

Cancer Incidence in Daegu in 1997-98: The First Results of the Daegu Cancer Registry

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Purpose: A population-based cancer registry was set up in January 1, 1997 to estimate the incidence of cancer in Daegu, South Korea.

Materials and Methods: Data sources for case-finding and abstracting were hospital inpatients, other sources in hospitals other than inpatients, and private pathology laboratories. The registered cases were matched against two external databases, the death certificate and medical insurance claims.

Results: A total of 7,837 cases (4,203 males, 3,634 females) were registered in 1997-98 excluding 2,718 cases of DCN. The crude incidence rates of all cancers combined were 170.7/100,000 (ASR 255.0) in males and 149.8 (ASR 154.4) in females. In males, the most common cancer was stomach (47.3, ASR 69.0), followed by liver (28.0, ASR 37.6), lung (26.0, ASR 44.1), colorectum (14.9, ASR 23.3),

urinary bladder (4.5, ASR 7.0) and prostate (3.5, ASR 7.0). The most common cancer in females was stomach (25.8, ASR 26.9), followed by breast (21.7, ASR 20.4), cervix uteri (21.1, ASR 20.4), colorectum (14.9, ASR 16.0), lung (9.9, ASR 11.0), liver (9.3, ASR 10.1), and thyroid (6.1, ASR 5.7). The overall percentage of microscopically verified and the DCN% were 80.3%, 27.7% in males and 88.7%, 20.7% in females, respectively.

Conclusion: These results show that the incidence level of all cancers combined in both sexes in Daegu is approaching that of other industrialized regions in Asia as well as in the world. (*J Korean Cancer Assoc 2001;33:136-148*)

Key Words: Cancer registry, Daegu

(1) 가 (population-based cancer registry)

1980 WHO (multi-hospital central cancer registry)

(2) ,

(3) 1992-95 (4)가 , (5) 7)가

8 (8,9).

1997 1 1 1998 12 31

2 1997-98

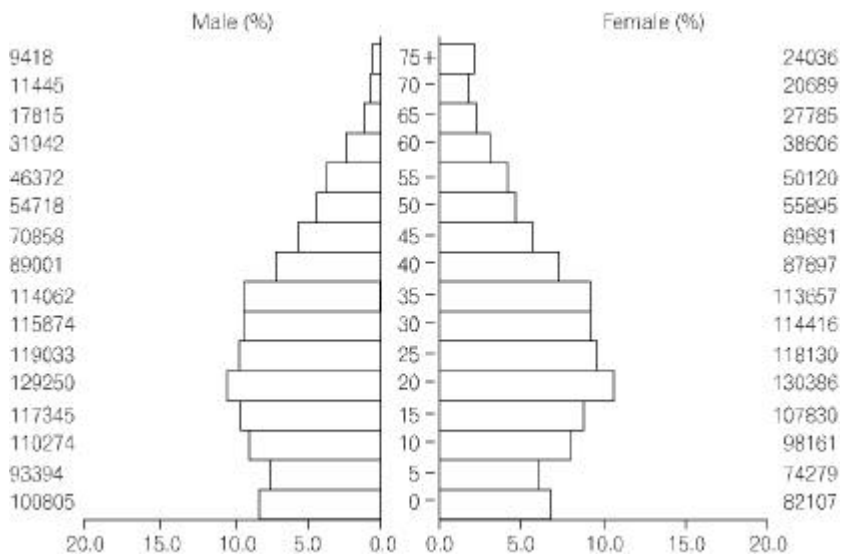


Fig. 1. Age structure in Daegu, 1995.

