

The Burden of Head and Neck Cancers in Thailand

Patravoot Vatanasapt MD*, Sanguansak Thanaviratananich MD*,
Teeraporn Ratanaanekchai MD*, Kaewjai Thepsuthammarat PhD**

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

** Clinical Epidemiology Unit, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Objective: To determine the overall burden of disease vis-a-vis head and neck cancers in Thailand, as indicated by visits to healthcare units, admissions for treatment and expenditures at all levels of the healthcare delivery system.

Material and Method: A descriptive study was conducted by retrieving and analysing data for the fiscal year 2010 from the National Health Security Office (NHSO) and the Social Security Office, Thailand and from in-patient data of the Civil Servants Benefit System from the Comptroller General's Department.

Results: In 2010, there were 167,199 visits to outpatient departments (OPDs) and 26,012 admissions to hospital (IPD) for diagnosis and treatment of head and neck cancers. The most common diagnosis for visits to OPD and admission to IPD was oral cancer (28.2% and 25%, respectively). The mean length of hospital stay was 9 days. About half of admissions took place in the central region. The hospital charges totalled 691 million Baht (US\$ 21.8 million), or an average of 26,556 Baht (US\$ 838) per admission.

Conclusion: Since a relatively high volume of hospital visits was found, there is an urgent need to train sufficient numbers of specialists in the field of head and neck cancer treatments to provide efficient healthcare.

Keywords: Burden, Inpatient, Outpatient, Expenditure, Head and neck cancers, Thailand

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Head and neck cancers are defined as a group of malignant neoplasms occurring in the upper aerodigestive tract and the tissues within the head and neck regions. Unlike other major cancers, its burden has been neglected or overlooked as data are usually displayed separately from other cancer sites.

In Thailand, the estimated incidence of head and neck cancers are 14.2 per 100,000 in males and 9.7 per 100,000 in females⁽¹⁾. According to the currently available evidence, their incidence are not declining and survival rates are not improving. On the contrary, the incidence of tumours at certain sites has been found to be increasing, e.g., oral cancers in females in the northeastern region⁽²⁾.

Accessibility of healthcare service in Thailand has improved dramatically since launching the universal coverage scheme in 2000. In 2010, about 97% of the Thai population of 64.8 million have healthcare coverage by the Civil Servant Medical Benefit (CSMB) scheme, the Social Security (SS) scheme or the Universal Coverage (UC) scheme⁽³⁾.

Notwithstanding, delays in the diagnosis and treatment of patients with cancer, including of the head and neck remain a challenge.

Foremost, there is a shortage of specialists in the field, mainly head and neck surgeons and radiotherapists. Knowing the burden of head and neck cancers should provide impetus for setting priorities and improving the quality of service for this suite of health problems. The present study, therefore, aimed to determine the overall burden of head and neck cancers in Thailand, as judged by visits to healthcare units, admissions for treatment and expenditures at all levels (i.e., primary, secondary, tertiary and private) of the healthcare delivery system.

Material and Method

Data on both in- and out-patients were retrieved from the Medical Expense Forms submitted for the fiscal year 2010 (October 1, 2009 to September 31, 2010) from the National Health Security Office (NHSO) and the Social Security Office, Thailand. In-patient data was also available from the Civil Servants Benefit System from the Comptroller General's Department. Details of the data gathering methodological were reported in the first published paper of this special issue.

Correspondence to:

Vatanasapt P, Department of Otorhinolaryngology, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand.
Phone: 043-348-396
E-mail: patvat@kku.ac.th

Head and neck cancers were defined as patients diagnosed with cancer of the oral cavity and pharynx (according to ICD-10: C00-06 and C09-14), nasopharynx (C11), parotid and major salivary glands (C07-08), nose and paranasal sinuses (C30-31), thyroid gland (C73), parathyroid gland (C75), external ear and middle ear (C30.1) and skin cancer on the scalp, face, and neck area-both melanoma and non-melanoma type (C43.0-43.4 and C44.0-44.4). In addition, data for benign neoplasms were also retrieved to provide comparative information; including of the mouth and pharynx (D10), major salivary gland (D11), thyroid gland (D34, E04.1-04.2), larynx (14.1), nasal cavity, paranasal sinuses and middle ear (14.0). All hospital discharges with a primary diagnosis of one of the above were collected.

