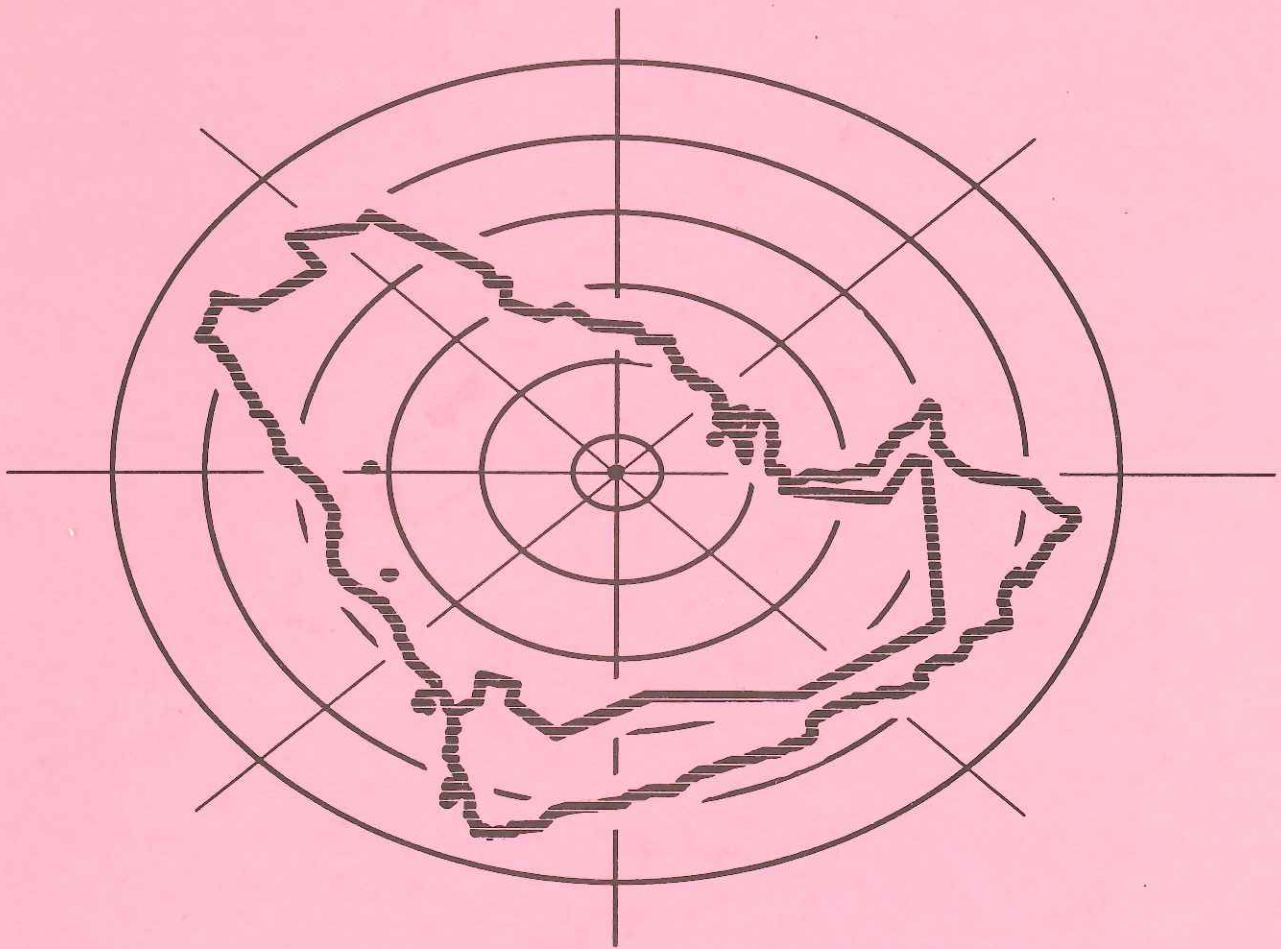


1993  
ANNUAL REPORT  
OF THE  
TUMOR REGISTRY



KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTRE  
RIYADH, KINGDOM OF SAUDI ARABIA

PROPERTY OF  
Dolores Michels - Harper

**ACKNOWLEDGEMENTS:**

The Cancer Program is a combined effort of many individuals. It is not possible to enumerate all the nurses, technicians, therapists, pharmacists, dentists, physicians, scientists, social workers and others whose work is primarily on behalf of the patient with cancer. In addition, nearly everyone associated with the hospital comes in contact with the cancer patient from time to time, frequently contributing significantly to their care. The staff of the Tumor Registry and members of the Tumor Committee recognize this hospital-wide involvement in the care of cancer patients. The information in this report is provided to assist all health care professionals to better understand the problems faced in treating patients with cancer.

The following Departments have assisted throughout the year and without their invaluable support this report would not be possible. The Tumor Registry staff acknowledges these Departments:

Department of Pathology & Laboratory Medicine  
Computer and Hospital Information Centre  
Medical Records Department  
Department of Oncology  
Home Health Care

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October 1994

1993 ANNUAL REPORT OF THE TUMOR REGISTRY

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## I. KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTRE CANCER PROGRAM ACTIVITIES

### TUMOR REGISTRY

#### History

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 hospital for Oncology and the principal center for cancer therapy in Saudi Arabia. There are about 500 inpatient beds.

The KFSH&RC Tumor Registry is a hospital-wide data system designed for the collection, management, and analysis of data on patients with the diagnosis of a malignant neoplasm (cancer). The Registry was established to meet one of the requirements for an Approved Cancer Program of the American College of Surgeons (ACoS) and is under the supervision of the Tumor Committee. The database now includes more than 26,100 malignant cases seen at KFSH&RC from June 1975 through December 31, 1993. Approximately 2,000 new cases are added annually.

There are four (4) certified tumor registrars out of six (6) approved positions that 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 is the mechanism by which the details of each diagnosed cancer case is entered and stored. (Please refer to Figures 1-A to 1-D for a sample data set.)

#### Data Use

Besides providing the statistics for the publication of the KFSH&RC annual report which summarizes the hospital's cancer experience, the data maintained in the Tumor Registry also support 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 1993, the Tumor Registry supported 52 special studies (see Appendix A for a listing of Special Studies requested in 1993).

#### Procedural and Administrative Changes During 1993

Oncology Clinic daily patient schedules are checked against the Master Index File in order to maximize new case identification on those patients without histopathology confirmation. These cases have the potential to be missed in the database if there is no inpatient admission since Medical Records Department does not code outpatient admissions.

A comprehensive review of the current automated system was conducted to include the data elements, entry, retrieval and edit functions. The recommendation was made to the Tumor Committee to obtain the updated Tumor Registry system from the American College of Surgeons as the current system is not meeting the needs of the clinicians or tumor registrars.

At the request of the Tumor Registry, the Computer and Hospital Information Centre (CHIC) developed a matching program of the Tumor Registry cases against the Admission/Discharge program. If there has been any patient activity since the date of last contact as noted on the Tumor Registry data set, the latest date the patient was seen is then electronically entered. This program is ran every two (2) months and has resulted in the follow up rate continuing to improve and it currently stands at 44% lost to follow up.

With the assistance of CHIC, an electronic productivity monitoring program directed at counting cases abstracted was developed. The tumor registrars rotate a manual quality control review of newly abstracted cases which supports the integrity of the data. Also, prior to microfiche, all medical records of deceased oncology patients 1975-1988 have been reviewed against the Tumor Registry data set to assure completeness and accuracy.

The Grade 8, Assistant Tumor Registrar and Grade 9, Associate Tumor Registrar job descriptions were revised in order to more clearly define job responsibilities and to facilitate recruitment. These were submitted to the Tumor Committee for approval.

In April, Tumor Registry personnel conducted a three-day training program in Tumor Registry Fundamentals for tumor registrars, data managers and data analysts from within the KFSH&RC and from outside hospital personnel.

#### Publications and Presentations

Michels D: Outcome Assessment - A Product of Comprehensive Followup. THE ABSTRACT, Vol 19:No 3, Journal of National Cancer Registrars Association, April 1993.

Michels D: International Classification of Diseases-Oncology (ICD-O) Coding. MODULE 7: FUNDAMENTAL TUMOR REGISTRY OPERATIONS PROGRAM. Edition 2, 1993, Cancer Department, American College of Surgeons.

Michels D: Abstracting. MODULE 11: FUNDAMENTAL TUMOR REGISTRY OPERATIONS PROGRAM. Edition 2, 1993, Cancer Department, American College of Surgeons.

Sackey K (presenter).....Anderson M, Atwood J, Becker N, Lange B, Michels D, Te O ..... Neuroblastoma. RIYADH ONCOLOGY SYMPOSIUM, 27-28 April, 1993.

Michels D (Contributor, Oncology Care Indicator Development Task Force): The Measurement Mandate, On the road to performance improvement in health care. Joint Commission on Accreditation of Healthcare Organizations (JCAHO), 1993.

#### TUMOR COMMITTEE

The multidisciplinary Tumor Committee, which meets bimonthly, is the policy-making body of the Cancer Program at KFSH&RC (see Appendix B for membership listing). During 1993, the Committee provided professional and administrative guidance to the Tumor Registry and supported the following activities:

- A. Based on assessment of the existing electronic data system by Tumor Registry and Computer and Hospital Information Centre personnel, the Committee approved the recommendation that the updated software system be purchased from the American College of Surgeons.
- B. A subcommittee was appointed to assess the hospital's need for patient educational brochures. The subcommittee is to review existing brochures and recommend to the departments if an update is needed. It is also to identify if patient brochures are needed on topics not available and recommend their development to the appropriate department.
- C. A subcommittee was appointed to develop guidelines for standardization of staging of cancer on newly diagnosed malignancies seen at KFSH&RC.

#### **TUMOR BOARD**

This educational conference is held as frequently as once weekly for the benefit of the attending staff, house staff, allied health professionals and visiting attending staff from other hospitals. Cases of various types of malignant disease are selected for presentation on the basis of complexity, unusual manifestations of the disease, or interest. Each presentation includes an outline of the medical history, physical findings, clinical course, radiographic studies, and pathological interpretations. Following each presentation, there is an informal discussion of the case and a review of pertinent medical literature. Those attending are encouraged to share personal experience in the management of similar cases. Please refer to Appendix C for a summary of cases presented in 1993.

#### **ONCOLOGY GRAND ROUNDS**

This didactic conference is held weekly and is attended by the Medical staff and allied health professionals. Speakers are drawn from the KFSH&RC Medical and Research staff as well as from visiting guests. Please refer to Appendix D for listing of the topics presented at the Oncology Grand Rounds in 1993.

FIGURE 1-A

**KING FAISAL SPECIALIST HOSPITAL  
AND RESEARCH CENTRE**

**CANCER REGISTRY WORKSHEET  
(CanSur 3.0)**

PATIENT NAME/PLATE

<b>PF 10 TACS - ACCESSION FILE MAINTENANCE</b>		<b>MARITAL STATUS AT DX :</b> <span style="float:right">2</span>	
ACCESSION NUMBER (ACSN): <u>870123</u>		1 - Single                      3 - Separated                      5 - Widowed 2 - Married                      4 - Divorced                      9 - Unknown	
TUMOR SEQUENCE (SEQ): <u>00</u>		<b>RELIGION :</b> <span style="float:right">01</span>	
Malignant/In situ tumors                      Benign tumors 00 - One primary only                      XX - One primary only 01 - First of two or more                      AA - First of two or more .... 08 - 8th or later primary                      IIII - 8th or later primary 99 - Unspecified sequence                      II - Unspecified sequence		01 - Muslim                      03 - Hindu                      06 - Other 02 - Christian                      04 - Buddhist                      99 - Unknown	
THIS CANCER ACCESSION YEAR: <u>87</u>		<b>ALCOHOL USAGE :</b> <span style="float:right">3</span>	
MEDICAL RECORD NO.: <u>394657</u>		1 - Current alcohol usage                      3 - Never used alcohol 2 - Past history of alcohol usage                      9 - Unknown	
CASE STATUS: <span style="float:right">3</span> 0 - Suspense 1 - Incomplete 3 - Completed per Release 3		<b>FAMILY HISTORY OF CANCER :</b> <span style="float:right">1</span>	
PATIENT NAME Last: _____ First: _____ Second: _____ Third: _____		1 - Family history of cancer                      8 - Unknown 2 - No family history of cancer	
ADDRESS AT DIAGNOSIS P.O. Box _____ <u>Riyadh</u> City		<b>SMOKING/CHEWING HISTORY :</b> <span style="float:right">3</span>	
RY Prov.      ZIP Code: _____		1 - Current smoker cig.                      5 - Shamma 2 - Past smoker                      6 - Shisha 3 - Patient never smoked                      7 - Combo 4 - Chai                      8 - Other 9 - Unknown	
<b>PF 11 TPAT - PATIENT IDENTIFICATION</b>		TOTAL PACK YEARS: _____	
SAUDI ID: <u>12345</u>		INDUSTRY: _____	
BIRTH DATE: <u>01/01/1946</u>		OCCUPATION: <u>Teacher</u>	
AGE AT DX: <u>041</u>		DATE ADMITTED (mm/dd/yyyy): <u>01/20/1987</u>	
SEX: <span style="float:right">2</span> 1 - Male                      2 - Female                      9 - Unknown		DATE DISCHARGED (mm/dd/yyyy): <u>02/15/1987</u>	
NATIONALITY: <span style="float:right">00</span> 00 - Saudi                      04 - Yemeni                      08 - 01 - Amer, Can, Brit                      05 - Other Arab                      09 - Other 02 - Egyptian                      06 - Ind, Pak 03 - Leb, Syr, Pol                      07 - African		REPORTING SOURCE: <span style="float:right">1</span> 1 - Inpatient                      4 - Physician's office                      7 - Death Cert. 2 - Clinic/outpatient                      5 - Nursing home                      8 - Unknown 3 - Laboratory                      6 - Autopsy	
HOSPITAL REFERRED FROM: <u>0000101</u> <u>Riyadh Central Hospital</u>		HOSPITAL REFERRED TO: _____	



