

Chapter 26

Cancer survival in Khon Kaen, Thailand, 1993–1997

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Abstract

The Khon Kaen cancer registry was established in 1984 as a hospital-based cancer registry, and population-based cancer registration started in 1988 with retrospective data collection from 1985. Cancer registration is done by passive and active methods. Data on survival for 13 cancer sites or types registered during 1993–1997 were reported. Follow-up was done by active methods, with median follow-up ranging between 8–32 months for different cancers. The proportion with histologically verified diagnosis for various cancers ranged between 54–100%; death certificates only (DCOs) comprised 0–5%; 85–97% of total registered cases were included for survival analysis. Five-year follow-up ranged from 40–83%. Five-year age-standardized relative survival rates for common cancers were cervix (58%), breast (61%), colon (39%), ovary (43%), non-Hodgkin lymphoma (42%) and rectum (43%). Five-year relative survival by age group portrayed an inverse relationship or was fluctuating. Five-year survival was the highest for localized disease, followed by the regional and distant metastasis categories. Trends in 5-year relative survival in 1993–1997 compared to 1985–1992 showed a marked increase for cancers of the rectum, breast, ovary, Hodgkin and non-Hodgkin lymphomas and decrease for cancers of the lip and larynx.

Khon Kaen cancer registry

The Khon Kaen cancer registry was established in 1984 as a hospital-based cancer registry at the Faculty of Medicine, Srinagarind Hospital, Khon Kaen University. Population-based cancer registration started in 1988 with retrospective data collection from 1985, and the registry has been contributing data to the quinquennial IARC publication *Cancer Incidence in Five Continents* since volume VI [1]. Cancer registration is done by both passive and active methods. The principal sources of information on cancer cases are the hospital and pathology records. The registry covers an area of 10 866 km² and caters to a mixed urban and rural population of about 1.6 million with a sex ratio of 1008 females to 1000 males in 1995. The average annual age-standardized incidence rate is 179 per 100 000 among males and 128 per 100 000 among females, with a lifetime cumulative risk of one in 6 of developing cancer for both sexes in the period 1993–1997. The top-ranking cancers among males are liver, lung and colon, among females, the order is liver, cervix and breast.

The registry has contributed data on survival from 33 cancer sites or types for the first volume of the IARC publication on *Cancer Survival in Developing*

Countries [2]. In the present volume, data on survival from 13 cancer sites or types registered during 1993–1997 are reported.

Data quality indices (Table 1)

The proportion of cases having a histologically verified cancer diagnosis in this series is 77%, varying between 100% for the lymphomas and 54% for colon cancer. The proportion of cases registered as death certificate only (DCO) is 2%, ranging between 0% for many cancers and 5% for cancer of the cervix. Cases excluded without any follow-up constitute 7%. The exclusion of cases from the survival analysis is the greatest among those with cancer of the cervix (15%) and the least among rectal cancer (3%). Thus, 85–97% of the total cases registered among selected cancers are included in the estimation of the survival probability.

Outcome of follow-up (Table 2)

Follow-up has been carried out predominantly by active methods. These include abstraction of cancer mortality from death certificates with a mention of cancer from the office of the Ministry of the Interior. Death certificates in remote villages are filled in by

the headman of the village and are sent to the registry. The data collected are matched with the incident cancer database. The vital status information of the unmatched incident cases is obtained by repeated scrutiny of records in the hospitals, postal enquiry and house visits.

