Childhood Neoplasms: Analysis of Thai Children 2010

Surapon Wiangnon MD*, Arunee Jetsrisuparb MD*,
Patcharee Komvilaisak MD*, Sumitr Sutra MD*

** Department of Pediatrics, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand*

Background: *Between 1990 and 2010, many national and international factors converged to both beneficially and antagonistically affect people's health as well as the Thai healthcare system. Among these were: a falling birth rate in Thailand and a gradual decline in poverty-related diseases. Cancer becomes the most common cause of death.*

Objective: *To analyze Thailand's childhood neoplasm issues for baseline information for changing medical education, services and research.*

Material and Method: *Information on the illnesses of in-patients, out-patients and casualties was based on hospital withdrawals nationwide from the three health insurance schemes in the fiscal year 2010. The data, which included 96% of the population, were analyzed by age groups and burden of neoplasm disease.*

Results: *The children with neoplasms were treated 127,597 times at outpatient departments (OPD) and 19,159 times at inpatient departments (IPD) at community hospitals (4.3%), provincial hospitals (8.5%), regional or university hospitals (86.1%) and private hospitals (1.1%). Malignant neoplasms of lymphoid hematopoietic and related tissues were the most common in both IPD and OPD settings, which resulted in the highest cost of treatment. Tumors of the central nervous system were associated with the highest cost. The mean length of stay for all patients with neoplasm was 7.85 days.*

Conclusion: *Sufficient budget should be allocated to the more heavily frequented treatment center. Specific and better care, national treatment protocols for each type of childhood cancer (including palliative care) should be developed to improve the treatment outcomes and/or the quality of life. Medical schools and health service systems need to be recalibrated to respond proactively to these changes being experienced by the healthcare system.*

Keywords: *Childhood, Neoplasms, Cancer, Thai children*

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Childhood cancer is not a single disease entity, but rather a spectrum of different malignancies. In Thailand, 21% of the population are children < 15 years of age[1] and although cancer among this age group is rare, approximately 1,000 cases per year are expected to be diagnosed with cancer; based on incidence rates reported in previous studies[2].

The aged standardized rate of childhood cancer was 74.9 per million[2]. The prognosis of childhood cancer is currently excellent with the improvements in treatment modalities. In Thailand, the treatment cost of cancer is fully recoverable from government support since 2002; as per the health security provided by the 30-baht universal healthcare scheme.

In 2006, the disease management project aiming to treat patients with leukemia and lymphoma-was implemented[3]. With the various social welfare programmes, all childhood cancer patients can access treatment. Between 2003 and 2005, the 5-year overall survival rate of Thai children with cancer (under 15) was 54.9%[2]. Between 2007 and 2008, the respective cancer-related mortality rates among Thai children between 6-12 and 13-18 years of age were 2.16 and 2.13/100,000[4]. Thailand has been developing into an industrialized society; with improving access to healthcare service and declining mortality vis-a-vis poverty-related diseases, but cancer has now become a relatively more common cause of mortality.

Correspondence to:
Wiangnon S, Department of Pediatrics, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.
Phone: 08-9714-5030
E-mail: suraponwiangnon@gmail.com

Objective

The authors objective was to analyze the burden of neoplasm among children under 18 in the medical healthcare delivery system in 2010, by using information from the Universal Health Care System, the Social Welfare System, the Civil Service Benefits System and research reports. This information was assessed according to the subclasses of age group (0-12 months, 1-5 years, 6-12 years and 13-18 years). These categories of information will also serve as baseline

data for future health research.

Material and Method

Data included both in- and out-patient Medical Expense Forms for fiscal year 2010 (October 1, 2009 and September 31, 2010) from the National Health Security Office (NHSO) and the Social Security Office, Thailand; and in-patient data from the Civil Servants Benefit System from the Comptroller General's Department (Table 1).

