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1), 2)  
3), 4)

## Trends of Cancer Mortality in Gyeongsangbuk-do from 1991 to 1998

Byung-Guk Kim<sup>1)\*</sup>, Sung-Kook Lee<sup>2)</sup>, Tea-Woong Kim<sup>1)</sup>, Do-Young Lee<sup>3)</sup>,  
Kyeong-Soo Lee<sup>4)</sup>

Division of Health and Sanitation, Gyeongsangbuk-do<sup>1)</sup>,  
Public Health and Environment Research

*Institute of Gyeongsangbuk-do<sup>2)</sup>, Department of Preventive Medicine  
and Public Health, College of Medicine, Kyungpook National University<sup>3)</sup>*

*Department of Preventive Medicine and Public Health, College of Medicine,  
Yeungnam University<sup>4)</sup>*

### = ABSTRACT =

Data on reported cancer mortality in the Gyeongsangbuk-do province from 1991 to 1998 were collected and analyzed using the existing mortality reporting system as well as the public health network to furnish accurate data on reported cancer death and to collect data to establish a high quality district health plan.

The overall crude death rate in Gyeongsangbuk province in 1991 was 74.56 deaths per 100,000-person but this rate increased to 79.22 in 1998. Among the deaths, the overall death rate of cancer was 16.7% in 1991, which increased to 19.3% in 1998; specifically the death rate of men increased from 19.4% in 1991 to 22.3% in 1998 while that of women increased from 12.4% in 1991 to 15.5% in 1998, showing a more increase among women.

The types of cancer and associated death rates in 1991 were gastric cancer(41.5%), followed by liver cancer(28.8%), and lung and bronchogenic carcinoma(8.7%) and in 1998, gastric cancer(24.7%), followed by liver cancer(22.7%), lung and bronchogenic carcinoma(19.3%), showing the same order. For men and women, gastric cancer(40.2% and 44.7%, respectively) was the most common cancer death, followed by liver cancer(33.7% and 16.7%, respectively), and lung and bronchogenic

carcinoma(10.2% and 5.0%, respectively) in 1991. However, in 1998, gastric cancer(27.8%) was still the most common type among both men and women, followed by liver cancer (18.5%) and lung and bronchogenic carcinoma(12.7%), showing the most decrease in gastric cancer but most increase in lung and bronchogenic carcinoma.

The age-adjusted mortality rates by gastric cancer, hepatoma, laryngeal carcinoma were decreased in both male and female, and also uterine cancer was decreased in female. The age-adjusted mortality rates by lung and bronchogenic carcinoma, pancreatic cancer, rectal cancer were increased in both male and female, and also breast cancer was increased in female.

The calculated overall age-adjusted death rate based on the 1995 population was 84.25 in 1991, which decreased to 77.67 in 1998. Male death rate decreased significantly from 119.81 in 1991 to 101.82 in 1998 while the female death rate increased from 48.64 in 1991 to 53.80 in 1998.

A census of cancer death rate using accurate death records is important for the establishment of proper and high-quality district health and medical plan and policy. The effort to improve the accuracy of death reports using the health facility network, as had been attempted by this study, can be continued. Furthermore, there must be a way for the Health and Welfare Department to use the death reports to improve the present reporting system. Lastly, additional studies need to be conducted to investigate how much the accuracy was improved by the supplemented death reports in this study.

KEY WORDS: Cancer, Mortality, Rural area

가 .  
가 ,  
1998 22.3% ,  
2 ,  
가 가 (Percy , 1981; ,  
( , 1999). 가 1997; Laplanche, 1998; , 2000).  
(Kircher , 1985; Klatt Nogu-  
chi, 1989; Nuttens , 1990; Nielsen , 1991; 가  
Lu , 2000).

가 가 69.2%, 1.1%, 29.7% ( , 1999) . . . . .

가 가 20 . . . . .

가 1980 가 가 . . . . .

가 가 가 가 . . . . .

가가 가 . . . . .

가 1998 8 1991 . . . . .

가 1 , 1 . . . . .

2 ( ) . ( ) . . . . . ( )

(District Health Information: DHI)

가 1 . . . . .

가 가 . . . . .

가 가 . . . . .

, 1998 가

4

가

가

SPSS(ver 10.0)

가

1995

1991 2,871,821

1998 2,809,595 7 2.2%

( 1).

가

1991 16.7%, 1995 18.9%, 1997

가 )

20.4%

가

1998 19.3%

( 2).

