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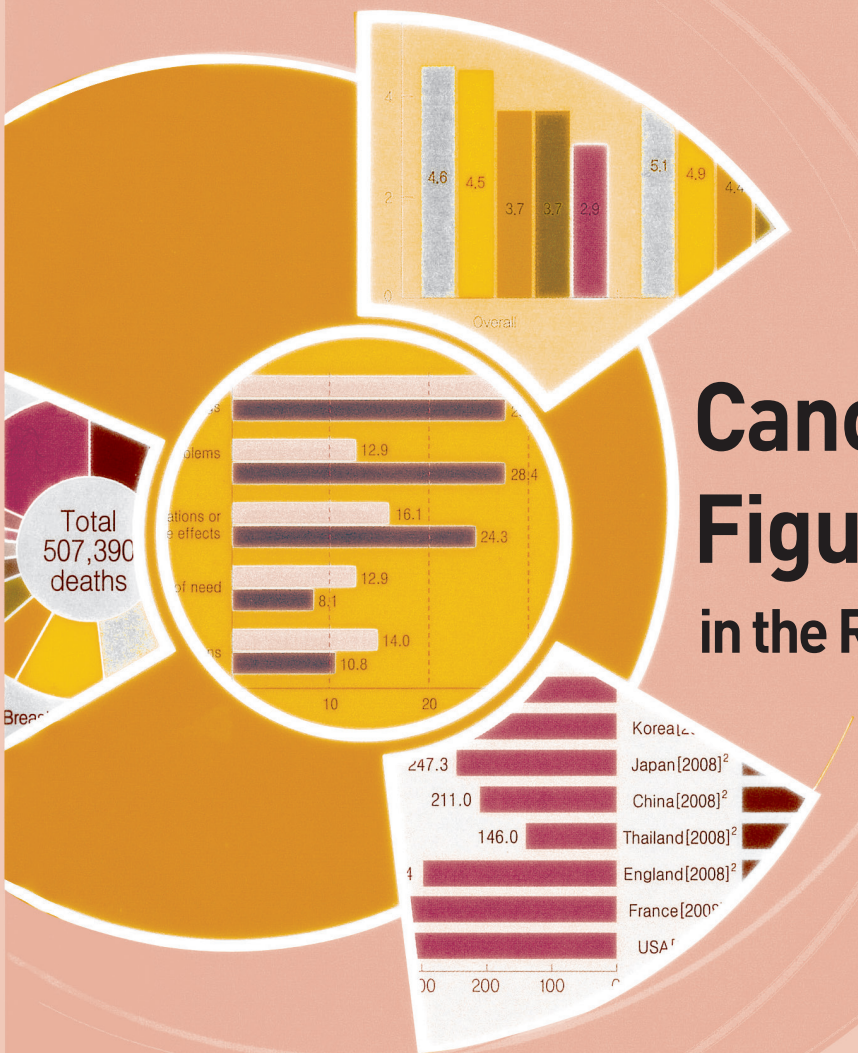


Cancer Facts & Figures 2014

in the Republic of Korea

MINISTRY OF HEALTH & WELFARE
REPUBLIC OF KOREA

NATIONAL CANCER CENTER

Cancer Facts & Figures 2014

Foreword

Cancer is the leading cause of death in Korea. Furthermore, the number of deaths caused by cancer is expected to increase due to country's aging population and changing lifestyles. According to the World Health Organization, however, at least one-third of all cancer cases are preventable, another third can be completely cured with early diagnosis and treatment, and even the rest can be overcome with adequate treatment. The Korean government established the First 10-Year Plan for National Cancer Control in 1996 to implement an infrastructure for fighting cancer. In 2006, the Second 10-Year Plan for National Cancer Control was announced and is currently being driven by public and private sectors.

Founded in 2000 as part of the nationwide effort to fight cancer, the National Cancer Center strives to lower cancer incidence and mortality rates of Korean citizens and to improve the quality of life for patients with cancer by performing research, providing treatment , supporting national cancer control projects, and training and educating cancer treatment professionals. In particular, the National Cancer Center is actively supporting the Second 10-Year Plan for National Cancer Control by developing cancer control policies, conducting research projects, and strengthening collaborative networks in Korea and abroad among medical facilities and international organizations specializing in cancer research and treatment.

The latest publication from the National Cancer Center is titled Cancer Facts & Figures in the Republic of Korea 2014. It is a compilation of cancer-related reports, academic papers, and data published in Korea. The publication also explains that the National Cancer Control Project is administered by the National Cancer Control Project Division at the National Cancer Center. Cancer Facts & Figures in the Republic of Korea 2014 offers helpful information about the current state control projects, providing a direction for future projects focused on fighting and controlling cancer.

It is our sincere hope that Cancer Facts & Figures in the Republic of Korea 2014 serves as a pedestal for conquering cancer not only in Korea but also in other countries throughout Asia and across the globe. I would like to express my sincere appreciation to the staff and associates of the National Cancer Center who have made this publication possible.

May 2014

Jin-Soo Lee, M.D., Ph.D

President, National Cancer Center

Contents

Chapter 1.
The Second 10-year Plan for National Cancer Control

1.1 The Second 10-year Plan for National Cancer Control (Revised)

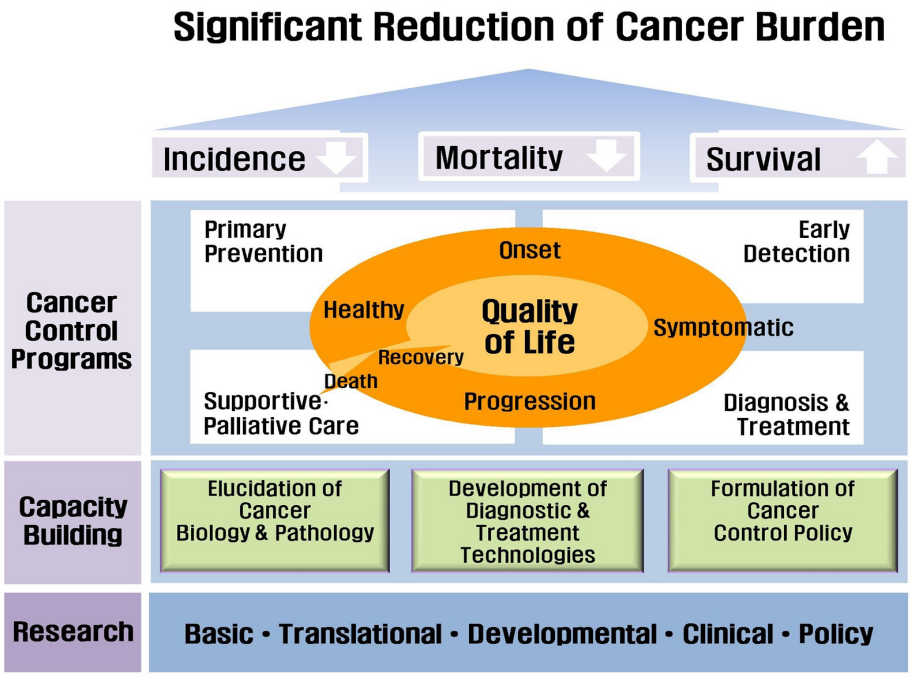
Following the First 10-year Plan for National Cancer Control (1996 to 2005), the Korean government implemented the Second 10-year Plan for National Cancer Control (2006 to 2015) for effective control and management of cancer at the national level.

The Revised Second 10-year Plan for National Cancer Control (2011 to 2015) incorporates the results of the progress evaluation performed in 2011, which covers the first five years (2006 to 2010), as well as modifications made to the original plan based on the latest data and information. The significance of the revised plan is that it provides a system for actively driving the national cancer control project to reduce the burden of cancer for citizens by strengthening measures against cancer mortality and slowing or stemming the increased incidence rate caused by the aging population and the changes in the disease structure.

With a vision of minimizing cancer incidences and deaths through comprehensive cancer control, the objective of the Revised Second 10-Year Plan for National Cancer Control is to reduce the cancer mortality rate and increase the survival rate. In order to achieve this objective, projects in various areas have been undertaken, including intensified cancer prevention by focusing on management of risk factors, cancer screening for every citizen, assurance of cancer treatment and improvements in the quality of treatment, support for rehabilitation and palliative care, building infrastructures for active national cancer control, developing

cutting-edge technologies for cancer diagnosis and treatment, providing educational and promotional programs to every citizen, and systematic cancer registration and management.

The Second 10-year Plan for National Cancer Control



Source) Ministry of Health & Welfare, 2011

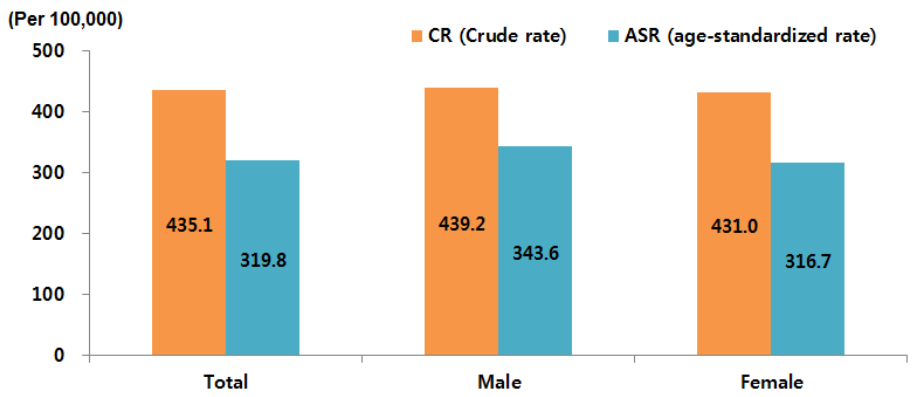
Chapter 2.
Basic Facts

2.1 Cancer Incidence

Cancer Incidence Rates

In Korea, the age-standardized cancer incidence rate in 2011 was 319.8 per 100,000 individuals (343.6 for males and 316.7 for females).

Cancer Incidence Rates (2011)



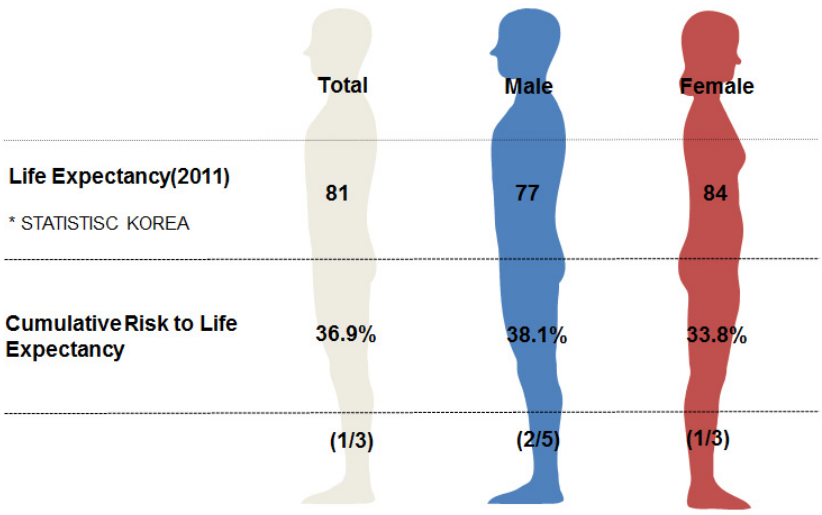
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

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 36.9%. The risk for males was higher than that for females at 38.1% and 33.8%, respectively.

Cumulative Risk of Cancer (2011)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

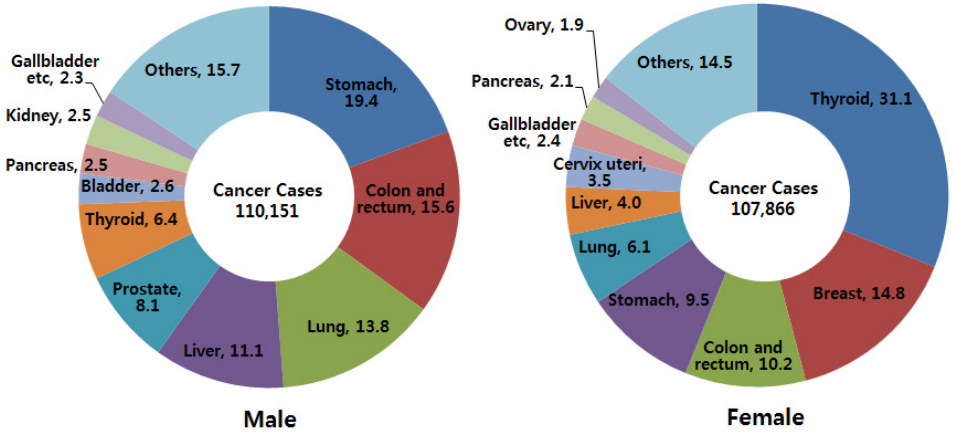
Proportion of Cancer Incidences

In males, stomach cancer occurred most frequently, accounting for 19.4% of all cases, followed by colon and rectum cancer (15.6%), lung cancer (13.8%), and liver cancer (11.1%).

In females, thyroid cancer occurred most frequently, accounting for 31.1% of all cases, followed by breast cancer (14.8%), colon and rectum cancer (10.2%), stomach cancer (9.5%), and lung cancer (6.1%).

Proportion of Cancer Incidences (2011)

(Unit: %)



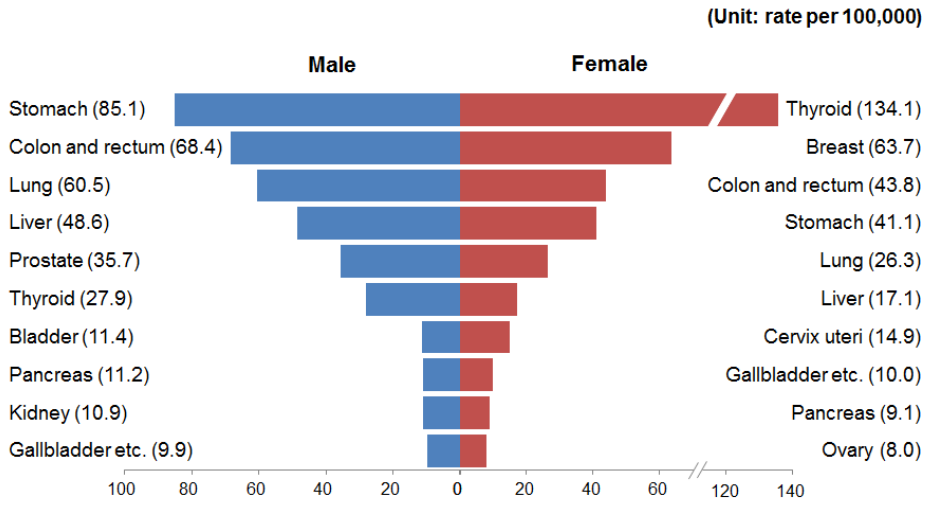
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

Site-Specific Cancer Incidence Rates by Gender

In males, the crude incidence rate[1)] of stomach cancer was 85.1 per 100,000 individuals. The incidence rates for colon and rectum, lung, and liver cancers were 68.4, 60.5, and 48.6, respectively.

In females, the crude incidence rate of thyroid cancer was 134.1. The incidence rates for breast, colon and rectum, and stomach cancers were 63.7, 43.8, and 41.1, respectively.

Crude Rates of the Top 10 Cancer Sites by Gender (2011)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

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

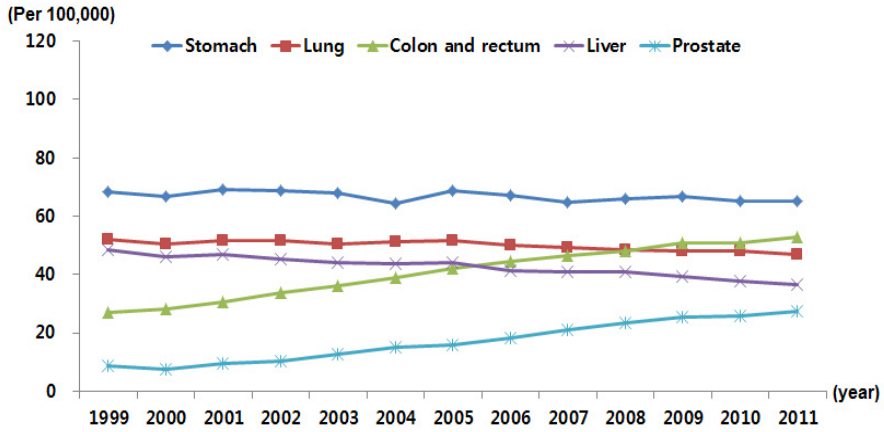
Trends in Age-standardized Incidence Rates of Major Cancers

From 1999 to 2011, the total incidence rate for all cancers increased by 1.6% and 5.7% each year in males and females, respectively.

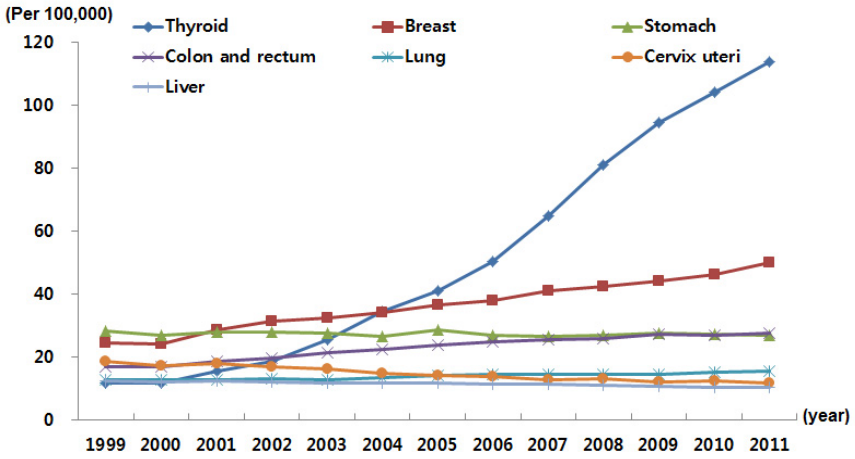
In males, rates of liver and lung cancers decreased, while those of thyroid, prostate, and colon and rectum cancers increased by 25.0%, 12.1%, and 6.1%, respectively.

In females, rates of cervix uteri and liver cancers decreased, but the rate of thyroid cancer sharply increased by 23.5% each year, and the rates of breast, colon and rectum and lung cancers also increased.

Trends in Age-standardized Incidence Rates of Major Cancers: Male



Trends in Age-standardized Incidence Rates of Major Cancers: Female



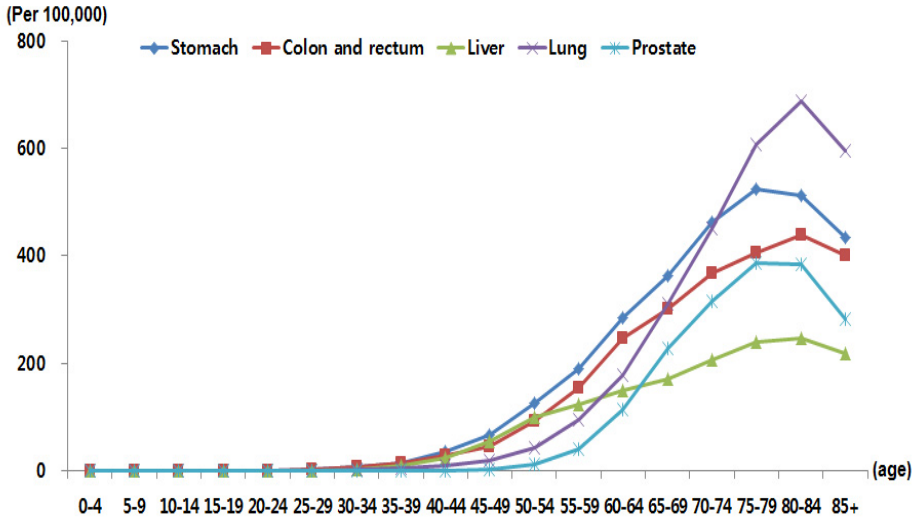
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

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

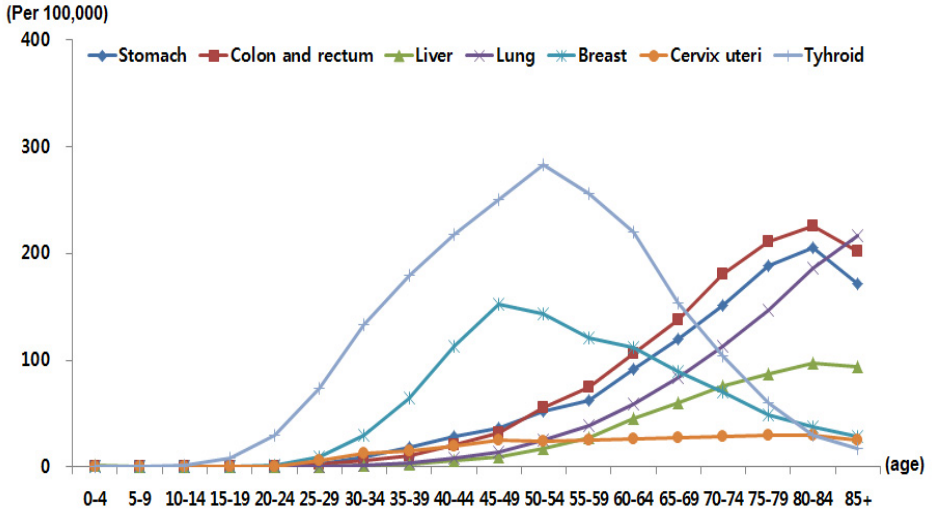
Age-specific Incidence Rates of Major Cancers According to Gender

According to the incidence rates of major cancers in various male age groups examined in 2011, the most frequent types of cancer were stomach and liver cancers in the 40-49 age group, and lung cancers in the 70 and older age group. For females, thyroid cancer had the highest incidence for those under 65, and colon and rectum cancers had the highest incidences for those 70 and older.

