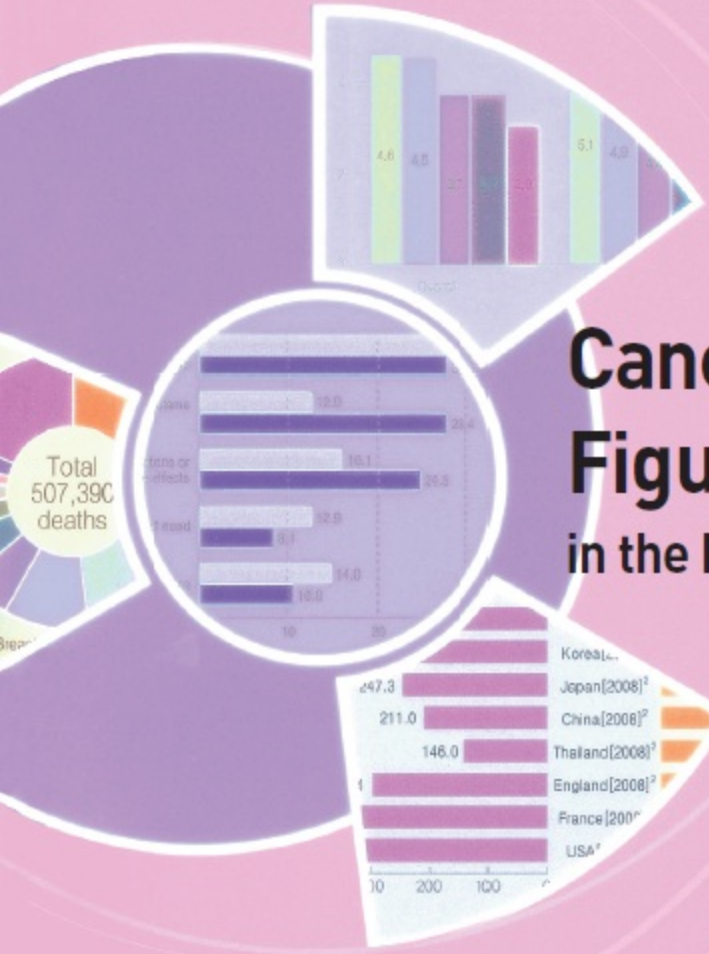


Cancer Facts & Figures 2013

in the Republic of Korea

MINISTRY OF HEALTH & WELFARE
REPUBLIC OF KOREA

NATIONAL CANCER CENTER

Cancer Facts & Figures 2013

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 of 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 the 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 cancer research, providing treatment for patients with cancer, 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, supporting cancer-related research projects, and strengthening collaborative networks among medical facilities specializing in cancer in Korea and abroad along with various international organizations.

The latest publication from the National Cancer Center is titled Cancer Facts & Figures in the Republic of Korea 2013. It is a compilation of cancer-related reports, academic papers, and data published in Korea, with the information presented according to various topics. 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 2013 offers helpful information about the current state of cancer control in Korea and the achievements of national cancer 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 2013 serves as a pedestal for conquering cancer not only in Korea, but also in other countries throughout Asia and across the globe. We would like to express sincere appreciation to the staff and associates of the National Cancer Center who have made this publication possible.

June 2013

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)

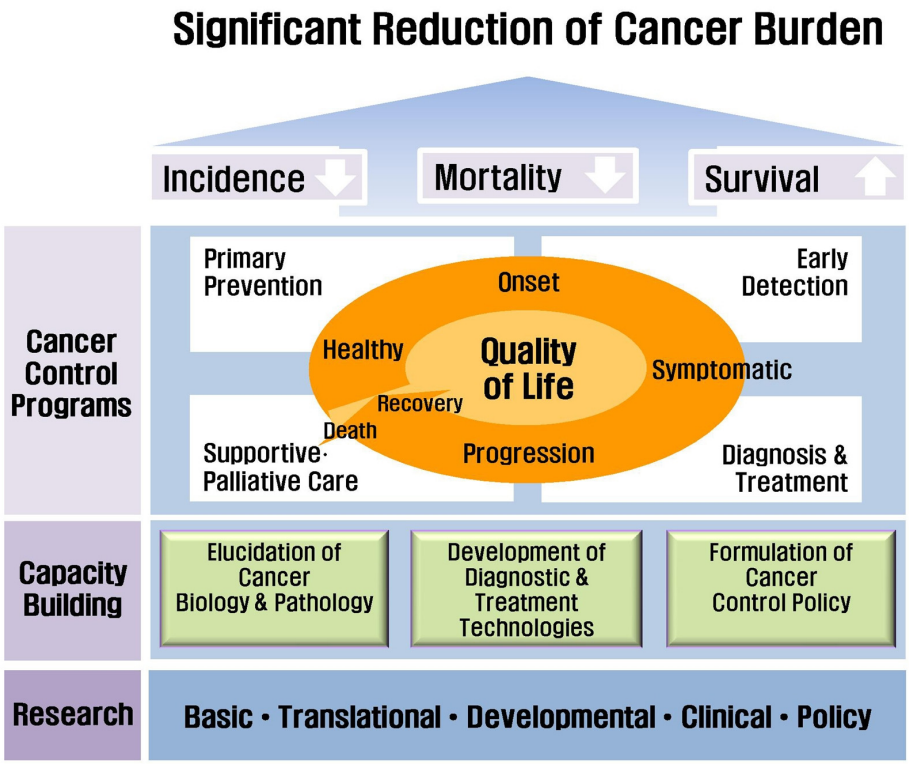
Following the First 10-year Plan for National Cancer Control (1996 to 2005), the Korean government implemented the Second 10-year Plan for National Cancer Control (2006 to 2015) for effective control and management of cancer at the national level.

The Revised Second 10-year Plan for National Cancer Control (2011 to 2015) incorporates the results of the progress evaluation performed in 2011 that 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 due to the aging population and the changing 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 survivor 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, guarantee of cancer treatment and improvements in the quality of treatment, support for rehabilitation and palliative care for patients with cancer, building infrastructures for active national

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

The Second 10-year Plan for National Cancer Control



Source) Ministry of Health & Welfare, 2011

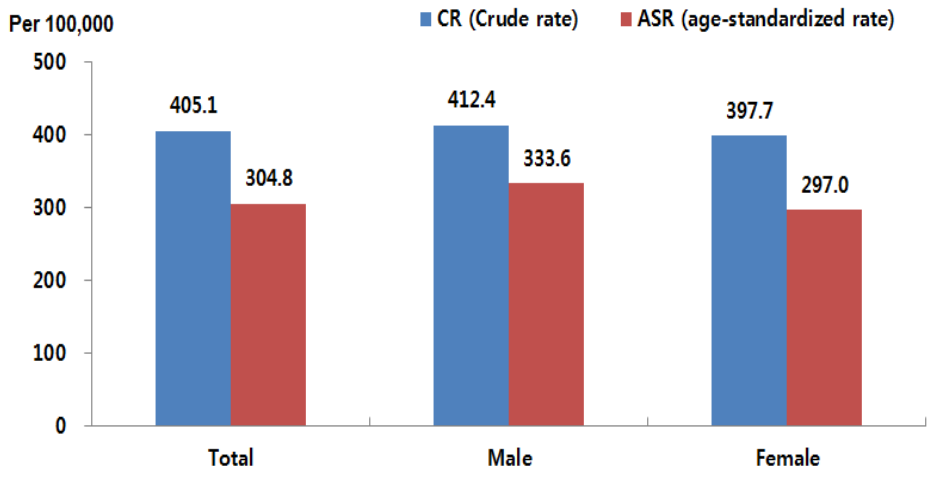
Chapter 2.
Basic Facts

2.1 Cancer Incidence

Cancer Incidence Rates

In Korea, the age-standardized cancer incidence rate in 2010 was 304.8 per 100,000 individuals (333.6 for males and 297.0 for females).

Cancer Incidence Rates (2010)



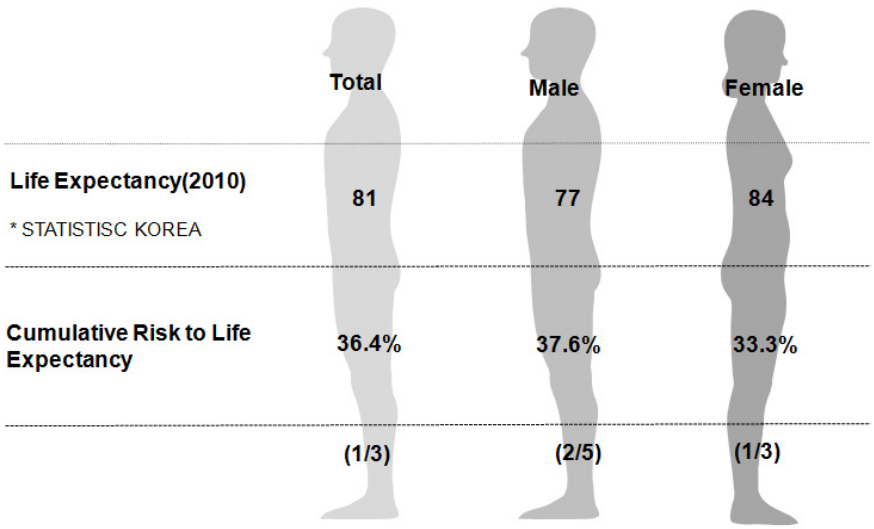
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Note) ASR (Age-standardized rate) standard population: Korean mid-year population in 2000

Cumulative Risk of Cancer

The cumulative risk of cancer during average life expectancy was 36.4%. The risk for males was higher than that for females at 37.6% and 33.3%, respectively.

Cumulative Risk of Cancer (2010)



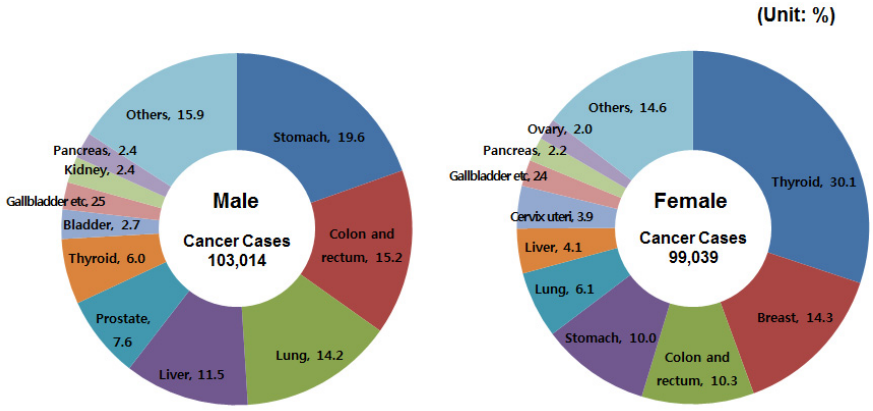
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Proportion of Cancer Incidence

In males, stomach cancer occurred most frequently, accounting for 19.6% of all cases, followed by colon and rectum cancer (15.2%), lung cancer (14.2%), and liver cancer (11.5%).

In females, thyroid cancer occurred most frequently, accounting for 30.1% of all cases, followed by breast cancer (14.3%), stomach cancer (10.3%), colon and rectum cancer (10.0%), and lung cancer (6.1%).

Proportion of Cancer Incidence (2010)



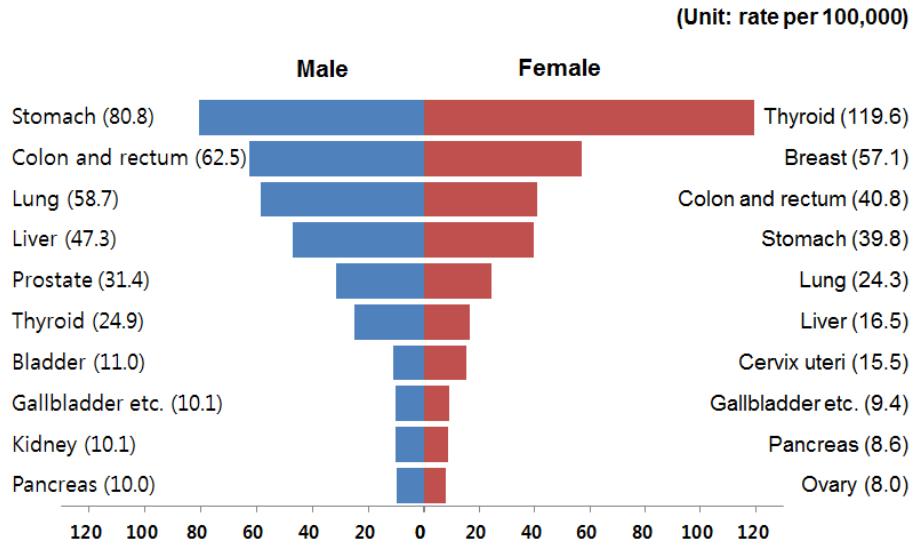
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Site-Specific Cancer Incidence Rates by Gender

In males, the crude incidence rate[1)] of stomach cancer was 80.8 per 100,000 individuals. The incidence rates for other cancer sites were 62.5, 58.7, and 47.3 for colon and rectum, lung, and liver cancers, respectively.

In females, the crude incidence rate of thyroid cancer was 119.6. The incidence rates for other cancer sites were 57.1, 40.8, and 39.8 for breast, colon and rectum, and stomach cancers, respectively.

Crude Rates of Ten Major Cancer Sites (2010)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

1) Crude incidence rate = The number of new cancer cases / mid-year population × 100,000

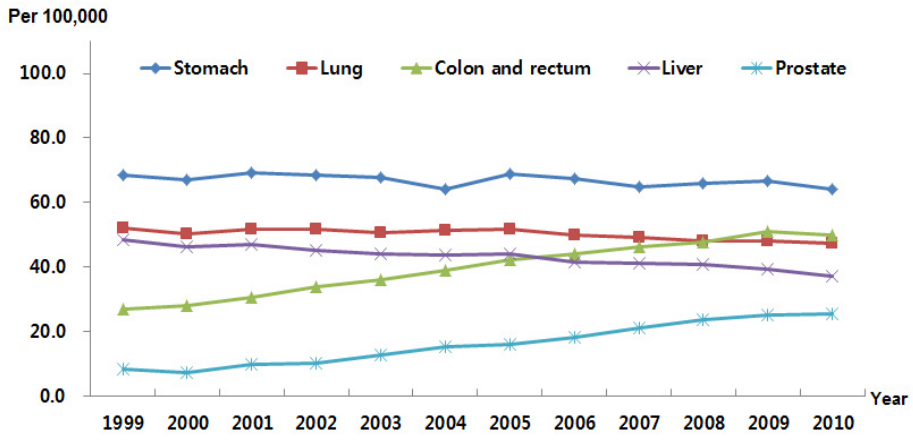
Trends of Age-standardized Incidence Rates of Major Cancers

From 1999 to 2010, the total incidence rate for all cancers increased by 1.6% and 5.6% each year in males and females, respectively.

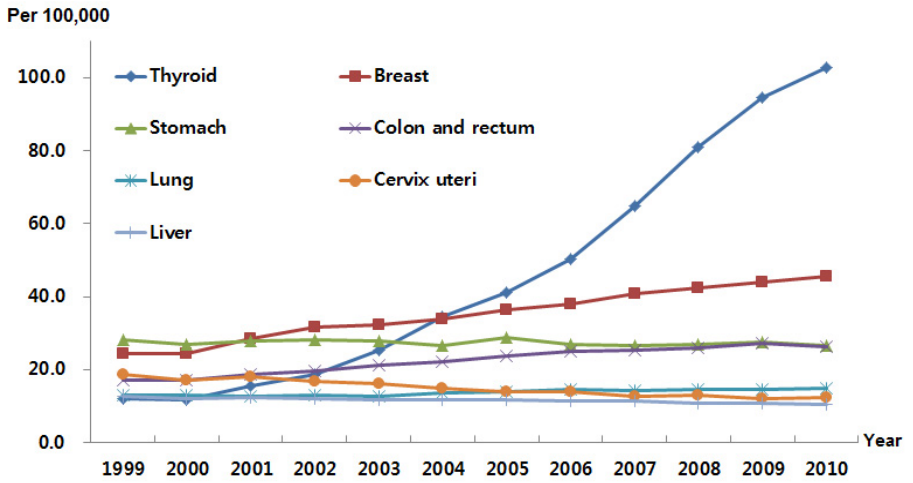
In males, rates of liver and lung cancers decreased, while those of thyroid, prostate, and colon and rectum cancers increased by 25.5%, 12.6%, and 6.3%, respectively.

In females, rates of cervix uteri and liver cancers decreased, but the rate of thyroid cancer sharply increased by 24.5% each year, and the rates of breast, colon and rectum and lung cancers also increased.

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



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



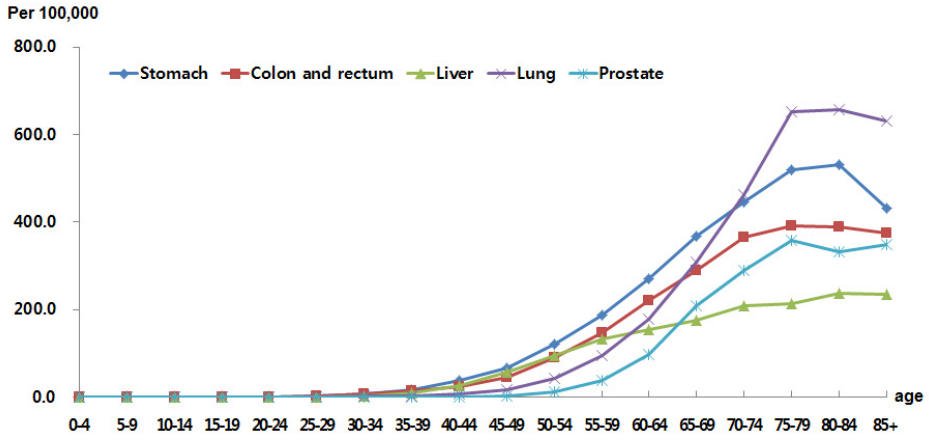
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Note) ASR (Age-standardized rate) standard population: Korean mid-year population in 2010

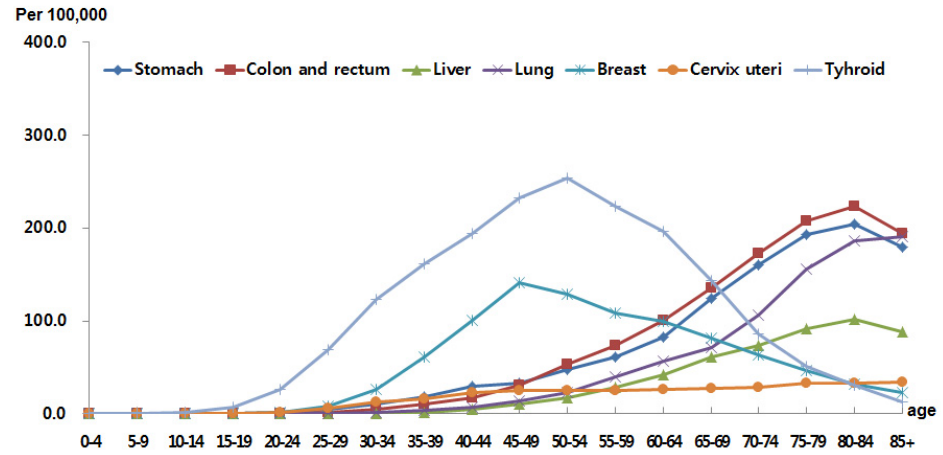
Age-specific Incidence Rates of Major Cancers According to Gender

According to the incidence rates of major cancers in various male age groups examined in 2010, 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 (2010)



Age-specific Cancer Incidence Rates : Female (2010)

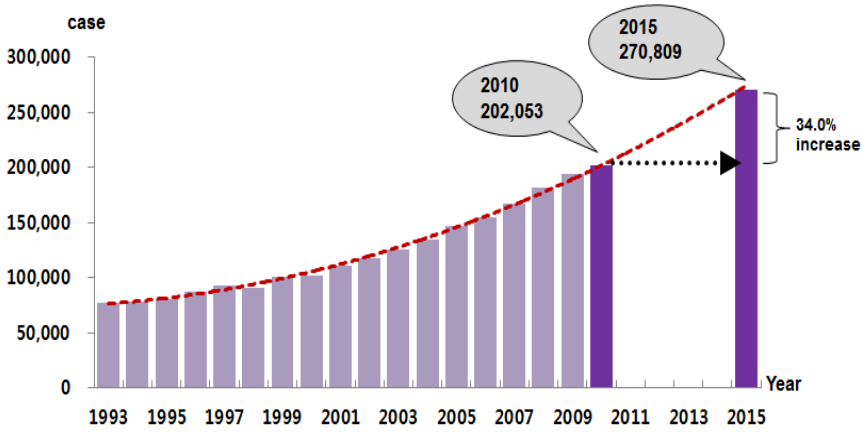


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Projection of Cancer Incidences

The total number of cancer cases is expected to increase from 202,053 in 2010 to 270,809 in 2015, a 34.0% increase over the five-year period.

Projection of Cancer Incidences

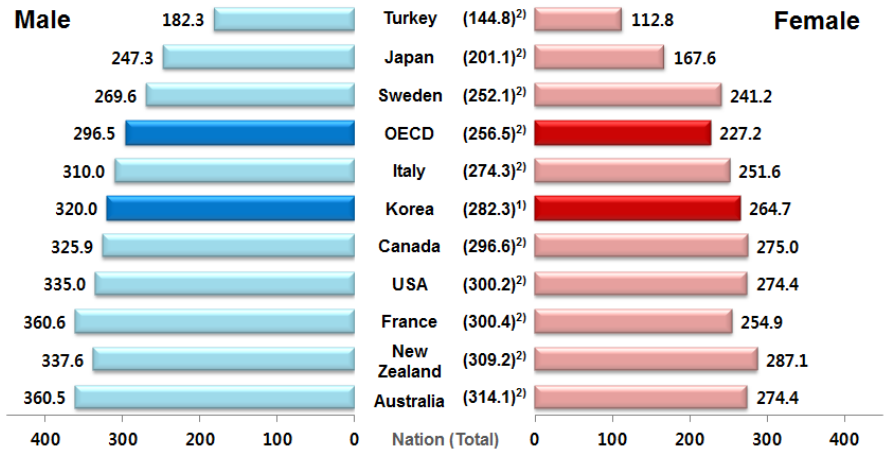


Source) National Cancer Center, 2010

Comparison of Age-Standardized Cancer Incidence Rates with Other Countries

The age-standardized cancer incidence rate of Korea is higher than that of Japan and 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, 2012
2) GLOBOCAN 2008, IARC (International Agency for Research on Cancer) 2010

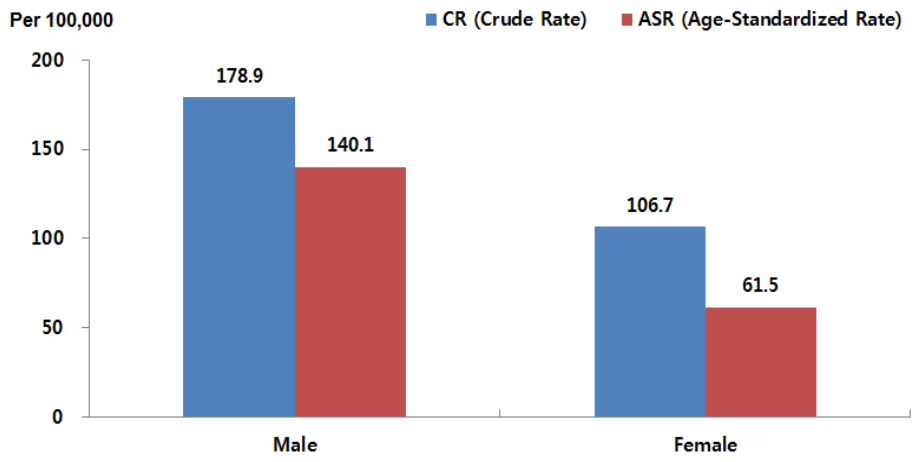
Note) Age-standardized incidence rates use the world standard population, and exclude other malignant neoplasms of skin (C44)

2.2 Cancer Mortality

Cancer Mortality Rates

The age-standardized cancer mortality rates in Korea in 2011 were 140.1 per 100,000 males and 61.5 per 100,000 females.