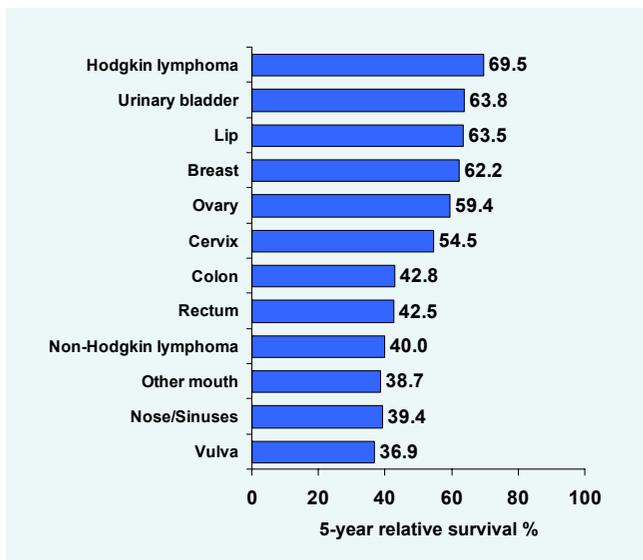
The closing date of follow-up was 31st December 2000. The median follow-up time ranged between 8 months for cancer of the urinary bladder to 32 months for lip cancer. Complete follow-up information at five years from the incidence date ranged from 83% for rectal cancer to 40% for cancer of the cervix. The proportion of cases lost to follow-up was generally the highest within one year from the incidence date.

Survival statistics

All ages and both sexes together (Table 3)

The 5-year relative survival is the highest in Hodgkin disease (70%) and the lowest in tongue cancer (30%). Among head and neck cancers, the survival figures are lip (64%), oral cavity with tongue excluded (39%), nasopharynx (33%) and larynx (35%). The survival is similar for colon and rectal cancers (43%). Non-Hodgkin lymphoma has a relative survival of 40% at 5 years from incidence date.

Figure 1a. Top ten cancers (ranked by survival), Khon Kaen, Thailand, 1993–1997



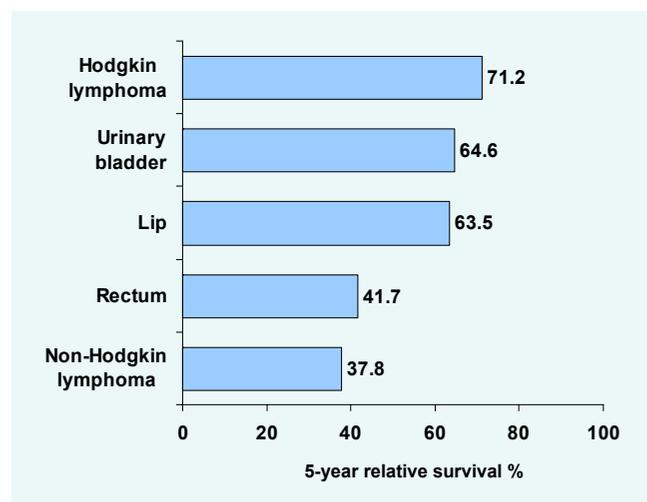
The 5-year age-standardized relative survival (ASRS) probability for all ages together is generally less than or similar to the corresponding unadjusted one for most cancers. Also, the 5-year ASRS (0–74 years of age) is generally higher than or similar to the corresponding ASRS (all ages) for a majority of cancers.

Sex

Male (Table 4a)

The top ranking cancers on the basis of 5-year relative survival are Hodgkin lymphoma (71%), cancers of the urinary bladder (65%), lip (64%) and rectum (42%), and non-Hodgkin lymphoma (38%).

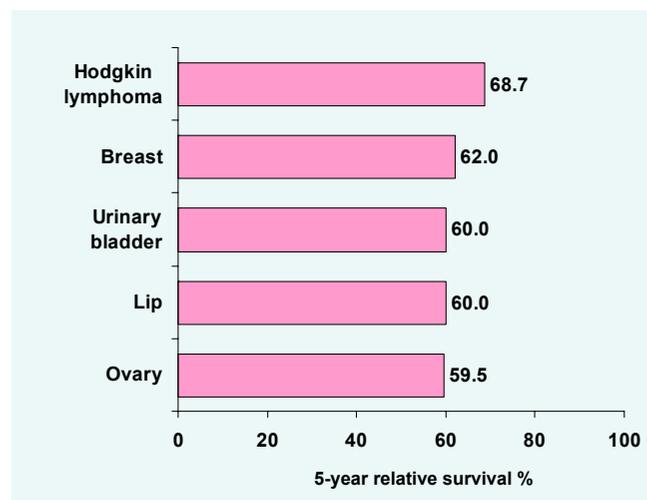
Figure 1b. Top five cancers (ranked by survival), Male, Khon Kaen, Thailand, 1993–1997



Female (Table 4a)

The top five cancers ranked on 5-year relative survival are Hodgkin lymphoma (69%), breast (62%), lip and bladder (60%), ovary (60%) and cervix (55%). Survival is distinctly higher among females than males for cancers of the tongue, oral cavity, nasopharynx and colon.

