

APPENDIX

F

RAYONG
CANCER
REGISTRY

Petcharin Srivatanakul, Ph.D.

Registration area

Rayong is one of the country's major agricultural and industrial provinces. The province is well known for its pristine beaches stretching along a 100-kilometer coastline both on the mainland and islands and scenic waterfalls amidst exotic surroundings.

Rayong is located on the east coast of Thailand, about 220 kilometers from Bangkok, at a latitude 12:40 N and longitude 101:20 E, 5 meters above sea level. The north and the west of Rayong is Chon Buri Province, Chanta Buri Province on the east and the Gulf of Thailand on the South. The total area is 3,552 square kilometers. Most of the land is marked by a series of mountains and large tracts of forest and fruit plantation. Administrative, it is divided into 6 districts and 2 sub-districts Amphoe Mueang Rayong, Klaeng, Ban Khai, Ban Chang, Pluak Daeng, Wang Chan districts and Khao Chamao and Nikhom Phatthana sub-districts.

There is evidence that exposure to known and suspected carcinogens occurs at the Map Ta Phut Industrial Estate (MTPIE) in the Amphoe Mueang Rayong, and in the surrounding residential areas. The MTPIE was established in the 1980. This has generated widespread concern about possible health effects in the local communities. Among the chemicals that have been detected in a survey conducted in December 1998 are benzene and vinyl chloride (IARC Group 1), 1,3-butadiene (IARC Group 2A), dichloromethane and dichloroethane (IARC Group 2B), and various polycyclic aromatic hydrocarbons (PAHs; IARC Groups 2A and 2B).

Cancer care facilities

Thailand has a national health care system. At the primary health care level, there are no facilities for specialized cancer diagnosis and treatment. The provincial hospital is a general hospital. At the provincial level, there are facilities for cancer surgery, no chemotherapy or radiotherapy. Most of cancer patients are referred to cancer centers and other hospitals for diagnosis and treatment.

Cancer surgery services are provided at Rayong provincial hospital and private hospitals. The cancer patients are referred for chemotherapy and radiotherapy to Chon Buri Cancer Center or other hospitals in Bangkok.

Registry structure and methods

The population-based cancer registry of Rayong Province was set up at National Cancer Institute, Bangkok in 1999. The sources of information are all hospitals in Rayong Province, Chonburi Hospital, Chonburi Cancer Center, Prapokkloa Hospital in Chanthaburi and Bangkok Cancer Registry. Cancer cases are collected from the medical records department, outpatient clinics, pathology laboratories, clinical laboratories and death certificates. All data are checked for duplication, verified, coded and keyed into The CanReg4 Programme.

The data on cancer patients are collected by both active and passive methods Active reporting (collection at source) involves registry personnel actually visiting the sources of data and abstracting the required information onto special forms, or obtaining copies of the necessary documents.

Passive reporting relies upon

other health care workers to complete notification forms and forward them to the registry, or send copies of the necessary data.

The primary site and histology are coded according to ICD-O version 3. Second and subsequent primary cancers are also registered. A new registration number is given for each new primary cancer as indicated by the 3 digit ICD-O code,

(or cancers with different histology at the same site), as specified in the ICD-O manual.

Cases of carcinoma *in situ* are registered but not included in the calculation of incidence rates. Those that become invasive are re-registered as invasive carcinomas, with the behaviour code changed to “3” (malignant). The most valid basis of diagnosis is recorded for

all registered cases.

Follow up of registered cancer patients is performed by a mixture of active and passive methods. Registered cases are 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 enquires and by home visits.