cer registry) 1997 1 1 (, ,
 CT/MRI , ,)
 1995 (10) 2,445,277 (
 1,231,602 , 1,213,675) Fig. 1 가 ,
 가 , ,
 ICD-O-2 /3 (11,12).
 IARC 가
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 (12) 1997 1 1 1998 12 31 2
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 (matching)
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 , , , , , , (morphology), (internal database) 2
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 (Fig. 2). 8 notification (DCN)
 (inpatients database) , (suspense file) , (prevalent
 cases) 1993 1996
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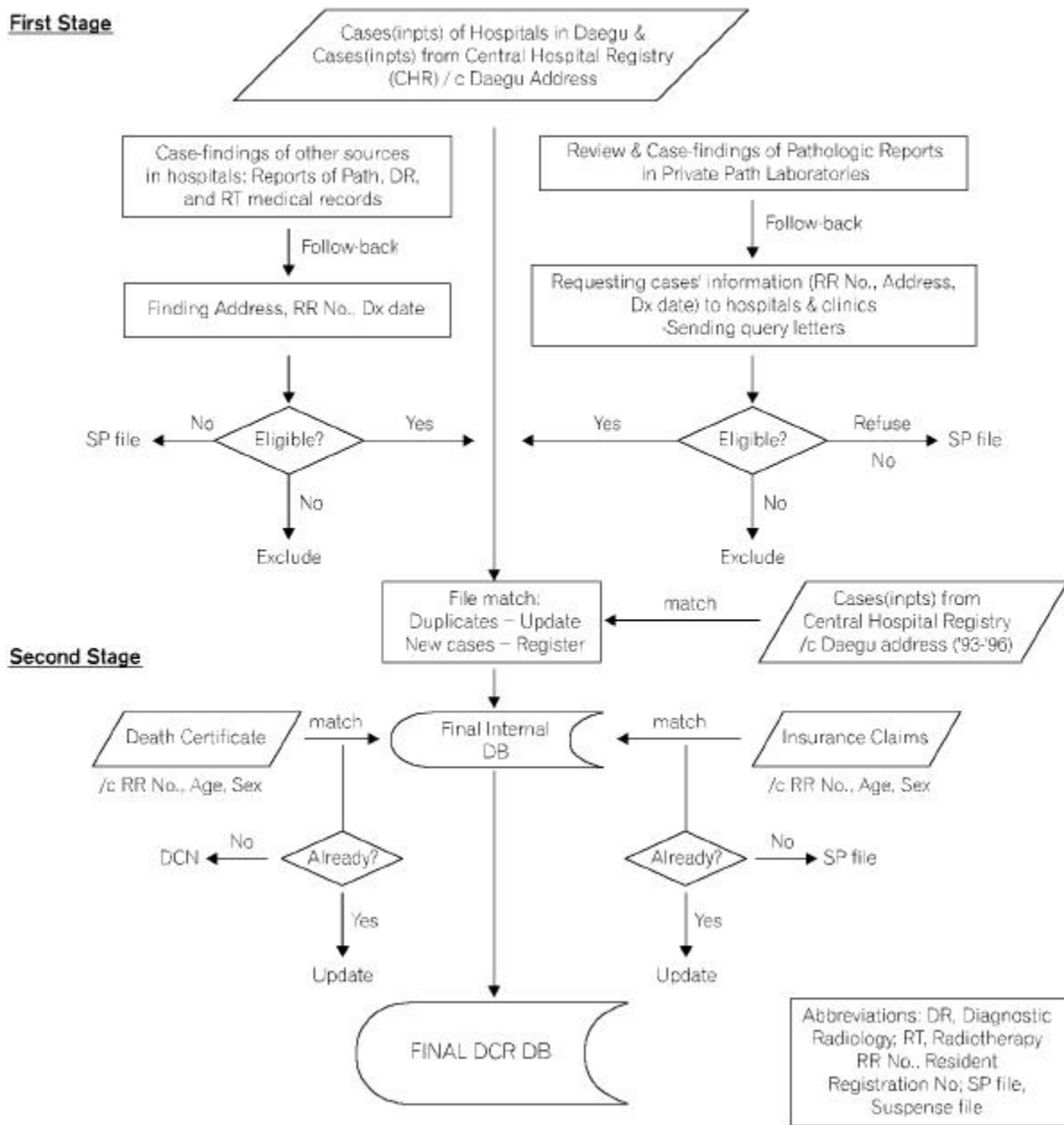


Fig. 2. Data collection mechanism and input diagram.

가 (1). CANREG-37가

(13). (15).

(microscopic verification%, MV%),

(death certificate notification, DCN)%,

/ (mortality/incidence ratios, MI ratios)

. MV% CI5 (14) 1997 98 2 4,203 ,

(needle biopsy) 7,837 10

3,634 .