FIGURE 1-B

<p><b>PF 12</b>                      <b>TTXT - MISCELLANEOUS TEXT</b></p> <p>PHYSICAL EXAM: <u>6-mo hx 2 cm mass rt breast UOQ, mobile, no skin changes. 3x4 cm rt axillary LN. Lt breast NED.</u></p> <hr/> <p>x RAYS / SCANS: <u>01/20/87 Bilat Mammogram - 2x2.5x2.5 cm mass rt breast UOQ. CXR, Bone Scan, U/S Abdomen - NED</u></p> <hr/> <p>SCOPES / LAB: <u>01/25/87 ERA (+), PRA (+)</u></p> <hr/> <p>OPERATIVES FINDINGS: <u>01/25/87 Rt Mod Rad Mastectomy - no description of tumor.</u></p> <hr/> <p>PATHOLOGY / AUTOPSY: <u>87SP3286 01/25/87 Duct Cell Ca, gr 3; 11/19 LN's. (tumor size: 2.2x2x1.8 cm completely excised) Nipple &amp; overlying skin NED. (largest LN 1.5 cm)</u></p>	<p style="text-align: center;"><b>TCAN - Cancer Identification (Continued)</b></p> <p><b>GRADE:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1 - Well differentiated (I)</td> <td style="width: 50%;">5 - T-cell</td> </tr> <tr> <td>2 - Mod well differentiated (II)</td> <td>6 - B-cell</td> </tr> <tr> <td>3 - Poorly differentiated (III)</td> <td>7 - Null cell</td> </tr> <tr> <td>4 - Undifferentiated (IV)</td> <td>9 - Not stated, unknown</td> </tr> </table> <p><b>LATERALITY:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">0 - Not paired organ</td> <td style="width: 50%;">3 - Rt or lt unspecified</td> </tr> <tr> <td>1 - Right</td> <td>4 - Both, simultaneous</td> </tr> <tr> <td>2 - Left</td> <td>9 - Unknown laterality</td> </tr> </table> <p><b>DX CONFIRMATION:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1 - Positive histology</td> <td style="width: 50%;">6 - Direct visualization</td> </tr> <tr> <td>2 - Cytology</td> <td>7 - Radiography</td> </tr> <tr> <td>4 - Pos. micro, confirm, NOS</td> <td>8 - Clinical</td> </tr> <tr> <td>5 - Laboratory test/marker</td> <td>9 - Unknown</td> </tr> </table> <p><b>REGIONAL NODES EXAMINED:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">00 - No nodes examined</td> <td style="width: 50%;">97 - 97 + nodes examined</td> </tr> <tr> <td>01 - One node examined</td> <td>98 - Nodes examined, number unknown</td> </tr> <tr> <td>....</td> <td>99 - Unknown if nodes examined</td> </tr> </table> <p><b>REGIONAL NODES POSITIVE:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">00 - No nodes positive</td> <td style="width: 50%;">97 - Positive nodes, number unknown</td> </tr> <tr> <td>01 - One node positive</td> <td>98 - No nodes examined</td> </tr> <tr> <td>....</td> <td>99 - Unknown if any nodes +/-</td> </tr> <tr> <td>99 - 99 + nodes positive</td> <td></td> </tr> </table> <p><b>TUMOR SIZE (cm)</b></p> <p>eg. 000 - No mass, 002 - 0.2 cm, 055 - 5.5 cm, 999 - Unknown</p> <p><b>RESIDUAL TUMOR:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">0 - None</td> <td style="width: 33%;">2 - Macroscopic</td> <td style="width: 33%;">9 - Unknown</td> </tr> <tr> <td>1 - Microscopic</td> <td>8 - No resection, NA</td> <td></td> </tr> </table> <p><b>DISTANT METS:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">0 - Bone Mar.</td> <td style="width: 33%;">4 - Liver</td> <td style="width: 33%;">6 - Lymph node (distal)</td> </tr> <tr> <td>1 - Peritoneum</td> <td>5 - Bone</td> <td>9 - Unknown/other</td> </tr> <tr> <td>2 - Lung</td> <td>6 - CNS</td> <td></td> </tr> <tr> <td>3 - Pleura</td> <td>7 - Skin</td> <td></td> </tr> </table> <p><b>GENERAL SUMMARY STAGE:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">0 - In situ</td> <td style="width: 50%;">4 - Regional, both 2 &amp; 3</td> </tr> <tr> <td>1 - Localized</td> <td>5 - Regional, NOS</td> </tr> <tr> <td>2 - Regional, direct extension</td> <td>7 - Distant</td> </tr> <tr> <td>3 - Regional, nodes</td> <td>9 - Unknown/unstageable</td> </tr> </table> <p><b>AJCC STAGE:</b></p> <p>CLINICAL T [2] N [1] M [0] STAGE GROUP [2] B</p> <p>PATHOLOGICAL T [2] N [1] M [0] STAGE GROUP [2] B</p> <p>OTHER*** [ ] T [ ] N [ ] M [ ] STAGE GROUP [ ]</p> <p>*TNM Codes - (use alpha codes as appropriate; eg. T2A 2A, T2 2, N1B-1B, M0-0, IS- In situ, X- Unknown)</p> <p>**AJCC Stage Group - use alpha codes as appropriate; eg. 3A, Stage IIIA, 1- Stage I</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">0 - In situ</td> <td style="width: 33%;">2 - Stage II</td> <td style="width: 33%;">4 - Stage IV</td> </tr> <tr> <td>1 - Stage I</td> <td>3 - Stage III</td> <td>9 - Unknown</td> </tr> </table> <p>***Other Basis: (S-Surgical), A-Autopsy, R-Retreatment</p>	1 - Well differentiated (I)	5 - T-cell	2 - Mod well differentiated (II)	6 - B-cell	3 - Poorly differentiated (III)	7 - Null cell	4 - Undifferentiated (IV)	9 - Not stated, unknown	0 - Not paired organ	3 - Rt or lt unspecified	1 - Right	4 - Both, simultaneous	2 - Left	9 - Unknown laterality	1 - Positive histology	6 - Direct visualization	2 - Cytology	7 - Radiography	4 - Pos. micro, confirm, NOS	8 - Clinical	5 - Laboratory test/marker	9 - Unknown	00 - No nodes examined	97 - 97 + nodes examined	01 - One node examined	98 - Nodes examined, number unknown	....	99 - Unknown if nodes examined	00 - No nodes positive	97 - Positive nodes, number unknown	01 - One node positive	98 - No nodes examined	....	99 - Unknown if any nodes +/-	99 - 99 + nodes positive		0 - None	2 - Macroscopic	9 - Unknown	1 - Microscopic	8 - No resection, NA		0 - Bone Mar.	4 - Liver	6 - Lymph node (distal)	1 - Peritoneum	5 - Bone	9 - Unknown/other	2 - Lung	6 - CNS		3 - Pleura	7 - Skin		0 - In situ	4 - Regional, both 2 & 3	1 - Localized	5 - Regional, NOS	2 - Regional, direct extension	7 - Distant	3 - Regional, nodes	9 - Unknown/unstageable	0 - In situ	2 - Stage II	4 - Stage IV	1 - Stage I	3 - Stage III	9 - Unknown
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<p><b>PF 13</b>                      <b>TCAN - CANCER IDENTIFICATION</b></p> <p>DATE OF INITIAL DIAGNOSIS: (mm/dd/yyyy) <u>01/25/1987</u></p> <p>CLASS OF CASE: <u>1</u></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">0 - Dx here, rx elsewhere</td> <td style="width: 50%;">4 - Rx here prior</td> </tr> <tr> <td>1 - Dx &amp; rx here</td> <td>5 - Dx at autopsy</td> </tr> <tr> <td>2 - Rx here</td> <td>9 - Unknown</td> </tr> <tr> <td>3 - Rx elsewhere</td> <td></td> </tr> </table> <p>PRIMARY SITE - TEXT: <u>Breast, Right UOQ</u></p> <p>CODE: <u>1741</u></p> <p>HISTOLOGY - TEXT: <u>Duct Cell Carcinoma, gr 3</u></p> <p>CODE: <u>8500/3</u></p>	0 - Dx here, rx elsewhere	4 - Rx here prior	1 - Dx & rx here	5 - Dx at autopsy	2 - Rx here	9 - Unknown	3 - Rx elsewhere																																																														
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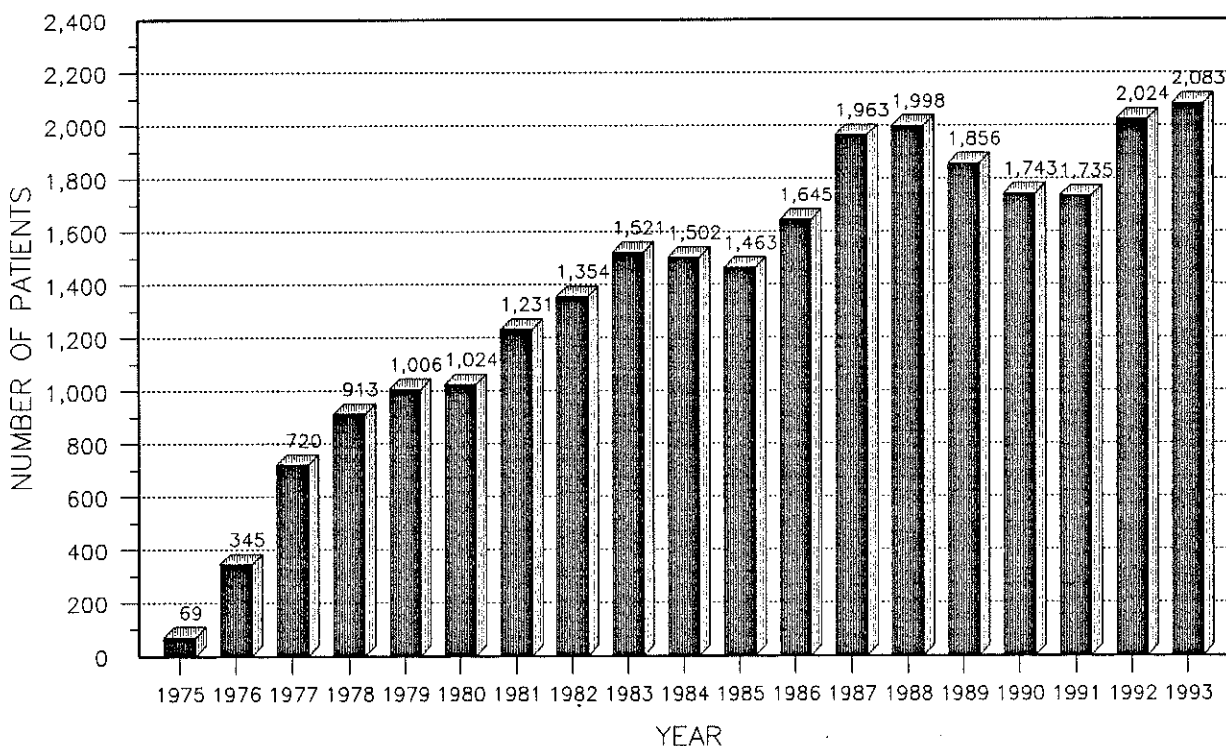




## II. KFSH&RC CANCER PATIENT POPULATION

A total of 2,083 cases were accessioned in 1993, with 1,048 males and 1,035 females or a male/female ratio of 1.01:1. This represents a 2.9% increase from 1992.

FIGURE 2  
DISTRIBUTION OF ALL CASES ACCESSIONED BY YEAR  
1975 - 1993 (TOTAL CASES = 26,195)



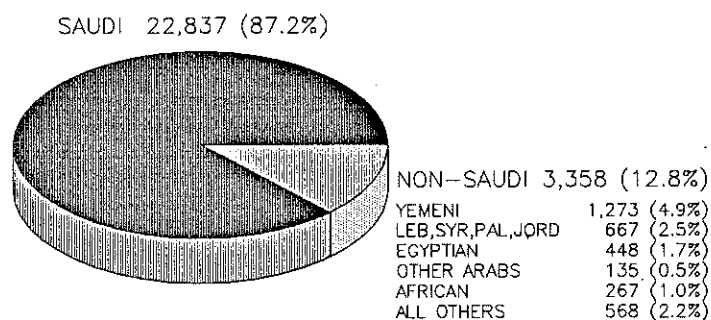
From the opening of the hospital (mid 1975) until December 1993, 26,195 cancer cases were registered (14,466 males and 11,729 females) with a male/female ratio of 1.2:1. There were 3,301 (12.6%) pediatric cases (0 to 14 years of age) and 22,894 (87.4%) adults (15 years old and above). Only a slight difference in the proportion was noted in 1993, 13.4% (279) for pediatrics and 86.6% (1,804) for adults.

TABLE 1  
ALL CASES SEEN AT KFSH&RC (MALE/FEMALE & CHILDREN/ADULTS) BY 5-YEAR PERIOD  
1975 - 1993

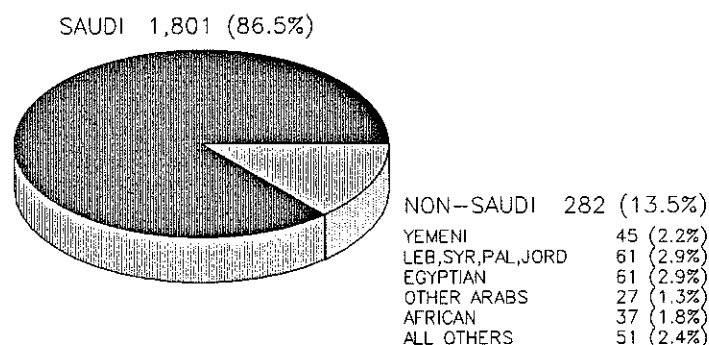
	1975-1976*		1977-1981		1982-1986		1987-1991		1992-1993		T O T A L	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
MALE	280		2,969		4,136		4,961		2,120		14,466	
FEMALE	134		1,925		3,349		4,334		1,987		11,729	
TOTAL	414		4,894		7,485		9,295		4,107		26,195	
M/F RATIO	2.1:1		1.5:1		1.2:1		1.1:1		1.1:1		1.2:1	
CHILDREN**	55	13.3	587	12.0	985	13.2	1,157	12.4	517	12.6	3,301	12.6
ADULTS	359	86.7	4,307	88.0	6,500	86.8	8,138	87.6	3,590	87.4	22,894	87.4
TOTAL	414	100	4,894	100	7,485	100	9,295	100	4,107	100	26,195	100

\* First two years of KFSH&RC partial operation.  
\*\* Children = 0 to 14 years of age; Adults = 15 years and above.

FIGURE 3  
DISTRIBUTION OF ALL CASES BY NATIONALITY  
1975 - 1993 (TOTAL CASES = 26,195)



1993 CASES (TOTAL = 2,083)

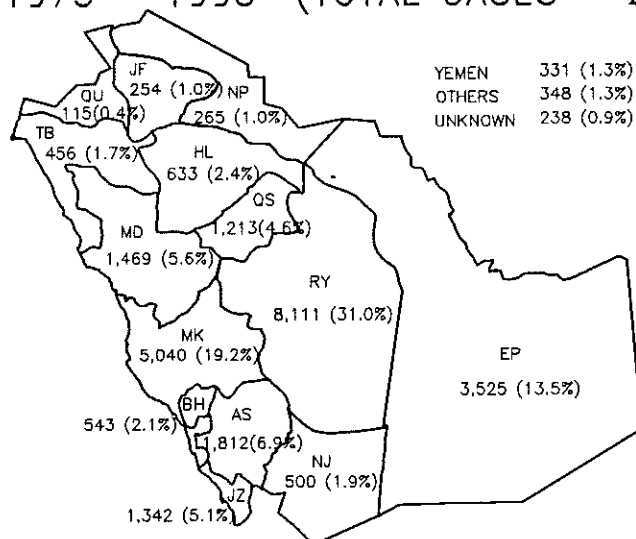


Saudi nationals totalled 1,801 (86.5%) in 1993 and the non-Saudi, 282 (13.5%). During the period 1975 to 1993, the former accounted for 87.2% (22,837) while the latter, 12.8% (3,358).

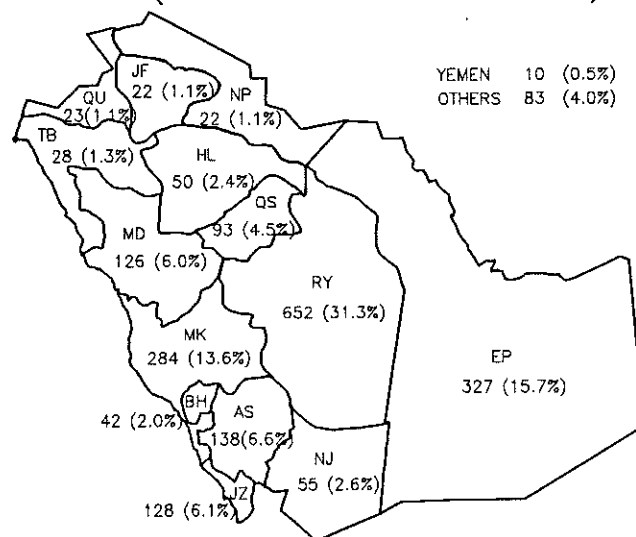
Geographically, the referral pattern is mainly from the Riyadh Region with 31.3% of all cases, followed by the Eastern Province and the Makkah Region with 15.7% and 13.6%, respectively, in 1993. The same regions had the most number of cases during the 19 years in review, i.e., 31.0% from Riyadh, 19.2% from Makkah and 13.5% from the Eastern Province.

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

FIGURE 4  
DISTRIBUTION OF ALL CASES BY GEOGRAPHIC REGION  
(Based on Given Address at the Time of Diagnosis)  
1975 - 1993 (TOTAL CASES = 26,195)



1993 (TOTAL CASES = 2,083)



AS - ASIR	JZ - JIZAN	QS - AL QASSIM
BH - AL BAHA	MD - AL MADINAH	QU - AL QURAYYAT
EP - EASTERN PROVINCE	MK - MAKKAH	RY - RIYADH
HL - HAIL	NJ - NAJRAN	TB - TABUK
JF - AL JAWF	NP - NORTHERN PROVINCE	

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

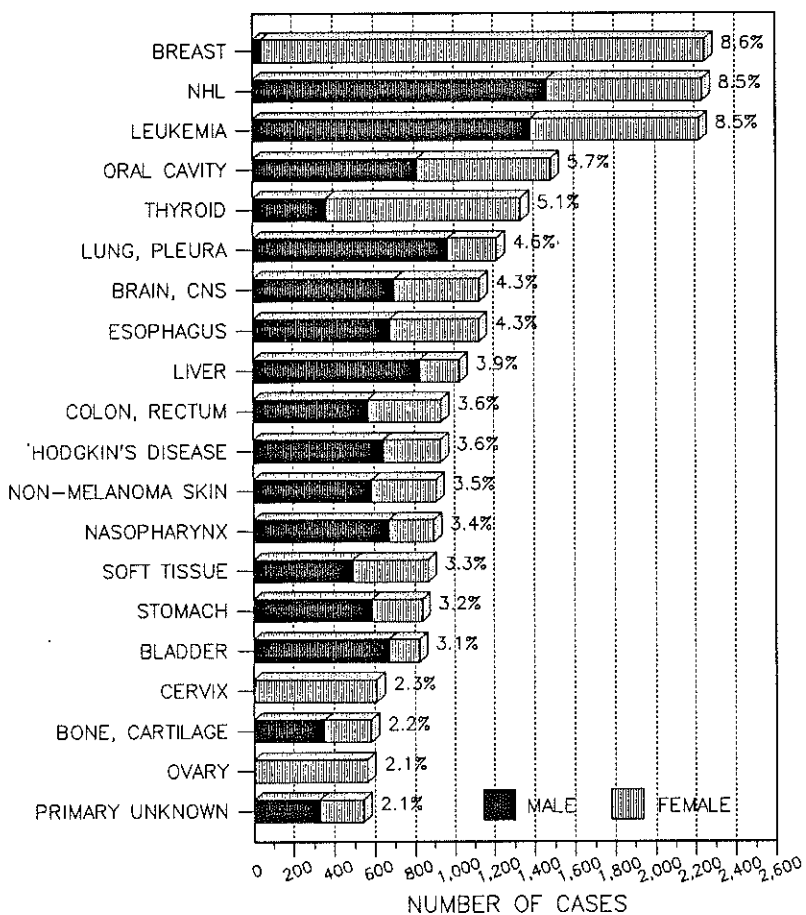
The crude relative frequency is the proportion of a given cancer in relation to all cases in a clinical or pathological series. Although such frequencies are subject to many biases, historically many elevated frequencies have been confirmed when complete cancer registration was introduced.

