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FORWARD

Lampang Cancer Hospital is one of the 7 regional cancer hospitals in Thailand. We provide medical services for 12 provinces in the north of Thailand and have duties in all activities of cancer management, including prevention and control, screening and diagnosis, treatment, and supportive and palliative care. The Lampang cancer registry is an important part of infrastructure in cancer services of Lampang cancer hospital. It provides information on cancer burden, including cancer incidence, survival and mortality. Population-based survival reflects a border range of cancer control activities and can be interpreted as the indicator of overall effectiveness of the secondary prevention and treatment of cancer in defined population. There are several statistic indicators such as observed survival and relative survival. Observed survival refers to survival up to point of death from all causes while relative survival measures survival in cancer patients relative to the expected survival of a comparable group in the general population.

The Cancer Survival Trends in Lampang, Thailand, 1988-2007 is the twenty first of our cancer registry publications. This publication has presented data mainly in terms of relative survival by sex and periods such as 1988-1992, 1993-1997, 1998-2002 and 2003-2007. Relative survival will be useful for policy makers and health professionals involved in cancer control. We have also included data on observed survival by extent of disease and pathology as this information will be useful for clinicians and patients. In addition, this monograph has incorporated short commentaries from our medical specialists.

Finally, we at Lampang Cancer Hospital, along with Cancer Survival Trends in Lampang, Thailand, 1988-2007 Report's partners, hope that you will find this report to be a valuable reference tool and a stimulus for cancer care and cancer control action.

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We would like to acknowledge personals of Lampang Provincial Health Service, who provided the original source of death certificates used in this report and follow-up information. A survival report would not be possible without information on death and follow-up.

Special thanks must also go to Associate Professor Hutcha Sriplung, our consultant, who provided training in relative survival analysis.

Finally, we want to thank registry team and director of all hospitals, and director of Lampang Cancer Hospital.

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4.4 Theon Hospital

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Saowaluck Yana	

4.6 Mae Prik Hospital

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4.11 Hang Chat Hospital

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Pluengpayu Aupanan	

6. Private Hospitals in Lampang

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7.2 Nantawadee Duangkaew	Koh Kha District
7.4 Pimpan Na Lampang	Ngao District
7.5 Tawin Sakunwanawong	Chae Hom District
7.6 Poonsuk Pisanyajit	Theon District
7.7 Sumon jaetapai	Mae Tha District
7.8 Supattra Miserendino	Mae Prik District
7.9 Sangduan Booncharoen	Mae Moh District
7.10 Jakkapong Uadrang	Wang Nua District
7.11 Pawitra Paithong	Sop prap District
7.12 Nutkridta borriboon	Soem Ngam District
7.13 Komkham Daram	Hang Chat District
7.14 Nadda Wanlaem	Muang Pan District

INTRODUCTION

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Reliable data on the magnitude of the cancer problem are essential for monitoring the health status in the community, assessing the performance of the health care system and allowing authorities to make informed decisions. The population-based cancer survival estimates are unbiased by selection, as they reflect the mixture of different socio-economic factors, health care seeking behaviors, natural histories, and the efficiency of the health care services in responding to the needs of early diagnosis, prompt treatment and follow-up care. Population-based survival represents the average prognosis of a given cancer in a given setting and is a very useful summary measure to evaluate progress in cancer control and to advocate for improved and equitable cancer care (R. Sankaranarayanan, R. Swaminathan & E. Lucas, 2011). Population-based cancer registries also provide information on variations in survival with respect to different prognostic factors (size, and spread of tumors). Population-based survival from cancer registries reflects a broader range of cancer control activities, including screening and organization of treatment services.

The aim of survival analysis is to estimate the probability of cancer survival which use to evaluate the efficacy of treatment and to provide a sound base for therapeutic planning for cancer control program (early diagnosis and treatment). The early cancer diagnosis can therefore be an important determination of cancer patient chances of survival. The importance of treating early stage of disease in improving the survival of cancer patient is well established. The survival expresses as time elapsed since diagnosis. It is commonly used the term "Survival Rate" to describe this quantity. The population-based data summarize the experience of totality of cancer patients including those who receive no treatment and cannot normally be used to assess the efficacy of specific anti cancer therapies. The survival of unselected groups of cancer patients from population-based cancer registries offers an important index for evaluation of cancer diagnosis and treatment in a community, like the other comparative measures of cancer control.

Lampang Cancer Registry has been collating data on cancer incidence and mortality in Lampang province. This is complemented by collaborative survival studies that are follow up cancer patients by Lampang provincial hospital, Lampang provincial public health service, private hospital, community hospital and military hospital.

This monograph is published by Lampang Cancer Hospital (changed name from Lampang Cancer Center since July 2012). The presentation publication covers cancer survival from 1988-2007. The main purpose of the publication is to provide health professionals researchers and policy-makers with detailed information regarding trend cancer survival from 1988 to 2007 and the cancer survival by sites and by staging.

It is hoped that these data will stimulate decisions-making and priority-etting processes at the individual, community, province and nation levels. Material in this publication may be used for genuine education and health research. This monograph can also be used by educators, the media and members of the public with an interest in cancer.

Background

The first Thailand's population based cancer registration was established in Chiang Mai province in 1986. It began by building up a database on the incidence and mortality of cancer in Chiang Mai province since 1983 by retrospective data collection from 1983-1987 as a cancer research project which was supported by the China Medical Board and the Faculty of Medicine, Chiang Mai University. The first report published in 1989 (Martin *et al.*, 1989).

A hospital-based cancer registry was established in Lampang Provincial hospital in 1989 (Pongnikorn *et al.,* 1990). The first population-based cancer registration in Lampang between 1988 to 1992 was carried out in 1993 by the retrospective study of cancer in the province (Srivatanakul *et al.,* 1994), the registration between 1992 to 1994 was reported in "Cancer in Thailand 1999 Vol. II" (Deerasamee *et al.*, 1999). The registration over the period 1993-1997, was reported as a "Cancer in Lampang Vol. II" (Pongnikorn *et al.*, 2002) and also included in "Cancer in Five Continents Vol. VIII" (Parkin *et al.*, 2002). Cancer mortality in Lampang over the period 1990-2000, was published in "Cancer Mortality in Lampang" (Pongnikorn *et al.*, 2003). The registration over the period 1995-1997 was reported in "Cancer in Thailand Vol. III" (Hutcha *et al.*, 2003). The result 1998-2002 was published in "Cancer Incidence and Mortality in Lampang, Thailand Vol. III 1998-2002" (Pongnikorn *et al.*, 2004) and "Cancer Survival in Lampang 1990-2000" will be include in "Cancer Survival in Developing Countries Vol.II" by IARC (International Agency for Research on Cancer, WHO).

Lampang Regional Cancer Registry is the voting member of International Association for Cancer Registry (IACR) which provides links with cancer registries throughout the world.

Lampang Cancer Hospital, one of the seven regional cancer hospitals was established in 1994, under the supervision of the National Cancer Institute for cancer prevention and control in the northern part of Thailand as a result the population-based cancer registration in the province has been set up. The National Cancer Institute and all regional cancer hospitals have a role in all main activities of cancer prevention and control, including prevention, screening and tertiary care as well as having clinical research activity. Lampang Cancer Hospital has provided programs in patient and public education and in continuing education for health professionals, particularly family physicians and general nurses.

Geographic situation of Lampang

Lampang is one of the 17 provinces of the Northern region of Thailand, located at the latitude 17-19 °N and longitude 98-100 °E. It is 268.8 meters above sea level with land area of 12,534 km^2. It has common boundary with Chiang Mai and Phayao in the north, Phare in the east, Tak and Sukhothai in the south and Lamphun and Chiang Mai in the west. Lampang cancer registry covers the population of 13 districts.

The total population in 2010 (housing census by National Statistics Office, Thailand) was 743,143 with 367,509 males and 375,635 females. About 30% of the populations live in urban areas; 97% are Buddists, the remainder mainly Christians or Muslims. The average population density is about 59.3 persons per square kilometer (National Statistics Office, Thailand, 2012).

Occupation

The most important occupations are farming of rice, peanuts, sugar beans, longan and tobacco. Weaving, wood - carving and handicrafts are the main industries. In Lampang province there are very large open cast coal- mines (with national coal-fired electricity-generating plants close by). The porcelain production is also important. An important lifestyle feature is the smoking of home-produced cigars and cigarettes.

Medical services

Lampang province, health care service is provided in 12 community hospitals, one Lampang provincial hospital, two private hospitals, one military hospital and Lampang Cancer Hospital. For cancer care, these hospitals have cancer diagnostic services (including CT scan, clinical consultations and radiological, pathological investigations), oncologic surgery services, chemotherapy and targeted therapy are available in Lampang cancer Hospital and Lampang provincial hospital. Radiation therapy is available only in Lampang Cancer Hospital. There are two simulators, two cobalt-60 machines, one linear accelerator, one dual energy linear accelerator with multi leaf collimator, one High Dose Rate machine and two Low Dose Rate machines for brachytherapy are provided in Lampang Cancer Hospital. All hospitals in the province provide palliative care. However, some patients are referred to National Cancer Institute, university hospital in Chiang Mai and Bangkok. The ratio of doctors to population is 1:2,925. The ratio between registered nurses to population is 1:538. (Ministry of public Health, 2007)

Figure1: Map of Lampang, Thailand

Sources of data

All data on cancer patients were collected by passive methods involving notification by the staff of the Lampang provincial hospital, the Lampang Cancer Hospital, 1 Army hospital, 2 private hospitals, 12 community hospitals, 1 laboratory in Chiang Mai, Cancer Registration Unit of Maharaj Nakorn Chiang Mai University Hospital, National Cancer Institute in Bangkok and information of deaths from all causes from the Provincial Public Health Service of Lampang.

The Lampang registry was set up in 1995, with the back-up cancer data since 1963 to 1994 of cancer cases in Lampang province, which was collected by Dr. Nimit Martin, the expert consultant.

Before 1994 the data were collected by active method from the provincial hospital, 2 private hospital, military hospital and 12 community hospitals and passive method from reviewing dead certificates. The data may be incomplete due to losing of clinical case diagnosis only.

After 1994, the data on cancer patients were collected by passive methods involving notification by the staffs of the Lampang provincial hospital, the Lampang Cancer Hospital, military hospital, 2 private hospitals, 12 community hospitals, pathological laboratory in Chiang Mai, Cancer Registration Unit of Chiang Mai University hospital, National Cancer Institute in Bangkok and death certificates in Lampang (Figure 2.1). Registry receives information from Lampang Provincial Public Health Service on deaths from all causes. All death certificates are matched with the incidence case records of the registry (Figure 2.2). In addition, ascertainment has probably been more complete.

Individual certified as having died of cancer are registered as "Death Certificate Only (DCO)" cases if no other information about the individual can be traced from the other sources.

Registry method

New cancer cases were collected from out and in patient departments, wards, radiotherapy unit, surgery unit, cytology unit, hematology unit, medical record, pathological unit and autopsy service. The data information collected includes demographic details for each cancer patient that consists of: registry number, name, residential address, date of birth, age, sex, date of diagnosis, site of cancer, histology of cancer, staging, extension of disease, method of diagnosis, treatment, date of last contact and status of cancer patients (alive or dead).

The primary site and histology were coded according to ICD-O second edition (Percy *et al*, 1990). Second primary cancer was also registered; a new registration number was given for each new primary cancer. Cases of carcinoma in situ were registered but not included in the analysis. The computed data form was checked and extended into data base files, using the CanReg3 program for data entry and analysis.

The database is continually being updated and quality of data improved across the entire period of cancer reporting, consequently a small change may be expected when this step complete and publication.

Type of diagnosis

Type of diagnosis has been divided into two broad categories: histological confirm and no histological confirm. These are given below in approximate order of increase validity.

No histological confirm;

0. Death certificate only
1. Clinical only
2. Clinical investigation (including X-ray, ultrasound, CT scan, etc.)
3. Surgery/autopsy without histology
4. Specific immunological and/or biochemical tests

Histological confirm;

5. Cytology or hematology
6. Histology of metastasis
7. Histology of primary
8. Autopsy with concurrent or previous histology

Extension of cancer

Extensionin cancer registration is used with the following items;

1. In situ
2. Localized
3. Direct extension
4. Regional nodes metastasis
5. Distant metastasis
8. Not applicable
9. Unknown

Staging of cancers

Staging of cancers in this cancer registration is used with the American Joint Committee on Cancer; AJCC Cancer Staging Manual seven edition (S.B. Edge*et al.*, 2009).

Clinical extent of disease

This variable is not directly available by Lampang cancer registry. It derives from extension and staging of cancers that are routinely collected by our registry. This variable is rathersignificant in correlating local factors with the estimated survival. It can be classified into four categories as follows;

Localized: Tumor confined to the organ of origin without invasion into the surrounding tissue/organ and without involvement of any regional or distant lymph nodes or organs

Regional: Tumor not confined to the organ of origin with invasion into surrounding tissue/organ, with or without the involvement of the regional lymph nodes and not involving or spread to the non-regional lymph nodes or organs

Distant metastasis: Tumor involving or spread to the non-regional lymph nodes or distant organs

Unknown: The above information is unknown

Date of diagnosis

All cancer registries have some registrations from death certificate only (DCO). If it is not possible to ascertain a date of diagnosis prior to death then date of diagnosis is deemed to be the same as the date of death and the case is classified as a DCO.

Similarly, when notification occurs only from an autopsy report, the date of diagnosis is the same as the date of death.

Follow-up

Follow up is very important for cancer registration. If it has a good follow up, the analysis of cancer survival can be obtained. Follow-ups of Lampang's registered cancer patients were performed in all cancer cases.

A mixture of active and passive methods was carried out. Registered cases were first matched with death certificates. For the remaining cases thought to be alive, follow-up information was obtained by repeated scrutiny of hospital case records, postal esquires and if these measures failed to establish a patient's vital status and home visits done by personals of the Public Health Service of Lampang.

The first task of registry was to match increasing notifications against the registration to see if the case had already been registered from by other sources. Demographic details and codes for cancer site and histology were entered in the system and data was checked for internal consistency and completeness. Further notifications for cancer already on the system were also processed, with differences being resolved by follow ups, and censoring data for survival analysis.

Statistical methods

Survival analysis

The survival time for a cancer patient is defined as the time elapsed between diagnosis and death. The estimation of patient survival is complicated by the fact that same patient die of causes unrelated to cancer of interest. To allow for death due to other diseases, survival is expressed as relative survival rate. Relative survival is the ratio of the observed survival divided by the survival that the patients would have experienced if they had the same probability of dying as general population having the same age and sex. Also patients may still be alive at the time the analysis is performed. Relative survival is higher than observed survival and also higher than "disease free survival" as patients may live for many years with their disease.

Observed survival rate

Observed rates use of the actuarial or life table method provides a means for using all the follow up information accumulated up to the closing date of the study. The actuarial method has the advantage of providing information on the survival pattern that is the manner in which the patient group was depleted during the total period of observation. Observed survival relates to deaths from all causes among the group of cancer patients under follow up. (For example table 1)

Table 1: Calculation of observed survival rate by the actuarial (life table) method

Interval (years) (t_i)	No.alive at beginning of year (n_i)	No. dying during year (d_i)	No. last Seen Alive During Year (w_i)	Effective no. at risk (r_i)	Proportion Dying During year (q_i)	Proportion Surviving year (p_i)	Cumulative Prob. Of Survival (to end of year) (IIp_i)
0	50	9	0	50.0	0.180	0.820	0.820
1	41	6	1	40.5	0.148	0.852	0.699
2	34	2	4	32.0	0.063	0.937	0.655
3	28	1	5	25.5	0.039	0.961	0.629
4	22	2	3	20.5	0.098	0.902	0.567
5	17	-	17	-	-	-	-
Total		20	30				

From table 1 The effective number of subjects at risk during each interval is calculated as

$$r_i = n_i - (w_i / 2)$$

The probability of death during the interval from

$$q_i = d_i / r_i$$

The probability of survival during the interval beginning t_i is then calculated as

$$p_i = 1 - q_i$$

The cumulative probability of survival up to time t_{i+1} is derived from the product of the p_i

$$t_{i+1} = II\ p_i$$

Cohort analysis

There are several approaches to estimate survival probability. In this study, Cohort analysis was used to calculate the estimates. It computes the ratio of the number of subjects alive at the end by the total number of subjects in the study at the beginning of the study, excluding those who did not have a chance to be followed for specific interval time. For example, to analyze 5-year survival, only subjects potentially under observation for at least 5 years and having a potentially complete follow-up of five years are taken into consideration. This approach is illustrated in Table 2.

Table 2: Cohort analysis to derive 5-year survival estimates based on data of patients diagnosed in 2003-2007 and followed until the end of 2012

Year of Diagnosis	Calendar Period									
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
2003	0-1	1-2	2-3	3-4	4-5	5				
2004		0-1	1-2	2-3	3-4	4-5	5			
2005			0-1	1-2	2-3	3-4	4-5	5		
2006				0-1	1-2	2-3	3-4	4-5	5	
2007					0-1	1-2	2-3	3-4	4-5	5
2008										
2009										
2010										
2011										
2012										

Expected survivalrate

Expected survival probabilities were estimated from Thailand general population which included deaths from all causes.The survival functions used for the calculation of expected survival were taken from World Health Organization (WHO, 2012)

Relative survival rate

Relative survival rate is the ratio of the observed survival rate to the expected rate for a group of people in the general population similar to the patient group with respect to race, sex and calendar period of observation.

$$\text{Relative survival rate} = \frac{\text{Observed survival rate}}{\text{Expected survival rate}} \times 100$$

Software used

All statistical analyses were performed using R (R Core Team, 2012). Relative survival was calculated using CRStat package developed by Hutcha Sriplung (Hutcha Sriplung, 2012).

Quality control

Quality control was carried out through the following indices:

Histologically Verified Percentage (%HV): The percentage of cases diagnosed was based on histology examination of tissue from primary site or from metastasis site, bone marrow, cytology and peripheral blood for leukaemia. A low proportion of histologic verification suggests over reporting or it is very difficult to get a tissue diagnosis. A hundred percent of histological verification suggests under reporting. Clinical cases were not included unless they were easily to get tissue diagnosis.

Death Certificate Only (DCO) Percentage: The percentage of cases where diagnosis was based on information obtained from a death certificate. When a death certificate was received containing information on a tumor or patient not previously known to the registry, the records were checked to confirm the disease and date of diagnosis. All death certificates mentioned cancer deaths, were reviewed and

matched against the registered cases in our files. The case for which no matching records were founded, were traced back to the relevant data.

Those could not be traced back to an existing entry in the registered cases would be labeled as a 'Dead Certificate Only' and the date of death would be taken as the date of diagnosis.

The proportion of DCO registration is widely used as an indicator of ascertainment and data quality, if this percentage is high, it reflects the degree of under reporting in the registry and is missing cancers as they are diagnosed. A low level of DCO (less than 5%) is regarded as an indicator of good data quality, a high degree of completeness. A very low or zero level of DCO cases may indicate that the registry is not receiving information on all deaths.

The Mortality Incidence Ratio: M/I ratio is the number of deaths in a given time period divided by the number of incidence cases for that time period expressed as a percentage.

If the number of death in a period exceeds the number of incidence cases, the Mortality/Incidence ratio expressed as percentage may be in excess of 100. As a result, the cancer registration is considered incomplete, under reporting, may be occurring, of course for rarer cancers and occurring if incidence was declining very rapidly. A high level of mortality incidence ratio is regarded a very difficult to treat or to diagnose of that cancer. A low proportion is regarded as a good result of treatment or easily to diagnose. Mortality incidence ratio closes to 100% are founded for cancer of poor prognosis. This ratio should be low than 100% for cancer with good prognosis such as skin cancer, breast cancer and cervical cancer.

Figure 2: Source of data

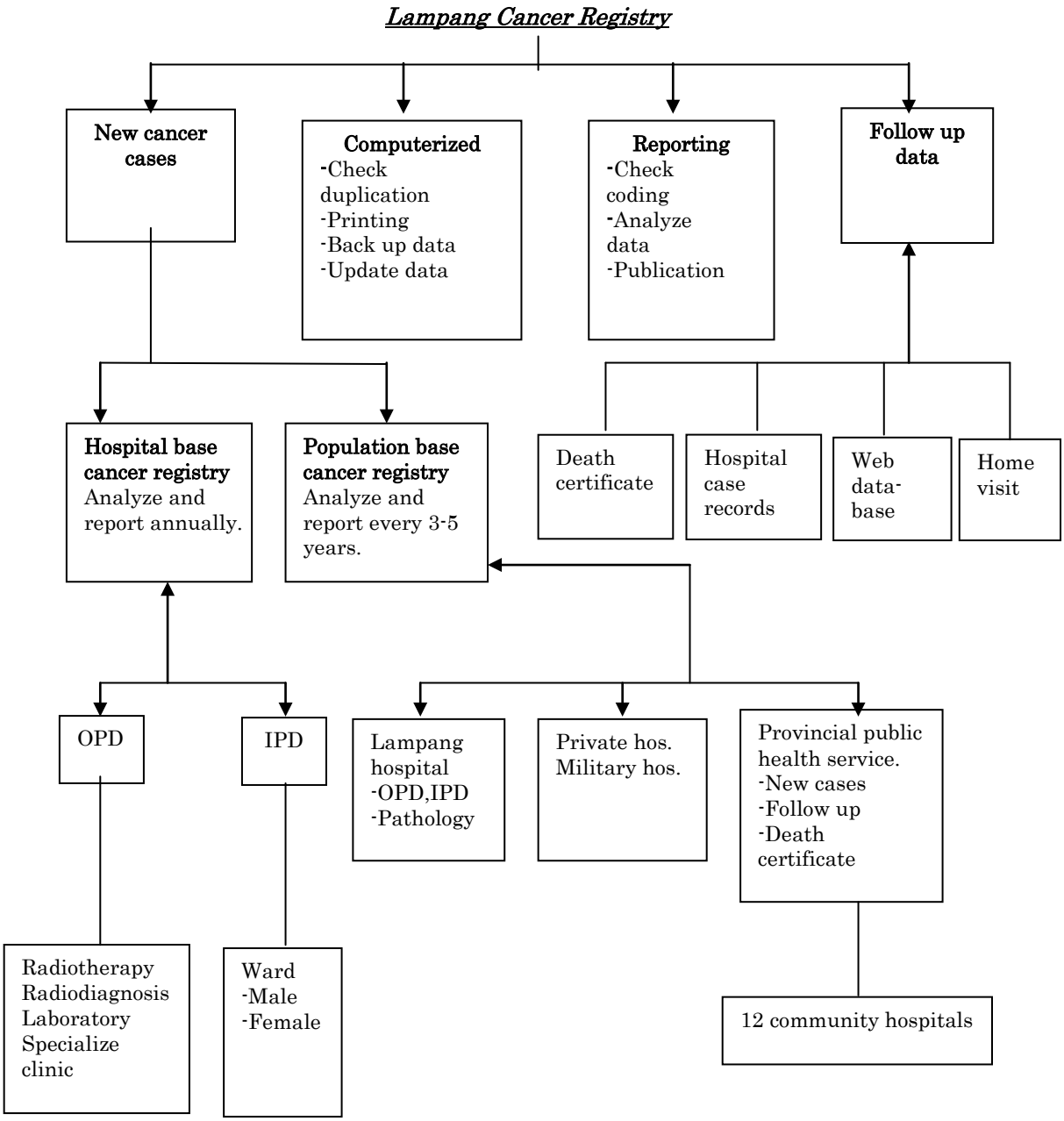


Figure 3: Source of data from Death Certificate Only (DCO)

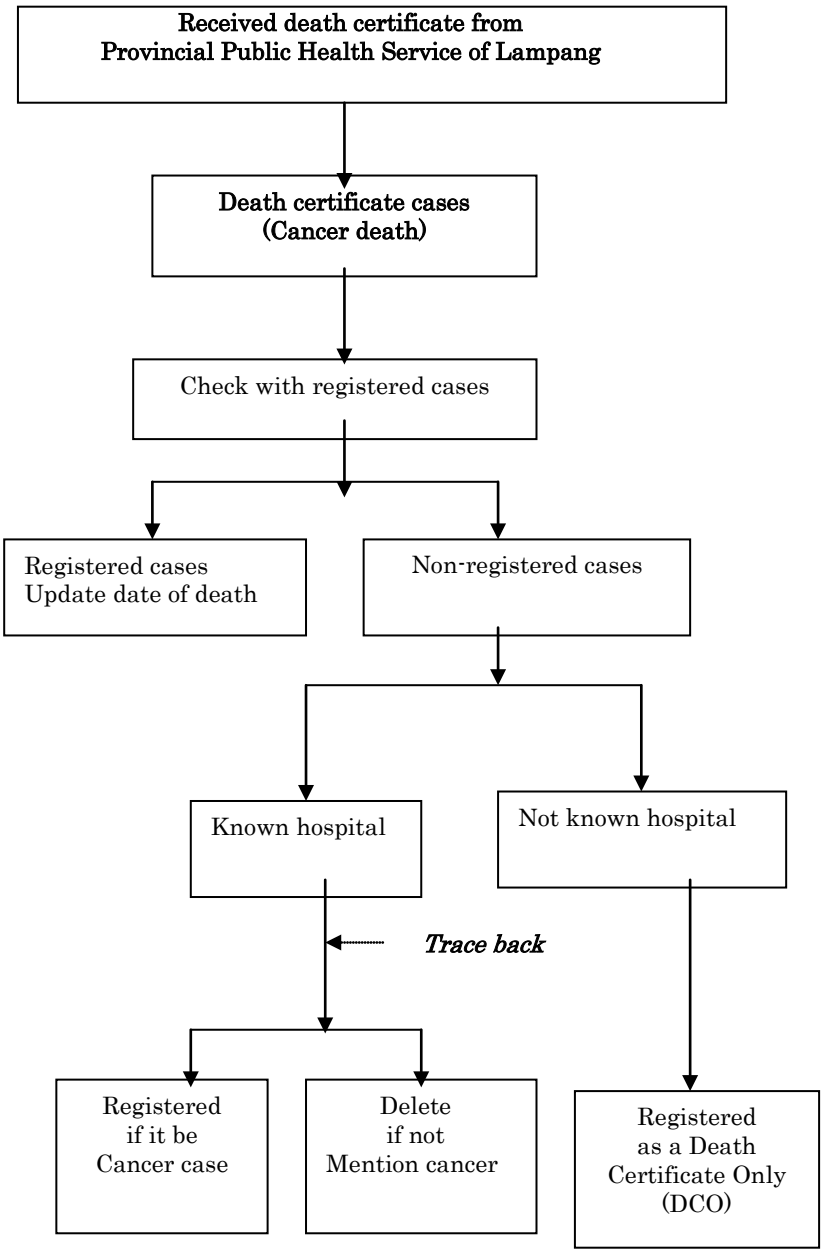
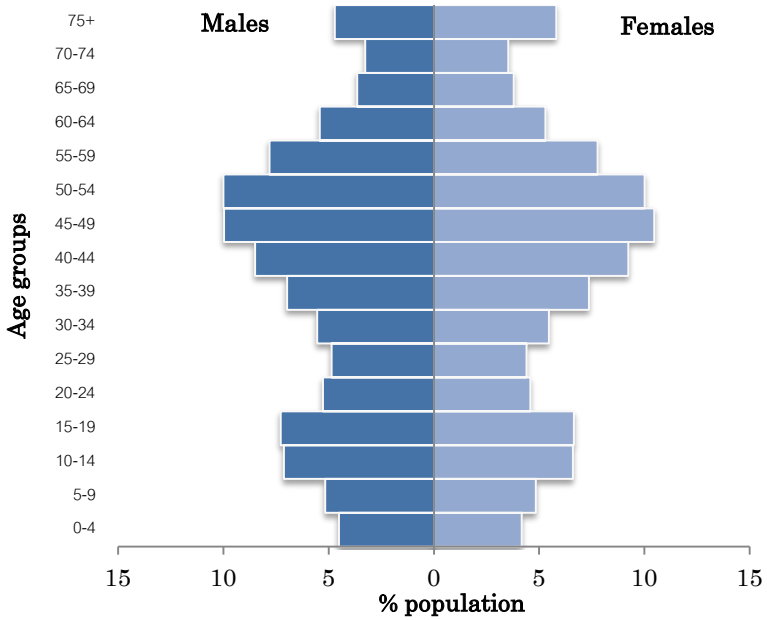


Figure 4: Population pyramid of Lampang, 2010 (Census)



Age group	Male	Female
0-4	16573	15677
5-9	18950	18202
10-14	26160	24787
15-19	26751	25002
20-24	19373	17215
25-29	17856	16506
30-34	20381	20519
35-39	25637	27639
40-44	31188	34687
45-49	36624	39331
50-54	36710	37571
55-59	28688	29229
60-64	19934	19896
65-69	13395	14264
70-74	11974	13294
75+	17314	21816
Total	367508	367508

Subjects

During the period 1988-2007, the registry identified 26,887 incident cases of cancer in Lampang province. The proportion of cases having a histologically verified cancer diagnosis is 68.5%, varied from 27.0% in liver cancer to 100% in leukaemia and lymphoma. The higher histologically verified above 90% were found in leukaemia and lymphoma (100%), skin (95.8%), breast (92.1%) and cervical cancer (91.1%), respectively. The proportion of cases registered as DCO is 7.5% ranging between 0% for many cancer and 14.3% for other and unknown primary cancer. The mortality incidence ratio was 74.1% for all cancers, the ranging between 38.6% in skin cancers and over 90% in liver cancer (90.6 %). The proportion of high histologically verified cases and low proportion of DCO registration indicate that cancer registration is fairly complete. Table 3 shows data quality by cancer sites in both sexes.