170.7 ,

18

Table 2. Average annual age-specific incidence rates, crude rates (all ages), ASR in Daegu 1997-98 by primary site and age in females

SITE	All ages	AGE																			Crude rate	ASR world	ICD (10th)
		UNK	0	1	4-5	9-10	14-15	19-20	24-25	29-30	34-35	39-40	44-45	49-50	54-55	59-60	64-65	69-70	74-75	79-80			
Lip	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	C00
Tongue	7	0	-	-	-	-	-	-	0.4	-	0.4	-	-	-	-	1.3	5.4	-	-	4.4	0.3	0.3	C01-C02
Salivary gland	11	0	-	-	-	0.5	-	-	0.4	0.9	0.4	-	1.4	1.8	1.0	-	1.8	-	-	-	0.5	0.4	C07-C08
Mouth	7	0	-	-	-	-	-	-	-	-	-	-	0.7	0.9	-	1.3	3.6	-	7.8	-	0.3	0.3	C03-C06
Oropharynx	5	0	-	-	-	-	-	-	-	-	0.4	-	0.7	-	1.0	2.6	-	-	-	-	0.2	0.2	C09-C10
Nasopharynx	8	0	-	-	-	-	-	1.2	-	-	-	-	-	0.9	1.0	1.3	-	2.4	-	4.4	0.3	0.3	C11
Hypopharynx	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.9	4.4	0.1	0.1	C12-C13	
Pharynx unspec.	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	-	0.0	0.0	C14
Oesophagus	14	0	-	-	-	-	-	-	-	0.9	-	-	0.9	1.0	-	7.2	7.3	3.9	8.9	0.6	0.6	C15	
Stomach	626	0	-	-	-	0.9	1.2	7.6	11.8	18.0	23.9	40.9	39.4	69.9	101.1	147.7	193.5	211.8	124.2	25.8	26.9	C16	
Small intestine	19	0	-	-	-	-	-	0.4	-	0.4	-	-	-	7.0	5.2	3.6	4.8	3.9	4.4	0.8	0.8	C17	
Colon	164	0	-	-	0.5	-	0.8	-	0.4	4.0	1.1	7.2	15.2	21.0	29.8	52.2	55.6	51.0	57.7	6.8	7.4	C18	
Rectum	196	0	-	-	-	-	-	0.4	2.6	3.1	4.6	10.8	19.7	36.9	37.6	45.0	53.2	82.4	13.3	8.1	8.6	C19-C21	
Liver	225	0	-	0.8	-	0.5	0.4	0.8	2.2	3.5	8.0	12.2	18.8	37.9	46.7	68.4	48.4	54.9	39.9	9.3	10.1	C22	
Gallbladder etc.	128	0	-	-	-	-	-	0.4	-	1.3	1.1	4.3	9.0	13.0	24.6	37.8	65.3	39.2	71.0	5.3	5.9	C23-C24	
Pancreas	59	0	-	-	-	-	-	0.4	0.4	-	-	0.7	3.6	5.0	6.5	32.4	31.4	27.5	17.7	2.4	2.8	C25	
Nose, sinuses etc.	13	0	-	-	0.5	0.5	0.4	0.4	-	-	-	-	-	-	1.3	3.6	4.8	3.9	13.3	0.5	0.6	C30-C31	
Larynx	13	0	-	-	-	-	-	-	-	-	1.1	-	0.9	2.0	2.6	3.6	2.4	11.8	-	0.5	0.6	C32	
Bronchus, lung	241	0	-	-	-	-	-	-	2.6	2.6	7.4	5.0	9.8	18.0	53.1	77.4	120.9	109.8	79.8	9.9	11.0	C33-C34	
Other thoracic organs	24	0	-	-	-	-	-	-	-	0.6	2.9	-	4.0	2.6	7.2	12.1	3.9	13.3	1.0	1.1	1.1	C37-C38	
Bone	19	0	-	-	1.5	0.5	0.8	-	-	1.3	0.6	1.4	1.8	4.0	1.3	-	-	-	-	0.8	0.7	C40-C41	
Connective tissue	27	0	-	0.7	-	1.9	0.4	0.8	1.3	1.3	0.6	0.7	-	2.0	2.6	5.4	7.3	3.9	-	1.1	1.1	C47-C49	
Mesothelioma	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-	0.0	0.1	C45	
Kaposi's sarcoma	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	C46	