As most surgical procedures for treating head and neck cancers are described in broad non-specific terms, used in both cancer and non-cancer cases (*e.g.*, wide excision), only certain procedures specific for cancer were included in the analysis, *viz.*, laryngectomy, maxillectomy and neck dissection.

The authors assessed the frequency of visits to an out-patient department (OPD) according to types of cancer and frequency of admissions to an in-patient department (IPD). Expenditures were determined by proxy from hospital charges for reimbursement. The performance of the healthcare service was also evaluated by proxy, in terms of length of hospital stay for specific procedures used in the treatment of head and neck cancers.

Results

Out-patient and In-patient visits

In the fiscal year 2010, the database recorded 167,199 visits to the OPD and 26,012 admissions to hospital (IPD), for diagnosis and treatment of head and neck cancers. By comparison, there were 207,439 OPD visits and 8,360 admissions for benign neoplasms of the head and neck (Table 1).

Among the head and neck cancers, cancer of the oral cavity was the cause of the highest number of visits to the OPD and admissions to IPD (28.2% and

Table 1. Number of visits to the out-patient departments (OPD) and admissions to the in-patient departments (IPD) by types of head and neck neoplasms

Types of neoplasms	Visits to OPD		Admissions to IPD		O/I ratio*
	Number	%	Number	%	
Malignancies of Head & Neck					
Oral cavity	47,188	28.2	6,491	25.0	7.3
Oropharynx	14,546	8.7	1,415	5.4	10.3
Ill-defined sites in oral cavity & pharynx	3,567	2.1	162	0.6	22.0
Parotid & major salivary gland	4,278	2.6	539	2.1	7.9
Nasopharynx	23,986	14.3	5,803	22.3	4.1
Hypopharynx	5,882	3.5	1,985	7.6	3.0
Nose & paranasal sinuses	3,990	2.4	765	2.9	5.2
Larynx	13,104	7.8	3,349	12.9	3.9
Thyroid	43,101	25.8	4,275	16.4	10.1
Parathyroid gland	1,218	0.7	204	0.8	6.0
External & middle ear	2,726	1.6	178	0.7	15.3
Malignant melanoma	460	0.3	41	0.2	11.2
Non melanoma skin cancer	3,153	1.9	805	3.1	3.9
Total malignancy	167,199	100	26,012	100	0.0
Benign neoplasms of Head & Neck					
Mouth & pharynx	12,876	6.2	245	2.9	52.6
Major salivary gland	6,026	2.9	561	6.7	10.7
Thyroid gland & non toxic single/multiple thyroid nodule	186,736	90.0	6,719	80.4	27.8
Larynx	565	0.3	538	6.4	1.1
Nasal cavity, paranasal sinuses & middle ear	1,236	0.6	297	3.6	4.2
Total benign	207,439	100	8,360	100	24.8

Note * O/I ratio = number of visits to OPD ÷ the number of admissions to IPD

25.0%, respectively), followed by thyroid cancer (25.8% and 16.4%, respectively) and nasopharyngeal cancer (14.3% and 22.3%, respectively). Patients with malignant neoplasms were more likely to be treated as in-patients than those with benign neoplasms, as the out-/in-patient ratio was less for malignant than for benign neoplasms (Table 1). A non-cancer-related co-morbidity was found in 56% of all admissions (data not shown).

The monthly distribution of patient visits to the OPD was relatively higher in March, June and October; the year-round pattern of visits of the malignant tumour group was similar to the benign group (Fig. 1).

One-half of all admissions for head and neck cancers were in the central region (49.7%)-where the capital Bangkok, is located-compared to ~23.5, 14.4 and 12.5% in the northeastern, northern and southern regions, respectively (Table 2). Similarly, 58% of all operations on head and neck cancers were performed in the central region (Table 3).

