

2014년 사망원인 통계

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Cause-of-death statistics in the Republic of Korea, 2014

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This article presents recent trends and statistical indicators related to mortality in the Republic of Korea by analyzing the 2014 cause-of-death statistics. Specifically, we assessed the number of deaths, the crude death rate, the ranking of causes of death, and trends in the death rate from the major causes of death. Causes of death were classified according to the International Statistical Classification of Diseases and Related Health Problems, 10th revision, as recommended by the World Health Organization. In order to determine the ranking of causes of death, Statistics Korea used the selection list of 56 causes of death from the 80 causes of death list for tabulation mortality statistics recommended by World Health Organization to better fit the Korean situation. The 10 leading causes of death were, in order, cancer, heart disease, cerebrovascular disease, suicide, pneumonia, diabetes mellitus, chronic lower respiratory disease, liver disease, transport accidents, and hypertensive diseases. The top 10 causes of death accounted for 70.5% of all Korean deaths. The ranking of cancer types as causes of death was lung, liver, stomach, colon, and pancreatic cancer. Death rates for heart disease increased from the third in 2013 to the second leading cause in 2014 and the rank of pneumonia moved up from the sixth in 2013 to the fifth in 2014. The mortality rate due to stomach cancer has decreased continuously over time. This finding may reflect changes in Korean society involving population structure, epidemiological patterns, and lifestyles, including dietary habits.

Key Words: Neoplasms; Cardiovascular diseases; Cause of death; Heart diseases; Korea

Introduction

Statistics Korea has published an annual report on the cause-of-death statistics of the Korean population since

1982. The first report, published in 1982, dealt with causes of death in 1980. Analyses of the cause-of-death data from 2003 to 2014 are available at the homepage of Statistics Korea [1]. Although this resource is easily accessible to the public, it is difficult to cite the data since the report is in Korean, making it difficult to foreigners to access. Therefore, the editor of the *Journal of the Korean Medical Association* and the corresponding staff of Statistics Korea discussed the publication of these data in the journal in December 2015, and agreed to jointly author an article in English drawing on the cause-of-death data from 2014, which was made

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publically available in September 2015. This is the first effort between these two organizations to facilitate the wider propagation of this valuable information.

The annual reporting of cause-of-death statistics is a duty of the governments of World Health Organization (WHO) member countries, and the Korean government has fulfilled this duty. These statistics are important because they can provide a basis for national demographic and health care policies by identifying the number, causes, and geographical distribution of deaths. The distribution of causes of death in the Korean population is of interest not only for members researchers, and the government, but also for policymakers and researchers worldwide, because Korea is undergoing economic and demographic changes at an unusually rapid rate. Examining the corresponding changes in the causes of death in the Korean population may provide some insights regarding how to cope with issues of public health and welfare in developing countries as well as in other Organization for Economic Co-operation and Development countries.

Beginning in 2000, cause of death statistics has provided regional figures along with nation-wide data. However, in this article, only nation-wide data are presented and discussed. This article presents the recent trends and statistical indicators related to death by analyzing the cause-of-death statistics in 2014. In particular, we analyzed the number of deaths, the crude death rate, the ranking of causes of death, and trends in the death rate from the major causes of death.

Methods

Cause-of-death statistics were collected based on the Statistics Act and Act on the Registration, etc. of Family Relationships (<http://elaw.klri.re.kr>). Statistics Korea collected

data from death certificates issued for deaths in 2014 filed in local administration offices. When death occurs, family should submit the death report form with death medical certificate issued by physicians to local offices. The present data reflect an analysis of death certificates issued up to April 30, 2015 for deaths from January 1, 2014 to December 31, 2014 [1]. In order to compare the data internationally, the causes of death were classified according to the International Statistical Classification of Diseases and Related Health Problems, 10th revision, as recommended by the WHO, as well as the KCD-6 (Korean Standard Classification of Diseases and Causes of Death), which has been modified to fit circumstances in Korea [2,3]. In order to determine the ranking of causes of death, Statistics Korea used the selection list of 56 causes of death from the 80 causes of death list for tabulation mortality statistics recommended by WHO to better fit the Korean situation. A variety of cancers (malignant neoplasms) were integrated into the single item of cancer [1]. Descriptive analysis was performed.

Results

1. Number of deaths and crude death rate

The total number of deaths was 267,692, which was an increase of 1,435 (0.5%) from 2013. The number of deaths has continually increased over the last 20 years (Figure 1, Table 1). The number of deaths among men was 147,321, which was an increase of 722 (0.5%) from 2013. The number of deaths among women was 120,371, which was an increase of 713 (0.6%) from 2013. More precise information on the death rate is available in Supplementary Tables 1 and 2.

The crude death rate (number of deaths per 100,000 population) was 527.3, which was an increase of 0.7 (0.1%) compared to the crude death rate observed in 2013 (Table 1). The crude death rate among men was 580.6, which was

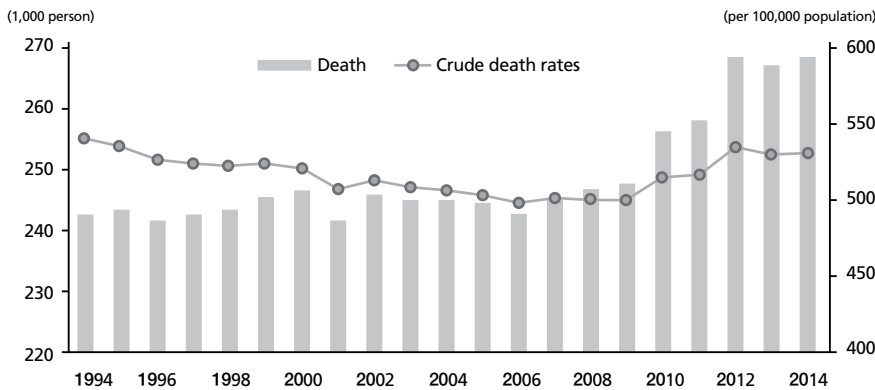


Figure 1. Trends in the number of deaths and crude death rate from 1994 to 2014 based on annual cause-of-death statistics for the Korean population.