Cancer Mortality Rates (2011)



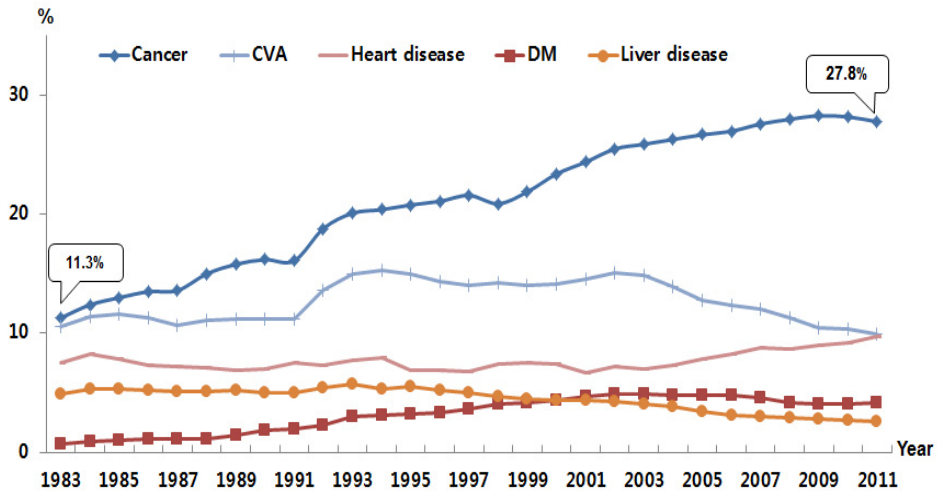
Source) STATISTICS KOREA, 2012

Note) ASR (Age-standardized rate) standard population: Korean mid-year population in 2010

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, and accounting for 27.8% of total deaths in 2011.

Causes of Disease Deaths (1983~2011)

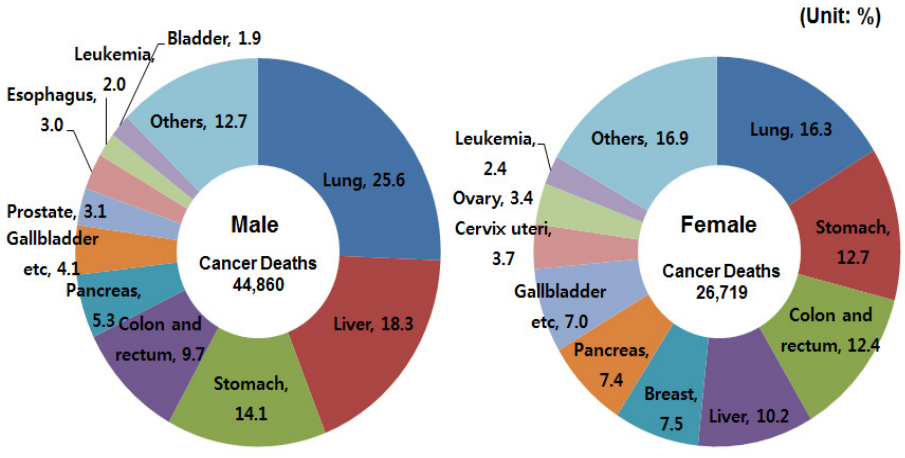


Source) STATISTICS KOREA, 2012

Proportion of Cancer Deaths

In 2011, lung, liver, stomach, and colon and rectum cancers accounted for 25.6%, 18.3%, 14.1%, and 9.7% of cancer deaths in males, respectively. For females, lung, stomach, colon and rectum, and liver cancers accounted for 16.3%, 12.7%, 12.4%, and 10.2%, respectively.

Relative Frequency of Cancer Deaths (2011)



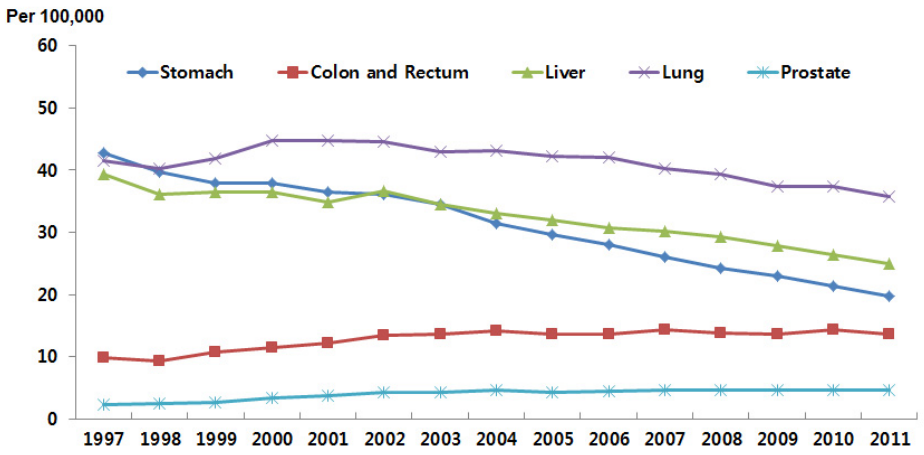
Source) STATISTICS KOREA, 2012

Age-standardized Mortality Rates of Major Cancers by Gender

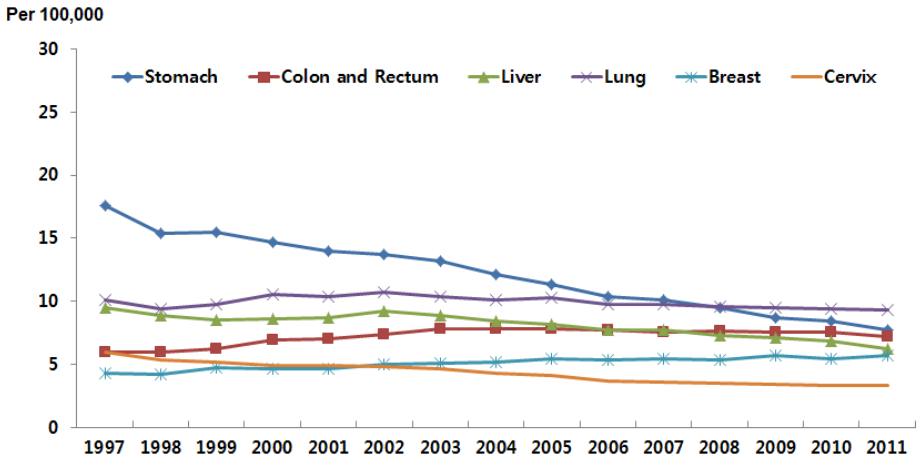
The age-standardized mortality rates of stomach and liver cancer have fallen in males, but the rate of colon and rectum cancer has increased consistently. On the other hand, the rate of lung cancer in males has been decreasing since 2000.

The mortality rate of stomach cancer in females has shown the largest decrease. The rates of liver and cervix uteri 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



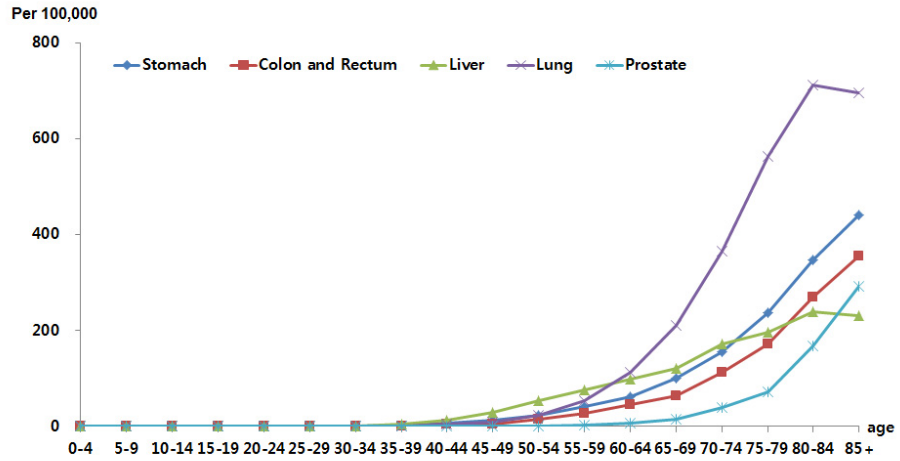
Source) STATISTICS KOREA, 2012

Note) ASR (Age-standardized rate) standard population: Korean mid-year population in 2010
Cervix cancer: C53-55 (International Classification of Disease, ICD-10)

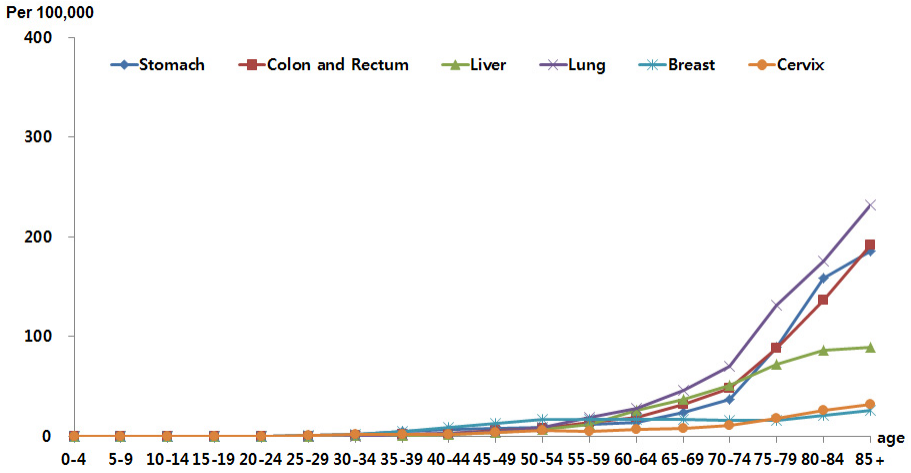
Age-specific Mortality Rates of Major Cancers by Gender

The age-specific mortality rates of major cancers in 2011 indicate that the rates are higher for older patients.

Age-specific Cancer Mortality Rates : Male (2011)



Age-specific Cancer Mortality Rates : Female (2011)



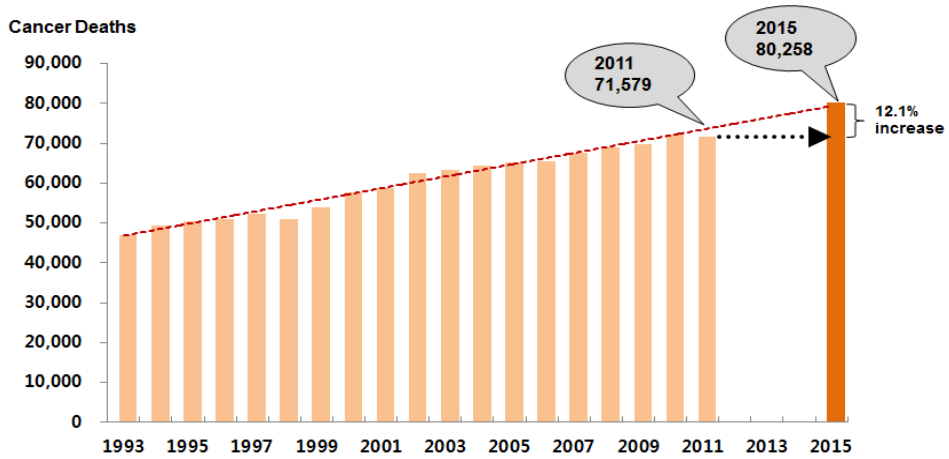
Source) STATISTICS KOREA, 2012

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

Projection of Cancer Deaths

The total number of cancer deaths is expected to grow from 71,579 in 2011 to 80,258 in 2015, a 12.1% increase in the next four-years.

Projection of Cancer Deaths (1993~2015)



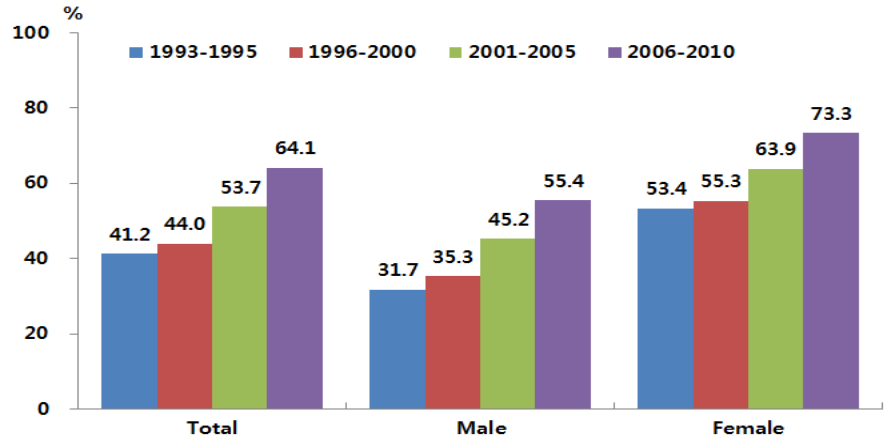
Source) National Cancer Center, 2010

2.3 Cancer Survival

Five-year Cancer Relative Survival Rates

The five-year cancer relative survival rate[2] from 2006 to 2010 was 64.1%, which is a 22.9% and 10.4% increase from 1993 to 1995 (41.2%) and 2001 to 2005 (53.7%), respectively. The survival rate has shown steady improvements, and more than half of current patients with cancer in Korea survive for five years or longer.

Five-year Cancer Relative Survival Rates (1993~2010)



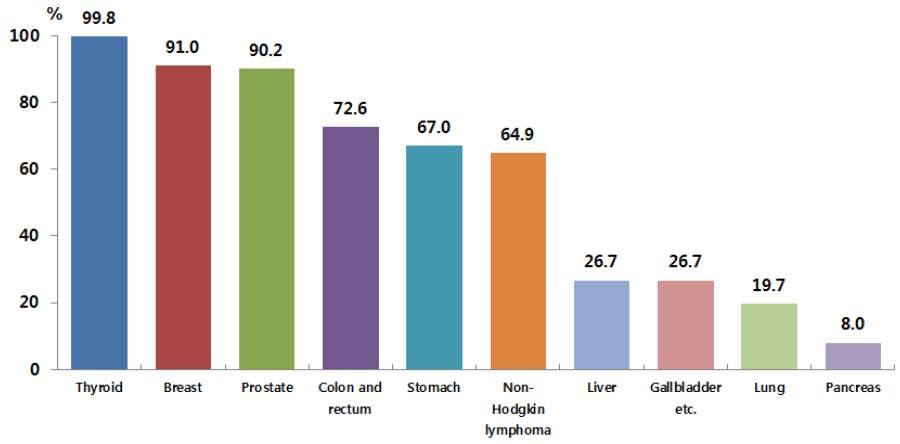
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

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

Five-year Relative Survival Rates according to Major Cancer Sites

The five-year relative survival rates for thyroid, breast, prostate, colon and rectum, and stomach cancers were 99.8%, 91.0%, 90.2%, 72.6%, and 67.0%, respectively.

Five-year Relative Survival Rated by Major Cancer Sites (2006~2010)

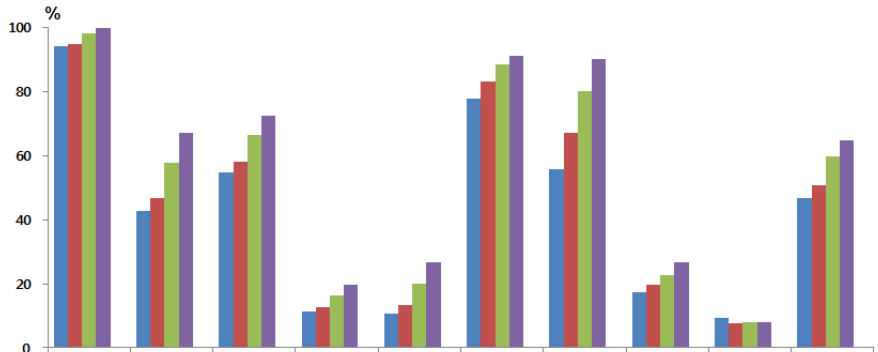


Source) Ministry of Health and Welfare, The Korea Central Cancer Registry, 2012

Comparison of Five-year Relative Survival Rates

Among major cancers, prostate cancer showed the most significant improvement from 2006 to 2010 (up by 34.3% points from 1993 to 1995), followed by stomach cancer (24.2% points), non-Hodgkin lymphoma (18.3% points), and colon and rectal cancer (17.8% points). Survival rates of all major cancers, with the exception of pancreatic cancer, improved.

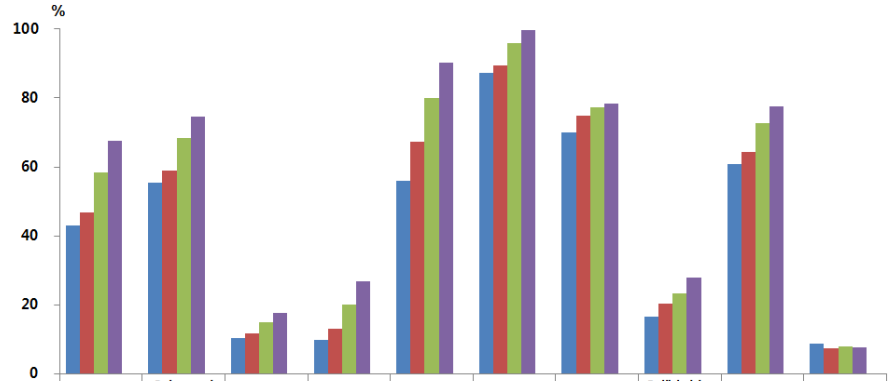
Comparison of Five-year Relative Survival Rates (1993~2010)



	Thyroid	Stomach	Colon and rectum	Lung	Liver	Breast	Prostate	Gallbradder etc.	Pancreas	Non-Hodgkin lymphoma
1993-1995	94.2	42.8	54.8	11.3	10.7	77.9	55.9	17.3	9.4	46.6
1996-2000	94.9	46.6	58.0	12.7	13.2	83.2	67.2	19.7	7.6	50.8
2001-2005	98.3	57.7	66.6	16.2	20.1	88.5	80.1	22.8	8.0	59.9
2006-2010	99.8	67.0	72.6	19.7	26.7	91.0	90.2	26.7	8.0	64.9
variance	5.6	24.2	17.8	8.4	16.0	13.1	34.3	9.4	-1.4	18.3

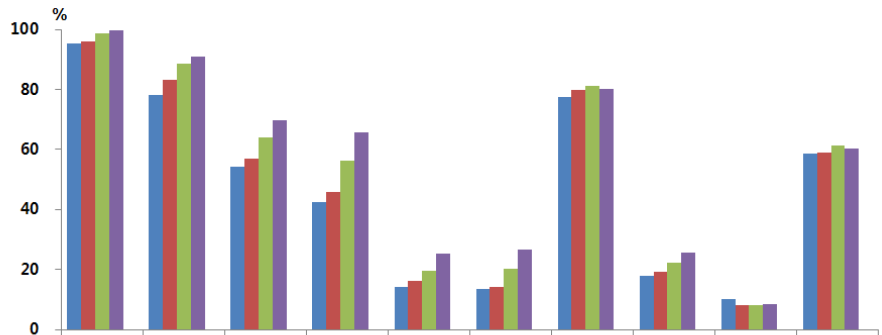
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Comparison of Five-year Relative Survival Rates: Male (1993~2010)



	Stomach	Colon and rectum	Lung	Liver	Prostate	Thyroid	Bladder	Gallbladder etc.	Kidney	Pancreas
1993-1995	43.0	55.3	10.4	9.9	55.9	87.2	70.0	16.6	60.8	8.8
1996-2000	46.9	59.0	11.6	12.9	67.2	89.5	74.8	20.3	64.4	7.3
2001-2005	58.4	68.5	14.9	20.1	80.1	95.8	77.3	23.3	72.8	8.0
2006-2010	67.7	74.5	17.5	26.7	90.2	99.8	78.3	27.9	77.7	7.7
variance	24.7	19.2	7.1	16.8	34.3	12.6	8.3	11.3	16.9	-1.1

Comparison of Five-year Relative Survival Rates: Female (1993~2010)



	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	56.3	19.7	20.3	81.2	22.3	8.1	61.3
2006-2010	99.7	91.0	69.9	65.7	25.4	26.8	80.2	25.5	8.3	60.4
variance	4.3	13.0	15.7	23.1	11.2	13.2	2.7	7.5	-1.8	1.7

Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

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, are higher in Korea than in the United States and Canada.