Melanoma of skin	12	0	-	-	-	-	-	-	0.4	-	1.4	2.7	1.0	2.6	1.8	-	3.9	4.4	0.5	0.5	0.5	C43	
Other skin	61	0	-	-	-	0.5	0.4	0.4	-	0.4	1.1	3.6	0.9	5.0	3.9	16.2	7.3	51.0	71.0	2.5	2.7	C44	
Breast	527	0	-	-	-	-	1.9	7.6	16.6	29.9	49.0	65.3	69.8	64.9	41.5	30.6	38.7	27.5	26.6	21.7	20.4	C50	
Uterus unspec.	7	0	-	-	-	-	-	-	0.9	-	-	0.7	0.9	1.0	-	1.8	-	3.9	-	0.3	0.3	C55	
Cervix uteri	513	0	-	0.8	-	-	1.5	4.2	16.6	28.2	46.1	51.7	51.0	55.9	73.9	48.6	60.5	51.0	35.5	21.1	20.4	C53	
Placenta	2	0	-	-	-	0.5	-	-	0.4	-	-	-	-	-	-	-	-	-	-	0.1	0.1	C58	
Corpus uteri	51	0	-	-	-	-	0.8	-	0.9	2.2	3.4	5.0	7.2	5.0	3.9	16.2	4.8	3.9	4.4	2.1	2.1	C54	
Ovary etc.	116	0	-	0.7	1.5	2.8	2.7	1.3	3.5	2.2	8.0	10.8	9.0	14.0	11.7	21.6	7.3	3.9	22.2	4.8	4.8	C56	
Other female genital	26	0	-	0.8	-	-	0.5	-	-	0.9	0.6	1.4	1.8	2.0	6.5	10.8	2.4	3.9	8.9	1.1	1.2	C51-C52; C57	
Bladder	35	0	-	-	-	-	-	0.4	-	-	-	-	1.8	3.0	1.3	16.2	19.3	23.5	22.2	1.4	1.6	C57	
Kidney etc.	44	0	-	-	-	-	-	-	0.4	-	3.4	2.2	7.2	5.0	11.7	9.0	9.7	7.8	4.4	1.8	2.0	C64-C66; C68	
Eye	3	0	-	-	-	-	-	-	-	0.4	-	-	-	-	-	-	4.8	-	-	0.1	0.1	C69	
Brain, nervous system	36	0	-	3.0	2.7	1.0	2.8	0.8	0.4	2.2	1.3	0.6	2.9	0.9	1.0	2.6	-	-	-	1.5	1.6	C70-C72	
Thyroid	147	0	-	0.7	0.5	2.3	1.9	2.5	7.4	7.0	13.7	10.1	6.3	12.0	18.1	21.6	16.9	7.8	17.7	6.1	5.7	C73	
Other endocrine	3	0	-	1.5	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	C74-C75	
Hodgkin's disease	4	0	-	-	-	-	-	-	-	0.4	-	-	-	-	-	2.6	-	-	3.9	-	0.2	0.2	C81
Non-Hodgkin lymphoma	69	0	-	-	-	1.0	0.5	0.8	0.8	2.6	1.3	2.3	2.2	5.4	9.0	11.7	14.4	16.9	3.9	26.6	2.8	2.9	C82-C85; C96
Multiple myeloma	15	0	-	-	-	-	-	-	-	0.4	1.1	1.4	-	1.0	5.2	3.6	-	11.8	-	0.6	0.7	C88-C90	
Lymphoid leukaemia	26	0	-	2.3	2.0	1.5	0.9	0.8	2.5	0.9	0.4	0.6	0.7	-	1.0	-	-	2.4	-	1.1	1.2	C91	
Myeloid leukaemia	50	0	-	1.5	1.3	2.0	-	1.5	1.7	1.3	3.5	1.7	1.4	3.6	4.0	3.9	5.4	2.4	-	13.3	2.1	2.0	C92
Monocytic leukaemia	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	C93	
Other leukaemia	1	0	-	-	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	0.0	0.0	C94	
Leukaemia unspec.	11	0	3.1	0.8	0.7	-	-	0.4	0.4	-	0.4	0.6	-	-	1.0	1.3	1.8	-	3.9	-	0.5	0.5	C95
Other & unspecified	65	0	-	2.3	0.7	0.5	0.5	0.4	-	0.4	1.3	1.1	5.7	4.5	7.0	7.8	18.0	24.2	15.7	8.9	2.7	3.0	
All sites	3634	0	3.0	14.0	10.0	11.0	15.0	19.0	35.0	77.0	119.0	182.0	256.0	295.0	417.0	531.0	742.0	830.0	847.0	723.0	149.8	154.4	
All sites but C44	3573	0	3.0	14.0	10.0	11.0	14.5	18.6	34.6	77.0	118.6	180.9	252.4	294.1	412.0	527.1	725.8	822.7	796.0	652.0	147.3	151.7	

