Correction: Long Term Trends and the Future Gastric Cancer Mortality in Korea: 1983~2013

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CORRECTIONS IN THE ABSTRACT

Purpose: In spite of gastric cancer's decreasing incidence and mortality rates, it is still the most common cancer in Korea. In the present study, weexamined the temporal trends of gastric cancer mortality during the past 20 years in Korea by using an age-period-cohort model, and we predicted the mortality rates for the next 10 years.

Materials and Methods: Data on the annual number of deaths due to gastric cancer and data on population statistics from 1984 to 2003 were obtained from the Korean National Statistical Office. A log-linear Poisson age-period-cohort model was used to estimate age, period and birth cohort effects. To project two periods (10 years) into the future, the new cohort values were estimated by performing linear regression that was applied to a chosen number of the most recent cohort values.

Results: The trends of gastric cancer mortality were predominantly explained by the cohort effect the risk of gastric cancer death decreased since the 1919 birth cohort for both genders. The predicted, expected age- adjusted mortality rates per 100,000 for males and females are 45.74 and 23.70, respectively, during 2004~2008, and 27.77 and 14.92 respectively, during 2009~2013. During 2004~2008 and 2009~2013, the predicted numbers of deaths due to gastric cancer in males are 36,940 and 27,967, respectively, whereas those in females are 19,658 and 14,843, respectively.

Conclusions: Not only the mortality,but also the incidence of gastric cancer in Korea is expected to further decrease in both men and women if the trends of the past 20 years continue.

CORRECTIONS IN THE RESULTS

Table 1 shows the observed and predicted mortality rates for gastric cancer during 1984~2013 in Korea. For both genders, the observed mortality rates of gastric cancer decreased with the time period for the people with an age under 74, whereas they increased for the people with an age over 74. The observed age-adjusted gastric cancer mortality per 100,000 in men fell from 94.11 to 58.26 during the last 20 years. The predicted expected mortality rates per 100,000 for the males were 45.74 and 27.77 during 2004~2008 and 2009~2013, respectively. The observed age-adjusted cancer mortality per 100,000 for the females fell from 48.90 to 29.85during the last 20 years. The predicted expected age-adjusted mortality rates per 100,000 for the females are 23.70 and 14.92. during 2004~2008 and 2009~2013, respectively.

Table 2 shows the goodness of fit (scaled deviance) for the age-period-cohort models. Both the period and cohort effect were significant ($p < 0.001$) after adjusting the age effect for the males and females. When the age-period-cohort model was compared with the age-cohort or age-period sub-model, only the cohort effect was significant for males, while both cohort and period effects were significant for females ($p < 0.05$). The values of $adj\text{-}R^2_A$ for the age-cohort model were almost same as those for the full models for both genders, suggesting the trend of gastric cancer mortality was explained enough by the age and cohort effect. Hence, the age-cohort models were adequate to preidct gastric cancer mortality in Korea, even though the period effect was significant in females. There was no reason to apply the full model, which had an unidentifiableproblem.

Fig. 1 shows the estimated cohort effects. The risk of gastric cancer death decreased since the 1919 birth cohort for both genders. These decreasing trends were extrapolated into the future for making predictions. The predicted cohort values are marked by open symbols in Fig. 1.

Table 3 shows the observed and the expected number of deaths. During the periods 2004~2008 and 2009~2013, the predicted numbers of deaths due to gastric cancer for males are 36,940 and 27,967, respectively, whereas those for the females are 19,658 and 14,843, respectively.

CORRECTIONS IN THE TABLE 1, 2 AND 3

Table 1. Age-specific mortality rates for cancer during the period 1984~2013 in Korea (per 100,000 person)