Figure 1c. Top five cancers (ranked by survival), Female, Khon Kaen, Thailand, 1993–1997



Age group (Table 4b)

The 5-year relative survival by age group reveals an inverse relationship, a decreasing survival with increasing age at diagnosis, for lip cancer. In the rest, it is observed to be fluctuating.

Extent of disease (Table 5; Figure 2)

The proportion of cases by extent of disease among breast cancer is 5% localized, 42% regional and 21% distant metastasis. The corresponding figures for cancer of the cervix are 17%, 54% and 6%, respectively. Ovarian cancer is represented equally by cases with localized and distant metastatic disease. The extent of disease is unknown in 19–32%. The 5-year absolute survival by extent of disease follows the expected pattern: highest for localized cases followed by regional and distant metastasis cases among known categories of extent of disease.

Survival trend (Table 6)

The 5-year relative survival for cases registered in 1993–1997 compared to those in 1985–1992 [2] shows a marked increase in cancers of the rectum, breast, ovary, Hodgkin and non-Hodgkin lymphomas. A decrease in survival in the corresponding period is observed for cancers of the lip and larynx. For the rest, the absolute difference in survival is <10% percent units.

References

1. Parkin DM, Whelan SL, Ferlay J and Storm H. *Cancer Incidence in Five Continents, Vol I to VIII: IARC Cancerbase No. 7*. IARC Press, Lyon, 2005.
2. Vatanasapt V, Sriamporn S, Kamsa-Ard S, Suwanrungruang K, Pengsaa P, Charoensiri DJ, Chaiyakum J and Pesee M. Cancer survival in Khon Kaen, Thailand. In: *Cancer Survival in Developing Countries* (eds) R Sankaranarayanan, RJ Black and DM Parkin. IARC Scientific Publications No. 145. IARC Press, Lyon, 1998, pp 123–134.

Figure 2. Absolute survival (%) from selected cancers by extent of disease, Khon Kaen, Thailand

