transitional Cell Carcinoma	11	8	3	0	0
	Squamous Cell Carcinoma	3	1	2	0	0
	Carcinosarcoma	1	1	0	0	0
	Malignant Rhabdoid Tumor	1	0	1	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	0	1
<b>OTHER, UNSPECIFIED URINARY ORGAN</b>		<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
	Papillary Transitional Cell Carcinoma	1	1	0	0	0
<b>EYE, ADNEXA</b>		<b>22</b>	<b>2</b>	<b>0</b>	<b>9</b>	<b>11</b>
	Retinoblastoma	14	0	0	6	8
	Retinoblastoma Undifferentiated	5	0	0	3	2
	Carcinoma NOS	2	2	0	0	0
	Embryonal Rhabdomyosarcoma	1	0	0	0	1

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
<b>BRAIN</b>		<b>85</b>	<b>30</b>	<b>20</b>	<b>21</b>	<b>14</b>
	Glioblastoma	21	11	8	1	1
	Medulloblastoma	9	1	0	8	0
	Glioma Malignant	9	3	1	3	2
	Oligodendroglioma	8	3	4	0	1
	Ependymoma Anaplastic	5	1	1	1	2
	Ependymoma	4	1	1	2	0
	Astrocytoma	4	0	2	1	1
	Pilocytic Astrocytoma	4	0	0	1	3
	Atypical Teratoid/Rhabdoid Tumor	4	0	0	3	1
	Mixed Glioma	3	2	1	0	0
	Ganglioglioma Anaplastic	3	0	0	1	2
	Germinoma	2	1	1	0	0
	Desmoplastic Nodular Medulloblastoma	2	0	1	0	1
	Astroblastoma	1	1	0	0	0
	Hemangiopericytoma Malignant	1	1	0	0	0
	Pleomorphic Xanthoastrocytoma	1	1	0	0	0
	Oligodendroglioma Anaplastic	1	1	0	0	0
	Primitive Neuroectodermal Tumor	1	1	0	0	0
	Astrocytoma Anaplastic	1	1	0	0	0
	Chondroid Chordoma	1	1	0	0	0
<b>MENINGES</b>		<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
	Meningioma Malignant	1	0	1	0	0
<b>THYROID</b>		<b>242</b>	<b>44</b>	<b>194</b>	<b>1</b>	<b>3</b>
	Papillary Adenocarcinoma	99	16	79	1	3
	Papillary Carcinoma Follicular Variant	50	8	42	0	0
	Papillary Carcinoma Columnar Cell	29	5	24	0	0
	Papillary Microcarcinoma	22	6	16	0	0
	Papillary Carcinoma Encapsulated	11	2	9	0	0
	Follicular Carcinoma Minimally Invasive	11	1	10	0	0
	Oxyphilic Adenocarcinoma	6	2	4	0	0
	Medullary Carcinoma	6	3	3	0	0
	Follicular Adenocarcinoma	2	0	2	0	0
	Papillary Carcinoma Oxyphilic Cell	2	0	2	0	0
	Carcinoma NOS	2	0	2	0	0
	Carcinoma Anaplastic	1	1	0	0	0
	Non-encapsulated Sclerosing Carcinoma	1	0	1	0	0
<b>ADRENAL GLAND</b>		<b>13</b>	<b>0</b>	<b>3</b>	<b>5</b>	<b>5</b>
	Neuroblastoma	10	0	1	5	4
	Malignant Rhabdoid Tumor	1	0	1	0	0
	Ganglioneuroblastoma	1	0	0	0	1
	Gastrointestinal Stromal Sarcoma	1	0	1	0	0
<b>OTHER ENDOCRINE GLANDS</b>		<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
	Thymoma Type B2 Malignant	1	1	0	0	0
<b>OTHER AND ILL DEFINED SITES</b>		<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
	Plasmablastic Lymphoma	1	1	0	0	0
	Squamous Cell Carcinoma	1	1	0	0	0
<b>LYMPH NODES (HODGKIN'S LYMPHOMA)</b>		<b>106</b>	<b>52</b>	<b>34</b>	<b>15</b>	<b>5</b>
	Nodular Sclerosis	66	29	24	10	3
	Hodgkin's Lymphoma NOS	16	10	4	1	1
	Mixed Cellularity	12	4	3	4	1
	Nodular Lymphocyte Predominance	6	6	0	0	0
	Lymphocyte Rich	4	3	1	0	0
	Lymphocyte Depletion	2	0	2	0	0

SITE	HISTOLOGY (NOS - Not Otherwise Specified)	ALL CASES	ADULTS		PEDIATRICS	
			MALE	FEMALE	MALE	FEMALE
<b>LYMPH NODES (NON HODGKIN'S LYMPHOMA)</b>		<b>158</b>	<b>86</b>	<b>63</b>	<b>7</b>	<b>2</b>
	Large B-Cell Diffuse	86	42	44	0	0
	Follicular Lymphoma Grade 2	12	7	5	0	0
	Burkitt Lymphoma	12	5	0	6	1
	Non-Hodgkin's Lymphoma NOS	7	4	3	0	0
	Anaplastic Large Cell Lymphoma T Cell and Null Cell Type	7	4	3	0	0
	Mycosis Fungoides	5	1	4	0	0
	Mature T-Cell Lymphoma	5	4	1	0	0
	T-Cell/Histiocytes Rich Large B-Cell Lymphoma	4	3	0	1	0
	Marginal Zone B-Cell Lymphoma	4	3	1	0	0
	Mantle Cell Lymphoma	4	3	1	0	0
	Follicular Lymphoma Grade1	3	3	0	0	0
	Hepatosplenic (Gamma-Delta) Cell Lymphoma	2	2	0	0	0
	Mediastinal Large B-Cell Lymphoma	2	0	1	0	1
	Follicular lymphoma NOS	2	2	0	0	0
	Sezary Syndrome	1	1	0	0	0
	NK/T-Cell Lymphoma Nasal and Nasal Type	1	1	0	0	0
	Intestinal T-Cell Lymphoma	1	1	0	0	0
<b>PRIMARY UNKNOWN</b>		<b>37</b>	<b>20</b>	<b>17</b>	<b>0</b>	<b>0</b>
	Adenocarcinoma NOS	14	5	9	0	0
	Carcinoma NOS	6	5	1	0	0
	Mucinous Adenocarcinoma	3	2	1	0	0
	Neuroendocrine Carcinoma	3	2	1	0	0
	Neoplasm Malignant	2	1	1	0	0
	Pseudosarcomatous Carcinoma	1	1	0	0	0
	Serous Cystadenocarcinoma	1	0	1	0	0
	Spindle Cell Sarcoma	1	1	0	0	0
	Carcinoma Undifferentiated	1	1	0	0	0
	Hemangiosarcoma	1	0	1	0	0
	Leiomyosarcoma	1	1	0	0	0
	Clear Cell Sarcoma (Except of Kidney)	1	0	1	0	0
	Malignant Melanoma NOS	1	1	0	0	0

