

Chapter  
III

# CHILDHOOD CANCER



## CHAPTER

CHILDHOOD  
CANCER

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Nearly 24.4 percent of Thailand population is younger than 15 years of age (National Statistical Office 2002). Although cancer is rare among those younger than 15 years of age, it is estimated that approximately 1 500 children younger than 15 years of age were diagnosed with cancer in 2000 (Vatanasapt *et al.*, 1999). In 1982 cancer ranked fifth as a cause of death behind infectious diseases, accident, cardiac diseases and respiratory diseases, (Porapakkham *et al.*, 1986) and ranked sixth behind drowning, accident, dengue hemorrhagic fever, malformation and HIV during 1987-1998 (Chooprapawan, 2000)

The population-based data for incidence of childhood cancer are from cancer registries in Khon Kaen, Chiang Mai, Songkhla, Lampang, and Bangkok. Information from five provinces comprising about 22 percent of Thailand

population are used in this monograph. These data series includes 636 cancers diagnosed between 1995 and 1997 in persons younger than 15 years of age who resided in Khon Kaen, Chiang Mai, Songkhla, Lampang, and Bangkok (Table 3.1).

In order to calculate rates, population estimates were obtained from the Bureau of the Census. In 1996 there were 2 449 580 children residing in Khon Kaen, Chiang Mai, Songkhla, Lampang, and Bangkok areas. In the 1996 census, there were about 16 million children younger than 15 years of age which were 27.4 percent of Thailand population (Table 3.2).

In these data series most of the pediatric cancers (87.9%) are histologically confirmed. The percentage of histologically confirmed cases, however, does vary by ICCC category ranging from a low of 65.3 percent for the central nervous sys-

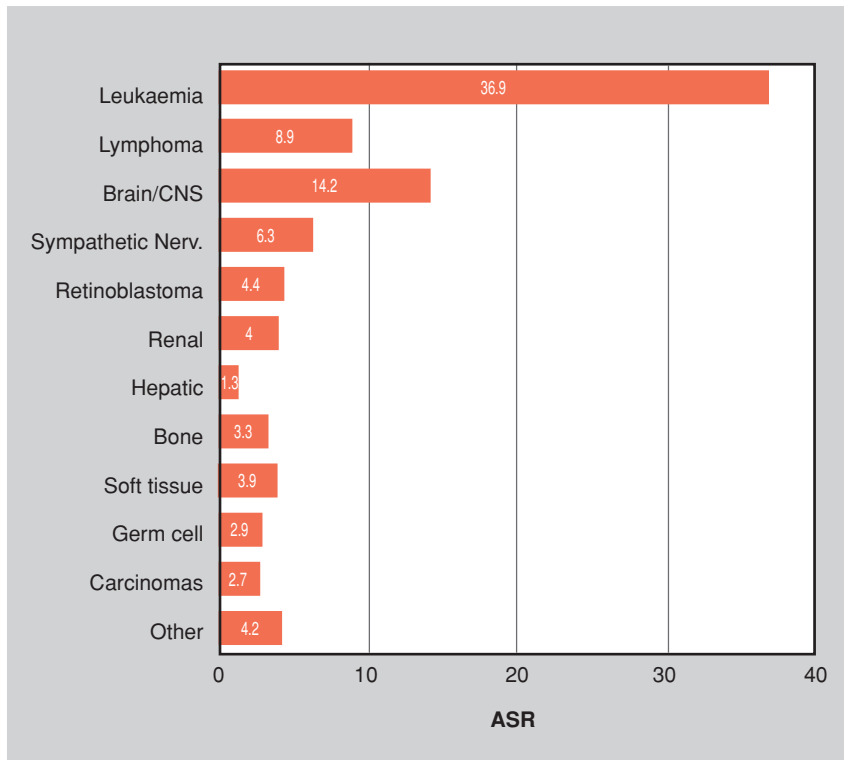
**Table 3.1** Contributing registries

Registry	Cases	(%)	Person-years	(%)
Bangkok	356	56.0	3 499 122	47.6
Chiang Mai	86	13.5	963 339	13.1
Khon Kaen	83	13.1	1 385 306	18.8
Lampang	36	5.7	511 357	7.0
Songkhla	75	11.8	990 015	13.5
<b>Thailand</b>	<b>636</b>	<b>100.0</b>	<b>7 349 138</b>	<b>100.0</b>