가

가

1991 19.4%, 1995

21.9%, 1997 23.6%

가

3 1995

1998 22.3%

1991 12.4%, 1995 14.7%, 1997

1994

16.1%

가

1998 15.5%

( 3).

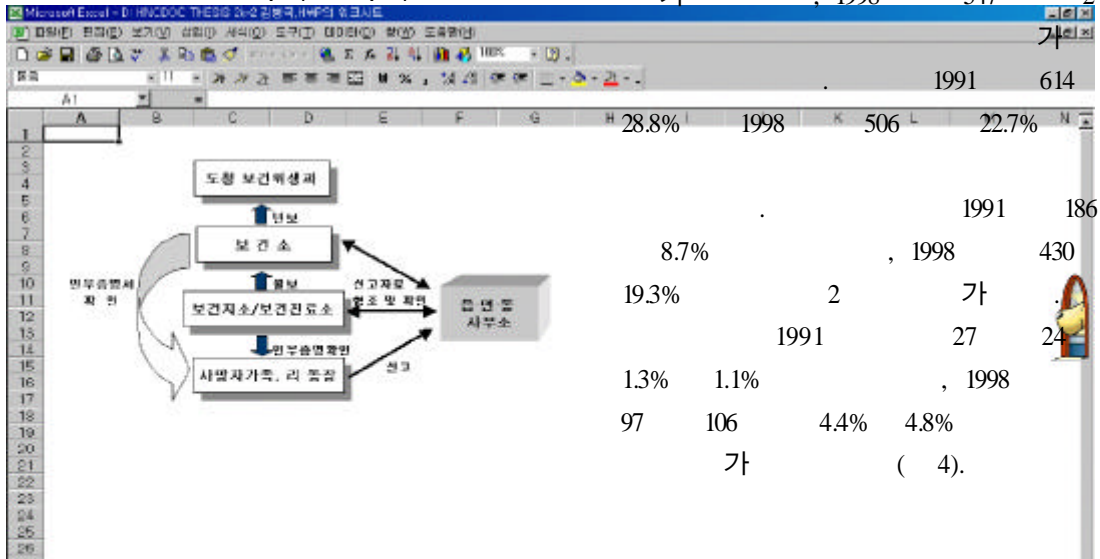
1991 885 41.5%

1 ( 1 )

가

, 1998 547 24.7%

1991 614



가 ( 4).

1.

1991	1992	1993	1994	1995	1996	1997	1998
1,442,465	1,443,421	1,445,914	1,445,244	1,333,759	1,403,863	1,409,973	1,408,418
1,429,356	1,429,915	1,431,860	1,430,491	1,338,739	1,395,308	1,401,613	1,401,177
2,871,821	2,873,336	2,877,774	2,875,735	2,672,498	2,779,171	2,811,586	2,809,595
:		( '91- '98 )			( )		

2.

가

: (%)

	( )	( )	( )
1991	12,792	2,133	16.7
1992	11,633	2,069	17.8
1993	11,420	2,072	18.1
1994	11,550	2,098	18.2
1995	11,505	2,180	18.9
1996	11,510	2,262	19.7
1997	12,647	2,583	20.4
1998	11,504	2,226	19.3

3.

가

: (%)

1991	7,792	1,515	19.4	5,000	618	12.4
1992	6,940	1,420	20.5	4,693	649	13.8
1993	6,675	1,404	21.0	4,745	668	14.1
1994	6,667	1,356	20.3	4,883	742	15.2
1995	6,749	1,480	21.9	4,756	700	14.7
1996	6,824	1,516	22.2	4,686	746	15.9
1997	7,330	1,728	23.6	5,317	855	16.1
1998	6,525	1,453	22.3	4,979	773	15.5
	55,502	11,872	21.4	39,059	5,751	14.7

4.