Five-year Relative Survival Rates of Major Cancers in Various Countries

(unit: %)

Site	Korea ('96-'00)	Korea ('01-'05)	Korea ('06-'10)	USA[1] ('02-'08')	Canada[2] ('04-'06)	Japan[3] ('97-'99)
All cancers	44.0	53.7	64.1	65.4	62	54.3
Stomach	46.6	57.7	67.0	26.9	24	62.1
Liver	13.2	20.1	26.7	16.0	18	23.1
Cervix uteri	80.0	81.2	80.2	67.9	75	71.5
Colon and rectum	58.0	66.6	72.6	64.3	63	65.2
Thyroid	94.9	98.3	99.8	97.5	98	92.4
Breast	83.2	88.5	91.0	88.9	88	85.5
Lung	12.7	16.2	19.7	15.9	16	25.6
Pancreas	7.6	8.0	8.0	5.8	6	6.7
Prostate	67.2	80.1	90.2	99.2	96	75.5

Source)

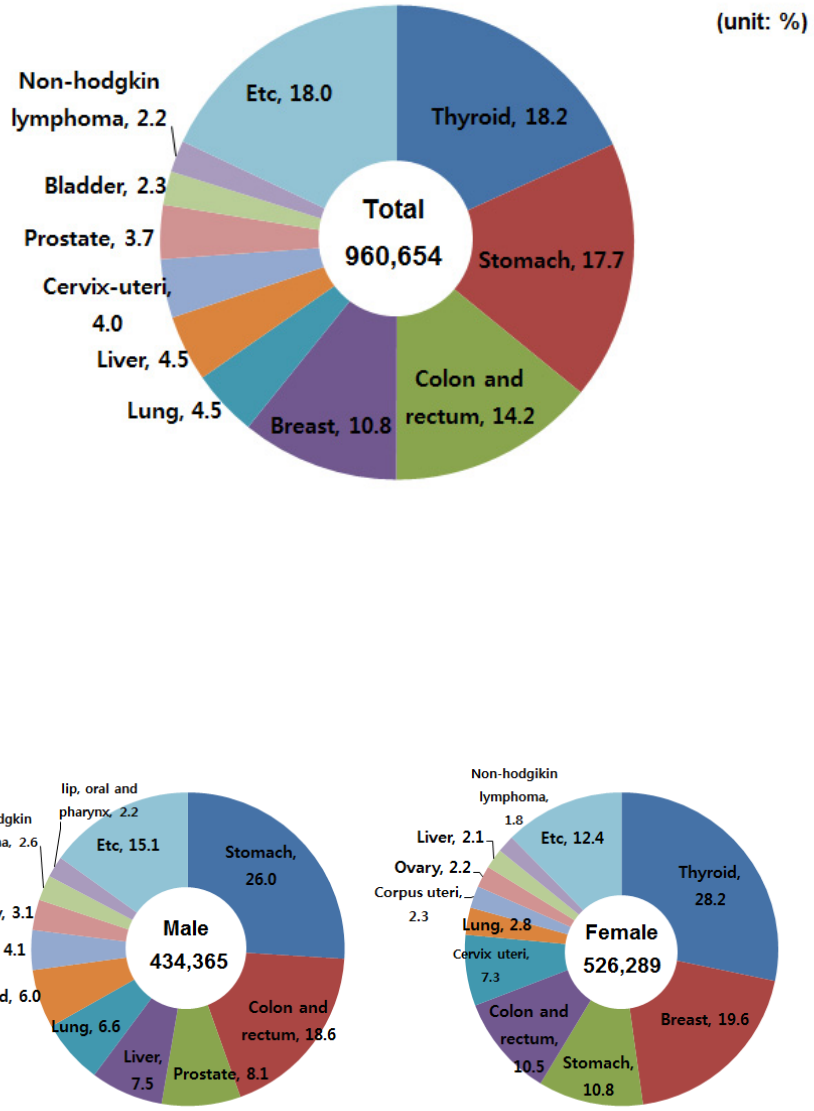
1) Howlader N, Noone AM, Krapcho M, Neyman N, Aminou R, Altekruse SF, et al (eds). SEER Cancer Statistics Review, 1975~2009, 2012
2) Canadian Cancer Society, Statistics Canada and Provincial/Territorial Cancer Registry. Canadian Cancer Statistics 2011
3) Matsuda T, Ajiki W, et al. Population-based survival of cancer patients diagnosed between 1993 and 1999 in Japan: A chronological and International Comparative Study, Japanese Journal of Clinical Oncology. 2011

2.4 Cancer Prevalence

Cancer Prevalence

Between January 1, 1999 and December 31, 2010, 960,654 patients were diagnosed with cancer in Korea. The thyroid was the most prevalent cancer site, followed by stomach, colon and rectum, breast, lung, and liver.

Cancer Prevalence (2010)

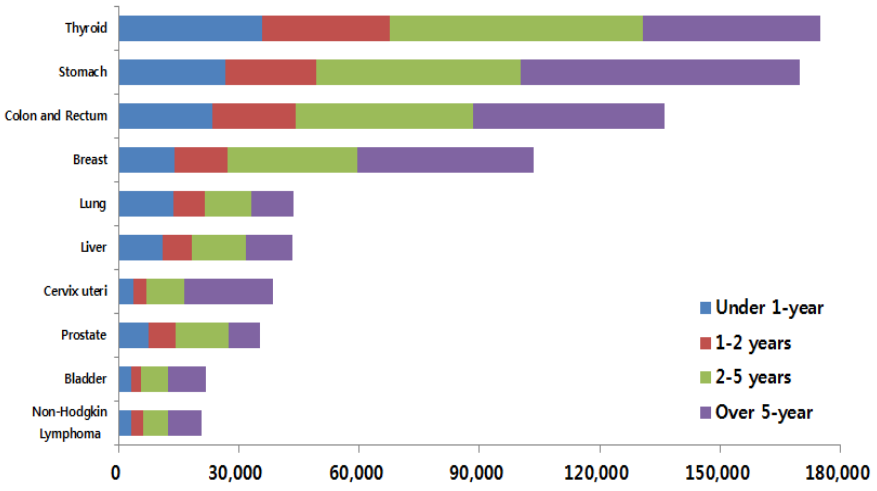


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Post-Diagnosis Cancer Prevalence

Among patients diagnosed with cancer between January 1, 1999 and December 31, 2010, stomach cancer showed the highest prevalence in patients of 5-year and longer, followed by colon and rectum, thyroid, and breast cancers.

Post-Diagnosis Cancer Prevalence (2010)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

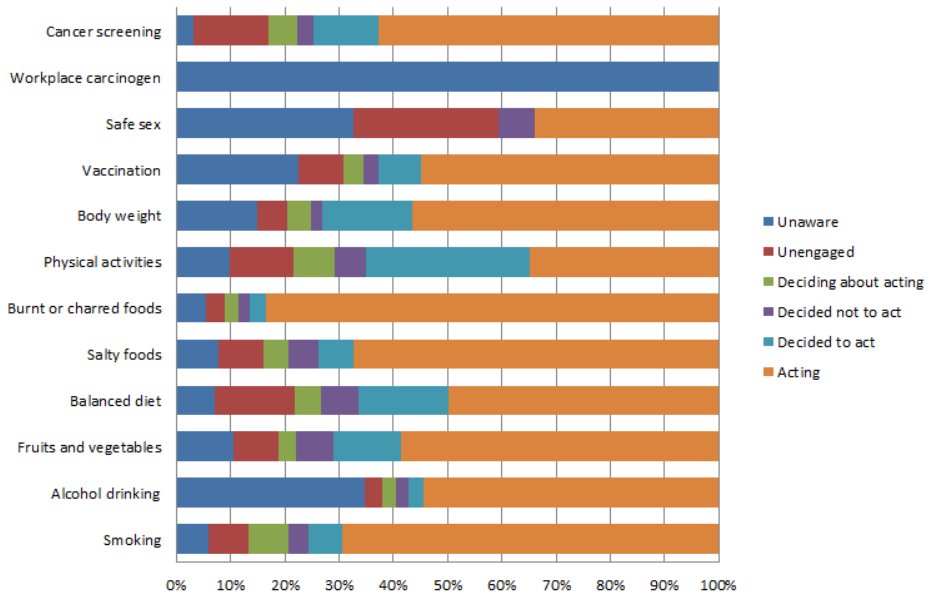
Chapter 3.
Cancer Prevention

3.1 Overview

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 1,006 male and female adults 19 years or older, 90.2% said that they avoid burnt food to prevent cancer. Also, 70.2% and 72.0% of the respondents said that they try to stay away from salty foods and smoking, respectively.

Awareness of the Ten Codes for Cancer Prevention (2010)



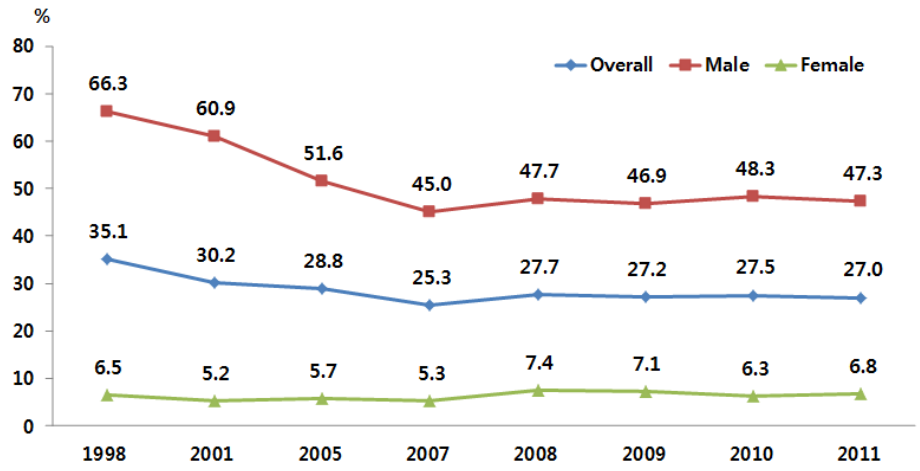
Source) National Cancer Center. The Survey on Awareness and Behavior for Cancer Prevention, 2012

3.2 Smoking

Prevalence and Trends in Cigarette Smoking among Adults

From 1998 to 2011, smoking prevalence in Korea decreased from 66.3% to 47.3% in male adults. However, the rate of decline has slowed down in recent years. Female smoking prevalence has been low at less than 10% since 1998.

Prevalence and Trends in Cigarette Smoking

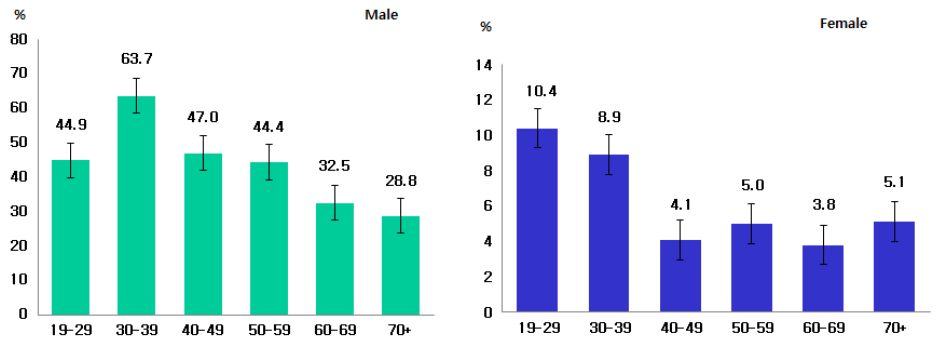


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2011

Smoking Prevalence among Adults by Age and Gender

Smoking prevalence[3] by age and gender indicate 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



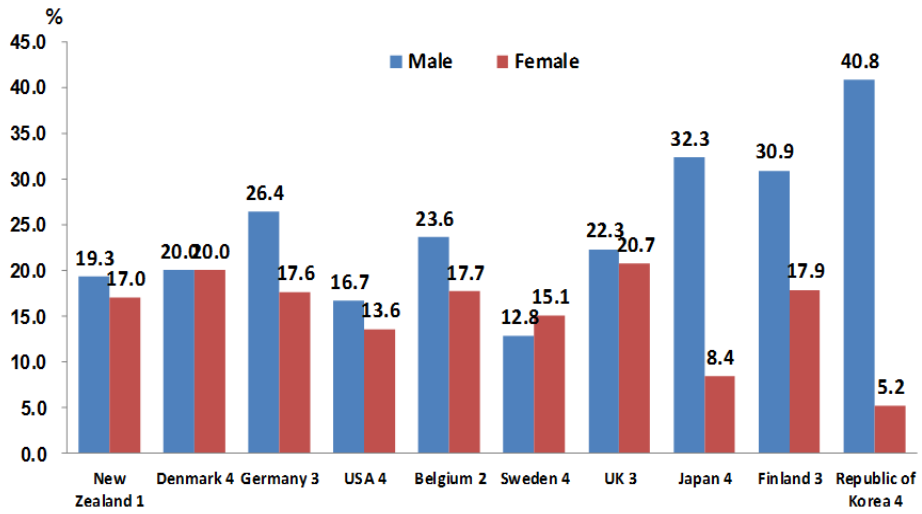
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2011

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

Prevalence of Daily Smoking among Adults in OECD Countries

Among males, the prevalence of daily smoking in Korea is considerably higher than in other OECD countries (40.8% for males and 5.2% for females).

Prevalence of Daily Smoking in OECD Countries



Source) OECD Health Data, OECD 2012

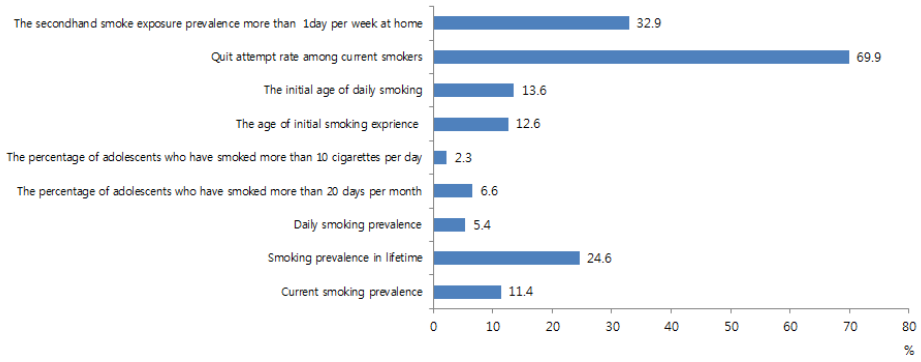
Note) age: 15 or older

Note) 1): 2007 2): 2008 3): 2009 4): 2010

Adolescent Smoking

In 2012, 11.4% of adolescents said that they have smoked for one or more days in the previous 30 days, and 24.6% said that they have tried smoking at least once. The average age they started smoking was 12.6. Among them, 69.9 % have tried to quit. More than half (61.4%) 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

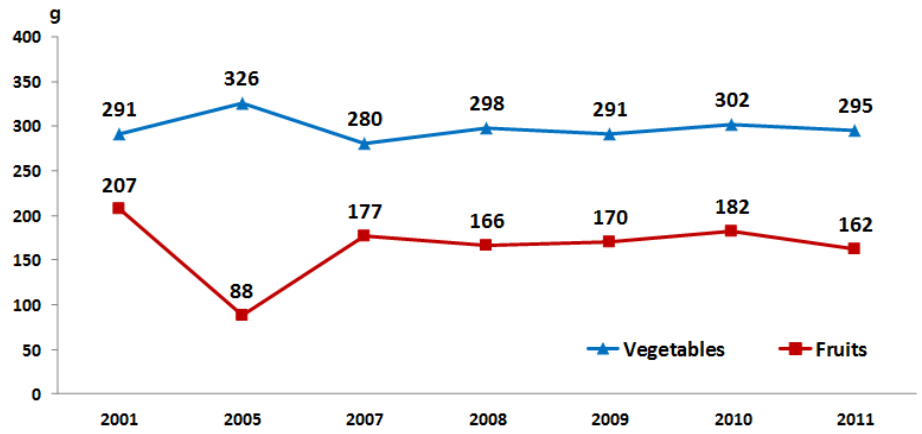
Source) Korea Youth Risk Behavior Web-based Survey, 2012

3.3 Consumption of Fruits and Vegetables

Fruit and Vegetable Consumption among Adults

The average daily consumptions of fruits and vegetables among adults in 2011 were 162g and 295g, respectively.

Average Fruit and Vegetable Consumption among Adults

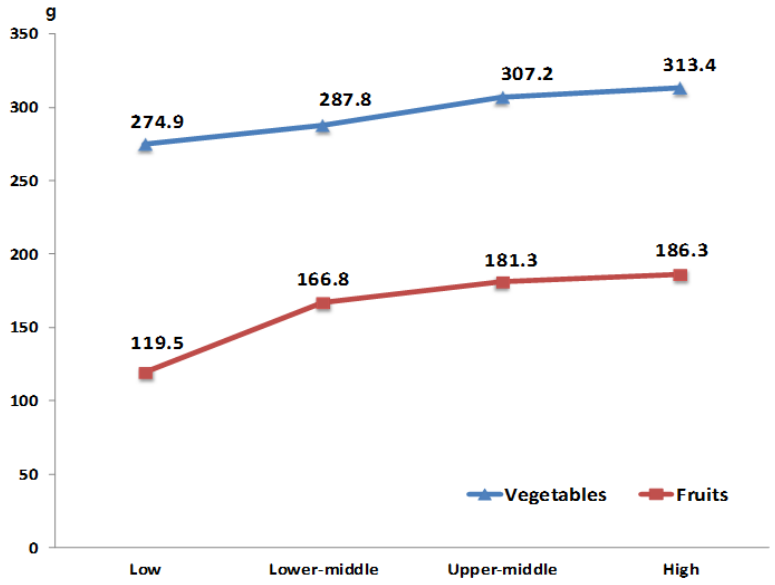


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2011

Fruit and Vegetable Consumption among Adults by Income Levels

Statistics indicate that those with higher incomes consume more fruits and vegetables.

Fruit and Vegetable Consumption among Adults by Income Levels

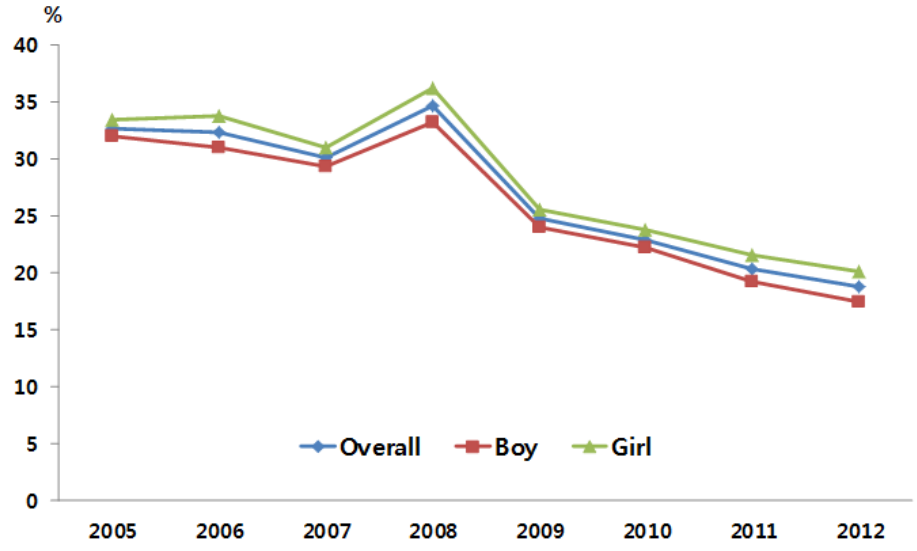


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2011

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

In 2012, 18.7% of adolescents ate at least one serving of fruit per day (17.4% of males and 20.1% of females). The percentage of adolescents who consumed at least one serving of fruit each day has decreased since 2005.

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



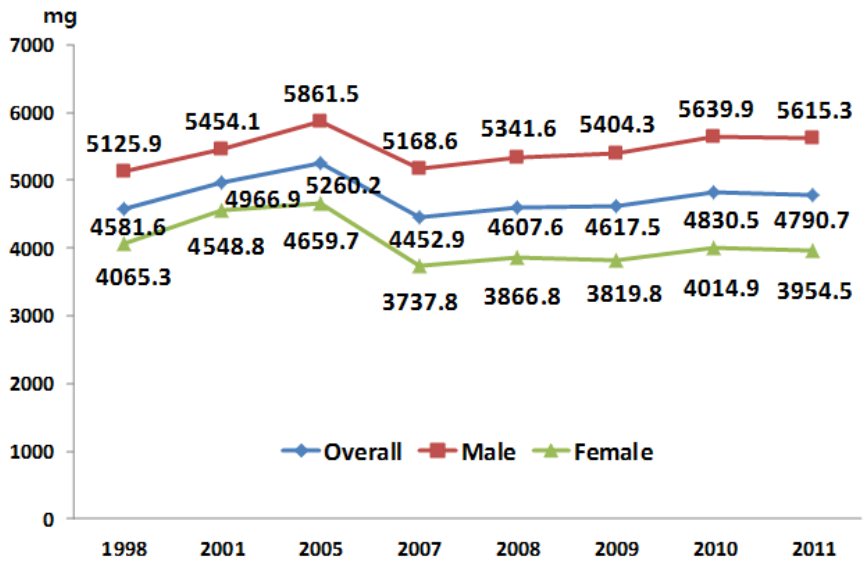
Source) Korea Youth Risk Behavior Web-based Survey, 2012

3.4 Sodium Intake

Sodium Intake among Adults

Statistics for the past ten years indicate that Koreans consume excessive amounts of sodium, males more so than females.

Daily Sodium Intake among Adults



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

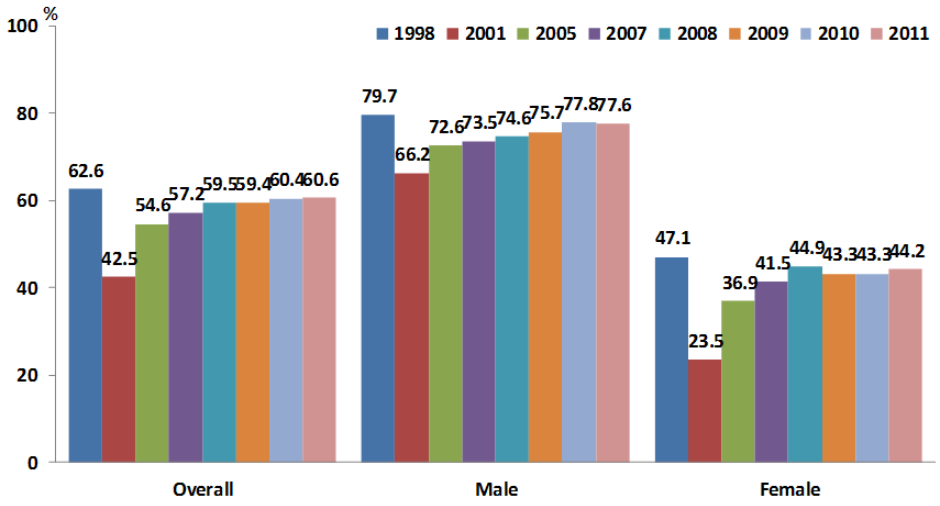
Note) Daily sodium intake targets: 2,000mg (Suggested by Korean Nutrition Society, 2005)

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 increased for the past eight years.