Length of hospital stay and Expenditures

Among in-patients, head and neck cancers accounted for 233,525 days of hospitalization (mean, 9 days). The length of hospital stay for thyroid cancer was the shortest (Table 4). The mean length of stay for benign neoplasm was about one-half that for malignancies.

The total of hospital charges for head and neck cancer in the fiscal year 2010 was 691 million Baht (US\$ 21.8 million), with a mean of 26,556 Baht (US\$ 838) per admission. This was slightly higher than the mean charge for benign neoplasms (Table 4). Cancer of the parathyroid gland had the highest mean charge per admission; substantially greater than for the any other tumours. Among 1,242 admissions for the selected surgical procedures, the mean hospital charge was

78,940 Baht (US\$ 2,491); about three times greater than the overall mean charge. In-hospital mortality occurred in 17 admissions (1.4%).

Discussion

The present study mainly demonstrated the burden of head and neck cancers management for healthcare providers in Thailand. The volume of OPD visits and IPD admissions for the various types of head and neck cancers correlated well with the distribution of new diagnosed cases (incident cases) derived from population-based cancer registries (Table 5)⁽¹⁾. Oral cancer, the most common site for head and neck cancers in Thailand⁽¹⁾, contributed the highest volume of activity for both OPD and IPD services. The number of admissions for head and neck cancers was more than three times greater than the estimated number of incident cases (Table 5); due to multiple admissions of new cases plus those of pre-existing cases requiring inpatient care. The number of OPD visits was about 6.5 times greater than IPD admissions; likely due to visits by pre-existing cases and repeated OPD visits by new cases. The above basic information provides an estimate of the workload for healthcare services.

The nationwide number of hospitalizations for oral and oropharyngeal cancers was 8,368 admissions, comparable to that in Spain⁽⁴⁾. By comparison, the total number of admissions for head and neck cancer in the USA was less than that in Thailand^(5,6), even though the number of new cases diagnosed in the USA was almost six-time greater⁽⁷⁾. This raises questions about the reasons for the higher admission rate in Thailand, meriting further study.

Even though less than one-third of the Thai population resides in the central region-where the incidence of head and neck cancers is similar to the other regions-nearly half of all cases were admitted and ~60% of surgical procedures performed there. This is probably due to a concentration of healthcare providers in Bangkok, where the population to physician ratio is 565:1 compared to 2,870:1 in the Northeast⁽³⁾. The imbalance has lessened during the last two decades but resource dilution is a balancing consideration. Since, however, there is no exclusive specialist in most hospitals, except for head and neck surgeons in the university hospitals, it is necessary to determine what should be an appropriate level of personnel/equipment resources for head and neck cancers. Currently, along with radiotherapists, most head and neck cancers are treated by otolaryngologists and head and neck surgeons. A similar situation,

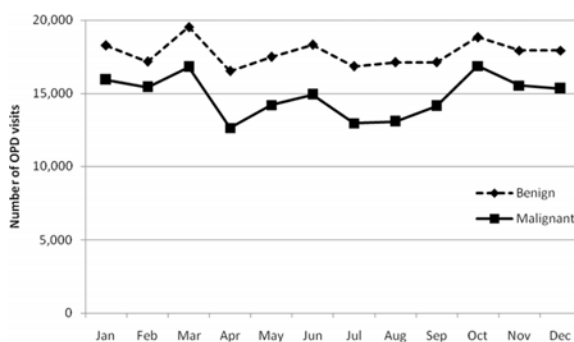


Fig. 1 Trends in number of visits to OPD for benign and malignant neoplasms in 2010