A total of 2017 (7.5% of registered cases) were registered on a death certificate only (DCO) basis. All of these were excluded from the final analysis. Thus 24860 cases (92.5%) of the total registered cases were included in the estimation of the survival analysis; 12302 cases were males and 12558 cases were females. Of these, 18,954 have died. Cases excluded and included of all cancers are shown in Table 4.

Table 3: Data quality by cancer sites in both sexes

Site	No. of cases registered	Data quality		
		%DCO	%HV	M/I ratio
Oral cavity	493	3.0	88.0	80.1
Nasopharynx	341	0.9	87.7	72.7
Stomach	758	6.1	73.2	86.9
Colon	1113	13.8	65.9	67.8
Rectum	615	0.5	86.0	66.8
Liver	3680	14.0	27.0	90.6
Larynx	282	2.8	86.9	84.4
Lung	6246	7.3	67.2	89.3
Skin	645	1.2	95.8	38.6
Breast	1950	1.2	92.1	40.9
Cervix	2047	1.1	91.1	46.6
Corpus uteri	254	6.7	82.3	44.1
Ovary	453	0.2	81.2	51.2
Prostate	391	2.3	84.9	59.6
Bladder	583	0.7	88.5	62.4
Thyroid	350	2.3	84.0	37.7
Lymphoma	879	0.0	100.0	68.3
Leukaemia	713	0.0	100.0	58.8
Other and unk. primary	5084	14.3	55.8	82.8
All sites	**26887**	**7.5**	**68.5**	**74.1**

Table 4: Cancer cases registered in both sexes

Sites	No. of cases registered	Case excluded		Case included	
		DCO	Other	Number	%
Oral cavity	493	15	0	478	97.0
Nasopharynx	341	3	0	338	99.1
Stomach	758	46	0	712	93.9
Colon	1113	154	0	959	86.2
Rectum	615	3	0	612	99.5
Liver	3680	515	0	3165	86.0
Larynx	282	8	0	274	97.2
Lung	6246	455	0	5791	92.7
Skin	645	8	0	637	98.8
Breast	1950	24	0	1926	98.8
Cervix	2047	22	0	2025	98.9
Corpus uteri	254	17	0	237	93.3
Ovary	453	1	0	452	99.8
Prostate	391	9	0	382	97.7
Bladder	583	4	0	579	99.3
Thyroid	350	8	0	342	97.7
Lymphoma	879	0	0	879	100.0
Leukaemia	713	0	0	713	100.0
Other and unknown primary	5084	725	0	4359	85.7
All sites	**26887**	**2017**	**0**	**24860**	**92.5**

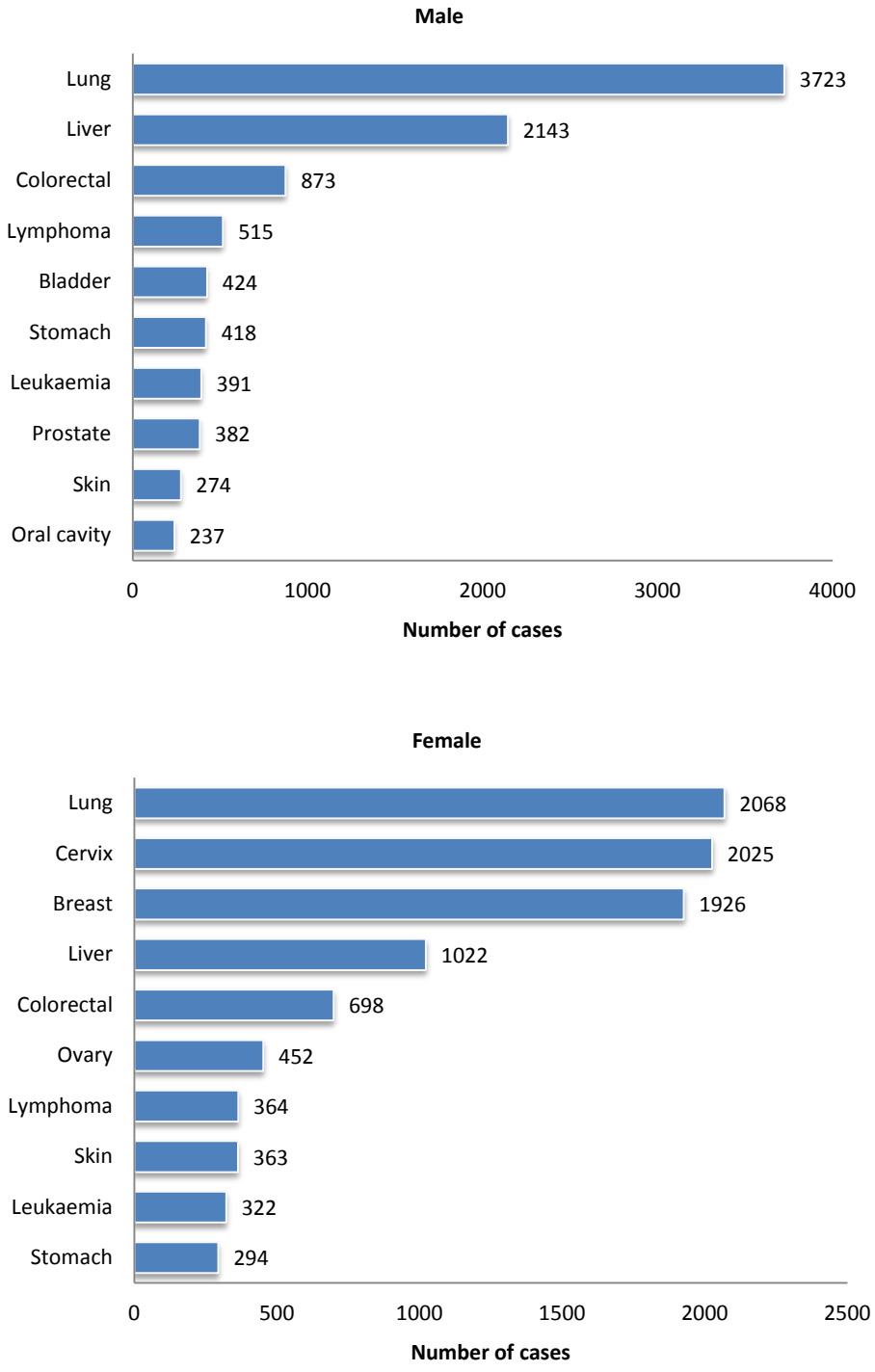
Follow up

Follow up has been carried out by passive and active methods. These included notification of cancer mortality information from Lampang Provincial Public Health Service records. The mortality data were matched with the incident cancer database. Unmatched incident cases were then subjected to one or more of the following to obtain the vital status information; repeat scrutiny of records in the respective sources of registration, postal enquiry and house visits. The closing date of follow up was 30th July 2012. The percentage of complete follow-up outcome of all cancers is 83.6% and of unknown status is 16.4% in both sexes.

Result

A breakdown of the ten most frequent cancers in males and females for the period 1988-2007 is given in Figure 5 below.

Figure 5: Top ten most frequent cancers, 1988-2007



Trends in over all cancer survival estimates will be affected by clinical extent of disease. For the period 1988-2007, 10% of the cancers in both sexes were classified as localized, 35% regional, 30% distant metastasis and 25% of an unknown extension (Figure 6). Table 5 shows number of cases and percentage by extension, sexes and periods.

Figure 6: Extension of all cancer sites in Lampang, 1988-2007

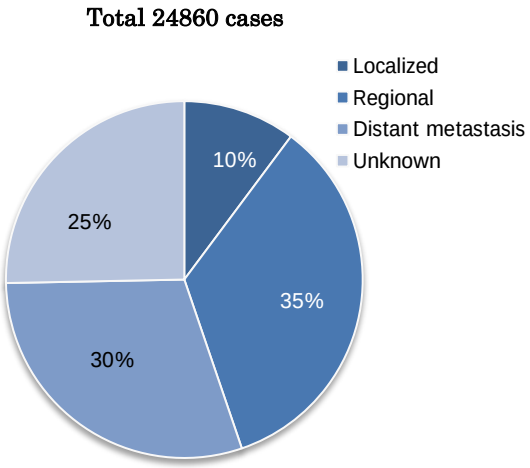


Table 5: Number of cases and percentage by extension, sexes and periods, Lampang, 1988-2007

Periods	Number of cases (%) by extension and sexes			
	Localized	Regional LN.	Distant metastasis	Unknown
1988-1992				
Male	168 (37.9)	825 (37.9)	897 (41.2)	285 (13.1)
Female	14 (15.9)	10 (43.4)	4 (28.7)	16 (11.9)
1993-1997				
Male	276 (9.1)	864 (28.4)	1105 (36.4)	793 (26.1)
Female	479 (16.4)	997 (34.1)	886 (30.3)	560 (19.2)
1998-2002				
Male	439 (13.8)	933 (29.2)	988 (31.0)	830 (26.0)
Female	725 (15.9)	1161 (34.5)	739 (22.0)	740 (22.0)
2003-2007				
Male	224 (5.7)	927 (23.8)	1170 (30.0)	1578 (40.5)
Female	634 (15.6)	1167 (28.6)	922 (22.6)	1353 (33.2)

For the period 1988-2007, the relative survival rate in male was lower than in female. For the males, the 5-year relative survival rate was 16%; and for the females, the 5-year relative survival was 38% (Figure 7).

The 5-year relative survival rates of all cancers for females have remained unchanged from 1988 to 2007; that was approximately 37%. For the males, the 5-year relative survival rates of all cancer showed that there was a decrease in the survival pattern from 1988-2002, and then an increase in survival could be observed in the period 2003-2007 (Figure 8).

The highest five-year relative survival rate could be observed in skin cancer in both sexes. The top-ranking cancers in terms of 5-year relative survival among males were cancer of skin (78%), thyroid (49%), prostate (46%), bladder (42%) and colon cancer (34%). The top-ranking cancers in terms of 5-year relative survival among females were cancer of skin (82%), thyroid (72.0%), corpus uteri (71%), breast (65%) and cervical uteri (61%). The cancers that had very low survival rate (less than 10%) were liver, lung and stomach cancer. Figure 9 shows top ten of cancers by 5-years relative survival rate in both sexes. Considering specific cancer sites, the improvement in survival could be observed in bladder and thyroid cancer for the males; and in breast, cervical, corpus uteri and thyroid cancer for the females (Table 6&7).

The five-year observed survival by extent of disease generally followed a trend: highest survival for localized disease followed by regional and distant metastasis. The five-year relative survival of all cancers, males and females by extent of disease are shown in Figure 10 and table 8.

Figure 7: Cancer survival by gender in Lampang, 1988-2007.

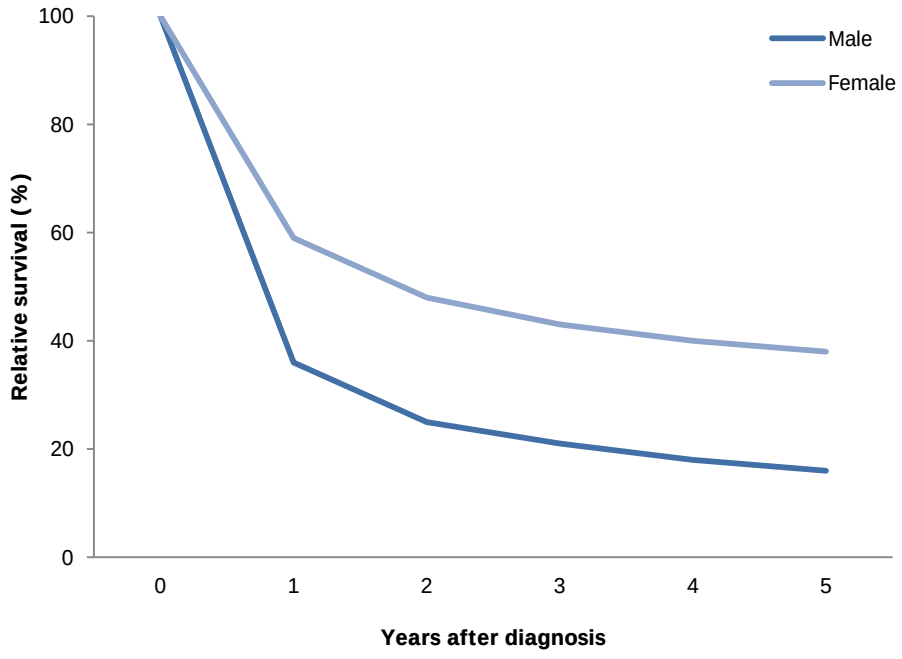


Figure 8: Cancer survival by period in Lampang, 1988-2007

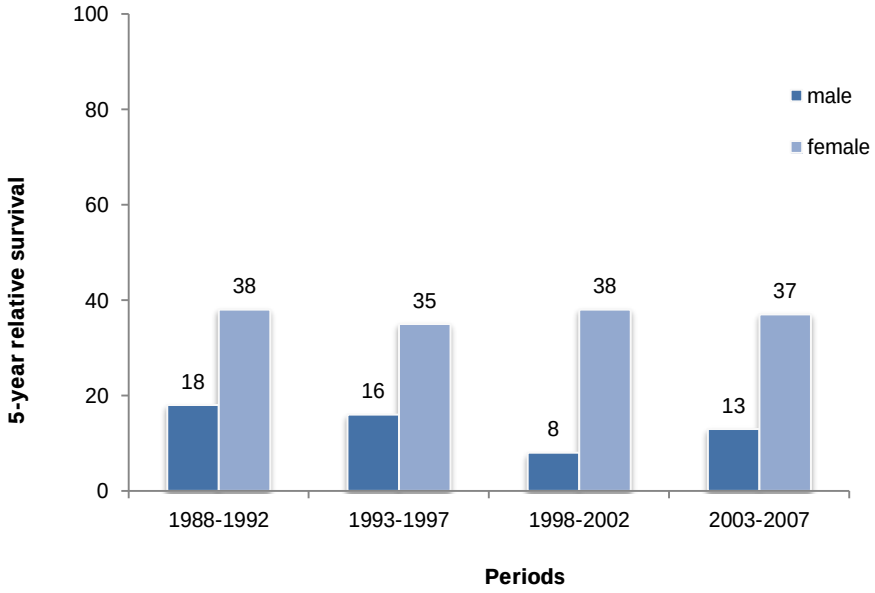
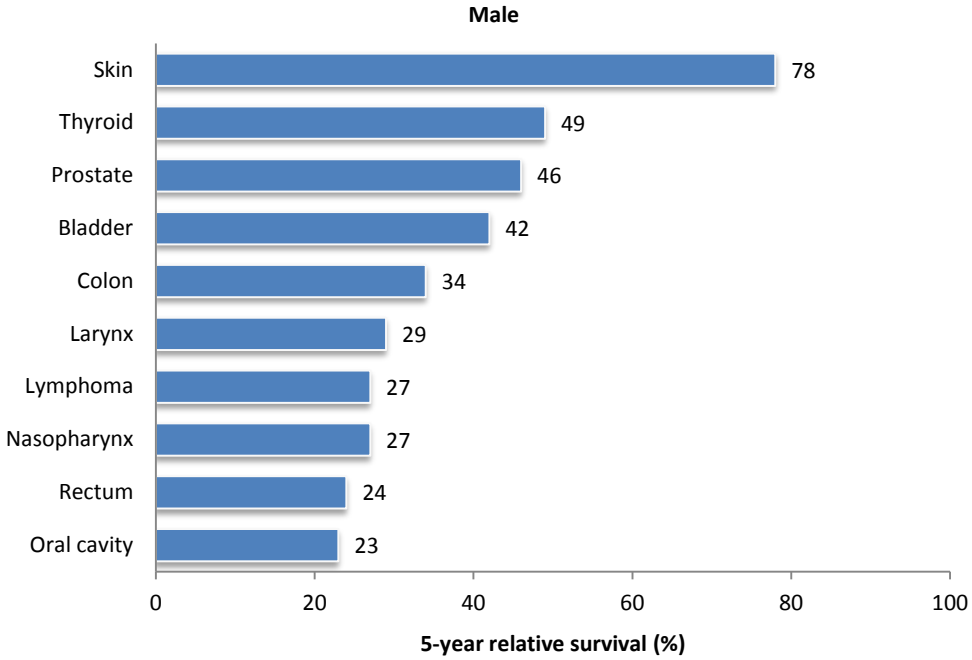


Figure 9: Top ten of cancers by 5-years relative survival rate in Lampang, 1988-2007.



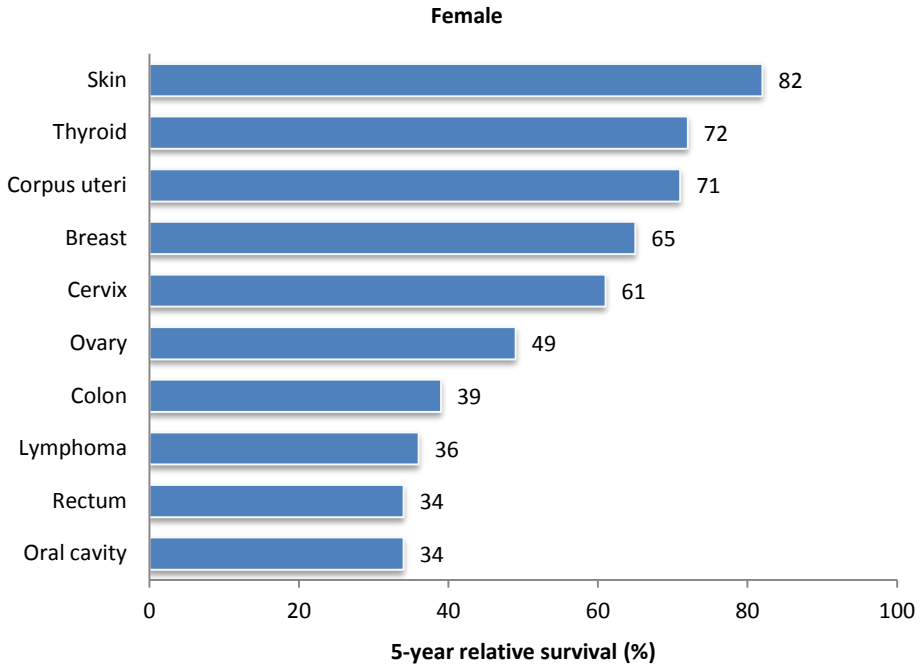


Table 6: 5-year relative survival in male, Lampang, Thailand, 1988-2007

Site	5- year relative survival (%)				
	overall	1988-1992	1993-1997	1998-2002	2003-2007
Oral cavity	23	22	33	32	12
Nasopharynx	27	30	43	24	11
Stomach	9	11	8	13	6
Colon	34	41	28	39	30
Rectum	24	29	18	24	26
Liver	5	7	6	6	2
Larynx	29	38	31	31	11
Lung	6	8	6	7	4
Skin	78	71	81	81	76
Prostate	46	40	47	54	43
Bladder	42	40	40	39	47
Thyroid	49	42	61	42	48
Lymphoma	27	32	28	36	16
Leukaemia	19	22	18	20	16
All sites	**16**	**18**	**16**	**8**	**13**

Table 7: 5-years relative survival in female, Lampang, Thailand, 1988-2007

Site	5- year relative survival (%)				
	Overall	1988-1992	1993-1997	1998-2002	2003-2007
Oral cavity	34	35	30	33	33
Nasopharynx	32	29	26	39	30
Stomach	11	17	10	10	10
Colon	39	55	29	41	33
Rectum	34	30	30	40	28
Liver	7	5	10	10	3
Larynx	30	41	14	42	9
Lung	6	10	8	7	2
Skin	82	68	85	79	72
Breast	65	51	62	63	69
Cervix	61	67	54	57	62
Corpus uteri	71	68	63	70	72
Ovary	49	51	49	50	44
Bladder	31	8	35	35	29
Thyroid	72	51	76	63	78
Lymphoma	36	48	37	41	22
Leukaemia	21	21	21	25	16
All sites	**38**	**38**	**35**	**38**	**37**

Figure 10: 5-year observed survival rate by extent of disease in Lampang, 1988-2007

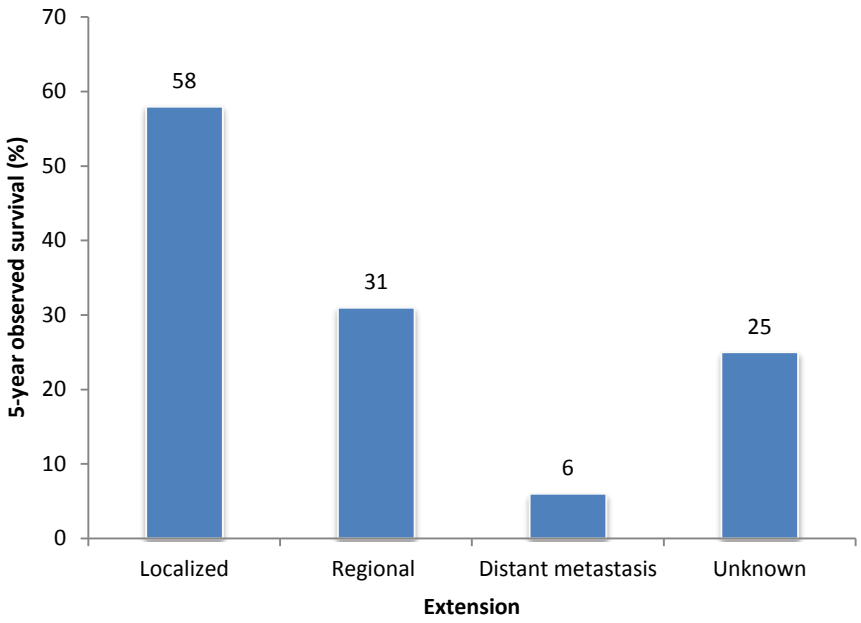


Table 8: 5-years relative survival by extent of disease for specific sites, Lampang, Thailand, 1988-2007

Site	5- years relative survival (%) by extension			
	Localized	Regional LN.	Distant metastasis	Unknown
Oral cavity	44	22	15	21
Nasopharynx	19	31	12	26
Stomach	14	10	4	16
Colon	51	46	8	37
Rectum	13	32	8	26
Liver	7	5	3	5
Larynx	43	24	13	22
Lung	17	7	3	7
Skin	76	58	39	65
Breast	82	59	28	78
Cervix	81	51	24	67
Corpus uteri	79	65	22	80
Ovary	79	43	17	69
Prostate	39	40	17	37
Bladder	49	33	8	34
Thyroid	85	63	13	72
All sites	58	31	6	25

Discussion

During the period 1988-2007, female cases had better survival than male cases. The main reason is that; among females, there were a high proportion of good survival cancers such as breast and cervical cancers which can be diagnosed at early stage. Adequate treatment by surgery at stage I or II and combination of surgery, radiotherapy, chemotherapy and hormonal therapy especially breast cancer for advance disease improved the survival of these cancers.

Considering the males, there were higher incidences of poor survival cancers such as lung and liver than females. These cancers are very difficult to be diagnosed at early stage, most of these cancers could be diagnosed at stage III and IV and misclassification for stage could be observed. There are no effective screening programs to detect early stage of these cancers; therefore, primary prevention is a key in cancer care in our area.

Commentaries on selected site

Survival by sex : The 5-year survival was slightly higher for women than for men (34% and 23% respectively) (Figure 11).

Survival by subsite: There were slight differences in survival for different subsites within the oral cavity. Lip cancer has 5-year survival better than tongue and mouth cancers (for male 58%, 13 and 18% respectively and for female 54%, 31 and 23% respectively) (Table 9).

Extent of disease: The 5-year survival was 44% for localized, 22% for regional, 15 % for distant metastasis and 21% for unknown (Figure 12).

Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 22% to 12% in male and for female, survival slightly decreased from 35% to 33% (Figure 13).

A clinician's comment: The decrease in survival of period 2003-2007 was observed that may be due to the high proportion of regional and distant metastasis. It was rather difficult to distinguish early stage of this cancer from premalignant lesion and these could be an obstacle of early diagnosis.

Table 9: 5- year survival by sex, extent of disease, tumor subsites and periods for oral cavity cancer in Lampang, Thailand, 1988-2007.

