

Cancer Facts & Figures 2015

Foreword

Cancer is a dominant health-threatening disease and is currently the leading cause of death in Korea. Today, it is no longer a mere family affair but is already the responsibility of the whole society. Cancer patients and their family members go through physical, emotional, and social struggles, and the socioeconomic cost of cancer ranks the highest among the five major causes of death at present (cancer, cerebrovascular disease, heart disease, diabetes, and suicide).

According to the World Health Organization, however, one-third of all cancer cases are preventable, another third can be completely cured with early diagnosis and treatment, and the rest can be palliated with adequate treatment. Subsequently, the Korean government enacted the Cancer Control Act and established a series of comprehensive cancer control plans, carrying out research projects and national cancer control programs mainly driven by National Cancer Center (NCC).

Founded in 2000 as part of the nationwide efforts to fight cancer, NCC strives to lower the cancer incidence and mortality rates among the Korean citizens, and to improve the quality of life for cancer patients by performing research, providing treatment, supporting national cancer control programs, and training and educating cancer treatment professionals.

Cancer Facts & Figures in Korea 2015 compiled the cancer-related works of NCC and other cancer-related reports and academic papers published at home and abroad. It is our sincere hope that it would help broaden the general public's understanding of cancer, and that it would be utilized as a primary source of data for cancer-related researches and projects.

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

June 2015

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

President, National Cancer Center

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

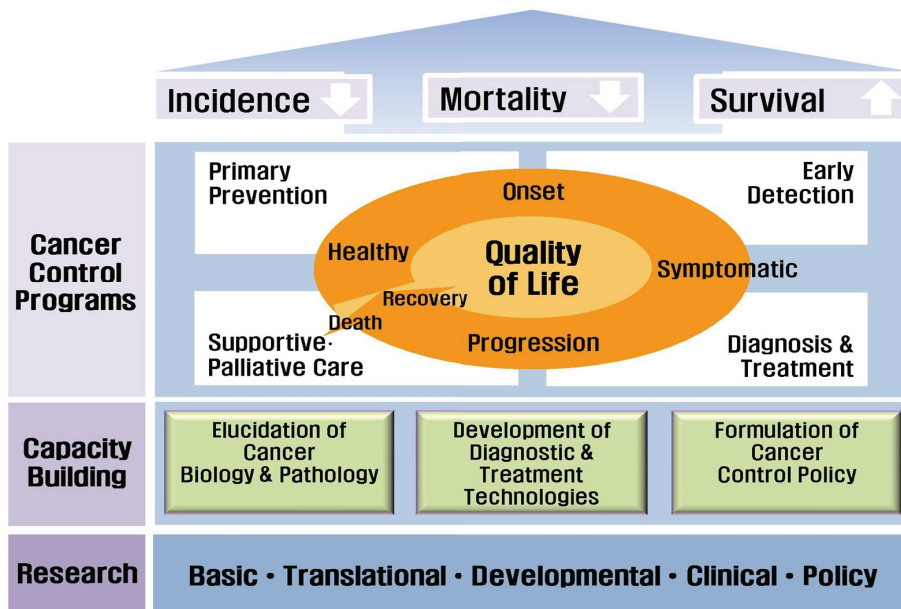
The Revised Second 10-Year Plan for National Cancer Control (2011–2015) incorporates the results of the progress evaluation performed in 2011, which covers the first five years (2006–2010), as well as the modifications made to the original plan based on the latest data and information. The significance 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 the measures against cancer mortality and slowing or stemming the increased cancer incidence rate caused by the aging population and the changes in the disease structure.

With a vision of minimizing the 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. To achieve this objective, projects in various areas have been undertaken, including intensified cancer prevention by focusing on risk factor management, cancer screening for every citizen, assurance of cancer treatment and treatment quality improvements, 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

Significant Reduction of Cancer Burden



Source) Ministry of Health & Welfare, 2011



Chapter 2.

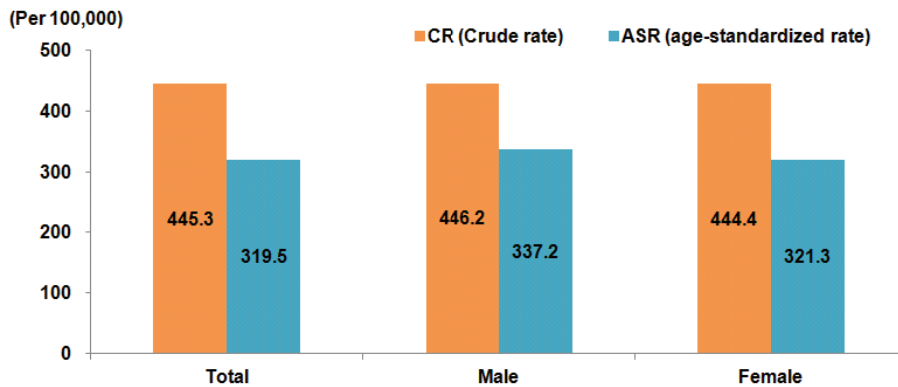
Basic Facts

2.1 Cancer Incidence

Cancer Incidence Rates

In Korea, the age-standardized cancer incidence rate in 2012 was 319.5 per 100,000 people (337.2 for males and 321.3 for females).

Cancer Incidence Rates (2012)



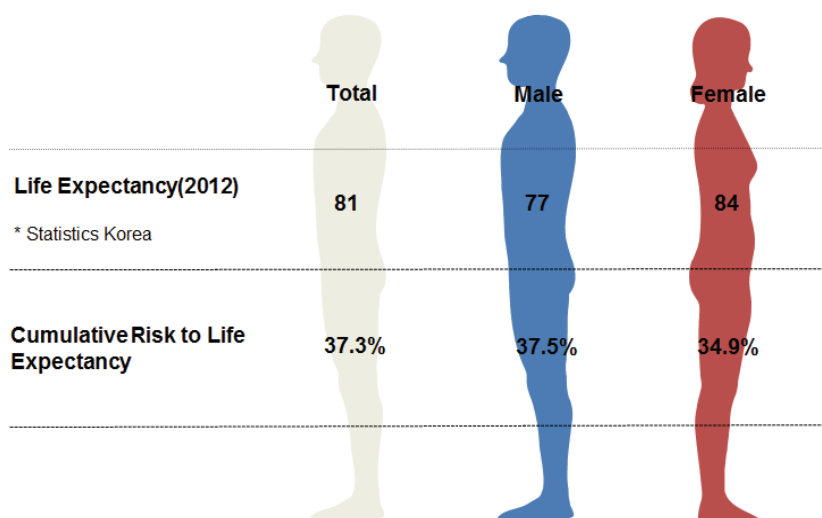
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

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 for the duration of the average life expectancy was 37.3%. The risk for males (37.5%) was higher than that for females (34.9%).

Cumulative Risk of Cancer (2012)



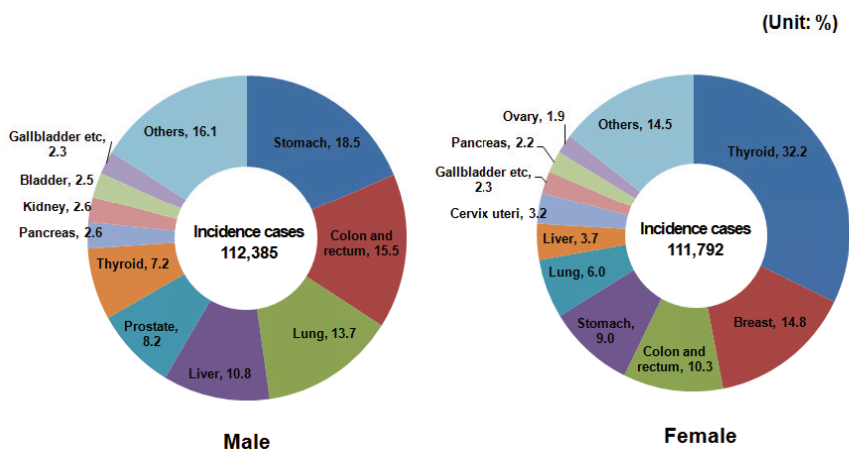
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

Proportion of Cancer Incidences

In males, stomach cancer occurred most frequently, accounting for 18.5% of all the cases, followed by colon and rectum cancer (15.5%), lung cancer (13.7%), and liver cancer (10.8%).

In females, thyroid cancer occurred most frequently, accounting for 32.2% of all the cases, followed by breast cancer (14.8%), colon and rectum cancer (10.3%), stomach cancer (9.0%), and lung cancer (6.0%).

Proportion of Cancer Incidences (2012)



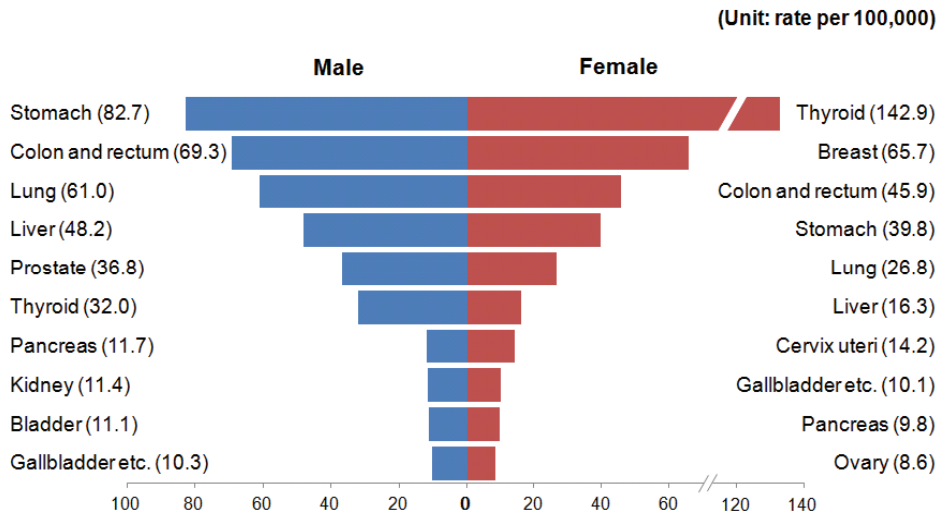
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

Site-Specific Cancer Incidence Rates by Gender

In males, the crude incidence rate¹⁾ of stomach cancer was 82.7 per 100,000 people. The incidence rates of colon and rectum, lung, and liver cancer were 69.3, 61.0, and 48.2 per 100,000 people, respectively.

In females, the crude incidence rate of thyroid cancer was 142.9 per 100,000 people. The incidence rates of breast, colon and rectum, and stomach cancer were 65.7, 45.9, and 39.8 per 100,000 people, respectively.

Crude Rates of the Top 10 Cancer Sites by Gender (2012)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

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

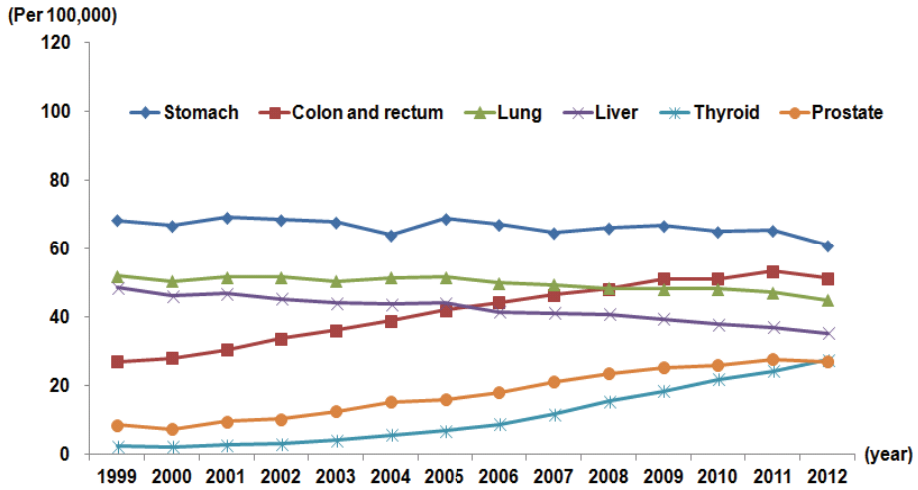
Trends in Age-standardized Incidence Rates of Major Cancers

From 1999 to 2012, the age-standardized incidence rate for all cancers increased by 1.6% and 5.6% each year in males and females, respectively.

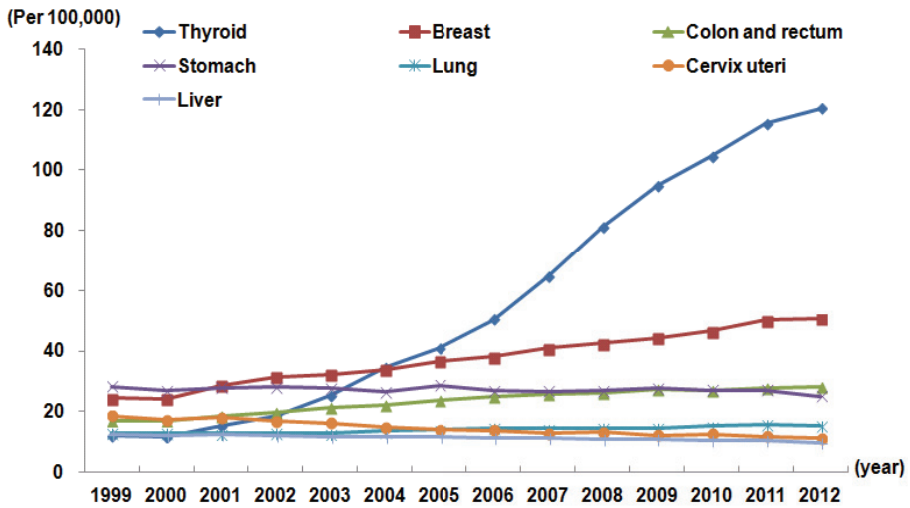
In males, the age-standardized incidence rates of liver and lung cancer decreased while those of thyroid, prostate, and colon and rectum cancer increased by 24.3%, 11.4%, and 5.6% each year, respectively.

In females, the age-standardized incidence rates of cervix uteri and liver cancer decreased, but the rate of thyroid cancer sharply increased by 22.4% each year, and the rates of breast, colon and rectum, and lung cancer 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, 2014

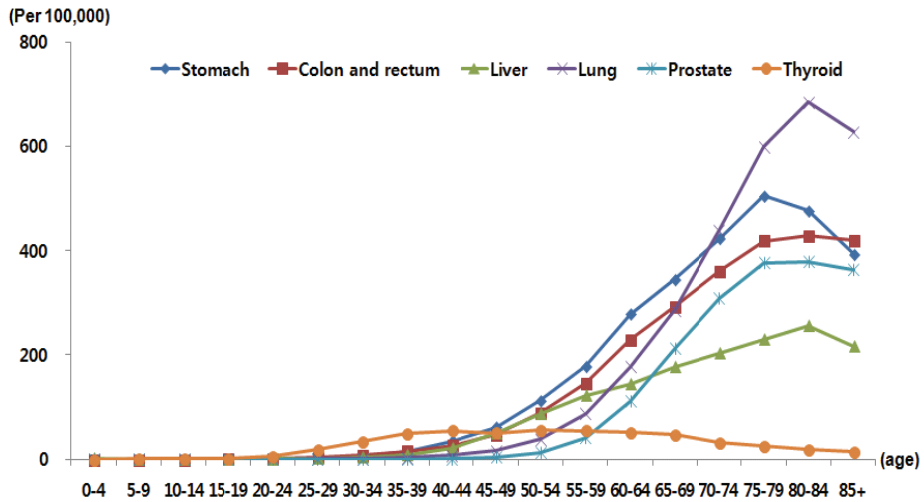
Note) The age-standardized rate (ASR) was calculated based on Korea's mid-year population of 2000

Age-specific Incidence Rates of Major Cancers by Gender

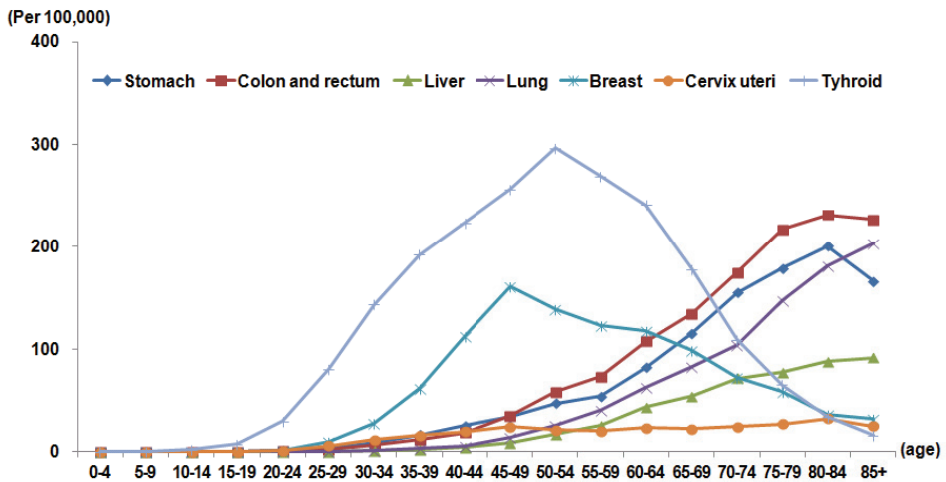
According to the incidence rates of major cancers in various male age groups examined in 2012, the most frequent types of cancer was thyroid cancer for those under 44, and stomach cancer in the 50–59 age group and lung cancer in the 70 and older age group.

For females, thyroid cancer had the highest incidence rate for those under 69, and colon and rectum cancer had the highest incidence rates for those 70 and older age group.

Age-specific Cancer Incidence Rates: Male (2012)



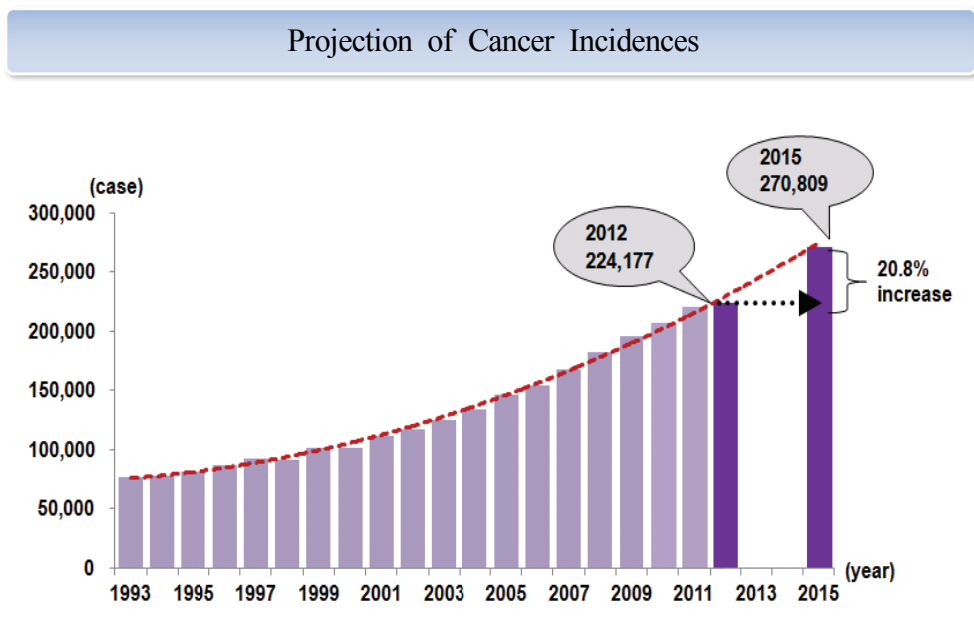
Age-specific Cancer Incidence Rates: Female (2012)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

Projection of Cancer Incidences

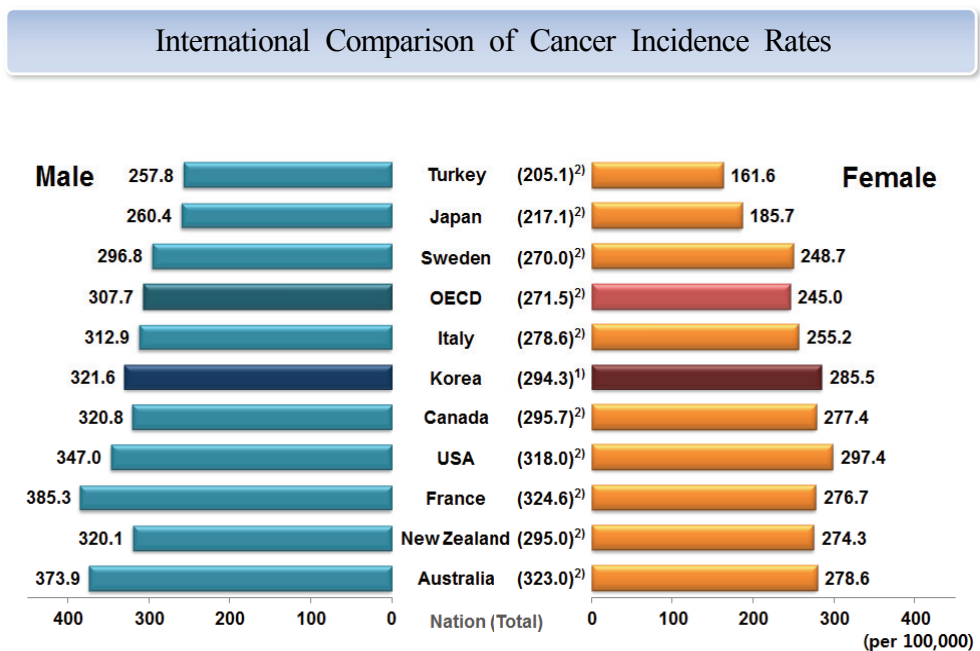
The total number of cancer cases is expected to increase from 224,177 in 2012 to 270,809 in 2015, a 20.8% increase over a three-year period.



