

APPENDIX

B

LAMPANG CANCER REGISTRY

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Registration data

Lampang is a province among 17 provinces located in the northern part in Thailand between latitude 17-19 N and longitude 98-100 E. It is 268.8 meters above sea level with the land area of 12 534 square kilometers. It has common boundary with Chiang Mai and Phayao in the north, Phrae in the east, Tak and Sukhothai in the south and Lamphun and Chiang Mai in the west.

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

The northern region is predominantly mountainous with a much cooler temperature than the rest of the country. The lowest temperature is about 8.9 °C in winter, from November to February and the highest of 42.1 °C, from March to May in summer. The average total rainfall is 974.5 millimeters per year. The rainy season lasts from June to October.

In census April 2000, Lampang was divided into 13 districts; Muang, Koh Kha, Ngao, Chae Hom, Theon, Mae Tha, Mae Phrik, Mae Moh, Wang Nua, Sop Prap, Soem Ngam, Hang Chat and Muang Pan.

The total population at 2000 census was 782 152 with 390 256 males and 391 896 females. The average population density is about 62.4 persons per square kilometer

(National Statistics: Lampang, 2001).

About 30% of the population live in urban areas; 97% are Buddhists, the remainder mainly Christians.

Cancer care facilities

Lampang Cancer Center, one of the six regional cancer centers 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 centers 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 Center has provided programs in patient and public education and in continuing education for health professionals, particularly family physicians and general nurses.

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

General health care in the region is provided in all 13 districts. In the urban area (Muang district), there is one cancer center (Lampang Cancer Center), two private hospitals and one military hospital. Cancer diagnostic services including CT scan (clinical consultations and radiological, pathological investigations), cancer surgery services and chemotherapy are available in Lampang cancer center and Lampang provincial hospital. Radiation therapy equipment: one simulator,

two cobalt-60 machines, one linear accelerator and two remotes after-loading for brachytherapy are provided in Lampang Cancer Center. All hospitals in the province provide palliative care.

Patients suspected to have cancer in the primary and secondary health cares in the registry area are mostly referred to Lampang Cancer Center and Lampang provincial hospital.

Registry structure and methods

The registry is located within Lampang Cancer Center, and is funded by cancer research foundation of the National Cancer Institute. Lampang Cancer Center pro-

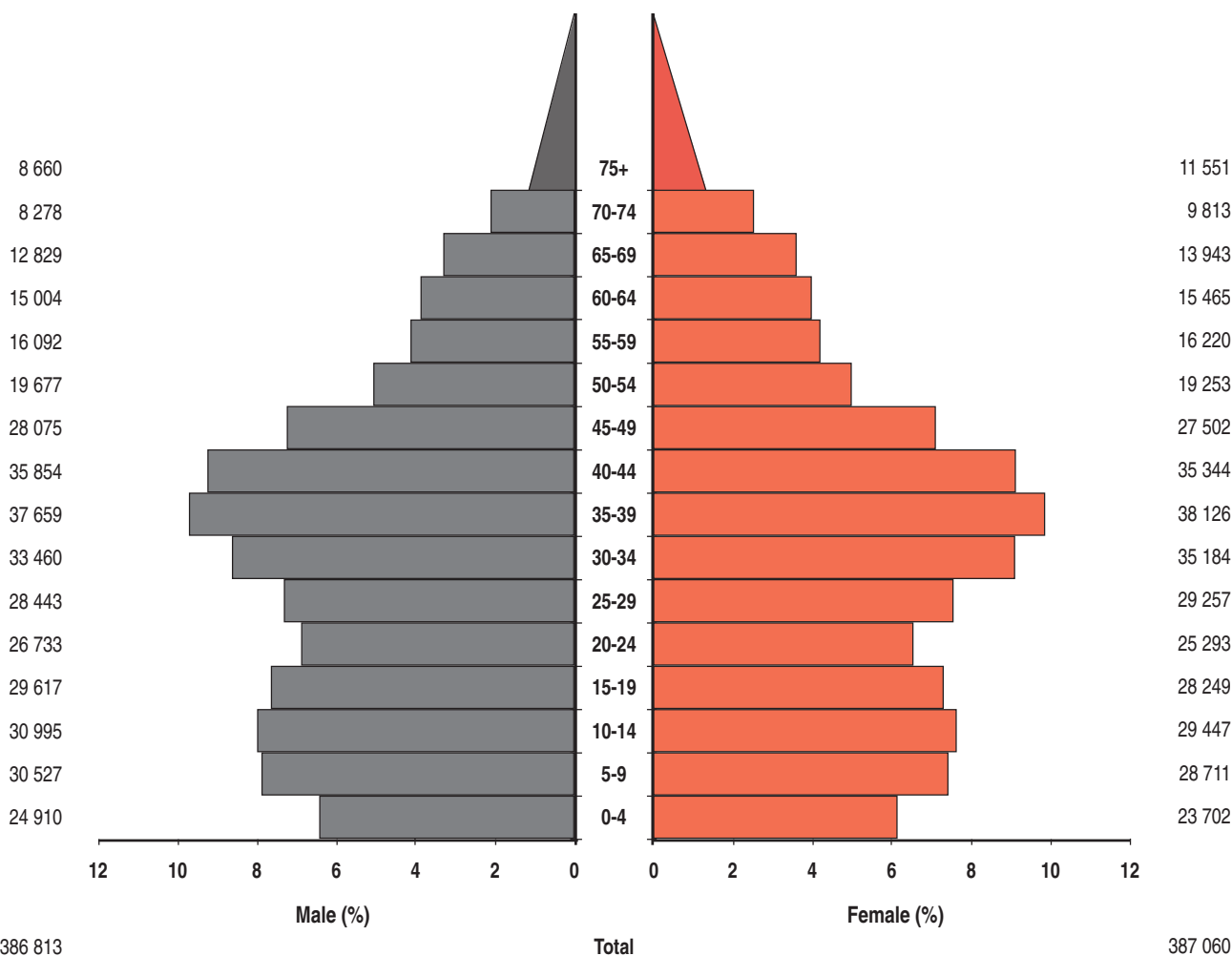
vides equipments. The registry is staffed by a part time expert consultant, a part time doctor, a part time nurse and two full time health workers.