**Table 3.2** Sites and population

Site	1996	
	Age <15	%
Bangkok	1 166 292	47.6
Khon Kaen	461 729	18.8
Chiang Mai	321 112	13.1
Songkhla	330 000	13.5
Lampang	170 448	7.0
<b>Total (5 Sites)</b>	<b>2 449 580</b>	<b>14.9</b>
<b>Total (Thailand)</b>	<b>16 447 000</b>	

**Figure 3.1** Incidence rates for childhood cancers by ICCC group age <15 both sexes, Thailand, 1995-1997



tem (ICCC group III) to a high of 97.0 percent for leukaemia (ICCC group I).

**INCIDENCE**

A total of 636 childhood cancers were registered, 354 boys and 282 girls, in the three year period (1995-1997). The corresponding combined incidence rate for all cancers is 99.7 per million in boys and 85.9 per million in girls. For both sexes combined the age-standardized rate is 93.0 per million (Figure 3.1, Tables 3.3 & 3.4).

The incidence of most cancer is higher in boys than girls, particularly Hodgkin’s disease. The incidences of other selected site childhood cancers are shown in Figure 3.1. Age-specific incidences of selected site are shown in Figure 3.3.

**Figure 3.2** Number of cases of all childhood cancers by ICCC and age both sexes, Thailand, 1995-1997

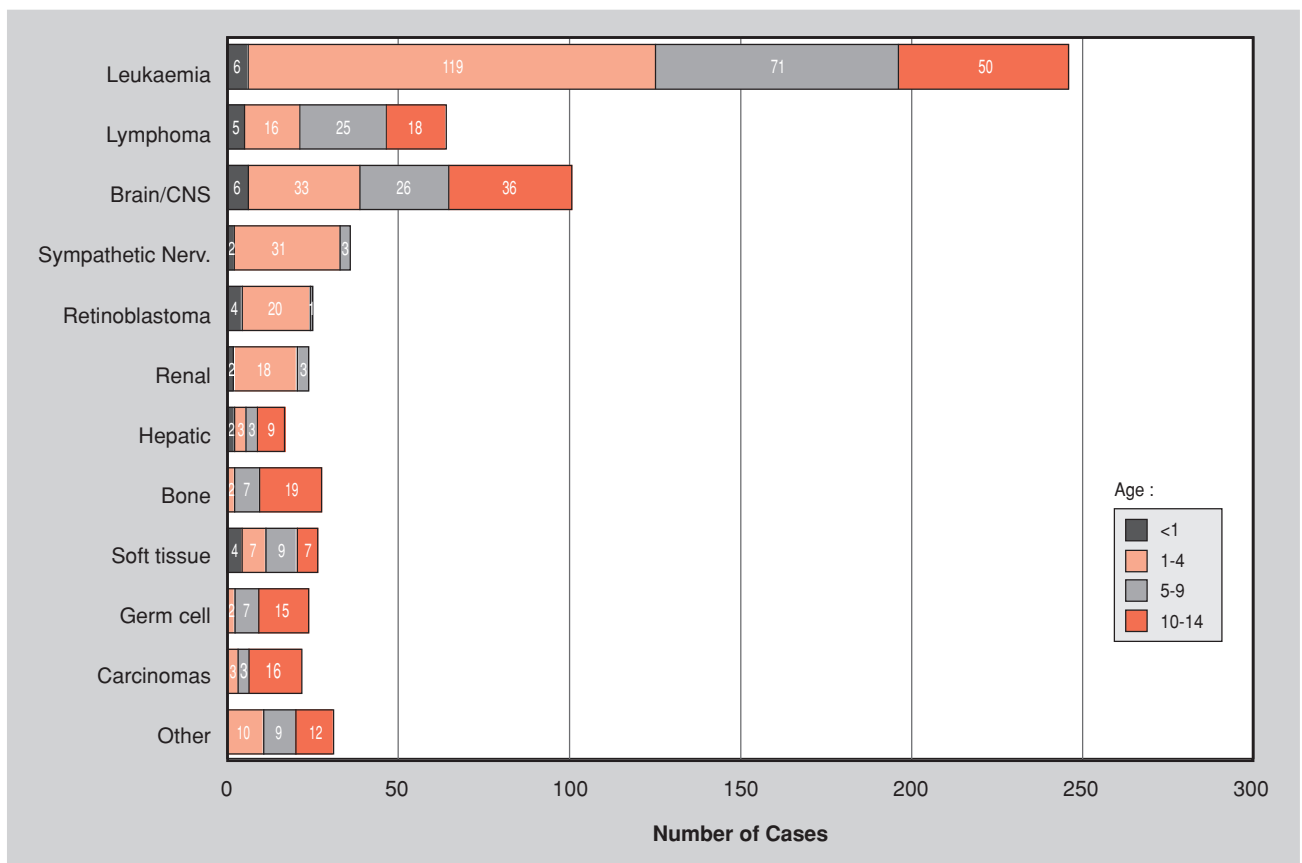


Table 3.3 Incidence of cancer in childhood, both sexes, Thailand (1995-1997)