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 the average for OECD countries for both males and females.



Source 1) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

2) GLOBOCAN 2012, IARC 2013

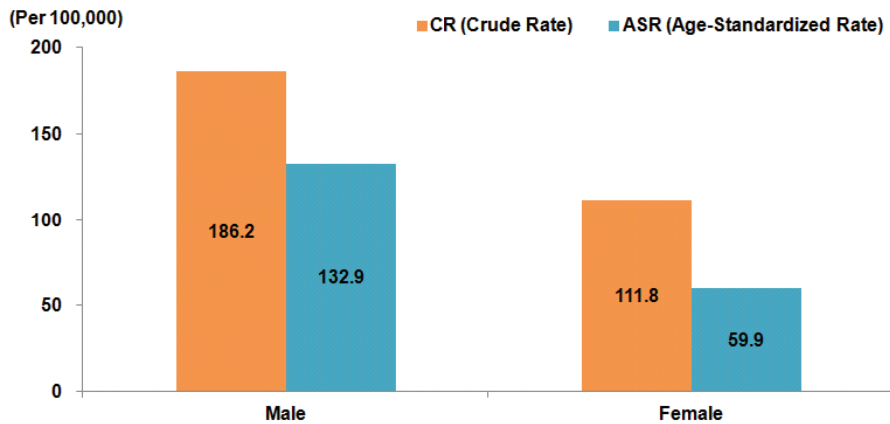
Note) Age-standardized incidence rates use the world standard population, and exclude other malignant neoplasms of the skin (C44)

2.2 Cancer Mortality

Cancer Mortality Rates

The age-standardized cancer mortality rates in Korea in 2013 were 132.9 per 100,000 for males and 59.9 per 100,000 for females.

Cancer Mortality Rates (2013)



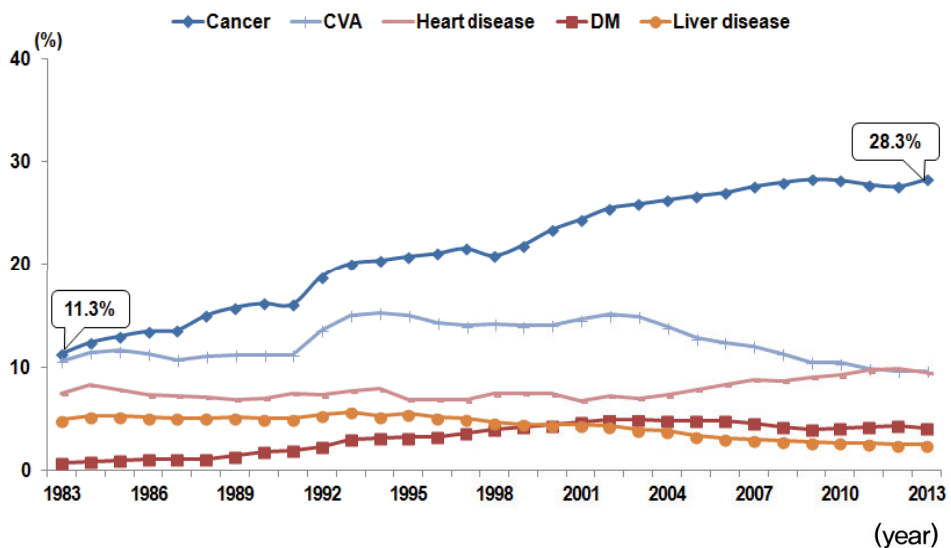
Source) Statistics Korea, 2014

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. The proportion of death from cancer has increased steadily, accounting for 28.3% of the total deaths in 2013.

Causes of Disease Deaths (1983-2013)

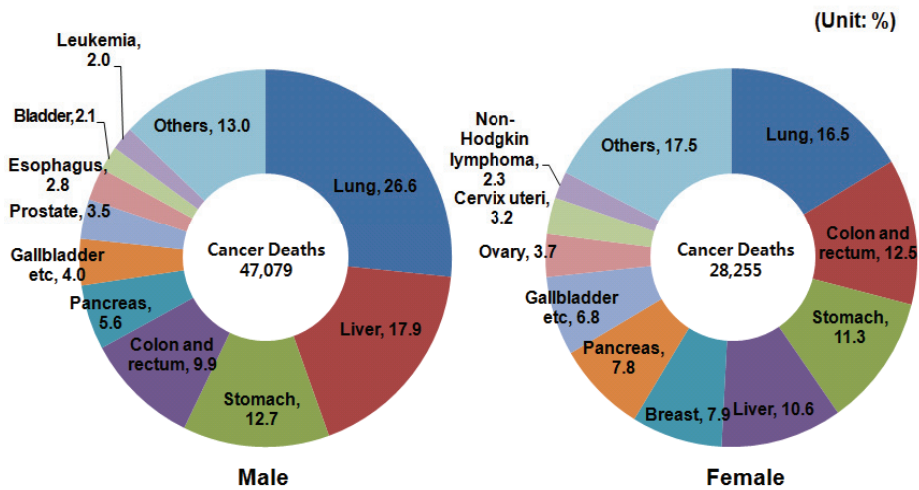


Source) Statistics Korea, 2014

Proportion of Cancer Deaths

In 2013, lung, liver, stomach, and colorectal cancer accounted for 26.6%, 17.9%, 12.7%, and 9.9% of the cancer-related deaths in males, respectively. For females, lung, colorectal, stomach, and liver cancer accounted for 16.5%, 12.5%, 11.3%, and 10.6% of the cancer-related deaths, respectively.

Proportion of Cancer Deaths (2013)



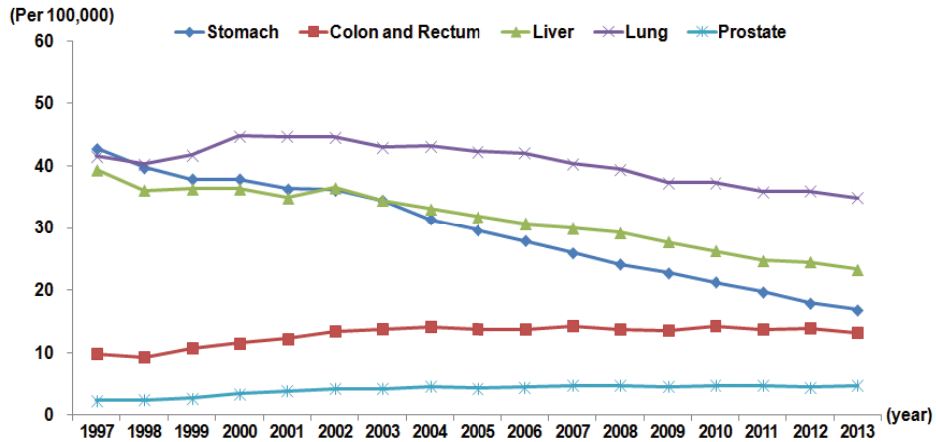
Source) Statistics Korea, 2014

Age-standardized Mortality Rates of Major Cancers by Gender

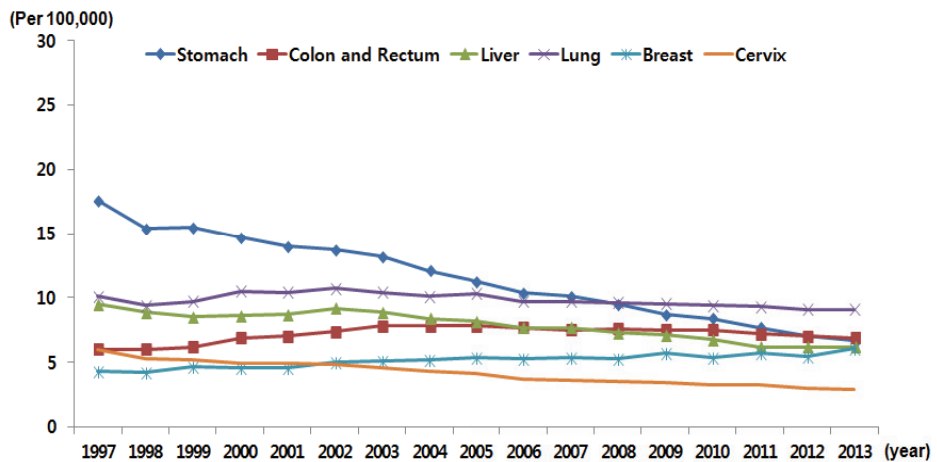
The age-standardized mortality rates of stomach and liver cancer have decreased in males, but the rate of colon and rectum cancer has increased until 2004. On the other hand, the rate of lung cancer in males has been decreasing since 2000.

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 breast cancer have gradually increased.

Age-standardized Mortality Rates of Major Cancers: Male



Age-standardized Mortality Rates of Major Cancers: Female



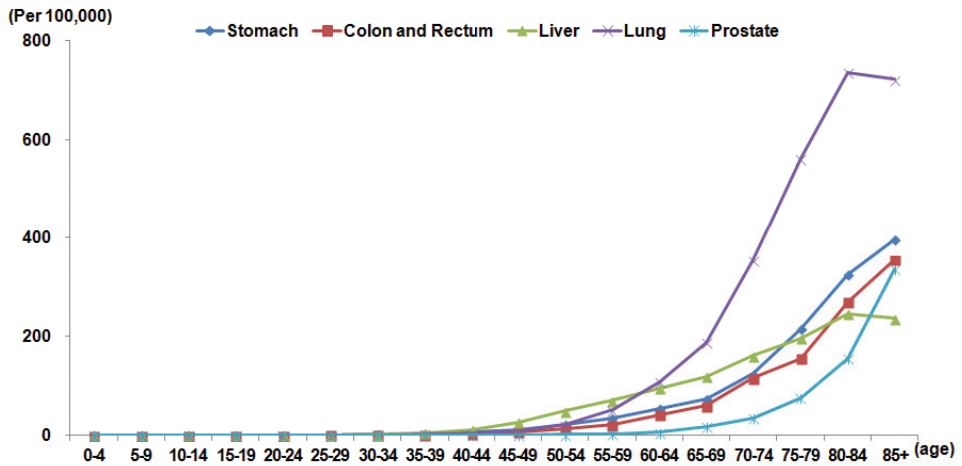
Source) Statistics Korea, 2014

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)

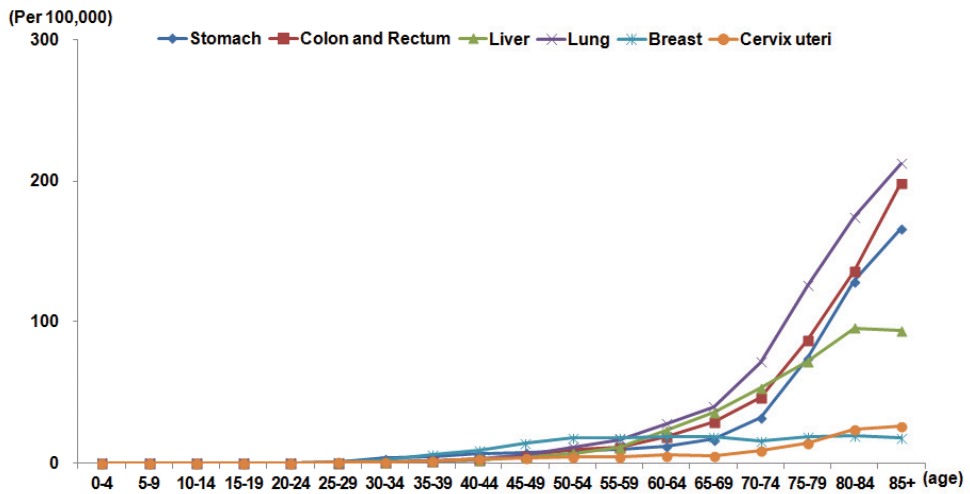
Age-specific Mortality Rates of Major Cancers by Gender

The age-specific mortality rates of major cancers in 2013 indicate that the rates are higher for older patients except for breast cancer.

Age-specific Cancer Mortality Rates: Male (2013)



Age-specific Cancer Mortality Rates: Female (2013)



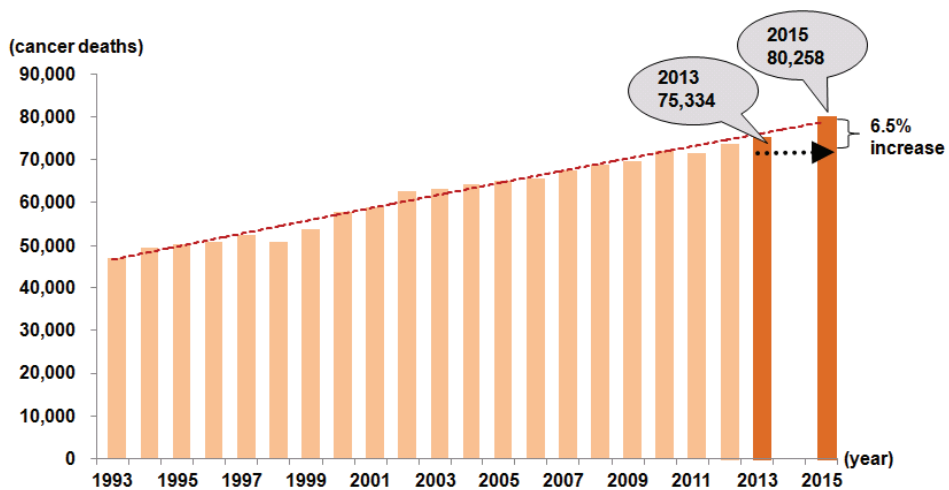
Source) Statistics Korea, 2014

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 6.5% in the next two years, from 75,334 in 2013 to 80,258 in 2015.

Projection of Cancer Deaths (1993-2015)



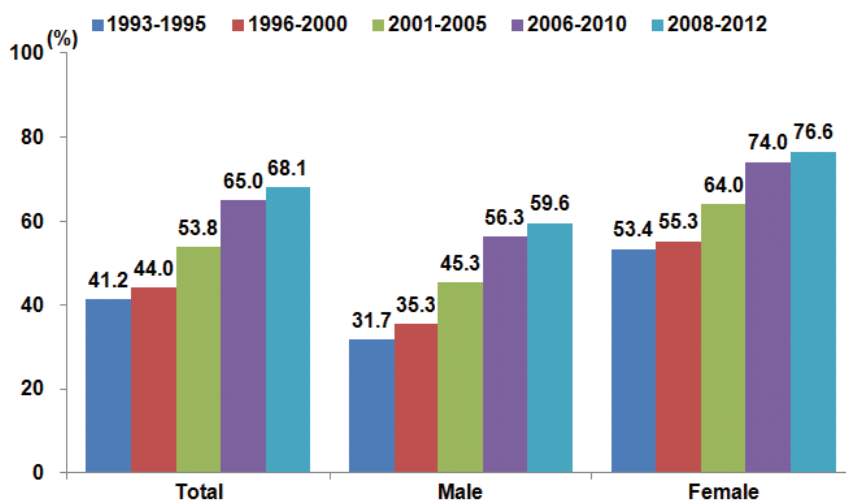
Source) National Cancer Center, 2010

2.3 Cancer Survival

Five-Year Relative Cancer Survival Rates

The five-year relative cancer survival rate²⁾ from 2008 to 2012 was 68.1%, indicating that 26.9% points were larger than 41.2% between 1993 and 1995 and 14.3% points larger than 53.8% between 2001 and 2005. The survival rate has shown a steady improvement, and more than half of the current patients with cancer in Korea survive for five years or longer.

Five-Year Relative Cancer Survival Rates (1993-2012)



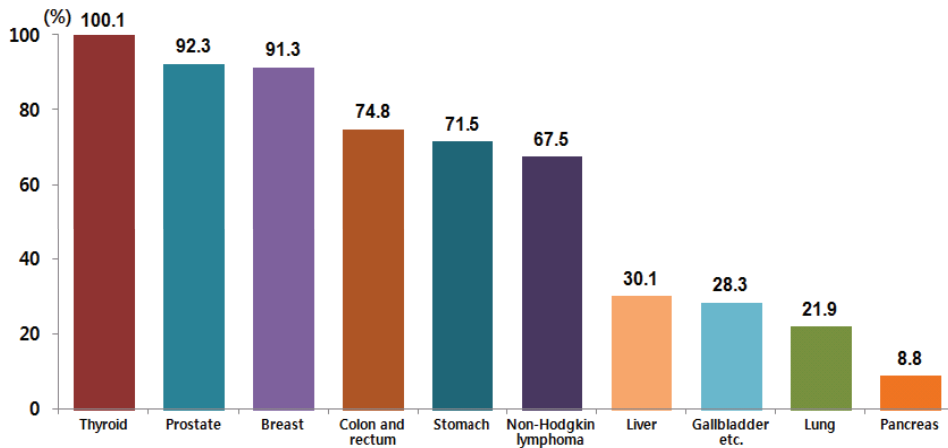
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

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.

Five-Year Relative Survival Rates by Major Cancer Sites

The five-year relative survival rates for thyroid, prostate, breast, colon and rectum, and stomach cancer were 100.1%, 92.3%, 91.3%, 74.8%, and 71.5%, respectively.