Prevalence of Alcohol Consumption among Adults



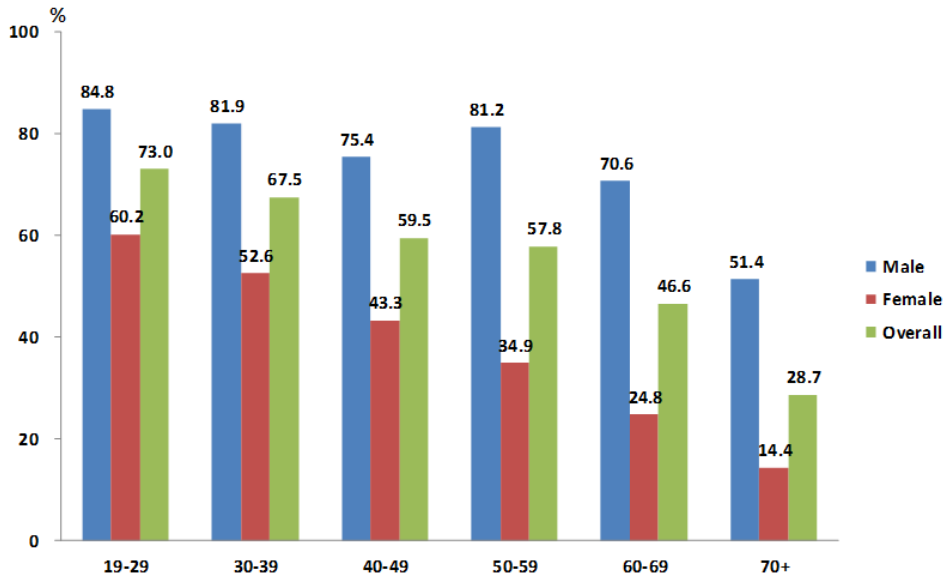
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2011

4) Prevalence of alcohol consumption among adults: percentage of adults (19 or 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 decreases with age.

Prevalence of Alcohol Consumption among Adults by Age



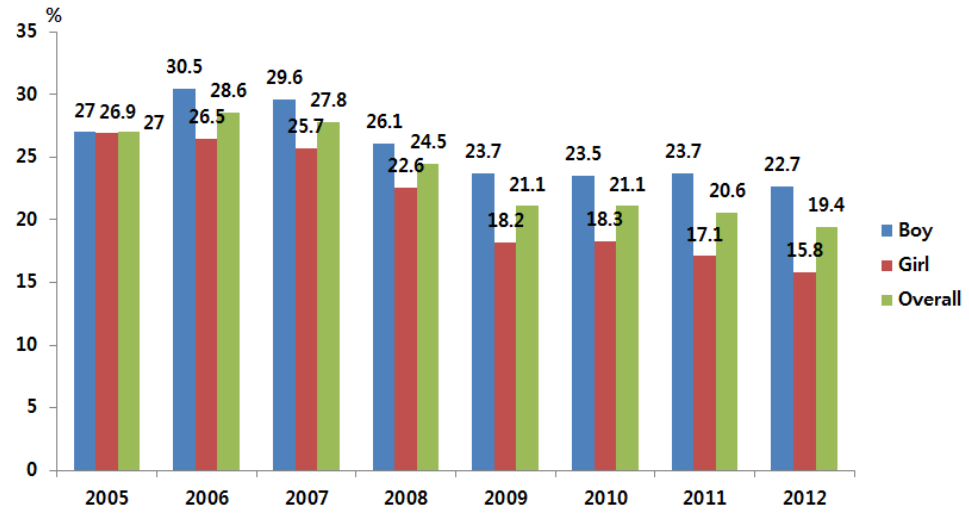
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2011

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

Prevalence of Alcohol Consumption among Adolescents

Prevalence of Alcohol Consumption among Korean adolescents in 2012 was 19.4% (22.7% for boys and 15.8% for girls).

Current Alcohol Consumption Rate in Adolescents



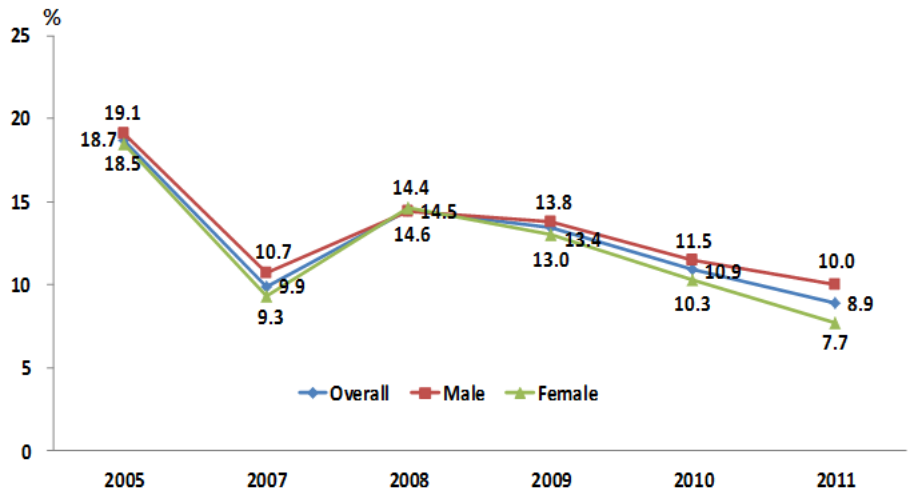
Source) Korea Youth Risk Behavior Web-based Survey, 2012

3.6 Physical Activity

Percentage of Adults with Moderate-intensity Level of Daily Physical Activity

The moderate-intensity physical activity rate among Korean citizens in 2011 was 8.9%, showing a decreasing trend since 2005.

Moderate-Intensity Physical Activity Rate in Adults



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

Note)

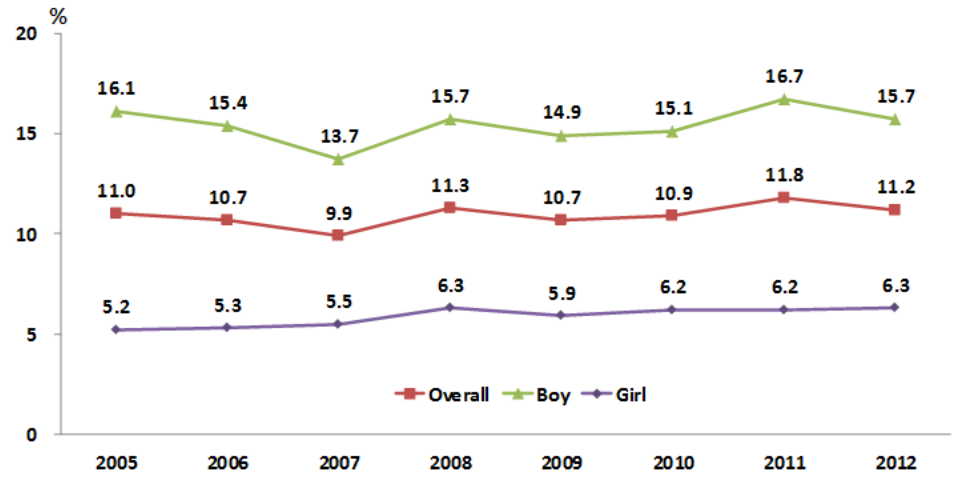
1) 2010 Health Plan recommends engaging in moderate-intensity physical activity for at least 30 minutes a day, 5 days per week.

2) Age-standardized rates based on 2005 Korean population

Percentage of Adolescents with Moderate-intensity Level of Daily Physical Activity[6)]

In 2012, the moderate-intensity physical activity rate among Korean adolescents was 11.2% (15.7% of boys and 6.3% of girls).

Percentage of Adolescents with Moderate-intensity Level of Daily Physical Activity



Source) Korea Youth Risk Behavior Web-based Survey, 2012

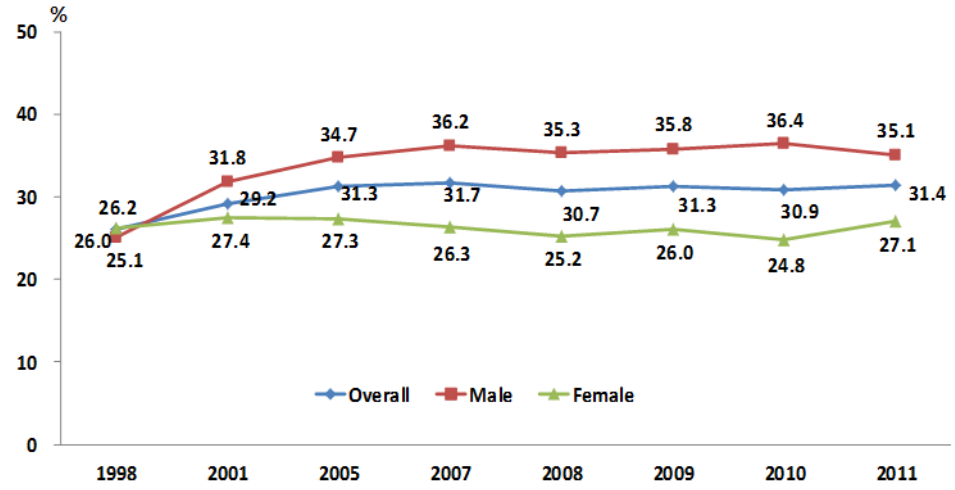
6) Moderate-intensity physical activity rate in adolescents: Percentage of adolescents aged 13 to 18 years who conduct moderate-intensity physical activity (such as table tennis, carrying light weights, swimming, volleyball, and badminton) for more than 30 minutes, 5 or more days per week.

3.7 Obesity

Obesity among Adults

Obesity among adults (19 or older, standardized) increased from 26.0% in 1998 to 31.7% in 2007. However, the rate has stayed at around 35% for the past five years. While male obesity has shown a gradual increase in the past ten years, obesity in females has maintained a steady level.

Obesity among Adults



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

Note)

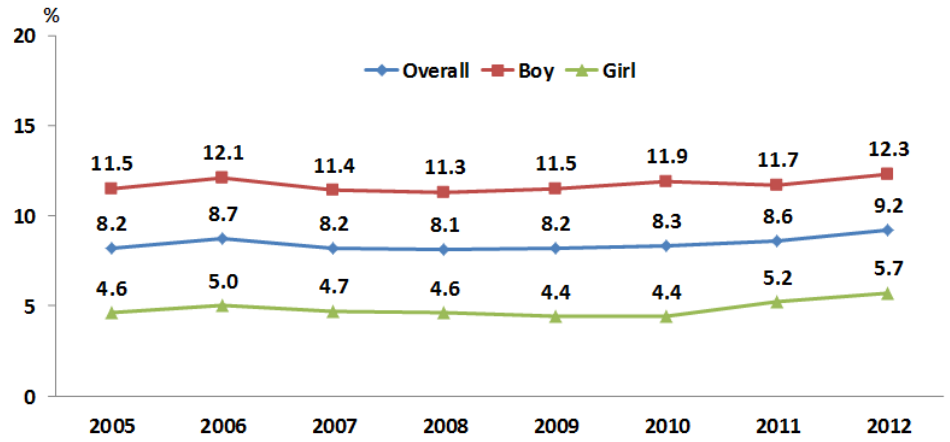
1) The age-standardized rates are based on 2005 Korean population.

2) Obesity: Body Mass Index(BMI) ≥ 25

Obesity among Adolescents[7)]

Obesity among adolescents was 9.2% in 2012 (12.3% of boys and 5.7% of girls).

Obesity among Adolescents



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

Note) Obesity: Body Mass Index(BMI) ≥ 25

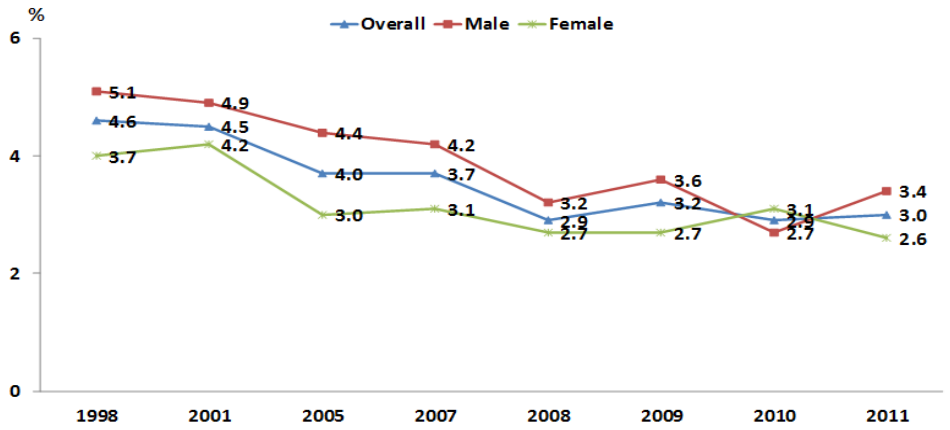
7) Adolescent obesity rate: Percentage of adolescents(13 to 18 years old) whose body mass indexes(BMIs) are more than 95% in the BMI distribution or more than 25 BMI

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[8], which indicates a Hepatitis B virus infection (in individuals 10 years or 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 (10 years or older)



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

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

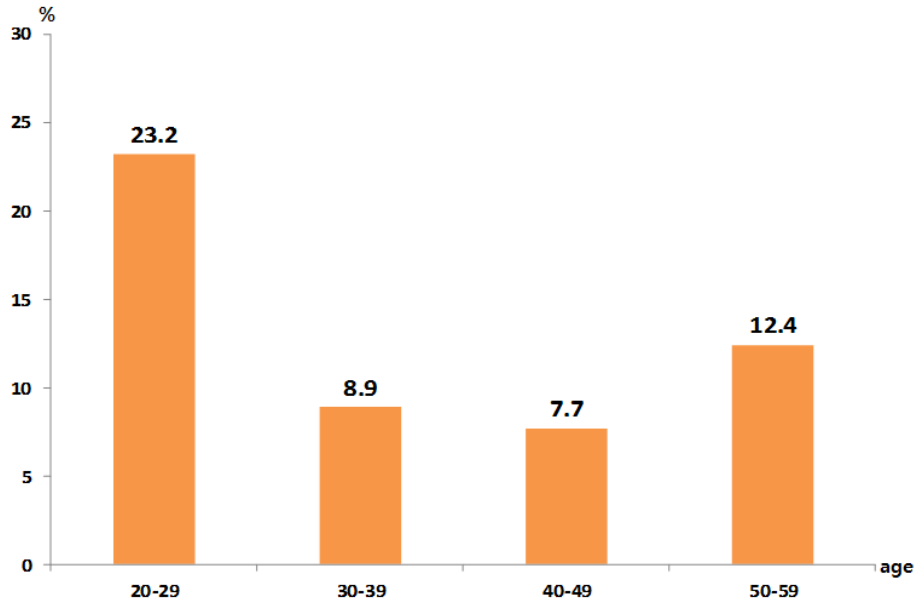
8) HBsAg seropositivity: Percentage of individuals who have tested positive to HBsAg (10 years or older)

3.9 Human Papilloma Virus Infection

Prevalence of Human Papilloma Virus Infection

Human Papilloma Virus (HPV) infection is very common, with about 13% of Korean females being infected. Because HPV is mainly 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 Papilloma Virus (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, 35 cases (10 cases of hematologic malignancy, 19 cases of respiratory cancer, 3 cases of malignant mesothelioma, and 3 cases of other cancers) have been diagnosed between 2005 and 2007. From 1993 to 2007, 122 additional cases have been diagnosed as occupational cancers.

Occupational Cancers

	Causal carcinogens	Work-related cases
Respiratory system		71
Lung	Asbestos, cystalline 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

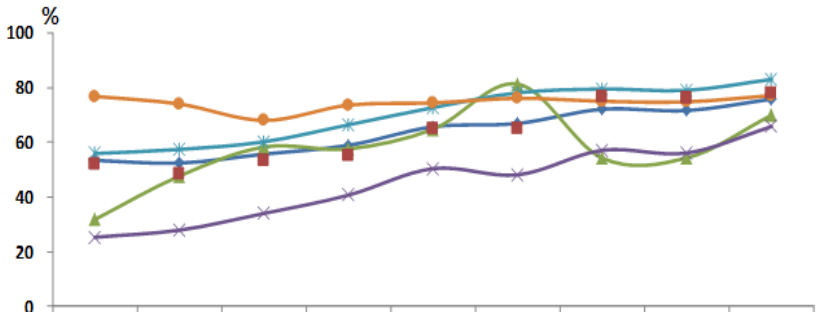
Cancer Screening Rates

The average lifetime screening rate[9] of the five major cancers identified in the National Cancer Screening Program in 2012 was 75.8%, and the average cancer screening rate based on recommendation[10] was 63.4%. With the exception of liver cancer, the cancer screening rate[11] of all cancers has increased (1.63 times from 2004).

In 2012, breast cancer had the highest cancer screening rate based on recommendation (71.0%), followed by stomach cancer (70.9%), cervix uteri cancer (67.9%), colon and rectum cancer (44.7%), and the high-risk group of liver cancer (21.5%).

9) Lifetime screening rate: Percentage of individuals who have undergone at least one cancer screening.
10) 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 (such as liver, colon and rectum cancers)
11) Screening rate = (number of screened individuals / candidates) × 100

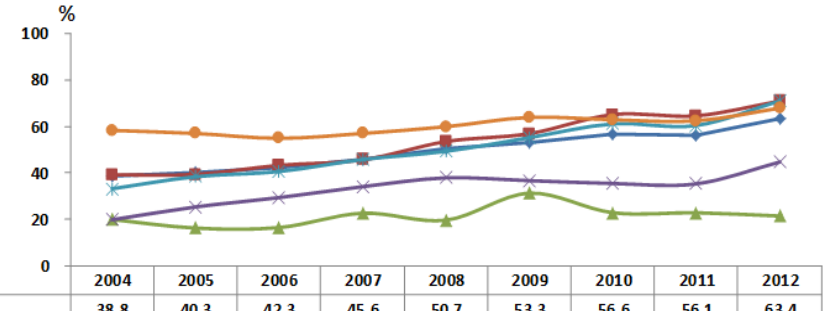
Lifetime Cancer Screening Rates (2004~2012)



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

Source) Korean National Cancer Screening Survey, 2004~2012

Cancer Screening Rates based on Recommendation (2004~2012)



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

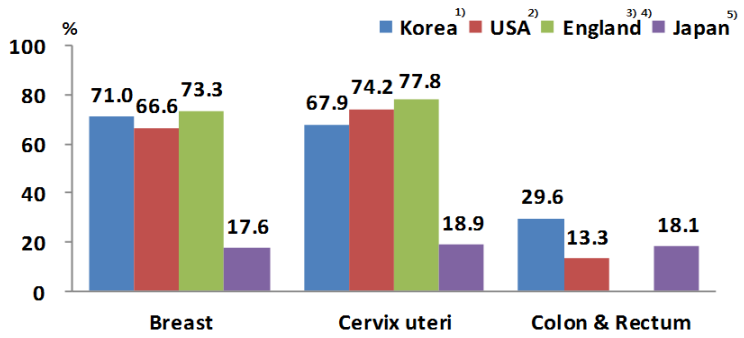
Source) National Cancer Center. Korean National Cancer Screening Survey, 2004~2012

Cancer Screening Rates : International Comparison

A comparison of the cancer screening rate based on recommendations in Korea with those in other countries showed that the screening rates for cervix uteri cancers (67.9%) in Korea were lower than those of England (77.8%) and the United States (74.2%).

The rate of fecal occult blood testing (FOBT) for colon and rectum cancer screenings in Korea was 29.6%, which was higher than the rates of the United States (13.3%) and Japan (18.1%).

Cancer Screening Rates : International Comparison



Cancer Screening Rates : Internatonal Comparison

		Korea [1]	USA [2]	England [3] [4]	Japan [5]
Breast	Cancer Screening Rates	71.0%	66.6%	73.3%	17.6%
	Target Population	40 & over	40 & over	45-74	40 & over
	Frequency	every 2 years	every 2 years	every 3 years	every 2 years
	Test or Procedure	Mammography	Mammography	Mammography	Mammography & CBE
Cervix uteri	Cancer Screening Rates	67.9%	74.2%	25-49, 79.0% 50-64, 77.8%	18.9%
	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 5 years	every 2 years
	Test or Procedure	Pap smear	Pap smear	Pap smear	Pap smear
Colon & Rectum	Cancer Screening Rates	29.6%	13.3%	-	18.1%
	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)

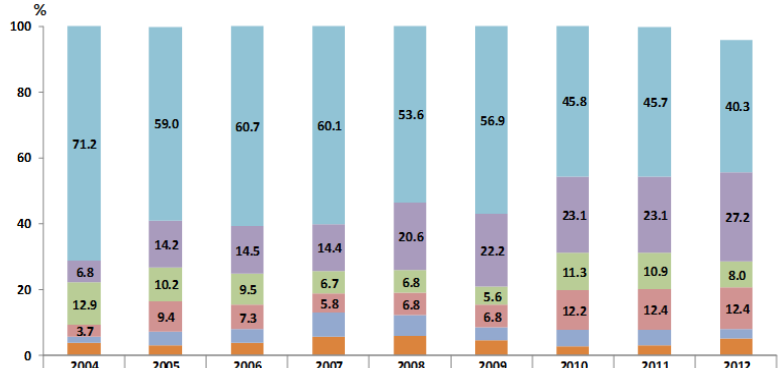
1) National Cancer Center. Korean National Cancer Screening Survey, 2004~2012
2) National Cancer Institute. Cancer Trends Progress Report, 2010
3) NHS Cancer Screening Programmes, NHS Breast Screening Programme Annual Review, 2011
4) NHS Cancer Screening Programmes, NHS Cervical Screening Programme Annual Review, 2011
5) Health Statistics in Japan, 2007

Note) CBE(Clinical Breast Examination), FOBT(Fecal Occult Blood Test)

Reasons for Not Undergoing Cancer Screening

From 2004 to 2012, 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 40.3% in 2012), whereas the percentage of those who said that they did not have time to be screened increased (6.8% in 2004 to 27.2% in 2012).