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	56	50-63	55	49-63
2	39	33-47	45	39-53
3	32	26-39	39	33-46
4	25	20-33	35	29-43
5	23	17-30	34	28-42
Extent of disease	**5-year survival (%)**		**95% CI**	
Localized	44		33-55	
Regional	22		17-27	
Distant metastasis	15		5-27	
Unknown	21		12-31	
5-year relative survival				
By sub group	**Male**		**Female**	
	(%)	**95% CI**	**(%)**	**95% CI**
Tumor subsite				
Lip	58	40-85	54	40-73
Tongue	13	8-22	31	22-45
Mouth	18	12-27	23	16-32
Periods				
1988-1992	22	11-42	35	23-54
1993-1997	33	22-55	30	20-51
1998-2002	32	20-51	33	24-49
2003-2007	12	6-23	33	23-48

Figure 11: Overall survival by sex for oral cavity cancer, Lampang, Thailand, 1988-2007

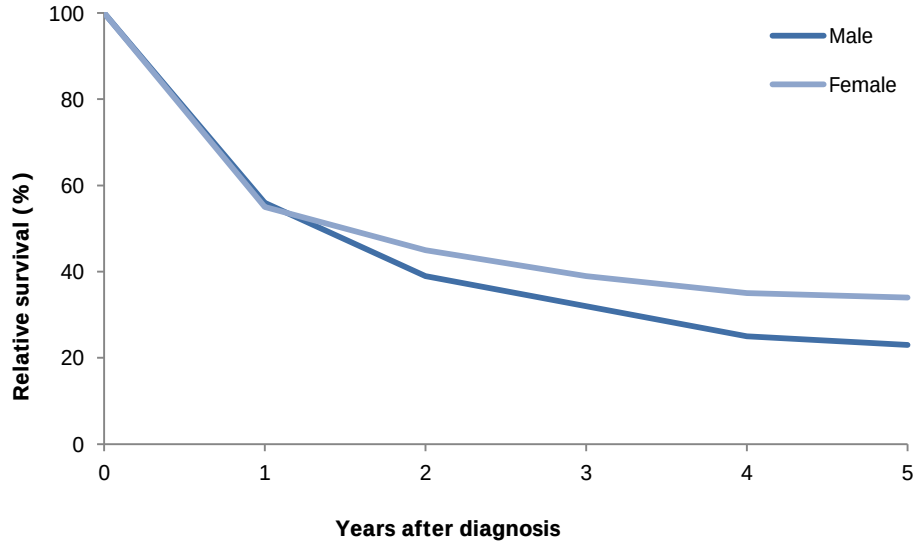


Figure12: Overall survival by extension for oral cavity cancer, Lampang, Thailand, 1988-2007

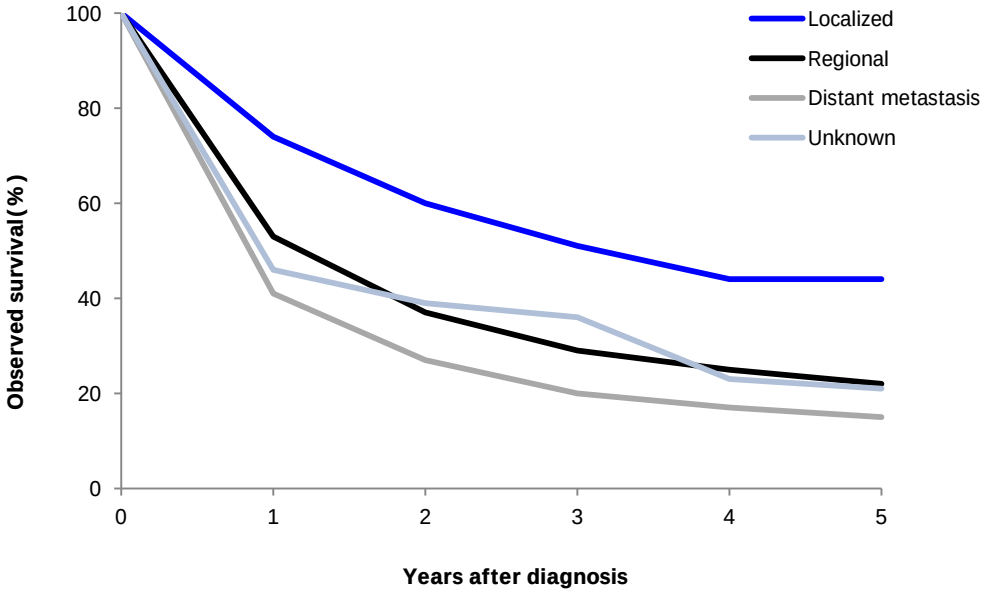
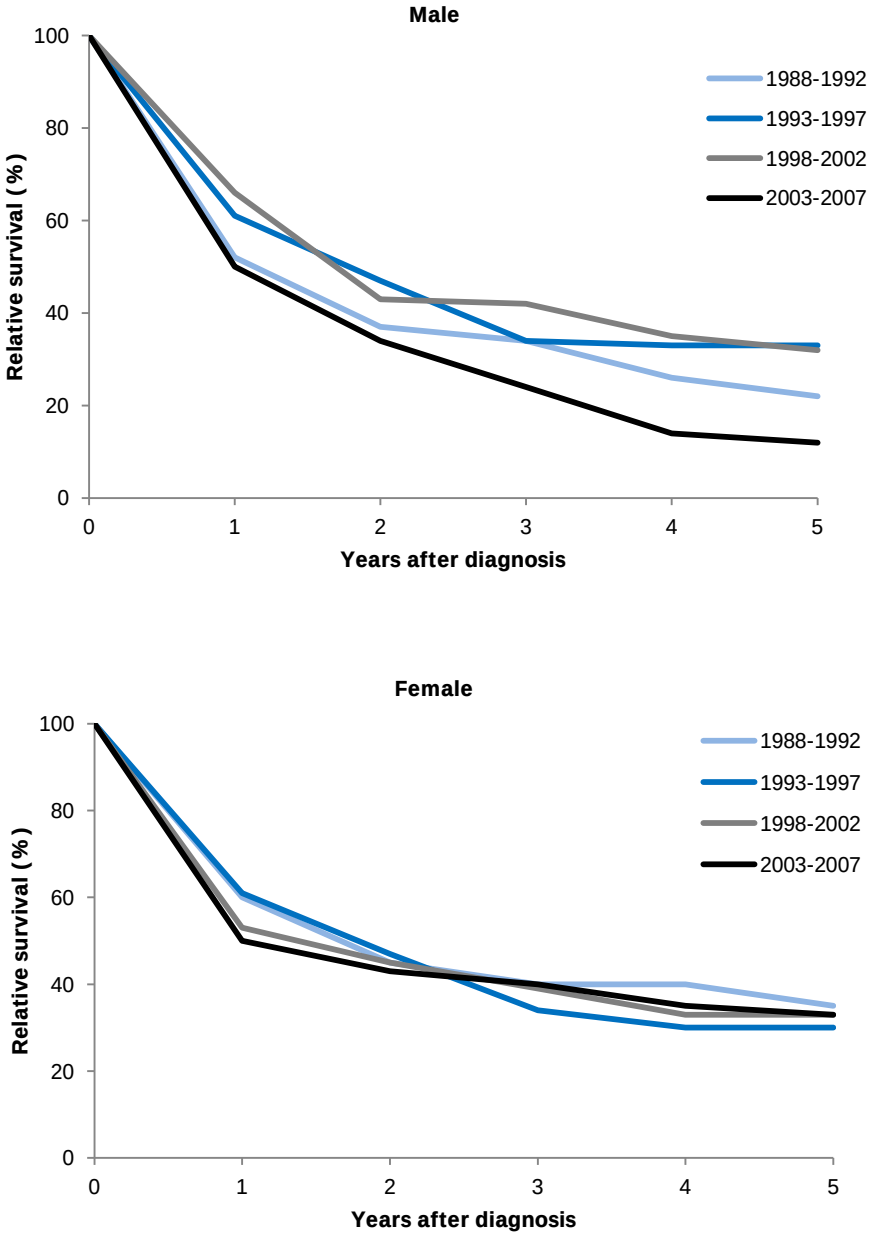


Figure 13: Survival by periods for oral cavity cancer, Lampang, Thailand,1988-2007



Survival by sex: The 5-year survival was slightly higher for women than for men (32% and 27% respectively) (Figure 14).

Extent of disease: The 5-year survival was 19% for localized, 31% for regional, 12% for distant metastasis and 26 % for unknown (Figure 15).

Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 20% to 12% in male. However for female, survival improved from 35% to 33% (Figure 16).

A clinician's comment: Considering extent of disease, survival of regional was higher than localized. This may be due to the misinterpretation of clinical extent of disease. MRI scan could give more accurate interpretation than our commonly used CT scan. In addition, we observed the higher amount of unknown stage in the last period (2003-2007). Nasopharynx is one of the areas that are difficult to detect abnormalities. Improving early detection can improve the survival of this cancer.

Table 10: 5-year survival by sex, extent of disease and periods for nasopharyngeal cancer in Lampang Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	71	65-78	71	63-80
2	51	44-59	53	44-64
3	39	33-47	45	36-56
4	32	26-40	38	29-49
5	27	21-35	32	24-43

Extent of disease	5-year survival (%)	95% CI
Localized	19	5-40
Regional	31	24-37
Distant metastasis	12	4-25
Unknown	26	12-42

5-year survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	30	19-53	29	14-60
1993-1997	43	30-62	26	12-59
1998-2002	24	15-40	39	25-60
2003-2007	11	4-27	30	17-52

Figure 14: Overall survival by sex for nasopharyngeal cancer, Lampang, Thailand, 1988-2007

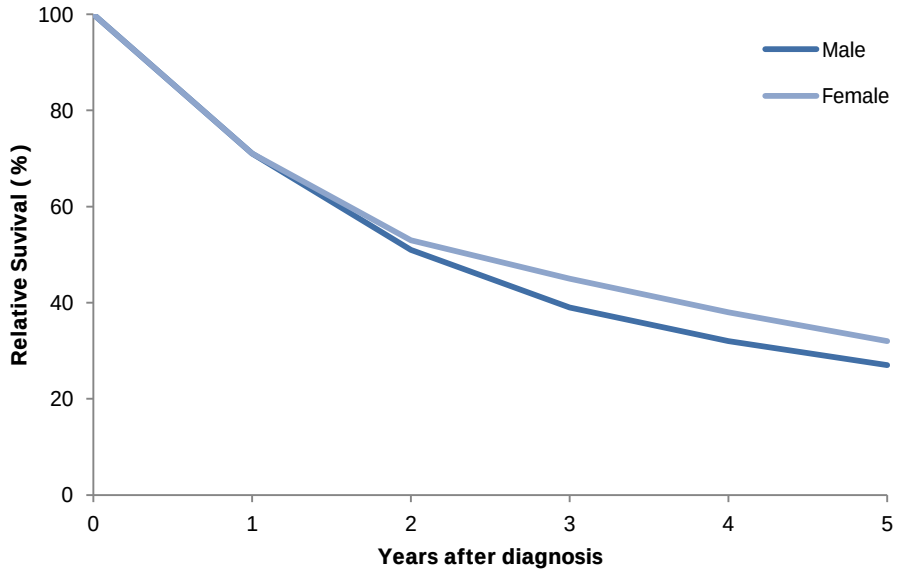


Figure 15: Overall survival by extension for nasopharyngeal cancer, Lampang, Thailand, 1988-2007

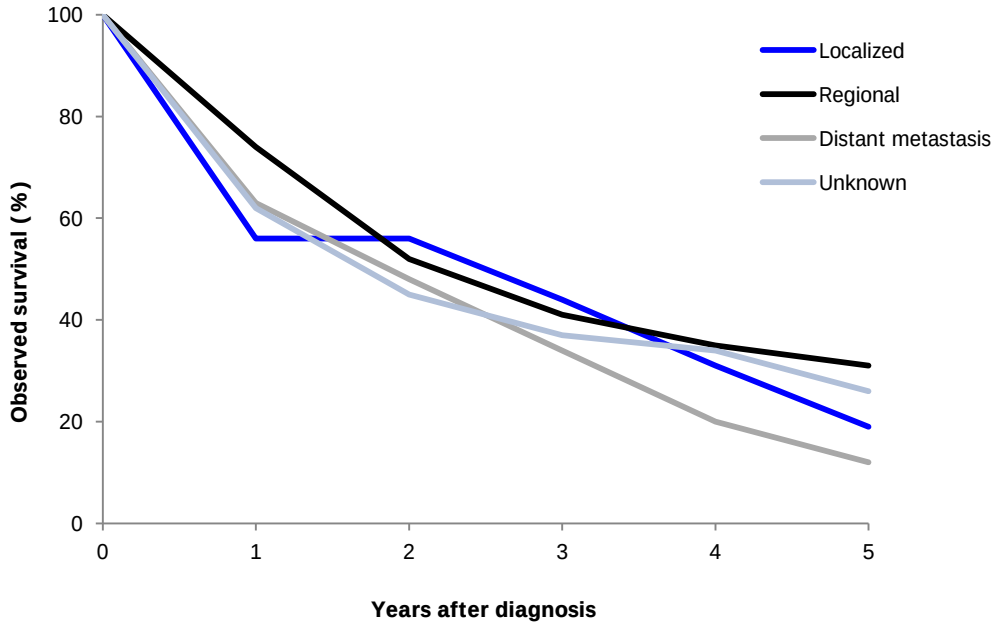
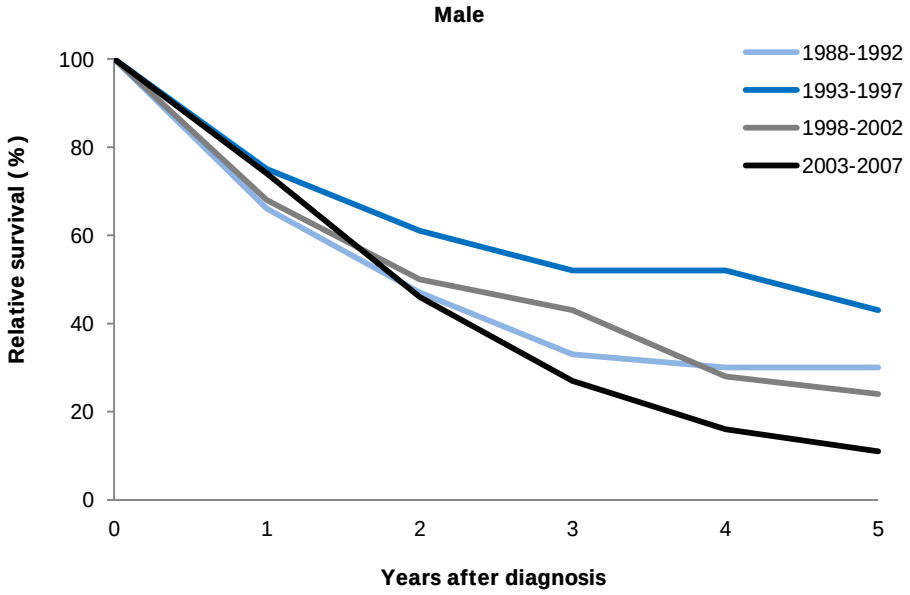
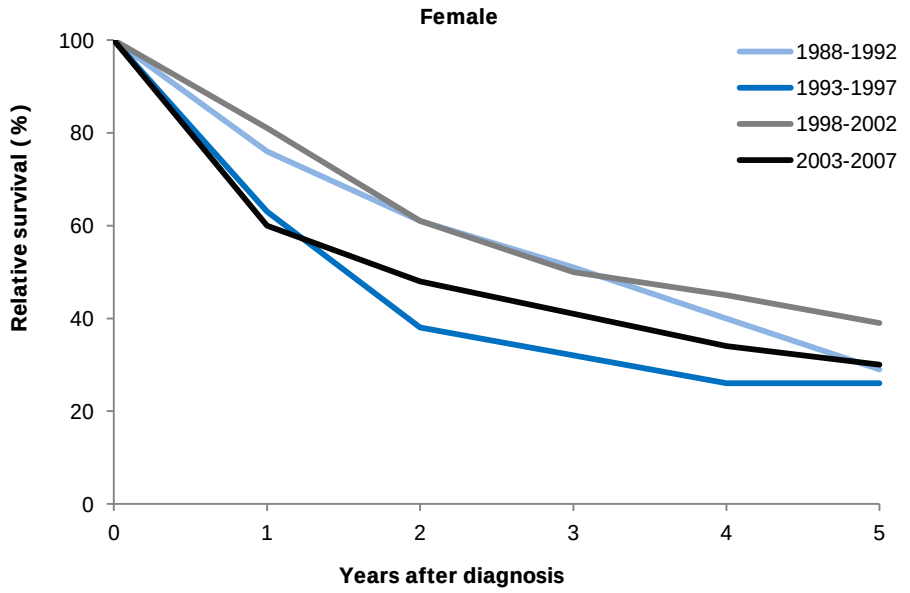


Figure 16: Survival by periods for nasopharyngeal cancer, Lampang, Thailand, 1988-2007





Survival by sex: The 5-year survival was slightly higher for women than for men (9% and 11% respectively) (Figure 15).

Extent of disease: The 5-year survival was 19% for localized, 31% for regional, 12% for distant metastasis and 26% for unknown (Figure 16).

Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 11% to 6% in male and from 17% to 10% in female (Figure 17).

A clinician's comment: The 5-year survival rate of female gastric cancer patients is slightly better than male patients supporting the evidence that female sex is a predictor of better outcome. The 5-year survival rate in metastatic disease is 4% which is comparable with SEER database. In localized disease and those with regional lymph node involvement, the 5-year survivals are very low. In 1998-2002, 5-year survival has slightly improved which may result from more localized disease and few metastatic diseases than other period (Appendix). Patients with gastric cancer mainly present with nodal involvement and metastatic disease. Therefore, in the past 20 years, the 5-year survival rate is approximately 10% and no improvement observed.

Table 11: Survival by years after diagnosis, staging and periods for stomach cancer in Lampang Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	36	31-41	39	33-45
2	20	16-25	25	20-31
3	16	13-21	19	15-25
4	13	10-17	16	12-22
5	9	6-13	11	8-17

Extent of disease	5-year survival	95% CI
Localized	14	4-30
Regional	10	6-14
Distant metas	4	2-7
Unknown	16	10-24

5-year survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	11	5-22	17	9-33
1993-1997	8	4-16	10	5-21
1998-2002	13	7-23	10	4-23
2003-2007	6	3-16	10	4-22

Figure 17: Overall survival by sex for stomach cancer, Lampang, Thailand, 1988-2007

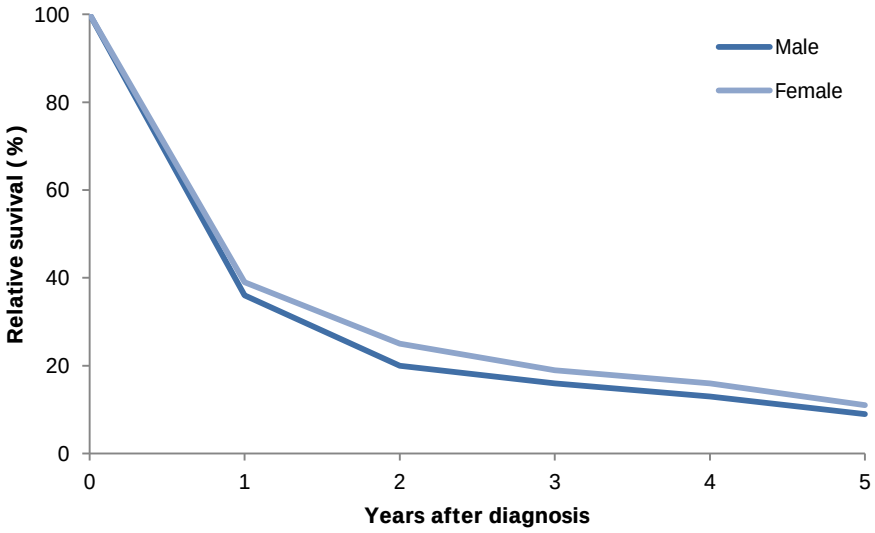


Figure 18: Overall survival by extension for stomach cancer, Lampang, Thailand, 1988-2007

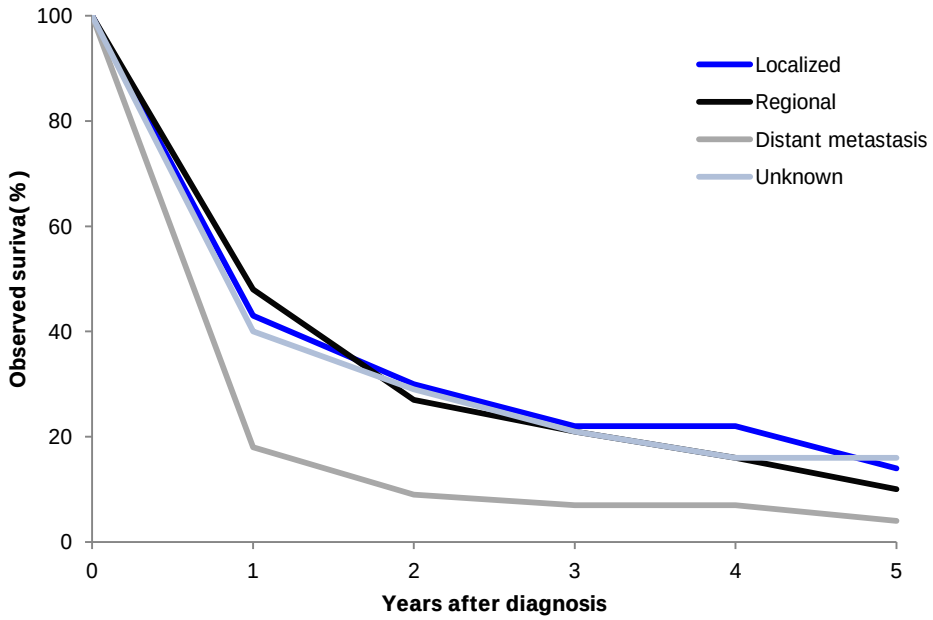
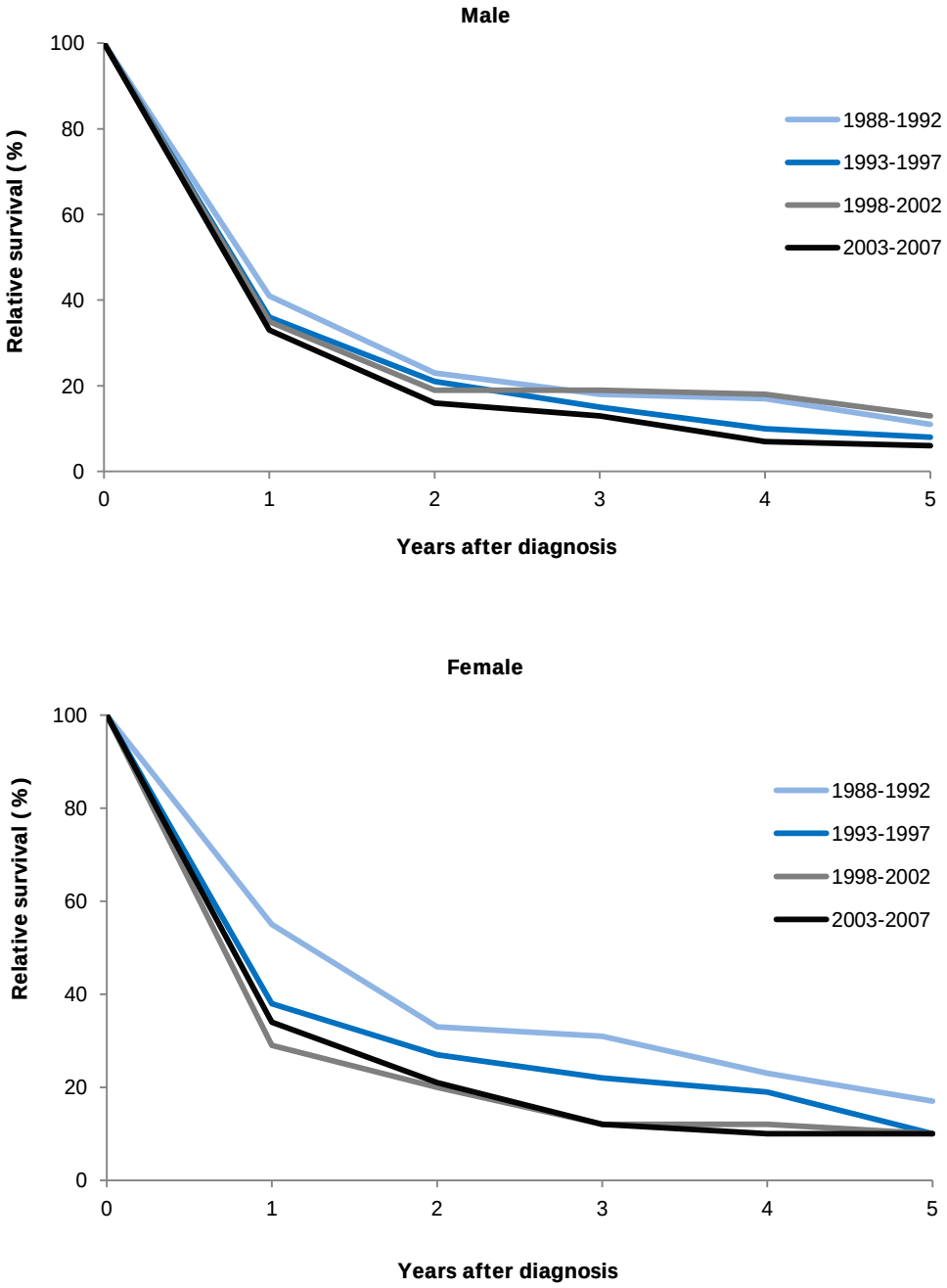


Figure 19: Survival by periods for stomach cancer, Lampang, Thailand, 1988-2007



Survival by sex: The 5-year survival was slightly higher for women than for men (39% and 34% respectively) (Figure 20).

Extent of disease: The 5-year survival was 51% for localized, 46% for regional, 8% for distant metastasis and 37 % for unknown (Figure 21).

Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 41% to 30% in male and from 55 % to 33% in female (Figure 22).

A clinician's comment: The 5-year survival rates of colon cancer unfortunately have not improved in the last 10 years in both male and female. The majority of cases have regional lymph node involvement and distant metastasis. Newer chemotherapy regimen for adjuvant and metastatic disease were introduced after 2009. We expected the improvement of 5-year survival rates in the next 5 years period.