Five-Year Relative Survival Rates by Major Cancer Site (2008-2012)

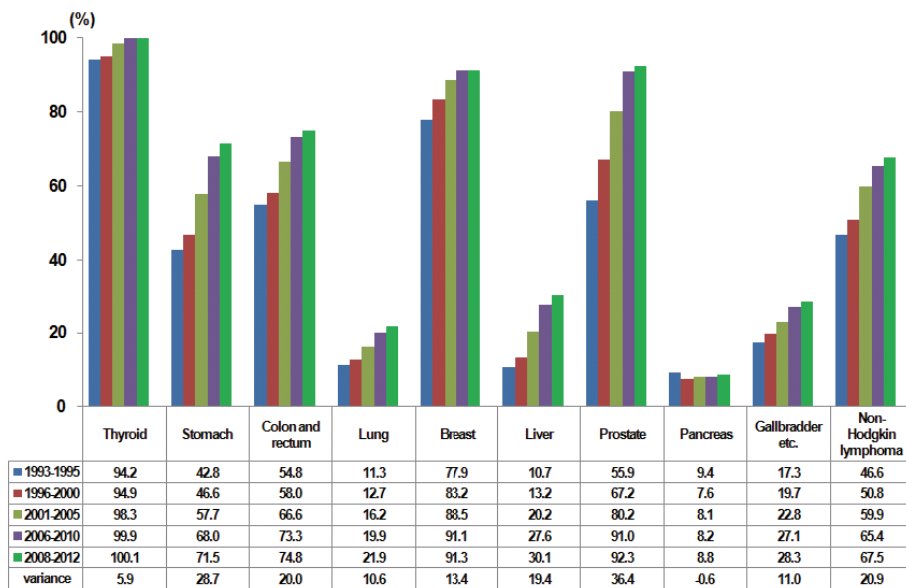


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

Trends in Five-Year Relative Survival Rates

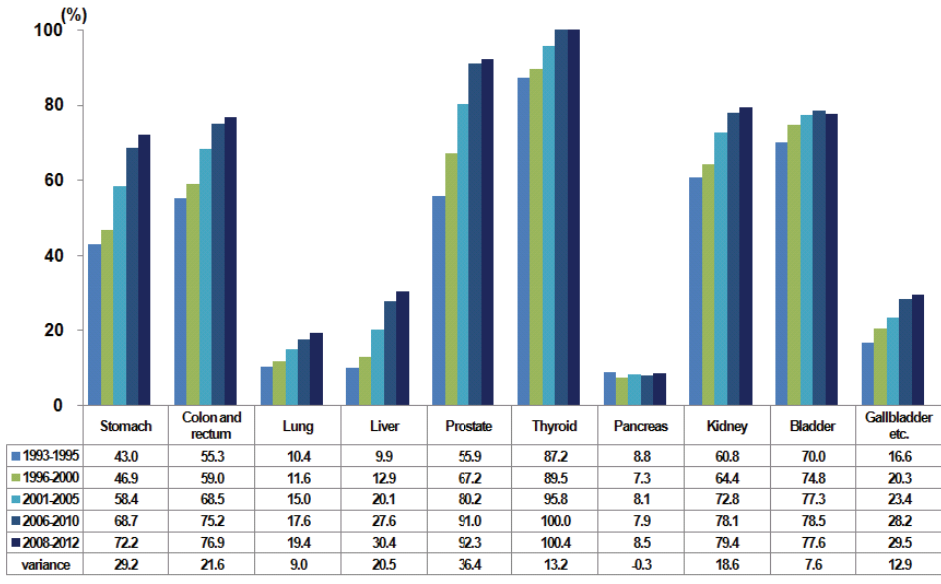
Among the major cancers, prostate cancer showed the most significant improvement from 2008 to 2012 (up by 36.4% points from 1993 to 1995), followed by stomach cancer (28.7% points), non-Hodgkin lymphoma (20.9% points), and colon and rectum cancer (20.0% points). The survival rates of all major cancers, with the exception of pancreatic cancer, improved.

Trends in Five-Year Relative Survival Rates (1993-2012)

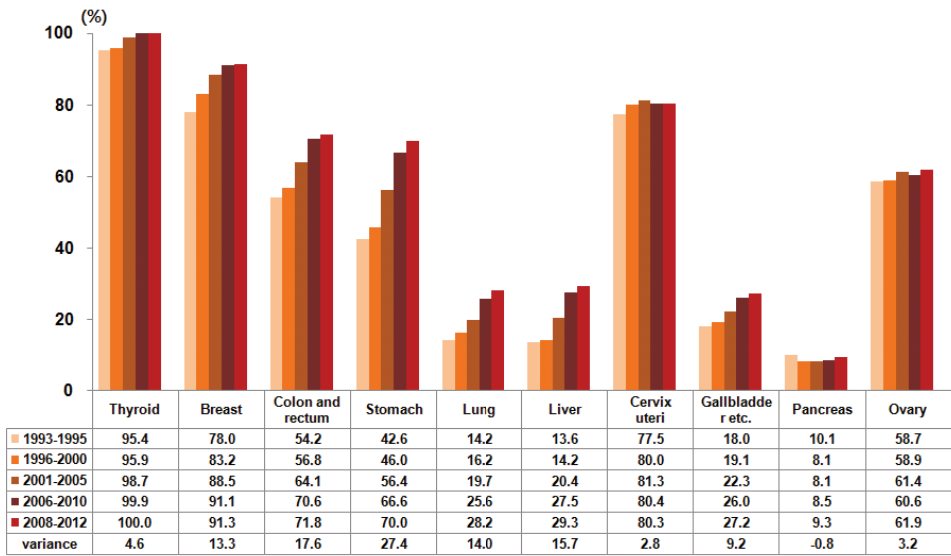


(Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014
variance: variance in the cancer survival rates between 1993–1995 and 2008–2012

Comparison of Five-Year Relative Survival Rates: Male (1993-2012)



Comparison of Five-Year Relative Survival Rates: Female (1993-2012)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014
 variance: variance in the cancer survival rates between 1993-1995 and 2008-2012

2.4 Cancer Prevalence

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 cancer, were higher in Korea than those in the United States and Canada.

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

(Unit : %)

| Site | Korea ('96-'00) | Korea ('01-'05) | Korea ('08-'12) | USA ¹⁾ ('04-'10') | Canada ²⁾ ('06-'08) | Japan ³⁾ ('03-'05) |
|------------------|-----------------|-----------------|-----------------|------------------------------|--------------------------------|-------------------------------|
| All cancers | 44.0 | 53.8 | 68.1 | 66.1 | 63 | 58.6 |
| Thyroid | 94.9 | 98.3 | 100.1 | 97.8 | 98 | 92.2 |
| Stomach | 46.6 | 57.7 | 71.5 | 28.3 | 25 | 63.3 |
| Colon and rectum | 58.0 | 66.6 | 74.8 | 64.7 | 64 | 69.2 |
| Lung | 12.7 | 16.2 | 21.9 | 16.8 | 17 | 29.7 |
| Liver | 13.2 | 20.2 | 30.1 | 16.6 | 20 | 27.9 |
| Breast | 83.2 | 88.5 | 91.3 | 89.2 | 88 | 89.1 |
| Prostate | 67.2 | 80.2 | 92.3 | 98.9 | 96 | 93.8 |
| Pancreas | 7.6 | 8.1 | 8.8 | 6.7 | 8 | 7.0 |
| Cervix uteri | 80.0 | 81.3 | 80.3 | 67.9 | 74 | 72.2 |

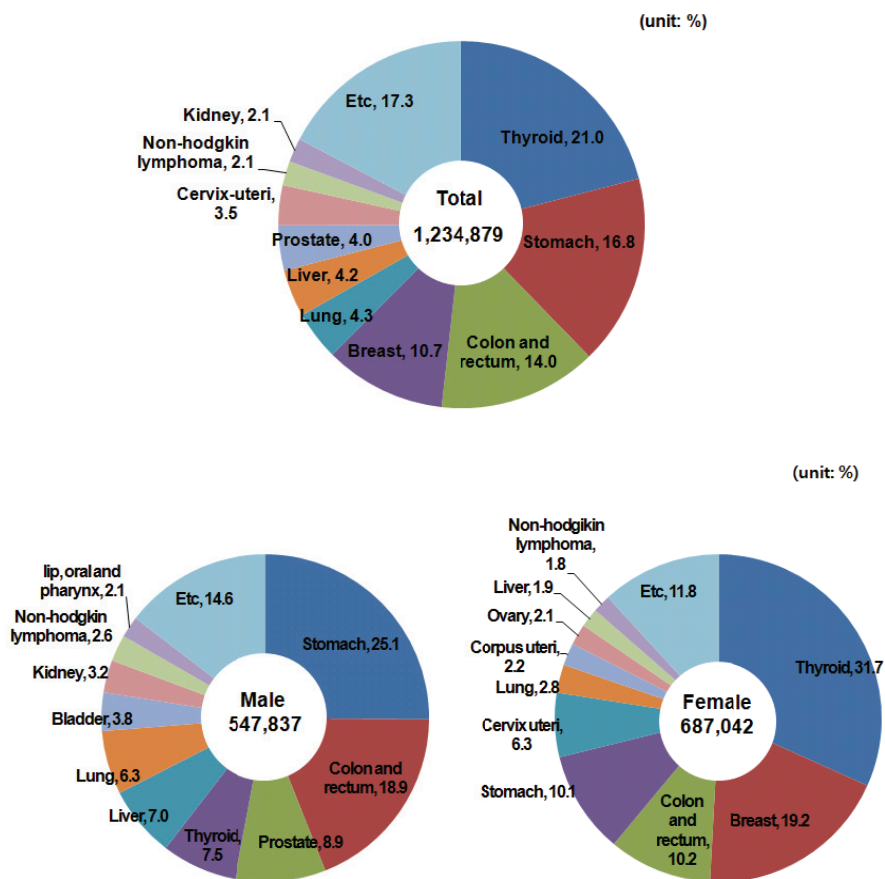
Source)

- 1) Howlader N, Noone AM, Krapcho M, Garshell J, Miller D, Altekruse SF, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975–2011, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2011/, based on November 2013 SEER data submission, posted to the SEER web site, April 2014.
- 2) Canadian Cancer Society, Statistics Canada and Provincial/Territorial Cancer Registry. Canadian Cancer Statistics 2014
- 3) Center for Cancer Control and Information Services, National Cancer Center, Monitoring of Cancer Incidence in Japan – Survival 2003–2005 report 2013

Cancer Prevalence

Between 1999 and 2012, 1,234,879 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 (2012)

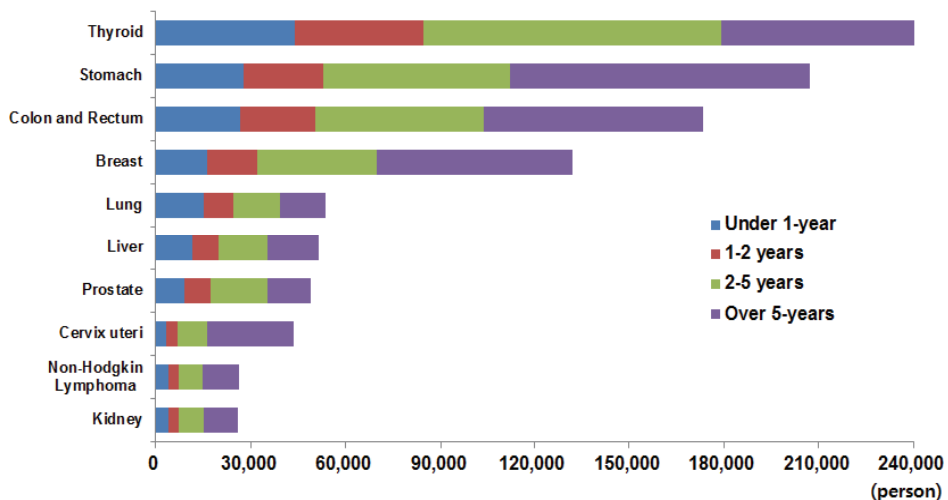


Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

Cancer Prevalence by Time since Diagnosis

Among the patients diagnosed with cancer between 1999 and 2012, stomach cancer showed the highest prevalence in the patients who had cancer for five years or longer, followed by thyroid, colon and rectum, and breast cancer. The long-term prevalences of lung and liver cancer were relatively low due to their low survival rates.

Cancer Prevalence by Time since Diagnosis (2012)



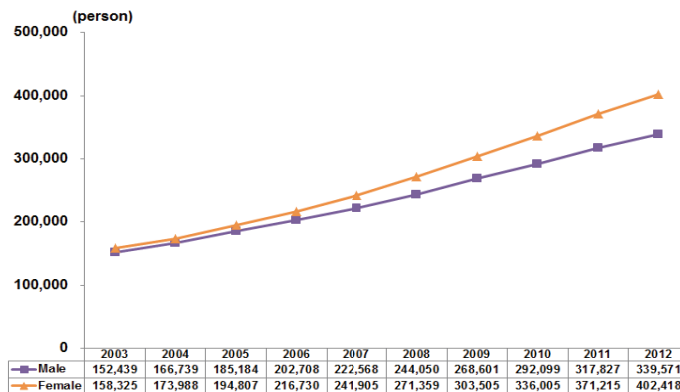
Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014

Five-Year Cancer Survivors

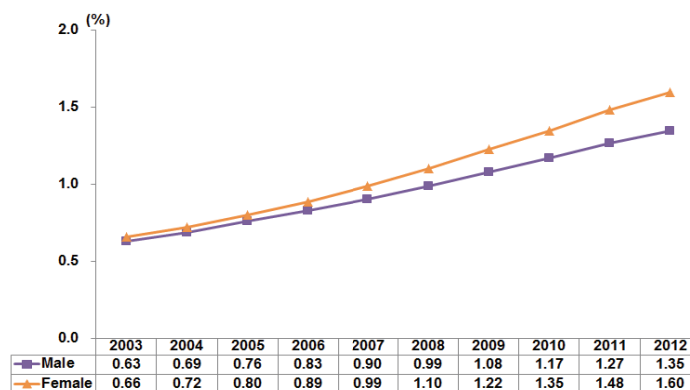
The number of five-year cancer survivors increased from 310,764 in 2003 to 741,989 in 2012 (339,571 males and 402,418 females).

The percentage of five-year cancer survivors among the general population was 1.47% (1.35% of males and 1.60% of females) in 2012.

Estimated Number of Five-Year Cancer Survivors (2003-2012)



Percentage of Five-Year Cancer Survivors (2003-2012)



Source) Ministry of Health & Welfare, Korea Central Cancer Registry, 2014



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

Causes of Cancer

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

Source) * World Cancer Report, IARC, 2008

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










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

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

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

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.

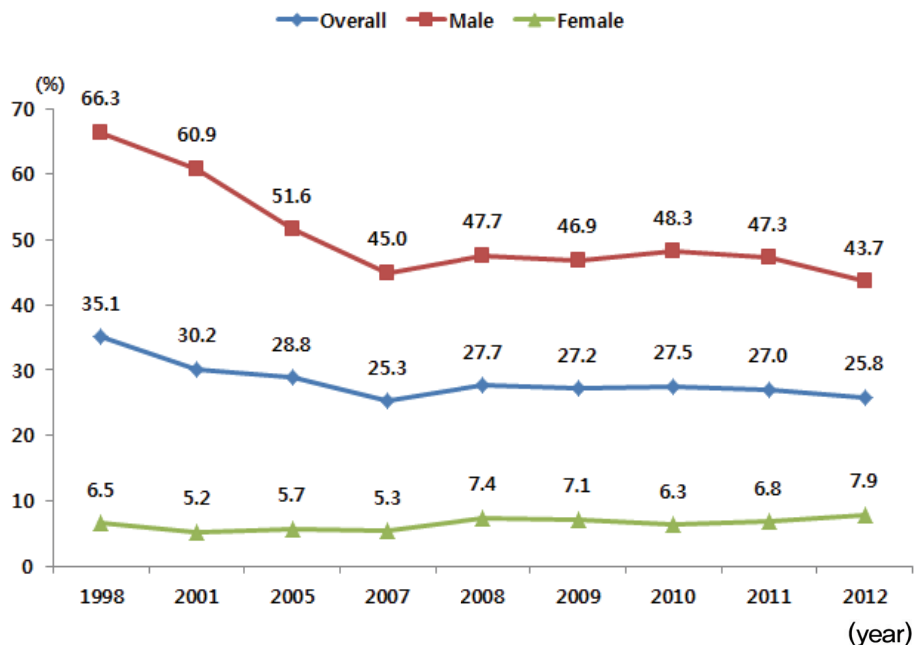
-  Don't smoke and avoid smoke-filled environments
-  Consume sufficient amounts of fruits and vegetables and balance your diet with a wide range of healthy foods
-  Limit your salt intake from all sources, and avoid burnt or charred foods
-  Limit your consumption of alcoholic beverages to one or two drinks per day
-  Engage in at least 30 minutes of regular, moderate-intensity physical activity on most days of the week
-  Maintain your body weight within a healthy range
-  Ensure vaccination against hepatitis B virus following the HBV vaccination schedule
-  Engage in safe sexual behavior to avoid sexually transmitted diseases
-  Follow all health and safety instructions at work places aimed at preventing exposure to known cancer-causing agents
-  Undergo routine check-ups following the cancer screening programs

3.2 Smoking

Prevalence and Trends of Cigarette Smoking among Adults

From 1998 to 2013, the smoking prevalence in Korea decreased from 66.3 to 42.1% in the male adults, however, the rate of decline has slowed down of late. The female smoking prevalence has maintained a low level (below 10%) since 1998.

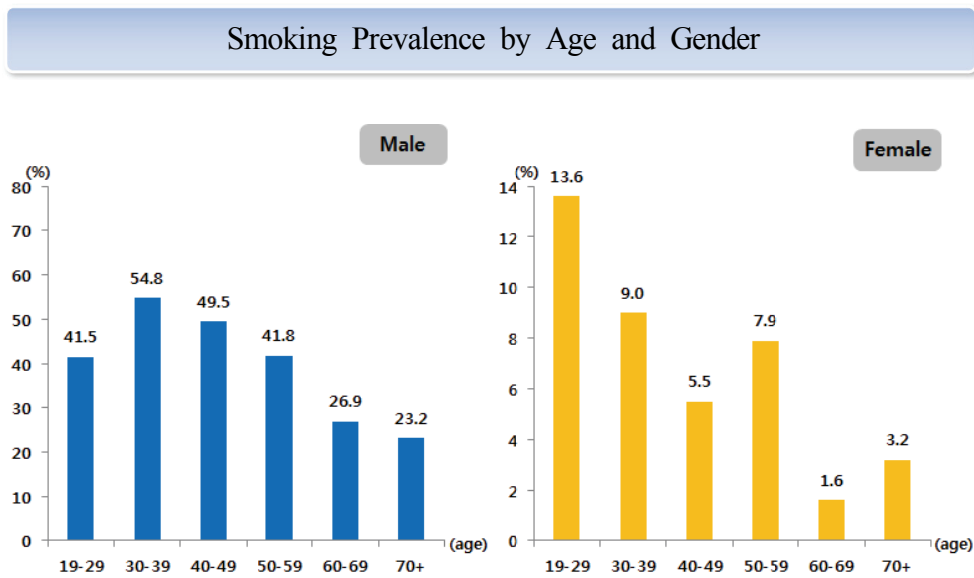
Prevalence and Trends of Cigarette Smoking



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

Smoking Prevalence among Adults by Age and Gender

Smoking prevalence³⁾ by age and gender indicates that the male and female smoking prevalence were high in young adults, with the highest percentages in the 30–39 and 40–49 age groups.



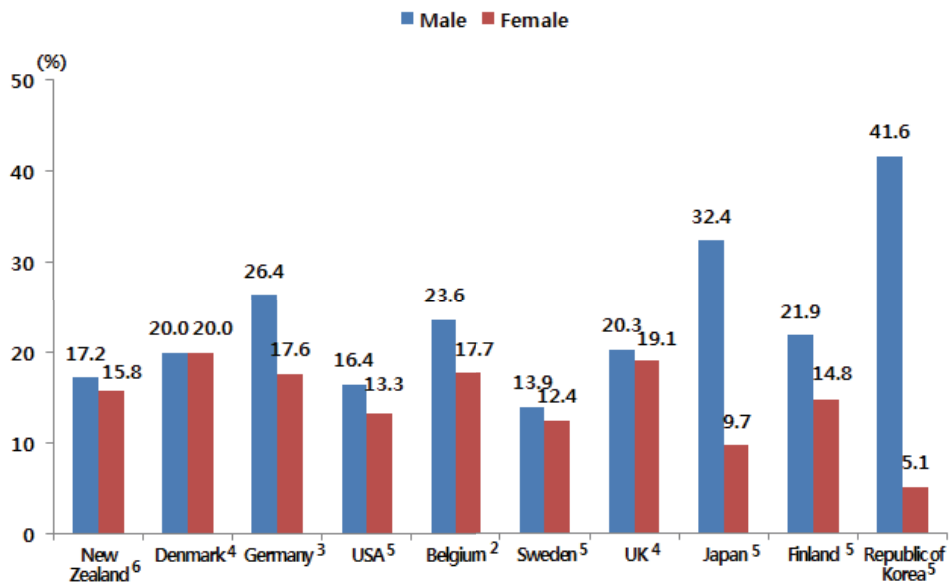
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

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

Prevalence of Daily Smoking among Adults in the OECD Countries

Among males, the prevalence of daily smoking in Korea was considerably higher than in other OECD countries (males, 41.6%; females, 5.1%).

