발 간 등 록 번 호
11-1352000-001186-10

Cancer Facts & Figures 2017

in the Republic of Korea

Cancer Facts & Figures 2017 in the Republic of Korea

Cancer Facts & Figures 2017 in the Republic of Korea

Ministry of Health and Welfare

NATIONAL CANCER CENTER

ISSN 2384-0889

Ministry of Health and Welfare

NATIONAL CANCER CENTER

Cancer Facts & Figures 2017

Foreword

Cancer is currently one of the leading causes of death in Korea and patients need support not only from their family, but also the entire society. The socioeconomic cost of cancer is the highest, and patients and their families go through immense physical, emotional, and social challenges.

Fortunately, in Korea, the survival rate of cancer patients has been steadily increasing since 2000, when the National Cancer Control Program was expanded in earnest. The 5-year relative survival rate of cancer patients in the last 5 years (2010-2014, 70.3%) has increased by 16.4% since 2001-2005 (53.9%) and by 29.1% since 1993-1995 (41.2%).

In order to reduce personal suffering, damage, and social burden caused by cancer, as well as to contribute to the promotion of public health, Korea is establishing and implementing a comprehensive plan for cancer control. Recently, The Third Term of the Comprehensive Plan for Cancer Control (2016-2020) has been planned; it includes cancer research projects and comprehensive plans for cancer control at the National Cancer Center (NCC).

The NCC was established in 2000 as part of a nationwide effort to fight cancer. It strives to lower cancer incidence and mortality rates among Korean citizens and to improve the quality of life of cancer patients by performing research, providing treatment, supporting national cancer control programs, and training and educating professionals involved in cancer treatment.

Cancer Facts & Figures of Korea (2017) compiled cancer-related activities of the NCC, other cancer-related reports, and academic papers published in Korea and internationally. We sincerely hope that this would help in broadening the general public's understanding of

cancer, and that it can be utilized as a primary source of data for cancer-related research and projects.

I would like to express my profound gratitude to the staff and associates of the NCC, who have made this publication possible.

March 2017

Kang Hyun Lee, M.D., Ph.D.

President, National Cancer Center

Contents

Chapter 1.
The Third Term Comprehensive Plan for Cancer Control

1.1 The Third Term Comprehensive Plan for Cancer Control

Following the First 10-Year Plan for National Cancer Control (1996-2005) and the Second 10-Year Plan for National Cancer Control (2006-2015), the Korean government implemented the Third Term Comprehensive Plan for Cancer Control (2016-2020) for the effective control and management of cancer at the national level.

The Third Term Comprehensive Plan for Cancer Control (2016-2020) incorporates the evaluation of the goals of each project in the Second Term Comprehensive Plan for Cancer Control in terms of the structure indicator, process indicator, and result indicator, and suggest the draft plan for the comprehensive plan for cancer control through the review of domestic and overseas data, analysis of the policy, and collection and review of the opinions of the experts. The significance of the plan is that it provides a system for systematic driving the national cancer control project to improve the quality of life for citizens by considering the changed policy environment in domestic and foreign countries, including Increased expectations of cancer patients and family and financial expansion.

With a vision of improving the quality of life by decreasing the social, economic, and emotional burden of cancer patients as well as their families, the objective of the Third Term Comprehensive Plan for Cancer Control is to decrease the incidence of cancer to the average incidence in the Organisation for Economic Co-operation and Development(OECD) member countries to promote early screening, to increase the cancer survival rate, to improve the quality of life of the terminal-stage cancer patients and cancer survivors and building infrastructures for precision medicine.

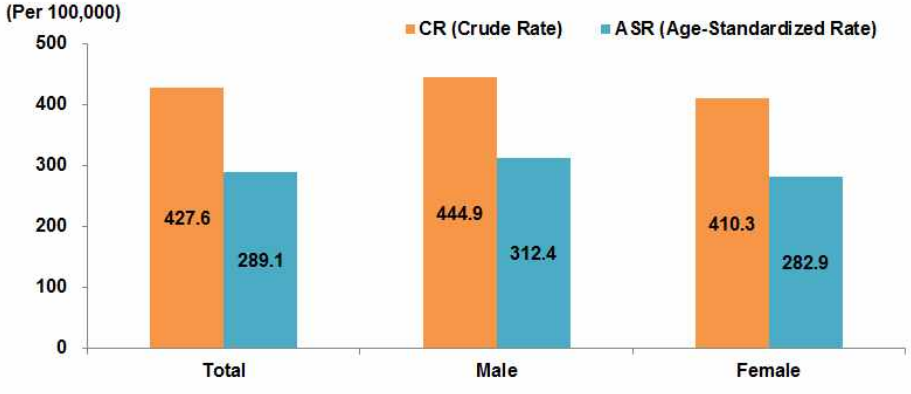
Chapter 2.
Basic Facts

2.1 Cancer Incidence

Cancer Incidence Rates

In Korea, the age-standardized cancer incidence rate in 2014 was 289.1 per 100,000 individuals (312.4 for males and 282.9 for females).

Cancer Incidence Rates (2014)



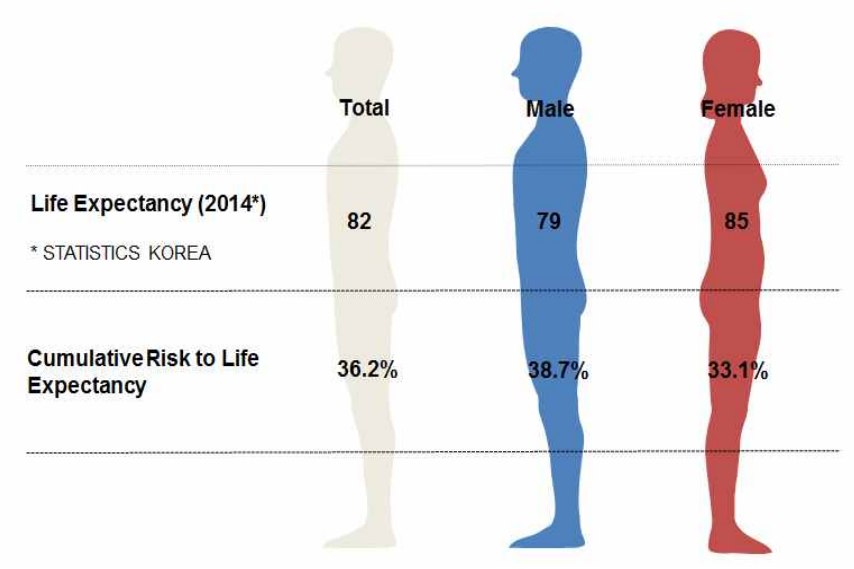
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Cumulative Risk of Cancer

The cumulative risk of cancer during average life expectancy was 36.2%. The risk for males was higher than that for females at 38.7% and 33.1%, respectively.

Cumulative Risk of Cancer (2014)



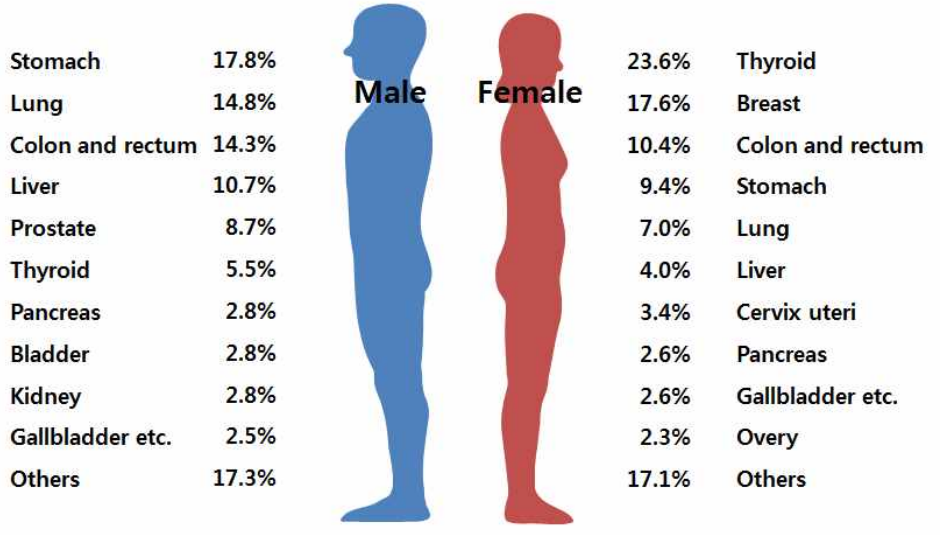
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Proportion of Cancer Incidences

In males, stomach cancer occurred most frequently, accounting for 17.8% of all cases, followed by lung cancer (14.8%), colon and rectum cancer (14.8%), and liver cancer (10.7%).

In females, thyroid cancer occurred most frequently, accounting for 23.6% of all cases, followed by breast cancer (17.6%), colon and rectum cancer (10.4%), stomach cancer (9.4%), and lung cancer (7.0%).

Proportion of Cancer Incidences (2014)



Male		Female	
Stomach	17.8%	23.6%	Thyroid
Lung	14.8%	17.6%	Breast
Colon and rectum	14.3%	10.4%	Colon and rectum
Liver	10.7%	9.4%	Stomach
Prostate	8.7%	7.0%	Lung
Thyroid	5.5%	4.0%	Liver
Pancreas	2.8%	3.4%	Cervix uteri
Bladder	2.8%	2.6%	Pancreas
Kidney	2.8%	2.6%	Gallbladder etc.
Gallbladder etc.	2.5%	2.3%	Overy
Others	17.3%	17.1%	Others

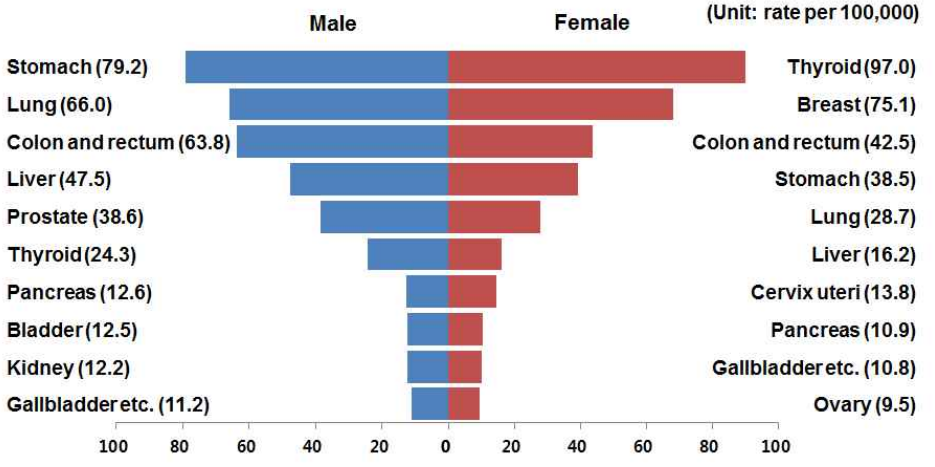
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Site-Specific Cancer Incidence Rates by Sex

In males, the crude incidence rate[1)] of stomach cancer was 79.2 per 100,000 individuals. The crude incidence rates for lung, colon and rectum, and liver cancers were 66.0, 63.8, and 47.5, respectively.

In females, the crude incidence rate of thyroid cancer was 97.0. The crude incidence rates for breast, colon and rectum, and stomach cancers were 75.1, 42.5, and 38.5, respectively.

Crude Rates of Ten Major Cancer Sites by Sex (2014)



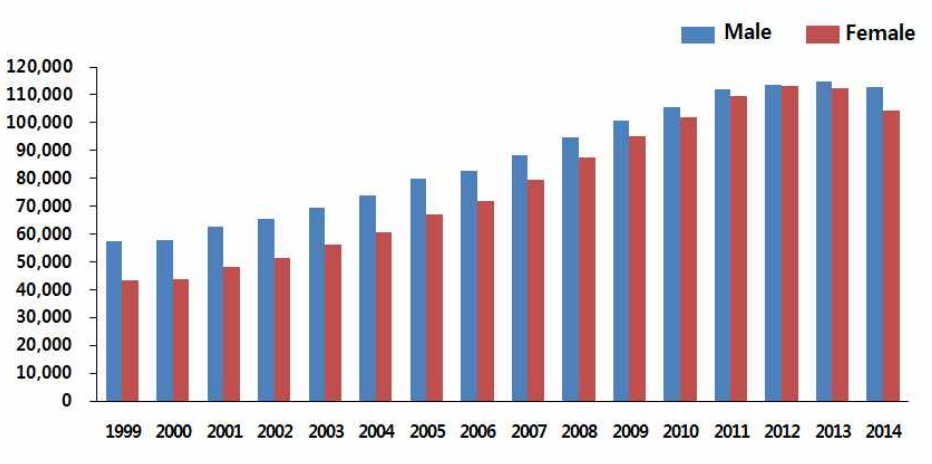
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

1) Crude incidence rate = Number of new cancer cases / Mid-year population × 100,000

The Number of Cancers

The number of cancers increased from 101,032 in 1999 to 217,057 in 2014 (112,882 males and 104,175 females)

The Number of Cancers (1999-2014)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

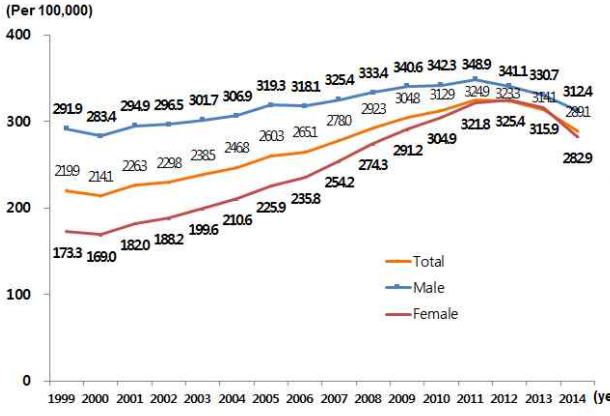
Trends in Age-Standardized Incidence Rates

From 1999 to 2012, age-standardized incidence rate for all cancers showed an annual increase of 3.6%, but decreased by 6.5% since 2012.

Since 2012, age-standardized incidence rate for all cancers began to decrease by 6.5% and reached 289.1 in 2014 (Male 312.4, Female 282.9)

Male incidences started to decline in 2011 and female incidences started to decline in 2012(Annual rate of change : Male -3.4%, Female

Trends in Age-Standardized Incidence Rates (1999-2014)



sex	Trend1		Trend2	
	Year	Annual rate of change (%)	Year	Annual rate of change (%)
Total	1999-2012	3.6*	2012-2014	-6.5*
M	1999-2011	1.8*	2011-2014	-3.4*
W	1999-2012	5.8*	2012-2014	-7.9*

* P < .05

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Trends in Age-Standardized Incidences Rates of Major Cancers

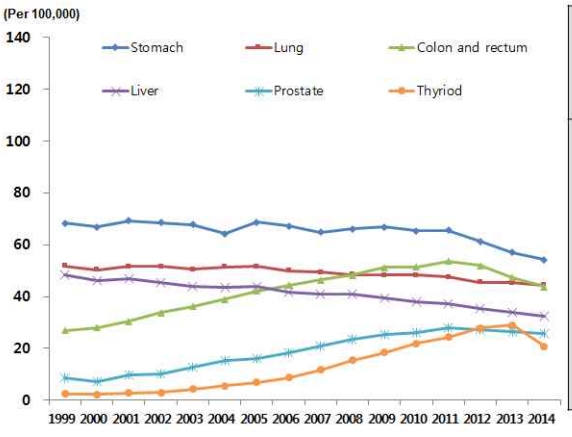
Including breast cancer, all cancers (stomach, colon and rectum, liver, cervix uterus) that are subjects of National Cancer Screening-have decreased in incidence.

Since 1999, the incidence of cervix and uterus cancer (Female -3.7%) began to decrease. Liver cancer (Male -3.9% Female -6.0%) has shown a declining trend 2009 and 2011, respectively. The incidences of stomach cancer (Male -6.3%, Female -5.4%) and colon and rectum cancer (Male -8.1%, Female -6.5%) began to decrease since 2011.

Breast cancer has shown an annual decreased in incidence since 2005 (Female 7.5% to 4.5%)

The lung cancer incidence among male began to decrease since 2005 (-1.5%), but lung cancer among female has increased 1.9% every year since 2011.

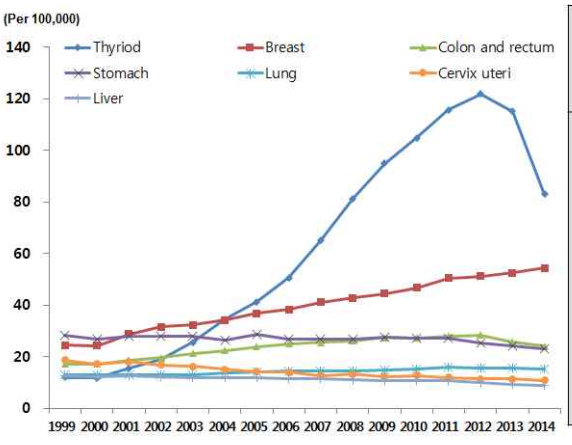
Trends in Age-Standardized Incidences Rates of Major Cancers: Male (1999-2014)



Cancer	Trend1		Trend2	
	Year	Annual rate of change (%)	Year	Annual rate of change (%)
Stomach	1999-2011	-0.4*	2011-2014	-6.3*
Lung	1999-2005	0.0	2005-2014	-1.5*
Colon and rectum	1999-2011	5.8*	2011-2014	-8.1*
Liver	1999-2009	-1.9*	2009-2014	-3.9*
Prostate	1999-2009	13.4*	2009-2014	-0.2
Thyroid	1999-2012	23.6*	2012-2014	-16.4*

* P < .05

Trends in Age-Standardized Incidences Rates of Major Cancers: Female (1999-2014)



Cancer	Trend1		Trend2	
	Year	Annual rate of change (%)	Year	Annual rate of change (%)
Thyroid	1999-2011	22.3*	2011-2014	-11.7*
Breast	1999-2005	7.5*	2005-2014	4.5*
Colon and rectum	1999-2011	4.5*	2011-2014	-6.5*
Stomach	1999-2011	-0.3	2011-2014	-5.4*
Lung	1999-2011	1.9*	2011-2014	-0.5
Cervix uteri	1999-2014	-3.7*		
Liver	1999-2011	-1.4*	2011-2014	-6.0*

* P < .05

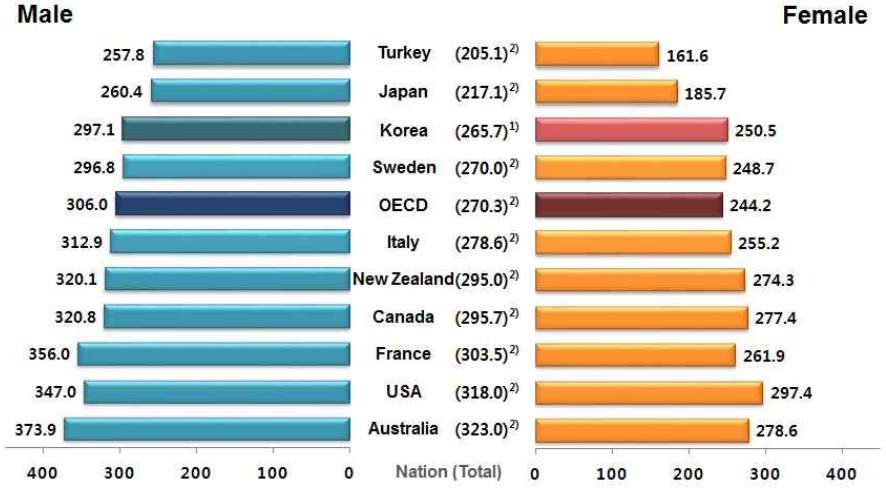
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Comparison of Age-Standardized Cancer Incidences Rates with Other Countries

The age-standardized cancer incidence in Korea adjusted for the world standard population was 265.7 per 100,000. The age-standardized cancer incidence in Korea is similar to the OECD (270.3 per 100,000).

International Comparison of Cancer Incidence Rates



Source 1) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016
2) GLOBOCAN 2012, IARC 2013

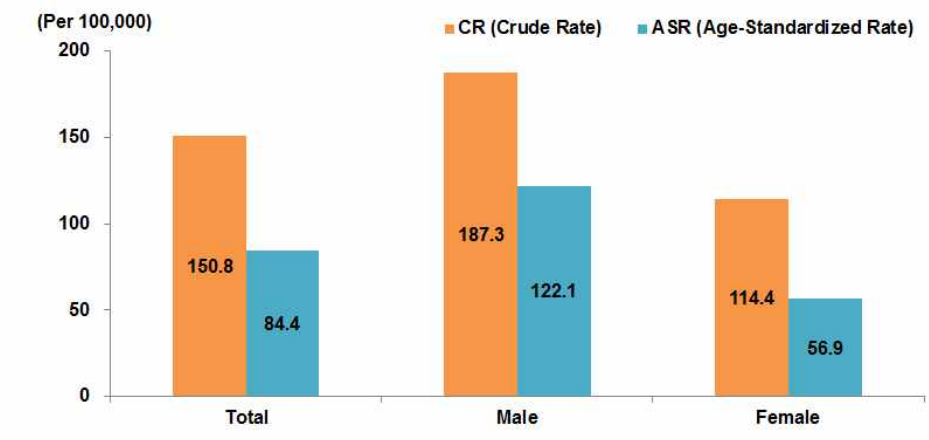
Note) Age-standardized incidence rates use the world standard population, and exclude all malignant neoplasms of the skin (C44)

2.2 Cancer Mortality

Cancer Mortality Rates

The age-standardized cancer mortality rates in Korea in 2015 were 122.1 per 100,000 males and 56.9 per 100,000 females.

Cancer Mortality Rates (2015)



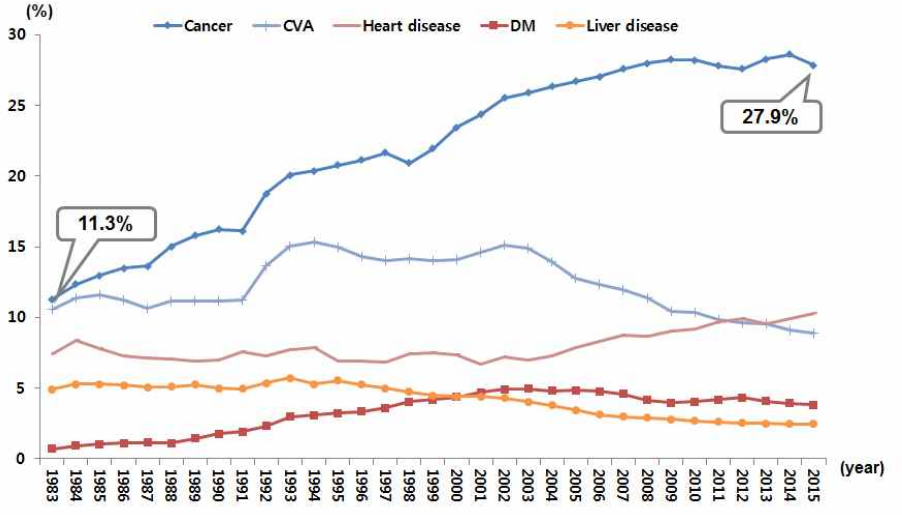
Source) STATISTICS KOREA, 2016

Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Causes of Death

Cancer has been the leading cause of death in Korea since 1983, accounting for 11.3% of the total number of deaths in 1983. Deaths from cancer have increased steadily to account for 27.9% of total deaths in 2015.

Causes of Disease Deaths (1983-2015)

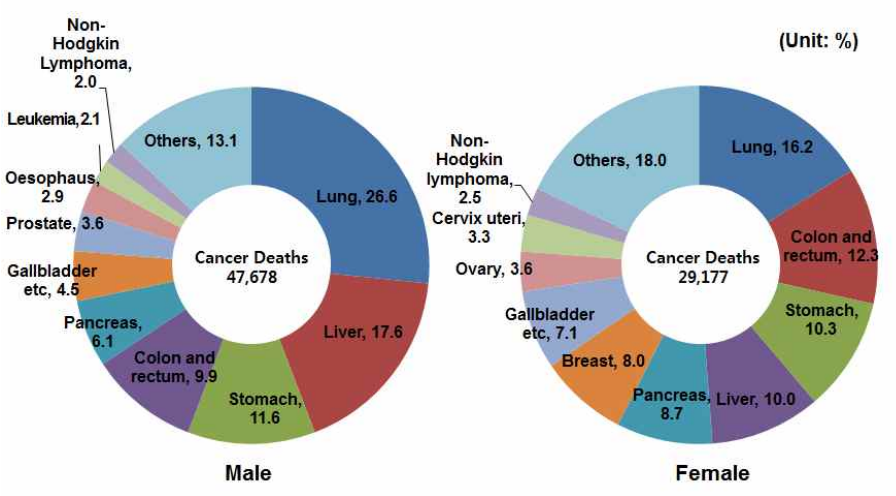


Source) STATISTICS KOREA, 2016

Proportion of Cancer Deaths

In 2015, lung, liver, stomach, and colon and rectum cancers accounted for 26.6%, 17.6%, 11.6%, and 9.9% of cancer deaths in males, respectively. For females, lung, colon and rectum, stomach, and liver cancers accounted for 16.2%, 12.3%, 10.3%, and 10.0%, respectively.

Proportion of Cancer Deaths (2015)

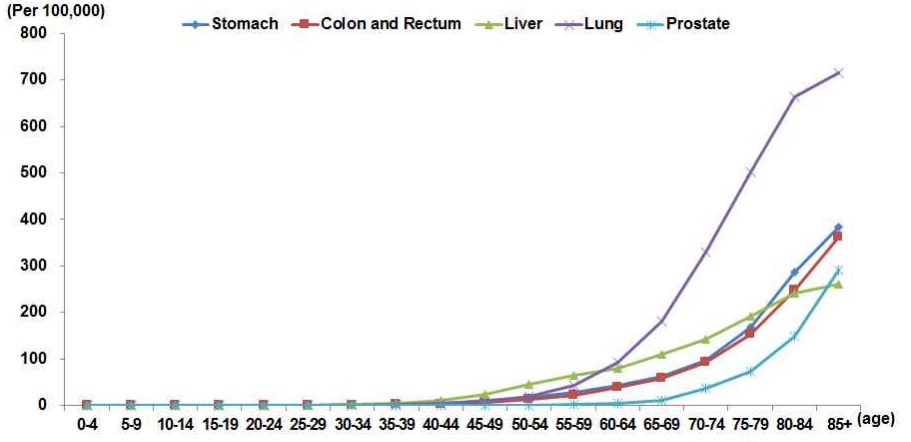


Source) STATISTICS KOREA, 2016

Age-Specific Mortality Rates of Major Cancers by Sex

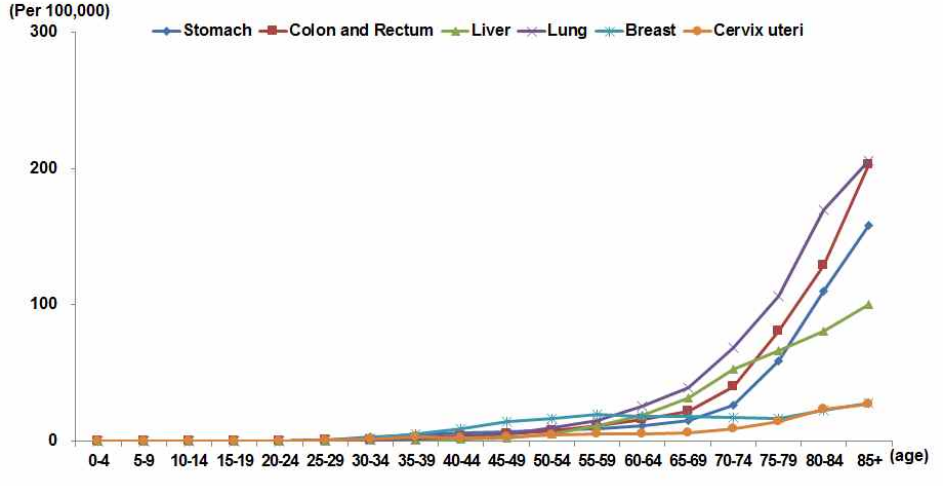
The age-specific mortality rates of major cancers in 2015 indicate that the rates are higher for older patients.

Age-Specific Cancer Mortality Rates: Male (2015)



Source) STATISTICS KOREA, 2016

Age-Specific Cancer Mortality Rates: Female (2015)



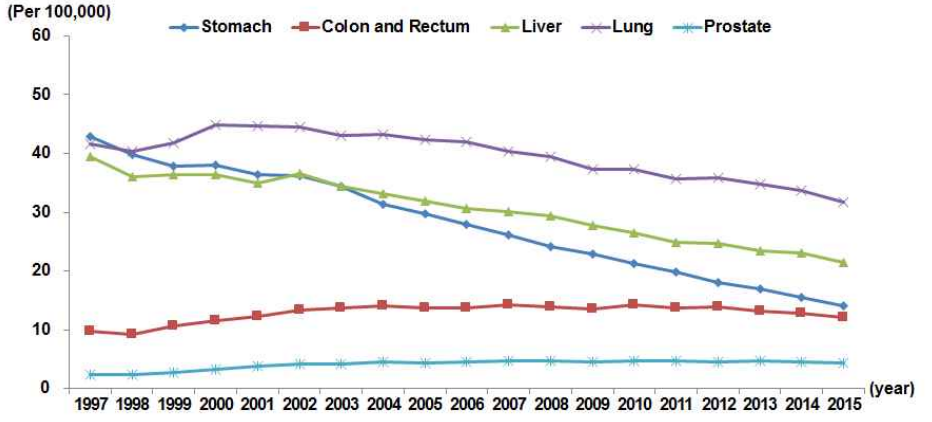
Source) STATISTICS KOREA, 2016

Age-Standardized Mortality Rates of Major Cancers by Sex

The age-standardized mortality rates of stomach and liver cancers have fallen in males. The mortality rate of lung cancer in males has been decreasing since 2000.

The mortality rate of stomach cancer in females has shown the largest decrease. The mortality rates of liver and lung colon and rectum cancers have also decreased. In contrast, the mortality rates of breast and cervical cancers have gradually increased.