Table 1. Trends of number of deaths and crude death rates of Korean people from 1990 to 2014

Year	No. of deaths			Crude death rate			Sex ratio (male/female)	Average daily no. of deaths
	Total	Male	Female	Total	Male	Female		
1990	241,616	138,730	102,886	563.6	643.2	483.0	1.33	662
1991	242,270	138,270	104,000	559.6	634.7	483.5	1.31	664
1992	236,162	134,231	101,931	539.8	609.8	469.0	1.30	645
2000	246,163	136,486	109,677	517.9	571.9	463.3	1.23	673
2001	241,521	134,058	107,463	504.5	557.8	450.7	1.24	662
2002	245,317	134,742	110,575	509.7	557.9	461.2	1.21	672
2003	244,506	134,887	109,619	506.1	556.6	455.4	1.22	670
2004	244,217	135,218	108,999	503.7	556.1	451.0	1.23	667
2005	243,883	134,382	109,501	501.0	550.5	451.1	1.22	668
2006	242,266	133,725	108,541	495.6	545.7	445.2	1.23	664
2007	244,874	134,922	109,952	498.4	547.9	448.7	1.22	671
2008	246,113	136,932	109,181	498.2	553.1	443.0	1.25	672
2009	246,942	137,736	109,206	497.3	553.7	440.7	1.26	677
2010	255,405	142,358	113,047	512.0	570.0	454.0	1.26	700
2011	257,396	143,250	114,146	513.6	571.1	456.0	1.25	705
2012	267,221	147,372	119,849	530.8	585.1	476.4	1.23	730
2013	266,257	146,599	119,658	526.6	579.8	473.4	1.22	729
2014	267,692	147,321	120,371	527.3	580.6	474.1	1.22	733
From 2013	Change	1,435	722	713	0.7	0.8	0.7	
	Percentage change	0.5	0.5	0.6	0.1	0.1	0.1	

Unit: person, per 100,000 population, person, %

an increase of 0.8 (0.1%) from 2013. The crude death rate among women was 474.1, which was an increase of 0.7 (0.1%) from 2013. The crude death rate among men was 1.22 times higher than among women, and this discrepancy did not change from 2013 (Table 2).

When death numbers were analyzed according to age, increases were observed in the over 80-year-old group

(4.4%) and in the 10- to 19-year-old group (2.3%) (Table 2). Deaths in people over 80 years of age accounted for 38.8% of all deaths. In most age groups, the number of deaths in both sexes decreased compared to 2013. However, increases were observed in males aged 0 year (2.4%), men in their fifties (0.2%), men in their eighties or older (5.6%), females aged 10 to 19 years (12.5%), and women in their eighties or older (3.8%). The male-to-female death ratio was 2.88 for people in their fifties, 2.51 for people in their sixties, and 2.37 times for people in their forties.

The death rate according to years of age decreased in all age groups except the 10- to 19-year-old groups (Table 3) due to tragic water transport accident happened in 2014. The male death rate showed the greatest decrease in the 1- to 9-year-old group (-24.0%) and in individuals in their twenties (-6.7%). The female death rate exhibited the greatest decrease

among individuals in their twenties (-9.1%) and the 1- to 9-year-old group (-6.4%).

The death rate was higher in men, and in particular, the death rate among men in their fifties was 2.85 times higher than that of women in their fifties. The death rate of women increased with age up to women in their fifties, but then decreased slowly afterwards.

Table 2. Trends of number of deaths of Korean people by sex and age in 2004, 2013, and 2014

		Age (yr)											
		Total	0	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80≤	
Total	2004	244,217	2,228	1,375	1,526	3,961	8,613	20,649	26,080	47,578	61,943	70,255	
	2013	266,257	1,305	595	1,084	2,782	6,273	15,270	29,754	35,696	74,130	99,332	
	2014	267,692	1,305	493	1,109	2,580	5,940	14,611	29,795	35,409	72,660	103,748	
	From 2013	Change	1,435	0	-102	25	-202	-333	-659	41	-287	-1,470	4,416
		Percentage change	0.5	0.0	-17.1	2.3	-7.3	-5.3	-4.3	0.1	-0.8	-2.0	4.4
	2004	135,218	1,221	814	1,021	2,667	5,927	15,319	19,510	32,470	32,273	23,994	
	2013	146,599	698	352	733	1,850	4,083	10,833	22,068	25,329	44,484	36,159	
	2014	147,321	715	266	714	1,735	3,843	10,278	22,123	25,324	44,135	38,167	
	From 2013	Change	722	17	-86	-19	-115	-240	-555	55	-5	-349	2,008
		Percentage change	0.5	2.4	-24.4	-2.6	-6.2	-5.9	-5.1	0.2	-0.0	-0.8	5.6
Male	2004	108,999	1,007	561	505	1,294	2,686	5,330	6,570	15,108	29,670	46,261	
	2013	119,658	607	243	351	932	2,190	4,437	7,686	10,367	29,646	63,173	
	2014	120,371	590	227	395	845	2,097	4,333	7,672	10,085	28,525	65,581	
	From 2013	Change	713	-17	-16	44	-87	-93	-104	-14	-282	-1,121	2,408
		Percentage change	0.6	-2.8	-6.6	12.5	-9.3	-4.2	-2.3	-0.2	-2.7	-3.8	3.8
Sex ratio (male/female)	2004	1.24	1.21	1.45	2.02	2.06	2.21	2.87	2.97	2.15	1.09	0.52	
	2013	1.23	1.15	1.45	2.09	1.98	1.86	2.44	2.87	2.44	1.50	0.57	
	2014	1.22	1.21	1.17	1.81	2.05	1.83	2.37	2.88	2.51	1.55	0.58	