Table 12: 5-year survival by sex, extent of disease and periods for colon cancer in Lampang Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	60	56-65	65	61-70
2	46	42-51	53	48-59
3	41	36-46	47	41-52
4	37	33-43	40	35-46
5	34	29-39	39	33-45
Extent of disease	5-year survival		95% CI	
Localized	51		34-66	
Regional	46		41-52	
Distant metastasis	8		5-12	
Unknown	37		28-45	
5-year relative survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	41	29-60	55	43-75
1993-1997	28	20-40	29	19-42
1998-2002	39	30-50	41	33-54
2003-2007	30	24-40	33	25-43

Figure 20: Overall survival by sex for colon cancer, Lampang, Thailand, 1988-2007

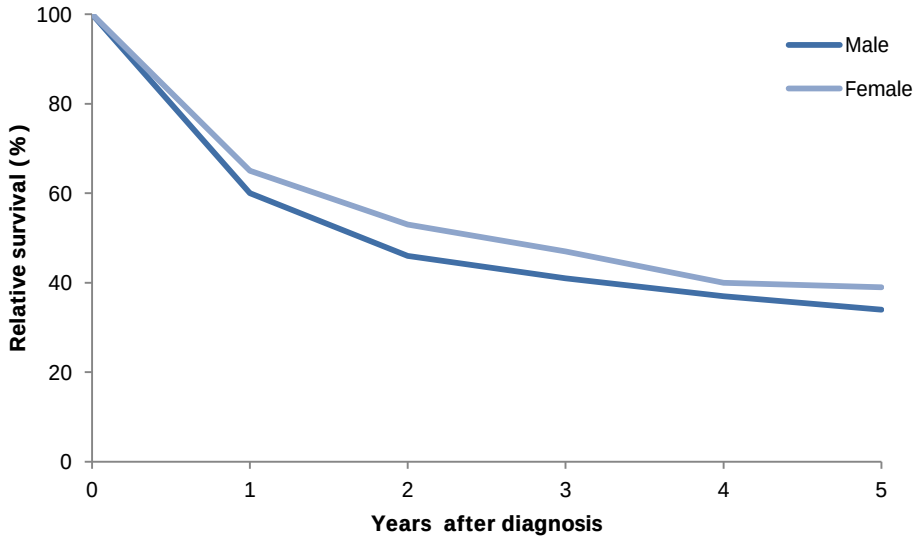


Figure 21: Overall survival by extension for colon cancer, Lampang, Thailand, 1988-2007

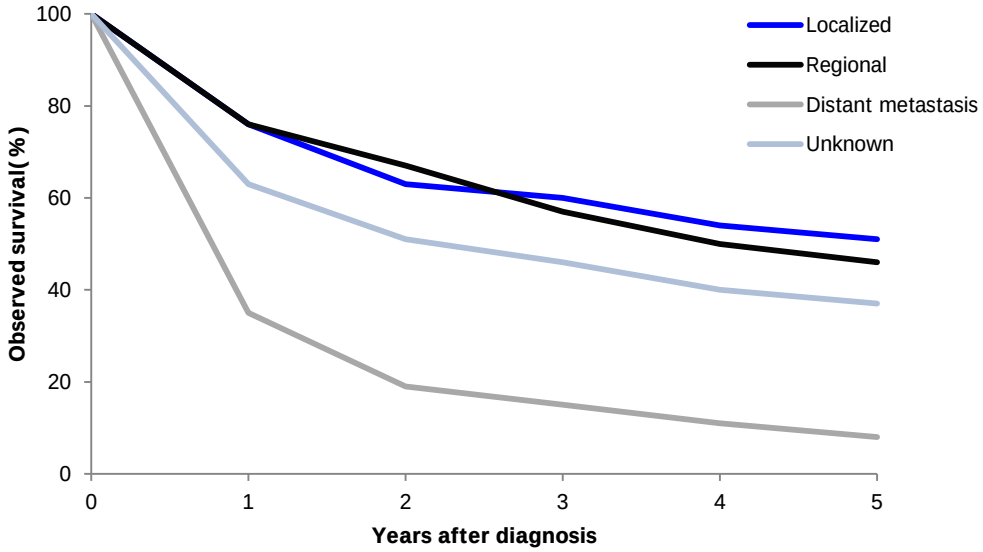
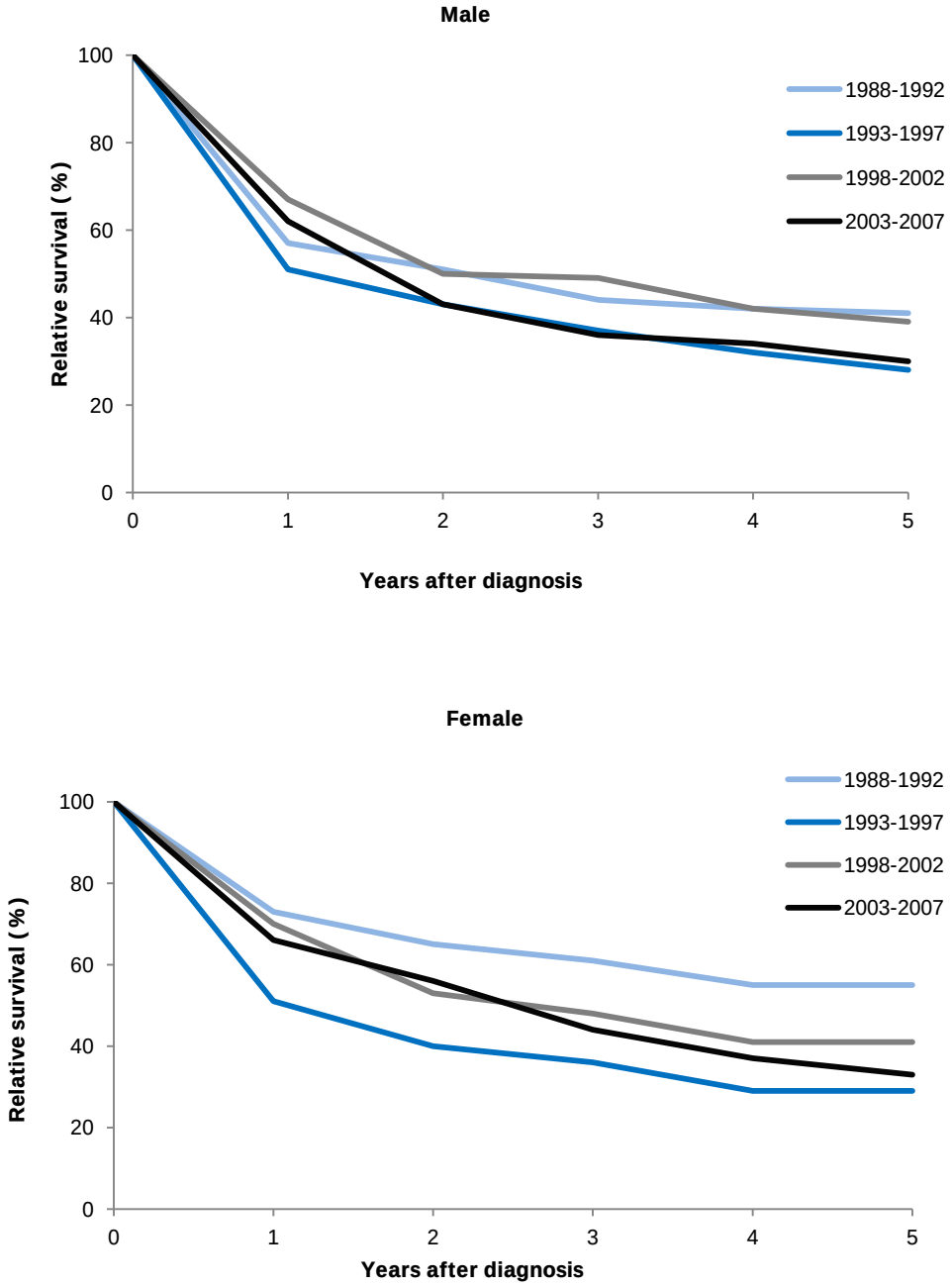


Figure 22: Survival by periods for colon cancer, Lampang, Thailand, 1988-2007



Survival by sex: The 5-year survival was slightly higher for women than for men (34% and 24% respectively) (Figure 23).

Extent of disease: The extent of disease was 13% for localized, 32% for regional, 8% for distant metastasis and 26 % for unknown (Figure 24).

Time trends: In the twenty years from 1988 to 2007, 5-year survival slightly decreased from 29% to 26% in male and from 30% to 28% in female (Figure 25).

A clinician's comment: The 5-year survival rates in male patients have slightly improved but lower than in female patients. Most of the patients suffer from locally advanced disease resulting in poor prognosis. Newer chemotherapy regimen for metastatic disease was introduced in 2009. We expected the improvement of 5-year survival rates in the next 5 years period.

Table 13: Survival by sex, extent of disease and periods for rectal cancer in Lampang, Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	69	64-74	68	62-74
2	48	42-54	52	46-59
3	33	28-40	42	36-49
4	28	23-34	36	30-44
5	24	19-31	34	27-41
Extent of disease	5-year survival		95% CI	
Localized	13		4-28	
Regional	32		26-38	
Distant metastasis	8		4-15	
Unknown	26		18-35	
5-year relative survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	29	16-52	30	19-54
1993-1997	18	10-34	30	20-49
1998-2002	24	16-38	40	28-58
2003-2007	26	18-37	28	19-41

Figure 23: Overall survival by sex for rectal cancer, Lampang, Thailand, 1988-2007

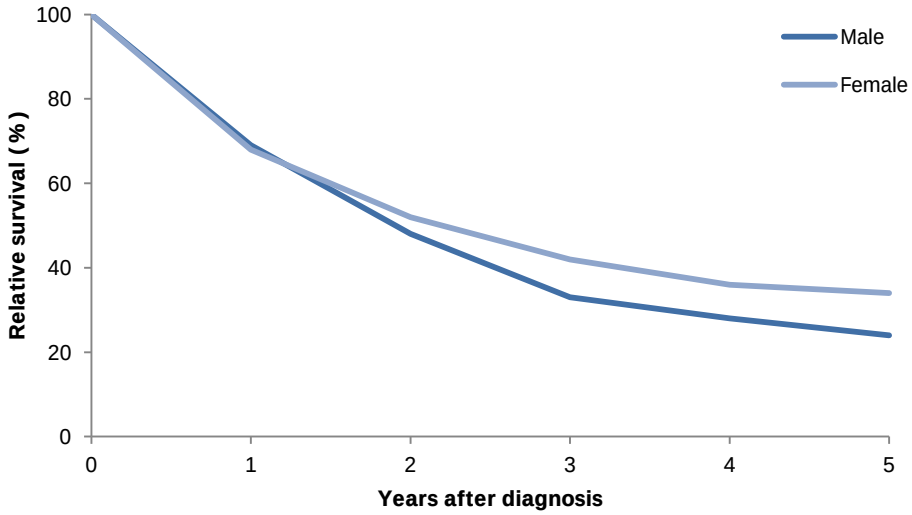


Figure 24: Overall survival by extension for rectal cancer, Lampang, Thailand, 1988-2007

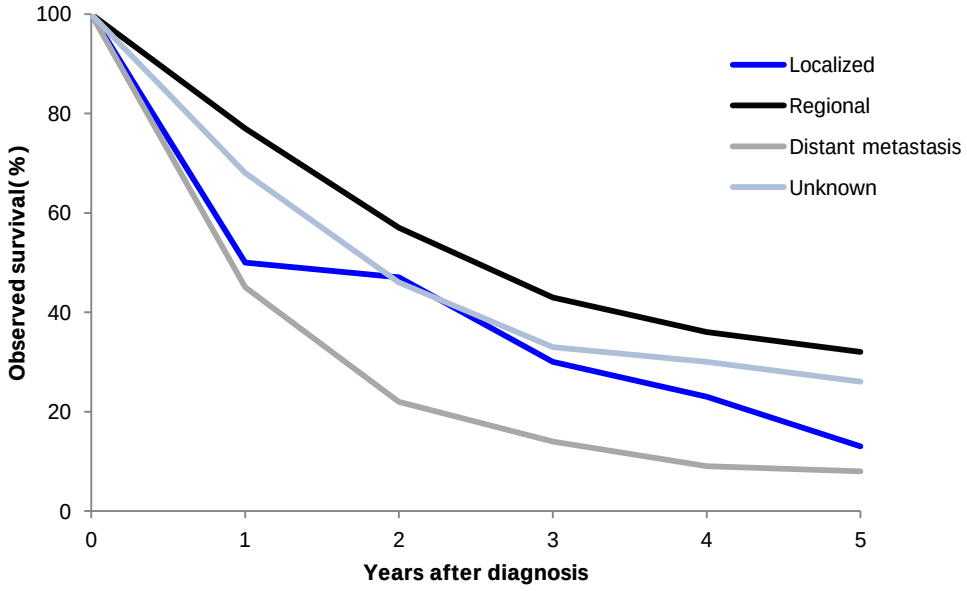
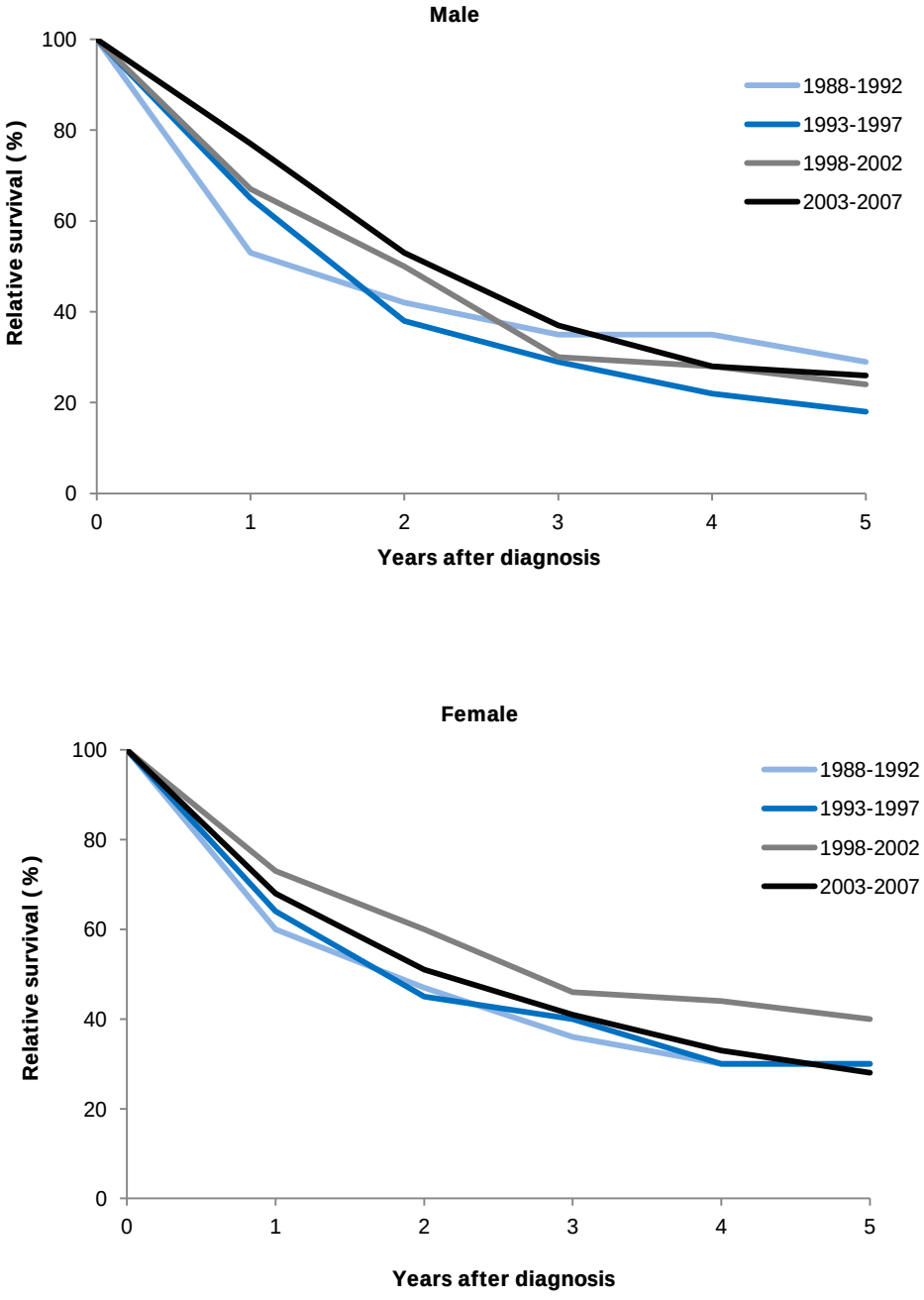


Figure 25: Survival by periods for rectal cancer, Lampang, Thailand, 1988-2007



Survival by sex: The 5-year survival was slightly higher for women than for men (7% and 5% respectively) (Figure 26).

Extent of disease: The 5-year survival was 7% for localized, 5% for regional, 3% for distant metastasis and 5% for unknown (Figure 27).

Time trends: In the twenty years from 1988to 2007, 5-year survival decreased from 7% to 2% in male and from 5% to 3% in female (Figure 28).

A clinician's comment: Hepatocellular carcinoma and cholangiocarcinoma are aggressive, poor prognosis cancer. The 5-year survival rates are very low. All modalities of treatment have contributed to minimal improvement in survival over the past 20 years. Primary prevention such as HBV vaccination and health promotion to eliminate raw fish consumption in population should play a major role in reducing the incidence of these cancers.

Table 14: Survival by sex, extent of disease, morphology and periods for liver cancer in Lampang Thailand, 1988-2007.

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	14	13-16	18	16-21
2	8	7-10	11	9-13
3	6	5-7	9	7-11
4	5	4-6	8	6-10
5	5	4-6	7	5-9

Extent of disease	5-year survival	95% CI
Localized	7	2-13
Regional	5	4-7
Distant metastasis	3	2-5
Unknown	5	4-7

Morphology	5-year survival	95% CI
Cholangiocarcinoma	3	1-5
Hepatocellular carcinoma	7	5-10

Periods	5-year relative survival			
	Male		Female	
	Survival(%)	95% CI	Survival (%)	95% CI
1988-1992	7	4-11	5	3-11
1993-1997	6	4-9	10	7-16
1998-2002	6	4-9	10	7-15
2003-2007	2	1-4	3	2-6

Figure 26: Overall survival by sex for liver cancer, Lampang, Thailand, 1988-2007

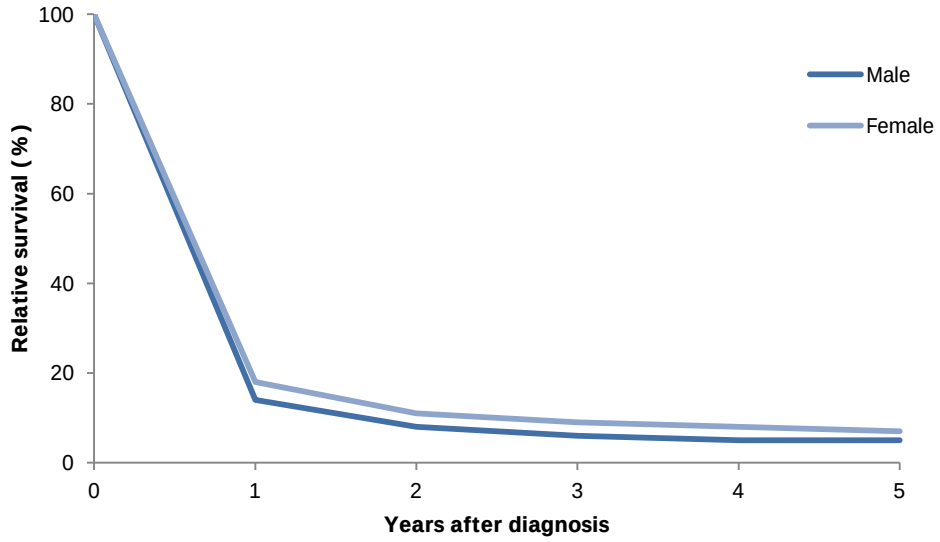


Figure 27: Overall survival by extension for liver cancer, Lampang, Thailand, 1988-2007

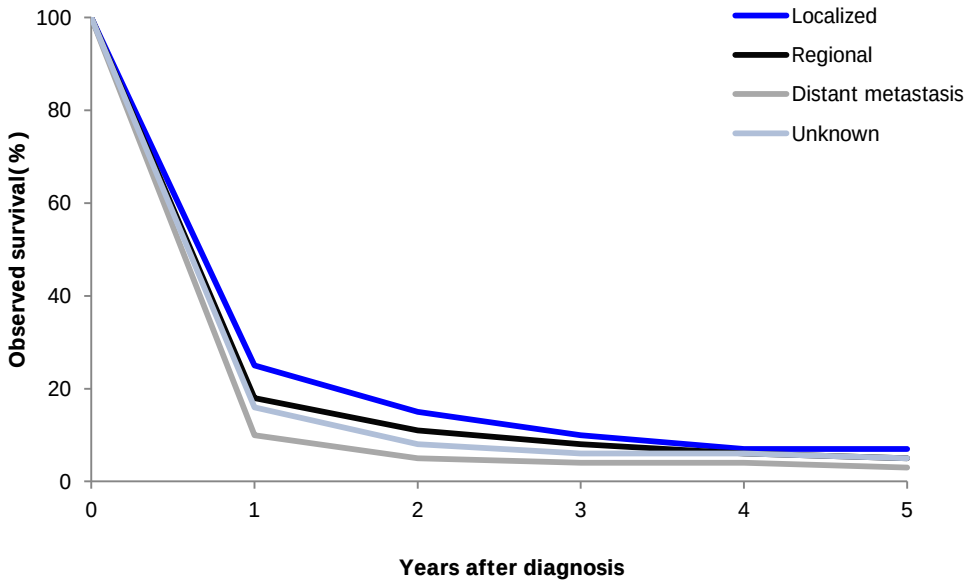
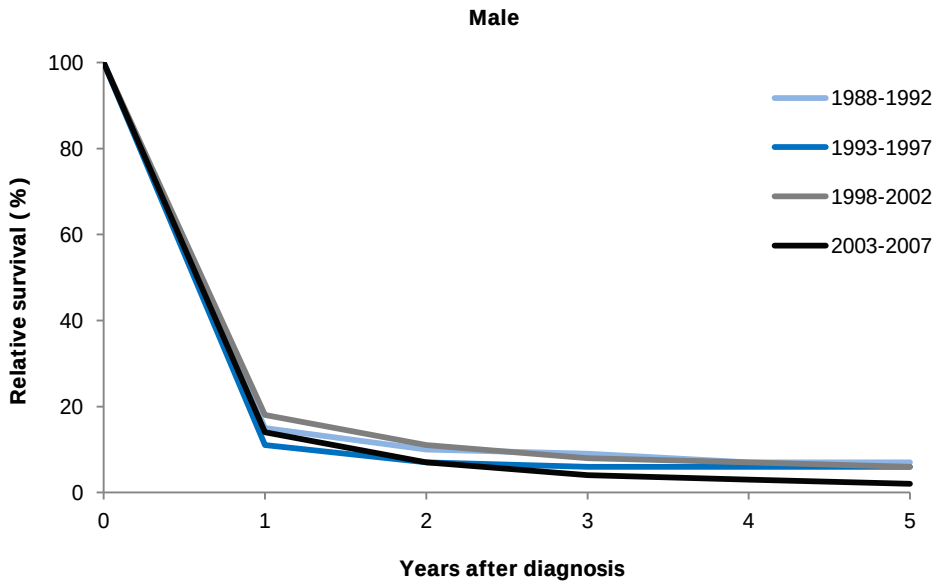
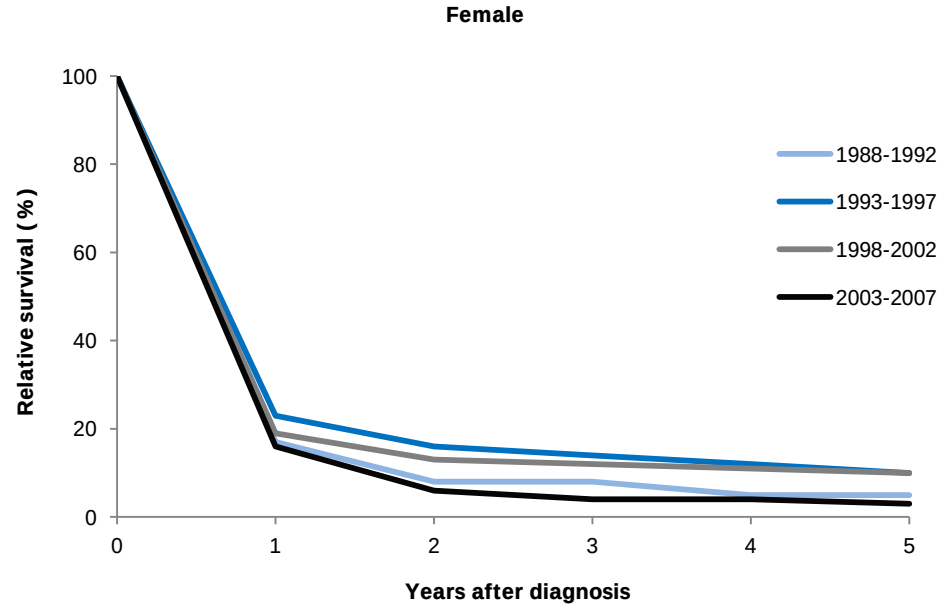


Figure 28: Survival by periods for liver cancer, Lampang, Thailand, 1988-2007





Survival by sex: The 5-year survival was slightly higher for women than for men (30% and 29% respectively) (Figure 29).
Extent of disease: The 5-year survival was 43% for localize, 24% for regional, 13% for distant metastasis and 22% for unknown (Figure 30).
Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 38% to 11% in male and from 41% to 9% in female (Figure 31).
A clinician's comment: The decrease in 5-year survival over 20 year was observed. This may be because of the increase in cases with unknown stage and these patients might not be access to cancer care program.