Data analysis team: A team of data analysts checked data for accuracy in (a) overlapping information (b) visiting dates (c) missing items (d) incorrect coding and (e) correctly dating the fiscal year. The basic statistical analysis of variables, including frequency and interrelationships, were calculated using the SPSS program. After analyzing the data, the research team passed on the primary analysis to ten medical specialists in order to check face validity; after which, the data were compared (a) to the Ministry of Public Health's Statistics Report 2010 for trend congruence as well as (b) to the hospital's mortality reporting for each age and disease group for a comparison with the National Death Registration of the Registry Administration, Ministry of Interior[5].

Results

Information on illness of in-patients, out-patients and casualties were sourced from hospitals nationwide and from hospital insurance withdrawals from the three health insurance schemes in fiscal 2010. The data covered 96% of the Thai population.

According to ICD-10 grouping, neoplasms in children under 18 in Thailand are not included in the top 10 diseases for either visits to out-patient departments (OPDs) or in-patient departments (IPDs).

The children under 18 with neoplasms were treated 127,597 times at outpatient clinics and 19,159 times as in-patients at community (4.3%), provincial (8.5%), regional or university (86.1%) or private hospitals (1.1%). The benign neoplams accounted for 26.8% and 14.3% of all neoplasm at OPD and IPD visits, respectively (Table 2-4).

In OPD settings, malignant neoplasms of lymphoid haematopoietic and related tissues (C81-C96) were the most common cancer for all age groups. Interestingly, neoplasms of uncertain or unknown behaviours (D37-D48) and malignant neoplasms of ill-defined, secondary and unspecified sites (C76-C80) were exceedingly frequent. Cancers of the lip, oral cavity and pharynx (C00-C14) were also unexpectedly frequent. Bone cancer (C40-C41) is evidently frequent in the older age group. Despite the rarity of endocrine gland cancer, visits of patients for thyroid and other endocrine glands (C73-7C5) were quite numerous perhaps because of the high number of patients with neurobalstoma (C74) included in the group.

In IPD settings, benign neoplasms are not frequent and mortality is low (0.1%). As lymphoid cancers are the most common type among childhood

Table 1. Information data on in- and out-patients in the Thai National Health Insurance Scheme*

In-Patients	Out-Patients
1. Individual personal code	1. Individual personal code
2. Hospital code	2. Hospital code
3. D/M/Y of birth	3. D/M/Y of birth
4. Sex	4. Sex
5. D/M/Y of admission	5. D/M/Y of out-patient visit
6. D/M/Y of discharge	6. Clinic
7. Discharge status	7. Primary diagnosis (PDX) ICD
8. Hospital charge	8. Operations/ Procedures/Non Procedures (ICD 9 CM)
9. Primary diagnosis (PDX) ICD 10	9. Referral hospital
External causes of morbidity (ICD 10)	10. Transfering hospital
10. Secondary diagnosis (SDX) (co-morbidity) (ICD 10)	
11. Operations/Procedures/Non Procedures (ICD 9CM)	
Complications (ICD 10)	
12. Discharge Status and type of Discharge	
13. Cause of death	

* For newborns and Labor and delivery, summaries of the respective data were used

