

# Cancer Statistics in Korea: Incidence, Mortality, Survival, and Prevalence in 2015

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## Purpose

This study presents the 2015 nationwide cancer statistics in Korea, including the incidence, survival, prevalence, and mortality.

## Materials and Methods

Cancer incidence data from 1999 to 2015 was obtained from the Korea National Cancer Incidence Database and followed until December 31, 2016. Mortality data from 1983 to 2015 were obtained from Statistics Korea. The prevalence was defined as the number of cancer patients alive on January 1, 2016, among all cancer patients diagnosed since 1999. Crude and age-standardized rates (ASRs) for incidence, mortality and prevalence and 5-year relative survivals were also calculated.

## Results

Herein, 214,701 and 76,855 Koreans were newly diagnosed and died from cancer in 2015, respectively. The ASRs for cancer incidence and mortality in 2015 were 258.9 and 82.0 per 100,000, respectively. The overall cancer incidence rate has increased significantly by 3.4% annually from 1999 to 2012, and started to decrease after 2012 (2012-2015, annual percent change, -6.1%). However, the overall cancer mortality has decreased 2.7% annually since 2002. The 5-year relative survival rate for patients diagnosed with cancer between 2011 and 2015 was 70.7%, an improvement from the 41.2% for patients diagnosed between 1993 and 1995.

## Conclusion

Age-standardized cancer incidence rates have decreased since 2012 and mortality rates have declined since 2002; however, the 5-year survival rates have improved remarkably from 1993-1995 to 2011-2015 in Korea.

## Key words

Incidence, Survival, Prevalence, Mortality, Neoplasms, Korea

## Introduction

Cancer is a major life-threatening disease worldwide. Approximately 14.1 million patients were newly diagnosed with cancer and 8.2 million people died from cancer in 2012 worldwide [1]. The global burden of cancer is expected to grow rapidly due to aging population [2].

In Korea, cancer accounts for one in four deaths and more than 200,000 new cancer cases were diagnosed in 2014 [3].

The number of cancer incidences and deaths are expected to increase with the aging population and westernized lifestyles [4]. Additionally, the economic burden of cancer in Korea increased approximately 1.8-fold, from \$11,424 to \$20,858 million, between 2000 and 2010 [5].

In this context, cancer statistics are the most important indicator of the national cancer burden and can be used to form cancer prevention and control strategies. This study aims to provide nationwide cancer statistics including the incidence, survival, prevalence, and mortality in 2015.

## Materials and Methods

### 1. Data sources

The Korea Central Cancer Registry (KCCR) was established by the Ministry of Health and Welfare in 1980 as a nationwide hospital-based cancer registry. Since 1999, the KCCR has collected cancer incidence data for the entire nation by compiling a nationwide hospital-based KCCR database that contains data from regional cancer registry programs. The KCCR currently provides the nationwide cancer incidence, survival, and prevalence statistics annually [6].

The KCCR constructed the Korea National Cancer Incidence Database (KNCI DB) using hospitals data, 11 population-based registries, and additional medical chart reviews. The KNCI DB contains information regarding the age, sex, address, date of diagnosis, primary cancer site, histological type, most valid diagnostic method, and Surveillance, Epidemiology, and End Results (SEER) stage. The completeness of cancer incidence data for 2015 was estimated to be 98.2% based on the method proposed by Ajiki et al. [7]. The mid-year population and cancer mortality data from 1983 to 2015 were obtained from Statistics Korea [8]. To ascertain vital status and to calculate survival and prevalence, the KNCI DB was linked to the mortality data and population registration data established by the Ministry of the Interior and Safety.

### 2. Classification

All incident cases were registered according to the International Classification of Diseases for Oncology, third edition [9], and converted to the International Classification of Diseases, 10th edition (ICD-10) codes [10]. The mortality cases were registered according to ICD-10 codes. All cancer cases were reported based on the 24 cancer types.

### 3. Statistical analyses

Rates were expressed as crude and age-standardized rates (CR and ASR, respectively) per 100,000 individuals. The CR was calculated as the total number of incidence/mortality cases divided by the mid-year population for the specified years. The ASR is a weighted average of the age-specific rates, where the weights are the proportions of persons in the corresponding age groups of a standard population [11]. In this report, ASRs were calculated using Segi's world standard population [12]. The cumulative risk of developing cancer from birth to life expectancy was calculated using cumulative rates; that is, the sum of the age-specific rates from birth to life expectancy, as follows [13]:

$$\text{Cumulative risk of developing cancer from birth to life expectancy} = 100 \times \left( 1 - e^{-\frac{\text{cumulative rate}}{100}} \right)$$

Trends in incidence/mortality rates were summarized as an annual percentage change (APC) by using a Joinpoint regression. APC is the average percentage change of rates and is calculated as follows [11]:

$$APC = \frac{R_{y+1} - R_y}{R_y} \times 100 = (e^{b_1} - 1) \times 100$$

, where  $\log(R_y) = b_0 + b_1 y$ ,

$\log(R_y)$  is the natural log transformed age standardized rates.

$y$ =year,  $b_0$ =intercept,  $b_1$ =slope

The survival duration for each cancer case was calculated as the interval between the date of the initial diagnosis and the date of death, date of loss to follow-up, or closing date for follow-up. The 5-year relative survival rates (RSRs) were calculated as the ratios of the observed survival of the cancer patients to the expected survival of the general population, which was derived from the standard life table provided by Statistics Korea. Trends in 5-year RSRs were evaluated as percentage differences in 5-year RSRs from 1993-1995 and 2011-2015. RSRs were calculated using the Ederer II method [14] with some minor corrections, based on an algorithm established by Paul Dickman [15].

Prevalent cases were defined as the number of cancer patients alive on January 1, 2016 among all cancer patients diagnosed between 1999 and 2015. Limited-duration prevalences were calculated using SEER\*Stat software. Any p-values less than 0.05 were considered statistically significant. SEER\*Stat 8.2.1 (National Cancer Institute, Bethesda, MD), Joinpoint 4.1.1 (National Cancer Institute), and SAS 9.4 (SAS Institute Inc., Cary, NC) were used in this report.

## Selected Findings

### 1. Incidence

A total of 214,701 cases were newly diagnosed with cancer during 2015 (Table 1). Of these cases, 113,335 (52.8%) were men and 101,366 (47.2%) were women. Stomach cancer was the most commonly diagnosed cancer in 2015, followed by colorectal, thyroid, lung, and breast cancer. The overall cumulative risk of developing cancer from birth to life expectancy was 35.3%. However, the cumulative risk of developing cancer from birth to life expectancy was higher in men (37.9%) than in women (32.0%) (data not shown).

**Table 1.** Cancer incidence, deaths and prevalence by sex in Korea, 2015

Site/Type	New cases			Deaths			Prevalent cases <sup>a)</sup>		
	Both sexes	Men	Women	Both sexes	Men	Women	Both sexes	Men	Women
All sites	214,701	113,335	101,366	76,855	47,678	29,177	1,611,487	707,977	903,510
Lip, oral cavity, and pharynx	3,309	2,390	919	1,170	884	286	21,827	14,656	7,171
Esophagus	2,420	2,201	219	1,531	1,401	130	9,171	8,262	909
Stomach	29,207	19,545	9,662	8,526	5,507	3,019	256,995	170,294	86,701
Colon and rectum	26,790	15,911	10,879	8,301	4,698	3,603	220,653	131,579	89,074
Liver	15,757	11,732	4,025	11,311	8,382	2,929	61,290	45,881	15,409
Gallbladder <sup>b)</sup>	6,251	3,220	3,031	4,211	2,135	2,076	19,468	9,958	9,510
Pancreas	6,342	3,359	2,983	5,439	2,908	2,531	9,517	5,031	4,486
Larynx	1,146	1,079	67	344	319	25	10,049	9,452	597
Lung	24,267	17,015	7,252	17,399	12,677	4,722	69,931	43,987	25,944
Breast	19,219	77	19,142	2,354	16	2,338	179,081	686	178,395
Cervix uteri	3,582	-	3,582	967	-	3,582	50,477	-	3,582
Corpus uteri	2,404	-	2,404	319	-	2,404	20,859	-	2,404
Ovary	2,443	-	2,443	1,055	-	2,443	18,112	-	2,443
Prostate	10,212	10,212	-	1,700	1,700	-	69,438	69,438	-
Testis	286	286	-	10	10	-	2,939	2,939	-
Kidney	4,555	3,134	1,421	952	672	280	35,333	23,862	11,471
Bladder	4,033	3,245	788	1,299	960	339	31,407	25,609	5,798
Brain and CNS	1,776	958	818	1,266	674	592	10,349	5,334	5,015
Thyroid	25,029	5,386	19,643	341	106	235	355,057	60,151	294,906
Hodgkin lymphoma	271	174	97	49	33	16	2,571	1,623	948
Non-Hodgkin lymphoma	4,396	2,519	1,877	1,771	1,026	745	27,478	15,622	11,856
Multiple myeloma	1,455	762	693	889	466	423	5,330	2,779	2,551
Leukemia	3,242	1,830	1,412	1,720	1,003	717	19,260	10,654	8,606
Other and ill-defined	16,309	8,300	8,009	3,931	2,101	1,830	104,895	50,180	54,715