Table 15: 5-year survival by sex, extent of disease and periods for laryngeal cancer in Lampang Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	Survival (%)	95% CI	Survival (%)	95% CI
1	56	49-64	58	48-71
2	42	35-50	42	32-56
3	33	26-41	38	28-53
4	30	24-39	33	23-47
5	29	23-39	30	20-45

Extent of disease	5-year survival	95% CI
Localized	43	25-59
Regional	24	18-31
Distant metastasis	13	4-30
Unknown	22	7-37

Periods	5-year relative survival Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	38	26-60	41	24-71
1993-1997	31	21-49	14	4-53
1998-2002	31	19-56	42	25-80
2003-2007	11	4-33	9	1-57

Figure 29: Overall survival by sex for laryngeal cancer, Lampang, Thailand, 1988-2007

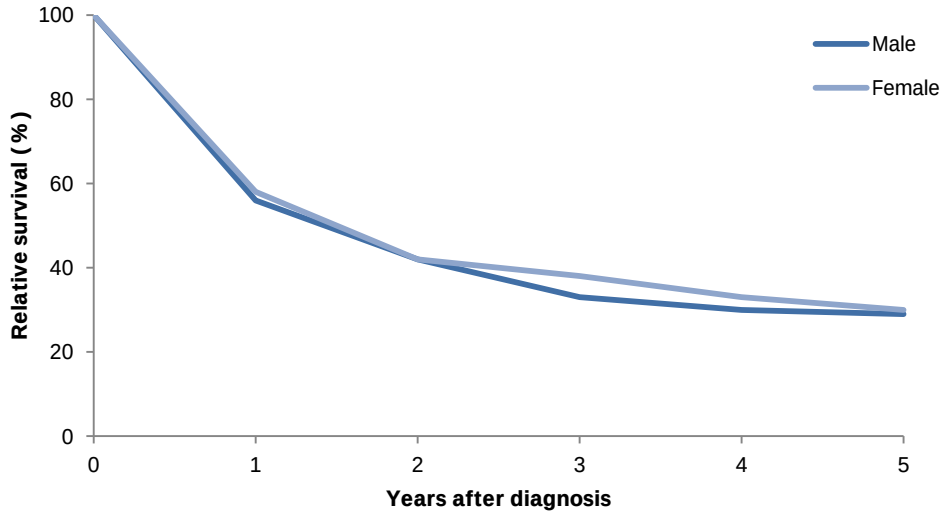


Figure 30: Overall survival by extension for laryngeal cancer, Lampang, Thailand, 1988-2007

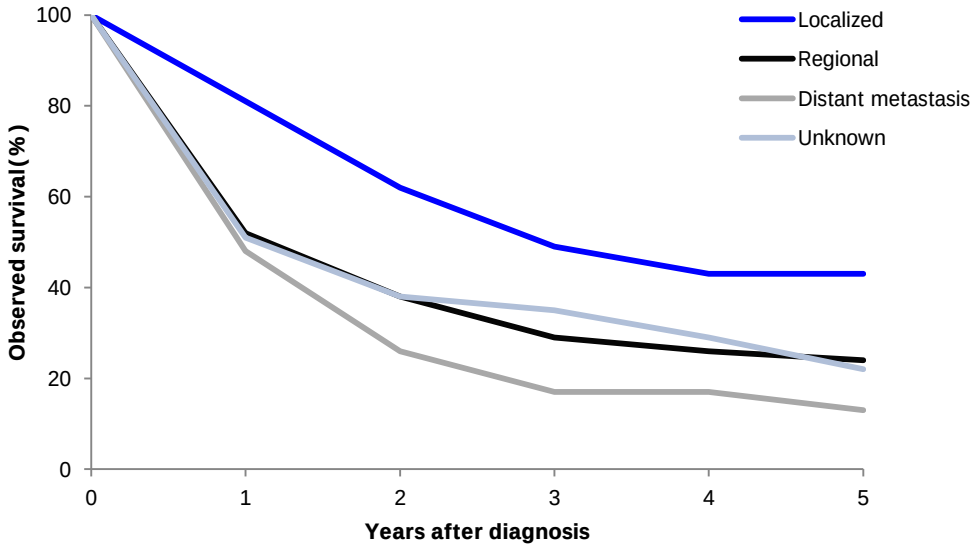
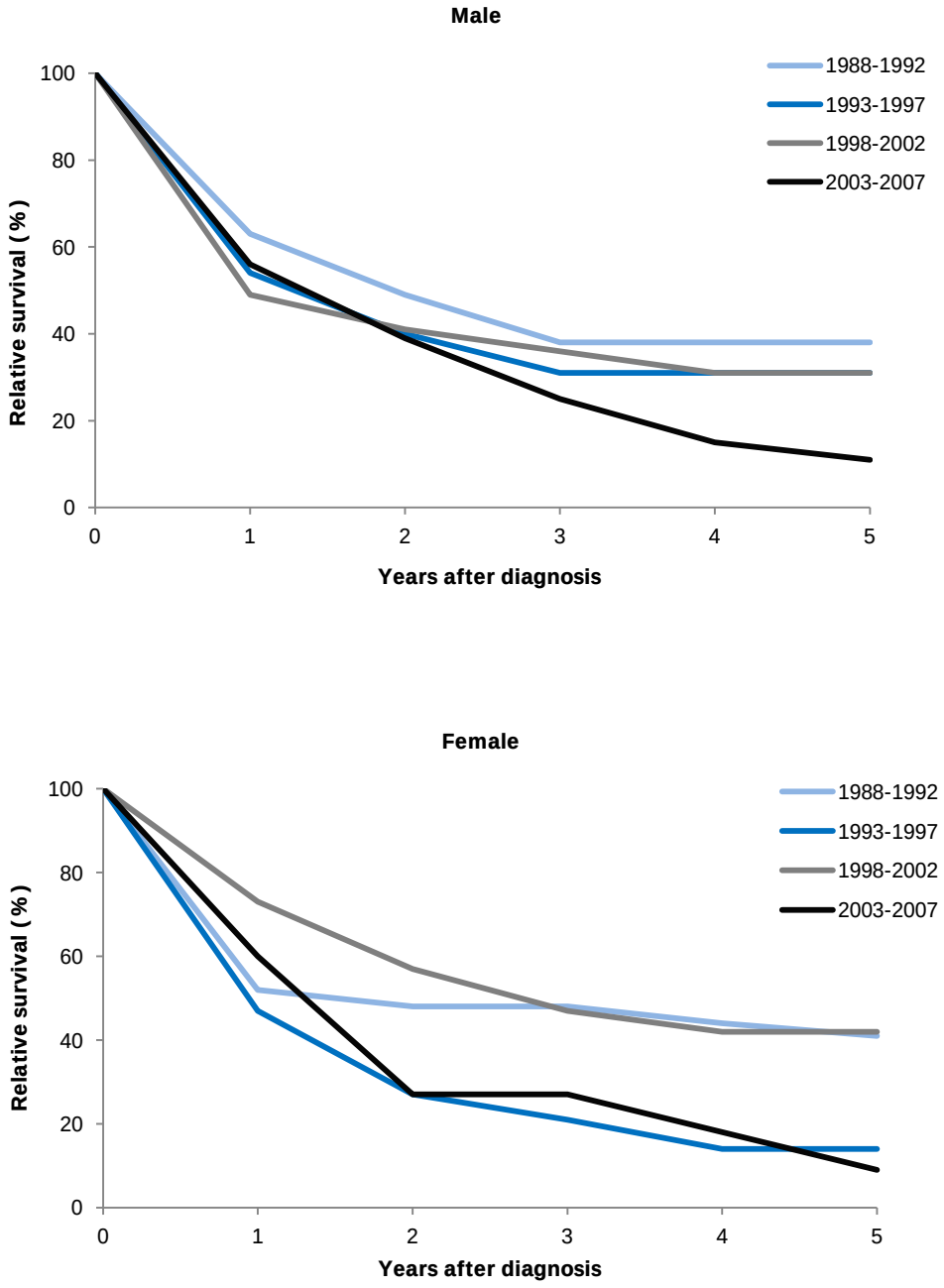


Figure 31: Survival by periods for laryngeal cancer, Lampang, Thailand, 1988-2007



Survival by sex: The 5-year survival was not different between male and female (6%) (Figure 32).

Extent of disease: The 5-year survival was for 17% localized, 7% for regional, 3% for distant metastasis and 7% for unknown (Figure 33).

Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 8% to 4% in male and from 10% to 2% in female (Figure 34).

A clinician's comment: In each period, the incidence of lung cancer cases were two times higher in male than female (Appendix). However, the overall survival had no gender difference, with 23% expected to survive for at least one year then survival rate decreased to 6% for 5-year survival. In 1988-1997, five-year survival of female was slightly better than male but then began lowering in the recent decades (Table 15).

Stage at presentation is one of the important prognostic factors. Over half of new cases were diagnosed at advanced or distant metastatic disease with the 5-year survival rate of 3% (Table16). The higher survival (17%) in patients with localized disease was due to the opportunity of curative resection but was still low when compared with 52% 5-year survival rate of SEER data (1975-2008). The number of patients with unknown staging had been increased over 20 years and had better overall 5-year survival rate than distant metastasis.

In summary, there was no improvement of survival in lung cancer over time because the majority of patients were in advanced or metastatic stage. Main cause of lung cancer for population in this area is smoking e.g. cigarette and cheroot. So the priority of improving outcomes should consist of effective screening test for early diagnosis and the intervention to lower risk factors.

Table 16: Survival by sex, extent of disease and periods for lung cancer in Lampang Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	23	21-24	23	21-25
2	11	10-12	11	10-13
3	8	7-9	8	7-10
4	7	6-8	7	6-8
5	6	5-7	6	5-7
Extent of disease	**5-year survival**		**95% CI**	
Localized	17		11-23	
Regional	7		6-8	
Distant metastasis	3		2-4	
Unknown	7		6-9	
Morphology	**5-year survival**		**95% CI**	
Squamous cell carcinoma	4		3-5	
Adenocarcinoma	5		4-6	
Small cell carcinoma	3		2-5	

Periods	5-year relative survival Male (%)	95% CI	Female (%)	95% CI
1988-1992	8	6-11	10	6-14
1993-1997	6	5-8	8	6-11
1998-2002	7	5-9	7	5-10
2003-2007	4	3-5	2	1-3

Figure 32: Overall survival by sex for lung cancer, Lampang, Thailand, 1988-2007

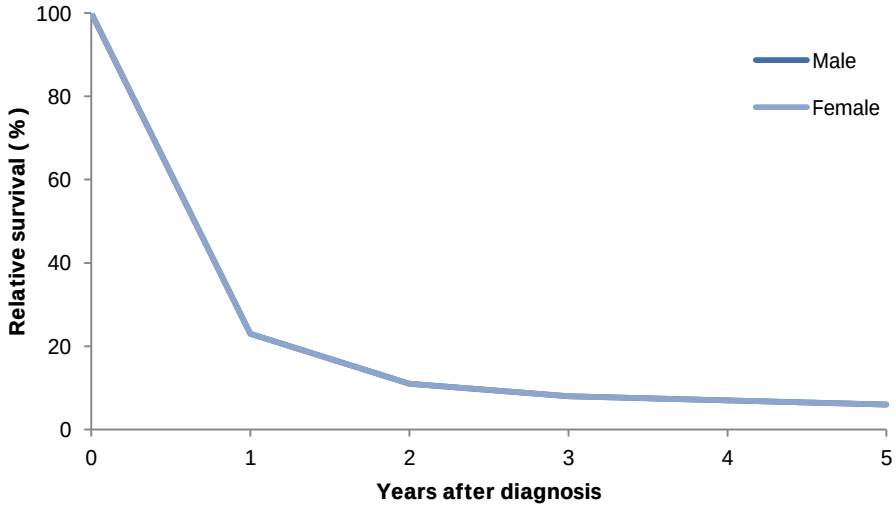


Figure 33: Overall survival by extension for lung cancer, Lampang, Thailand, 1988-2007

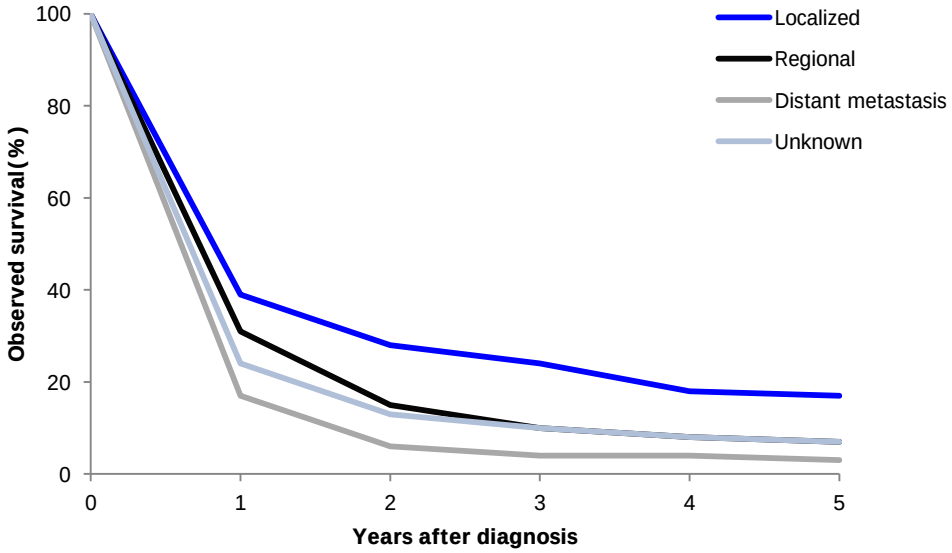
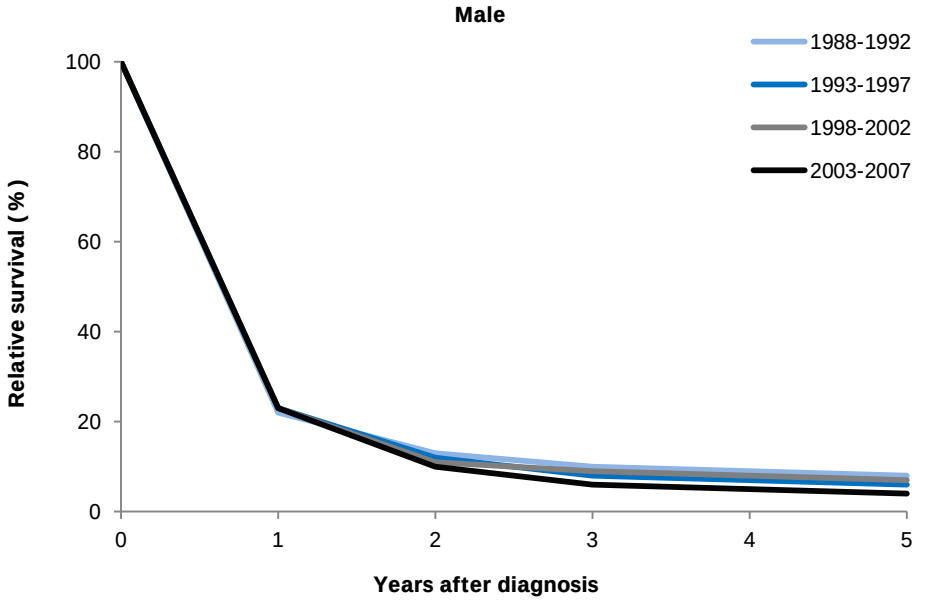
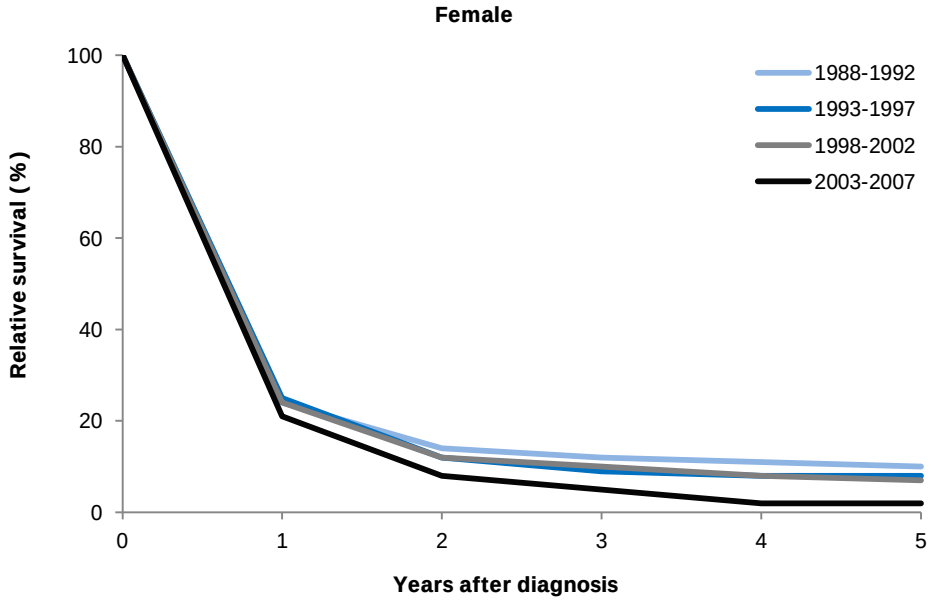


Figure 34: Survival by periods for lung cancer, Lampang, Thailand, 1988-2007





Survival by sex: The 5-year survival was slightly higher for women than for men (82% and 78% respectively) (Figure 35).

Extent of disease: The5-year survival was 76% for localized, 58% for regional, 39% for distant metastasis and 65% for unknown (Figure 36).

Time trends: In the twenty years from 1988 to 2007, 5-year survival improved from 71% to 76% in male and from 68% to 72% in female (Figure 37).

A clinician's comment: The survival rates of this cancer were high in both sexes. The best survival rate was in localized cases, considering clinical extent of disease. Furthermore, the trend of survival had not obviously changed over 20 year from 1988 to 2007.

Table 17: Survival by sex, extent of disease and periods for skin cancer in Lampang Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	87	82-92	93	90-96
2	83	77-89	89	85-93
3	81	76-89	86	82-92
4	79	73-87	84	79-90
5	78	72-87	82	76-88

Extent of disease	5-year survival	95% CI
Localized	76	71-80
Regional	58	49-67
Distant metastasis	39	17-60
Unknown	65	51-76

5-year relative survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	71	59-94	68	51-95
1993-1997	81	70-107	85	76-99
1998-2002	81	70-96	79	70-96
2003-2007	76	65-92	72	65-81

Figure 35: Overall survival by sex for skin cancer, Lampang, Thailand, 1988-2007

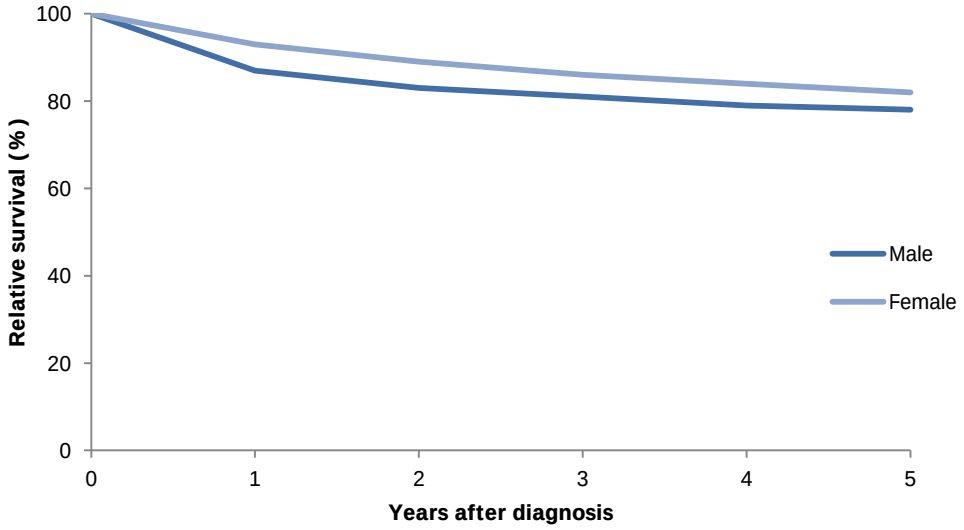


Figure 36: Overall survival by extension for skin cancer, Lampang, Thailand, 1988-2007

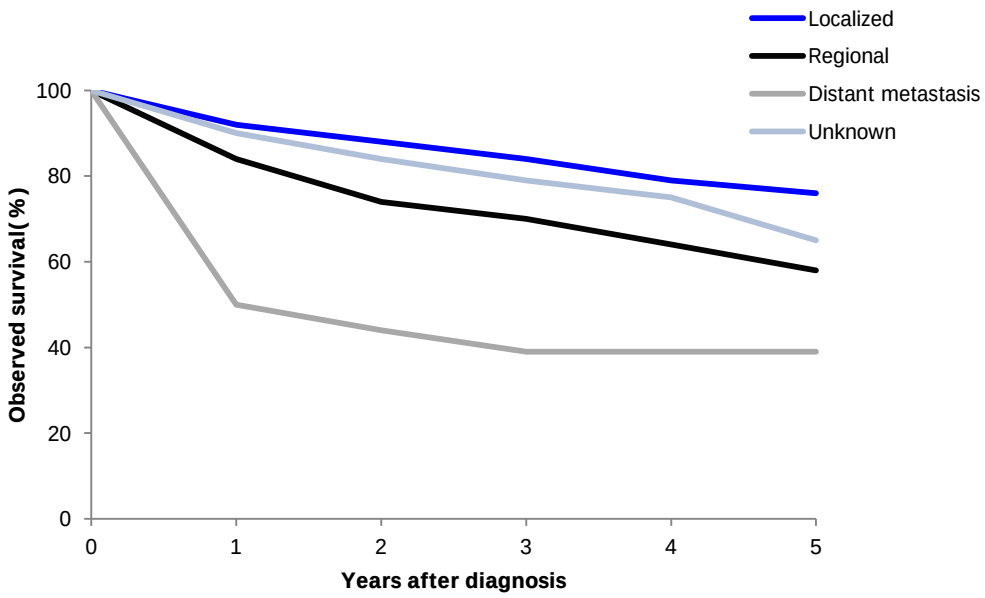
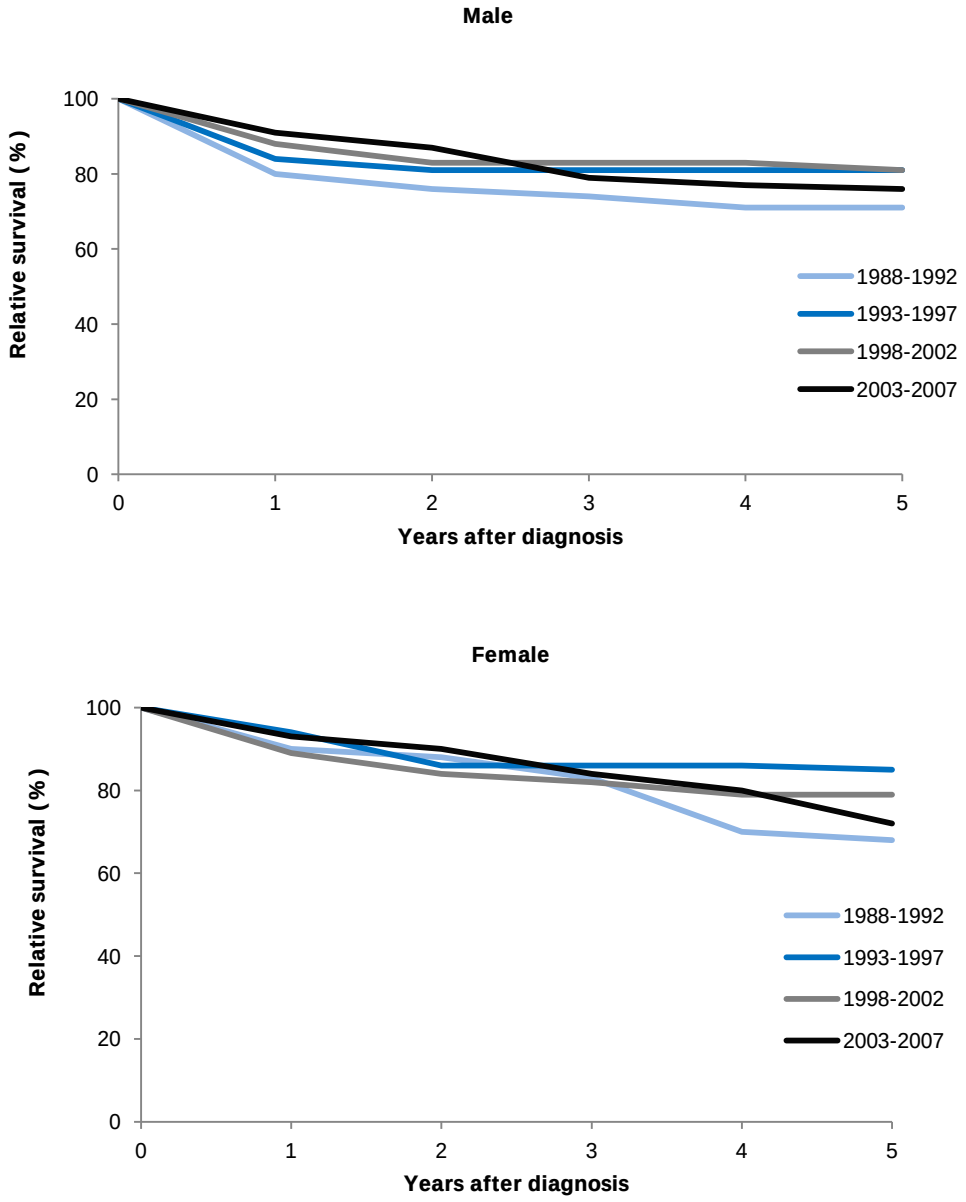


Figure 37: Survival by periods for skin cancer, Lampang, Thailand, 1988-2007



The overall 5-year survival for people in Lampang with breast cancer was 65% (Figure 38).

Extent of disease: The 5-year survival was 82% for localized, 59% for regional, 28% for distant metastasis and 78% for unknown (Figure 39).

Time trends: In the twenty years from 1988to 2007, 5-year survival improved from 51% to 69% (Figure 40).

A clinician's comment: The 18 % survival improvement over 20 years is mainly the effect of early detection, better adjuvant systemic treatments both with increasingly effective chemotherapy and then with targeted antiestrogen; tamoxifen. The screening program include mammography has largely contributed to early detection, resulted in an increase in the number of localized cancer detected and better survival rate in earlier staging (Appendix). Five-year survival rate of the unknown staging group is quite high when compared with advanced groups, so the definite staging for this group should be find out explicitly for further analysis.

Table 18: 5-year survival by years after diagnosis, extent of disease and periods for breast cancer in Lampang Thailand, 1988-2007.