Sex	Age group	Observed				Predicted	
		1984~1988	1989~1993	1994~1998	1999~2003	2004~2008	2009~2013
Male	25~29	4.55	3.06	2.06	1.68	1.36	1.02
	30~34	8.59	6.40	4.75	3.67	2.60	2.10
	35~39	16.63	11.68	8.66	7.39	4.87	3.64
	40~44	34.68	23.43	16.33	12.96	9.91	6.91
	45~49	67.93	46.01	30.23	23.41	17.43	13.44
	50~54	111.13	87.27	59.66	42.10	29.88	22.82
	55~59	171.87	138.19	109.20	78.30	51.70	37.45
	60~64	255.31	212.20	174.32	133.43	94.35	63.77
	65~69	**317.20**	303.21	263.61	200.26	160.67	112.40
	70~74	351.72	**379.75**	371.35	303.28	244.50	192.74
	75~79	340.27	404.09	**453.19**	410.40	353.16	281.70
	80+	363.97	362.84	432.89	**487.65**	456.01	383.65
	Adjust*	94.11	82.83	71.75	58.26	45.74	27.77
Female	25~29	5.64	4.23	3.50	2.58	1.85	1.39
	30~34	8.79	7.69	6.43	5.40	3.76	2.68
	35~39	13.82	10.50	8.51	7.66	6.04	4.30
	40~44	22.78	14.69	10.77	9.26	7.84	6.39
	45~49	34.32	24.22	16.52	11.58	10.09	8.50
	50~54	48.94	34.58	23.31	16.20	11.55	9.95
	55~59	68.49	52.30	35.97	25.25	16.86	12.20
	60~64	92.28	74.59	57.87	38.92	27.51	18.40
	65~69	**120.43**	104.22	89.63	64.73	45.51	31.89
	70~74	139.84	**141.74**	133.48	104.98	80.33	55.54
	75~79	146.05	159.24	**184.55**	162.05	130.31	98.38
	80+	177.43	174.39	202.35	**196.64**	185.29	150.51
	Adjust*	48.90	41.86	37.17	29.85	23.70	14.92

*age-adjusted mortality rates standardized by the 2004~2008 population in Korea.

Table 2. Summary statistics of the age-period-cohort models for gastric cancer mortality for the period 1984~2003

Sex	Model	DEVIANCE (df)	ΔD	Δdf	p-value	Effect	adj-R^2_A
Male	AGE	**9,487.57 (36)**					
	AGE+drift	**3,699.25 (35)**	5,788.32	1	<0.0001	D ∣ A	0.60
	AGE+PERIOD	3,673.04 (33)	5,814.53	3	<0.0001	P ∣ A	0.58
	AGE+COHORT	48.29 (22)	9,439.28	14	<0.0001	C ∣ A	0.99
	AGE+P+C	45.82 (20)	2.47	2	0.29	P ∣ AC	0.99
			3,627.22	13	<0.0001	C ∣ AP	
Female	AGE	5,627.07 (36)					
	AGE+drift	2,369.30 (35)	3,257.77	1	<0.0001	D ∣ A	0.57
	AGE+PERIOD	2,346.68 (33)	3,280.39	3	<0.0001	P ∣ A	0.55
	AGE+COHORT	44.20 (22)	5,582.87	14	<0.0001	C ∣ A	0.99
	AGE+P+C	33.95 (20)	10.25	2	0.006	P ∣ AC	0.99
			2,312.73	13	<0.0001	C ∣ AP	

Table 3. Observed and predicted number of gastric cancer deaths in Korea (1984~2013)

Sex	Age group	Observed death				Predicted death	
		1984~1988	1989~1993	1994~1998	1999~2003	2004~2008	2009~2013
Male	25~29	484	335	229	181	139	104
	30~34	741	692	520	404	282	228
	35~39	1,119	979	923	799	537	402
	40~44	2,039	1,526	1,338	1,354	1,062	741
	45~49	3,718	2,563	1,907	1,866	1,789	1,379
	50~54	4,787	4,479	3,162	2,573	2,328	1,778
	55~59	5,111	5,435	5,173	3,926	3,051	2,210
	60~64	5,792	5,540	6,235	5,822	4,436	2,998
	65~69	5,036	5,760	5,987	6,376	6,364	4,452
	70~74	3,556	4,647	5,666	5,750	6,737	5,311
	75~79	1,804	2,784	3,913	4,605	5,258	4,194
	80+	1,040	1,490	2,427	3,617	4,957	4,170
	Total	**35,227**	**36,230**	**37,480**	**37,273**	**36,940**	**27,967**
Female	25~29	577	440	372	263	176	133
	30~34	706	789	665	569	382	273
	35~39	857	834	870	791	634	452
	40~44	1,262	913	845	939	803	655
	45~49	1,826	1,307	1,006	897	1,017	856
	50~54	2,218	1,794	1,225	973	891	768
	55~59	2,478	2,310	1,825	1,304	1,002	725
	60~64	2,667	2,584	2,481	1,919	1,384	926
	65~69	2,584	2,804	2,935	2,649	2,155	1,510
	70~74	2,226	2,700	3,229	3,143	3,056	2,113
	75~79	1,538	2,113	2,901	3,300	3,390	2,559
	80+	1,507	2,009	3,047	3,682	4,768	3,873
	Total	**20,446**	**20,597**	**21,401**	**20,429**	**19,658**	**14,843**