	Number of Cases					Rel. Freq. (%)		Rates per Million					Cum.	ASR	%MV
	0	1-4	5-9	10-14	All	M/F	Overall	0-4	5-9	10-14	Crude				
							Group								
<b>Leukaemia</b>	6	119	71	50	246	1.3	38.7	100.0	57.6	28.5	18.6	33.5	36.9	523	97.6
Lymphoid	3	92	51	30	176	1.3	27.7	71.5	43.8	20.5	11.2	23.9	26.8	377	100.0
Acute non-lymphocytic	-	15	10	10	36	1.4	5.7	14.6	7.4	4.0	3.7	4.9	5.2	75	100.0
Chronic myeloid	1	1	2	4	7	1.3	1.1	2.8	0.5	0.8	1.5	1.0	0.9	13	100.0
Other specified	-	-	1	-	1	-	0.2	0.4	-	-	-	-	0.1	2	100.0
Unspecified	2	11	7	6	26	1.2	4.1	10.6	6.0	2.8	2.2	3.5	3.9	55	76.9
<b>Lymphomas</b>	5	16	25	18	64	1.7	10.1	100.0	9.7	10.0	6.7	8.7	8.9	132	96.9
Hodgkin's disease	-	3	4	1	8	7.0	1.3	12.5	1.4	1.6	0.4	1.1	1.2	16	100.0
Non-Hodgkin lymphomas	2	1	8	6	17	3.3	0.7	26.6	1.4	3.2	2.2	2.3	2.2	34	100.0
Burkitt's lymphoma	-	2	1	1	4	3.0	0.6	6.3	0.9	0.4	0.4	0.5	0.6	8	100.0
Miscellaneous lymphoreticular neoplasms	3	4	1	1	9	0.3	1.4	14.1	3.2	0.4	0.4	1.2	1.5	19	100.0
Unspecified	-	6	11	9	26	1.4	4.1	40.	2.8	4.4	3.3	3.5	3.5	52	92.3
<b>Brain and Spinal Neoplasms</b>	6	33	26	36	101	1.1	15.9	100.0	18.0	10.4	13.4	13.7	14.2	209	65.3
Ependymoma	-	3	-	1	4	0.3	0.6	4.0	1.4	-	0.4	0.5	0.6	8	100.0
Astrocytoma	2	7	8	14	31	0.7	4.9	30.7	4.1	3.2	5.2	4.2	4.2	62	100.0
Primitive neuroectodermal tumours	1	9	4	7	21	1.6	3.3	20.8	4.6	1.6	2.6	2.9	3.1	44	100.0
Other gliomas	-	2	5	2	9	2.0	1.4	8.9	0.9	2.0	0.7	1.2	1.2	18	100.0
Other specified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unspecified	3	12	9	12	36	1.3	5.7	35.6	6.9	3.6	4.5	4.9	5.1	74	2.8
<b>Sympathetic Nervous System Tumors</b>	2	31	3	-	36	1.8	5.7	100.0	15.2	1.2	-	4.9	6.3	82	100.0
Neuroblastoma	2	31	3	-	36	1.8	5.7	100.0	15.2	1.2	-	4.9	6.3	82	100.0
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Retinoblastoma</b>	4	20	1	-	25	0.7	3.9	100.0	11.1	0.4	-	3.4	4.4	57	100.0
<b>Renal Tumours</b>	2	18	3	-	23	0.8	3.6	100.0	9.2	1.2	-	3.1	4.0	52	73.9
Wilms' tumour	1	15	1	-	17	0.5	2.7	73.9	7.4	0.4	-	2.3	3.0	38	100.0
Renal carcinoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unspecified	1	3	2	-	6	2.0	0.9	26.1	1.8	0.8	-	0.8	1.0	13	0.0
<b>Hepatic Tumours</b>	2	3	1	3	9	1.3	1.4	100.0	2.3	0.4	1.1	1.2	1.3	19	77.8
Hepatoblastoma	1	2	1	-	4	1.0	0.6	44.4	1.4	0.4	-	0.5	0.7	8	100.0