Biases that may have an affect on the relative frequencies of cancer cases at KFSH&RC include:

- possible nonusage of medical services by some of the population so that the hospital population may not reflect the disease state of the community
- resistance to examination by part of the female population
- absence of postmortem examinations/death certificates
- selective referral of certain malignancies because of a speciality service available
- eligibility criteria for admission to KFSH&RC
- age distribution of the population

Breast cancer led the list of total cancer cases seen from 1975 to 1993 with 8.6%, followed by Non-Hodgkin's Lymphoma (8.5%), Leukemia (8.5%), Oral Cavity (5.7%) and Thyroid (5.1%).

FIGURE 5  
DISTRIBUTION OF 20 MOST COMMON MALIGNANCIES  
1975 - 1993 ( TOTAL CASES = 26,195)



Cancer among children under the age of 15 accounted for 12.6% of all cases from 1975 to 1993. The five most common childhood malignancies were Leukemia (26.2%), Lymphoma (21.3%) [NHL 13.0% and HD 8.3%], Brain/CNS (15.3%), Eye (8.4%) and Soft Tissue (7.8%).

FIGURE 6  
DISTRIBUTION OF 10 MOST COMMON CHILDHOOD MALIGNANCIES  
1975 - 1993 (TOTAL CASES = 3,301)

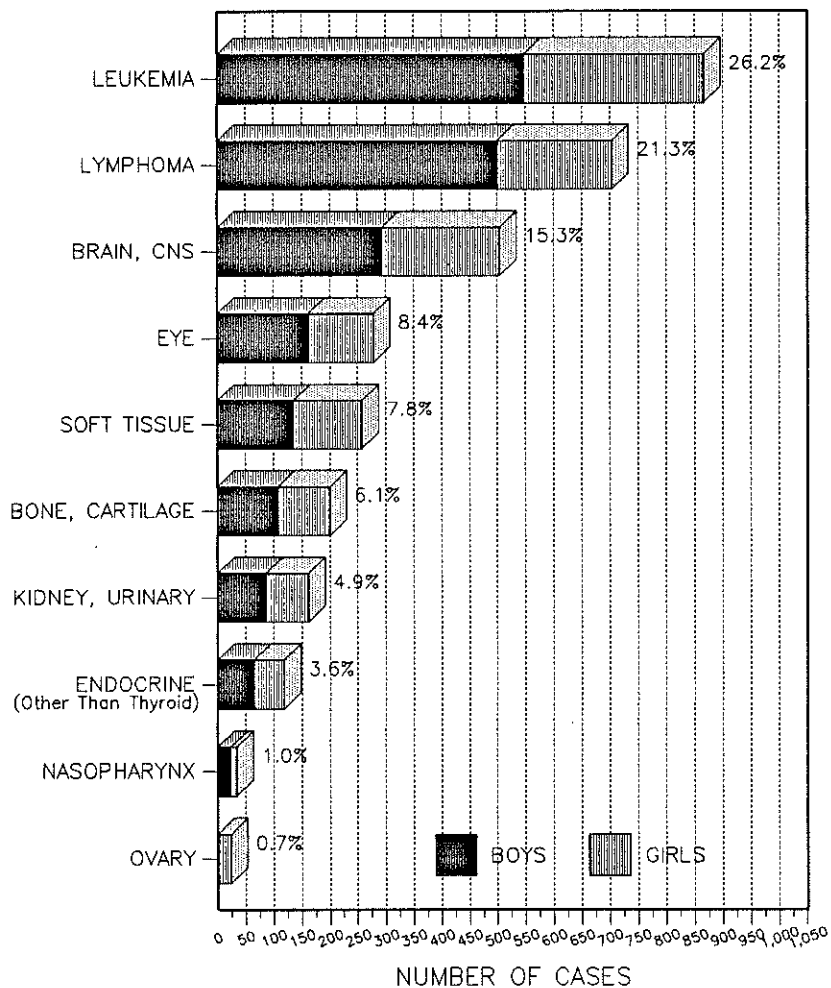


Table 2 shows the number of all malignant cases seen at KFSH&RC from 1975 to 1993 by site and year and Table 3, the 5-year summaries.



TABLE 2

ALL CASES SEEN AT KFHS&RC BY SITE\* AND YEAR  
1975 - 1993

SITE	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	TOTAL
Oral Cavity	1	14	33	80	67	67	54	79	99	81	100	73	95	127	102	103	101	111	98	1,485
Nasopharynx	3	11	39	35	38	34	48	45	64	46	45	48	79	64	62	62	61	53	59	896
Esophagus	1	15	51	62	67	68	58	62	75	76	56	69	77	66	67	73	66	68	47	1,124
Stomach	2	15	32	35	49	37	48	51	66	58	48	63	59	47	51	51	35	48	42	837
Colon, Rectum	1	13	22	24	30	36	47	38	42	59	45	51	70	82	61	64	80	88	80	933
Liver	7	15	33	44	49	33	44	55	52	64	56	84	76	71	68	54	66	75	81	1,027
Pancreas	1	5	7	11	16	11	21	20	14	20	17	27	19	16	27	12	12	26	20	302
Other G.I.	2	5	10	11	10	15	10	10	11	14	16	21	28	22	21	20	13	28	32	299
Larynx	1	5	11	11	13	17	23	14	23	19	25	16	24	33	21	26	34	27	31	374
Lung, Pleura	3	11	24	34	45	39	53	63	77	77	89	85	83	108	90	76	85	83	89	1,214
Multiple Myeloma	0	5	6	11	8	9	7	13	9	12	14	12	24	21	29	13	24	24	22	263
Lymphoid Leukemia	4	14	15	38	32	37	53	69	65	48	59	84	92	78	75	56	74	77	86	1,056
Myeloid Leukemia	3	13	22	44	50	38	62	49	42	69	55	72	86	71	72	70	71	60	91	1,040
Other Leukemias	0	1	3	5	9	6	6	6	9	11	6	3	8	8	9	6	12	6	9	123
Reticuloendothelium	0	1	0	1	1	1	1	1	1	1	1	6	2	1	1	1	0	0	0	20
Bone, Cartilage	1	6	12	25	18	22	22	40	35	42	25	31	38	43	45	36	37	50	52	580
Soft Tissue	1	14	31	33	38	27	40	45	37	44	49	55	60	57	64	71	83	61	56	866
Skin Melanoma	0	4	4	8	8	6	7	4	11	12	9	8	11	12	6	5	9	14	8	146
Non-Melanoma Skin Ca	2	15	27	31	48	40	51	57	55	60	70	71	53	52	59	49	54	61	55	910
Breast	3	24	53	46	57	63	101	111	109	151	131	125	174	193	138	168	168	187	248	2,250
Uterus, Genital	0	2	10	10	15	11	16	15	36	21	19	28	36	37	33	34	30	41	36	430
Cervix	0	10	18	18	23	18	23	25	33	32	41	54	51	50	33	44	35	52	50	610
Ovary	2	6	10	10	17	20	21	35	32	27	24	35	43	48	53	46	37	45	52	563
Prostate	0	7	5	4	5	11	11	18	26	17	21	16	22	27	27	23	16	37	26	319
Testis, Genital	0	4	10	8	13	10	15	13	11	15	13	14	17	19	13	19	15	21	27	257
Bladder	4	7	12	23	29	37	35	23	42	35	45	52	79	74	73	58	44	63	87	822
Kidney, Urinary	0	9	18	19	18	16	18	31	24	22	25	43	34	58	33	34	35	53	51	541
Eye	0	6	11	18	11	22	27	35	25	16	30	22	32	42	26	28	6	15	38	410
Brain, CNS	3	24	26	38	26	31	31	77	51	58	49	72	88	92	98	81	84	112	87	1,128
Thyroid	2	8	17	29	33	43	57	50	64	71	63	82	119	112	110	92	111	141	131	1,335
Other Endocrine	1	1	2	2	2	9	7	8	15	9	18	9	12	13	2	6	8	14	10	148
NHL - Lymph Nodes	4	19	62	72	97	97	114	99	137	107	88	84	95	100	91	92	71	88	78	1,595
NHL - Extra-nodal	0	3	10	2	5	15	16	15	33	27	35	55	57	52	72	59	52	59	73	640
Hodgkin's Disease	13	19	40	41	35	42	45	42	54	50	48	55	64	57	75	56	56	75	73	930
Primary Unknown	3	11	23	21	19	25	31	25	33	26	22	21	34	32	44	40	40	50	42	542
ALL Other Sites	1	3	11	9	5	11	8	11	9	5	6	9	22	13	5	14	11	11	16	180
TOTAL	69	345	720	913	1006	1024	1231	1354	1521	1502	1463	1645	1963	1998	1856	1742	1736	2024	2083	26,195

\* Includes Multiple Primary Neoplasms.

TABLE 3  
ALL CASES SEEN AT KFHS&RC BY SITE\* AND 5-YEAR PERIOD  
1975 - 1993

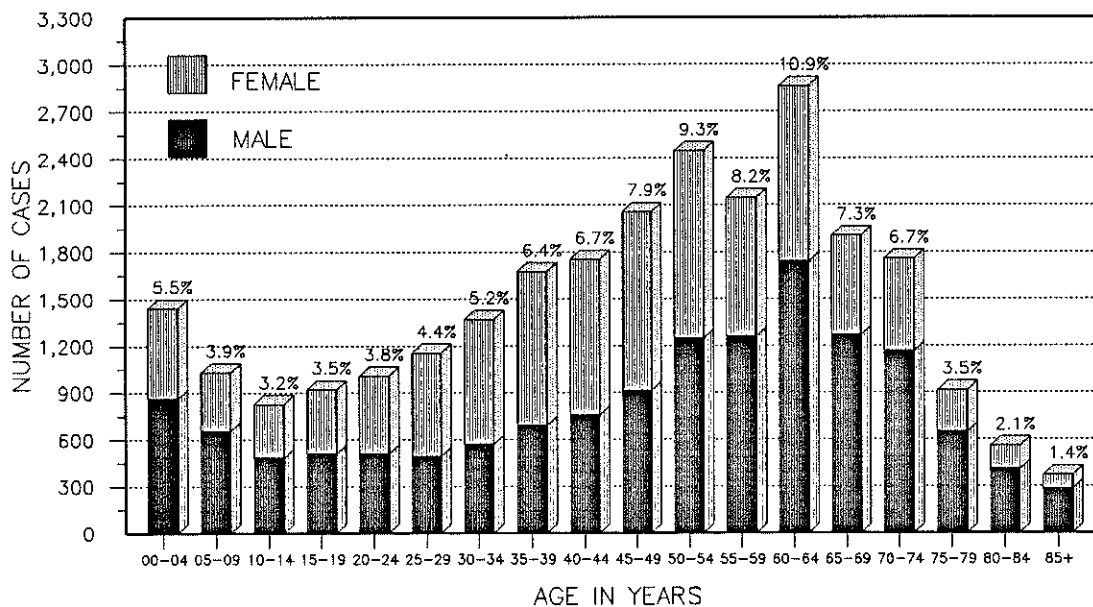
SITE	1975-1976**		1977-1981		1982-1986		1987-1991		1992-1993		TOTAL	
	No	%	No	%	No	%	No	%	No	%	No	%
Oral Cavity	15	3.6%	301	6.2%	432	5.8%	528	5.7%	209	5.1%	1,485	5.7%
Nasopharynx	14	3.4%	194	4.0%	248	3.3%	328	3.5%	112	2.7%	896	3.4%
Esophagus	16	3.9%	306	6.3%	338	4.5%	349	3.8%	115	2.8%	1,124	4.3%
Stomach	17	4.1%	201	4.1%	286	3.8%	243	2.6%	90	2.2%	837	3.2%
Colon, Rectum	14	3.4%	159	3.2%	235	3.1%	357	3.8%	168	4.1%	933	3.6%
Liver	22	5.3%	203	4.1%	311	4.2%	335	3.6%	156	3.8%	1,027	3.9%
Pancreas	6	1.4%	66	1.3%	98	1.3%	86	0.9%	46	1.1%	302	1.2%
Other G.I.	7	1.7%	56	1.1%	72	1.0%	104	1.1%	60	1.5%	299	1.1%
Larynx	6	1.4%	75	1.5%	97	1.3%	138	1.5%	58	1.4%	374	1.4%
Lung, Pleura	14	3.4%	195	4.0%	391	5.2%	442	4.8%	172	4.2%	1,214	4.6%
Multiple Myeloma	5	1.2%	41	0.8%	60	0.8%	111	1.2%	46	1.1%	263	1.0%
Lymphoid Leukemia	18	4.3%	175	3.6%	325	4.3%	375	4.0%	163	4.0%	1,056	4.0%
Myeloid Leukemia	16	3.9%	216	4.4%	287	3.8%	370	4.0%	151	3.7%	1,040	4.0%
Other Leukemias	1	0.2%	29	0.6%	35	0.5%	43	0.5%	15	0.4%	123	0.5%
Reticuloendothelium	1	0.2%	4	0.1%	10	0.1%	5	0.1%	0	0.0%	20	0.1%
Bone, Cartilage	7	1.7%	99	2.0%	173	2.3%	199	2.1%	102	2.5%	580	2.2%
Soft Tissue	15	3.6%	169	3.5%	230	3.1%	335	3.6%	117	2.8%	866	3.3%
Skin Melanoma	4	1.0%	33	0.7%	44	0.6%	43	0.5%	22	0.5%	146	0.6%
Non-Melanoma Skin Ca	17	4.1%	197	4.0%	313	4.2%	267	2.9%	116	2.8%	910	3.5%
Breast	27	6.5%	320	6.5%	627	8.4%	841	9.0%	435	10.6%	2,250	8.6%
Uterus, Genital	2	0.5%	62	1.3%	119	1.6%	170	1.8%	77	1.9%	430	1.6%
Cervix	10	2.4%	100	2.0%	185	2.5%	213	2.3%	102	2.5%	610	2.3%
Ovary	8	1.9%	78	1.6%	153	2.0%	227	2.4%	97	2.4%	563	2.1%
Prostate	7	1.7%	36	0.7%	98	1.3%	115	1.2%	63	1.5%	319	1.2%
Testis, Genital	4	1.0%	56	1.1%	66	0.9%	83	0.9%	48	1.2%	257	1.0%
Bladder	11	2.7%	136	2.8%	197	2.6%	328	3.5%	150	3.7%	822	3.1%
Kidney, Urinary	9	2.2%	89	1.8%	145	1.9%	194	2.1%	104	2.5%	541	2.1%
Eye	6	1.4%	89	1.8%	128	1.7%	134	1.4%	53	1.3%	410	1.6%
Brain, CNS	27	6.5%	152	3.1%	307	4.1%	443	4.8%	199	4.8%	1,128	4.3%
Thyroid	10	2.4%	179	3.7%	330	4.4%	544	5.9%	272	6.6%	1,335	5.1%
Other Endocrine	2	0.5%	22	0.4%	59	0.8%	41	0.4%	24	0.6%	148	0.6%
NHL - Lymph Nodes	23	5.6%	442	9.0%	515	6.9%	449	4.8%	166	4.0%	1,595	6.1%
NHL - Extra-nodal	3	0.7%	48	1.0%	165	2.2%	292	3.1%	132	3.2%	640	2.4%
Hodgkin's Disease	32	7.7%	203	4.1%	239	3.2%	308	3.3%	148	3.6%	930	3.6%
Primary Unknown	14	3.4%	119	2.4%	127	1.7%	190	2.0%	92	2.2%	542	2.1%
All Other Sites	4	1.0%	44	0.9%	40	0.5%	65	0.7%	27	0.7%	180	0.7%
TOTAL	414	100.0%	4,894	100.0%	7,485	100.0%	9,295	100.0%	4,107	100.0%	26,195	100.0%

\* Includes Multiple Primary Neoplasms.