Unit: person

Table 3. Trends of death rates of Korean people by sex and age in 2004, 2013, and 2014

		Age (yr)												
		Total	0	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80≤		
Total	2004	503.7	484.1	24.4	23.1	50.3	96.8	252.1	545.0	1,306.8	3,506.6	11,199.5		
	2013	526.6	294.6	14.2	17.1	42.3	78.2	174.4	382.1	821.8	2,475.5	8,902.6		
	2014	527.3	310.2	11.8	18.2	39.2	75.7	165.8	372.4	781.7	2,358.0	8,597.5		
	From 2013	Change	0.7	15.6	-2.4	1.1	-3.1	-2.5	-8.6	-9.7	-40.2	-117.5	-305.1	
		Percentage change	0.1	5.3	-16.8	6.1	-7.4	-3.2	-4.9	-2.5	-4.9	-4.7	-3.4	
	Male	2004	556.1	510.2	27.6	29.3	66.1	130.6	367.3	817.1	1,945.3	4,912.6	13,134.3	
		2013	579.8	306.9	16.2	22.1	53.8	99.9	243.3	564.5	1,209.1	3,534.4	11,044.8	
		2014	580.6	331.4	12.3	22.4	50.2	96.1	229.7	550.2	1,154.1	3,380.9	10,608.0	
		From 2013	Change	0.8	24.5	-3.9	0.3	-3.6	-3.9	-13.6	-14.3	-55.0	-153.5	-436.8
			Percentage change	0.1	8.0	-24.0	1.4	-6.7	-3.9	-5.6	-2.5	-4.6	-4.3	-4.0
Female	2004	451.0	455.9	21.0	16.1	33.7	61.6	132.6	274.0	766.2	2,674.1	10,404.6		
	2013	473.4	281.7	11.9	11.7	29.7	55.7	103.1	198.2	461.1	1,707.8	8,013.0		
	2014	474.1	287.9	11.2	13.6	27.0	54.5	99.9	192.8	431.8	1,606.1	7,743.3		
	From 2013	Change	0.7	6.3	-0.8	1.9	-2.7	-1.2	-3.2	-5.5	-29.3	-101.6	-269.6	
		Percentage change	0.1	2.2	-6.4	16.4	-9.1	-2.1	-3.1	-2.8	-6.3	-6.0	-3.4	
Sex ratio (male/female)	2004	1.23	1.12	1.32	1.81	1.96	2.12	2.77	2.98	2.54	1.84	1.26		
	2013	1.22	1.09	1.36	1.89	1.81	1.79	2.36	2.85	2.62	2.07	1.38		
	2014	1.22	1.15	1.10	1.64	1.86	1.76	2.30	2.85	2.67	2.10	1.37		

Unit: per 100,000 population, %

2. Ranking of causes of death

The mortality rates of the three top causes of death per

100,000 people were 150.9 for cancer, 52.4 for heart disease, and 48.2 for cerebrovascular disease (Table 4). These

Table 4. Trends of leading causes of death of Korean people in 2004, 2013, and 2014

Rank	2004		2013		2014			
	Causes of death	Death rate	Causes of death	Death rate	Causes of death	No. of death	Percentage	Death rate
1	Malignant neoplasms	132.6	Malignant neoplasms	149.0	Malignant neoplasms	76,611	28.6	150.9
2	Cerebrovascular disease	70.1	Cerebrovascular disease	50.3	Heart disease	26,588	9.9	52.4
3	Heart disease	36.7	Heart disease	50.2	Cerebrovascular disease	24,486	9.1	48.2
4	Diabetes mellitus	24.2	Suicides	28.5	Suicides	13,836	5.2	27.3
5	Suicides	23.7	Diabetes mellitus	21.5	Pneumonia	12,021	4.5	23.7
6	Liver disease	19.0	Pneumonia	21.4	Diabetes mellitus	10,526	3.9	20.7
7	Chronic lower respiratory disease	17.3	Chronic lower respiratory disease	14.0	Chronic lower respiratory disease	7,171	2.7	14.1
8	Transfer accidents	17.1	Liver disease	13.2	Liver disease	6,635	2.5	13.1
9	Hypertensive disease	10.4	Transfer accidents	11.9	Transfer accidents	5,700	2.1	11.2
10	Pneumonia	7.1	Hypertensive disease	9.4	Hypertensive disease	5,061	1.9	10.0

Unit: per 100,000 population, person, %

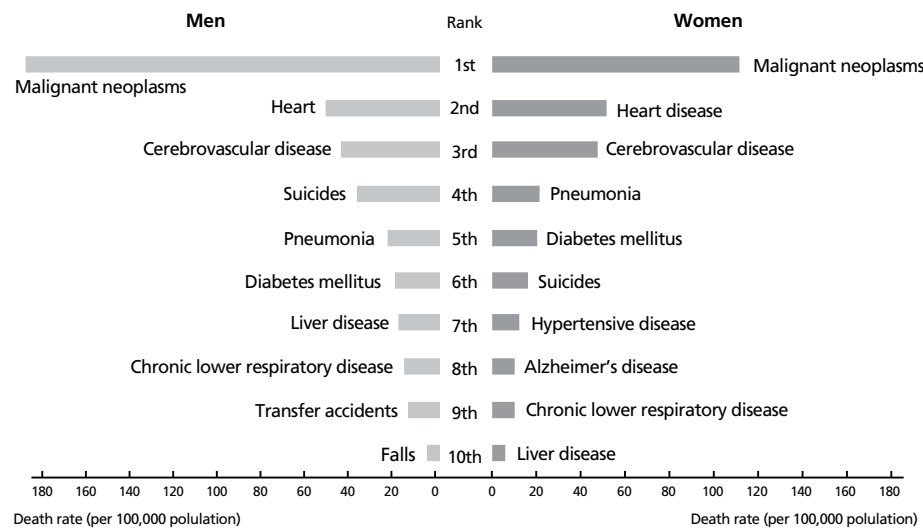


Figure 2. Leading causes of death by sex in 2014 based on annual cause-of-death statistics for the Korean population.