**TABLE 11**  
**MULTIPLE PRIMARY SITES TABLE**  
**2 0 1 3**

<b>PRIMARY SITE</b>	<b>HISTOLOGY</b>	<b>OTHER PRIMARIES</b>	<b>ALL</b>	<b>MALE</b>	<b>FEMALE</b>
<b>2013</b>	<b>(NOS - Not Otherwise Specified)</b>	<b>(PREVIOUS OR CONCURRENT)</b>	<b>CASES</b>		
			<b>124</b>	<b>48</b>	<b>76</b>
<b>LIP</b>			<b>3</b>	<b>1</b>	<b>2</b>
Squamous Cell Carcinoma*	Skin - Basal Cell Carcinoma		1	1	0
	Skin - Sq Cell Carcinoma				
Squamous Cell Carcinoma	Gum, Verrucous Carcinoma		1	0	1
Squamous Cell Carcinoma	Tongue - Sq Cell Carcinoma		1	0	1
<b>TONGUE</b>			<b>1</b>	<b>1</b>	<b>0</b>
Squamous Cell Carcinoma	Ampulla of Vater - Adenocarcinoma		1	1	0
<b>MOUTH</b>			<b>3</b>	<b>2</b>	<b>1</b>
Squamous Cell Carcinoma	Tongue - Sq Cell Carcinoma		1	1	0
Squamous Cell Carcinoma	LN's - HL Nodular Sclerosis		1	0	1
Squamous Cell Carcinoma*	Cheek Mucosa,Rt - Sq Cell Carcinoma		1	1	0
	Cheek Mucosa,Lt - Verrucous Carcinoma				
<b>PAROTID GLAND</b>			<b>1</b>	<b>0</b>	<b>1</b>
Mucoepidermoid Carcinoma	Breast - Ductal Carcinoma		1	0	1
<b>GUM</b>			<b>3</b>	<b>3</b>	<b>0</b>
Squamous Cell Carcinoma*	Buccal Mucosa - Sq Cell Carcinoma		1	1	0
	BM - Pre-B Cell Lymphoblastic Leukemia				
Squamous Cell Carcinoma*	Tongue - Sq Cell Carcinoma		1	1	0
Squamous Cell Carcinoma*	Lip - Sq Cell Carcinoma		1	1	0
	Tongue - Sq Cell Carcinoma				
<b>PALATE</b>			<b>1</b>	<b>1</b>	<b>0</b>
Squamous Cell Carcinoma*	Gum - Sq Cell Carcinoma		1	1	0
	Tongue - Sq Cell Carcinoma				
<b>PYRIFORM SINUS</b>			<b>1</b>	<b>1</b>	<b>0</b>
Squamous Cell Carcinoma	Glottis - Sq Cell Carcinoma		1	1	0
<b>ESOPHAGUS</b>			<b>2</b>	<b>0</b>	<b>2</b>
Squamous Cell Carcinoma	Retromolar - Sq Cell Carcinoma		1	0	1
Squamous Cell Carcinoma	Thymus - Thymoma Malignant		1	0	1
<b>STOMACH</b>			<b>3</b>	<b>3</b>	<b>0</b>
Neuroendocrine Carcinoma	Thyroid - Papillary Ca Follicular variant		1	1	0
Signet Ring Cell Carcinoma	Esophagus - Sq Cell Carcinoma		1	1	0
Lymphoma Large B-cell	Prostate - Adenocarcinoma		1	1	0
<b>SMALL INTESTINE</b>			<b>1</b>	<b>1</b>	<b>0</b>
Neuroendocrine Carcinoma	Colon - Adenocarcinoma		1	1	0
<b>COLON</b>			<b>5</b>	<b>3</b>	<b>2</b>
Adenocarcinoma	Endometrium - Clear Cell Adenoca		1	0	1
Adenocarcinoma	Retroperitoneum - Liposarcoma		1	1	0
Adenocarcinoma	Bladder - Papillary Transitional Cell Ca		1	1	0
Adenocarcinoma	Pancreas - Adenocarcinoma		1	0	1
Neuroendocrine Carcinoma	Pancreas - Neuroendocrine Ca		1	1	0
<b>RECTOSIGMOID JUNCTION</b>			<b>4</b>	<b>3</b>	<b>1</b>
Adenocarcinoma	Brain - Medulloblastoma		1	0	1
Adenocarcinoma	Skin - Mycosis Fungoides		1	1	0
Adenocarcinoma	Colon - Adenocarcinoma		1	1	0
Adenocarcinoma	Rectum - Adenocarcinoma		1	1	0
<b>RECTUM</b>			<b>3</b>	<b>1</b>	<b>2</b>
Adenocarcinoma	Cervix - Non-Keratinizing Carcinoma		1	0	1
Adenocarcinoma	Brain - Oligodendroglioma		1	1	0

PRIMARY SITE 2013	HISTOLOGY (NOS - Not Otherwise Specified)	OTHER PRIMARIES (PREVIOUS OR CONCURRENT)	ALL CASES	MALE	FEMALE
	Adenocarcinoma*	Colon Ascending - Adenocarcinoma Colon Descending - Adenocarcinoma	1	0	1
<b>ANUS/ANAL CANAL</b>			<b>2</b>	<b>0</b>	<b>2</b>
	Mucinous Adenocarcinoma	Breast - Ductal Carcinoma	1	0	1
	Adenocarcinoma	Breast - Ductal Carcinoma	1	0	1
<b>LIVER, INTRAHEPATIC BILE DUCT</b>			<b>1</b>	<b>0</b>	<b>1</b>
	Hepatocellular Carcinoma	Rectum - Adenocarcinoma	1	0	1
<b>PANCREAS</b>			<b>3</b>	<b>1</b>	<b>2</b>
	Adenocarcinoma	Skin - Kaposi Sarcoma	1	1	0
	Adenocarcinoma	Breast - Lobular and Ductal Carcinoma	1	0	1
	Adenocarcinoma	Kidney- Cyst Associated Renal Cell Ca	1	0	1
<b>LARYNX</b>			<b>1</b>	<b>1</b>	<b>0</b>
	Squamous Cell Carcinoma	Skin - Sq Cell Carcinoma	1	1	0
<b>LUNG</b>			<b>3</b>	<b>2</b>	<b>1</b>
	Adenocarcinoma	Thyroid - Papillary Adenocarcinoma	1	1	0
	Adenocarcinoma	Prostate - Adenocarcinoma	1	1	0
	Carcinoma	Thyroid - Papillary Carcinoma	1	0	1
<b>BONE</b>			<b>2</b>	<b>1</b>	<b>1</b>
	Osteosarcoma	Nasopharynx - Carcinoma	1	0	1
	Spindle Cell Sarcoma	Bone - Pleomorphic Cell Sarcoma	1	1	0
<b>BONE MARROW</b>			<b>8</b>	<b>4</b>	<b>4</b>
	Therapy-Related AML	LN's - Hodgkin's Lymphoma	1	1	0
	Refractory Anemia w/ Excess Blasts	Skin - Basal Cell Carcinoma	1	0	1
	Acute Myeloid Leukemia	Myelofibrosis w/ Myeloid Metaplasia	1	1	0
	Acute Myeloid Leukemia	Chronic Myeloid Leukemia	1	0	1
	Acute Myeloid Leukemia	Myelodysplastic/MPN Unclassifiable	1	1	0
	Acute Myelomonocytic Leukemia	Precursor Cell Lymphoblastic Leukemia	1	1	0
	Pre-T Cell Lympho Leukemia	Acute Myeloid Leukemia	1	0	1
	Myelodysplastic Syndrome	Colon - Mucinous Adenocarcinoma	1	0	1
<b>SOFT TISSUE</b>			<b>4</b>	<b>2</b>	<b>2</b>
	Dermatofibrosarcoma	Rt Thigh - Spindle Cell Sarcoma	1	1	0
	Spindle Cell Sarcoma	Breast - Ductal Carcinoma	1	0	1
	Giant Cell Sarcoma (Except Bone)	Breast - Ductal Carcinoma	1	0	1
	Liposarcoma	Stomach - Adenocarcinoma	1	1	0
<b>SKIN</b>			<b>8</b>	<b>6</b>	<b>2</b>
	Basal Cell Carcinoma**	Ear - Basal Cell Ca Nodular Face - Basal Cell Carcinoma Skin, NOS - Sq Cell Carcinoma	1	0	1
	Squamous Cell Ca In Situ***	Rt Temple - Sq Cell Carcinoma Parotid - Small Cell Carcinommm Nose - Basal Cell Carcinoma Rt Cheek - Sq Cell Carcinoma	1	1	0
	Squamous Cell Carcinoma	Liver - Hepatocellular Carcinoma	1	1	0
	Basal Cell Ca Nodular	Eyelid - Basal Cell Ca Nodular	1	1	0
	Infiltrating Basal Cell Ca*	Cheek - Basal Cell Carcinoma Forehead - Basal Cell Carcinoma	1	0	1
	Basosquamous Carcinoma**	Rt Leg - Sq Cell Carcinoma Face - Sq Cell Carcinoma Eyelid - Sebaceous Carcinoma	1	1	0
	Squamous Cell Ca In Situ*	Nose - Basosquamous Carcinoma Rt Nostril - Sq Cell Carcinoma	1	1	0
	Basal Cell Ca Superficial*	Forehead - Basal Cell Carcinoma Ear - Basal Cell Carcinoma	1	1	0