Reasons for Not Undergoing Cancer Screening (2004~2012)



	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belief of healthiness	71.2	59.0	60.7	60.1	53.6	56.9	45.8	45.7	40.3
Time constraints to be screened	6.8	14.2	14.5	14.4	20.6	22.2	23.1	23.1	27.2
Too expensive	12.9	10.2	9.5	6.7	6.8	5.6	11.3	10.9	8.0
Too painful, unpleasant	3.7	9.4	7.3	5.8	6.8	6.8	12.2	12.4	12.4
Fear of detection	1.7	4.2	4.3	7.5	6.3	4.0	4.9	4.8	3.0
Others	3.8	2.9	3.7	5.5	5.9	4.5	2.8	3.0	5.1

Source) National Cancer Center. Korean National Cancer Screening Survey, 2004~2012

4.2 National Cancer Screening Program

National Cancer Screening Program Statistics (2002~2011)

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, 2012

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

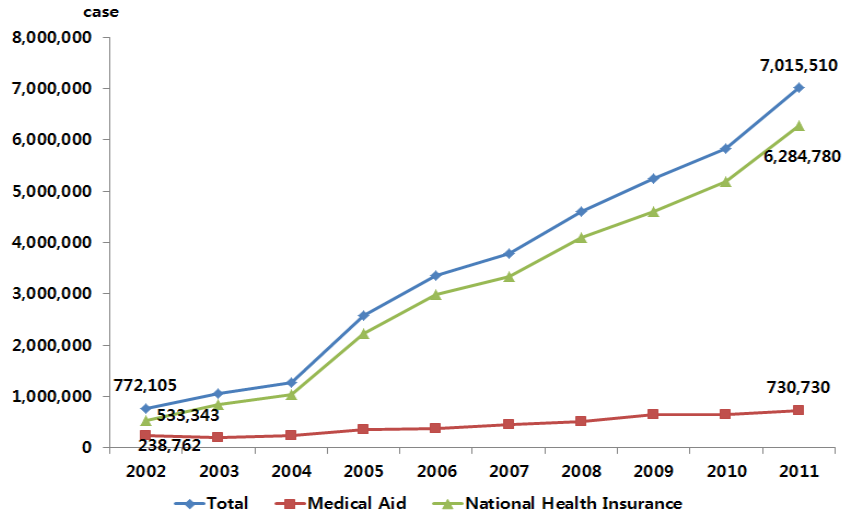
†High-risk group: HBs Ag positive, anti-HCV Ab positive, or liver cirrhosis

Number of Participants in the National Cancer Screening Program

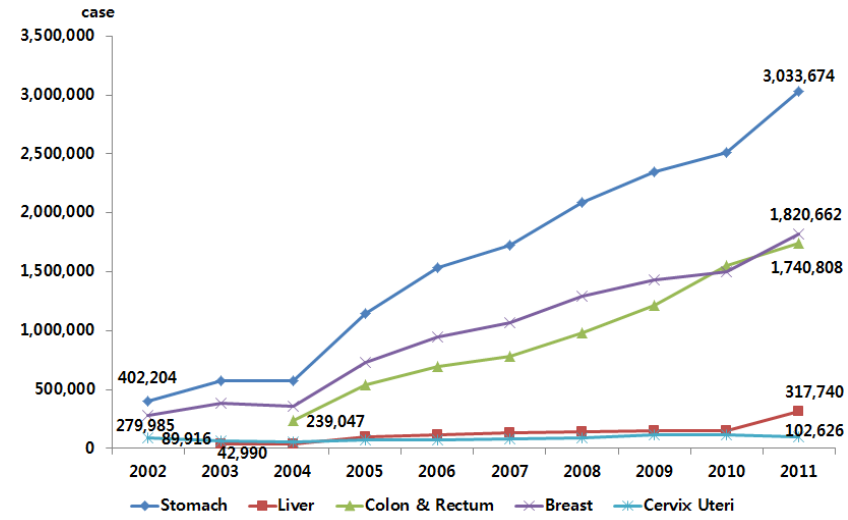
The target population of the National Cancer Screening Program consists of those insured by Medical Aid and the National Health Insurance program. The number of screened individual insured by Medical Aid increased from 238,762 in 2002 to 730,730 in 2011. The number of screened individuals insured by the National Health Insurance program increased from 533,343 in 2002 to 6,284,780 in 2011.

In 2011, among the five cancers in the National Cancer Screening Program, the type of cancer for which individuals were screened was stomach cancer (3,033,674), followed by breast cancer (1,820,662).

Number of Participants in the National Cancer Screening Program (2002~2011)



Number of Participants in the National Cancer Screening Program by Cancer Sites (2002~2011)



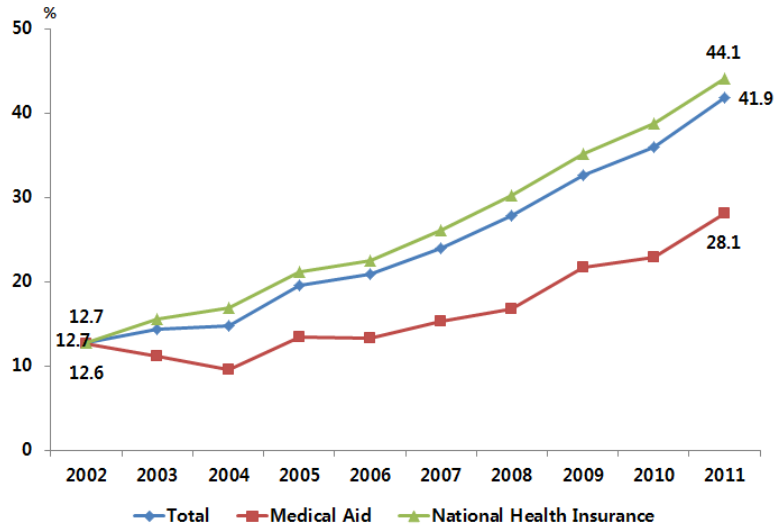
Source) National Cancer Center, 2012

Participation Rates in the National Cancer Screening Program

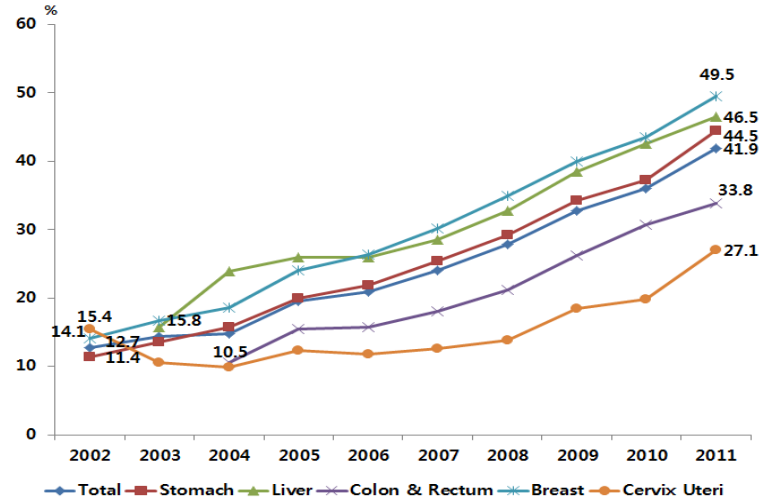
The overall rate of participation in the National Cancer Screening Program was 41.9% in 2011 (28.1% of Medical Aid recipients and 44.1% of the National Health Insurance holders), and the rate is increasing each year.

In 2011, screening for breast cancer had the highest participation rate (49.5%), followed by liver cancer (46.5%) and stomach cancer (44.5%).

Participation Rates in the National Cancer Screening Program (2002~2011)



Participation Rates in the National Cancer Screening Program by Cancer Sites (2002~2011)



Source) National Cancer Center, 2012

Chapter 5.
Cancer Diagnosis and Treatment

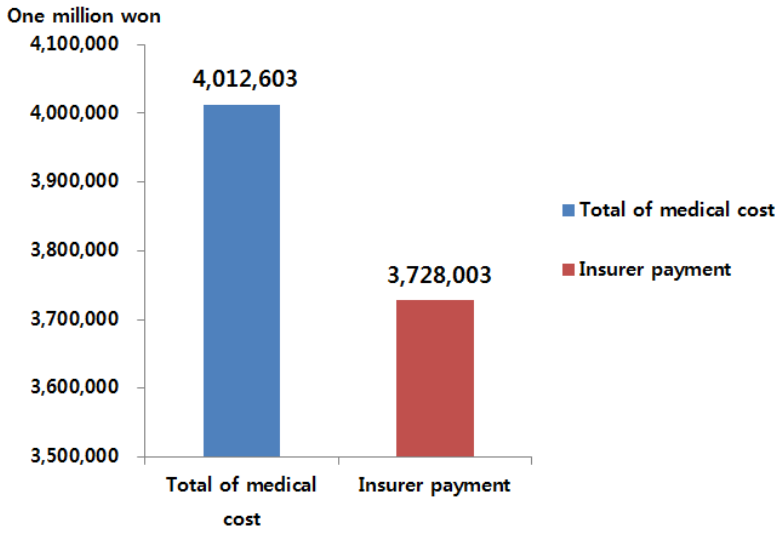
5.1 Costs of Cancer

Health Insurance Coverage of Cancer Treatment and Expenditure

In 2011, the total treatment cost for 874,279 cancer patients covered by the national health insurance was 4,012,600 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 3,728,000 million won.

Health Insurance Coverage of Cancer Treatment and Expenditure (2011)

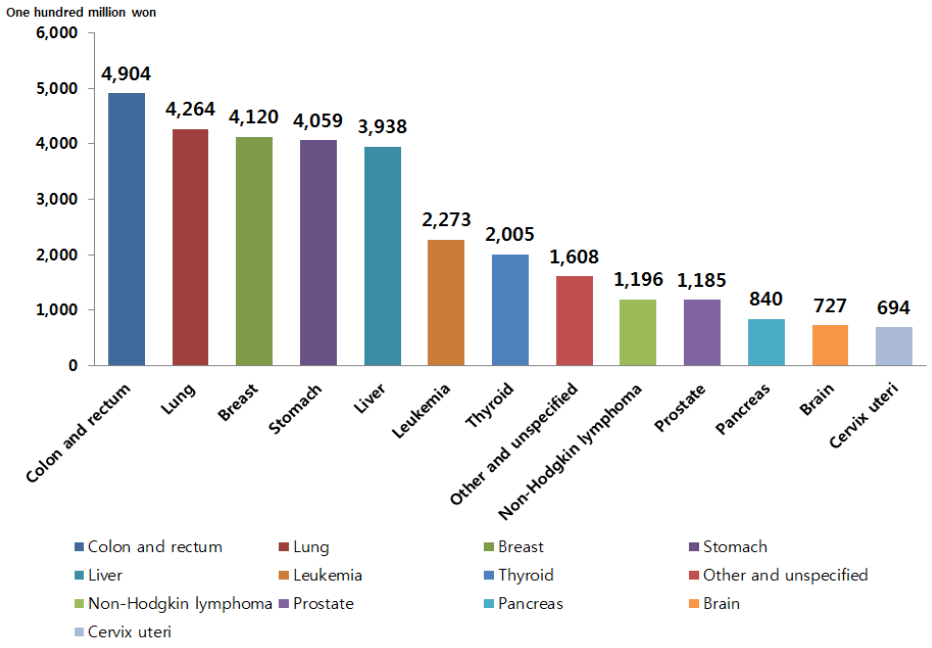


Source) National Health Insurance Corporation. The analysis on cost of cancer patients, 2011

Insurance Coverage of Expenses for the Treatment of Major Cancers

Of the 3.728 trillion expenditure from the National Health Insurance Corporation, colon and rectum cancer was responsible for the highest percentage (490.4 billion won, 13.2%), followed by lung cancer (426.4 billion won, 11.4%), breast cancer (412.0 billion won, 11.1%), stomach cancer (405.9 billion won, 10.9%), and liver cancer (393.8 billion won, 10.6%). The ten most common cancers accounted for 79.5% of the total expenditure.

Health Insurance Expenditures for Major Cancers (2011)



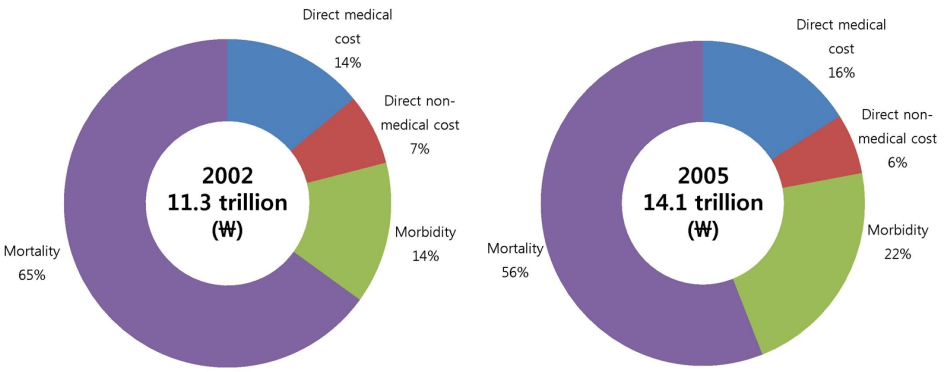
Source) National Health Insurance Corporation. The analysis on cost of cancer patients, 2011

5.2 Socioeconomic Costs

Socioeconomic Cost of Cancer

The socioeconomic cost of cancer in Korea increased from 11.3 trillion won in 2002 to 14.1 trillion won in 2005.

Socioeconomic burden of Cancer



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

5.3 Cancer Patient's Experiences in Korea

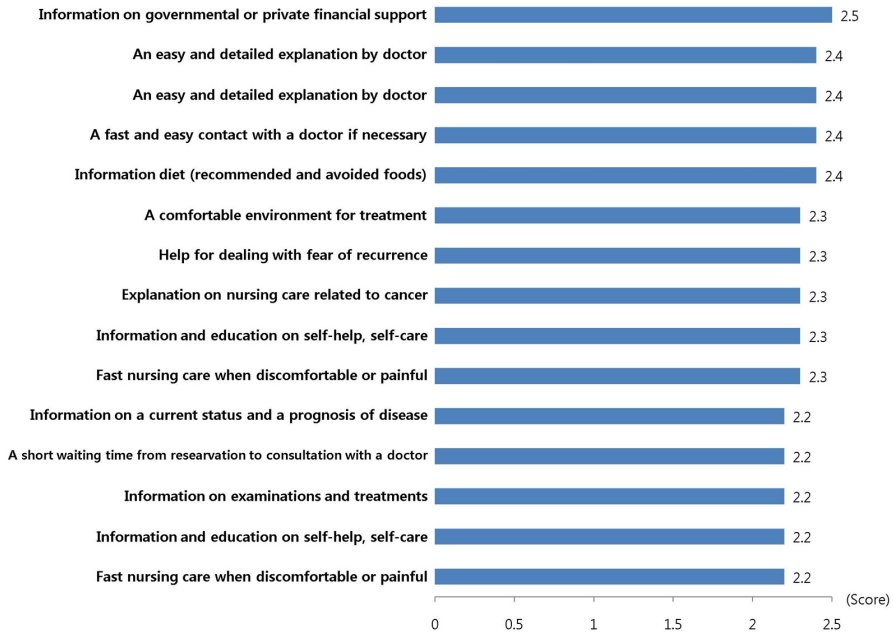
From 2008 to 2012, annual surveys were conducted of cancer care to cancer patients, caregivers, and oncologists at the National Cancer Center and regional cancer centers throughout Korea

In 2012, the survey focused on cancer patients' consultation with oncologists, and participation in the decision-making process regarding cancer treatment.

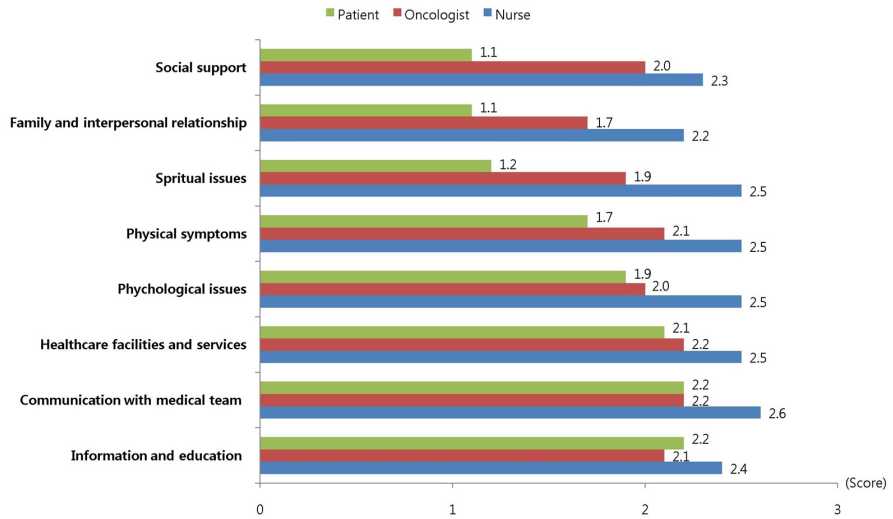
Based on a 4-point Likert scale, patients felt the strongest need for 'information on financial assistance from the government or the private sector', followed by 'information on help for medical costs and income loss related to cancer', and 'less waiting time from reservation to consultation with a physician.'

In terms of specific service domains of cancer care, patients thought both 'information, and education', and 'communication with the medical staff' were important. Oncologists thought 'communication among medical staff' and 'hospital facilities and services' were important. Nurses thought 'communication among medical staff' was the most important part of the service.

Needs of Cancer Patients (2010)



Important Domains of Cancer Treatment Service (2010)



Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2010

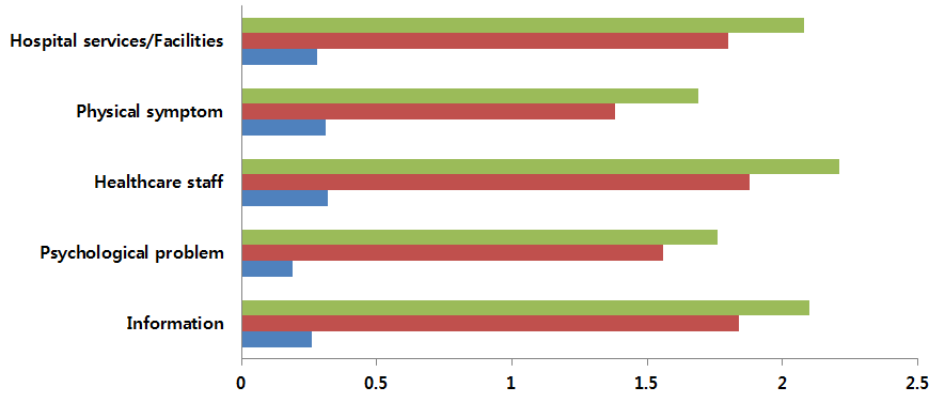
Discordance in Perceived Needs Between Patients and Oncologists

Comparing the perceived supportive care needs sought by cancer patients and their oncologists, the result indicates that oncologists do not fully understand the needs felt by cancer patients.

Oncologists showed low levels of understanding of supportive care needed by cancer patients in all areas. In particular, there was the greatest discrepancy in the need regarding the medical staffs.

Analysis of the response indicates that there is the lowest level of correspondence between cancer patients and oncologists regarding ‘the need for information about financial support for cancer patients’ (25.8%), followed by ‘concerns for family’ (26.2%), and ‘concerns about adverse effects from treatment’ (27.5%).

Perceived Supportive Care Needs (2008~2011)



	Information	Psychological problem	Healthcare staff	Physical symptom	Hospital services/Facilities
Patient	2.1	1.76	2.21	1.69	2.08
Oncologist	1.84	1.56	1.88	1.38	1.8
Differences	0.26	0.19	0.32	0.31	0.28

Source) Shin DW et al. Journal of Clinical Oncology 2011

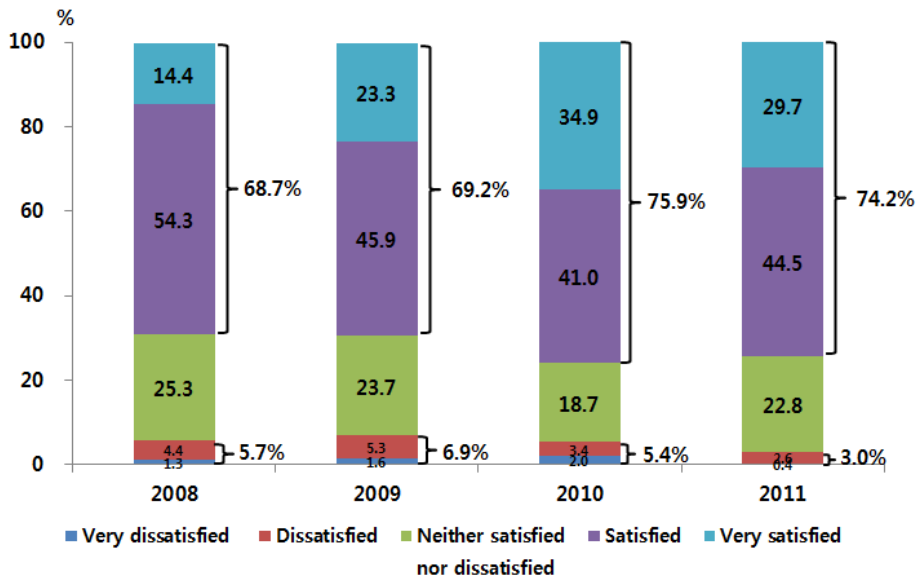
Satisfaction with Medical Services

In the 2010 survey on the satisfaction with treatment services conducted to patients with cancer, 34.9% responded 'very satisfied', and 41% responded 'satisfied'.

In 2011, satisfaction with treatment services improved: 29.7% responded 'very satisfied', and 44.5% 'satisfied'

Comparing 2008 and 2011 surveys, the percentage of patients dissatisfied with their treatments decreased, while the percentage of those very satisfied increased.

Satisfaction with Medical Services (2008~2011)



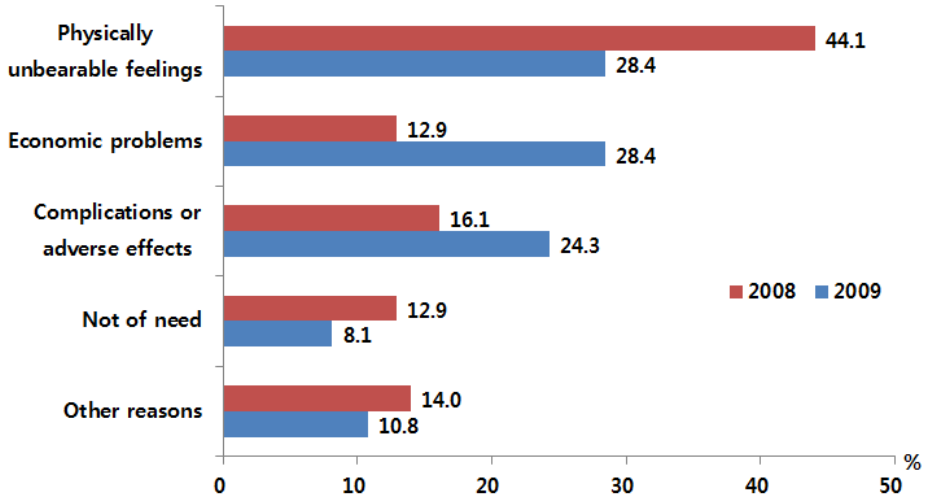
Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2011

Compliance with Treatment

Asked about the reasons for rejecting treatment recommended by physicians(2008), 28.4% of the respondents said that it was because of 'physically unbearable feelings', 'financial problems' respectively, 24.5% said because of ‘complications or adverse effects’ from treatment, 8.1% felt that ‘they did not need treatment’, and 10.8% stated that they had rejected them for ‘other reasons’.

In 2009, 44.1% said because of 'physically unbearable feelings' which was a large increase from 2008, followed by economic problems (12.9%), complications or adverse effects from treatment (16.1%), not needing treatment (12.9%), and ‘other reasons’ (14.0%).

