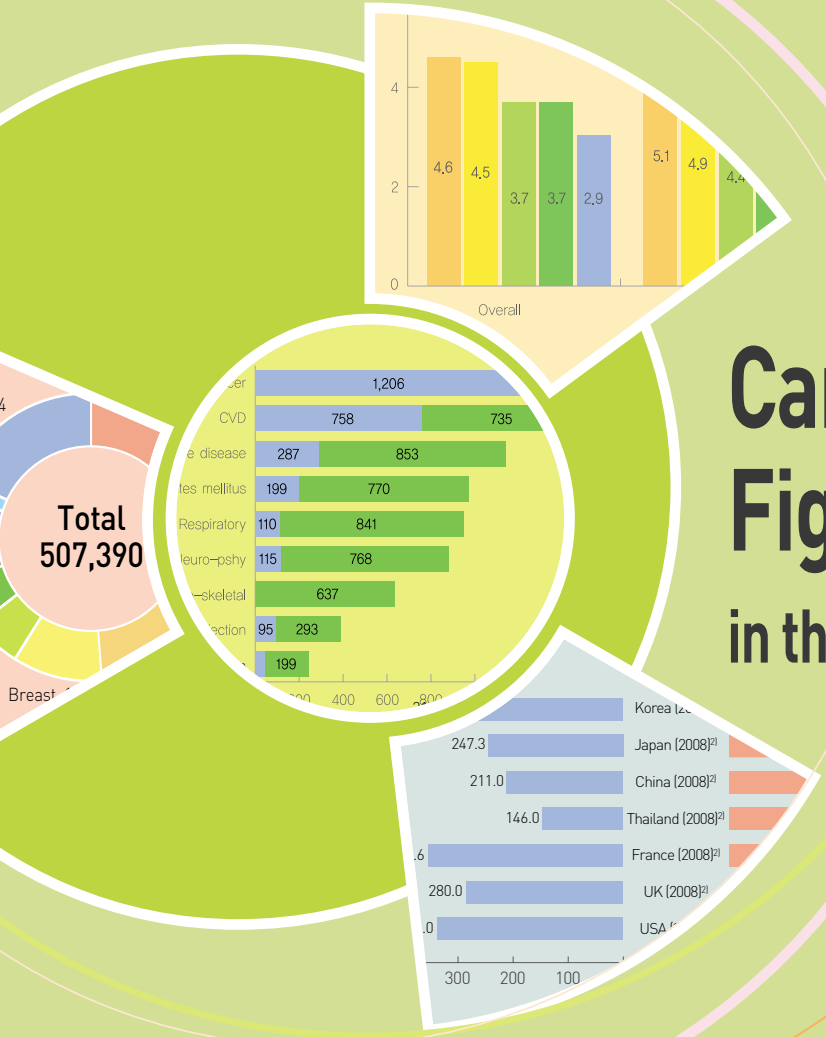

Cancer Facts & Figures 2011

in the Republic of Korea

MINISTRY OF HEALTH & WELFARE

NATIONAL CANCER CENTER

Cancer Facts & Figures 2011

Foreword

Cancer, the number one cause of death in Korea, is the most dreadful disease that imposes enormous emotional and financial burden on our society. Its incidence and mortality is forecasted to increase in Korea due to the westernized life style and aging population.

The World Health Organization has reported that one-third of all cancers could be prevented, another one-third could be completely cured by early detection, and the rest of one-third could be overcome through medical cure.

The Korean Government built the infrastructure to overcome cancer by establishing the 1st "10-year Cancer Control Plan" in 1996, and the 2nd "10-year Cancer Control Plan" established in 2006 has been processing.

As one of serial efforts to overcome cancer, National Cancer Center(NCC) offers assistance to cancer research, diagnosing and treating cancer patients, assisting in the National Cancer Control Program, and finally, education and training cancer specialists. NCC believe that these efforts will help to decrease the cancer incidence and mortality, and to improve the quality of patients' life. Especially, NCC has been supporting the 2nd "10-year Cancer Control Plan" by strengthening the cooperative

network with many cancer-specialized medical institutions in Korea and international organizations, and also by funding cancer research, and developing cancer control policies.

This monograph, titled °ÆCancer Facts and Figures 2011 Korea' which is the fourth in a series published annually since 2008, includes comprehensive reports on the national cancer control programs carried out in Korea. I am pleased to share the results of our efforts with the colleagues in Korea and abroad as well. I hope that our small efforts will help laying down a stepping-stone toward winning the war against cancer in many other developing countries, especially, in Asia.

Finally, I sincerely appreciate the efforts of the specialists and the staffs of NCC for this publication.

June, 2011

Jin Soo Lee, MD, PhD
President, National Cancer Center

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Chapter 1.
Basic Facts

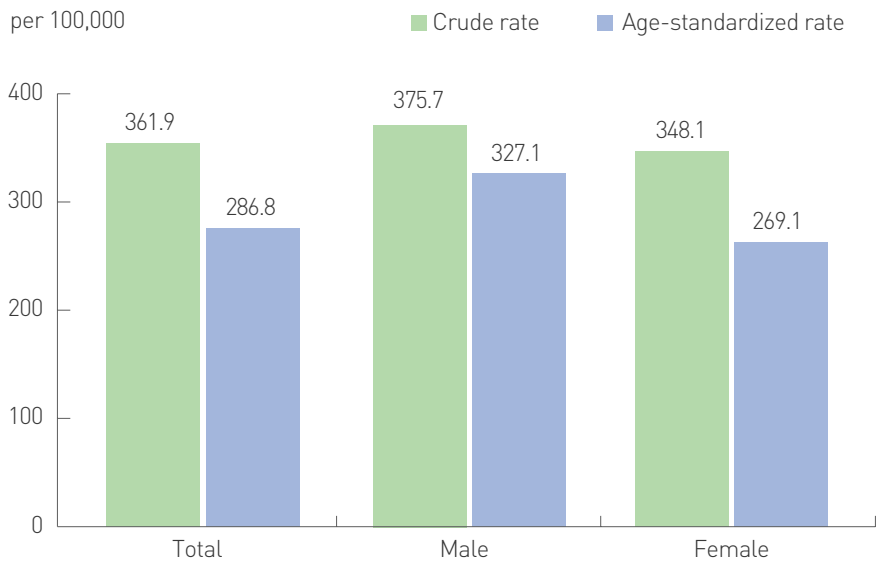
Cancer Facts & Figures 2011

1.1 Cancer Incidence

Cancer Incidence Rates

In Korea, the age-standardized cancer incidence rates in 2008 was 286.8 (male 327.1, female 269.1) per 100,000 persons.

Cancer Incidence Rates [2008]



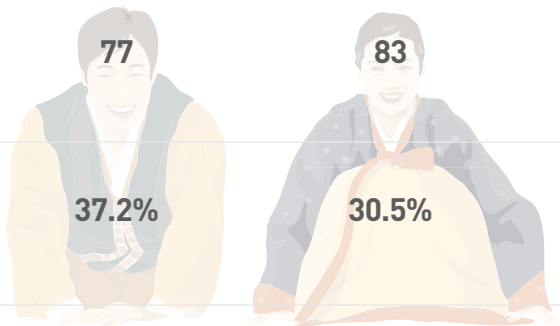
Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010
Note) Age-standardized incidence rate uses "mid-year population in 2000"as standard population.

Cumulative Risk of Cancer

The cumulative risk of cancer after living to the life expectancy was 34.0%. The risk for males was higher than that for females, 37.2% and 30.5%, respectively.

Cumulative Risk of Cancer

	Total	Male	Female
Life Expectancy (2008) * STATISTISC KOREA, 2009	80	77	83
Cumulative Risk to Life Expectancy	34.0%	37.2%	30.5%
	(1/3)	(1/3)	(3/10)



Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

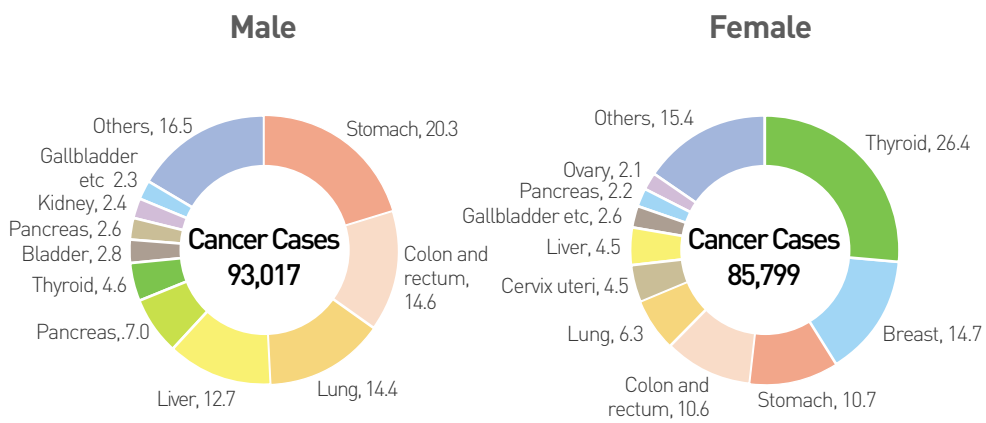
Proportion of Cancer Incidence

In males, stomach cancer occurred most frequently, accounting for 20.3% of all cases, followed in order by colorectal (14.6%), lung (14.4%) and liver cancer (12.7%).

In females, thyroid occurred most frequently, accounting for 26.4% of all cases, followed in order by breast (14.7%), stomach (10.7%), colorectal (10.6%) and lung cancer (6.3%).

Proportion of Cancer Incidence[2008]

(Unit: %)



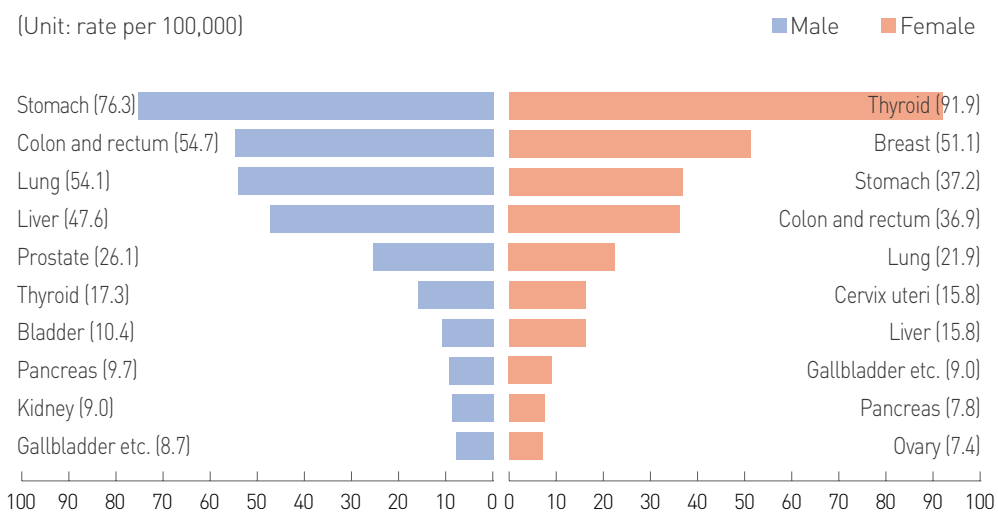
Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

Site-specific Cancer Incidence Rates by Sex

In males, the crude incidence rate[1)] of stomach cancer was 76.3 per 100,000 persons. The incidence rate for other cancer sites were 54.7, 54.1 and 47.6 for colon & rectum, lung and liver cancer, respectively.

In females, the crude incidence rate of thyroid cancer was 91.9. The incidence rate for other cancer sites were 51.1, 37.2, and 36.9 for breast, stomach, and colon & rectum, respectively.

Crude Rates of Ten Major Cancer Sites [2008]



Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

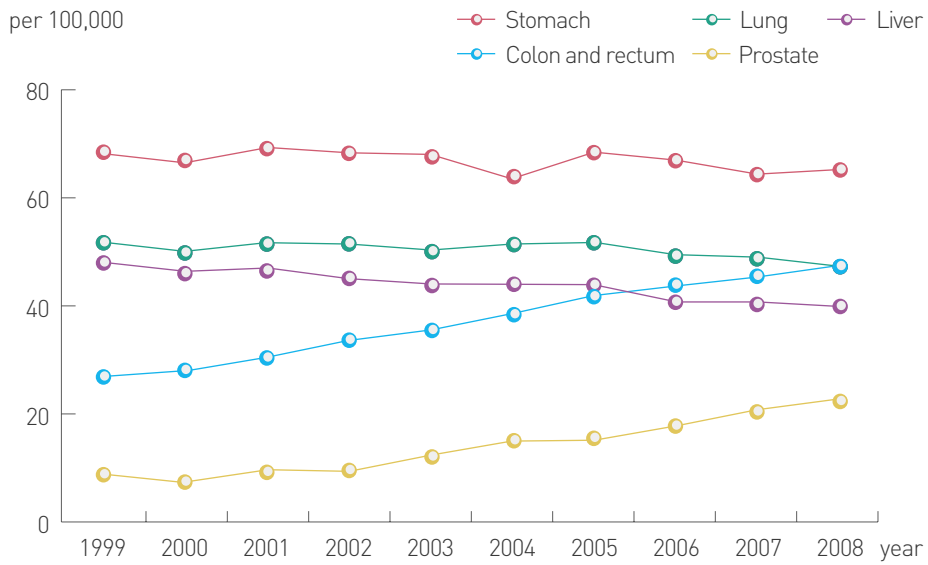
1) Crude incidence rate = The number of new cancer cases / mid year population x 100,000

Trends of Age-standardized Incidence Rates in Major Cancers

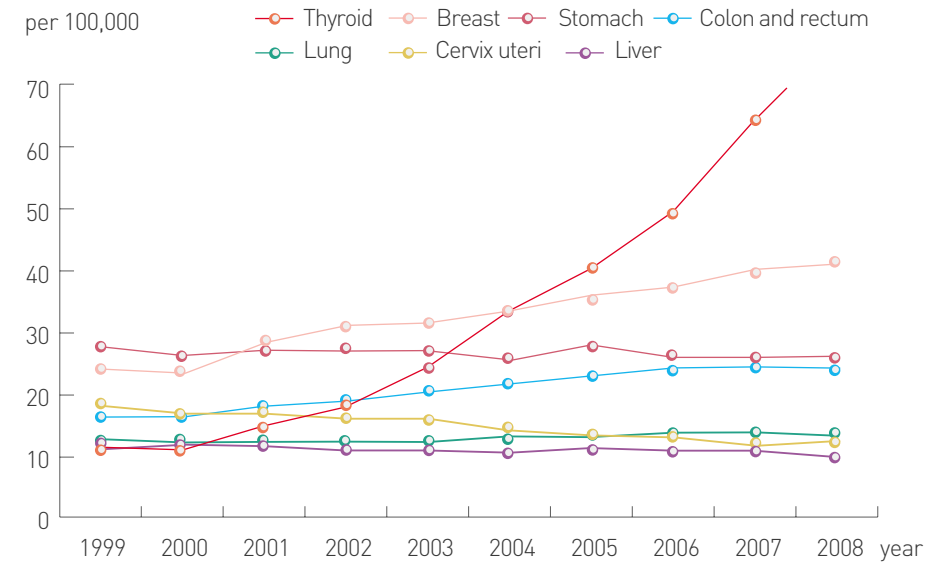
ncidence rate for all sites combined increased by 1.5% per year in males, and by 5.3% in females from 1999 to 2008. In males, oesophagus, liver and lung cancers decreased, while the rates of thyroid, prostate and colorectal cancers increased by 25.3%, 13.5%, and 6.9% respectively.

Females showed a decreasing tendency in the rates of cervix uteri and liver cancers. But, the rates of thyroid cancer sharply increased by 25.7% per year and the rates of breast, colorectal and lung cancers also increased.

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

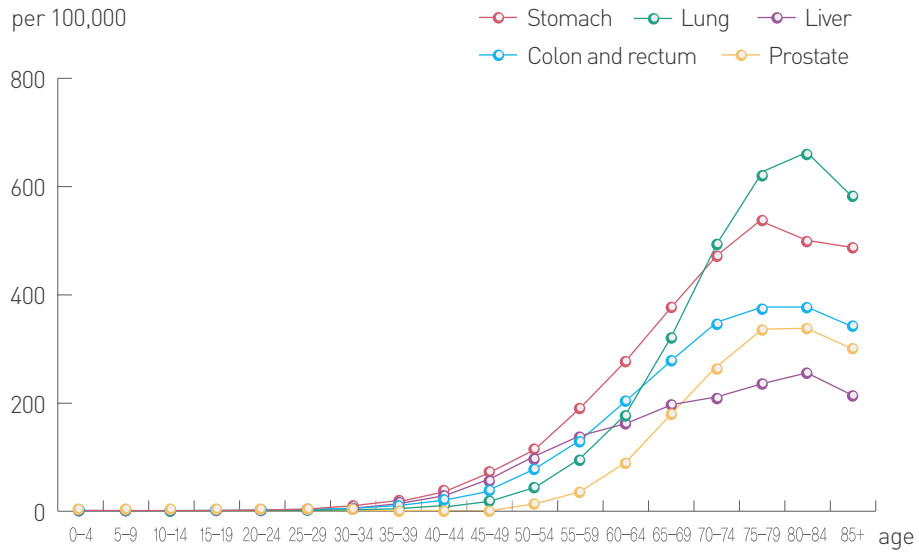


Trends of Age-standardized Incidence Rates in Major Cancers : Female

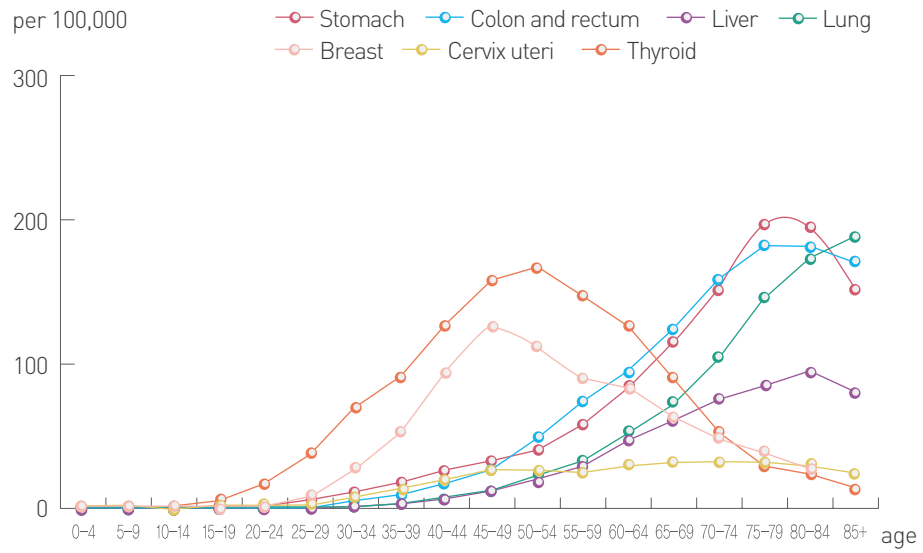


Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010
Note) Age-standardized incidence rate uses "mid-year population in 2000"as standard population.