Table 2. Number of OPD visits by primary diagnosis and age group

Primary diagnosis	Age group (Year)									
	Total		0-1		1-5		6-12		13-18	
	Count	%	Count	%	Count	%	Count	%	Count	%
Total	127,597	100.0	7,846	6.1	35,604	27.9	46,725	36.6	37,422	29.3
D10-D36 Benign neoplasms	34,172	100.0	3,478	10.2	8,227	24.1	10,745	31.4	11,722	34.3
C81-C96 Malignant neoplasms of lymphoid haematopoietic and related tissues	23,102	100.0	337	1.5	5,387	23.3	11,049	47.8	6,329	27.4
D00-D09 In situ neoplasms	16,565	100.0	1,095	6.6	5,492	33.2	5,802	35.0	4,176	25.2
C00-C14 Lip, oral cavity and pharynx	12,525	100.0	656	5.2	4,604	36.8	4,852	38.7	2,413	19.3
D37-D48 Neoplasms of uncertain or unknown behaviour	9,903	100.0	536	5.4	2,026	20.5	3,480	35.1	3,861	39.0
C30-C39 Respiratory and intrathoracic organs	7,970	100.0	660	8.3	3,568	44.8	2,688	33.7	1,054	13.2
C69-C72 Eye, brain and other parts of central nervous system	6,872	100.0	379	5.5	2,033	29.6	2,374	34.5	2,086	30.4
C76-C80 Malignant neoplasms of ill-defined, secondary and unspecified sites	4,319	100.0	141	3.3	1,070	24.8	1,874	43.4	1,234	28.6
C15-C26 Digestive organs	3,572	100.0	248	6.9	906	25.4	1,225	34.3	1,193	33.4
C40-C41 Bone and articular cartilage	1,607	100.0	21	1.3	105	6.5	432	26.9	1,049	65.3
C73-C75 Thyroid and other endocrine glands	1,534	100.0	19	1.2	451	29.4	481	31.4	583	38.0
C64-C68 Urinary tract	1,287	100.0	77	6.0	617	47.9	395	30.7	198	15.4
C45-C49 Mesothelial and soft tissue	1,218	100.0	59	4.8	248	20.4	373	30.6	538	44.2
C51-C58 Female genital organs	984	100.0	17	1.7	162	16.5	251	25.5	554	56.3
C60-C63 Male genital organs	965	100.0	66	6.8	430	44.6	358	37.1	111	11.5
C43-C44 Skin	741	100.0	40	5.4	239	32.3	273	36.8	189	25.5
C50 Breast	257	100.0	17	6.6	38	14.8	71	27.6	131	51.0
C97 Malignant neoplasms of independent multiple sites	4	100.0	0	0.0	1	25.0	2	50.0	1	25.0

Table 3. Number of admissions by primary diagnosis and age group and death

Primary diagnosis	Age group (Year)														
	Total			0-1			1-5			6-12			13-18		
	Total	Death		Total	Death		Total	Death		Total	Death		Total	Death	
	n	n	%	n	n	%	n	n	%	n	n	%	n	n	%
Total	19,159	410	2.1	1,226	44	3.6	5,421	87	1.6	6,534	117	1.8	5,978	162	2.7
C81-C96 Malignant neoplasms of lymphoid haematopoietic and related tissues	9,167	215	2.3	191	20	10.5	2,727	48	1.8	3,745	65	1.7	2,504	82	3.3
D10-D36 Benign neoplasms	2,743	4	0.1	479	2	0.4	611	1	0.2	722	1	0.1	931	0	0.0
C69-C72 Eye, brain and other parts of central nervous system	1,484	43	2.9	62	2	3.2	615	13	2.1	537	16	3.0	270	12	4.4
D37-D48 Neoplasms of uncertain or unknown behaviour	1,300	31	2.4	153	6	3.9	200	6	3.0	412	8	1.9	535	11	2.1
C40-C41 Bone and articular cartilage	1,106	20	1.8	9	1	11.1	86	0	0.0	300	4	1.3	711	15	2.1
C73-C75 Thyroid and other endocrine glands	927	26	2.8	39	4	10.3	362	4	1.1	355	13	3.7	171	5	2.9
C45-C49 Mesothelial and soft tissue	559	11	2.0	62	1	1.6	224	2	0.9	125	1	0.8	148	7	4.7
C51-C58 Female genital organs	400	5	1.3	14	0	0.0	57	0	0.0	89	1	1.1	240	4	1.7
C15-C26 Digestive organs	360	16	4.4	91	5	5.5	109	2	1.8	50	3	6.0	110	6	5.5
C64-C68 Urinary tract	359	5	1.4	59	1	1.7	238	3	1.3	37	0	0.0	25	1	4.0
C30-C39 Respiratory and intrathoracic organs	229	14	6.1	20	1	5.0	48	3	6.3	76	2	2.6	85	8	9.4
C76-C80 Malignant neoplasms of ill-defined, secondary and unspecified sites	223	16	7.2	13	1	7.7	61	4	6.6	52	3	5.8	97	8	8.2
C00-C14 Lip, oral cavity and pharynx	153	4	2.6	12	0	0.0	19	1	5.3	14	0	0.0	108	3	2.8
C60-C63 Male genital organs	78	0	0.0	7	0	0.0	41	0	0.0	6	0	0.0	24	0	0.0
C43-C44 Skin	33	0	0.0	2	0	0.0	18	0	0.0	5	0	0.0	8	0	0.0
C50 Breast	22	0	0.0	8	0	0.0	3	0	0.0	4	0	0.0	7	0	0.0
D00-D09 In situ neoplasms	16	0	0.0	5	0	0.0	2	0	0.0	5	0	0.0	4	0	0.0