Prevalence of Daily Smoking in the OECD Countries



Source) OECD Health Data, OECD 2013

Note) Age: 15 and older

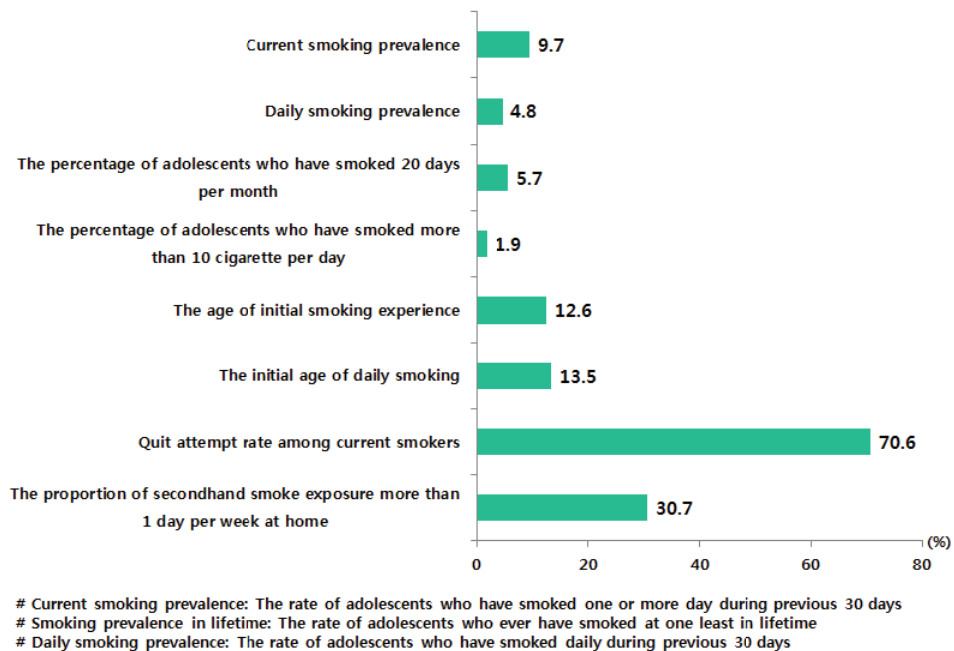
Note) 1): 2007 2): 2008 3): 2009 4): 2010 5): 2011 6): 2012

Adolescent Smoking

In 2014, 9.2% of the Korean adolescents said that they had smoked for one or more days in the previous 30 days, and 4.8% of the adolescents smoke every day. The average age at which they started smoking was 12.6.

Among the current adolescent smokers in Korea, 71.3% said that they had tried to quit, and 33.8% of the adolescents were exposed to secondhand smoke at home for more than a day each week.

Adolescent Smoking in Korea



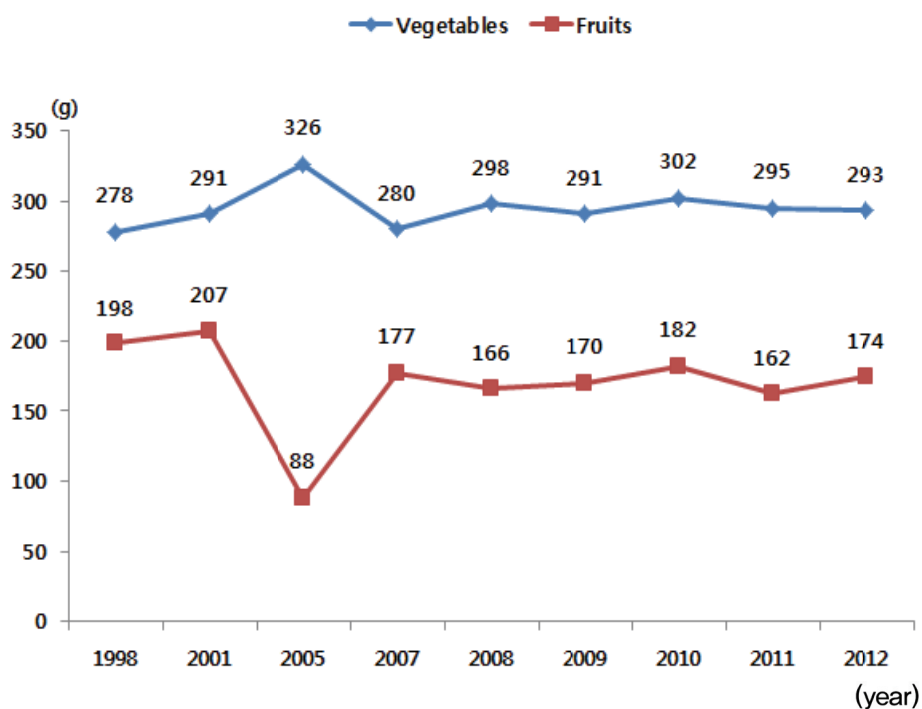
Source) Korea Youth Risk Behavior Web-based Survey, 2014

3.3 Consumption of Fruits and Vegetables

Consumption of Fruits and Vegetables among Adults

The average daily consumption of fruits and vegetables among adults in 2013 was 168.3 and 288 g, respectively.

Average Consumption of Fruits and Vegetables among Adults (1998-2012)

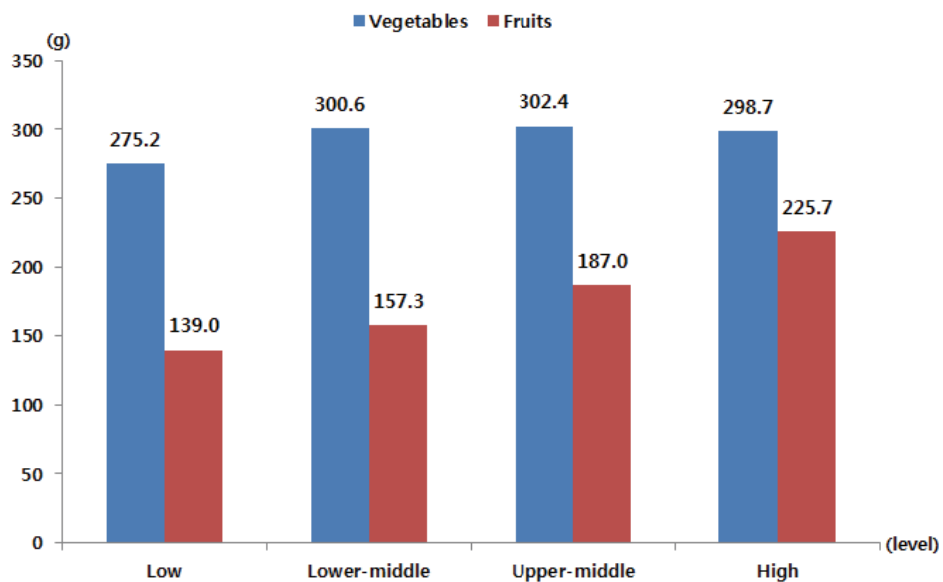


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

Consumption of Fruits and Vegetables by Income Level

In Korea, the higher income groups consumed more fruits and vegetables.

Average Consumption of Fruits and Vegetables by Income Level

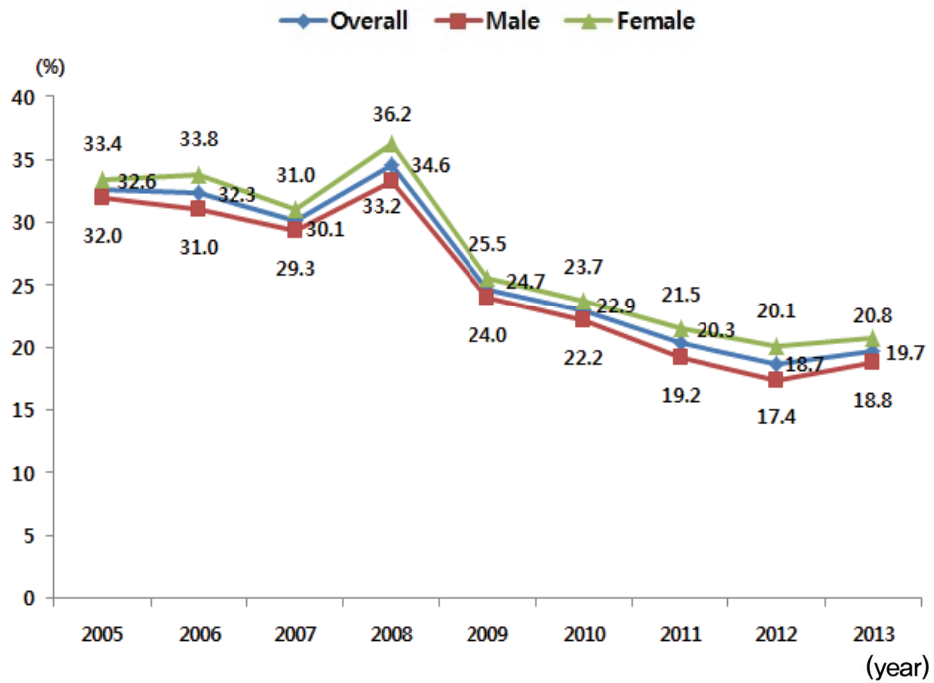


Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

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

In 2014, 22.0% of the adolescents consumed at least one serving of fruit per day (males, 20.8%; females, 23.4%).

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



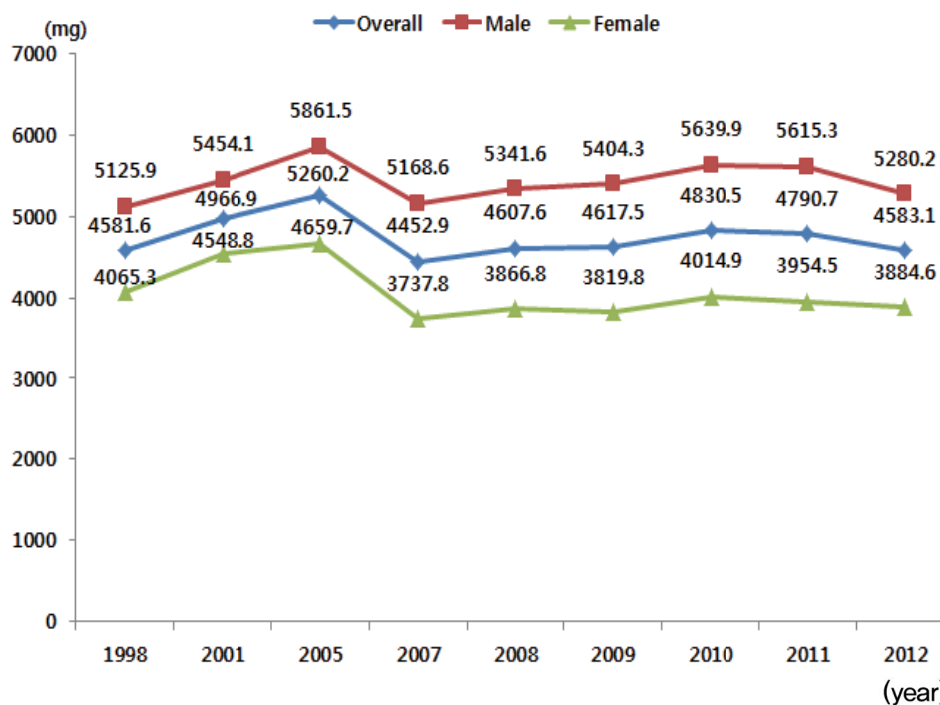
Source) Korea Youth Risk Behavior Web-based Survey, 2014

3.4 Sodium Intake

Sodium Intake among Adults

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

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



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

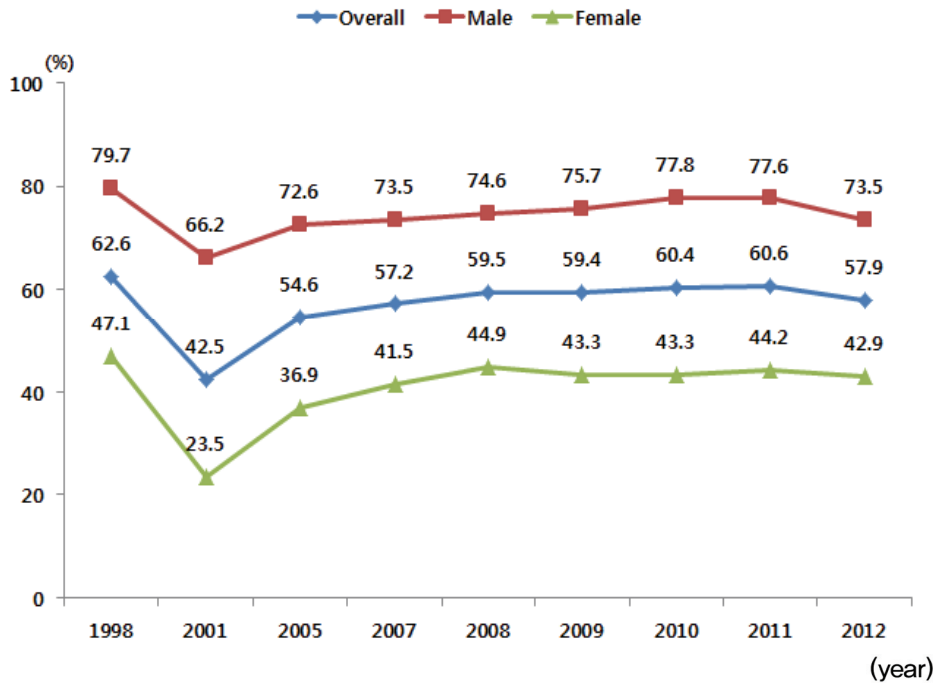
Note) Daily sodium intake targets: 2,000mg (suggested by Korean Nutrition Society, 2005)

3.5 Alcohol Consumption

Prevalence of Alcohol Consumption among Adults⁴⁾

The 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)



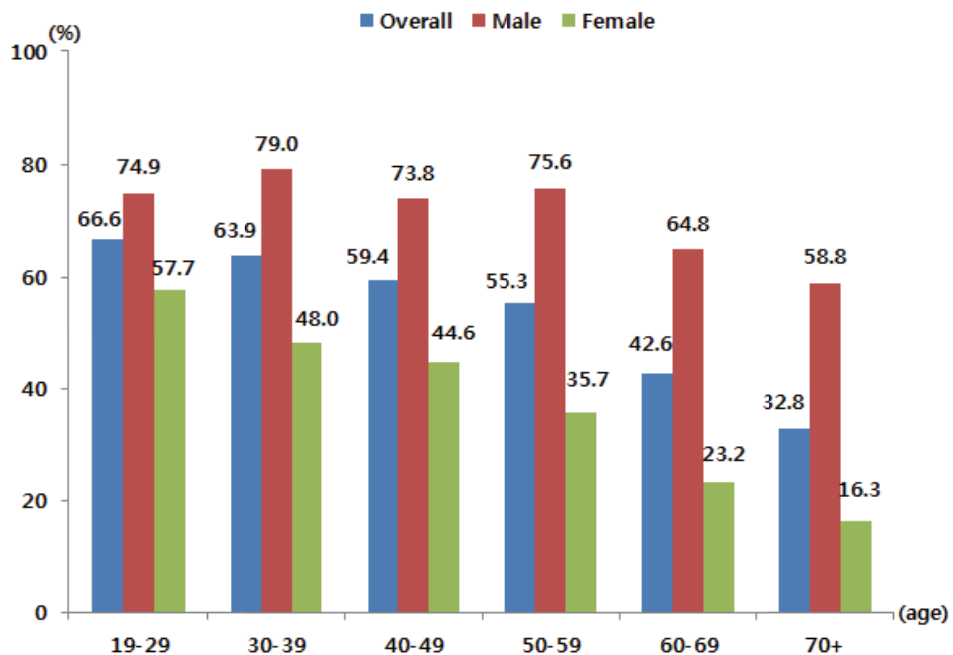
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

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

Prevalence of Alcohol Consumption among Adults⁵⁾ by Age

The prevalence of alcohol consumption decreased with age.

Prevalence of Alcohol Consumption among Adults by Age (2012)



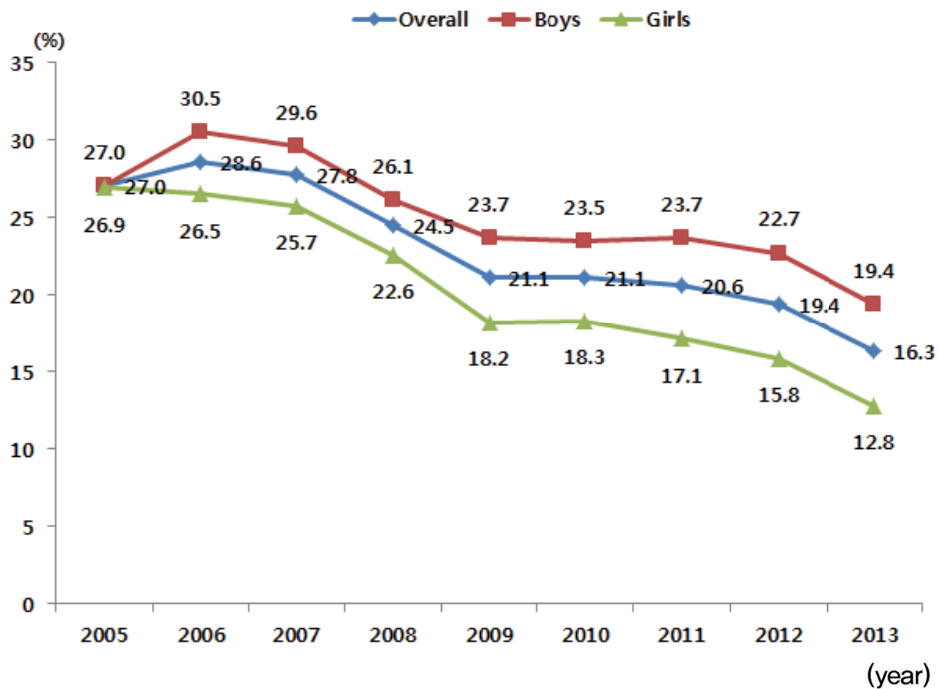
Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

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

Alcohol Consumption among Adolescents

The percentage of Korean adolescents who consumed alcohol in 2014 was 16.7% (boys, 20.5%; girls, 12.6%).