PRIMARY SITE 2013	HISTOLOGY (NOS - Not Otherwise Specified)	OTHER PRIMARIES (PREVIOUS OR CONCURRENT)	ALL CASES	MALE	FEMALE
<b>BREAST</b>			29	0	29
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma In Situ	Bladder - Papillary Transitional Cell Ca		1	0	1
Ductal Carcinoma	Cervix Uteri - Carcinoma In Situ		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Placenta - Choriocarcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Medullary Carcinoma		1	0	1
Ductal Carcinoma	LNs - HL Mixed Cellularity		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal & Lobular Carcinoma	Contra Breast - Lobular Carcinoma		1	0	1
Ductal Carcinoma	Stomach - Malt Lymphoma Large B-Cell		1	0	1
Intraductal Ca NonInfiltrating	LNs - Malt Lymphoma Large B-Cell		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Rectosigmoid - Adenocarcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Tubular Carcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Thyroid - Papillary Microcarcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma*	Contra Breast (LOQ) - Ductal Carcinoma		1	0	1
	Breast Rt Upper Half - Ductal Carcinoma				
Lobular Mixed w/ Other Type	Contra Breast - Lobular Carcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Ductal & Lobular Ca		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Thyroid - Pap Ca Follicular Variant		1	0	1
Ductal Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
Ductal Carcinoma	Ovary - Adenocarcinoma		1	0	1
Ductal Carcinoma	Contra Breast - Intraductal Carcinoma Noninfiltrating		1	0	1
Carcinoma	Contra Breast - Ductal Carcinoma		1	0	1
<b>CORPUS UTERI</b>			2	0	2
Clear Cell Adenocarcinoma	Cervix - Sq Cell Carcinoma		1	0	1
Endometrioid Adenocarcinoma	Breast - Ductal Carcinoma		1	0	1
<b>OVARY</b>			2	0	2
Serous Cystadenocarcinoma	Thyroid - Papillary Adenocarcinoma		1	0	1
Serous Cystadenocarcinoma	Stomach - Gastrointestinal Stromal Sarcoma		1	0	1
<b>PROSTATE GLAND</b>			1	1	0
Adenocarcinoma**	Vocal Cord - Sq Cell Carcinoma		1	1	0
	LNs - Malignant B-Cell Lymphoma				
	Nasopharynx - Sq Cell Carcinoma				
<b>KIDNEY</b>			2	1	1
Carcinoma	Thyroid - Papillary Adenocarcinoma		1	0	1
Papillary Adenocarcinoma	Appendix - Carcinoid Tumor		1	1	0
<b>URINARY BLADDER</b>			4	4	0
Papillary Urothelial Ca	Skin - Sq Cell Carcinoma		1	1	0
Papillary Urothelial Ca	Bladder - Pap Urothelial Ca Noninvasive		1	1	0
Papillary Urothelial Ca	Floor of Mouth - Sq Cell Carcinoma		1	1	0
Papillary Urothelial Ca Noninvasive	Bladder - Papillary Urothelial Ca		1	1	0
<b>LYMPH NODES</b>			4	2	2
Marginal Zone B-Cell Lymph	Brain - Malt Lymphoma Large B-Cell		1	0	1
Follicular Lymphoma Low Gr	Thyroid - Papillary Adenocarcinoma		1	1	0

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PRIMARY SITE 2013	HISTOLOGY (NOS - Not Otherwise Specified)	OTHER PRIMARIES (PREVIOUS OR CONCURRENT)	ALL		
			CASES	MALE	FEMALE
Malt Lymphoma Large B-Cell		Inguinal - Follicular Lymphoma Gr 1	1	1	0
B-Cell CLL / SLL		Breast - Ductal Carcinoma	1	0	1
<b>THYROID</b>			<b>16</b>	<b>2</b>	<b>14</b>
Pap Ca Follicular Variant		Breast - Ductal Carcinoma	1	0	1
Papillary Microcarcinoma		GE Junction - Adenoca Intestinal Type	1	1	0
Papillary Adenocarcinoma*		BM - Pre-T Cell Lymphoblastic Leukemia	1	1	0
		Brain - Glioma, Malignant			
Papillary Microcarcinoma		Breast - Ductal Carcinoma	1	0	1
Papillary Microcarcinoma		Breast - Ductal Carcinoma	1	0	1
Papillary Adenocarcinoma		Nasal Cavity - Olfactory Neuroblastoma	1	0	1
Papillary Adenocarcinoma*		Brain - Medulloblastoma	1	0	1
		Colon - Adenocarcinoma			
Papillary Microcarcinoma		LN's - HL Nodular Sclerosis	1	0	1
Oxyphilic Adenocarcinoma		Stomach - Adenocarcinoma	1	0	1
Pap Ca Columnar Cell		Breast - Ductal Carcinoma	1	0	1
Pap Ca Follicular Variant		Thyroid - Carcinoma	1	0	1
Pap Ca Oxyphilic Cell		Liver - Hepatocellular Carcinoma	1	0	1
Papillary Adenocarcinoma		Thyroid - Medullary Carcinoma	1	0	1
Pap Ca Follicular Variant		Thyroid - Medullary Carcinoma	1	0	1
Papillary Adenocarcinoma		Parotid - Acinar Cell Carcinoma	1	0	1
Papillary Carcinoma		Skin - Sq Cell Carcinoma	1	0	1
<b>UNKNOWN PRIMARY</b>			<b>1</b>	<b>1</b>	<b>0</b>
Mucinous Adenocarcinoma		Ovary - Papillary Serous Cystadenoca	1	0	1

\* Patient has three primary malignancies

\*\* Patient has four primary malignancies

\*\*\* Patient has five primary malignancies

## STAGE OF DISEASE AT DIAGNOSIS

Stage in any malignant process may be defined as the particular step, phase, or extent in a tumor's development, which is one of the predictors for outcome and treatment selection assigned at the time of initial diagnosis. The microscopic appearance, extent, and biological behavior of a tumor, as well as host factors, play a part in prognosis and are therefore important in staging.

The SEER (Surveillance, Epidemiology and End Results) Summary Staging Guide was utilized for all stageable cases. This system summarizes the disease categories into four general staging groups (i.e., in situ, localized, regional and distant). Stage categories are based on a combination of clinical observations and operative-pathological evaluation.