The Lampang registry was set up since 1995 with the back up data of some cancer cases in Lampang since 1963 which collected by Dr.Nimit Martin, our expert consultant. The registration uses passive methods by notification from 21 sources of data consisting of cancer centers, general hospitals, all community hospitals, 2 private hospitals, Chiang Mai university hospital, provincial public health service of Lampang and pathological laboratories.

New cancer cases from all hospitals were collected from out and in patient departments, wards, radiotherapy unit, surgical unit, pathological service, cytological unit, hematological unit, medical record and autopsy service. The data information collection 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 histol-

Figure 1 Population pyramid, Lumpang, 1999



ogy 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.

All death certificates are matched with the incidence case records of the registry. 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.

The follow-up was carried out by active and passive methods of all registered cases. 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 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.

The cancer cases are collected from all hospitals in Lampang. However, some patients are referred to Chiang Mai university hospital and National Cancer Institute in Bangkok. These cases have also been collected in the registry.

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.

Interpreting of results

Data quality, to achieve its objectives, the Cancer Registry data must be of high quality. The data must also be comparable with data from other cancer registries and from one period to the other.

The data quality of Lampang registration was rather fair with the level of histology verified cases over 60 % in both males and females. The levels of death certificate only cases were rather high especially in males (15.2%) and 10.9 % in females and high age-standardized incidence rates level of unknown primary 13.2 in males and 8 in females. Primary site unknown, other and unspecified: a high proportion of cases that are assigned to this category generally imply poor diagnostic precision or failure to specify the site of primary cancer which indicated a degree of under-ascertainment and lack of validity.

The average age- standardized incidence rates were 160.7 per 100 000 population among males and 148.9 among females. Lung cancer was the most common can-

cer in males followed by liver cancer and colorectal cancer. In females the most common cancer was lung cancer followed by cervical cancer and breast cancer.

In Thailand, Lampang had the highest incidence rates of lung cancer in both males (ASR = 53.3) and females (ASR = 27.6). Rate of childhood cancer are low.

Over all Mortality and Incidence ratio was approximately 64.9% in males and 47.9% in females. Females had better prognosis than males.

Uses of the data

The detailed result of registration over the period 1992 to 1994 was reported in Cancer in Thailand 1999 Vol. II (Deerasamee *et al.*, 1999), over the period 1995-1997 was reported in “Cancer in Thailand Vol. III” (Sriplung *et al.*, 2003) and 1998-2000 was included in this publication. The registration over the period 1993-1997 and 1998-2002 were reported as “Cancer in Lampang Vol. II and III” (Pongnikorn *et al.*, 2002 and 2004), the result 1993-1997 also included in “Cancer in Five Continents Vol. VIII” (Parkin *et al.*, 2002) and result 1998-2002 will be including in “Cancer in Five Continents Vol. IX”, next volume. The result over the period 1990-2000 was published as a “Cancer Mortality in Lampang” (Pongnikorn *et al.*, 2003). The data during 1993-2002 was report as “Cancer Survival in Lampang” (Pongnikorn *et al.*, 2005) and was including in the “Cancer Survival of Developing Countries Vol.II” project by International Agency Research on Cancer (IARC).