CNS, central nervous system. <sup>a)</sup>Limited-duration prevalent cases on January 1, 2016. These are patients who were diagnosed between January 1, 1999 and December 31, 2015 and who were alive on January 1, 2016. Multiple primary cancer cases were counted multiple times, <sup>b)</sup>Include the gallbladder and other/unspecified parts of the biliary tract.

The total CR and ASR for the overall cancer incidences in 2015 were 421.4 and 258.9 per 100,000, respectively (Table 2). According to sex, the CRs for all sites combined were 445.2 in men and 397.6 in women. The ASRs were 291.7 and 241.1 in men and women, respectively. Stomach cancer (CR, 76.8) was the most common cancer in men, followed by lung (CR, 66.8), colorectal (CR, 62.5), liver (CR, 46.1), and prostate cancer (CR, 40.1). These five cancers accounted for 65.7% of the newly diagnosed cases in men during the study period. In contrast, thyroid cancer (CR, 77.1) was the most common cancer among women, followed by breast (CR, 75.1), colorectal (CR, 42.7), stomach (CR, 37.9), and lung cancer (CR, 28.4), which five cancers accounted for 65.7% of the cases in women.

## 2. Mortality

In 2015, the total number of deaths from cancer was 76,855, accounting for 27.9% of all deaths (Table 3). In terms of sex, 62.0% and 38.0% of cancer deaths occurred in men and women, respectively (Table 1).

The total CR and ASR for cancer deaths were 150.8 and 82.0 per 100,000, respectively, in 2015 (Table 4). The total CR and ASR for cancer deaths per 100,000 were higher among men (CR, 187.3; ASR, 119.6) than among women (CR, 114.4; ASR, 54.6).

According to cancer sites, lung cancer (CR, 49.8) was the leading cause of death in men, followed by liver (CR, 32.9), stomach (CR, 21.6), colorectal (CR, 18.5), and pancreatic cancer (CR, 11.4). The top five causes of deaths from cancer in

**Table 2.** Crude and age-standardized cancer incidence rates by sex in Korea, 2015

Site/Type	Crude incidence rate per 100,000			Age-standardized incidence rate per 100,000 <sup>a)</sup>		
	Both sexes	Men	Women	Both sexes	Men	Women
All sites	421.4	445.2	397.6	258.9	291.7	241.1
Lip, oral cavity, and pharynx	6.5	9.4	3.6	4.1	6.2	2.2
Esophagus	4.7	8.6	0.9	2.7	5.5	0.4
Stomach	57.3	76.8	37.9	33.8	49.3	20.5
Colon and rectum	52.6	62.5	42.7	30.4	40.2	22.2
Liver	30.9	46.1	15.8	18.2	29.5	8.2
Gallbladder <sup>b)</sup>	12.3	12.6	11.9	6.6	8.0	5.5
Pancreas	12.4	13.2	11.7	7.0	8.5	5.7
Larynx	2.2	4.2	0.3	1.3	2.7	0.1
Lung	47.6	66.8	28.4	26.4	42.3	14.3
Breast	37.7	0.3	75.1	24.8	0.2	49.2
Cervix uteri	7.0	-	14.1	4.6	-	9.1
Corpus uteri	4.7	-	9.4	3.1	-	6.1
Ovary	4.8	-	9.6	3.2	-	6.3
Prostate	20.0	40.1	-	11.2	25.4	-
Testis	0.6	1.1	-	0.6	1.1	-
Kidney	8.9	12.3	5.6	5.7	8.2	3.4
Bladder	7.9	12.7	3.1	4.3	8.1	1.5
Brain and CNS	3.5	3.8	3.2	2.8	3.1	2.4
Thyroid	49.1	21.2	77.1	35.2	15.1	55.6
Hodgkin lymphoma	0.5	0.7	0.4	0.5	0.6	0.4
Non-Hodgkin lymphoma	8.6	9.9	7.4	5.9	7.2	4.6
Multiple myeloma	2.9	3.0	2.7	1.6	1.9	1.4
Leukemia	6.4	7.2	5.5	5.3	6.2	4.5
Other and ill-defined	32.0	32.6	31.4	19.7	22.6	17.4

CNS, central nervous system. <sup>a)</sup>Age-adjusted using the Segi's world standard population, <sup>b)</sup>Includes the gallbladder and other/unspecified parts of the biliary tract.

**Table 3.** The top 10 leading causes of death in Korea, 2015

Rank	Cause of death	No. of deaths (%)	Age-standardized death rate per 100,000 <sup>a)</sup>
	All causes	275,895 (100)	289.3
1	Cancer	76,855 (27.9)	82.0
2	Heart disease	28,326 (10.3)	27.9
3	Cerebrovascular disease	24,455 (8.9)	23.4
4	Pneumonia	14,718 (5.3)	13.5
5	Intentional self-harm (suicide)	13,513 (4.9)	18.3
6	Diabetes mellitus	10,558 (3.8)	10.2
7	Chronic lower respiratory diseases	7,538 (2.7)	6.8
8	Disease of liver	6,847 (2.5)	8.1
9	Transport accidents	5,539 (2.0)	7.6
10	Hypertensive diseases	5,050 (1.8)	4.6
	Others	82,496 (29.9)	87.1

Source: Mortality Data, 2015, Statistics Korea [8]. <sup>a)</sup>Age-adjusted using the Segi's world standard population.

**Table 4.** Crude and age-standardized cancer mortality rates by sex in Korea, 2015

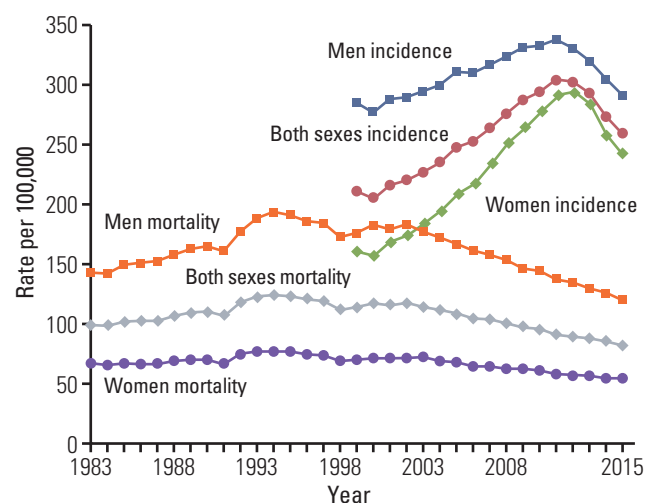
Site/Type	Crude mortality rate per 100,000			Age-standardized mortality rate per 100,000 <sup>a)</sup>		
	Both sexes	Men	Women	Both sexes	Men	Women
All sites	150.8	187.3	114.4	82.0	119.6	54.6
Lip, oral cavity, and pharynx	2.3	3.5	1.1	1.3	2.3	0.6
Esophagus	3.0	5.5	0.5	1.6	3.4	0.2
Stomach	16.7	21.6	11.8	8.9	13.8	5.4
Colon and rectum	16.3	18.5	14.1	8.5	11.8	6.1
Liver	22.2	32.9	11.5	12.6	20.9	5.4
Gallbladder <sup>b)</sup>	8.3	8.4	8.1	4.2	5.3	3.4
Pancreas	10.7	11.4	9.9	5.7	7.2	4.5
Larynx	0.7	1.3	0.1	0.4	0.8	0.0
Lung	34.1	49.8	18.5	17.9	31.2	8.2
Breast	4.6	0.1	9.2	2.8	0.0	5.5
Cervix uteri	1.9	-	3.8	1.1	-	2.0
Corpus uteri	0.6	-	1.3	0.4	-	0.7
Ovary	2.1	-	4.1	1.2	-	2.2
Prostate	3.3	6.7	-	1.6	4.3	-
Testis	0.0	0.0	-	0.0	0.0	-
Kidney	1.9	2.6	1.1	1.0	1.7	0.5
Bladder	2.5	3.8	1.3	1.2	2.4	0.5
Brain and CNS	2.5	2.6	2.3	1.7	1.9	1.5
Thyroid	0.7	0.4	0.9	0.3	0.3	0.4
Hodgkin lymphoma	0.1	0.1	0.1	0.1	0.1	0.0
Non-Hodgkin lymphoma	3.5	4.0	2.9	2.0	2.7	1.4
Multiple myeloma	1.7	1.8	1.7	1.0	1.2	0.8
Leukemia	3.4	3.9	2.8	2.2	2.8	1.7
Other and ill-defined	7.7	8.3	7.2	4.3	5.5	3.5