Age-specific Cancer Incidence Rates: Male (2011)



Age-specific Cancer Incidence Rates: Female (2011)

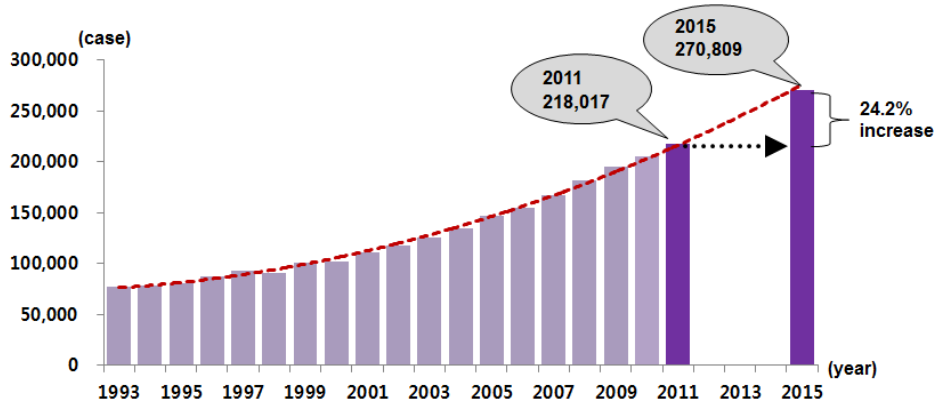


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

Projection of Cancer Incidences

The total number of cancer cases is expected to increase from 218,017 in 2011 to 270,809 in 2015, a 24.2% increase over the four-year period.

Projection of Cancer Incidences

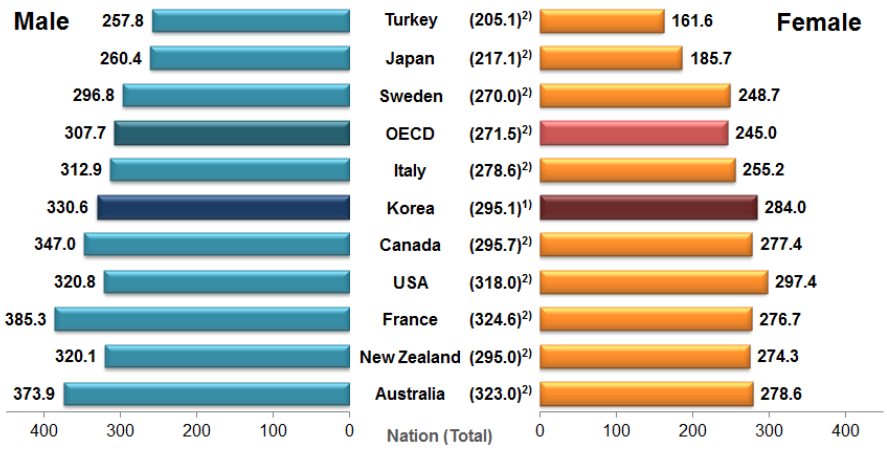


Source) National Cancer Center, 2010

Comparison of Age-Standardized Cancer Incidence Rates with Other Countries

The age-standardized cancer incidence rate of Korea is higher than that of Japan but lower than that of the United States for both males and females.

International Comparison of Cancer Incidence Rates



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

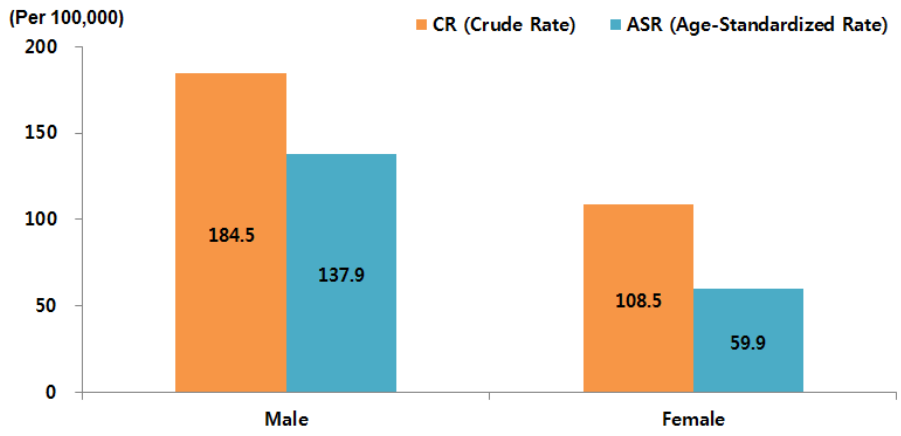
Note) Age-standardized incidence rates use the world standard population, and exclude other malignant neoplasms of the skin (C44)

2.2 Cancer Mortality

Cancer Mortality Rates

The age-standardized cancer mortality rates in Korea in 2012 were 137.9 per 100,000 males and 59.9 per 100,000 females.

Cancer Mortality Rates (2012)



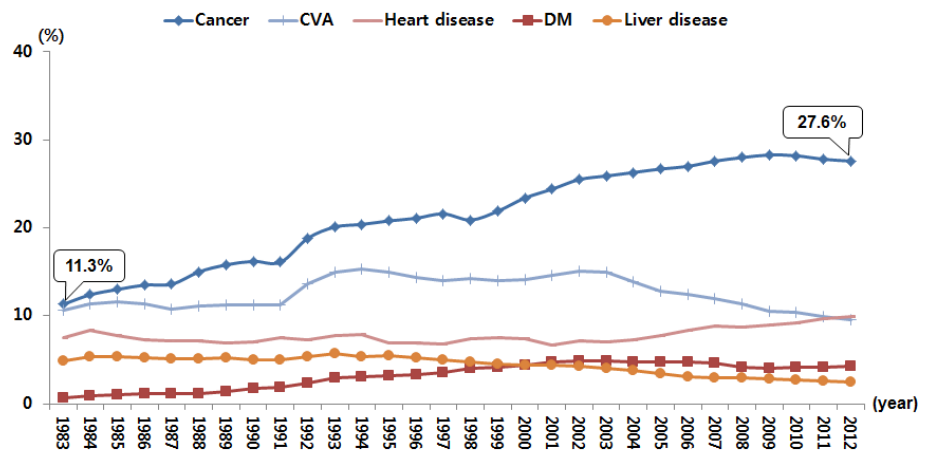
Source) STATISTICS KOREA, 2013

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 27.6% of total deaths in 2012.

Causes of Disease Deaths (1983-2012)

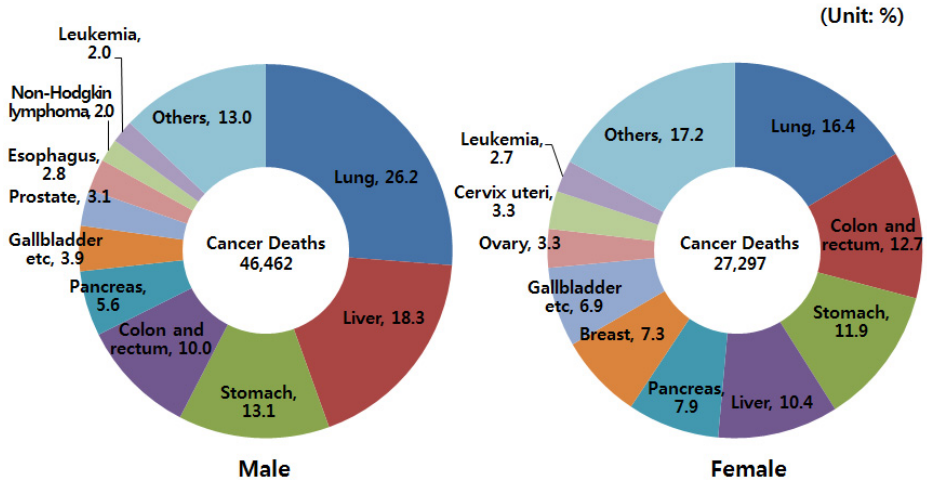


Source) STATISTICS KOREA, 2013

Proportion of Cancer Deaths

In 2012, lung, liver, stomach, and colon and rectum cancers accounted for 26.2%, 18.3%, 13.1%, and 10.0% of cancer deaths in males, respectively. For females, lung, colon and rectum, stomach, and liver cancers accounted for 16.4%, 12.7%, 11.9%, and 10.4%, respectively.

Proportion of Cancer Deaths (2012)



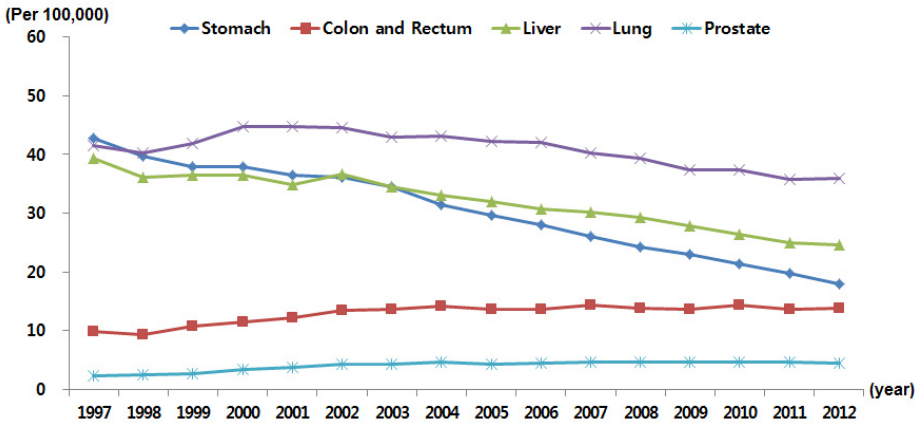
Source) STATISTICS KOREA, 2013

Age-standardized Mortality Rates of Major Cancers by Gender

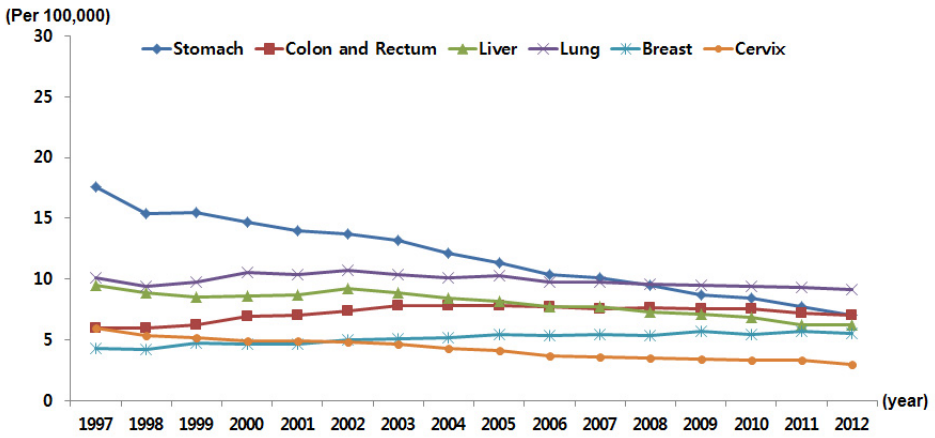
The age-standardized mortality rates of stomach and liver cancer have fallen in males, but the rate of colon and rectum cancer has increased consistently. On the other hand, the rate of lung cancer in males has been decreasing since 2000.

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

Age-standardized Mortality Rates of Major Cancers: Male



Age-standardized Mortality Rates of Major Cancers: Female



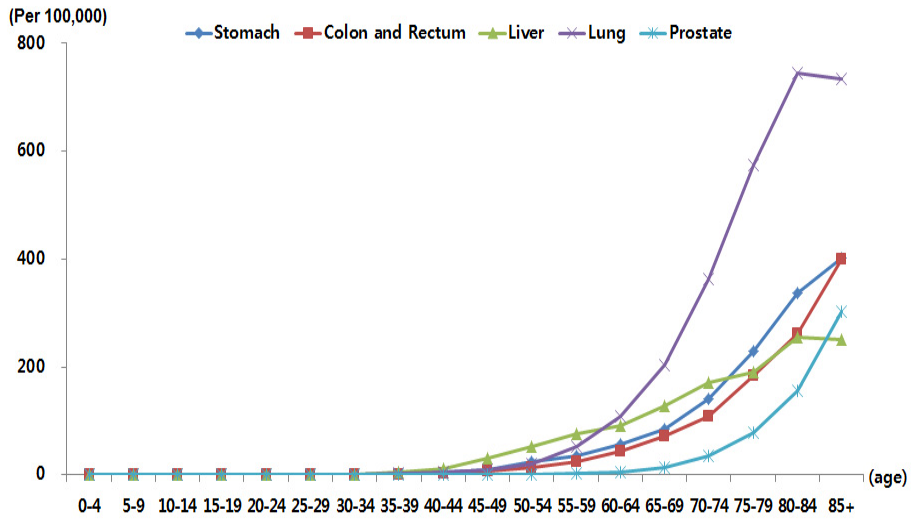
Source) STATISTICS KOREA, 2013

Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000
Cervix cancer: C53-55 (International Classification of Disease, ICD-10)

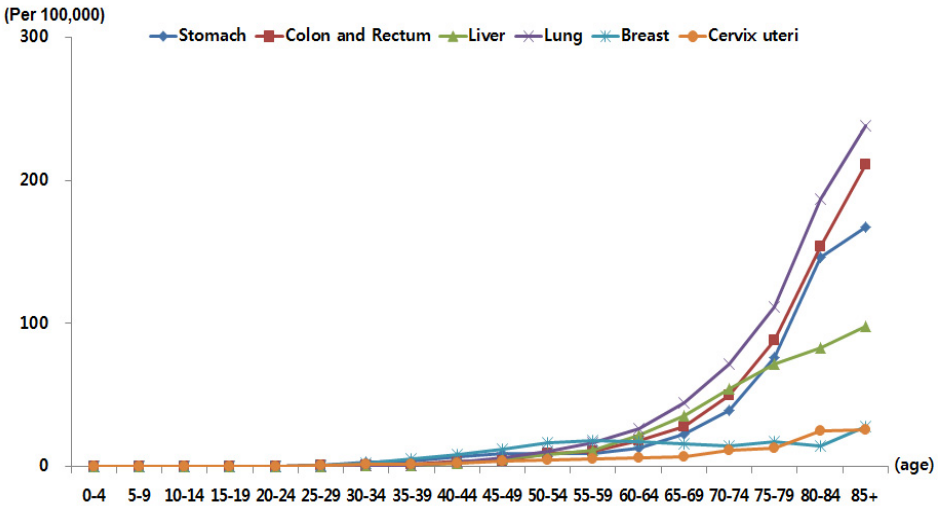
Age-specific Mortality Rates of Major Cancers by Gender

The age-specific mortality rates of major cancers in 2012 indicate that the rates are higher for older patients.

Age-specific Cancer Mortality Rates: Male (2012)



Age-specific Cancer Mortality Rates: Female (2012)



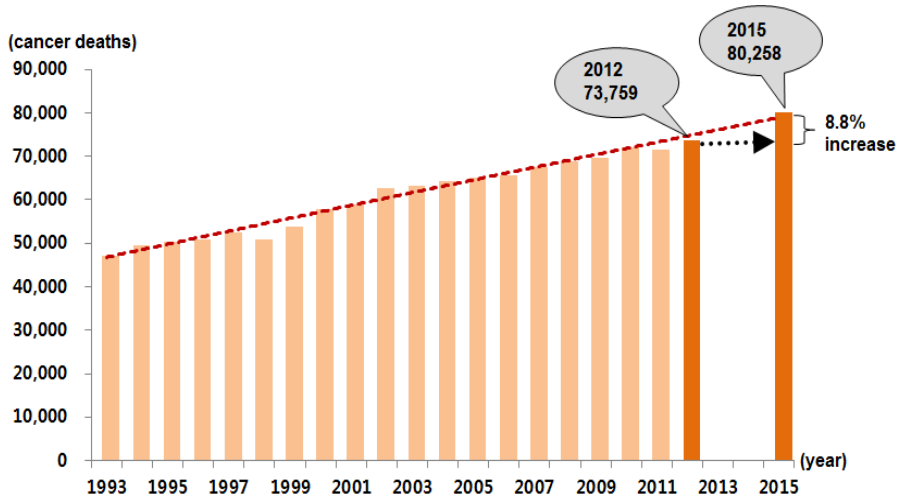
Source) STATISTICS KOREA, 2013

Note) Cervix uteri: C53 (International Classification of Disease, ICD-10)

Projection of Cancer Deaths

The total number of cancer deaths is expected to grow by 8.8% in the next three years, from 73,759 in 2012 to 80,258 in 2015.

Projection of Cancer Deaths (1993-2015)



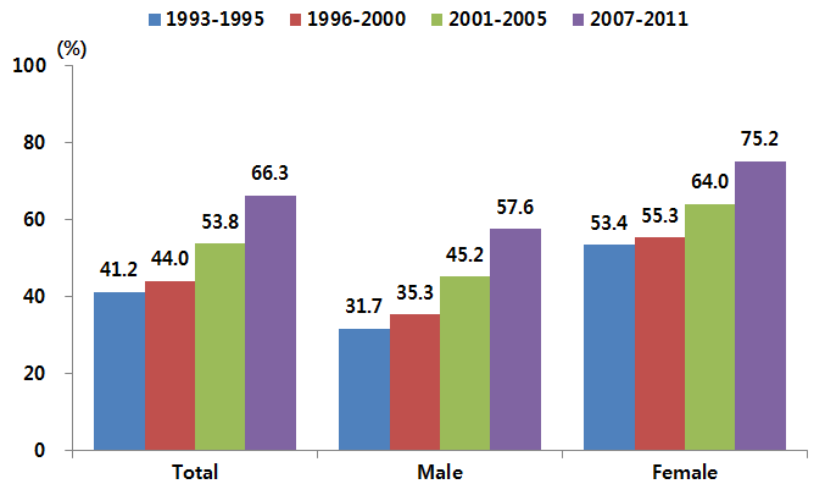
Source) National Cancer Center, 2010

2.3 Cancer Survival

Five-year Relative Cancer Survival Rates

The five-year relative cancer survival rate[2] from 2007 to 2011 was 66.3%, which is a 25.1% points and 12.5% points increase from 1993 to 1995 (41.2%) and 2001 to 2005 (53.8%), respectively. The survival rate has shown a steady improvement, and more than half of current patients with cancer in Korea survive for five years or longer.

Five-year Relative Cancer Survival Rates (1993-2011)



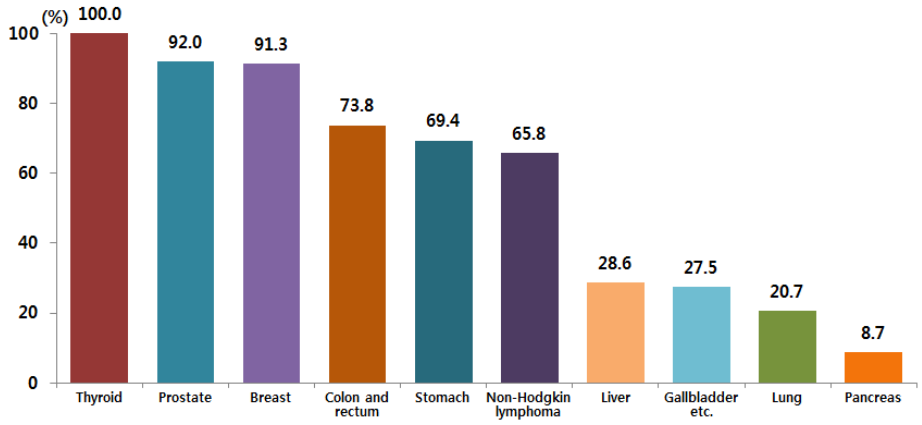
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

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

Five-year Relative Survival Rates according to Major Cancer Sites

The five-year relative survival rates for thyroid, prostate, breast, colon and rectum, and stomach cancers were 100.0%, 92.0%, 91.3%, 73.8%, and 69.4%, respectively.

Five-year Relative Survival Rated by Major Cancer Sites (2007-2011)

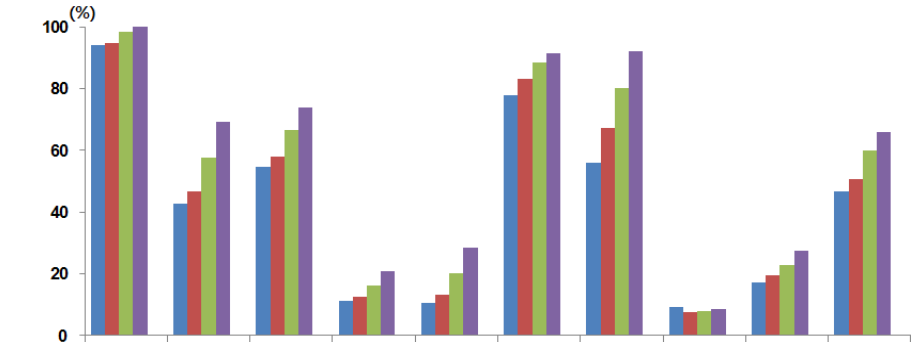


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

Comparison of Five-year Relative Survival Rates

Among major cancers, prostate cancer showed the most significant improvement from 2007 to 2011 (up by 36.1% points from 1993 to 1995), followed by stomach cancer (26.6% points), non-Hodgkin lymphoma (19.2% points), and colon and rectum cancer (19.0% points). Survival rates of all major cancers, with the exception of pancreatic cancer, improved.