\*\* First Two Years of KFHS&RC Partial Operation.

The largest number of cases was noted in the 5th and 6th decades in males and in the 4th and 5th in females. In 1993, the mean age was 52.4, the median is 50.3 and the mode is 60.0. Childhood malignancies are most common among children three years of age.

FIGURE 7  
DISTRIBUTION OF ALL CASES BY AGE AT DIAGNOSIS  
1975 - 1993 (TOTAL CASES = 26,195)



1993 (TOTAL CASES = 2,083)

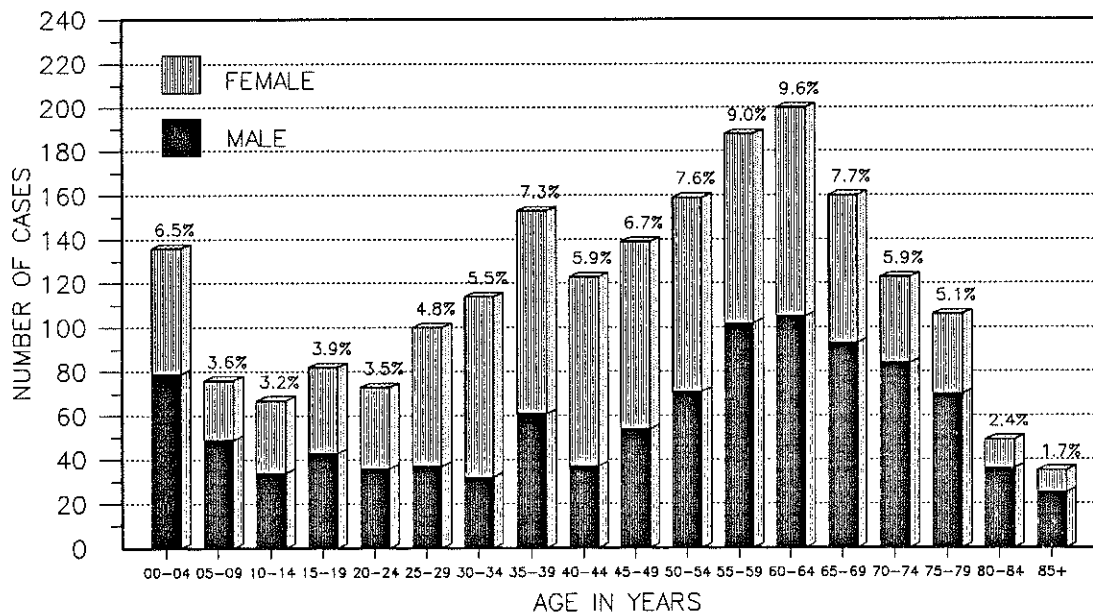
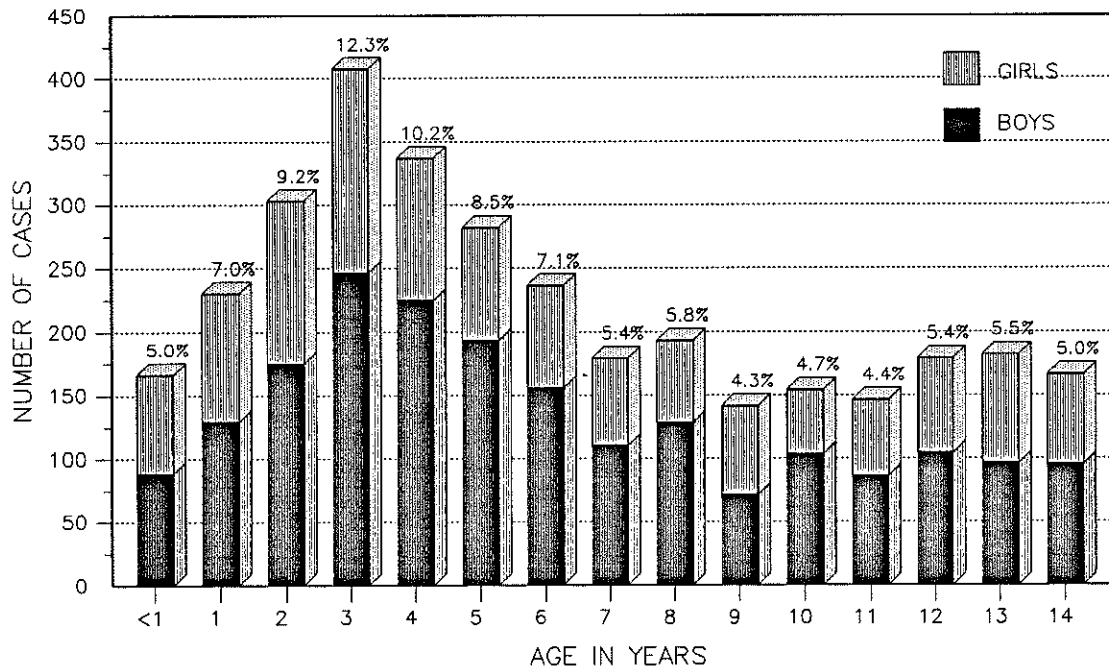


FIGURE 8  
 DISTRIBUTION OF ALL PEDIATRIC CASES BY AGE AT DIAGNOSIS  
 1975 - 1993 (TOTAL CASES = 3,301)



Of the 2,083 cases in 1993, 1,570 (75.4%) 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 513 cases (24.6%) were *non-analytic* (defined as cases diagnosed elsewhere and receiving all of their first course of treatment elsewhere). Out of the 1,570 analytic cases, pediatric cases totalled 211, with 123 boys and 88 girls.

See Table 4 for the distribution of cases by site, sex, class of case, and stage at diagnosis and Tables 5, 6 and 7 for the distributions of analytic cases by site, sex and age at diagnosis.

TABLE 4

ALL CASES SEEN AT KFHSRRC BY SITE\*, SEX, CLASS OF CASE AND SUMMARY STAGE

1993

SITE	TOTAL Number	%	SEX		CLASS OF CASE**		GENERAL SUMMARY STAGE		ANALYTIC CASES		
			Male	Female	Analytic	Non-Anal	In Situ	Localized	Regional	Distant	MA/Unknown
Breast	248	11.9%	1	247	204	44	4	60	103	34	3
Leukemia	186	8.9%	121	65	133	53	0	0	0	133	0
Non-Hodgkin's Lymphoma	151	7.2%	89	62	123	28	0	19	45	54	5
Thyroid	131	6.3%	25	106	107	24	0	44	46	16	1
Oral Cavity	98	4.7%	43	55	82	16	0	20	45	14	3
Lung	89	4.3%	77	12	69	20	0	5	21	39	4
Brain, CNS	87	4.2%	51	36	78	9	0	58	17	3	0
Bladder	87	4.2%	69	18	59	28	0	25	26	6	2
Liver	81	3.9%	68	13	52	29	0	16	8	24	4
Colon, Rectum	80	3.8%	45	35	52	28	0	7	26	12	7
Hodgkin's Disease	73	3.5%	48	25	57	16	0	12	21	24	0
Nasopharynx	59	2.8%	47	12	54	5	0	2	33	19	0
Soft Tissue	56	2.7%	30	26	35	21	0	10	12	10	3
Non-Melanoma Skin Ca	55	2.6%	37	18	31	24	0	16	5	7	3
Bone, Cartilage	52	2.5%	29	23	46	6	0	4	33	9	0
Ovary	52	2.5%	0	52	36	16	0	8	4	24	0
Kidney, Urinary	51	2.4%	26	25	40	11	0	20	11	9	0
Cervix	50	2.4%	0	50	44	6	3	10	25	6	0
Esophagus	47	2.3%	25	22	42	5	0	14	16	11	1
Stomach	42	2.0%	29	13	28	14	0	2	19	7	0
Primary Unknown	42	2.0%	21	21	28	14	0	0	0	0	28
Eye	38	1.8%	21	17	17	21	0	4	12	1	0
Uterus, Genital	36	1.7%	0	36	30	6	0	10	8	12	0
Other G.I.	32	1.5%	14	18	18	14	1	3	7	6	1
Larynx	31	1.5%	29	2	27	4	1	15	7	4	0
Testis, Genital	27	1.3%	27	0	21	6	0	7	6	8	0
Prostate	26	1.2%	26	0	11	15	0	1	2	6	2
Multiple Myeloma	22	1.1%	15	7	13	9	0	0	0	13	0
Pancreas	20	1.0%	14	6	8	12	0	2	2	4	0
ALL Other Sites	16	0.8%	11	5	13	3	0	2	7	3	1
Other Endocrine	10	0.5%	7	3	8	2	0	2	0	6	0
Skin Melanoma	8	0.4%	3	5	4	4	1	1	0	1	1
TOTAL	2,083	100.0%	1,048	1,035	1,570	513	10	399	567	525	69

\* Includes Multiple Primary Neoplasms.

\*\* Analytic Cases - cases which were first diagnosed and/or received all or part of their first course of treatment at KFHSRRC.  
 Non-Analytic Cases - cases which were diagnosed elsewhere and received all of their first course of treatment elsewhere.

TABLE 5

ANALYTIC CASES SEEN AT KFSH&RC BY SITE\* AND AGE

1993

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	1	1	2	1	4	4	6	9	8	12	5	7	13	4	5	82
Nasopharynx	0	0	2	3	3	2	5	3	3	6	6	11	4	1	2	3	0	0	54
Esophagus	0	0	0	0	0	0	1	1	2	1	7	6	5	6	5	6	0	2	42
Stomach	0	0	0	0	0	1	0	1	0	3	3	2	2	4	2	5	3	2	28
Colon, Rectum	0	0	0	0	2	5	2	7	3	1	2	9	3	9	5	1	2	1	52
Liver	0	0	0	0	0	0	0	0	0	5	6	9	9	10	4	4	3	2	52
Pancreas	0	0	0	0	0	0	0	0	0	0	1	4	0	1	1	1	0	0	8
Other G.I.	1	0	0	1	0	0	0	2	1	1	1	4	2	2	2	1	0	0	18
Larynx	0	0	0	0	0	0	2	1	0	2	1	6	3	1	4	4	3	0	27
Lung, Pleura	0	0	0	0	0	0	1	6	3	3	12	2	15	11	7	7	1	1	69
Multiple Myeloma	0	0	0	0	0	0	0	1	0	2	1	1	2	2	3	0	0	1	13
Lymphoid Leukemia	24	12	6	5	3	2	0	1	0	1	1	3	0	0	0	1	0	0	59
Myeloid Leukemia	9	6	5	12	4	5	4	11	2	2	1	2	2	1	1	0	0	0	67
Other Leukemias	2	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	1	7
Bone, Cartilage	1	4	13	14	4	2	4	2	0	1	0	3	2	2	1	2	0	0	46
Soft Tissue	9	2	4	2	2	4	1	2	0	0	1	2	2	2	1	0	0	1	35
Skin Melanoma	0	0	4	2	2	4	1	2	0	0	1	0	0	0	1	0	0	0	4
Non-Melanoma Skin Ca	0	2	1	0	0	1	0	4	1	3	1	3	4	7	1	0	3	0	31
Breast	0	0	0	1	4	11	24	25	34	26	23	19	13	11	7	4	1	1	204
Uterus, Genital	0	0	0	0	1	2	3	1	3	3	4	5	4	3	0	1	0	0	30
Cervix	0	0	0	0	0	3	4	4	6	8	4	3	4	3	2	1	2	0	44
Ovary	0	1	2	3	3	0	1	3	5	4	3	1	5	4	0	1	0	0	36
Prostate	0	0	0	0	0	0	0	0	0	0	1	0	1	2	3	4	0	0	11
Testis, Genital	1	0	0	0	4	3	4	3	2	0	1	2	1	0	0	0	0	0	21
Bladder	0	0	0	0	0	0	3	2	4	3	2	9	9	5	9	5	6	2	59
Kidney, Urinary	4	3	0	0	0	2	2	1	3	3	3	3	5	3	3	2	2	1	40
Eye	12	1	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	0	17
Brain, CNS	7	20	10	8	5	4	2	2	7	7	2	3	2	2	2	0	0	0	78
Thyroid	0	0	0	6	9	23	14	10	9	9	5	8	7	2	4	2	1	0	107
Other Endocrine	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
NHL - Lymph Nodes	2	1	2	3	1	1	4	4	2	7	3	5	5	5	7	4	1	2	59
NHL - Extra-nodal	9	1	1	1	2	2	5	2	4	5	3	3	4	7	6	6	1	2	64
Hodgkin's Disease	6	6	9	6	5	5	1	5	0	3	2	0	1	2	0	0	0	0	53
H.D. - Extra-nodal	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0	0	0	4
Primary Unknown	1	0	0	0	0	1	2	1	0	2	5	2	5	2	2	1	2	2	28
All Other Sites	1	0	0	2	1	0	2	1	2	0	0	0	0	0	1	1	0	2	13
TOTAL	95	60	56	70	54	83	88	111	100	111	116	138	135	113	94	82	36	28	1,570

\* Includes Multiple Primary Neoplasms.

TABLE 6

ANALYTIC "MALE" CASES SEEN AT KFSH&RC BY SITE\* AND AGE  
1993

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	0	0	0	3	3	2	3	3	3	4	4	6	2	2	35
Nasopharynx	0	0	2	3	1	1	4	3	2	5	4	9	2	1	2	3	0	0	42
Esophagus	0	0	0	0	0	0	1	0	0	0	3	4	1	5	4	4	0	2	24
Stomach	0	0	0	0	0	0	0	1	0	1	2	0	2	2	1	5	3	2	19
Colon, Rectum	0	0	0	0	1	4	0	2	1	0	2	7	1	5	2	0	0	1	26
Liver	0	0	0	0	0	0	0	0	0	2	6	8	9	8	4	3	3	1	44
Pancreas	0	0	0	0	0	0	0	0	0	1	1	3	0	1	1	1	0	0	7
Other G.I.	0	0	0	0	0	0	0	1	0	1	0	1	1	0	1	1	0	0	7
Larynx	0	0	0	0	0	0	2	1	0	2	1	5	3	1	4	4	3	0	26
Lung, Pleura	0	0	0	0	0	0	0	4	3	3	10	1	14	11	5	6	1	1	59
Multiple Myeloma	0	0	0	0	0	0	0	1	0	1	0	0	2	1	3	0	0	1	9
Lymphoid Leukemia	13	7	3	3	2	2	2	1	0	1	1	3	0	0	0	1	0	0	37
Myeloid Leukemia	7	4	2	11	2	1	2	7	0	0	0	1	2	0	1	0	0	0	40
Other Leukemias	2	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	1	7
Bone, Cartilage	0	2	5	8	3	2	1	0	0	1	1	2	2	0	1	0	0	0	25
Soft Tissue	5	0	2	1	1	2	1	0	0	0	1	2	2	0	1	0	0	0	18
Skin Melanoma	0	0	2	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	3
Non-Melanoma Skin Ca	0	2	0	0	0	1	0	2	1	1	1	3	3	5	1	0	3	0	23
Breast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uterus, Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cervix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ovary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostate	0	0	0	0	0	0	0	0	0	0	1	0	1	2	3	4	0	0	11
Testis, Genital	1	0	0	0	0	4	3	2	0	0	1	2	1	0	0	0	0	0	21
Bladder	0	0	0	0	0	0	1	2	4	2	1	7	7	5	6	4	5	2	46
Kidney, Urinary	1	1	0	0	0	0	2	0	1	2	0	1	3	2	0	2	2	0	19
Eye	8	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	11
Brain, CNS	3	13	5	2	2	2	1	2	4	2	2	1	1	1	1	0	0	0	42
Thyroid	0	0	0	1	2	1	1	3	1	0	3	1	1	1	1	1	0	0	17
Other Endocrine	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
NHL - Lymph Nodes	2	1	1	3	1	0	2	1	0	4	2	3	4	3	6	1	1	2	37
NHL - Extra-nodal	6	0	1	0	2	2	1	1	3	5	2	2	1	3	4	4	0	1	38
Hodgkin's Disease	4	5	6	1	5	3	1	4	0	2	2	0	0	0	0	0	0	0	35
H.D. - Extra-nodal	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Primary Unknown	1	0	0	0	0	0	0	0	0	0	2	2	4	1	0	0	1	1	12
All Other Sites	1	0	0	1	1	0	1	0	1	0	0	0	0	0	1	1	0	2	9
TOTAL	59	36	28	35	27	28	24	44	26	38	52	69	70	62	59	55	25	19	756

\* Includes Multiple Primary Neoplasms.