CNS, central nervous system. <sup>a)</sup>Age-adjusted using the world standard population, <sup>b)</sup>Includes the gallbladder and other/ unspecified parts of the biliary tract.

women included lung (CR, 18.5), colorectal (CR, 14.1), stomach (CR, 11.8), liver (CR, 11.5), and pancreatic cancer (CR, 9.9).

### 3. Trends in cancer incidence and mortality

Fig. 1 shows the trends in cancer incidence and mortality from 1983 to 2015. The ASR for all-cancer incidence increased by 3.4% annually from 1999 to 2012, and then began to decrease from 2012 to 2015 (APC, -6.1%) (Table 5, Fig. 1). The incidence of cancers in stomach, colorectum, lung and thyroid started to decrease around 2011. Especially, the ASR for thyroid cancer has increased rapidly 22.8% from 1999 to 2011, but then decreased swiftly 13.3% annually starting in 2011. Incidence of breast cancer has increased constantly throughout the period, but the APC slowly started to decrease since 2007. Conversely, the incidence rates of cervix and liver



**Fig. 1.** Annual age-standardized cancer incidence and death rates by sex for all sites from 1983 to 2015 in Korea. Age standardization was based on the Segi's world standard population.

**Table 5.** Trends in cancer incidence rates from 1999 to 2015 in Korea

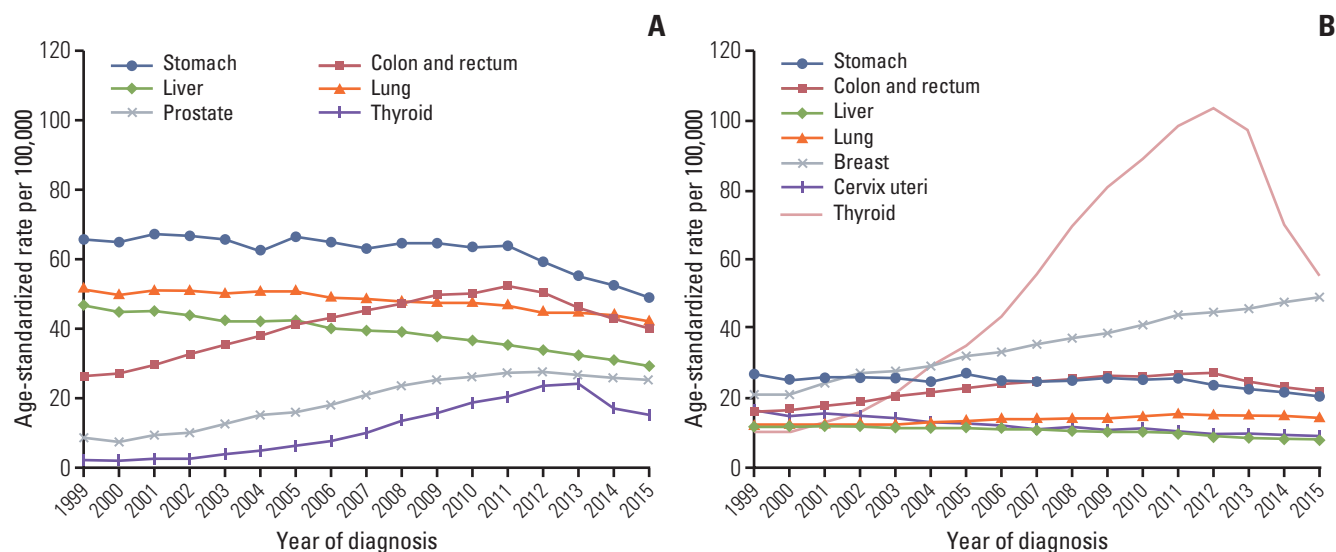
Site/Type	Both sexes						Men			Women								
	1999		2015		Trend 2		1999		2015		Trend 1		Trend 2					
	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC				
All sites	210.5	258.9	1999-2012	3.4 <sup>a)</sup>	2012-2015	-6.1 <sup>a)</sup>	285.0	291.7	1999-2011	1.7 <sup>a)</sup>	2011-2015	-3.6 <sup>a)</sup>	161.1	241.1	1999-2012	5.5 <sup>a)</sup>	2012-2015	-7.5 <sup>a)</sup>
Lip, oral cavity, and pharynx	3.6	4.1	1999-2015	0.5 <sup>a)</sup>	-	-	6.1	6.2	1999-2015	-0.2	-	-	1.6	2.2	1999-2015	1.4 <sup>a)</sup>	-	-
Esophagus	4.1	2.7	1999-2015	-2.3 <sup>a)</sup>	-	-	8.8	5.5	1999-2015	-2.7 <sup>a)</sup>	-	-	0.6	0.4	1999-2015	-1.8 <sup>a)</sup>	-	-
Stomach	43.6	33.8	1999-2011	-0.1	2011-2015	-5.7 <sup>a)</sup>	66.2	49.3	1999-2011	-0.3	2011-2015	-6.2 <sup>a)</sup>	26.7	20.5	1999-2011	-0.3	2011-2015	-5.1 <sup>a)</sup>
Colon and rectum	20.4	30.4	1999-2010	6.0 <sup>a)</sup>	2010-2015	-4.9 <sup>a)</sup>	26.2	40.2	1999-2010	6.5 <sup>a)</sup>	2010-2015	-5.4 <sup>a)</sup>	16.4	22.2	1999-2010	4.9 <sup>a)</sup>	2010-2015	-4.3 <sup>a)</sup>
Liver	27.9	18.2	1999-2010	-1.7 <sup>a)</sup>	2010-2015	-4.6 <sup>a)</sup>	46.8	29.5	1999-2009	-1.9 <sup>a)</sup>	2009-2015	-4.2 <sup>a)</sup>	12.3	8.2	1999-2010	-1.5 <sup>a)</sup>	2010-2015	-5.0 <sup>a)</sup>
Gallbladder <sup>b)</sup>	6.5	6.6	1999-2004	1.5	2004-2015	-0.3	8.1	8.0	1999-2015	0.0	-	-	5.4	5.5	1999-2003	2.5	2003-2015	-0.6 <sup>a)</sup>
Pancreas	5.6	7.0	1999-2015	1.4 <sup>a)</sup>	-	-	7.8	8.5	1999-2015	0.7 <sup>a)</sup>	-	-	4.0	5.7	1999-2015	2.2 <sup>a)</sup>	-	-
Larynx	2.3	1.3	1999-2015	-3.6 <sup>a)</sup>	-	-	4.9	2.7	1999-2015	-3.8 <sup>a)</sup>	-	-	0.4	0.1	1999-2007	-8.9 <sup>a)</sup>	2007-2015	-4.2 <sup>a)</sup>
Lung	28.5	26.4	1999-2011	0.1	2011-2015	-1.8 <sup>a)</sup>	51.4	42.3	1999-2005	-0.1	2005-2015	-1.6 <sup>a)</sup>	12.4	14.3	1999-2012	1.9 <sup>a)</sup>	2012-2015	-2.0
Breast	10.7	24.8	1999-2007	6.9 <sup>a)</sup>	2007-2015	4.0 <sup>a)</sup>	0.2	0.2	1999-2015	-1.1	-	-	20.9	49.2	1999-2007	7.1 <sup>a)</sup>	2007-2015	4.1 <sup>a)</sup>
Cervix uteri	8.5	4.6	1999-2015	-3.9 <sup>a)</sup>	-	-	-	-	-	-	-	-	16.3	9.1	1999-2015	-3.7 <sup>a)</sup>	-	-
Corpus uteri	1.4	3.1	1999-2009	6.2 <sup>a)</sup>	2009-2015	3.1 <sup>a)</sup>	-	-	-	-	-	-	2.8	6.1	1999-2009	6.4 <sup>a)</sup>	2009-2015	3.3 <sup>a)</sup>
Ovary	2.7	3.2	1999-2015	1.6 <sup>a)</sup>	-	-	-	-	-	-	-	-	5.0	6.3	1999-2015	1.8 <sup>a)</sup>	-	-
Prostate	3.1	11.2	1999-2009	15.3 <sup>a)</sup>	2009-2015	0.3	8.4	25.4	1999-2009	13.7 <sup>a)</sup>	2009-2015	-0.5	-	-	-	-	-	-
Testis	0.3	0.6	1999-2015	4.9 <sup>a)</sup>	-	-	0.6	1.1	1999-2015	4.8 <sup>a)</sup>	-	-	-	-	-	-	-	-
Kidney	3.0	5.7	1999-2009	6.7 <sup>a)</sup>	2009-2015	1.3 <sup>a)</sup>	4.5	8.2	1999-2010	6.1 <sup>a)</sup>	2010-2015	0.4	1.7	3.4	1999-2009	6.6 <sup>a)</sup>	2009-2015	1.1
Bladder	4.6	4.3	1999-2004	2.4 <sup>a)</sup>	2004-2015	-1.5 <sup>a)</sup>	9.0	8.1	1999-2005	1.5 <sup>a)</sup>	2005-2015	-1.8 <sup>a)</sup>	1.6	1.5	1999-2003	2.6	2003-2015	-1.7 <sup>a)</sup>
Brain and CNS	2.9	2.8	1999-2008	1.3 <sup>a)</sup>	2008-2015	-1.6 <sup>a)</sup>	3.2	3.1	1999-2009	1.2 <sup>a)</sup>	2009-2015	-2.0	2.6	2.4	1999-2007	1.5	2007-2015	-1.5 <sup>a)</sup>
Thyroid	6.3	35.2	1999-2011	22.8 <sup>a)</sup>	2011-2015	-13.3 <sup>a)</sup>	2.1	15.1	1999-2012	22.9 <sup>a)</sup>	2012-2015	-16.9 <sup>a)</sup>	10.4	55.6	1999-2011	22.4 <sup>a)</sup>	2011-2015	-14.4 <sup>a)</sup>
Hodgkin lymphoma	0.2	0.5	1999-2015	4.1 <sup>a)</sup>	-	-	0.4	0.6	1999-2015	3.2 <sup>a)</sup>	-	-	0.1	0.4	1999-2015	5.3 <sup>a)</sup>	-	-
Non-Hodgkin lymphoma	4.3	5.9	1999-2015	2.3 <sup>a)</sup>	-	-	5.6	7.2	1999-2015	1.9 <sup>a)</sup>	-	-	3.3	4.6	1999-2015	2.6 <sup>a)</sup>	-	-
Multiple myeloma	1.0	1.6	1999-2015	3.3 <sup>a)</sup>	-	-	1.2	1.9	1999-2015	3.0 <sup>a)</sup>	-	-	0.8	1.4	1999-2015	3.5 <sup>a)</sup>	-	-
Leukemia	4.7	5.3	1999-2015	0.9 <sup>a)</sup>	-	-	5.5	6.2	1999-2015	1.0 <sup>a)</sup>	-	-	3.9	4.5	1999-2015	0.7 <sup>a)</sup>	-	-
Other and ill-defined	14.4	19.7	1999-2008	3.5 <sup>a)</sup>	2008-2015	1.3 <sup>a)</sup>	18.1	22.6	1999-2015	1.8 <sup>a)</sup>	-	-	11.9	17.4	1999-2011	3.8 <sup>a)</sup>	2011-2015	-0.3