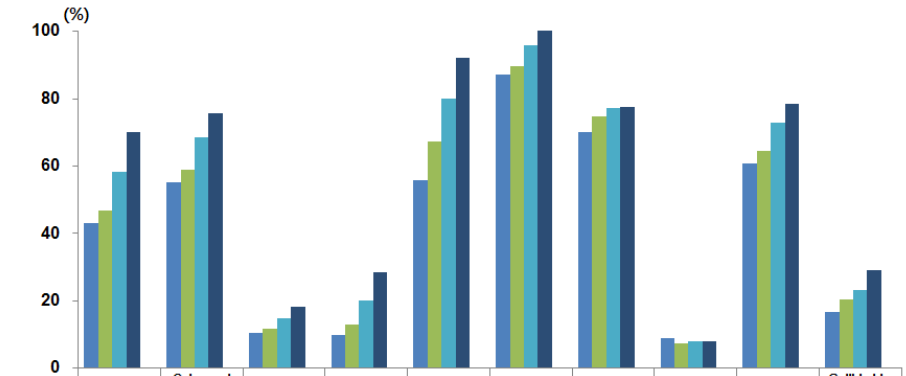
Comparison of Five-year Relative Survival Rates (1993-2011)



	Thyroid	Stomach	Colon and rectum	Lung	Liver	Breast	Prostate	Pancreas	Gallbradder etc.	Non-Hodgkin lymphoma
1993-1995	94.2	42.8	54.8	11.3	10.7	77.9	55.9	9.4	17.3	46.6
1996-2000	94.9	46.6	58.0	12.7	13.2	83.2	67.2	7.6	19.7	50.8
2001-2005	98.3	57.7	66.6	16.2	20.2	88.5	80.1	8.0	22.8	59.9
2007-2011	100.0	69.4	73.8	20.7	28.6	91.3	92.0	8.7	27.5	65.8
variance	5.8	26.6	19.0	9.4	17.9	13.4	36.1	-0.7	10.2	19.2

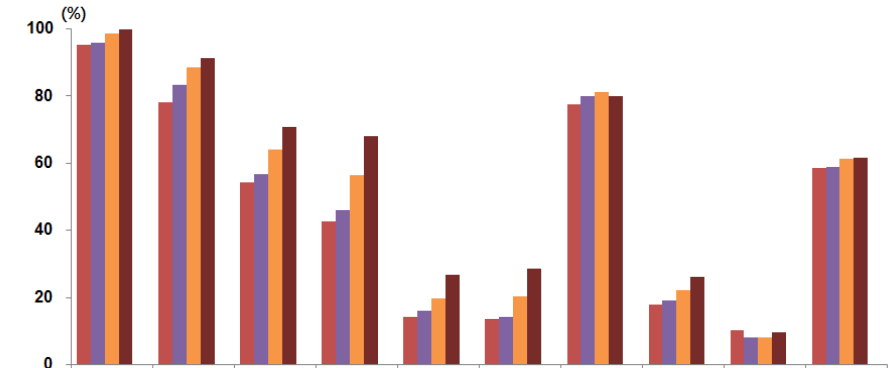
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

Comparison of Five-year Relative Survival Rates: Male (1993-2011)



	Stomach	Colon and rectum	Lung	Liver	Prostate	Thyroid	Bladder	Pancreas	Kidney	Gallbladder etc.
1993-1995	43.0	55.3	10.4	9.9	55.9	87.2	70.0	8.8	60.8	16.6
1996-2000	46.9	59.0	11.6	12.9	67.2	89.5	74.8	7.3	64.4	20.3
2001-2005	58.4	68.5	15.0	20.1	80.1	95.8	77.3	8.0	72.8	23.3
2007-2011	70.1	75.8	18.3	28.5	92.0	100.1	77.4	8.1	78.4	29.0
variance	27.1	20.5	7.9	18.6	36.1	12.9	7.4	-0.7	17.6	12.4

Comparison of Five-year Relative Survival Rates: Female (1993-2011)



	Thyroid	Breast	Colon and rectum	Stomach	Lung	Liver	Cervix uteri	Gallbladder etc.	Pancreas	Ovary
1993-1995	95.4	78.0	54.2	42.6	14.2	13.6	77.5	18.0	10.1	58.7
1996-2000	95.9	83.2	56.8	46.0	16.2	14.2	80.0	19.1	8.1	58.9
2001-2005	98.7	88.5	64.1	56.4	19.7	20.3	81.3	22.3	8.1	61.4
2007-2011	99.9	91.3	70.7	67.9	26.8	28.7	80.1	26.1	9.5	61.6
variance	4.5	13.3	16.5	25.3	12.6	15.1	2.6	8.1	-0.6	2.9

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

International Comparison of Five-year Relative Survival Rates of Major Cancers

The five-year relative survival rates of Korea's most common cancers, such as stomach, cervix uteri, and liver cancers, were higher in Korea than in the United States and Canada.

International Comparison of Five-year Relatives Survival Rates of Major Cancers

(unit: %)

Site	Korea ('96-'00)	Korea ('01-'05)	Korea ('07-'11)	USA[1] ('03-'09')	Canada[2] ('06-'08)	Japan[3] ('03-'05)
All cancers	44.0	53.8	**66.3**	65.8	63	58.6
Stomach	46.6	57.7	**69.4**	27.7	25	63.3
Liver	13.2	20.2	**28.6**	16.1	20	27.9
Cervix uteri	80.0	81.3	**80.1**	67.9	74	72.2
Colon and rectum	58.0	66.6	**73.8**	64.9	65	69.2
Thyroid	94.9	98.3	**100.0**	97.7	98	92.2
Breast	83.2	88.5	**91.3**	89.2	88	89.1
Lung	12.7	16.2	**20.7**	16.6	17	29.7
Pancreas	7.6	8.0	**8.7**	6.0	8	7.0
Prostate	67.2	80.1	**92.0**	99.2	96	93.8

Source)

1) Howlader N, Noone AM, Krapcho M, Neyman N, Aminou R, Altekruse SF, et al (eds). SEER Cancer Statistics Review 1975-2010, 2013
2) Canadian Cancer Society, Statistics Canada and Provincial/Territorial Cancer Registry. Canadian Cancer Statistics 2013
3) Center for Cancer Control and Information Services, National Cancer Center, Monitoring of Cancer Incidence in Japan - Survival 2003-2005 report 2013

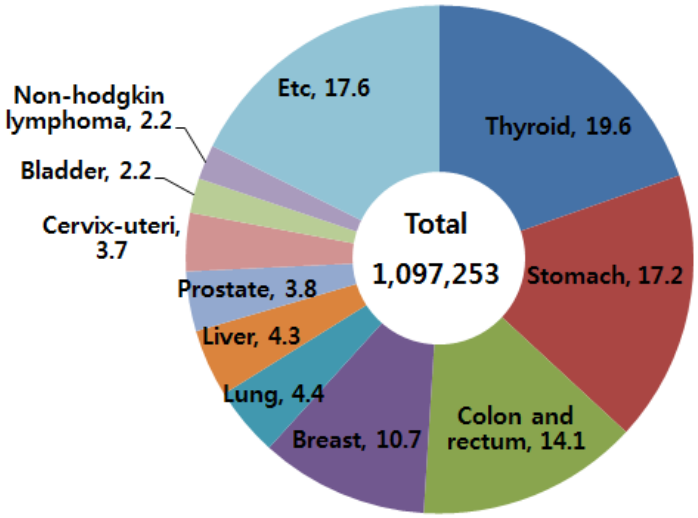
2.4 Cancer Prevalence

Cancer Prevalence

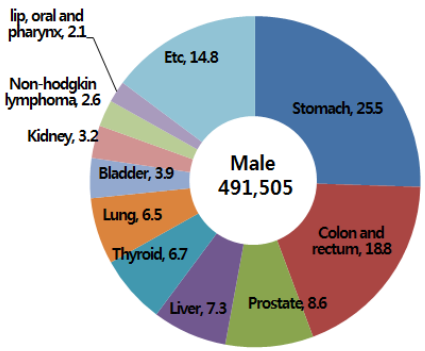
Between 1999 and 2011, 1,097,253 patients were diagnosed with cancer in Korea. The thyroid was the most prevalent cancer site, followed by the stomach, colon and rectum, breast, lung, and liver.

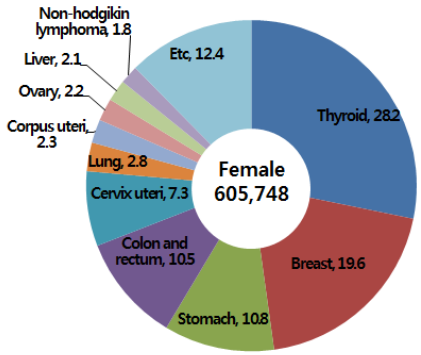
Cancer Prevalence (2011)

(unit: %)



(unit: %)



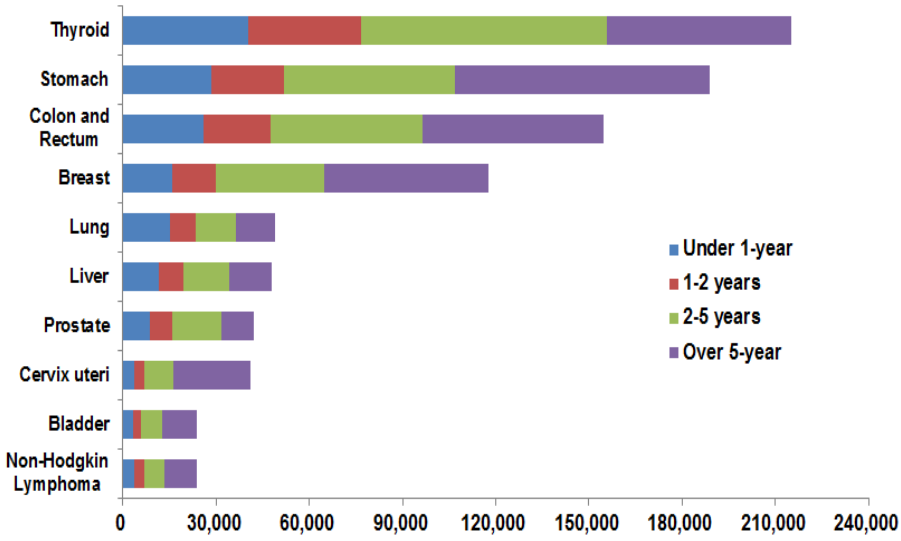


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

Cancer Prevalence by Time since Diagnosis

Among patients diagnosed with cancer between 1999 and 2011, stomach cancer showed the highest prevalence in patients of five-years or longer, followed by colon and rectum, thyroid, and breast cancers. The long-term prevalence of lung and liver cancers was relatively low due to their low survival rates.

Cancer Prevalence by Time since Diagnosis (2011)



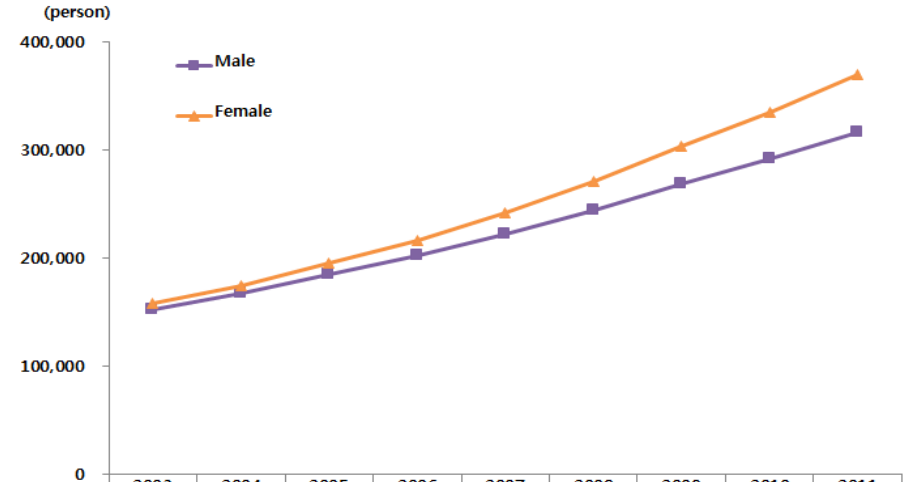
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

Five-year Cancer Survivors

The number of five-year cancer survivors increased from 310,388 in 2003 to 684,796 in 2011 (315,708 males and 369,088 females).

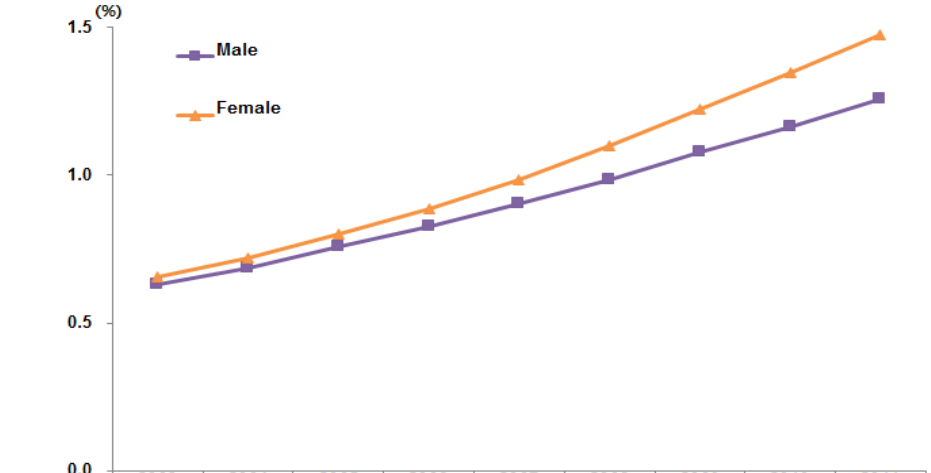
The percentage of five-year cancer survivors among the general population was 1.37% (1.26% of males and 1.47% of females) in 2011.

Estimated Number of Five-year Cancer Survivors (2003-2011)



	2003	2004	2005	2006	2007	2008	2009	2010	2011
Male	152,219	166,516	184,935	202,402	222,163	243,537	267,890	290,965	315,708
Female	158,169	173,787	194,551	216,446	241,529	270,840	302,843	334,973	369,088

Percentage of Five-year Cancer Survivors (2003-2011)



	2003	2004	2005	2006	2007	2008	2009	2010	2011
Male	0.63	0.68	0.76	0.83	0.90	0.98	1.08	1.16	1.26
Female	0.66	0.72	0.80	0.89	0.99	1.10	1.22	1.35	1.47

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2013

Chapter 3.
Cancer Prevention

3.1 Overview

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 20.1% of cancer incidences and 23.6% of cancer deaths. Tobacco use in Korea causes 11.9% of cancer incidences and 22.8% of cancer deaths.

Causes of Cancer

Risk factors	World(2000)*	Republic of Korea**(2012)	
		Incidence	Death
Tobacco use	32%	11.9%	22.8%
Chronic infection	10-20%	20.1%	23.6%
Diet	30%	-	-
Occupational exposure	5%	-	-
Genetic factor	5%	-	-
Alcohol drinking	3%	1.8%	1.8%
Reproductive factors	5%	1.6%	0.9%
Exposure of environmental carcinogen	3%	-	-
Radiation exposure	3%		
Obesity	-	1.8%	1.3%
Lack of physical activity	-	0.7%	0.3%

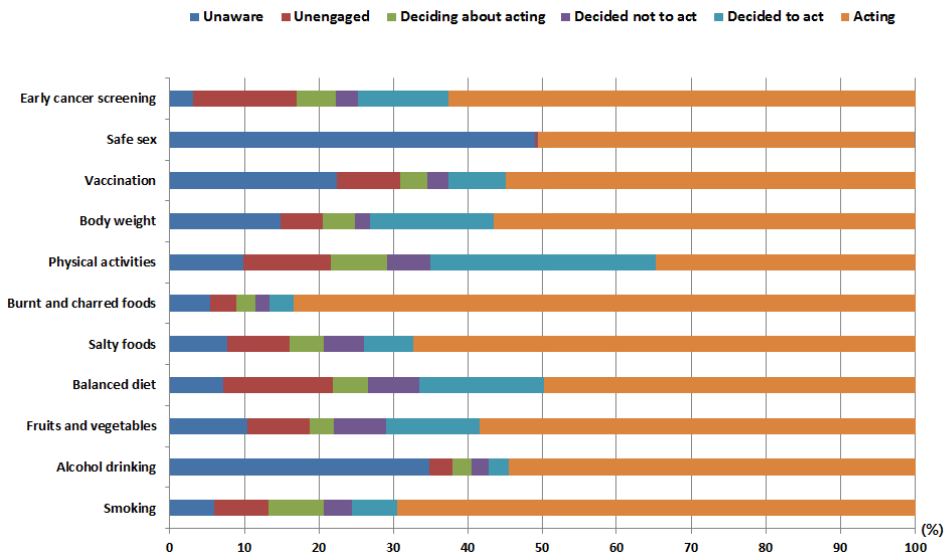
Source) * World Cancer Report, IARC, 2008

** National Cancer Center. Attributable Causes of Cancer in Korea in the Year 2009, 2013

Awareness of the Ten Codes for Cancer Prevention

According to a survey conducted on the awareness and practice of the Ten Codes of Conduct for Cancer Prevention among 1,000 male and female adults 19 years or older, 83.4% said that they avoided burnt foods to prevent cancer. Also, 67.4% and 69.5% of the respondents said that they tried to stay away from salty foods and smoking, respectively.

Awareness of the Ten Codes for Cancer Prevention (2012)



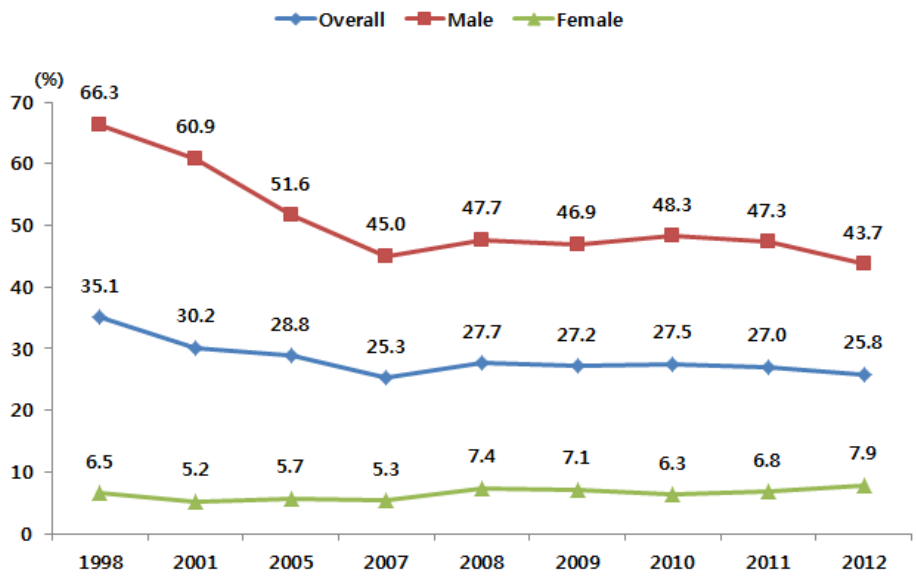
Source) National Cancer Center. The Survey on Awareness and Behavior for Cancer Prevention, 2012

3.2. Smoking

Prevalence and Trends in Cigarette Smoking among Adults

From 1998 to 2012, smoking prevalence in Korea decreased from 66.3% to 43.7% in male adults. However, the rate of decline has slowed down in recent years. Female smoking prevalence has maintained a low level below 10% since 1998.

Prevalence and Trends in Cigarette Smoking

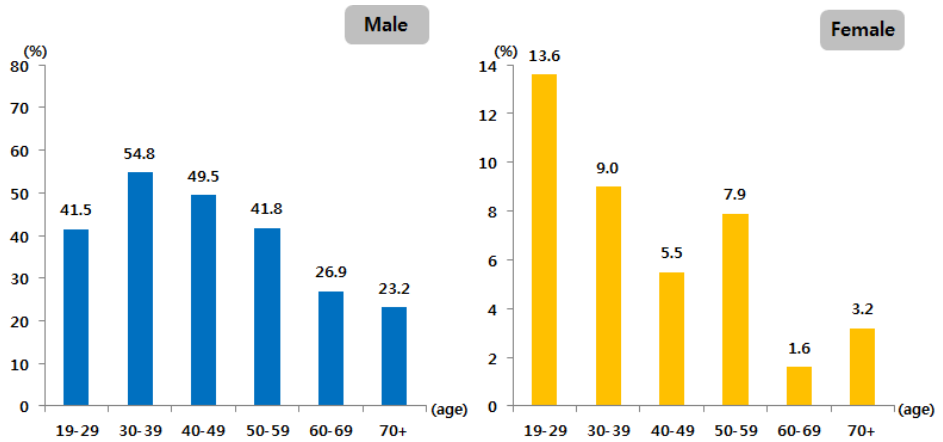


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

Smoking Prevalence among Adults by Age and Gender

Smoking prevalence[3] by age and gender indicates that male and female smoking prevalence is high in young adults, with highest percentages in the 19-29 and 30-39 age groups.

Smoking Prevalence by Age and Gender



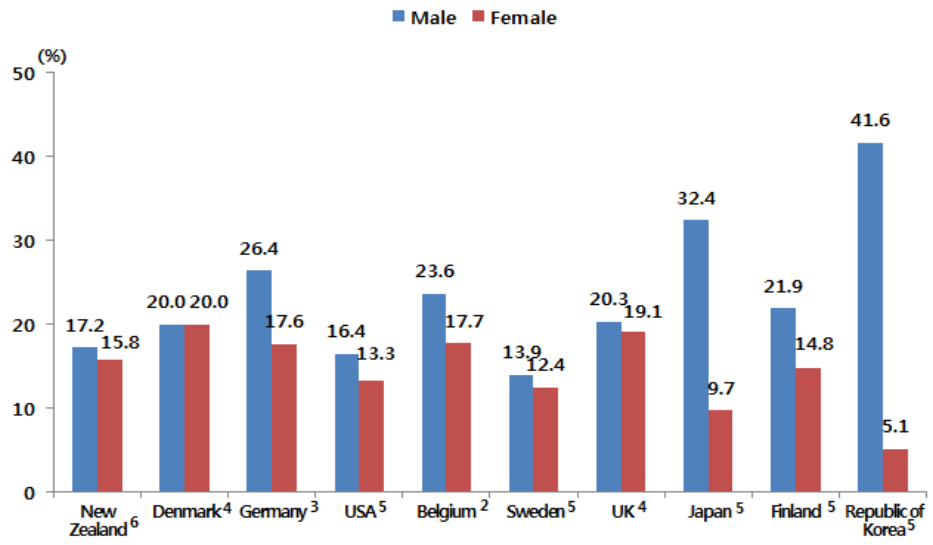
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

3) Smoking prevalence: percentage of adults(19 and older) who have smoked five or more packs(100) of cigarettes and are currently smoking

Prevalence of Daily Smoking among Adults in OECD Countries

Among males, prevalence of daily smoking in Korea is considerably higher than in other OECD countries (41.6% for males and 5.1% for females).