Hepatic carcinoma	-	1	-	2	3	0.5	0.5	33.3	-	0.5	-	0.7	0.4	0.4	6100.0
Unspecified	1	-	-	1	2	0.3	22.2	-	0.5	-	0.4	0.3	0.3	4	-
<b>Malignant Bone Tumours</b>	-	2	7	19	28	2.5	4.4	100.0	0.9	2.8	7.1	3.8	3.3	53	100.0
Osteosarcoma	-	-	6	19	25	2.6	3.9	89.3	-	2.4	7.1	3.4	2.8	47	100.0
Chondrosarcoma	-	2	1	-	3	2.0	0.5	10.7	0.9	0.4	-	0.4	0.5	6	100.0
Ewing's sarcoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other specified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unspecified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Soft Tissue Sarcomas</b>	4	7	9	7	27	0.9	4.2	100.0	5.1	3.6	2.6	3.7	3.9	56	100.0
Rhabdomyosarcoma	1	6	7	2	16	1.3	2.5	59.3	3.2	2.8	0.7	2.2	2.4	33	100.0
Fibrosarcoma	1	1	1	2	4	1.0	0.6	14.8	0.5	0.4	0.7	0.5	0.5	8	100.0
Kaposi's sarcoma	2	-	-	3	5	0.7	0.8	18.5	0.5	-	-	0.1	0.2	2	100.0
Other specified	-	-	1	-	1	-	0.2	3.7	-	-	-	0.7	0.7	10	100.0
Unspecified	-	-	-	-	-	-	0.2	3.7	-	0.4	-	0.1	0.1	2	100.0
<b>Germ Cell and Gonadal Neoplasms</b>	-	2	7	15	24	1.0	3.8	100.0	0.9	2.8	5.6	3.3	2.9	46	100.0
Intracranial and intraspinal germ cell	-	-	1	4	5	4.0	0.8	20.8	-	0.4	1.5	0.7	0.6	9	100.0
Other and unspecified non-gonadal germ cell	-	2	4	7	13	0.4	2.0	54.2	0.9	1.6	2.6	1.8	1.6	25	100.0
Gonadal germ cell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gonadal carcinoma	-	-	2	-	2	-	0.3	8.3	-	0.8	-	0.3	0.3	4	100.0
Other and unspecified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Carcinomas and Epithelial Neoplasms</b>	-	3	3	16	22	0.8	3.5	100.0	1.4	1.2	6.0	3.0	2.7	42	100.0
Adrenocortical	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	2	3	5	0.3	0.8	22.7	-	0.8	1.1	0.7	0.6	9	100.0
Nasopharyngeal	-	1	-	3	4	0.5	0.5	13.6	-	-	1.1	0.4	0.3	5	100.0
Melanoma	-	-	-	3	4	0.3	0.6	18.2	0.5	-	1.1	0.5	0.5	7	100.0
Skin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other and unspecified	-	2	1	7	10	2.3	1.6	45.5	0.9	0.4	2.6	1.4	1.2	19	100.0
<b>Other and Unspecified Neoplasms</b>	-	10	9	12	31	1.4	4.9	100.0	4.6	3.6	4.5	4.2	4.2	63	12.9
Other specified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other unspecified	-	10	9	12	31	1.4	4.9	100.0	4.6	3.6	4.5	4.2	4.2	63	12.9
<b>Total</b>	31	264	165	176	636	1.3	100.0	100.0	135.9	66.3	65.5	86.5	93.0	1 338	87.7