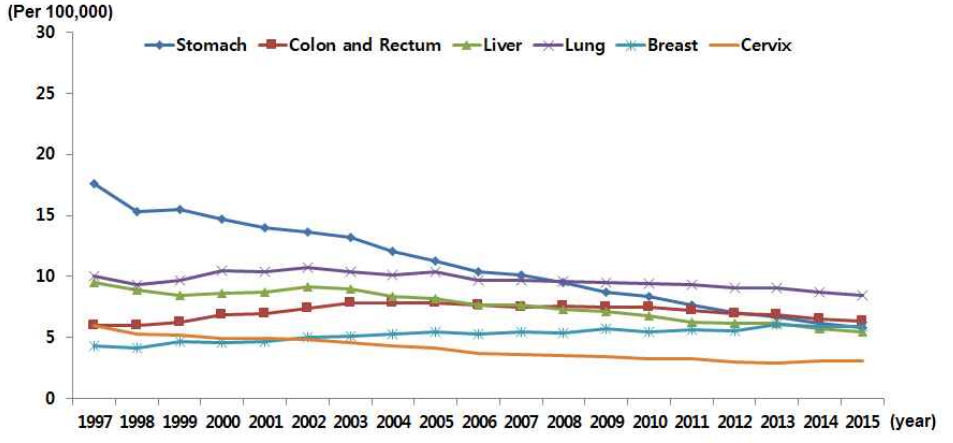
Age-Standardized Mortality Rates of Major Cancers: Male (1997-2015)



Source) STATISTICS KOREA, 2016

Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Age-Standardized Mortality Rates of Major Cancers: Female (1997-2015)



Source) STATISTICS KOREA, 2016

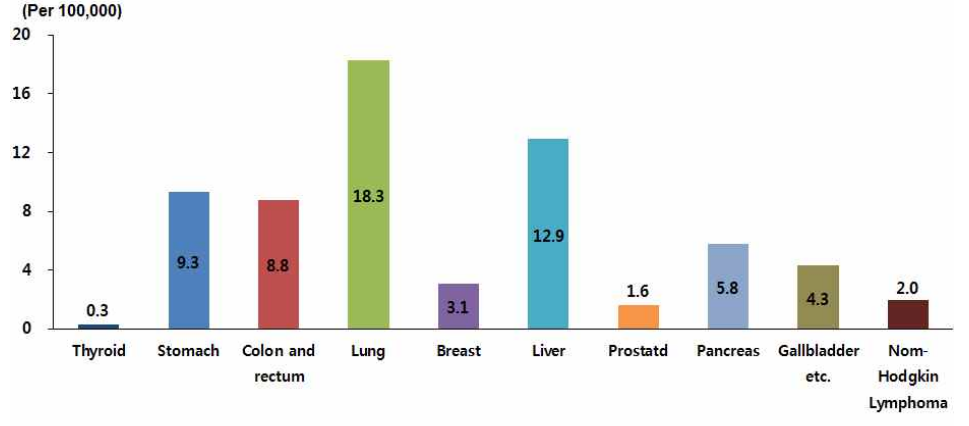
Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Cervical cancer: C53-55 (International Classification of Disease, ICD-10)

Comparison of Age-Standardized Mortality Rates for Ten Major Cancers

In 2015, lung, liver, and stomach cancers accounted for 18.3 per 100,000, 12.9 per 100,000, and 9.3 per 100,000 of cancer deaths, respectively.

Comparison of Age-Standardized Mortality Rate for Ten Major Cancers (2015)



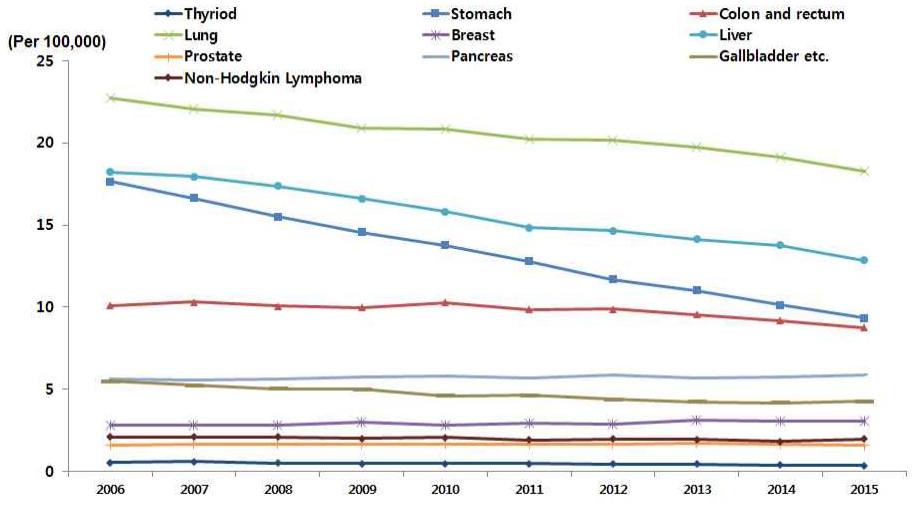
Source) STATISTICS KOREA, 2016

Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Trends of Age-Standardized Mortality Rates for Ten Major Cancers

The age-standardized mortality rate of stomach, lung, and liver cancers has shown the largest decrease. Trends for thyroid, breast, prostate, pancreas, and non-Hodgkin lymphoma cancers are similar. Colon and rectum and gallbladder cancers have shown a decrease in mortality.

Trends of Age-Standardized Mortality Rates for Ten Major Cancers (2006-2015)



Source) STATISTICS KOREA, 2016

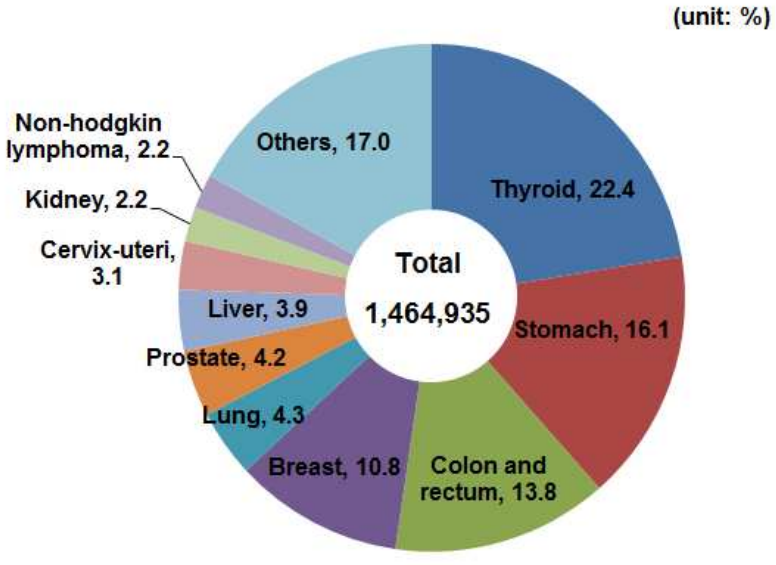
Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

2.3 Cancer Prevalence

Cancer Prevalence

Between 1999 and 2014, 1,464,935 patients were diagnosed with cancer in Korea. The thyroid was the most prevalent cancer site, followed by the stomach, colon and rectum, breast, lung and prostate.

Cancer Prevalence (2014)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

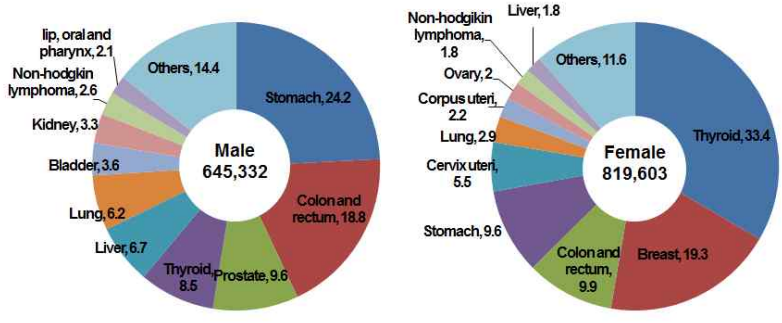
Cancer Prevalence by Sex

In male, stomach cancer was the most prevalent cancer site, followed by the colon and rectum, prostate, thyroid, liver and lung.

In Female, the thyroid was the most prevalent cancer site, followed by the breast, colon and rectum, stomach and cervix uteri.

Cancer Prevalence by Sex (2014)

(unit: %)

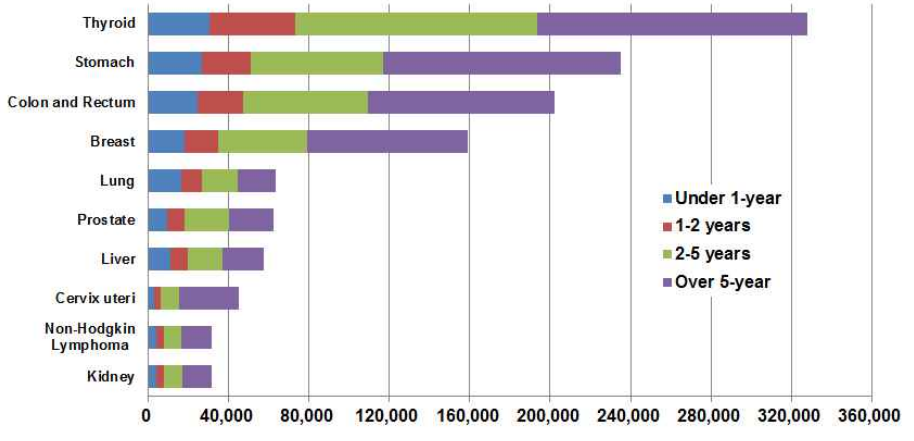


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Cancer Prevalence by Time Since Diagnosis

Among patients diagnosed with cancer between 1999 and 2014, thyroid cancer showed the highest prevalence in patients 5 years or longer after diagnosis, followed by thyroid, stomach, and colon and rectum cancers.

Cancer Prevalence by Time Since Diagnosis (2014)

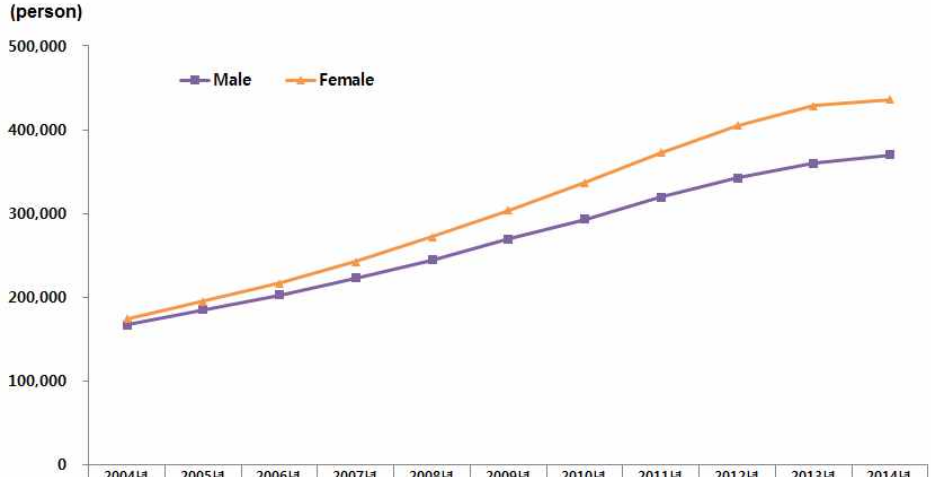


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Five-Year Cancer Survivors

The number of 5-year cancer survivors increased from 341,521 in 2004 to 806,780 in 2014 (370,268 males and 436,512 females).

Estimated Number of 5-Year Cancer Survivors (2004-2014)



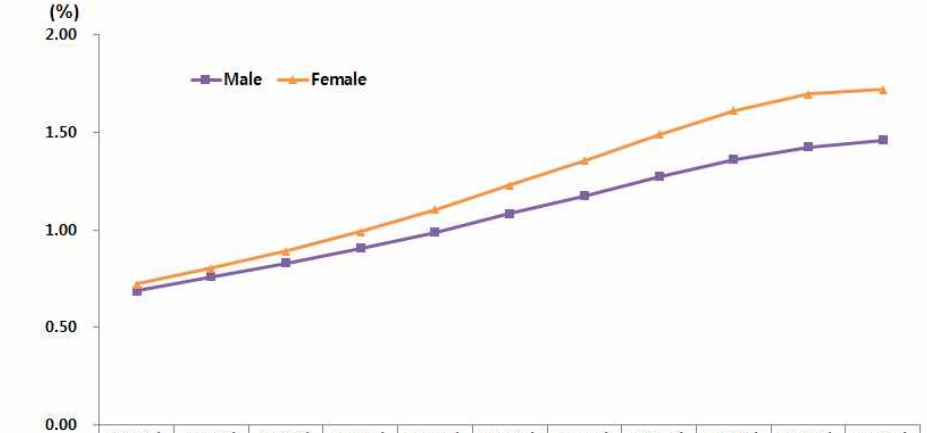
	2004년	2005년	2006년	2007년	2008년	2009년	2010년	2011년	2012년	2013년	2014년
Male	167122	185582	203176	223096	244713	269420	293250	319500	342401	360322	370268
Female	174399	195238	217231	242471	272073	304381	337192	372885	405447	428948	436512

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Percentage of Five-Year Cancer Survivors

The percentage of 5-year cancer survivors among the general population was 1.59% (1.46% of males and 1.72% of females) in 2014.

Percentage of 5-Year Cancer Survivors (2004-2014)



	2004년	2005년	2006년	2007년	2008년	2009년	2010년	2011년	2012년	2013년	2014년
Male	0.69	0.76	0.83	0.91	0.99	1.08	1.17	1.27	1.36	1.43	1.46
Female	0.72	0.80	0.89	0.99	1.10	1.23	1.35	1.49	1.61	1.70	1.72

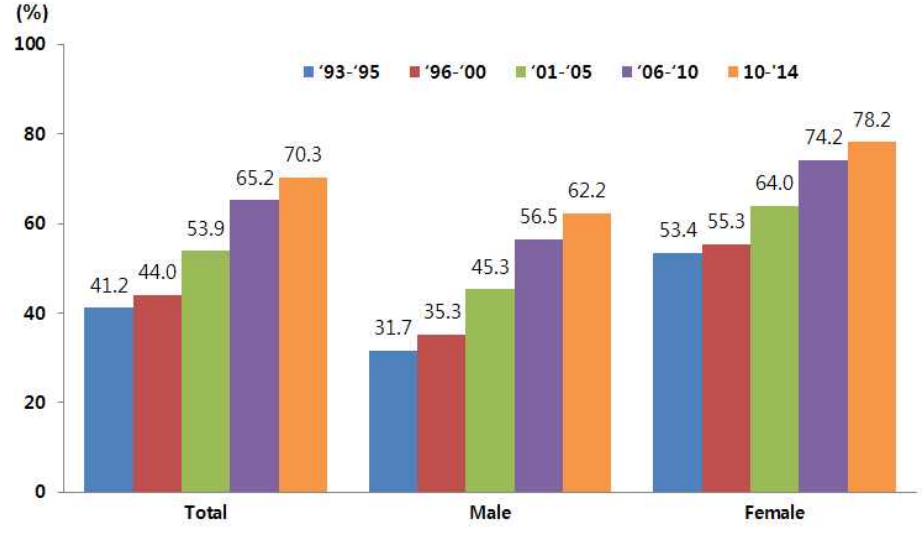
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

2.4 Cancer Survivors

Five-Year Relative Cancer Survival Rates

The 5-year relative cancer survival rate[2] from 2010 to 2014 was 70.3%, which is a 29.1%p and 16.4%p increase from 1993 and 1995 (41.2%) to 2001 and 2005 (53.9%), respectively. The survival rate has shown a steady improvement, and more than half of current patients with cancer in Korea have survived for 5 years or longer.

Five-Year Relative Cancer Survival Rates (1993-2014)



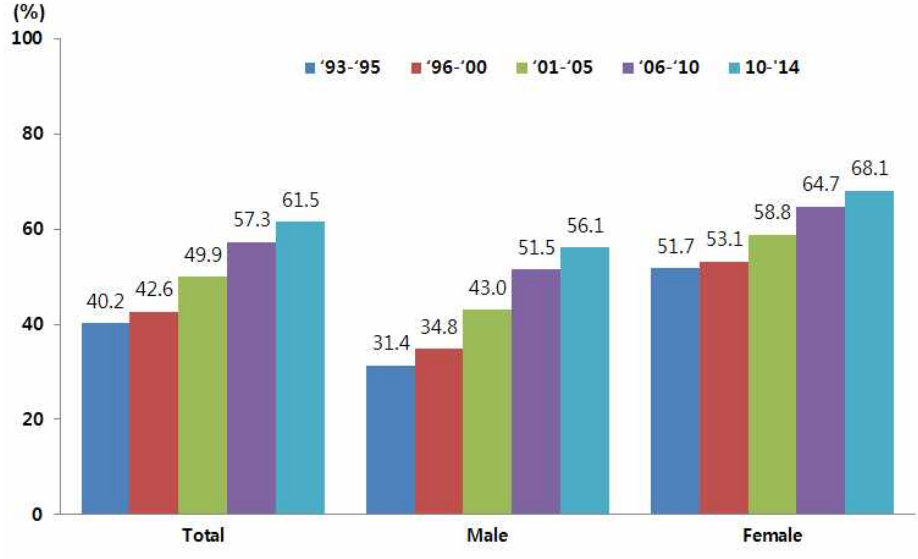
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

2) The relative survival rate is calculated by dividing the observed survival rates among patients with a disease by the expected survival rate among the general population of the same sex and age group. It excludes deaths from other causes.

Five-Year Relative Cancer Survival Rates (Except for Thyroid and Prostate Cancer)

Excluding thyroid and prostate cancers, the 5-year relative cancer survival rate[3] from 2010 to 2014 was 61.5%, which is a 21.3%p point and 11.6% point increase from 1993 to 1995 (40.2%) and 2001 to 2005 (49.9%), respectively. The survival rate has shown a continuous improvement, and more than half of current patients with cancer in Korea survive for five years or longer.

Five-Year Relative Cancer Survival Rates (Except for Thyroid and Prostate Cancer) (1993-2014)



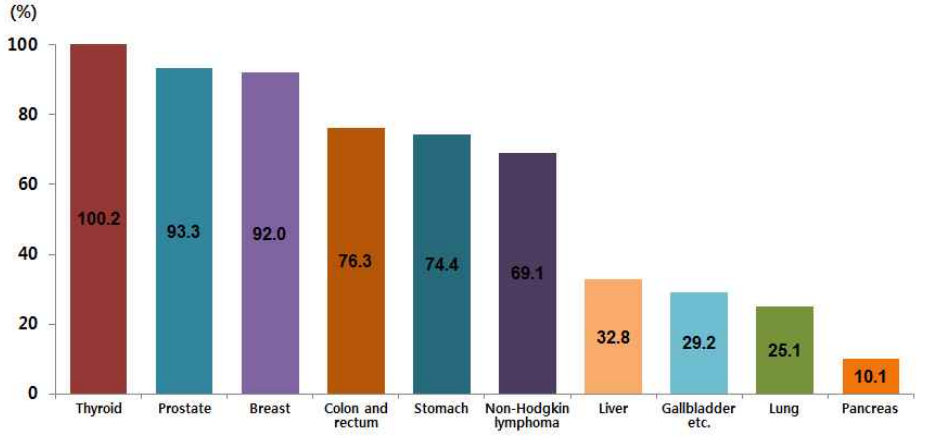
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

3) The relative survival rate is calculated by dividing the observed survival rates among patients with a disease by the expected survival rate among the general population of the same gender and age group. It excludes deaths from other causes.

Five-Year Relative Survival Rates According to Major Cancer Sites

The 5-year relative survival rates for thyroid, prostate, breast, colon and rectum, and stomach cancers were 100.2%, 93.3%, 92.0%, 76.3%, and 74.4%, respectively.

Five-Year Relative Survival Rated by Major Cancer Sites (2010-2014)

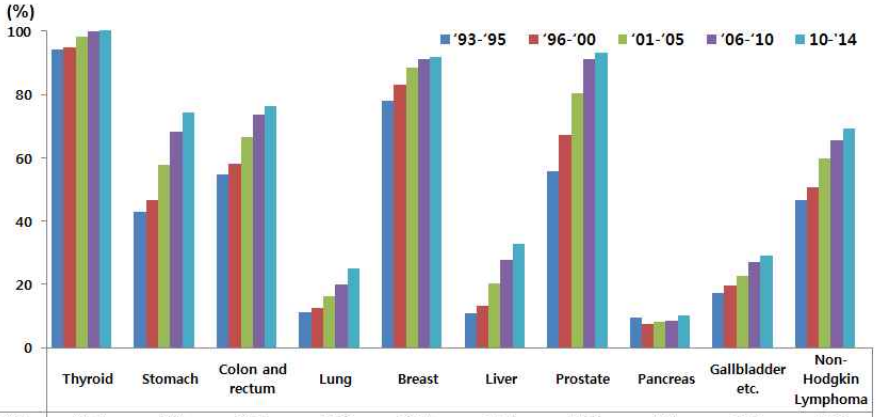


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Comparison of 5-Year Relative Survival Rates

Among major cancers, prostate cancer showed the most significant improvement from 2010 to 2014 (up by 37.4% from 1993 to 1995), followed by stomach cancer (31.6%p), non-Hodgkin lymphoma cancer (22.5%p), and liver cancer (22.1%p). The survival rates of all major cancers have been similar.

Comparison of 5-Year Relative Survival Rates (1993-2014)



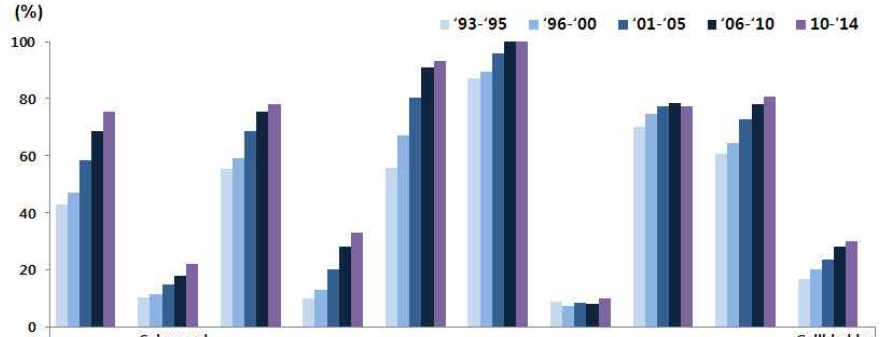
	Thyroid	Stomach	Colon and rectum	Lung	Breast	Liver	Prostate	Pancreas	Gallbladder etc.	Non-Hodgkin Lymphoma
'93-'95	94.2	42.8	54.8	11.3	77.9	10.7	55.9	9.4	17.3	46.6
'96-'00	94.9	46.6	58.0	12.7	83.2	13.2	67.2	7.6	19.7	50.8
'01-'05	98.3	57.7	66.6	16.2	88.5	20.2	80.3	8.2	22.8	59.9
'06-'10	99.9	68.1	73.5	20.1	91.1	27.9	91.1	8.4	27.1	65.6
10-'14	100.2	74.4	76.3	25.1	92.0	32.8	93.3	10.1	29.2	69.1
variance*	6.0	31.6	21.5	13.8	14.1	22.1	37.4	0.7	11.9	22.5

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Comparison of 5-Year Relative Survival Rates by Sex

The survival rates of thyroid cancer in male had highest level between 2010 and 2014, followed prostrate, kidney, colon and rectum cancers. The survival rates of thyroid cancer in females showed the highest level between 2010 and 2014, followed by breast, cervix uteri, and colon and rectum cancers.

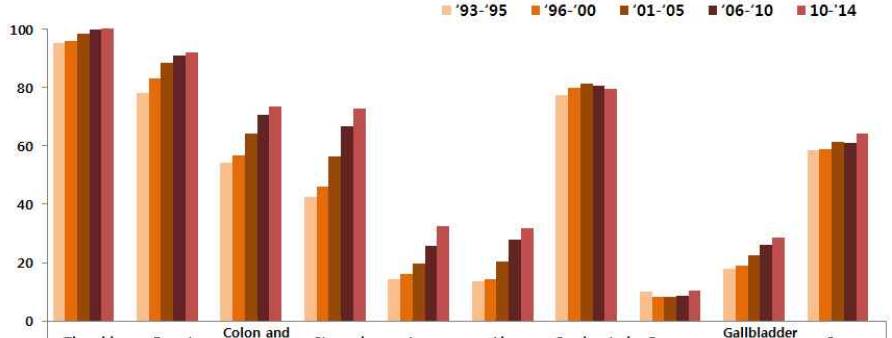
Comparison of 5-Year Relative Survival Rates: Male (1993-2014)



	Stomach	Colon and rectum	Lung	Liver	Prostate	Thyroid	Bladder	Kidney	Pancreas	Gallbladder etc.
'93-'95	43.0	10.4	55.3	9.9	55.9	87.2	8.8	70.0	60.8	16.6
'96-'00	46.9	11.6	59.0	12.9	67.2	89.5	7.3	74.8	64.4	20.3
'01-'05	58.4	15.0	68.5	20.2	80.3	95.8	8.2	77.4	72.8	23.4
'06-'10	68.8	17.8	75.4	27.9	91.1	100.0	8.1	78.5	78.1	28.2
10-'14	75.3	21.9	78.1	33.1	93.3	100.5	9.8	77.5	80.8	30.1
variance*	32.3	11.5	22.8	23.2	37.4	13.3	1.0	7.5	20.0	13.5

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Comparison of Five-year Relative Survival Rates: Female (1993-2014)



	Thyroid	Breast	Colon and rectum	Stomach	Lung	Liver	Cervix uteri	Pancreas	Gallbladder etc.	Ovary
'93-'95	95.4	78.0	54.2	42.6	14.2	13.6	77.5	10.1	18.0	58.7
'96-'00	95.9	83.2	56.8	46.0	16.2	14.2	80.0	8.1	19.1	58.9
'01-'05	98.7	88.5	64.2	56.4	19.7	20.5	81.3	8.2	22.4	61.5
'06-'10	99.9	91.1	70.8	66.8	25.8	27.8	80.5	8.6	26.0	60.9
10-'14	100.1	92.0	73.4	72.7	32.4	31.9	79.7	10.5	28.4	64.1
variance*	4.7	14	19.2	30.1	18.2	18.3	2.2	0.4	10.4	5.4

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Five-Year Relative Survival Rate by SEER Summary Stage

In the case of stomach (60.3%), breast (57.4%), and prostate (56.3%) cancers, more than half of current cancer cases are diagnosed early.

Localized prostate (100.9%), thyroid (100.6%), breast (98.1%), stomach (95.9%), colon and rectum (95.6%) cancers have a higher 5-year survival rate. However, localized liver (53.1%) and pancreas (32.5%) cancers have shown a lower 5-year survival rate.

Regionally localized lung (33.7%), gallbladder etc. (33.6%), liver (19.3%), and pancreas (14.5%) cancers have a lower 5-year survival rate. However, regionally localized thyroid (100.4%), prostate (97.4%), and breast (90.6%) cancers have shown a higher 5-year survival rate.

For distant cancers, thyroid cancers (71.6%) have a higher 5-year survival rate. Distant stomach (6.3%), lung (5.9%), liver (3.2%), gallbladder etc. (2.5%), and pancreas (1.7%) cancers have a relatively lower 5-year survival rate.

Five-Year Relative Survival Rates by SEER Summary Stage : Total (2010-2014)

(unit: %)

Rank	Site	Summary Stage							
		Localized		Regional		Distant		Unknown	
		%	5-year survival	%	5-year survival	%	5-year survival	%	5-year survival
	All Cancers	**44.1**	**89.6**	**31.0**	**73.7**	**16.5**	**20.5**	**8.4**	**53.7**
1	Thyroid	42.6	100.6	50.6	100.4	0.7	71.6	6.1	99.1
2	Stomach	60.3	95.9	23.0	60.1	11.2	6.3	5.5	41.9
3	Colon and rectum	38.1	95.6	41.2	81.2	14.9	19.3	5.8	60.0
4	Lung	20.0	61.2	26.6	33.7	44.5	5.9	8.8	17.2
5	Breast	57.4	98.1	34.6	90.6	4.8	37.3	3.3	83.6
6	Liver	46.0	53.1	24.7	19.3	15.9	3.2	13.4	24.1
7	Prostate	56.3	100.9	22.3	97.4	9.1	42.1	12.3	86.8
8	Pancreas	11.0	32.5	31.9	14.5	45.6	1.7	11.5	10.8
9	Gallbladder etc.	24.6	52.9	40.6	33.6	23.9	2.5	10.9	19.4
10	Non-Hodgkin lymphoma	39.5	81.7	14.1	69.6	33.6	53.9	12.8	69.2

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

Five-Year Relative Survival Rates by SEER Summary Stage : Male (2010-2014)

(unit: %)

Rank	Site	Summary Stage							
		Localized		Regional		Distant		Unknown	
		%	5-year survival	%	5-year survival	%	5-year survival	%	5-year survival
	All Cancers	**42.8**	**86.2**	**28.2**	**61.9**	**19.9**	**17.5**	**9.0**	**47.8**
1	Stomach	61.0	96.6	22.8	60.0	11.2	6.7	5.0	44.2
2	Lung	18.5	54.7	28.4	30.6	44.5	4.8	8.6	14.0
3	Colon and rectum	39.7	96.8	40.5	82.1	14.3	19.7	5.5	65.9
4	Liver	46.0	53.7	25.4	19.5	15.7	3.0	12.8	24.3
5	Prostate	56.3	100.9	22.3	97.4	9.1	42.1	12.3	86.8
6	Thyroid	36.2	101.6	56.4	100.6	1.0	65.6	6.4	98.9
7	Pancreas	9.8	32.4	31.4	14.8	48.5	1.7	10.3	11.8
8	Bladder	73.6	86.3	11.9	52.1	4.3	17.1	10.3	71.8
9	Kidney	70.0	96.3	11.7	72.8	13.4	13.7	4.9	62.4
10	Gallbladder etc.	24.3	53.5	43.3	34.0	22.1	2.0	10.2	20.5

Five-Year Relative Survival Rates by SEER Summary Stage : Female (2010-2014)

(unit: %)

Rank	Site	Summary Stage							
		Localized		Regional		Distant		Unknown	
		%	5-year survival	%	5-year survival	%	5-year survival	%	5-year survival
	All Cancers	**45.4**	**92.7**	**33.7**	**83.4**	**13.1**	**25.0**	**7.7**	**60.4**
1	Thyroid	44.0	100.5	49.3	100.3	0.6	73.9	6.1	99.1
2	Breast	57.4	98.1	34.5	90.6	4.7	37.4	3.3	83.7
3	Colon and rectum	35.8	93.5	42.2	79.9	15.7	18.8	6.3	52.0
4	Stomach	58.9	94.6	23.3	60.2	11.2	5.4	6.6	38.2
5	Lung	23.8	72.9	22.3	43.1	44.6	8.5	9.4	23.9
6	Liver	45.8	51.3	22.6	18.5	16.3	3.8	15.3	23.7
7	Cervix uteri	57.8	92.5	27.7	72.4	8.1	23.6	6.4	66.1
8	Pancreas	12.3	32.5	32.4	14.1	42.3	1.8	13.0	9.7
9	Gallbladder etc.	24.8	52.3	37.8	33.2	25.8	3.0	11.6	18.4
10	Ovary	29.5	92.0	17.7	78.3	45.9	42.4	6.9	53.9

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2016

International Comparison of 5-Year Relative Survival Rates of Major Cancers

Five-year relative survival rates of cancers subjected to National Cancer Screening, namely the stomach, colon and rectum, liver, breast, and cervix uteri, were 74.4%, 76.3%, 32.8%, 92.0%, and 79.7%, respectively. Five-year relative survival rates in Korea were higher than in the United States.