Prevalence of Daily Smoking in OECD Countries



Source) OECD Health Data, OECD 2013

Note) Age: 15 and older

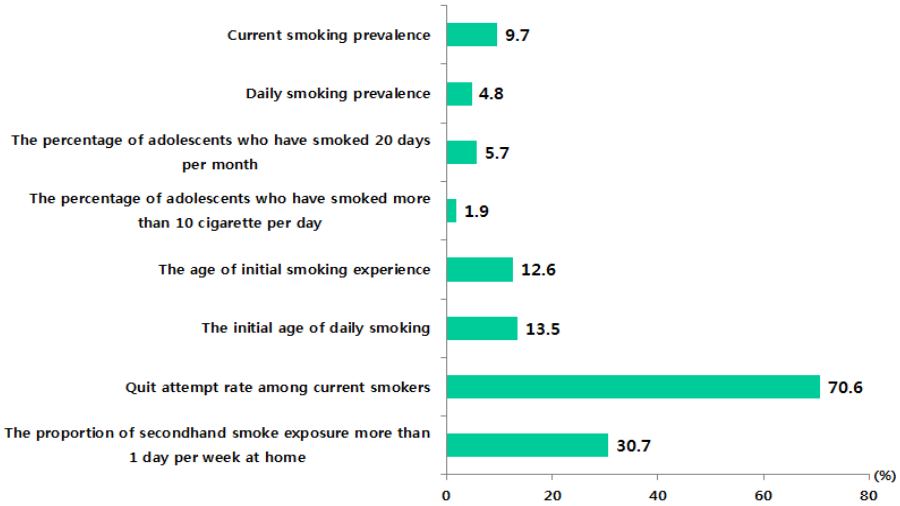
Note) 1): 2007 2): 2008 3): 2009 4): 2010 5): 2011 6): 2012

Adolescent Smoking

In 2013, 9.7% of Korean adolescents said that they have smoked for one or more days in the previous 30 days, and 21.4% said that they have tried smoking at least once. The average age they started smoking was 12.6.

Among current adolescent smokers in Korea, 70.6 % said that they had tried quit. 30.7% of adolescents were exposed to secondhand smoke at home for more than a day each week.

Adolescent Smoking in Korea



Current smoking prevalence: The rate of adolescents who have smoked one or more day during previous 30 days
Smoking prevalence in lifetime: The rate of adolescents who ever have smoked at one least in lifetime
Daily smoking prevalence: The rate of adolescents who have smoked daily during previous 30 days

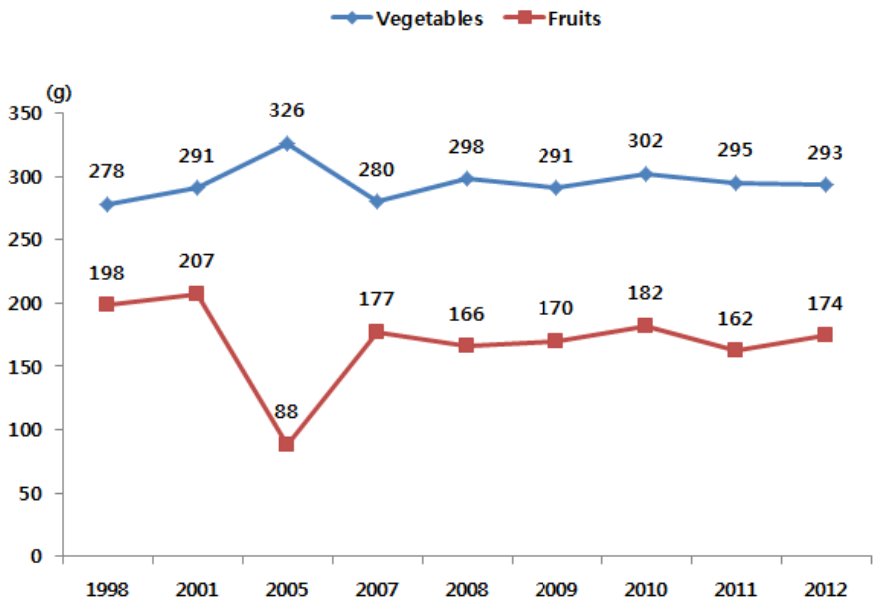
Source) Korea Youth Risk Behavior Web-based Survey, 2013

3.3 Consumption of Fruits and Vegetables

Intake of Fruit and Vegetable among Adults

The average daily consumption of fruits and vegetables among adults in 2012 were 174g and 293g, respectively.

Average Intake of Fruit and Vegetable among Adults (1998-2012)

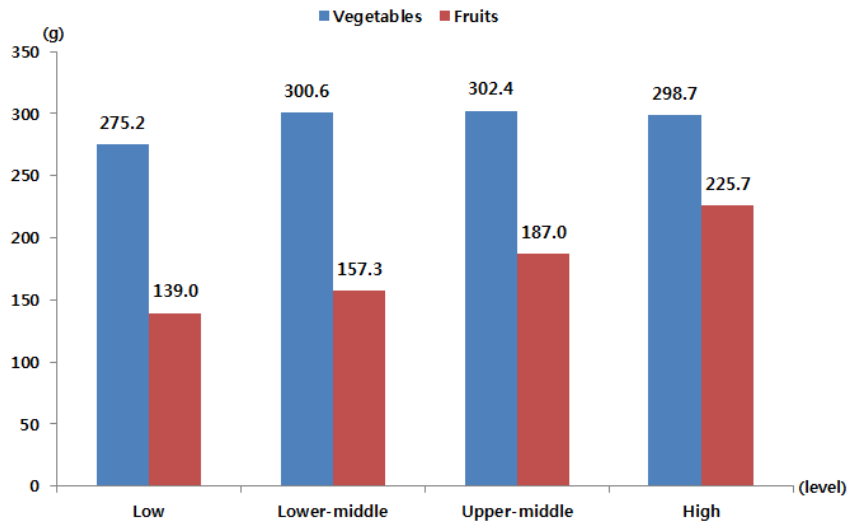


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

Intake of Fruit and Vegetable by Income Levels

In Korea, higher income groups consume more fruits and vegetables.

Average Intake of Fruit and Vegetable by Income Levels

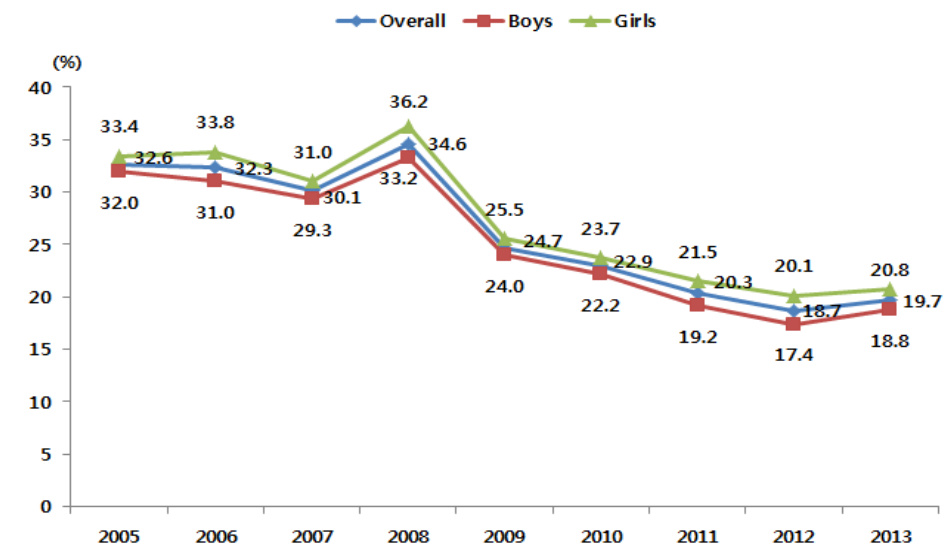


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

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

In 2013, 19.7% of adolescents consumed at least one serving of fruit per day (18.8% of males and 20.8% of females). The percentage of adolescents consuming at least one serving of fruit per day decreased from 32.6% in 2005 to 18.7 in 2012 before increasing slightly to 19.7% in 2013.

Percentage of Adolescents Who Consume at least One Serving of Fruit Each Day (2005-2013)



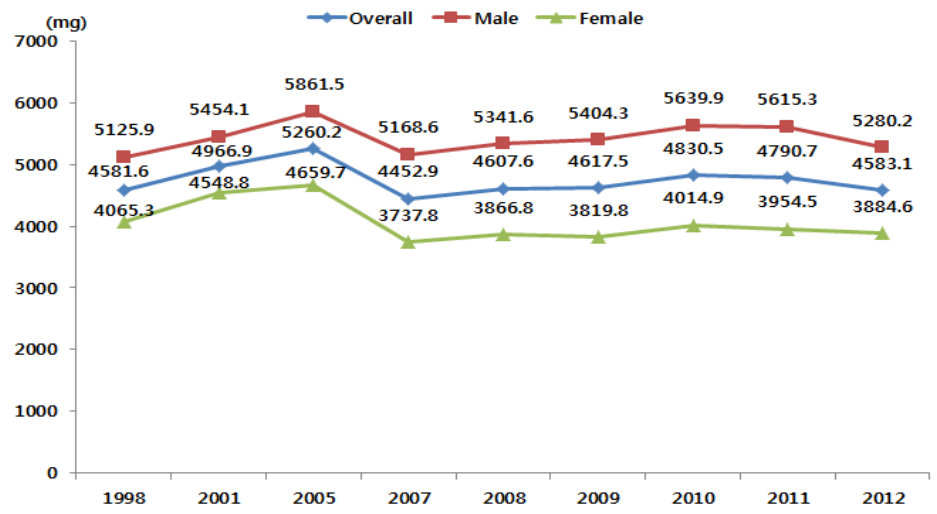
Source) Korea Youth Risk Behavior Web-based Survey, 2013

3.4 Sodium Intake

Sodium Intake among Adults

For the past 15 years, Koreans have consumed excessive amounts of sodium, males more so than females.

Trend of Daily Sodium Intake among Adults (1998-2012)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

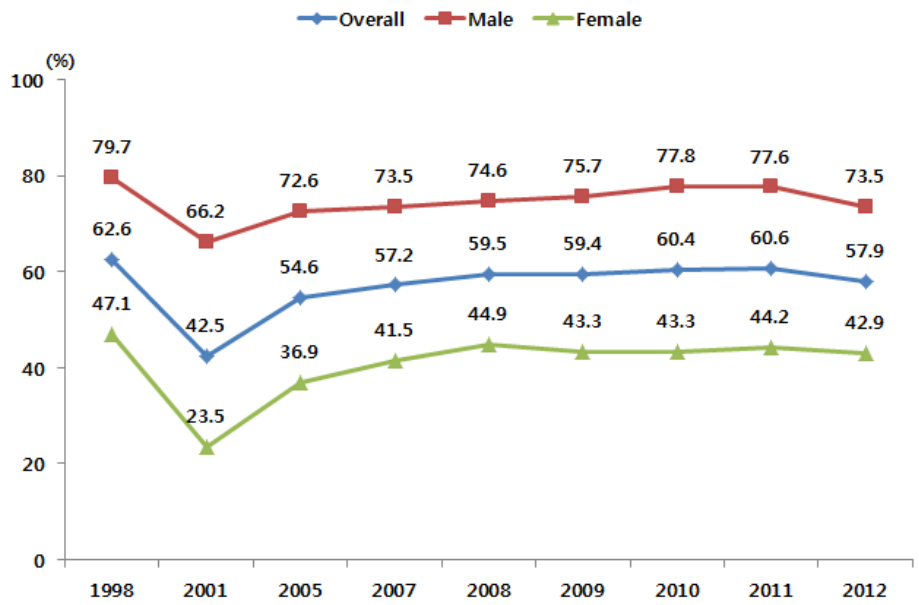
Note) Daily sodium intake targets: 2,000mg (suggested by Korean Nutrition Society, 2005)

3.5 Alcohol Consumption

Prevalence of Alcohol Consumption among Adults[4)]

Percentage of adults who consume one or more glasses of alcohol every month has not decreased for the past 6 years.

Prevalence of Alcohol Consumption among Adults (1998-2012)



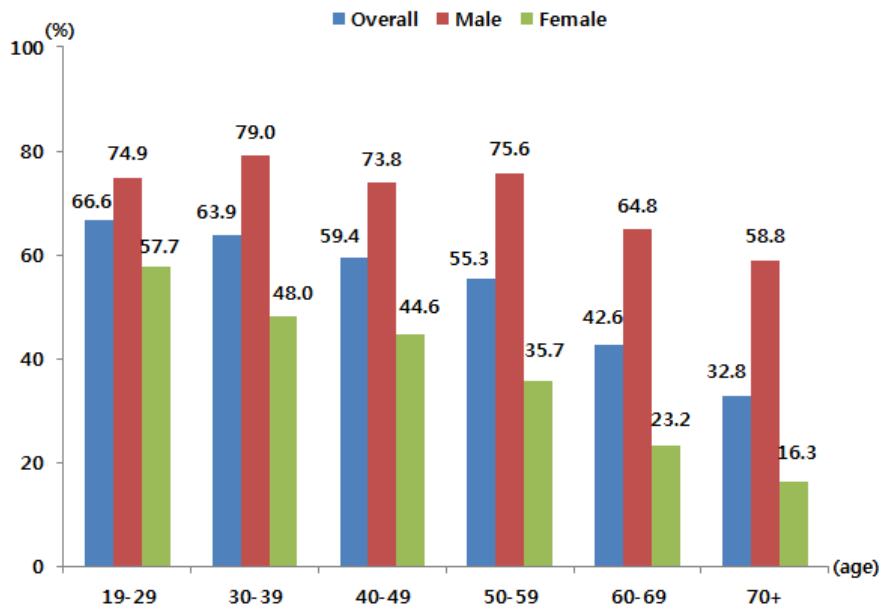
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

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 Alcohol Consumption among Adults[5] by Age

Prevalence of alcohol consumption decreased with age.

Prevalence of Alcohol Consumption among Adults by Age (2012)



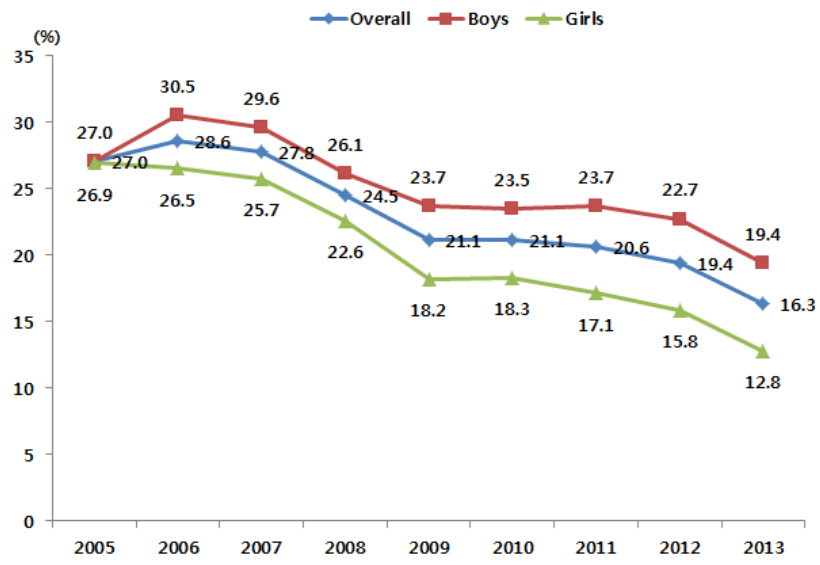
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

5) 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.

Alcohol Consumption among Adolescents

Percentage of Korean adolescents who consumed alcohol in 2013 was 16.3% (19.4% for boys and 12.8% for girls).

Alcohol Consumption among Adolescents (2005-2013)



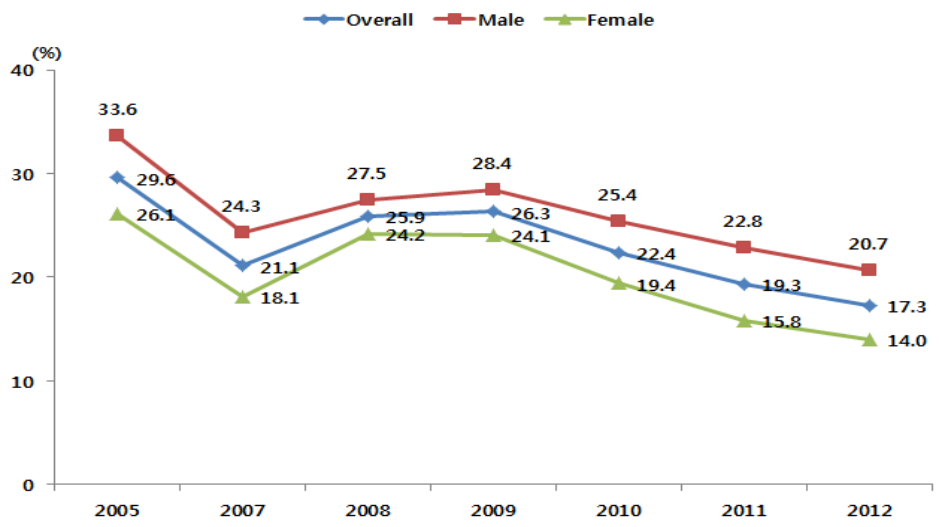
Source) Korea Youth Risk Behavior Web-based Survey, 2013

3.6 Physical Activity

Percentage of Adults Engaging in Moderate or Higher Intensity Level of Physical Activity

In Korea, the percentage of adults engaging in moderate or higher intensity level of physical activity in 2012 was 17.3%, showing a decreasing trend since 2005.

Percentage of Adults Engaging in Moderate or Higher Intensity Level of Physical Activity



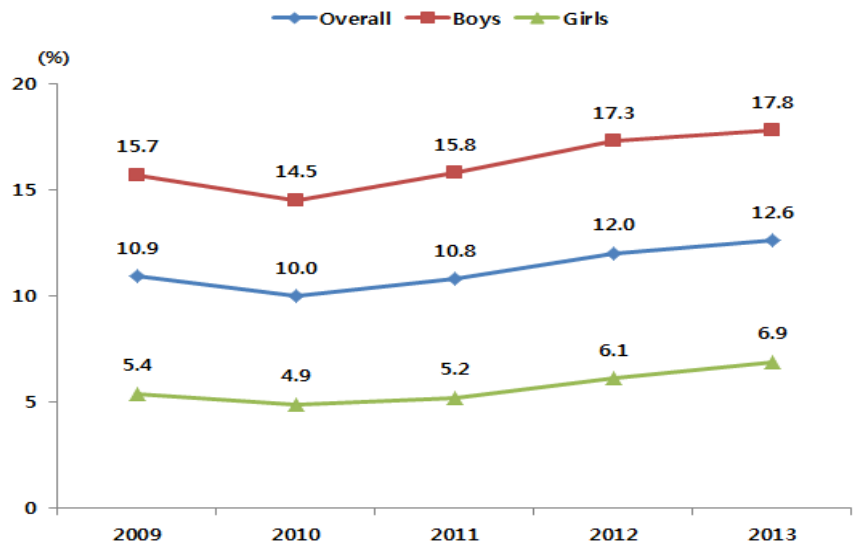
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

Note)
1) 2010 Health Plan recommends engaging in moderate-intensity physical activity for at least 30 minutes a day, 5 days a week.
2) Age-standardized rates were calculated based on 2005 Korean population

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

In 2013, the percentage of adolescents engaging in physical activity for at least 60 minutes a day, 5 days a week was 12.6% (17.8% of boys and 6.9% of girls).

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



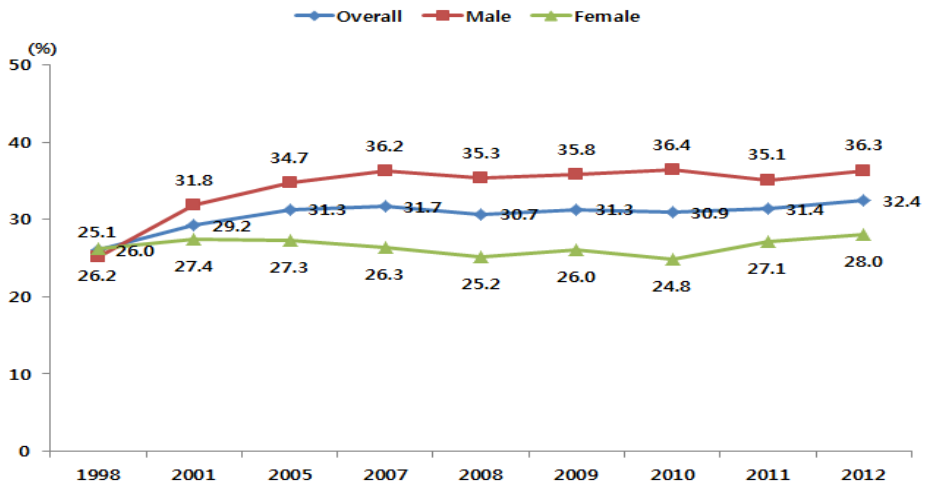
Source) Korea Youth Risk Behavior Web-based Survey, 2013

3.7 Obesity

Obesity Trend 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 five years. Male obesity rate has shown a gradual increase in the past ten years, and female obesity rate has also increased in the recent four years.

Trend of Obesity Rate among Adults (1998-2012)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2012

Note)

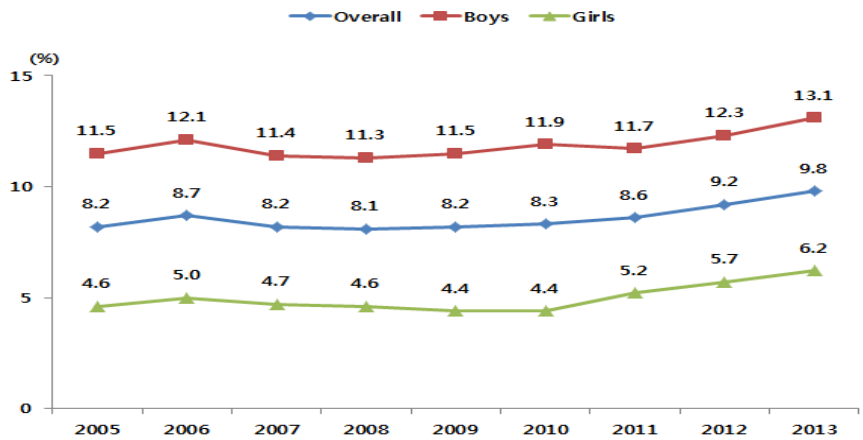
1) The age-standardized rates were calculated based on 2005 Korean population.

2) Obesity: body mass index(BMI)≥25

Obesity Trend among Adolescents

Adolescents obesity rate[6] was 9.8% in 2013 (13.1% of boys and 6.2% of girls).