Years after diagnosis	Overall relative survival (%)	95% CI
1	92	90-93
2	82	80-84
3	75	73-77
4	69	67-72
5	65	63-68
Extent of disease	**5-year survival**	**95% CI**
Localized	82	76-86
Regional	59	56-62
Distant metastasis	28	22-35
Unknown	78	73-83
Periods	**5-year relative survival (%)**	**95% CI**
1988-1992	51	44-59
1993-1997	62	57-68
1998-2002	63	58-68
2003-2007	69	66-72

Figure 38: Overall survival for breast cancer, Lampang, Thailand, 1988-2007

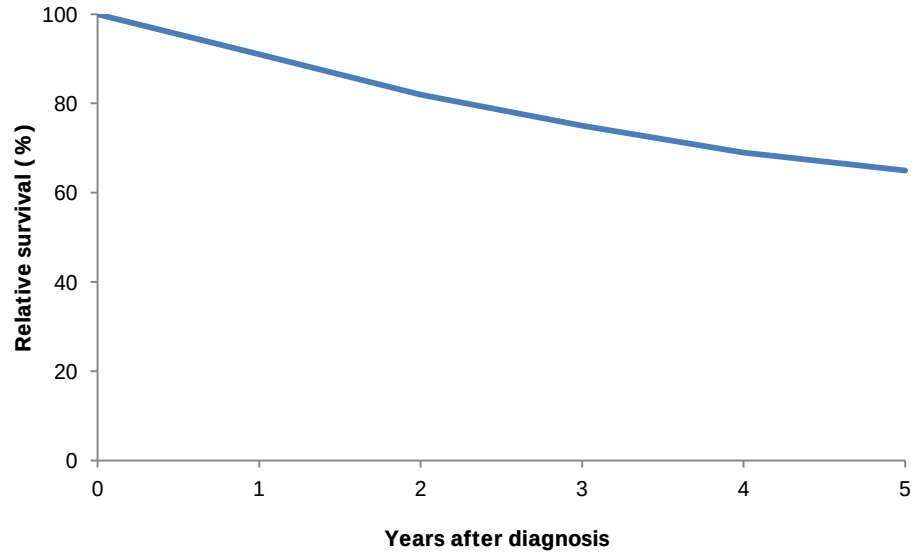


Figure 39: Overall survival by extension for breast cancer, Lampang, Thailand, 1988-2007

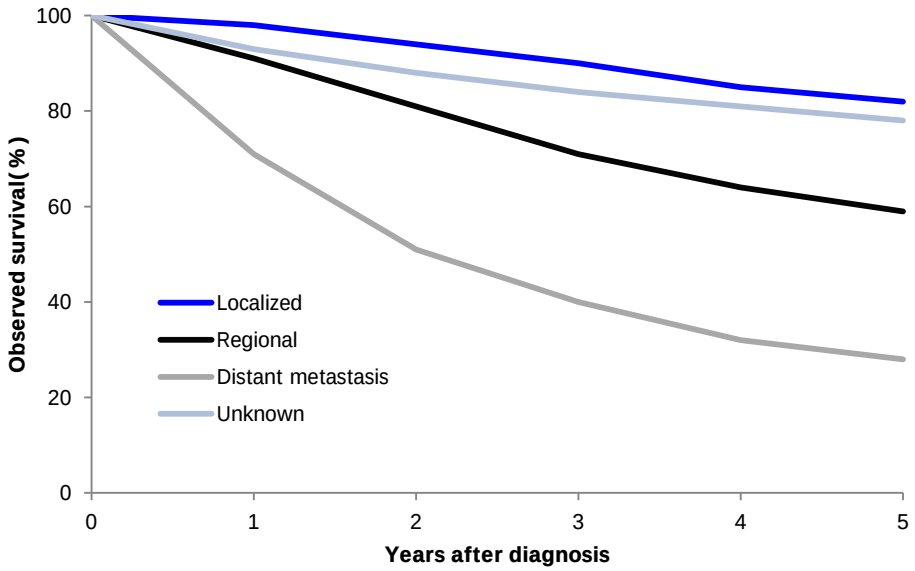
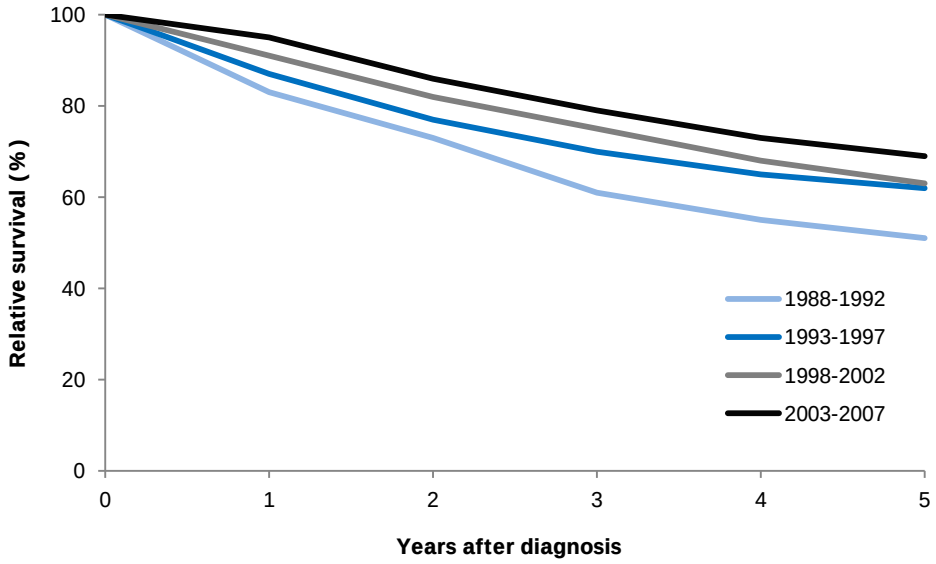


Figure 40: Survival by periods for breast cancer, Lampang, Thailand, 1988-2007



The overall 5-year survival for people in Lampang with cervical cancer was 61% (Figure 41).

Extent of disease: The 5-year survival was 81% for localized, 51% for regional, 24% for distant metastasis and 67% for unknown (Figure 42).

Time trends: In the twenty years from 1988 to 2007, 5-year survival slightly decreased from 67% to 62% (Figure 43).

A clinician's comment: Cervical cancer remains the major gynecological problem in the last 20 years. The improved survival has resulted from early diagnosis and improved treatment protocol. The comparable survival figures for squamous versus adenocarcinoma tends to be at odds with the rest of the world literature.

Table 19: 5-year survival by years after diagnosis, extent of disease and periods for cervical cancer in Lampang Thailand, 1988-2007

Years after diagnosis	Overall survival survival(%)	95% CI
1	86	85-88
2	76	74-78
3	69	67-71
4	64	62-66
5	61	58-63
Extent of disease	**5-year survival (%)**	**95% CI**
Localized	81	77-85
Regional	51	48-54
Distant metastasis	24	16-33
Unknown	67	60-73
Morphology	**5-year survival (%)**	**95% CI**
Squamous cell carcinoma	57	54-59
Adenocarcinoma	57	51-63
Periods	**5-year survival (%)**	**95% CI**
1988-1992	67	62-73
1993-1997	54	49-60
1998-2002	57	52-62
2003-2007	62	58-67

Figure 41: Overall survival for cervical cancer, Lampang, Thailand, 1988-2007

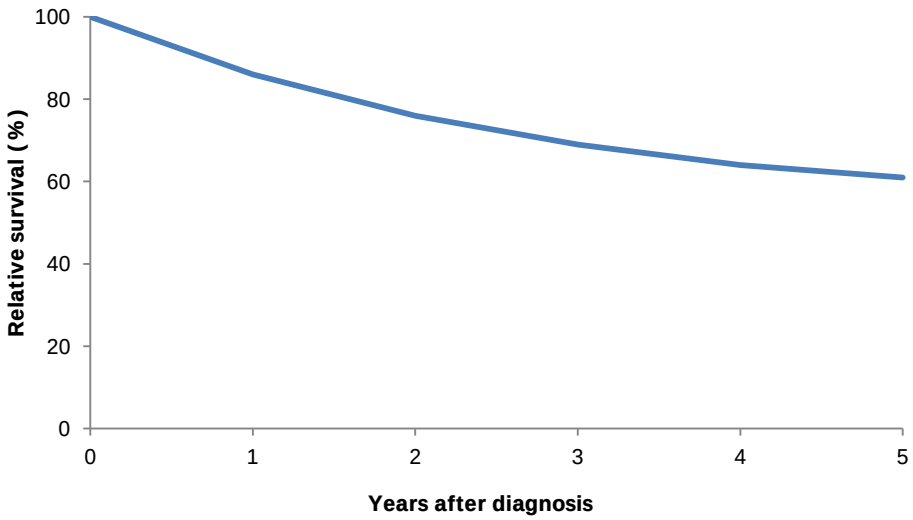


Figure 42: Overall survival by extension for cervical cancer, Lampang, Thailand, 1988-2007

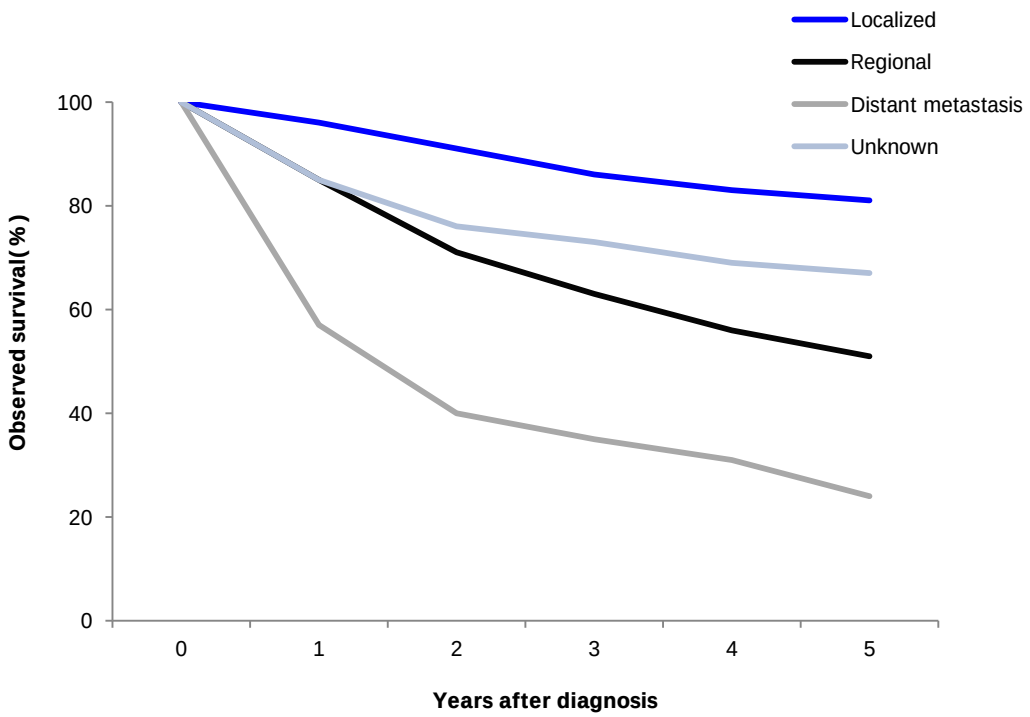
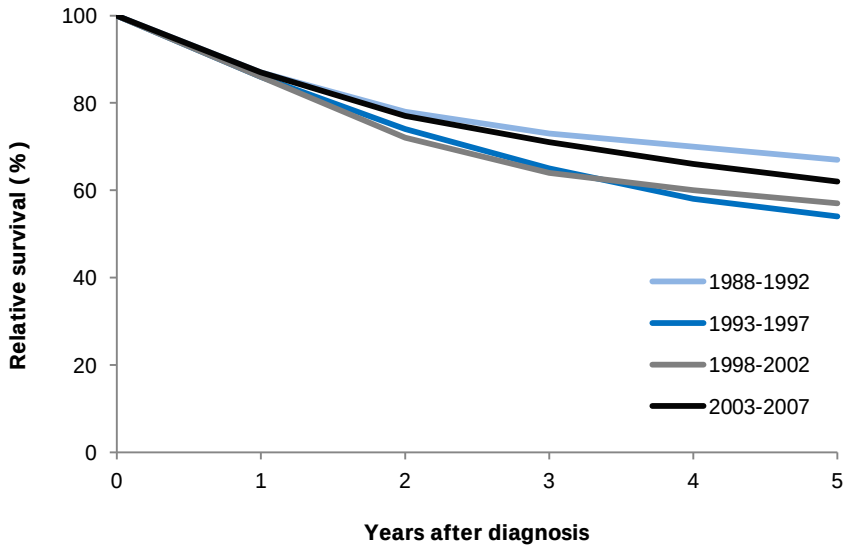


Figure 43: Survival by periods for cervical cancer, Lampang, Thailand, 1988-2007



The overall 5-year survival for people in Lampang with uterine cancer was 71% (Figure 44).

Extent of disease: The 5-year survival was 79% for localized was, 65% for regional, 22% for distant metastasis and 80% for unknown (Figure 45).

Time trends: In the twenty years from 1988 to 2007, 5-year survival improved from 68% to 72% (Figure 46).

A clinician's comment: Survival for uterine cancer continues to creep up due to the increase in multimodality treatments, including surgery, chemotherapy, radiotherapy and hormonal therapy. Moreover, the improvement in survival is most likely due to the better palliative care.

Table 20: Survival by years after diagnosis, extent of disease and periods for uterine cancer in Lampang Thailand, 1988-2007.

Years after diagnosis	Overall relative survival (%)	95% CI
1	87	83-92
2	80	75-86
3	71	70-82
4	73	66-80
5	71	65-78
Extent of disease	**5-year survival (%)**	**95% CI**
Localized	79	67-88
Regional	65	53-75
Distant metastasis	22	8-40
Unknown	80	63-90
Periods	**5-year relative survival (%)**	**95% CI**
1988-1992	68	55-94
1993-1997	63	50-82
1998-2002	70	58-86
2003-2007	72	63-83

Figure 44: Overall survival for uterine cancer, Lampang, Thailand, 1988-2007

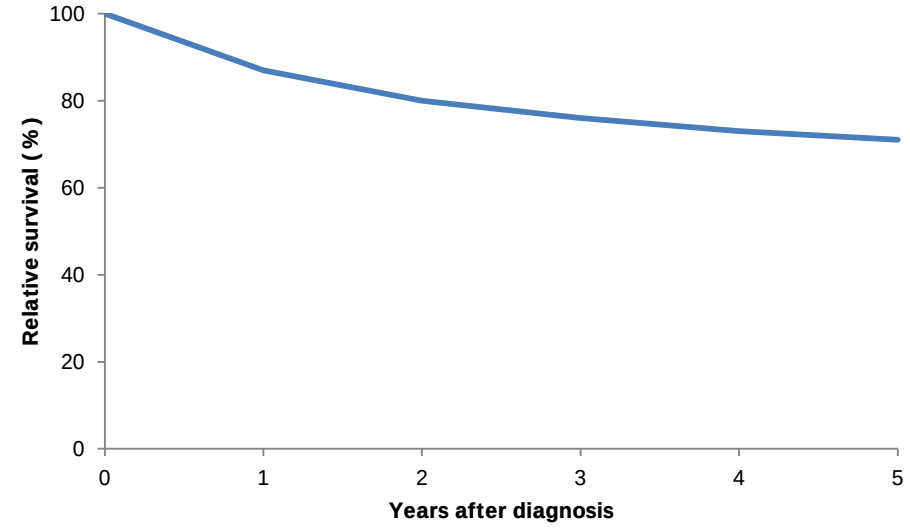


Figure 45: Overall survival by extension for uterine cancer, Lampang, Thailand, 1988-2007

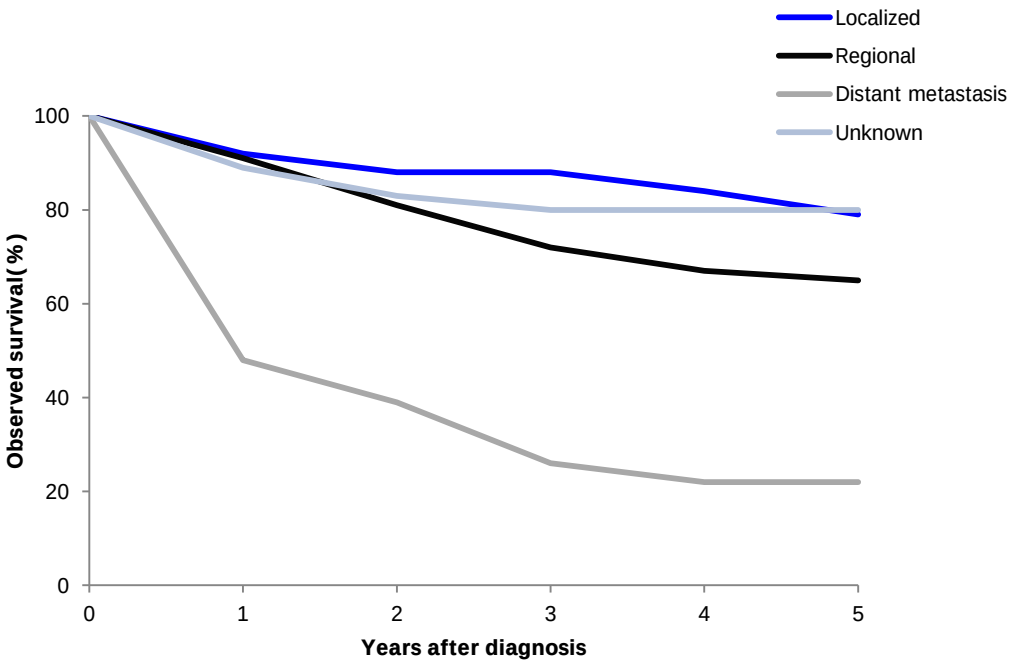
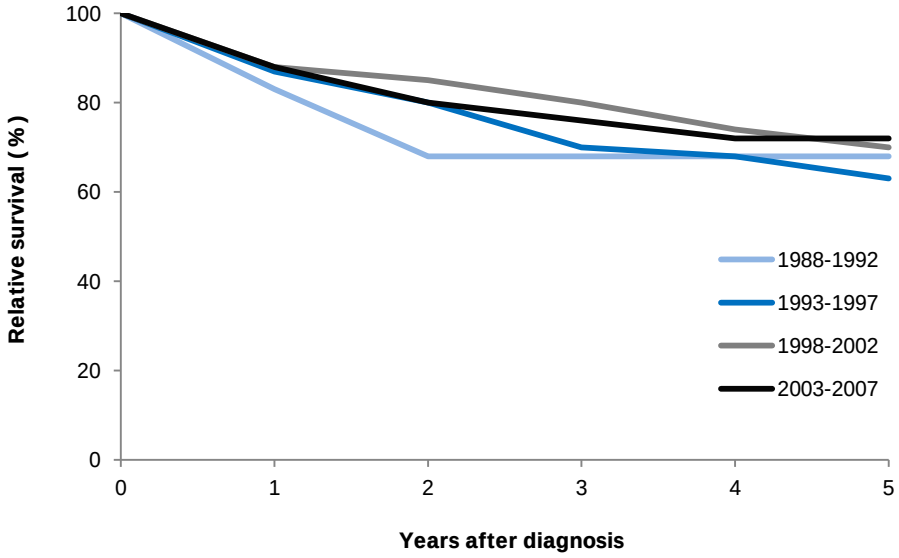


Figure 46: Survival by periods for uterine cancer, Lampang, Thailand, 1988-2007



The overall 5-year survival for people in Lampang with ovarian cancer was 49% (Figure 47).

Extent of disease: The 5-year survival was 79% for localized, 43% for regional, 17% for distant metastasis and 69% for unknown (Figure 48).

Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 51% to 44% (Figure 49).

A clinician's comment: Overall survival of ovarian cancer has not improved over 20 years because more patients were diagnosed with advanced stage. However, if the better screening method is found and this cancer can be detected earlier, the increase in overall survival is likely to occur.

Table 21: Survival by years after diagnosis, extent of disease and periods for ovarian cancer in Lampang Thailand, 1988-2007.

Years after diagnosis	Overall relative survival (%)	95% CI
1	73	68-77
2	61	56-66
3	54	49-59
4	51	46-56
5	49	44-54
Extent of disease	**5-year observed survival (%)**	**95% CI**
Localized	79	69-86
Regional	43	34-52
Distant metastasis	17	10-24
Unknown	69	54-80
Periods	**5-year relative survival (%)**	**95% CI**
1988-1992	51	39-66
1993-1997	49	39-64
1998-2002	50	41-61
2003-2007	44	36-53

Figure 47: Overall survival for ovarian cancer, Lampang, Thailand, 1988-2007

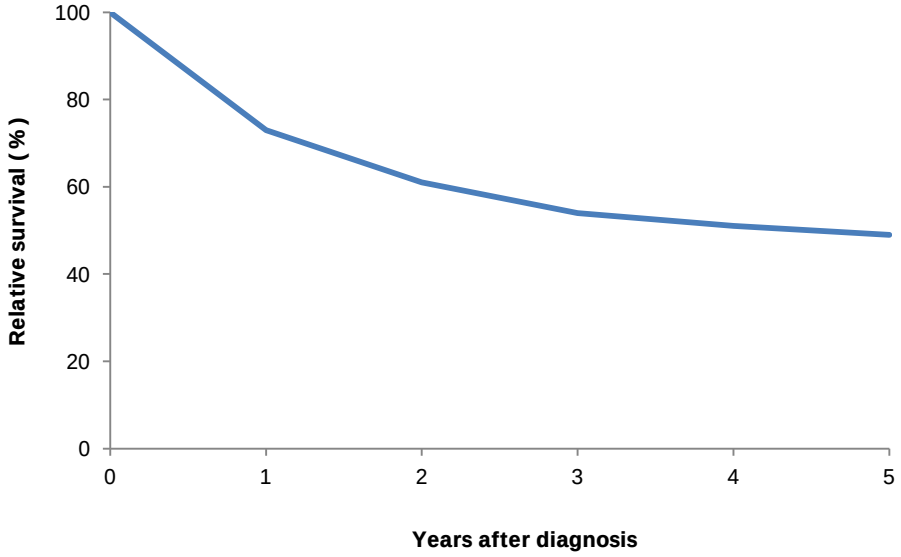


Figure 48: Overall survival by extension for ovarian cancer, Lampang, Thailand, 1988-2007

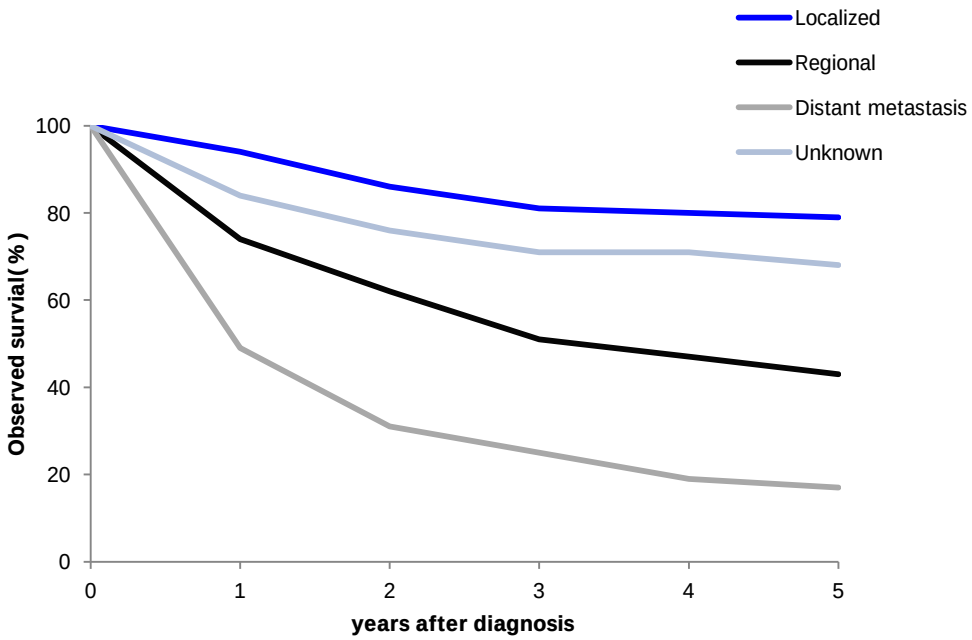
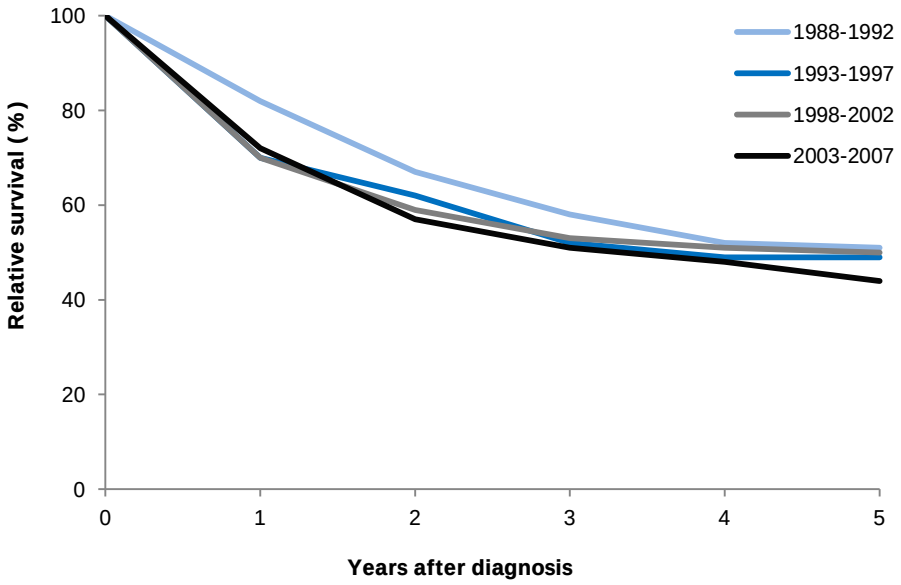


Figure 49: Survival by periods for ovarian cancer, Lampang, Thailand, 1988-2007



The overall 5-year survival for people in Lampang with prostate cancer was 46% (Figure 50).

Extent of disease: The 5-year survival was 39% for localized, 40% for regional 17% for distant metastasis and 37 % for unknown (Figure 51).

Time trends: In the twenty years from 1988 to 2007, 5-year survival improved from 40% to 43% (Figure 52).

A clinician's comment: Significant improvement of survival has not been observed in the past 20 years. Most of patients suffer from locally advanced and metastatic disease which may reflect average survival outcome.