International Comparison of 5-Year Relative Survival Rates of Major Cancers

(unit: %)

Site	Korea ('96-'00)	Korea ('01-'05)	Korea ('10-'14)	USA[1] ('06-'12)	Canada[2] ('06-'08)	Japan[3] ('06-'08)
All cancers	44.0	53.9	**70.3**	69.0	60	62.1
Thyroid	94.9	98.3	**100.2**	98.3	98	93.7
Stomach	46.6	57.7	**74.4**	31.1	25	64.6
Colon and rectum	58.0	66.6	**76.3**	66.2	64	71.1
Lung	12.7	16.2	**25.1**	18.7	17	31.9
Breast	83.2	88.5	**92.0**	90.8	87	91.1
Liver	13.2	20.2	**32.8**	18.1	19	32.6
Prostate	67.2	80.3	**93.3**	99.3	95	97.5
Pancreas	7.6	8.2	**10.1**	8.5	8	7.7
Cervix uteri	80.0	81.3	**79.7**	68.8	73	73.4

Source)

1) Howlader N, et al. SEER Cancer Statistics Review, 1975-2013, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2013/, based on November 2015 SEER data submission, posted to the SEER web site, April 2016
2) Canadian Cancer Society, Statistics Canada and Provincial/Territorial Cancer Registry. Canadian Cancer Statistics 2016
3) Center for Cancer Control and Information Services, National Cancer Center,Monitoring of Cancer Incidence in Japan - Survival 2006-2008 report 2016

Chapter 3.
Cancer Prevention

3.1 Attributable risk

Causes of Cancer

Globally, tobacco use is an important risk factor for cancer, causing over 32% of cancer deaths, followed by inappropriate diet pattern, which causes 30% of cancer deaths. Chronic infection is also an important risk factor, causing over 10-20% of cancer deaths. In Korea, however, the most important risk factor for cancer is chronic infection, which contributes in 21.2% of cancer diagnoses and 24.7% of cancer deaths. Tobacco use in Korea causes 11.9% of cancer diagnoses and 22.7% of cancer deaths.

Causes of Cancer

Risk factors	World (%, 2000)*	Republic of Korea**(2009)	
		Incidence(%)	Death(%)
Tobacco use	32	11.9	22.7
Chronic infection	10~20	21.2	24.7
Diet	30	-	-
Occupational exposure	5	1.1	1.7
Genetic factor	5	-	-
Alcohol drinking	3	Male 3.0, Female 0.5	Male 2.8, Female 0.1
Reproductive factors	5	-	-
Exposure to environmental carcinogen	3	-	-
Radiation exposure	3	-	-
Obesity	-	Male 1.5, Female 2.2	-
Lack of physical activity	-	Male 0.1, Female 1.4	-

Source) * World Cancer Report, IARC, 2008

** Park S, et al. Attributable fraction of tobacco smoking on cancer using population-based nationwide cancer incidence and mortality data in Korea. BMC Cancer. 2014 Jun 6;14:406.

*** Shin A, et al. Population attributable fraction of infection-related cancers in Korea. Ann Oncol. 2011 Jun;22(6):1435-42.

**** Park S, et al, Attributable fraction of alcohol consumption on cancer using population-based nationwide cancer incidence and mortality data in the Republic of Korea. BMC Cancer. 2014 Jun 10;14:420.

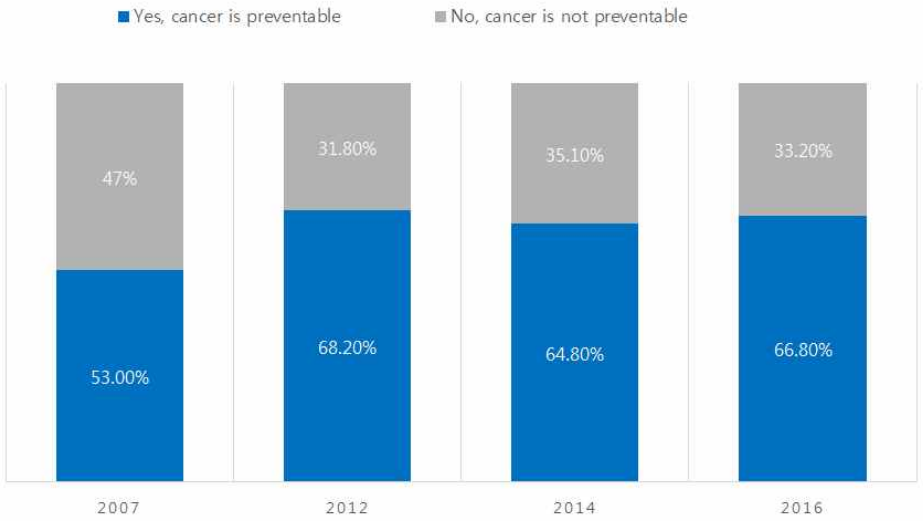
***** Park S, et al. Population-attributable causes of cancer in Korea: obesity and physical inactivity. PLoS One. 2014 Apr 10;9(4):e90871.

3.2 Awareness of Cancer Prevention

Trends for Awareness of Cancer Prevention

According to a survey conducted on the awareness of cancer prevention among 1,200 male and female adults 19 years or older in 2016 year, 66.8% answered that cancer is possible to be prevented.

Awareness of Cancer Prevention (2007, 2012, 2014, 2016)



Source) National Cancer Center. The Survey on Awareness for Cancer Prevention, 2007, 2012, 2014, 2016

Awareness of the Ten Codes for Cancer Prevention (2016)

Don't smoke and avoid smoke-filled environments

Consume sufficient amounts of fruits and vegetables and balance your diet with a wide range of healthy foods

Limit your salt intake from all sources, and avoid burnt or charred foods

Don't drink alcoholic beverage even lesser than one or two drink per day for cancer prevention

Engage in at least 30 minutes of regular, moderate physical activity on most days of the week

Maintain your body weight within a healthy range

Ensure vaccination against HBV and HPV following the vaccination schedule

Engage in safe sexual behavior to avoid sexually transmitted diseases

Follow all health and safety instructions at work places aimed at preventing exposure to known cancer-causing agents

Undergo routine check-ups following the cancer screening programs

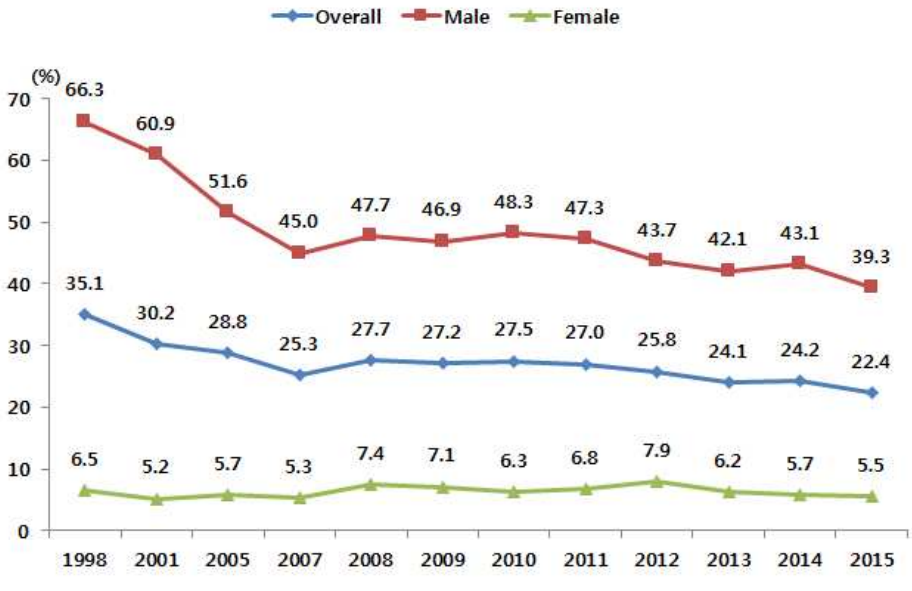
Source) National Cancer Center. The Survey on Awareness and Behavior for Cancer Prevention, 2016

3.3 Smoking

Prevalence and Trends in Cigarette Smoking among Adults

From 1998 to 2015, smoking prevalence in Korea decreased from 66.3% to 39.3% in male. However, the rate of decline has slowed in recent years. Smoking prevalence among female has maintained a low level below 10% since 1998.

Prevalence and Trends in Cigarette Smoking

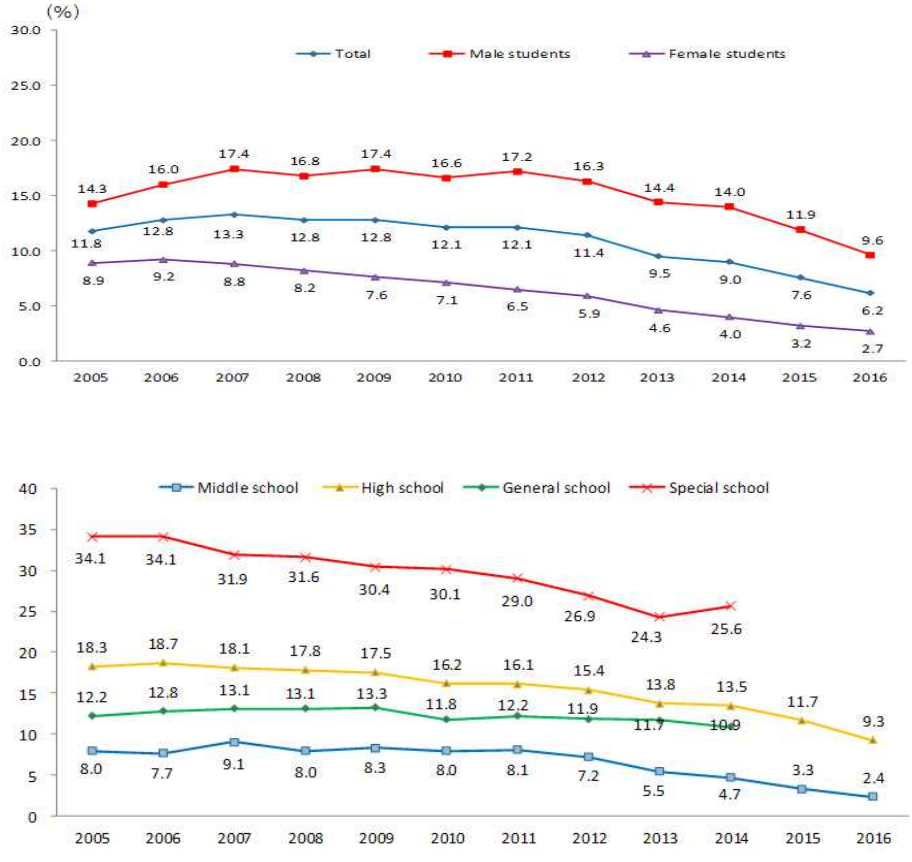


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

Adolescent Smoking

In 2016, 6.2% of Korean adolescents said that they have smoked on one or more days in the previous 30 days, and 9.3% of high school students had the highest smoking rate compared to 2.4% of middle school students. Both of male and female have shown a steady decline in smoking rates over time.

Trend of Adolescent Smoking



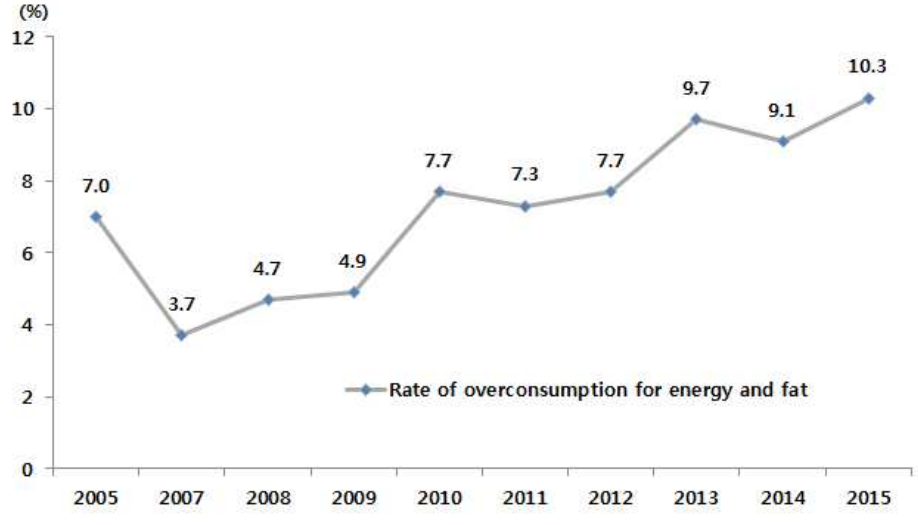
Source) Korea Youth Risk Behavior Web-based Survey, 2016

3.4 Overconsumption of Energy and Fat

Trend of Overconsumption of Energy and Fat

The percentage of people in the population overconsuming energy and fat in 2007 was 3.7%. However, its percentage steadily increased to 9.7% in 2013, and then slightly increased to 10.3% in 2015.

Overconsumption Trend for Energy and Fat



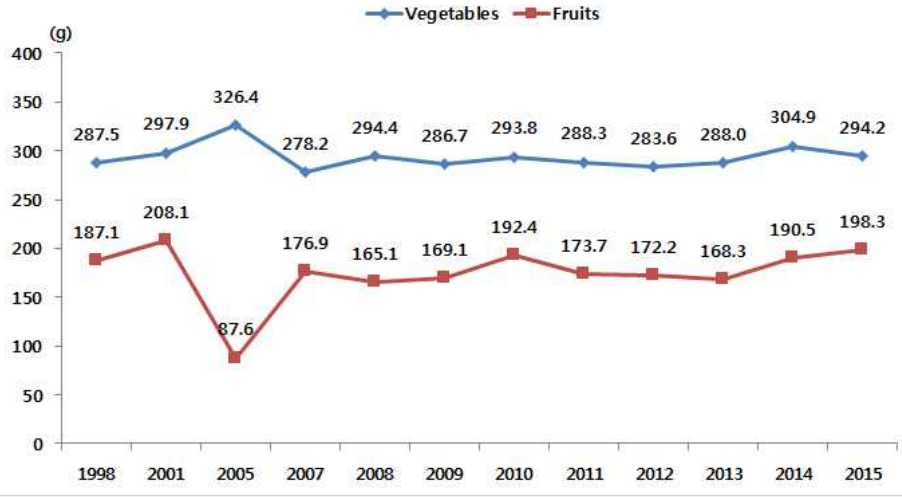
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

3.5 Consumption of Fruits and Vegetables

Intake of Fruits and Vegetables

The average daily consumption of fruits and vegetables among adults in 2015 was 198.3 g and 294.2 g, respectively.

Average Intake of Fruits and Vegetables among Adults (1998-2015)

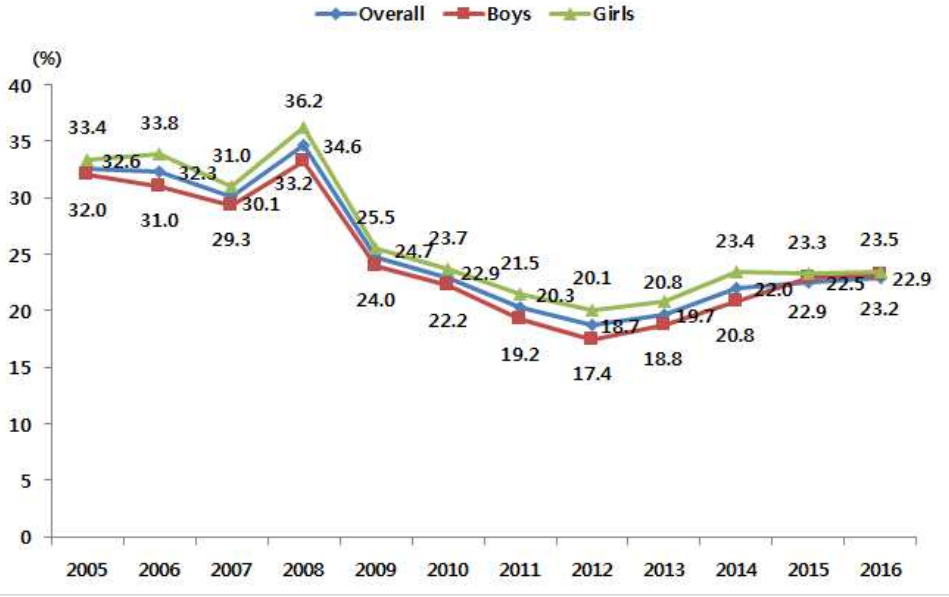


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

Percentage of Adolescents Who Consume at least One Serving of Fruit Each Day

In 2016, 23.2% of adolescents consumed at least one serving of fruit per day (22.9% of males and 23.5% of females).

Percentage of Adolescents Who Consume at Least One Serving of Fruit Each Day (2005-2016)



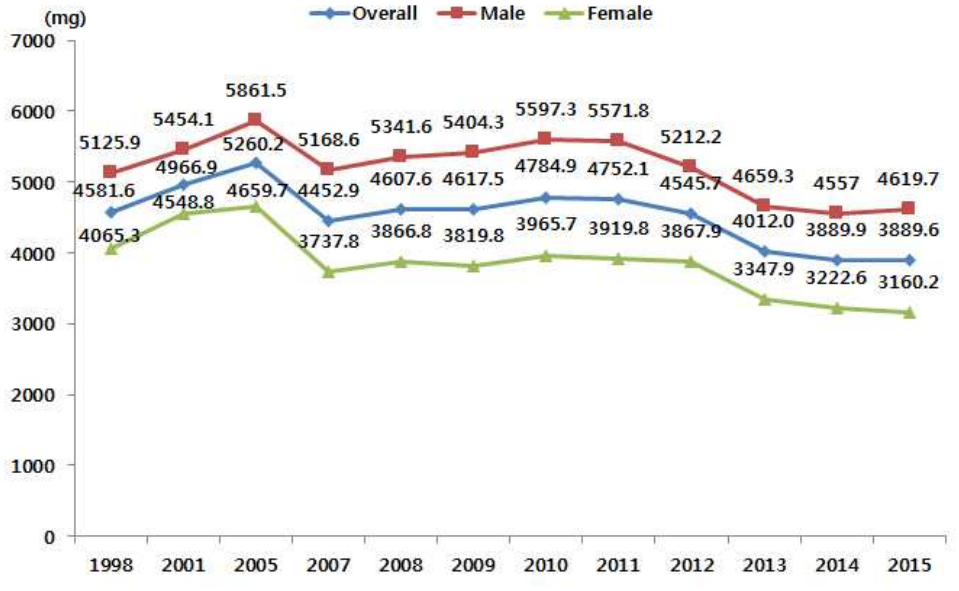
Source) Korea Youth Risk Behavior Web-based Survey, 2016

3.6 Sodium Intake

Sodium Intake among Adults

For the past 10 years, Koreans have consumed excessive amounts of sodium, males more so than females.

Trend of Daily Sodium Intake among Adults (1998-2015)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

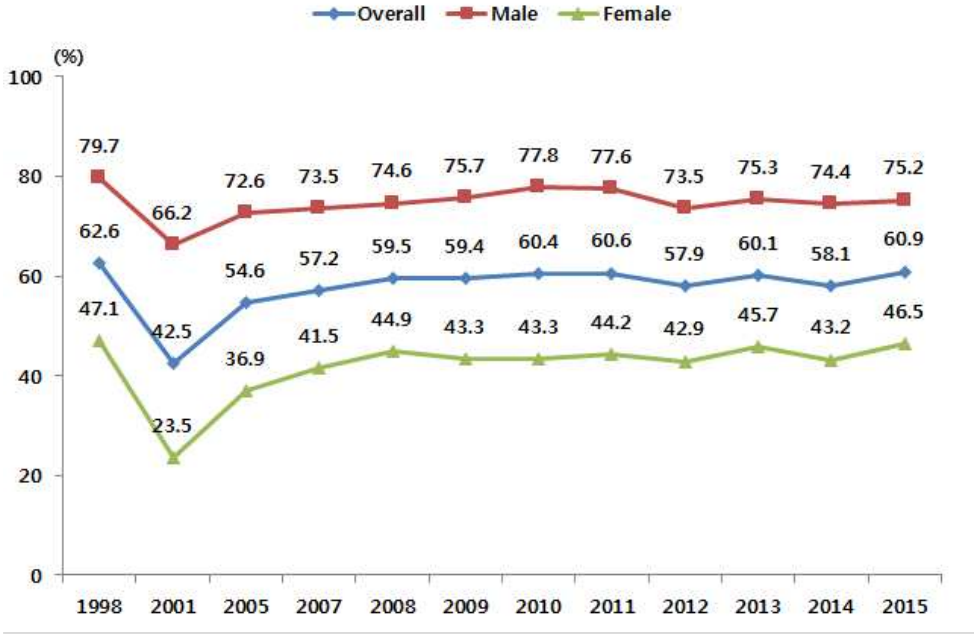
Note) Daily sodium intake targets: 2,000mg (suggested by Korean Nutrition Society, 2005)

3.7 Alcohol Consumption

Prevalence of Alcohol Consumption among Adults[4)]

The percentage of adults who consume one or more glasses of alcohol every month has not decreased over the past 6 years.

Prevalence of Alcohol Consumption among Adults (1998-2015)



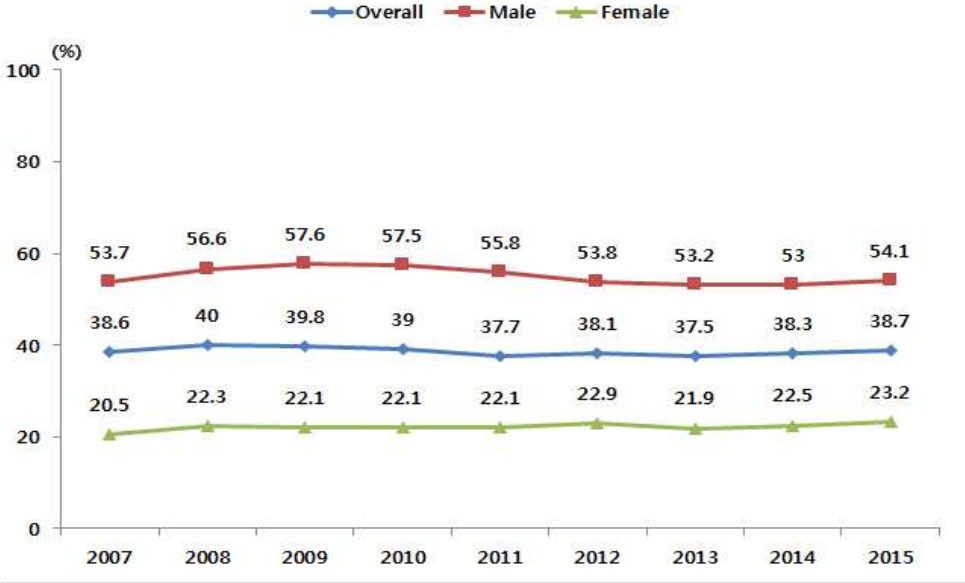
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

4) Prevalence of alcohol consumption among adults: percentage of adults (19 and older) who have consumed one or more glasses of alcohol every month over the past year.

Prevalence of Binge Alcohol Consumption among Adults[5)]

The percentage of adults who consume seven or more glasses of alcohol every month among male and female has not decreased over the past 6 years.

Prevalence of Binge Alcohol Consumption among Adults (2007-2015)



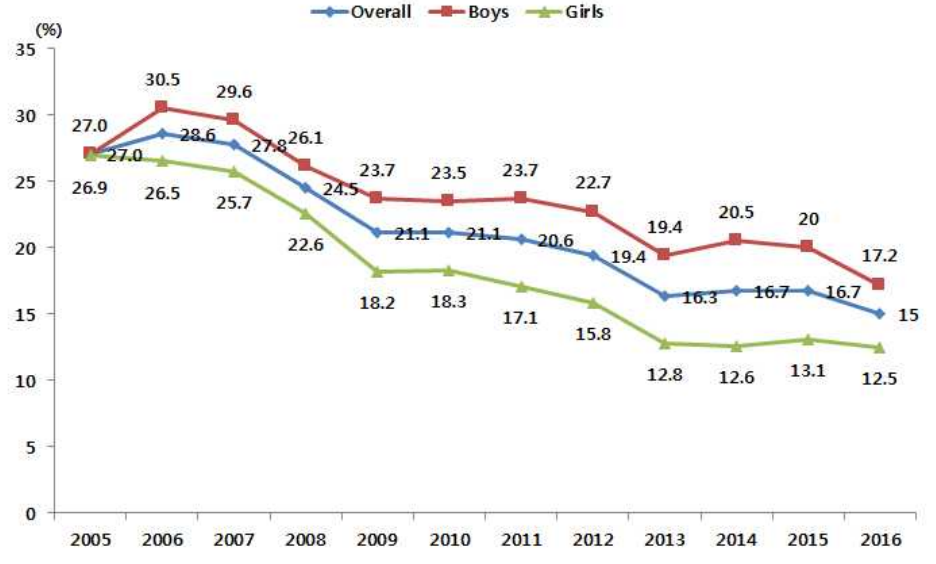
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

5) Prevalence of alcohol consumption among adults: percentage of adults (19 and older) who have consumed seven or more glasses of alcohol for male (female has consumed five or more) every month over the past year.

Alcohol Consumption among Adolescents

The percentage of Korean adolescents who consumed alcohol in 2016 was 15.0% (17.2% for boys and 12.5% for girls).

Alcohol Consumption among Adolescents (2005-2016)



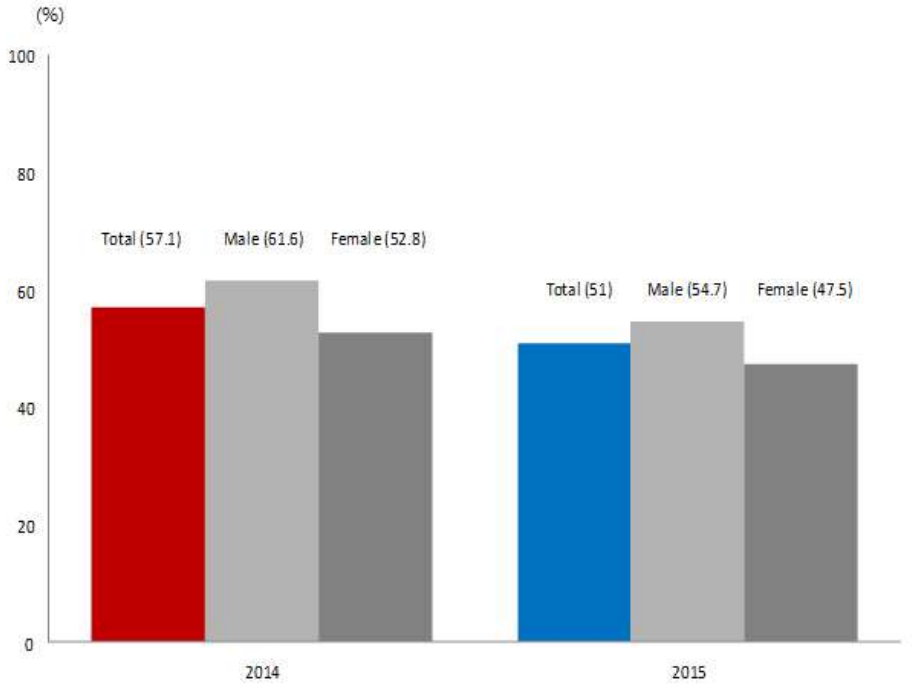
Source) Korea Youth Risk Behavior Web-based Survey, 2016

3.8 Physical Activity

Percentage of Individuals Engaging in Aerobic Physical Activity

The percentage of individuals engaging in aerobic physical activity was measured in 2014. The percentage of adults (19 and older) engaging in aerobic physical activity was 57.1% (61.6% for male and 52.8% for female).

Aerobic Physical Activity in adult population (2014, 2015)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

Note)

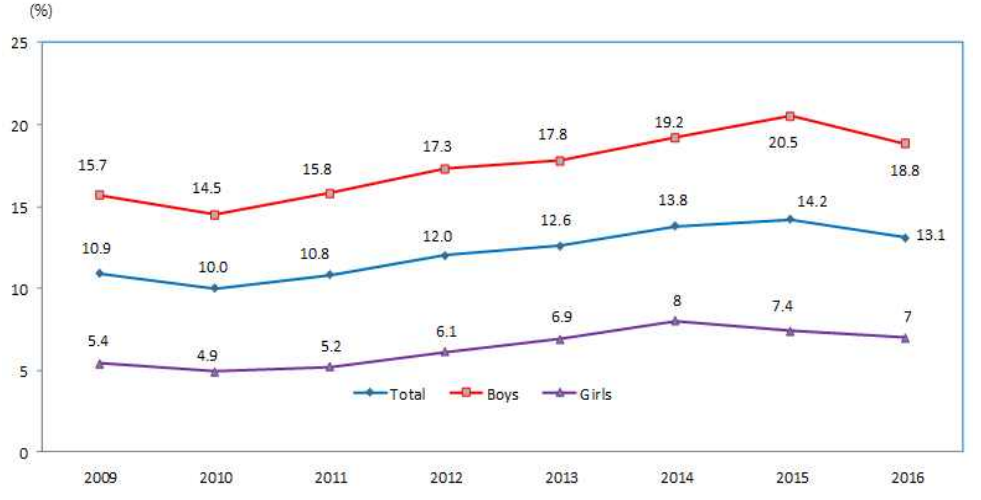
1) Aerobic physical activity: Percentage of individuals engaging in moderate-intensity physical activity over 2 hours and 30 minutes or in high-intensity physical activity over 1 hours and 15 minutes or a mixture of moderate-intensity (1 minute) and high-intensity physical activity (2 minutes).