Age-specific Cancer Incidence Rates : Male [2008]



Age-specific Cancer Incidence Rates : Female [2008]

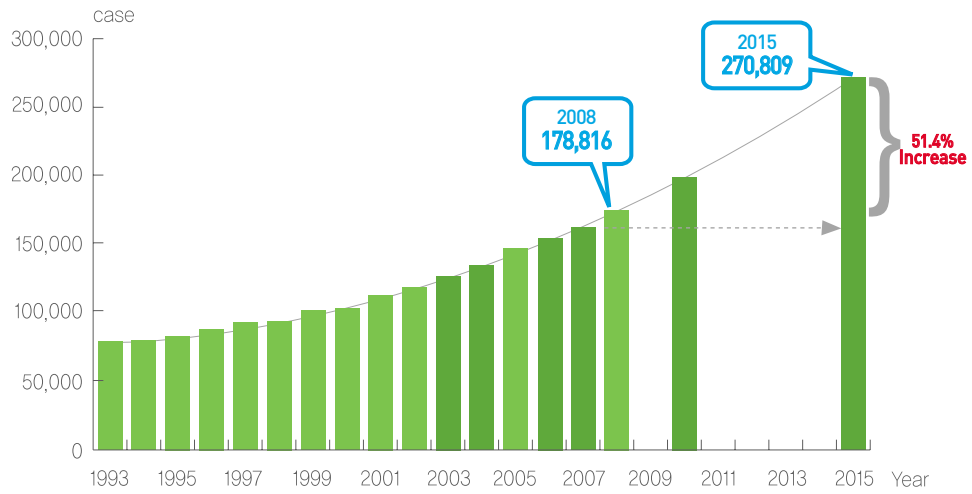


Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

Projection of Cancer Incident Cases

According to the projection, the total number of cancer cases is expected to increase from 178,816 in 2008 to 270,809 in 2015, showing a projected 51.4% increase over a seven-year period.

Projection of Cancer Incident Cases

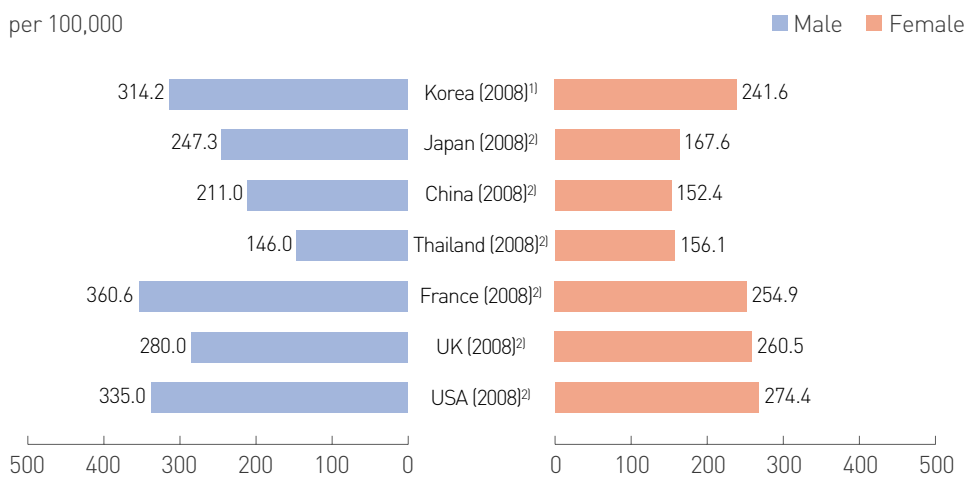


Source) National Cancer Center, 2010

International Comparison of Age-standardized Cancer Incidence Rates

When the age-standardized cancer incidence rate of Korea was compared with those of other countries, the rates of both males and females were the highest among Asian countries, while lower than those in the USA.

International Comparison of Cancer Incidence Rates



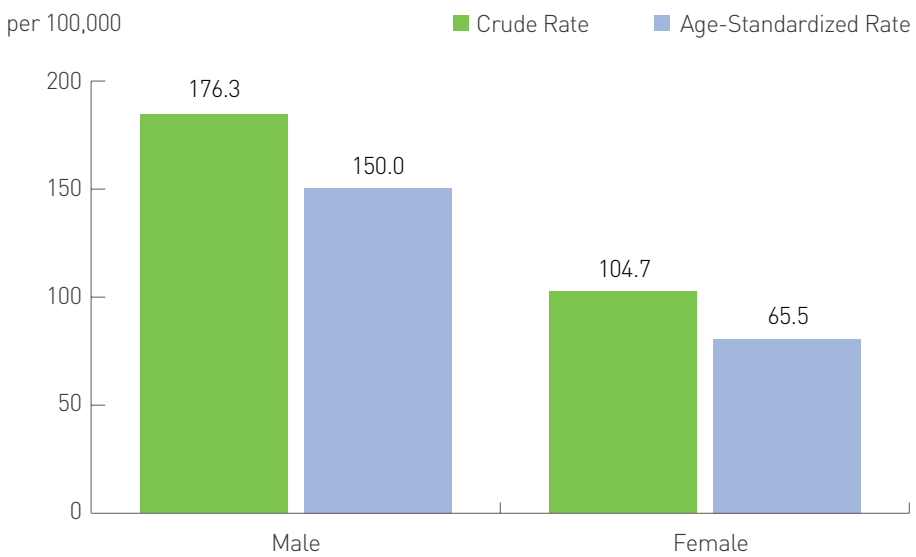
Source) 1. Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010
2. GLOBOCAN 2008, International Agency for Research on Cancer, 2010
Note) Age-standardized incidence rates using the world standard population, exclusedother malignant neoplasmsof skin (C44)

1.2 Cancer Mortality

Cancer Mortality Rates

The age-standardized cancer mortality rates of Korea in 2009 were 150.0 per 100,000 men and 65.5 per 100,000 women.

Cancer Mortality Rates [2009]

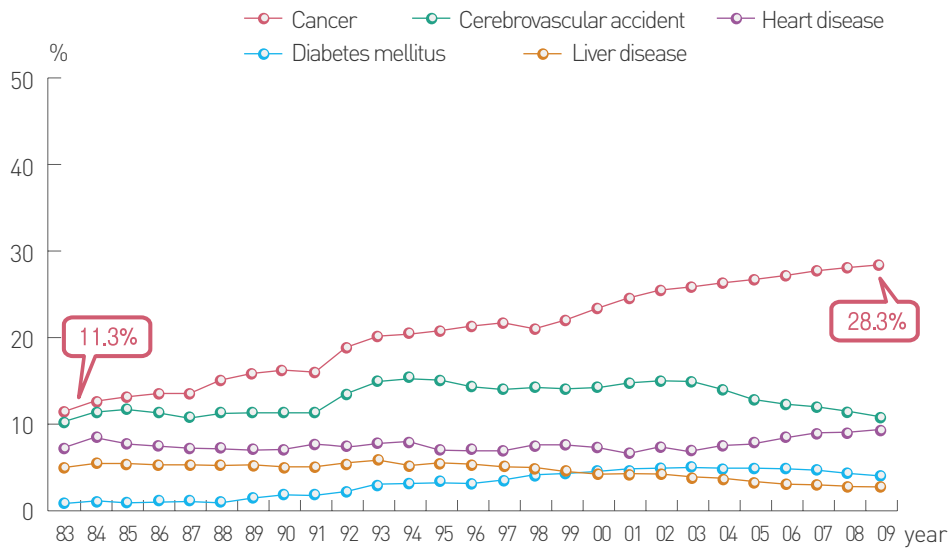


Source) STATISTICS KOREA, 2010
Note) Age-standardized incidence rate uses "mid-year population in 2000"as standard population.

Trends of 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 that year. Deaths from cancer have increased steadily and accounted for 28.3% of the total 246,942 deaths in 2009.

Trends of Diseases Deaths [1983-2009]



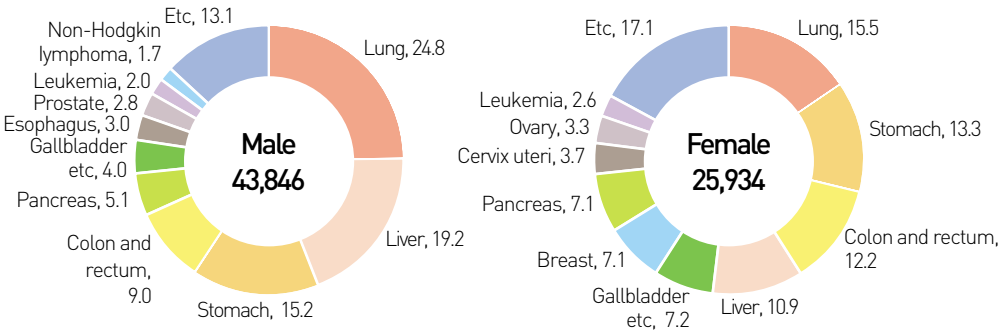
Source) STATISTICS KOREA, 2010

Proportion of Cancer Death

For the relative frequency of cancer deaths by sex in 2009, lung, liver, stomach and colorectal cancer accounted for 24.8%, 19.2%, 15.2% and 9.0% of cancer deaths in males, respectively.

In females, lung, stomach, colorectal and liver cancer accounted for 15.5%, 13.3%, 12.2% and 10.9% of cancer deaths, respectively.

Proportion of cancer death [2009]



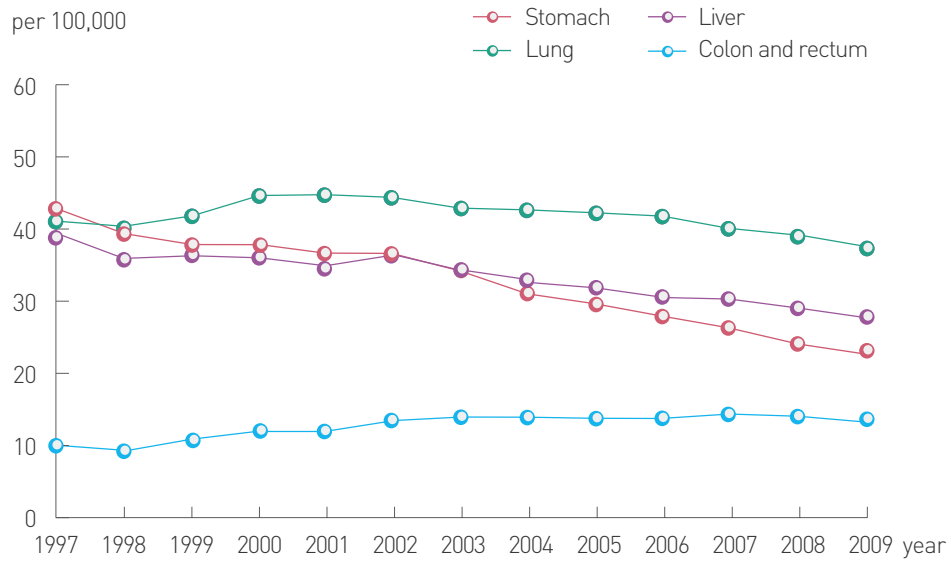
Source) STATISTICS KOREA, 2010
Note) Colon and rectum C18-C21 (International Classification of Diseases for Oncology, ICD-10),
Non Hodgkin lymphoma C82-C85 (International Classification of Diseases for Oncology, ICD-10)

Trends of Age-standardized Mortality Rates in Major Cancers

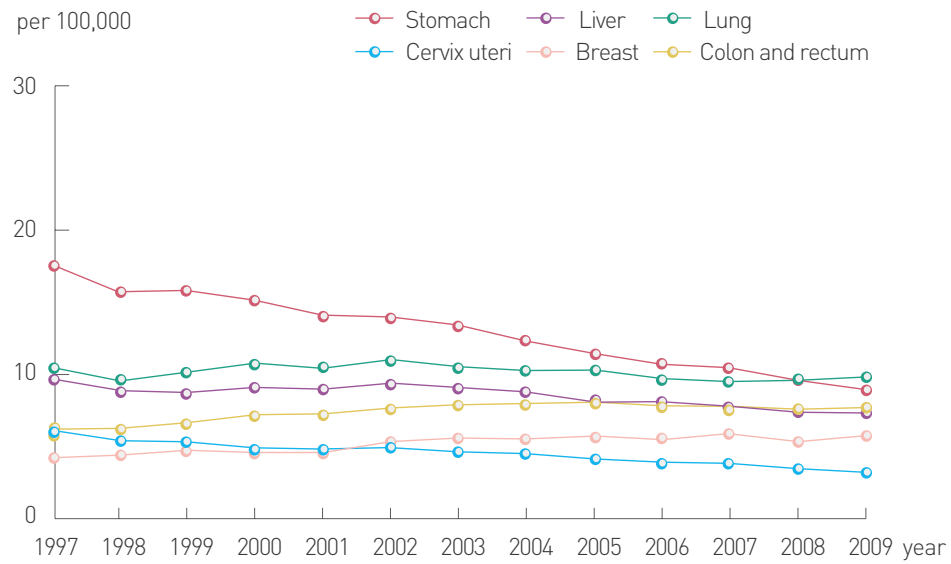
Regarding the trends of age-standardized mortality rates in males, the rates of stomach and liver cancer tended to fall but the rate of colorectal cancer has increased consistently. On the other hand, the rate of lung cancer in males has been decreasing since 2000.

The mortality rates of stomach cancer in females have shown the largest decrease. The rate of liver cancer has also decreased. In contrast, the rates of colorectal and breast cancer have increased gradually but the rate of cervix uteri cancer has tended to decline in females recently.

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

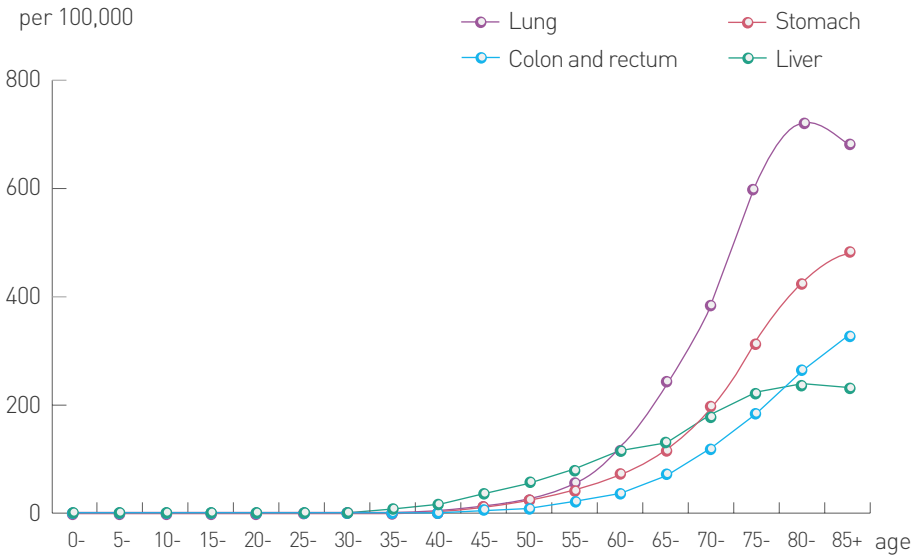


Trends of Age-standardized Mortality Rates in Major Cancers : Female

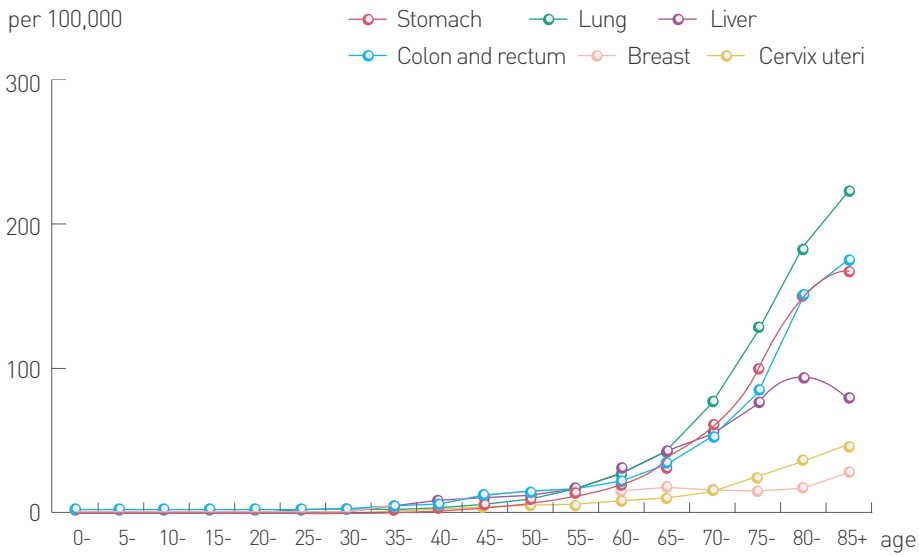


Source) STATISTICS KOREA, 2010
Note) Age-standardized incidence rate uses "mid-year population in 2000"as standard population.
Colon and rectum C18-C21 (International Classification of Diseases , ICO-10)

Age-specific Cancer Mortality Rates : Male [2009]



Age-specific Cancer Mortality Rates : Female [2009]

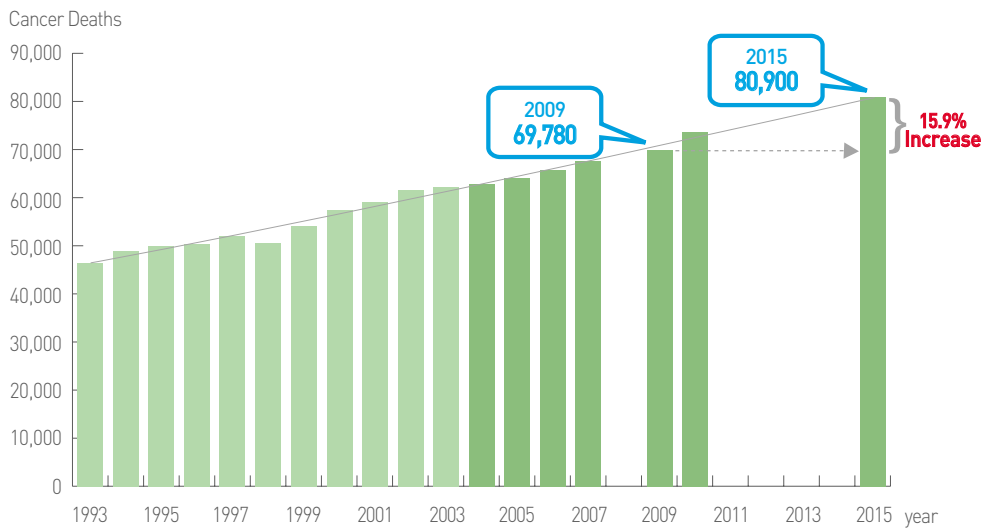


Source) STATISTICS KOREA, 2010
Note) Colon and rectum C18-C21 (International Classification of Diseases , ICO-10)

Projection of Cancer Deaths

According to the projection, the total number of cancer deaths is expected to increase from 69,780 in 2009 to 80,900 in 2015, indicating 15.9% increase in the next six-year period.