Table 22: 5-year survival by years after diagnosis, extent of disease and periods for prostate cancer in Lampang Thailand, 1988-2007

Years after diagnosis	Overall relative survival l (%)	95% CI
1	84	79-88
2	72	66-77
3	61	55-68
4	53	47-60
5	46	40-54
Extent of disease	**5-year observe survival(%)**	**95% CI**
Localized	39	27-51
Regional	40	30-49
Distant metastasis	17	8-29
Unknown	37	27-47
Periods	**5-year relative survival(%)**	**95% CI**
1988-1992	40	27-73
1993-1997	47	33-66
1998-2002	54	42-69
2003-2007	43	33-56

Figure 50: Overall survival for prostate cancer, Lampang, Thailand, 1988-2007

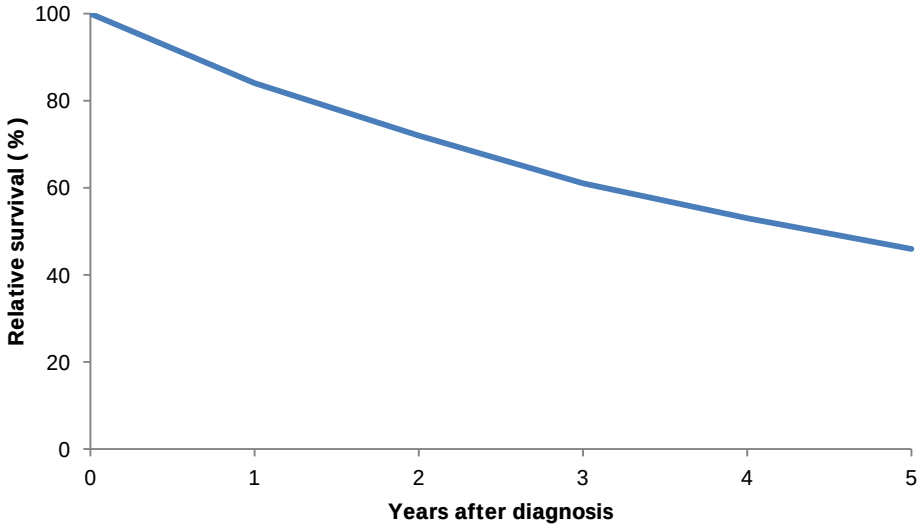


Figure 51: Overall survival by extension for prostate cancer, Lampang, Thailand, 1988-2007

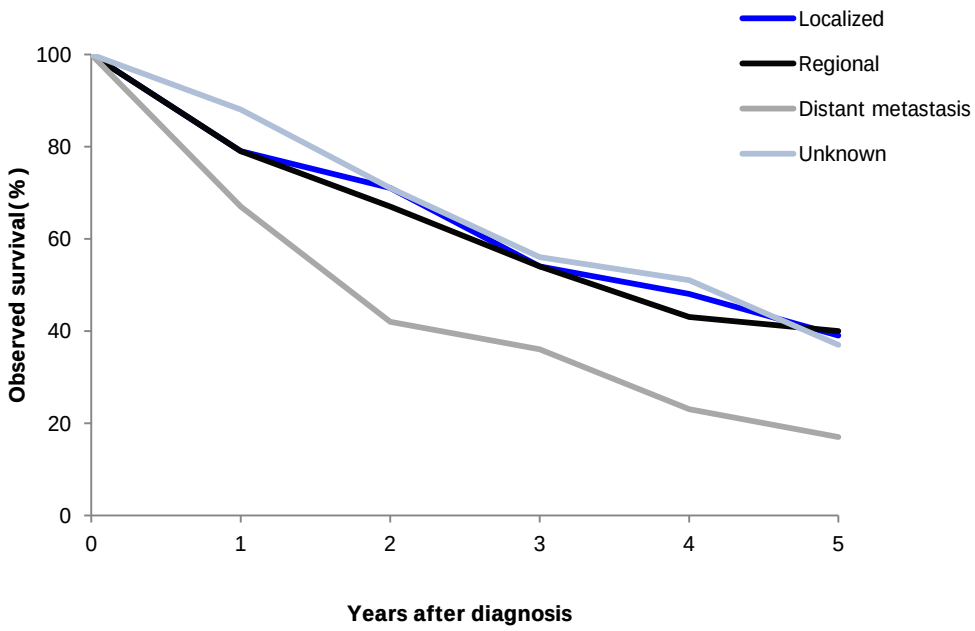
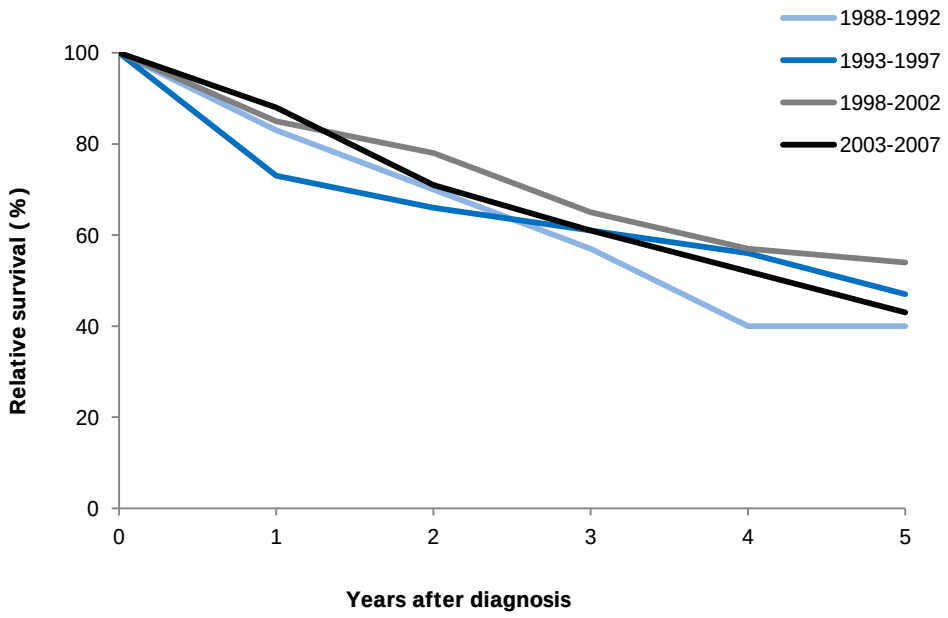


Figure 52: Survival by periods for prostate cancer, Lampang, Thailand, 1988-2007



Survival by sex: The 5-year survival was slightly higher for men than for women (42% and 31% respectively) (Figure 53).
Extent of disease: The 5-year survival was 49% for localized, 33% for regional, 8% for distant metastasis and 34% for unknown (Figure 54).
Time trends: In the twenty years from 1988 to 2007, 5-year survival improved from 40% to 47%in male and from 8% to 29% in female (Figure 55).
A clinician's comment: Bladder cancer remains a major uro-oncology problem. The survival was higher for men (42%) than women (31%) suggesting an impact of delay to diagnosis. Many women presenting with hematuria were treated as having an infection rather than being investigated for potential bladder cancer. Possible reasons for the poor outcomes include staging errors with delayed to diagnosis and treatment and prolonged attempts of bladder preservation.

Table 23: 5-year survival by sex, extent of disease and periods for bladder cancer in Lampang Thailand, 1988-2007

Overall survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	74	70-79	60	52-69
2	59	54-65	46	38-56
3	51	46-57	37	29-47
4	47	41-53	35	28-45
5	42	36-48	31	24-41
Extent of disease	5-year survival (%)		95% CI	
Localized	49		38-59	
Regional	33		27-39	
Distant metastasis	8		3-16	
Unknown	34		26-44	
5-year relative survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	40	27-58	8	1-53
1993-1997	40	30-55	35	21-59
1998-2002	39	30-51	35	21-60
2003-2007	47	37-59	29	19-45

Figure 53: Overall survival by sex for bladder cancer, Lampang, Thailand, 1988-2007

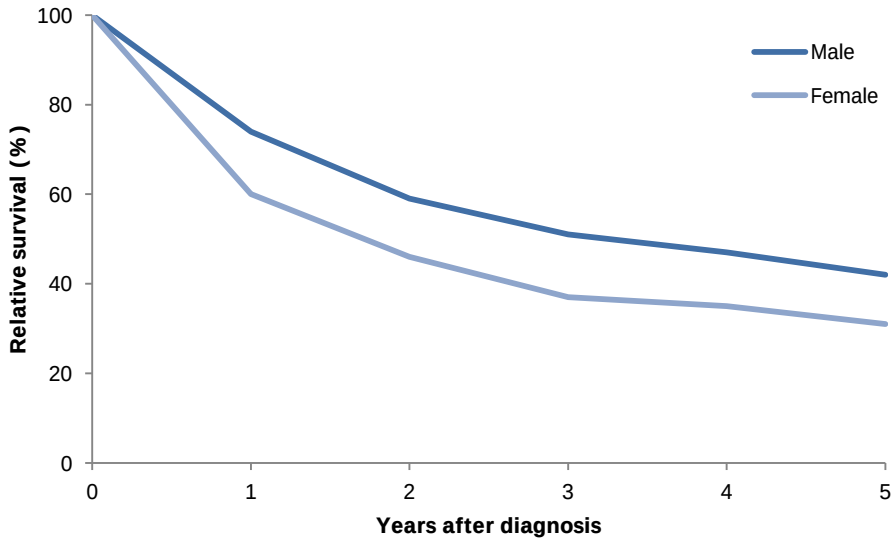


Figure 54: Overall survival by staging for bladder cancer, Lampang, Thailand, 1988-2007

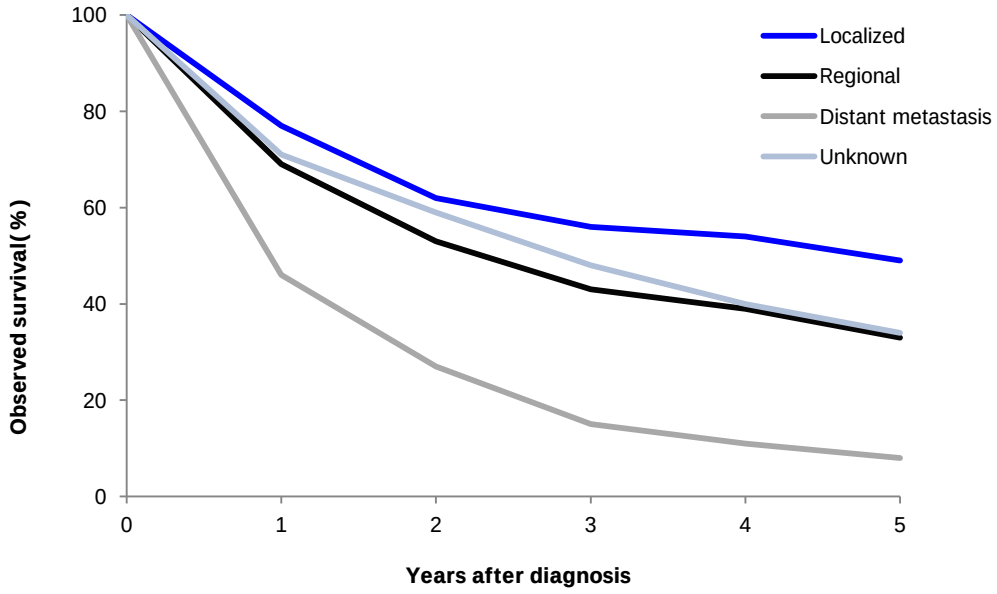
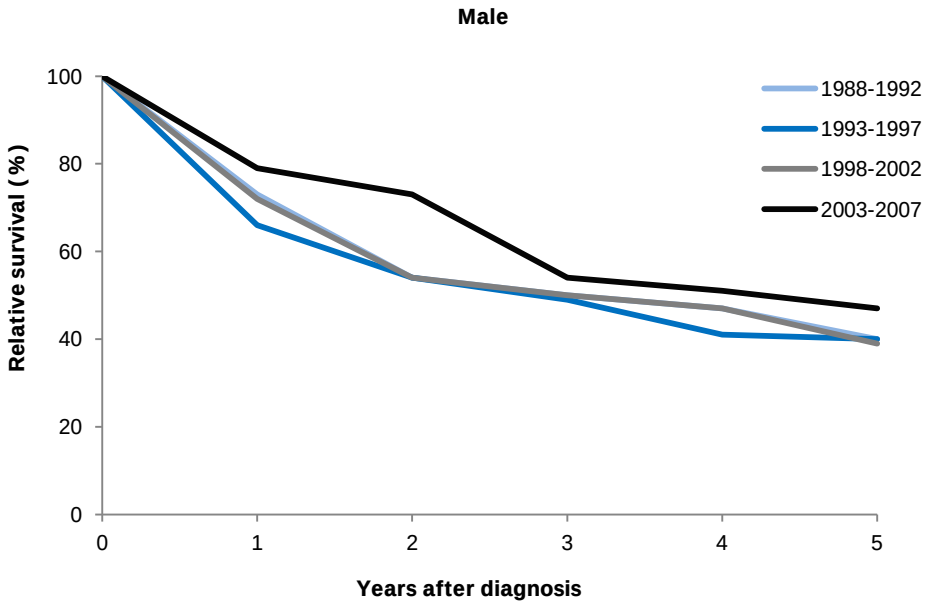
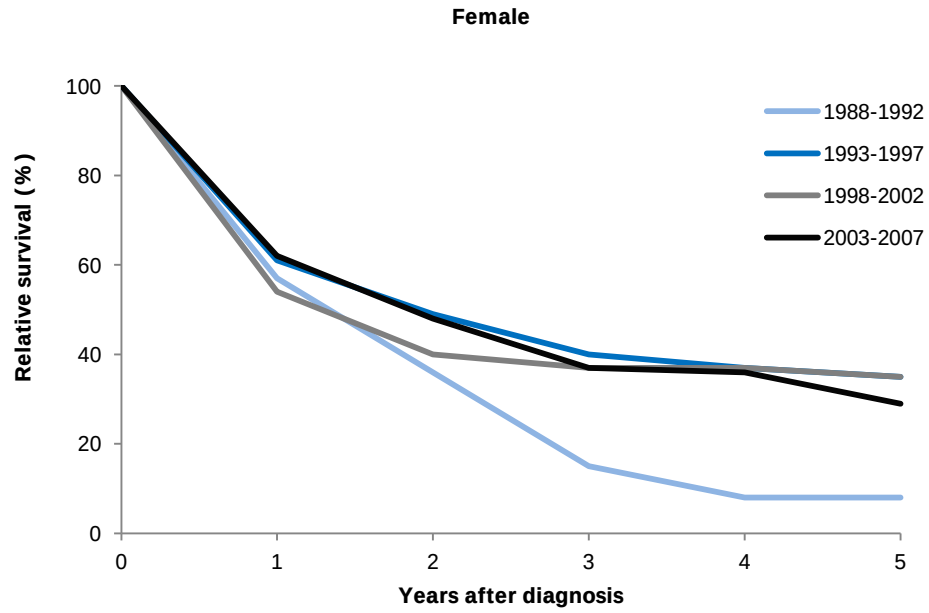


Figure 55: Survival by periods for bladder cancer, Lampang, Thailand, 1988-2007





Survival by sex: 5-year survival was slightly higher for women than for men (72% and 49% respectively) (Figure 56).

Extent of disease: The 5- year survival was 85% for localized, 63% for regional, 13% for distant metastasis and 72% for unknown (Figure 57).

Time trends: In the twenty years from 1988 to 2007, 5-year survival improved from 42% to 48% in male and from 51% to 78% in female (Figure 58).

A clinician's comment: There are many factors, which improve the overall survival in thyroid cancer, such as early detection and surgery, pathological result, adequate radioactive iodine therapy and thyroid hormone suppression therapy. The 5-year-survival depends on thyroid cancer staging. In early stage, the 5-year-survival is excellent. So early detection and early treatment have important factor for improvement of the survival.

Table 24: 5-year survival by sex, extent of disease, morphology and periods for thyroid cancer in Lampang Thailand, 1988-2007.

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	72	60-86	80	76-86
2	60	47-77	76	71-82
3	55	43-75	75	70-81
4	54	42-74	74	68-80
5	49	35-69	72	66-79

Extent of disease	5-year survival(%)	95% CI
Localized	85	75-91
Regional	63	54-72
Distant metastasis	13	5-27
Unknown	72	58-82

Morphology	5-year survival(%)	95% CI
Papillary carcinoma	84	76-90
Follicular carcinoma	72	60-81
Medullary carcinoma	69	21-91

5-year relative survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	42	15-112	51	37-76
1993-1997	61	40-118	76	65-94
1998-2002	42	22-82	63	52-78
2003-2007	48	27-85	78	69-87

Figure 56: Overall survival by sex for thyroid cancer, Lampang, Thailand, 1988-2007

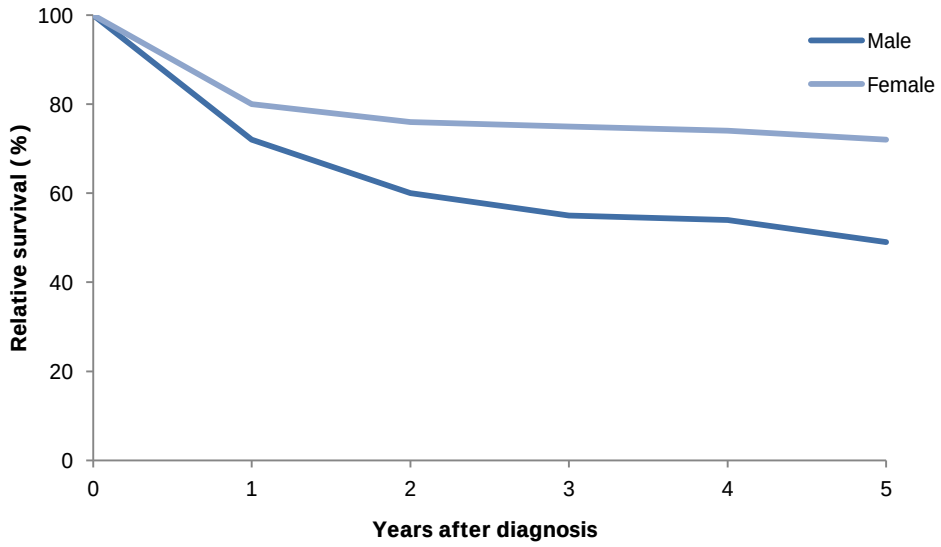


Figure 57: Overall survival by extension for thyroid cancer, Lampang, Thailand, 1988-2007

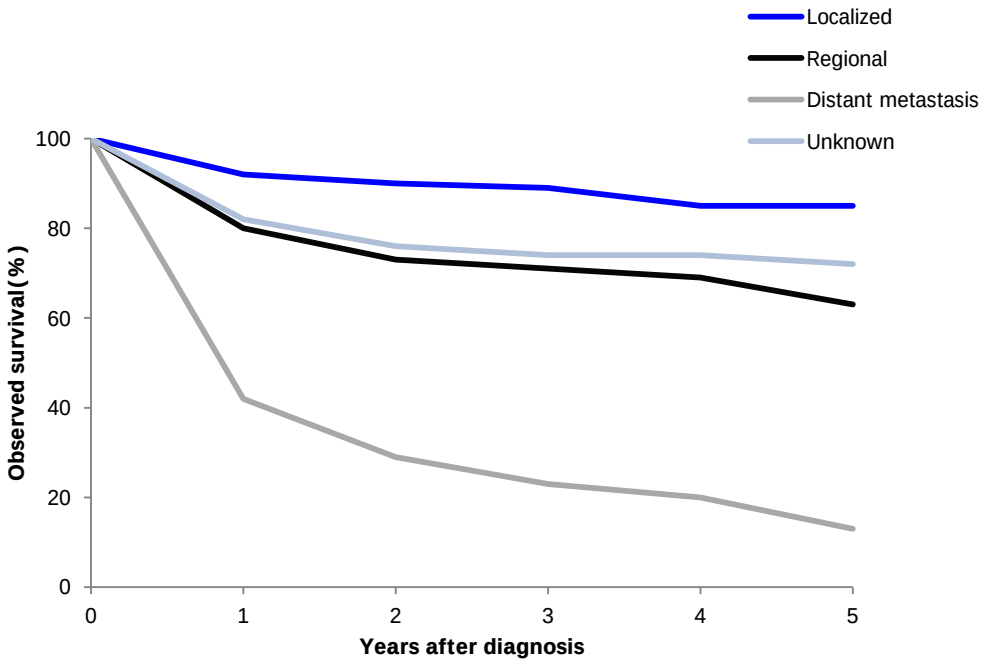
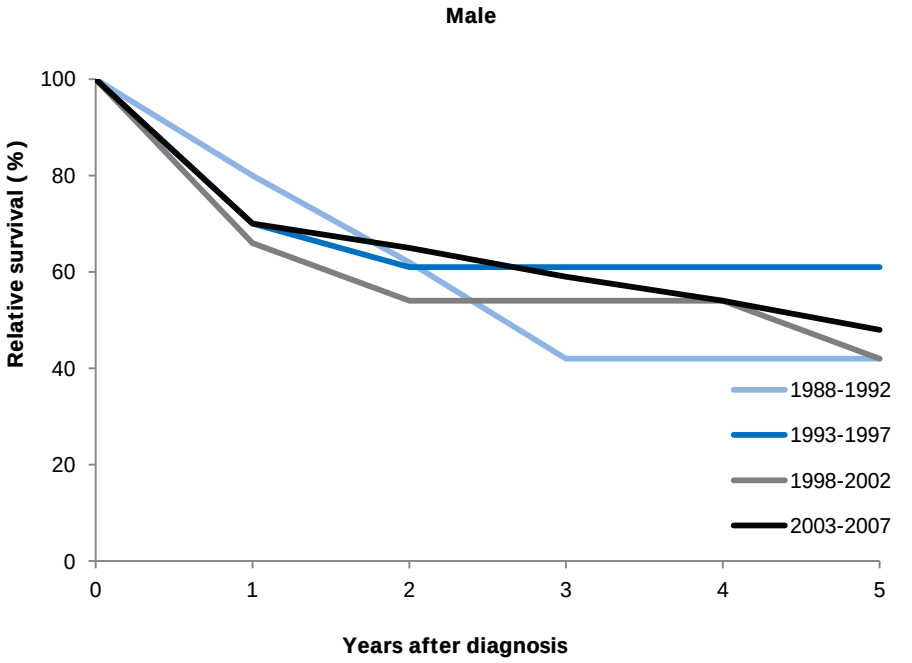
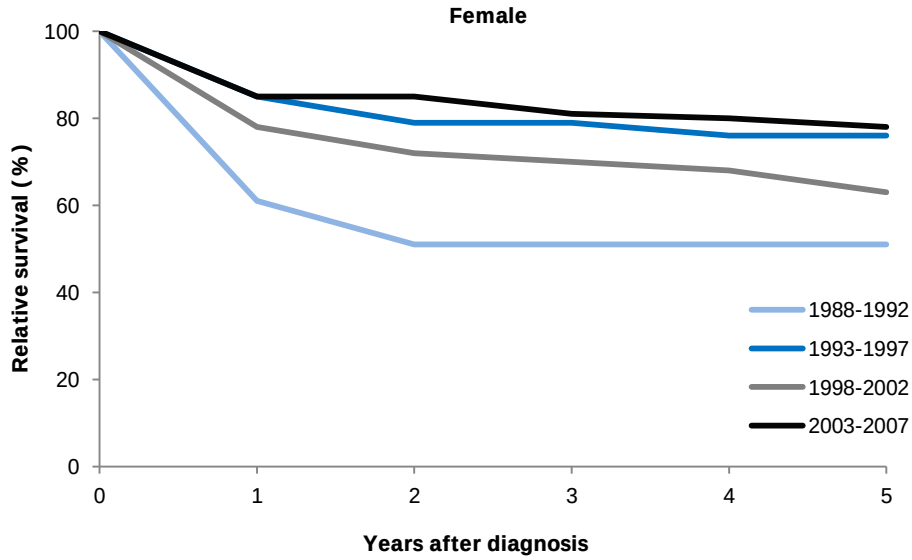


Figure 58: Survival by periods for thyroid cancer, Lampang, Thailand, 1988-2007





Survival by sex: The5-year survival was slightly higher for women than for men (36% and 27% respectively) (Figure 59).

Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 32% to 16% in male and from 48% to 22% in female (Figure 60).

A clinician's comment: The number of five-year survival seems to decrease due to the advancement of diagnostic tools which lead to more diagnosis of the disease. However, staging, cell type and international prognostic index (IPI) are important data of expected survival. The limited accessibility to certain drug, infection, complication of treatment and the completeness of follow up can also effect the survival.

Table 25: 5-year relative survival by sex and periods for lymphoma in Lampang Thailand, 1988-2007

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	56	52-61	53	47-59
2	44	39-49	41	36-48
3	36	31-41	39	33-45
4	32	27-37	38	32-44
5	27	23-33	36	31-43
5-year relative survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	32	23-45	48	34-67
1993-1997	28	20-39	37	27-51
1998-2002	36	27-48	41	32-54
2003-2007	16	10-26	22	14-34

Figure 59: Overall relative survival by sex for lymphoma, Lampang, Thailand, 1988-2007

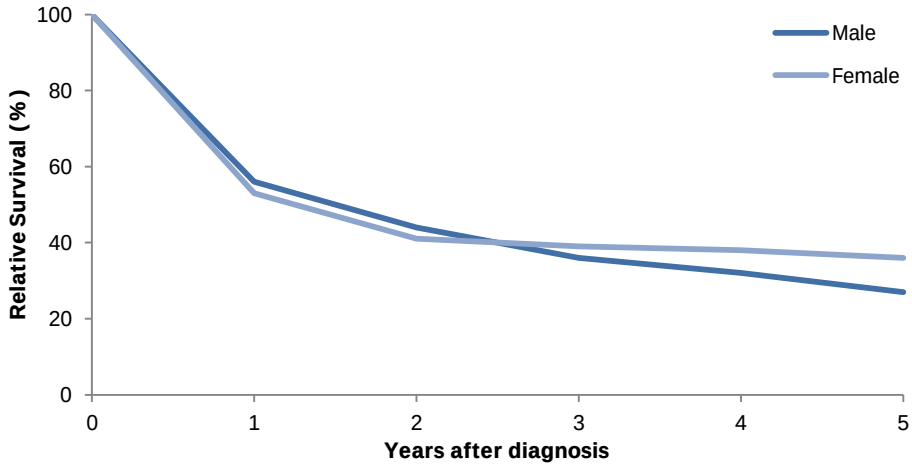
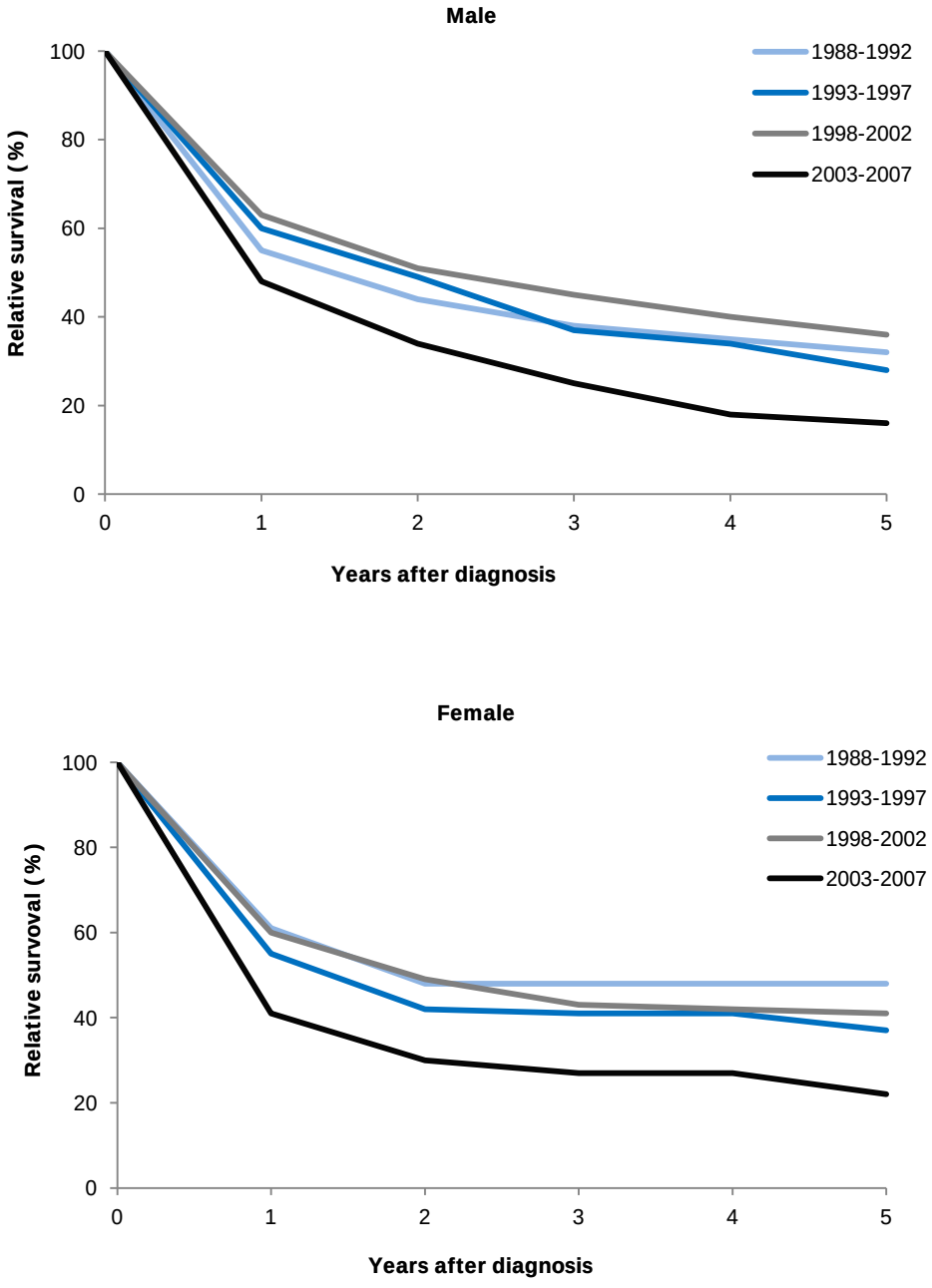


Figure 60: Relative survival by periods for lymphoma, Lampang, Thailand, 1988-2007



Survival by sex: The 5-year survival was slightly higher for women than for men (21% and 19% respectively) (Figure 61).
Time trends: In the twenty years from 1988 to 2007, 5-year survival decreased from 22% to 16% in male and from 21% to 16% in female (Figure 62).
A clinician's comment: The decrease in five-year survival rates for leukemia may be due to more diagnosis of the disease from the advancement of diagnostic tools such as Flow cytometry, chromosome study and molecular study. Furthermore, the limited accessibility to certain treatment such as the transplantation and drugs may be the cause of survival rate decreasing.