Obesity Trend among Adolescents (2005-2013)



Source) Korea Youth Risk Behavior Web-based Survey, 2013

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

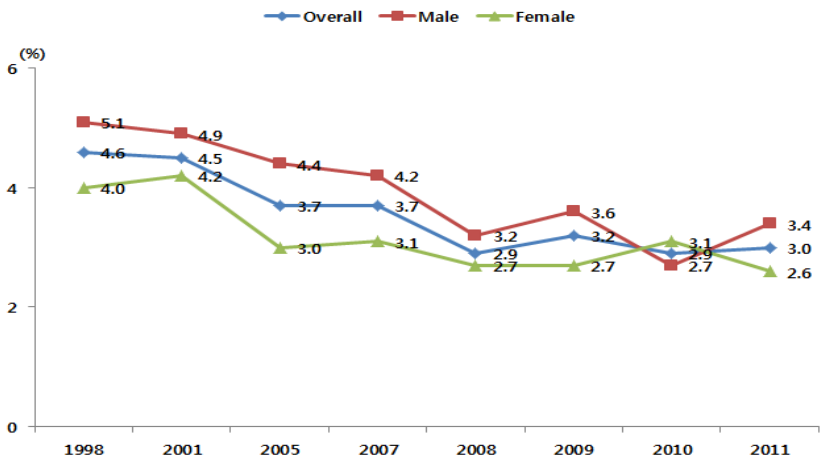
6) Adolescent obesity rate: percentage of adolescents(13 to 18 years old) whose body mass index(BMI) is more than 95% in the BMI distribution or more than 25 BMI

3.8 Hepatitis B Virus 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 3.0% in 2011.

HBsAg Seropositivity (1998-2011)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2011

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

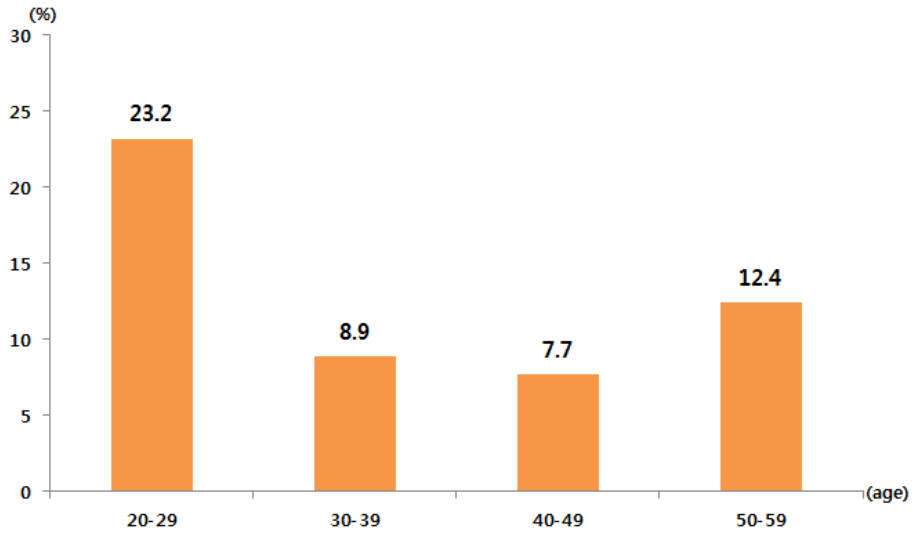
7) HBsAg seropositivity: percentage of individuals(10 years and older) who have tested positive for HBsAg

3.9 Human Papillomavirus Infection

Prevalence of Human Papillomavirus Infection

Human Papillomavirus (HPV) infection is very common, affecting about 13% of Korean females. Because HPV is primarily transmitted through sexual intercourse, prevalence is highest among female in the 20–29 age group who are beginning to be sexually active. The prevalence of HPV decreases with age.

Prevalence of Human Papillomavirus (HPV)



Source) Kim MA et al. Obstet Gynecol 2010

3.10 Occupational Cancer

Occupational Cancers in Korea

Occupational cancers are types of cancers for which medical treatment has been authorized by the Industrial Accident Compensation Insurance Act. Since the first case of malignant mesothelioma in 1993, 110 cases (71 cases of respiratory cancer, 22 cases of hematologic malignancy, 13 cases of malignant mesothelioma, and 4 cases of other cancers) have been recognized as occupational cancers based on epidemiological investigations conducted by KOSHA between 1993 and 2008. From 2000 to 2011, 447 occupational cancer cases have been compensated for.

Occupational Cancers

	Causal carcinogens	Work-related cases
Respiratory system		71
Lung	Asbestos, crystalline silica, diesel exhaust, chromium and cadmium, nickel, PAH	67
Larynx	PAH	2
Nasopharynx	Chromium, PAH	2
Malignant mesothelioma	Asbestos	13
LHP system[1)]		22
Leukemia	Benzene, radiation, anticancer drug	16
Malignant lymphoma	Benzene	6
Urologic system		
Bladder	Benzidine and benzidine based dye	3
CNS[2)]	Methylene chloride	1
Total		**110**

Source) Kim EA et al. Safety and Health at Work 2010

Note)

1) LHP: lymphohematopoietic system

2) CNS: central nervous system

Chapter 4.
Cancer Screening Program

4.1 Cancer Screening Rates

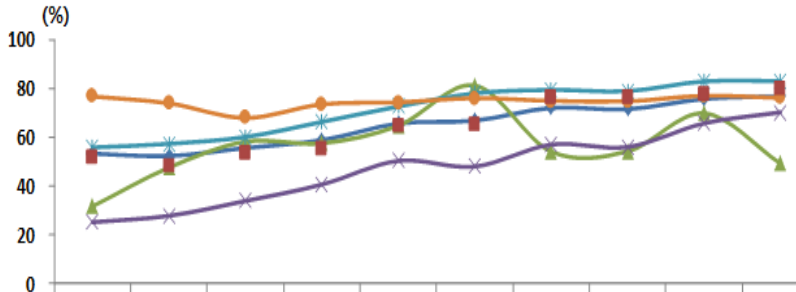
Cancer Screening Rates

The average lifetime screening rate[8] of the five major cancers identified in the National Cancer Screening Program in 2013 was 76.8%, and the average cancer screening rate based on recommendation[9] was 64.7%. The cancer screening rate[10] of all cancers has increased from 2004 to 2013 by 1.67 times.

In 2013, stomach cancer had the highest screening rate based on recommendation (73.6%), followed by cervix uteri cancer (67.0%), breast cancer (59.7%), colon and rectum cancer (55.6%), and the high-risk group of liver cancer (33.6%).

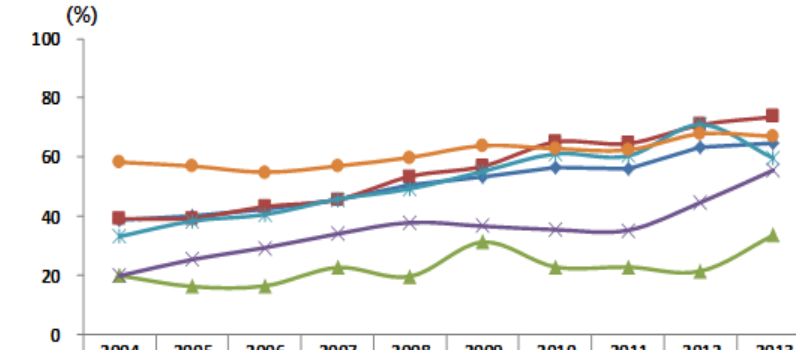
8) Lifetime screening rate: percentage of individuals who have undergone at least one cancer screening.
9) Screening rate based on recommendation: percentage of individuals who have undergone screening as part of the National Cancer Screening Program (for stomach, breast, and cervix uteri cancers) or based on cancer screening recommendation (for other types of cancer, such as liver and colon and rectum cancers)
10) Screening rate = (number of screened individuals / candidates) × 100

Lifetime Cancer Screening Rates (2004-2013)



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

Cancer Screening Rates based on Recommendation (2004-2013)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Mean	38.8	40.3	42.3	45.6	50.7	53.3	56.6	56.1	63.4	64.7
Stomach	39.2	39.4	43.3	45.6	53.5	56.9	65.1	64.6	70.9	73.6
Liver	20.0	16.3	16.5	22.7	19.7	31.3	22.9	22.9	21.5	33.6
Colon & Rectum	19.9	25.4	29.4	34.1	37.9	36.7	35.5	35.3	44.7	55.6
Breast	33.2	38.4	40.6	45.8	49.3	55.2	61.1	60.4	71.0	59.7
Cervix uteri	58.3	57.0	54.9	57.0	59.9	63.9	62.9	62.4	67.9	67.0

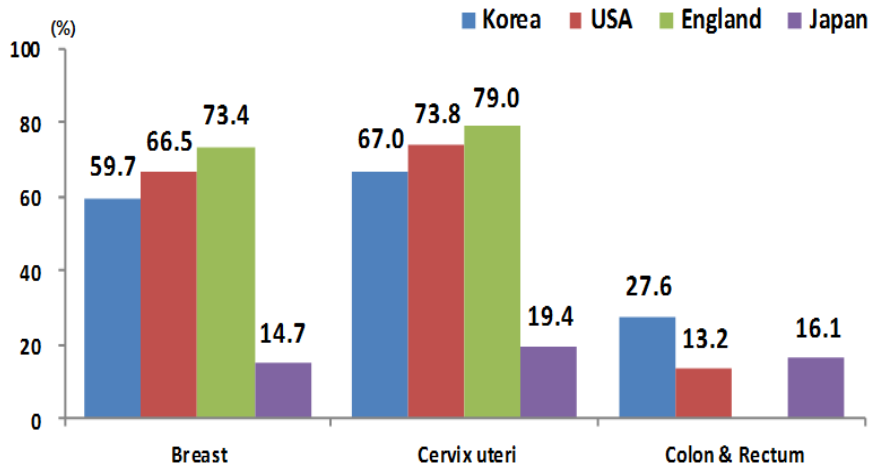
Source) Korean National Cancer Screening Survey, 2004-2013

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 cervix uteri cancers (67.0%) in Korea was lower than those of England (79.0%) and the United States (73.8%).

The rate of fecal occult blood testing (FOBT) for colon and rectum cancer screenings in Korea was 27.6%, which was higher than the rates of the United States (13.2%) and Japan (16.1%).

Cancer Screening Rates: International Comparison



Source) Korean National Cancer Screening Survey, 2004-2013

Cancer Screening Rates: International Comparison

		Korea [1]	USA [2]	England [3] [4]	Japan [5]
Breast	Cancer Screening Rates	**59.7%**	**66.5%**	**73.4%**	**14.7%**
	Target Population	40 & over	**40**& over	**45-74**	**40**& over
	Frequency	every 2 years	every 2 years	every 3 years	**2**every 2 years
	Test or Procedure	Mammography	Mammography	Mammography	Mammography **& CBE**
Cervix uteri	Cancer Screening Rates	**67.0%**	**73.8%**	**25-49, 79.0%** **50-64, 77.8%**	**19.4%**
	Target Population	**30**& over	**18**& over	**25-64**	**20**& over
	Frequency	every 2 years	every 3 years	**25-49,** every 3 years **50-64,** every 5years	every 2 years
	Test or Procedure	Pap smear	Pap smear	Pap smear	Pap smear
Colon & Rectum	Cancer Screening Rates	**27.6%**	**13.2%**	-	**16.1%**
	Target Population	**50**& over	**50**& over	**60-69**	**40**& over
	Frequency	every 1 years	every 2 years	every 2 years	every 1 years
	Test or Procedure	FOBT	FOBT	FOBT	FOBT

Source)

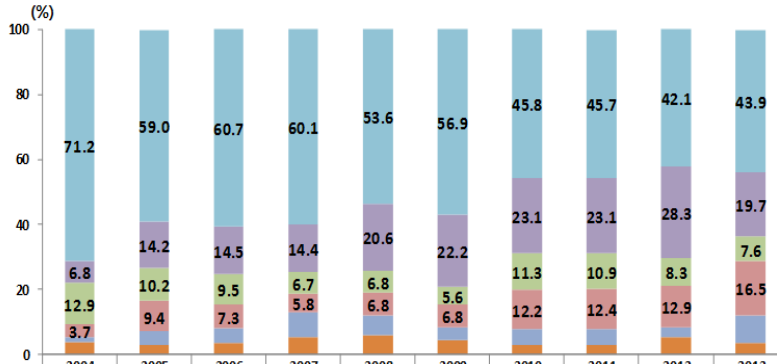
1) Korean National Cancer Screening Survey, 2013
2) National Cancer Institute. Cancer Trends Progress Report, 2012
3) NHS Cancer Screening Programmes, NHS Breast Screening Programme Annual Review, 2012
4) NHS Cancer Screening Programmes, NHS Cervical Screening Programme Annual Review, 2012
5) Health Statistics in Japan, 2010

Note) CBE(clinical breast examination), FOBT(fecal occult blood test)

Reasons for Not Undergoing Cancer Screening

From 2004 to 2013, 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 43.9% in 2013), whereas the percentage of those who said that they did not have time to be screened increased (6.8% in 2004 to 19.7% in 2013).

Reasons for Not Undergoing Cancer Screening (2004-2013)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belief of healthiness	71.2	59.0	60.7	60.1	53.6	56.9	45.8	45.7	42.1	43.9
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
Too expensive	12.9	10.2	9.5	6.7	6.8	5.6	11.3	10.9	8.3	7.6
Too painful, unpleasant	3.7	9.4	7.3	5.8	6.8	6.8	12.2	12.4	12.9	16.5
Fear of detection	1.7	4.2	4.3	7.5	6.3	4.0	4.9	4.8	3.1	8.5
Others	3.8	2.9	3.7	5.5	5.9	4.5	2.8	3.0	5.3	3.7

Source) Korean National Cancer Screening Survey, 2004-2013

4.2 National Cancer Screening Program

National Cancer Screening Program Statistics (2002-2012)

Guidelines of the National Cancer Screening Program

Cancer	Target Population	nterval	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	2 years	Pap smear

Source) National Cancer Center, 2013

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

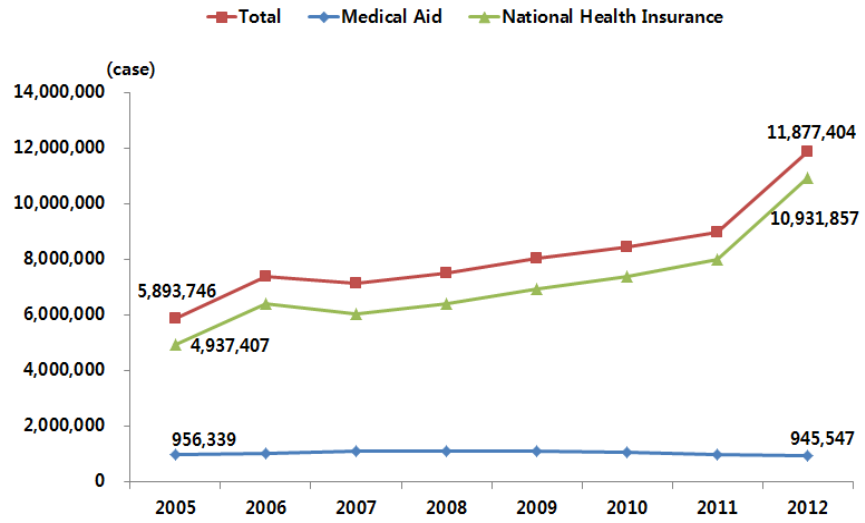
†High-risk group: HBs Ag positive, anti-HCV Ab positive, or diagnosed with liver cirrhosis

Number of Participants in the National Cancer Screening Program

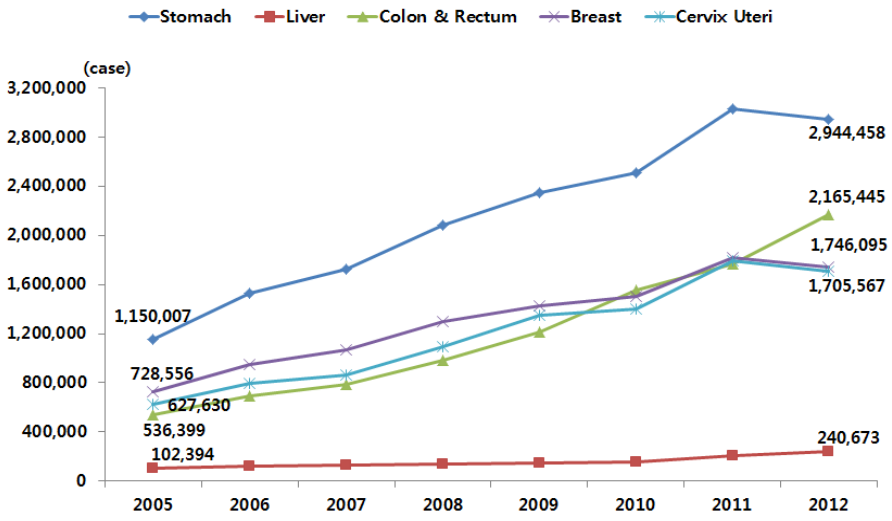
The target population of the National Cancer Screening Program consists of those insured by Medical Aid and the National Health Insurance program. The number of screened individuals insured by the National Health Insurance program increased from 4,937,407 in 2005 to 10,931,857 in 2012.

In 2012, among the five cancers in the National Cancer Screening Program, the type of cancer for which the most number of individuals were screened was stomach cancer (2,944,458), followed by colon and rectum cancer (2,165,445).

Number of Participants in the National Cancer Screening Program (2005-2012)



Number of Participants in the National Cancer Screening Program by Cancer Sites (2005-2012)



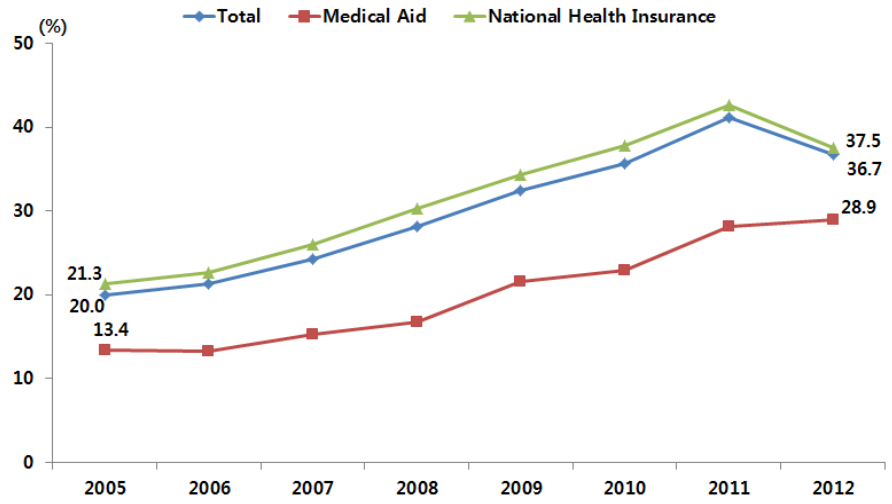
Source) National Cancer Center, 2013

Participation Rates in the National Cancer Screening Program

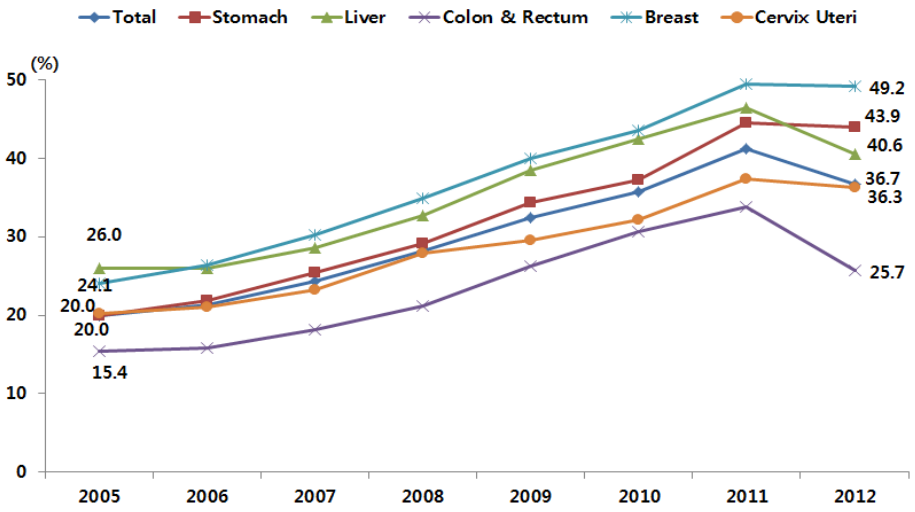
The overall rate of participation in the National Cancer Screening Program was 37.5% in 2012 (28.9% of Medical Aid recipients and 36.7% of the National Health Insurance holders).

In 2012, screening for breast cancer had the highest participation rate (49.2%), followed by stomach cancer (43.9%) and liver cancer (40.6%).

Participation Rates in the National Cancer Screening Program(2005-2012)



Participation Rates in the National Cancer Screening Program by Cancer Sites (2005-2012)



Source) National Cancer Center, 2013

Chapter 5.
Cost and Management of Cancer Treatment

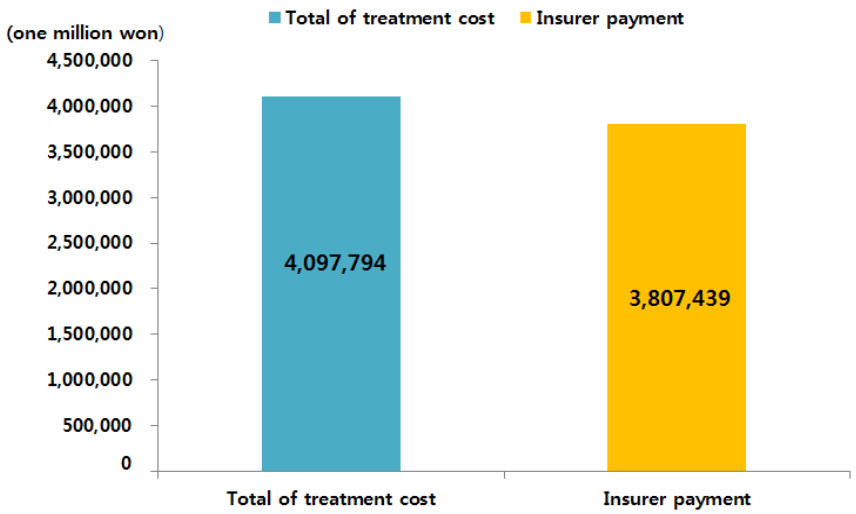
5.1 Costs of Cancer

Health Insurance Coverage of Cancer Treatment and Expenditure

In 2012, the total treatment cost for 995,644 cancer patients covered by the National Health Insurance was 4,097,794 million won (excluding non-insured areas, such as selective treatments, ultrasound tests, and hospital bed upgrade).

Health insurance expenditure accounted for 92.9% of the total cost or 3,807,439 million won.