2) Age-standardized rates were calculated based on the 2005 Korean population

Percentage of Adolescents Engaging in Physical Activity for at Least 60 minutes a Day, 5 days a week

In 2016, the percentage of adolescents engaging in physical activity for at least 60 minutes a day, 5 days a week was 13.1% (18.8% of boys and 7.0% of girls).

Percentage of Adolescents Engaging in Physical Activity for at Least 60 Minutes a Day, 5 days a Week



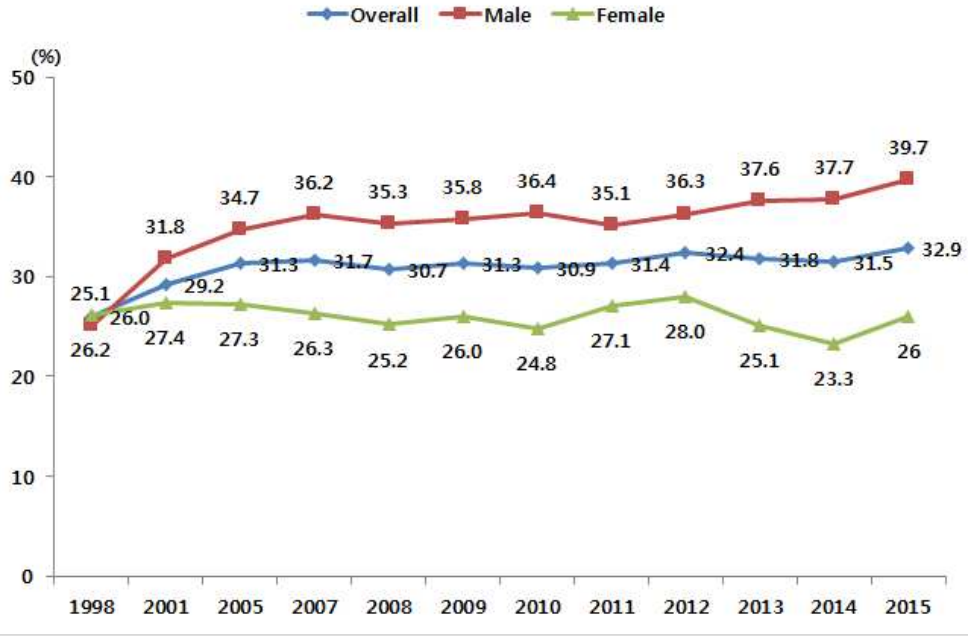
Source) Korea Youth Risk Behavior Web-based Survey, 2016

3.9 Obesity

Obesity Trends among Adults

Obesity among adults (19 and older, standardized) increased from 26.0% in 1998 to 31.7% in 2007. However, the rate has stayed at around 30% for the past 5 years. The male obesity rate has shown a gradual increase in the past 10 years, and the female obesity rate has also increased in 2015 to 26%.

Trend of Obesity Rate among Adults (1998-2015)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

Note)

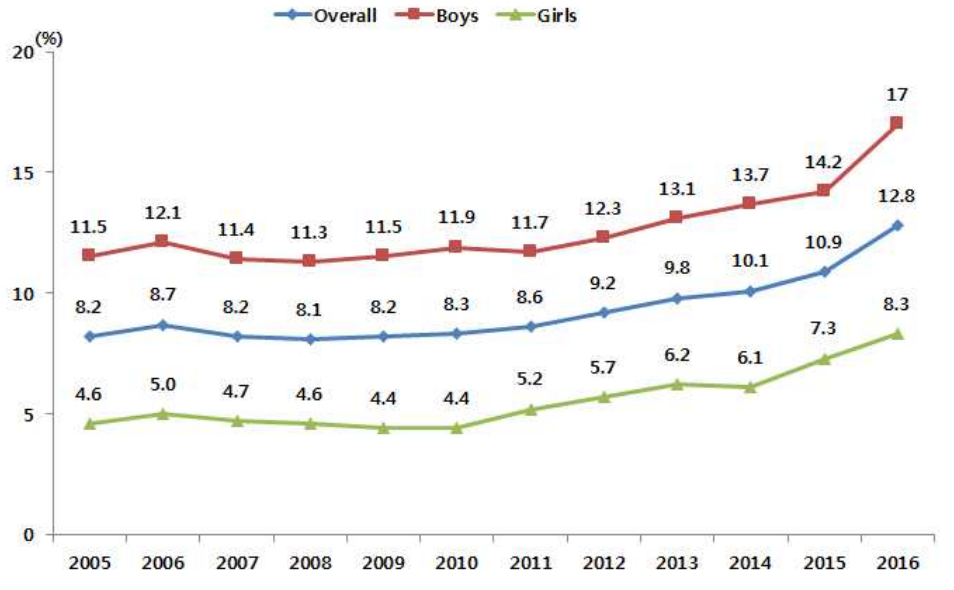
1) The age-standardized rates were calculated based on the 2005 Korean population.

2) Obesity: body mass index(BMI)≥25

Obesity Trend among Adolescents[6)]

The obesity rate among adolescents was 12.8% in 2016 (17.0% of boys and 8.3% of girls).

Obesity Trend among Adolescents (2005-2016)



Source) Korea Youth Risk Behavior Web-based Survey, 2016

Note) Obesity: body mass index(BMI)≥25, or more than 95 percentile of BMI distribution

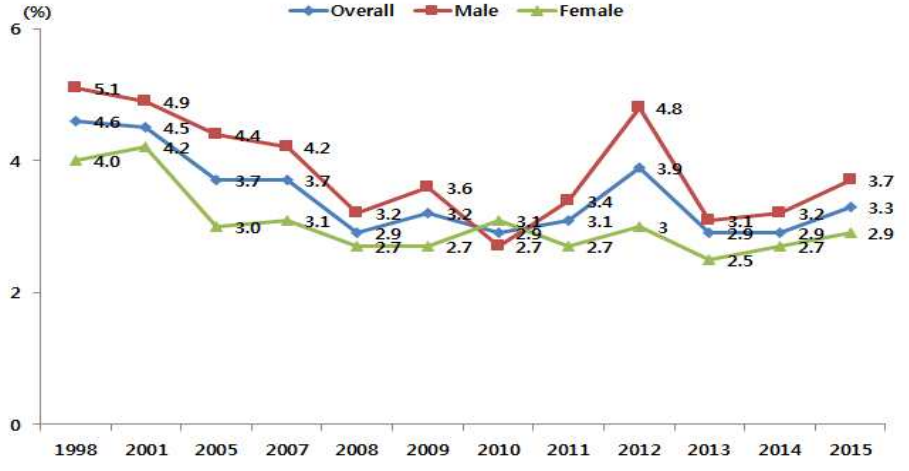
6) Adolescent obesity rate: percentage of adolescents (13 to 18 years old) whose body mass index (BMI) was more than 95% of the BMI distribution or ≥25

3.10 Infection

HBsAg Seropositivity

A Hepatitis B virus infection is one of the major risk factors of liver cancer. HBsAg seropositivity[7], which indicates a Hepatitis B virus infection (in individuals 10 years and older, standardized), was high at 7-8% of the population in the 1970s and 1980s. Since the Hepatitis B vaccine was included in the national immunization program in 1995, HBsAg seropositivity has steadily decreased from 4.6% in 1998 to 3.3% in 2015.

HBsAg Seropositivity (1998-2015)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

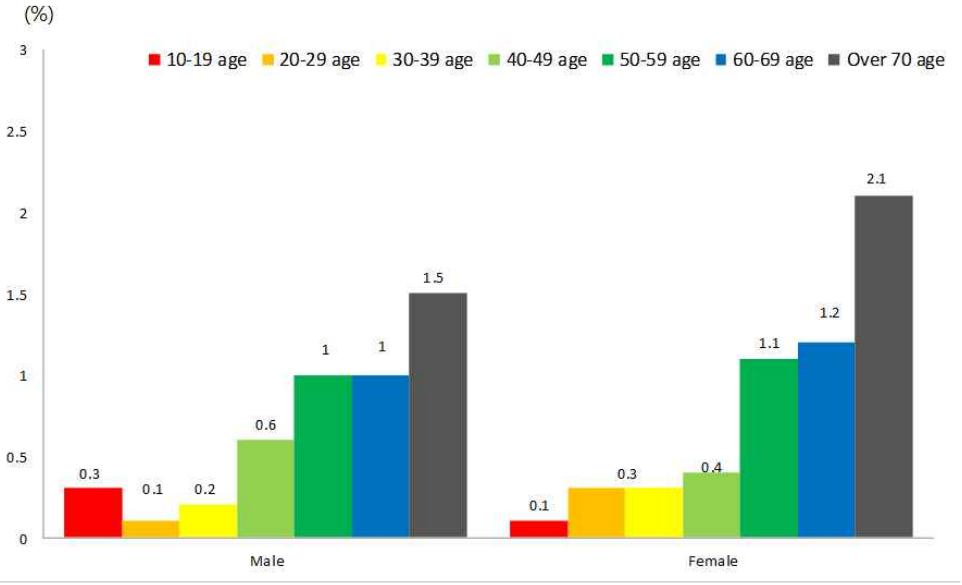
Note) The age-standardized rates were calculated based on 2005 Korean population

7) HBsAg seropositivity: percentage of individuals(10 years and older) who have tested positive for HBsAg

Hepatitis C Seropositivity

A Hepatitis C virus infection (hepatitis C seropositivity)[8] rate was high in both gender when they were getting old. Especially, female was more higher infection rate (0.1-2.1%) than male infection rate (0.1-1.5%).

Hepatitis C Seropositivity by gender (2012~2015)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2015

Note) The age-standardized rates were calculated based on 2005 Korean population

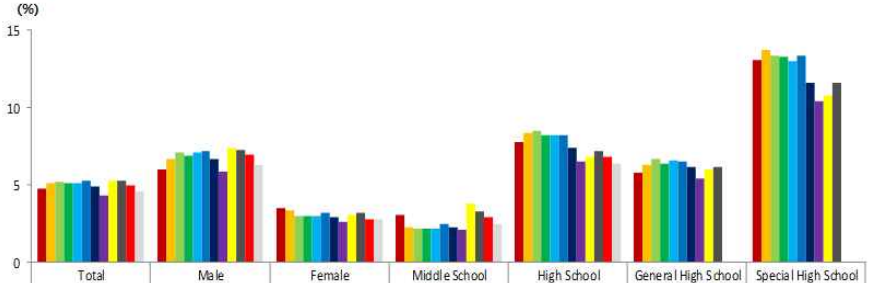
8) Hepatitis C seropositivity: percentage of individuals(10 years and older) who have tested positive for Hepatitis C infection

3.11 Safe Sexual Behavior

Rate of Sexual experience in Adolescents

The Sexual experience rate of adolescents[9] was lower in 2016 (4.6%) rather than in 2005 (4.8%). The Sexual experience rate among male adolescents (6.3%) was more than twice as high as that among female adolescents (2.8%) in 2016.

Trend of Sexual Experience Rate in Adolescents (2005~2016)



	Total	Male	Female	Middle School	High School	General High School	Special High School
2005(M1-H2)	4.8	6	3.5	3.1	7.8	5.8	13.1
2006(M1-H3)	5.1	6.7	3.4	2.3	8.4	6.3	13.7
2007(M1-H3)	5.2	7.1	3	2.2	8.5	6.7	13.4
2008(M1-H3)	5.1	6.9	3.0	2.2	8.2	6.4	13.3
2009(M1-H3)	5.1	7.1	3	2.2	8.2	6.6	13
2010(M1-H3)	5.3	7.2	3.2	2.5	8.2	6.5	13.4
2011(M1-H3)	4.9	6.7	2.9	2.3	7.4	6.2	11.6
2012(M1-H3)	4.3	5.9	2.6	2.1	6.5	5.4	10.4
2013(M1-H3)	5.3	7.4	3.1	3.8	6.8	6	10.8
2014(M1-H3)	5.3	7.3	3.2	3.3	7.2	6.2	11.6
2015(M1-H3)	5	7	2.8	2.9	6.8		
2015(M1-H3)	4.6	6.3	2.8	2.5	6.4		

M1: Middle School 1year
H2: High School 2 year
H3: High School 3 year
Source) Korea Youth Risk Behavior Web-based Survey, 2016

9) Sex experience rate : People who had been sex experienced in their life

3.12 Carcinogenic Risk Factors

Incidence and Mortality Rate of Carcinogenic Risk Factors in Korea

Recently, it has become clear that environmental factors, such as various air pollutants, which are exposed to people in daily life, cause cancer in humans.

In order to make it easier for the general public to identify scientifically proven carcinogens, we translated the cancer-causing factors classified as “Carcinogenic to humans” (Group 1) by the International Agency for Research on Cancer (IARC) into Korean and provided it through the National Cancer Information Center.

http://www.cancer.go.kr/mbs/cancer/subview.jsp?id=cancer_010401040000

Figure 1. Information of Carcinogens for Cancer Prevention

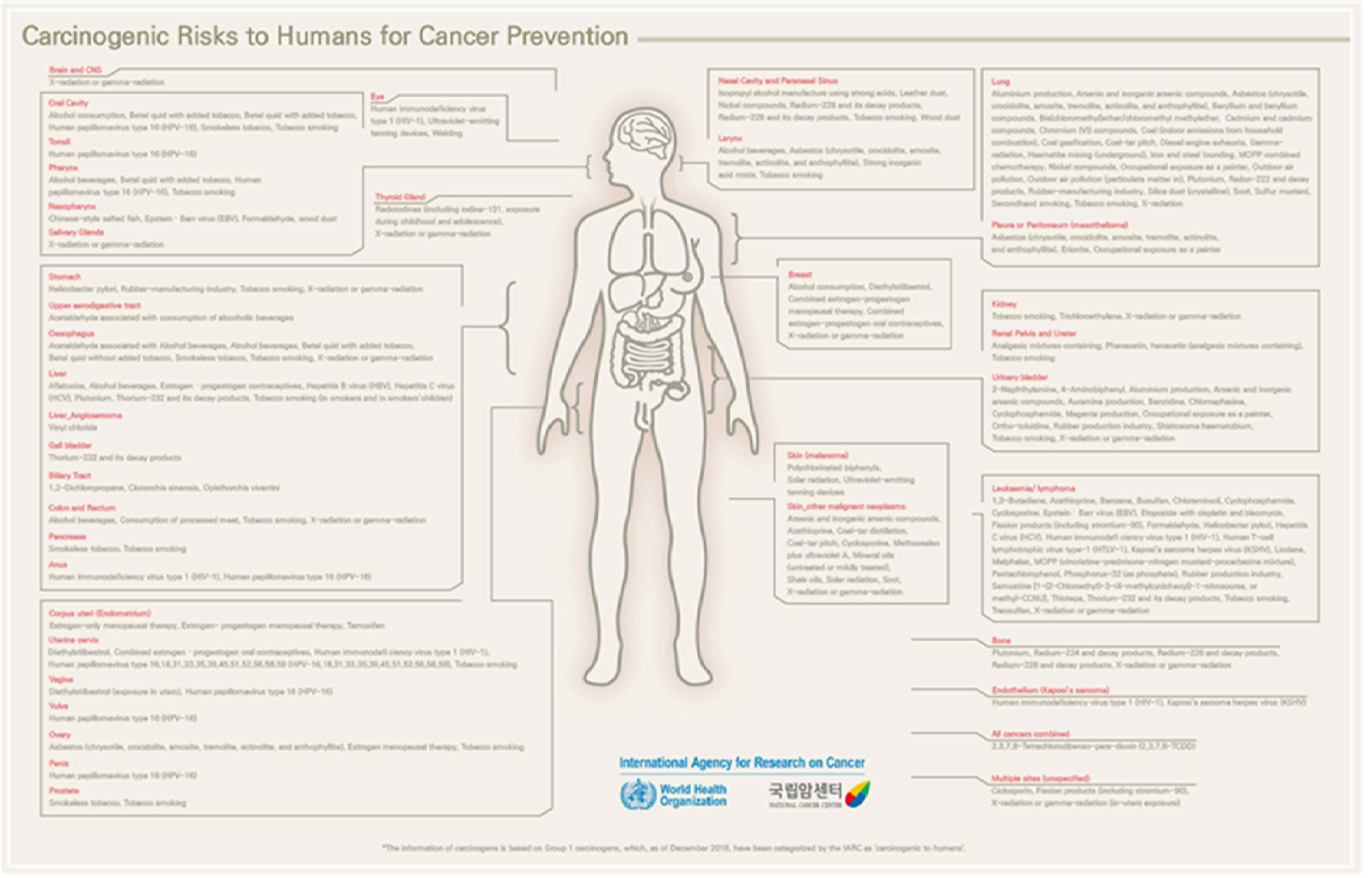


Figure 2. The Occurrence of Incidence by Major Cancer Type and Group 1 Carcinogens

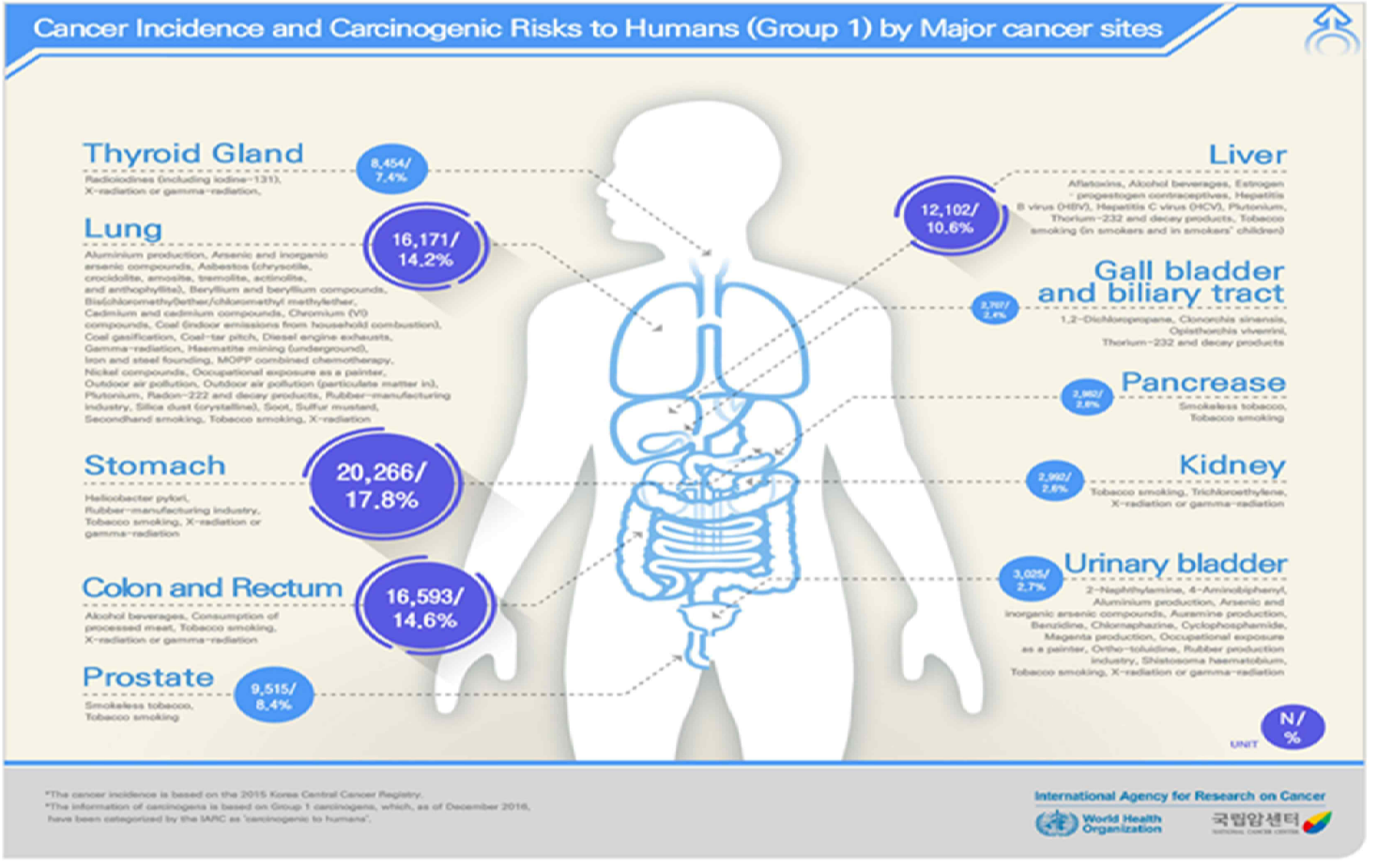


Figure 3. The Occurrence of Incidence by Major Cancer Type and Group 1 Carcinogens (for female)

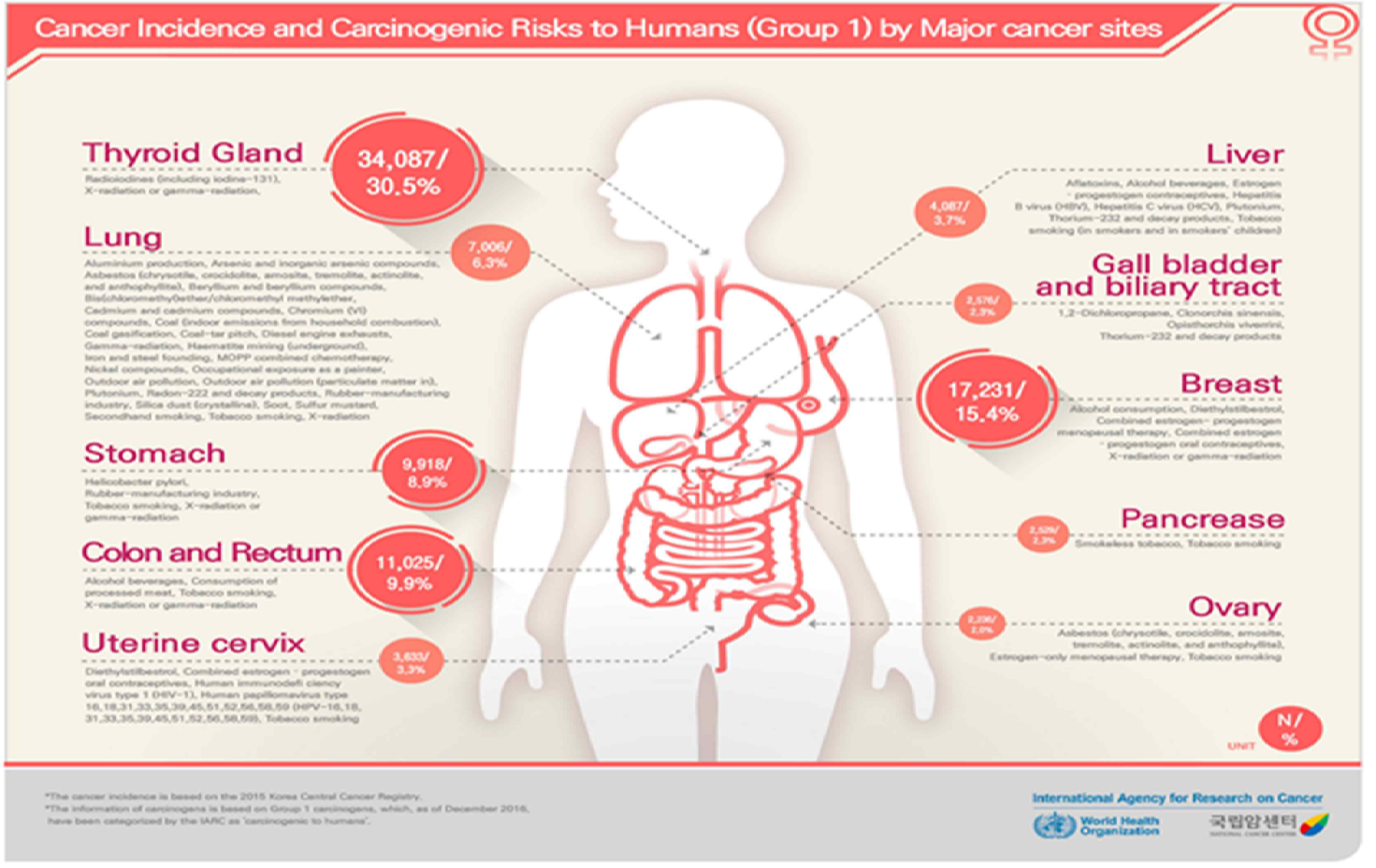
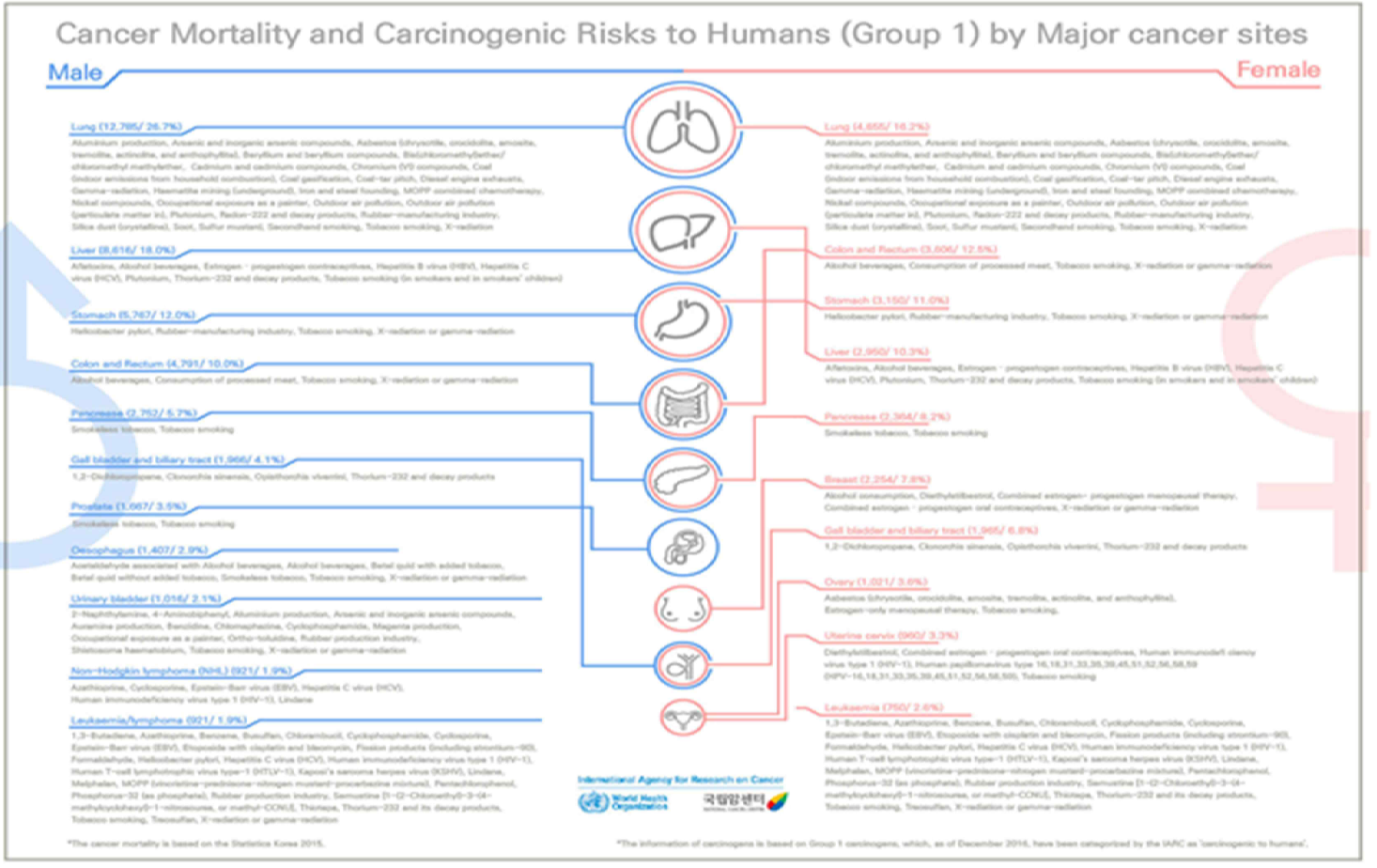


Figure 4. The Occurrence of Mortality by Major Cancer Type and Group 1 Carcinogens



Chapter 4.
Cancer Screening Program

4.1 Cancer Screening Rates

Korean National Cancer Screening Survey[14)]

The average lifetime screening rate[15)] of the five major cancers identified in the National Cancer Screening Program in 2016 was 79.7%, and the average cancer screening rates with recommendation[16)] was 63.5%. The screening rate[17)] for all cancers increased 1.64 times from 2004 to 2016.

In 2016, stomach cancer had the highest screening rates(73.0%), followed by cervix uteri cancer (62.1%), breast cancer (62.9%), colon and rectum cancer (54.6%), and the liver cancer of high-risk group (27.7%).

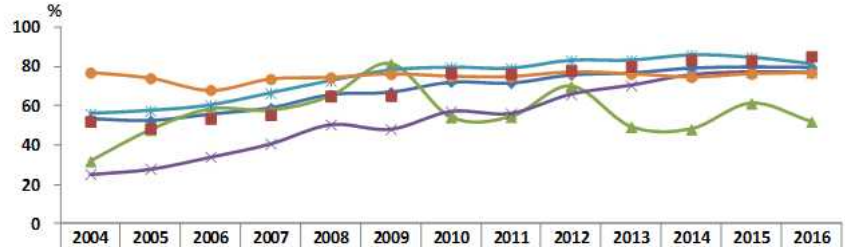
14) Korean National Cancer Screening Survey: the results of status and recognition for cancer screening in 4,000 adults (40-74 years old men and 30-74 years old women) who had been never diagnosed with cancer. A stratified, multistage sampling design was used to represent of the national population according to geographical area, age, and sex.

15) Lifetime screening rate: percentage of individuals who have undergone screening for at least one cancer.