Figure 1 Population pyramid, Rayong, 1999

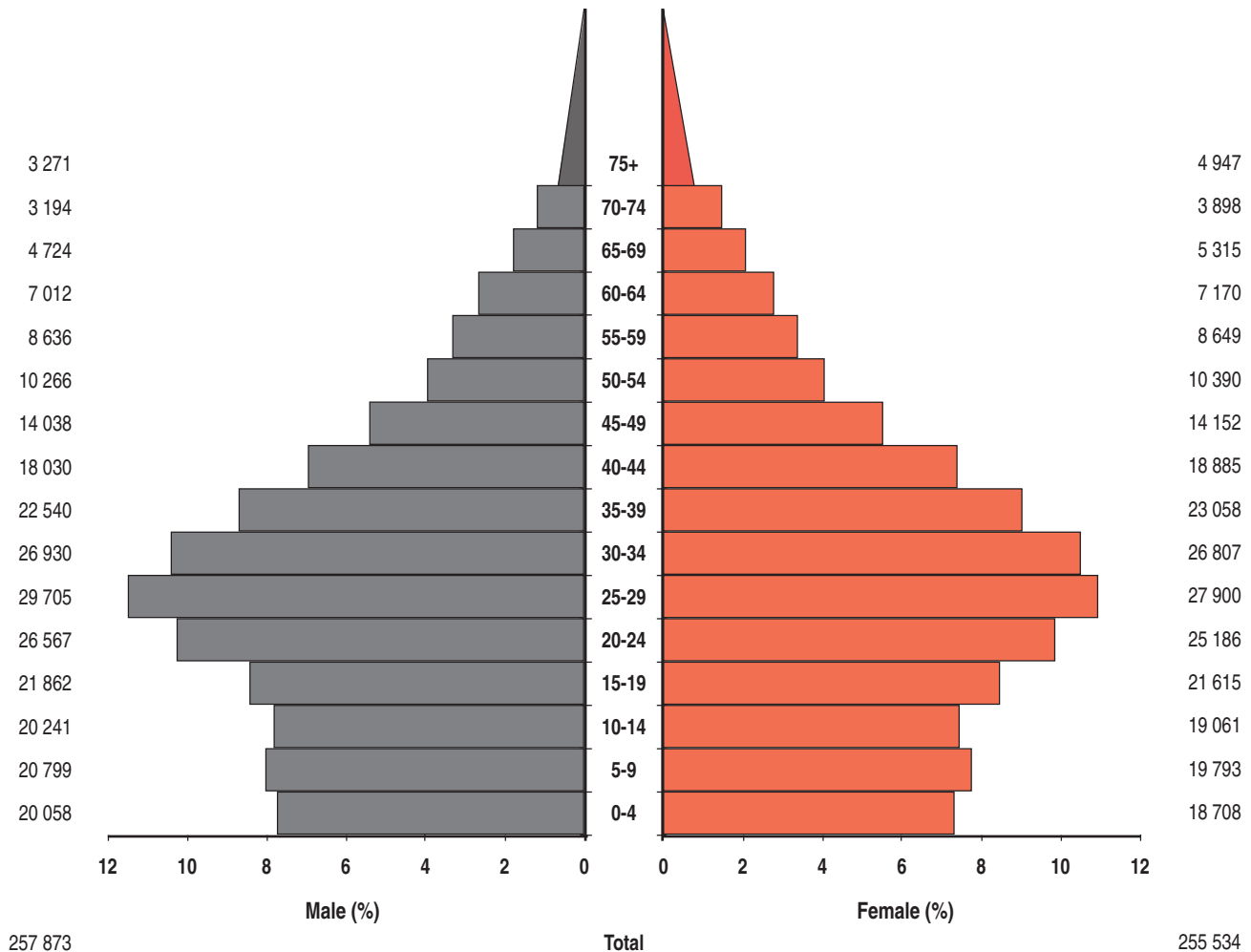


Table 1 Annual incidence, Rayong, 1998-2000

	Male						Female						ICD-10
	No.	Freq.	Crude	ASR	Cum. rates		No.	Freq.	Crude	ASR	Cum. rates		
	cases	(%)	rate	world	0-64	0-74	cases	(%)	rate	world	0-64	0-74	
		(per 100,000)	(per 100,000)	(percent)	(percent)			(per 100,000)	(per 100,000)	(percent)	(percent)		
Lip	2	1.2	0.3	0.4	0.02	0.02	10	1.2	1.3	1.5	0.07	0.11	C00
Tongue	27	1.0	3.5	5.1	0.17	0.76	8	1.0	1.0	1.2	0.08	0.16	C01-02
Salivary gland	2	0.0	0.3	0.3	0.03	0.03	0	0.0	0.0	0.0	0.00	0.00	C07-C08
Mouth	20	1.7	2.6	3.5	0.25	0.37	14	1.7	1.8	2.2	0.05	0.31	C03-C06
Oropharynx	20	0.5	2.6	3.6	0.21	0.42	4	0.5	0.5	0.7	0.06	0.09	C09-C10
Nasopharynx	19	1.4	2.5	2.7	0.23	0.31	11	1.4	1.4	1.3	0.09	0.14	C11
Hypopharynx	9	0.1	1.2	1.8	0.06	0.29	1	0.1	0.1	0.1	0.00	0.00	C12-C13
Pharynx unspecified	1	0.1	0.1	0.1	0.01	0.01	1	0.1	0.1	0.2	0.02	0.02	C14
Esophagus	58	2.7	7.5	10.3	0.64	1.38	22	2.7	2.9	3.5	0.09	0.41	C15
Stomach	20	2.9	2.6	3.5	0.23	0.46	23	2.9	3.0	3.3	0.23	0.31	C16
Small intestine	1	0.1	0.1	0.2	0.00	0.00	1	0.1	0.1	0.1	0.01	0.01	C17
Colon	18	3.3	2.3	2.7	0.14	0.31	27	3.3	3.5	3.9	0.17	0.45	C18
Rectum	27	2.2	3.5	4.6	0.29	0.62	18	2.2	2.3	2.6	0.11	0.24	C19-21
Liver and bile duct	94	3.2	12.2	14.9	1.01	1.85	26	3.2	3.4	4.1	0.19	0.61	C22,C24
Gallbladder	3	0.6	0.4	0.6	0.00	0.12	5	0.6	0.7	0.8	0.04	0.12	C23
Pancreas	11	0.9	1.4	1.9	0.14	0.21	7	0.9	0.9	1.2	0.02	0.16	C25
Nose, sinuses etc.	2	0.4	0.3	0.4	0.02	0.07	3	0.4	0.4	0.3	0.03	0.03	C30-C31
Larynx	23	0.2	3.0	4.2	0.22	0.45	2	0.2	0.3	0.2	0.01	0.01	C32
Bronchus, lung	134	6.2	17.3	25.1	1.13	3.50	50	6.2	6.5	7.5	0.40	0.92	C33-C34
Other thoracic organs	1	0.0	0.1	0.1	0.01	0.01	0	0.0	0.0	0.0	0.00	0.00	C37-C38