TABLE 7  
ANALYTIC "FEMALE" CASES SEEN AT KFSH&RC BY SITE\* AND AGE  
1993

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	1	1	2	1	1	1	4	6	5	9	1	3	7	2	3	47
Nasopharynx	0	0	0	0	2	1	1	0	1	1	2	2	2	0	0	0	0	0	12
Esophagus	0	0	0	0	0	0	0	1	2	1	4	2	4	1	1	2	0	0	18
Stomach	0	0	0	0	0	1	0	0	0	2	1	2	0	2	1	0	0	0	9
Colon, Rectum	0	0	0	0	1	1	2	5	2	1	0	2	2	4	3	1	2	0	26
Liver	0	0	0	0	0	0	0	0	0	3	0	1	0	2	0	1	0	1	8
Pancreas	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Other G.I.	1	0	0	1	0	0	0	1	1	0	1	3	1	2	0	0	0	0	11
Larynx	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Lung, Pleura	0	0	0	0	0	0	1	2	0	0	2	1	1	0	2	1	0	0	10
Multiple Myeloma	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	4
Lymphoid Leukemia	11	5	3	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	22
Myeloid Leukemia	2	2	3	1	2	4	2	4	2	2	1	1	0	1	0	0	0	0	27
Other Leukemias	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bone, Cartilage	1	2	8	6	1	1	0	0	0	0	0	3	0	0	0	0	0	0	21
Soft Tissue	4	2	2	1	1	2	0	2	0	0	0	0	0	2	0	0	0	1	17
Skin Melanoma	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Non-Melanoma Skin Ca	0	0	1	0	0	0	0	2	0	2	0	0	1	2	0	0	0	0	8
Breast	0	0	0	1	4	11	24	25	34	26	23	19	13	11	7	4	1	1	204
Uterus, Genital	0	0	0	0	0	1	3	1	3	3	4	5	4	3	0	1	0	0	30
Cervix	0	0	0	0	0	3	4	4	6	8	4	3	4	3	2	1	2	0	44
Ovary	0	1	2	3	3	0	1	3	5	4	3	1	5	4	0	1	0	0	36
Prostate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Testis, Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bladder	0	0	0	0	0	0	2	0	0	1	1	2	2	0	3	1	1	0	13
Kidney, Urinary	3	2	0	0	0	0	0	1	2	1	3	2	2	1	3	0	0	1	21
Eye	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	6
Brain, CNS	4	7	5	6	3	2	1	0	3	0	0	2	1	1	1	0	0	0	36
Thyroid	0	0	0	5	7	22	13	7	8	7	2	7	6	1	3	1	1	0	90
Other Endocrine	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
NHL - Lymph Nodes	0	0	1	0	0	1	2	3	2	3	1	2	1	2	1	3	0	0	22
NHL - Extra-nodal	3	1	0	1	0	0	4	1	1	0	1	1	3	4	2	2	1	1	26
Hodgkin's Disease	2	1	3	5	0	2	0	1	0	1	0	0	1	2	0	0	0	0	18
H.D. - Extra-nodal	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	3
Primary Unknown	0	0	0	0	0	1	2	1	0	2	3	0	1	1	2	1	1	1	16
All Other Sites	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	4
TOTAL	36	24	28	35	27	55	64	67	74	73	64	69	65	51	35	27	11	9	814

\* Includes Multiple Primary Neoplasms.



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

The 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 soft tissue sarcoma, among others, is more common. The following 1993 analytic cases exhibit significant differences in trends from those of the West:

**Breast** - The most common malignancy seen at KFSH&RC is breast cancer, comprising 13.0% of all cases, as compared to about 16% of all neoplasms diagnosed in the U.S.A. It affects mostly women less than the age of 50, while in the U.S.A. those more than 50 years of age are mostly affected. As in the Western countries, it is the number one cancer among women.

**Leukemia** - Leukemia constitutes 8.5% of all cases seen at KFSH&RC, as compared to about 2% of all neoplasms diagnosed in the U.S.A. The male/female ratio is 1.7:1. It is the most common type of malignancy seen in males and the third most common in females. It is also the most common malignancy in children under the age of 15.

**Non-Hodgkin's Lymphoma** - The most striking feature is the unusually high crude relative frequency of non-Hodgkin's lymphoma, accounting for 7.8% of all cases. The male/female ratio is 1.6:1. In the U.S.A., NHL accounts for only about 4% of all cancer.

**Thyroid** - 2.2% of all male malignancies in KFSH&RC are thyroid tumors. However, they represent 11.1% of female malignant neoplasms, second to breast cancer. The male/female ratio is 0.2:1. Thyroid cancer accounts for only 1.1% of all cases in the U.S.A. and 1.6% of female malignancies.

**Oral Cavity** - A high crude relative frequency rate was also noted in cancer of the oral cavity. In Western countries, oral cancer accounts for no more than 3% of all cancers, whereas at KFSH&RC it represents 5.2% of the cases. The male/female ratio is 0.7:1.

**Brain/CNS** - Primary malignant neoplasm of the brain and CNS accounts for 5.0% of all malignancies and ranks second among the most common childhood malignancies. The male/female ratio is 1.2:1. This is comparatively higher than in the West with only 1.5% of all cases.

**Lung** - Frequency of lung cancer is much lower than in Western countries, most likely reflecting the much lower levels of smoking and industrial pollution. In the U.S.A., primary lung cancer represents about 15% of all cancer cases (17% in males, and 12% in females).

At KFSH&RC, 4.4% of the diagnoses are lung cancer, although in males it is the third most common tumor, constituting 7.8% of male malignancies and 1.2% in females. The male/female ratio is 5.9:1.

**Colo-Rectal** - Markedly less common than in the West, for which dietary factors (particularly lower animal fat intake) may play a role, this disease represents only 3.3% of all tumors. In the U.S.A. it constitutes 13% of newly diagnosed cancer cases. The male/female ratio at KFSH&RC is 1.0:1.

**Esophagus** - The incidence of esophageal carcinoma is comparatively more frequent at KFSH&RC than in Western countries. In the U.S.A. it constitutes 1% of all cancers, compared to 2.7% at KFSH&RC. The male/female ratio is 1.3:1.

**Liver** - Although the relative frequency of liver cancer at the KFSH&RC (3.3%) is almost the same as that of the West, the male/female ratio appears to be significant and may be an area for future research investigations. KFSH&RC has 5.5:1 and the West, 1.2:1.

**Nasopharynx** - A higher crude relative frequency rate is seen in nasopharyngeal cancer. It constitutes less than 1% of the pathologically diagnosed cancers in most centers in the West, but is 3.4% of the cases at KFSH&RC. The male/female ratio is 3.5:1.

**Soft Tissue** - KFSH&RC cases show a higher rate of soft tissue malignancies than the U.S.A., with 2.2% against the latter's 0.5% of all cases. The male/female ratio is 1.1:1.

**Prostate** - The observed rate of prostatic cancer in men is much lower than in the West, where it is one of the most common male cancers (constituting 14% of the malignancies). This is in contrast to the KFSH&RC experience, where prostatic cancer makes up only 0.7% of the male cancer. This is probably due to the population age difference. Prostate cancer is a disease chiefly of old men and the population of Saudi Arabia is in general very young.

FIGURE 9

DISTRIBUTION OF 20 MOST COMMON MALIGNANCIES  
1993 ANALYTIC CASES (TOTAL CASES = 1,570)

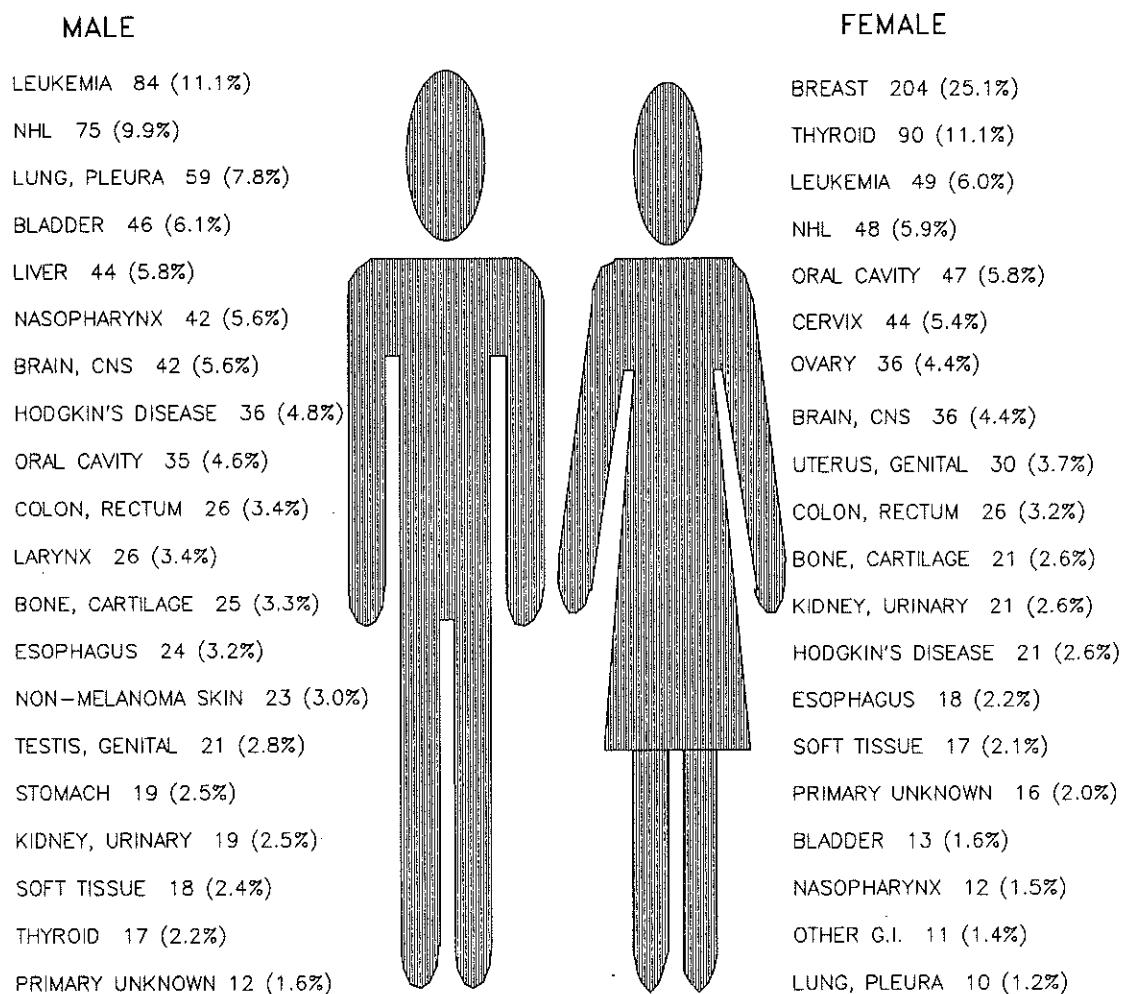


FIGURE 10  
 DISTRIBUTION OF CHILDHOOD MALIGNANCIES  
 1993 ANALYTIC CASES (TOTAL CASES = 211)

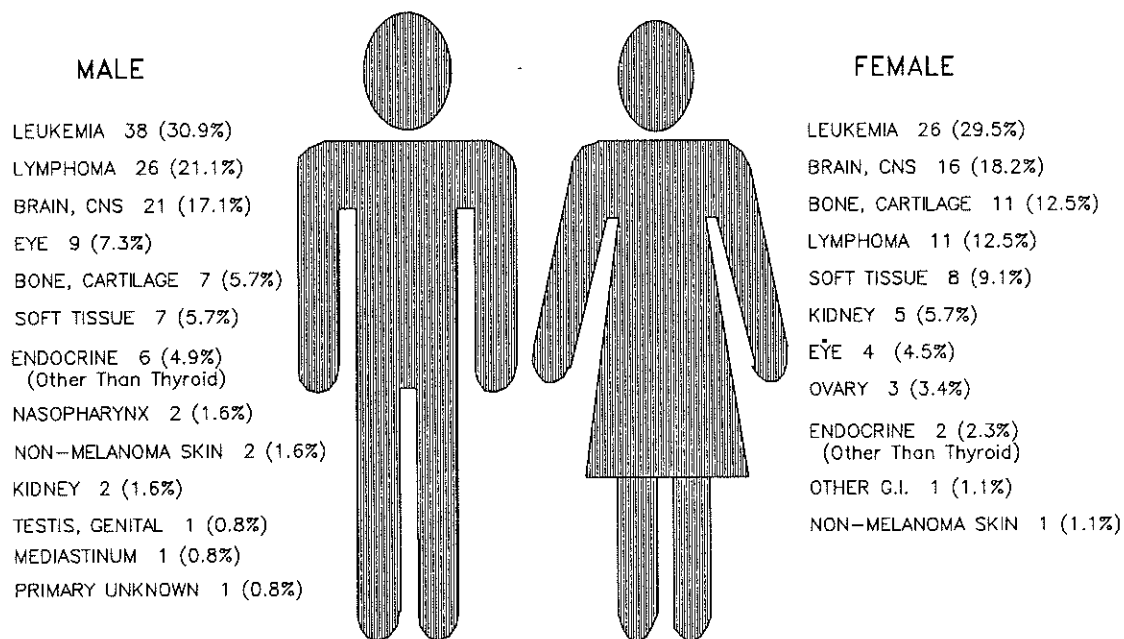


TABLE 8  
PRIMARY SITE TABLE  
(INCLUDES MULTIPLE PRIMARIES)  
1 9 9 3

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
(NOS - Not Otherwise Specified)		2,083	1,048	1,035
<b>LIP</b>		<b>4</b>	<b>1</b>	<b>3</b>
	Squamous Cell Carinoma			
<b>TONGUE</b>		<b>27</b>	<b>14</b>	<b>13</b>
	Squamous Cell Carinoma	25	12	13
	Verrucous Carcinoma	2	2	0
<b>MAJOR SALIVARY GLANDS</b>		<b>7</b>	<b>3</b>	<b>4</b>
	Mucoepidermoid Carcinoma	3	1	2
	Carcinoma, NOS	2	2	0
	Adenoid Cystic Carcinoma	1	0	1
	Acinar Cell Carcinoma	1	0	1
<b>GUM</b>		<b>17</b>	<b>9</b>	<b>8</b>
	Squamous Cell Carcinoma	14	6	8
	Non-Hodgkin's Lymphoma	2	2	0
	Verrucous Carcinoma	1	1	0
<b>OTHER PARTS OF MOUTH</b>		<b>17</b>	<b>8</b>	<b>9</b>
	Squamous Cell Carcinoma	12	5	7
	Adenoid Cystic Carcinoma	2	0	2
	Mucoepidermoid Carcinoma	1	1	0
	Non-Hodgkin's Lymphoma	1	1	0
	Malignant Neoplasm	1	1	0
<b>OROPHARYNX</b>		<b>9</b>	<b>4</b>	<b>5</b>
	Non-Hodgkin's Lymphoma	6	4	2
	Squamous Cell Carcinoma	2	0	2
	Carcinoma, NOS	1	0	1
<b>NASOPHARYNX</b>		<b>61</b>	<b>48</b>	<b>13</b>
	Squamous Cell Carcinoma	35	28	7
	Undifferentiated Carcinoma	13	11	2
	Carcinoma, NOS	10	8	2
	Lymphoepithelial Carcinoma	1	0	1
	Non-Hodgkin's Lymphoma	1	1	0
	Hodgkin's Disease	1	0	1
<b>HYPOPHARYNX</b>		<b>25</b>	<b>10</b>	<b>15</b>
	Squamous Cell Carcinoma			
<b>PHARYNX, NOS</b>		<b>1</b>	<b>1</b>	<b>0</b>
	Squamous Cell Carcinoma			
<b>ESOPHAGUS</b>		<b>47</b>	<b>25</b>	<b>22</b>
	Squamous Cell Carcinoma	42	22	20
	Adenocarcinoma, NOS	2	2	0
	Carcinoma, NOS	2	0	2
	Malignant Neoplasm	1	1	0