### Summary Staging Definitions:

IN SITU	:	Intraepithelial, noninvasive, noninfiltrating
LOCALIZED	:	Within organ <ul style="list-style-type: none"> <li>a. Invasive cancer confined to the organ of origin</li> <li>b. Intraluminal extension where specified</li> </ul>
REGIONAL	:	Beyond the organ of origin <ul style="list-style-type: none"> <li>a. By direct extension to adjacent organs/tissues</li> <li>b. To regional lymph nodes</li> <li>c. Both (a) and (b)</li> </ul>
DISTANT	:	Direct extension or metastasis <ul style="list-style-type: none"> <li>a. Direct continuity to organs other than above</li> <li>b. Discontinuous metastasis</li> <li>c. To distant lymph nodes</li> </ul>

Systemic diseases, i.e., leukemia and multiple myeloma and cases of unstageable unknown primary were disregarded in graphically illustrating the stages for all analytic cases seen at KFSH&RC in 2013 (Figure 13). The 88 cases unstageable at diagnosis were those patients who refused further diagnostic workup, or further workup was not possible due to the patients' state of health, e.g., terminal cases or those with co-morbid conditions, or those with not enough information from the referring hospitals to stage the disease. Please refer also to Table 5 for the distribution of the 2013 analytic cases by site and stage at diagnosis.

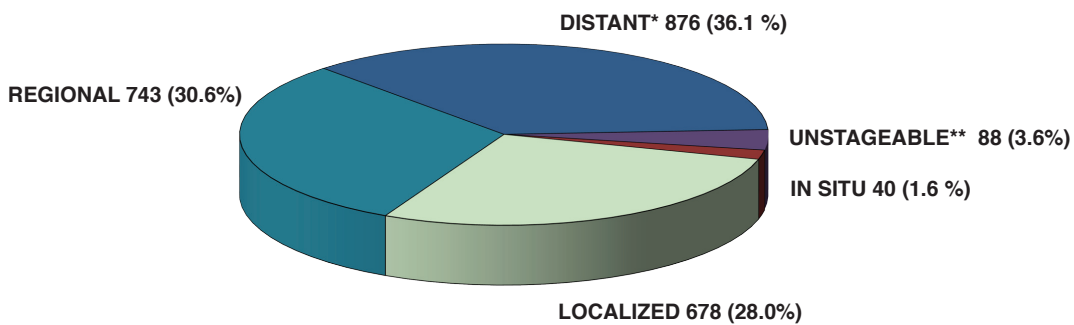
In addition to the SEER Summary Staging, the cases were also staged according to the American Joint Committee on Cancer (AJCC) TNM system. This scheme is based on the premise that cancers of similar histology or site of origin share similar patterns of growth and extension. This system is based on the assessment of three components:

- T: Extent of the primary tumor
- N: Absence or presence and extent of regional lymph node involvement
- M: Absence or presence of distant metastasis

Analytic cases of four major sites, i.e., breast, lung, nasopharynx and hodgkin's lymphoma are presented in Table 12 with their clinical group stages and yearly comparative figures from 2009 to 2013. The pathologic group stages of Stomach and Colon, Rectum are also presented in the same table.

FIGURE 13

DISTRIBUTION OF ANALYTIC CASES BY STAGE (SEER) AT DIAGNOSIS 2013 (TOTAL CASES = 2,120)



\*Excludes Hematopoietic Primaries (217 cases)  
 \*\*Excludes Unstageable Unknown Primaries (88 cases)

FIGURE 14

DISTRIBUTION OF ANALYTIC CASES BY FIRST COURSE OF TREATMENT MODALITY 2013 (TOTAL CASES = 2,425)

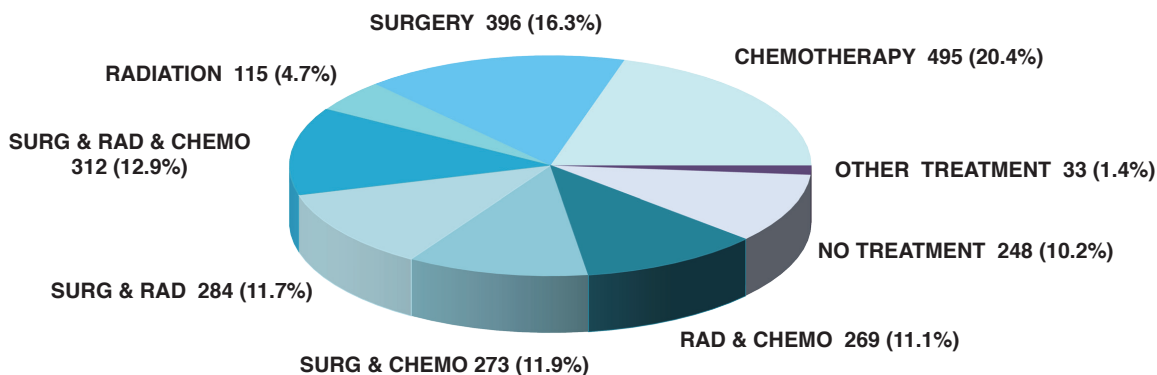


TABLE 12

AJCC CLINICAL TNM GROUP STAGE OF ANALYTIC CASES OF MAJOR SITES\* BY YEAR  
2009 - 2013

## BREAST

Stage	2009		2010		2011		2012		2013		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	10	3.2	6	1.7	12	3.1	13	3.7	13	3.3	54	3.1
1	34	11.0	-	-	-	-	-	-	6	1.5	40	2.2
1A	-	-	37	10.6	39	10.2	37	10.5	26	6.5	139	7.7
1B	-	-	0	0.0	0	0.0	0	0.0	2	0.5	2	0.1
2A	44	14.2	61	17.5	66	17.2	71	20.0	81	20.3	323	18.0
2B	41	13.3	51	14.7	60	15.6	33	9.3	60	15.0	245	13.8
3A	17	5.5	16	4.6	30	7.8	31	8.7	45	11.3	139	7.7
3B	36	11.7	34	9.8	44	11.4	39	11.0	50	12.5	203	11.3
3C	5	1.6	5	1.4	3	0.8	8	2.3	1	0.3	22	1.2
4	70	22.7	71	20.4	64	16.7	63	17.8	64	16.0	332	18.5
Unstageable	52	16.8	67	19.3	66	17.2	59	16.7	51	12.8	295	16.4
<b>Total</b>	<b>309</b>	<b>100.0</b>	<b>348</b>	<b>100.0</b>	<b>384</b>	<b>100.0</b>	<b>354</b>	<b>100.0</b>	<b>399</b>	<b>100.0</b>	<b>1,794</b>	<b>100.0</b>

## LUNG

Stage	2009		2010		2011		2012		2013		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1A	3	5.5	4	6.7	4	5.9	5	7.6	3	4.2	19	6.0
1B	6	11.1	0	0.0	4	5.9	2	3.0	3	4.2	15	4.7
2A	0	0.0	0	0.0	2	2.9	3	4.5	3	4.2	8	2.5
2B	2	3.7	3	5.0	0	0.0	0	0.0	2	2.8	7	2.2
3A	3	5.6	7	11.7	5	7.4	5	7.6	5	7.0	25	7.8
3B	9	16.7	3	5.0	7	10.3	5	7.6	7	9.9	31	9.7
4	28	51.9	43	71.7	41	60.3	39	59.1	43	60.6	194	60.8
Unstageable	3	5.6	0	0.0	5	7.4	7	10.6	5	7.0	20	6.3
<b>Total</b>	<b>54</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>68</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>	<b>71</b>	<b>100.0</b>	<b>319</b>	<b>100.0</b>