**Table 3.4** Incidence of cancer in childhood, male and female, Thailand (1995-1997)

	Male						Female									
	Number of Cases			Rates per Million			Number of Cases			Rates per Million						
	0	1-4	5-9	10-14	All	Crude	ASR	Cum.	0	1-4	5-9	10-14	All	Crude	ASR	Cum.
<b>Leukaemia</b>	2	66	45	27	140	37.2	40.6	578	4	53	26	23	106	29.6	33.0	465
Lymphoid	2	51	32	16	101	26.8	29.8	420	1	41	19	14	75	20.9	23.6	331
Acute non-lymphocytic	-	8	7	6	21	5.6	5.8	85	1	7	3	4	15	4.2	4.6	65
Chronic myeloid	-	1	2	1	4	1.1	1.1	15	-	-	-	-	3	0.8	0.7	11
Other specified	-	6	4	4	14	3.7	3.9	57	2	5	3	2	12	3.3	3.8	53
Unspecified	-	10	15	14	40	10.6	10.6	158	4	6	10	4	24	6.7	7.2	104
<b>Lymphomas</b>	-	3	3	1	7	1.9	2.0	28	-	-	1	-	1	0.3	0.3	4
Hodgkin's disease	1	1	5	6	13	3.5	3.2	50	1	-	3	-	4	1.1	1.2	17
Non-Hodgkin lymphomas	-	1	1	1	3	0.8	0.8	12	3	1	-	-	4	2.0	2.0	4
Burkitt's lymphoma	-	1	1	1	3	0.5	0.6	8	3	3	1	-	7	2.0	2.5	32
Miscellaneous lymphoreticular neoplasms	-	4	6	5	15	4.0	4.0	59	3	16	5	4	11	3.1	3.0	45
Unspecified	3	17	18	15	53	14.1	14.6	214	3	16	8	21	48	13.4	13.7	202
<b>Brain and spinal Neoplasms</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ependymoma	-	3	4	3	13	3.5	3.3	51	2	4	4	8	18	5.0	5.0	75
Astrocytoma	1	6	3	3	13	3.5	3.8	53	3	3	1	4	8	2.2	2.2	33
Primitive neuroectodermal tumours	-	1	5	-	6	1.6	1.6	23	-	1	-	2	3	0.8	0.8	12
Other gliomas	-	1	1	-	2	0.5	0.5	8	-	-	-	-	-	-	-	-
Other specified	2	7	6	5	20	5.3	5.7	81	1	5	3	7	16	4.5	4.5	67
Unspecified	2	19	2	-	23	6.1	7.8	101	-	12	1	-	13	3.6	4.7	61
<b>Sympathetic Nervous System Tumours</b>	2	19	2	-	23	6.1	7.8	101	-	12	1	-	13	3.6	4.7	61
Neuroblastoma	2	19	2	-	23	6.1	7.8	101	-	12	1	-	13	3.6	4.7	61
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Retinoblastoma</b>	1	9	-	-	10	2.7	3.5	44	3	11	1	-	15	4.2	5.4	70
<b>Renal Tumours</b>	1	7	2	-	10	2.7	3.3	43	1	11	1	-	13	3.6	4.7	61
Wilms' tumour	1	5	-	-	6	1.6	2.1	26	-	10	1	-	11	3.1	3.9	51
Renal carcinoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unspecified	-	2	2	-	4	1.1	1.2	16	1	1	-	-	2	0.6	0.7	9
<b>Hepatic Tumours</b>	1	1	1	2	5	1.3	1.4	20	1	2	-	1	4	1.1	1.3	18