: (%)

	1991	1995	1998
	885(41.5)	694(31.8)	547(24.7)
	614(28.8)	502(23.0)	506(22.7)
	186( 8.7)	395(18.1)	430(19.3)
	87( 4.1)	58( 2.7)	53( 2.4)
	68( 3.2)	67( 3.1)	61( 2.7)
	53( 2.5)	60( 2.8)	82( 3.7)
	51( 2.4)	22( 1.0)	49( 2.2)
	37( 1.7)	36( 1.7)	45( 2.0)
	27( 1.3)	65( 3.0)	97( 4.4)
	24( 1.1)	70( 3.2)	106( 4.8)
	16( 0.8)	19( 0.9)	25( 1.1)
	85( 3.9)	192( 8.7)	225(10.0)
	2,133(100.0)	2,180(100.0)	2,226(100.0)

44.7% 가 , 1998  
 215 27.8% 1  
 1991 609 332 103 16.7%  
 40.2% 가 , 1998 1998 143  
 22.8%  
 1991 511 33.7% 18.5% 가  
 1998 363 25.0% 1991 31  
 1 5.0% 4 , 1998 98  
 1991 155 가 3 가 12.7%  
 10.2% 3 , 1998 332 , 3 1991  
 22.8% 2 가 2 1.5% 1.6% 1998 4.9%  
 1991 18 5.7% 가  
 14 1.2% 0.9% , 1998 1991 87  
 59 62 14.1% 3  
 4.1% 4.3% 가 , 1998 53 6.9%  
 ( 5). 4 1991 2.6%  
 1991 276 1998 3.2% 가 ( 6).

5.

: (%)

	1991	1995	1998
	609(40.2)	460(31.1)	332(22.8)
	511(33.7)	37.9(25.6)	363(25.0)
	155(10.2)	292(19.7)	332(22.8)
	-	-	-
	53( 3.5)	57( 3.9)	49( 3.4)
	42( 2.8)	52( 3.5)	63( 4.3)
	37( 2.4)	10( 0.7)	24( 1.7)
	20( 1.3)	18( 1.2)	23( 1.6)
	18( 1.2)	46( 3.1)	59( 4.1)
	14( 0.9)	39( 2.6)	62( 4.3)
	-	-	-
	56( 3.7)	127( 8.6)	146(10.0)
	1,515(100.0)	1,480(100.0)	1,453(100.0)

6.

: (%)

	1991	1995	1998
	276(44.7)	234(33.4)	215(27.8)
	103(16.7)	123(17.6)	143(18.5)
	31( 5.0)	103(14.7)	98(12.7)
	87(14.1)	58( 8.3)	53( 6.9)
	15( 2.4)	10( 1.4)	12( 1.6)
	11( 1.8)	8( 1.1)	19( 2.5)
	14( 2.3)	12( 1.7)	25( 3.2)
	17( 2.8)	18( 2.6)	22( 2.8)
	9( 1.5)	19( 2.7)	38( 4.9)
	10( 1.6)	31( 4.4)	44( 5.7)
	16( 2.6)	19( 2.7)	25( 3.2)
	29( 4.7)	65( 9.3)	79(10.2)
	618(100.0)	700(100.0)	773(100.0)

10 1991 74.56, 가 가 1998 103.15 .  
 1995 81.57 가 가 1998 1991 42.59 1998  
 79.22 . 23.57 , 1991 35.73  
 1991 30.94 1998 19.47 , 1998 25.77 .  
 1991 21.47 1998 18.01 1991 10.84 1998 23.57 2 가  
 . 1991 6.50 1998 , 1991 1.26 1998  
 15.30 2 가 , 1991 4.19 가 , 1991 0.98  
 0.94 1998 3.45 가 , 1998 4.40 4 가 .  
 1991 0.84 1998 3.77 4 , 1991  
 가 . , 3.71% 2.59% , 1998  
 1991 2.38% 1.78% 1998 3.48% 1.70% ( 8).  
 2.17% 1.74% ( 7). 10 1991 43.22  
 10 1998 55.16 가 .  
 1991 105.96 , 1995 110.93 1991 19.30 1998 15.34

7. 10

	1991	1995	1998
	30.94	25.97	19.47
	21.47	18.78	18.01
	6.50	14.78	15.30
	3.04	2.17	1.89
	2.38	2.51	2.17
	1.85	2.25	2.92
	1.78	0.82	1.74
	1.29	1.35	1.60
	0.94	2.43	3.45
	0.84	2.62	3.77
	0.56	0.71	0.89
	2.97	7.18	8.01
	74.56	81.57	79.22



8. 10

	1991	1995	1998
	42.59	34.49	23.57
	35.73	28.42	25.77
	10.84	21.86	23.57
	-	-	-
	3.71	4.27	3.48
	2.94	3.90	4.47
	2.59	0.75	1.70
	1.40	1.35	1.63
	1.26	3.45	4.19
	0.98	2.92	4.40
	-	-	-
	3.92	9.52	10.37
	105.96	110.93	103.15