Projection of Cancer Deaths [1993-2015]



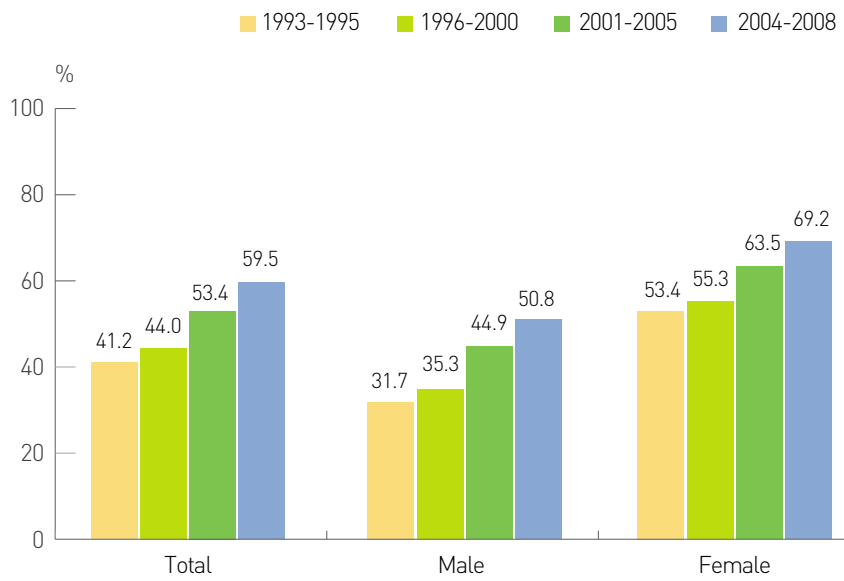
Source) National Cancer Center, 2010

1.3 Cancer Survival

Five-year Cancer Relative Survival Rates[2)]

The five-year cancer relative survival rates increased from 31.7% in 1993-1995 to 50.8% in 2004-2008 by 19.1% points in males and from 53.4% in 1993-1995 to 69.2% in 2004-2008 by 15.8% points in females.

Five-year Cancer Relative Survival Rates [1993-2008]



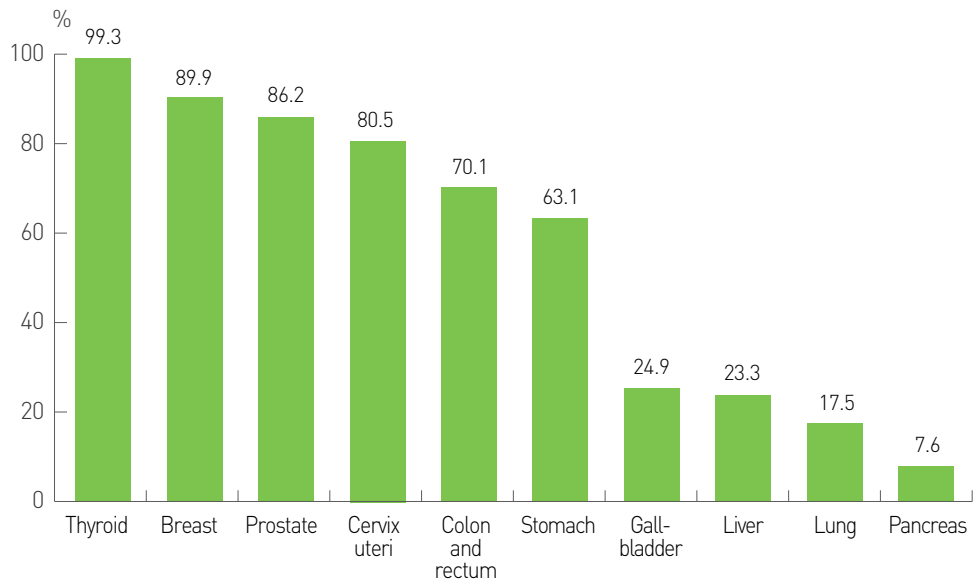
Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

2) Cancer relative survival rate : The rate was calculated by dividing the observed survival rates of the disease of interest by expected survival rates of general people of the same gender and age. It accounts for the effects of deaths from other cause.

Five-year Relative Survival Rates by Major Cancer Sites

The five-year relative survival rates by cancer sites were 99.3%, 89.9%, 86.2%, 80.5% and 70.1% for thyroid, breast, prostate, cervix uteri and colorectal cancers, respectively.

Five-year Relative Survival Rates by Major Cancer Sites [2004-2008]



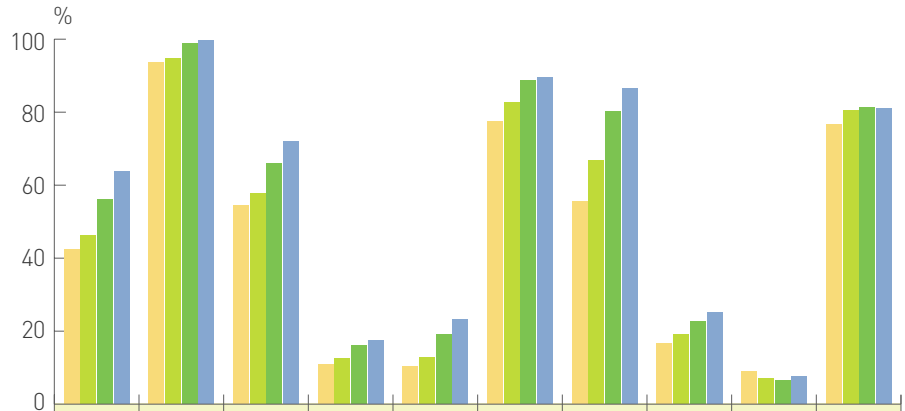
Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

Comparison of Five-year Relative Survival Rates

When the five-year relative survival rates of all cancers combined were studied by period, they increased from 41.2% in 1993-1995 to 59.5% in 2004-2008 by 18.3% points.

Prostate cancer showed the greatest improvement in the survival rates with 30.3% points increase in 2004-2008 compared to 1993-1995 followed by stomach and colorectal cancers recording the enhancement of 20.3% points and 15.3% points, respectively. The relative survival rates of all major cancers improved, except for pancreas.

Comparison of Five-year Relative Survival Rates [1993-2008]



	Stomach	Tyroid	Colon&rectum	Lung	Liver	Breast	Prostate	Gallbladder	Pancreas	Cervix uteri
1993-1995	42.8	94.2	54.8	11.3	10.7	77.9	55.9	17.3	9.4	77.5
1996-2000	46.6	94.9	58.0	12.7	13.2	83.2	67.2	19.7	7.6	80.0
2001-2005	57.4	98.1	66.3	15.8	19.7	88.2	79.5	22.3	7.5	81.0
2004-2008	63.1	99.3	70.1	17.5	23.3	89.9	86.2	24.9	7.6	80.5
variance	20.3	5.1	15.3	6.2	12.6	12.0	30.3	7.6	-1.8	3.0

Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

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

The five-year relative survival rates of cancers, which are found more frequently in Korea among major cancers, such as stomach, cervix uteri and liver cancers in Korea, were higher than those in the USA or Canada.

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

(unit : %)

Site	Korea ('96-'00)	Korea ('01-'05)	Korea ('04-'08)	USA[1] ('99-'06)	Canada[2] ('04-'08)	Japan[3] ('97-'99)
All cancers	44.0	53.4	59.5	66.0	62	54.3
Stomach	46.6	57.4	63.1	26.0	22	62.1
Liver	13.2	19.7	23.3	13.8	15	23.1
Cervix uteri	80.0	81.0	80.5	70.2	70	71.5
Colon and rectum	58.0	66.3	70.1	65.0	61	65.2
Thyroid	94.9	98.1	99.3	97.3	97	92.4
Breast	83.2	88.2	89.9	89.0	82	85.5
Lung	12.7	15.8	17.5	15.8	12	25.6
Pancreas	7.6	7.5	7.6	5.6	6	6.7
Prostate	67.2	79.5	86.2	99.1	95	75.5

Source) 1) Horner MJ, RiesLAG, KrapchoM, NeymanN, AminouR, HowladerN, etal (eds). SEER Cancer Statistics Review, 1975-2007, National Cancer Institute. 2010
2) Canadian Cancer Registry, Statistics Canada and Provincial/Territorial Cancer Registries. Available from: http://www.statcan.gc.ca/pub/82-003-x/2010003/article/11334/tbl/tbl01-eng.htm
3) National Cancer Center in Japan. Cancer Statistics in Japan, 2009

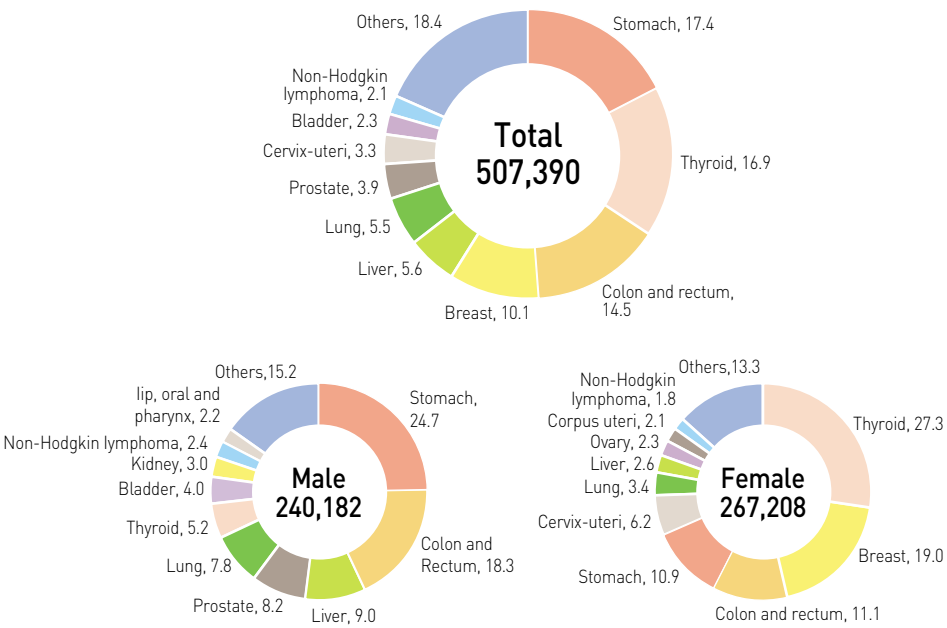
1.4 Cancer Prevalence

Five-year Cancer Prevalence

The number of five-year cancer prevalence was 507,390 patients in 2008, Stomach were shown the most highest prevalent cancer sites and the followings were shown by the order of thyroid, colorectal, breast, liver, lung cancer.

Five year Cancer Prevalence [2008]

(unit : %)

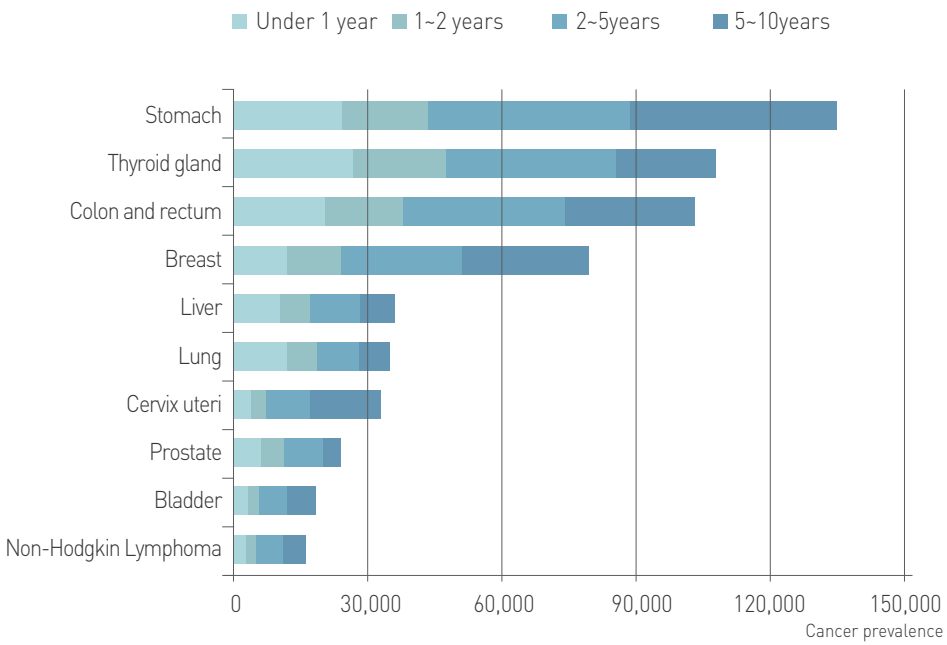


Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

Cancer Prevalence by Time since Diagnosis

For all cancers combined, the 1- to 2-year prevalence represented 37% of the total prevalent cases. The 1-to 2-year prevalence as a percentage of the total was highest for thyroid cancer (18%) followed by stomach (16%), and colorectal cancer (14%), which has high incidence rates and a good prognosis. For all cancers combined, the 2- to 5-year prevalence and the 5- to 10-year prevalence constituted 33%, 30% of the total prevalence in both sexes, respectively. The long-term prevalence of lung and liver cancer was relatively low due to lower survival.

Cancer Prevalence by prevalence period



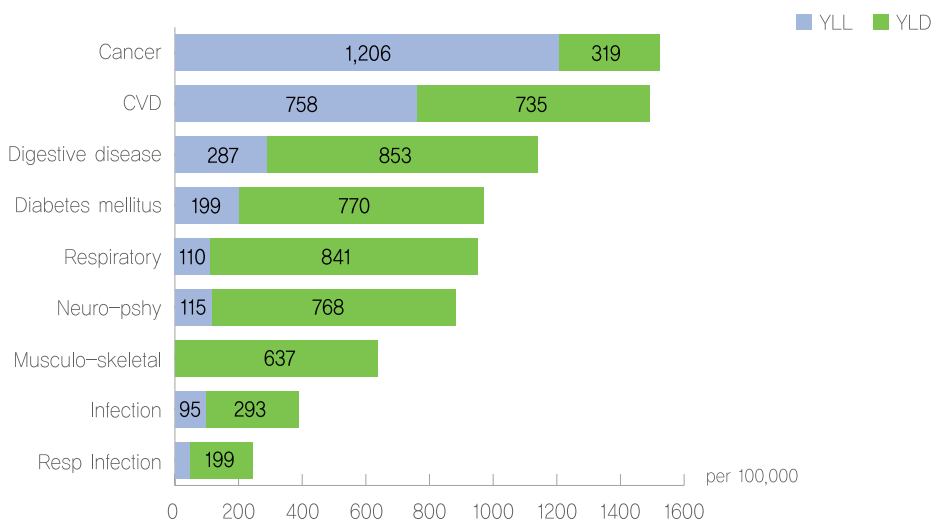
Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

1.5 Disability Adjusted Life Years (DALY) related Cancer

DALY of Major Diseases

For the disability adjusted life years (DALY) of major diseases in Korea, cancer recorded the largest DALY with 1,525 person-years, followed by cardiovascular and digestive diseases 1,493 and 1,140 respectively.

Disability Adjusted Life Years (DALY) of Major Diseases

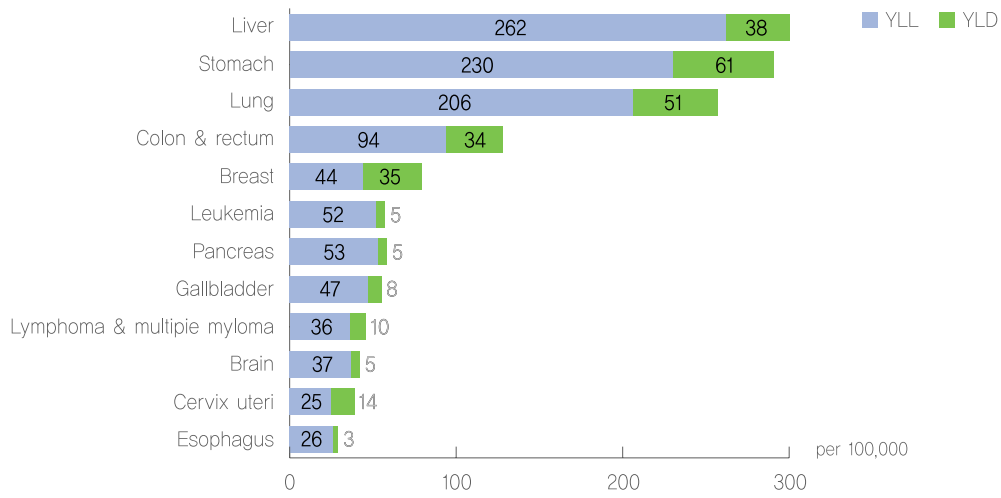


Source) Ministry of health and welfare, 2006
Note) YLL (Years Life Lost due to premature death), YLD (Years of Lived with Disability)

DALY by Cancer Sites

The DALY by cancer site were 300, 291, 257, 128 and 79 person-years for liver, stomach, bronchus and lung, colon & rectum and breast cancer, respectively.

Disability Adjusted Life Years (DALY) by Cancer Sites



Source) Yoon SJ et al, J Korean Med Sci, 2002
Note) DALY (Disability Adjusted Life Years) = YLL+ YLD

Chapter 2.
Cancer Prevention

Cancer Facts & Figures 2011

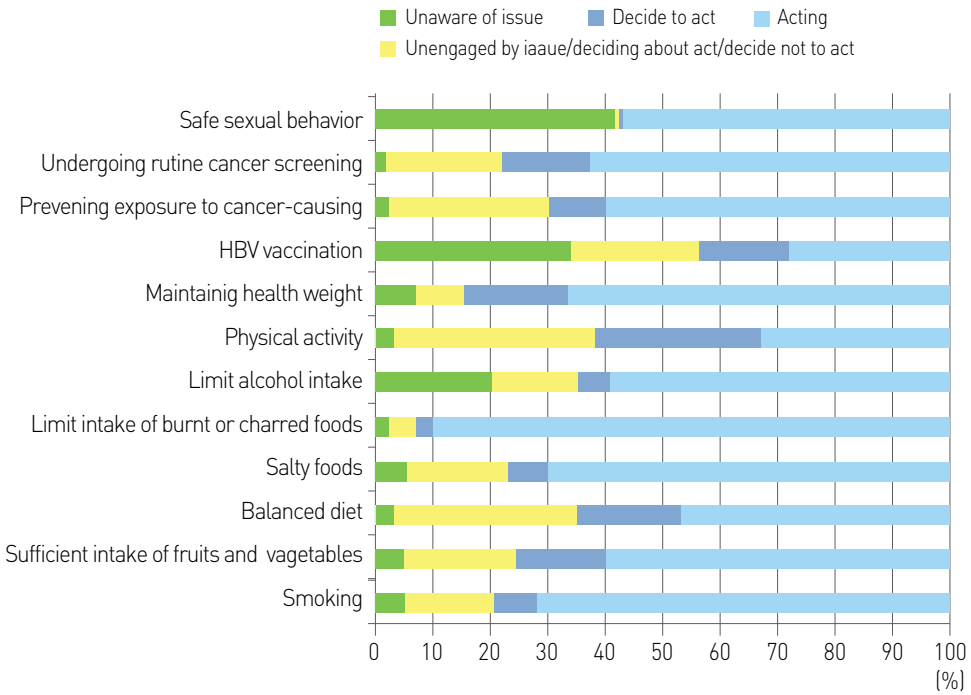
2.1 General Outline

The Awareness on the '10 Codes of Conduct for Cancer Prevention' in 2010

The awareness and practice on '10 codes of conduct for cancer prevention' was investigated with 1,006 adult males and females of age 19 or older. Among them, 90.2% and 70.2% avoided burnt foods and salty foods, respectively. 72.0% was non-smoker.