Health Insurance Coverage of Cancer Treatment and Expenditure (2012)

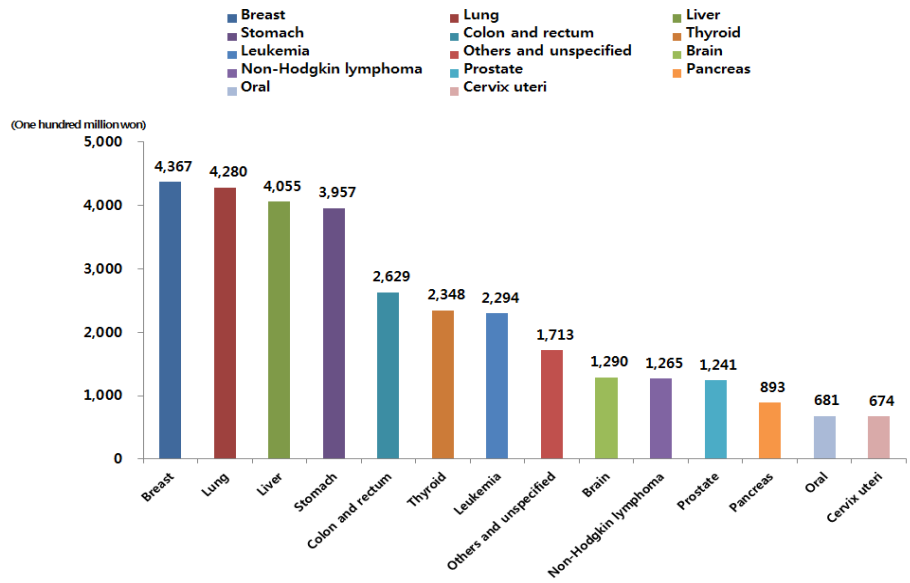


Source) National Health Insurance Corporation. Analysis on cost of cancer patients, 2012

Insurance Coverage of Expenses for the Treatment of Major Cancers

Of the 3.807 trillion won expenditure from the National Health Insurance Corporation, breast cancer was responsible for the highest percentage (436.7 billion won, 11.5%), followed by lung cancer (428.0 billion won, 11.2%), liver cancer (405.5 billion won, 10.7%), stomach cancer (395.7 billion won, 10.4%), and colon and rectum cancer (262.9 billion won, 6.9%). The ten most common cancers accounted for 74.1% of the total expenditure.

Health Insurance Expenditures for Major Cancers (2012)



Source) National Health Insurance Corporation. Analysis on cost of cancer patients, 2012

Cancer Patient Financial Aid Program

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

The Cancer Patient Financial Aid Program for child cancer patients supports patients under 18 (Medicaid beneficiaries and Korean National Health Insurance enrollees who qualify based on the income and asset standard).

Cancer Patient Financial Aid Program (2013)

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, colon and rectum cancer	2 million won (Insurer payment)	2005
	• Medicaid beneficiary (including the quasi-poor class)	All cancers	1.2 million won (Insurer payment) 1 million won (copayment)	
	• Lung cancer patients (Medicaid beneficiary, National Health Insurance enrollees)	Primary lung cancer	1 million won (fixed)	
Child (under 18)	• Medicaid beneficiary (including the quasi-poor class)	All cancers	Leukemia : 30 million won Otherwise: Maximum 20 million won (30 million won for Hematopoietic stem cell transplantation)	2002
	• National Health Insurance enrollees (those qualifying for insurance fee criteria)			

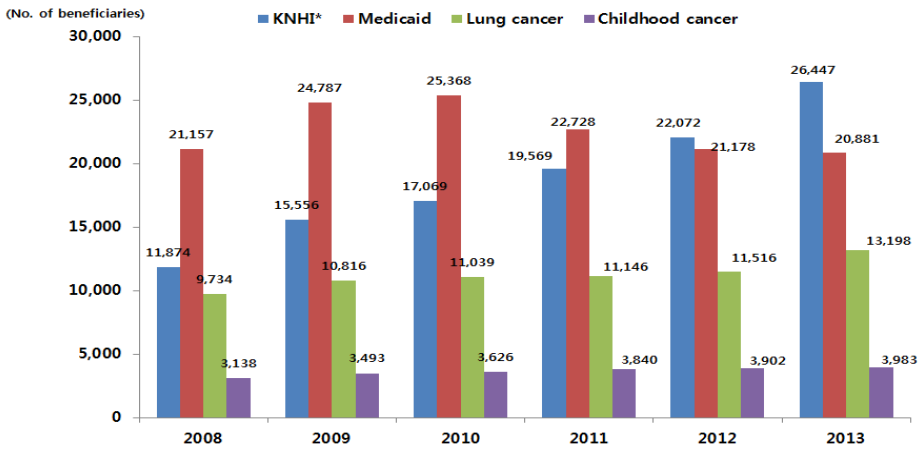
Source) National Cancer Center, 2013

Cancer Patient Financial Aid Program Results

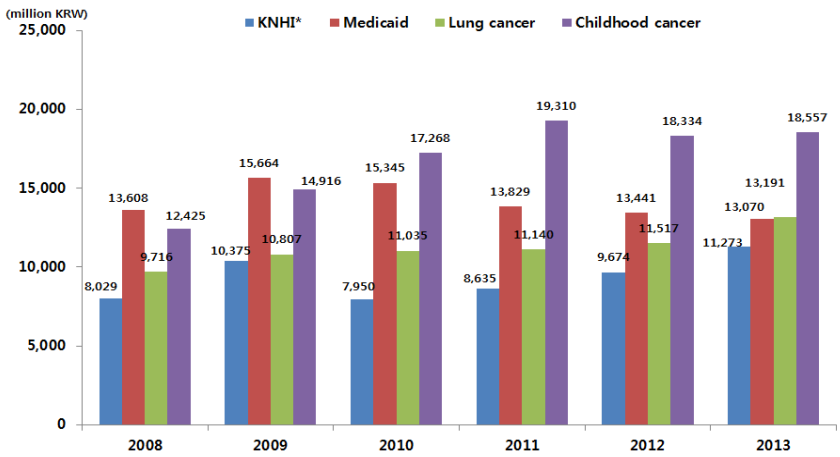
The number of adult National Health Insurance enrollees and Medicaid beneficiaries among the Cancer Patient Financial Aid Program beneficiaries increased from 7,120 in 2007 to 22,072 in 2012 and 15,107 in 2007 to 21,178 in 2012, respectively. The numbers of adult beneficiaries with lung cancer and child beneficiaries with cancer are also on the rise, increasing 7,763 in 2007 to 11,516 in 2012 and 2,426 in 2007 to 3,902, respectively.

Cancer Patient Financial Aid payment for adult National Health Insurance enrollees, adult Medicaid beneficiaries, and adult lung cancer patients increased from 4,727 million won in 2007 to 9,674 million won, from 9,790 million won in 2007 to 13,441 million won in 2012, and from 7,756 million won in 2007 to 11,517 million won in 2012, respectively. Also, payment for childhood cancer patients increased from 8,642 million won to 18,334 million won in 2012.

Cancer Patients Financial Aid Program Results (Number of Beneficiaries, 2007-2013)



Cancer Patients Financial Aid Program Results (Payment, 2007-2013)



Source) National Cancer Center. Patient Financial Aid System 2014

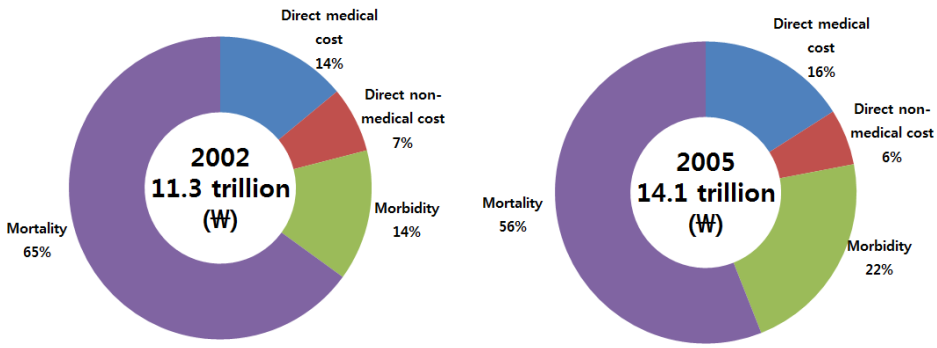
*KNHI: Korean National Health Insurance

5.3 Socioeconomic Costs of Cancer

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



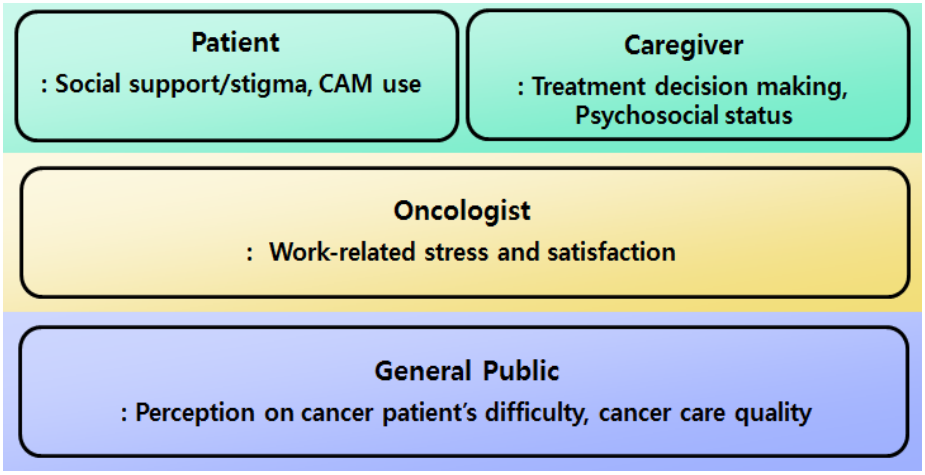
Source) Kim JH et al. J Prev Med Public Health 2009

5.4 Survey on Cancer Treatment

From July to September of each year since 2008, the National Cancer Center has conducted a nationwide survey to 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, satisfaction, 3) general public's perception on cancer-related issues.

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



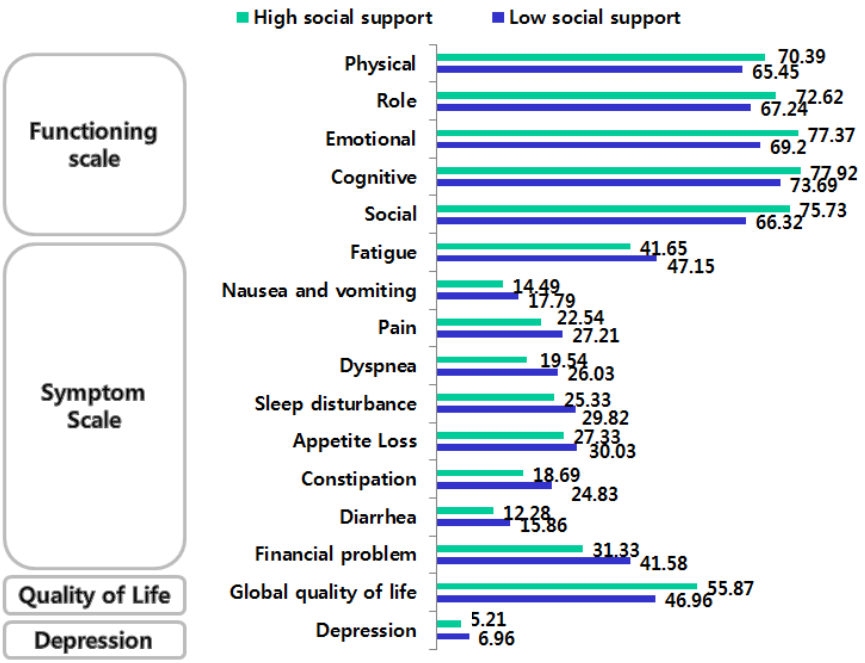
Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care 2013

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.

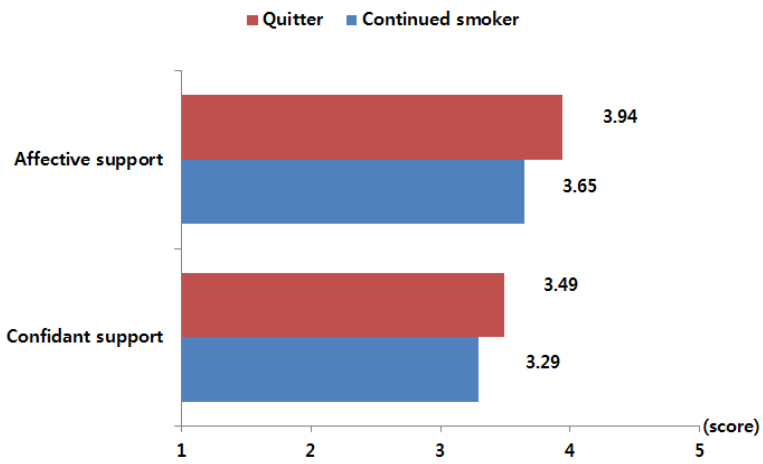
Among 493 participants who were smoking at the time of cancer diagnosis, 131(26.6%) continued to smoke at the time of survey.

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 continued smoking.

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

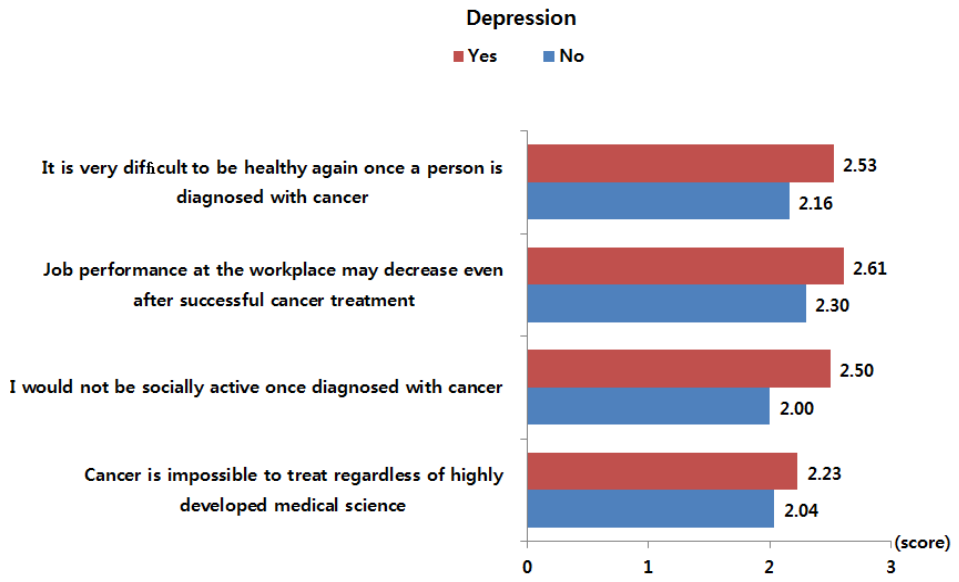
To evaluate the possible association between cancer stigma and depression among cancer patients, cancer stigma was assessed by using a set of 12 questions grouped in three domains; incurability, stereotypes about cancer patients, and experience of social discrimination.

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.

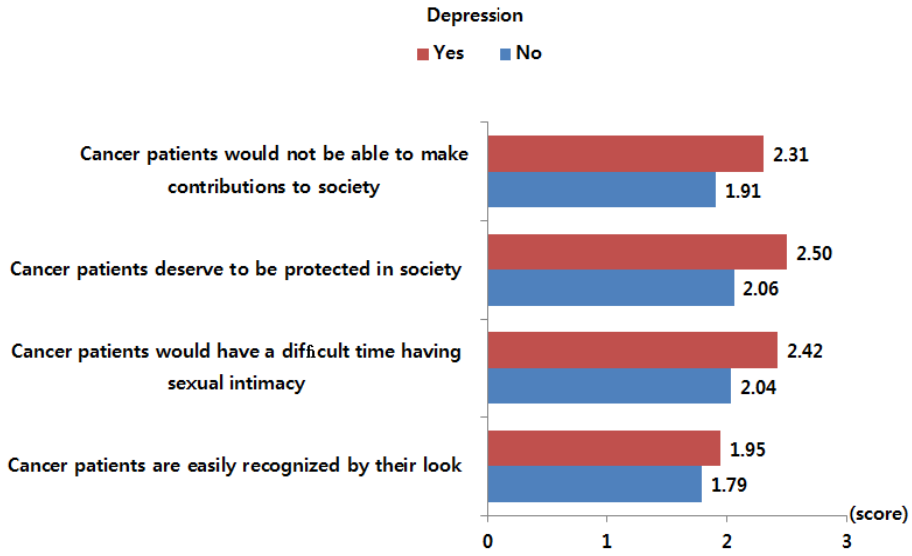
The biggest stereotype about cancer patients was that their 'Job performance at the workplace may decrease even after a successful cancer treatment', followed by 'Cancer is impossible to treat even with highly developed medical science'.

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)

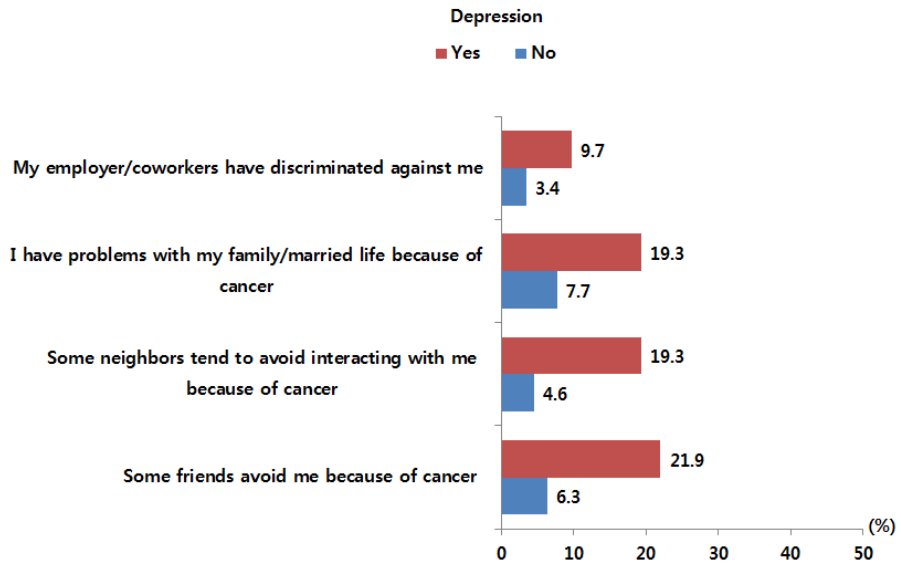


Stereotypes Experienced by Cancer Patients (2010)



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.

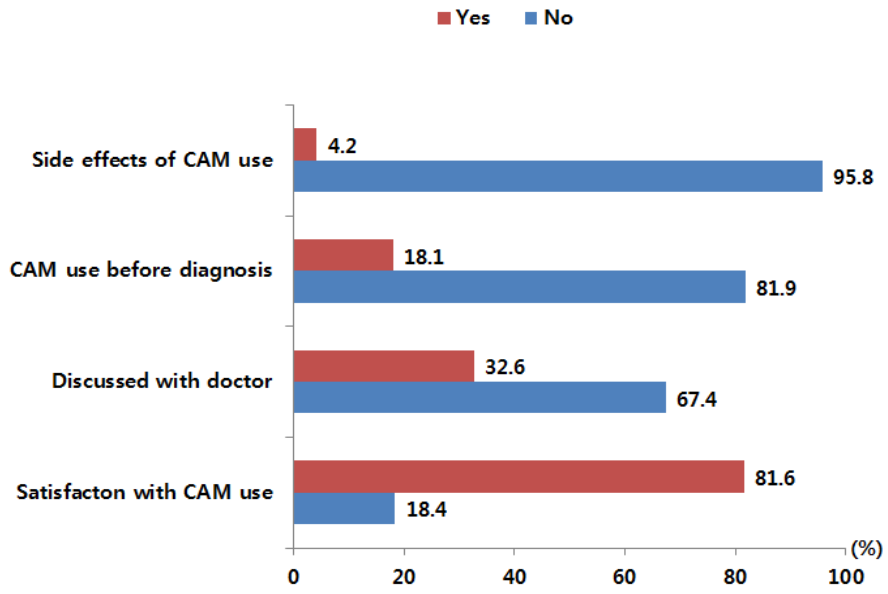
25.3% (674 of 2,661) had used CAM, whereas 38.3% (258 of 674) of those with CAM experience had discontinued CAM therapy. The most frequently used form of CAM was herbs (43.5%).

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 5 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

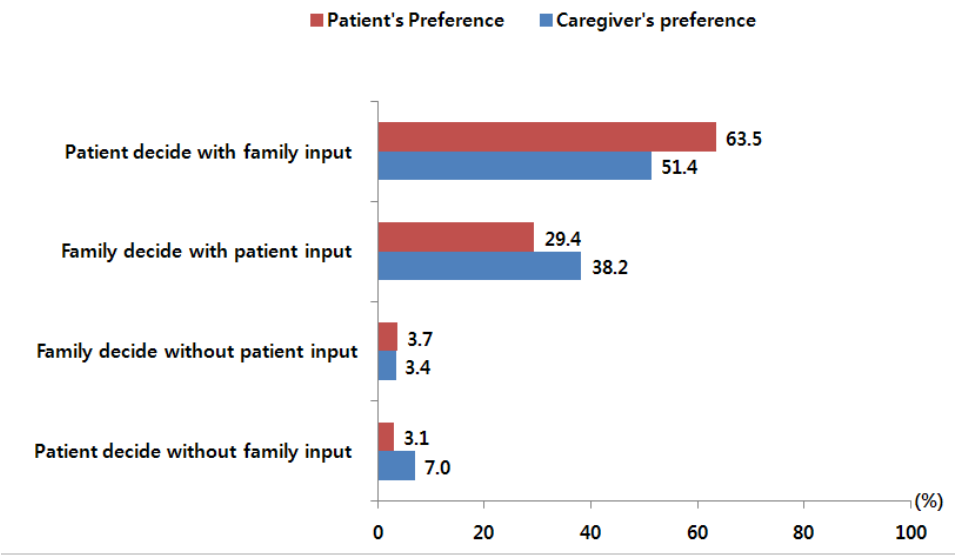
We looked into how patients and family caregivers felt about being involved in the decision-making process regarding cancer treatment.