## NASOPHARYNX

Stage	2009		2010		2011		2012		2013		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
1	1	1.8	2	2.8	4	6.3	2	3.6	4	6.2	13	4.2
2	-	-	6	8.5	8	12.7	5	9.1	1	1.5	20	6.5
2A	1	1.8	-	-	-	-	-	-	-	-	1	0.3
2B	2	3.6	-	-	-	-	-	-	-	-	2	0.6
3	21	38.2	19	26.8	13	20.6	9	16.4	10	15.4	72	23.3
4A	9	16.4	13	18.3	12	19.0	17	30.9	15	23.1	66	21.4
4B	13	23.6	21	29.6	18	28.6	17	30.9	24	36.9	93	30.1
4C	7	12.7	9	12.7	8	12.7	4	7.3	11	16.9	39	12.6
Unstageable	1	1.8	1	1.4	0	0.0	1	1.8	0	0.0	3	1.0
<b>Total</b>	<b>55</b>	<b>100.0</b>	<b>71</b>	<b>100.0</b>	<b>63</b>	<b>100.0</b>	<b>55</b>	<b>100.0</b>	<b>65</b>	<b>100.0</b>	<b>309</b>	<b>100.0</b>

\*Excludes Lymphoma Cases

**AJCC CLINICAL TNM GROUP STAGE OF ANALYTIC CASES OF MAJOR SITES BY YEAR  
2009 - 2013**

**HODGKIN'S LYMPHOMA**

Stage	2009		2010		2011		2012		2013		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
1A	3	3.2	4	4.8	3	4.3	8	9.2	7	8.2	25	6.1
1B	2	2.2	1	1.2	0	0.0	0	0.0	1	1.2	4	1.0
2A	22	23.7	22	26.5	17	24.3	19	21.8	14	16.5	94	22.4
2B	9	9.7	10	12.0	5	7.1	8	9.2	10	11.8	42	10.0
3A	20	21.5	8	9.6	10	14.3	15	17.2	16	18.8	69	16.5
3B	9	9.7	11	13.3	12	17.1	6	6.9	11	12.9	49	11.7
4A	10	10.8	2	2.4	5	7.1	9	10.3	7	8.2	33	7.9
4B	17	18.3	24	29.0	18	25.7	21	24.1	19	22.3	99	23.7
Unstageable	1	1.1	1	1.2	0	0.0	1	1.1	0	0.0	3	0.7
<b>Total</b>	<b>93</b>	<b>100.0</b>	<b>83</b>	<b>100.0</b>	<b>70</b>	<b>100.0</b>	<b>87</b>	<b>100.0</b>	<b>85</b>	<b>100.0</b>	<b>418</b>	<b>100.0</b>

**AJCC PATHOLOGIC TNM GROUP STAGE OF ANALYTIC CASES OF MAJOR SITES\* BY YEAR  
2009 - 2013**

**STOMACH**

Stage	2009		2010		2011		2012		2013		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	0	0.0	0	0.0	0	0.0	2	3.5	2	0.7
1A	0	0.0	0	0.0	1	1.9	0	0.0	1	1.8	2	0.7
1B	3	5.2	4	7.1	2	3.7	0	0.0	0	0.0	9	3.2
2	5	8.6	-	-	-	-	-	-	-	-	5	1.8
2A	-	-	2	3.6	2	3.7	1	1.9	0	0.0	5	1.8
2B	-	-	1	1.8	2	3.7	2	3.7	0	0.0	5	1.8
3A	1	1.7	3	5.4	1	1.9	1	1.9	1	1.8	7	2.5
3B	4	6.9	5	8.9	2	3.7	1	1.9	1	1.8	13	4.7
3C	-	-	3	5	5	9.3	0	0.0	0	0.0	8	2.9
4	8	13.8	5	8.9	2	3.7	2	3.7	2	3.5	19	6.8
Unstageable	37	63.8	33	58.9	37	68.5	47	87.0	50	87.7	204	73.1
<b>Total</b>	<b>58</b>	<b>100.0</b>	<b>56</b>	<b>100.0</b>	<b>54</b>	<b>100.0</b>	<b>54</b>	<b>100.0</b>	<b>57</b>	<b>100.0</b>	<b>279</b>	<b>100.0</b>

**COLON, RECTUM**

Stage	2009		2010		2011		2012		2013		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	1	0.1
1	10	6.1	6	4.1	10	5.8	7	4.2	6	3.4	39	4.7
2A	18	11.0	12	8.2	16	9.3	10	5.9	24	13.5	80	9.7
2B	1	0.6	1	0.7	0	0.0	1	0.6	4	2.3	7	0.8
2C	-	-	2	1.4	0	0.0	1	0.6	0	0.0	3	0.4
3A	2	1.2	2	1.4	3	1.7	2	1.2	1	0.6	10	1.2
3B	14	8.5	7	4.8	17	9.9	20	12.0	12	6.8	70	8.5
3C	4	2.4	4	2.7	2	1.2	4	2.4	9	5.0	23	2.8
4	17	10.4	-	-	-	-	1	0.6	0	0.0	18	2.2
4A	1	0.6	10	6.8	8	4.7	6	3.6	15	8.5	40	4.8
4B	-	-	12	8.2	7	4.1	6	3.6	7	4.0	32	3.9
4C	-	-	0	0.0	0	0.0	2	1.2	0	0.0	2	0.2
Unstageable	97	59.1	90	61.6	109	63.3	106	63.5	99	55.9	501	60.7
<b>Total</b>	<b>164</b>	<b>100.0</b>	<b>146</b>	<b>100.0</b>	<b>172</b>	<b>100.0</b>	<b>167</b>	<b>100.0</b>	<b>177</b>	<b>100.0</b>	<b>826</b>	<b>100.0</b>

\* Excludes Lymphoma Cases

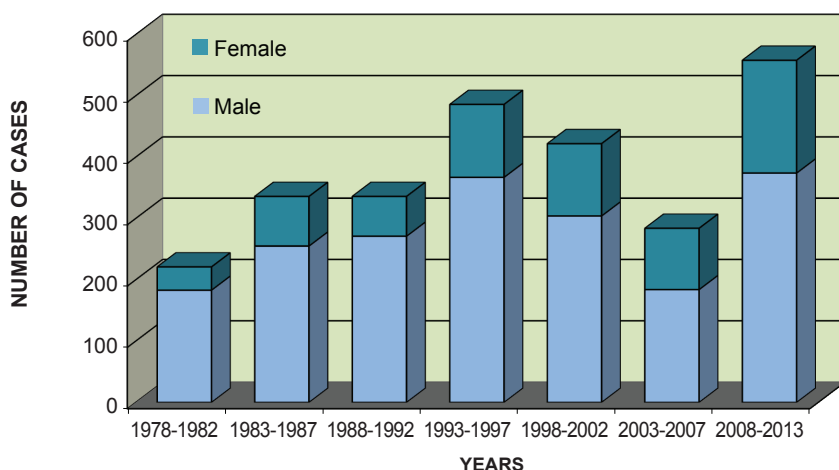
## IV. SPECIAL STUDY

### HEPATIC CARCINOMA; KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTER EXPERIENCE

Fazal Hussain, MD, Shouki Bazarbashi, MD, Haya Al-Eid, DDS, Naeem Chaudhri, MD

Primary hepatic carcinoma is the 4<sup>th</sup> most common cancer among men and 9<sup>th</sup> most common cancer among women at KFSH&RC. During 2013, 92 new cases (57 males and 35 females) of hepatic carcinoma were registered at KFSH&RC compared to 95 in 2012. KFSH&RC is the tertiary care referral center and have seen a steady increase in the numbers of hepatic carcinoma cases since 1978 (Figure 1) It's primarily due to significant expansion of cancer services, including screening and early detection, in the Kingdom. A total of 2,643 liver cancer cases have been registered at KFSH&RC out of a total of 78,045 cancer cases by the end of 2013. Liver cancer accounts for 3.38% of all cancers in KFSH&RC; 2.48% of all male and 0.9% of all female malignant cases with a male to female ratio of 1.62:1.