Table 4. Number of admissions by primary diagnosis and hospital level

Primary diagnosis	Hosptital level									
	Total		Primary		Secondary		Tertiary		Private	
	N	%	N	%	N	%	N	%	N	%
Total	19,159	100.0	817	4.3	1,633	8.5	16,504	86.1	205	1.1
C81-C96 Malignant neoplasms of lymphoid haematopoietic and related tissues	9,167	100.0	307	3.3	463	5.1	8,368	91.3	29	0.3
D10-D36 Benign neoplasms	2,743	100.0	172	6.3	531	19.4	1,944	70.9	96	3.5
C69-C72 Eye, brain and other parts of central nervous system	1,484	100.0	51	3.4	81	5.5	1,343	90.5	9	0.6
D37-D48 Neoplasms of uncertain or unknown behaviour	1,300	100.0	113	8.7	298	22.9	860	66.2	29	2.2
C40-C41 Bone and articular cartilage	1,106	100.0	39	3.5	41	3.7	1,014	91.7	12	1.1
C73-C75 Thyroid and other endocrine glands	927	100.0	18	1.9	37	4.0	870	93.9	2	0.2
C45-C49 Mesothelial and soft tissue	559	100.0	12	2.1	37	6.6	509	91.1	1	0.2
C51-C58 Female genital organs	400	100.0	10	2.5	15	3.8	363	90.8	12	3.0
C15-C26 Digestive organs	360	100.0	29	8.1	30	8.3	296	82.2	5	1.4
C64-C68 Urinary tract	359	100.0	10	2.8	32	8.9	317	88.3	0	0.0
C30-C39 Respiratory and intrathoracic organs	229	100.0	10	4.4	7	3.1	212	92.6	0	0.0
C76-C80 Malignant neoplasms of ill-defined, secondary and unspecified sites	223	100.0	21	9.4	33	14.8	166	74.4	3	1.3
C00-C14 Lip, oral cavity and pharynx	153	100.0	13	8.5	13	8.5	126	82.4	1	0.7
C60-C63 Male genital organs	78	100.0	1	1.3	2	2.6	75	96.2	0	0.0
C43-C44 Skin	33	100.0	1	3.0	3	9.1	28	84.8	1	3.0
C50 Breast	22	100.0	3	13.6	6	27.3	9	40.9	4	18.2
D00-D09 In situ neoplasms	16	100.0	7	43.8	4	25.0	4	25.0	1	6.3

cancers, total admissions account for almost half of all admissions (47.8%) with death of 2.3%. In these cancer categories, the death was particularily high among infants (10.5%). Mortality was also high for malignant neplasms of ill-defined and unspecified sites (7.2%) but low (2.9%) in cancers of the eye, brain and other parts of the central nervous system (C69-C72). These observations may be explained by the good treatment outcomes of the subgroup of patients.

Most children with cancer were admitted to a tertiary hospital (86.1%) while a relatively high number of patients with the diagnosis of neoplasms of uncertain or unknown behaviour (D37-D48) and malignant neoplasms of ill-defined, secondary and unspecified sites (C76-C80) were admitted to primary hospitals. As a consequence, the final diagnosis of neoplasm may not be specified due to a limitation of sophisticated investigative resources at primary hospitals. Notwithstanding, it is quite possible that 70.9% of benign neoplasms were correctly diagnosed, referred and admitted to tertiary hospitals according to the referral sysytem (Table 4).