Hepatoblastoma	-	1	1	-	2	0.5	0.6	8	1	1	-	-	2	0.6	0.7	9
Hepatic carcinoma	1	-	-	1	2	0.5	0.6	8	-	-	-	-	2	0.6	0.6	8
Unspecified	1	-	-	1	2	0.5	0.6	8	-	-	-	-	2	0.6	0.6	8
<b>Malignant Bone Tumours</b>	-	1	4	15	20	5.3	4.6	75	-	1	3	4	8	2.2	2.0	32
Osteosarcoma	-	-	3	15	18	4.8	4.0	66	-	-	3	4	7	2.0	1.7	27
Chondrosarcoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ewing's sarcoma	-	1	1	-	2	0.5	0.6	8	-	1	-	-	1	0.3	0.4	4
Other specified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unspecified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Soft Tissue Sarcomas</b>	2	2	6	3	13	3.5	3.5	52	2	5	3	4	14	3.9	4.3	60
Rhabdomyosarcoma	1	2	5	1	9	2.4	2.5	36	-	4	2	1	7	2.0	2.2	31
Fibrosarcoma	-	1	1	1	3	0.5	0.5	7	1	1	-	1	3	0.6	0.6	8
Kaposi's sarcoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other specified	1	-	-	1	2	0.5	0.6	8	1	1	-	2	3	0.8	0.8	12
Unspecified	-	-	-	-	-	-	-	-	-	-	1	-	1	0.3	0.3	4
<b>Germ Cell and Gonadal Neoplasms</b>	-	1	2	9	12	3.2	2.8	45	-	1	5	6	12	3.3	3.0	48
Intracranial and intraspinal germ cell	-	-	-	4	4	1.1	0.9	14	-	-	1	-	1	0.3	0.3	4
Other and unspecified non-gonadal germ cell	-	1	2	1	4	1.1	0.9	14	-	1	2	6	9	2.5	2.2	35
Gonadal germ cell	-	-	-	-	-	-	-	-	-	-	2	-	2	0.6	0.5	8
Gonadal carcinoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other and unspecified	-	2	2	6	10	2.7	2.5	38	-	1	1	10	12	3.3	2.8	46
<b>Carcinomas and Epithelial Neoplasms</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adrenocortical	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	1	-	1	0.3	0.3	3	-	-	1	-	1	1.1	0.9	15
Nasopharyngeal	-	-	-	1	1	0.3	0.2	3	-	-	-	2	2	0.6	0.4	7
Melanoma	-	-	-	1	1	0.3	0.2	3	-	1	-	-	3	0.8	0.8	12
Skin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other and unspecified	-	2	1	4	7	1.9	1.8	27	-	-	-	3	3	0.8	0.7	11
<b>Other and Unspecified Neoplasms</b>	-	5	6	7	18	4.8	4.7	71	-	5	3	5	13	3.6	3.7	55
Other specified	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-
Other unspecified	-	5	6	7	18	4.8	4.7	71	-	5	3	5	13	3.6	3.7	55
<b>Total</b>	13	140	103	98	354	94.0	99.7	1 444	18	124	62	282	282	78.7	85.9	1 225