Table 2. Number of admissions for head and neck cancers by regions of Thailand

Type of Cancer	Total		Northern		Northeastern		Central		Southern	
	Number	%	Number	%	Number	%	Number	%	Number	%
Oral cavity	6,491	100	770	11.9	1,774	27.3	3,093	47.7	854	13.2
Oropharynx	1,415	100	206	14.6	290	20.5	715	50.5	204	14.4
Ill-defined sites in oral cavity & pharynx	162	100	16	9.9	44	27.2	47	29.0	55	34.0
Parotid & major salivary gland	539	100	85	15.8	131	24.3	282	52.3	41	7.6
Nasopharynx	5,803	100	999	17.2	1,421	24.5	2,829	48.8	554	9.5
Hypopharynx	1,985	100	256	12.9	266	13.4	1,124	56.6	339	17.1
Nose & paranasal sinuses	765	100	124	16.2	195	25.5	369	48.2	77	10.1
Larynx	3,349	100	508	15.2	531	15.9	1,793	53.5	517	15.4
Thyroid	4,275	100	526	12.3	1,133	26.5	2,129	49.8	487	11.4
Parathyroid gland	204	100	18	8.8	35	17.2	132	64.7	19	9.3
External & middle ear	178	100	32	18.0	33	18.5	98	55.1	15	8.4
Malignant melanoma	41	100	13	31.7	9	22.0	15	36.6	4	9.8
Non-melanoma skin cancer	805	100	191	23.7	247	30.7	292	36.3	75	9.3
Total	26,012	100	3,744	14.4	6,109	23.5	12,918	49.7	3,241	12.5

Table 3. Selected surgical procedures for head and neck cancers by regions of Thailand

Procedures	Total		Northern		Northeastern		Central		Southern	
	Number	%	Number	%	Number	%	Number	%	Number	%
Complete laryngectomy	159	100	29	18.2	23	14.5	83	52.2	24	15.1
Complete laryngectomy with radical neck dissection	144	100	9	6.3	24	16.7	92	63.9	19	13.2
Radical/Regional neck dissection-unilateral	743	100	109	14.7	122	16.4	431	58.0	81	10.9
Radical neck dissection-bilateral	131	100	12	9.2	29	22.1	83	63.4	7	5.3
Medial/partial/total maxillectomy	65	100	16	25.0	10	15.6	27	42.2	12	17.2
Total	743	100	109	14.7	122	16.4	431	58.0	81	10.9

Table 4. Length of stay (days) and hospital charges (Baht) by type of head and neck neoplasms

Types of Neoplasms	Number			Length of stay			Hospital charges		
	Sum (days)	Mean (days)	95% Confidence Intervals	Sum (Baht)	Mean (Baht)	95% Confidence Intervals			
Malignant neoplasms	6,491	11.0	10.7-11.4	191,685,473	29,531	28,316.1-30,745.8			
Oral cavity	1,415	10.1	9.3-10.8	37,258,803	26,331	23,994.8-28,667.8			
Oropharynx	162	8.5	6.6-10.4	3,135,667	19,356	14,621.5-24,090.4			
Ill-defined sites in oral cavity & pharynx	539	9.6	8.2-10.9	17,310,008	32,115	26,208.3-38,021.8			
Parotid & major salivary gland	5,803	7.9	7.6-8.2	125,094,971	21,557	20,416.3-22,697.6			
Nasopharynx	1,985	10.4	9.8-11.0	60,779,579	30,619	27,931.9-33,307.0			
Hypopharynx	765	9.1	8.3-10.0	22,047,579	28,820	25,625.6-32,015.2			
Nose & paranasal sinuses	3,349	10.0	9.5-10.5	91,317,767	27,267	25,624.9-28,909.4			
Larynx	4,275	5.4	5.2-5.7	103,573,835	24,228	22,957.5-25,498.1			
Thyroid	204	16.2	13.3-19.0	14,981,660	73,440	57,618.8-89,260.3			
Parathyroid gland	178	10.5	8.5-12.4	6,314,753	35,476	27,223.0-43,729.2			
External & middle ear	41	8.0	6.0-9.9	1,192,214	29,078	20,045.4-38,111.4			
Malignant melanoma	805	7.1	6.3-7.9	16,090,905	19,989	17,826.9-22,150.5			
Non melanoma skin cancer	26,012	9.0	8.8-9.1	690,783,214	26,556	25,960.2-27,152.5			
Total									
Benign neoplasms	245	4.2	3.7-4.8	4,160,478	16,982	13,798.2-20,164.9			
Mouth and pharynx	561	5.1	4.8-5.3	13,056,241	23,273	22,028.9-24,517.4			
Major salivary gland	6,719	4.3	4.2-4.3	141,607,003	21,076	20,778.9-21,372.3			
Thyroid gland & non-toxic single/multiple thyroid nodule	538	2.7	2.5-2.9	6,465,170	12,017	11,359.9-12,674.1			
Larynx	297	4.9	4.2-5.6	7,975,762	26,854	22,465.0-31,243.8			
Nasal cavity, paranasal sinuses & middle ear	8,360	4.2	4.2-4.3	173,264,654	20,725	20,406.4-21,044.5			
Total									