16) Cancer screening rates with recommendation: percentage of individuals who have undergone screening as part of the National Cancer Screening Program or based on cancer screening recommendation

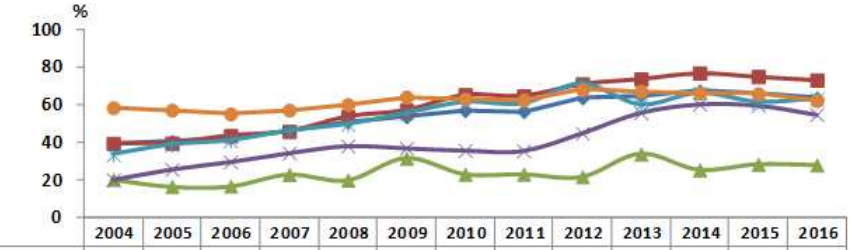
17) Screening rate = (number of screened individuals / candidates) × 100

Lifetime Cancer Screening Rates (2004-2016)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Mean	53.4	52.4	55.7	58.9	65.7	66.9	72.1	71.6	75.8	76.8	79.3	79.9	79.7
Stomach	52.0	48.5	53.5	55.3	65.0	65.1	76.7	76.2	77.9	80.0	83.4	83.0	85.2
Liver	31.8	47.7	58.3	57.6	64.8	81.3	54.2	54.3	69.9	49.3	48.1	61.2	51.9
Colon & Rectum	25.3	27.9	34.0	40.7	50.4	48.1	57.1	56.1	65.8	70.3	75.6	77.1	76.7
Breast	55.9	57.4	60.2	66.4	72.7	78.1	79.5	79.0	83.0	83.1	85.8	84.6	81.3
Cervix uteri	76.8	74.0	68.0	73.6	74.4	76.1	75.0	74.8	77.1	76.2	74.6	76.2	76.7

Cancer Screening Rates with Recommendation (2004-2016)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Mean	38.8	40.3	42.3	45.6	50.7	53.3	56.6	56.1	63.4	64.7	67.3	65.8	63.5
Stomach	39.2	39.4	43.3	45.6	53.5	56.9	65.1	64.6	70.9	73.6	76.7	74.8	73.0
Liver	20.0	16.3	16.5	22.7	19.7	31.3	22.9	22.9	21.5	33.6	25.2	28.1	27.7
Colon & Rectum	19.9	25.4	29.4	34.1	37.9	36.7	35.5	35.3	44.7	55.6	60.1	59.5	54.6
Breast	33.2	38.4	40.6	45.8	49.3	55.2	61.1	60.4	71.0	59.7	66.0	61.2	62.9
Cervix uteri	58.3	57.0	54.9	57.0	59.9	63.9	62.9	62.4	67.9	67.0	66.1	65.6	62.1

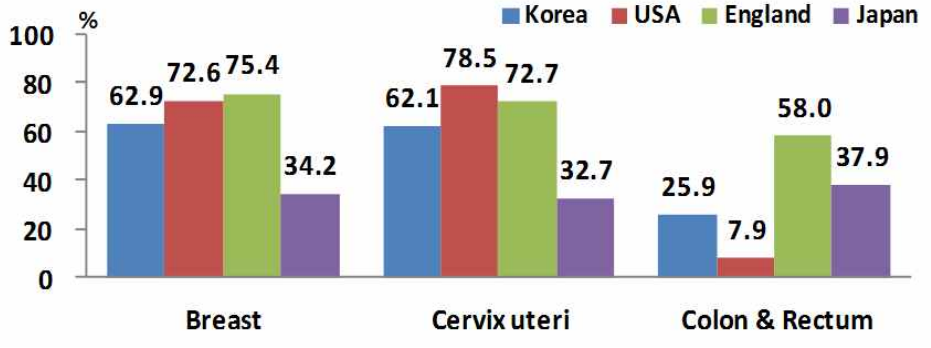
Source) Korean National Cancer Screening Survey, 2004-2016

Cancer Screening Rates: International Comparison

A comparison of the cancer screening rate based on recommendation in Korea with those in other countries showed that the screening rate for breast and cervix uteri cancers (62.9%, 62.1%) in Korea was lower than those of England (75.4%, 72.7%) and the United States (72.6%, 78.5%).

The rate of fecal occult blood testing (FOBT) during colon and rectum cancer screenings in Korea was 25.9%, which was lower than the rates in England (58.0%) and Japan (37.9%)

Cancer Screening Rates: International Comparison



Cancer Screening Rates: International Comparison

		Korea [1]	USA [2]	England [3] [4]	Japan [5]
Breast	Cancer Screening Rates	**62.9%**	**72.6%**	**75.4%**	**34.2%**
	Target Population	**40 & over**	**50-74**	**53-70**	**40-69**
	Frequency	every 2 years	every 2 years	every 3 years	every 2 years
	Test or Procedure	Mammography	Mammography	Mammography	Mammography
Cervix uteri	Cancer Screening Rates	**62.1%**	**78.5%**	**72.7%**	**32.7%**
	Target Population	**30 & over**	**21-65**	**25-64**	**20-69**
	Frequency	every 2 years	every 3 years	**25-49,** every 3.5 years **50-64,** every 5.5years	every 2 years
	Test or Procedure	Pap smear	Pap smear	Pap smear	Pap smear
Colon & Rectum	Cancer Screening Rates	**25.9%**	**7.9%**	**50-58%**	**37.9%**
	Target Population	**50 & over**	**50 & over**	**60-74 (50-74, in Scotland)**	**40-69**
	Frequency	every 1 years	every 2 years	every 2 years	every 1 years
	Test or Procedure	FOBT	FOBT	FOBT	FOBT

Source)

1) Korean National Cancer Screening Survey, 2016

2) National Cancer Institute. Cancer Trends Progress Report, 2015

3) NHS Cancer Screening Programmes, NHS Breast Screening Programme Annual Review, 2013-14, 2015

4) NHS Cancer Screening Programmes, NHS Cervical Screening Programme Annual Review, 2013-14, 2015

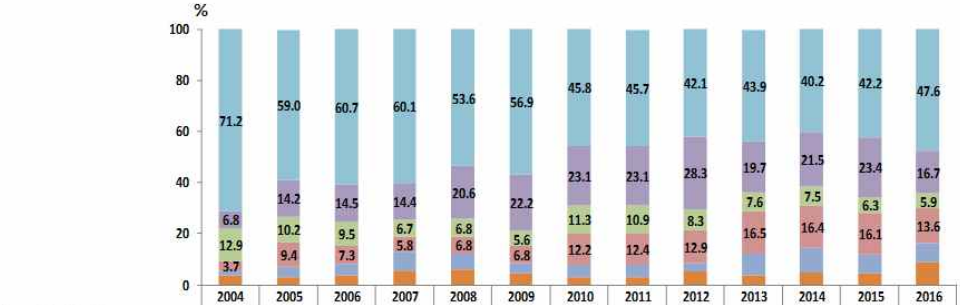
5) Health Statistics in Japan, 2015

Note) FOBT(fecal occult blood test)

Reasons for Not Undergoing Cancer Screening

From 2004 to 2016, the percentage of people who said that they did not undergo cancer screening because they believed they were healthy decreased (71.2% in 2004 to 47.6% in 2016), whereas the percentage of those who said that they did not have time to be screened increased (6.8% in 2004 to 16.7% in 2016).

Reasons for Not Undergoing Cancer Screening (2004-2016)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Belief of healthiness	71.2	59.0	60.7	60.1	53.6	56.9	45.8	45.7	42.1	43.9	40.2	42.2	47.6
Time constraints to be screened	6.8	14.2	14.5	14.4	20.6	22.2	23.1	23.1	28.3	19.7	21.5	23.4	16.7
Too expensive	12.9	10.2	9.5	6.7	6.8	5.6	11.3	10.9	8.3	7.6	7.5	6.3	5.9
Too painful, unpleasant	3.7	9.4	7.3	5.8	6.8	6.8	12.2	12.4	12.9	16.5	16.4	16.1	13.6
Fear of detection	1.7	4.2	4.3	7.5	6.3	4.0	4.9	4.8	3.1	8.5	9.6	7.6	7.3
Others	3.8	2.9	3.7	5.5	5.9	4.5	2.8	3.0	5.3	3.7	4.9	4.4	8.9

Source) Korean National Cancer Screening Survey, 2004-2016

4.2 National Cancer Screening Program

National Cancer Screening Program Statistics (2005-2015)

Guidelines of the National Cancer Screening Program*

Cancer	Target Population	Interval	Test or Procedure
Stomach	Age 40 & Over	2 years	Endoscopy or UGI
Liver	Age 40 & Over High risk group †	1 year	Sonography & AFP
Colon & rectum	Age 50 & Over	1 year	FOBT : In case of an abnormal result, Colonoscopy or DCBE
Breast	Age 40 & Over Woman	2 years	Mammography
Cervix uteri	Age 30 & Over Woman (Medical Aid : Age 20 & Over)	2 years	Pap smear

Source) National Cancer Center, 2016

Note)

1) UGI: upper gastro-intestinal series
2) AFP: serum alpha-feto protein test
3) FOBT: fecal occult blood test
4) DCBE: double-contrast barium enema

*National Cancer Screening Program(2015)

There were some revisions of National Cancer Screening Program in 2016

1.Liver cancer screening interval was changed from one year to six months.

2.Cervix uteri cancer screening target population was changed. It was expansion from 30 & over to 20 & over.

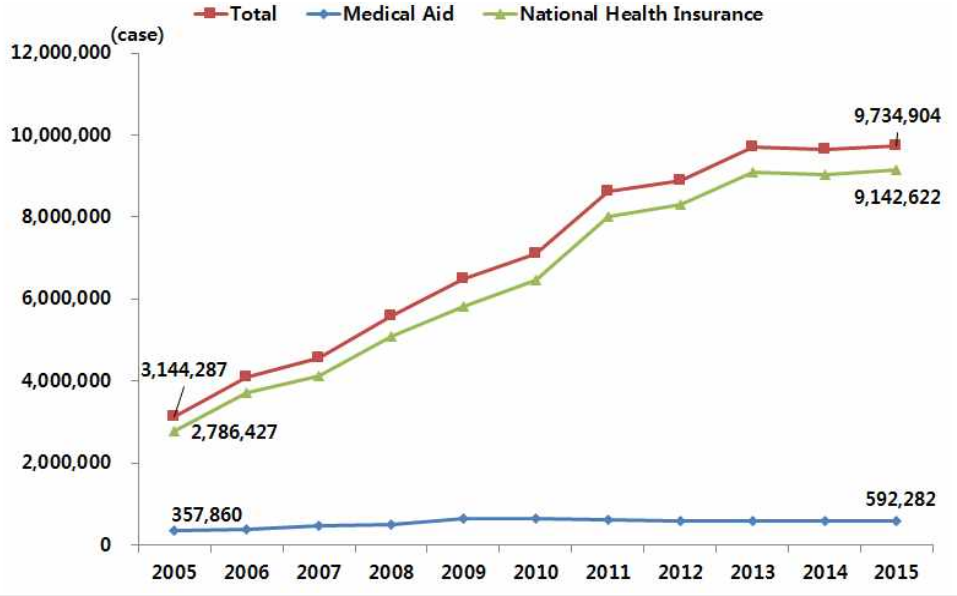
†High risk group: HBsAg positive, anti-HCV Ab positive, or diagnosed with liver cirrhosis

Number of Participants in the National Cancer Screening Program

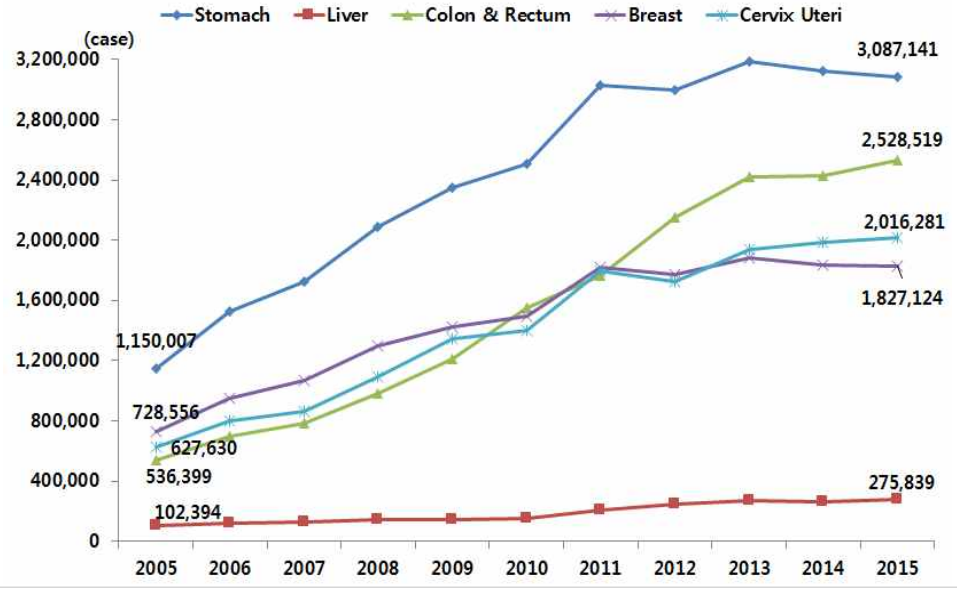
The target population of the National Cancer Screening Program consists of those insured by Medical Aid and the National Health Insurance program. The number of screened individuals insured by the National Health Insurance program increased from 2,786,427 in 2005 to 9,142,622 in 2015.

In 2015, among the five cancers in the National Cancer Screening Program, the cancer with the highest number of individuals screened was stomach cancer (3,087,141), followed by colon and rectum cancer (2,528,519).

Number of Participants in the National Cancer Screening Program (2005-2015)



Number of Participants in the National Cancer Screening Program by Cancer Sites (2005-2015)



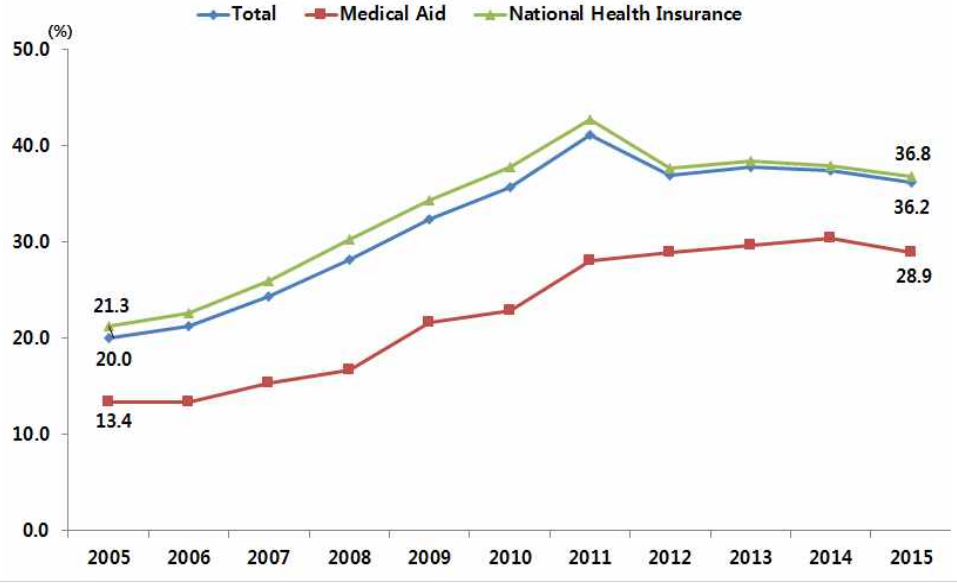
Source) National Cancer Center, 2016

Participation Rates in the National Cancer Screening Program

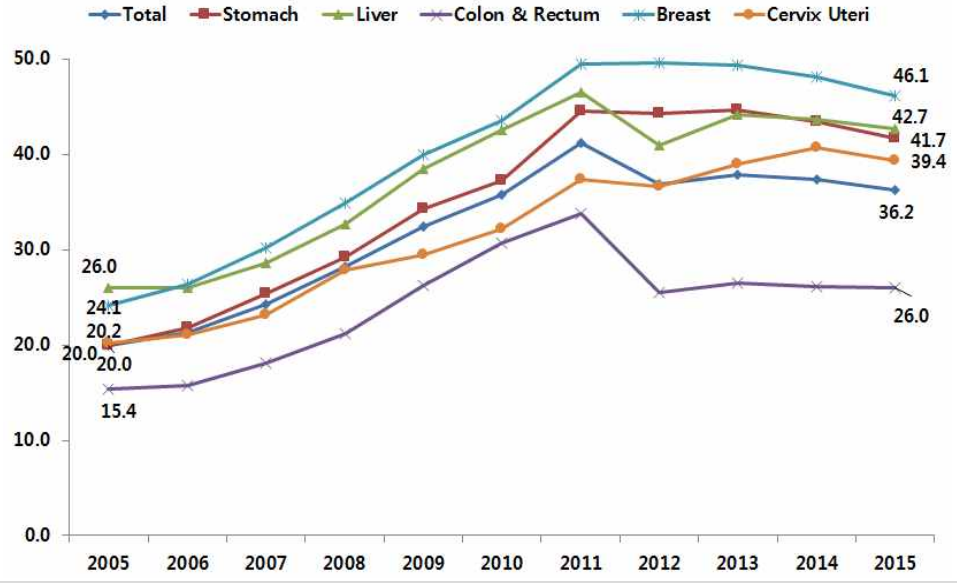
The overall rate of participation in the National Cancer Screening Program was 36.2% in 2015 (28.9% of Medical Aid recipients and 36.8% of the National Health Insurance holders).

In 2015, screening for breast cancer had the highest participation rate (46.1%), followed by liver cancer (42.7%) and stomach cancer (41.7%).

Participation Rates in the National Cancer Screening Program(2005-2015)



Participation Rates in the National Cancer Screening Program by Cancer Sites (2005-2015)



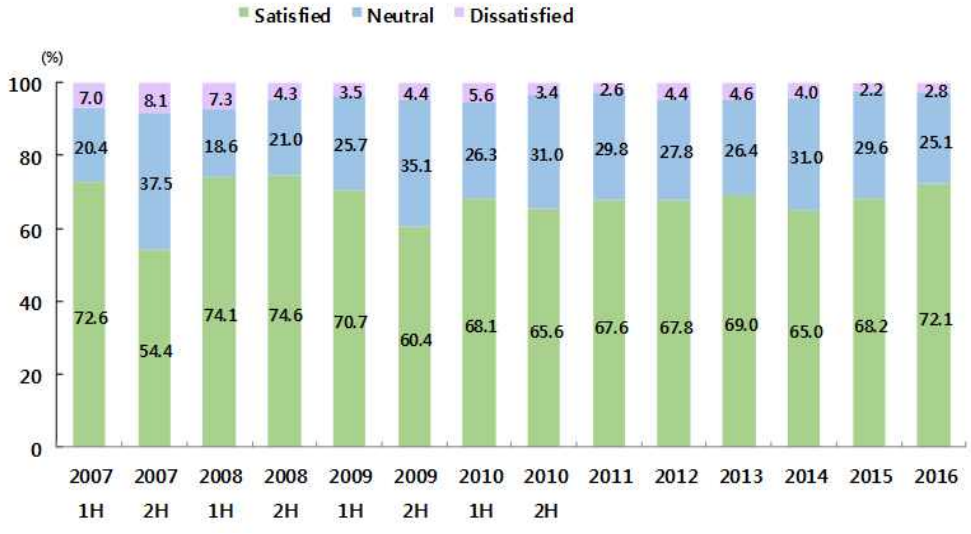
Source) National Cancer Center, 2016

4.3 Level of Satisfaction with National Cancer Screening[18)]

Level of Satisfaction with National Cancer Screening

Level of Satisfaction with National Cancer Screening Program was 72.1% in 2016. The level has been maintained above 65% since 2010.

Satisfaction of National Cancer Screening
(2007-2016)



Source) National Cancer Center, 2016

18) Satisfaction level of national cancer screening : Survey on satisfaction level of national cancer screening monitoring for 900 participants who are aged for 30 to 65 and participated in national cancer screening program.

Chapter 5.
Financial Aid Program and Regional Cancer Center

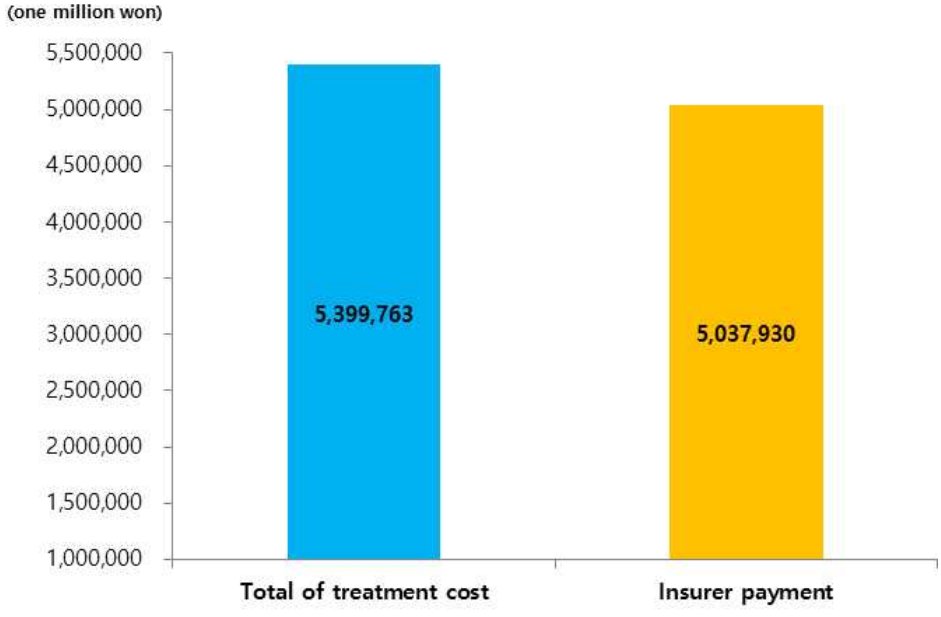
5.1 Costs of Cancer

Health Insurance Coverage of Cancer Treatment and Expenditure

In 2015, the total treatment cost for 1,027,828 cancer patients covered by the National Health Insurance was 5,399,763 million won (excluding non-insured areas, such as selective treatments, ultrasound tests, and hospital bed upgrade).

Health insurance expenditure accounted for 93.3% of the total cost or 5,037,930 million won.

Health Insurance Coverage of Cancer Treatment and Expenditure (2015)

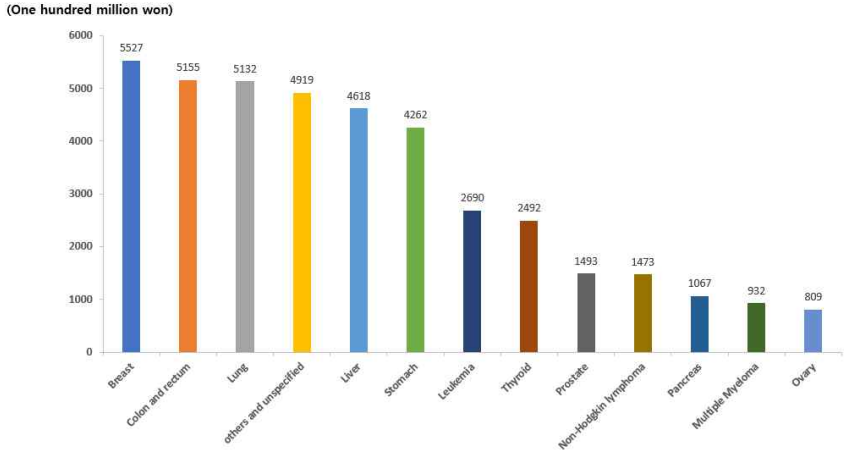


Source) National Health Insurance Corporation. Analysis on cost of cancer patients, 2015

Insurance Coverage of Expenses for the Treatment of Major Cancers

Of the 4.741 trillion won expenditure from the National Health Insurance Corporation, breast cancer was responsible for the highest percentage (552.7 billion won, 11.7%), followed by colon and rectum cancer (515.5 billion won, 10.9%), lung cancer (513.2 billion won, 10.8%), others and unspecified (491.9 billion won, 10.4%), and liver cancer (461.8 billion won, 9.7%). The ten most common cancers accounted for 79.6% of the total expenditure.

Health Insurance Expenditures for Major Cancers (2014)



Source) National Health Insurance Corporation. Analysis on cost of cancer patients, 2014

5.2 Cancer Patient Financial Aid Program

Cancer Patient Financial Aid Program

The Cancer Patient Financial Aid Program was started in 2002 to subsidize the medical costs of pediatric cancer patients, and was expanded to include adult cancer patients in 2005. Currently, it supports adult cancer patients 18 and over among Medicaid beneficiaries (including the quasi-poor class), lung cancer patients (Medicaid beneficiaries and National Health Insurance enrollees qualifying for health insurance fee criteria), and National Health Insurance enrollees newly diagnosed through National Cancer Screening Program.

Cancer Patient Financial Aid Program for pediatric cancer patients, supports cancer patients under 18 years (Medicaid beneficiaries and Korean National Health Insurance enrollees qualifying for an income and asset standard).

Cancer Patient Financial Aid Program (2016)

Beneficiary type		Cancer type	Annual maximum payment	Starting year
Adult (18 and over)	• National Cancer Screening Program examinee	Stomach cancer, breast cancer, cervical cancer, liver cancer, colorectal cancer	2 million KRW (Insurer payment)	2005
	• Medicaid beneficiary (including the quasi-poor class)	All cancers	1.2 million KRW (Insurer payment) 1 million KRW (copayment)	
	• Lung cancer patients - Medicaid beneficiary	Primary lung cancer	1.2 million KRW (Insurer payment) 1 million KRW (copayment)	
	• Lung cancer patients - National Health Insurance enrollees	Primary lung cancer	2 million KRW (Insurer payment)	
Child (under 18)	• Medicaid beneficiary (including the quasi-poor class)	All cancers	Leukemia : 30 million KRW Otherwise: Maximum 20 million KRW (30 million KRW for Hematopoietic stem cell transplantation)	2002
	• National Health Insurance enrollees (those qualifying for insurance fee criteria)			

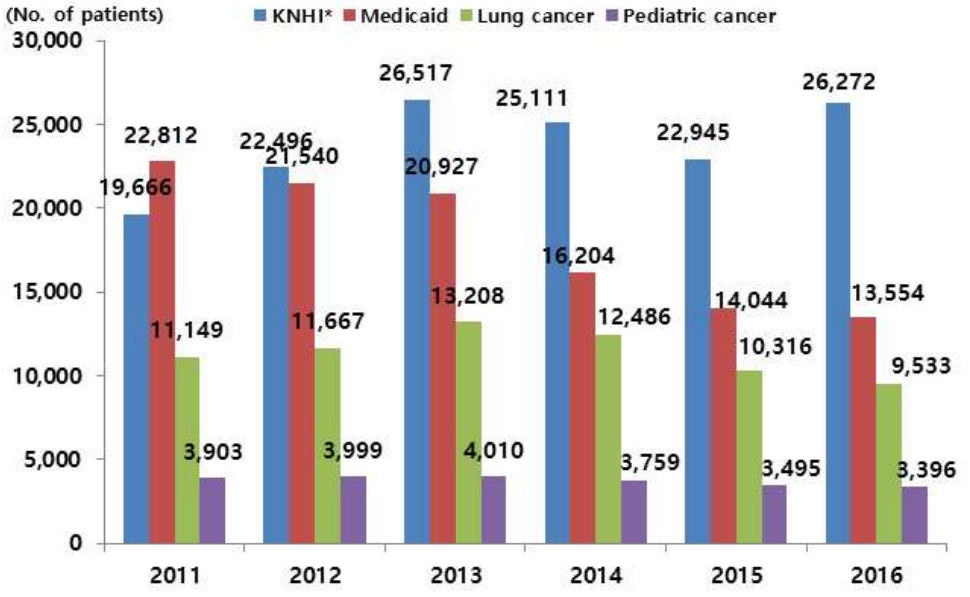
Source) National Cancer Center 2016

Results of the Financial Aid Program for Cancer Patients

The number of adult National Health Insurance enrollees among the Cancer Patient Financial Aid Program beneficiaries increased from 19,666 in 2011 to 26,272 in 2016, respectively. The numbers of adult Medicaid beneficiaries and adult lung cancer patients decreased from 22,812 in 2011 to 13,554 in 2016 and from 11,149 in 2011 to 9,533 in 2016, respectively. The numbers of pediatric cancer patients also decreased from 3,903 in 2011 to 3,396 in 2016.

Cancer Patient Financial Aid payment for adult National Health Insurance enrollees increased from 8.6 billion won in 2011 to 16.6 billion won in 2016, respectively. However, Cancer Patient Financial Aid payment for adult Medicaid beneficiaries, and adult lung cancer patients decreased from 13.8 billion won in 2011 to 9.1 billion won and from 11.1 billion won in 2011 to 8.1 billion won in 2016, respectively. Also, payment for pediatric cancer patients decreased from 19.3 billion won in 2011 to 16.2 billion won in 2016.

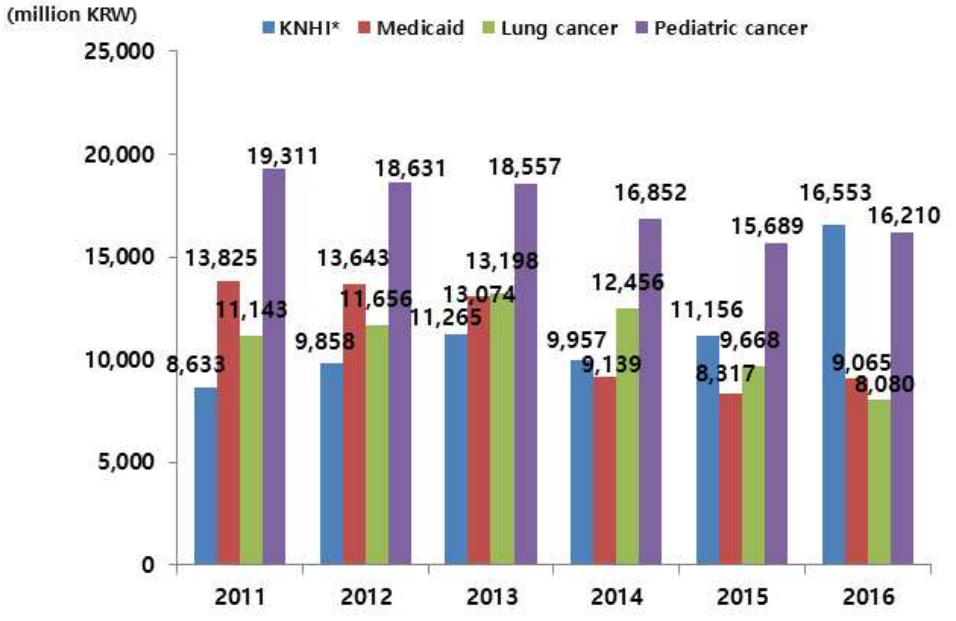
Cancer Patients Financial Aid Program Results (Number of Beneficiaries, 2011-2016



Source) National Cancer Center. Patient Financial Aid System 2016

*KNHI: Korean National Health Insurance

Cancer Patients Financial Aid Program Results (Payment, 2011-2016)



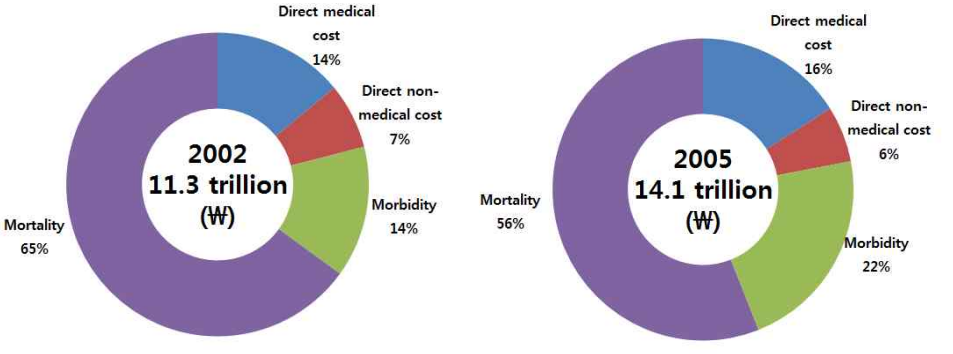
Source) National Cancer Center. Patient Financial Aid System 2016

*KNHI: Korean National Health Insurance

Socioeconomic Costs of Cancer

Socioeconomic costs of cancer in Korea increased from 11.3 trillion won in 2002 to 14.1 trillion won in 2005.