## Primary Site Table con't

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
<b>STOMACH</b>		<b>57</b>	<b>35</b>	<b>22</b>
	Adenocarcinoma, NOS	32	23	9
	Non-Hodgkin's Lymphoma	15	6	9
	Signet Ring Cell Carcinoma	3	2	1
	Squamous Cell Carcinoma	3	2	1
	Carcinoma, NOS	2	1	1
	Adenosquamous Carcinoma	1	0	1
	Malignant Neoplasm	1	1	0
<b>SMALL INTESTINE</b>		<b>15</b>	<b>9</b>	<b>6</b>
	Non-Hodgkin's Lymphoma	11	6	5
	Adenocarcinoma, NOS	2	1	1
	Neuroendocrine Carcinoma	1	1	0
	Carcinoid Tumor	1	1	0
<b>COLON</b>		<b>30</b>	<b>18</b>	<b>12</b>
	Adenocarcinoma, NOS	13	6	7
	Mucinous Adenocarcinoma	6	6	0
	Non-Hodgkin's Lymphoma	6	4	2
	Adenocarcinoma in Adenomatous Polyp	2	0	2
	Hodgkin's Disease	1	0	1
	Carcinoma, NOS	1	1	0
	Malignant Neoplasm	1	1	0
<b>RECTUM/RECTOSIGMOID JUNCTION/ANUS</b>		<b>57</b>	<b>31</b>	<b>26</b>
	Adenocarcinoma, NOS	35	20	15
	Mucinous Adenocarcinoma	8	5	3
	Squamous Cell Carcinoma	5	3	2
	Adenocarcinoma in Adenomatous Polyp	2	0	2
	Adenocarcinoma in Villous Adenoma	1	0	1
	Mucin-Producing Adenocarcinoma	1	0	1
	Signet Ring Cell Carcinoma	1	0	1
	Small Cell Carcinoma	1	1	0
	Basaloid Carcinoma	1	0	1
	Carcinoma, NOS	1	1	0
	Malignant Neoplasm	1	1	0
<b>LIVER/INTRAHEPATIC BILE DUCTS</b>		<b>81</b>	<b>68</b>	<b>13</b>
	Hepatocellular Carcinoma	74	63	11
	Cholangiocarcinoma	3	2	1
	Malignant Neoplasm	2	2	0
	Combined Hepatocellular & Cholangiocarcinoma	1	0	1
	Carcinoma, NOS	1	1	0
<b>GALLBLADDER/EXTRAHEPATIC BILE DUCTS</b>		<b>21</b>	<b>6</b>	<b>15</b>
	Adenocarcinoma, NOS	20	6	14
	Carcinoma, NOS	1	0	1
<b>PANCREAS</b>		<b>22</b>	<b>16</b>	<b>6</b>
	Adenocarcinoma, NOS	15	11	4
	Malignant Neoplasm	4	3	1
	Non-Hodgkin's Lymphoma	2	2	0
	Carcinoma, NOS	1	0	1
<b>RETROPERITONEUM/PERITONEUM</b>		<b>2</b>	<b>0</b>	<b>2</b>
	Endodermal Sinus Tumor	1	0	1
	Non-Hodgkin's Lymphoma	1	0	1

## Primary Site Table con't

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
<b>OTHER G.I. SITES</b>		<b>8</b>	<b>5</b>	<b>3</b>
	Adenocarcinoma	2	2	0
	Carcinoid Tumor	2	1	1
	Non-Hodgkin's Lymphoma	2	0	2
	Signet Ring Cell Carcinoma	1	1	0
	Malignant Neoplasm	1	1	0
<b>NASAL CAVITIES/ACCESSORY SINUSES</b>		<b>11</b>	<b>7</b>	<b>4</b>
	Squamous Cell Carcinoma	4	2	2
	Non-Hodgkin's Lymphoma	2	1	1
	Carcinoma, NOS	2	1	1
	Adenoid Cystic Carcinoma	1	1	0
	Solitary Plasmacytoma	1	1	0
	Adenocarcinoma, NOS	1	1	0
<b>LARYNX</b>		<b>31</b>	<b>29</b>	<b>2</b>
	Squamous Cell Carcinoma	28	27	1
	Carcinoma, NOS	2	1	1
	Verrucous Carcinoma	1	1	0
<b>BRONCHUS/LUNG</b>		<b>85</b>	<b>75</b>	<b>10</b>
	Adenocarcinoma	32	26	6
	Squamous Cell Carcinoma	22	21	1
	Carcinoma, NOS	6	6	0
	Small Cell Carcinoma	4	4	0
	Undifferentiated Carcinoma	4	3	1
	Carcinoid Tumor	4	2	2
	Bronchio-Alveolar Adenocarcinoma	3	3	0
	Large Cell Carcinoma	2	2	0
	Giant Cell Carcinoma	2	2	0
	Malignant Neoplasm	2	2	0
	Mixed Small & Large Cell Carcinoma	1	1	0
	Solid Large Cell Carcinoma	1	1	0
	Adenosquamous Carcinoma	1	1	0
	Signet Ring Cell Carcinoma	1	1	0
<b>PLEURA</b>		<b>4</b>	<b>2</b>	<b>2</b>
	Mesothelioma	3	1	2
	Adenocarcinoma	1	1	0
<b>THYMUS/MEDIASTINUM</b>		<b>14</b>	<b>10</b>	<b>4</b>
	Malignant Thymoma	2	1	1
	Neuroblastoma	2	2	0
	Hodgkin's Disease	2	1	1
	Malignant Neoplasm	2	1	1
	Malignant Neurilemmoma	1	1	0
	Non-Hodgkin's Lymphoma	1	0	1
	Endodermal Sinus Tumor	1	1	0
	Squamous Cell Carcinoma	1	1	0
	Ganglioneuroblastoma	1	1	0
	Ewing's Sarcoma	1	1	0
<b>MULTIPLE MYELOMA</b>		<b>22</b>	<b>15</b>	<b>7</b>

## Primary Site Table con't

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
<b>BONE MARROW</b>		<b>186</b>	<b>121</b>	<b>65</b>
	Acute Lymphoid Leukemia	76	47	29
	Acute Myeloid Leukemia	38	23	15
	Chronic Myeloid Leukemia	38	23	15
	Chronic Lymphoid Leukemia	10	10	0
	Acute Myelomonocytic Leukemia	8	6	2
	Acute Promyelocytic Leukemia	6	4	2
	Acute Leukemia, NOS	3	3	0
	Acute Monocytic Leukemia	3	2	1
	Chronic Myelomonocytic Leukemia	1	0	1
	Megakaryocytic Leukemia	1	1	0
	Erythroleukemia	1	1	0
	Leukemia, NOS	1	1	0
<b>BONE &amp; CARTILAGE</b>		<b>57</b>	<b>30</b>	<b>27</b>
	Osteosarcoma, NOS	24	11	13
	Ewing's Sarcoma	15	8	7
	Chondrosarcoma, NOS	7	5	2
	Non-Hodgkin's Lymphoma	5	1	4
	Chondroblastic Osteosarcoma	2	2	0
	Juxtacortical Osteosarcoma	1	1	0
	Solitary Plasmacytoma	1	1	0
	Sarcoma, NOS	1	1	0
	Malignant Neoplasm	1	0	1
<b>CONNECTIVE/SUBCUTANEOUS/SOFT TISSUE</b>		<b>53</b>	<b>27</b>	<b>26</b>
	Neuroblastoma	7	3	4
	Leiomyosarcoma	6	3	3
	Embryonal Rhabdomyosarcoma	4	2	2
	Malignant Fibrous Histiocytoma	4	3	1
	Rhabdomyosarcoma, NOS	3	2	1
	Synovial Sarcoma	3	2	1
	Sarcoma, NOS	3	2	1
	Malignant Neoplasm	3	1	2
	Spindle Cell Sarcoma	2	1	1
	Alveolar Rhabdomyosarcoma	2	0	2
	Fibrosarcoma, NOS	2	1	1
	Peripheral Neuroectodermal Tumor	2	1	1
	Chordoma	2	2	0
	Non-Hodgkin's Lymphoma	2	2	0
	Myxoid Liposarcoma	1	0	1
	Liposarcoma	1	0	1
	Clear Cell Sarcoma	1	0	1
	Hemangiosarcoma	1	0	1
	Malignant Hemangiopericytoma	1	0	1
	Malignant Neurilemmoma	1	0	1
	Malignant Triton Tumor	1	1	0
	Ewing's Sarcoma	1	1	0
<b>SKIN (MELANOMA)</b>		<b>8</b>	<b>3</b>	<b>5</b>

## Primary Site Table con't

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
<b>SKIN (NON-MELANOMA)</b>		<b>55</b>	<b>37</b>	<b>18</b>
	Squamous Cell Carcinoma	25	19	6
	Basal Cell Carcinoma	15	10	5
	Basosquamous Carcinoma	7	4	3
	Mycosis Fungoides	2	1	1
	Kaposi's Sarcoma	1	1	0
	Dermatofibrosarcoma Protuberans	1	1	0
	Sweat Gland Adenocarcinoma	1	0	1
	Sebaceous Adenocarcinoma	1	0	1
	Adenoid Cystic Adenocarcinoma	1	0	1
	Adenocarcinoma, NOS	1	1	0
<b>BREAST, FEMALE</b>		<b>248</b>	<b>0</b>	<b>248</b>
	Duct Cell Carcinoma	204	0	204
	Carcinoma, NOS	11	0	11
	Paget's Disease & Duct Cell Carcinoma	5	0	5
	Adenocarcinoma, NOS	5	0	5
	Medullary Carcinoma	4	0	4
	Intraductal Carcinoma	4	0	4
	Lobular Carcinoma	4	0	4
	Comedocarcinoma	3	0	3
	Malignant Neoplasm	3	0	3
	Cystosarcoma Phyllodes	1	0	1
	Tubular Adenocarcinoma	1	0	1
	Inflammatory Carcinoma	1	0	1
	(Mucinous) Colloid Carcinoma	1	0	1
	Non-Hodgkin's Lymphoma	1	0	1
<b>BREAST, MALE</b>		<b>1</b>	<b>1</b>	<b>0</b>
	Paget's Disease & Duct Cell Carcinoma			
<b>CERVIX UTERI</b>		<b>50</b>	<b>0</b>	<b>50</b>
	Squamous Cell Carcinoma	34	0	34
	Adenocarcinoma, NOS	8	0	8
	Adenosquamous Carcinoma	2	0	2
	Carcinoma, NOS	2	0	2
	Mucin-Producing Adenocarcinoma	1	0	1
	Papillary Adenocarcinoma	1	0	1
	Clear Cell Adenocarcinoma	1	0	1
	Undifferentiated Small Cell Carcinoma	1	0	1
<b>PLACENTA</b>		<b>12</b>	<b>0</b>	<b>12</b>
	Choriocarcinoma	10	0	10
	Trophoblastic Tumor	2	0	2
<b>CORPUS UTERI</b>		<b>20</b>	<b>0</b>	<b>20</b>
	Adenocarcinoma, NOS	15	0	15
	Endometrial Stromal Sarcoma	2	0	2
	Serous Papillary Carcinoma	1	0	1
	Adenosarcoma	1	0	1
	Carcinoma, NOS	1	0	1



## Primary Site Table con't

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
<b>OVARY</b>		<b>52</b>	<b>0</b>	<b>52</b>
	Adenocarcinoma, NOS	9	0	9
	Dysgerminoma	7	0	7
	Mucinous Cystadenocarcinoma	6	0	6
	Carcinoma, NOS	4	0	4
	Serous Cystadenocarcinoma	3	0	3
	Papillary Adenocarcinoma	3	0	3
	Papillary Serous Cystadenocarcinoma	3	0	3
	Endodermal Sinus Tumor	3	0	3
	Mucinous Adenocarcinoma	2	0	2
	Malignant Teratoma	2	0	2
	Papillary Serous, Borderline Malignancy	2	0	2
	Serous Tumor, Bordeline Malignancy	2	0	2
	Serous Papillary Carcinoma	1	0	1
	Endometrioid Carcinoma	1	0	1
	Papillary Cystadenocarcinoma	1	0	1
	Cystadenocarcinoma, NOS	1	0	1
	Choriocarcinoma	1	0	1
	Squamous Cell Carcinoma	1	0	1
<b>OTHER FEMALE GENITAL ORGANS</b>		<b>4</b>	<b>0</b>	<b>4</b>
	Squamous Cell Carcinoma	3	0	3
	Melanoma	1	0	1
<b>PROSTATE</b>		<b>26</b>	<b>26</b>	<b>0</b>
	Adenocarcinoma, NOS	23	23	0
	Mucinous Adenocarcinoma	1	1	0
	Carcinoma, NOS	2	2	0
<b>TESTIS</b>		<b>27</b>	<b>27</b>	<b>0</b>
	Seminoma, NOS	12	12	0
	Mixed Germ Cell Tumor	11	11	0
	Endodermal Sinus Tumor	2	2	0
	Non-Hodgkin's Lymphoma	2	2	0
<b>OTHER MALE GENITAL ORGANS</b>		<b>2</b>	<b>2</b>	<b>0</b>
	Kaposi's Sarcoma	1	1	0
	Squamous Cell Carcinoma	1	1	0
<b>URINARY BLADDER</b>		<b>87</b>	<b>69</b>	<b>18</b>
	Papillary Transitional Carcinoma	36	27	9
	Transitional Cell Carcinoma	33	28	5
	Squamous Cell Carcinoma	13	10	3
	Carcinoma, NOS	3	2	1
	Solid Carcinoma	1	1	0
	Malignant Neoplasm	1	1	0
<b>KIDNEY/URETER</b>		<b>52</b>	<b>27</b>	<b>25</b>
	Renal Cell Carcinoma	36	22	14
	Nephroblastoma	8	2	6
	Transitional Cell Carcinoma	2	2	0
	Carcinoma, NOS	2	0	2
	Renal Cell Carcinoma, Granular Cell	1	0	1
	Adenocarcinoma, NOS	1	0	1
	Non-Hodgkin's Lymphoma	1	1	0
	Malignant Neoplasm	1	0	1

## Primary Site Table con't

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
<b>EYE</b>			<b>39</b>	<b>2217</b>
	Retinoblastoma	33	18	15
	Squamous Cell Carcinoma	3	2	1
	Melanoma	2	1	1
	Sarcoma	1	1	0
<b>BRAIN</b>		<b>85</b>	<b>51</b>	<b>34</b>
	Glioblastoma	26	14	12
	Astrocytoma	19	11	8
	Medulloblastoma, NOS	13	9	4
	Malignant Glioma	6	4	2
	Non-Hodgkin's Lymphoma	5	4	1
	Malignant Neoplasm	4	4	0
	Ependymoma	3	1	2
	Oligodendroglioma, NOS	3	1	2
	Desmoplastic Medulloblastoma	1	1	0
	Primitive Neuroectodermal Tumor	1	0	1
	Anaplastic Astrocytoma	1	1	0
	Pilocytic Astrocytoma	1	0	1
	Endodermal Sinus Tumor	1	0	1
	Germinoma	1	1	0
<b>OTHER NERVOUS SYSTEM</b>		<b>9</b>	<b>6</b>	<b>3</b>
	Astrocytoma, NOS	4	2	2
	Non-Hodgkin's Lymphoma	2	2	0
	Malignant Glioma	1	0	1
	Ependymoma	1	1	0
	Ewing's Sarcoma	1	1	0
<b>THYROID</b>		<b>136</b>	<b>29</b>	<b>107</b>
	Papillary Carcinoma, NOS	96	20	76
	Papillary & Follicular Adenocarcinoma	22	0	22
	Non-Hodgkin's Lymphoma	5	4	1
	Medullary Carcinoma	5	2	3
	Follicular Adenocarcinoma	3	0	3
	Oxyphilic Adenocarcinoma	2	1	1
	Carcinoma, Anaplastic Type	1	0	1
	Clear Cell Adenocarcinoma	1	1	0
	Carcinoma, NOS	1	1	0
<b>OTHER ENDOCRINE GLANDS</b>		<b>10</b>	<b>7</b>	<b>3</b>
	Neuroblastoma	8	6	2
	Germinoma	1	1	0
	Malignant Neoplasm	1	0	1
<b>LYMPH NODES, NON-HODGKIN'S LYMPHOMA (Excluding Extra-Nodal Lymphomas)</b>		<b>78</b>	<b>46</b>	<b>32</b>
	Large Cell Lymphoma	33	18	15
	Malignant Lymphoma, NOS	8	3	5
	Small Cell Lymphoma	7	6	1
	Immunoblastic Lymphoma	6	4	2
	Lymphoblastic Lymphoma	5	3	2
	Non-Hodgkin's Lymphoma, NOS	4	3	1
	Mixed Small Cleaved & Large Cell, Follicular	3	2	1
	Mixed Small & Large Cell, Diffuse	3	2	1
	Burkitt's Lymphoma	2	2	0