three major causes of death (cancer, heart disease, and cerebrovascular disease) accounted for 47.7% of the total mortality rate, which was an increase of 0.3%p from 2013. Within the 10 top causes of death, the rankings of heart disease and pneumonia increased; while those of cerebrovascular disease and diabetes fell. In comparison to 10 years ago (2004), increases were found in the ranking of heart disease (third to second place), suicide (fifth to fourth place), and pneumonia (tenth to fifth place), while decreases were observed in the ranking of cerebrovascular disease (second to third place), diabetes (fourth to sixth place), liver disease

(sixth to eighth place), traffic/transit accidents (eighth to ninth place), and hypertensive disorders (ninth to tenth).

The top-ranking cause of death for men was the same as in 2013. In women, rises in the ranking of heart disease (third to second place), pneumonia (fifth to fourth place), and liver disease (eleventh to tenth place) were observed (Figure 2). In both sexes, cancer was

the top-ranking cause of death. The mortality rate of men due to cancer was 1.67 times higher than that of women. The top-ranked causes of death were cancer in the 1- to 9-year-old group and the forties or older, transport accidents in the 10- to 19-year-old group, and suicide in individuals in their thirties (Table 5). More detailed information is presented in Supplementary Tables 3 and 4.

3. Trends in the top two causes of death

1) Cancer mortality rate

The mortality rate due to cancer was found to have

Table 5. Percentage and death rate of Korean people due to three leading causes by age in 2014

Age (yr)	1st			2nd			3rd		
	Cause of death	Percentage	Death rate	Cause of death	Percentage	Death rate	No. of death	Percentage	Death rate
1-9	Malignant neoplasms	17.8	2.1	Transfer accidents	10.5	1.2	Congenital deformity	9.5	1.1
10-19	Transfer accidents	26.2	4.8	Suicides	24.7	4.5	Malignant neoplasms	14.3	2.6
20-29	Suicides	45.5	17.8	Transfer accidents	15.4	6.0	Malignant neoplasms	10.6	4.1
30-39	Suicides	36.9	27.9	Malignant neoplasms	19.5	14.7	Transfer accidents	7.8	5.9
40-49	Malignant neoplasms	29.3	48.6	Suicides	19.5	32.4	Liver disease	7.9	13.2
50-59	Malignant neoplasms	38.8	144.6	Suicides	9.8	36.4	Heart disease	7.9	29.3
60-69	Malignant neoplasms	44.1	344.4	Heart disease	8.6	67.1	Cerebrovascular disease	7.7	59.8
70-79	Malignant neoplasms	35.1	827.1	Cerebrovascular disease	10.5	248.5	Heart disease	9.9	234.6
80≤	Malignant neoplasms	17.3	1490.8	Heart disease	11.9	1027.2	Cerebrovascular disease	10.8	925.1

Unit: %, per 100,000 population

Table 6. Trends of death rate of Korean people due to cancer by sex in 2004, 2013, and 2014

		Malignant neoplasm	Esophagus	Stomach	Colon, rectum and anus	Liver and intrahepatic bile ducts	Pancreas	Trachea, bronchus and lung	Breast	Cervix uteri	Prostate	Meninges, brain and central nervous system	Leukaemia	
Total	2004	132.6	3.1	23.1	12.1	22.4	6.3	27.3	3.1	2.2	1.9	2.3	3.0	
	2013	149.0	2.9	18.2	16.4	22.6	9.6	34.0	4.4	1.8	3.2	2.4	3.2	
	2014	150.9	3.0	17.6	16.5	22.8	10.1	34.4	4.5	1.9	3.3	2.5	3.3	
	From 2013	Change	1.9	0.2	-0.6	0.2	0.2	0.5	0.4	0.0	0.1	0.1	0.2	0.1
	Percentage change	1.3	5.9	-3.3	1.1	1.0	5.5	1.1	0.8	7.2	1.9	7.0	4.5	
Male	2004	168.7	5.6	29.9	13.3	33.7	7.2	40.4	0.1	-	3.8	2.4	3.5	
	2013	186.2	5.2	23.7	18.5	33.3	10.3	49.5	0.1	-	6.4	2.5	3.7	
	2014	188.7	5.5	22.7	18.9	34.0	10.8	50.4	0.1	-	6.6	2.8	3.6	
	From 2013	Change	2.4	0.3	-1.0	0.3	0.6	0.5	0.9	0.0	-	0.1	0.3	-0.1
	Percentage change	1.3	6.2	-4.2	1.9	1.9	4.9	1.8	30.3	-	2.0	14.1	-2.9	
Female	2004	96.4	0.5	16.2	10.8	11.0	5.4	14.2	6.1	4.5	-	2.2	2.6	
	2013	111.8	0.5	12.6	14.2	11.8	8.8	18.4	8.8	3.5	-	2.3	2.6	
	2014	113.2	0.5	12.4	14.2	11.6	9.3	18.3	8.9	3.8	-	2.2	3.0	
	From 2013	Change	1.4	0.0	-0.2	0.0	-0.2	0.5	-0.1	0.1	0.3	-	-0.0	0.4
	Percentage change	1.3	3.4	-1.5	0.2	-1.6	6.2	-0.5	0.6	7.1	-	-0.8	15.2	
Sex ratio (male/female)	2004	1.75	10.27	1.85	1.23	3.06	1.34	2.85	0.01	-	-	1.11	1.37	
	2013	1.67	10.31	1.88	1.31	2.82	1.18	2.69	0.01	-	-	1.09	1.46	
	2014	1.67	10.58	1.83	1.33	2.92	1.16	2.75	0.01	-	-	1.26	1.23	