Socioeconomic Costs of Cancer



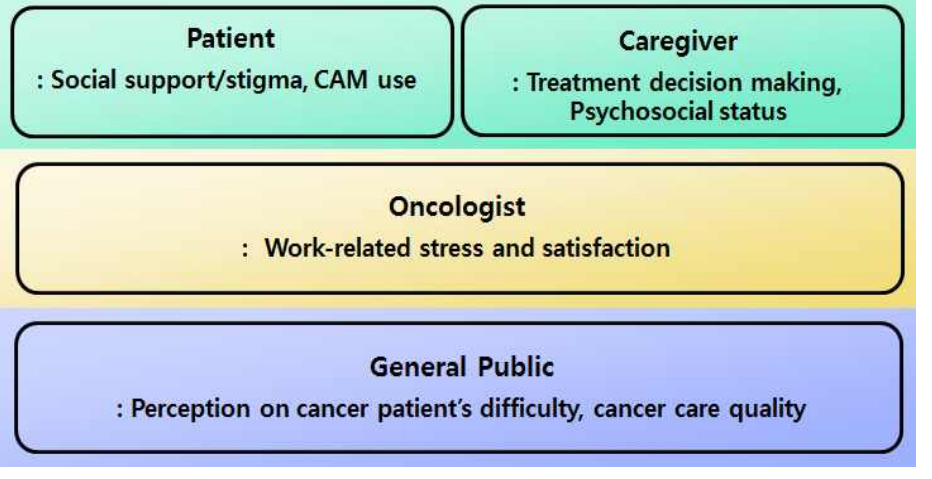
Source) Kim JH et al. J Prev Med Public Health 2009

5.4 Survey on Cancer Treatment

From July to September of each year since 2008, the National Cancer Center has conducted a nationwide survey with cancer patients, caregivers, and oncologists in NCC and 12 regional cancer centers throughout Korea.

In 2013, the survey covered areas including 1) cancer care experience of both patients and caregivers, 2) oncologists' work-related burnout and satisfaction, 3) general public's perception on cancer-related issues.

Subjects and Major Content of Survey on Cancer Treatment (2013)



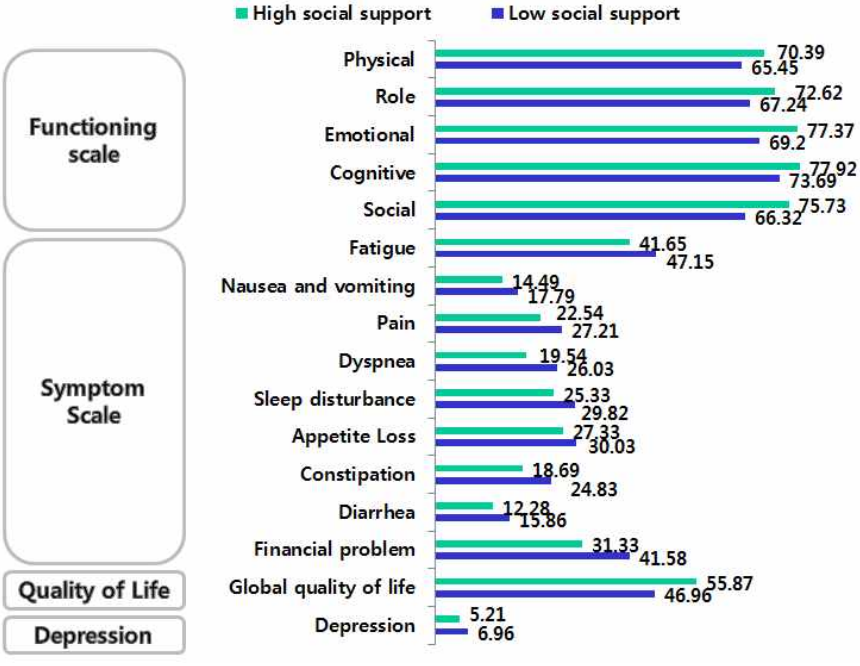
Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care 2013

Effects of Social Support on Cancer Patients

We investigated how perceived social support is associated with depression and quality of life among cancer patients.

Patients with low levels of perceived social support reported significantly higher levels of depression, lower scores on all functional scales, higher scores on all three symptom scales, lower global health/quality of life scale scores.

Effects of Social Support on Cancer Patients (2012)



Source) Eom CS et al. Psycho-Oncology 2013

Cancer survivors with low levels of perceived social support were more likely to continue smoking.

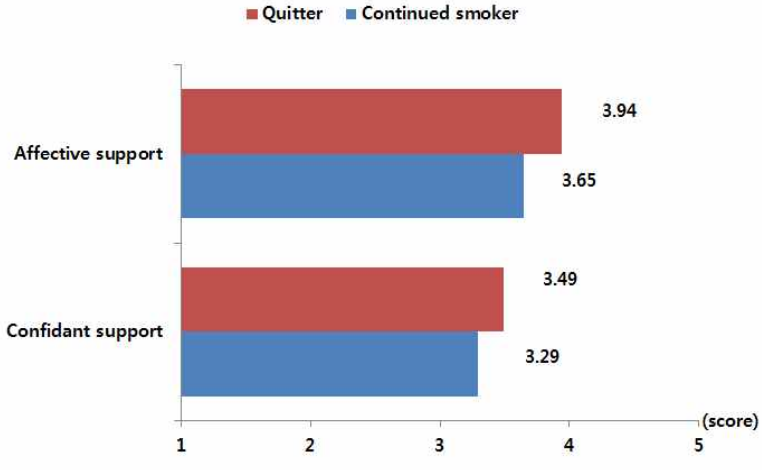
Among 493 participants who were smoking at the time of cancer diagnosis, 131(26.6%) continued to smoke at the time of survey.

Continued smokers assessed their levels of confidence and effective support to be lower than those of quitters.

In a multivariate logistic regression analysis, current alcohol consumption, early cancer stage, lung cancer diagnosis, and high perceived social support showed significant associations with smoking continuation.

Our study suggests that perceived social support may be an important factor for smoking cessation and maintenance of smoking cessation.

Effects of Social Support on Cancer Patients (2012)



Source) Yang HK et al. Japanese Journal of Clinical Oncology 2013

Stereotypes Associated with Cancer Patients

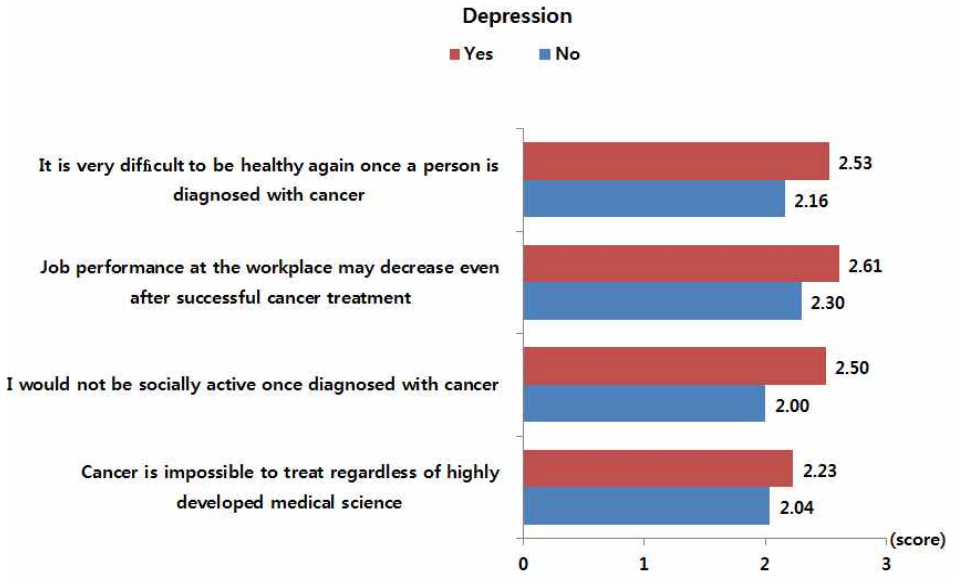
To evaluate the possible association between cancer stigma and depression among cancer patients, cancer stigma was assessed by using a set of 12 questions grouped in three domains; incurability, stereotypes about cancer patients, and experience of social discrimination.

A total of 466 cancer patients were included in the study. Over 30% of the study participants had negative attitudes toward cancer and held stereotypical views on themselves. About 10% of the participants had experienced social discrimination due to cancer, and 24.5% reported clinically significant depressive symptoms.

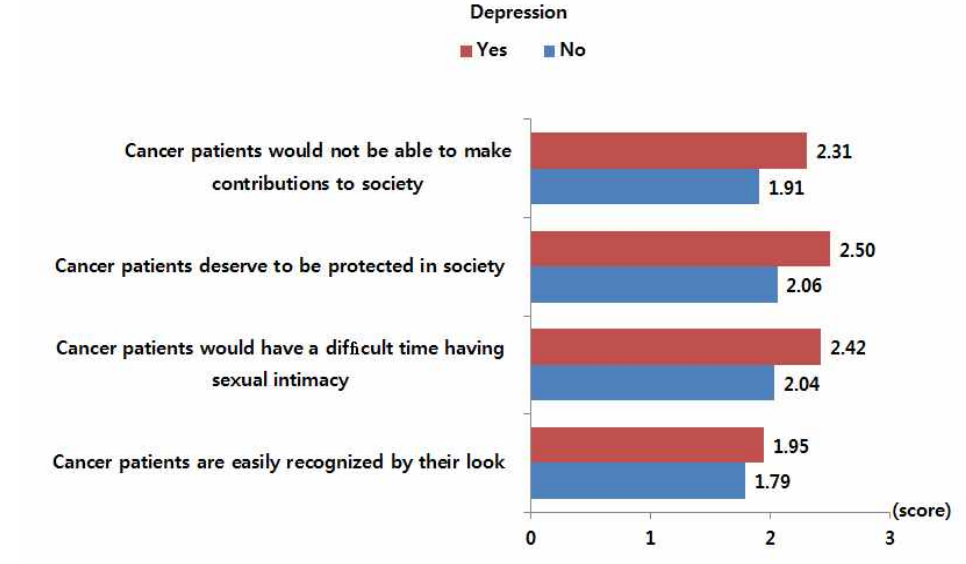
The biggest stereotype about cancer patients was that their 'Job performance at the workplace may decrease even after a successful cancer treatment', followed by 'Cancer is impossible to treat even with highly developed medical science'.

Patients who had experienced cancer stigma were 2.5 times more likely to develop depression than patients with positive attitudes.

Cancer Patients' Sense of Incurability (2010)

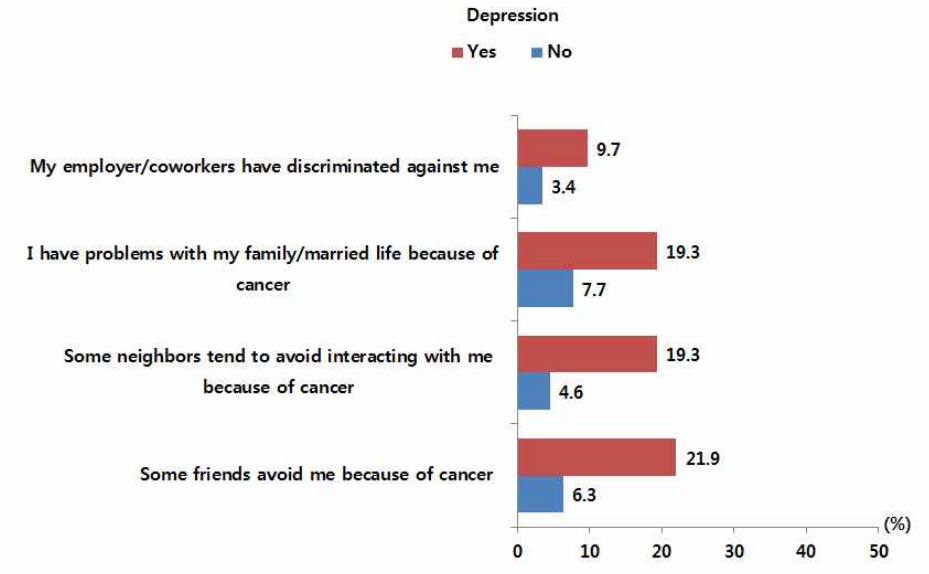


Stereotypes Experienced by Cancer Patients (2010)



Source) Cho JH et al. Psycho-Oncology 2013

Social Discrimination toward Cancer Patients (2010)



Source) Cho JH et al. Psycho-Oncology 2013

Experience of Using Complementary and Alternative Medicine(CAM)

Cancer patients were analyzed for their use of complementary and alternative medicine (CAM) after cancer diagnosis.

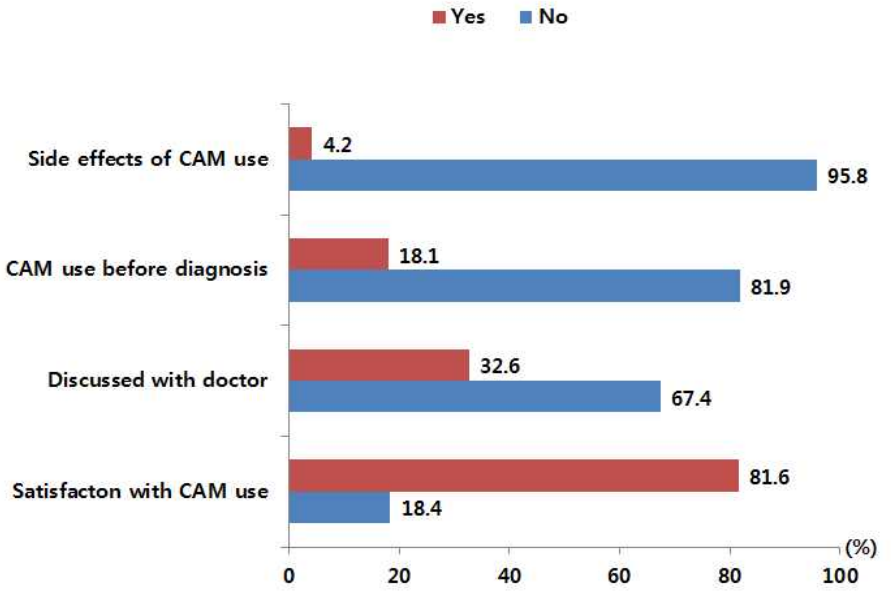
We found that 25.3% (674 of 2,661) had used CAM, whereas 38.3% (258 of 674) of those who had used CAM had discontinued CAM therapy. The most frequently used form of CAM was herbs (43.5%).

Major reasons for discontinuation of CAM included ineffectiveness (23.9%), financial burden (22.9%), and physician's opposition (13.7%).

Among those who experienced CAM, 18% reported they had used CAM before cancer diagnosis, and 32% had consulted an oncologist about CAM use. Most of the patients were satisfied with CAM use, and only 5% reported side effects of CAM.

Other factors associated with discontinuation of CAM included metastatic cancer, long duration of cancer treatment (more than five years), dissatisfaction, and side effects from CAM therapy.

Experience of Using CAM



Source) Kim SY et al. Asian Pacific Journal of Cancer Prevention 2013

Cancer Patients and Caregivers Making Decision about Treatment

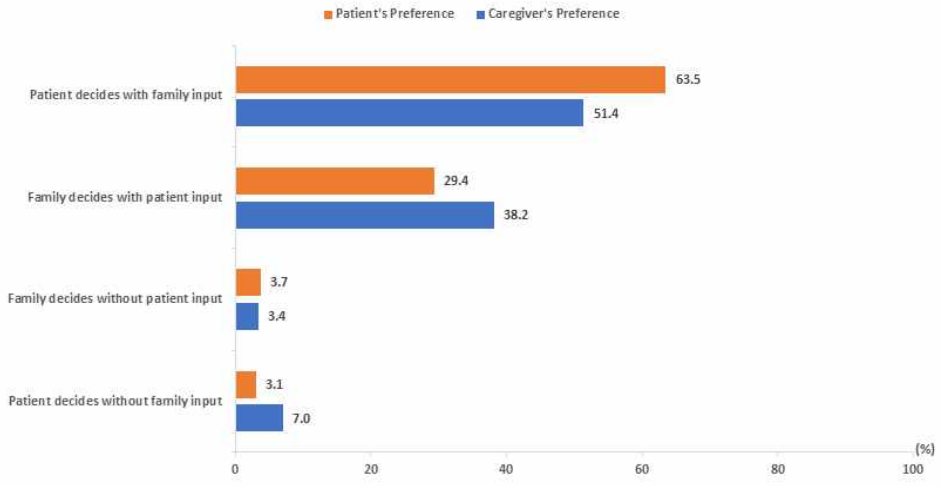
We looked into how patients and family caregivers felt about being involved in the decision-making process regarding cancer treatment.

A national survey was conducted with 990 patient-caregiver dyads. A majority of patients (63.5%) and about a half of caregivers (51.4%) expressed preference for allowing patients to make primary decisions on treatment with family input. A smaller percentage of patients (29.4%) and caregivers (38.2%) preferred family members to make primary decisions with patient input. Only a small proportion of patients and caregivers expressed preference for unilateral decision-making.

Patients with higher educational background showed preference for greater levels of decision-making concordance, whereas lower levels of concordance were evident in younger patients, less educated caregivers, dyads of a child patient and an adult caregiver (as opposed to a spouse-patient dyads), and families having difficulties talking about cancer.

Most patients and family caregivers valued and expected family involvement in treatment decision-making. However, there is little explicit agreement about which party in the dyad should take decisional leadership and who should play a supporting role.

Treatment-Related Decision Making Roles of Cancer Patients and Caregivers (2012)



Source) Shin DW et al. Psycho-Oncology 2013

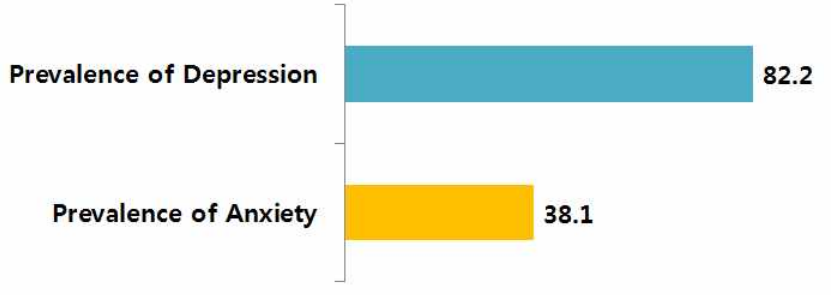
Psychological Health of Caregivers

We identified the prevalence and predictors of anxiety and depression, as well as suicidal ideation and attempts of suicide among family caregivers of cancer patients in Korea.

The prevalence of anxiety in family caregivers was 38.1 %: 20.3 % reported mild anxiety, 13.3 % reported moderate anxiety, and 4.6% reported severe anxiety.

The prevalence of depression was 82.2%: 40.4% reported mild depression, 25.5% reported moderate depression, and 16.3% reported severe depression.

Depression and Anxiety in Cancer Patients and Caregivers (2011)



Source) Park BY et al. Supportive Care in Cancer 2013

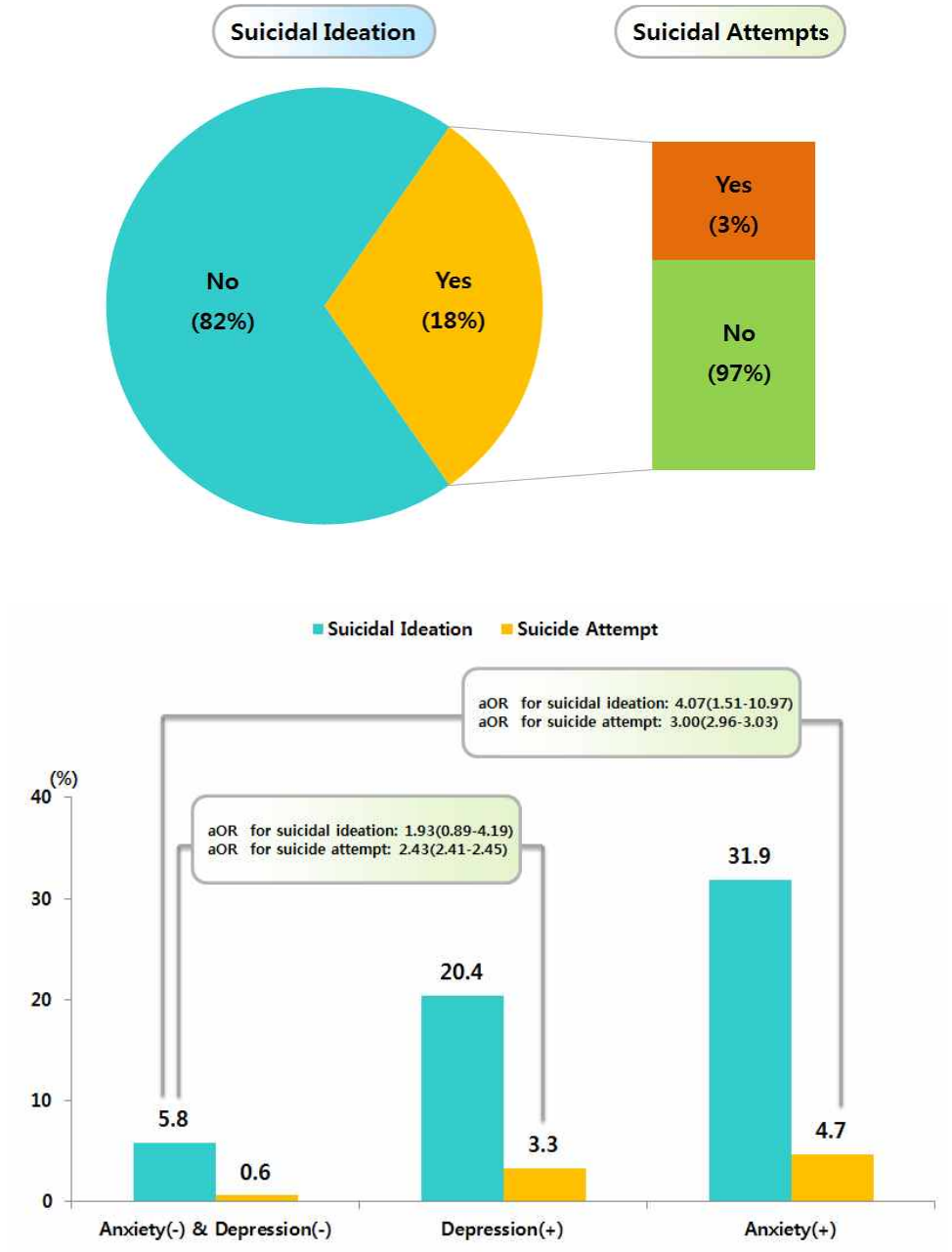
A total of 17.7% family caregivers reported suicidal ideation, and 2.8% had attempted suicide during the previous year.

Among family caregivers with anxiety, 31.9% had suicidal ideation and 4.7% attempted suicide; the corresponding values for family caregivers with depression were 20.4% and 3.3%, respectively.

Family caregivers with anxiety or depression showed higher adjusted odds ratios (aOR) for suicidal ideation than those without such symptoms.

Among family caregivers with anxiety or depression, females, unmarried individuals, individuals who were unemployed during caregiving, and those with a low quality of life with respect to financial matters were found to be have a high risk of suicide.

Suicidal Ideation and Attempts by Cancer Patients and Caregivers (2011)



Source) Park BY et al. PLos One 2013

Work-Related Stress and Satisfaction of Oncologists

In 2013, a survey was conducted among 680 oncologists working at the national and regional cancer centers to evaluate the levels of work-related stress and satisfaction based on a four-point scale (scores from zero to three).

Among the areas of work-related stress experienced by oncologists, 'Overload disruption to home life' scored highest with 1.66, indicating that it is the primary cause of stress.

Specific items receiving high scores included 'Having conflicting demands on your time(e.g., patient care/management/research /college: 1.89 points)', and 'Having a conflict of responsibilities (e.g., clinical vs. managerial; clinical vs. research: 1.88 points).'

Work-Related Stress of Oncologists (2013)

Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care, 2013

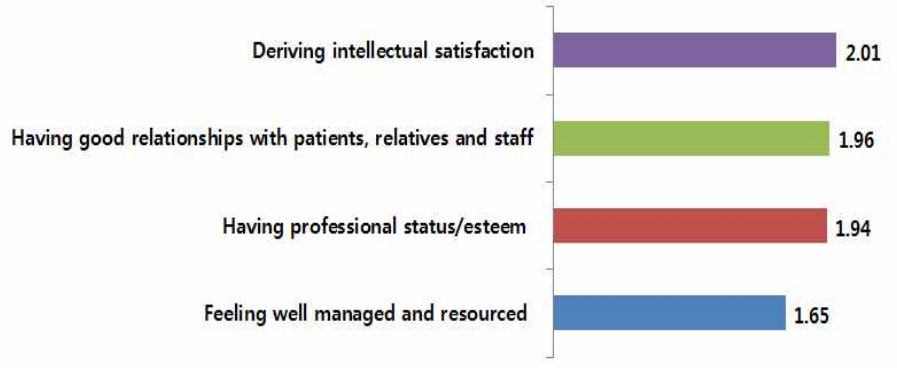
According to the survey results on the level of work-related satisfaction of oncologists, 'Deriving intellectual stimulation from teaching' was the area with highest satisfaction (2.01 points), while 'Feeling well managed and resourced' had the lowest score of 1.65.

Specific items that received high scores included 'Being an expert in a specialist area' (2.3 points) and 'Having good relationships with patients' (2.08 points). On the other hand, 'Feeling you have adequate financial resources to do a good job' scored the lowest (1.23 points).

Analyzing the survey results on work satisfaction, men on average experienced less stress and showed a higher level of work satisfaction than women. Individuals who are older, earning higher income, and displaying higher satisfaction with their income level were shown to have less stress and higher satisfaction about their work. On the other hand, longer night shifts and weekly treatment hours tended to increase work stress and reduce work satisfaction.

In terms of overall levels of work stress and satisfaction, the average work stress score was 2.12 and the average satisfaction score was 2.72.

Work Satisfaction of Oncologists



Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care, 2013

Public Perception of Cancer-Related Issues

We asked the public about their perception about the quality of cancer treatment, satisfaction about cancer policy and their perspectives on cancer patients.

The target population was men and women 40-70 years old who had never been diagnosed with cancer.

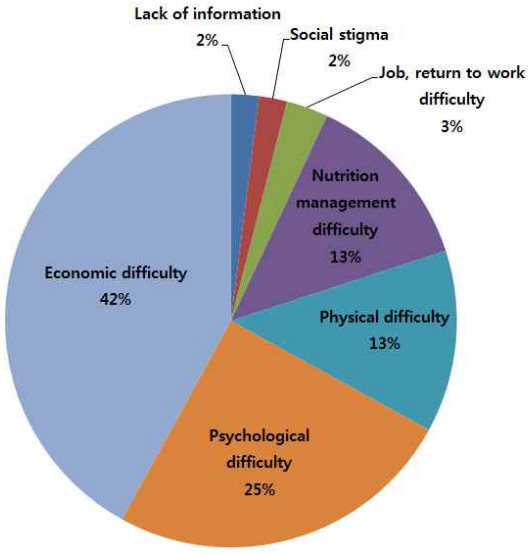
We surveyed 2,000 households throughout Korea in 2012.

The general perception about the difficulties facing cancer patients was 'Financial difficulty' (42%), followed by 'Emotional difficulty' (25%), 'Physical difficulty' (13%).

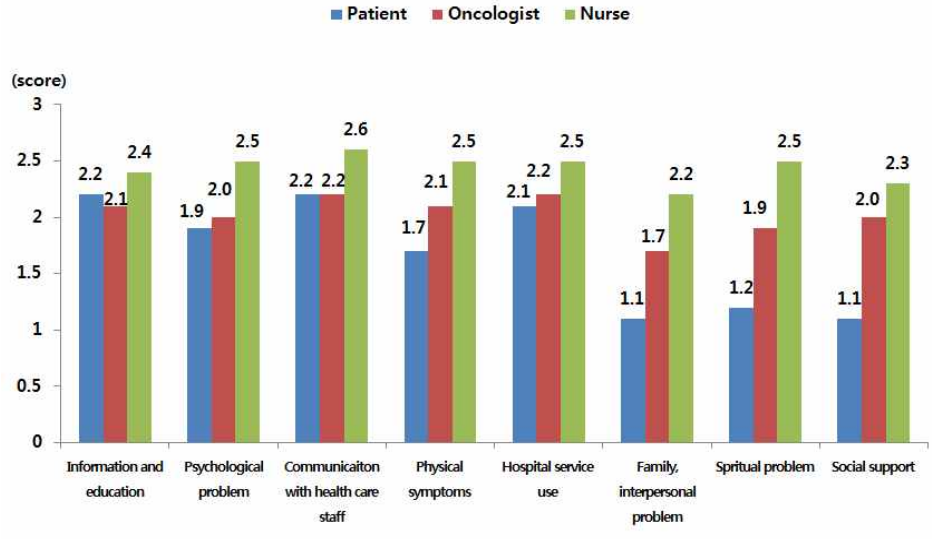
When we asked a similar question to cancer patients and medical providers, such as oncologists and nurses, regarding the most important service for cancer patients, cancer patients said 'Information about financial support for medical expenses from government' was most important, while medical providers thought 'Communication with the hospital staff' was.

The general public sympathized with cancer patients' hardship, not only physical challenges, but also emotional, social, and financial difficulties.