APC was calculated using age-standardized incidence data based on the Segi's world standard population. APC, annual percentage change; CNS, central nervous system. <sup>a)</sup>Significantly different from zero ( $p < 0.05$ ). <sup>b)</sup>Includes the gallbladder and other/ unspecified parts of the biliary tract.

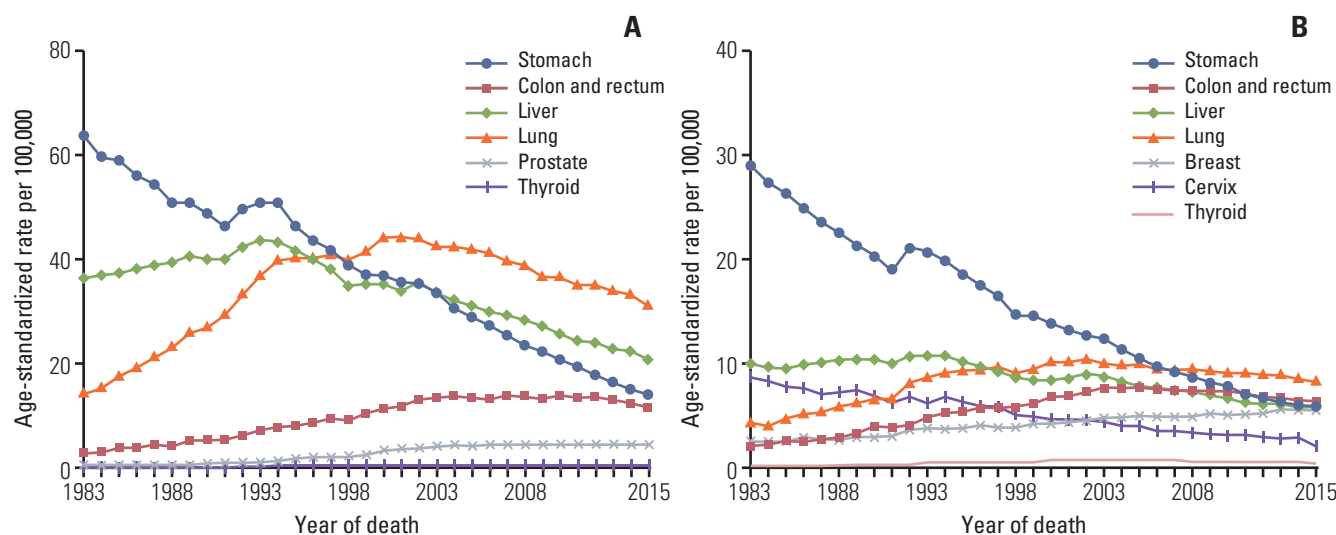
**Table 6.** Trends in cancer mortality rates from 1999 to 2015 in Korea