1 가 (Table 1). 1997-98 2
 10
 149.8 , 154.4 가 가
 25.8 (ASR 26.9) 84.4% .
 2 21.7 (ASR 20.4) . 80.3%, 88.7%
 21.1 (ASR 20.4), 14.9 (ASR 16.0), 가 100%
 9.9 (ASR 11.0), 9.3 (ASR 10.1), 6.1 , Hodgkin's disease ,
 (ASR 5.7), 5.3 (ASR 5.9), 4.8 (ASR 4.8), .
 Non-Hodgkin's lymphoma 2.8 (ASR 2.9) (Table 2). 57.7%, 34.9%,

Table 3. Percentage of cases registered with microscopic verification of diagnosis (MV%), and death certification notification (DCN (%)), mortality/incidence ratio percent by site and sex 1997-98, Daegu Cancer Registry

Sites	MV %*			DCN %			M : I (%)		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
Pharynx etc.	95.3	100.0	96.2	11.5	6.8	10.6	36.5	43.9	27.7
Oesophagus	97.4	93.3	88.1	25.0	28.6	25.4	82.1	48.1	78.7
Stomach	95.1	95.2	95.1	21.0	27.2	23.3	52.6	66.3	57.4
Small intestine	90.9	89.5	90.2	15.4	9.5	12.8	—	—	—
Colon	91.8	88.5	90.2	19.1	27.9	23.6	46.2	64.2	55.0
Rectum	93.3	96.4	94.9	15.8	13.2	14.5	41.1	33.6	37.4
Liver	30.9	36.4	32.3	39.8	41.2	40.1	106.1	114.3	108.3
Gallbladder	55.6	59.7	57.7	38.1	29.5	33.9	102.8	78.5	90.2
Pancreas	31.4	39.0	34.9	54.8	49.1	52.4	191.4	140.8	165.9
Larynx	92.9	85.7	92.0	26.7	30.0	27.1	55.8	74.2	57.7
Bronchus, Lung	88.5	79.9	86.2	30.4	39.3	33.1	93.5	103.6	96.3
Bone	95.5	95.5	95.5	24.1	18.5	21.4	54.1	36.0	47.5
Connective tissue	90.9	96.3	93.9	18.5	3.6	10.9	—	—	—
Melanoma of skin	100.0	100.0	100.0	7.7	7.7	7.7	—	—	—
Other skin	96.6	98.4	97.5	4.9	7.5	6.3	—	—	—
Breast	100.0	96.4	96.5	—	7.2	7.2	—	17.7	17.7
Cervix uteri	—	96.6	96.6	—	4.2	4.2	—	10.9	10.9
Uterus unspec.	—	85.7	85.7	—	75.9	75.9	—	—	—
Corpus uteri	—	96.2	96.2	—	3.7	3.7	—	5.9	5.9
Ovary	—	92.4	92.4	—	9.2	9.2	—	0.0	0.0
Prostate	90.6	—	90.6	18.1	—	18.1	31.3	—	31.3
Bladder	85.5	82.9	84.8	16.0	18.6	16.7	28.0	35.3	29.7
Kidney etc.	87.5	80.8	85.0	15.4	16.7	15.8	35.0	43.5	37.9
Brain, nervous system	81.4	83.3	82.3	40.3	52.6	46.6	117.0	131.8	126.0
Thyroid	84.6	93.3	93.5	5.1	4.5	4.6	13.5	6.1	7.6
Non-Hodgkin lymphoma	100.0	87.0	94.1	26.3	22.5	24.6	58.5	48.6	53.6
Hodgkin's disease	100.0	100.0	100.0	—	—	—	—	—	—
Multiple myeloma	95.7	88.2	92.5	14.8	22.7	18.4	58.6	54.9	55.3
Lymphoid leukaemia	90.0	100.0	94.6	16.7	21.2	18.8	40.6	30.0	35.7
Myeloid leukaemia	95.3	98.0	96.8	18.9	23.9	21.7	57.3	41.2	48.9
Leukaemia unspec.	90.9	81.8	86.4	69.7	67.6	67.2	345.1	329.6	332.4
All sites	80.3	88.7	84.4	27.7	20.7	25.5	70.6	50.9	61.5