Public Opinion Regarding Difficulties Facing Cancer Patients (2012)



Opinions of Cancer Patients and Oncologists Regarding Services Important to Cancer Patients (2012)



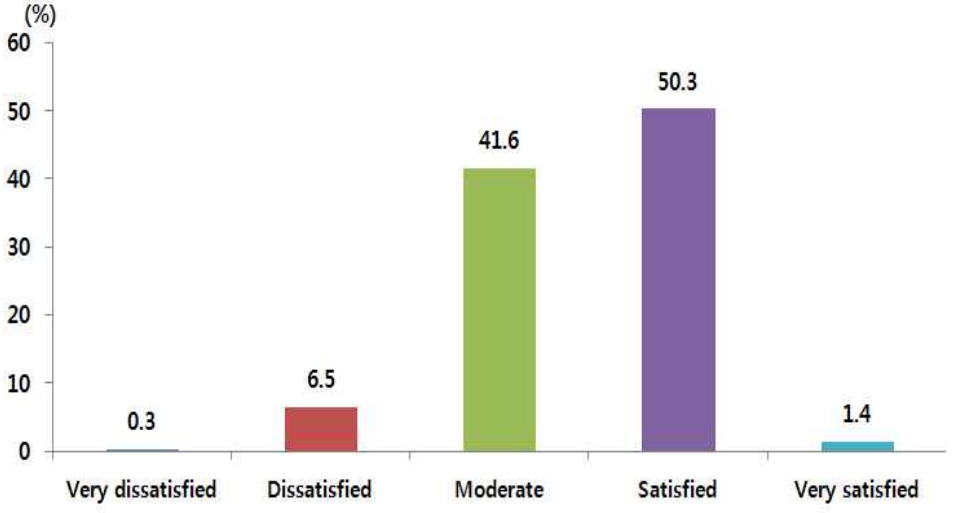
Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care, 2013

Public's Satisfaction on Cancer Care Quality and Cancer-Related Policy

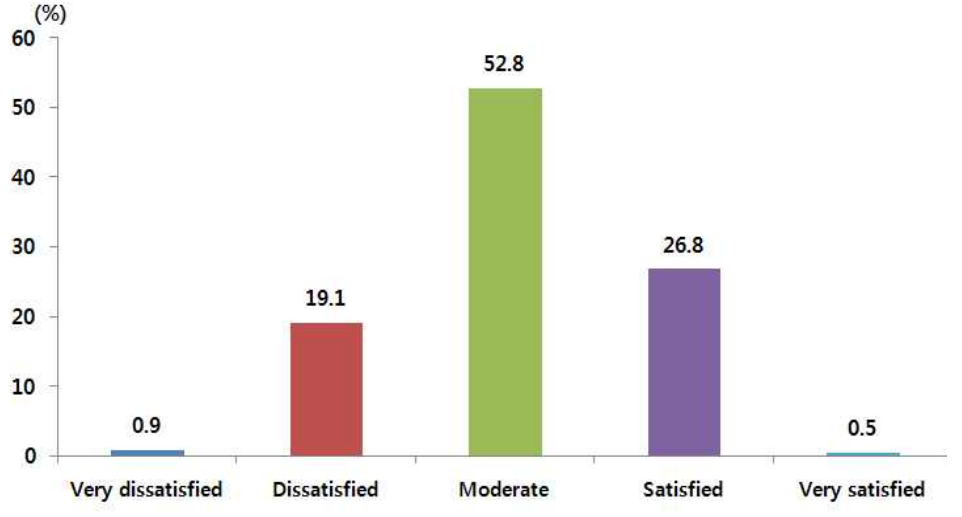
Regarding the overall quality of cancer care, including therapeutic techniques and cancer survival rate, half of the public were satisfied, 41% felt that the level of quality was average, and only 6% were dissatisfied.

26% of the public were satisfied with cancer policies, including cancer screening, benefits, and financial subsidies. About half said moderate satisfaction with cancer-related policies.

Satisfaction on Overall Level of Cancer Care (2012)



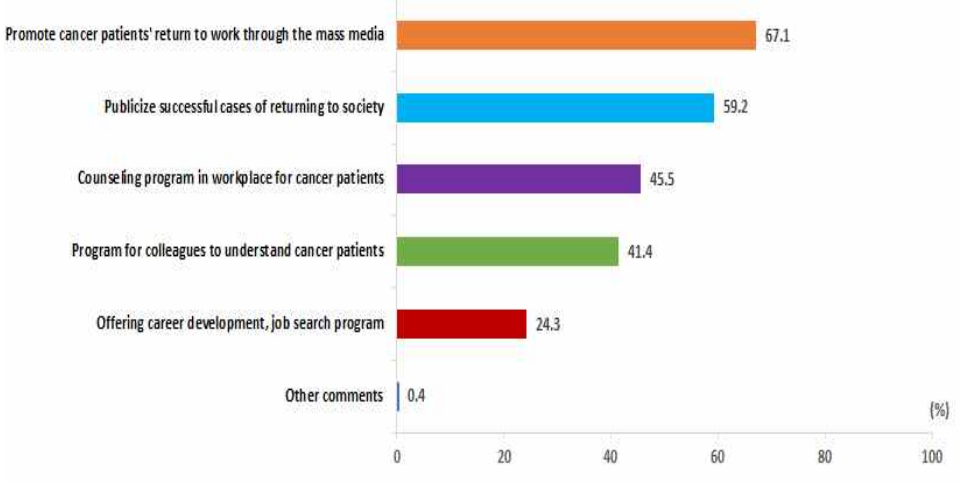
Satisfaction on Overall Policy on Cancer Patients (2012)



Public Opinion on Improving Cancer Patients' Return to Society

For helping cancer patients return to society after treatment, the public thought the most effective way is to 'Promote cancer patients' return to work through the mass media' (67%), followed by 'Publicize successful cases of returning to society' (60%).

Requirements for Improving Awareness of Cancer Patients' Return to Society (2012)



Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care, 2013

5.5 Regional Cancer Center

Locations of Regional Cancer Centers

Regional cancer centers have been implemented to alleviate the symptoms of cancer patients in the provinces, to reverse the relevant infrastructures' tendency to concentrate on Seoul, and to establish a regional cancer control system in accordance with the National Cancer Control Programs.

Between 2004 and 2006, nine national university hospitals in provincial areas were designated as the comprehensive Regional Cancer Centers (RCCs). In 2011, three private university hospitals were selected as specialized RCCs. As of 2017, 12 RCCs are in operation.

- 2004: Jeonnam (Chonnam National Univ. Hwasun Hospital),
  Jeonbuk (Chonbuk National Univ. Hospital),
  Gyeongnam (Gyeongsang National Univ. Hospital)
- 2005: Busan (Pusan National Univ. Hospital),
  Daejeon (Chungnam National Univ. Hospital),
  Daegu/Gyeongbuk (Kyungpook National Univ. Medical Center)
- 2006: Gangwon (Kangwon National Univ. Hospital),
  Chungbuk (Chungbuk National Univ. Hospital),
  Jeju (Jeju National Univ. Hospital)
- 2011: Incheon (Gachon Univ. Gil Medical Center),
  Gyeonggi (Ajou Univ. Hospital),
  Ulsan (Ulsan Univ. Hospital)

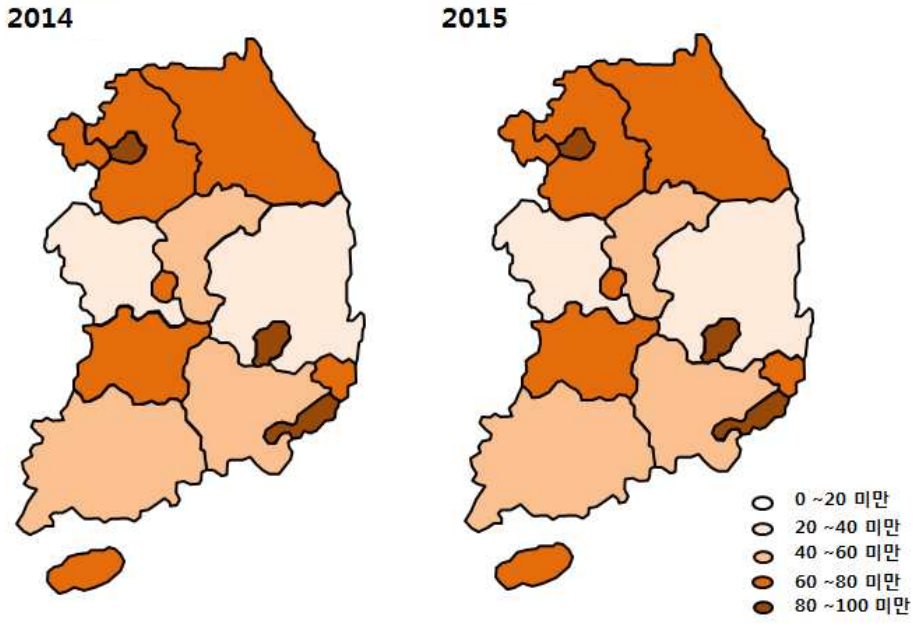
Regional Cancer Centers in Korea

Source) National Cancer Center, 2016

Self-Sufficiency of Cancer Patients[19)]

Self-sufficiency of cancer patients refers to the proportion of the visits cancer patients made to medical institutions in their area of residence. It is an indicator of the pattern of outflow of medical service at the regional level.

Self-Sufficiency of Cancer Patients[20)]



19) Self-sufficiency: The proportion of the visits cancer patients made to medical institutions in their residence area (relevance index (RI): Ratio using the local medical facilities of the medical usage of local residents)

20) NHIS, Registry data of Health Insurance Benefits(2014-2015)

According to the data calculated based on the NHIS's Registry Data of Health Insurance Benefits, the level of self-sufficiency, except for Seoul, was highest in Daegu(89.6%) in 2015 and Gyeongbuk(32.2%) had the lowest level.

Comparing the trends in self-sufficiency levels of 16 cities. and provinces in the country between 2014 and 2015, Gyeongnam's level increased the most (2.7%p), followed by Gangwon (1.7%p) and Chungbuk (1.6%p). In the same period, Meanwhile, Jeju's level decreased the most (-2.8%p).

Trend in Self-Sufficiency Levels in 16 Cities (2014-2015)[21)]

(Unit : %)

Region	Overall		
	2014 (A)	2015 (B)	Change in self-sufficiency(%p)
Seoul	92.5	92.5	0.0
Busan	82.9	80.7	-2.2
Chungbuk	49.8	51.4	1.6
Chungnam (including Sejong)	39.0	39.7	0.7
Daegu	89.2	89.6	0.4
Daejeon	79.4	79.5	0.1
Gangwon	62.9	64.6	1.7
Gwangju	55.0	55.0	0.0
Gyeongbuk	32.2	32.2	0.0
Gyeonggi	60.7	62.2	1.5
Gyeongnam	53.0	55.7	2.7
Incheon	69.0	71.0	2.0
Jeju	76.8	74.0	-2.8
Jeonbuk	72.0	71.1	-0.9
Jeonnam	55.4	56.7	1.3
Ulsan	70.7	71.9	1.2
Average (excluding Seoul)	63.2	63.7	0.5

In 2015, the level of self-sufficiency in 9 regions, except for metropolitan areas, was highest in Gyeonnam(84.8%) and Chungbuk had the lowest level(51.4%).

21) NHIS, Registry Data of Health Insurance Benefits (2014-2015)

Trend in Self-Sufficiency Levels in 9 Regions (2005-2015)

Region	Registry Data of Advanced Disease[22]									Registry Data[23]	
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Metropolitan Areas	99.1	98.8	98.6	98.5	98.4	98.5	98.7	98.9	98.9	98.0	98.0
Gangwon	48.3	58.5	62.9	64.4	64.4	61.5	61.6	64.1	62.1	62.9	64.6
Gyeongnam	79.7	81.6	84.4	83.2	82.0	82.6	83.4	84.3	85.3	84.2	84.8
Gyeongbuk	73.5	77.3	80.1	79.6	79.1	78.4	79.2	80.2	79.9	78.7	79.0
Jeonnam	66.2	73.1	79.4	78.0	78.5	77.2	77.7	78.4	79.1	78.9	79.0
Jeonbuk	62.4	69.5	73.0	73.5	72.6	70.7	72.8	73.4	72.9	72.0	71.1
Jeju	51.8	56.6	64.4	67.3	70.9	74.3	74.0	76.5	78.7	76.8	74.0
Chungnam	51.8	58.2	65.6	63.3	63.2	62.2	63.1	64.9	64.9	64.9	65.8
Chungbuk	28.0	40.7	47.4	44.4	44.0	41.8	44.5	48.4	48.7	49.8	51.4
Average (excluding Seoul)	57.7	64.4	69.6	69.2	69.3	68.6	69.6	71.3	71.5	71.0	71.2

*Metropolitan Areas(Seoul, Gyeonggi, Incheon)/ Gangwon/ Gyeongnam(Busan, Gyeongnam, Ulsan)/ Gyeongbuk(Daegu, Gyeongbuk)/ Jeonnam(Gwangju, Jeonnam)/ Jeonbuk/ Jeju/ Chungnam(Daejeon, Chungnam, Sejong)/ Chungbuk

22) NHIS, Registry Data of Health Insurance Benefits (2005-2013)
- It is based on patients registered as advanced cancer and applied to financial assistance for medical expenses including 5-year special medical benefit, at a hospital where they are diagnosed with cancer initially.
- Coverage effective date : 1) definite diagnosis date basis : applied within 30 days since diagnosis, 2) Application date basis : applied after 30 days since diagnosis
- With ongoing a cancer treatment after 5 years, a patient can apply for 5-year special medical benefit as before.

23) NHIS, Registry Data of Health Insurance Benefits (2014-2015)
- It is based on patients with cancer who are hospitalized over 1 time or visit over 3 times within 1 year since diagnosis.
- A region is based on a medical record of patient's first cancer treatment.

Chapter 6.
Palliative Care

6.1 Status of Palliative Care Institutions

Current Status of Palliative Care Institutions

To expand the services of palliative care for terminal cancer patients, the Ministry of Health and Welfare enacted the Notification of Palliative Care Institution Designation Standards in September 2008, and by 2016, 77 palliative care institutions had been established. Since 2005, the Ministry of Health and Welfare has invited public palliative care institutions to be subsidized for their operating expenses.

Current Status of Palliative Care Institutions (2016)

Section	2008	2009	2010	2011	2012	2013	2014	2015	2016
Designated institutions	19	40	42	46	56	54	57	66	77*
Beds	282	633	675	755	893	867	950	1100	1293

*As of December 2016

Source) National Cancer Center, 2016

Designated Palliative Care Institutions (2016)

No.	Region	Name
1	Seoul	Seoul St. Mary's Hospital
2		St. Paul's Hospital
3		Yeouido St. Mary's Hospital*
4		Korea Univ. Guro Hospital
5		National Medical Center
6		Seoul Dongbu Hospital
7		Seoul Bukbu Hospital
8		Seoul Seonam hospital
9		Seoul Seobuk Hospital
10		Seoul Medical Center
11		Jeonjinsang Clinic
12		Jung-Ang Veterans Hospital
13		Korea Cancer Center Hospital
14	Busan	Dongnae St.Mary's Hospital
15		Kosin Univ. Gospel Hospital*
16		Busan St. Mary's Hospital
17		Busan Regional Cancer Center
18		Busan Veterans Hospital
19	Daegu	Keimyung Univ. Dongsan Medical Center
20		Daegu Catholic Univ. Medical Center
21		Daegu·Gyeongbuk Regional Cancer Center
22		Daegu Veterans Hospital
23		Daegu Veterans Hospital
24		Daegu Fatima Hospital
25		Love Tree Clinic*
26	Daejeon	Daejeon St. Mary's Hospital
27		Daejeon Veterans Hospital
28		Daejeon Regional Cancer Center
29	Gwangju	Gwangju Christian Hospital
30		Gwangju Veterans Hospital
31		St. John of God Hospital
32	Incheon	Catholic KwanDong Univ.International St. Mary's Hospital
33		Catholic Univ.of Korea Incheon St. Mary's Hospital
34		Inchon Regional Cancer Center
35		Inha University Hospital

Designated Palliative Care Institutions (2016)

No.	Region	Name
36	Ulsan	Ulsan Regional Cancer Center
37	Gyeonggi	Bucheon St. Mary's Hospital
38		St. Vincent's Hospital
39		Gyeonggi-do Medical Center Uijeongbu Hospital
40		Gyeonggi-do Medical Center Paju Hospital
41		Gyeonggi Regional Cancer Center
42		National Cancer Center
43		National Health Insurance Service Ilsan Hospital
44		Good People Clinic
45		Namcheon Hospital*
46		Mohyeon Center Clinic
47		Saeoreum Hospital
48		Saemmul Hospice Hospital
49		Suwon Christian Clinic
50		Anyang SAM Hospital
51		Metro Hospital
52		G SAM Hospital*
53		Harang Clinic*
54	Gangwon	Calvary Clinic
55		Gangwon Regional Cancer Center
56		Chuncheon Christian Clinic
57	Chungbuk	Cheongju Medical Center
58		Chungbuk Regional Cancer Center
59	Chungnam	Hongseong Medical Center
60	Jeonbuk	Gunsan Medical Center*
61		Namwon Medical Center
62		Design Hospital*
63		Emmaus Charity Hospital
64		Won Hospital*
65		Jeonbuk Regional Cancer Center
66	Jeonnam	Mokpo Jung-Ang Hospital
67		St. Carollo Hospital
68		Suncheon Medical Center
69		Jeonnam Regional Cancer Center

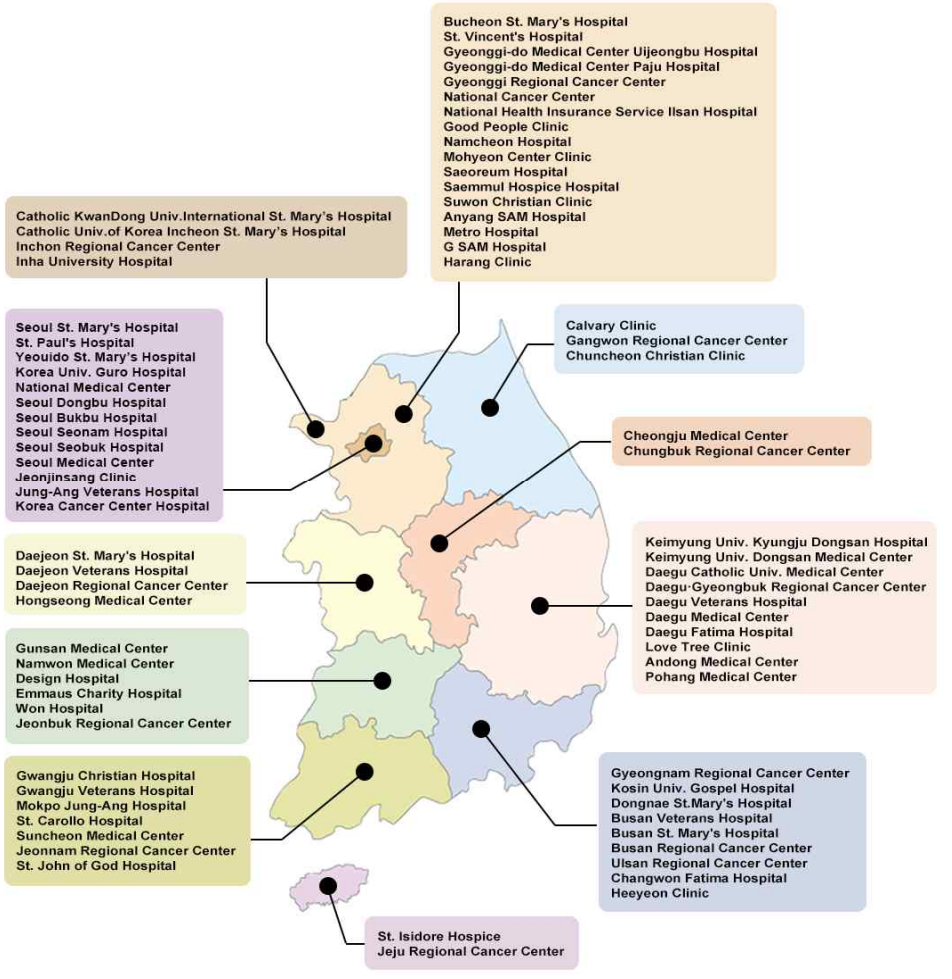
Designated Palliative Care Institutions (2016)

No.	Region	Name
70	Gyeongbuk	Keimyung Univ. Kyungju Dongsan Hospital*
71		Andong Medical Center*
72		Pohang Medical Center
73	Gyeonnam	Gyeongnam Regional Cancer Center
74		Changwon Fatima Hospital
75		Heeyeon Clinic*
76	Jeju	St. Isidore Hospice
77		Jeju Regional Cancer Center

* Designated Palliative Care Institutions in 2016

Source) National Cancer Center, 2016

Designated Palliative Care Institutions (2016)



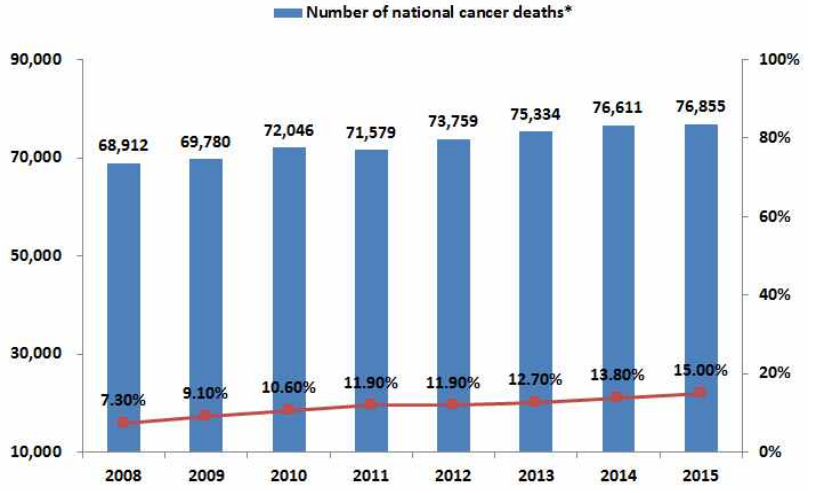
* 77 Palliative Care Institutions are designed in 2016

Source) National Cancer Center, 2016

Utilization of Palliative Care Institution

In 2015, 11,504 cancer patients used 66 palliative care institutions. Among those who died from cancer, 15.0% had used palliative care institutions.

Utilization of Palliative Care Service (2008-2015)



Year	New inpatients*	Number of national cancer deaths**	Rate of Palliative Care Service Utilization***
2008	5,046	68,912	7.3%
2009	6,365	69,780	9.1%
2010	7,654	72,046	10.6%
2011	8,494	71,579	11.9%
2012	8,742	73,759	11.9%
2013	9,573	75,334	12.7%
2014	10,559	76,611	13.8%
2015	11,504	76,855	15.0%

* Source) Palliative care practice status of application, 2009-2016

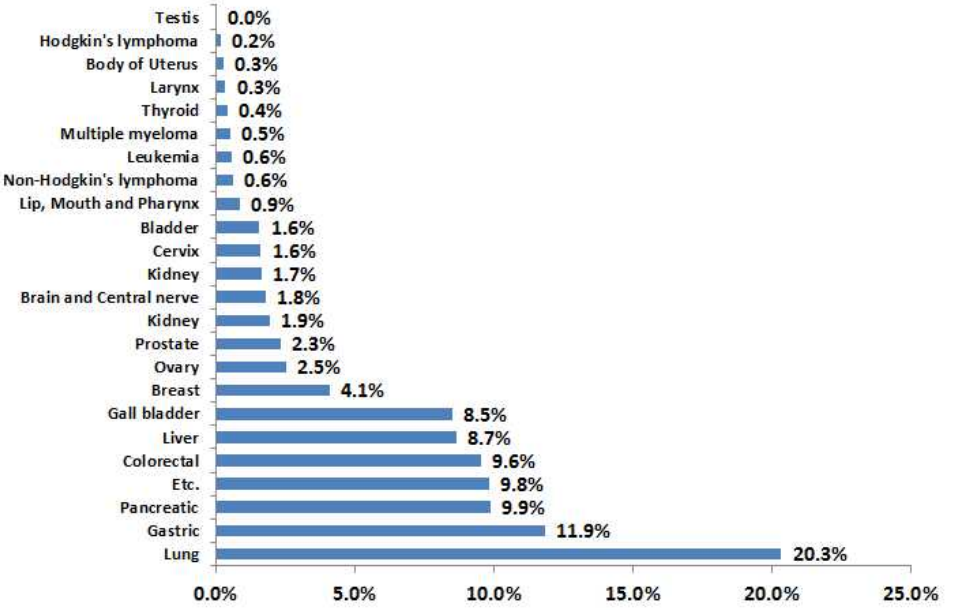
** Source) STATISTICS KOREA. Annual report on the cause of death statistics, 2008-2015

*** (Number of new inpatients / number of national cancer deaths) x 100

Source) National Cancer Center, Support for activation of palliative care service, 2016

In 2016, 14,851 cancer patients used palliative care institutions. According to the types of cancer, the number of lung cancer patients was the highest (3,022, 20.3%), followed by gastric cancer (1,760, 11.9%), pancreatic cancer (1,469, 9.9%), colorectal cancer (1,419, 9.6%), and liver cancer (1288, 8.7%).

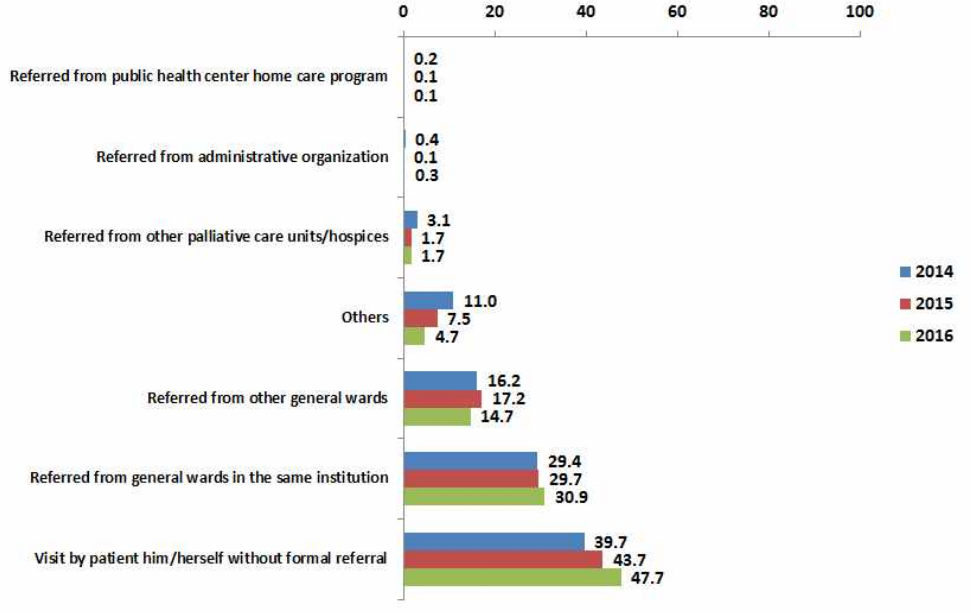
Use of Hospice and Palliative Care Services by Types of Cancer (2016)



Source) National Cancer Center. Support for activation of palliative care service, 2016

As for admission routes of patients who used palliative care institutions in 2016, the highest number of patients visited the institution without formal referral (6,632, 47.7%), followed by patients who were referred from the general wards in the same health institution (4,298, 30.9%), and from other health institutions or wards (2,041, 14.7%).

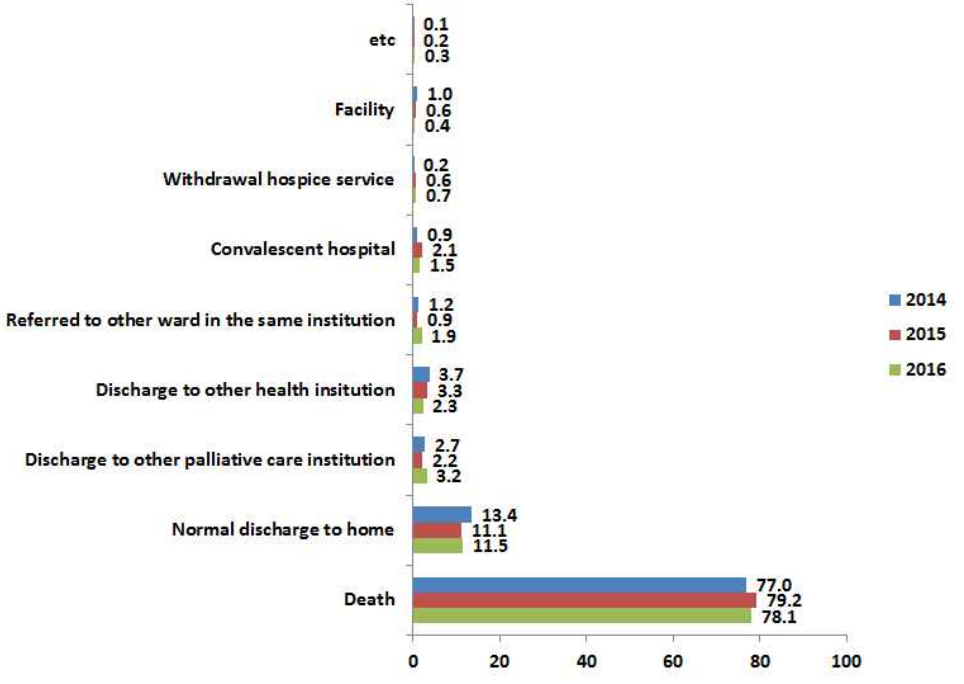
Admission Routes to Palliative Care Institutions (2014-2016)



Source) National Cancer Center. Support for activation of palliative care service, 2016

The most common reason for discharge from initial admission was death (10,748, 78.1%), followed by discharge to home (1,586, 11.5%), and discharge to another health institution (434, 3.2%).