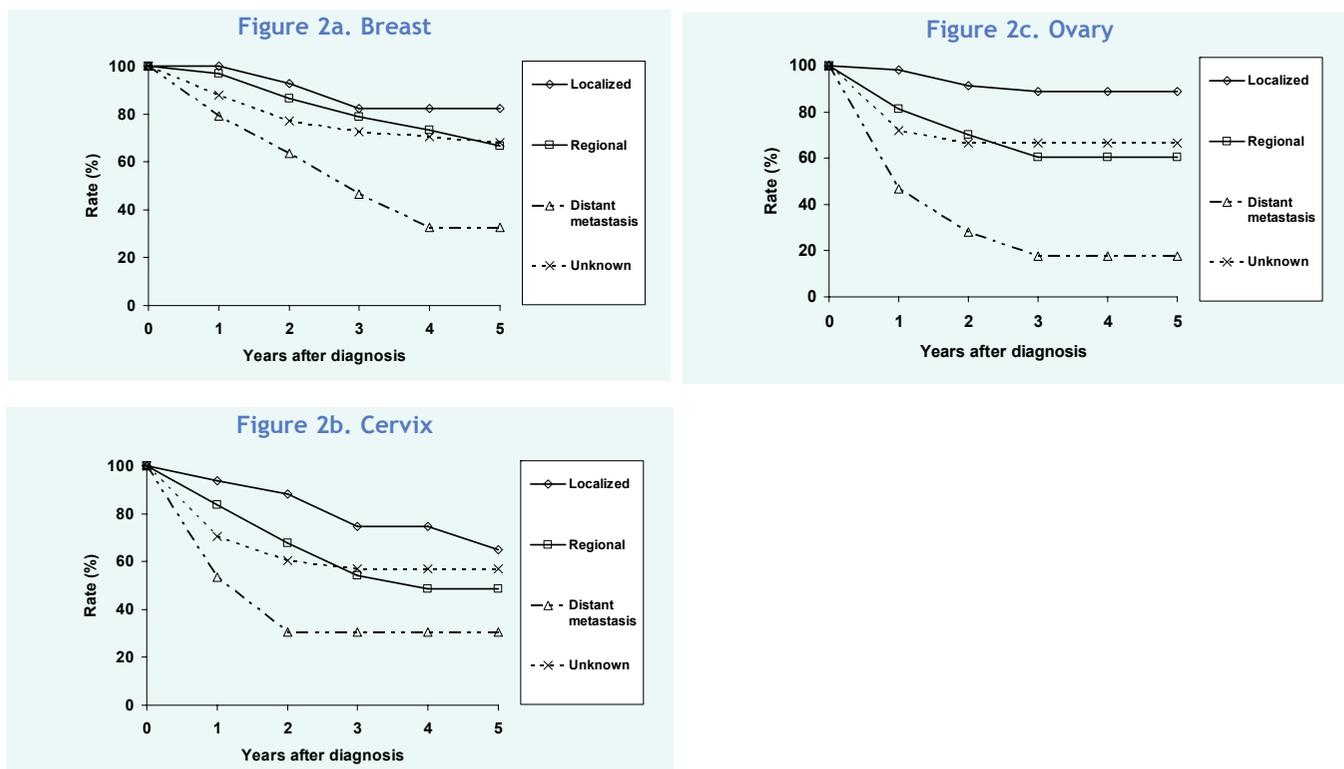


Table 1. Data quality indices - Proportion of histologically verified and death certificate only cases, number and proportion of included and excluded cases by site: Khon Kaen, Thailand, 1993–1997 cases followed-up until 2000

Site	ICD-10	Total registered	%		Excluded cases					Included cases	
			HV	DCO	DCO	Follow-up	Others	Total	%	No.	%
Lip	C00	88	85.2	1.1	1	8	0	9	10.2	79	89.8
Tongue	C01-02	57	77.2	0.0	0	3	0	3	5.3	54	94.7
Oral cavity	C03-06	120	80.8	3.3	4	9	0	13	10.8	107	89.2
Nasopharynx	C11	123	84.6	0.0	0	4	1	5	4.1	118	95.9
Colon	C18	258	54.3	1.6	4	11	1	16	6.2	242	93.8
Rectum	C19-20	143	67.1	0.0	0	3	1	4	2.8	139	97.2
Larynx	C32	38	68.4	0.0	0	2	0	2	5.3	36	94.7
Breast	C50	446	83.6	1.1	5	22	1	28	6.3	418	93.7
Cervix	C53	655	75.0	5.0	33	66	2	101	15.4	554	84.6
Ovary	C56	230	75.2	0.9	2	22	0	24	10.4	206	89.6
Urinary bladder	C67	114	77.2	0.0	0	10	1	11	9.6	103	90.4
Hodgkin lymphoma	C81	31	100.0	0.0	0	2	0	2	6.5	29	93.5
Non-Hodgkin lymphoma	C82-85+C96	191	100.0	0.0	0	23	0	23	12.0	168	88.0

HV: histologically verified; DCO: death certificate only

Table 2. Number and proportion of cases with complete/incomplete follow-up (in years) and median follow-up (in months) by site: Khon Kaen, Thailand, 1993–1997 cases followed-up until 2000