- 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

The Awareness on the '10 codes of Conduct for Cancer Prevention' in 2010



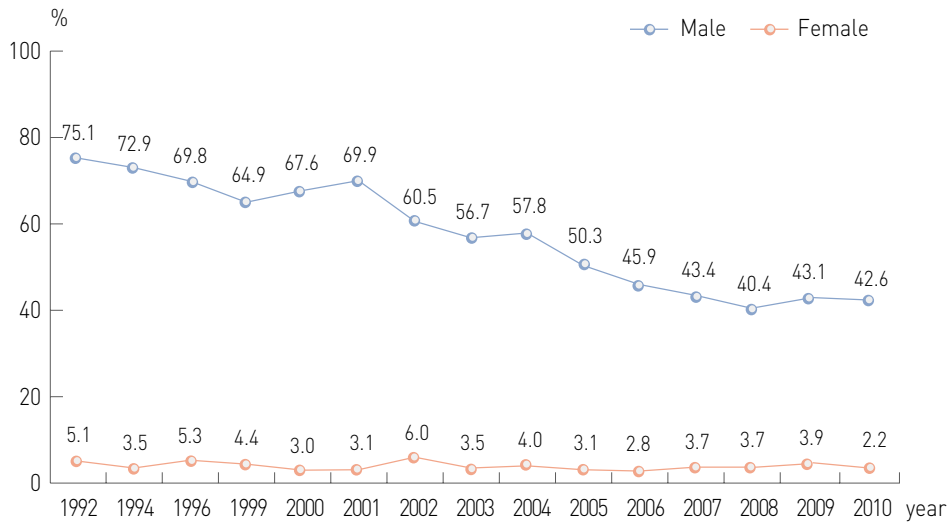
Source) The Survey on Awareness and Behavior for Cancer Prevention, National Cancer Center Korea, 2010

2.2 Smoking

Trends of Smoking Rates

In Korea, smoking rates of males have tended to be decreased from 75.1% in 1992 to 42.6% in 2010, although it is still high comparing with other hight-resource country.

Trends on Smoking Rates 1992-2010

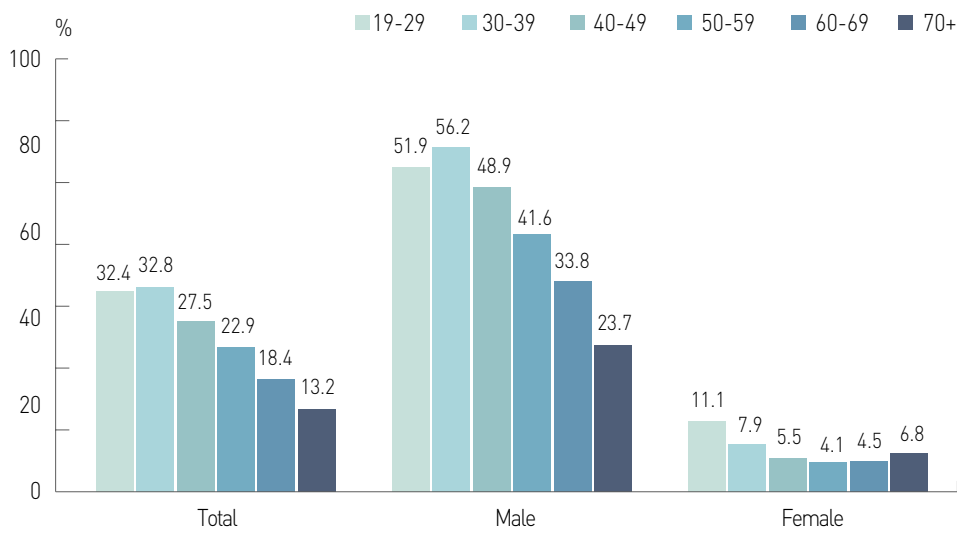


Source) Korean Association of Smoking and Health, 2010

Current Smoking Rates by Age

Current smoking rates of people who were over 19 years old in 2009 were 27.2%[male 46.9% and female 7.1%].
The age with highest rate of male and female are the 30's and 20's, respectively. As age was lower, current smoking rates were higher.

Current Smoking Rates by Age in 2009

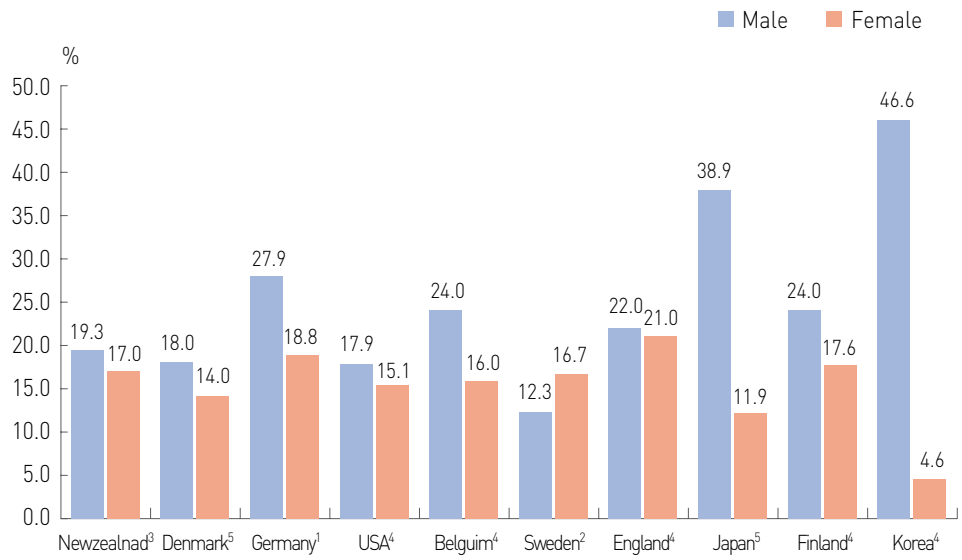


Source) Korean National Health and Nutrition Examination Survey, 2010

The Rate of Daily Smokers in OECD Countries : Adults

Among male, the rate of daily smokers in Korea was considerably higher than in other OECD Countries. It was 46.6% and 4.6% in male and female, respectively.

Comparison of Daily Smoking Rates of Adult among OECD Countries

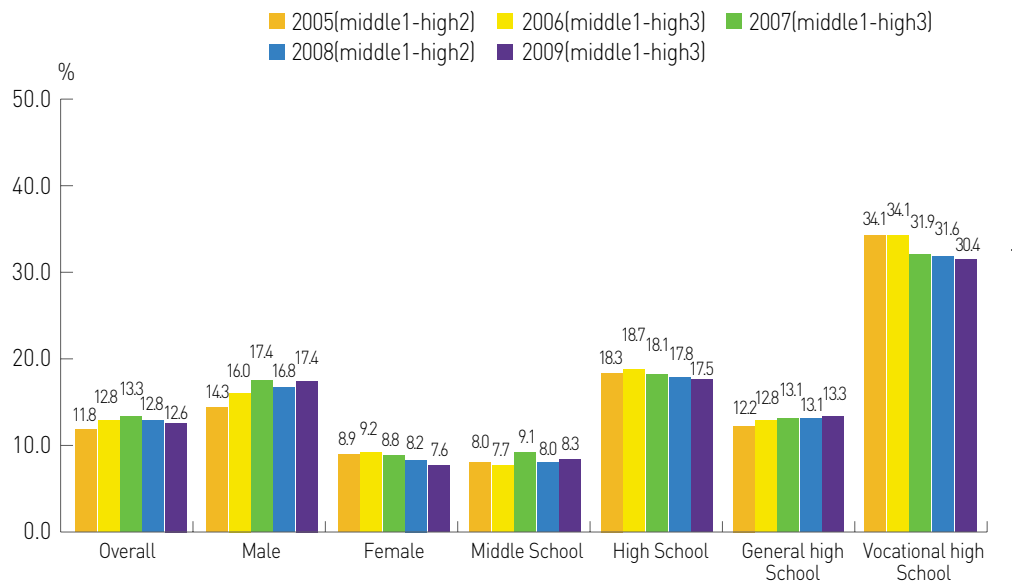


Source) OECD Health Data, OECD2010
Note) 1. [1]: 2005 [2] : 2006 [3] : 2007 [4] : 2008 [5] : 2009
2. age : 15 or older

The Rate of Current Smoker in Adolescents

The rate of current smoker[1)] was higher in boys(17.4%) than female(7.6%). In addition, Vocational high school students showed high level of smoking rate, approximately 2.5 fold higher than in general high school students.

The rate of current smoker in adolescents



Source) Youth Behavior Risk Factor Surveillance, Korea Center for Disease Control and Prevention, 2005-2009

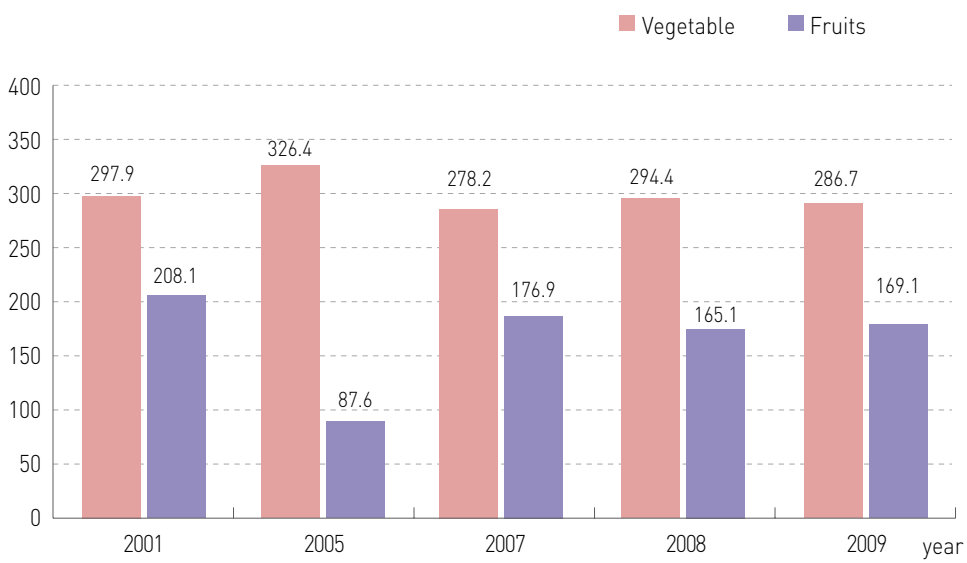
1) Current Smoker : person who smoked once or more for last month

2.3 Intake of Vegetables and Fruits

Average Amount of Vegetables and Fruits Intake in Adults

In vegetable intake, one person per day ate 286.7g/day in 2009 and fruits was 169.1g/day.

Average amount of Vegetables and Fruits Intake in Adults

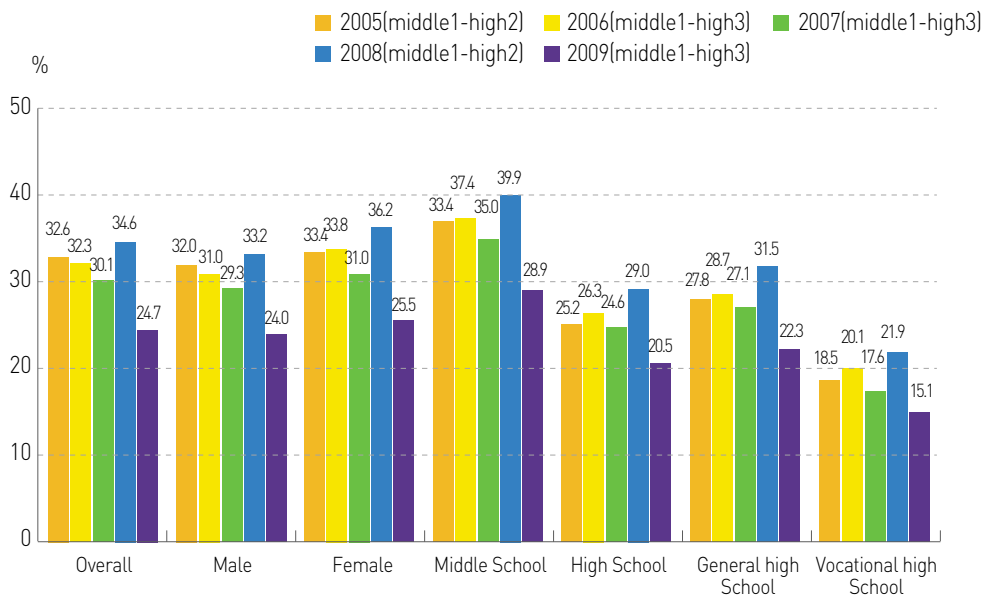


Source) Korean National Health and Nutrition Examination Survey, 2010
Note) Survey period : Nov.~Dec. of 1998, 2007 / Apr.~May of 2005 / Jan. of 2007 ~ Jul. of 2008 / Jan.~Dec. of 2008 /Jan.~Dec. of 2009

Percentage of Fruit Intake more than 1 serve/day in Adolescents

Percentage of fruit intake more than 1 serve/day in adolescent was 24.7% (24.0% in boys and 25.5% in girls in 2009). Percentage of fruit intake is likely to be decreased for recent 5 years.

Percentage of fruit intake more than 1 serve/day in adolescents



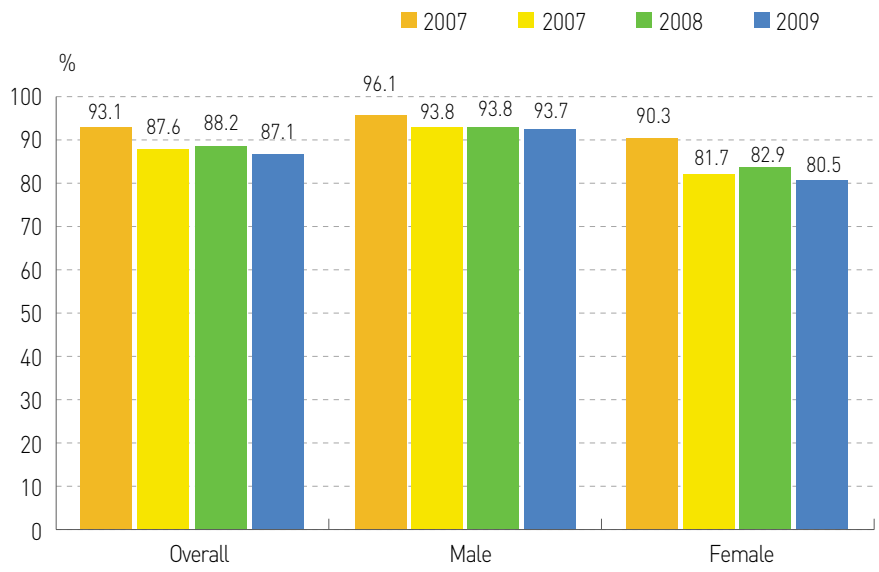
Source) Youth Behavior Risk Factor Surveillance, Korea Center for Disease Control and Prevention, 2005-2009

2.4 Intake of Sodium

Percentage of Sodium Intake more than 2,000mg/day in Adults

In 2009, percentage of sodium intake more than 2,000mg/day was about 87.1% in adult population(93.7% in male and 80.5% in female). Percentage of over sodium intake in male was higher than do in female.

Percentage of sodium intake more than 2,000mg/day in adults



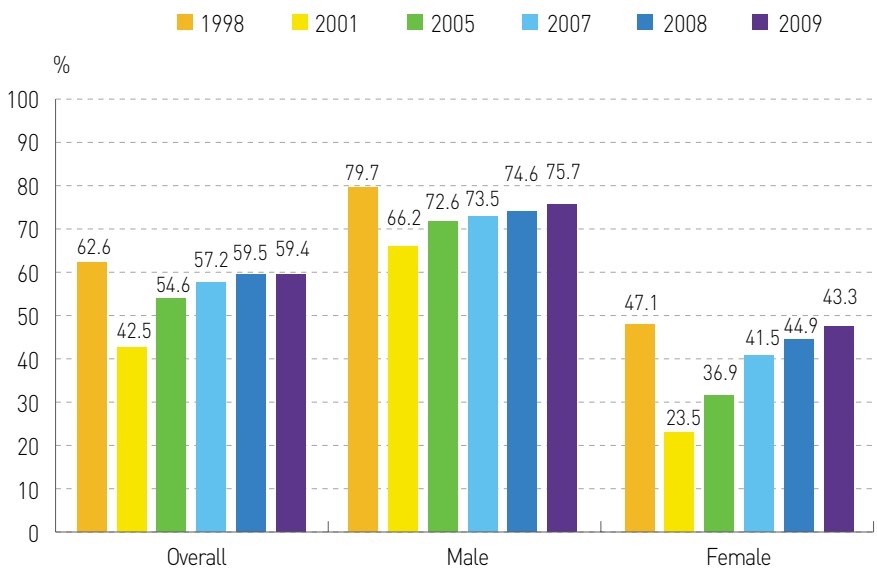
Source) Korean National Health and Nutrition Examination Survey, 2010
Note) Target amount of sodiun intake : less than 2,000mg (Suggested by Korean Nutrition Society, 2005)

2.5 Alcohol Drinking

The Rate of Alcohol Drinkers by Month[2)]

The rates of adult alcohol drinkers by month is likely to be increased for recent 7 years. Monthly drinking rate in male was higher than in female.

The Rates of Alcohol Drinkers by Month



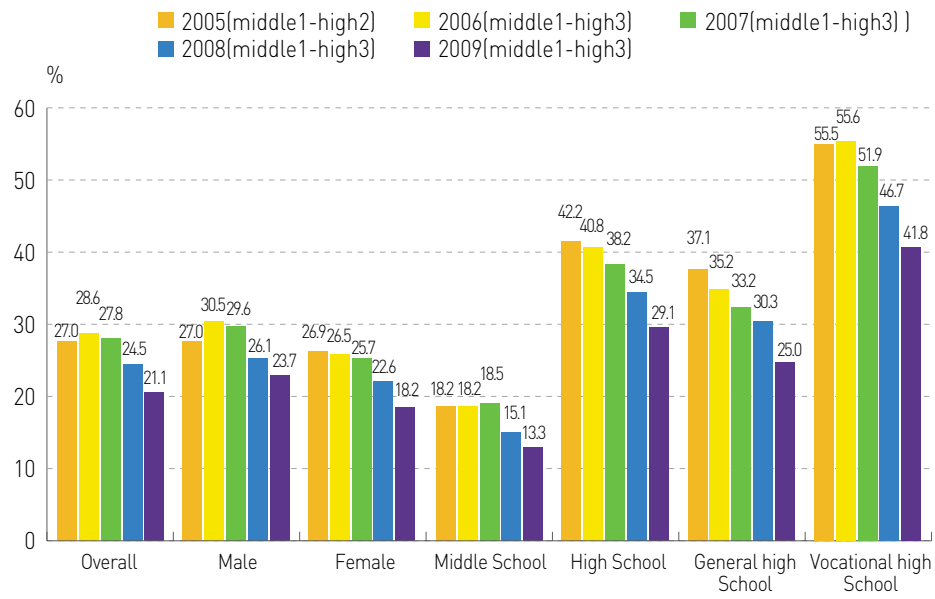
Source) Korean National Health and Nutrition Examination Survey, 2010

2) The rate of alcohol drinkers by month: A rate of adults aged 19 or more years who have drunk one or more glasses every glasses every month for the last one year.

The Rate of Current Drinker in Adolescents

The overall rate of current drinker[3] in adolescents was 21.2% (23.7% in boys and 18.2% in girls).