**AGE (5-YEAR AGE GROUPS)**

The average age-specific incidence rates for each of the three calendar periods of observation show much higher cancer rates for the youngest (younger than 5 years of age) particularly leukemia, sympathetic nervous system, retinoblastoma, renal tumor and older age group for tumors of the central nervous system and bone tumors (Figure 3.2).

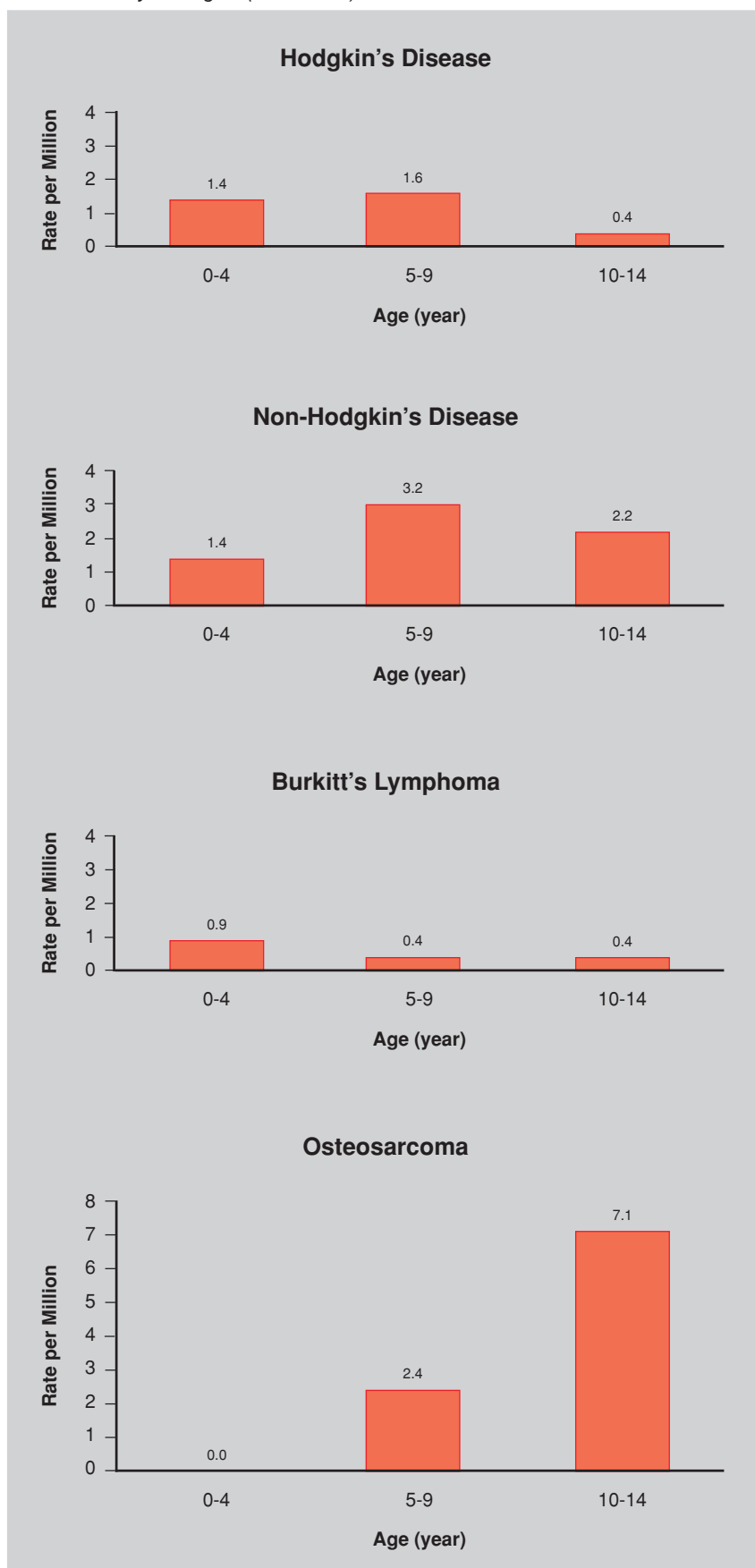
**AGE AND ICCG GROUP**

Sixty-five percent of the cancers found among children younger than 15 years of age were leukemia, malignant tumors of the central nervous system and lymphoma. The relative percentage, however, varied by age group (Figure 3.2). Leukemia was the most common diagnosis for those younger than 5, 5-9, and 10-14 years of age but the relative proportion of it decreased as age increased, from 42.4 percent in those younger than 5 years of age to only 28.4 percent in adolescents 10-14 years of age. Leukemias comprised 38.7 percent of all childhood cancers. Acute lymphocytic leukemia comprised 71.5 percent of all leukaemia. The second most common type of cancer was malignant tumors of the central nervous system. Lymphoma ranked third among male and female (Figure 3.1 & 3.2).