Site/Type	Both sexes						Men						Women												
	1999		2015		Trend 1		Trend 2		1999		2015		Trend 1		Trend 2		1999		2015		Trend 1		Trend 2		
	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	Year	APC	
All sites	114.3	82.0	1999-2002	1.0	2002-2015	-2.7 <sup>a)</sup>	176.6	119.6	1999-2002	1.2	2002-2015	-3.1 <sup>a)</sup>	70.6	54.6	1999-2002	1.0	2002-2015	-2.2 <sup>a)</sup>	0.4	0.6	1999-2015	-2.7 <sup>a)</sup>	-	-	-
Lip, oral cavity, and pharynx	1.1	1.3	1999-2015	-1.8 <sup>a)</sup>	-	-	2.0	2.3	1999-2015	-2.1 <sup>a)</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Esophagus	3.1	1.6	1999-2015	-4.4 <sup>a)</sup>	-	-	6.8	3.4	1999-2015	-4.6 <sup>a)</sup>	-	-	0.5	0.2	1999-2015	-5.1 <sup>a)</sup>	-	-	-	-	-	-	-	-	-
Stomach	23.8	8.9	1999-2003	-3.3 <sup>a)</sup>	2003-2015	-6.7 <sup>a)</sup>	36.9	13.8	1999-2003	-2.6 <sup>a)</sup>	2003-2015	-7.0 <sup>a)</sup>	14.6	5.4	1999-2003	-4.4 <sup>a)</sup>	2003-2015	-6.6 <sup>a)</sup>	-	-	-	-	-	-	-
Colon and rectum	7.7	8.5	1999-2004	5.5 <sup>a)</sup>	2004-2015	-1.3 <sup>a)</sup>	10.5	11.8	1999-2004	5.9 <sup>a)</sup>	2004-2015	-1.0 <sup>a)</sup>	6.0	6.1	1999-2004	4.9 <sup>a)</sup>	2004-2015	-1.8 <sup>a)</sup>	-	-	-	-	-	-	-
Liver	20.4	12.6	1999-2002	0.8	2002-2015	-3.6 <sup>a)</sup>	35.3	20.9	1999-2002	-0.1	2002-2015	-3.7 <sup>a)</sup>	8.3	5.4	1999-2002	2.9	2002-2015	-3.7 <sup>a)</sup>	-	-	-	-	-	-	-
Gallbladder <sup>b)</sup>	5.2	4.2	1999-2001	7.4	2001-2015	-2.7 <sup>a)</sup>	6.8	5.3	1999-2001	6.2	2001-2015	-2.8 <sup>a)</sup>	4.1	3.4	1999-2001	9.2	2001-2015	-2.6 <sup>a)</sup>	-	-	-	-	-	-	-
Pancreas	5.4	5.7	1999-2015	0.3 <sup>a)</sup>	-	-	7.6	7.2	1999-2015	-0.4 <sup>a)</sup>	-	-	3.9	4.5	1999-2015	0.9 <sup>a)</sup>	-	-	-	-	-	-	-	-	-
Larynx	1.6	0.4	1999-2015	-9.5 <sup>a)</sup>	-	-	3.4	0.8	1999-2015	-9.1 <sup>a)</sup>	-	-	0.4	0.0	1999-2010	-15.4 <sup>a)</sup>	2010-2015	-6.2	-	-	-	-	-	-	-
Lung	22.4	17.9	1999-2002	1.8	2002-2015	-2.1 <sup>a)</sup>	41.5	31.2	1999-2001	4.3	2001-2015	-2.5 <sup>a)</sup>	9.4	8.2	1999-2002	2.3	2002-2015	-1.5 <sup>a)</sup>	-	-	-	-	-	-	-
Breast	2.2	2.8	1999-2015	1.4 <sup>a)</sup>	-	-	0.1	0.0	1999-2015	-4.5 <sup>a)</sup>	-	-	4.2	5.5	1999-2015	1.7 <sup>a)</sup>	-	-	-	-	-	-	-	-	-
Cervix uteri	1.4	1.1	1999-2003	8.4 <sup>a)</sup>	2003-2015	-5.2 <sup>a)</sup>	-	-	-	-	-	-	2.6	2.0	1999-2003	7.8 <sup>a)</sup>	2003-2015	-4.9 <sup>a)</sup>	-	-	-	-	-	-	-
Corpus uteri	0.1	0.4	1999-2002	51.8 <sup>a)</sup>	2002-2015	3.4 <sup>a)</sup>	-	-	-	-	-	-	0.1	0.7	1999-2002	51.6 <sup>a)</sup>	2002-2015	3.8 <sup>a)</sup>	-	-	-	-	-	-	-
Ovary	0.9	1.2	1999-2001	10.9	2001-2015	0.2	-	-	-	-	-	-	1.7	2.2	1999-2001	10.2	2001-2015	0.5	-	-	-	-	-	-	-
Prostate	0.9	1.6	1999-2004	9.4 <sup>a)</sup>	2004-2015	0.4	2.6	4.3	1999-2002	17.5 <sup>a)</sup>	2002-2015	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-
Testis	0.0	0.0	1999-2015	-2.5	-	-	0.1	0.0	1999-2015	-2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kidney	1.1	1.0	1999-2015	-0.1	-	-	1.8	1.7	1999-2015	0.0	-	-	0.5	0.5	1999-2015	-0.8	-	-	-	-	-	-	-	-	-
Bladder	1.3	1.2	1999-2015	-1.3 <sup>a)</sup>	-	-	2.6	2.4	1999-2015	-1.6 <sup>a)</sup>	-	-	0.5	0.5	1999-2001	10.8	2001-2015	-1.9 <sup>a)</sup>	-	-	-	-	-	-	-
Brain and CNS	1.9	1.7	1999-2002	4.4	2002-2015	-2.0 <sup>a)</sup>	2.2	1.9	1999-2015	-1.5 <sup>a)</sup>	-	-	1.6	1.5	1999-2015	-1.4 <sup>a)</sup>	-	-	-	-	-	-	-	-	-
Thyroid	0.4	0.3	1999-2003	7.0	2003-2015	-4.2 <sup>a)</sup>	0.3	0.3	1999-2002	16.0	2002-2015	-4.0 <sup>a)</sup>	0.5	0.4	1999-2004	4.3	2004-2015	-4.7 <sup>a)</sup>	-	-	-	-	-	-	-
Hodgkin lymphoma	0.0	0.1	1999-2003	29.6	2003-2015	-0.2	0.0	0.1	1999-2004	19.2 <sup>a)</sup>	2004-2015	-2.0	0.0	0.0	1999-2003	40.8	2003-2015	1.3	-	-	-	-	-	-	-
Non-Hodgkin lymphoma	2.1	2.0	1999-2015	-0.5 <sup>a)</sup>	-	-	3.0	2.7	1999-2015	-0.8 <sup>a)</sup>	-	-	1.4	1.4	1999-2015	-0.2	-	-	-	-	-	-	-	-	-
Multiple myeloma	0.6	1.0	1999-2003	12.8 <sup>a)</sup>	2003-2015	0.8	0.8	1.2	1999-2003	10.9 <sup>a)</sup>	2003-2015	0.8	0.4	0.8	1999-2007	7.4 <sup>a)</sup>	2007-2015	-1.1	-	-	-	-	-	-	-
Leukemia	2.9	2.2	1999-2001	1.4	2001-2015	-2.1 <sup>a)</sup>	3.5	2.8	1999-2015	-1.7 <sup>a)</sup>	-	-	2.4	1.7	1999-2015	-2.1 <sup>a)</sup>	-	-	-	-	-	-	-	-	-
Other and ill-defined	7.8	4.3	1999-2015	-3.1 <sup>a)</sup>	-	-	9.0	5.5	1999-2009	-0.6	2009-2015	-6.8 <sup>a)</sup>	7.0	3.5	1999-2005	-7.0 <sup>a)</sup>	2005-2015	-2.2 <sup>a)</sup>	-	-	-	-	-	-	-

APC was calculated using age-standardized incidence data based on the Segi's world standard population. APC, annual percentage change; CNS, central nervous system. <sup>a)</sup>Significantly different from zero ( $p < 0.05$ ). <sup>b)</sup>Includes the gallbladder and other/ unspecified parts of the biliary tract.



**Fig. 2.** Trends in age-standardized incidences of selected cancers by sex from 1999 to 2015 in Korea. Age standardization was based on the Segi's world standard population. (A) Men. (B) Women.



**Fig. 3.** Annual age-standardized cancer mortalities of selected cancers by sex from 1983 to 2015 in Korea. (A) Men. (B) Women. Age-standardization was based on the Segi's world standard population.

showed a constant decrease for the whole period. The incidence of liver cancer decreased drastically starting in 2010 (Fig. 2).