Alcohol Consumption among Adolescents (2005-2013)



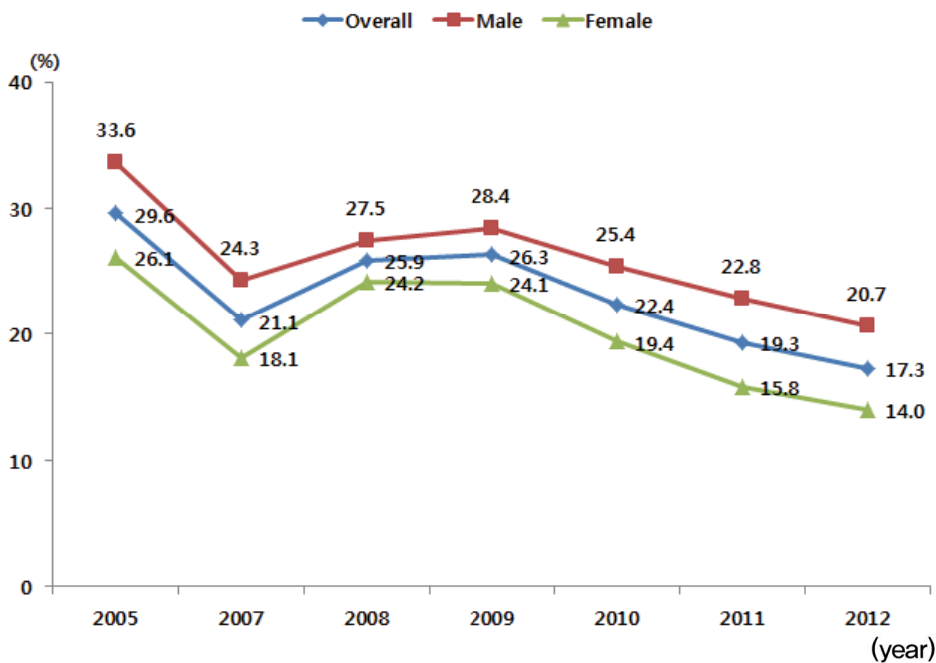
Source) Korea Youth Risk Behavior Web-based Survey, 2014

3.6 Physical Activity

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

In Korea, the percentage of adults engaging in moderate- or higher-intensity-level physical activity in 2013 was 20.5%.

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



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

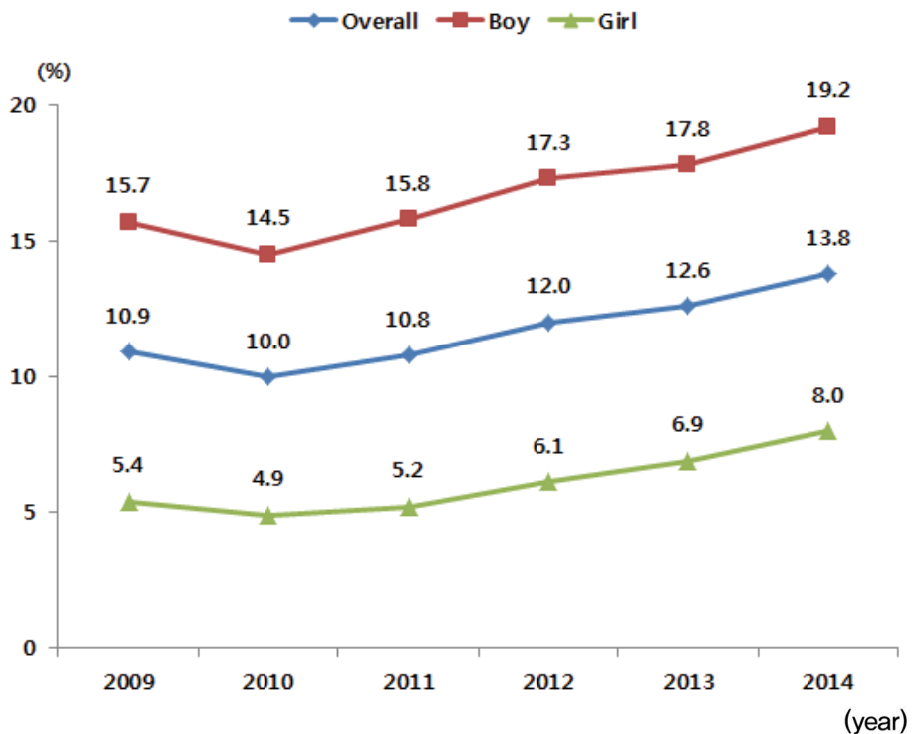
Note)

- 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 2014, the percentage of adolescents engaging in physical activity for at least 60 minutes a day, 5 days a week was 13.8% (boy, 19.2%; girl, 8.0%).

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



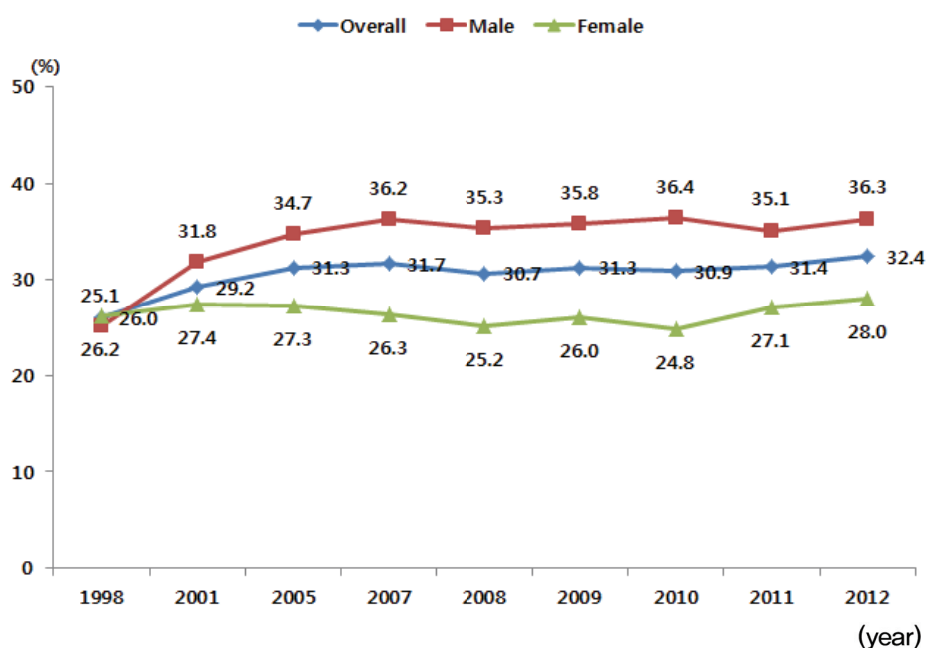
Source) Korea Youth Risk Behavior Web-based Survey, 2014

3.7 Obesity

Obesity Trend among Adults

Obesity among adults (19 years and older, standardized) increased from 26.0% in 1998 to 31.7% in 2007, but the rate remained at around 30% for the past five years. The male obesity rate showed a gradual increase in the past ten years, and the female obesity rate 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, 2013

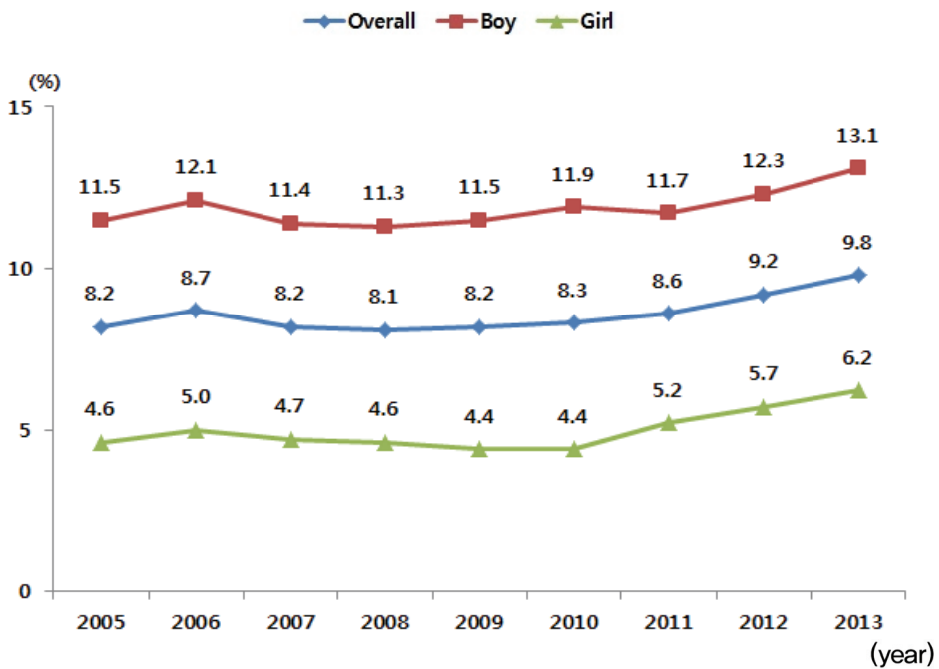
Note)

- 1) The age-standardized rates were calculated based on 2005 Korean population.
- 2) Obesity: body mass index(BMI) ≥ 25

Obesity Trend among Adolescents⁶⁾

The obesity rate among adolescents was 10.1% in 2014 (boy, 13.7%; girl, 6.1%).

Obesity Trend among Adolescents (2005-2013)



Source) Korea Youth Risk Behavior Web-based Survey, 2014

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

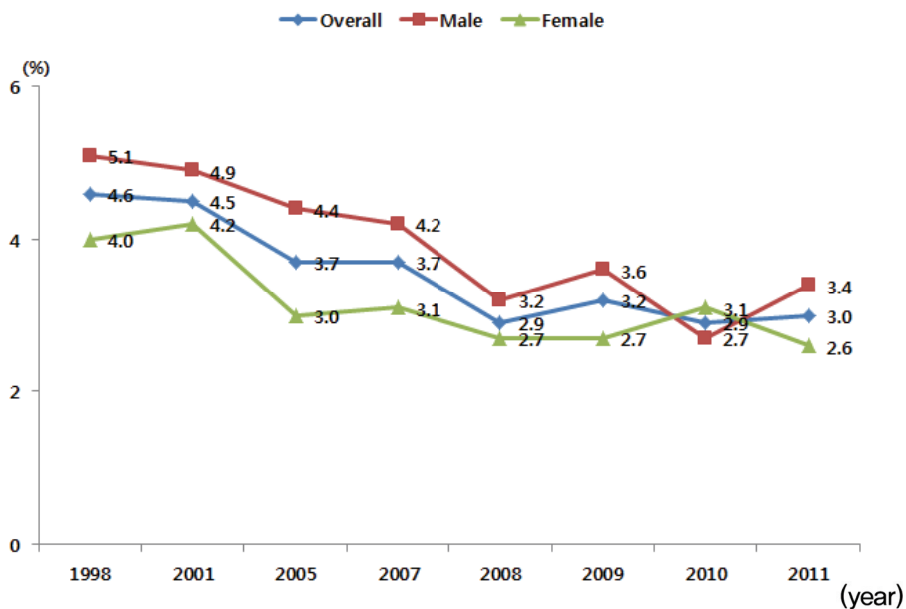
6) Adolescent obesity rate: percentage of adolescents (16–18 years old) whose body mass index (BMI) is more than 95% in the BMI distribution or more than 25 BMI

3.8 Hepatitis B Virus Infection

HBsAg Seropositivity

Hepatitis B virus infection is one of the major risk factors of liver cancer. HBsAg seropositivity⁷⁾, which indicates hepatitis B virus infection (in individuals 10 years and older, standardized), was high at 7–8% of the population in the 1970s and 1980s. Ever since the inclusion of the hepatitis B vaccine in the national immunization program in 1995, the HBsAg seropositivity has steadily decreased from 4.6% in 1998 to 2.9% in 2013.

HBsAg Seropositivity (1998-2011)



Source) Korea Health Statistics. Korea National Health and Nutrition Examination Survey, 2013

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

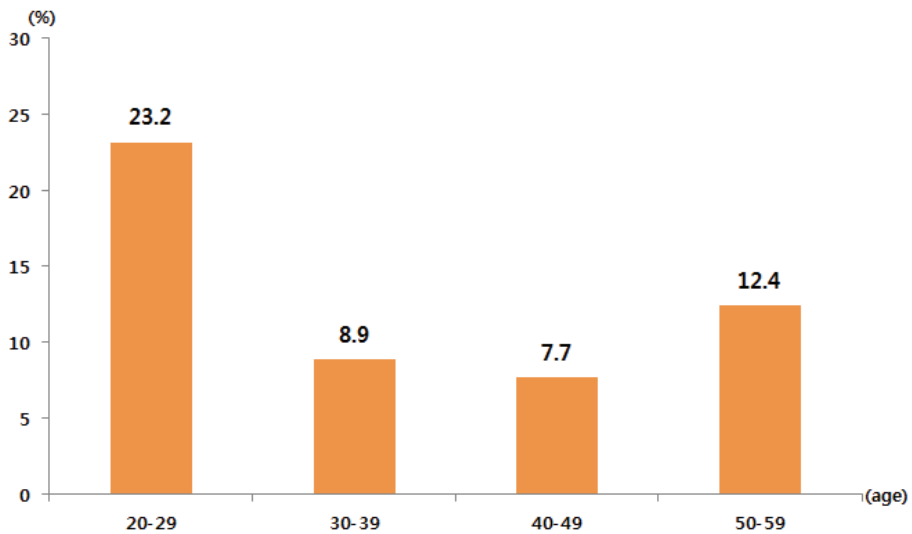
7) HBsAg seropositivity: percentage of individuals (10 years and older) who have tested positive for HBsAg

3.9 Human Papillomavirus Infection

Prevalence of Human Papillomavirus Infection

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

Prevalence of Human Papillomavirus (HPV)



Source) Kim MA et al. Obstet Gynecol 2010



Chapter 4.

Cancer Screening Program

4.1 Cancer Screening Rates

Cancer Screening Rates

The average lifetime screening rate⁸⁾ of the five major cancers identified in the National Cancer Screening Program in 2014 was 79.3%, and the average cancer screening rate based on the recommendation⁹⁾ was 67.3%. The cancer screening rate¹⁰⁾ of all cancers increased 1.73-fold from 2004 to 2014.

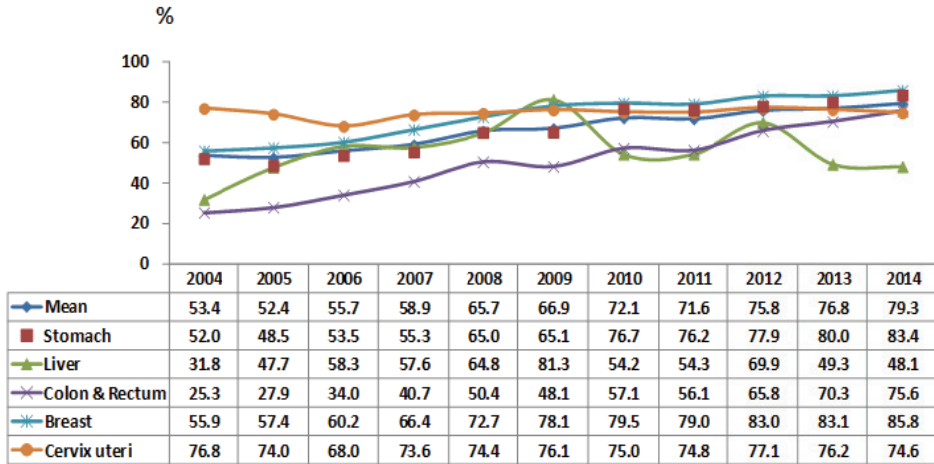
In 2014, stomach cancer had the highest screening rate based on the recommendation (76.7%), followed by cervix uteri cancer (66.1%), breast cancer (66.0%), colon and rectum cancer (60.1%), and the high-risk group of liver cancer (25.2%).

8) Lifetime screening rate: percentage of individuals who have undergone at least one cancer screening

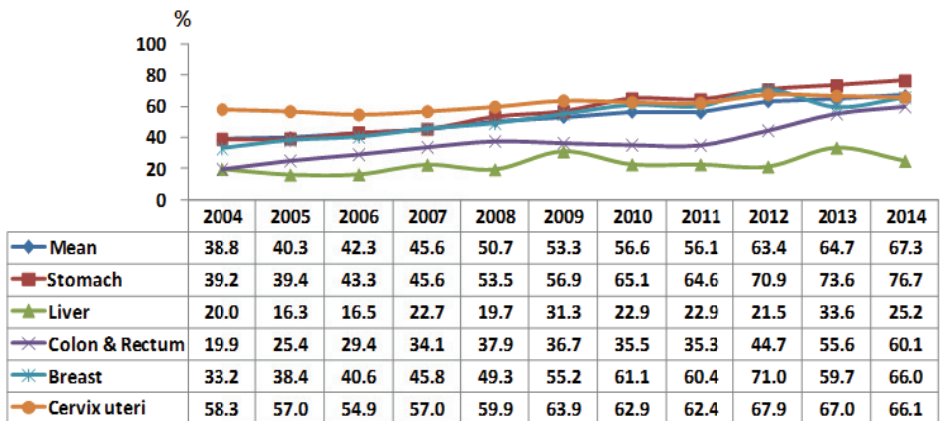
9) Screening rate based on recommendation: percentage of individuals who have undergone screening as part of the National Center Screening Program (for stomach, breast, and cervix uteri cancer) or based on the cancer screening recommendation (for other types of cancer, such as liver and colon and rectum cancer)

10) Screening rate = (number of screened individuals / candidates) X 100

Lifetime Cancer Screening Rates (2004-2014)



Cancer Screening Rates based on the Recommendation (2004-2014)



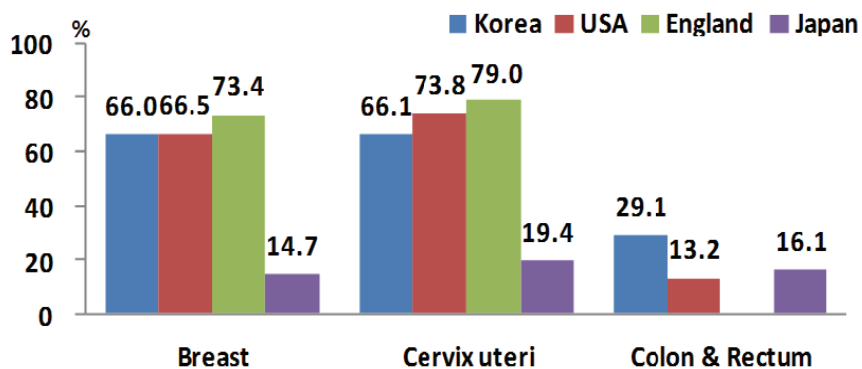
Source) Korean National Cancer Screening Survey, 2004-2014

Cancer Screening Rates: International Comparison

A comparison of the cancer screening rate based on the recommendation in Korea with those in other countries showed that the screening rate for cervix uteri cancer (66.1%) 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 29.1%, 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, 2004–2014

Cancer Screening Rates: International Comparison

| | | Korea ¹⁾ | USA ²⁾ | England ^{3) 4)} | Japan ⁵⁾ |
|----------------|------------------------|---------------------|-------------------|---|---------------------|
| Breast | Cancer Screening Rates | 66.0% | 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 | 2every 2 years |
| | Test or Procedure | Mammography | Mammography | Mammography | Mammography & CBE |
| Cervix uteri | Cancer Screening Rates | 66.1% | 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 | 29.1% | 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)

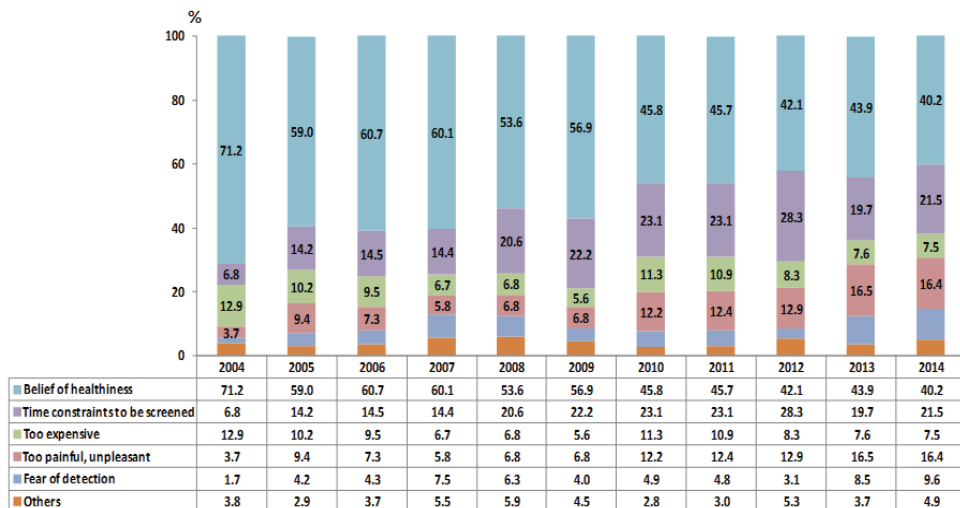
- 1) Korean National Cancer Screening Survey, 2014
- 2) National Cancer Institute. Cancer Trends Progress Report, 2011/2012
- 3) NHS Cancer Screening Programmes, NHS Breast Screening Programme Annual Review, 2012
- 4) NHS Cancer Screening Programmes, NHS Cervical Screening Programme Annual Review, 2012
- 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 2014, 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 40.2% in 2014) whereas the percentage of those who said that they did not have time to be screened increased (6.8% in 2004 to 21.5% in 2014).