Site	ICD-10	No. of cases included	Complete FU		Incomplete FU: loss to FU*							% with complete FU at 5 years	Median FU (in months)
			Alive/dead at end of FU		% lost to FU: years from diagnosis								
			No.	%	No.	%	< 1	1-3	3-5	> 5			
Lip	C00	79	53	67.1	26	32.9	19.0	5.1	6.3	2.5	69.6	32.0	
Tongue	C01-02	54	42	77.8	12	22.2	20.4	1.9	0.0	0.0	77.8	8.4	
Oral cavity	C03-06	107	79	73.8	28	26.2	19.6	2.8	1.9	1.9	75.7	12.3	
Nasopharynx	C11	118	95	80.5	23	19.5	12.7	4.2	0.8	1.7	82.2	18.1	
Colon	C18	242	193	79.8	49	20.2	6.6	6.2	5.4	2.0	81.8	18.2	
Rectum	C19-20	139	112	80.6	27	19.4	10.1	6.5	0.7	2.1	82.7	18.6	
Larynx	C32	36	29	80.6	7	19.4	19.4	0.0	0.0	0.0	80.6	13.8	
Breast	C50	418	173	41.4	245	58.6	24.4	22.2	7.7	4.3	45.7	21.5	
Cervix	C53	554	210	37.9	344	62.1	39.2	15.9	5.1	1.9	39.8	9.9	
Ovary	C56	206	97	47.1	109	52.9	28.6	12.6	8.7	3.0	50.1	11.5	
Urinary bladder	C67	103	43	41.7	60	58.3	35.9	10.7	8.7	3.0	44.7	7.8	
Hodgkin lymphoma	C81	29	11	37.9	18	62.1	27.6	17.2	6.9	10.4	48.3	24.3	
Non-Hodgkin lymphoma	C82-85+C96	168	89	53.0	79	47.0	28.0	10.1	6.0	2.9	55.9	9.1	

*FU: follow-up; * non-random*

Table 3. Comparison of 1-, 3- and 5-year absolute and relative survival and 5-year age-standardized relative survival by site: Khon Kaen, Thailand, 1993–1997 cases followed-up until 2000

Site	ICD-10	Cases included	% Absolute survival			% Relative survival			% ASRS at 5-years	
			1-year	3-year	5-year	1-year	3-year	5-year	all ages	0-74 years
Lip	C00	79	93.0	65.3	59.4	94.1	67.8	63.5	70.2	72.9
Tongue	C01-02	54	58.8	37.6	28.5	59.3	38.9	29.9	30.0	32.4
Oral cavity	C03-06	107	67.0	46.4	36.7	67.7	47.8	38.7	41.1	41.9
Nasopharynx	C11	118	76.5	43.9	31.8	77.1	44.8	32.9	28.4	34.6
Colon	C18	242	64.5	50.5	40.8	65.1	51.8	42.8	38.7	44.3
Rectum	C19-20	139	70.5	44.4	40.2	71.1	45.7	42.5	42.5	42.8
Larynx	C32	36	75.4	32.3	32.3	76.5	33.7	34.5	26.2	26.5
Breast	C50	418	90.5	70.2	60.8	90.9	71.2	62.2	61.0	65.6
Cervix	C53	554	80.5	57.7	53.3	80.9	58.4	54.5	58.3	53.9
Ovary	C56	206	74.6	58.6	58.6	74.8	59.1	59.4	42.5	58.1
Urinary bladder	C67	103	76.3	59.6	59.6	77.3	61.9	63.8	67.3	59.7
Hodgkin lymphoma	C81	29	80.3	75.5	68.3	80.7	76.3	69.5	67.6	67.7
Non-Hodgkin lymphoma	C82-85+C96	168	63.3	46.6	38.2	63.8	47.7	40.0	42.0	39.3

ASRS: age-standardized relative survival

Table 4a. Site-wise number of cases, 5-year absolute and relative survival by sex: Khon Kaen, Thailand, 1993–1997 cases followed-up until 2000

Site	ICD-10	Cases included	Male			Female		
			% 5-year survival			% 5-year survival		
			No.	Abs	Rel	No.	Abs	Rel
Lip	C00	79	9	59.4	63.5	70	56.0	60.0
Tongue	C01-02	54	24	19.5	20.9	30	35.5	37.0
Oral cavity	C03-06	107	42	30.4	31.7	65	40.5	43.0
Nasopharynx	C11	118	82	24.5	25.5	36	50.6	51.8
Colon	C18	242	146	34.4	36.1	96	51.1	53.7
Rectum	C19-20	139	71	39.2	41.7	68	41.5	43.4
Larynx	C32	36	35	33.3	35.7	1	0.0	0.0
Breast	C50	418	5	60.0	71.6	413	60.7	62.0
Cervix	C53	554				554	53.3	54.5
Ovary	C56	206				206	58.6	59.5
Urinary bladder	C67	103	87	60.2	64.6	16	57.0	60.0
Hodgkin lymphoma	C81	29	18	69.9	71.2	11	67.7	68.7
Non-Hodgkin lymphoma	C82-85+C96	168	95	35.7	37.8	73	40.4	41.6