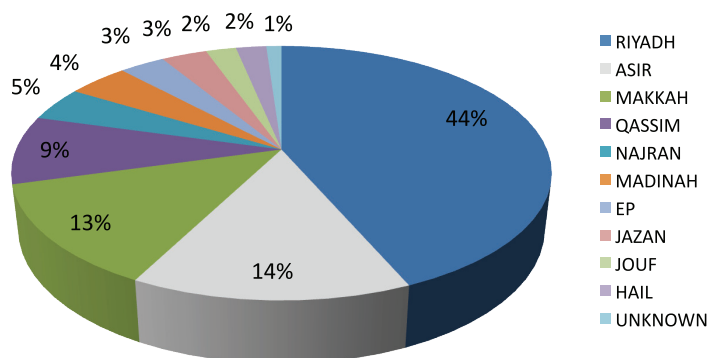
**FIGURE 1**  
**DISTRIBUTION OF LIVER CANCER CASES (1978-2013)**



Relative frequencies of major cancers seen at KFSH&RC although reflect the national trends, as evidenced by Saudi Cancer Registry data, are very different from the Western countries. For instance, hepatic carcinomas accounts for 3.38% of all cancer cases at our center, 4.8% in Saudi Cancer Registry, and < 3% of all cancers in the United States.

Majority (44%) of our liver cancer patients are referred from central region (Riyadh). Although our center receives patients from all parts of the Kingdom; Asir, Makkah, and Qassim are the major referring areas for liver cancers to KFSH&RC (Figure 2).

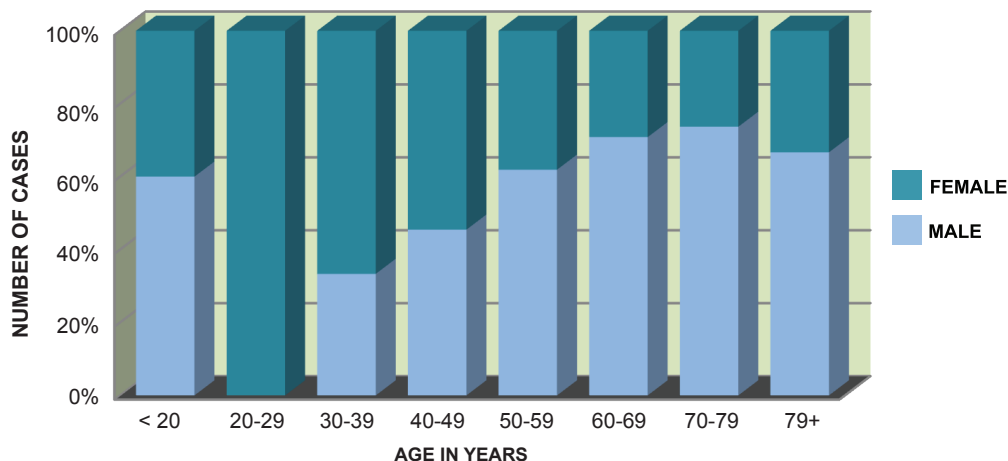
**FIGURE 2**  
**DISTRIBUTION OF 2013 LIVER CANCER ANALYTIC CASES BY REGION (BASED ON GIVEN ADDRESS AT THE TIME OF DIAGNOSIS)**



Majority of these liver cancer patients present in 60-69 years age group. However, the age distribution is more widely distributed with majority presenting at an older age in 6<sup>th</sup> and 7<sup>th</sup> decades of life (Figure 3).

**FIGURE 3**

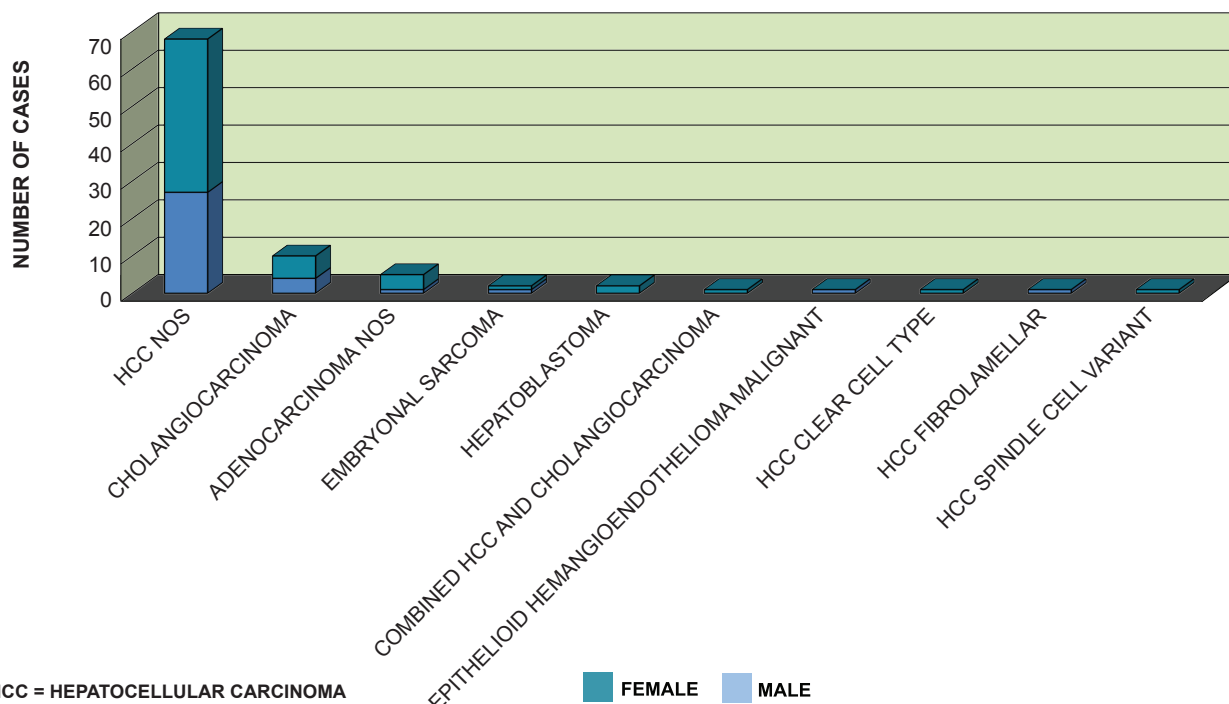
**DISTRIBUTION OF 2013 LIVER CANCER ANALYTIC CASES BY AGE VS. SEX**



Majority of liver cancers seen at KFSH&RC were Hepatocellular carcinomas (HCC). In 2013, 74% of all liver cancers seen at our institution were HCC, 11% were Cholangiocarcinoma and 5% were Adenocarcinoma. Only 2% were Embryonal Sarcoma (Figure 4).

**FIGURE 4**

**DISTRIBUTION OF 2013 LIVER CANCER ANALYTIC CASES BY HISTO-PATHOLOGICAL TYPE**



\* HCC = HEPATOCELLULAR CARCINOMA

Female Male

As per Saudi Cancer Registry (SCR) 2010 published report, annual incidence rate for Saudi Arabia was 483 cases (ASR of 4.8) among Saudis; accounting for 4.8% of all newly diagnosed cases in 2010. There were additional 81 cases diagnosed among non-Saudis in the same year. It ranked as the 4<sup>th</sup> most common cancer among males and 8<sup>th</sup> among females with a M:F ratio of 2.13:1.00. The median age at diagnosis was 69 years among males and 64 years among females in Saudi population. The Figures 5-6 show the age standardized incidence rates and comparisons with different populations for liver cancers for the year 2010 as reported by SCR.