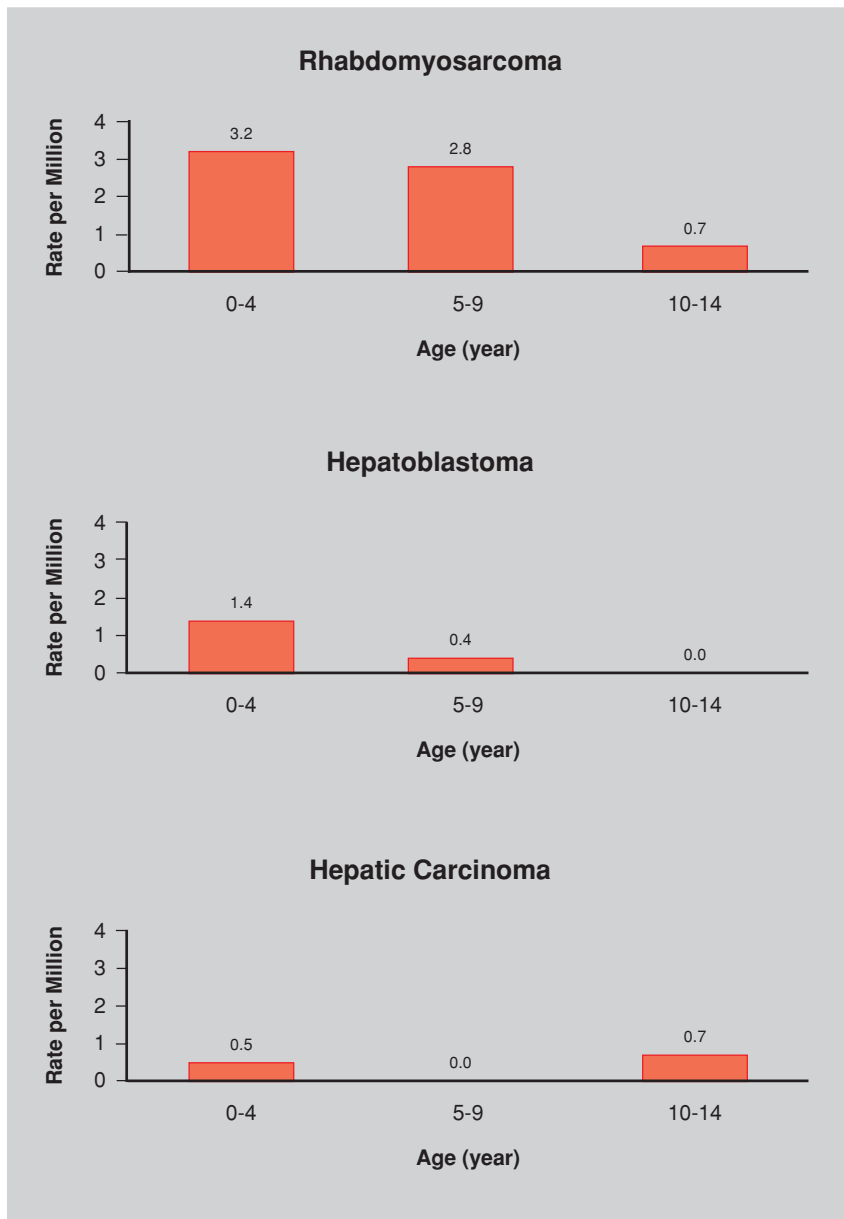
**COMMENTARY**

The incidence rates of childhood cancer in Thailand are rather low by international standards, compared to other registries. However, it is higher than the incidence rate registered in 1988-1994 (Vatanasapt *et al.*, 1999, Sriamporn *et al.*, 1996). The incidence still low compared to incidence in some

**Figure 3.3** Age-specific incidence rate per million of childhood cancer (selected sites) boys and girls (1995-1997)



**Figure 3.3 (continued)** Age-specific incidence rate per million of childhood cancer (selected sites) boys and girls (1995-1997)



Asian countries. Some underreporting is possible in all five cancer registries. There are increasing difficulties in ascertaining cases from private hospitals due to confidentiality, particularly in Bangkok. In addition, in order to receive the best medical treatment available, some non-residents register as Bangkok residents.

As frequently noted in other Asian countries, a relatively small number of children aged less than one year is registered. This may be because parents are unaware of possibility of cancer in such a young child, and prefer home treatment rather than seeking professional help. Moreover, no screening program for childhood cancer has operated in areas covered by population based cancer registries.