unit: per 100,000 population, %

increased to 150.9 out of 100,000, which was an increase of 1.9 (1.3%) compared to 2013. The greatest contributions to the mortality rate due to cancer were made by lung

cancer (34.4), liver cancer (22.8), and stomach cancer (17.6). The mortality rate of men due to cancer (188.7) was 1.67-fold higher than that of women (113.2) (Table

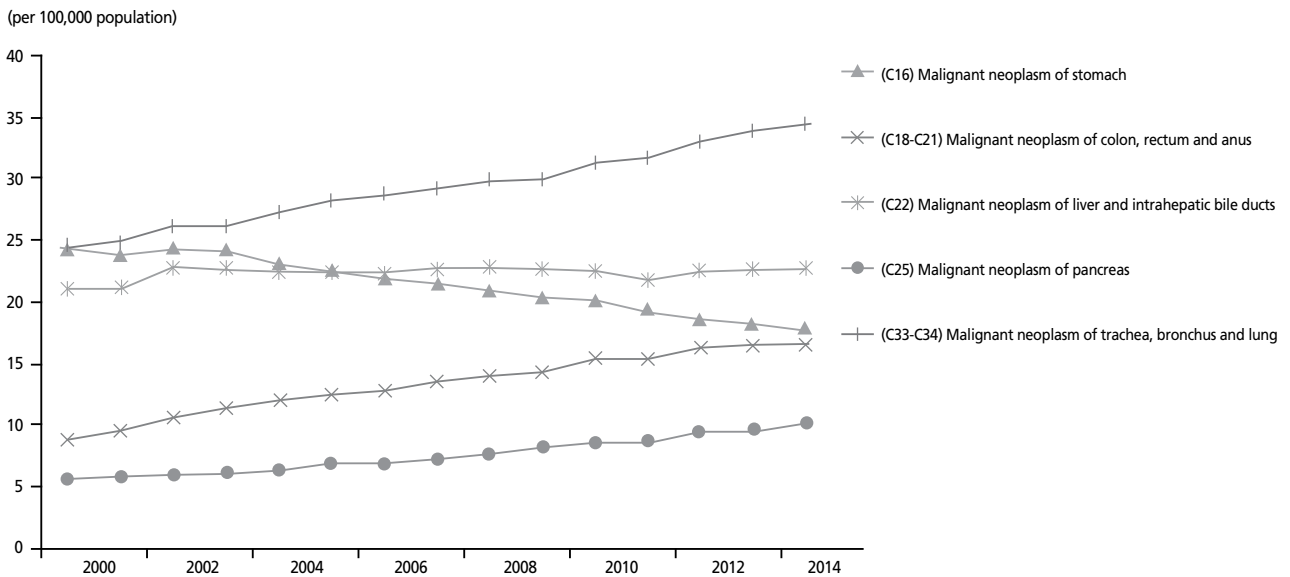


Figure 3. Trends in the death rate due to the five leading cancers from 2000 to 2014 based on annual cause-of-death statistics for the Korean population.

Table 7. Trends of death rate of Korean people due to cancer by sex in 2004, 2013, and 2014

Age (yr)			Malignant neoplasm										
	2013	2014	Eso-phagus	Sto-mach	Colon, rectum and anus	Liver and intrahepatic bile ducts	Pancreas	Trachea, bronchus and lung	Breast	Cervix uteri	Prostate	Meninges, brain and central nervous system	Leu-kaemia
Total	149.0	150.9	3.0	17.6	16.5	22.8	10.1	34.4	4.5	1.9	3.3	2.5	3.3
0	2.5	2.1	-	-	-	0.5	-	-	-	-	-	0.2	0.2
1-9	2.4	2.1	-	-	-	0.0	-	-	-	-	-	0.7	0.8
10-19	2.7	2.6	-	0.0	-	0.1	-	0.0	0.0	-	-	0.6	0.9
20-29	4.7	4.1	0.0	0.3	0.2	0.2	0.1	0.1	0.1	0.1	-	0.5	1.1
30-39	15.4	14.7	0.0	2.4	1.1	2.1	0.4	1.2	1.7	0.8	0.0	0.7	1.2
40-49	50.3	48.6	0.6	6.7	4.3	10.4	2.2	4.7	5.8	1.7	0.0	1.7	1.7
50-59	146.3	144.6	3.2	17.2	14.2	33.4	9.4	22.1	9.0	2.5	0.6	3.1	3.2
60-69	361.5	344.4	8.9	34.8	34.1	61.6	24.9	85.1	9.0	3.0	4.3	6.0	6.2
70-79	852.2	827.1	19.6	88.8	89.0	106.8	61.8	227.5	9.7	7.1	21.8	10.2	15.3
80≤	1,477.6	1,490.8	18.0	201.0	206.2	141.9	91.4	355.5	15.5	15.7	61.6	12.3	21.4

Unit: per 100,000 population

6). Compared to the previous year, mortality due to lung cancer (1.1%) and liver cancer (1.0%) increased, while mortality due to gastric cancer (-3.3 %) decreased (Figure 3). The mortality rate increased by 2.4 in men (1.3%) and 1.4 (1.3%) in women compared to 2013. The major types of cancer among men were lung cancer (50.4), liver cancer (34.0), and stomach cancer (22.7), in comparison to lung cancer (18.3), colo-rectal cancer (14.2), and stomach

cancer (12.4) in women. Differences in mortality between men and women were highest in esophageal cancer (10.58 times), liver cancer (2.92 times), and lung cancer (2.75 times).