The ASR for the all-cancer mortality rate has been increased until 2002 (Table 6, Fig. 1). After that year, it began to decrease (2002-2015, APC, -2.7%). Similar patterns were observed in men and women. According to cancer sites, the

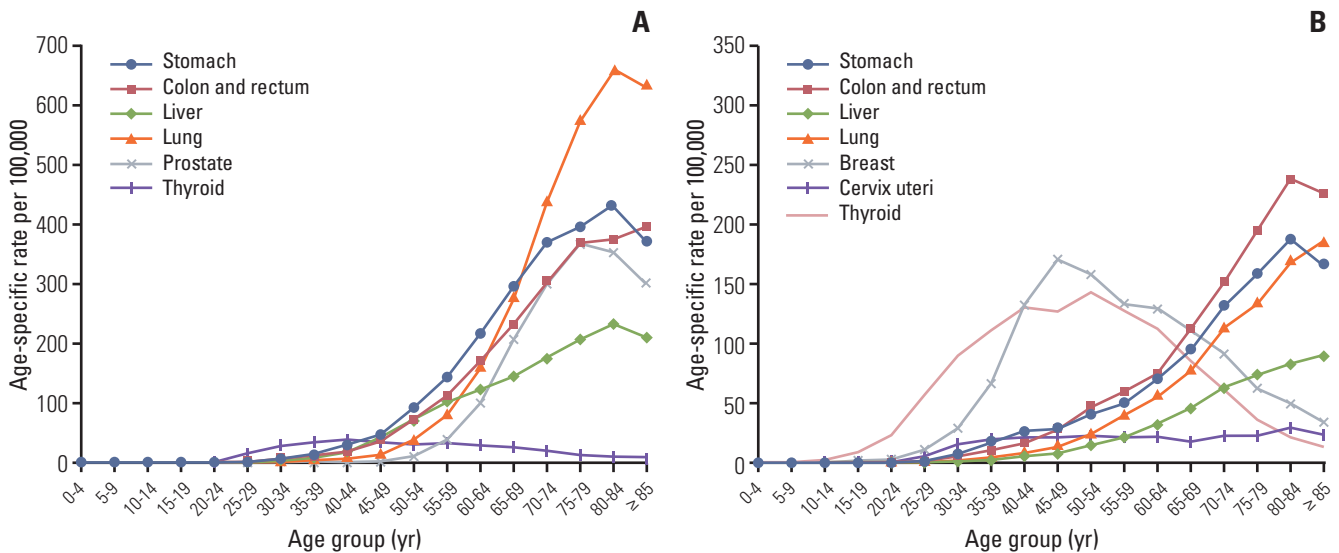
mortality rates for most cancers including those of the lung, liver, colorectum, gallbladder, leukemia, brain and central nervous system, cervix uteri, and thyroid started to decrease in the early 2000s. However, the mortality rates for cancers of the stomach, larynx, testis, bladder, and non-Hodgkin lymphoma decreased starting in 1999 (Fig. 3). Cancers in the pancreas, breast, and prostate showed constant increasing



**Table 7.** The five common sites/types of cancer incidence by age group and sex in Korea, 2015

Rank	Age (yr)			
	0-14	15-34	35-64	≥ 65
<b>Men</b>				
1	Leukemia (4.7)	Thyroid (11.9)	Stomach (81.9)	Lung (436.0)
2	Non-Hodgkin lymphoma (2.7)	Leukemia (3.8)	Colon and rectum (62.9)	Stomach (353.5)
3	Brain and CNS (1.9)	Non-Hodgkin lymphoma (2.8)	Liver (56.9)	Colon and rectum (300.4)
4	Kidney (0.5)	Colon and rectum (2.7)	Lung (42.1)	Prostate (284.2)
5	Liver (0.4)	Testis (2.3)	Thyroid (33.7)	Liver (178.7)
<b>Women</b>				
1	Leukemia (4.1)	Thyroid (45.9)	Breast (132.5)	Colon and rectum (168.4)
2	Brain and CNS (1.6)	Breast (10.9)	Thyroid (125.6)	Stomach (137.0)
3	Non-Hodgkin lymphoma (1.5)	Cervix uteri (5.2)	Colon and rectum (37.0)	Lung (122.1)
4	Thyroid (0.9)	Ovary (3.0)	Stomach (36.5)	Breast (78.2)
5	Ovary (0.6)	Stomach (2.9)	Lung (21.9)	Live (66.3)

CNS, central nervous system.



**Fig. 4.** Age-specific incidence rates of common cancers for 2015 in Korea. (A) Men. (B) Women.

trends for the whole period.

**4. Age-specific incidence**

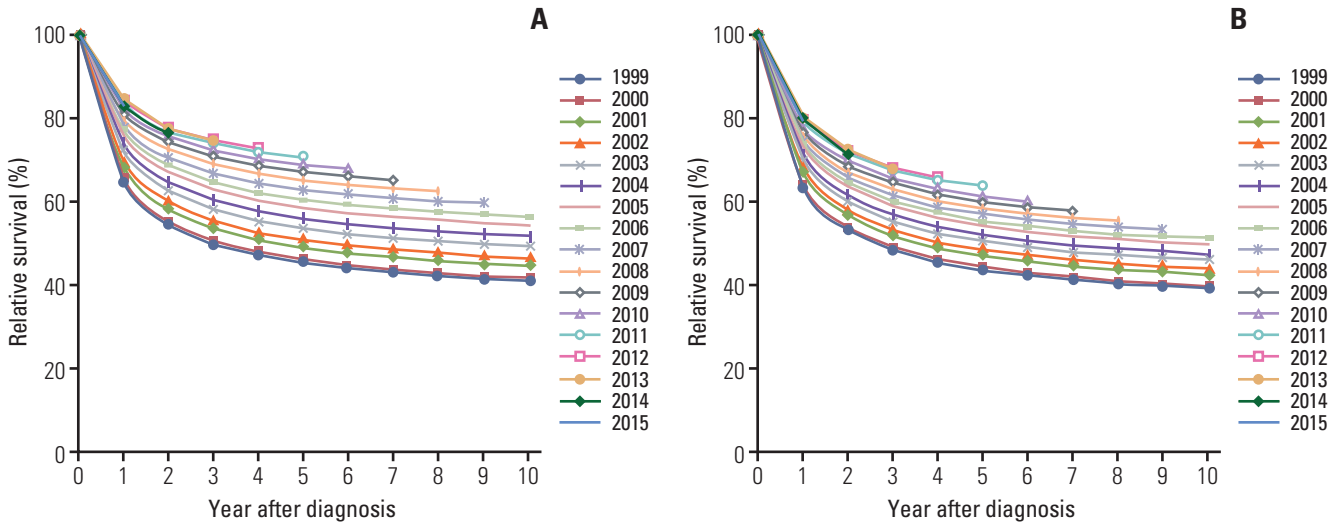
Leukemia was the most commonly diagnosed cancer among children aged 0-14 years (Table 7). Thyroid cancer was the most common cancer among adolescents and young adults between 15 and 34 years of age. For men, the incidence rate of cancer increased before age 70 years (Fig. 4A). Stom-

ach cancer was the most commonly diagnosed cancer among men aged 35 to 64 years, while lung cancer was the most common among men aged ≥ 65 years. In contrast, breast cancer was most commonly diagnosed among women aged 35-64 years, while colorectal cancer was the most common among women aged ≥ 65 years. The incidence rates for thyroid and breast cancer showed an inverted U-shaped pattern when analyzed according to age (Fig. 4B).

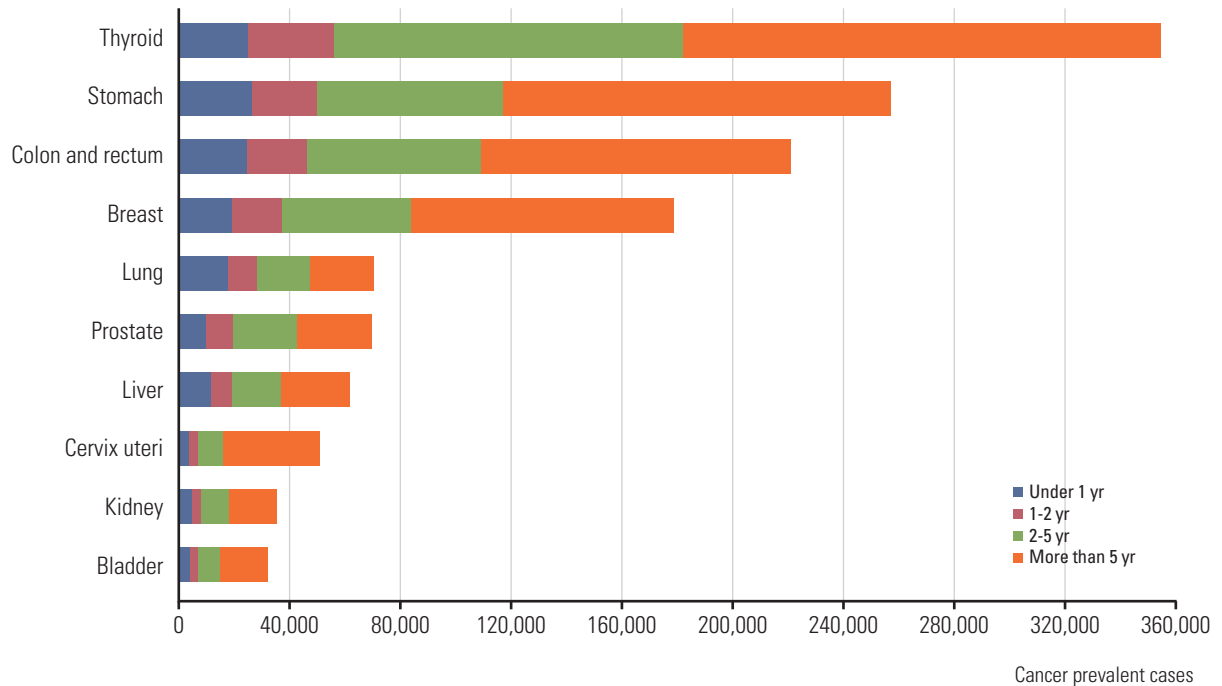
**Table 8.** Trends in the 5-year relative survival rates (%) by year of diagnosis from 1993 to 2015 in Korea