Bone	4	0.1	0.5	0.6	0.04	0.08	1	0.1	0.1	0.1	0.01	0.01	C40-C41
Connective tissue	5	0.6	0.6	0.8	0.05	0.11	5	0.6	0.7	0.8	0.03	0.06	C47,C49
Melanoma of skin	2	0.2	0.3	0.3	0.04	0.04	2	0.2	0.3	0.3	0.00	0.04	C43
Other skin	18	1.7	2.3	3.2	0.14	0.35	14	1.7	1.8	2.4	0.14	0.37	C44
Breast	0	20.5	0.0	0.0	0.00	0.00	165	20.5	21.5	22.0	1.62	2.26	C50
Uterus unspecified							2	0.2	0.3	0.2	0.02	0.02	C55
Cervix uteri							207	25.7	27.0	28.5	2.30	3.11	C53
Placenta							1	0.1	0.1	0.1	0.01	0.01	C58
Corpus uteri							15	1.9	2.0	2.2	0.22	0.22	C54
Ovary							31	3.8	4.0	4.5	0.40	0.40	C56
Other female genital							5	0.6	0.7	0.9	0.04	0.16	C51,C52,C57
Prostate	20	2.8	2.6	3.9	0.10	0.36							C61
Testis	7	1.0	0.9	0.8	0.07	0.07							C62
Penis	12	1.7	1.6	1.7	0.11	0.23							C60
Bladder	38	5.3	4.9	7.0	0.41	0.87	13	1.6	1.7	2.1	0.11	0.22	C67
Kidney etc.	4	0.6	0.5	0.6	0.04	0.07	4	0.5	0.5	0.7	0.02	0.07	C64-C66:C68
Eye	2	0.3	0.3	0.2	0.03	0.03	2	0.2	0.3	0.4	0.02	0.02	C69
Brain, nervous system	7	1.0	0.9	1.1	0.03	0.12	8	1.0	1.0	1.4	0.06	0.12	C70-C72
Thyroid	5	0.7	0.6	0.9	0.02	0.09	29	3.6	3.8	3.7	0.26	0.35	C73
Other endocrine	0	0.0	0.0	0.0	0.00	0.00	0	0.0	0.0	0.0	0.00	0.00	C74-C75
Hodgkin disease	2	0.3	0.3	0.4	0.02	0.02	0	0.0	0.0	0.0	0.00	0.00	C81
Non-Hodgkin lymphoma	24	3.3	3.1	3.6	0.25	0.34	15	1.9	2.0	2.5	0.12	0.30	C82-C85,C96
Multiple myeloma	3	0.4	0.4	0.5	0.04	0.04	3	0.4	0.4	0.5	0.02	0.10	C88,C90
Lymphoid leukemia	11	1.5	1.4	1.7	0.11	0.17	5	0.6	0.7	0.7	0.03	0.06	C91
Myeloid leukemia	12	1.7	1.6	1.7	0.13	0.16	10	1.2	1.3	1.4	0.06	0.13	C92
Leukemia unspecified	12	1.7	1.6	1.5	0.10	0.10	9	1.1	1.2	1.3	0.08	0.08	C95
Other and unspecified	39	5.4	5.0	6.3	0.29	0.82	27	3.3	3.5	3.7	0.23	0.38	O&U
All sites	719	100.0	92.9	122.8	6.82	15.24	806	100.0	105.1	115.2	7.48	12.60	ALL