Reasons of Rejecting Treatment Recommended by Physicians

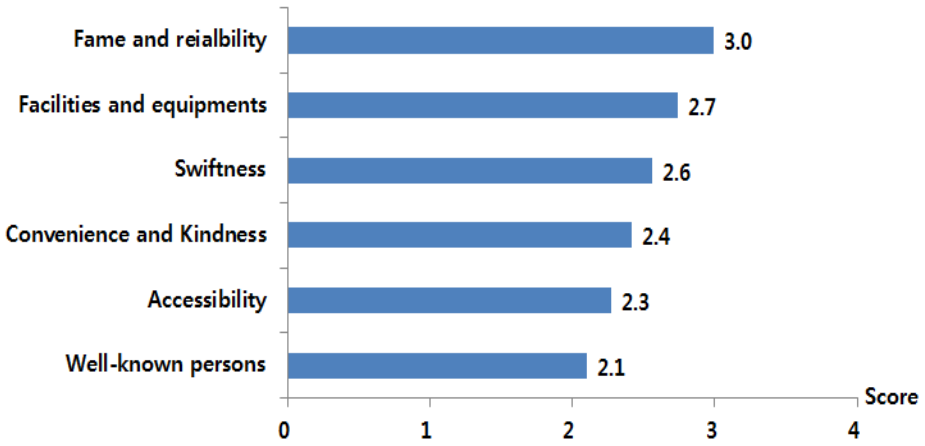


Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2009

Criteria for Choosing Hospital

In terms of the factors that affect patient's choice of medical institutions, 'reputation and reliability' ranked highest, followed by 'facilities and equipment', 'swiftness', 'convenience and kindness', 'accessibility', and 'acclaimed physicians'.

Criteria for Choosing Hospital

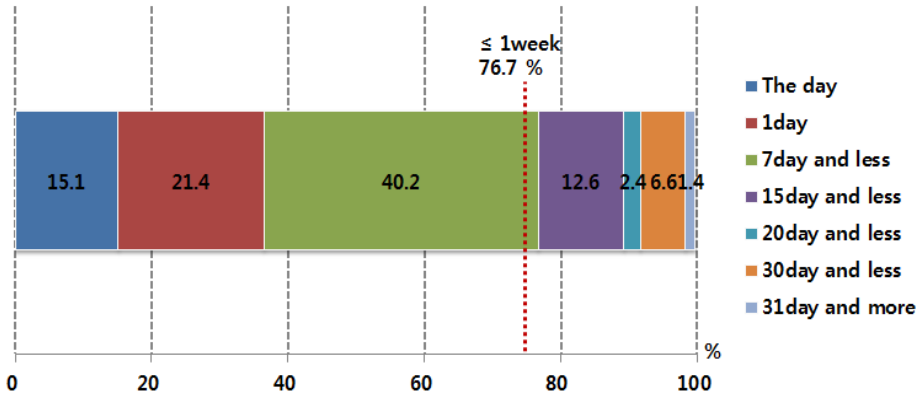


Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2008

Time from Making an Appointment to Consultation with a Physician

Among 2,661 cancer patients surveyed, (40.2%) had to wait 2 to 7 days to see a physician after making an initial appointment, but 12.6% had to wait 15 days or longer. The average waiting time period from making an appointment was 7 days.

Waiting Time for Consultation with a Physician

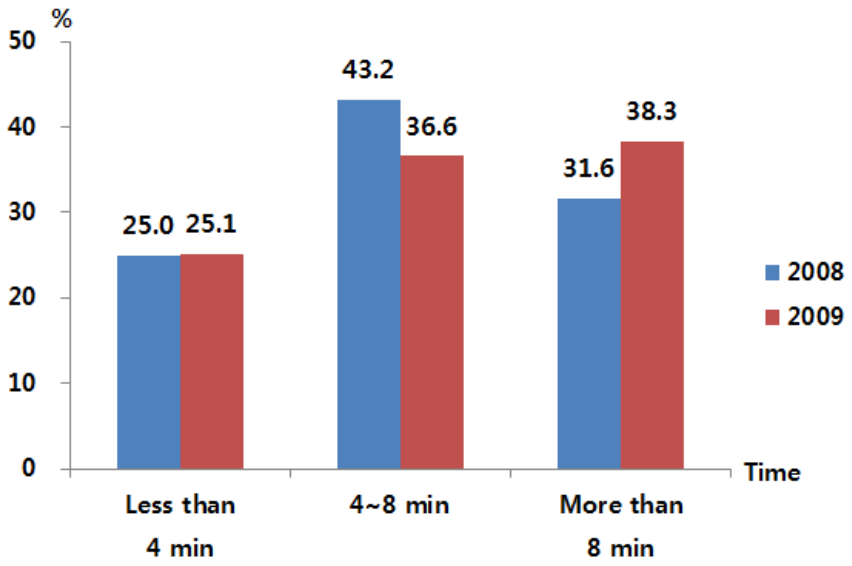


Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2008

Average Consultation Time with Physicians

Among the patients with cancer, 43% reported they received a consultation that lasted 4 to 8 minutes in 2008, and 38% reported their consultation lasted 8 minutes or longer in 2009. In 2008, the mean perceived consultation time was 7.1 minutes.

Average Consultation Time

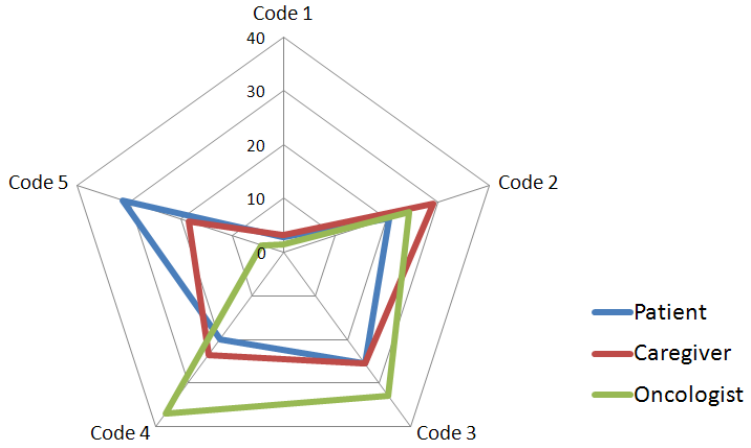


Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2009

Participation in Decision Making on Treatment

A survey was taken from cancer patients, caregivers, and oncologists regarding making decisions on cancer treatment, and the results showed discrepancies in responses among the groups. The highest percentage of cancer patients (31%) said that the physician made all of the decisions, and 29% of caregivers said that the patient made decisions after listening to physician's advice. The highest percentage of oncologists (37%) responded that the physician made decisions by taking patient's opinion into consideration.

Participation in Decision Making on Treatment



Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2009

Code 1: The patient made the final decision about which treatment he/she would receive.

Code 2: The patient made the final decision about which treatment he/she would receive after seriously considering his/her physician's opinion.

Code 3: The physician and the patient shared responsibility for deciding which treatment would be best for the patient.

Code 4: The physician made the final decision about the treatment after taking into account the patient's opinion.

Code 5: All of the decisions regarding patient's treatment were made by the physician

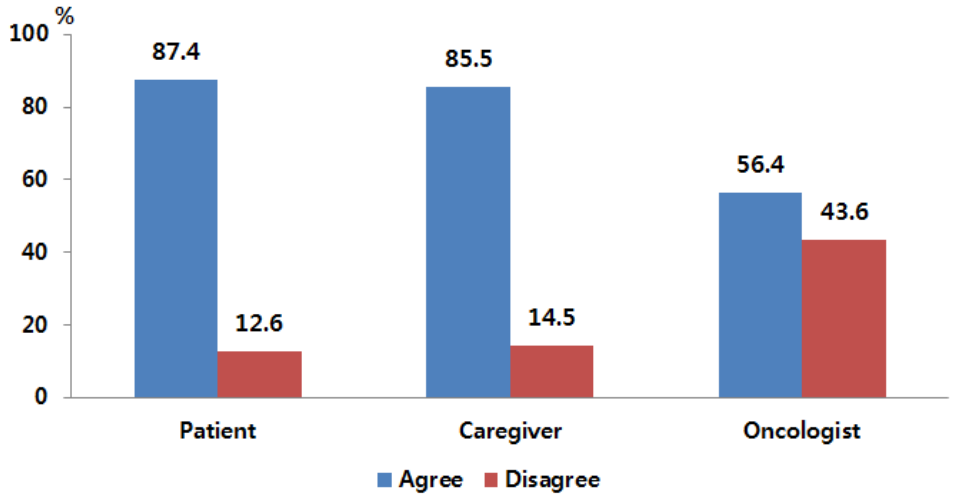
Caregivers' Involvement in Decision Making

A survey was taken among cancer patients, caregivers, and oncologists on family's involvement in cancer treatment. According to the results, most responders (more than 95%) agreed and said that families and caregivers should participate in decision making on treatment. Even when the patient does not want family's involvement, more than 85% of cancer patients and caregivers and 56.4% of oncologists agreed that families and caregivers should participate in the decision-making process.

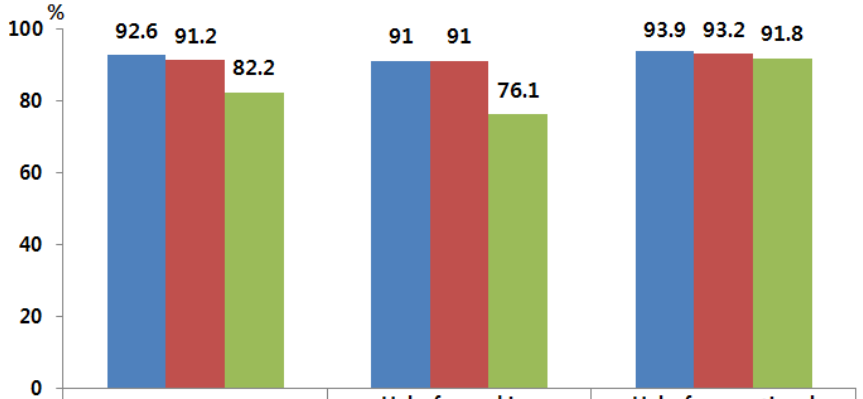
More than 95% of cancer patients and their caregivers, and 80% of oncologists said that families and caregivers have the rights to be involved in decision making on cancer treatment. On whether caregivers' involvement has positive effects such as psychological support, decision making support, and communication, cancer patients showed the highest level of agreement while oncologists showed the lowest level of agreement. Regarding the positive aspects of caregivers' involvement in decision making, the highest percentage of oncologists said psychological support (91%), followed by communication (82%), and decision-making support (76%).

As for the negative aspects of caregiver's involvement, 34% of oncologists said that it complicates the decision making process, and 56% said that it undermines patient's autonomous decision making. In comparison, 21% and 30% of cancer patients agreed with the two arguments, respectively.

Caregivers' Involvement in Decision Making despite Cancer Patient's Dissent (2012)



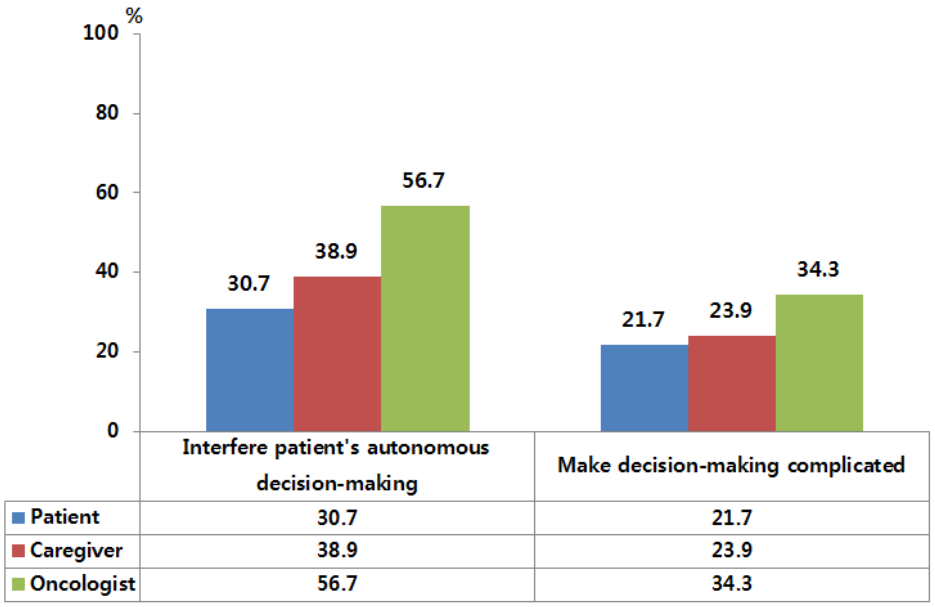
Positive Opinion on Caregivers' Involvement in Making Decision (2012)



	Help for communicating	Help for making decisions	Help for emotional support
Patient	92.6	91	93.9
Caregiver	91.2	91	93.2
Oncologist	82.2	76.1	91.8

Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2012

Negative Opinion on Caregivers' Involvement in Making Decisions (2012)



	Interfere patient's autonomous decision-making	Make decision-making complicated
Patient	30.7	21.7
Caregiver	38.9	23.9
Oncologist	56.7	34.3

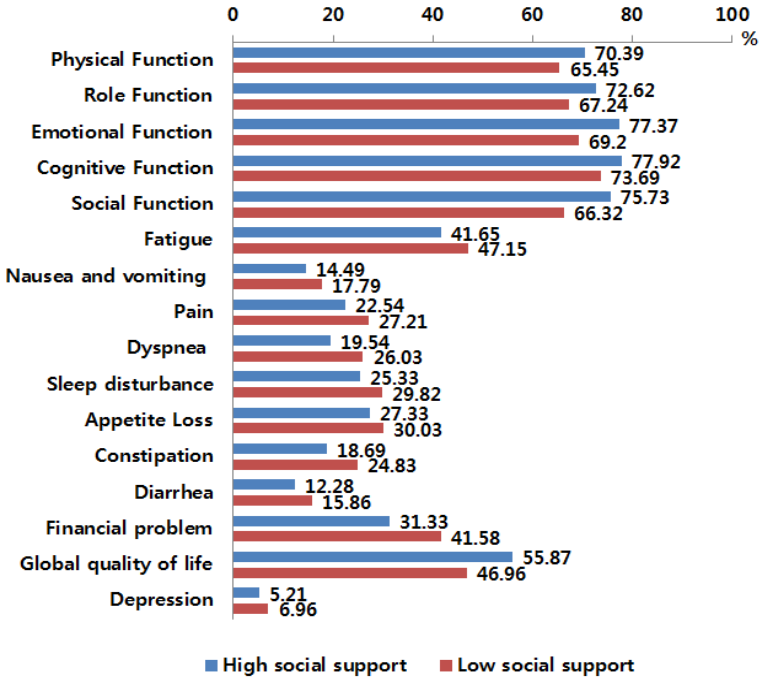
Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2012

Influence of Social Support on Cancer Patients

The influence of social support on cancer patients was evaluated based on 8 questions: Affective Support (three items) relates to more emotional forms of support or caring, feeling valued and loved and Confidant Support (five items) reflects aspects of a relationship where important matters in life are discussed and shared.

Cancer patients who felt that they were receiving low levels of social support showed high levels of depression, as well as low indices regarding physical, emotional, cognitive, and social functions. They were also more prone to suffer from adverse symptoms, such as fatigue, pain, sleep disorder, constipation, and diarrhea. Moreover, it was shown that they had lower overall quality of life than other patients.

Influence of Social Support on Cancer Patients (2012)



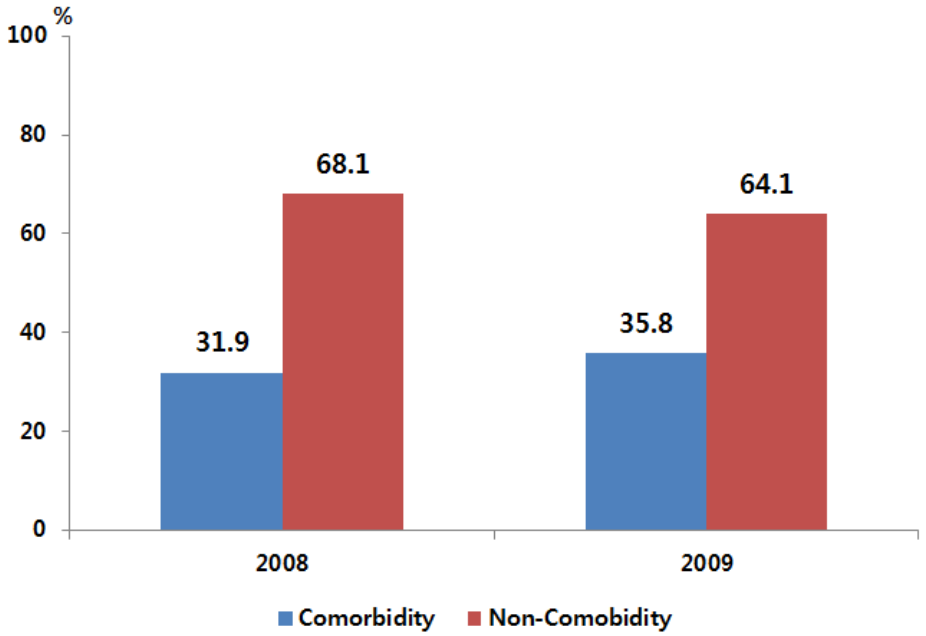
Source) Eom CS et al. Psycho-Oncology 2012

Comorbidity Management of Cancer Patients

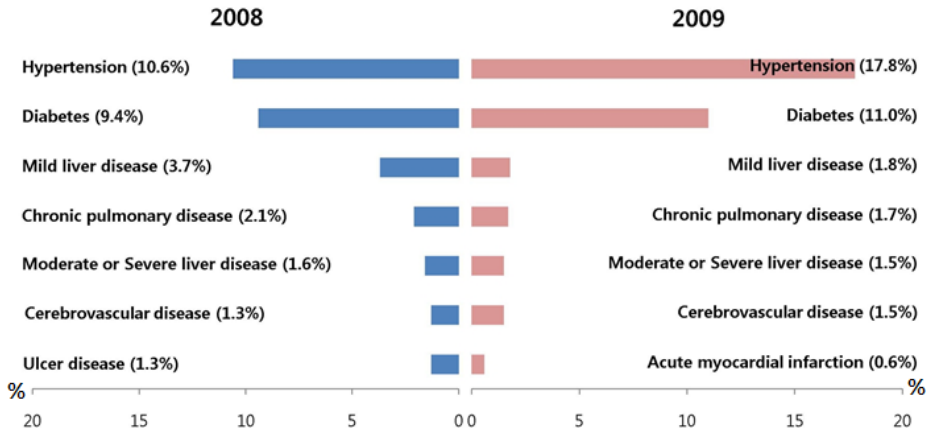
According to the 2008 survey on comorbidities of patients with cancer, 31.9% of patients had comorbidity. In 2009, the percentage of patients with comorbidity was 35.8%.

Looking at the data regarding the seven most frequently occurring comorbidities among patients with cancer in 2008, the highest was hypertension (10.6%), followed by diabetes (9.4%), mild liver diseases (3.7%), chronic pulmonary diseases (2.1%), moderate or severe liver diseases (1.6%), cerebrovascular diseases (1.3%), and ulcer diseases (1.3%). In 2009, the most frequently occurring comorbidities were hypertension (17.8%), diabetes (11.0%), mild liver disease (1.8%), chronic pulmonary disease (1.7%), cerebrovascular disease (1.5%), ulcer disease (1.5%), and myocardial infarction (0.6%).

Comorbidities among Patients with Cancer



Frequent Comorbidities among Patients with Cancer



Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2009

Comparison of Quality of Life between Patients with Cancer and Patients with Other Diseases

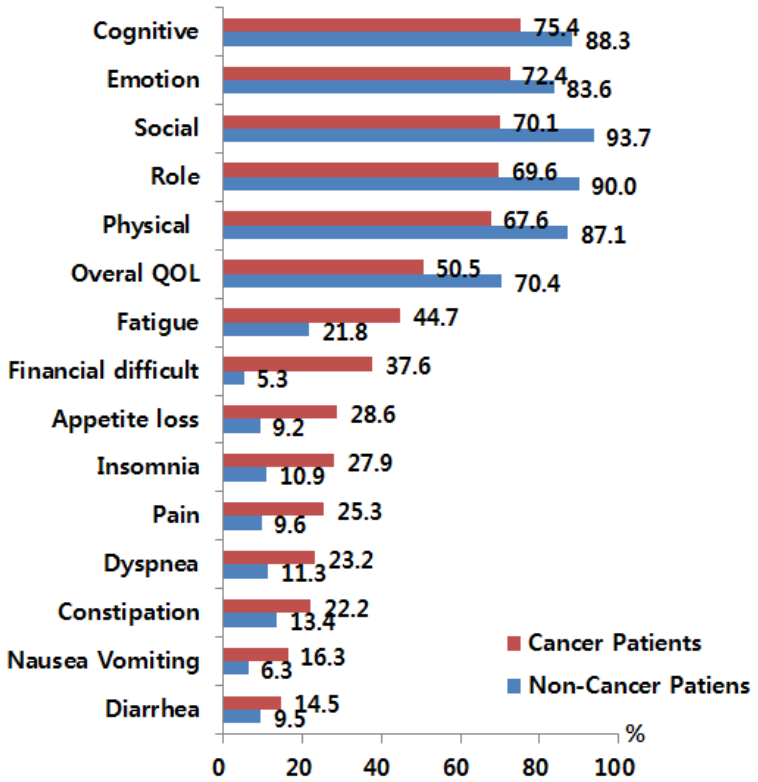
The overall quality of life among patients with cancer scored an average of 50.5 points, while the average score of patients with other diseases was 70.4, indicating that the overall quality of life of patients with cancer was significantly poorer than that of other patients.

For patients with other diseases, social quality of life scored highest, followed by roles, cognitive and physical, and emotional aspects.

In the case of patients with cancer, cognitive quality of life scored highest, followed by emotional, social, role, and physical aspects.

The results show that patients with cancer are limited in their social and role functions, and that their quality of life in those areas is lower than patients with other diseases.

Quality of Life(QoL) Comparison between Patients with Cancer and Patients with Other Diseases



Source 1) National Cancer Center. Quality, equity, and coverage in cancer care, 2009

2) Yun YH et al. Journal of Clinical Epidemiology 2007

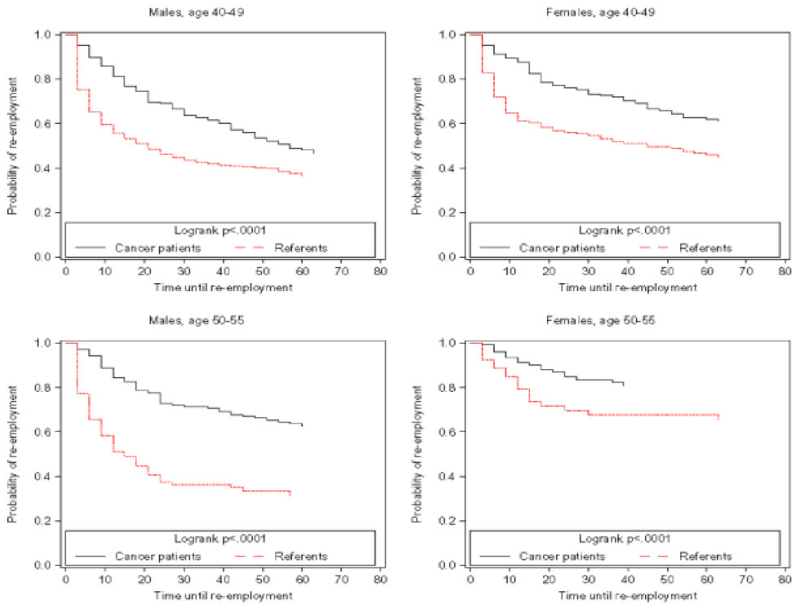
Note) Higher the score of ability, higher the ability status and QOL while higher the score of symptom, lower the QOL relates to symptoms

Influence of Cancer Diagnosis on Employment

A 2001 comparative study conducted with 4,991 cancer patients covered by the National Health Insurance program in their workplace and individuals without cancer indicates that cancer patients lose their jobs after diagnosis at a much higher rate than others and a lower percentage of cancer patients return to their jobs.