Individuals in their thirties showed a high mortality rate due to stomach cancer, while individuals in their forties and fifties showed high mortality rates due to liver cancer, and lung cancer took an especially high toll among

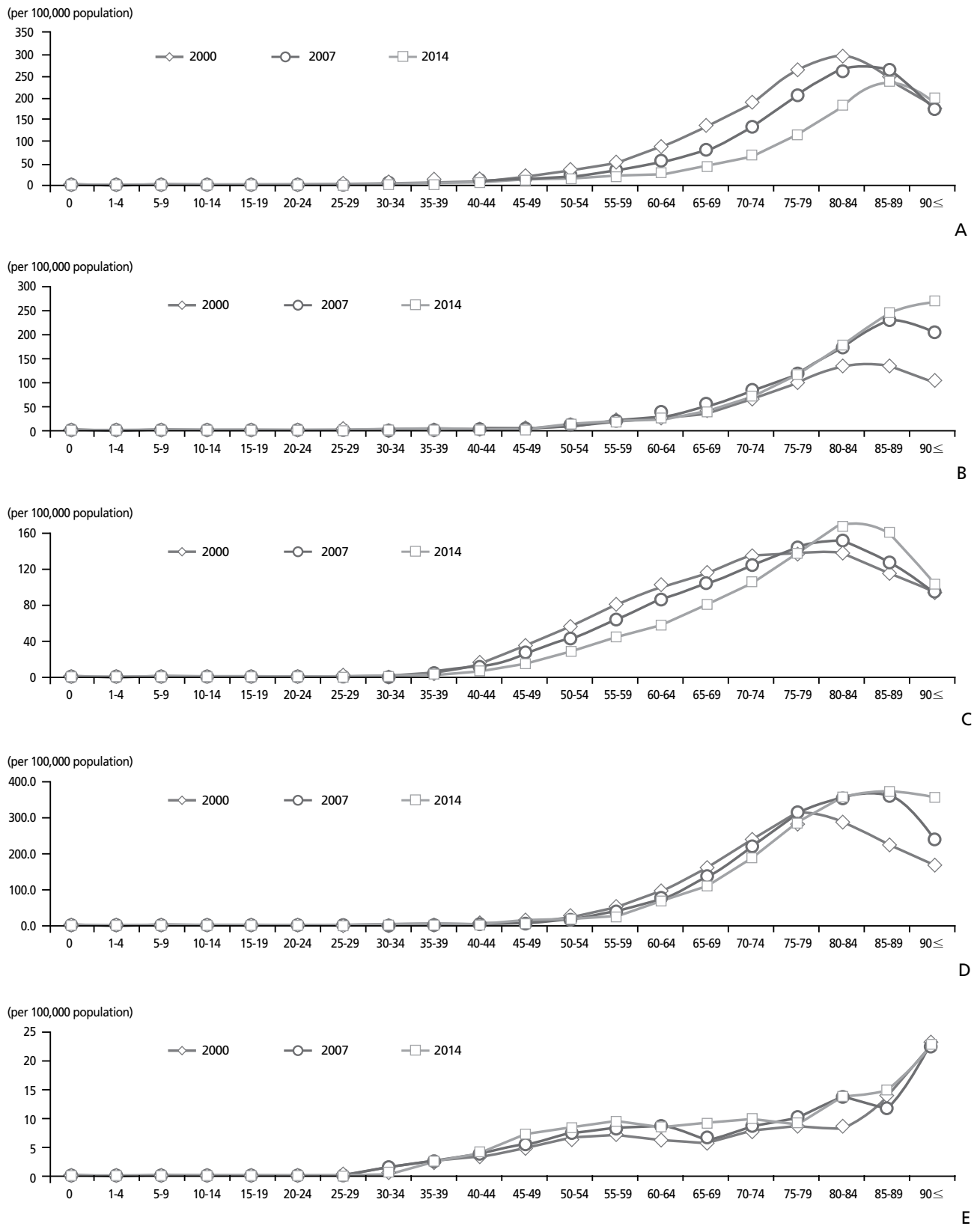


Figure 4. (Continuing)