## Primary Site Table con't

SITE	HISTOLOGY	ALL CASES	MALES	FEMALES
<b>LYMPH NODES, NON-HODGKIN'S LYMPHOMA (Cont'd)</b>				
<b>(Excluding Extra-Nodal Lymphomas)</b>				
	Small Lymphocytic Lymphoma	2	2	0
	Nodular Lymphoma	2	0	2
	Lymphocytic Lymphoma	1	0	1
	Lymphoepithelioid Lymphoma	1	0	1
	T-Cell Lymphoma	1	1	0
<b>LYMPH NODES, HODGKIN'S DISEASE</b>				
	Nodular Sclerosis	68	46	22
	Mixed Cellularity	36	24	12
	Hodgkin's Disease, NOS	15	8	7
	Lymphocytic Predominance	13	11	2
		4	3	1
<b>PRIMARY UNKNOWN</b>				
	Adenocarcinoma, NOS	42	21	21
	Carcinoma, NOS	16	5	11
	Squamous Cell Carcinoma	11	5	6
	Malignant Neoplasm	5	1	4
	Neuroendocrine Carcinoma	3	3	0
	Undifferentiated Carcinoma	1	1	0
	Malignant Teratoma	1	1	0
	Transitional Cell Carcinoma	1	1	0
	Melanoma	1	1	0
	Mucinous Adenocarcinoma	1	1	0
	Signet Ring Cell Carcinoma	1	1	0

**TABLE 9**  
**PATIENTS WITH MULTIPLE PRIMARIES**  
**1 9 9 3**

PRIMARY SITE 1993	HISTOLOGY	OTHER PRIMARIES (PREVIOUS OR CONCURRENT)	ALL CASES	MALES	FEMALES
			50	24	26
<b>ORAL CAVITY</b>			2	1	1
	Lymphoepithelial Ca-NP	Thyroid	1	0	1
	Sq Cell Ca-Hypopharynx	Tongue	1	1	0
<b>ESOPHAGUS</b>			2	2	0
	Adenocarcinoma	Chr Lymphocytic Leukemia	1	1	0
	Malign Neoplasm	Tongue	1	1	0
<b>STOMACH</b>			1	0	1
	Non-Hodgkin's Lymphoma	Thyroid			
<b>SMALL INTESTINE</b>			1	0	1
	Non-Hodgkin's Lymphoma*	Descending Colon Cecum			
<b>COLON</b>			1	1	0
	Mucinous Adenocarcinoma	Descending Colon			
<b>RECTUM</b>			1	1	0
	Adenocarcinoma	Thyroid			
<b>LIVER</b>			4	2	2
	Hepatocellular Ca	Tongue	1	0	1
	Hepatocellular Ca	Buccal Mucosa	1	1	0
	Hepatocellular Ca	Skin	1	0	1
	Hepatocellular Ca	Thyroid	1	1	0
<b>GALLBLADDER</b>			2	0	2
	Adenocarcinoma	Stomach - NHL	1	0	1
	Carcinoma In Situ	Ovary	1	0	1
<b>PANCREAS</b>			2	2	0
	Adenocarcinoma	Vocal Cord	1	1	0
	Adenocarcinoma	Liver - HCC	1	1	0
<b>LUNG</b>			1	1	0
	Carcinoid Tumor	Thyroid			
<b>BONE MARROW</b>			2	1	1
	Acute Myeloid Leukemia	Non-Hodgkin's Lymphoma	1	0	1
	Acute Myeloid Leukemia	Non-Hodgkin's Lymphoma	1	1	0
<b>BONE</b>			1	1	0
	Ewing's Sarcoma	Non-Hodgkin's Lymphoma			
<b>CONNECTIVE TISSUE</b>			1	1	0
	Leiomyosarcoma	Rectum			
<b>SKIN</b>			6	4	2
	Basal Cell Carcinoma	Nasopharynx	1	0	1
	Basal Cell Carcinoma	ST - Malign Histiocytoma	1	0	1
	Basal Cell Carcinoma	Skin - Sq Cell Ca	1	1	0
	Basal Cell Carcinoma	Skin - Sq Cell Ca	1	1	0
	Melanoma	Skin - Basal Cell Ca	1	1	0
	Basosquamous Carcinoma	Tongue	1	1	0

## Multiple Primaries con't

PRIMARY SITE	HISTOLOGY	OTHER PRIMARIES (PREVIOUS OR CONCURRENT)	ALL CASES	MALES	FEMALES
<b>BREAST</b>			<b>9</b>	<b>0</b>	<b>9</b>
Duct Cell Carcinoma		Contra Breast	1	0	1
Duct Cell Carcinoma		Contra Breast	1	0	1
Duct Cell Carcinoma		Contra Breast	1	0	1
Duct Cell Carcinoma		Hodgkin's Disease	1	0	1
Duct Cell Carcinoma		Non-Hodgkin's Lymphoma	1	0	1
Inflammatory Carcinoma		Contra Breast-Duct Cell Ca	1	0	1
Paget's Disease & Duct Ca		Contra Breast-Comedoca	1	0	1
Tubular Adenocarcinoma		Lobular Ca In Situ	1	0	1
Carcinoma, NOS		Thyroid	1	0	1
<b>CERVIX</b>			<b>1</b>	<b>0</b>	<b>1</b>
Squamous Cell Carcinoma		Breast			
<b>PROSTATE</b>			<b>2</b>	<b>2</b>	<b>0</b>
Adenocarcinoma		Thyroid	1	1	0
Adenocarcinoma		Thyroid	1	1	0
<b>BLADDER</b>			<b>1</b>	<b>1</b>	<b>0</b>
Transitional Cell Ca		Kidney			
<b>KIDNEY</b>			<b>2</b>	<b>1</b>	<b>1</b>
Renal Cell Carcinoma		Larynx	1	1	0
Renal Cell Carcinoma		ST - Liposarcoma	1	0	1
<b>BRAIN &amp; CNS</b>			<b>5</b>	<b>2</b>	<b>3</b>
Glioblastoma		Acute Lymphoid Leukemia	1	0	1
Glioblastoma		Non-Hodgkin's Lymphoma	1	0	1
Glioblastoma		Bone	1	0	1
Malignant Neoplasm		Thyroid	1	1	0
Malignant Neoplasm		Non-Hodgkin's Lymphoma	1	1	0
<b>THYROID</b>			<b>2</b>	<b>1</b>	<b>1</b>
Papillary Carcinoma		Lip	1	1	0
Papillary Carcinoma		Colon	1	0	1
<b>LYMPH NODES</b>			<b>1</b>	<b>0</b>	<b>1</b>
Non-Hodgkin's Lymphoma		Hodgkin's Disease	1	0	1

\* Patient has three 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.

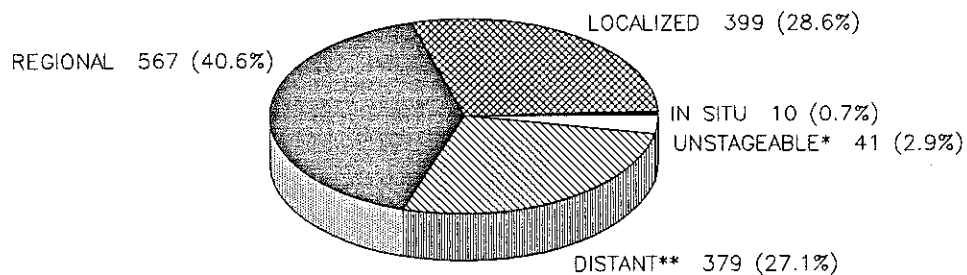
### Summary Staging Definitions:

- IN SITU:** Intraepithelial, noninvasive, noninfiltrating
- LOCALIZED:** Within organ
- a. Invasive cancer confined to the organ of origin
  - b. Intraluminal extension where specified
- REGIONAL:** Beyond the organ of origin
- a. By direct extension to adjacent organs/tissues
  - b. To regional lymph nodes
  - c. Both (a) and (b)
- DISTANT:** Direct extension or metastasis
- a. Direct continuity to organs other than above
  - b. Discontinuous metastasis
  - c. To distant lymph nodes

Systemic diseases, i.e., leukemia and multiple myeloma and cases of unknown primary were disregarded in graphically illustrating the stages for all analytic cases seen at KFSH&RC in 1993. The 41 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. Please refer also to Table 4, page 17, for the distribution of the 1993 analytic cases by site and stage at diagnosis.

FIGURE 11

DISTRIBUTION OF ANALYTIC CASES BY STAGE AT  
DIAGNOSIS - 1993 (TOTAL CASES = 1,396)

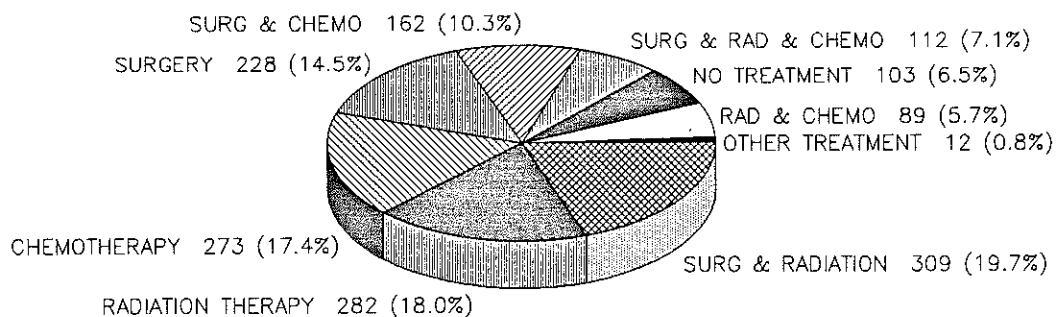


\*Excludes Unknown Primaries (28 cases)

\*\*Excludes Leukemia and Multiple Myeloma (146 cases)

FIGURE 12

DISTRIBUTION OF ANALYTIC CASES BY FIRST COURSE  
OF TREATMENT (SINGLY OR IN COMBINATION)  
1993 (TOTAL CASES = 1,570)



**GASTROINTESTINAL NON-HODGKIN'S LYMPHOMA IN ADULTS  
AT KING FAISAL SPECIALIST HOSPITAL AND RESEARCH CENTRE (1985-1992)**

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The incidence of any malignant disease in the Kingdom of Saudi Arabia is not known, but hopefully the newly created National Cancer Registry will be able to shed some light on this issue in the near future. Since the opening of the King Faisal Specialist Hospital and Research Centre (KFSH&RC) in 1975 and up to December 1992, a total of 24,050 cases of various malignant disease were registered at our hospital-based Tumor Registry. Non-Hodgkin's lymphoma (NHL) is the most common malignant disease referred to KFSH&RC, representing 8.6% of all malignant cases.

In this report we will give an overview on extranodal NHL referred to our institution between 1985 and 1992 with special emphasis on the gastrointestinal NHL (GI NHL).

A total of 1,117 NHL cases were referred to KFSH&RC during the study period of which 438 (39.2%) were extranodal in origin. We will concentrate here on 321 extranodal analytic cases involving adult patients. Adult is defined as age of 15 years or above and analytic cases are patients who received either part or the whole treatment at our hospital.

The anatomic distribution of analytic extranodal NHL is shown in Figure 1. Waldeyer's ring lymphomas in this report are included in the head and neck lymphomas, not with the gastrointestinal. The median age for all cases was 54 years (range 15-91). The majority of the patients were Saudi nationals (90%) and the male:female ratio was 1.4:1. The histopathology according to International Working Formulation (IWF) revealed: low grade (2.5%), intermediate (79.1%), high grade (15%), and not classified, 3.4%.

Using the Ann Arbor Staging System, we found Stage I in 24.3%, Stage II in 57.6%, Stage III in 5.6%, Stage IV in 12.2% and unstaged 0.3%. Constitutional B-symptoms were found in 39% of all cases. Frequently, multimodality treatment (surgery, radiation and/or chemotherapy) were used in managing these patients, depending on but not limited to such factors as site and stage. A total of 145 cases had surgical resection, radiation therapy as adjunctive therapy or for palliation was used in 111 cases while chemotherapy was given to 244 cases. The crude survival rate for all extranodal lymphomas in this series was 59.4% at 73.7 months (Figure 2).

For the 122 (38%) primary GI NHL in this report, the median age was 51.5 years (range 15-91), the majority were Saudi (92%) and the male:female ratio was 1.6:1. The age distribution as compared to all patients with extranodal NHL is shown in Figure 3. In patients with GI NHL, the stomach was the most common site (70%), followed by small intestinal involvement (22%) and the colon, 8%. Applying the IWF for the GI NHL, we found low grade lymphoma in 2.5%, intermediate 80.3%, high grade 14.8% while 2.4% were unclassified. Over the study period, we did not encounter a single case of Mediterranean lymphoma, otherwise known as immunoproliferative small intestinal disease (IPSID). Ann Arbor Staging revealed: 23% Stage I, 59.8% Stage II, 8.2% Stage III, 8.2% Stage IV, while 0.8% could not be staged. Constitutional B-symptoms were found in 61% of GI NHL.

For gastric lymphoma, 53/85 underwent surgery at presentation; partial gastrectomy in 36, total gastrectomy in 16 and local excision in one patient. Surgery rendered 17 patients with residual disease, 29 without, while in 7 patients this could not be ascertained. In small intestinal NHL, 20/27 underwent simple removal of the tumor or resection ± anastomosis while one patient had radical surgery. In colonic NHL, 7/10 underwent hemicolectomy and one patient had total colectomy.



Various chemotherapy regimens were used in managing these patients ranging from first to third generation anti-lymphoma therapy depending on the available protocol at the time. A total of 100 patients with gastrointestinal NHL received chemotherapy. The complete response (CR) was 49%, partial response (PR) 13%, progressive disease (PD) 8%, while 30% were not evaluable (as they received the chemotherapy as adjuvant therapy or for microscopic disease at resection margins). Radiation therapy was given to 17 patients; CR and PR were seen in 8 and 2 patients, respectively. The other 7 patients were not evaluable (NE) as for the above reasons.

When all modalities were combined, the CR was 63.9%, PR 8.2%, PD 10.7% and NE in 17.2%. The overall survival for all GI NHL at 73 months was 58.1% which was similar to all cases of extranodal NHL (Figure 2).

Our study, as compared with recent reports from Italy<sup>1</sup>, the Netherlands<sup>2</sup> and Britain<sup>3</sup>, is summarized in Table 1. The number of cases in our report in relation to the study period is higher than the others with the exception of the Netherlands since their cases were reported from a regional registry the population of which is not stated. Our patients are younger than in other reports. However, this should be interpreted with caution since we cannot account with any certainty for the referral bias (young patients seem to be referred more than older ones because of the belief that they stand a better chance of survival). An additional fact is that the birth date as used in official documents has only recently been introduced in Saudi Arabia.

The anatomical distribution within the gastrointestinal tract varies from one country to country. Ours was similar to the Milan series. There is no perfect staging system for NHL in general and GI NHL in particular, though the Ann Arbor Staging is widely applied and showed marked variation among the four series. Again there are several histological classification that can be used in lymphomas but perhaps the International Working Formulation is the most common. Both staging and histology variations make comparisons difficult among different series. This coupled with the fact that great emphasis is to ascertain the origin of the GI NHL and whether it is of MALT (mucosa-associated lymphoma tissues) origin or not. Only the Netherlands series could be compared with ours since they used IWF and both revealed the majority to be of intermediate or high grade origin.

There are no standard approaches in the management of GI NHL, but frequently surgery, radiation, chemotherapy and/or any combination of these modalities are used in the treatment. We did not attempt to analyze the outcome of patients in these series according to the treatment modalities used.

The overall survival (OS) for GI NHL in both Milan and the British series reported 42% and 44%, respectively at 10 years. The OS from the Netherlands series and ours revealed 50% and 62% at 4 and 5 years, respectively.

In conclusion, our series is similar to other reports in many aspects and all of them underline the need for better histological classification, more precise staging system and standardization of treatment according to site, stage and histology.

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1. Tondini C, Giardini R, Bozzetti F, Valagussa P, Santoro A, Bertulli R, Balzarotti M, Rocca A, Lombardi F, Ferreri AJM and Bonadonna G. Combined modality treatment for primary gastrointestinal non-Hodgkin's lymphoma. The Milan Cancer Institute Experience. *Annals of Oncology* 4; 831-837, 1993.
2. Otter P, Bieger R, Kluin PM, Hermans J and Willemze R on behalf of the Study Group. Primary gastrointestinal non-Hodgkin's lymphoma in a population-based registry. *Br J Cancer* 60: 745-750, 1989.

3. Morton JE, Leyland MJ, Vaughan Hudson G, Vaughan Hudson B, Anderson L, Bennett MH and MacLennan KA. Primary gastrointestinal non-Hodgkin's lymphoma: A review of 175 British national lymphoma investigation cases. *Br J Cancer* 67; 776-782, 1993.