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

	Male			Female			ICD-10
	Cases	%MV	%DCO	Cases	%MV	%DCO	
Oral cavity	51	72.5	0.0	32	90.6	0.0	C00-C08
Oropharynx, etc.	21	71.4	0.0	5	80.0	0.0	C09-C10;C14
Nasopharynx	19	84.2	0.0	11	45.5	0.0	C11
Hypopharynx	9	77.8	0.0	1	100.0	0.0	C12-C13
Esophagus	58	75.9	0.0	22	59.1	0.0	C15
Stomach	20	65.0	0.0	23	34.8	0.0	C16
Small intestine	1	100.0	0.0	1	100.0	0.0	C17
Colon and rectum	45	64.4	0.0	45	48.9	0.0	C18-C21
Liver and bile duct	94	25.5	0.0	26	26.9	0.0	C22;C24
Gallbladder	3	0.0	0.0	5	20.0	0.0	C23
Pancreas	11	27.3	0.0	7	57.1	0.0	C25
Nose, sinuses etc.	2	100.0	0.0	3	100.0	0.0	C30-C31
Larynx	23	73.9	0.0	2	0.0	0.0	C32
Bronchus, lung	134	47.0	0.0	50	62.0	0.0	C33-C34
Other thoracic organs	1	100.0	0.0	0	0.0	0.0	C37-C38
Bone	4	50.0	0.0	1	100.0	0.0	C40-C41
Connective tissue	5	0.0	0.0	5	0.0	0.0	C47,C49
Skin Cancer	20	95.0	0.0	16	87.5	0.0	C43-C44
Breast	0	0.0	0.0	165	75.8	0.0	C50
Cervix uteri				207	70.0	0.0	C53
Corpus uteri				15	80.0	0.0	C54
Uterus unspecified				2	0.0	0.0	C55
Ovary				31	61.3	0.0	C56
Other female genital				5	0.0	0.0	C51,C52,C57
Placenta				1	0.0	0.0	C58
Penis	12	58.3	0.0				C60
Prostate	20	60.0	0.0				C61
Testis	7	100.0	0.0				C62
Kidney etc.	4	75.0	0.0	4	50.0	0.0	C64-C66,C68
Bladder	38	52.6	0.0	13	30.8	0.0	C67
Eye	2	100.0	0.0	2	50.0	0.0	C69
Brain, nervous system	7	71.4	0.0	8	62.5	0.0	C70-C72
Thyroid	5	60.0	0.0	29	65.5	0.0	C73
Other endocrine	0	0.0	0.0	0	0.0	0.0	C74-C75
Hongkin disease	2	100.0	0.0	0	0.0	0.0	C81
Non-Hodgkin lymphoma	24	76.9	0.0	15	66.7	0.0	C82-C85,C96
Multiple myeloma	3	100.0	0.0	3	100.0	0.0	C88;C90
Leukemia	35	97.1	0.0	24	41.7	0.0	C91-C95
Other and unspecified	39	61.5	0.0	27	48.1	0.0	O&U
All sites	719	60.5	0.0	806	66.3	0.0	ALL