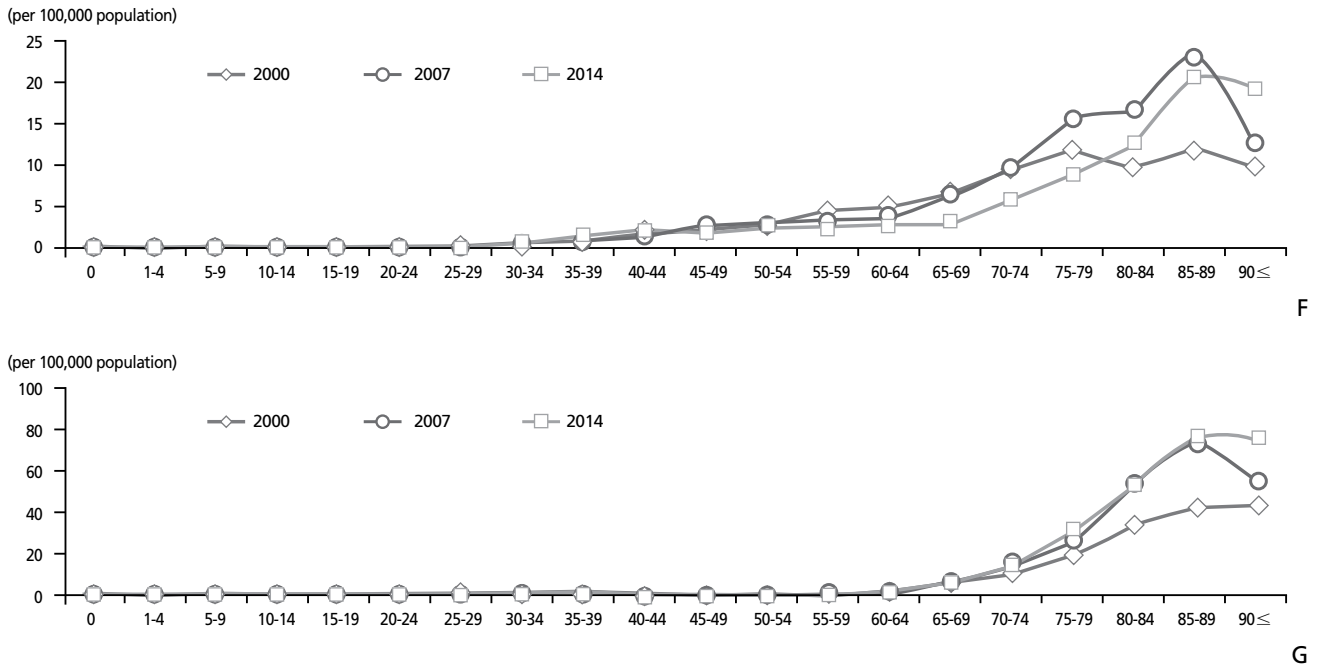


Figure 4. Trends in the death rate due to cancers by age from 2000 to 2014 based on annual cause-of-death statistics for the Korean population. (A) Malignant neoplasm of stomach, (B) malignant neoplasm of colon, rectum and anus, (C) malignant neoplasm of liver and intrahepatic bile ducts, (D) malignant neoplasm of trachea, bronchus and lung, (E) malignant neoplasm of breast, (F) malignant neoplasm of cervix uteri, and (G) malignant neoplasm of prostate.

Table 8. Trends of death rate of Korean people due to disease of the circulatory system by sex in 2004, 2013, and 2014

		Disease of the circulatory	Hyper-tensive disease	Heart disease			Cerebrovas-cular disease	
				Total	Ischemic heart disease ^{a)}	Other heart disease ^{b)}		
Total	2004	119.9	10.4	36.7	26.2	10.5	70.1	
	2013	113.1	9.4	50.2	26.8	23.3	50.3	
	2014	113.9	10.0	52.4	27.9	24.4	48.2	
	From 2013	Change	0.8	0.6	2.2	1.1	1.1	-2.1
	Percentage change	0.7	6.5	4.4	4.1	4.8	-4.2	
Male	2004	114.7	6.9	38.5	27.9	10.6	66.5	
	2013	107.2	5.9	49.9	28.3	21.6	47.8	
	2014	108.4	6.0	52.3	29.5	22.8	46.6	
	From 2013	Change	1.2	0.1	2.4	1.2	1.3	-1.2
	Percentage change	1.1	1.0	4.9	4.2	5.8	-2.6	
Female	2004	125.1	13.8	34.9	24.5	10.3	73.8	
	2013	119.0	12.8	50.4	25.4	25.1	52.8	
	2014	119.4	14.0	52.4	26.4	26.0	49.9	
	From 2013	Change	0.4	1.2	2.0	1.0	1.0	-3.0
	Percentage change	0.3	9.1	3.9	4.0	3.9	-5.6	
Sex ratio (male/female)	2004	0.92	0.50	1.10	1.14	1.02	0.90	
	2013	0.90	0.46	0.99	1.11	0.86	0.91	
	2014	0.91	0.43	1.00	1.12	0.88	0.93	

Unit: per 100,000 population, %

^{a)}Myocardial infarction and angina were include in ischemic heart disease; ^{b)}Heart failure and endocarditis, etc were included in other heart disease.x

individuals in their sixties or older (Table 7). Age-specific mortality rate trends due to cancers of the stomach, colon, liver, lung, breast, cervix, and prostate are shown in Figure 4. The age-specific mortality rate due to cancer decreased in all age groups in comparison to the rates observed in 2013 except among individuals in their eight-ies or older.

2) Mortality rates due to circulatory system diseases

The mortality rate due to circulatory system diseases was 113.9 out of 100,000 and this category consisted of heart disease (52.4), cerebrovascular disease (48.2), and hypertensive disorders (10.0). Women (119.4) had a higher mortality rate than men (108.4) (Table

Table 9. Trends of death rate of Korean people due to diseases of the circulatory system by age in 2013 and 2014

Age (yr)	2013	2014	Hyper-tensive disease	Heart disease			Cerebrovascular disease
				Total	Ischemic ^{a)} heart disease	Other ^{b)} heart disease	
Total	113.1	113.9	10.0	52.4	27.9	24.4	48.2
0	5.6	4.0	-	3.6	-	3.6	0.2
1-9	0.7	0.7	-	0.6	-	0.6	0.1
10-19	1.1	0.9	-	0.5	0.0	0.5	0.3
20-29	2.3	2.3	-	1.5	0.3	1.3	0.7
30-39	7.3	7.6	0.2	4.2	2.0	2.2	3.0
40-49	23.4	23.2	0.3	12.2	5.7	6.4	10.1
50-59	55.4	54.4	1.5	29.3	16.4	13.0	22.1
60-69	139.8	137.2	5.3	67.1	38.1	29.0	59.8
70-79		571.2	533.9	33.7	234.6	130.5	104.1
80≤	2,398.7	2,311.1	299.8	1,027.2	534.1	493.1	925.1

Unit: per 100,000 population

^{a)}Myocardial infarction and angina were include in ischemic heart disease; ^{b)}Heart failure and endocarditis, etc were included in other heart disease.