Length of hospital stay is another indicator of national health expenditures. Avoiding hospital admission means having hospital beds available for critically ill persons. Cancer patients generally occupy beds longer than patients with benign neoplasm (7.85 vs. 4.49 days). Patients at different age groups were hospitalized for similar durations. A trend showed that CNS tumor patients were hospitalized for longer duration (Table 5).

Cost of treatment

Cancer treatment is basically very costly and represents a large proportion of health expenditures. Hospital charges are partly due to the cost of treating cancer and benign neoplasm. The five leading costs of treatment for patients with neoplasm are: 1) C81-C96, malignant neoplasms of lymphoid hematopoietic and related tissue; 2) C69-C72, eye & brain and other parts of central nervous sysytem; 3) D10-D36, benign neoplasms; 4) C40-C41, bone and articular cartilage; and 5) C73-C75, thyroid and other endocrine gland. The high-low rank of costs per group of disease was: 1) C69-C72, eye & brain and other parts of central nervous sysytem; 2) C30-C39, respiratory and intrathoracic organs; 3) C15-C26, digestive organ; 4) C76-C80, malignant neoplasm of ill-defined, secondary and unspecified sites and 5) C81-C96, malignant neoplasms of lymphoid hematopoietic and related tissue (Table 6).

Discussion

The present study aimed to identify the burden of benign and maligant neoplasms among Thai children and adolescents. The plan was to use all of the available health information in Thailand in order to reform the medical curriculum, health planning and service system. The data sources included out-patient data and the in-patient discharge forms, which every hospital must submit for reimbursement from any one of the three public health insurance schemes, which cover 96% of the population. The data of both out-patients and in-patients comprised: demographics and diagnosis, hospital, hospital charges, length of stay and mortality. These data allowed a specific analysis of the neoplams of both malignant and benign neoplasm groups as per the International Classification of Disease version 10 (ICD 10). Notably, benign neoplasms comprise a variety of diseases; therefore, the benign neoplasms analysed here may only roughly reflect the burden of benign diseases. It would be more precise and accurate if the malignant neoplasms were classified and grouped according to cancer in children as per the International Childhood Cancer Classification; since cancer in children is different from that in adults[6]. In addition, the basis of diagnosis according to the ICD10 system is not possible to know; as the final diagnosis depends on the attending physician's conclusion.

The incidence of childhood cancer in Thailand is relatively low compared to that in Western countries, with an aged-standardized rate of 74.9 per million. The long-term overall survival rate of population-based registration between 2003-5 appears relatively low (54.9%)[2]. Currently, the outcome of treatment for childhood cancer in resource-rich countries is higher than 70%[7].

Leukemia and related lymphoid neoplasms are the most common cancers in childhood and take up most of the treatment expenditures, as was the case in the current study. However, with a standard therapeutic approach, these neoplasms are mostly curable. Since 2006, the disease management for leukemia and lymphoma has been implemented nationwide. The patients were treated with a standard common national protocol and the treatment centers were paid through the patient's being registered with the National Health Security Office. Consequently, patients with these cancers were commonly able to receive the standard treatment. The Thai Pediatric Oncology Group (ThaiPOG) has shown that the survival of patients with acute lymphoblastic leukemia treated with national protocol can achieve a survival of 70%[8]. Until now,