10.21 가 , 1991 7.20 1998 1991 119.81 , 1998 101.82  
 2.17 1998 6.99 3 가 , 53.80 가 , 1991 48.64 , 1998  
 1991 6.08 1998 3.78 1991 35.40 1998 19.06  
 . 1991 0.63 1998 2.71 , 1991 48.65 1998  
 가 , 1991 0.70 1998 23.26 , 1991 22.08  
 3.14 4 가 . 1991 1998 14.93  
 1.12 1998 1.78 가 1991 23.86 1998 17.66  
 , 1991 0.98 , 1991 39.86 1998 25.41  
 1998 1.78 가 ( 9). , 1991 7.97 1998  
 1995 9.95 가 .  
 1991 1991 7.48 1998  
 84.25 1998 77.67 15.00 2 가 ,  
 , , , , , 1991 12.45 1998 23.29 가 ,  
 , . , , , , 1991 2.48 1998 6.80 가  
 , 가 . 1991 1.08

9.	10		
	1991	1995	1998
	19.30	17.48	15.34
	7.20	9.19	10.21
	2.17	7.69	6.99
	6.08	4.33	3.78
	1.05	0.75	0.86
	0.77	0.60	1.36
	0.98	0.90	1.78
	1.19	1.34	1.57
	0.63	1.42	2.71
	0.70	2.32	3.14
	1.12	1.42	1.78
	2.03	4.86	5.64
	43.22	52.30	55.16

, 1998 3.38 3 가 , 40  
 1991 1.44 1998 4.13 1991 8.09 ,  
 가 , 1991 0.71 1998 9.03 , 1998  
 2.64 가 . 6.73 , 6.56 .  
 1991 0.94 1998 3.70 가 1991 11.56  
 , 1991 1.09 1998 , 1998 7.57 ,  
 4.34 가 , 1991 0.79 1991 6.24 , 1998 5.44  
 1998 3.07 가 .  
 1991 6.62 1.23 1991 2.63 , 1998 1.48  
 , 1998 3.70 1.76 , 1991 3.18 1998 1.54  
 가 . , 1991 2.01  
 , , , 1998 1.40 .  
 , . , , , , 1991 2.57 1998 1.43  
 가 , 1995 가 , 1991 4.24 1998 1.97  
 , 1998 1991 0.73 1998 0.82  
 가 . 1991 1991  
 , , , , , , 0.53 1998 0.45 ,  
 , , , , , , 1991 0.90 1998 0.54  
 가 ( 10). , 1991 0.13 1998 0.35

10.

	91	95	98	91	95	98	91	95	98
	35.40	25.97	19.06	48.65	34.49	23.26	22.08	17.48	14.93
	23.86	18.78	17.66	39.86	28.42	25.41	7.97	9.19	9.95
	7.48	14.78	15.00	12.45	21.86	23.29	2.48	7.69	6.80
	3.33	2.17	1.85	-	-	-	6.62	4.33	3.70
	2.71	2.51	2.13	4.21	4.27	3.44	1.22	0.75	0.83
	2.13	2.25	2.86	3.36	3.90	4.42	0.89	0.60	1.32
	2.04	0.82	1.71	2.94	0.75	1.68	1.14	0.90	1.74
	1.35	1.35	1.57	1.47	1.35	1.60	1.23	1.34	1.54
	1.08	2.43	3.38	1.44	3.45	4.13	0.71	1.42	2.64
	0.94	2.62	3.70	1.09	2.92	4.34	0.79	2.32	3.07
	0.62	0.71	0.88	-	-	-	1.23	1.42	1.76
	3.31	7.18	7.87	4.34	9.52	10.25	2.28	4.86	5.52
	84.25	81.57	77.67	119.81	110.93	101.82	48.64	52.30	53.80

가 . 1991 58.25 .  
 0.05 1998 0.11 2 가 . 1991 46.44 , 1998  
 1991 0.05 17.61 , 1991  
 1998 0.22 가 . 66.96 1998 22.09 ,  
 1991 1.42 0.39 1991 27.09 1998 13.17 .  
 , 1998 0.35 0.49 1991 50.93 1998  
 가 ( 11). 25.50 , 1991 87.40  
 40 59 1998 39.13 , 1991  
 1991 136.78 , 16.67 1998 12.10 가 .  
 133.47 , 1998 1991 8.56  
 86.79 , 89.50 1998 14.94 가 , 1991  
 . 1991 14.15 1998 24.69 가 ,  
 196.36 , 1998 121.17 1991 3.32 1998 5.32 가 .  
 , 1991 74.26 , 1998 1991 1.40 1998