8). Within the category of heart disease, ischemic heart disease (27.9) caused the most mortality. The mortality rate of women (119.4 people) due to circulatory system diseases was higher than that of men (108.4 people). The mortality rates due to circulatory system diseases increased by 1.2 (1.1%) in men and 0.4 (0.3%) in women in comparison to 2013. The mortality rate of women due to hypertensive disorders (14.0) was higher than that of men (6.0). The mortality rate of men due to ischemic heart disease (29.5) was higher than that of women (26.4).

The mortality rate due to circulatory system diseases decreased in all age groups except in individuals in their thirties (Table 9). Mortality due to circulatory system diseases showed a tendency to increase with increasing age. In particular, age-specific mortality rates soared after age 70. The highest death rate due to diseases of the circulatory system was due to heart disease in most age groups, except for participants in their seventies, in whom the mortality rate due to cerebrovascular disease (248.5) was higher than that due to heart disease (234.6). Within the category of heart disease, other heart disease was the most common cause of death in individuals less than 50 years of age,

whereas ischemic heart disease was the most common cause of death in this category in individuals 50 years of age or older.

Discussion

The total number of deaths of in the Korean population was 267,692 in 2014. This number has continued to grow as the proportion of the aging population has increased; however, the mortality rate has remained at

a similar level, exhibiting an increase of 0.5%. The ten leading causes of death, in order, were cancer, heart disease, cerebrovascular disease, suicide, pneumonia, diabetes mellitus, chronic lower respiratory disease, liver disease, traffic/transit accidents, and hyper-tensive diseases. The most remarkable change from the 2013 data was the increase in heart disease and decrease in cerebrovascular disease, such that heart disease increased from being the third most common cause of death to the second most common cause of death. This reflects changes in the prevalence of diseases corresponding to changes in dietary and exercise habits. Another remarkable change was the increase in pneumonia as a cause of death from sixth place in 2013 (21.4 persons out of 100,000 people) to fifth place in 2014 (23.7). This most likely reflects the increased proportion of elderly people in the population. In fact, pneumonia is expected to increase continuously if the population structure of Korea does not change. The mortality rate due to diabetes decreased compared to 2013, from 21.5 to 20.7. This is a good sign regarding the nationwide control of diabetes. Diabetes and pre-diabetes have been found to be epidemic in Korea, as reflected by an

estimated prevalence of diabetes and prediabetes of 12.4% and 38.3%, respectively, based on both hemoglobin A1c levels and fasting plasma glucose levels [4].

The cancers associated with the highest mortality rates were lung, liver, stomach, colon, and pancreatic cancer, in descending order. Mortality due to lung cancer has increased continuously from 2000 to the present. The mortality rate due to liver cancer has been consistent over recent years. However, the number of deaths due to liver cancer is expected to decrease soon in response to control of hepatitis B virus infections with antiviral drugs and improved sanitation. Stomach cancer is the only one of the five leading cancers to exhibit a continuously decreasing mortality rate since 2000. This is due to early detection and treatment, although stomach cancer remains the second most prevalent cancer, after thyroid cancer [5]. Mortality rates due to colon and pancreatic cancer have increased continuously from 2000. Colon cancer will increase further due to the increased preference for meat consumption exhibited by the Korean population.

The mortality rate of circulatory system diseases included heart disease (52.4), cerebrovascular disease (48.2), and hypertensive disorders (10.0). The mortality rate due to circulatory system diseases in women was higher than in men. Although the mortality rate of women (26.4) due to ischemic heart disease was lower than that of men (29.5), the mortality rates due to hypertensive diseases (14.0) and other heart diseases (26.0) were higher than those observed in men (6.0 and 22.8). It is estimated that heart disease will remain the leading cause of death in this category into the medium- to long-term future.

Conclusion

We summarized the annual report on the cause-of-death

statistics of the Korean population. We also identified changes in the ranking of leading causes of death in the Korean population from 2013 to 2014. Such findings are evidence of the dynamic changes that Korean society is currently undergoing from the perspective of population structure, disease patterns, and lifestyles, including dietary habits. Further analysis of supplementary raw data from Statistics Korea [1] may facilitate further valuable analyses with the goal of promoting the health of the Korean population.

Acknowledgement

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Supplementary materials

Supplementary tables are available from online only.

찾아보기말: 종양; 심장혈관질환; 사망원인; 심장질환; 한국

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Peer Reviewers' Commentary

The cause of death statistics of Korean people is one of the most important statistical data not only for the establishment of health policy by Korean Government, but also for the approach to patients care by medical health personnels. This article is a memorable one since this cause of death statistics is first exposed from the journal through agreement between editorial board of the Journal of the Korean Medical Association and Vital Statistics Division of the Statistics Korea. Korea is known to be one of the most dynamic countries in the world. The change of the cause of death may reflect the change of the Korean society from the perspective of economics, medical health, and social behavior. Especially the heart diseases became the 2nd ranking cause of death in 2014, surpassing cerebrovascular diseases. It may be originated from the increased uptake of meat and fatty diet. It is anticipated that this article to be read and cited by the researchers from both Korea and abroad. Articles on the health statistics of Korea will be published continuously with a variety of topics or more intensive analysis of each cause of death statistics.

[정리: 편집위원회]