Abs: absolute survival; Rel: relative survival

Table 4b. Site-wise number of cases and relative survival by age group: Khon Kaen, Thailand, 1993–1997 cases followed-up until 2000

Site	ICD-10	Cases included	Number of cases by age group					Relative survival by age group				
								% 5-year survival				
			< 45	45-54	55-64	65-74	> 75	< 45	45-54	55-64	65-74	> 75
Lip	C00	79	5	9	21	33	11	101.5	88.2	62.8	59.2	45.6
Tongue	C01-02	54	13	4	17	16	4	36.2	33.7	46.5	11.6	30.0
Oral cavity	C03-06	107	5	15	42	28	17	60.7	36.0	39.3	38.0	36.9
Nasopharynx	C11	118	36	17	38	17	10	55.2	26.8	20.7	26.1	21.3
Colon	C18	242	60	49	64	50	19	44.7	47.6	38.4	47.4	33.0
Rectum	C19-20	139	19	22	49	38	11	28.3	66.9	40.4	39.9	42.9
Larynx	C32	36	3	1	11	13	8	0.0	0.0	57.1	27.0	
Breast	C50	418	161	140	73	31	13	64.0	52.4	77.8	70.8	31.4
Cervix	C53	554	169	183	132	57	13	59.7	56.2	40.7	59.9	120.9
Ovary	C56	206	81	60	45	19	1	76.6	48.4	43.4	61.0	0.0
Urinary bladder	C67	103	14	14	22	37	16	82.9	62.7	49.2	60.5	81.4
Hodgkin lymphoma	C81	29	17	7	2	2	1	61.9	86.0			
Non-Hodgkin lymphoma	C82-85+C96	168	75	34	15	31	13	41.2	20.7	44.3	32.6	84.2

Table 5. Proportion of cases and 5-year absolute survival by extent of disease and site: Khon Kaen, Thailand, 1993–1997

Site	ICD-10	Cases included	% of cases by extent of disease				% 5-year absolute survival			
			Localized	Regional	Dist. met.	Unknown	Localized	Regional	Dist. met.	Unknown
Breast	C50	418	5.3	41.6	21.1	32.0	82.3	66.9	32.8	67.9
Cervix	C53	554	17.3	53.8	6.3	22.6	65.1	48.7	30.6	57.0
Ovary	C56	206	29.6	21.4	29.6	19.4	88.8	60.6	17.5	66.6

Dis. met.: distant metastasis

Table 6. Comparison of 5-year absolute and relative survival of cases diagnosed between 1985–1992 and 1993–1997, Khon Kaen, Thailand

Site	ICD-10	% 5-year absolute survival		% 5-year relative survival	
		1985–1992	1993–1997	1985–1992	1993–1997
Lip	C00	63.1	59.4	74.4	63.5
Tongue	C01-02	20.1	28.5	23.2	29.9
Oral cavity	C03-06	31.7	36.7	39.3	38.7
Nasopharynx	C11	26.8	31.8	29.1	32.9
Colon	C18	31.9	40.8	36.6	42.8
Rectum	C19-20	29.1	40.2	32.7	42.5
Larynx	C32	36.4	32.3	44.5	34.5
Breast	C50	44.9	60.8	47.1	62.2
Cervix	C53	54.5	53.3	57.5	54.5
Ovary	C56	34.0	58.6	35.6	59.4
Urinary bladder	C67	49.7	59.6	57.2	63.8
Hodgkin lymphoma	C81	29.4	68.3	31.1	69.5
Non-Hodgkin lymphoma	C82-85+C96	26.2	38.2	28.0	40.0