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, while a smaller percentages of patients (29.4%) and caregivers (38.2%) preferred family members to make primary decisions with patient input. Only small proportions 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 in regard to 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

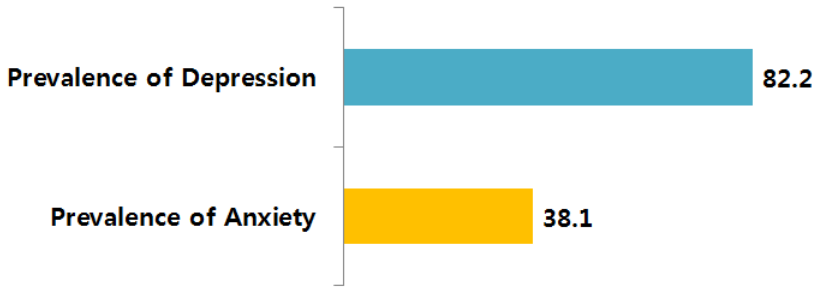
Psychological Health of Caregivers

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

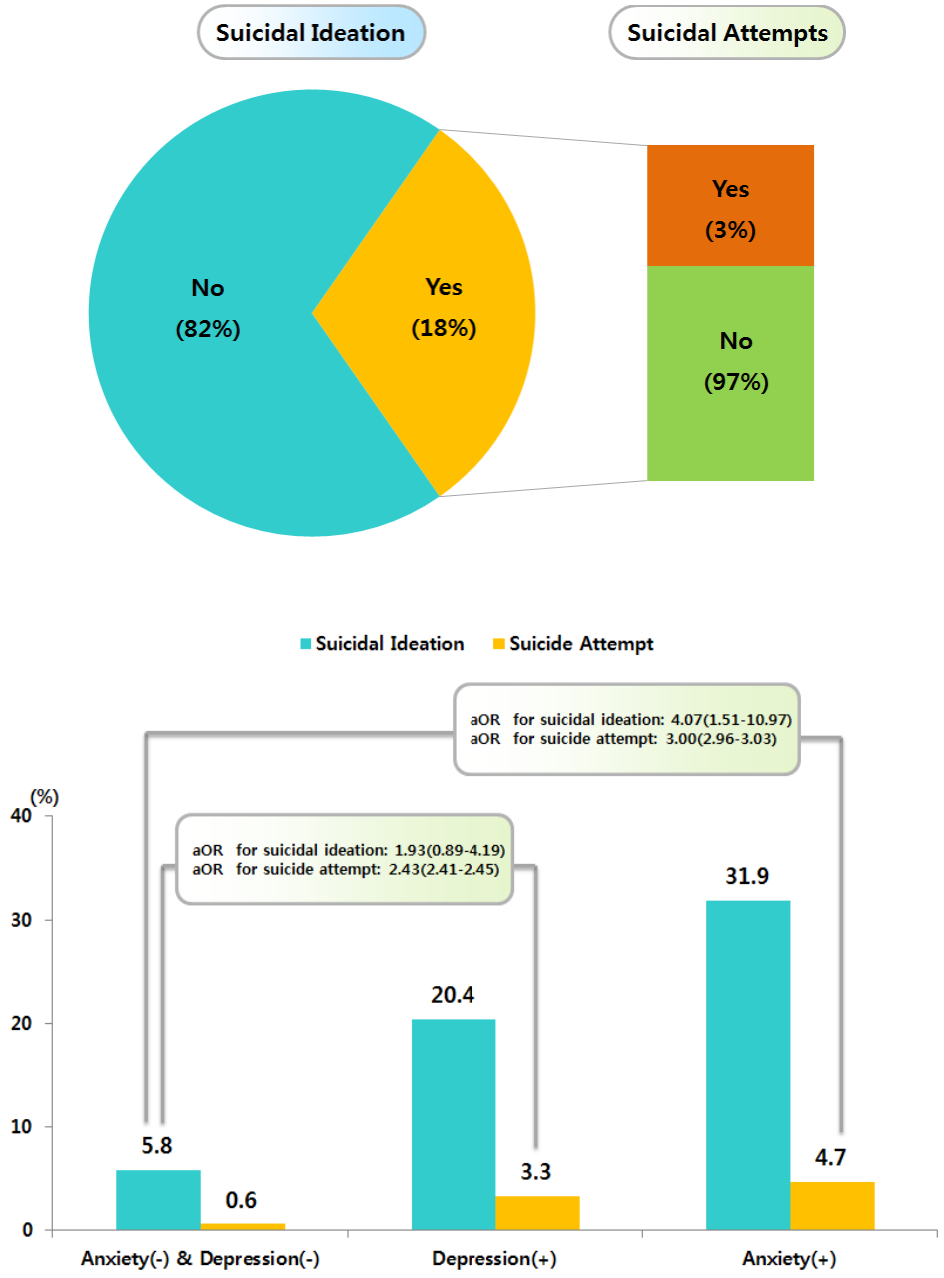
A total of 17.7% family caregivers reported suicidal ideation, and 2.8% had attempted suicide during the previous year.

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, female, unmarried, unemployed during caregiving, and having a low quality of life with respect to financial matters were found to be at high risk of suicide.

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



Source) Park BY et al. PLos One 2013

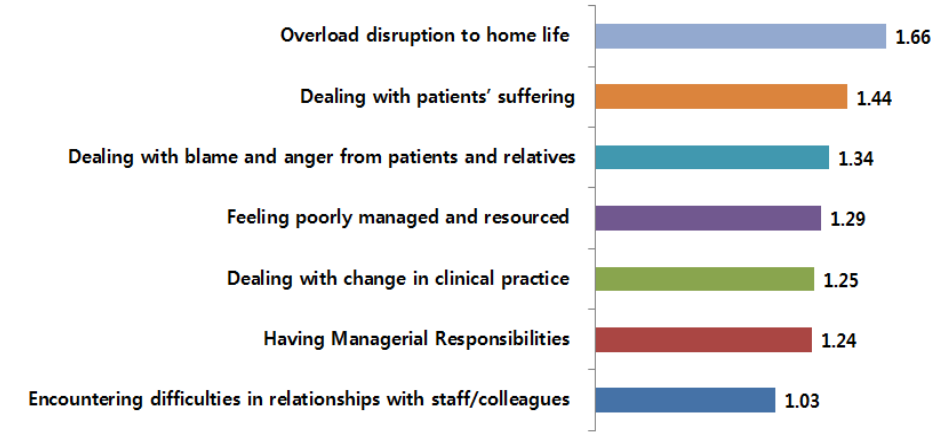
Work-Related Stress and Satisfaction of Oncologists

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 4-point scale (scores from 0 to 3).

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

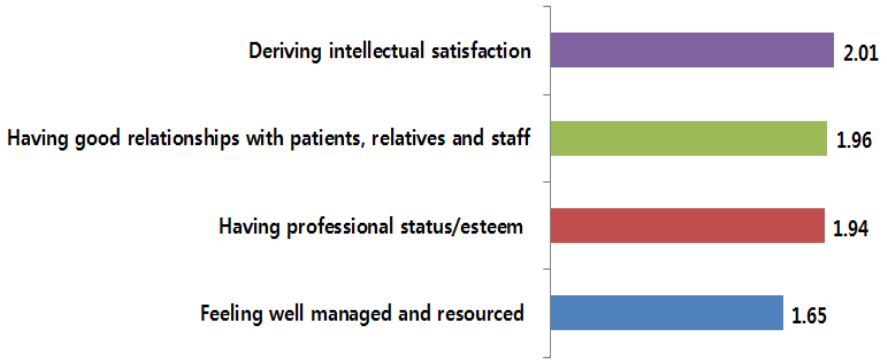
According to the survey results on the level of work-related satisfaction of oncologists, 'Deriving intellectual stimulation from teaching' was the area with highest satisfaction (2.01 points), while 'Feeling well managed and resourced' had the lowest score of 1.65.

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.

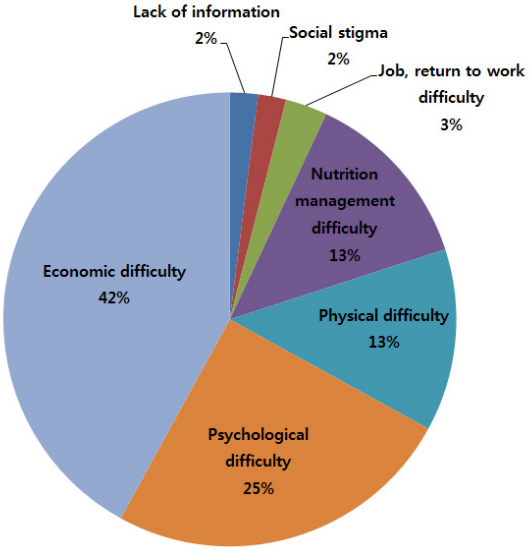
We surveyed 2,000 households throughout Korea in 2012.

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

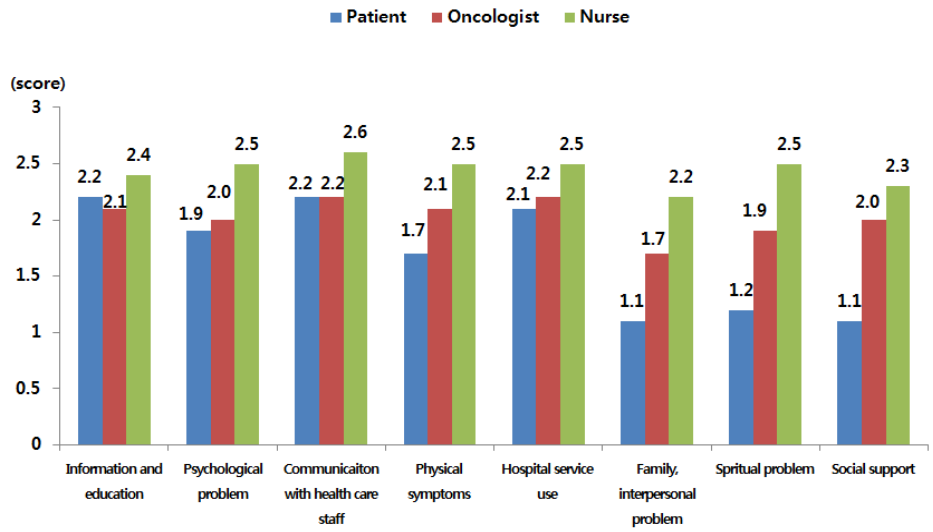
When we asked a similar question to cancer patients and medical providers, such as oncologists and nurses, regarding the most important service for cancer patients, cancer patients said 'Information about financial support for medical expenses from government' was most important, while medical providers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



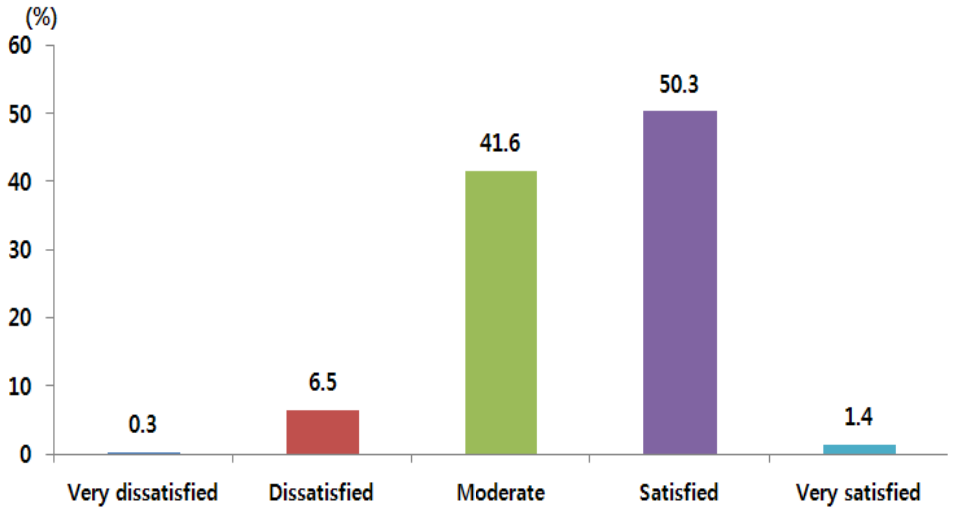
Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care, 2013

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

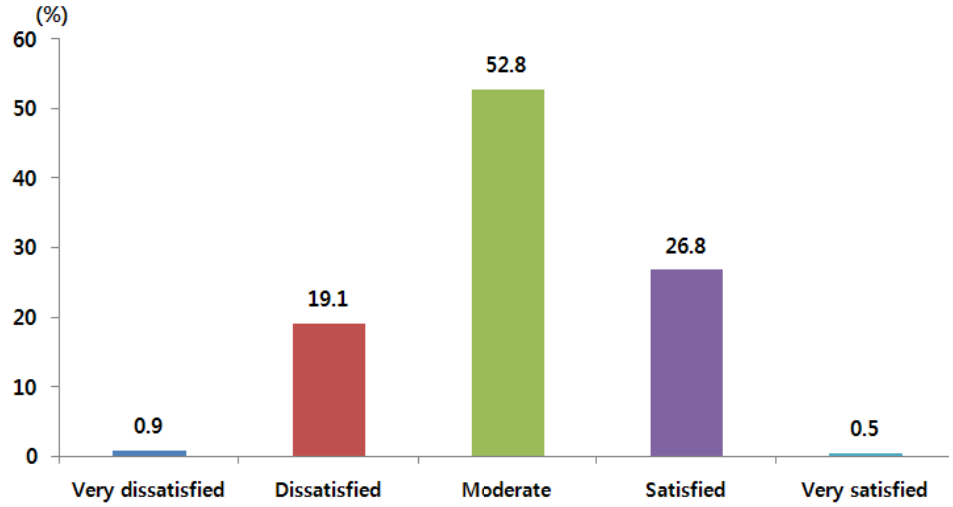
Regarding the overall quality of cancer care, including therapeutic techniques and cancer survival rate, half of the public were satisfied, 41% felt that the level of quality was average, and only 6% were dissatisfied.

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)

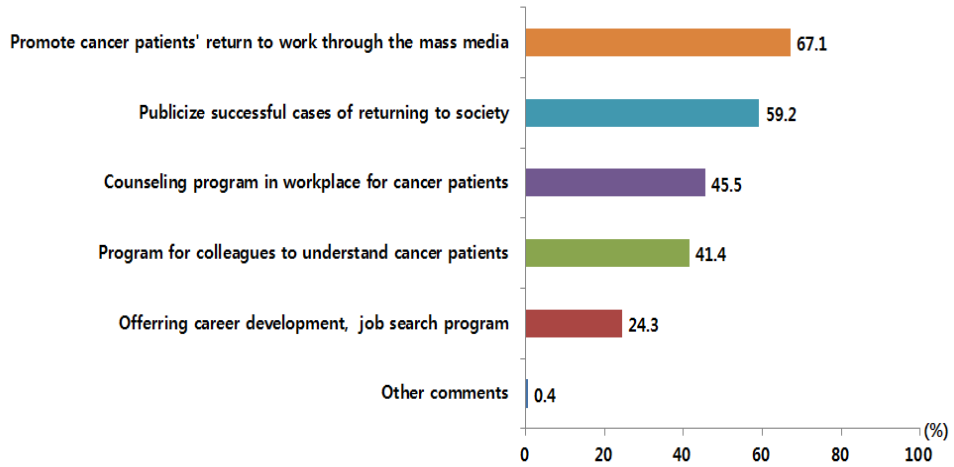


Source) National Cancer Center. Quality, Equity, and Coverage in Cancer Care, 2013

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

Chapter 6.
Palliative Care

6.1 Palliative Care

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 2013, 53 palliative care institutions have been established. Since 2005, the Ministry of Health and Welfare has invited public palliative care institutions to be subsidized for their operating expenses.

Section	2005	2006	2007	2008	2009	2010	2011	2012	2013
Designated institutions				19	40	42	46	56	53*
Subsidized institutions	15	21	23	30	34	40	43	44	52
Beds	261	362	415	524	546	628	728	720	842
Subsidies (million won)	240	800	1,050	1,300	1,300	1,730	2,160	2,310	2,679

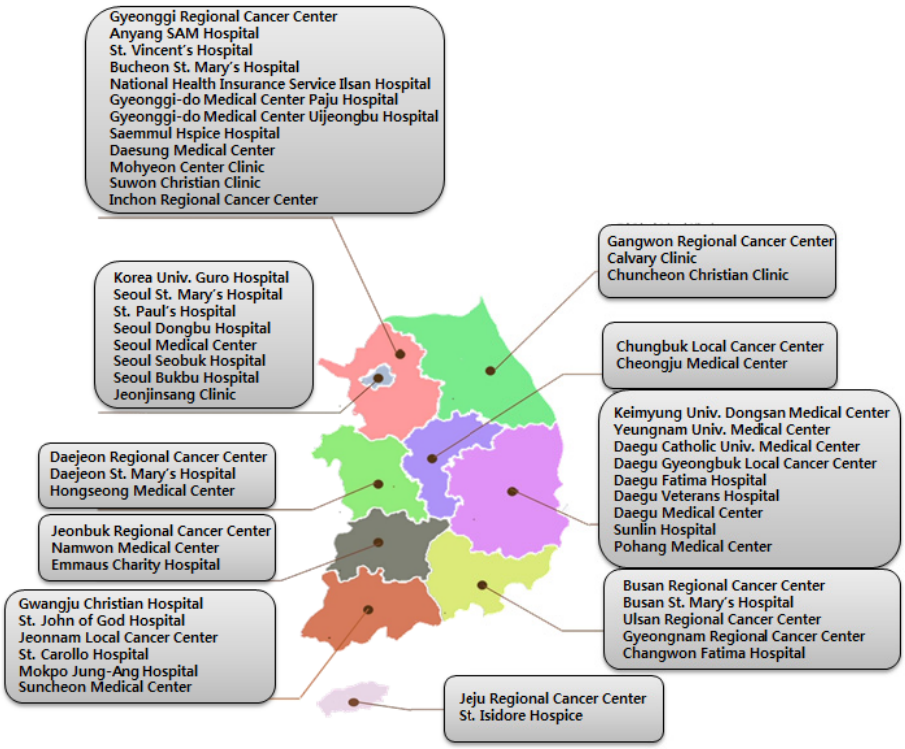
*As of December 2013

Designated Palliative Care Institutions (2013)

No.	Region	Name
1	Seoul	Korea Univ. Guro Hospital
2		Seoul St. Mary's Hospital
3		St. Paul's Hospital
4		Seoul Dongbu Hospital
5		Seoul Medical Center
6		Seoul Seobuk Hospital
7		Seoul Bukbu Hospital
8		Jeonjinsang Clinic
9	Busan	Busan Regional Cancer Center
10		Busan St. Mary's Hospital
11	Daegu	Keimyung Univ. Dongsan Medical Center

No.	Region	Name
12		Yeungnam Univ. Medical Center
13		Daegu Catholic Univ. Medical Center
14		Daegu·Gyeongbuk Regional Cancer Center
15		Daegu Fatima Hospital
16		Daegu Veterans Hospital
17		Daegu Medical Center
18	Daejeon	Daejeon Regional Cancer Center
19		Daejeon St. Mary's Hospital
20	Gwangju	Gwangju Christian Hospital
21		St. John of God Hospital
22	Inchon	Inchon Regional Cancer Center
23	Ulsan	Ulsan Regional Cancer Center
24	Gyeonggi	Gyeonggi Regional Cancer Center
25		Anyang SAM Hospital
26		St. Vincent's Hospital
27		Bucheon St. Mary's Hospital
28		National Health Insurance Service Ilsan Hospital
29		Gyeonggi-do Medical Center Paju Hospital
30		Gyeonggi-do Medical Center Uijeongbu Hospital
31		Saemmul Hospice Hospital
32		Daesung Medical Center
33		Mohyeon Center Clinic
34		Suwon Christian Clinic
35	Gangwon	Gangwon Regional Cancer Center
36		Calvary Clinic
37		Chuncheon Christian Clinic
38	Chungbuk	Chungbuk Regional Cancer Center
39		Cheongju Medical Center
40	Chungnam	Hongseong Medical Center
41	Jeonbuk	Jeonbuk Regional Cancer Center
42		Namwon Medical Center
43		Emmaus Charity Hospital
44	Jeonnam	Jeonnam Regional Cancer Center
45		St. Carollo Hospital
46		Mokpo Jung-Ang Hospital
47		Suncheon Medical Center
48	Gyeongbuk	Sunlin Hospital
49		Pohang Medical Center
50	Gyeonnam	Gyeongnam Regional Cancer Center
51		Changwon Fatima Hospital
52	Jeju	Jeju Regional Cancer Center
53		St. Isidore Hospice

Designated Palliative Care Institutions (2013)



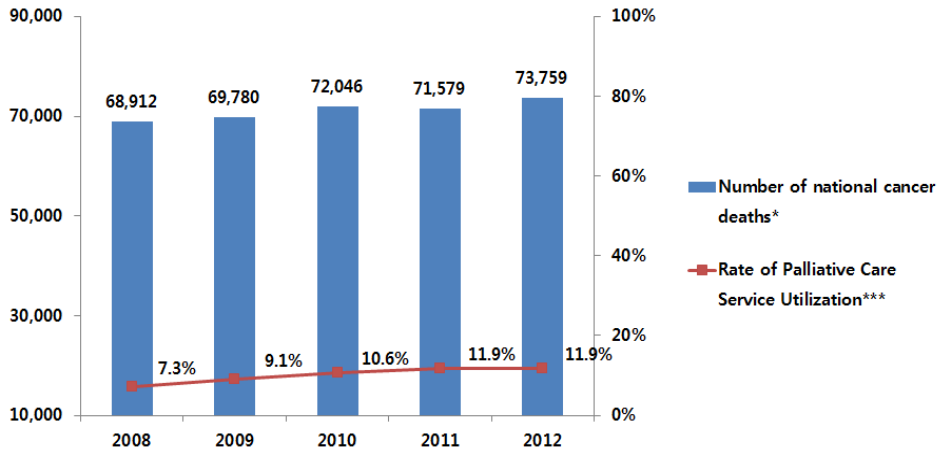
Source) National Cancer Center, 2013

Palliative Care Service Utilization

In 2012, 8,472 cancer patients used 44 palliative care institutions. Among those who died from cancer, 11.9% had used palliative care institutions.

In 2011, 87.7% of cancer deaths occurred at health institutions, 9.3% and 1.3% of cancer deaths occurred in patient's house and during transfer, respectively.