32.3% . (40.1%), (33.9%), (33.1%) .
 DCN 25.5% , 18.5%,
 27.7%, 20.7% . 3.6% .
 3.7% 가 4.2%, /
 4.6% . 10% 70.6%, 50.9% . 100%가
 , , 가
 75.9%, 345.1%, 19.14%, 117.0%,
 67.2% . 106.1%, 102.8% .
 30% (52.4%), 329.6%, 140.8%, 13.18%, 114.3%,

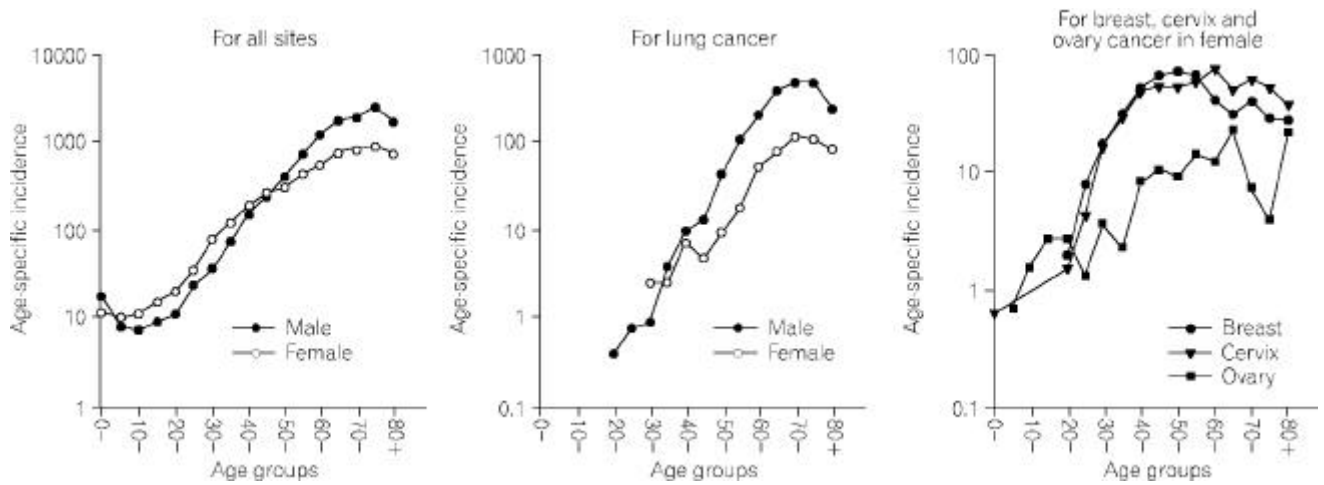


Fig. 3. Age-specific curves for all sites, lung, and selected female cancers, 1997-98, Daegu Cancer Registry.

Table 4. Number of cases registered by other sources and local laboratories alone by site and sex

Sites	Other sources			Local laboratories		
	Males	Females	Total	Males	Females	Total
Stomach	111 (31.5)	48 (15.0)	159 (23.6)	57 (74.0)	35 (29.7)	92 (47.2)
Colorectum	41 (11.6)	44 (14.4)	85 (12.6)	12 (15.5)	13 (11.0)	25 (12.8)
Liver	23 (6.5)	5 (1.5)	28 (4.1)	—	—	—
Gallbladder	10 (2.8)	7 (2.1)	17 (2.5)	—	—	—
Larynx	13 (3.6)	3 (0.9)	16 (2.3)	—	—	—
Lung	41 (11.6)	21 (6.5)	62 (9.2)	1 (1.3)	1 (0.8)	2 (1.0)
Other skin	14 (3.9)	15 (4.6)	29 (4.3)	2 (2.6)	9 (7.6)	11 (5.6)
Breast	—	43 (13.4)	43 (6.3)	—	23 (19.5)	23 (11.7)
Cervix uteri	—	59 (18.4)	59 (8.7)	—	35 (29.7)	35 (17.0)
Prostate	12 (3.4)	—	12 (1.7)	—	—	—
Bladder	18 (5.1)	5 (1.5)	23 (3.4)	—	1 (0.8)	1 (0.5)
Thyroid	4 (1.1)	17 (5.3)	21 (3.1)	—	—	—
Non-Hodgkin lymphoma	9 (2.5)	6 (1.8)	15 (2.2)	—	—	—
Leukaemia	11 (3.1)	7 (2.1)	18 (2.6)	—	—	—
Others	45 (12.7)	40 (12.5)	85 (12.6)	5 (6.5)	1 (0.8)	6 (3.1)
All sites	352 (100.0)	320 (100.0)	672 (100.0)	77 (100.0)	118 (100.0)	195 (100.0)