Reasons for Not Undergoing Cancer Screening (2004-2014)








Source) Korean National Cancer Screening Survey, 2004–2014

4.2 National Cancer Screening Program

National Cancer Screening Program Statistics (2005–2013)

Guidelines of the National Cancer Screening Program

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

Source) National Cancer Center, 2014

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

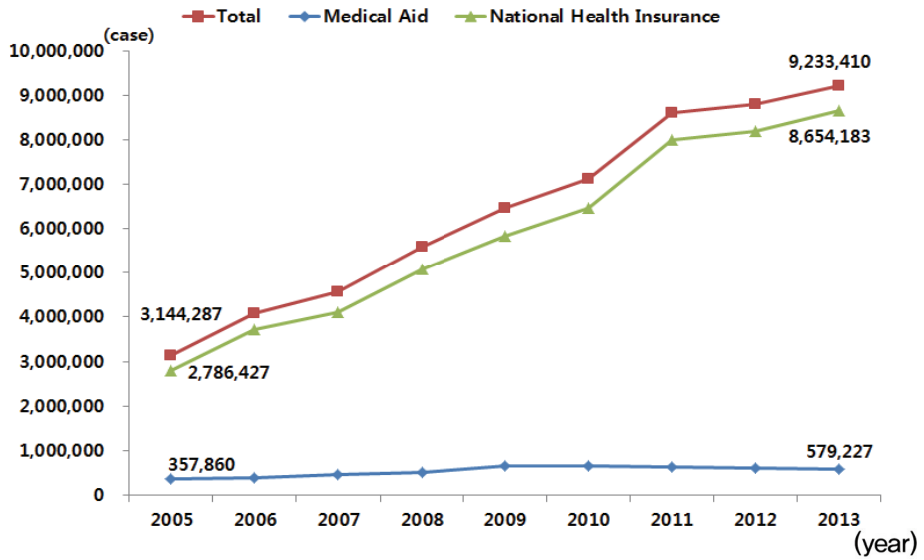
†High-risk group: HBs Ag positive, anti-HCV Ab positive, or diagnosed with liver cirrhosis

Number of Participants in the National Cancer Screening Program

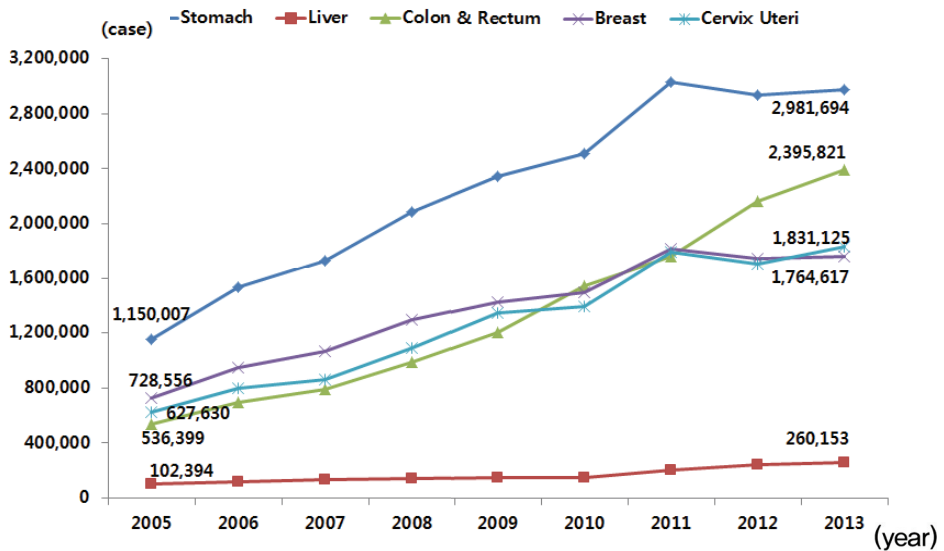
The target population of the National Cancer Screening Program consists of those insured by Medical Aid and the National Health Insurance program. The number of screened individuals insured by the National Health Insurance program increased from 2,786,427 in 2005 to 8,654,183 in 2013.

In 2013, 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 (2,981,694), followed by colon and rectum cancer (2,395,821).

Number of Participants in the National Cancer Screening Program (2005-2013)



Number of Participants in the National Cancer Screening Program by Cancer Site (2005-2013)



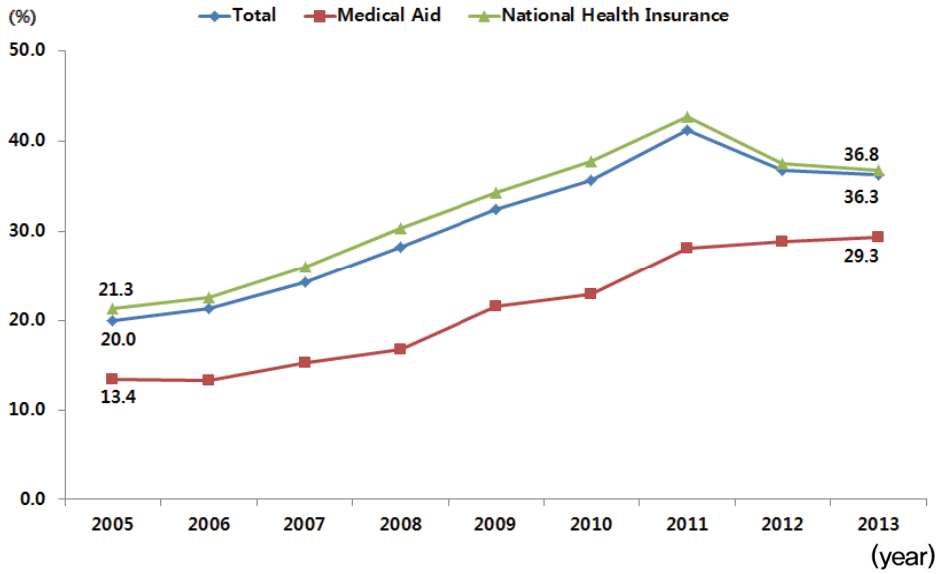
Source) National Cancer Center, 2014

Participation Rates in the National Cancer Screening Program

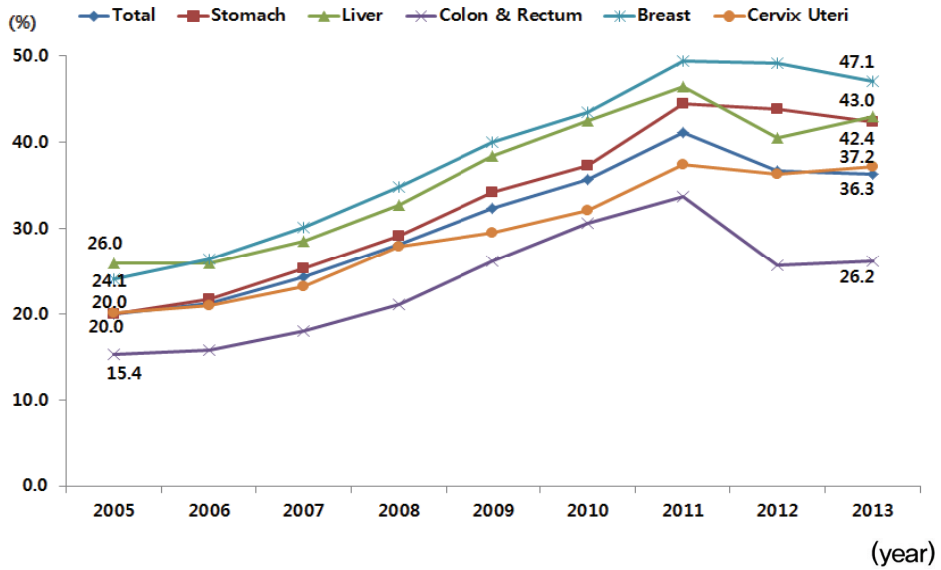
The overall rate of participation in the National Cancer Screening Program was 36.3% in 2013 (29.3% of the Medical Aid recipients and 36.8% of the National Health Insurance holders).

In 2013, screening for breast cancer had the highest participation rate (47.1%), followed by liver cancer (43.0%) and stomach cancer (42.4%).

Participation Rates in the National Cancer Screening Program (2005-2013)



Participation Rates in the National Cancer Screening Program by Cancer Site (2005-2013)



Source) National Cancer Center, 2014



Chapter 5.

Financial Aid Programs and Regional Cancer Center

5.1 Cancer Patient Financial Aid Program

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

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

Cancer Patient Financial Aid Program (2015)

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

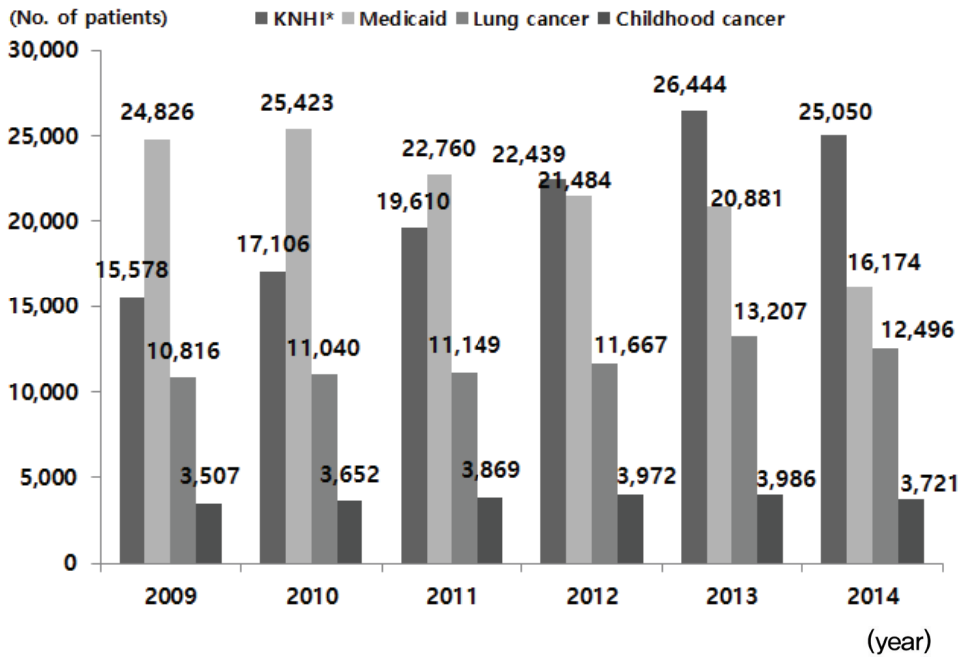
Source) National Cancer Center 2015

Cancer Patient Financial Aid Program Results

The number of adult National Health Insurance enrollees among the Cancer Patient Financial Aid Program beneficiaries increased from 15,578 in 2009 to 25,050 in 2014, but the number of adult Medicaid beneficiaries among the Cancer Patient Financial Aid Program beneficiaries decreased from 24,826 in 2009 to 16,174 in 2014. The number of adult lung cancer and childhood cancer beneficiaries is also on the rise, increasing from 10,816 in 2009 to 12,496 in 2014 and from 3,507 in 2009 to 3,721 in 2014, respectively.

The Cancer Patient Financial Aid payment for adult National Health Insurance enrollees and adult Medicaid beneficiaries decreased from KRW10,375 million in 2009 to KRW9,967 million in 2014, and from KRW15,664 million in 2009 to KRW9,147 million in 2014. The Cancer Patient Financial Aid payment for adult lung cancer patients increased from KRW10,807 million in 2009 to KRW12,464 million in 2014, respectively. Also, the payment for childhood cancer patients increased from KRW14,914 million to KRW16,868 million in 2014.

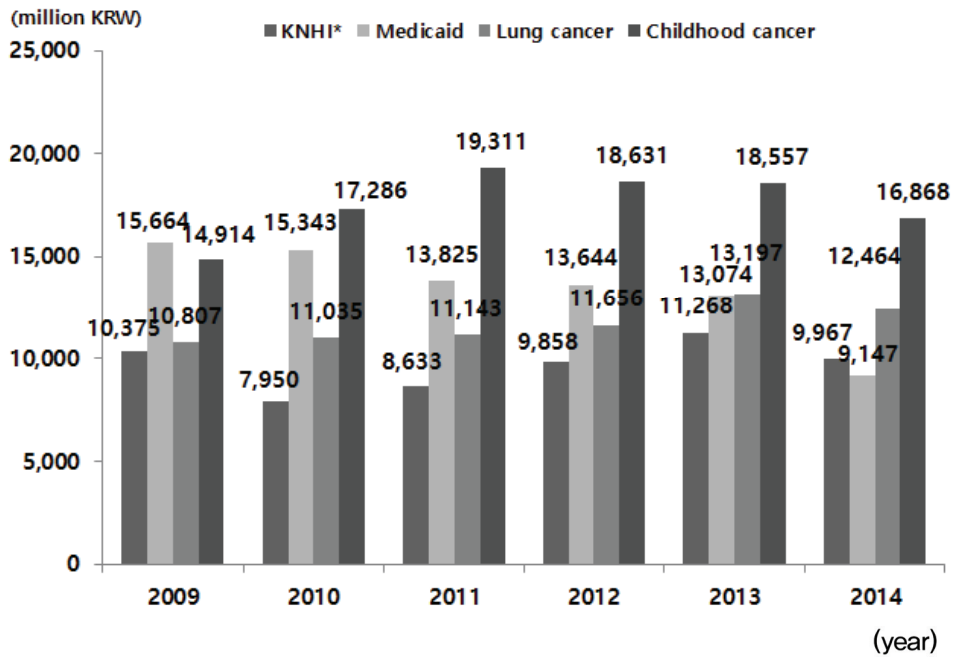
Cancer Patient Financial Aid Program Results(No. of Patients, 2009-2014)



*KNHI refers to Korean National Health Insurance

Source) National Cancer Center Cancer Patient Financial Aid System 2015

Cancer Patient Financial Aid Program Results (Payment Amount, 2009-2014)



*KNHI refers to Korean National Health Insurance

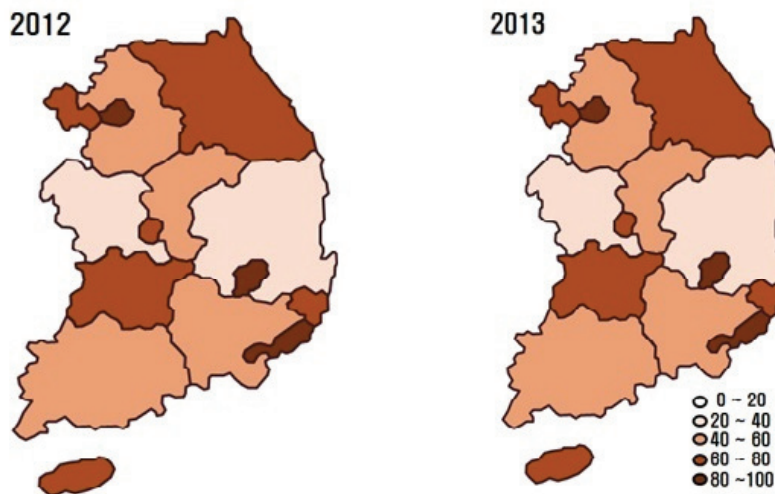
Source) National Cancer Center Financial Aid System 2015

5.2 Regional Cancer Center

Self-Sufficiency of Cancer Patients¹¹⁾

Self-sufficiency of cancer patients refers to the proportion of the visits cancer patients made to medical institutions in their area of residence. It is an indicator of the pattern of outflow of medical service at the regional level. The monitoring of self-sufficiency began in 2010.

Self-Sufficiency of Cancer Patients¹²⁾



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

12) NHIS's Registry data of Health Insurance Benefits(2013)

According to the data calculated based on NHIS's Registry Data of Health Insurance Benefits, the level of self-sufficiency was highest in Daegu in 2013, and a similar trend was observed in recent years. Meanwhile, Gyeongbuk had the lowest level.

Comparing the trends in self-sufficiency levels of 16 cities and provinces in the country between 2012 and 2013, Ulsan's level increased the most (7.7%p), followed by Gwangju (6.9%p) and Chungnam (3.5%p). In the same period, Gangwon marked the largest decrease.

Trend in Self-Sufficiency Levels in 16 Cities (2012-2013)¹³⁾

(Unit : %)

| Region | Overall | | |
|-----------|---------|---------|---------------------------------|
| | 2012(A) | 2013(B) | Change in self-sufficiency*(%p) |
| Seoul | 94.9 | 94.9 | 0.0 |
| Busan | 83.8 | 84.7 | 1.1 |
| Chungbuk | 48.4 | 48.7 | 0.6 |
| Chungnam | 34.0 | 35.2 | 3.5 |
| Daegu | 90.5 | 89.9 | -0.7 |
| Daejeon | 78.9 | 79.0 | 0.1 |
| Gangwon | 64.0 | 62.1 | -3.0 |
| Gwangju | 50.7 | 54.2 | 6.9 |
| Gyeongbuk | 27.2 | 27.5 | 1.1 |
| Gyeonggi | 58.1 | 59.3 | 2.1 |
| Gyeongnam | 47.4 | 48.1 | 1.5 |
| Incheon | 67.0 | 69.0 | 3.0 |
| Jeju | 76.5 | 78.7 | 2.9 |
| Jeonbuk | 73.4 | 72.9 | -0.7 |
| Jeonnam | 52.9 | 53.2 | 0.6 |
| Ulsan | 66.5 | 71.6 | 7.7 |

$$* \text{Change in self-sufficiency level}(\%) = \frac{(\text{self-sufficiency} \in 2013) - (\text{self-sufficiency} \in 2012)}{\text{self-sufficiency} \in 2012} \times 100$$

13) NHIS's Registry Data of Health Insurance Benefits (2012, 2013)

Location of Regional Cancer Centers

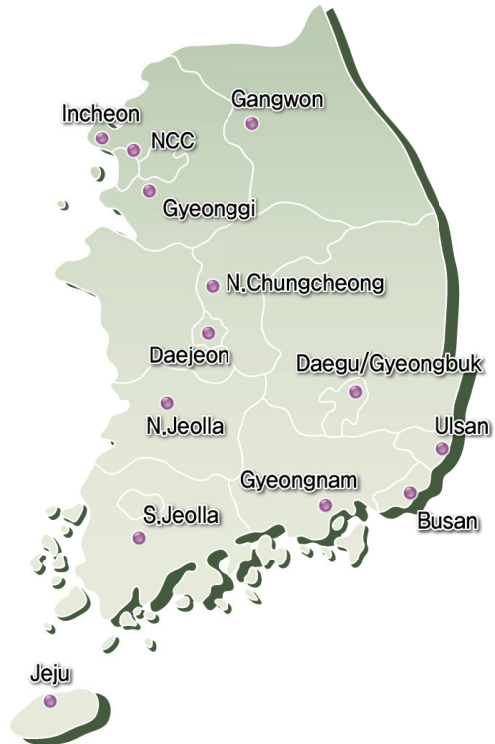
The designation of regional cancer centers has been implemented to alleviate the symptoms of the cancer patients in the provinces, to reverse the relevant infrastructures' tendency to concentrate on Seoul, and to establish a regional cancer control system in accordance with the National Cancer Control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

From 2004 to 2006, nine national university hospitals in provincial areas were designated as the comprehensive Regional Cancer Centers (RCCs). In 2011, three private university hospitals were selected as specialized RCCs. As of 2015, 12 RCCs are in operation.