Table 5. Length of stay by primary diagnosis and age group

Primary diagnosis	Age group (Year)														
	Total			0-1			1-5			6-12			13-18		
	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean
Total	19,159	150,459	7.85	1,226	10,448	8.52	5,421	41,691	7.69	6,534	49,566	7.59	5,978	48,754	8.16
C00-C14 Lip, oral cavity and pharynx	153	1,399	9.14	12	226	18.83	19	204	10.74	14	82	5.86	108	887	8.21
C15-C26 Digestive organs	360	2,645	7.35	91	565	6.21	109	727	6.67	50	606	12.12	110	747	6.79
C30-C39 Respiratory and intrathoracic organs	229	2,178	9.51	20	84	4.20	48	596	12.42	76	666	8.76	85	832	9.79
C40-C41 Bone and articular cartilage	1,106	8,094	7.32	9	73	8.11	86	570	6.63	300	1,832	6.11	711	5,619	7.90
C43-C44 Skin	33	136	4.12	2	29	14.50	18	52	2.89	5	33	6.60	8	22	2.75
C45-C49 Mesothelial and soft tissue	559	4,312	7.71	62	586	9.45	224	1,939	8.66	125	822	6.58	148	965	6.52
C50 Breast	22	103	4.68	8	70	8.75	3	13	4.33	4	5	1.25	7	15	2.14
C51-C58 Female genital organs	400	2,377	5.94	14	136	9.71	57	389	6.82	89	424	4.76	240	1,428	5.95
C60-C63 Male genital organs	78	419	5.37	7	45	6.43	41	163	3.98	6	17	2.83	24	194	8.08
C64-C68 Urinary tract	359	3,473	9.67	59	566	9.59	238	2,268	9.53	37	418	11.30	25	221	8.84
C69-C72 Eye, brain and other parts of central nervous system	1,484	15,668	10.56	62	872	14.06	615	4,529	7.36	537	6,753	12.58	270	3,514	13.01
C73-C75 Thyroid and other endocrine glands	927	7,060	7.62	39	305	7.82	362	2,668	7.37	355	2,476	6.97	171	1,611	9.42
C76-C80 malignant neoplasms of ill-defined, secondary and unspecified sites	223	2,139	9.59	13	129	9.92	61	497	8.15	52	539	10.37	97	974	10.04
C81-C96 Malignant neoplasms of lymphoid haematopoietic and related tissues	9,167	79,166	8.64	191	2,561	13.41	2,727	23,393	8.58	3,745	29,328	7.83	2,504	23,884	9.54
D00-D09 In situ neoplasms	16	59	3.69	5	21	4.20	2	8	4.00	5	15	3.00	4	15	3.75
D10-D36 Benign neoplasms	2,743	12,327	4.49	479	3,096	6.46	611	2,203	3.61	722	2,769	3.84	931	4,259	4.57
D37-D48 Neoplasms of uncertain or unknown behaviour	1,300	8,904	6.85	153	1,084	7.08	200	1,472	7.36	412	2,781	6.75	535	3,567	6.67

Table 6. Hospital charges by primary diagnosis and age group

Primary diagnosis	Age group (Year)														
	Total			0-1			1-5			6-12			13-18		
	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean
Total	19,159	616,415,221	32,174	1,226	35,529,814	28,980	5,421	139,820,872	25,792	6,534	197,315,750	30,198	5,978	243,748,785	40,774
C00-C14 Lip, oral cavity and pharynx	153	5,732,536	37,468	12	1,417,266	118,106	19	419,022	22,054	14	322,055	23,004	108	3,574,193	33,094
C15-C26 Digestive organs	360	10,188,490	28,301	91	1,711,780	18,811	109	2,626,559	24,097	50	2,255,170	45,103	110	3,594,981	32,682
C30-C39 Respiratory and intrathoracic organs	229	10,554,771	46,091	20	269,858	13,493	48	2,769,384	57,696	76	3,145,591	41,389	85	4,369,939	51,411
C40-C41 Bone and articular cartilage	1,106	37,283,949	33,711	9	152,290	16,921	86	1,582,090	18,396	300	9,477,507	31,592	711	26,072,062	36,670
C43-C44 Skin	33	482,806	14,630	2	55,664	27,832	18	210,895	11,716	5	143,463	28,693	8	72,784	9,098
C45-C49 Mesothelial and soft tissue	559	18,849,991	33,721	62	2,289,109	36,921	224	7,104,603	31,717	125	4,586,823	36,695	148	4,869,457	32,902
C50 Breast	22	207,671	9,440	8	100,159	12,520	3	39,463	13,154	4	23,956	5,989	7	44,093	6,299
C51-C58 Female genital organs	400	8,283,411	20,709	14	352,643	25,189	57	1,197,773	21,014	89	1,573,723	17,682	240	5,159,272	21,497
C60-C63 Male genital organs	78	2,177,412	27,916	7	88,123	12,589	41	556,535	13,574	6	61,537	10,256	24	1,471,217	61,301
C64-C68 Urinary tract	359	10,794,029	30,067	59	1,549,749	26,267	238	7,056,290	29,648	37	1,305,327	35,279	25	882,663	35,307
C69-C72 Eye, brain and other parts of central nervous system	1,484	70,037,582	47,195	62	3,961,441	63,894	615	20,256,831	32,938	537	27,257,446	50,759	270	18,561,864	68,748
C73-C75 Thyroid and other endocrine glands	927	29,534,979	31,861	39	1,054,891	27,048	362	8,887,133	24,550	355	11,180,175	31,493	171	8,412,780	49,198
C76-C80 Malignant neoplasms of ill-defined, secondary and unspecified sites	223	7,816,807	35,053	13	315,706	24,285	61	1,465,902	24,031	52	2,208,029	42,462	97	3,827,171	39,455