Palliative Care Service Utilization (2008-2012)



Source) National Cancer Center, Support for activation of palliative care service, 2013

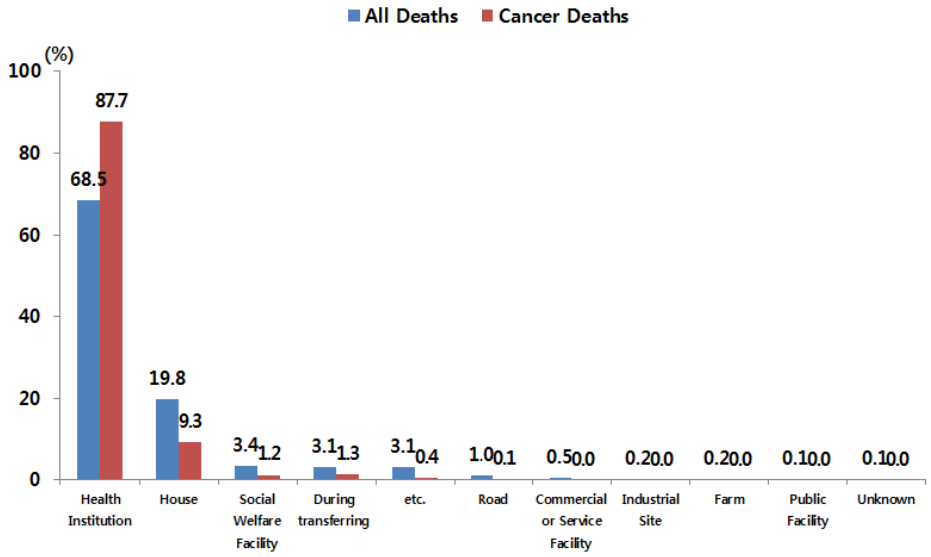
Year	New inpatients*	Number of national cancer deaths**	Rate of Palliative Care Service Utilization***
2008	5,046	68,912	7.3%
2009	6,365	69,780	9.1%
2010	7,654	72,046	10.6%
2011	8,494	71,579	11.9%
2012	8,742	73,759	11.9%

*Source) Palliative care practice status of application, 2009-2013

**Source) STATISTICS KOREA. Annual report on the cause of death statistics, 2008-2012

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

Place of Cancer Deaths (2011)



Source) STATISTICS KOREA. Annual report on the cause of death statistics, 2011

Cancer Mortality by Age and Place

The average age of cancer patients who died at social welfare facilities was 75.5, in their houses 72.7, during transfer 71.5, and at health institutions 67.6.

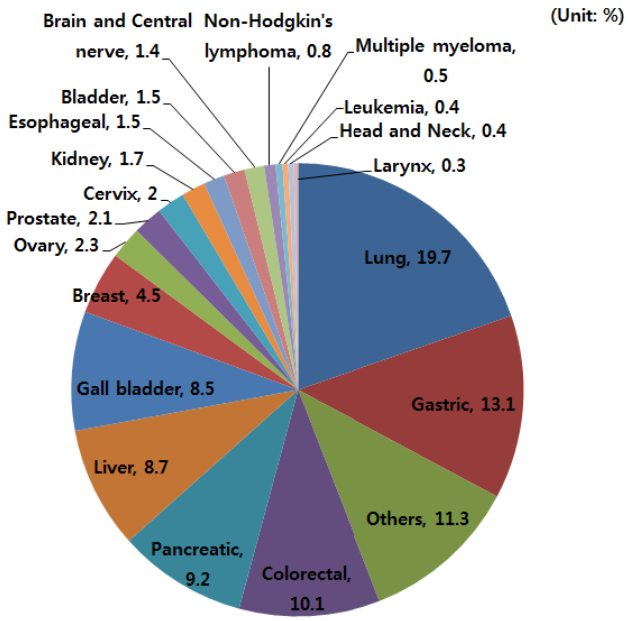
87.7% of cancer patients died in health institutions. The average age of patients who died from cancer was 68.2.

Place of Death	N	%	Age	
			Mean	S.D.
Health institution	62,755	87.7	67.6	13.6
House	6,654	9.3	72.7	11.8
During transfer	937	1.3	71.5	12.1
Social welfare facility	889	1.2	75.5	12.5
etc.	259	0.4	70.7	13.8
Road	36	0.1	68.8	13.1
Public facility	12	0.0	67.9	17.2
Unknown	15	0.0	69.9	14.0
Commercial or service facility	10	0.0	61.2	11.5
Industrial site	5	0.0	65.6	14.8
Farm	5	0.0	58.4	18.5
Total	71,577	100.0	68.2	13.5

Palliative Care Institution Utilization

In 2013, 8,084 cancer patients used palliative care institutions. According to the types of cancer, the number of lung cancer patients was the highest (1,329, 19.7%), followed by gastric cancer (883, 13.1%), colorectal cancer (684, 10.1%), pancreatic cancer (619, 9.2%), and liver cancer (584, 8.7%).

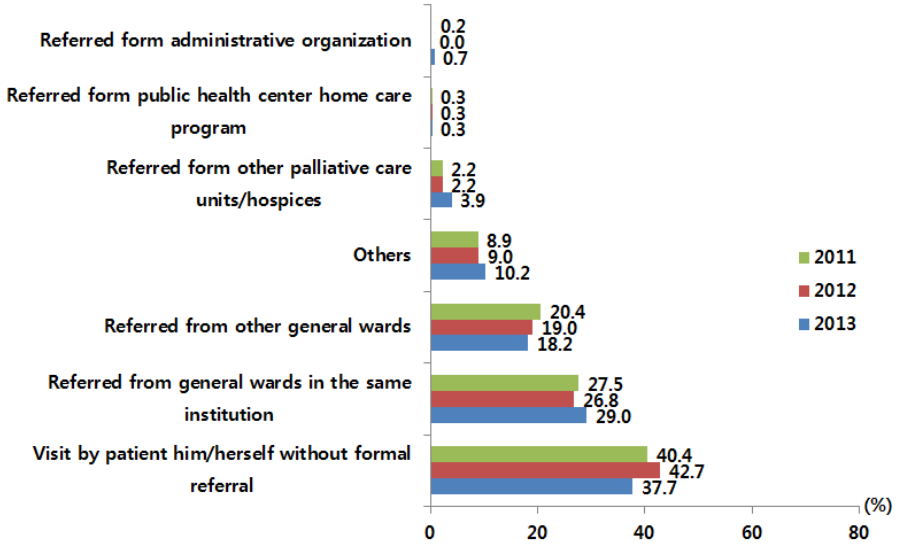
Use of Hospice and Palliative Care Services by Types of Cancer



Source) National Cancer Center. Support for activation of palliative care service, 2013

As for admission routes of patients who used palliative care institutions in 2013, the highest number of patients visited the institution without formal referral (2,535, 37.7%), followed by patients who were referred from the general wards in the same health institution (1,953, 29.0%), and from other health institutions or wards (1,224, 18.2%).

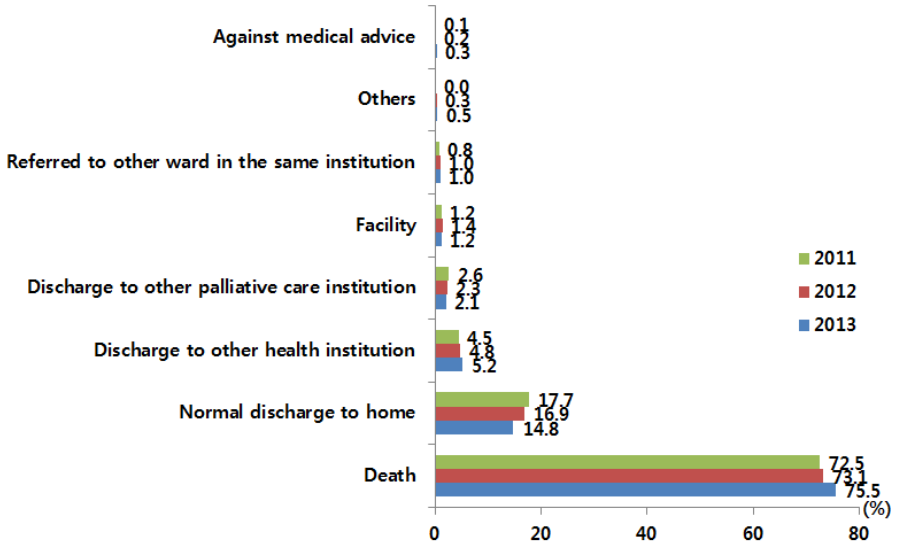
Admission Routes to Palliative Care Institutions (2011-2013)



Source) National Cancer Center. Support for activation of palliative care service, 2013

The most common reason of discharge from initial admission was death (4,694, 75.5%), followed by discharge to home (919, 14.8%), and discharge to another health institution (321, 5.2%).

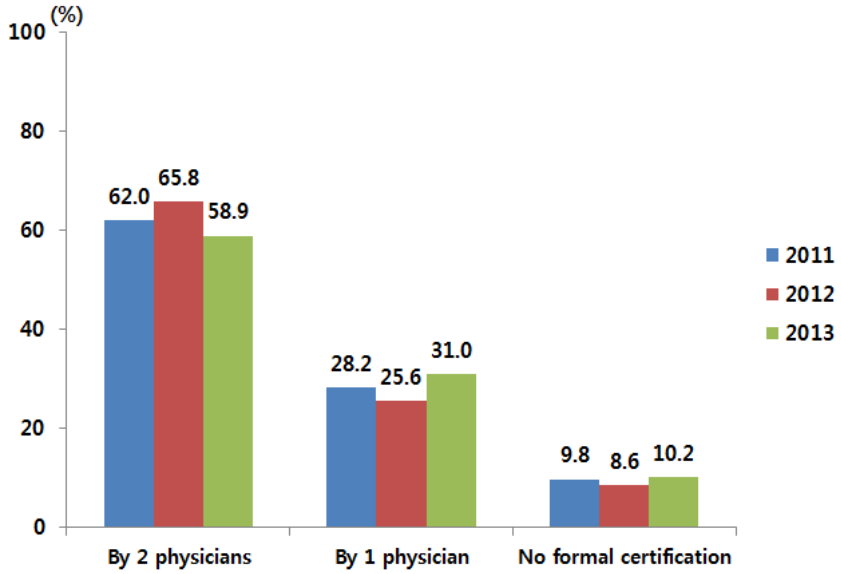
Reason for Discharge from Palliative Care Institution



Source) National Cancer Center. Support for activation of palliative care service, 2013

Regarding the status of terminal diagnosis or physician's note, 3,931 patients (58.9%) were diagnosed by two or more physicians, 2,067 (31.0%) were diagnosed by one physician, and 681 (10.2%) did not receive a diagnosis.

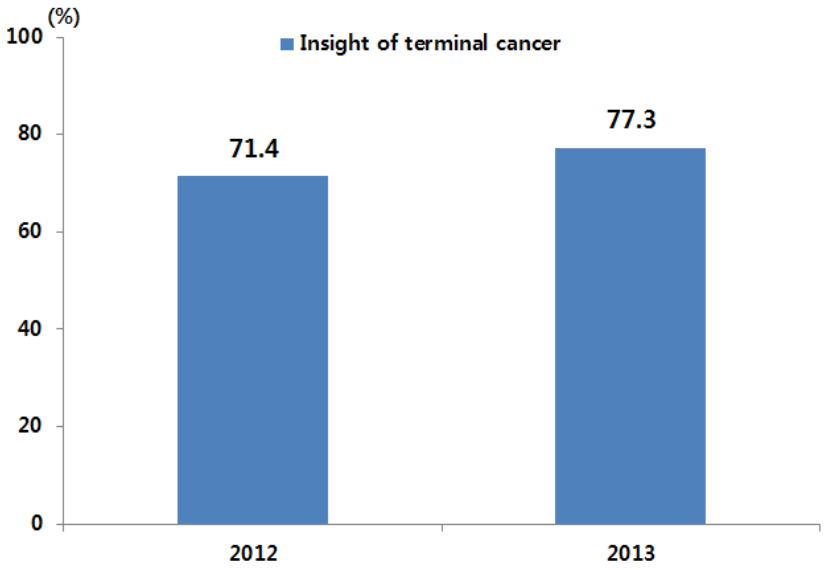
Status of Terminal Cancer Diagnosis (2011-2013)



Source) National Cancer Center. Support for activation of palliative care service, 2013

Patients' awareness of terminal cancer improved from 71.4% in 2012 to 77.3% in 2013, signifying that the level of awareness is still insufficient.

Awareness of Terminal Cancer

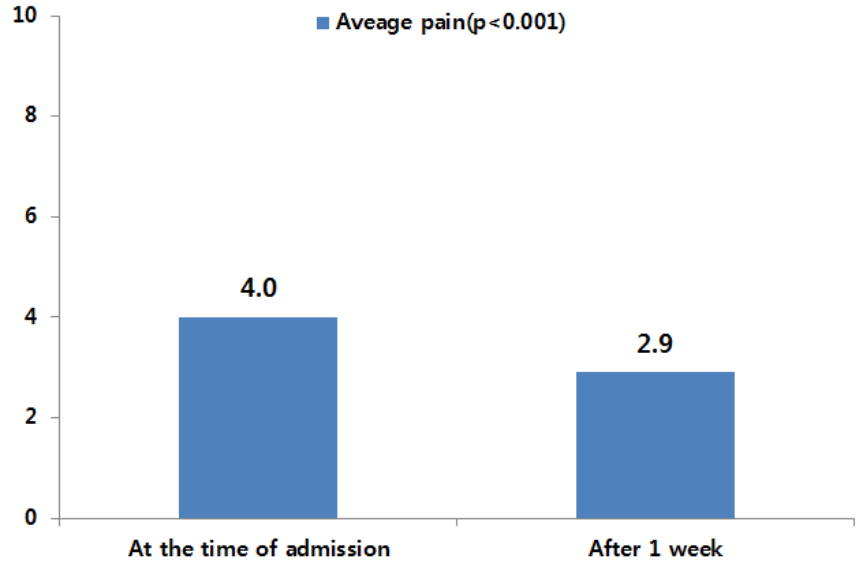


Source) National Cancer Center. Support for activation of palliative care service, 2013

Improvement of Pain Conditions at Palliative Care Institutions

Average level of pain after a week of admission to palliative care institutions declined from 4.0 to 2.9.

Improvement of Pain Condition after 1 Week at Palliative Care Institution



Source) National Cancer Center. Support for activation of palliative care service, 2013

Overall Satisfaction of Bereaved Family Using Palliative Care Institutions

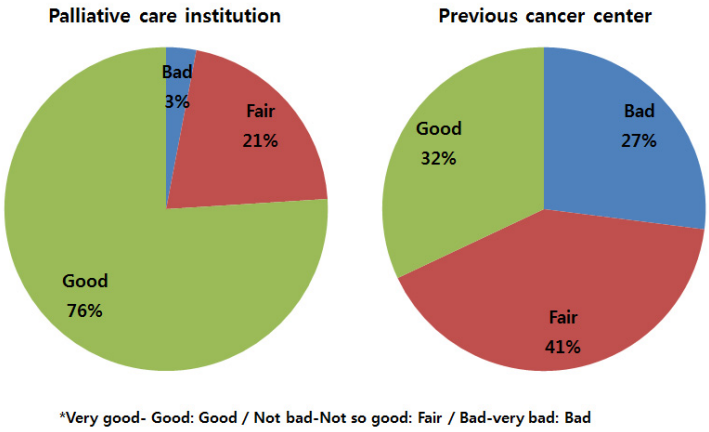
1. Purpose of the survey

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 2012, 32% of patients said that they were satisfied with cancer centers they had previously used. In comparison, 76% of patients said they were satisfied with palliative care institutions.

Satisfaction with Palliative Care Institution



Source) National Cancer Center. Support for activation of palliative care service, 2012

Satisfaction with Palliative Care Services

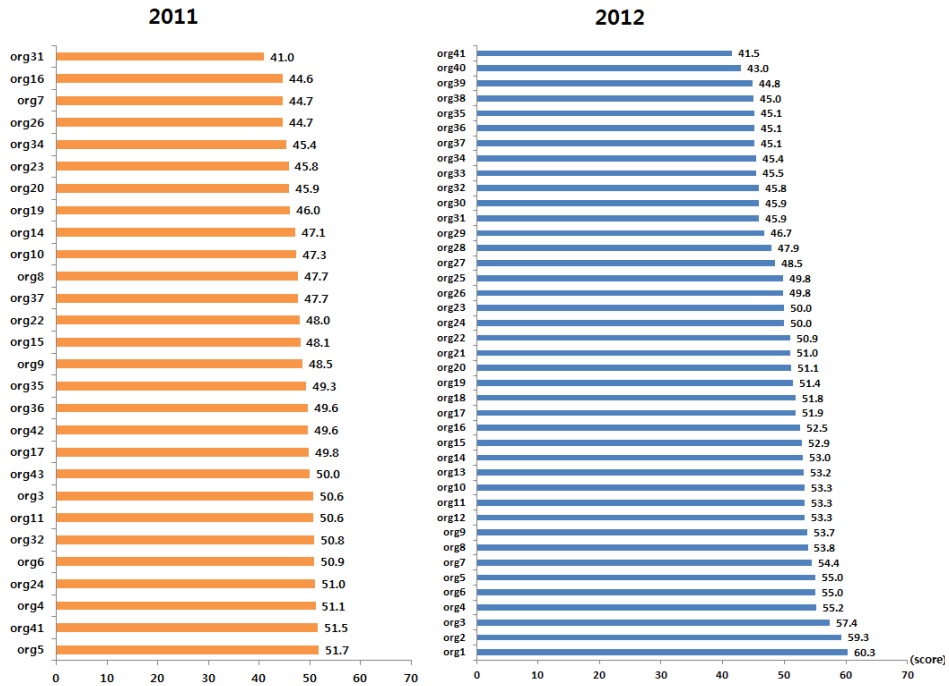
According to the result of a survey on the satisfaction of patients who used palliative care institutions, more than 70% of the respondents were satisfied with the physicians and palliative care teams in terms of their proper handling, expert knowledge, skill, and teamwork. Non-waiting hospitalization received the lowest level of satisfaction (63.6%).

	2010		2011		2012		P-value
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
1) Physician's swift action	72.0	20.7	75.8	20.3	75.0	19.7	<0.001**
2) Nurse's expert knowledge and skill	74.8	19.4	76.4	18.7	75.7	19.2	0.2633
3) Palliative care team's effort to meet patient's needs	77.1	19.9	78.5	18.7	77.4	18.7	0.2713
4) Physician's explanation to patient	68.6	23.4	70.5	23.5	70.6	22.9	0.2027
5) Physician's explanation to patient's family	74.7	21.5	77.8	20.6	77.1	21.3	<0.016*
6) Convenient and pleasant facility	68.4	22.9	71.3	23.0	71.5	22.5	<0.0194*
7) Consideration for maintaining health	64.8	22.4	67.4	22.6	68.0	22.6	<0.0228*
8) Reasonable cost	71.5	21.0	73.0	20.7	73.3	21.8	0.2178
9) Non-waiting hospitalization	60.9	25.6	66.9	25.7	63.6	25.8	<0.001**
10) Palliative care teamwork	73.2	20.1	76.0	19.7	75.1	20.3	<0.029*

Measurement tool: CES short version with 10 items and 6-point scale: 0 (Never) - 100 (Definitely)
*p<0.05, **P<0.001

Assessment of End-of-life

The end-of-life quality score varied significantly among palliative care institutions from 41.0 to 59.7 ($p<0.001$) in 2011, and from 41.5 to 60.3 ($p<0.001$) in 2012.



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

※Average end-of-life quality score among all institutions: 51.0 (2011), 51.6 (2012)

※Excludes institutions with less than 5 available answers

Source) National Cancer Center. Support for activation of palliative care service, 2013

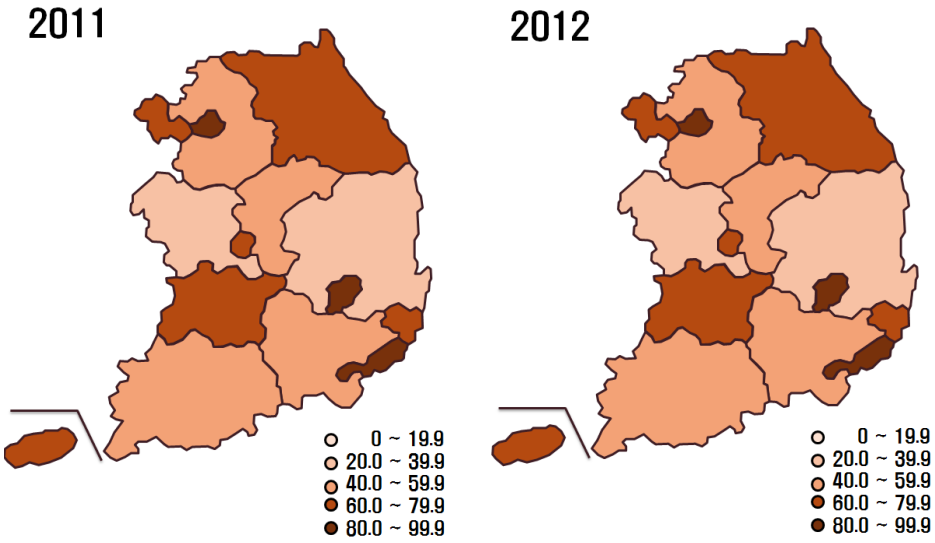
Chapter 7.
Regional Cancer Centers

Self-Sufficiency of Cancer Treatment

Outside of Seoul, Daegu had the highest level of self-sufficiency in treating cancer patients from 2011 to 2012. Gyeongbuk had the lowest level.

Comparing self-sufficiency levels of 16 cities and provinces between 2011 and 2012, Chungbuk showed the highest improvement, followed by Kangwon and Incheon.

Self-Sufficiency of Cancer Treatment



Source) National Cancer Center, 2012

Locations of Regional Cancer Centers

Each year from 2004 to 2006, three national university hospitals were designated as regional cancer centers. In 2011, three additional private university hospitals were designated, bringing the total to 12 regional cancer centers in operation throughout Korea.

- 2004: Jeonbuk, Jeonnam, and Gyeongmam
- 2005: Busan, Daejeon, and Daegu/Gyeongbuk
- 2006: Kangwon, Chungbuk, and Jeju
- 2011: Incheon, Gyeonggi, and Ulsan

Regional Cancer Centers

Source) National Cancer Center, 2013

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, 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, 2013

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