FIGURE 5

AGE-SPECIFIC INCIDENCE RATE (AIR) FOR LIVER CANCERS IN SAUDI ARABIA, 2010

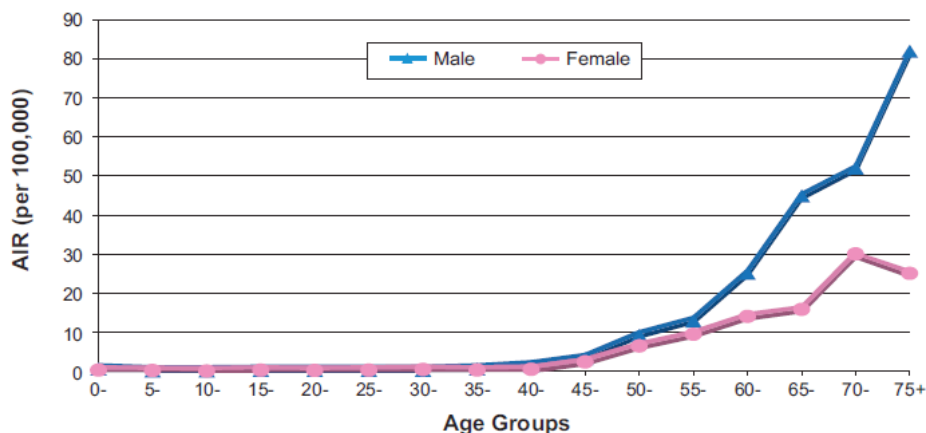
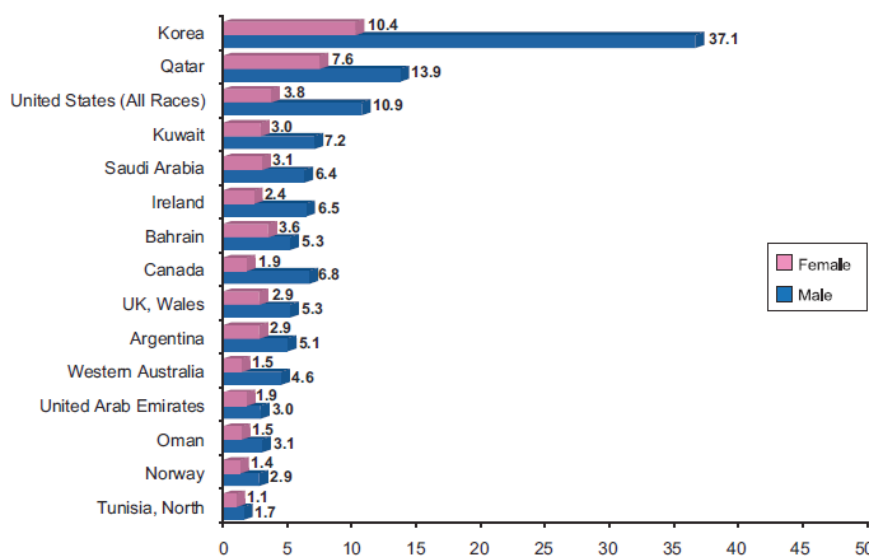


FIGURE 6

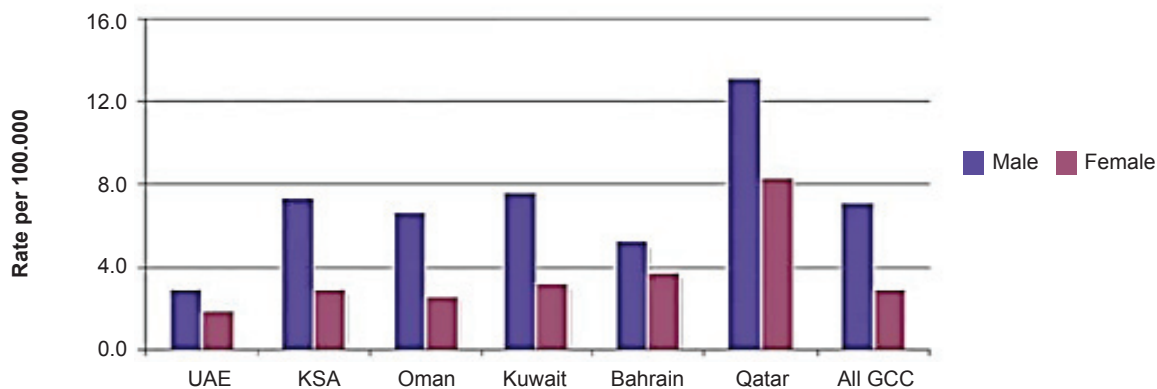
COMPARISON OF ASR FOR LIVER CANCER: SAUDI ARABIA VS. SELECTED COUNTRIES



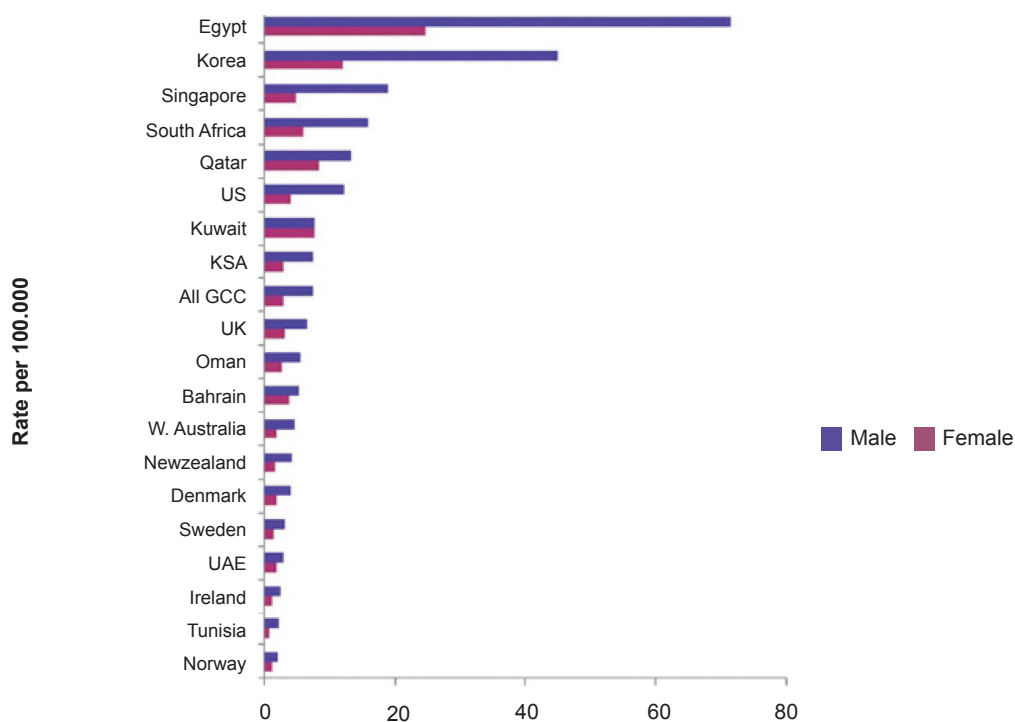
In the GCC States, liver cancer is the 6<sup>th</sup> most common cancer. A total of 6,071 liver cancer cases (5.0% of all cancers) were reported from GCC States between 1998-2009. The overall ASR was 7.1 and 2.9 per 100,000 populations for males and females, respectively. Liver cancer incidence is significantly higher among males compared to females in all GCC States. The highest incidence of liver cancers is among Qatari men with ASR of 13.1 followed by Kuwait and KSA (Fig. 7). Hepatocellular carcinoma was the most frequent type accounting for 76% of all liver cancers followed by the cholangiocarcinoma and adenocarcinoma. Liver cancer incidence continues to decline over the twelve-year period (1998-2009) in all GCC States. The total number of newly diagnosed liver cancers decreased by 11.6% in males and increased by 28.5% in females, over the twelve-year period, with significant decrease in the ASR trend among males only during the same period ( $p= 0.02$  in males and 0.38 in females). Hepatitis B infection accounts for over 75% of all hepatocellular carcinoma. The declining trend of liver cancer during the last 12 years is due to effective vaccination program for HBV, screening for Hepatitis B and C for expats, pre-marital screening for Hepatitis B and C for GCC nationals and effective and timely treatment availability.