Table 6. Cont.

Primary diagnosis	Total			Age group (Year)											
				0-1			1-5			6-12			13-18		
	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean	n	Sum	Mean
C81-C96 Malignant neoplasms of lymphoid haematopoietic and related tissues	9,167	320,428,095	34,955	191	8,682,270	45,457	2,727	72,162,817	26,462	3,745	110,187,663	29,423	2,504	129,395,346	51,675
D00-D09 In situ neoplasms	16	150,675	9,417	5	46,622	9,324	2	12,806	6,403	5	33,513	6,703	4	57,734	14,434
D10-D36 Benign neoplasms	2,743	47,194,748	17,206	479	9,471,087	19,773	611	8,003,214	13,099	722	9,801,727	13,576	931	19,918,721	21,395
D37-D48 Neoplasms of uncertain or unknown behaviour	1,300	36,697,270	28,229	153	4,011,158	26,217	200	5,469,557	27,348	412	13,752,046	33,379	535	13,464,510	25,167

there is no other such common protocol for any other maligancy.

Interestingly, a relatively high number of patients with a diagnosis of neoplasms of uncertain or unknown behaviour and malignant neoplasms of ill-defined, secondary and unspecified sites were concluded especially in primary hospitals. According to the limitation of sophisticated investigative procedures and equipment, the specific diagnosis of neoplasm cannot be made; therefore, tumor information shoud be shared interactively between/among referral and referring centers.

Malignant tumors of digestive organs are generally rare in children. Consequently, the number of patients in the present study is abnormally high. As mentioned, the diagnosis depends on the attending physician's summary which will be affected the diagnostic facilites available at each hospital.

The number of deaths in the present study does not indicate the treatment outcomes. There are cancers with good and poor prognoses grouped together (*e.g.*, C69-C72). Retinoblastoma (C69) conveys a good prognosis while specific types of CNS tumors (*e.g.*, C70-C72) bear very poor outcomes.

Most of the cancer patients are treated at tertiary centers including regional hospitals, cancer centers and university hospitals. With the number of cancer patients overwhelmingly in tertiary and teaching hospitals, according to the referral system, the burden is apparently very overloaded. Cancer patients usually occupy beds longer resulting in less bed-availability for critically ill persons, leaving no space for admission of patients with common diseases. Therefore medical students and residents unnecessarily have to focus on these sophisticated diseases and have less chance to practice with patients with common community diseases. The teaching and training system needs to be recalibrated to respond proactively to these changes.

Study limitations

In the current study, the authors analyzed the data from primary to tertiary care hospitals throughout the nation; therefore, the reliability and validity of the results depended on correct medical diagnoses and coding. Each of the public health insurance schemes did audits of both the OPD and IPD records of every hospital and found a 10% to 20% error in diagnostics and coding. During the analysis process, we asked medical experts in each field to validate the raw data. Caution should, therefore, be exercised when extrapolating the results.