11. 40

		91				95				98				
CMR <sup>1)</sup>	SMR <sup>2)</sup>	CMR	SMR	CMR	SMR	CMR	SMR	CMR	SMR	CMR	SMR	CMR	SMR	
2.82	3.18	1.76	2.01	2.31	2.63	2.15	1.62	1.90	1.62	1.54	1.45	1.40	1.54	1.48
3.73	4.24	0.66	0.73	2.26	2.57	1.70	1.00	1.37	2.06	1.97	0.84	0.82	1.48	1.43
0.81	0.90	0.11	0.13	0.47	0.53	0.79	0.50	0.65	0.54	0.54	0.36	0.35	0.46	0.45
-	-	1.21	1.42	0.58	0.68	-	0.37	0.18	-	-	0.36	0.35	0.17	0.16
0.10	0.10	-	-	0.05	0.05	0.11	-	0.06	0.32	0.32	-	-	0.17	0.17
0.20	0.22	0.11	0.13	0.16	0.18	0.11	-	0.06	-	-	0.24	0.24	0.11	0.11
0.30	0.33	-	-	0.16	0.18	0.11	0.12	0.12	-	-	0.12	0.12	0.06	0.05
1.11	1.15	0.88	0.89	1.00	1.02	1.13	1.37	1.25	0.87	0.84	0.84	0.83	0.86	0.83
-	-	0.11	0.10	0.05	0.05	-	-	-	0.22	0.21	-	-	0.11	0.11
0.10	0.10	-	-	0.05	0.05	0.45	0.62	0.54	0.43	0.41	-	-	0.23	0.22
-	-	0.33	0.39	0.16	0.18	-	0.12	0.06	-	-	0.48	0.49	0.23	0.23
1.21	1.34	0.44	0.44	0.84	0.91	1.59	1.25	1.43	1.73	1.74	0.84	0.84	1.31	1.32
10.38	11.56	5.61	6.24	8.09	9.03	8.14	6.97	7.62	7.79	7.57	5.53	5.44	6.73	6.56

: 1) CMR : (Crude Mortality Ratio).  
 2) SMR : (Standardized Mortality Ratio).

3.40 2 가 . 1991  
 1991 1.85 1998 5.34 577.36 , 1998 600.14 가  
 가 . 1991 160.46 , 1998  
 1991 15.17 2.19 , 1998 215.57 가 .  
 5.70 3.36 1991 159.00 , 1998  
 가 ( 12). 97.46 , 1991  
 60 266.79 1998 147.21 ,  
 1991 330.02 , 1991 84.67 1998 63.89 .  
 330.61 , 1998 1991 73.12 1998  
 371.26 , 370.18 . 76.70 가 , 1991 148.15

12. 40-59

91		95			98									
CMR	SMR	CMR	SMR	CMR	SMR	CMR	CMR	SMR	CMR	SMR	CMR	SMR	CMR	SMR
69.33	66.96	27.70	27.09	47.77	46.44	38.72	16.26	27.24	21.47	22.09	13.02	13.17	17.20	17.61
89.29	87.40	17.00	16.67	51.84	50.93	56.39	7.15	31.23	37.88	39.13	11.78	12.10	24.71	25.50
14.54	14.15	3.46	3.32	8.80	8.56	22.42	6.18	14.12	23.68	24.69	5.27	5.32	14.39	14.94
-	-	15.42	15.17	7.99	7.82	-	7.48	3.82	-	-	5.58	5.70	2.82	2.88
7.78	7.34	1.26	1.19	4.40	4.19	5.77	0.98	3.32	3.79	3.94	0.31	0.29	2.03	2.10
4.73	4.48	0.63	0.63	2.61	2.51	4.76	0.33	2.49	5.68	5.85	0.31	0.29	2.97	3.05
4.40	4.27	1.26	1.26	2.77	2.72	0.68	0.33	0.50	1.89	1.95	2.17	2.20	2.03	2.08
0.68	0.63	2.20	2.23	1.47	1.46	0.68	1.30	1.00	1.89	2.03	2.48	2.63	2.19	2.33
2.37	2.24	0.63	0.60	1.47	1.40	6.11	1.30	3.65	4.42	4.58	2.17	2.25	3.28	3.40
2.37	2.24	1.57	1.49	1.96	1.85	3.06	2.60	2.82	6.00	6.11	4.34	4.58	5.16	5.34
-	-	2.20	2.19	1.14	1.13	-	3.90	1.99	-	-	3.41	3.36	1.72	1.70
6.76	6.65	2.52	2.42	4.56	4.46	12.23	7.48	9.80	10.42	10.80	6.20	6.36	8.29	8.57
202.25	196.36	75.85	74.26	136.78	133.47	150.82	55.29	101.98	117.12	121.17	57.04	58.25	86.79	89.50