103.6% 78.5% 54 , 60 64
 100% . 가
 13.5%, 6.1% . 15 19
 61.5% (Table 3). 65 69 , 70 79
 5 9 80
 가 가 가 (Fig. 3).
 75 79 . 45 49
 가 가 672 ,
 40 195 2 8.6%,
 45 가 2.5% 가
 , 75 79 , 70 74 (31.5%)
 (11.6%), (11.6%) ,
 (18.4%), (15.0%), (14.4%), (13.4%)
 20 24 가 50 가

Table 5. Comparisons of major cancers among cancer registries by sex (ASR world)

Sites	DCR* (97-98)	Kangwha† (86-92)	LA Korean migrants† (88-92)	Japan† (1995)	Shanghai† (88-92)
Males					
All sites	255.0	201.7	188.8	265.8	230.5
Oesophagus	7.3	10.2	6.0	10.0	12.5
Stomach	69.0	65.9	35.5	66.5	46.5
Colon	11.5	4.5	14.1	30.3	12.2
Rectum	11.8	8.3	8.1	17.7	9.3
Liver	37.6	27.7	23.9	25.5	28.2
Gallbladder etc.	8.0	4.8	2.7	6.7	2.5
Pancreas	4.5	7.2	4.8	9.2	6.3
Larynx	5.9	1.4	5.5	2.9	3.3
Bronchus, lung	44.1	33.8	36.7	36.6	56.1
Prostate	7.0	0.9	10.2	10.2	2.3
Bladder	7.0	3.1	5.4	8.2	6.9
Kidney etc.	5.1	1.8	6.1	6.3	2.9
Females					
All sites	154.4	110.7	138.1	160.6	154.3
Stomach	26.9	25.0	16.2	27.1	21.0
Colon	7.4	2.3	8.2	17.3	10.8
Rectum	8.6	5.3	6.9	8.5	7.3
Liver	10.1	7.7	5.5	7.7	9.8
Gallbladder etc.	5.9	3.8	6.3	5.5	3.6
Pancreas	2.8	2.7	5.4	4.9	4.1
Bronchus, lung	11.0	8.4	12.3	10.7	18.2
Breast	20.4	7.1	21.4	30.8	26.5
Cervix uteri	20.4	21.8	13.4	8.5	3.3
Ovary etc.	4.8	2.8	4.9	6.4	5.8
Thyroid	5.7	6.0	4.8	5.6	3.0