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Potential conflicts of interest

None.

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สถานการณ์โรคมะเร็งและเนื้องอกในเด็กไทย พ.ศ. 2553

สุรพล เวียงนนท์, อรุณี เจตศรีสุภาพ, พัชรี คำวิลัยศักดิ์, สุมิตร สุตรา

ภูมิหลัง: *ในสองทศวรรษที่ผ่านมาได้เกิดการเปลี่ยนแปลงอย่างมากในสังคมไทย ทั้งปัจจัยภายนอกและภายในซึ่งมีผลต่อสุขภาพของประชาชนและระบบสุขภาพของประเทศไทย อัตราเกิดต่ำลง อายุขัยของประชากรเพิ่มขึ้นและภาวะเจ็บป่วยจากโรคที่เกี่ยวข้องกับความยากจนลดลง โรคมะเร็งมีแนวโน้มเพิ่มขึ้น*

วัตถุประสงค์: *เพื่อวิเคราะห์ปัญหาโรคมะเร็งและเนื้องอกในเด็กไทย เพื่อปรับเปลี่ยนกระบวนการเรียนการสอนการให้บริการด้านสุขภาพและเป็นข้อมูลพื้นฐานของการวิจัย*

วัสดุและวิธีการ: *โครงการวิจัยรวบรวมข้อมูลการเจ็บป่วยทั้งของผู้ป่วยนอก ผู้ป่วยในและผู้ที่เสียชีวิตในโรงพยาบาลโดยใช้ข้อมูลที่โรงพยาบาลส่งเบิกจ่ายจากสามระบบประกันสุขภาพ คือระบบประกันสุขภาพถ้วนหน้า ระบบประกันสังคม และระบบสวัสดิการรักษาพยาบาลข้าราชการ ในปีงบประมาณ พ.ศ. 2553 ซึ่งครอบคลุมประชากร 62 ล้านคน (ร้อยละ 96 ของประชากรของประเทศ) และวิเคราะห์ข้อมูลโรคมะเร็งและเนื้องอกในเด็กตามกลุ่มอายุและกลุ่มโรค*

ผลการศึกษา: *มีผู้ป่วยเด็กอายุน้อยกว่า 18 ปี ที่เป็นโรคมะเร็งและเนื้องอกมารับการรักษาแบบผู้ป่วยนอกทั้งสิ้น 127,597 ครั้ง และผู้ป่วยใน 19,159 ครั้ง จากโรงพยาบาลชุมชนร้อยละ 4.3 โรงพยาบาลจังหวัด ร้อยละ 8.5 โรงพยาบาลศูนย์และมหาวิทยาลัย ร้อยละ 86.1 และโรงพยาบาลเอกชน ร้อยละ 1.1 เป็นโรคในกลุ่มมะเร็งระบบเลือดมากที่สุด รวมทั้งสิ้นเปลืองค่ารักษาพยาบาลมากที่สุดด้วย มะเร็งระบบประสาทใช้ค่าใช้จ่ายสูงสุด อัตราการครองเตียงโดยรวมของทุกกลุ่มโรคคือ 7.85 วัน*

สรุป: *การรักษาโรคในกลุ่มมะเร็งและเนื้องอกส่วนใหญ่อยู่ที่โรงพยาบาลระดับตติยภูมิและต้องสิ้นเปลืองค่าใช้จ่ายสูง ดังนั้นรัฐบาลควรมีระบบบริหารงบประมาณสำหรับโรคกลุ่มนี้ รวมทั้งจัดทำสูตรการรักษาให้เป็นมาตรฐานเดียวกันทั้งประเทศ พัฒนาการรักษาแบบประคับประคองให้ผู้ป่วยมีคุณภาพชีวิตที่ดี โรงเรียนแพทย์ควรตระหนักและจัดระบบการเรียนการสอนให้เหมาะสมกับการเปลี่ยนแปลงนี้*