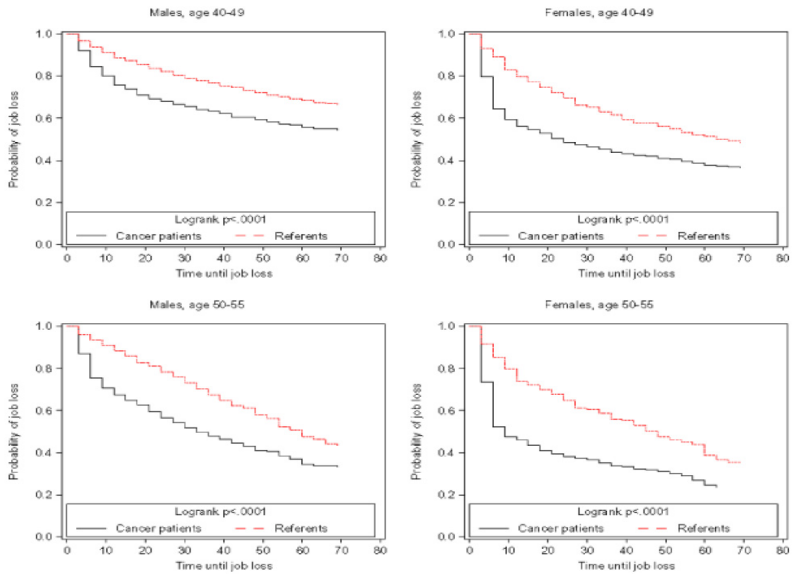
Patients with cancers which are difficult to cure, such as leukemia, cancer of the brain and the central nervous system, lung cancer, and liver cancer, as well as patients of cancers that require long term treatment, lost their jobs more quickly and were late in returning to work.

Time until Re-employment (2008)



Source) Park JH et al. Psycho-Oncology 2008

Time until Job Loss (2008)

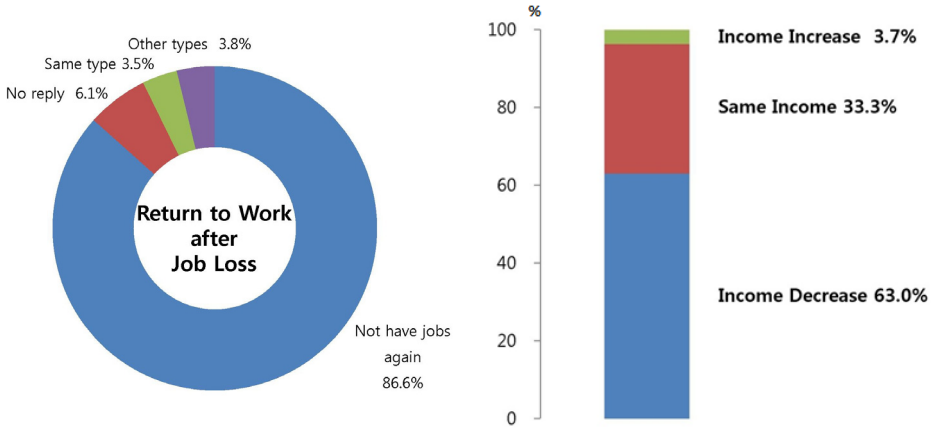


Source) Park JH et al. Psycho-Oncology 2008

Return to Work and Income Change

Among the patients with cancer who indicated that they had lost their job after cancer diagnosis, an overwhelming 86.6% could not return to the previous workplace. In addition, the number of patients finding other jobs (3.8%) was slightly higher than those who came back to their original job. Regarding changes in income after a returning to the workplace, 63.0% earned less than prior to being diagnosed with cancer.

Return to Work and Income Change



Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2008

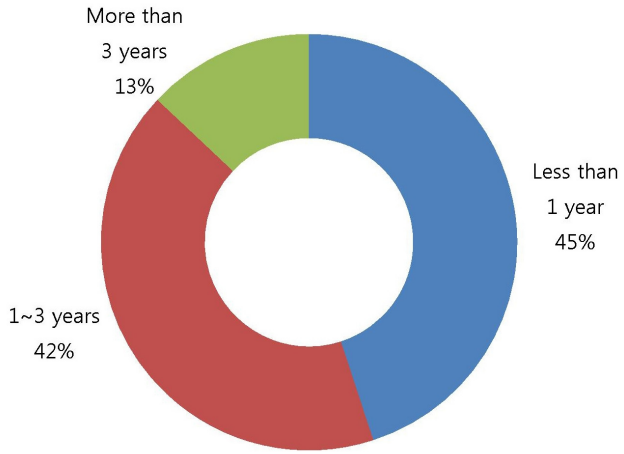
Caregiving for Patients with Cancer

According to the 2011 survey results from family caregivers of cancer inpatients and outpatients, the highest percentage of respondents said that they had been caring for the patient for 1 year or less (45%), followed by 1 to 3 years (42%).

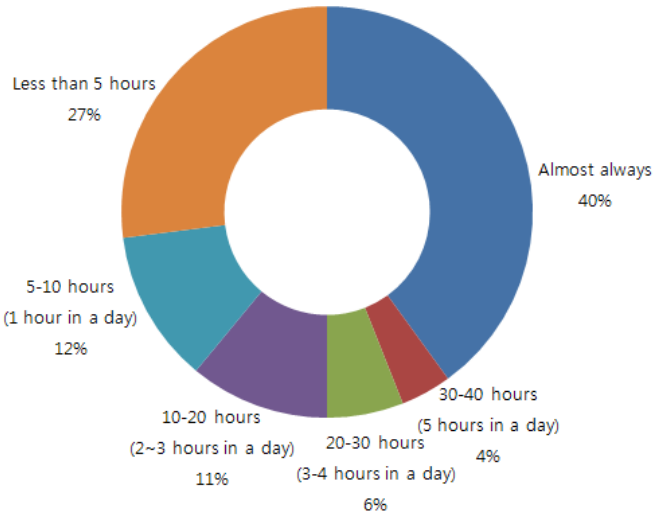
Regarding the time spent caring for a patient per week, 40% said that they provided care almost always, and 27% said they spent five hours or less (1 hour or less per day). When asked who had been most helpful in caring for them, 61% of the patients with cancer said their spouses and children.

61.9% of patients and 57.1% of caregivers said that they needed help from medical staffs as well as their family and friends when the patient was admitted to the hospital for treatments such as surgery. Although the exact results were somewhat different, the responses regarding the times when they needed help from those around them were similar between patients and caregivers.

Period of Providing Caregiving (2011)

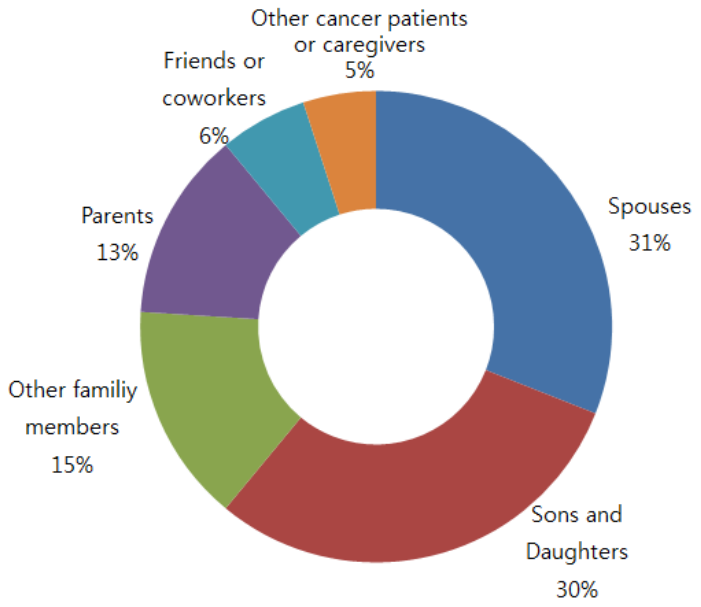


Time Spent on Providing Caregiving (2011)

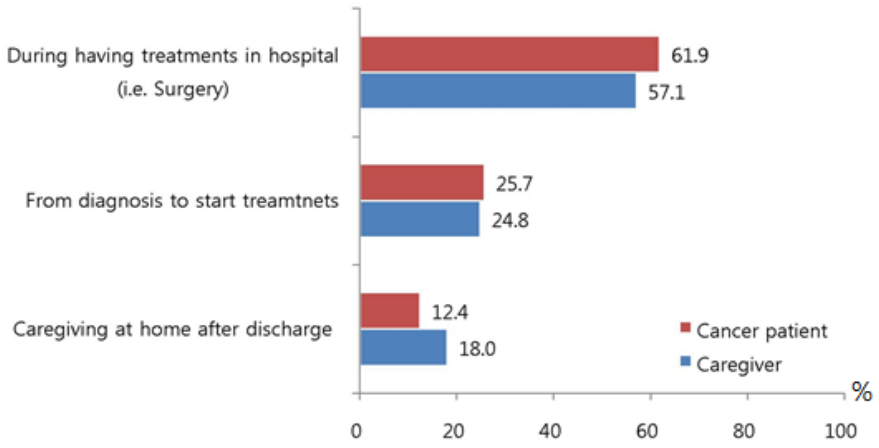


Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2011

The Most Helpful Person in Providing Care (2011)



The Time When Help is Most Needed (2011)



Source) National Cancer Center. Quality, equity, and coverage in cancer care, 2011

Chapter 6.
Palliative Care / Management of Cancer Survivors

6.1 Palliative Care

Current Status of Palliative Care Institutions

To expand the service 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 has established 56 palliative care institutions by 2012. The Ministry of Health and Welfare has invited public palliative care institutions to subsidize their operating expenses since 2005.

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

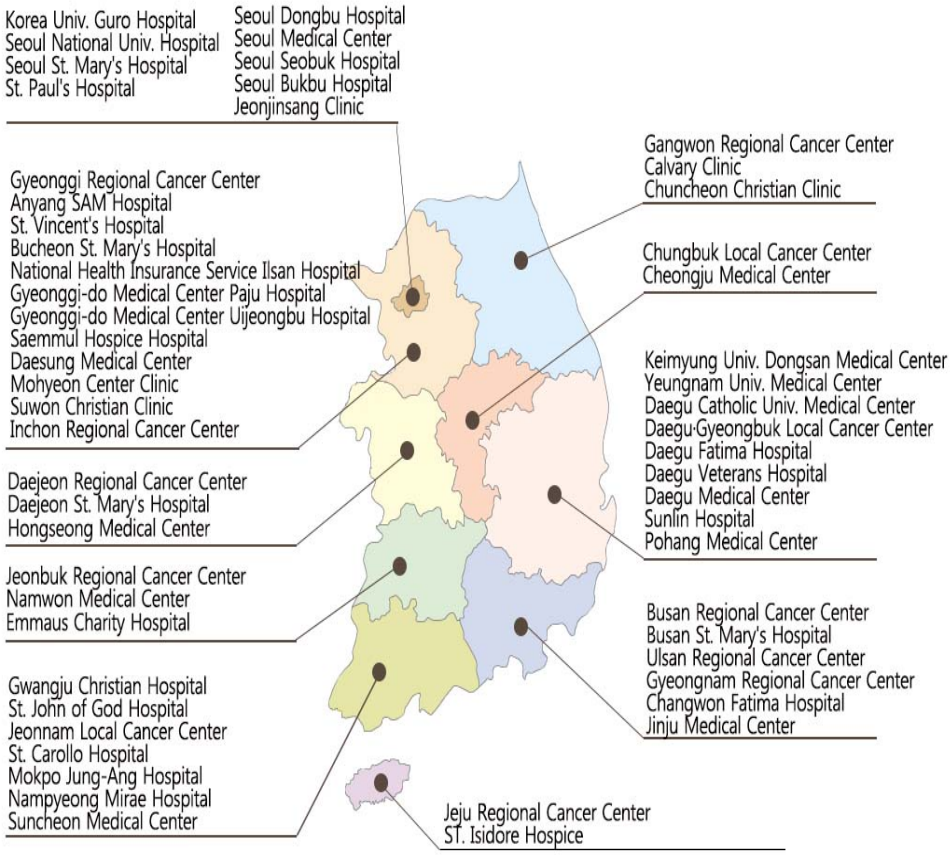
*31st December 2012

Current status of Designated Palliative Care Institutions (2012)

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

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

Current Status of Designated Palliative Care Institutions (2012)



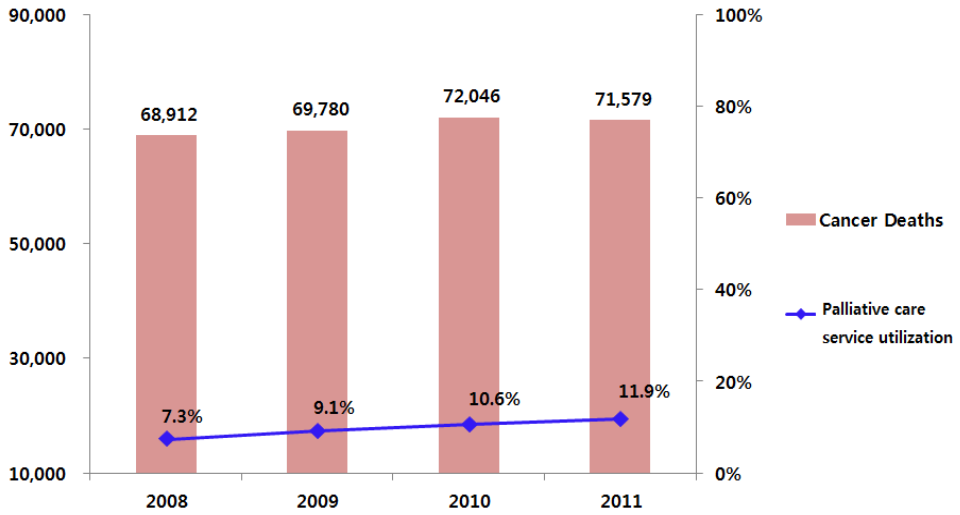
Source) National Cancer Center, 2012

Palliative Care Service Utilization

In 2011, 8,494 patients used 43 palliative care institutions. 11.9% of patients who died from cancer had used palliative care institutions.

In 2010, 86.6% of cancer deaths occurred at health institutions. 10.0% and 1.8% of cancer deaths occurred in patient's house and during transfer, respectively.

Palliative Care Service Utilization (2008~2011)



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

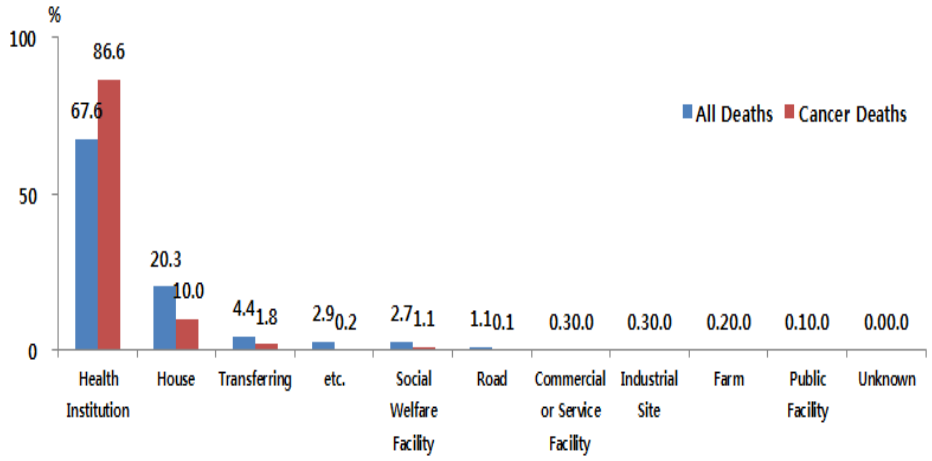
Year	New inpatients*	Number of national cancer deaths**	Rate of Palliative Care Service Utilization***
2008	5,046	68,912	7.3%
2009	6,365	69,780	9.1%
2010	7,654	72,046	10.6%
2011	8,494	71,579	11.9%

*Source) 2009~2012 Palliative care practice status of application

**Source) STATISTICS KOREA. Annual report on the cause of death statistics, 2008~2011

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

Place of Cancer Deaths



Source) STATISTICS KOREA. Annual report on the cause of death statistics, 2010

Cancer Mortality by Age and Place

The average age of cancer patients who died at social welfare facilities was 75.5, in their houses 72.5, during transfer 71.4, and at health institutions 67.2.

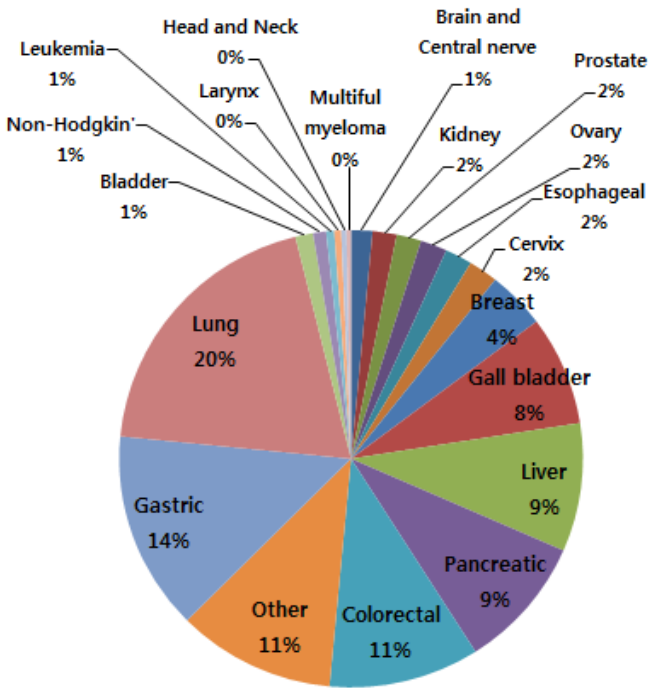
86.6% of cancer patients died in health institutions.

Place of Death	N	%	Age (yr)	
			Mean	S.D.
Health Institution	62,396	86.6	67.2	13.5
House	7,232	10.0	72.5	11.4
During transferring	1,328	1.8	71.4	12.4
Social Welfare Facility	799	1.1	75.5	12.1
etc.	166	0.2	69.4	14.8
Road	86	0.1	67.5	14.0
Public Facility	15	0.02	62.1	11.4
Unknown	9	0.01	69.3	15.8
Commercial or Service Facility	8	0.01	49.8	11.6
Industrial Site	3	0.004	57.7	9.0
Farm	3	0.004	52.3	17.5
Total	72,045	100.0	67.9	13.4

Palliative Care Institution Utilization

In 2012, 7,962 cancer patients used palliative care institutions. According to the types of cancer, the number of lung cancer patients was the highest (1,317 , 19.6%), followed by gastric cancer (1,146, 14.1%), colorectal cancer (707, 10.5%), pancreatic cancer (633, 9.4%), and liver cancer (610, 9.1%).

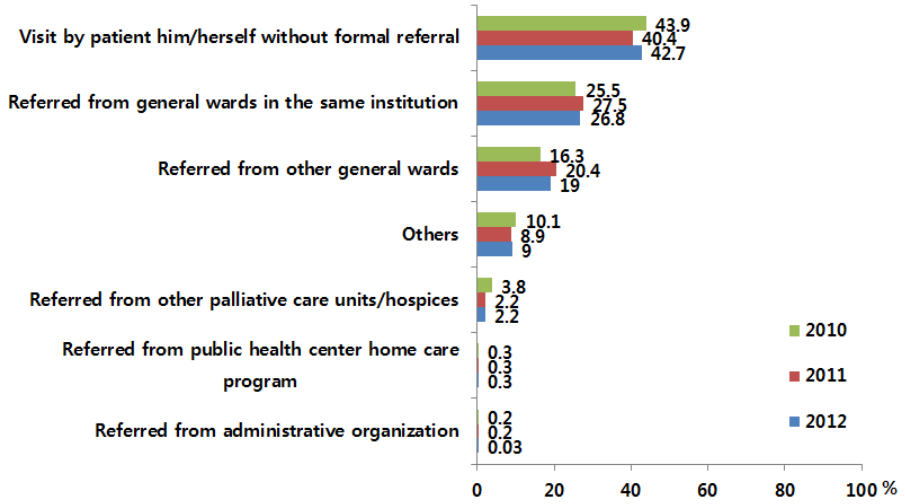
Use of Hospice and Palliative Care Services by Types of Cancer



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

As for admission routes of patients who used palliative care institutions in 2012, the highest number of patients visited the institution without formal referral (2,873, 42.7%), followed by patients who were referred from the general wards in the same health institution (1,805, 26.8%), and from other health institutions or wards (1,275, 19.0%).

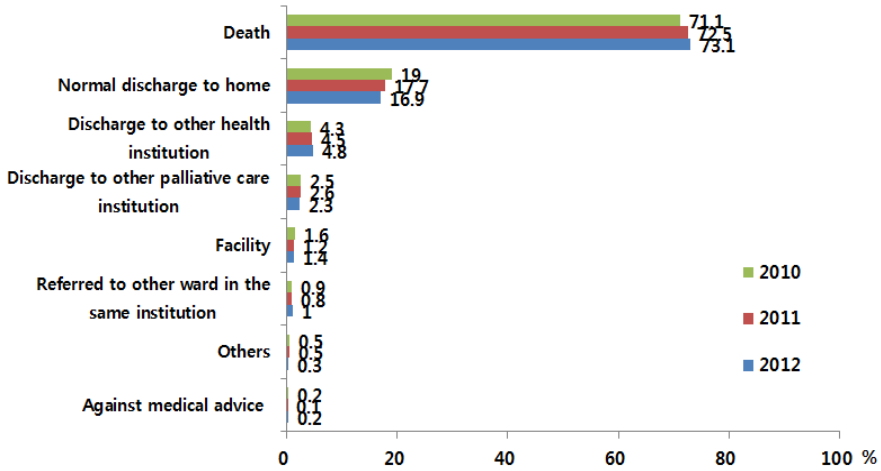
Admission Routes to Palliative Care Institutions



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

The most common reason of discharge from initial hospitalization was death (4,585, 73.1%), followed by discharge to home (1,063, 16.9%), and discharge to another health institution (301, 4.8%).