13. 60

91		95			98									
CMR	SMR	CMR	SMR	CMR	SMR	CMR	CMR	SMR	CMR	SMR	CMR	SMR	CMR	SMR
2553	2679	813	817	1564	1500	2078	739	1211	1807	1471	643	689	901	974
1430	1415	210	218	734	712	1253	424	746	1321	1324	318	385	768	760
745	747	92	93	351	352	1336	316	732	1486	1506	31.8	31.9	789	781
-	-	135	132	72	70	-	135	82	-	-	129	129	76	76
208	203	50	53	118	110	275	33	118	222	209	40	47	176	184
136	130	32	37	94	90	248	33	112	276	236	60	63	148	140
143	149	49	47	87	93	44	43	47	170	165	60	66	87	82
494	499	038	038	261	261	331	130	232	535	534	280	280	332	332
777	770	294	291	42	48	177	69	1106	257	272	123	123	179	172
424	440	245	251	318	327	160	77	112	219	282	119	118	160	162
-	-	294	292	174	172	-	260	154	-	-	400	404	239	243
165	172	834	841	1187	1196	486	135	204	578	575	279	281	352	356
5485	5736	1922	1946	3302	3306	6168	2511	3692	6061	6014	2778	2857	3726	3708

1998 132.94 , 1991 가 , 1996  
 21.18 1998 38.85 가 . 가  
 1991 35.82  
 1998 78.81 2 가 , ( , 2000).  
 1991 74.37 1998 150.06 2 , 2000).  
 가 , 1991 9.38 1998 30.89 , 가  
 3 가 . 가 .  
 1991 4.88 1998 17.72 3  
 가 .  
 1991 3.27 1998 16.22 5 , 1991 .  
 가 . 1991 .  
 7.82 1.74 , 1998  
 12.79 4.04 가 .  
 ( 13).

1995  
 1994  
 1.  
 가 .  
 가 가  
 , .  
 , .  
 가  
 가 ( , 1991). 가  
 1909  
 , 1945 1961 ,  
 가 1962 가 가  
 , 1980 가 가  
 가 가 가  
 ( , 1983).  
 가  
 가 ,  
 가 1993 ( , 1995) 51.9%  
 1998 ( , 2000) 70.3%  
 1991 1995 ,

가 가

가

가 1991 119.81 48.64  
2.5 1998 가 101.82,  
가 53.80 19 가

가

가

가

가

가

가

가

가

1991

48.65 39.86

(1996) 1987

33.8 25.8

22.08, 7.97,

6.62, 1.23 (1996)

2.

1991

1998

1991

20.1,

8.2,

6.3

12,792

1998

11,504

10.1%

2.4

가

가

가

가

가

가

가

. Claude

(1984)

310

가

93.7% 가

89.6%,

70%

가 50% 가

가

. Laplanche(1998)

1,194 1995 219 가 .  
 95%  
 . Hoel (1993)  
 18% 가  
 ,  
 가  
 가  
 10 ,  
 1991  
 가 29.5 , 가 36.2 , 가 22.5 가  
 가 31.0 , 가  
 42.6 , 가 19.3 가  
 , 1995  
 26.5 가 33.2 , 가 19.8  
 가 26.0 가  
 가 34.5 , 가 17.5 , 가  
 . 1991 23.7 ,  
 , 1995 22.0 1.7 ,  
 1991 1995 21.5 ,  
 18.8 2.7 .  
 1991 1995 가 (Engel , 1980; Kircher  
 , 1985; Lloy-Jones , 1998; D'Amico ,  
 1999) 가  
 35.7 28.4 7.3  
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 1991 1995 22.1 28.1  
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1991 16.7% 1998  
19.3% 가 , 1991 19.4%



- 1999; 32(3): 333-342
13. . , , 1991
  14. , , , . - , 2000, 153-154
  15. , , , . , 2000, 20-21
  16. , , . 가 , 1997
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