The rate of current drinker in adolescents



Source) Youth Behavior Risk Factor Surveillance, Korea Center for Disease Control and Prevention, 2005-2009

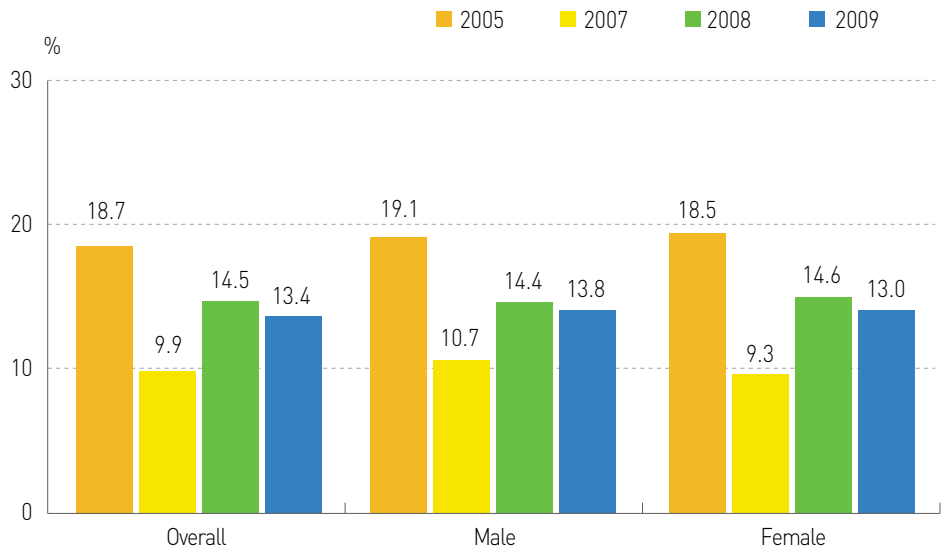
3) The rate of current drinker in adolescents : A rate of adolescents aged 13~18 years who have drunk one or more glasses for the last month

2.6 Physical Activity

Moderate-intensity Physical Activity Rate[4] in adults

n Korea, the Moderate-Intensity Physical Activity Rate was 13.4%. The rate in males(13.8%) was similar to do in female(13%).

Moderate-intensity Physical Activity Rates



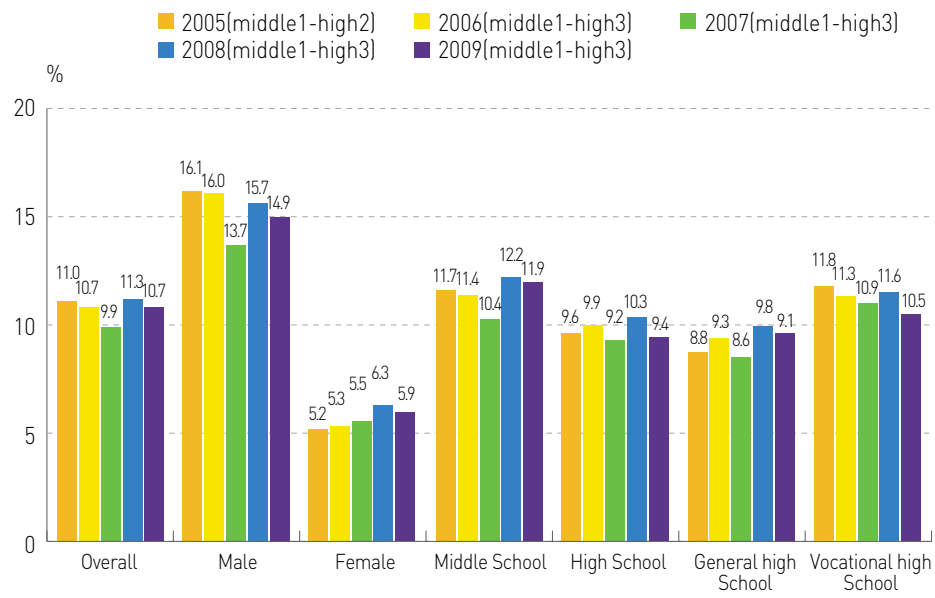
Source) Korean National Health and Nutrition Examination Survey, 2010
Note) 1. Goal of Health Plan 2010 : recommended engaging in a moderate-intensity physical activity at least 30 minutes on 5days of the week
2. Age standardized rates based on the 2005 Korean population

4) Moderate-intensity Physical Activity Rate : The rates for people who performed moderate-intensity physical activities more than 30 mins per once or 5 days per week with breathe fast or harder than normal conditions. (age: 19 or older)

The Rate of Moderate-intensity Physical Activity in Adolescents[5)]

In 2009, adolescents' the Moderate-Intensity Physical Activity Rate was 10.7% in total(14.9% in boys and 5.9% in girls).

The rate of moderate-intensity physical activity in adolescents



Source) Youth Behavior Risk Factor Surveillance, Korea Center for Disease Control and Prevention, 2005-2009

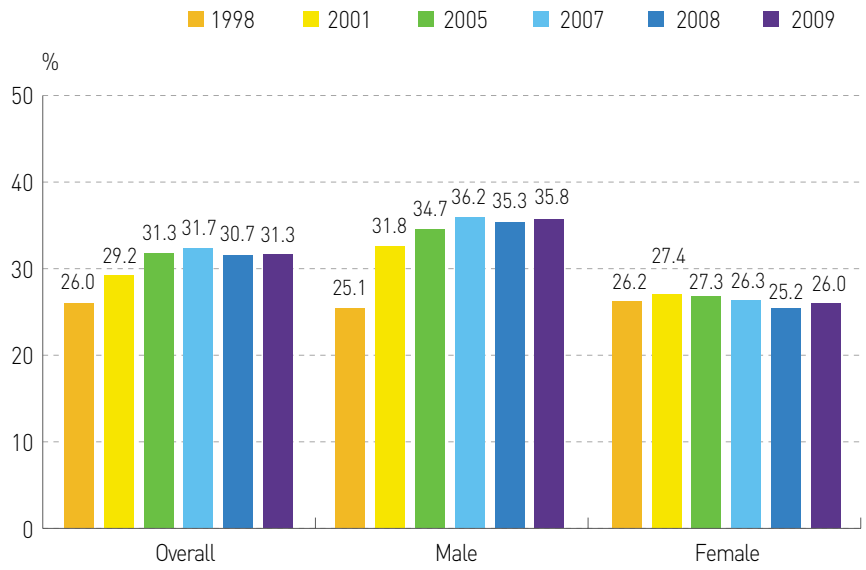
5) The rate of moderate-intensity physical activity in adolescents : The percentage of adolescent aged 13~18 years who conduct moderate-intensity physical activity (ping-pong, carrying light materials, swimming slowly, Volleyball and badminton not having a match and others] for more than 30 minutes for 5 or more days per week

2.7 Obesity

Prevalence of Obesity in Adults

In korea, age-standardized prevalence of obesity in adults tended to increase from 26.0% in 1998 to 31.3% in 2009. In particular, obesity prevalence in male is likely to be increased for 10 years.

Prevalence of Obesity

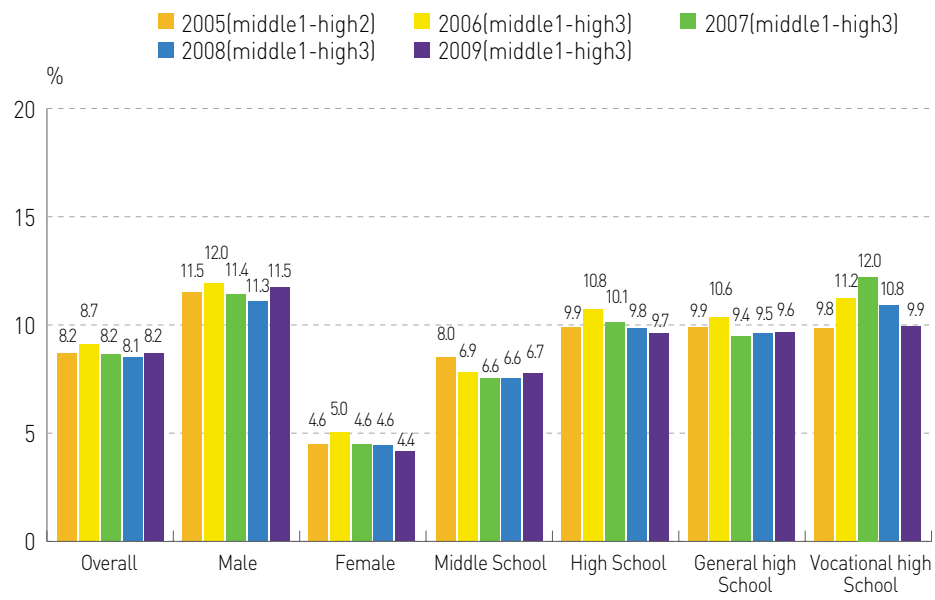


Source) Korea National Health and Nutrition Examination Survey, 2010
Note) 1. Age-standardized rates based on the 2005 Korean population
2. Obesity : Body Mass Index(BMI) ≥ 25

The Rate of Obesity in Adolescents[6)]

In 2009, the rate of obesity in adolescents was 8.2 in total(11.5% in boys and 4.4 in girls).

The rate of obesity in adolescents



Source) Youth Behavior Risk Factor Surveillance, Korea Center for Disease Control and Prevention, 2005-2009

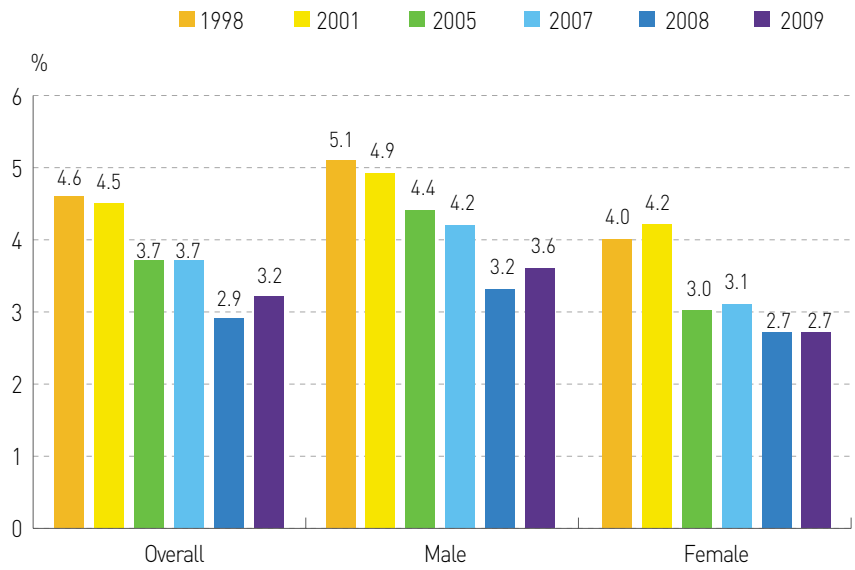
6) The rate of obesity : the percentage of adolescents aged 13~18 years who are more than 95% in BMI distribution or more than 25 BMI.

2.8 Hepatitis B Virus Infection

HBsAg Seropositivity

The age-standardized rate of positivity to hepatitis B surface antigens decreased from 4.6% in 1998 to 3.2% in 2009. The rate was higher in males (3.6%) than in females(2.7%).

Trends in HBsAg Sero-positivity (Aged ten years or more)



Source) Korea National Health and Nutrition Examination Survey, 2010
Note) Age standardized rates based on the 2005 Korean population

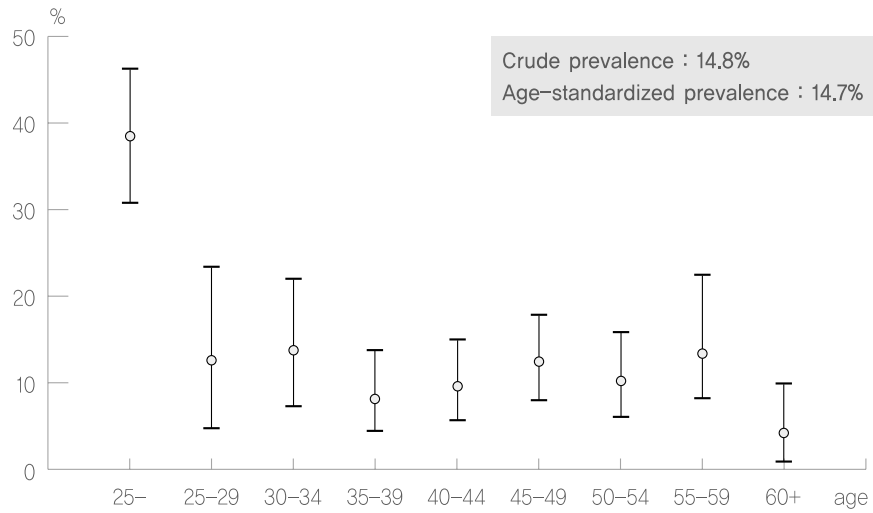
2.9 Human Papillomavirus (HPV) Infection

Prevalence of HPV Infection

he human Papilloma Virus(HPV) has been demonstrated to be a necessary cause of cervical cancer and is also related to the incidence of vulvar, vaginal, penis, anal and oropharyngeal cancer.

HPV infections are very common in Korea and its age-standardized prevalence was as 14.7% from the study results with a study on a representative female population. Moreover, it was highest in females aged less than 25 years.

Prevalence of Human Papillomavirus(HPV) Infection



Source) Shin et al. Int J Cancer 2003, Shin et al. J Infect Dis 2004

2.10 Occupational Cancer

Occupational Cancer Cases

Confirmed occupational cancer cases from epidemiologic investigations conducted by OSHIRI[7] of KOSHA[8] were 110 from 1992 to 2008.

Occupational cancer cases from epidemiologic investigation of OSHIRI, KOSHA

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

Source) Eun-A Kim et al. Safety and Health at Work 2010;1;61-68

7) OSHIRI : Occupational Safety and Health Institute
8) KOSHA : Korea Occupational Safety and Health Agency

Chapter 3.
Cancer Screening Program

Cancer Facts & Figures 2011

3.1 Cancer Screening Rates

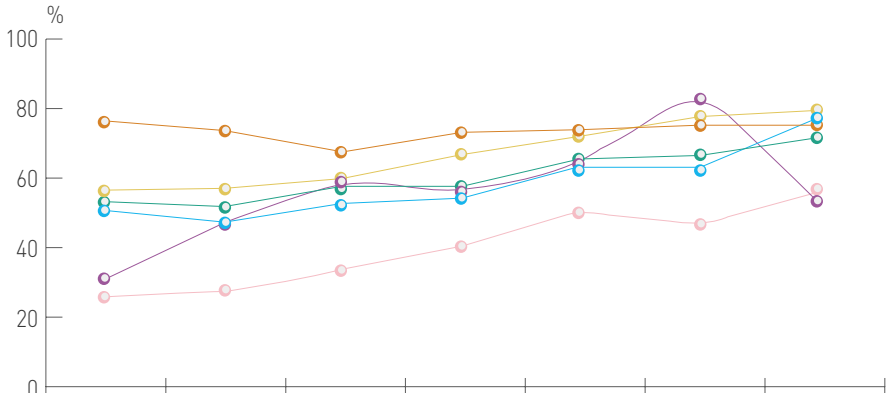
- Korean National Cancer Screening Survey 2004~2010 -

Cancer Screening Rates

The average lifetime screening rate of the 5 major cancers of the National Cancer Screening Program in 2010 was 72.1%. The average cancer screening rate with recommendations was 56.6%. It had increased [1.46 times versus 2004].

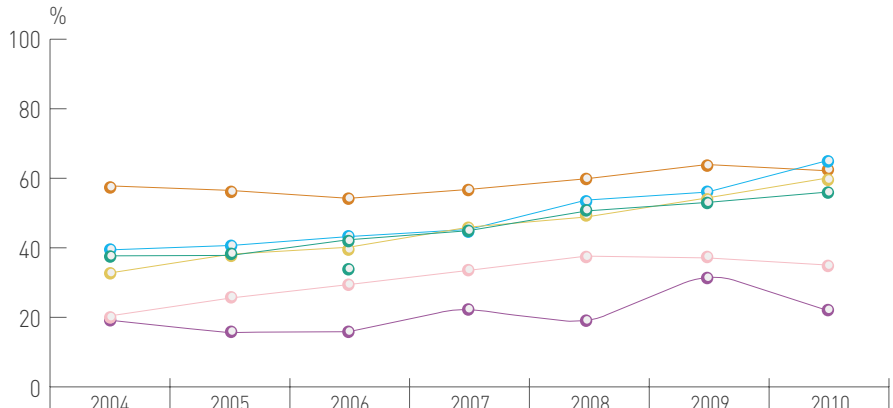
In addition, the cancer screening rates with recommendations were shown in the following order: stomach cancer[65.1%], cervical cancer[62.9%], breast cancer[61.1%], colon & rectum cancer[35.5%], and high-risk group of liver cancer[22.9%].

Lifetime Cancer Screening Rates (2004-2010)



	2004	2005	2006	2007	2008	2009	2010
Mean	51.4	25.4	55.7	58.9	65.7	66.9	72.1
Stomach	52.0	48.5	53.5	55.3	65.0	65.1	76.7
Liver	31.8	47.7	58.3	57.6	64.8	81.3	54.2
Colon & rectum	25.3	27.9	34.0	40.7	50.4	48.1	57.1
Breast	55.9	57.4	60.2	66.4	72.7	78.1	79.5
Cervix uteri	76.8	74.0	68.0	73.6	74.4	76.1	75.0

Cancer Screening Rates with Recommendations (2004~2010)



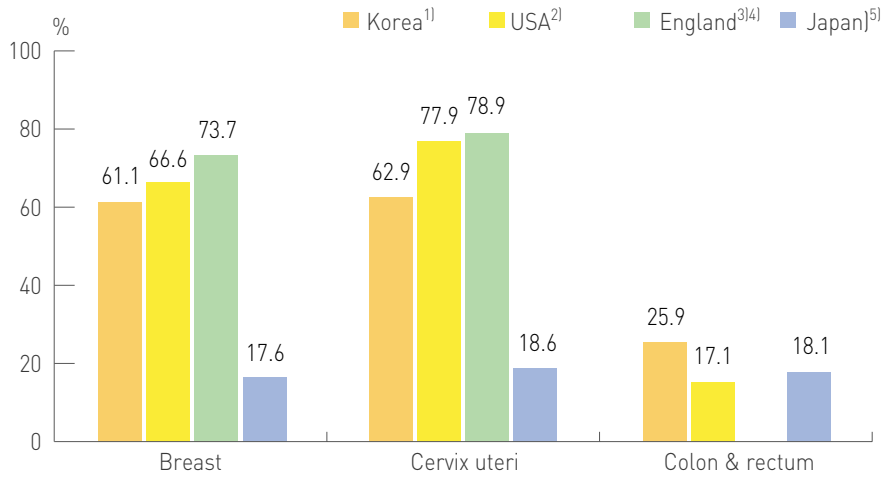
	2004	2005	2006	2007	2008	2009	2010
Mean	38.8	40.3	42.3	45.6	50.7	53.3	56.6
Stomach	39.2	39.4	43.3	45.6	53.5	56.9	65.1
Liver	20.0	16.3	16.5	22.7	19.7	31.3	22.9
Colon & rectum	19.9	25.4	29.4	34.1	37.9	36.7	35.5
Breast	33.2	38.4	40.6	45.8	49.3	55.2	61.1
Cervix uteri	58.3	57.0	54.9	57.0	59.9	63.9	62.9

Source) Korean National Cancer Screening Survey, 2004-2010

International Comparison of Cancer Screening Rates

A comparison of the cancer screening rates with recommendations in Korea with those in other countries showed that the rates of breast(61.1%) and cervix uteri cancer(62.9%) in Korea were lower than those of England and the USA; 73.7%, and 78.9 in England, and 66.6%, and 77.9% in USA, respectively.