Table 1  
SUMMARY OF GI NHL

	Milan <sup>1</sup>	Netherlands <sup>2</sup>	Britain <sup>3</sup>	KFSH&RC
Number of cases	135	96	175	122
Study period (yrs)	20	5	14	8
Age (median)	NA	65	NA	51.5
> 50 y	NA	NA	73%	54%
< 60 y	75%	NA	NA	69%
Male:female ratio	1.3:1	1.3:1	1.9:1	1. 6:1
Site of disease				
Stomach	73%	53%	45%	70%
Small Intestine	15%	14%	33%	22%
Large Bowel	9%	16%	15%	8%
> 1 site	4%	3%	7%	-
Mesenteric	-	14%		-
Stage				
I	56%	34%	19%	23.0%
II	{28%	39%	54%	59.8%
III	{	3%	1%	8.2%
IV	16%	24%	26%	8.2%
Unknown	0	0	0	0.8%
B-symptoms	NS	NS	33%	61%
Histology				
Low grade	30%	16%	NA	2.5%
Intermediate	{70%	48%	NA	80.3%
High grade	{	33%	NA	14.8%
Unclassified	0	3%		2.4%
Overall Survival (time)	42% 10 yrs	50% 4 yrs	44% 10 yrs	62% 5 yrs

NA - Not Applicable  
NS - Not Stated

Figure 1  
DISTRIBUTION OF ADULT ANALYTIC EXTRANODAL NHL BY SITE

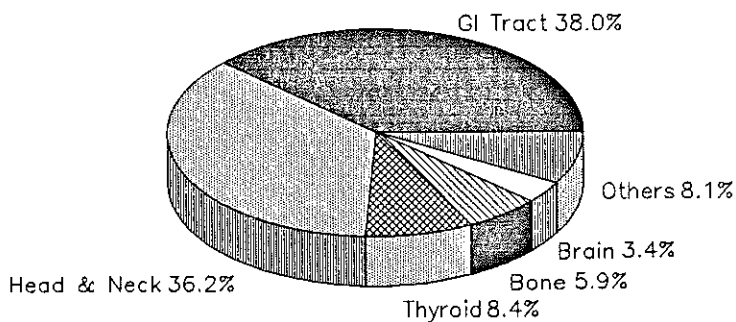


Figure 2  
ADULT ANALYTIC EXTRANODAL NHL OVERALL SURVIVAL

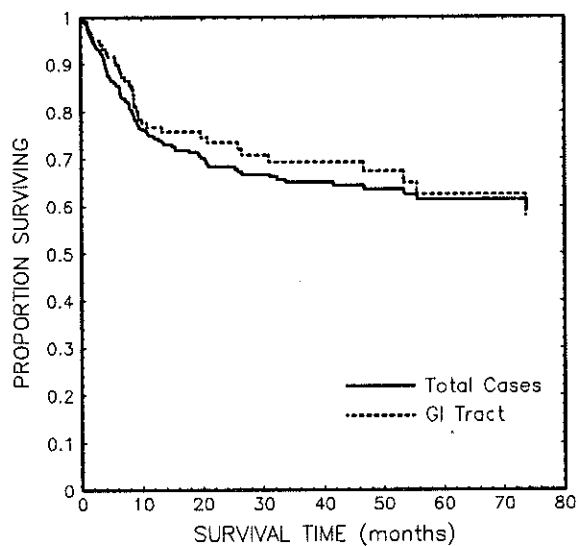
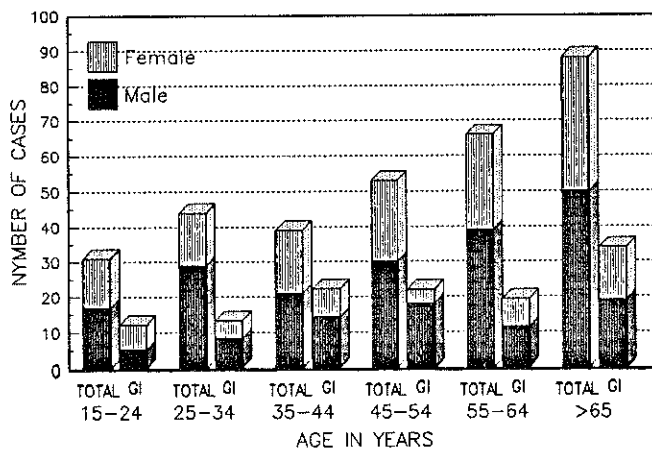


Figure 3  
DISTRIBUTION OF ADULT ANALYTIC EXTRANODAL NHL BY AGE



## APPENDIX A

## 1993 SPECIAL STUDY REQUESTS FOR TUMOR REGISTRY DATA

\*Publication \*\*KFSH&amp;RC Presentation \*\*\*Outside KFSH&amp;RC Presentation

## January

Neuroblastoma Cases with Age & Site (MR Numbers) (1983-1991)***	CRU for Dr. Sackey
Cerebellar Astrocytoma Cases with Age & Sex (MR Numbers) (1975-1993)*	Dr. M. Hassounah
Ependymoma, Ependymblastoma & Subependymoma Cases with Site, Histology, Age & Sex (MR Numbers) (1975-1993)*	Dr. M. Hassounah
B-Cell A.L.L. Pediatric Patients (MR Numbers) (1981-1993)	CRU for Dr. Martins
Acute Leukemia (ALL & AML) (MR Numbers) (1991-1993)	Dr. Al Fiar Fahad
Brain Stem Glioma/Astrocytoma Cases (MR Numbers) (1975-1993)*	Dr. M. Hassounah
Breast Cancer Cases which Had Radiation as Part of Initial Management (MR Numbers) (1985-1990)	CRU for Radiation Oncology
Marjolin's Ulcer (Squamous Cell Ca of Skin) Cases (MR Numbers) (1975-1993)	Dr. S. El Akkad
Total Number of Nasopharyngeal Cancer and All Malignant Cases in the Registry (1975-1993)	Dr. Sheth
Pituitary/Hypothalamic Tumor Cases (MR Numbers) (1975-1993)	Dr. M. Ahmed

## February

Breast Cancer Cases by Year, Age & Nationality (Saudi/Non-Saudi) (1989-1992)	Ministry of Health
Orbital Rhabdomyosarcoma Cases (MR Numbers) (1975-1993)	Dr. S. El Akkad
Retinoblastoma Cases (MR Numbers) (1975-1993)	Dr. S. El Akkad
Optic Glioma Cases (MR Numbers) (1975-1993)	Dr. S. El Akkad
Pediatric Benign Cases (MR Numbers) (1975-1993)	Dr. A. Ali

## March

Extra-Nodal NHL Adult Cases, as much information as can be extracted from the Registry (1985-1992)*	Dr. A. Ezzat
Leukemia, Lymphoma and Solid Tumor Cases by Year and Age Group (1975-1992)	Dr. S. Taher
Pediatric Cancer Cases by Histology, Site, Age Group, Sex, Sex Ratio, Stage at Dx (1982-1991)***	Dr. K. Sackey
Esophageal Cancer Cases by Stage at Dx and Treatment (1990-1991)	Dr. S. Bazarbashi
Osteogenic Sarcoma Cases, Total & Pediatrics, with Site, Sex, Age at Dx, Vital Status (MR Numbers) (1975-1992)*	Dr. S. Lindahl
Pediatric Neuroblastoma Cases (MR Numbers) (1989-1993)	Dr. A. Kofide

## April

Total Number of Osteogenic Sarcoma Cases (1981-1993)*	Dr. B. Sanjay
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<b>May</b>	
Pediatric A.M.L. Cases (MR Numbers) (1988-1992)	Dr. N. Giri
Cervical Cancer Cases (MR Numbers) (1975-1993)*	Dr. Y. Bakri
Ovarian Cancer Cases (MR Numbers) (1975-1993)*	Dr. Y. Bakri
Cancer of the Vulva Cases (MR Numbers) (1975-1993)*	Dr. Y. Bakri
Female Malignant Cases, Age 15-45, (MR Numbers) (1975-1993)***	Dr. A. Rejjal
Breast Cancer Cases (MR Numbers) (1985-1991)	Cl. Research Unit
Pediatric Malignant Brain & CNS Tumors with Histology, Sex & Age at Dx (MR Numbers) (1975-1993)**	Dr. Martins
Hypopharyngeal, Post-Cricoid & Pyriform Fossa Cancer Cases (MR Numbers) (1985-1993)	Dr. Z. Mahasin
<b>June</b>	
Glomus Jugulare and Carotid Body Tumor Cases (MR Numbers) (1975-1993)	Dr. K. Taibah
<b>July</b>	
Cancer Cases Treated By Radiation (as 1st course) by Year and Site. Ratio of Radiation Cases to All Malignant Cases (1988-1992)	Dr. A. Flores
<b>August</b>	
Bladder Cancer Cases (Analytic) by Year, Sex, Age, Saudi/Non-Saudi, Region, Histology, Stage at Dx, Treatment Modality (MR Number Listing, too) (1983-1992)*	Dr. M. Manzi
Teratoma, Germinoma, Endodermal Sinus Tumor, Embryonal Ca, Choriocarcinoma of the Brain & CNS (MR Numbers) (1975-1992)*	Dr. E. Al-Shail
Signet Ring Cell Carcinoma of the Colon Cases (MR Numbers) (1975-1993)	Dr. F. Kahlifa
Glioma and Astrocytoma (grades 3 & 4) Treated by Radiation (as 1st course) by Site, Sex, Age Group and Stage (1988-1992)***	Dr. A. Gray
Adult Kidney Cancer Cases (histologically proven) by Year, Sex, Age, Treatment Modality & Stage (1983-1992)***	Dr. A. H. Kardar
Stomach Cancer Cases with Age, Sex, Region and Histology (MR Numbers)	Dr. S. Shebib
<b>September</b>	
Malignant and Benign Thyroid Cases by Year (1990-1993)	Dr. M. Ahmed
<b>October</b>	
Thyroid Cancer Cases with Sex, Age, Region, Class of Case, Histology and Stage (MR Numbers) (1989-1993)	Dr. N. Farid
Osteogenic Sarcoma Cases (MR Numbers) (1991-1993)**	Dr. R. Wierzbicki
Slides of 2 Graphs in the 1991 Annual Report of the Tumor Registry***	Dr. A. Al-Nasser
Head & Neck Cancer Cases by Site, Histology, Sex, Age, Region, Saudi/Non-Saudi, Class of Case, Stage at Dx & Tx Modality (1985-1992)***	Dr. K. Taibah
Pediatric A.L.L. Cases by Year and Age Group (1975-1992)***	Dr. A. Al-Nasser
Colon and Rectal Cancer Cases by Site and Histology (1987-1992)***	Dr. M. Manji

## November

Slides of 6 Graphs in the 1991 Annual Report of the Tumor Registry***	Dr. A. Al-Nasser
Oropharynx (Tonsils, Base of Tongue, Pharyngeal Wall), Vallecula, Soft Palate & Uvula Cancer Cases with Site, Histology, Stage & Tx Modality (1985-1992)	Dr. A. Kandil
Thyroid Cancer Cases, downloading of some info into a diskette for patient follow-up (1975-1993)	Mr. K. Abdulkareem
Sarcoma of the Uterus and Endometrial Carcinoma with Age, Histology, Histology Grade and Stage (1975-1992)***	Dr. Y. Bakri

## December

Squamous Cell Ca, Adenoca and Sarcoma of the Larynx, Mouth, Pharynx, Nose, Paranasal Sinuses, Salivary Gland Cases w/ Age, Sex, Histology, Stage, Date of Last Follow-up and Vital Status (1986-1992)	Dr. A. Flores
Pediatric Malignant Cases with Second Primary (MR Numbers) (1975-1992)**	Dr. M. Mahr
Hodgkin's Disease Cases with Nasopharyngeal Involvement (MR Numbers) (1975-1993)	Dr. D. Pradhan
Male Breast Cancer Cases (MR Numbers) (1989-1993)	Dr. A. Ezzat
Ovarian Cancer Cases with Histology, Grade and Stage (MR Numbers) (1975-1993)*	Dr. Y. Bakri

## APPENDIX B

## 1993 Tumor Committee Members

A. M. Abdulkareem, M.D.	Surgery
M. Ashraf Ali, M.D.**	Pathology
William Allard, D.M.D.	Dentistry
Hamad Al Daig	CHIC
Peter Ernst, M.D.*	Medical Hematology
Adnan Ezzat, M.D.	Medical Oncology
Mohd Hannan, Ph.D.	B&MR Research Centre
Peter McArthur, M.D.	Surgery
Dolores K. Michels, C.T.R.	Tumor Registry
Lamia NouNou	Social Services
Robin Pavillard, M.D.	Quality Assurance
Assem Rostom, M.D.	Radiation Oncology
Rajeh Sabbah, M.D.***	Chairman, Oncology
Sultan Al Sedairy, Ph.D.	B&MR Research Centre
Jens O. Sieck, M.D.	Medicine
Jamal Al Subhi, M.D.	Obstetrics/Gynecology
Beth Ann Tomasek***	Quality Assurance

\* Tumor Committee Chairman  
 \*\* Deputy Chairman  
 \*\*\* Ad hoc Members

## APPENDIX C

SUMMARY OF CASES PRESENTED  
KFSH&RC TUMOR BOARD - 1993

SITE	NO.
Parotid Gland	1
Liver	1
Leukemia	2
Cutaneous T-Cell Lymphoma	1
Urinary Bladder	1
Brain	2
Thyroid	1
Lymphatic System	
Hodgkin's Disease	4
Non-Hodgkin's Lymphoma	3
Aggressive Fibromatosis	1

Tumor Board Coordinator: Dr. Shouki Bazarbashi



## APPENDIX D

## 1993 SUMMARY OF ONCOLOGY GRAND ROUNDS TOPICS

05 Jan	Interstitial Re-Irradiation for Recurrent or New Primary Gynecologic Malignancies	Dr. Randall
12 Jan	Total Body Irradiation	Dr. Wynne
19 Jan	Esophagus Cancer	Dr. A. Flores
02 Feb	Bone Marrow Transplantation in Children with Inborn Errors of Metabolism	Dr. P. Van Dijken
09 Feb	Taxol: A Review	Dr. Belanger
16 Feb	Recent Trends in Pediatric Radiation Oncology	Dr. Theriault
30 Mar	New Zealand Cancer Statistics	Dr. A. S. Abdelaal
06 Apr	Is More Better? Anthracyclines in Metastatic Breast Cancer	Dr. M. Dalmark
13 Apr	Minimal Residual Disease in Certain Hematological Disorders	Dr. M. Jackson Dr. B. Meyer Dr. R. Nounou
20 Apr	Hypercalcemia of Malignancy	Dr. A. Al-Nasser
04 May	Head and Neck Cancer	Drs Wierzbicki, Raja, Abdallah, Taibah, Osoba
11 May	Quality of Life for Cancer Patients	Dr. Osoba
22 June	Chemotherapy for Bladder Cancer	Dr. F. Freiha
29 June	Prostate Cancer - Methods of Early Detection	Dr. F. Freiha
06 July	Interferons	Dr. J. Berry
13 July	Immunophenotyping of Acute Leukemia in KFSH in 1992	Dr. S. Khalil
03 Aug	Brachytherapy	Dr. A. Flores
17 Aug	Chronic Myeloid Leukemia: Pathogenesis and Therapy	Dr. P. Stryckmans
24 Aug	Studies on Chemotherapy by Oral Route in Metastatic Breast Cancer	Dr. M. Dalmark
31 Aug	Palliative Care: Who Needs It?	Dr. A. Gray
05 Oct	Multiple Drug Resistance: Is It Reversible?	Dr. H. Solh
12 Oct	Hemorrhagic Cystitis Following Allo- genic & Autologous Bone Marrow Transplantation	Dr. A. Martins
19 Oct	Third Generation Anti-NHL Combination Chemotherapy at KFSH&RC	Dr. M. A. Raja Dr. A. Ezzat
26 Oct	Hyperthermia Enhances Chemotherapy	Dr. A. Kandil
02 Nov	A Diagnostic Dilemma	Dr. K. Rao Dr. A. Al-Nasser
09 Nov	GM-CSF Modulation of Macrophage/ Killer Cell Function	Dr. P. Ernst

23 Nov	C-MYC and P53 Mutations in Burkitt's Lymphoma and their Prognostic Significance	Dr. Kishor G. Bhatia
30 Nov	Management of Medulloblastoma	Dr. A. Jamshed
14 Dec	Good, Bad and the Ugly: Free Radicals?!	Dr. J. Berry
21 Dec	Geographical Epidemiology w/ Emphasis on Childhood Malignancies in the Middle East	Dr. K. Sackey Dr. M. Akhtar
28 Dec	Male Fertility Following Cancer Therapy	Dr. A. Rostom

Oncology Grand Rounds Coordinator: Dr. Kwesi Sackey

**V. GLOSSARY OF TERMS**

**Accessioned:** Patients 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:** Determined at the time of the first course of treatment.

**SEER Summary Staging Guide:**

**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.