Site/Type	Both sexes												Men						Women																	
	1993-1995		1996-2000		2001-2005		2006-2010		2011-2015		Change <sup>a)</sup>		1993-1995		1996-2000		2001-2005		2006-2010		2011-2015		Change <sup>b)</sup>													
	41.2	41.1	44.0	46.7	54.0	54.3	65.2	60.6	70.7	64.5	29.5	23.4	31.7	35.8	41.1	49.4	45.4	49.4	56.5	56.4	62.8	60.7	31.1	24.9												
All sites	41.2	41.1	44.0	46.7	54.0	54.3	65.2	60.6	70.7	64.5	29.5	23.4	31.7	35.8	41.1	49.4	45.4	49.4	56.5	56.4	62.8	60.7	31.1	24.9	53.4	58.1	64.2	67.8	74.2	74.1	78.4	74.1	25.0	16.0		
Lip, oral cavity, and pharynx	12.7	15.2	15.2	15.2	21.4	21.4	29.6	29.6	36.0	36.0	23.3	23.3	11.8	11.8	14.3	20.6	20.6	29.0	29.0	29.0	35.7	35.7	23.9	23.9	23.7	24.2	29.7	29.7	36.5	39.3	39.3	39.3	15.6	15.6		
Esophagus	42.8	46.6	46.6	46.6	57.8	57.8	68.1	68.1	75.4	75.4	32.6	32.6	43.0	43.0	46.9	58.4	58.4	68.7	68.7	68.7	76.3	76.3	33.3	33.3	42.6	46.0	56.5	66.7	66.7	73.7	73.7	73.7	31.1	31.1		
Stomach	54.8	58.0	58.0	58.0	66.7	66.7	73.5	73.5	76.3	76.3	21.5	21.5	55.3	55.3	59.0	68.5	68.5	75.4	75.4	75.4	78.0	78.0	22.7	22.7	54.2	56.8	64.3	70.8	70.8	73.6	73.6	73.6	19.4	19.4		
Colon and rectum	10.7	13.2	13.2	13.2	20.4	20.4	28.1	28.1	33.6	33.6	22.9	22.9	9.9	9.9	12.9	20.3	20.3	28.1	28.1	28.1	34.1	34.1	24.2	24.2	13.6	14.2	20.9	28.1	28.1	32.2	32.2	32.2	18.6	18.6		
Liver	17.3	19.7	19.7	19.7	23.1	23.1	26.8	26.8	29.1	29.1	11.8	11.8	16.6	16.6	20.3	23.5	23.5	27.7	27.7	27.7	30.2	30.2	13.6	13.6	18.0	19.1	22.7	25.9	25.9	28.0	28.0	28.0	10.0	10.0		
Gallbladder <sup>d)</sup>	9.4	7.6	7.6	7.6	8.4	8.4	8.4	8.4	10.8	10.8	1.4	1.4	8.8	8.8	7.3	8.4	8.4	8.1	8.1	10.3	10.3	10.3	1.5	1.5	10.1	8.1	8.5	8.7	8.7	11.5	11.5	11.5	1.4	1.4		
Pancreas	59.7	62.3	62.3	62.3	66.3	66.3	72.9	72.9	75.5	75.5	15.8	15.8	60.2	60.2	62.8	66.9	66.9	73.2	73.2	73.2	75.9	75.9	15.7	15.7	55.4	57.8	58.9	67.6	67.6	69.9	69.9	69.9	14.5	14.5		
Larynx	11.3	12.7	12.7	12.7	16.5	16.5	20.1	20.1	26.7	26.7	15.4	15.4	10.4	10.4	11.6	15.2	15.2	17.9	17.9	22.7	22.7	22.7	12.3	12.3	14.2	16.2	20.1	25.8	25.8	35.8	35.8	35.8	21.6	21.6		
Lung	77.9	83.2	83.2	83.2	88.6	88.6	91.1	91.1	92.3	92.3	14.4	14.4	75.1	75.1	85.6	87.2	87.2	89.9	89.9	87.1	87.1	87.1	12.0	12.0	78.0	83.2	88.6	91.1	91.1	92.3	92.3	92.3	14.3	14.3		
Breast	77.5	80.0	80.0	80.0	81.4	81.4	80.5	80.5	79.9	79.9	2.4	2.4	-	-	-	-	-	-	-	-	-	-	-	-	77.5	80.0	81.4	80.5	80.5	79.9	79.9	79.9	2.4	2.4		
Cervix uteri	81.5	81.8	81.8	81.8	84.5	84.5	86.4	86.4	87.8	87.8	6.3	6.3	-	-	-	-	-	-	-	-	-	-	-	-	81.5	81.8	84.5	86.4	86.4	87.8	87.8	87.8	6.3	6.3		
Corpus uteri	58.7	58.9	58.9	58.9	61.8	61.8	61.1	61.1	64.1	64.1	5.4	5.4	-	-	-	-	-	-	-	-	-	-	-	-	58.7	58.9	61.8	61.1	61.1	64.1	64.1	64.1	5.4	5.4		
Ovary	55.9	67.2	67.2	67.2	80.4	80.4	91.1	91.1	94.1	94.1	38.2	38.2	55.9	55.9	67.2	80.4	80.4	91.1	91.1	94.1	94.1	94.1	38.2	38.2	-	-	-	-	-	-	-	-	-	-	-	-
Prostate	85.4	90.4	90.4	90.4	90.7	90.7	93.1	93.1	95.6	95.6	10.2	10.2	85.4	85.4	90.4	90.7	90.7	93.1	93.1	95.6	95.6	95.6	10.2	10.2	-	-	-	-	-	-	-	-	-	-	-	-
Testis	62.0	66.1	66.1	66.1	73.6	73.6	78.4	78.4	82.2	82.2	20.2	20.2	60.8	60.8	64.4	73.0	73.0	78.2	78.2	81.6	81.6	81.6	20.8	20.8	64.5	69.7	74.7	78.8	78.8	83.6	83.6	83.6	19.1	19.1		
Kidney	69.1	73.1	73.1	73.1	75.7	75.7	76.7	76.7	75.8	75.8	6.7	6.7	70.0	70.0	74.8	77.5	77.5	78.8	78.8	77.8	77.8	77.8	7.8	7.8	65.5	66.3	68.8	68.6	68.6	67.7	67.7	67.7	2.2	2.2		
Bladder	38.5	39.0	39.0	39.0	40.9	40.9	42.8	42.8	40.7	40.7	2.2	2.2	37.2	37.2	37.5	40.2	40.2	41.4	41.4	39.1	39.1	39.1	1.9	1.9	40.2	40.7	41.7	44.4	44.4	42.6	42.6	42.6	2.4	2.4		
Brain and CNS	94.2	94.9	94.9	94.9	98.4	98.4	99.9	99.9	100.3	100.3	6.1	6.1	87.2	87.2	89.5	96.0	96.0	100.1	100.1	100.6	100.6	100.6	13.4	13.4	95.4	95.9	98.7	99.9	99.9	100.2	100.2	100.2	4.8	4.8		
Thyroid	68.0	71.2	71.2	71.2	76.7	76.7	81.0	81.0	82.2	82.2	14.2	14.2	67.6	67.6	68.1	74.7	74.7	80.7	80.7	82.8	82.8	82.8	15.2	15.2	68.6	77.4	80.7	81.6	81.6	81.2	81.2	81.2	12.6	12.6		
Hodgkin lymphoma	46.6	50.8	50.8	50.8	55.9	55.9	59.3	59.3	62.9	62.9	16.3	16.3	45.3	45.3	48.9	54.9	54.9	59.1	59.1	62.4	62.4	62.4	17.1	17.1	48.7	53.5	57.4	59.6	59.6	63.6	63.6	63.6	14.9	14.9		
Non-Hodgkin lymphoma	22.1	19.8	19.8	19.8	29.6	29.6	34.9	34.9	40.9	40.9	18.8	18.8	21.1	21.1	17.8	29.8	29.8	35.0	35.0	40.6	40.6	40.6	19.5	19.5	23.3	22.1	29.4	34.8	34.8	41.3	41.3	41.3	18.0	18.0		
Multiple myeloma	26.5	33.3	33.3	33.3	42.0	42.0	47.6	47.6	51.0	51.0	24.5	24.5	26.2	26.2	32.3	41.8	41.8	46.8	46.8	51.1	51.1	51.1	24.9	24.9	26.8	34.6	42.2	48.6	48.6	50.8	50.8	50.8	24.0	24.0		
Leukemia	42.1	45.9	45.9	45.9	57.6	57.6	67.2	67.2	72.2	72.2	30.1	30.1	37.4	37.4	42.4	53.8	53.8	63.4	63.4	68.9	68.9	68.9	31.5	31.5	47.4	50.0	61.8	71.0	71.0	75.5	75.5	75.5	28.1	28.1		
Other and ill-defined																																				