Cancer Screening Rates: International Comparison



		Korea [1)]	USA [2)]	England [3)4)]	Japan [5)]
Breast	Cancer Screening Rates	61.1%	66.6%	73.7%	17.6%
	Target Population	40 & over	40 & over	45-74	40 & over
	Interval	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	62.9%	77.9%	78.9%	18.9%
	Target Population	30 & over	18 & over	25-64	20 & over
	Interval	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	25.9%	17.1%	-	18.1%
	Target Population	50 & over	50 & over	60-69	40 & over
	Interval	every 1 year	every 2 years	every 2 years	every 1 year
	Test or Procedure	FOBT	FOBT	FOBT	FOBT

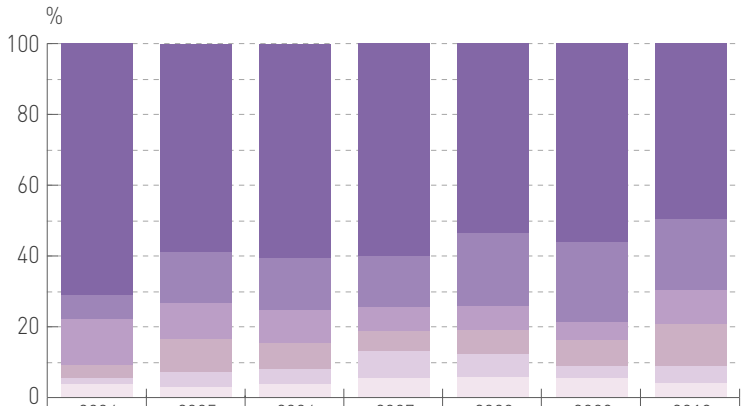
Source) 1) Korean National Cancer Screening Survey, 2004-2010
2) National Cancer Institute. Cancer Trends Progress Report, 2010
3) NHS Cancer Screening Programmes. NHS Breast Screening ProgrammeAnnual Review, 2009
4) NHS Cancer Screening Programmes. NHS Cervical Screening ProgrammeAnnual Review, 2009
5) Health Statistics in Japan, 2007

Note) CBE(Clinical breast examination), FOBT(Fecal occult blood test)

Reasons for Non-attendance for Cancer Screening

'Belief of healthiness' was pointed out by the largest number of subjects as a major reason for not having been screened. The subjects answering 'belief of healthiness' as the reason accounted for almost half on the total subjects but their rate tended to decrease(71.2% in 2004 to 45.8% in 2010). However, the proportion of subjects answering 'time constraints to be screened' showed an increasing tendency.

Reasons for Never Being Screened of Any Cancer (2004~2010)



	2004	2005	2006	2007	2008	2009	2010
Belief of healthiness	71.2	59.0	60.7	60.1	53.6	56.9	45.8
Time constraints to be screened	6.8	14.2	14.5	14.4	20.6	22.2	23.1
Too expensive	12.9	10.2	9.5	6.7	6.8	5.6	11.3
Too painful, unpleasant	3.7	9.4	7.4	5.8	6.8	6.8	12.2
Fear of detection	1.7	4.3	4.3	7.5	6.3	4.0	4.9
Others	3.8	2.9	3.7	5.5	5.9	4.5	2.8

Source) Korean National Cancer Screening Survey, 2004-2010

3.2 National Cancer Screening Program

- Performance from 2002 to 2009 -

Guideline of 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*	6 months	Sonography & AFP
Colon & rectum	Age 50 & over	1 year	FOBT: in case of an abnormal result, Colonoscopy or DCBE
Breast	Age 40 & over women	2 years	Mammography
Cervix uteri	Age 30 & over women	2 years	Pap smear

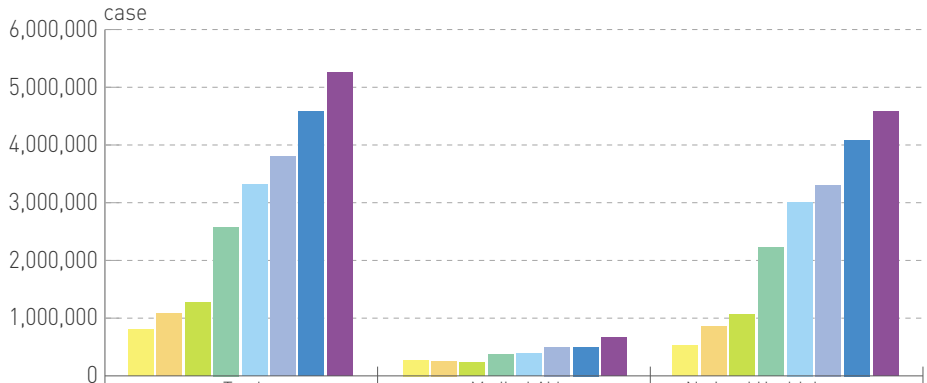
Source) National Cancer Center, 2001
Note) UGI(Upper gastro-intestinal series), AFP(Serum alpha-fetoprotein test), FOBT(Fecal occult blood test), DCBE(Double-contrast barium enema)
*High risk group: HBsAgpositive or anti-HCV Abpositiveor liver cirrhosis

Number of Screening Attendances of the National Cancer Screening Program

The target population of the National Cancer Screening Program(NCSP) constitutes people insured by the Medical Aid Program and the National Health Insurance. The number of screening attendances insured by Medical Aid increased from 238,762 cases in 2002 to 653,088 in 2009. The number of screened people insured by the National Health Insurance increased from 533,343 in 2002 to 4,597,783 in 2009.

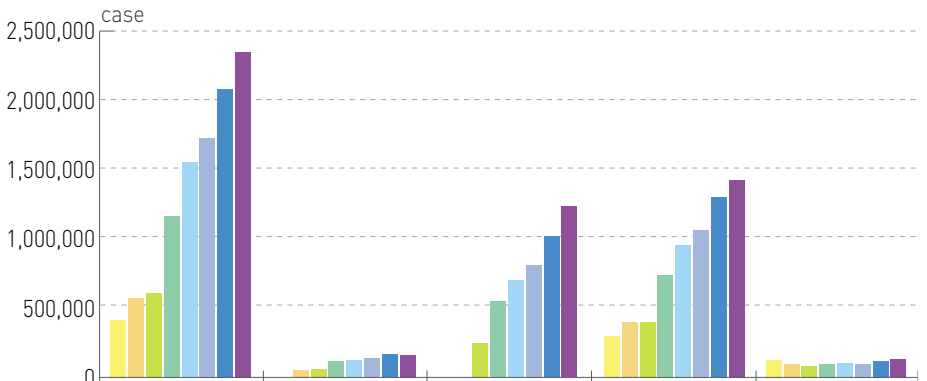
Among the five cancers in the National Cancer Screening Program, the number of recipients was highest in those with stomach cancer recording 2,347,206 followed by breast cancer 1,427,737 in 2009.

Number of Screened People of the National Cancer Screening Program (2002-2009)



	Total	Medical Aid	National Health Insurance
2002	772,105	238,762	533,343
2003	1,065,331	210,697	854,634
2004	1,271,921	237,189	1,034,732
2005	2,588,668	357,860	2,230,808
2006	3,365,338	370,955	2,994,383
2007	3,791,899	460,222	3,331,677
2008	4,597,968	507,797	4,090,171
2009	5,250,871	653,088	4,597,783

Number of Screened People of the National Cancer Screening Program by Cancer Sites (2002-2009)



	Stomach	Liver	Colon & rectum	Breast	Cervix uteri
2002	402,204	-	-	279,985	89,916
2003	575,124	42,990	-	385,994	61,223
2004	578,830	41,918	239,047	357,122	55,004
2005	1,150,007	102,394	536,399	728,556	71,312
2006	1,531,360	118,414	696,445	948,495	70,624
2007	1,727,910	130,531	785,919	1,066,882	80,657
2008	2,085,978	141,852	984,957	1,295,152	90,029
2009	2,347,206	147,106	1,210,728	1,427,737	118,094

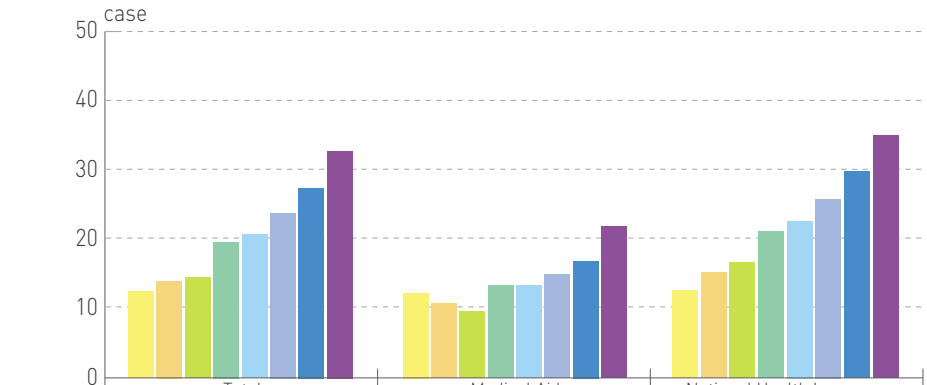
Source) National Cancer Center, 2010

Participation Rates in the National Cancer Screening Program

Average participation rates in the National Cancer Screening Program(NCSP) was 32.7% in 2009; 21.7% of the Medical Aid Program and 35.2% of the National Health Insurance. Participation rates of the NCSP for five cancers have been increased since 2002.

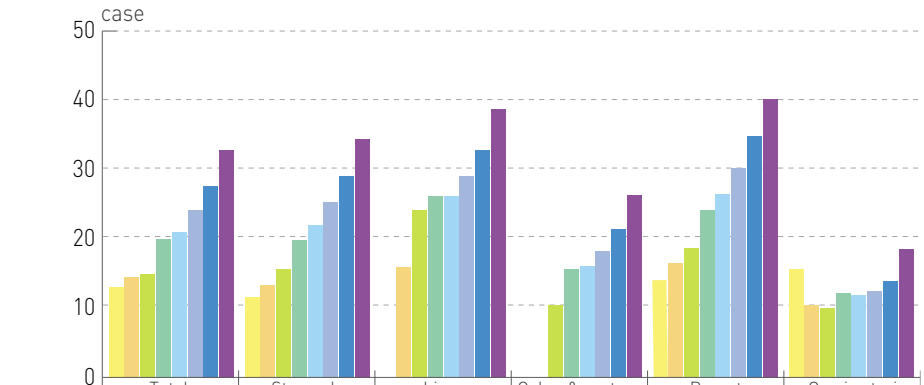
For the participation rates in the National Cancer Screening Program according to cancer sites, the rate of breast cancer was highest(40.0%) followed by liver cancer(38.5%), stomach cancer(34.3%) in 2009.

Cancer Screening Participation Rates in the National Cancer Screening Program (2002-2009)



	Total	Medical Aid	National Health Insurance
2002	12.7	12.6	12.7
2003	14.4	11.1	15.6
2004	14.8	9.6	16.9
2005	19.6	13.4	21.2
2006	20.9	13.3	22.5
2007	24.0	15.3	26.1
2008	27.8	16.8	30.2
2009	32.7	21.7	35.2

Cancer Screening Participation Rates in the National Cancer Screening Program by Cancer Sites (2002-2009)



	Total	Stomach	Liver	Colon & rectum	Breast	Cervix uteri
2002	12.7	11.4			14.1	15.4
2003	14.4	13.6	15.8		16.7	10.6
2004	14.8	15.7	23.9	-10.5	18.6	9.9
2005	19.6	20.0	26.0	-15.4	24.1	12.3
2006	20.9	21.8	26.0	15.8	26.4	11.8
2007	24.0	25.4	28.6	18.1	30.2	12.6
2008	27.8	29.2	32.7	21.2	34.9	13.9
2009	32.7	34.3	38.5	26.2	40.0	18.5

Source) National Cancer Center, 2010

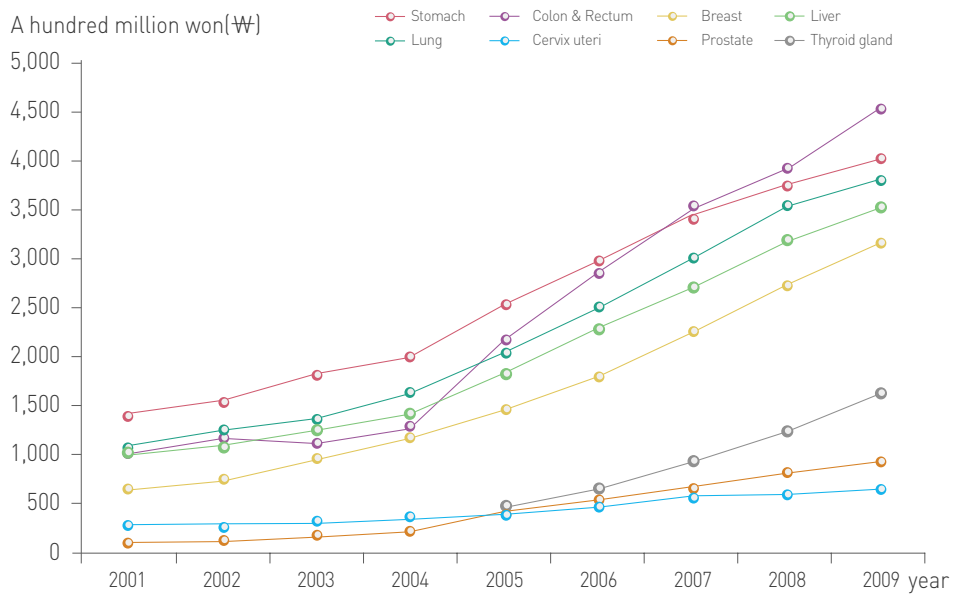
Chapter 4.
Cancer Diagnosis and Treatment

4.1 Cancer Costs

Medical costs of Major Cancers

According to a report by National Health Insurance Corporation, the costs of prostate cancer and breast cancer were increased dramatically by 9.9 (from 9.4 billion won to 93.2 billion won) and 5.0(from 63.6 billon won to 316.2 billion won) times respectively.

Medical Costs of Major Cancers (2000-2009)

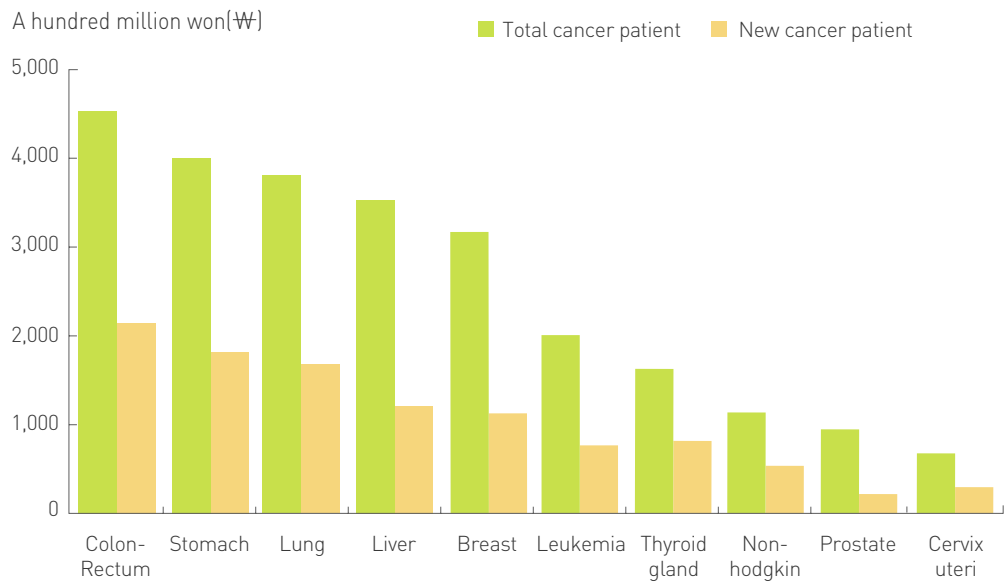


Source) National Health Insurance Corporation 2010

Expenses Paid by Insurance on Major Cancers

The medical cost covered by health insurance in 2009 was 3.2 trillion won for major cancers(with excepting uncovered medical cost). The colon & rectum cancer (404 billion won) accounts for the largest costs of the total budget, followed by stomach cancer 357 billion won), lung cancer(338 billion won) and liver cancer (313 billion won).

Medical Costs from Health Insurance of Major Cancers(2009)



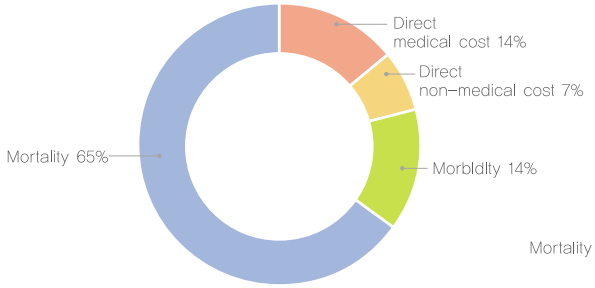
Source) National Health Insurance Corporation 2009

4.2 Socioeconomic Costs

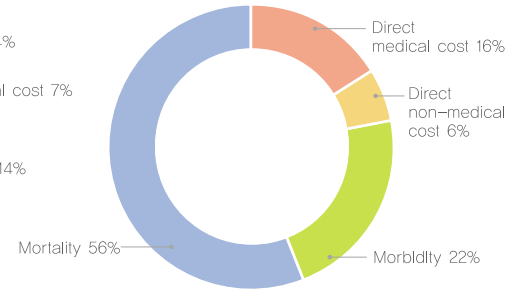
Socioeconomic Burden of Cancer

The Socioeconomic Burden of Cancer in Korea increased from 11. 3 trillion won in 2002 to 14.1 trillion won in 2005.

Socioeconomic Burden of Cancer



(2002 : 11.3 trillion won)



(2005 : 14.1 trillion won)

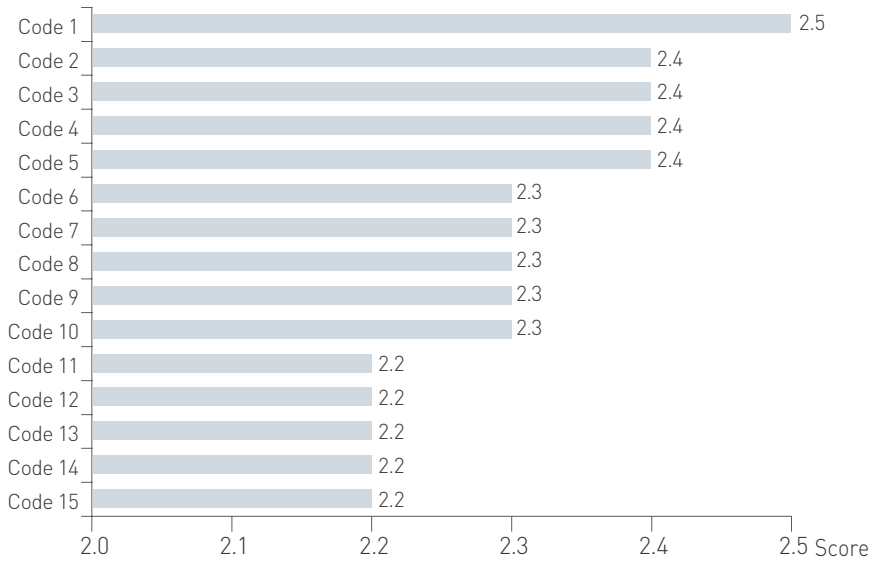
Source) KIM SG et al. Eur J Cancer Care, 2008, National Cancer Center, 2005

4.3 Needs and Experiences of Cancer Patients

A survey on needs and cancer-related experiences of cancer patients with protector in 2008, cancer patients in 2009 and cancer patients with medical attendant was conducted at 9 regional cancer centers and National Cancer Center.

Needs of cancer patients for each item was scored with 0~3 points (no/low/moderate/high need) and the ranking of the items was decided with their average scores. 'Information on governmental or private financial support' was needed most desperately with showing the highest score, and 'Help for medical costs and income loss related to cancer' and 'a short waiting time from reservation to consultation with doctor' followed it.