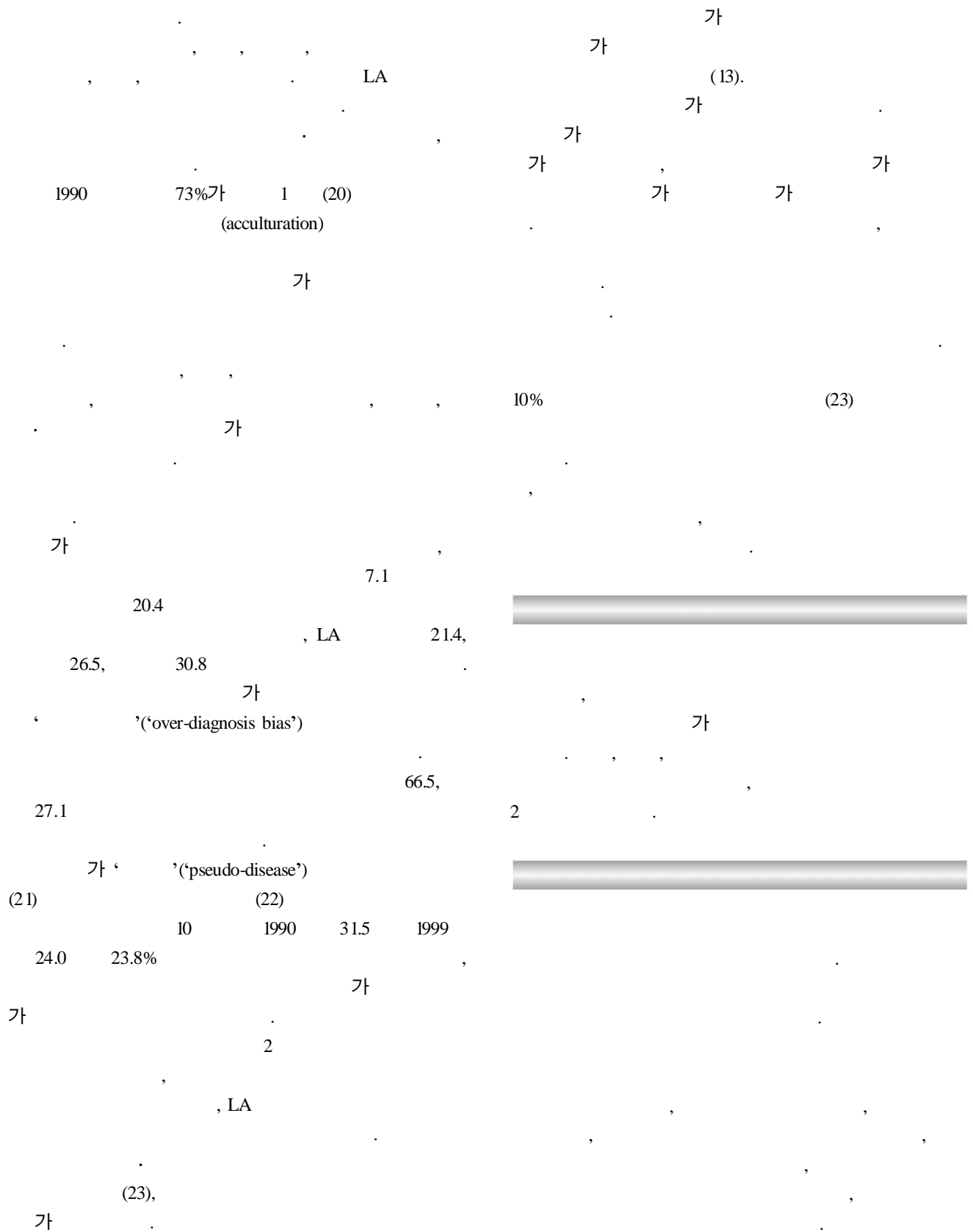
54.8%, 60.6%
 195 77 118
 74.0%, 15.5%
 가 89.6% 1995 (16)
 29.7%, 29.7%, 19.5%
 11.0% 89.8% (14). 가
 (Table 4). 가
 가
 가
 가 (13). (death certificate
 201.7, 110.7, LA 188.8, 138.1 method) 가 DCN%
 (13). 4820 1997 98
 1149 (23.8%)
 7.1 20.4 953 (19.8%)
 LA 2718 DCN (56.4%)가 DCN%
 69.0, LA 35.5, 37.6, LA 23.9 25.5% (27.7%, 20.7%)
 20.4, 21.4 . Spain Tor-
 26.9 16.2, ragona 1980
 10.1 5.5, 20.4 13.4 50%, 39% 10
 13%, 11% (13).
 가
 DCO%가 5% (8)
 1995 (16) 17.2%,
 16.9% / (M : I ratio)
 가 47.5%

(Table 5).



가
 가 (13).
 가 (13)
 55.0%, 37.4%
 CI5 6 (14)
 70.6%, 50.9% , CI5 7
 (8) Osaka 67%, 59%,
 SEER 42%, 43%

(13).
 5 9 가 , 가 가 .
 (17). 1993 1996 가 가 .
 (13). - , 1997 121 , 1998
 가 가 177 , 298
 50 가 가가 .
 , 45 50 .
 가 가 .
 50 가 가 .
 가 가 .
 15 24 , , 가 가 .
 가 (17). 가 가 .
 가 , 가 .
 가 1995 (18) 가 .
 가 55,016 가 .
 (C26, C42, C48, C76, C77, C80)가 88 , 65 .
 2.0%, 1.8% .
 10 5.6, 3.0 . CI5 7 (8)
 Osaka 4.2, 2.9, Khon .
 Kaen 23.3, 14.0, SEER
 9.2, 7.1, 12.5, 11.0 255.0 , 154.4
 가 .
 3가 CI5 7
 (8) 163
 , 54.8%, New Mexico 255.0
 60.6% , 253.8, 256.3 .
 , 89.6%, Shanghai 154.3 ,
 , 89.8% Yamagata, Osaka
 , 153.8, 155.5 . 190.0
 230.5, 102.9 154.3
 , 1995 (16)
 1996 2824 , 265.8, 160.6
 가 1997 3741 917
 가 가 가 .
 1995-1996 269.8, 198.3
 (19). (1986)



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