CNS), central nervous system. <sup>a)</sup>Percentage change in 5-year relative survival from 1993 to 1995 and 2011 to 2015, <sup>b)</sup>Includes the gallbladder and other/unspecified parts of the biliary tract.



**Fig. 5.** Trends in relative survival by year of diagnosis from 1999 to 2014. (A) All sites for both sexes. (B) All sites except thyroid cancer for both sexes.



	Thyroid	Stomach	Colon and rectum	Breast	Lung	Prostate	Liver	Cervix uteri	Kidney	Bladder	All cancers
Under 1 yr	24,903	26,423	24,400	19,000	17,387	9,945	11,303	3,419	4,259	3,687	187,370
1-2 yr	30,775	23,858	22,274	17,824	10,838	9,132	7,993	3,107	3,858	3,228	165,051
2-5 yr	126,900	66,852	62,715	46,659	19,417	23,472	17,626	8,845	9,927	7,581	462,639
More than 5 yr	172,479	139,862	111,264	95,598	22,289	26,889	24,368	35,106	17,289	16,911	796,427
<b>Total</b>	<b>355,057</b>	<b>256,995</b>	<b>220,653</b>	<b>179,081</b>	<b>69,931</b>	<b>69,438</b>	<b>61,290</b>	<b>50,477</b>	<b>35,333</b>	<b>31,407</b>	<b>1,611,487</b>

**Fig. 6.** Prevalence of common cancer sites by time period after cancer diagnosis. Prevalent cases were defined as the number of cancer patients alive on January 1, 2016 among all cancer patients diagnosed between 1999 and 2015.

**Table 9.** Crude and age-standardized rates of cancer prevalence by sex on January 1, 2016 in Korea

Site/Type	Crude prevalence rate per 100,000 <sup>a)</sup>			Age-standardized prevalence rate per 100,000 <sup>b)</sup>		
	Both sexes	Men	Women	Both sexes	Men	Women
All sites	3,162.8	2,781.0	3,544.1	1,956.9	1,826.6	2,171.5
Lip, oral cavity, and pharynx	42.8	57.6	28.1	26.8	37.9	17.2
Esophagus	18.0	32.5	3.6	10.3	20.6	1.8
Stomach	504.4	668.9	340.1	291.5	425.6	180.9
Colon and rectum	433.1	516.8	349.4	248.2	330.6	181.7
Liver	120.3	180.2	60.4	73.5	116.8	34.2
Gallbladder <sup>c)</sup>	38.2	39.1	37.3	21.1	24.7	18.4
Pancreas	18.7	19.8	17.6	11.1	12.9	9.7
Larynx	19.7	37.1	2.3	11.2	23.6	1.2
Lung	137.2	172.8	101.8	78.7	110.2	54.5
Breast	351.5	2.7	699.8	221.7	1.7	435.9
Cervix uteri	99.1	-	198.0	61.5	-	120.0
Corpus uteri	40.9	-	81.8	26.1	-	51.2
Ovary	35.5	-	71.0	24.2	-	48.1
Prostate	136.3	272.8	-	71.3	170.0	-
Testis	5.8	11.5	-	5.2	10.3	-
Kidney	69.3	93.7	45.0	43.5	62.0	27.1
Bladder	61.6	100.6	22.7	33.7	64.1	10.6
Brain and CNS	20.3	21.0	19.7	17.2	18.3	16.1
Thyroid	696.8	236.3	1,156.8	464.9	160.2	767.5
Hodgkin lymphoma	5.0	6.4	3.7	4.2	5.1	3.2
Non-Hodgkin lymphoma	53.9	61.4	46.5	38.2	45.9	31.1
Multiple myeloma	10.5	10.9	10.0	6.1	7.0	5.4
Leukemia	37.8	41.8	33.8	35.2	39.2	31.1
Other and ill-defined	205.9	197.1	214.6	131.4	139.9	124.4

CNS, central nervous system. <sup>a)</sup>Crude prevalence rate: number of prevalent cases divided by the corresponding person-years of observation. Prevalent cases were defined as patients who were diagnosed between January 1, 1999 and December 31, 2015 and who were alive on January 1, 2016. Multiple primary cancer cases were counted multiple times, <sup>b)</sup>Age-adjusted using the Segi's world standard population, <sup>c)</sup>Includes the gallbladder and other/unspecified parts of the biliary tract.

## 5. Survival rates

The 5-year RSRs for all cancer combined improved remarkably in both sexes, from 41.2% in 1993-1995 to 70.7% in 2011-2015 (Table 8, Fig. 5A). After excluding thyroid cancer, the 5-year RSRs for all cancer still increased from 1993 to 2015 (Fig. 5B).

The 5-year RSR during 2011-2015 for all cancers combined was 62.8% in men and 78.4% in women, respectively. The 5-year RSR for thyroid cancer was over 100%, while the 5-year RSRs for testis, prostate, and breast cancer were over 90% in 2011-2015 for both sexes. However, the 5-year RSR for pancreatic cancer was only 10.8% in both sexes in 2011-2015.

When compared to the 5-year RSR for men in 1993-1995,

prostate cancer diagnosed from 2011 to 2015 showed the most outstanding improvement, followed by stomach, leukemia, "lip, oral cavity and pharynx" and liver cancer. Among women, stomach cancer diagnosed during 2011-2015 showed the greatest improvement in 5-year RSRs compared to those between 1993 and 1995, followed by leukemia, lung, colorectal, and kidney cancer.

## 6. Prevalence

A total of 1,611,487 prevalent cancer cases were identified on January 1, 2016 (Table 1). Of these cases, 707,977 (43.9%) were men and 903,510 (56.1%) were women. The crude and age-standardized prevalence rates for overall cancer were 3,162.8 per 100,000 individuals and 1,956.9 per 100,000 indi-

viduals for both sexes, respectively, in 2015 (Table 9).

The five most common cancers for men were stomach (CR, 668.9), colorectal (CR, 516.8), prostate (CR, 272.8), thyroid (CR, 236.3), and liver cancer (CR, 180.2). In contrast, thyroid cancer was most common in women (CR, 1156.8), followed by breast (CR, 699.8), colorectal (CR, 349.4), stomach (CR, 340.1), and cervix uteri cancer (CR, 198.0).

Analysis of the period after cancer diagnosis revealed that thyroid (15.8%) cancer was the most prevalent cancer within 2 years after diagnosis, followed by stomach (14.3%) and colorectal cancer (13.2%) (Fig. 6). Thyroid cancer (27.4%) was most prevalent for 2-5 years, followed by stomach (14.5%) and colorectal cancer (13.6%). After 5 years, thyroid cancer (21.7%) was the most prevalent cancer, followed by stomach (17.6%) and colorectal cancer (14.0%).

### Conflicts of Interest

Conflict of interest relevant to this article was not reported.

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