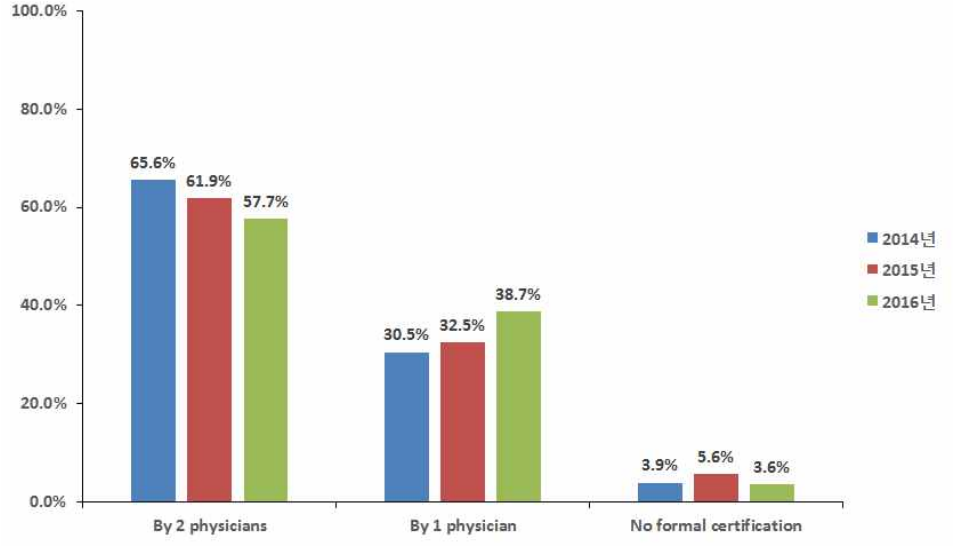
Reasons for Discharge from Palliative Care Institution (2014-2016)



Source) National Cancer Center. Support for activation of palliative care service, 2016

Regarding the status of terminal diagnosis or physician's note, 8,563 patients (57.7%) were diagnosed by two or more physicians, 5,751 (38.7%) were diagnosed by one physician, and 538 (3.6%) did not receive a diagnosis.

Status of Terminal Cancer Diagnosis (2014-2016)



Source) National Cancer Center. Support for activation of palliative care service, 2016

Patients' awareness of terminal cancer changed from 77.5% in 2015 to 77.9% in 2016, implying that the level of awareness is still insufficient.

Awareness of Terminal Cancer (2014-2016)

Source) National Cancer Center. Support for activation of palliative care service, 2016

Overall Satisfaction of Bereaved Family Using Palliative Care Institutions

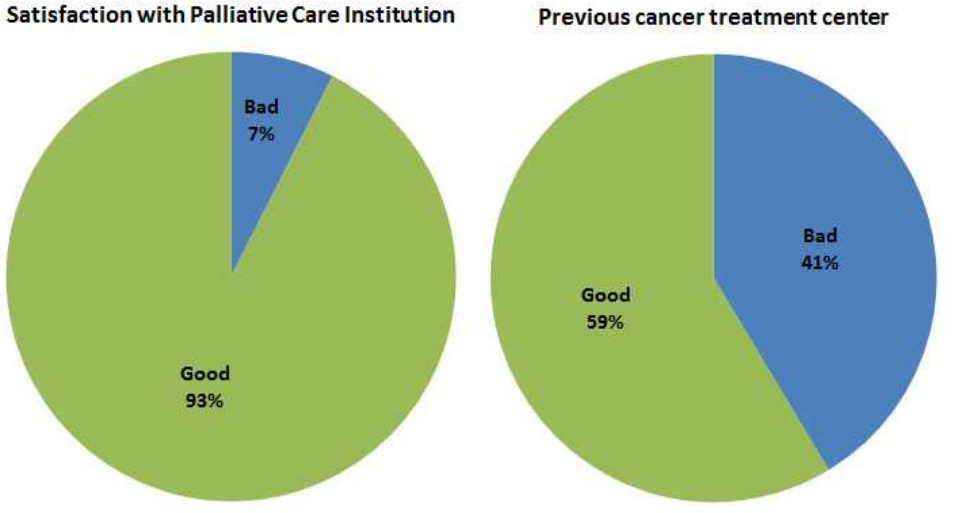
1. Purpose of the survey

To assess the overall satisfaction of bereaved families how had used palliative care institutions regarding the service quality and general experience.

2. Details and results

In 2015, 59% of patients said that they were satisfied with cancer centers they had previously used. In comparison, 93% of patients said they were satisfied with palliative care institutions.

Satisfaction with Palliative Care Institution (2015)



Source) National Cancer Center. Support for activation of palliative care service, 2016

Assessment of End-of-life

According to the result of a survey on the satisfaction of patients who used palliative care institutions, more than 70% of the respondents were satisfied with the physicians and palliative care teams in terms of their proper handling, expert knowledge, skill, and teamwork. Non-waiting hospitalization received the lowest level of satisfaction (63.5%).

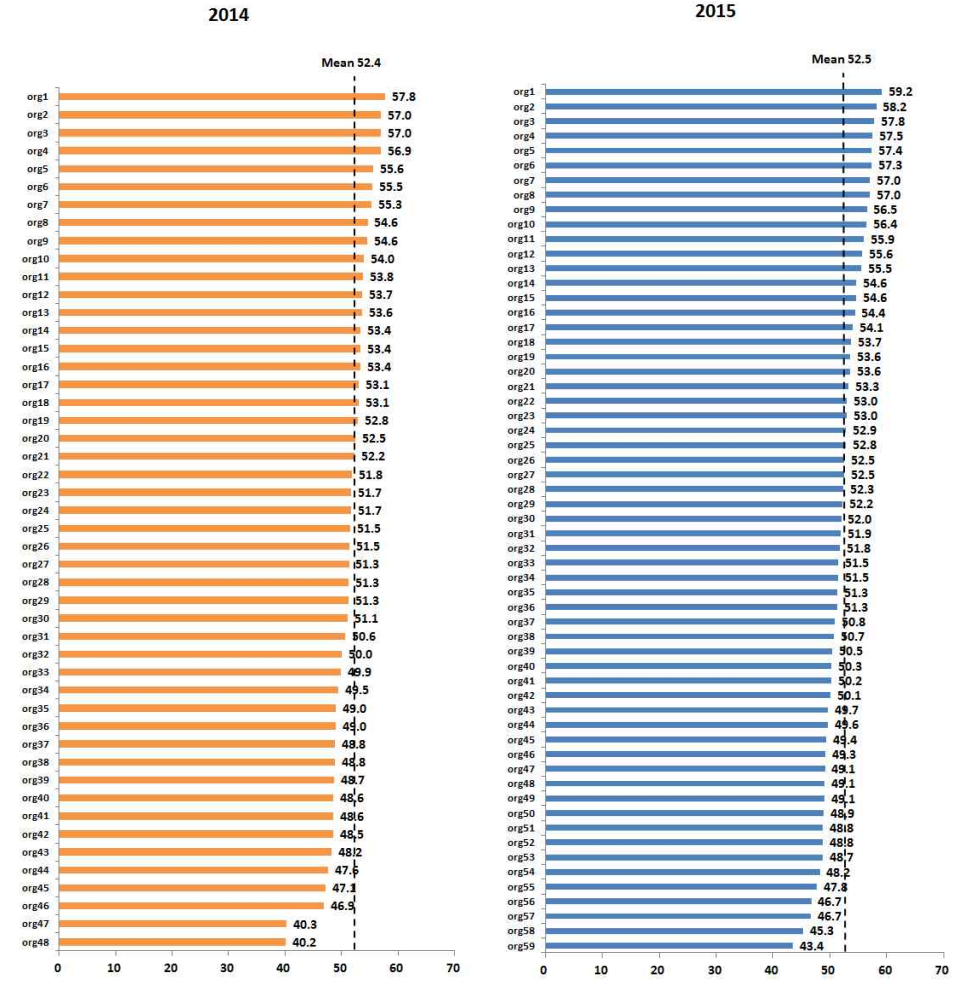
Assessment of End-of-life (2013-2015)

	2013		2014		2015		P-value
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
1) Physician's swift action	74.8	19.7	74.7	19.5	77.0	19.3	<0.01
2) Nurse's expert knowledge and skill	76.5	19.5	76.9	18.7	78.2	19.4	0.05
3) Palliative care team's effort to meet patient's needs	77.8	20.5	77.2	19.3	79.0	19.5	0.08
4) Physician's explanation to patient	71.0	23.5	71.7	22.6	73.8	22.6	<0.01
5) Physician's explanation to patient's family	76.6	21.2	77.7	21.5	79.4	20.5	<0.01
6) Convenient and pleasant facility	72.5	23.4	73.5	22.8	73.7	23.0	0.33
7) Consideration for maintaining health	69.6	23.0	71.1	22.0	71.9	23.0	0.03
8) Reasonable cost	73.4	21.1	74.9	20.7	77.8	20.9	<0.01
9) Non-waiting hospitalization	63.0	26.6	65.1	25.6	63.5	27.1	0.15
10) Palliative care teamwork	75.8	20.3	76.6	19.2	78.0	19.9	0.02
11) Social worker's offer proper advice or service to patient and patient's family	.	.	73.8	22.4	75.2	22.2	0.11

Measurement tool: (Care Evaluation Scale) short version with 11 items
and 6-point scale : 0 (Strongly Disagree) – 20 (Disagree) – 40 (Slightly Disagree)
– 60 (Slightly Agree) - 80 (Agree) – 100 (Strongly Agree)

The end-of-life quality score varied significantly among palliative care institutions from 40.2 to 57.8 (p<0.001) in 2014, and from 43.4 to 59.2 (p<0.001) in 2015.

Assessment of End-of-life (2014-2015)



* The end-of-life quality score: GDI 1-10 sum of score, 0-70

※Average end-of-life quality score among all institutions: 52.4 (2014), 52.5 (2015)

※Excludes institutions with less than 3 available answers

Source) National Cancer Center. Support for activation of palliative care service, 2016

6.3 Training Status of Palliative Care Manpower

Current Status of Palliative Care Manpower Training

The standard training program has developed from 2006 to 2008 and had pilot test in late 2008. It has operated around palliative care institutes and local cancer centers from 2009 with e-learning program which has started from 2011.

Status of Palliative Care Manpower Training

		2014	2015	2016	Total
		Number of completion			
Standard training	Doctor	48	81	353	482
	Nurse	209	248	1284	1741
	Social worker	36	52	293	381
	Priest	30	31	146	207
	Other	81	43	122	246
e-Learning	Doctor	97	157	446	700
	Nurse	179	449	1374	2002
	Social worker	28	120	202	350

Source) National Cancer Center, 2016

Chapter 7.
Information on Cancer Statistics

7.1 Information·Education for Cancer

Cancer information provided by National Cancer Information Center

According to the number of construction for cancer information database from 2003 to 2014, the database of 17 cancers are constructed in 2003, and increasing annually until 2014, total 100 cancers are constructed. Also, continually renewing the existing construction for cancer to provide the latest information.

Status of Construction of Cancer Information Databases (2003-2014)

Year	Development Statement	Detailed Statement
2003	17 cancers	Stomach cancer, lung cancer, liver cancer, colorectal cancer, breast cancer, thyroid cancer, cervical cancer, pancreatic cancer, bladder cancer, prostate cancer, kidney cancer, brain tumor, laryngeal cancer, young child leukemia, young child lymphoma, neuroblastoma, Wilms tumor
2004	5 cancers	Oral cancer, gallbladder cancer, biliary tract cancer, choroid melanoma, carcinoma of the small intestine, pharynx cancer
2005	7 cancers	Acute myelocyte leukemia, acute lymphoblastic leukemia, acoustic neurinoma, spinal cancer, pituitary adenoma, metastatic brain tumor, neuroglioma

Year	Development Statement	Detailed Statement
2006	11 cancers	Brain tumor in childhood, epithelial squamous cell cancer, basal cell carcinoma, malignant melanoma, mycosis fungoides, epithelial ovarian cancer, chronic myeloid leukemia, multiple myeloma, myelodysplastic syndrome, ureter cancer, pudendum cancer
2007	10 cancers	Malignant lymphoma, endometrial cancer, gestational trophoblastic disease, testis cancer, gastric lymphoma, non-small-cell lung cancer, esophageal cancer, small-cell lung cancer, uterine sarcoma, gastrointestinal stromal tumor
2008	12 cancers	Vaginal cancer, germ cell tumors of the ovary, skin cancer, parathyroid carcinoma, salivary gland cancer, unknown primary neoplasm, penile carcinoma, retinoblastoma, rectal carcinoid tumore, gastric carcinoid tumor, tonsillar cancer, eye tumor
2009	13 cancers	Sarcoma, rectal cancer, anal carcinoma, gallbladder cancer, biliary tract cancer, colorectal cancer, urethra cancer, malignant bone tumor, male breast cancer, adrenal gland cancer, malignant soft-tissue tumor, meningioma, glioblastoma multiforme
2010	5 cancers	Thymus cancer, tongue cancer, lung adenocarcinoma, lung squamous epithelium cell, thymus cancer
2011	5 cancers	Chronic lymphoblastic leukemia, malignant mesothelioma, Intrahepatic cholangiocarcinoma, ampullar of vater cancer, astrocytoma

Year	Development Statement	Detailed Statement
2012	5 cancers	Duodenal cancer, metastatic bone tumor, pseudomyxoma, sinonasal cancer, diffuse large B-cell lymphoma
2013	5 cancers	Lip cancer, non-Hodgkin's lymphomas, heart cancer, pleura cancer, Kaposi's sarcoma
2014	5 cancers	Ureter cancer, Paget's disease, hepatoblastoma, mediastinal cancer, rhabdomyosarcoma

Source) National Cancer Information Center http://www.cancer.go.kr 2016

Other types of cancer by National Information Center

	Detailed Statement
Prevention and Screening	Common cancer prevention, No smoking, Diet, Drinking, Exercise, Health weight, Infection, Occupational cancer, National cancer screening, Cancer Screening Recommendations, Carcinogen information
Management Information	Rehabilitation, Symptom management, Diet
Cancer Statistics	Incidence, Mortality, Survival rate, Prevalence
Educational Materials	Leaflet, Brochure, Video, Image (infographic, etc.), FAQ
Support program	Regional cancer center, Financial aid program, Hospice service, etc.

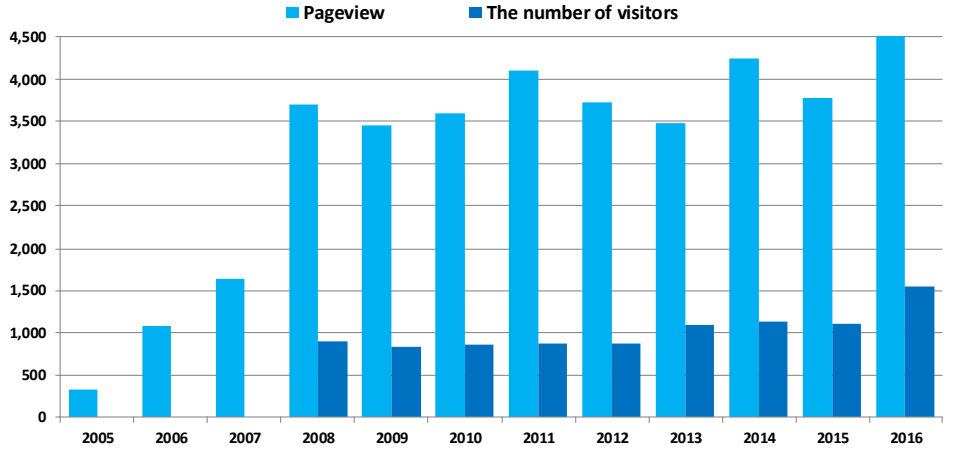
Source) National Cancer Information Center http://www.cancer.go.kr 2015

Cancer Information Service

▪ Internet Service for Cancer Information

The number of visitors who are using the internet service (www.cancer.go.kr) for cancer information from National Cancer Information Center in 2016 is 1,547,000 and the number of pageview is 4,833,000.

The number of visitors and internet pageview of National Cancer Information Service(2005~2016)



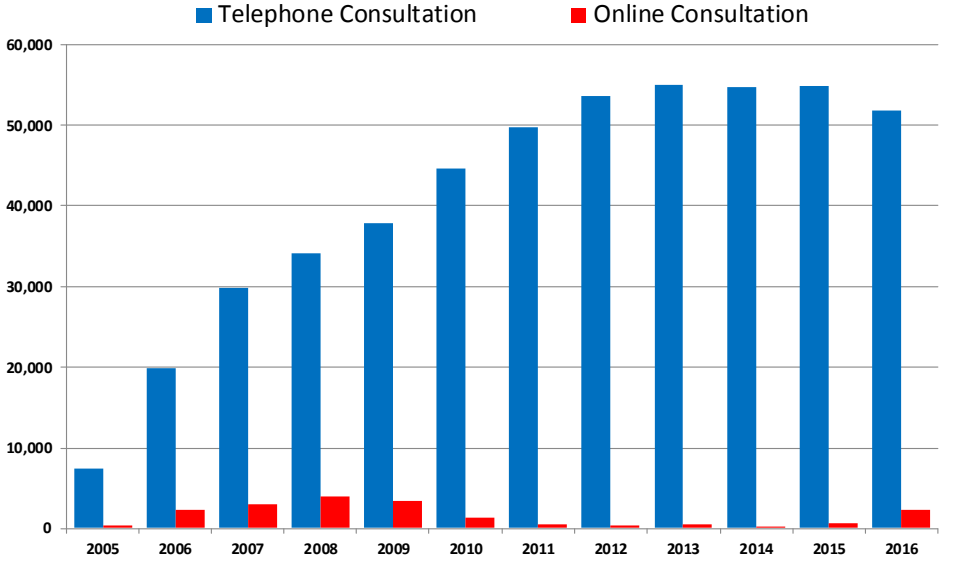
※ The Log Analysis begins on January in 2008

Source) National Cancer Information Center http://www.cancer.go.kr 2016

▪ Counseling Service for Cancer Information

In 2016, the number of telephone consultation(1577-8899) among the counseling service for cancer information is 51,870 and the number of online consultation is 2,277.

Number of Telephone and Online Consultations of National Cancer Information Service (2005-2016)



Source) National Cancer Information Center http://www.cancer.go.kr 2016

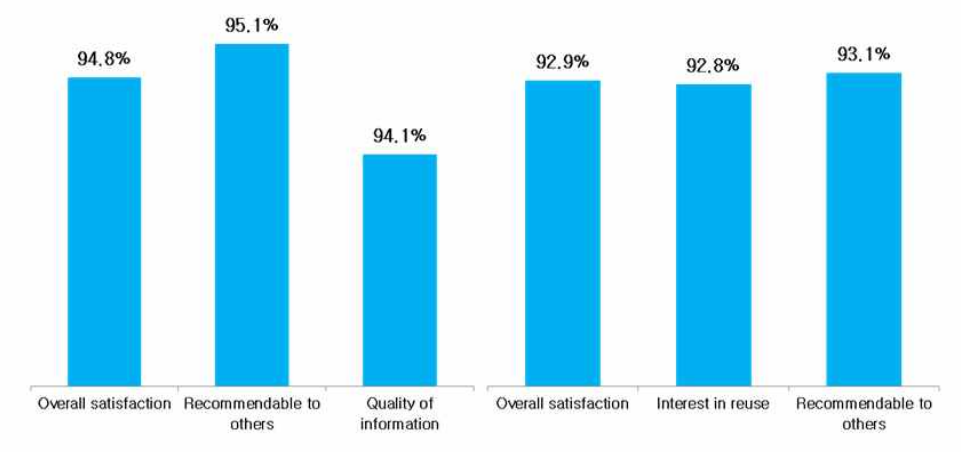
Cancer Information Internet and Telephone Counseling Service Satisfaction

In 2016, an annual user satisfaction survey of cancer information Internet service of National Cancer Information Center was conducted. A total of 1,690 answered.

Users' satisfaction on national cancer information service through Internet was 94.8%.

From a survey of randomly selected 1,200 people among 51,870 users of telephone counseling service, overall user satisfaction result was 92.9%.

User Satisfaction with the Cancer Information Telephone Service (2016)



[User Satisfaction of Internet Service] [User Satisfaction of Telephone Service]

Source) National Cancer Information Center http://www.cancer.go.kr 2016

Number of Developed Cancer Information Educational Materials

From 2006 to 2016, educational materials about cancer information has been developed. Starting with development of leaflets to explain cancer and cancer screening in 2006, a total of 139 educational materials has been developed, including twelve materials which were developed in 2016.

Number of Cancer Information Educational Materials Developed (2006-2016)

Year	Number of development	Details
2006	28	Cancer description (11) - Cancer, stomach cancer, liver cancer, colorectal cancer, breast cancer, cervical cancer, lung cancer, thyroid cancer, pancreas cancer, bile duct·gallbladder cancer, prostate cancer
		Leaflets for cancer screening (6) - Cancer, stomach cancer, liver cancer, colorectal cancer, breast cancer, cervical cancer
		Panel (11) - Understanding cancer, stomach cancer, liver cancer, colorectal cancer, breast cancer, cervical cancer, lung cancer, prostate cancer, National Cancer Information Center, National Cancer Control Program, guidelines of cancer prevention rules
2007	10	Leaflets (5) - Breast self-examination, cancer prevention rules for the public, prevention and control of clonorchis sinensis, cancer prevention and screening, Please speak out about your pain!
		Videos (2) - Breast cancer screening videos, educational videos for esophageal cancer patients

Year	Number of development	Details
		Bookmarks (2) - Pain ruler for doctors, pain ruler for patients
		Pamphlet (1) - Current status and policy recommendations for hospice and palliative care
2008	24	Wobbler (1) - Breast self-examination
		Pamphlet (PDF) (1) - Do the cancer screening in advance, when you are still healthy (5 major cancers)
		Video (1) - Moving beyond breast cancer
		Leaflets (2) - National support program for cancer patients, leaflets for lymphedema: upper limb
		A4 leaflets (11) - Hospice organization for terminal cancer patients, National Cancer Screening Program guide, National Cancer Screening Program, breast self-examination, cancer prevention rules for the public, stomach cancer prevention and screening, liver cancer prevention and screening, colorectal cancer prevention and screening, breast cancer prevention and screening, cervical cancer prevention and screening, 14 recommendations for cancer patients and their families
		Resizing panels (8) - Understanding cancer, stomach cancer, liver cancer, colorectal cancer, breast cancer, cervical cancer, lung cancer, prostate cancer
2009	7	Poster (1) - Please speak out about your pain! Leaflet (1) - National Cancer Information Center leaflet A4 leaflet (1) - What Is Lymphedema? Pamphlet (1) - Buddy Who Will Support You through Cancer? Video (1) - Animation for understanding cancer, cancer screening campaign, 10 rules for cancer prevention

Year	Number of development	Details
2010	8	Leaflet (1) - Lymphedema: lower limb A4 leaflets (2) - Lymphedema: Lymphedema self-measurement, lymphedema - treatment and management of lymphedema Symptom management educational animations for cancer patients (5) - Infection, anorexia, nausea and vomiting, stomatitis, constipation
2011	6	Symptom management educational animations for cancer patients (5) - Lymphedema, bleeding, hand and foot syndrome, alopecia, fatigue Cancer information storytelling picture book (1) - A Great Commotion in the Star of Health
2012	11	Symptom management educational animations for cancer patients (5) - Sexuality, exercise, depression and anxiety, symptom, diet Cancer infographics (5) - Utilization of cancer information, lifestyle and genes, alcohol, cancer incidence rates, cancer prevalence rates·cancer survival rates National Cancer Information Center introduction leaflet (1)
2013	19	Symptom management educational animations for cancer patients (5) - Exercise 2, symptom 2, insomnia, diarrhea, changes in the nervous system Cancer information motion graphic (1) - National Cancer Information Center promotional motion graphic Cancer information UCC (3) - No smoking 1, diet 2 Cancer infographics (10) - 10 common cancers in Koreans
2014	6	Management of patients after breast cancer surgery, management of patients after cervical cancer surgery (2) Cancer prevention Braille book (Know about Cancer, Win against Cancer) (1) Cancer information motion graphic (National Cancer Information Center promotional motion graphic) (1) Cancer information storytelling picture book

Year	Number of development	Details
2015	8	Cancer prevention brochure for Multicultural families(3) Breast self-examination brochure(1) Cancer prevention campaign bridge(3)-screening, diet, exercise National Cancer Information Center promotional motion graphic(1)
2016	12	Cancer prevention audiobook for Multicultural families(3) Cancer prevention audiobook for blind(1) Bone & soft tissue sarcoma brochure(1) National cancer prevention codes animations(5) -screening, Infection, Exercise, No smoking, weight Complement Alternative medicine motion graphic(1) Cancer prevention music video(1)

Source) National Cancer Information Center http://www.cancer.go.kr 2016

7.2 Cancer Registration System in Korea

Cancer Registration System in Korea

Cancer registration in Korea began in 1980 with the Central Cancer Registration Project, which involved compiling cancer data from training hospitals. Since the early 1990s, regional cancer registration projects have been carried out to calculate cancer incidences in respective regions.

In order to accurately calculate cancer-related statistics and constantly monitor related figures, the Ministry of Health & Welfare is conducting national cancer registration and statistics projects with the Korea Central Cancer Registry and 11 regional cancer registries (Busan, Daegu/Geyongbuk, Gwangju/Jeonnam, Incheon, Daejeon (Chungnam, Sejong), Ulsan, Jeju, Gangwon, Chungbuk, Jeonbuk, and Gyeongnam). In addition, clinical and academic societies operate their own cancer registries for various types of cancer.

The Korea Central Cancer Registry has implemented the national cancer incidence database, which includes data from type-specific cancer registries and 11 regional cancer registries. In 2005, the Korea Central Cancer Registry published cancer incidence data for the 1999–2001 period. Since then, the registry has been releasing cancer registration statistics, and regional cancer registries have been producing similar data regarding the citizens of their respective regions.

Population-based Cancer Registries

Source) National Cancer Center, 2016

References

Canadian Cancer Society, Statistics Canada and Provincial/Territorial Cancer Registry. Canadian Cancer Statistics 2016

Center for Cancer Control and Information Services, National Cancer Center, Monitoring of Cancer Incidence in Japan - Survival 2006-2008 report 2014

Cho JH et al. Association between cancer stigma and depression among cancer survivors: a nationwide survey in Korea. Psycho-Oncology 2013; 10

Eom CS et al. Impact of perceived social support on the mental health and health-related quality of life in cancer patients: results from a nationwide. multicenter survey in South Korea. Psycho-Oncology 2013; 22(6)

GLOBOCAN 2012. International Agency for Research on Cancer (IARC) 2013

Howlader N, et al. SEER Cancer Statistics Review, 1975-2013, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2013/, based on November 2015 SEER data submission, posted to the SEER web site, April 2016

IARC. World Cancer Report, 2008

Kim JH et al. Economic burden of cancer in South Korea for the year 2005. J Prev Med Public Health 2009; 42(3): 190-198

Kim SY et al. Factors associated with discontinuation of complementary and alternative medicine among Korean cancer patients. Asian Pacific Journal of Cancer Prevention 2013; 14(1)

Korea Health Statistics. Korea National Health and Nutrition

Examination Survey, 2015

Korea Youth Risk Behavior Web-based Survey, 2016

Ministry of Health and Welfare. Korea Central Cancer Registry (KCCR), Annual Report of Cancer Statistics in Korea in 2014, 2016

National Cancer Center, 2014-2016

National Cancer Center in Japan. Health Statistics in Japan, 2015

National Cancer Center. Korean National Cancer Screening Survey, 2004-2016

National Cancer Center. Palliative care practice status of application, 2009-2016

National Cancer Center. Patient Financial Aid System 2016

National Cancer Center. Quality, Equity, and Coverage in Cancer Care, 2013

National Cancer Center. Support for activation of palliative care service, 2016

National Cancer Center. The survey on Awareness for Cancer Prevention, 2007

National Cancer Center. The survey on Awareness for Cancer Prevention, 2012

National Cancer Center. The survey on Awareness for Cancer Prevention, 2014

National Cancer Center. The survey on Awareness for Cancer Prevention, 2016

National Cancer Institute. Cancer Trends Progress Report, 2015

National Health Insurance Corporation. Analysis on cost of cancer patients, 2015

NHS Cancer Screening Programmes. NHS Breast Screening Programme Annual Review, 2013-14

NHS Cancer Screening Programmes. NHS Breast Screening Programme Annual Review, 2015

NHS Cancer Screening Programmes. NHS Cervical Screening Programme Annual Review, 2013-14

NHS Cancer Screening Programmes. NHS Cervical Screening Programme Annual Review, 2015

NHIS, Registry data of Health Insurance Benefits(2014-2015)

OECD. OECD Health Data, 2013

Park S, et al. Attributable fraction of tobacco smoking on cancer using population-based nationwide cancer incidence and mortality data in Korea. BMC Cancer. 2014 Jun 6;14:406.

Shin A, et al. Population attributable fraction of infection-related cancers in Korea. Ann Oncol. 2011 Jun;22(6):1435-42.

Park S, et al, Attributable fraction of alcohol consumption on cancer using population-based nationwide cancer incidence and mortality data in the Republic of Korea. BMC Cancer. 2014 Jun 10;14:420.

Park S, et al. Population-attributable causes of cancer in Korea: obesity and physical inactivity. PLoS One. 2014 Apr 10;9(4):e90871.

Shin DW et al. Preferences for and experiences of family involvement in cancer treatment decision making: patient-caregiver

dyads study. Psycho-Oncology 2013; 22(11)

Park BY et al. Prevalence and predictors of anxiety and depression among family caregivers of cancer patients: a nationwide survey of patient-family caregiver dyads in Korea. Supportive care in Cancer 2013; 21(10)

Park BY et al. Suicidal ideation and suicide attempts in anxious or depressed family caregivers of patients with cancer: a nationwide survey in Korea. PLos One 2013; 8(4)

STATISTICS KOREA, 2016

STATISTICS KOREA. Annual Report on The Cause of Death Statistics, 2008-2016

Yang HK et al. The association between perceived social support and continued smoking in cancer survivors. Japanese Journal of Clinical Oncology 2013; 43(1)

Contributors

Directing Duk Hyoung Lee

Editorial Office Cancer Policy Branch, National Cancer Center

Ahn, Eun Mi	Chang, Yoon Jung	Cho, Hyunsoon
Choi, Jin Young	Choi, Kui Son	Hwang, Sung Ho
Jun, Jae Kwan	Jung, Kyu-won	Kim, Byung Mi
Kim, Yeol	Kim, Young Ae	Kong, Hyun-Joo
Kwon, Jeoung A	Kye, Su Yeon	Lee, Jae Wook
Lim, Jun Tae	Lim, Min-Kyung	Oh, Chang-Mo
Oh, Jin Kyung	Oh, Kyung Hee	Park, BoYoung
Park, Eun Young	Park, Keeho	Suh, Mina
Won, Young-Joo	Yang, Hyung-Kook	Yun, E Hwa

Cancer Facts & Figures 2017

Date of Publication	March 2017 (1st edition)
Publisher	Minister for Health and Welfare President of National Cancer Center
Address	Ministry of Health and Welfare, 13 Doum 4-ro, Sejong, 339-012, Republic of Korea National Cancer Center, 323 Ilsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, Republic of Korea
Contact	Telephone +82-31-920-2961 Fax +82-31-920-2949 E-mail 12367@ncc.re.kr
Website	www.ncc.re.kr

ISSN 2834-311X