Table 5. Comparison of number of new cancer cases, of visits to OPD, and of admission to IPD by major sub-sites of head and neck cancers

Type of Cancer	3-Year new cases*		Visits to OPD		Admission to IPD	
	Number	%	Number	%	Number	%
Oral cavity	6,662	30.4	47,188	28.2	6,491	25.0
Oropharynx	1,175	5.4	14,546	8.7	1,415	5.4
Ill-defined sites in the oral cavity and pharynx	209	1.0	3,567	2.1	162	0.6
Parotid and major salivary gland	776	3.5	4,278	2.6	539	2.1
Nasopharynx	4,092	18.6	23,986	14.3	5,803	22.3
Hypopharynx	966	4.4	5,882	3.5	1,985	7.6
Nose & paranasal sinuses	879	4.0	3,990	2.4	765	2.9
Larynx	2,361	10.8	13,104	7.8	3,349	12.9
Thyroid	4,829	22.0	43,101	25.8	4,275	16.4
Total	21,949	100	159,642	100	24,784	100

* Number of new cases between 2001 and 2003 from all population-based cancer registries covering 30% of the total population from 13 provinces representing all regions of Thailand

however, exists vis-a-vis radiation oncologists; one-half of the 64 radiation oncologists compared to one-fourth of the 620 otolaryngologists work in Bangkok. The nationwide estimated workload for head and neck surgeons in the USA is expected to grow by 15% by the year 2020⁽⁸⁾. No such data is available in Thailand; however, as increasing trends in incidence of a major head and neck cancer was shown⁽²⁾, attempts should be made to prepare sufficient numbers of the head and neck cancer specialists, especially to serve the population in regional areas.

The overall mean length of stay for head and neck cancer treatment was 9 days, slightly longer than that in the USA (7.9 days)⁽⁵⁾. Although the in-hospital mortality in our study was 1.4%, lower than that in USA (5.2%)⁽⁵⁾, this could be the result of the preference amongst Thais to die at home in familiar settings with family around.

Health expenditures as reflected by hospital charges for treatment of head and neck neoplasms was 864 million Baht (US\$ 27.3 million), ~8.25% of that for all types of neoplasms (benign and malignant). A study in the USA determined both the direct and indirect costs of cancer treatment and revealed that the average medical cost to treat the head and neck cancers was significantly higher than other cancers⁽⁹⁾.

Although survival of head and neck cancer has not improved over the last two decades⁽¹⁰⁾, the present study reveals several gaps in head and neck care provision. Addressing these could improve healthcare services by making them more appropriate to the current situation.

Limitations

Although the current study was conducted using a nationwide database, several limitations must be taken into account when interpreting the results. First, data were retrieved based on diagnosis and procedure rather than by individual patient identification. Second, the reliability of the information exclusively relied on final codings from medical records departments, which may not have been accurate. Third, since most of the terms used for surgical procedures in head and neck surgery are non-specific (*e.g.*, wide excision), the authors selected certain surgical procedures described by specific terms (*e.g.*, laryngectomy) instead of all the relevant procedures. The agreement between the distribution of new cases from the population-based data and of the admission data from the current study suggests that the data were nevertheless representative.