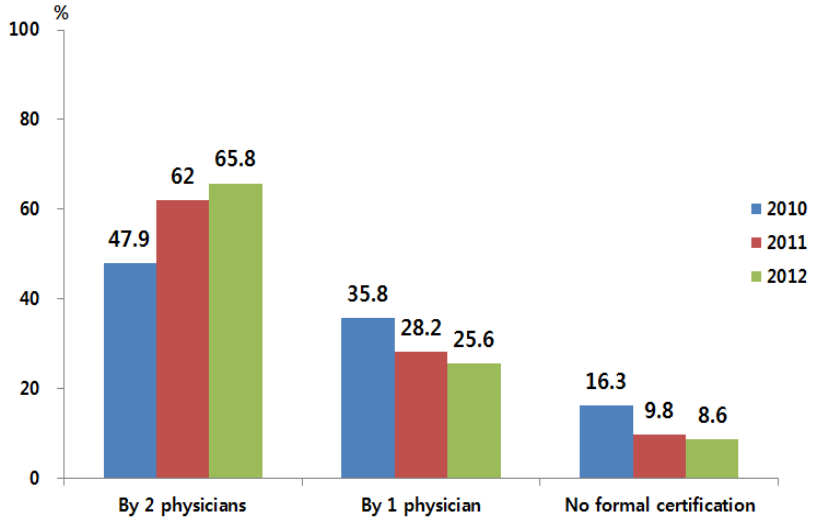
Reason for Discharge from Palliative Care Institution



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

Regarding the status of being equipped with terminal diagnosis or physician's note, 4,410 patients (65.8%) were diagnosed by more than two physicians, 1,720 (25.6%) were diagnosed by one physician, and 578 (8.6%) did not receive a diagnosis.

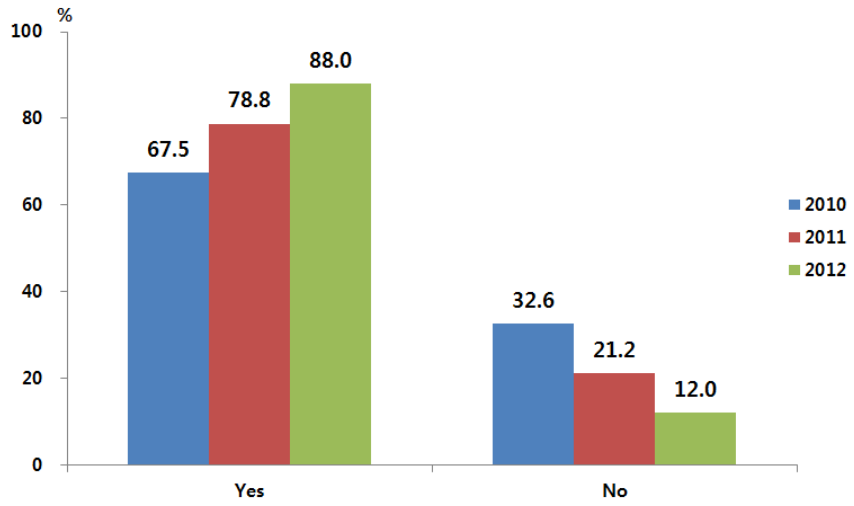
Availability of Terminal Cancer Diagnosis



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

5,915 patients (88.0%) had written advance directives, and the rest had not.

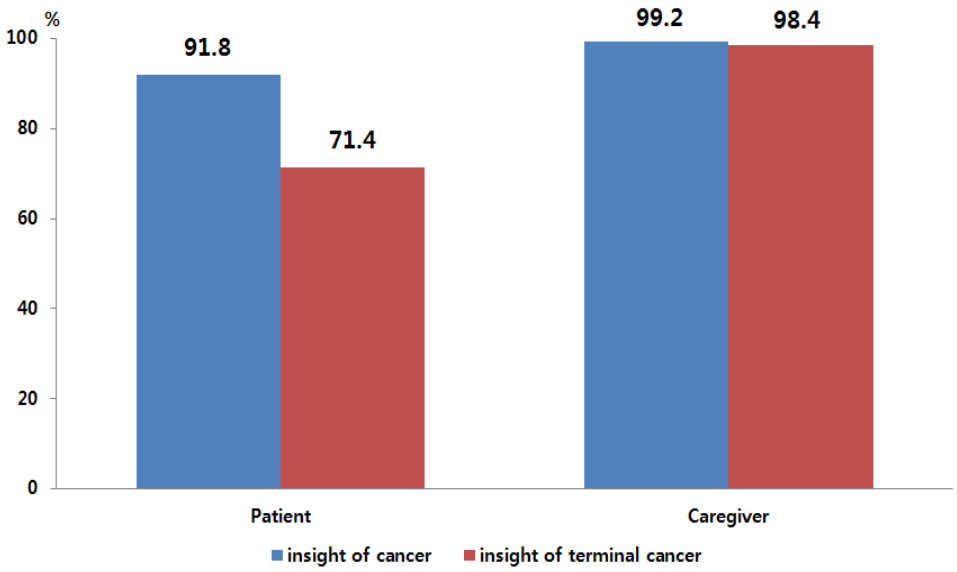
Had Written Advance Directives



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

The numbers of patients with insight of cancer and terminal cancer were 6,171 (91.8%) and 4,799 (71.4), respectively. These figures were lower than, caregivers' insight of cancer (6,412 persons, 99.2%) and terminal cancer (6,361 persons, 98.4%).

Insight of Cancer and Terminal Cancer

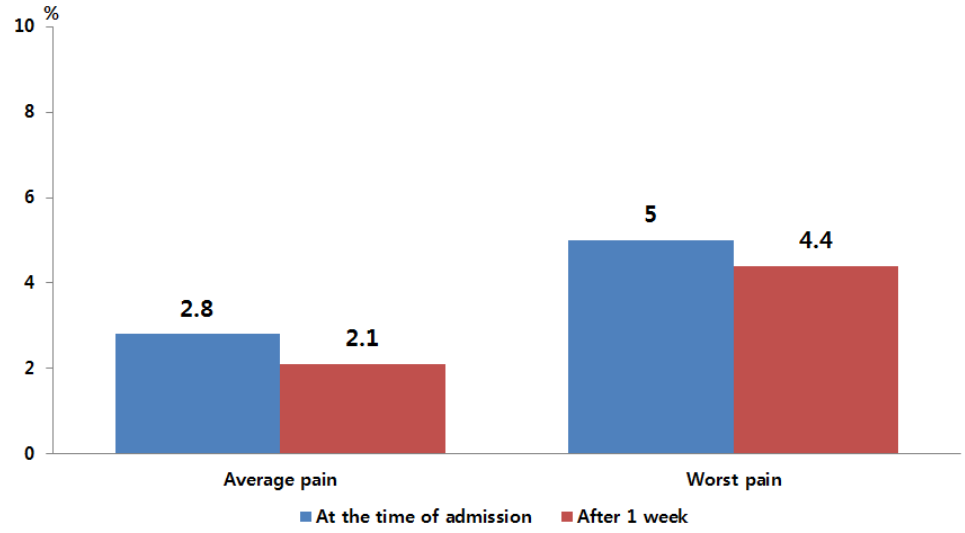


Source) National Cancer Center, Support for activation of palliative care service, 2012

Improvement of Pain Conditions at Palliative Care Institutions

Average pain after a week of admission to palliative care institutions declined from 2.8 to 2.1, and the worst level of pain declined from 5.0 to 4.4. All pain intensities also declined after a week of admission to palliative care institutions.

Improvement of Pain Condition after one week at Palliative care Institution



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

Overall Satisfaction of Bereavement Family Using Palliative Care Institutions

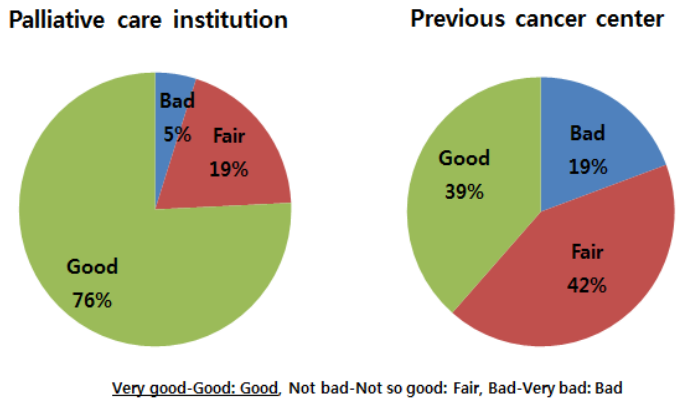
1. Purpose of the survey

To watch over the overall satisfaction and quality variation of service of palliative care institutions, conduct a survey of experience and satisfaction of bereavement family whose family used palliative care institutions.

2. Details and Results

In 2011. 39% of patients said that they were satisfied with their previous cancer centers. On the other hand, 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, 2011

Satisfaction regarding Palliative Care Services

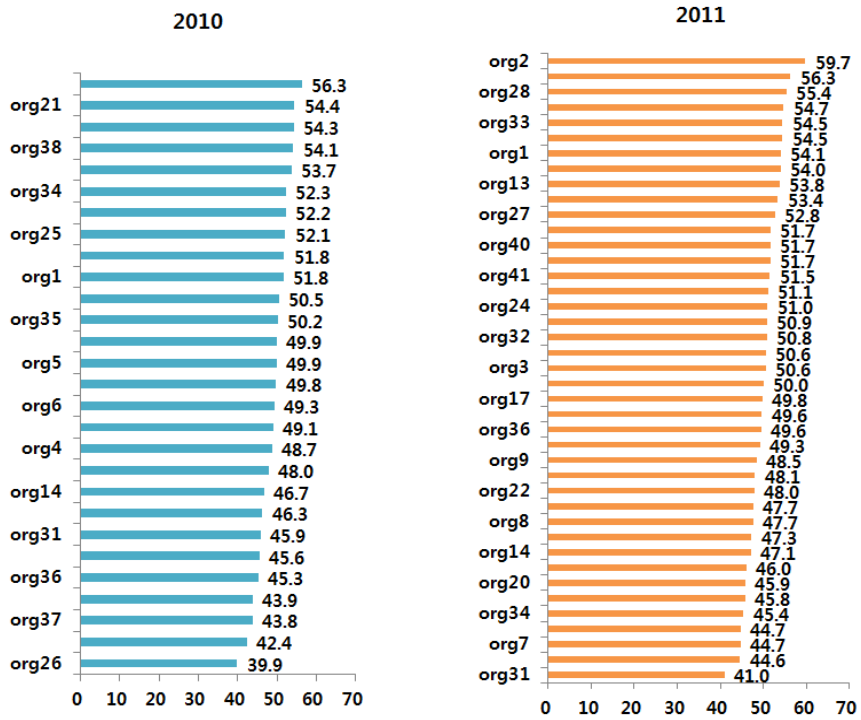
According to the result of a survey on the satisfaction of patients who used palliative care institutions, more than 70% of the respondents were satisfied with physicians and palliative care team's proper handling, expert knowledge, skill, and teamwork. Non-waiting hospitalization received the lowest level of satisfaction (66.9%).

	2010		2011		P-value*
	Mean	S.D.	Mean	S.D.	
1) Physician's swift action	72.0	20.7	75.8	20.3	<0.001
2) Nurse's expert knowledge and skill	74.8	19.4	76.4	18.7	0.102
3) Palliative care team's effort to meet patient's needs	77.1	19.9	78.5	18.7	0.161
4) Physician's explanation to patient	68.6	23.4	70.5	23.5	0.118
5) Physician's explanation to patient's family	74.7	21.5	77.8	20.6	<0.01
6) Convenient and pleasant facility	68.4	22.9	71.3	23.0	<0.05
7) Consideration for maintaining health	64.8	22.4	67.4	22.6	<0.05
8) Reasonable cost	71.5	21.0	73.0	20.7	0.144
9) Non-waiting hospitalization	60.9	25.6	66.9	25.7	<0.001
10) Palliative care teamwork	73.2	20.1	76.0	19.7	<0.01

Measurement tool : CES short version 10 items, 6 Scale : 0(Never) - 100 (Definitely)
*t – test

Assessment of End-of-life

The quality scores of end-of-life varied significantly among palliative care institutions from 39.9 to 56.3 ($p < 0.001$) in 2010, and from 41.0 to 59.7 ($p < 0.001$) in 2011.



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

※Average of quality score of end-of-life for all institutions : 50.3(2010), 51.0(2011)

※Excludes institutions with less than 5 available answers

Source) National Cancer Center, Support for activation of palliative care service, 2011

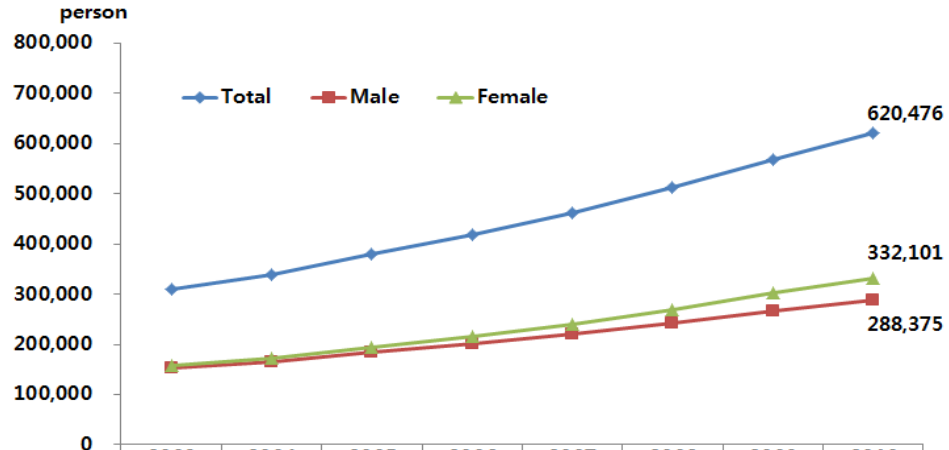
6.2 Management of Cancer Survivors

Five-year Cancer Survivors

The number of five-year cancer survivors increased from 309,963 in 2003 to 620,476 in 2010 (288,375 for males and 332,101 for females).

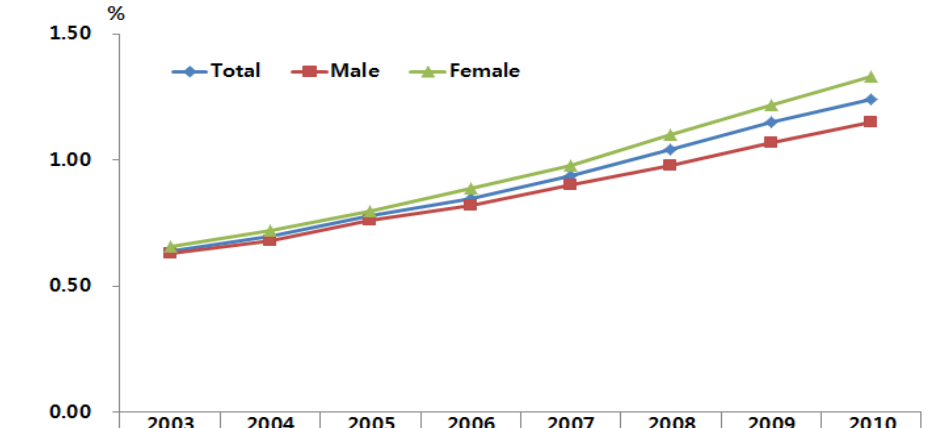
The percentage of five-year cancer survivors among the general population was 1.24% (1.15% in males and 1.33% in females) in 2010.

Estimated Number of Five-year Cancer Survivors (2003~2010)



	2003	2004	2005	2006	2007	2008	2009	2010
Total	309,963	339,731	378,820	417,977	462,571	512,880	568,591	620,476
Male	152,062	166,304	184,698	202,077	221,729	242,926	266,935	288,375
Female	157,901	173,427	194,122	215,900	240,842	269,954	301,656	332,101

Percentage of Five-year Cancer Survivors (2003~2010)



	2003	2004	2005	2006	2007	2008	2009	2010
Total	0.64	0.70	0.78	0.85	0.94	1.04	1.15	1.24
Male	0.63	0.68	0.76	0.82	0.90	0.98	1.07	1.15
Female	0.66	0.72	0.80	0.89	0.98	1.10	1.22	1.33

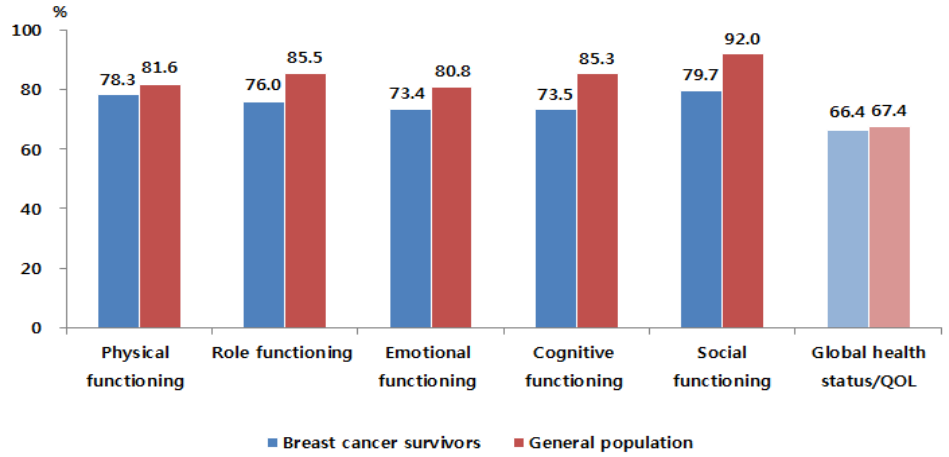
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2012

Quality of Life of Breast Cancer Survivors

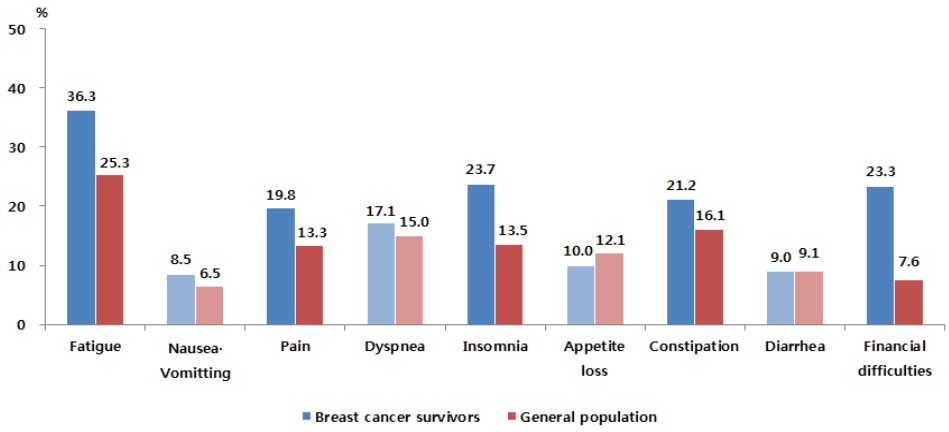
Among 10,796 patients with breast cancer who had undergone primary curative surgery at five major hospitals (the National Cancer Center, Seoul National University Hospital, the Yonsei University Health System, the Samsung Medical Center, and the Asan Medical Center) from 1993 to 2002, a questionnaire was completed by 1,933 survivors of cancer.

A comparison of the quality of life according to the functional state in survivors of breast cancer (n=1,933) with that in the general population (n=500) revealed that the survivors have a poorer performance in terms of their physical, role, emotional, cognitive, and social functioning as well as overall lower quality of life. In addition, a comparison of the quality of life according to negative symptoms in survivors of breast cancer with that in the general population showed that the survivors experience physical symptoms such as fatigue, nausea and vomiting, pain, dyspnea, insomnia and constipation. Furthermore, the percentage of breast cancer survivors experiencing financial difficulties was greater than in the general population (n=500).

Quality of Life (Functioning) in Breast Cancer Survivors



Quality of Life (Symptoms) in Breast Cancer Survivors



Source) Ahn Sh et al, Annals of Oncology 2007

Note)

1) *: p< 0.001 from analysis of covariance with a generalized linear model and are for the comparison between breast cancer survivors and the general population.
2) Cancer Survivor : patients without recurrence or metastasis of cancer after treatment for complete recovery from cancer.

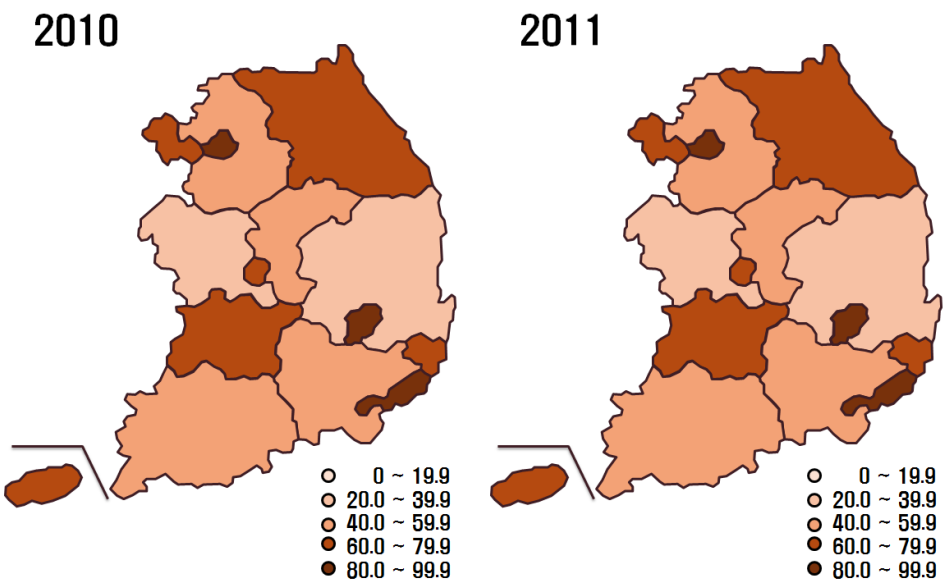
Chapter 7.
Regional Cancer Centers

Self-Sufficiency of Cancer Treatment

Outside of Seoul, Daegu had the highest level of self-sufficiency in treating patients with cancer from 2010 to 2011. Gyeongbuk had the lowest level.

Comparing self-sufficiency levels of 16 cities and provinces between 2010 and 2011, Incheon showed the highest improvement, followed by Chungbuk and Gyeonggi.

Self-Sufficiency of Cancer Treatment



Source) National Cancer Center, 2011

Geographic Location 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, 2011

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 accurate cancer incidences according to geographic 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 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 Central Cancer Registry has implemented the national cancer incidence database, which includes type-specific cancer registration data from 11 regional cancer registries. Since publishing cancer incidence data of 1999~2001 in 2005, the Central Cancer Registry has been releasing cancer registration statistics, and regional cancer registries have been producing similar data regarding the citizens of their respective regions.

Cancer Registries

Source) National Cancer Center, 2012

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