Table 1 Annual incidence, Lampang, 1998-2000

	Male						Female						ICD-10
	No. cases	Freq. (%)	Crude rate (per 100,000)	ASR world	Cum. rates 0-64 (percent)	Cum. rates 0-74 (percent)	No. cases	Freq. (%)	Crude rate (per 100,000)	ASR world	Cum. rates 0-64 (percent)	Cum. rates 0-74 (percent)	
Lip	2	0.1	0.2	0.1	0.01	0.02	7	0.3	0.6	0.5	0.02	0.04	C00
Tongue	11	0.5	0.9	0.8	0.07	0.11	13	0.6	1.1	0.9	0.05	0.11	C01-02
Salivary gland	4	0.2	0.3	0.3	0.01	0.03	7	0.3	0.6	0.5	0.01	0.07	C07-C08
Mouth	11	0.5	0.9	0.8	0.04	0.06	26	1.3	2.2	1.8	0.11	0.15	C03-C06
Oropharynx	12	0.6	1.0	0.9	0.05	0.11	3	0.1	0.3	0.2	0.00	0.00	C09-C10
Nasopharynx	30	1.5	2.6	2.2	0.17	0.26	21	1.0	1.8	1.6	0.13	0.19	C11
Hypopharynx	6	0.3	0.5	0.5	0.03	0.07	2	0.1	0.2	0.1	0.01	0.01	C12-C13
Pharynx unspecified	0	0.0	0.0	0.0	0.00	0.00	1	0.0	0.1	0.1	0.00	0.00	C14
Esophagus	18	0.9	1.6	1.4	0.09	0.13	12	0.6	1.0	0.9	0.05	0.13	C15
Stomach	65	3.2	5.6	5.0	0.21	0.63	49	2.4	4.2	3.6	0.24	0.42	C16
Small intestine	5	0.2	0.4	0.4	0.02	0.06	1	0.0	0.1	0.1	0.00	0.00	C17
Colon	101	4.9	8.7	7.9	0.50	0.87	105	5.1	9.0	7.6	0.52	0.86	C18
Rectum	49	2.4	4.2	3.8	0.17	0.52	27	1.3	2.3	1.9	0.11	0.23	C19-21
Liver and bile duct	426	20.9	36.7	32.9	2.11	4.17	198	9.7	17.1	14.7	1.01	1.80	C22,C24
Gallbladder	24	1.2	2.1	1.9	0.09	0.23	48	2.3	4.1	3.4	0.12	0.47	C23
Pancreas	22	1.1	1.9	1.7	0.10	0.16	31	1.5	2.7	2.3	0.13	0.26	C25
Nose, sinuses etc.	6	0.3	0.5	0.5	0.02	0.04	6	0.3	0.5	0.4	0.03	0.03	C30-C31
Larynx	23	1.1	2.0	1.8	0.05	0.18	16	0.8	1.4	1.1	0.03	0.16	C32
Bronchus, lung	664	32.5	57.2	53.0	2.93	6.93	373	18.2	32.1	27.6	1.72	3.55	C33-C34
Other thoracic organs	0	0.0	0.0	0.0	0.00	0.00	1	0.0	0.1	0.1	0.00	0.00	C37-C38
Bone	2	0.1	0.2	0.2	0.01	0.01	12	0.6	1.0	1.0	0.07	0.09	C40-C41
Connective tissue	15	0.7	1.3	1.3	0.08	0.10	4	0.2	0.3	0.3	0.02	0.04	C47,C49
Melanoma of skin	9	0.4	0.8	0.7	0.05	0.09	3	0.1	0.3	0.2	0.01	0.02	C43
Other skin	44	2.2	3.8	3.6	0.17	0.43	48	2.3	4.1	3.3	0.15	0.38	C44
Breast	0	0.0	0.0	0.0	0.00	0.00	295	14.4	25.4	20.8	1.72	2.24	C50
Uterus unspecified							0	0.0	0.0	0.0	0.00	0.00	C55
Cervix uteri							313	15.3	27.0	22.3	1.90	2.38	C53
Placenta							0	0.0	0.0	0.0	0.00	0.00	C58
Corpus uteri							41	2.0	3.5	3.0	0.24	0.38	C54
Ovary							61	3.0	5.3	4.6	0.37	0.46	C56
Other female genital							11	0.5	0.9	0.8	0.05	0.08	C51,C52,C57
Prostate	66	3.2	5.7	5.2	0.10	0.59							C61
Testis	8	0.4	0.7	0.5	0.04	0.04							C62
Penis	20	1.0	1.7	1.5	0.11	0.14							C60
Bladder	57	2.8	4.9	4.5	0.18	0.57	26	1.3	2.2	1.8	0.07	0.18	C67
Kidney etc.	20	1.0	1.7	1.5	0.11	0.18	8	0.4	0.7	0.6	0.05	0.08	C64-C66:C68
Eye	1	0.0	0.1	0.1	0.01	0.01	3	0.1	0.3	0.2	0.02	0.02	C69
Brain, nervous system	13	0.6	1.1	1.0	0.08	0.11	17	0.8	1.5	1.3	0.09	0.12	C70-C72
Thyroid	9	0.4	0.8	0.7	0.03	0.11	44	2.1	3.8	3.3	0.23	0.34	C73
Other endocrine	0	0.0	0.0	0.0	0.00	0.00	2	0.1	0.2	0.1	0.01	0.01	C74-C75
Hodgkin's disease	2	0.1	0.2	0.1	0.01	0.02	0	0.0	0.0	0.0	0.00	0.00	C81
Non-Hodgkin lymphoma	70	3.4	6.0	5.4	0.36	0.57	51	2.5	4.4	3.6	0.23	0.37	C82-C85,C96
Multiple myeloma	5	0.2	0.4	0.4	0.02	0.06	6	0.3	0.5	0.4	0.03	0.04	C88,C90
Lymphoid leukemia	20	1.0	1.7	2.1	0.11	0.11	16	0.8	1.4	1.6	0.09	0.12	C91
Myeloid leukemia	22	1.1	1.9	1.7	0.08	0.19	20	1.0	1.7	1.5	0.11	0.15	C92
Leukemia unspecified	10	0.5	0.9	0.9	0.05	0.07	12	0.6	1.0	0.9	0.07	0.09	C95
Other and unspecified	170	8.3	14.6	13.2	0.78	1.63	110	5.4	9.5	8.0	0.45	0.96	O&U
All sites	2042	100.0	176.0	160.7	9.04	19.61	2050	100.0	176.5	148.9	10.27	17.04	ALL