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

Regional Cancer Center

Regional Cancer Center in Korea



Source) National Cancer Center, 2014

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 2014, 57 palliative care institutions had been established. Since 2005, the Ministry of Health and Welfare has invited public palliative care institutions to be subsidized for their operating expenses.

| Section | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Designated institutions | | | | 19 | 40 | 42 | 46 | 56 | 53 | 57* |
| Subsidized institutions | 15 | 21 | 23 | 30 | 34 | 40 | 43 | 44 | 52 | 54 |
| Beds | 261 | 362 | 415 | 524 | 546 | 628 | 728 | 720 | 842 | 883 |
| Subsidies (million won) | 240 | 800 | 1,050 | 1,300 | 1,300 | 1,730 | 2,160 | 2,310 | 2,679 | 2,720 |

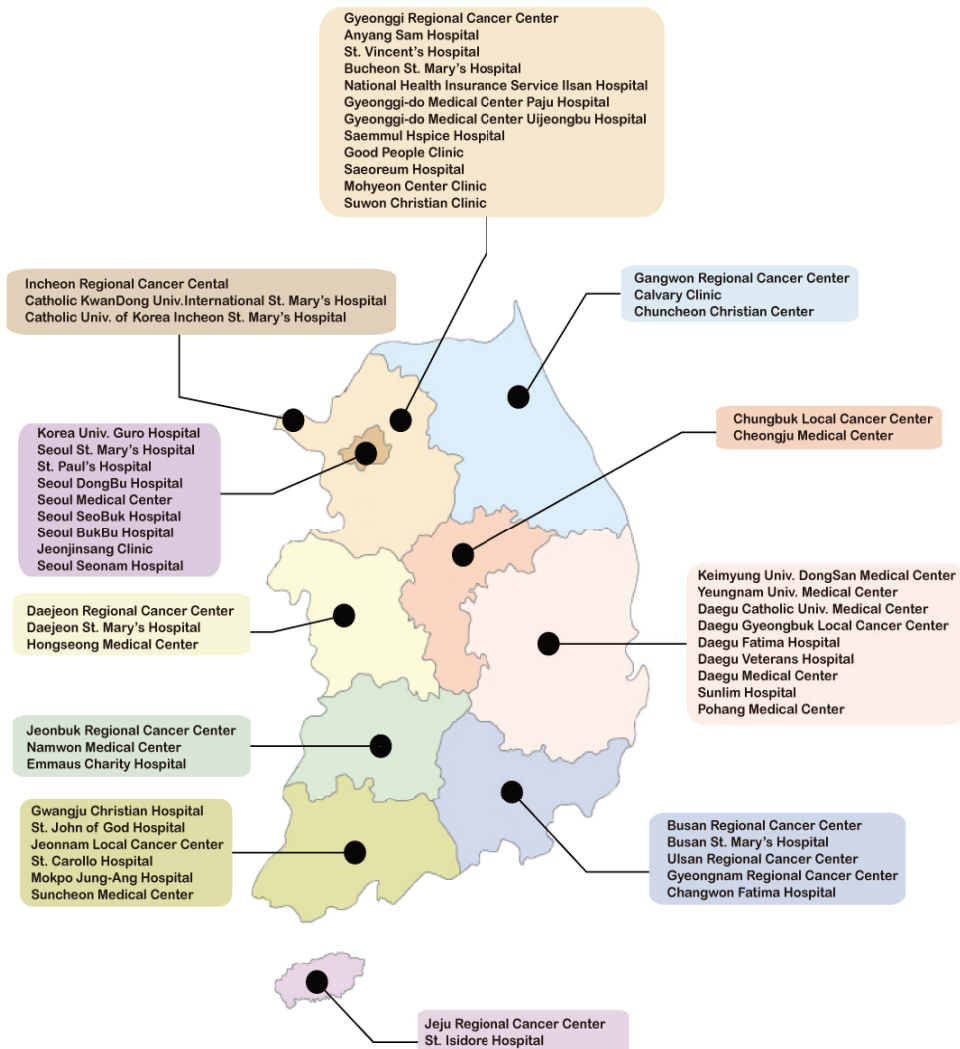
*As of December 2014

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 Seonam 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 |
| 20 | Daejeon St. Mary's Hospital | |
| 21 | Gwangju | Gwangju Christian Hospital |
| 22 | | St. John of God Hospital |
| 23 | Incheon | Incheon Regional Cancer Center |
| 24 | | Catholic KwanDong Univ.International St. Mary's Hospital |
| 25 | | Catholic Univ.of Korea Incheon St. Mary's Hospital |
| 26 | Ulsan | Ulsan Regional Cancer Center |
| 27 | Gyeonggi | Gyeonggi Regional Cancer Center |
| 28 | | Anyang SAM Hospital |
| 29 | | St. Vincent's Hospital |
| 30 | | Bucheon St. Mary's Hospital |
| 31 | | National Health Insurance Service Ilsan Hospital |
| 32 | | Gyeonggi-do Medical Center Paju Hospital |
| 33 | | Gyeonggi-do Medical Center Uijeongbu Hospital |
| 34 | | Saemmul Hospice Hospital |
| 35 | | Good People Clinic |
| 36 | | Saeoreum Hospital |
| 37 | | Mohyeon Center Clinic |
| 38 | | Suwon Christian Clinic |
| 39 | Gangwon | Gangwon Regional Cancer Center |
| 40 | | Calvary Clinic |
| 41 | | Chuncheon Christian Clinic |
| 42 | Chungbuk | Chungbuk Regional Cancer Center |
| 43 | | Cheongju Medical Center |
| 44 | Chungnam | Hongseong Medical Center |
| 45 | Jeonbuk | Jeonbuk Regional Cancer Center |
| 46 | | Namwon Medical Center |
| 47 | | Emmaus Charity Hospital |
| 48 | Jeonnam | Jeonnam Regional Cancer Center |
| 49 | | St. Carollo Hospital |
| 50 | | Mokpo Jung-Ang Hospital |
| 51 | | Suncheon Medical Center |
| 52 | Gyeongbuk | Sunlin Hospital |
| 53 | | Pohang Medical Center |
| 54 | Gyeongnam | Gyeongnam Regional Cancer Center |
| 55 | | Changwon Fatima Hospital |
| 56 | Jeju | Jeju Regional Cancer Center |
| 57 | | St. Isidore Hospice |

Designated Palliative Care Institutions (2014)



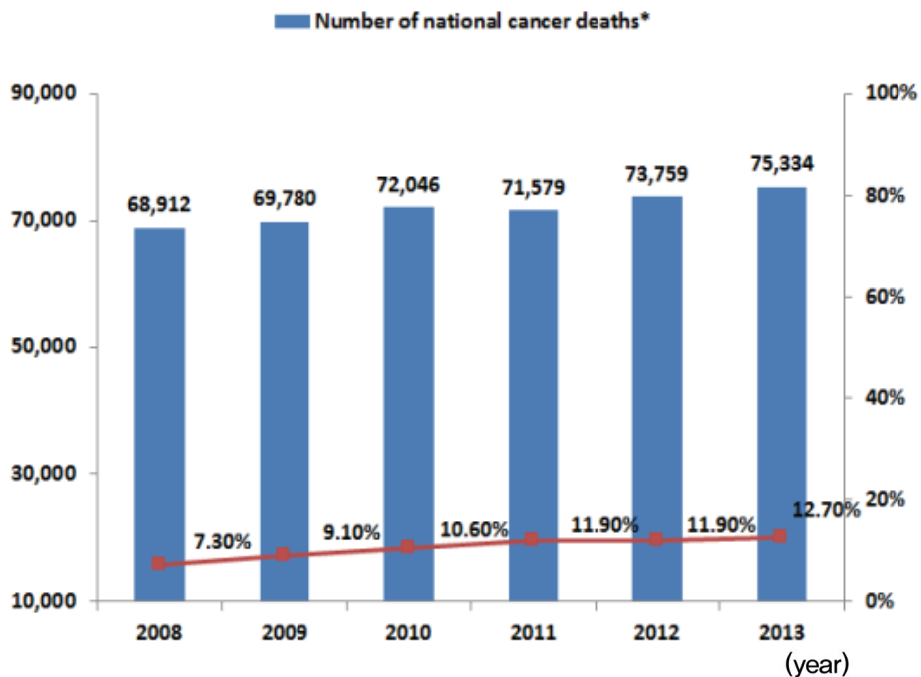
Source) National Cancer Center, 2014

Palliative Care Service Utilization

In 2013, 9,573 cancer patients used 57 palliative care institutions. Among those who died from cancer, 12.7% had used palliative care institutions.

In the same year, 88.1% of the cancer-related deaths occurred at health institutions, 9.2% occurred in the patient's house, and 1.3% occurred in a social welfare facility.

Palliative Care Service Utilization (2008-2013)



Source) National Cancer Center, Support for activation of palliative care service, 2014

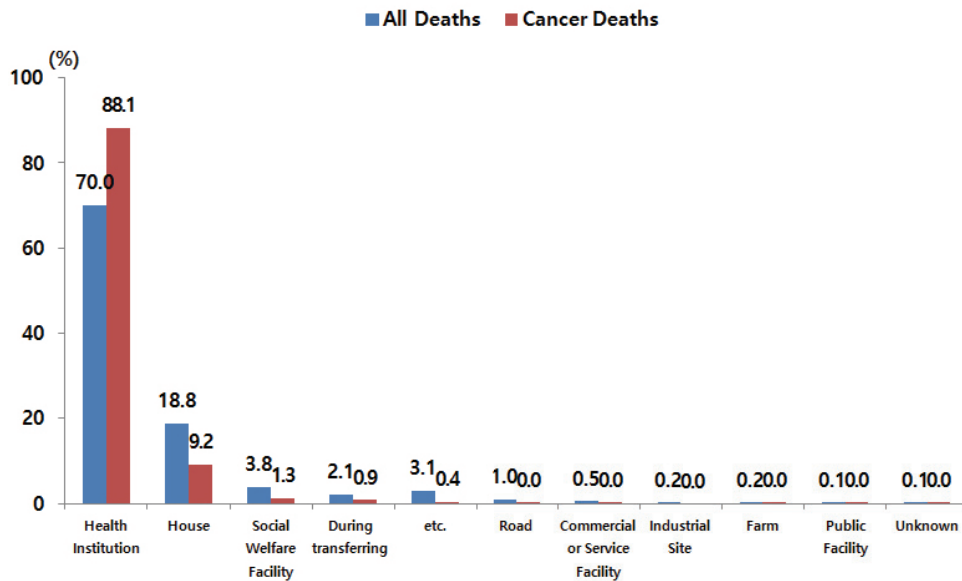
| Year | New inpatients* | Number of national cancer deaths** | Rate of Palliative Care Service Utilization*** |
|------|-----------------|------------------------------------|--|
| 2008 | 5,046 | 68,912 | 7.3% |
| 2009 | 6,365 | 69,780 | 9.1% |
| 2010 | 7,654 | 72,046 | 10.6% |
| 2011 | 8,494 | 71,579 | 11.9% |
| 2012 | 8,742 | 73,759 | 11.9% |
| 2013 | 9,573 | 75,334 | 12.7% |

*Source) Palliative care practice status of application, 2009–2014

**Source) Statistics Korea. Annual report on the cause of death statistics, 2008–2013

*** $(\text{Number of new inpatients} / \text{number of national cancer deaths}) \times 100$

Place of Cancer-related Deaths (2013)



Source) Statistics Korea. Annual report on the cause of death statistics, 2013

Cancer Mortality by Age and Place

The average age of cancer patients who died at a social welfare facility was 76.1; those in their house, 73.0; those in a public facility, 72.2; and during transfer, 71.6.

88.1% of the cancer patients died in a health institution. The average age of the patients who died from cancer was 68.1.

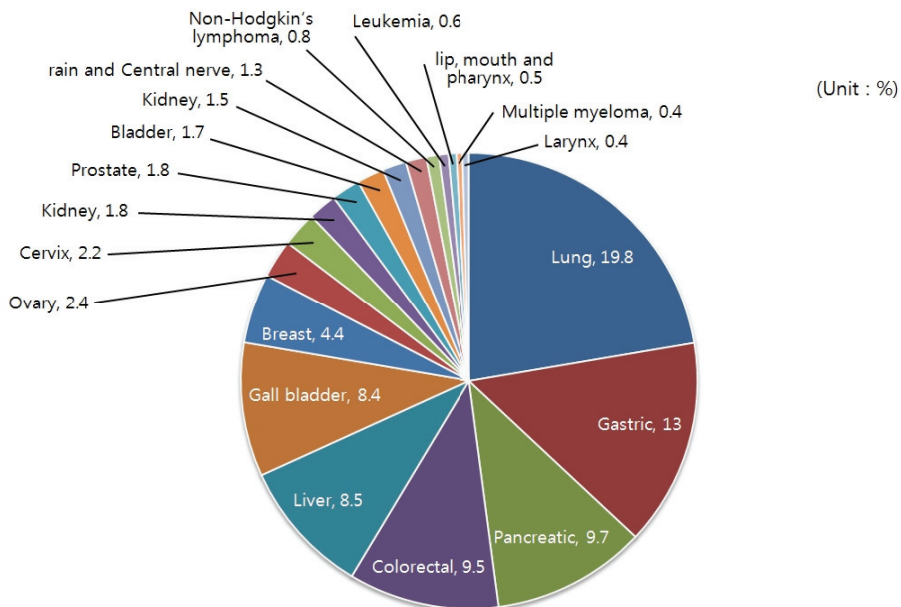
| Place of Death | N | % | Age | |
|--------------------------------|---------------|------------|-------------|--------------|
| | | | Mean | S.D. |
| Health institution | 65,411 | 88.13 | 68.1 | 14.94 |
| House | 6,838 | 9.21 | 73.0 | 11.51 |
| Social welfare facility | 939 | 1.27 | 76.1 | 11.96 |
| During transfer | 645 | 0.87 | 71.6 | 12.88 |
| Etc. | 297 | 0.40 | 71.9 | 12.74 |
| Road | 27 | 0.04 | 68.0 | 14.58 |
| Public facility | 22 | 0.03 | 72.2 | 9.53 |
| Unknown | 9 | 0.01 | 68.8 | 19.06 |
| Commercial or service facility | 19 | 0.03 | 62.1 | 15.95 |
| Industrial site | 3 | 0.00 | 54.0 | 3.61 |
| Farm | 7 | 0.01 | 66.4 | 16.44 |
| Total | 74,217 | 100 | 68.7 | 14.69 |

S.D.:Standard Deviation

Palliative Care Institution Utilization

In 2013, 9,573 cancer patients used palliative care institutions. According to the cancer type, the number of lung cancer patients was the highest (1,692, 19.8%), followed by gastric cancer (1,110, 13.0%), pancreatic cancer (827, 9.7%), colorectal cancer (814, 9.5%), and liver cancer (728, 8.5%)

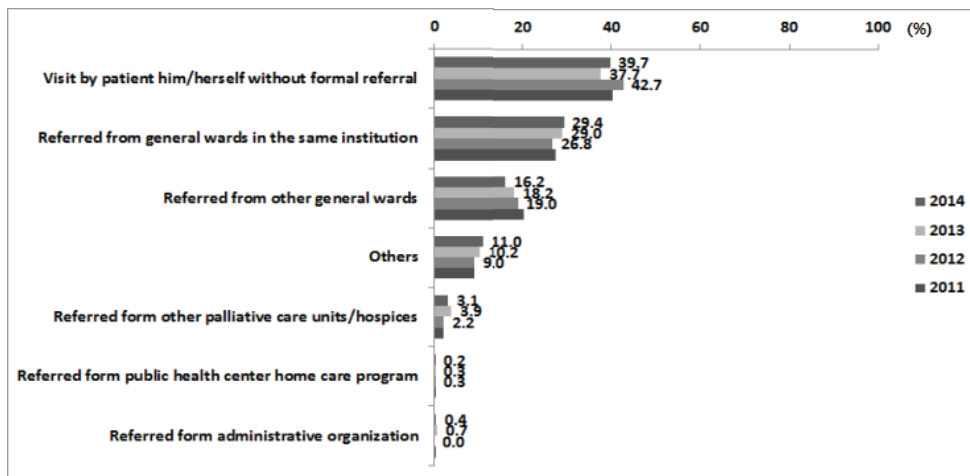
Use of Hospice and Palliative Care Services by Cancer Type



Source) National Cancer Center. Support for activation of palliative care service, 2014

As for the admission routes of the patients who used palliative care institutions in 2013, the highest number of patients visited the institution without formal referral (3,385, 39.7%), followed by the patients who were referred from the general wards in the same health institution (2,503, 29.4%), and from other health institutions or wards (1,380, 16.2%).

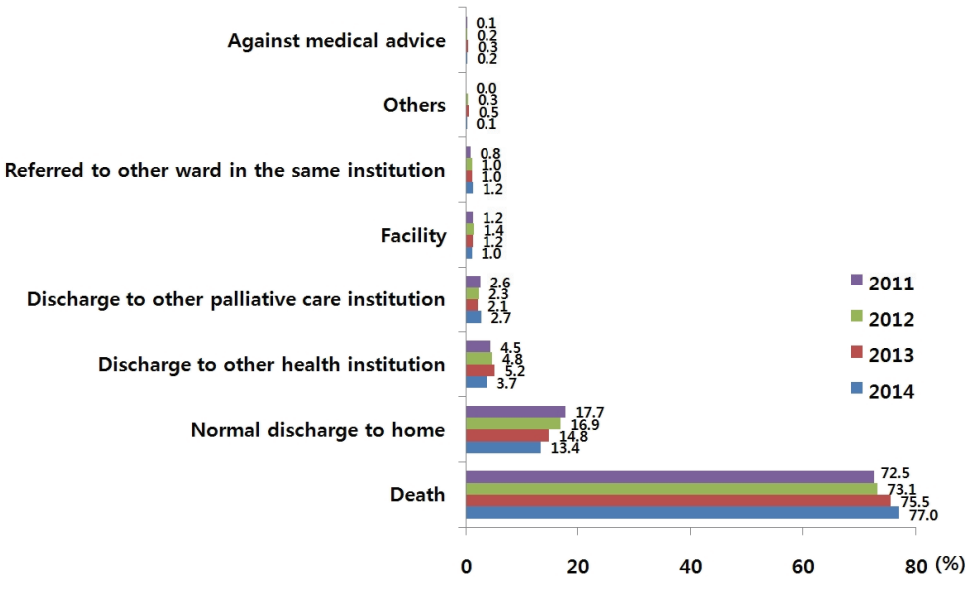
Admission Routes to Palliative Care Institutions (2011-2014)



Source) National Cancer Center. Support for activation of palliative care service, 2014

The most common reason of discharge from initial admission was death (6,188, 77.0%), followed by discharge to home (1,076, 13.4%) and discharge to another health institution (297, 3.7%).

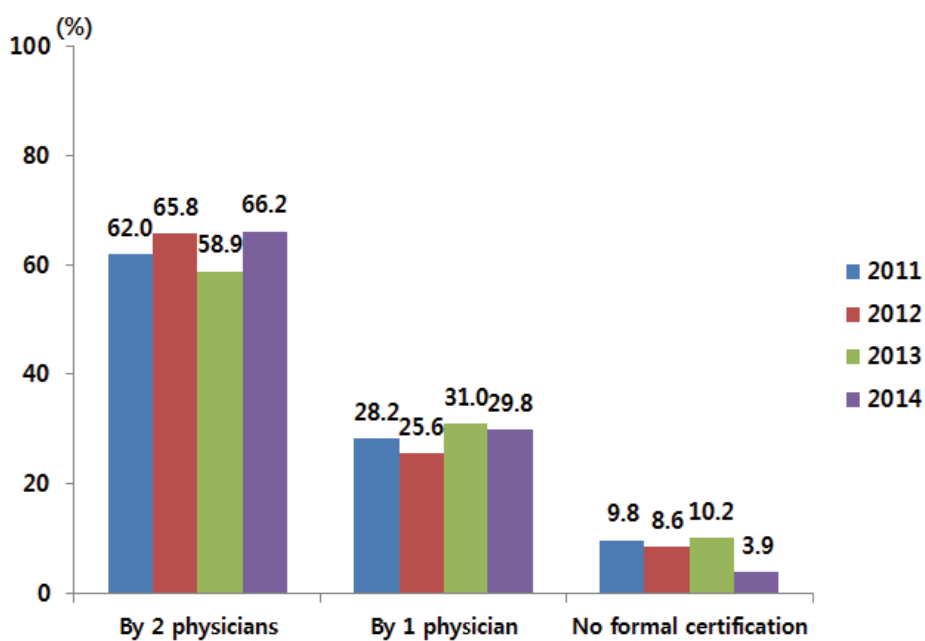
Reason for Discharge from Palliative Care Institution



Source) National Cancer Center. Support for activation of palliative care service, 2014

Regarding the status of terminal diagnosis or physician's note, 5,641 patients (66.2%) were diagnosed by two or more physicians, 2,540 (29.8%) were diagnosed by one physician, and 336 (3.9%) did not receive a diagnosis.