**FIGURE 7**  
**AGE STANDARDIZED INCIDENCE RATE (ASR) OF LIVER CANCERS IN GCC STATES (1998-2009)**



**FIGURE 8**  
**COMPARISON OF ASR OF LIVER CANCERS IN GCC STATES WITH SELECTED COUNTRIES**



Globally, liver cancer is largely a problem of the less developed regions where 83% (50% in China alone) of the estimated 782,000 new cancer cases worldwide occurred in 2012. It is the 5<sup>th</sup> most common cancer in men (554,000 cases, 7.5% of the total) and the 9<sup>th</sup> in women (228,000 cases, 3.4%). In men, the regions of high incidence are Eastern and South-Eastern Asia (ASRs 31.9 and 22.2 respectively). Intermediate rates occur in Southern Europe (9.5) and Northern America (9.3) and the lowest rates are in Northern Europe (4.6) and South-Central Asia (3.7). In women, the rates are generally much lower, the highest being in Eastern Asia and Western Africa (10.2 and 8.1 respectively), the lowest in Northern Europe (1.9) and Micronesia (1.6). Liver cancer is the second most common cause of death from cancer worldwide, estimated to be responsible for nearly 746,000 deaths in 2012 (9.1% of the total) with an overall ratio of mortality to incidence of 0.95.

In North America and other Western countries, the majority of liver cancer cases are due to alcohol-related cirrhosis, and possibly nonalcoholic fatty liver disease associated with obesity, diabetes, and related meta-

bolic disorders. Chronic hepatitis B and C virus (HBV/HCV) infections are associated with less than half of liver cancer cases in the US, although they are the major risk factors for the disease worldwide. In the US, rates of HCC are higher in immigrants from areas where HBV is endemic, such as China, Southeast Asia, and sub-Saharan Africa. HBV vaccine is recommended for all infants at birth; for all children under 18 years of age who were not vaccinated at birth; and for adults in high-risk groups (e.g., health care workers, injection drug users, and those younger than 60 years of age who have been diagnosed with diabetes). It is also recommended that pregnant women be tested for HBV.

There is no HCV vaccine, though new antiviral therapies may prevent chronic infection among those with acute infection. The Centers for Disease Control and Prevention (CDC) recommends one-time HCV testing for everyone born from 1945 to 1965 because people in this birth cohort account for about three-fourths of HCV-infected individuals and HCV-related deaths in the US. Routine testing is recommended for individuals at high risk of infection, such as injection drug users, those on hemodialysis, and people who are HIV infected. HCV positive patients can receive treatment to reduce the risk of liver cancer, and counseling to reduce the risk of HCV transmission to others. Other preventive measures for HCV infection include screening of donated blood, organs, and tissues; adherence to infection control practices and needle-exchange programs for injecting drug users. Other risk factors include hemochromatosis, schistosomiasis, and aflatoxin.

Liver cancers at KFSH&RC are managed by multidisciplinary approach. All cases are discussed in the tumor board and decisions are based upon personalized treatment to provide optimum care for each patient. Early stage liver cancer can sometimes be successfully treated with surgery in a limited number of patients with sufficient healthy liver tissue. Liver transplantation may be an option for individuals with small tumors that cannot be surgically removed. Other treatment options include ablation or embolization at KFSH&RC. Fewer treatment options exist for patients diagnosed at an advanced stage. Sorafenib is a targeted drug approved for the treatment of HCC in patients who are not candidates for surgery.

In summary, liver cancers remains one of the leading cancers in the Kingdom of Saudi Arabia and form a significant proportion of new patients referred to King Faisal Specialist Hospital & Research Center. Management of liver cancers continues to evolve with significant improvements in therapeutic strategies and prognosis over the course of last two decades. At our center, management follows established evidence based guidelines which are updated as soon as new evidence becomes available. The center is also a tertiary referral center for relapsed and refractory liver cancers treatment including transplant. KFSH&RC is the largest transplant center in the Middle East. Oncology Centre is a member of the Southwest Oncology Group (SWOG) and NRG Oncology in an effort to provide cutting edge treatment to our patients and to promote research and training in this vital area.

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## V. APPENDIX

### REQUESTS FOR TUMOR REGISTRY DATA 2013

#### January

MOH 2012 Statistics	Ministry of Health
Matching of MRNs of Renal Transplant Patients to know Role of Cancer in Renal Transplant population	Dr. T. Ali
2002 – 2011 Breast Cancer cases seen at KFSH&RC by Age Group, Year, Region and Clinical Stage	Dr. N. Khomais

#### February

MRNs for Neuroendocrine Tumors last 5 years (2007 – 2011)	Dr. A. Jubran
MRNs of Patients with Sarcomas, Melanomas in Head and Neck area and all Patients with Unknown Primaries (2005 – 2011)	Dr. M. Saleem

#### March

MRNs of Thyroid Cancer Patients (2002 – 2012)	Dr. A. Al-Zahrani
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#### July

MRNs of Patient with Differentiated Thyroid Cancer who were admitted to receive the first dose of Radioactive Iodine from 01/2002 – 12/2005	Dr. F. Al-Enazi
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#### December

Thyroid Cancers associated with other Malignancy (2000 – 2012)	Dr. F. Maha
Breast Cancer Patients under age of 40 (2005 – 2010)	Dr. F. Maha

## VI. GLOSSARY OF TERMS

**Accessioned:** Cases are entered into the Tumor Registry by the year in which they were first seen at KFSH&RC for each primary cancer.

**Age of Patient:** Recorded in completed years at the time of diagnosis.

**Analytic Cases:** Cases which were first diagnosed and/or received all or part of their first course of treatment at KFSH&RC.

**Non-Analytic Cases:** Cases diagnosed elsewhere and received all of their first course of treatment elsewhere.

**Case:** A diagnosis or finished abstract. A patient who has more than one primary is reported as multiple cases.

**Crude Relative Frequency:** The proportion of a given cancer in relation to all cases in a clinical or pathological series.

**First Course of Treatment:** The initial tumor-directed treatment or series of treatments, usually initiated within four months after diagnosis.

**Stage of Disease:** Extent of disease process determined at first course of treatment.

### SEER (Surveillance, Epidemiology and End Results) Summary Staging:

**In Situ:** Tumor meets all microscopic criteria for malignancy except invasion.

**Local:** Tumor is confined to organ of origin.

**Regional:** Tumor has spread by direct extension to immediately adjacent organs and/or lymph nodes and appears to have spread no further.

**Distant:** Tumor has spread beyond immediately adjacent organs or tissues by direct extension and/or has either developed secondary or metastatic tumors, metastasized to distant lymph nodes or has been determined to be systemic in origin.

**AJCC (American Joint Committee on Cancer) TNM Staging:** A classification scheme based on the premise that cancers of similar histology or site or origin share similar patterns of growth and extension.

### T+N+M = Stage

**T:** Extent of primary tumor

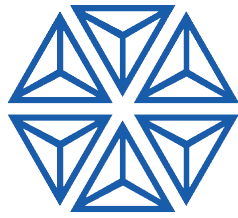
**N:** Extent of regional lymph node involvement

**M:** Distant Metastasis

**Clinical Stage:** Classification based on the evidence acquired before treatment. Such evidence arises from physical examination, imaging, endoscopy, biopsy, surgical exploration and other relevant findings.

**Pathologic Stage:** Classification based on the evidence acquired before treatment, supplemented or modified by the additional evidence acquired from surgery and from pathologic examination of the resected specimen.





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