Table 2 Percentage of morphologically verified and death certificate only cases, Lampang, 1998-2000

	Male			Female			ICD-10
	Cases	%MV	%DCO	Cases	%MV	%DCO	
Oral cavity	28	85.7	3.6	53	90.6	1.9	C00-C08
Oropharynx, etc.	12	91.7	0.0	4	100.0	0.0	C09-C10; C14
Nasopharynx	30	83.3	0.0	21	76.2	0.0	C11
Hypopharynx	6	83.3	0.0	2	50.0	0.0	C12-C13
Esophagus	18	77.8	11.1	12	41.7	16.7	C15
Stomach	65	69.2	15.4	49	69.4	18.4	C16
Small intestine	5	100.0	0.0	1	100.0	0.0	C17
Colon and rectum	150	62.7	18.7	132	52.3	30.3	C18-C21
Liver and bile duct	426	26.3	4.4	198	25.3	27.8	C22; C24
Gallbladder	24	50.0	12.5	48	47.9	4.2	C23
Pancreas	22	36.4	13.6	31	41.9	0.0	C25
Nose, sinuses etc.	6	100.0	0.0	6	50.0	0.0	C30-C31
Larynx	23	82.6	13.0	16	81.3	0.0	C32
Bronchus, lung	664	65.7	16.6	373	69.2	14.5	C33-C34
Other thoracic organs	0	0.0	0.0	1	100.0	0.0	C37-C38
Bone	2	50.0	50.0	12	25.0	58.3	C40-C41
Connective tissue	15	0.0	0.0	4	0.0	0.0	C47,C49
Skin and melanoma	53	98.1	0.0	51	100.0	0.0	C43-C44
Breast	0	0.0	0.0	295	90.2	3.1	C50
Cervix uteri				313	95.8	0.0	C53
Corpus uteri				41	75.6	12.2	C54
Uterus unspecified				0	0.0	0.0	C55
Ovary				61	70.5	0.0	C56
Other female genital				11	0.0	0.0	C51, C52, C57
Placenta				0	0.0	0.0	C58
Penis	20	95.0	0.0				C60
Prostate	66	87.9	0.0				C61
Testis	8	75.0	0.0				C62
Kidney etc.	20	65.0	15.0	8	50.0	12.5	C64-C66, C68
Bladder	57	82.5	0.0	26	73.1	7.7	C67
Eye	1	100.0	0.0	3	100.0	0.0	C69
Brain, nervous system	13	53.8	38.5	17	70.6	17.6	C70-C72
Thyroid	9	66.7	11.1	44	79.5	6.8	C73
Other endocrine	0	0.0	0.0	2	100.0	0.0	C74-C75
Hodgkin's disease	2	100.0	0.0	0	0.0	0.0	C81
Non-Hodgkin lymphoma	70	100.0	0.0	51	100.0	0.0	C82-C85, C96
Multiple myeloma	5	100.0	0.0	6	100.0	0.0	C88;C90
Leukemia	52	100.0	0.0	48	100.0	0.0	C91-C95
Other and unspecified	170	54.8	17.9	110	52.3	22.9	O&U
All sites	2042	61.0	15.2	2050	71.9	10.9	ALL