Conclusion

The current study revealed a substantial volume of oral, thyroid and nasopharyngeal cancers throughout Thailand. A relatively high rate of admissions was also found for head and neck cancer management. The majority of cases, however, are treated in the central region where resources are concentrated.

The results of the present study indicate the need for developing a long-term plan to train sufficient numbers of head and neck cancer specialists. A well-developed referral system would also allow appropriate case transfers to fully utilize existing resources. Further

research is required to directly determine the health care resources in management of the head and neck cancers.

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Potential conflicts of interest

None.

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ปัญหาโรคมะเร็งศีรษะและคอในประเทศไทย

ภัทรวดี วัฒนศัพท์, สงวนศักดิ์ ธนาวีรัตนานิจ, อธิพร รัตนาเอนกชัย, แก้วใจ เทพสุธรรมรัตน์

ภูมิหลัง: มะเร็งศีรษะและคอในประเทศไทยยังมีอุบัติการณ์ค่อนข้างสูง ในการวินิจฉัยและรักษาต้องอาศัยแพทย์เฉพาะทางซึ่งมีอยู่จำกัด ผู้ป่วยส่วนใหญ่ยังมารับการรักษาเมื่อโรคมะเร็งอยู่ในระยะลุกลาม ข้อมูลด้านภาวะการให้บริการจะเป็นประโยชน์ในการวางแผนการบริหารทรัพยากรและการผลิตบุคลากรให้เหมาะสม

วัตถุประสงค์: เพื่อศึกษาถึงขนาดของปัญหาโรคมะเร็งศีรษะและคอด้านปริมาณการเข้ารับบริการทั้งผู้ป่วยนอกและผู้ป่วยใน รวมทั้งค่าใช้จ่ายสำหรับกลุ่มโรคนี้จากหน่วยบริการสุขภาพทุกระดับ

วัสดุและวิธีการ: เป็นการวิจัยเชิงพรรณนา โดยใช้ฐานข้อมูลสำนักงานหลักประกันสุขภาพแห่งชาติ จากสำนักงานหลักประกันสังคม และฐานข้อมูลระบบสวัสดิการรักษายาบาลข้าราชการพลเรือนทั่วประเทศ ปีงบประมาณปี พ.ศ. 2553

ผลการศึกษา: พบจำนวนผู้ป่วยมะเร็งศีรษะและคอเข้ารับบริการแผนกผู้ป่วยนอก 167,199 ครั้ง และพักรักษาตัวในโรงพยาบาลจำนวน 26,012 ครั้ง โดยโรคที่มีสถิติการเข้ารับบริการสูงสุด คือ โรคมะเร็งช่องปาก (ร้อยละ 28.2 สำหรับผู้ป่วยนอก และร้อยละ 25 สำหรับผู้ป่วยใน) โดยพบว่าระยะเวลาพักรักษาตัวในโรงพยาบาลเฉลี่ย 9 วัน และครึ่งหนึ่งของจำนวนเข้ารับการรักษาตัวในโรงพยาบาลทั่วประเทศอยู่ในภาคกลาง จำนวนเงินที่โรงพยาบาลเรียกเก็บเป็นค่าใช้จ่ายการรักษาพยาบาลทั้งสิ้น 691 ล้านบาท หรือเฉลี่ย 26,556 บาทต่อการนอนพักรักษาตัว 1 ครั้ง

สรุป: ปริมาณการเข้ารับบริการของผู้ป่วยด้วยโรคมะเร็งศีรษะและคอยังอยู่ในระดับสูง สิ่งจำเป็นที่ต้องผลักดันให้ทัน คือ การเตรียมบุคลากรผู้เชี่ยวชาญเฉพาะทาง เพื่อให้สอดคล้องกับขนาดของปัญหาและการกระจายตัวของโรคในประเทศไทย