Table 26: 5-year relative survival by sex and periods for leukemia in Lampang Thailand, 1988-2007.

Overall relative survival				
Years after diagnosis	Male		Female	
	(%)	95% CI	(%)	95% CI
1	46	41-51	44	38-50
2	33	28-39	32	26-38
3	26	22-32	27	22-32
4	22	17-27	22	18-28
5	19	15-24	21	16-27
5-year relative survival				
Periods	Male		Female	
	(%)	95% CI	(%)	95% CI
1988-1992	22	13-37	21	11-40
1993-1997	18	11-29	21	12-38
1998-2002	20	13-32	25	16-38
2003-2007	16	9-28	16	10-27

Figure 61: Overall relative survival by sex for leukemia, Lampang, Thailand, 1988-2007

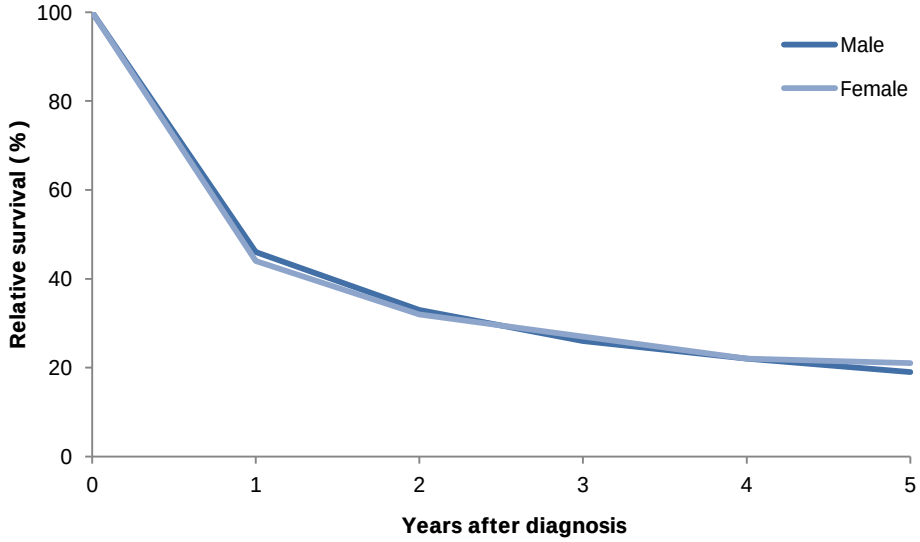
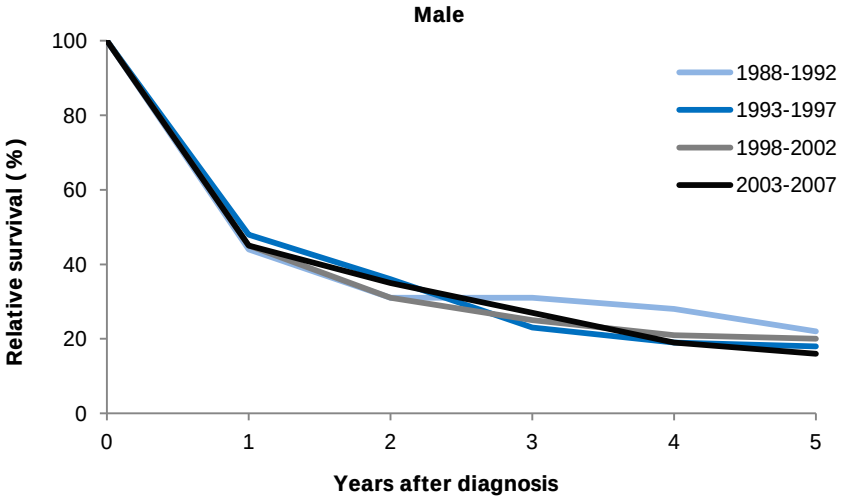
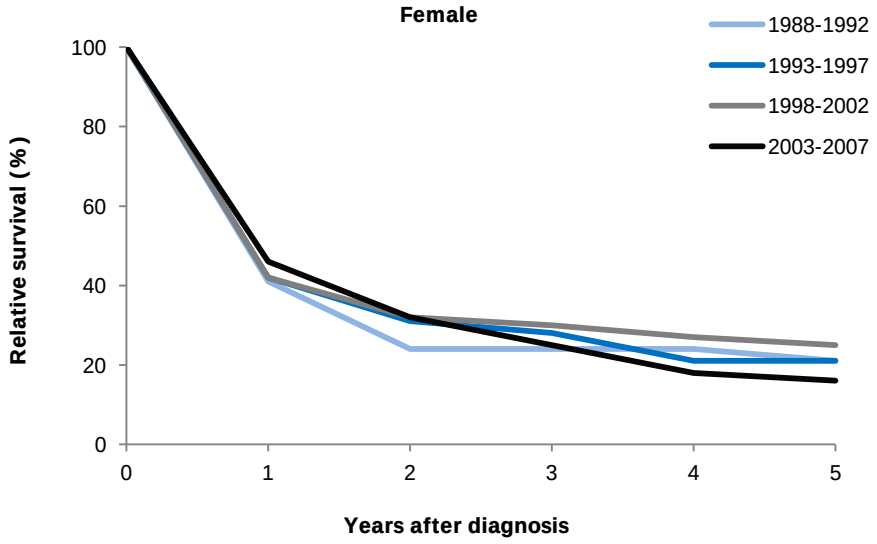


Figure 62: Survival by periods for leukaemia, Lampang, Thailand, 1988-2007





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APPENDIX

Table 27: Relative survival by site in Lampang, Thailand, 1988-2007.

Year after diagnosis	Male (%; 95% CI)					Female (%; 95% CI)				
	1	2	3	4	5	1	2	3	4	5
Oral cavity	56	39	32	25	23	55	45	39	35	34
	50 - 63	33 - 47	26 - 39	20 -33	17 - 30	49 - 63	39 - 53	33 - 46	29 - 43	28 -42
Nasopharynx	71	51	39	32	27	71	53	45	38	32
	65 - 78	44 - 59	33 - 47	26 - 40	21 - 35	63-80	44-64	36-56	29-49	24-43
Stomach	36	20	16	13	9	39	25	19	16	11
	31 - 41	16 - 25	13 - 21	10 - 17	6 -13	33-45	20 - 31	15 - 25	12 - 22	8 - 17
Colon	60	46	41	37	34	65	53	47	40	39
	56 -65	42 - 51	36 - 46	33 - 43	29 - 39	61 - 70	48 - 59	41 - 52	35 - 46	33 - 45
Rectum	69	48	33	28	24	68	52	42	36	34
	64 - 74	42 - 54	28 - 40	23 - 34	19 - 31	62 - 74	46 - 59	36 - 49	30 - 44	27 - 41
Liver	14	8	6	5	5	18	11	9	8	7
	13 - 16	7 - 10	5 - 7	4 - 6	4 - 6	16 - 21	9 - 13	7 - 11	6 - 10	5 - 9
Larynx	56	42	33	30	29	58	42	38	33	30
	49 - 64	35 - 50	26 -41	24 - 39	23 - 39	48 - 71	32 - 56	28 - 53	23 - 47	20 -45
Lung	23	11	8	7	6	23	11	8	7	6
	21 - 24	10 - 12	7 - 9	6 - 8	5 - 7	21 - 25	10 - 13	7 - 10	6 - 8	5 - 7
Skin	87	83	81	79	78	93	89	86	84	82
	82 - 92	77 - 89	76 - 89	73 - 87	72 - 87	90 - 96	85 - 93	82 - 92	79 - 90	76 - 88
Breast						91	82	75	69	65
						90 - 93	80 - 84	73 - 77	67 - 72	63 - 68
Cervix						86	76	69	64	61
						85 - 88	74 - 78	67 - 71	62 - 66	58 - 63
Corpus uteri						87	80	76	73	71
						83 - 92	75 - 86	70 - 82	66 - 80	65 - 78
Ovary						73	61	54	51	49
						68 - 77	56 - 66	49 - 59	46 - 56	44 - 54
Prostate	84	72	61	53	46					
	79 - 88	66 - 77	55 - 68	47 -60	40 - 54					
Bladder	74	59	51	47	42	60	46	37	35	31
	70 - 79	54 -65	46 - 57	41 -53	36 - 48	52 - 69	38 - 56	29 - 47	28 - 45	24 - 41
Thyroid	72	60	55	54	49	80	76	75	74	72
	60 - 86	47 - 77	43 - 75	42 - 74	35 - 69	76 - 86	71 - 82	70 - 81	68 - 80	66 - 79
lymphoma	56	44	36	32	27	53	41	39	38	36
	52 -61	39 - 49	31 - 41	27 - 37	23 - 33	47 - 59	36 - 48	33 - 45	32 - 44	31 - 43
Leukaemia	46	33	26	22	19	44	32	27	22	21
	41 - 51	28 - 39	22 - 32	17 - 27	15 -24	38 - 50	26 - 38	22 - 32	18 - 28	16 - 27

Table 28: Relative survival by site inLampang, Thailand, 1988-1992.

Year after diagnosis	Male (%; 95% CI)					Female (%; 95% CI)				
	1	2	3	4	5	1	2	3	4	5
Oral cavity	52	37	34	26	22	60	45	40	40	35
	38 - 71	25 - 58	21 - 54	15 - 47	11 - 42	47-77	33-63	27-58	28-60	23-54
Nasopharynx	66	47	33	30	30	76	61	51	40	29
	52 - 84	33 - 60	21 - 54	18 - 52	19 -53	59-97	43-87	33-79	23-71	14-60
Stomach	41	23	18	17	11	55	33	31	23	17
	31 - 53	16 -35	11 -30	10 - 30	5 - 22	43-69	22-48	21-47	14-39	9-33
Colon	57	51	44	42	41	73	65	61	55	55
	45 -72	39 - 68	31 - 61	30 - 61	29 - 60	61 - 87	52 - 81	48 - 78	42 - 73	43 - 75
Rectum	53	42	35	35	29	60	47	36	30	30
	40 - 70	29 - 41	22 - 54	23 - 57	16 - 52	45-79	32-67	23-57	18-52	19-54
Liver	15	10	9	7	7	14	8	8	5	5
	12 - 20	7 - 14	6 - 13	4 - 11	4 - 11	10-21	7-14	4-12	3-11	3-11
Larynx	63	49	38	38	38	52	48	48	44	41
	50 - 79	36 - 67	26 - 57	27 - 60	26 - 60	34-78	30-75	31-77	27-74	24-71
Lung	22	13	10	9	8	24	14	12	11	10
	19 - 26	10 - 16	8 - 13	7 - 12	6 - 11	20-30	11-19	8-17	8-16	6-14
Skin	80	76	74	71	71	90	88	83	70	68
	68 - 94	64 - 93	62 - 93	57 - 91	59 - 94	79-103	77-104	69-102	53-94	51-95
Breast						83	73	61	55	51
						79-89	67-79	54-68	48-63	44-59
Cervix						87	78	73	70	67
						83-90	74-83	69-78	65-75	62-73
Corpus uteri						83	68	68	68	68
						70-99	52-89	53-91	54-92	55-94
Ovary						82	67	58	52	51
						73-93	56-80	47-73	41-68	39-66
Prostate	83	70	57	40	40					
	70 - 99	55 - 91	42 - 82	25 - 67	27 - 73					
Bladder	73	54	50	47	40	57	36	15	8	8
	63 - 86	42 - 69	37 - 66	35 - 65	27 - 58	37-89	18-73	4-54	1-51	1-53
Thyroid	80	62	42	42	42	61	51	51	51	51
	53- 102	30- 104	14- 106	5 - 109	15- 112	46-82	35-73	36-74	36-75	37-76
Lymphoma	55	44	38	35	32	61	48	48	48	48
	45 - 67	34 - 57	28 - 51	26 - 48	23 - 45	48-78	35-66	35-67	36-68	34-67
Leukaemia	44	31	31	28	22	41	24	24	24	21
	33 - 59	21 - 46	21 - 47	18 - 43	13 - 37	28-59	13-43	13-43	14-43	11-40

Table 29: Relative survival by site in Lampang, Thailand, 1993-1997.

Year after diagnosis	Male (%; 95% CI)					Female (%; 95% CI)				
	1	2	3	4	5	1	2	3	4	5
Oral cavity	61	47	34	33	33	61	47	34	30	30
	48 - 78	34 - 65	22 - 53	21 - 53	22 - 55	48-77	34-64	23-52	19-49	20-51
Nasopharynx	75	61	52	52	43	63	38	32	26	26
	63 - 88	48 - 77	39 - 69	40 - 71	30 - 62	45-88	21-67	16-63	12-58	12-59
Stomach	36	21	15	10	8	38	27	22	19	10
	27 - 46	14 - 31	9 - 25	5 - 19	4 - 16	28-51	19-41	14-35	11-32	5-21
Colon	51	43	37	32	28	51	40	36	29	29
	42 - 62	34 - 54	28 - 48	24 - 44	20 - 40	41-64	30-53	27-49	20-43	19-42
Rectum	65	38	29	22	18	64	45	40	30	30
	54 - 79	27 - 53	19 - 44	13 - 37	10 - 34	51-79	32-62	27-56	19-48	20-49
Liver	11	7	6	6	6	23	16	14	12	10
	8 - 15	4 - 10	4 - 9	4 - 9	4 - 9	18-30	12-22	9-20	8-18	7-16
Larynx	54	40	31	31	31	47	27	21	14	14
	43 - 69	29 - 56	21 - 47	22 - 49	21 - 49	28-82	12-64	8-58	4-52	4-53
Lung	23	12	8	7	6	25	12	9	8	8
	21 - 26	10 - 14	7 - 11	5 - 9	5 - 8	21-29	10-16	7-12	6-11	6-11
Skin	84	81	81	81	81	94	86	86	86	85
	72 - 98	68 - 98	71- 102	70- 104	70- 107	89-101	77-96	79-98	77-99	76-99
Breast						87	77	70	65	62
						82-91	72-82	65-75	60-71	57-68
Cervix						86	74	65	58	54
						83-89	69-78	61-70	53-63	49-60
Corpus uteri						87	80	70	68	63
						77-98	68-94	57-87	55-85	50-82
Ovary						70	62	52	49	49
						60-82	51-75	42-66	38-64	39-64
Prostate	73	66	61	56	47					
	62 - 86	53 - 81	48 - 78	43 - 75	33 -66					
Bladder	66	54	49	41	40	61	49	40	37	35
	56 - 78	44 - 68	39 - 63	31 - 56	30 - 55	47-80	35-70	26-63	24-61	21-59
Thyroid	70	61	61	61	61	85	79	79	76	76
	48- 103	36- 106	37- 109	39- 114	40- 118	75-97	68-93	69-94	64-92	65-94
lymphoma	60	49	37	34	28	55	42	41	41	37
	52 - 70	40 - 59	29 - 49	26 - 45	20 - 39	44-68	32-56	31-55	30-55	27-51
leukaemia	48	36	23	19	18	42	31	28	21	21
	38 - 59	27 - 47	16 - 36	12 - 31	11 - 29	30-58	20-47	18-45	12-38	12-38

Table 30: Relative survival by site in Lampang, Thailand, 1998-2002

Year after diagnosis	Male (%; 95% CI)					Female (%; 95% CI)				
	1	2	3	4	5	1	2	3	4	5
Oral cavity	66	43	42	35	32	53	45	39	33	33
	53 - 81	30 - 61	29 - 60	24 - 55	20 - 51	43-66	35-59	28-53	23-48	24-49
Nasopharynx	68	50	43	28	24	81	61	50	45	39
	57 - 82	38 - 65	31 - 59	18 -44	15 - 40	69-95	47-80	36-70	31-66	25-60
Stomach	35	19	19	18	13	29	20	12	12	10
	26 - 46	12 - 29	13 - 30	11 - 29	7 - 23	20-43	12-33	6-25	6-25	4-23
Colon	67	50	49	42	39	70	53	48	41	41
	58 - 76	42 - 61	40 - 60	34 - 54	30 - 50	61-79	44-64	39-60	33-54	33-54
Rectum	67	50	30	28	24	73	60	46	44	40
	57 - 78	40 - 63	21 - 43	19 - 42	16 - 38	62-86	49-75	34-63	32-62	28-58
Liver	18	11	8	7	6	19	13	12	11	10
	15 - 21	9 - 15	6 - 11	5 - 9	4 - 9	15-25	9-18	8-17	7-16	7-15
Larynx	49	41	36	31	31	73	57	47	42	42
	35 - 69	27 - 63	23 - 58	18 - 54	19 - 56	55-98	38-87	28-79	24-77	25-80
Lung	23	11	9	8	7	24	12	10	8	7
	20 - 26	9 - 14	8 - 12	6 - 10	5 - 9	20-28	9-15	8-13	6-11	5-10
Skin	88	83	83	83	81	89	84	82	79	79
	80 - 97	74 - 94	77 - 98	74 - 98	70 - 96	81-97	75-94	74-95	68-93	70-96
Breast						91	82	75	68	63
						88-93	78-85	71-79	63-73	58-68
Cervix						86	72	64	60	57
						83-89	68-76	60-69	56-65	52-62
Corpus uteri						88	85	80	74	70
						80-97	76-96	69-92	63-88	58-86
Ovary						70	59	53	51	50
						62-79	51-69	44-63	43-62	41-61
Prostate	85	78	65	57	54					
	75 - 93	68 - 89	54 - 78	46 - 72	42 - 69					
Bladder	72	54	50	47	39	54	40	37	37	35
	64 - 81	45 - 64	42 -62	37 - 58	30 - 51	39-74	26-61	23-59	24-61	21-60
Thyroid	66	54	54	54	42	78	72	70	68	63
	47 - 94	34 - 87	35 - 89	36 - 92	22 - 82	70-88	62-83	61-83	58-82	52-78
Lymphoma	63	51	45	40	36	60	49	43	42	41
	54 - 72	42 - 61	36 - 56	31 - 51	27 - 48	50-71	40-62	33-55	32-55	32-54
Leukaemia	45	31	25	21	20	42	32	30	27	25
	35 - 57	22 - 43	18 - 38	14 - 33	13 - 32	32-55	23-46	21-43	18-40	16-38

Table 31: Relative survival by site in Lampang, Thailand, 2003-2007

Year after diagnosis	Male (%; 95% CI)					Female (%; 95% CI)				
	1	2	3	4	5	1	2	3	4	5
Oral cavity	50	34	24	14	12	50	43	40	35	33
	40 - 63	25 - 47	16 - 36	8 - 26	6 - 23	39-64	32-58	29-55	25-49	23-48
Nasopharynx	74	46	27	16	11	60	48	41	34	30
	63 - 87	34 - 63	17 - 43	8 - 33	4 - 27	46-80	33-69	27-62	20-56	17-52
Stomach	33	16	13	7	6	34	21	12	10	10
	24 - 44	10 - 27	7 - 23	3 - 17	3 - 16	25-48	13-34	6-24	4-22	4-22
Colon	62	43	36	34	30	66	56	44	37	33
	55 - 69	36 - 52	29 - 45	28 - 44	24 - 40	59-74	48-65	36-54	30-47	25-43
Rectum	77	53	37	28	26	68	51	41	33	28
	70 - 85	44 - 63	29 - 48	21 - 39	18 - 37	60-78	42-62	32-53	24-46	19-41
Liver	14	7	4	3	2	16	6	4	4	3
	12 - 16	5 - 9	3 - 5	2 - 4	1 - 4	13-21	4-10	3-7	2-6	2-6
Larynx	56	39	25	15	11	60	27	27	18	9
	42 - 75	26 - 59	14 - 46	6 - 36	4 - 33	40-91	11-68	11-68	5-61	1-57
Lung	23	10	6	5	4	21	8	5	2	2
	21 - 26	8 - 12	5 - 8	3 - 6	3 - 5	18-24	6-11	3-7	1-4	1-3
Skin	91	87	79	77	76	93	90	84	80	72
	85 - 99	78 - 98	70 - 93	66 - 91	65 - 92	89-98	84-95	78-90	74-88	65-81
Breast						95	86	79	73	69
						93-96	83-88	76-82	70-77	66-72
Cervix						87	77	71	66	62
						84-90	74-81	68-75	62-70	58-67
Corpus uteri						88	80	76	72	72
						81-95	72-89	67-86	63-83	63-83
Ovary						72	57	51	48	44
						65-79	50-66	44-60	40-57	36-53
Prostate	88	71	61	52	43					
	82 - 95	63 - 81	52 - 72	43 - 64	33 - 56					
Bladder	79	72	54	51	47	62	48	38	36	29
	72 - 87	63 - 81	45 - 65	41 - 63	37 - 59	50-76	37-64	27-54	25-52	19-45
Thyroid	70	65	59	54	48	85	85	81	80	78
	51 - 98	45 - 95	39 - 92	34 - 89	27 - 85	78-92	78-92	74-90	73-89	69-87
Lymphoma	48	34	25	18	16	41	30	27	24	22
	40 - 57	26 - 43	18 - 34	12 - 28	10 - 26	33-52	22-41	19-38	16-35	14-34
Leukaemia	45	35	27	19	16	46	32	25	18	16
	36 - 56	26 - 46	19 - 39	12 - 31	9 - 28	37-57	26-45	17-35	11-28	10-27

Table 32: Percentage of extension by site and periods in Lampang, Thailand

site	Localized				Regional lymph node				Distant metastasis				Unknown			
	1988-1992	1993-1997	1998-2002	2003-2007	1988-1992	1993-1997	1998-2002	2003-2007	1988-1992	1993-1997	1998-2002	2003-2007	1988-1992	1993-1997	1998-2002	2003-2007
Oral cavity	12.1	29.5	35.9	16.7	78.5	57.1	44.5	44.2	0.9	2.9	4.7	11.6	8.4	10.5	14.8	27.5
Nasopharynx	1.5	12.2	10.5	4.3	88.2	63.4	66.3	57.0	5.9	12.2	13.7	14.0	4.4	12.2	9.5	24.7
Stomach	2.3	5.2	14.8	3.5	53.2	44.3	40.3	30.1	36.3	36.5	25.6	32.9	8.2	14.1	19.3	33.5
Colon	6.6	7.2	12.7	7.9	60.7	38.0	40.8	37.9	31.1	40.4	25.8	28.2	1.6	14.4	20.8	26.0
Rectum	1.1	10.0	15.8	7.6	68.4	55.8	54.1	42.2	23.2	17.5	15.1	21.9	7.4	16.7	15.1	28.3
Liver	0.2	4.8	12.0	2.7	36.0	26.3	35.8	20.3	53.0	37.2	20.7	21.1	10.8	31.7	31.5	55.9
Larynx	7.8	14.5	32.1	8.6	75.3	60.2	50.0	56.9	10.4	3.6	3.6	6.9	6.5	21.7	14.3	27.6
Lung	2.3	4.0	6.5	1.5	30.1	27.9	27.6	20.4	61.3	47.4	45.8	45.6	6.3	20.7	20.0	32.5
Skin	76.5	70.2	73.8	55.8	20.6	15.3	14.6	11.3	1.0	3.1	3.7	2.9	2.0	11.5	7.9	30.0
Breast	17.4	16.0	29.2	20.3	59.7	54.5	48.0	46.0	14.7	15.2	9.1	9.1	8.1	14.3	13.8	24.5
Cervix	29.7	33.0	34.0	31.3	55.5	51.2	52.4	41.4	4.8	6.8	4.5	6.9	9.9	9.0	9.0	20.3
Corpus uteri	48.7	38.0	42.4	26.8	28.2	40.0	30.3	34.1	10.3	12.0	7.6	11.0	12.8	10.0	19.7	28.0
Ovary	43.4	18.5	19.8	25.3	27.7	35.8	31.0	21.6	24.1	28.4	27.0	32.7	4.8	17.3	22.2	20.4
Prostate	22.0	36.0	44.6	7.1	58.0	33.3	23.8	19.9	14.0	13.3	6.9	16.7	6.0	17.3	24.8	56.4
Bladder	17.2	31.9	29.4	14.7	62.4	38.5	33.8	35.1	8.6	8.9	11.3	11.5	11.8	20.7	25.6	38.7
Thyroid	22.2	36.9	33.7	33.6	46.7	32.3	30.7	27.5	22.2	9.2	17.8	6.9	8.9	21.5	17.8	32.1