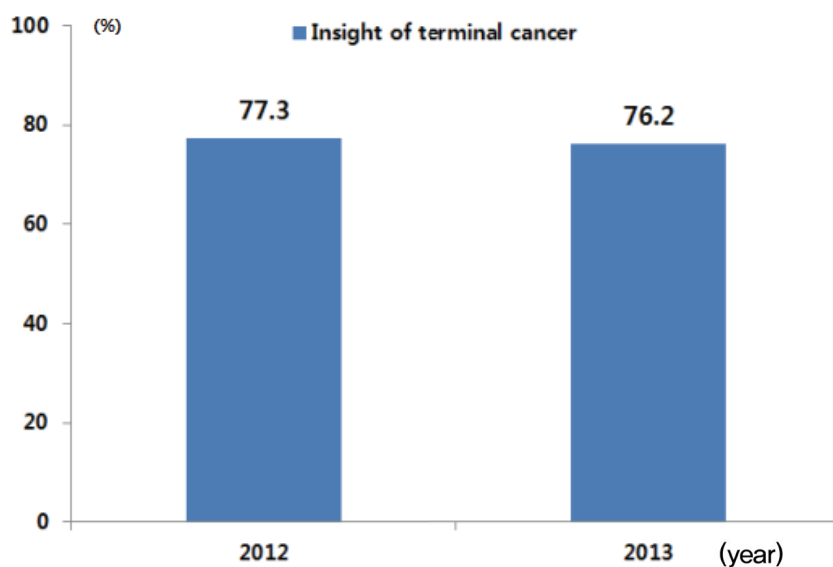
Status of Terminal Cancer Diagnosis (2011-2014)



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

The patients' awareness of his/her terminal cancer changed from 77.3% in 2012 to 76.2% in 2013, signifying that the level of awareness is still insufficient.

Awareness of Terminal Cancer

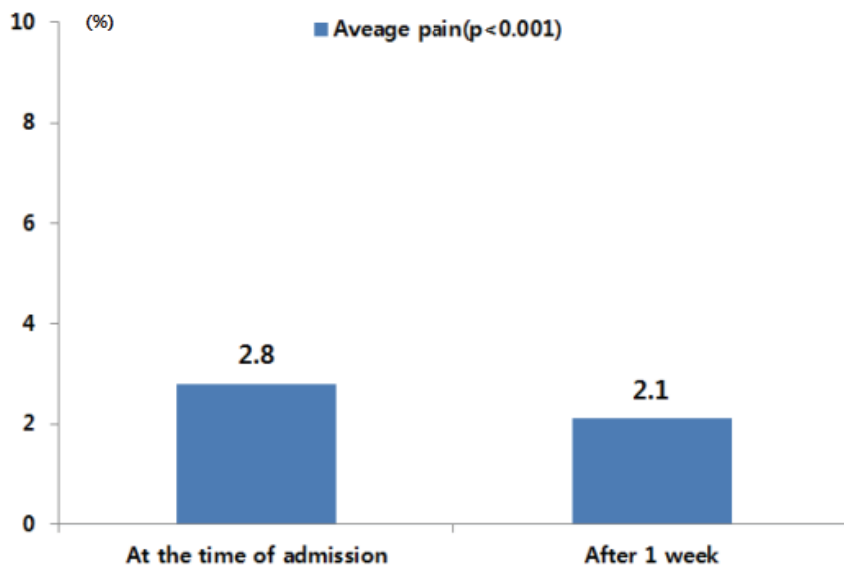


Source) National Cancer Center. Support for activation of palliative care service, 2014

Improvement of Pain Conditions at Palliative Care Institutions

The average level of pain after a week of admission to a palliative care institution declined from 2.8 to 2.1.

Improvement of Pain Condition after 1 Week at Palliative Care Institution



Source) National Cancer Center. Support for activation of palliative care service, 2014

Overall Satisfaction of Bereaved Family Using Palliative Care Institutions

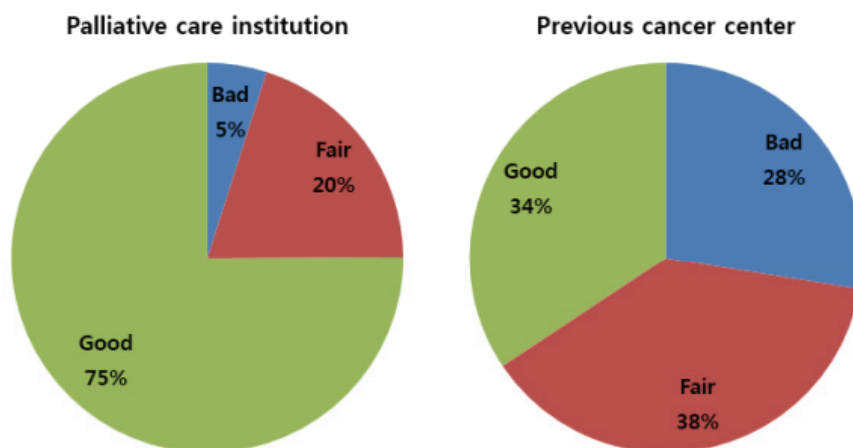
1. Purpose of the survey

To assess the overall satisfaction of the bereaved families who had used palliative care institutions with regard to the service quality of the institution and their general experience with it.

2. Details and results

In 2013, 34% of the patients said that they were satisfied with the cancer centers they had previously used. In comparison, 75% of the patients said that they were satisfied with the palliative care institutions they had gone to.

Satisfaction with Palliative Care Institution



*Very good- Good: Good / Not bad-Not so good: Fair / Bad-very bad: Bad

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

Satisfaction with Palliative Care Services

According to the results of a survey on the satisfaction of the patients who used palliative care institutions, more than 70% of the respondents were satisfied with the physicians and palliative care teams in terms of proper handling of the case, expert knowledge, skill, and teamwork. Non-waiting hospitalization received the lowest level of satisfaction (63.0%).

| | 2012 | | 2013 | | P-value |
|--|------|------|------|------|---------|
| | Mean | S.D. | Mean | S.D. | |
| 1) Physician's swift action | 75.0 | 19.7 | 74.8 | 19.7 | 0.7659 |
| 2) Nurse's expert knowledge and skill | 75.7 | 19.2 | 76.5 | 19.5 | 0.3265 |
| 3) Palliative care team's effort to meet patient's needs | 77.4 | 18.7 | 77.8 | 20.5 | 0.6128 |
| 4) Physician's explanation to patient | 70.6 | 22.9 | 71.0 | 23.5 | 0.6765 |
| 5) Physician's explanation to patient's family | 77.1 | 21.3 | 76.6 | 21.2 | 0.5602 |
| 6) Convenient and pleasant facility | 71.5 | 22.5 | 72.5 | 23.4 | 0.3000 |
| 7) Consideration for maintaining health | 68.0 | 22.6 | 69.6 | 23.0 | 0.0940 |
| 8) Reasonable cost | 73.3 | 21.8 | 73.4 | 21.1 | 0.8988 |
| 9) Non-waiting hospitalization | 63.6 | 25.8 | 63.0 | 26.6 | 0.5741 |
| 10) Palliative care teamwork | 75.1 | 20.3 | 75.8 | 20.3 | 0.3773 |

Measurement tool: CES short version with 10 items and 6-point scale: 0 (Never) - 100 (Definitely)

S.D.:Standard Deviation

Assessment of End of Life

The end-of-life quality score varied significantly among palliative care institutions, from 41.5 to 60.3 ($p < 0.001$) in 2012 and from 39.9 to 57.4 ($p < 0.001$) in 2013.



- ※ The end-of-life quality score: GDI 1–10 sum of score, 0–70
- ※ Average end-of-life quality score among all institutions: 51.6 (2012), 50.8 (2013)
- ※ Excludes institutions with less than 5 available answers

Source) National Cancer Center. Support for activation of palliative care service, 2014

Chapter 7.

Information on Cancer Statistics

7.1 Information-Education for Cancer

Number of Constructed Cancer Information Databases

With regard to the number of constructed cancer information databases from 2003 to 2014, the database of 17 cancers were constructed in 2003, and the number increased annually until 2014, by which time a total of 100 cancers had been constructed. Also, the already-existing cancer databases are continually being updated.

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

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

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

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

Source) National Cancer Information Center <http://www.cancer.go.kr> 2014

Renewal Cases of Existing Cancer Databases (2014)

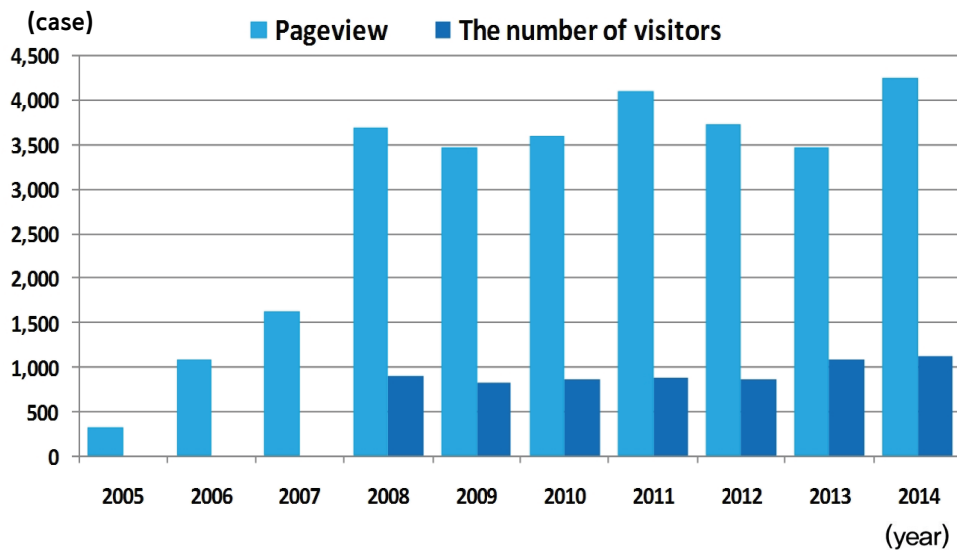
| Year | Development Statement | Detailed Statement |
|------|-----------------------|---|
| 2014 | 36 cancers | Intrahepatic cholangiocarcinoma, liver cancer, thyroid cancer, testicular cancer, myelodysplastic syndrome, acute myelocyte leukemia, acute lymphoblastic leukemia, basal cell carcinoma, epithelial ovarian cancer, brain tumor, multiple myeloma, gallbladder cancer, biliary tract cancer, colorectal cancer, chronic myeloid leukemia, choroid melanoma, bladder cancer, non-small-cell lung cancer, esophageal cancer, renal pelvic cancer, small-cell lung cancer, malignant lymphoma, malignant melanoma, ureter cancer, urethra cancer, breast cancer, Wilms tumor, stomach cancer, pharynx cancer, prostate cancer, pancreatic cancer, squamous epithelium cell cancer, lung adenocarcinoma, lung cancer, lung squamous epithelium cell cancer, laryngeal cancer |

Source) National Cancer Information Center <http://www.cancer.go.kr> 2014

Internet Service for Cancer Information

The number of visitors who were using the Internet service (www.cancer.go.kr) for cancer information from the National Cancer Information Center in 2014 was 1,125,000, and the number of page views was 4,250,000.

Number of Visitors and Internet Page Views of National Cancer Information Service (2005-2014)



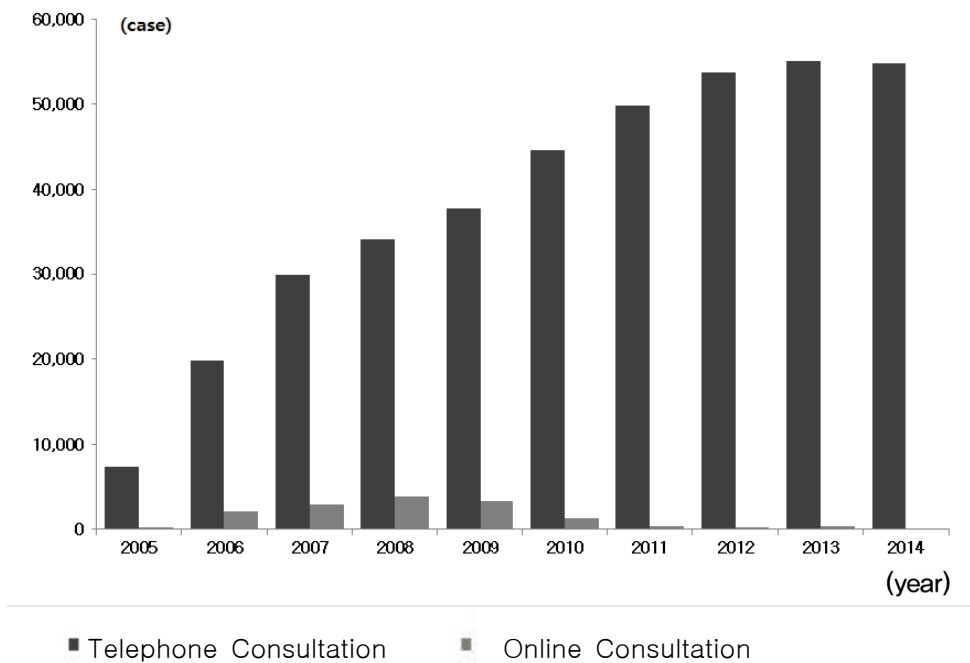
※ The Log Analysis begins on January in 2008

Source) National Cancer Information Center <http://www.cancer.go.kr> 2014

Counseling Service for Cancer Information

In 2014, the number of telephone consultations (1577-8899) among the counseling services for cancer information was 54,849, and the number of online consultations was 163.

Number of Telephone and Online Consultations of National Cancer Information Service (2005-2014)



Source) National Cancer Information Center <http://www.cancer.go.kr> 2014

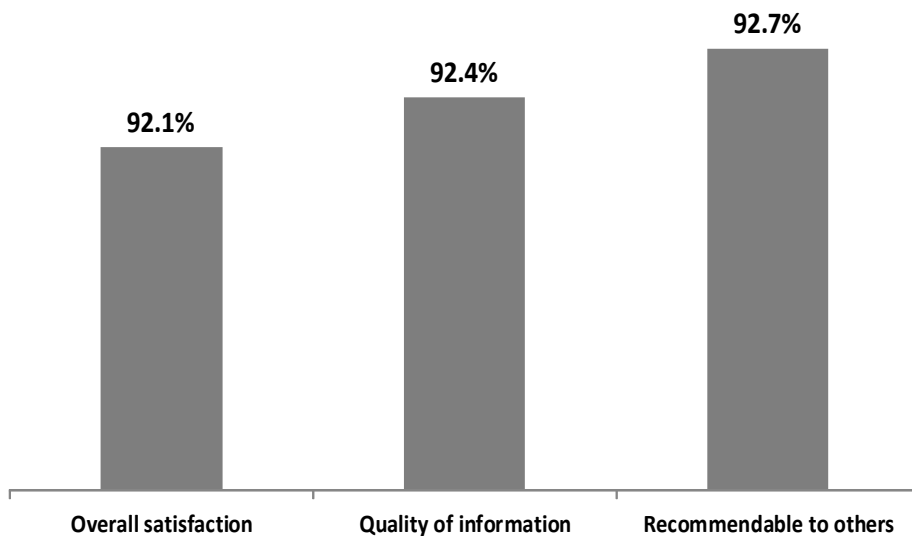
Cancer Information Internet and Telephone Counseling Service Satisfaction

In 2014, an annual user satisfaction survey of the cancer information Internet service of the National Cancer Information Center was conducted. A total of 1,172 participated in the survey.

The rate of user satisfaction with the national cancer information service through the Internet was 92.1%.

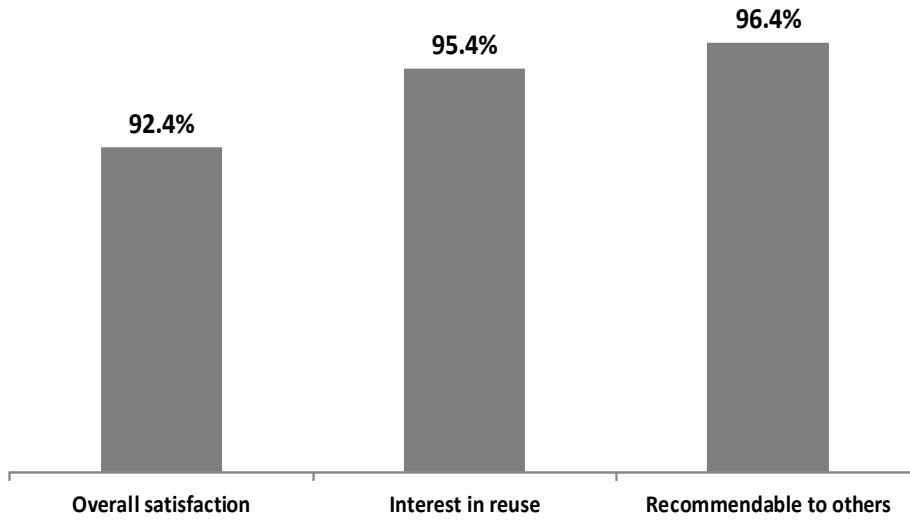
From a survey of randomly selected 1,200 people among 54,849 users of the telephone counseling service, the overall user satisfaction rate was 92.4%.

User Satisfaction with the Cancer Information Internet Service (2014)



Source) National Cancer Information Center <http://www.cancer.go.kr> 2014

User Satisfaction with the Cancer Information Telephone Service
(2014)



Source) National Cancer Information Center <http://www.cancer.go.kr> 2014

Number of Developed Cancer Information Educational Materials

From 2006 to 2014, educational materials about cancer were developed. Starting with the development of leaflets for explaining cancer and cancer screening in 2006, a total of 119 educational materials had been developed, including the six materials that were developed in 2014.

Number of Cancer Information Educational Materials Developed (2006-2014)

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

Source) National Cancer Information Center <http://www.cancer.go.kr> 2014

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

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

7.2 Cancer Registration System in Korea

Cancer Registration System in Korea

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

In order to accurately calculate cancer-related statistics and constantly monitor related figures, the Ministry of Health & Welfare is conducting national cancer registration and statistics projects with the Korea Central Cancer Registry and 11 regional cancer registries (Busan, Daegu/Gyeongbuk (N. Gyeongsang), Gwangju/Jeonnam (S. Jeolla), Incheon, Daejeon (Chungnam (S. Chungcheong), Sejong), Ulsan, Jeju, Gangwon, Chungbuk (N. Chungcheong), Jeonbuk (N. Jeolla), and Gyeongnam (S. Gyeongsang)). 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, 2015

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Cancer Facts & Figures 2015

| | |
|---------------------|---|
| Date of Publication | June 2015 (1st edition) |
| Publisher | Minister for Health and Welfare President of National Cancer Center |
| Address | Ministry of Health and Welfare, 13 Doum 4-ro, Sejong, 339-012, Republic of Korea National Cancer Center, 323 Ilsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, Republic of Korea |
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ISSN 2384-311X