Needs of Cancer Patients [2010]



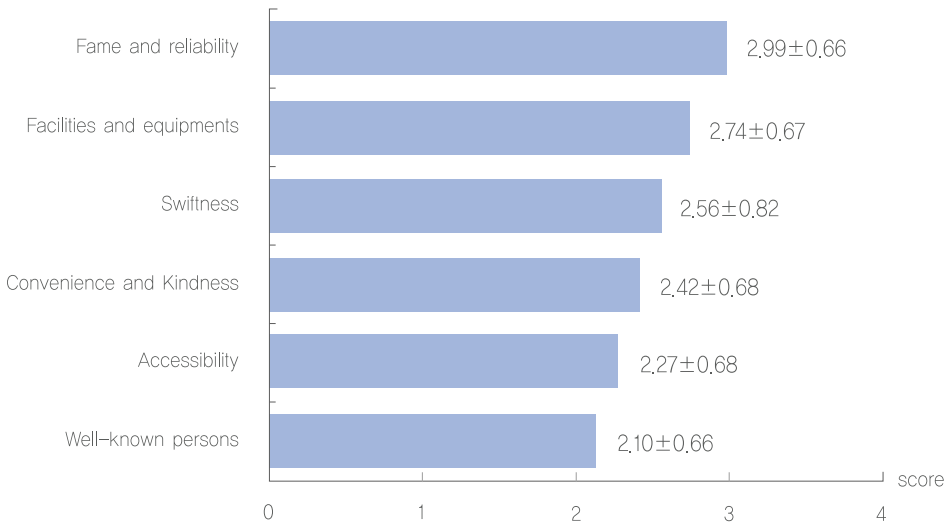
Source) National Cancer Center in Korea, 2010

Note) Code 1: Information on governmental or private financial support
Code 2: Information on diet (recommended and avoided foods)
Code 3: A fast and easy contact with a doctor if necessary
Code 4: Information on symptoms needing a visit to a hospital
Code 5: An easy and detailed explanation by doctor
Code 6: Fast nursing care when discomfortable or painful
Code 7: Information and education on self-help, self-care
Code 8: Explanation on nursing care related to cancer
Code 9: Help for dealing with fear of recurrence
Code 10: A comfortable environment for treatment
Code 11: A sincere concern and empathy of nurses
Code 12: An active cooperation and communication between medical staffs
Code 13: Information on examinations and treatments
Code 14: A short waiting time from reseravtion to consultation with a doctor
Code 15: Information on a current status and a prognosis of disease

Priority of Cancer Patients' Choice on Medical Institutions

When average scores for priority of factors affecting cancer patients' choice of medical institutions were compared, the score of 'fame and reliability' raked. 'Facilities and equipments', 'swiftness', 'convenience and kindness', 'accessibility' and 'well-known persons' followed it in order.

Priority among Factors Affecting Cancer Patients' Choice of Medical Institutions (2008)

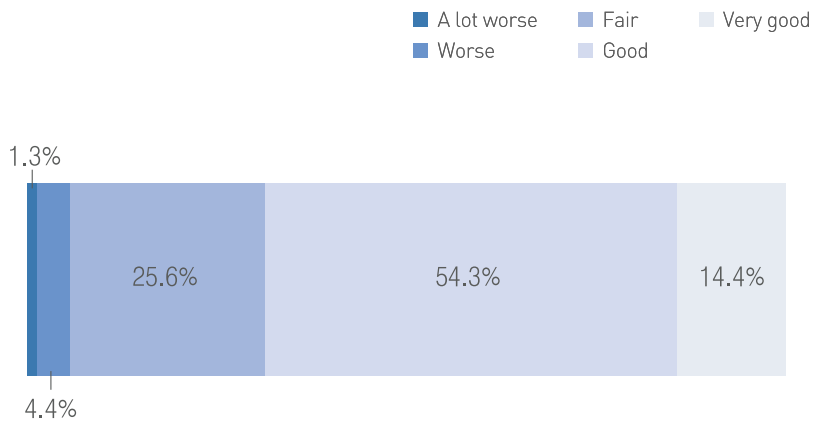


Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

Satisfaction on Received Medical Service

More than half were satisfied with medical service for cancer treatments, only 5.7% were dissatisfied with it.

Satisfaction on Received Medical Service [2008]

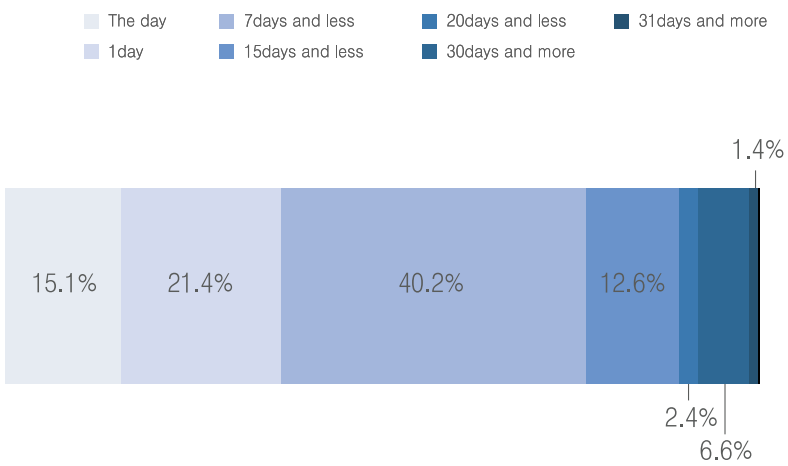


Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

Time from First Reservation to Consultation with a Doctors

Among totally 2,661 cancer patients, the largest number of them (40.2%) waited 2~7 days to see a doctor after the first reservation but 12.6% did over 15 days. The average waiting time from the first reservation was recorded to be 7.1 days.

Time from First Reservation to Consultation with Doctors [2008]



Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

Mental Health of Cancer Patients

When the degree of stress experienced by cancer patients in their daily life was investigated, 69.9% of the total subjects answered that they felt stress.

19.8% and 18.9% of the total subjects said that they experienced depression and suicide impulse respectively.

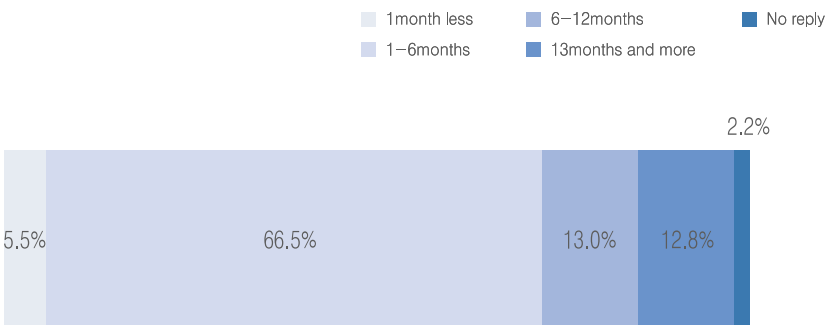
Mental Health of Cancer Patients [2008]

Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

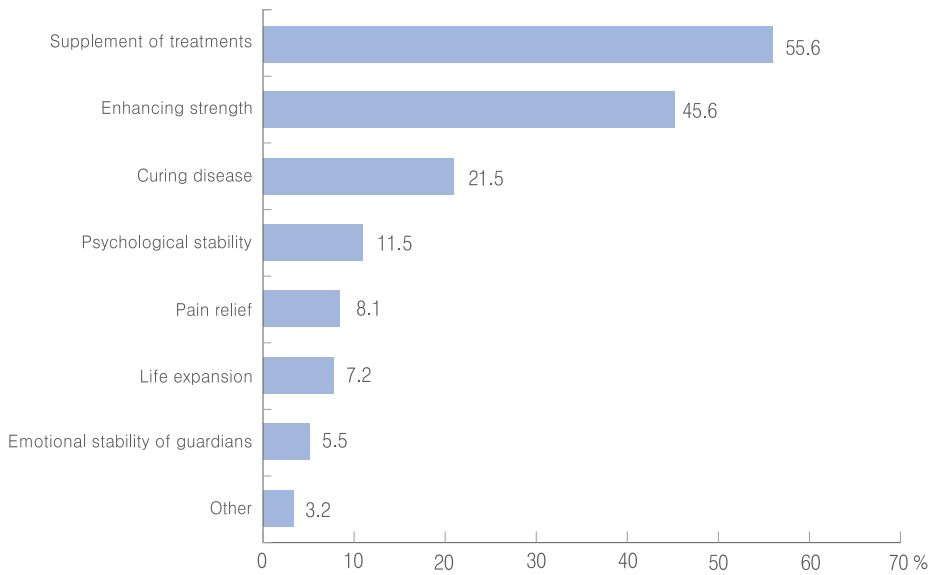
Complementary and Alternative Medicine(CAM) of Cancer Patients

66.5% used complementary and alternative medicine at 1~6 months after diagnosis of cancer.

The Timing Using CAM First after Diagnosis of Cancer [2008]



The Porpose of CAM [2008]



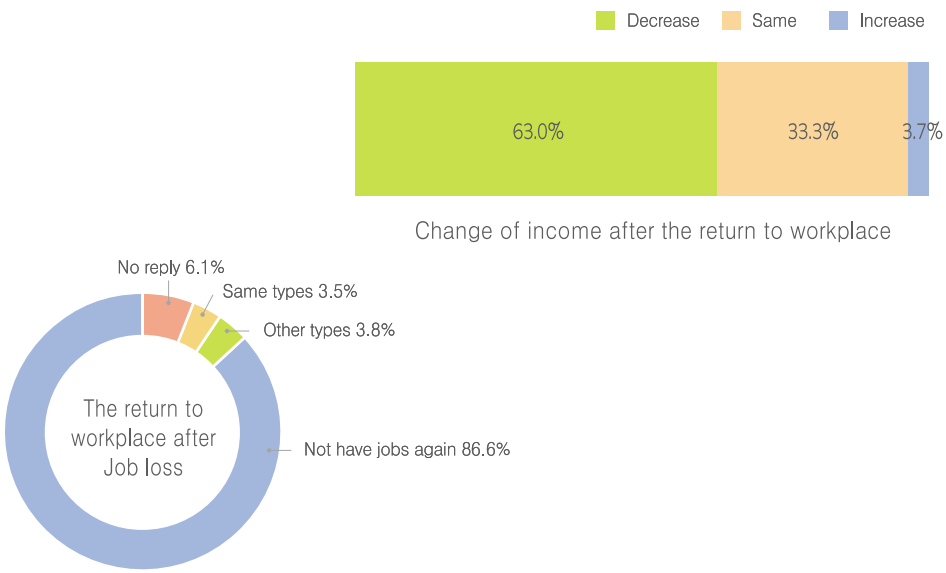
Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

Return to Workplace after Loss of Job and Change of Income

Among subjects who answered that they lost jobs after diagnosis of cancers, overwhelmingly 86.6% could not return to workplace. In addition, the number of subjects returning to other types of jobs(3.8%) was slightly higher than of subjects came back to the same types of jobs.

For change of income after the return to workplace, 63.0% earned less money.

Return to Workplace after Loss of Job and Change of Income [2008]



Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

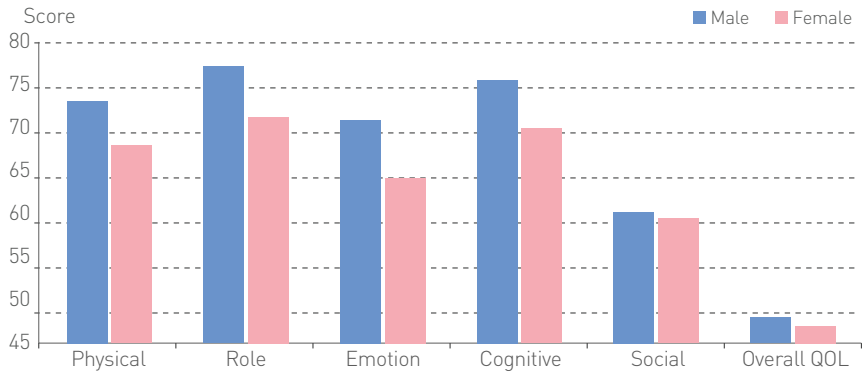
Quality of Life among Cancer Patients according to Gender, Type of Cancer, Income

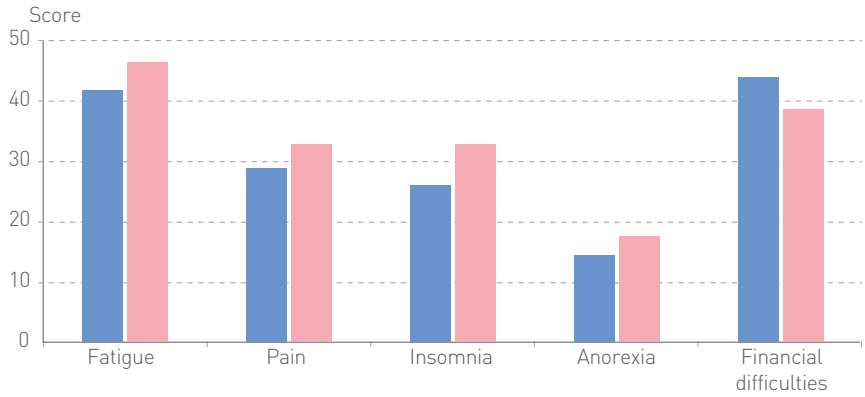
Generally women had lower the quality of life in functional status, overall, and in symptoms than men. Both men and women had higher score in following order of role, cognitive, physical, emotional and social functions. And the social function marked the lowest. Both men and women had higher fatigue score compared to other symptoms. It was shown that men had lower quality of life compared to women in terms of diarrhea and financial difficulties.

According to the result of comparison by different types of cancer, the social function was marked lowest in 6 types of cancers. The score of social function was the highest in gastric cancer and followed by colorectal, breast, liver, lung, cervix cancer. The highest score in physical function was found in colorectal cancer while the lowest in lung cancer. And highest score in role function was in gastric cancer whereas the lowest in lung cancer. The highest score in emotional function was marked in gastric cancer while the lowest was in cervix cancer. And the highest score in cognitive function was in colorectal cancer whereas the lowest in lung cancer. The highest score of overall quality of life was found in colorectal cancer and followed by gastric, breast, lung, liver, and cervical cancer in order where the lowest was in cervical cancer.

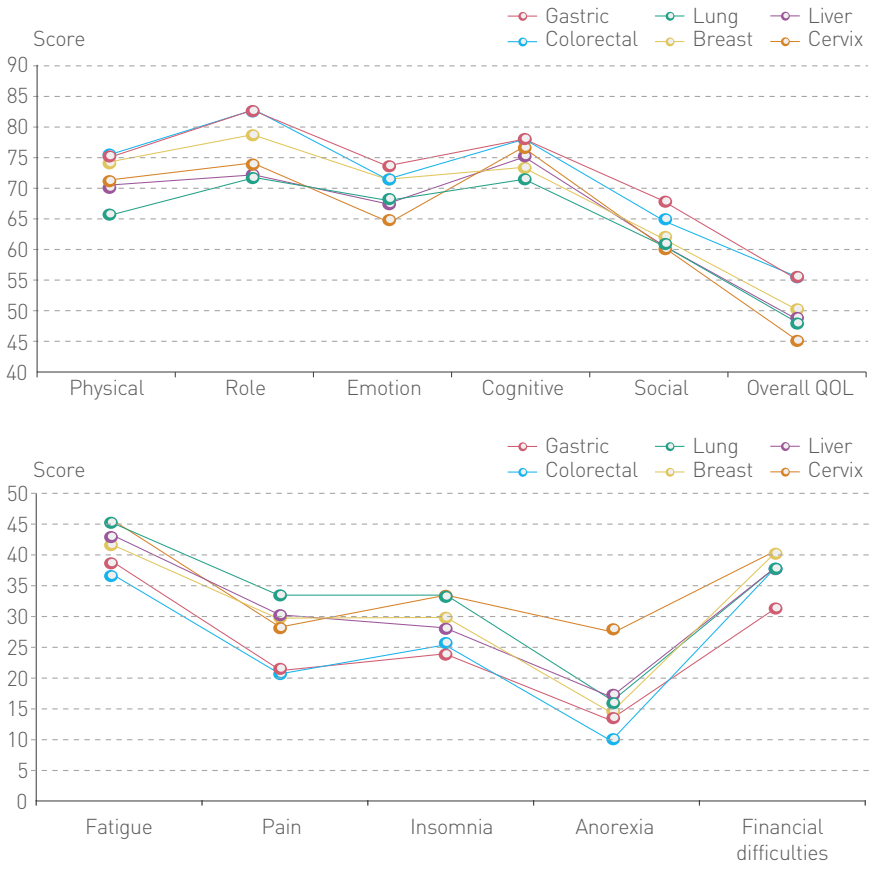
When cancer patients were compared by the average of monthly income, a group whose income was less than 3,000,000 Korean won appeared to have lower quality of life in functional status, symptoms, and overall compared to a group whose income was more than 3,000,000 won. And they had high appeal in financial difficulties.

Score Distribution of Quality of Life (QOL) according to Gender

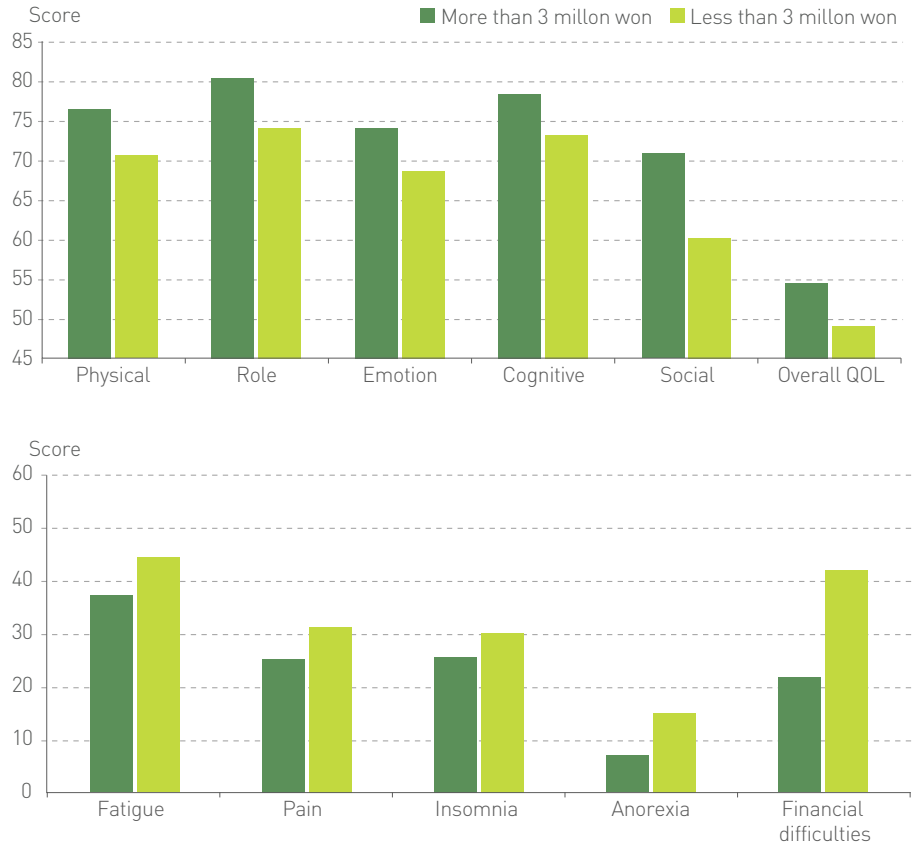




Secondary Gastric and Colorectal Cancer Screening



Secondary Gastric and Colorectal Cancer Screening



Source) National Cancer Center, 2009

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

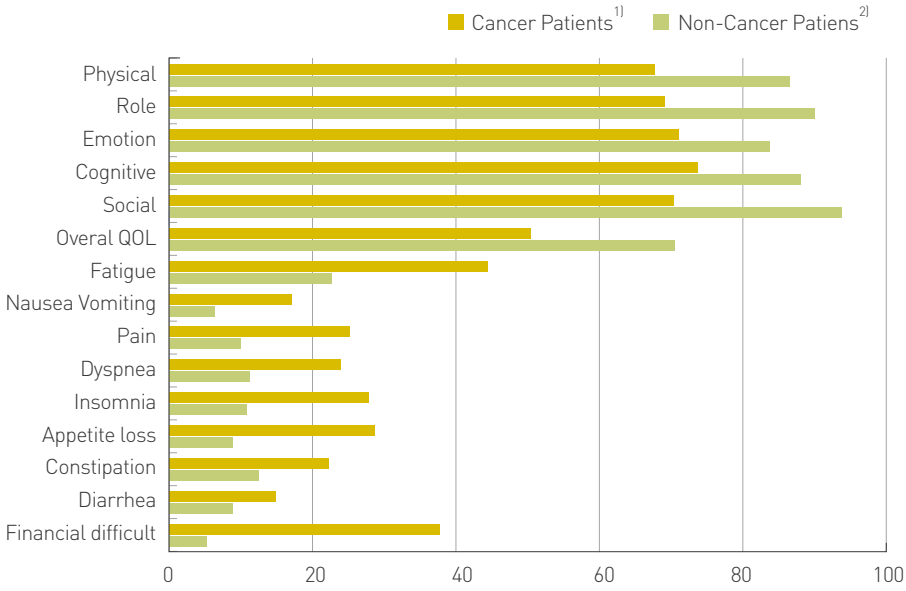
Comparison of Quality of Life between Non-Cancer Patients and Cancer Patients

The overall quality of life among cancer patients scored average of 50.5 points compared to average of 70.4 among non-cancer patients men and women indicating that the overall quality of life of cancer patients were significantly poorer.

Additionally, in case of non-cancer patients, the scores of functions were decreased in order of social, role, cognitive and physical, emotional function while in case of cancer patients, the scores were decreased in order of cognitive, emotional, social, role, and physical function.

This shows that cancer patients were limited in the social and role function, and that the related quality of life was degraded compared to non-cancer patients. This also indicates that the quality of life is qualitatively and quantitatively different between non-cancer patients and cancer patients.

Average Score of Quality of Life(QOL) between Non-Cancer Patients and Cancer Patients



Source) 1. National Cancer Center in Korea, 2009
2. YunYH etal. Journal of clinical epidemiology 2007

Note) Higher the score of ability, higher the ability status and QOL while higher the score of symptom the QOL related to synotoms

Depression depending on Carcinomas, Stages, Comorbidities, Social Supports, Pain, and physical functions

Emotional problems related to depression among cancer patients were as high as 1.779 times of cervix cancer, 0.803 times in lung, 0.795 times in colorectal, 0.753 times in breast, and 0.592 times in liver compared to gastric cancer. Yet the differences were of no significant level.

According to stages-conditions, the result was shown that the score of regional had 2.469 times higher risk of depression compared with that in situ, and for distant 2.025 times, local 1.780 times higher. Unknown had 0.992 times lower risk. However statistically significant difference was only found in regional.

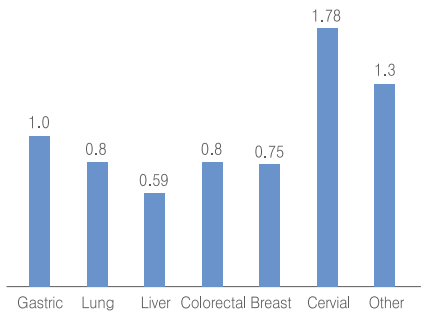
When the score of comorbidity was 2 points compared to the absence of comorbidity, risk of depression was increased significantly by 2.173 times.

Compared to patients who have enough social support as much as they want, risk of depression significantly increased twice in case of not having enough social support by 3.315 times and 1.744 times in case of having almost enough social support.

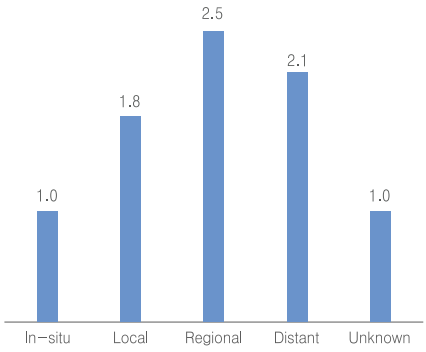
In a group of cancer patient with severe pain causing disability, the risk of depression was very significantly 7.552 times higher compared to a group with less pain.

The risk of depression in a group of cancer patient with physical function status considered as disability was 5.129 times higher compared to a group of relatively functional status.

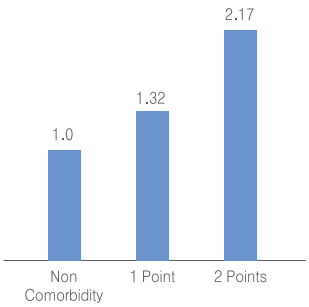
Depression according to Types of Cancer



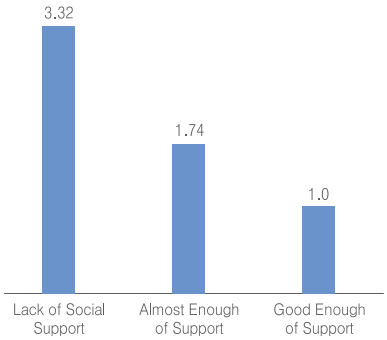
Depression according to Types of Stages of Cancer



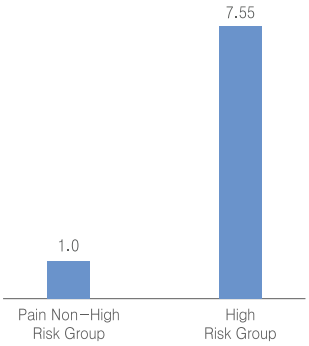
Depression according to Comorbidity



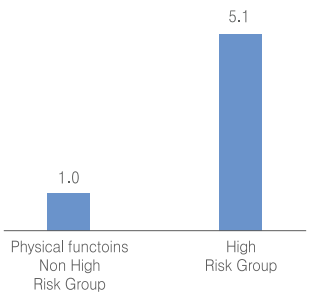
Depression according to Social Supports



Depression according to Pain



Depression according to Physical functions



Source) National Cancer Center in Korea, 2009

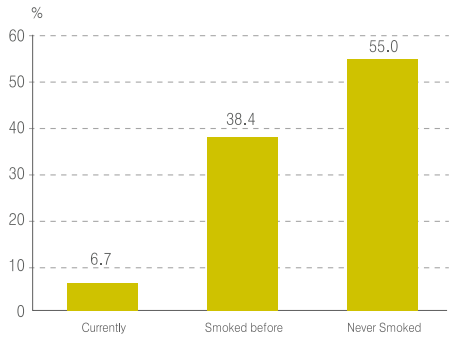
Smoking·Drinking Status among Cancer Patients

Looking into smoking experiences among cancer patients, only 6.7% were still smoking, and 38.4% had smoking experiences in the past, and 55.0% had no experience of smoking at all.

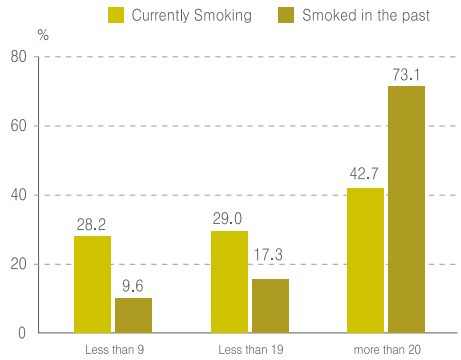
Looking into the average of daily smoking amount of cancer patients in present and in past, past smokers responded that 73.1% was 20 sticks of cigarettes or more, 17.3% was 19 sticks or less, and 9.6% was less than 9 sticks. Smokers of 20 sticks or more were predominantly high in number. And for the current smokers, 42.7% was 20 sticks of cigarettes or more, and 29% was 19 sticks or less, and 28.2% was less than 9 sticks. It was evident that the amount of smoking was reduced generally after cancer diagnosis.

Looking into the drinking experience of cancer patients, only 9.5% among all cancer patients was still drinking, and 45.1% was drinking in the past, and 45.4% had no drinking experience at all. Looking into average daily alcohol intake of the present and the past among cancer patients, in case of past drinkers, 34.2% had been drunk more than 10 cups, but for current drinkers, 43.5 percent responded for 1~2 cups after cancer diagnosis. This shows that alcohol intake was evidently decreased.

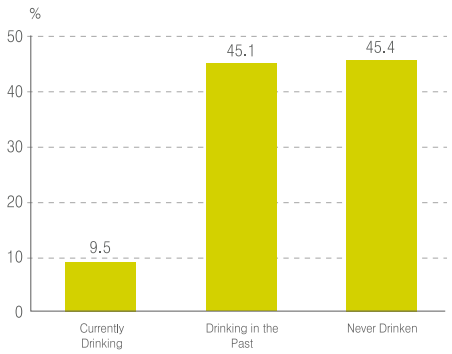
Smoking Experiences among Cancer Patients



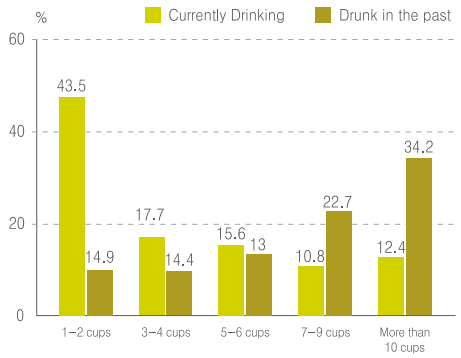
Average of Daily Smoking Amount of Smoking Cancer Patients in present



Drinking Experiences among Cancer Patients



Average of Daily Drinking Amount of drinking Cancer Patients in present



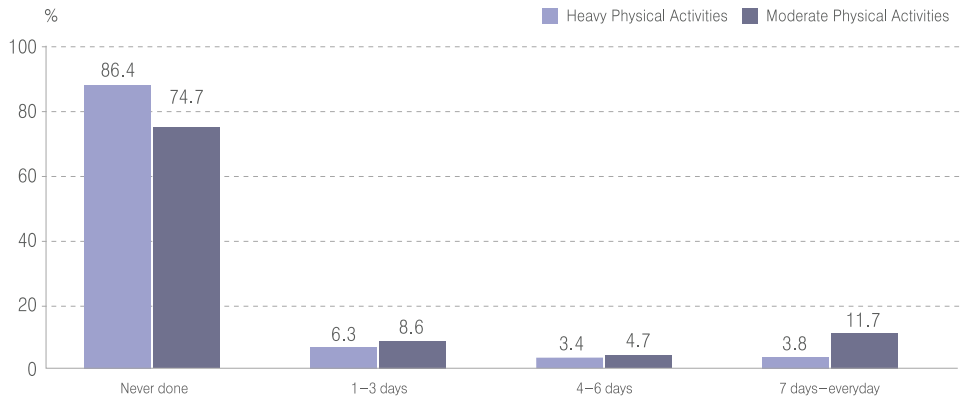
Source) National Cancer Center in Korea, 2009
Note) 1. Among total of 1,958 subjects, 131 was currently smoking and 751 had smoked in the past
2. Among total of 1,958 subjects, 186 was currently drinking and 883 had drunk in the past

Physical Activity among Cancer Patients

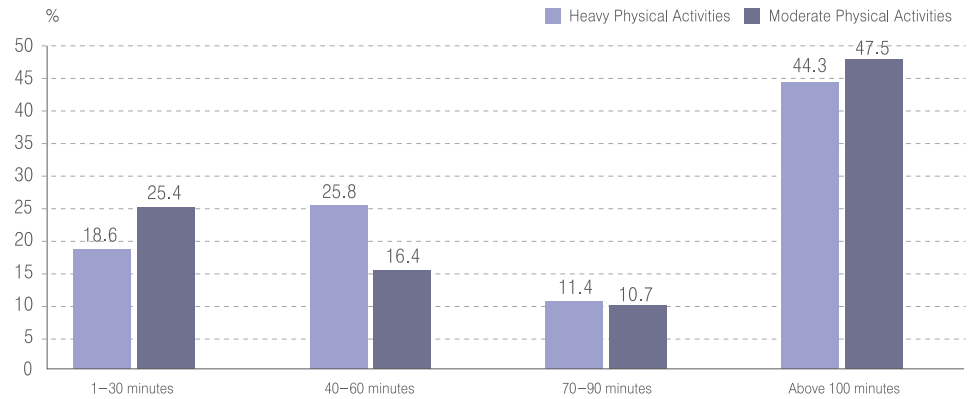
As the result of survey on physical activity among cancer patients, they responded that 86.4% was not doing heavy physical activities and 74.7% was not doing moderate physical activities at all. Meanwhile, moderate physical activities were done by 11.7% everyday, 8.6% in 1~3 days, and 3.4% in 4~6 days. And heavy physical activities were done for 6.3% in 1~3 days, 3.8% everyday and 3.4% in 4~6 days.

In case of the patients doing heavy physical activities, the result shows that 44.3% of the respondents did heavy physical activities for average of 100 minutes or more per day, and 25.8% for 40~60 minutes, and 18.6% for less than 30 minutes, and 11.4% for 70~90 minutes. In case of the patients doing moderate physical activities, 47.5% of the respondents did moderate physical activities for average of 100 minutes or more, 25.4% for less than 30 minutes, 16.4% 40~60 minutes, and 10.7% for 70-90 minutes.

Experiences of Physical Activities among Cancer Patients in recent 1-week



Average of Daily time of Physical Activities Cancer Patients in present



Source) National Cancer Center, 2009

Secondary Cancer Screening Services among Cancer Patients

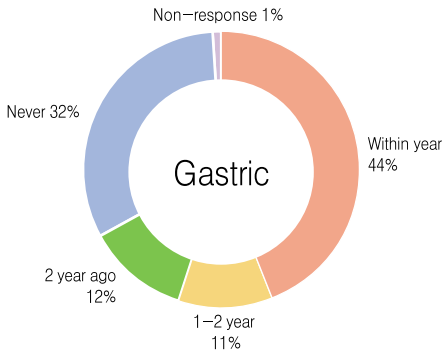
In the result of the survey on gastric cancer screening services for prevention of secondary cancer among cancer patients, 44% of respondents had screening services within 1 year, and 11% in 1~2 years for the last time, and 12% 2 years ago. And 32% never had secondary gastric cancer screening.

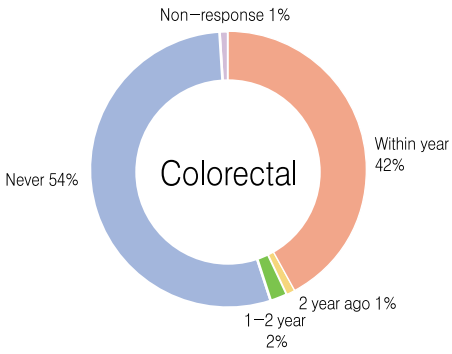
In the result of the survey on colorectal cancer screening services for prevention of secondary cancer, 42% of respondents had screening services within 1 year.

In the result of survey on breast cancer screening services, excluding male and patients undergone mastectomy (mammotomy), 43.4% of respondents had screening services within 1 year, and 10.1% in 1~2 years for the last time, and 10.8% 2 years ago. And 23.5% never had secondary breast cancer screening.

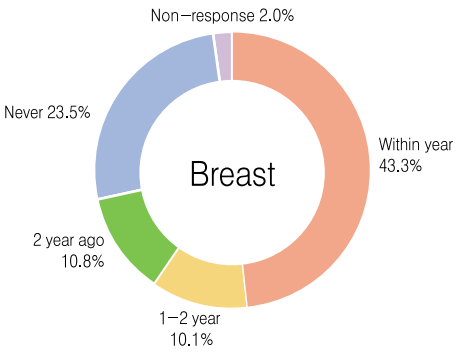
In the result of survey on cervix cancer screening services, excluding male and patients undergone hysterectomy, 44.3% of the respondents the screening services within 1 year, and 12.1% in 1~2 years, 13.1% 2 years ago. And 24.9% never had secondary cervix cancer screening.

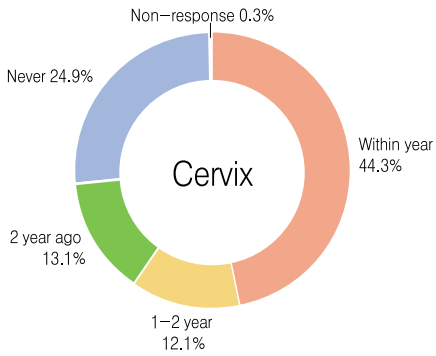
Secondary Gastric and Colorectal Cancer Screening





Secondary Breast and Cervix Cancer Screening





Source) National Cancer Center, 2009

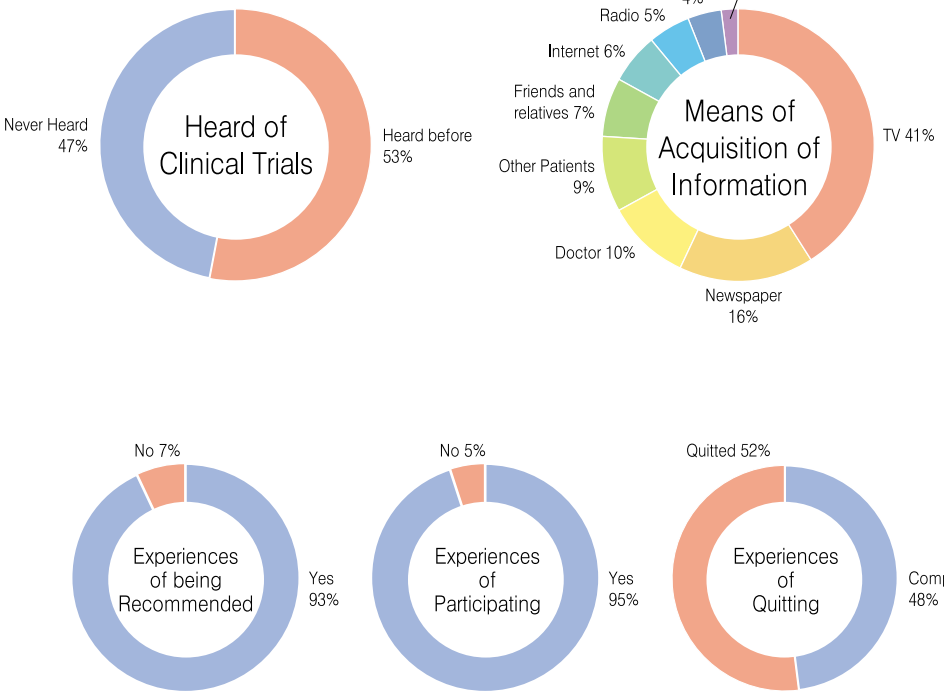
Experiences of Clinical Trials among Cancer Patients

Cancer patients responded that 53% of them had heard about clinical trials, and 47% had never heard.

As the means of acquiring information of clinical trials, cancer patients responded that 41% acquired information through TV, and 16% newspapers, 10% doctors, and 7% friends and relatives when multiple-response was permitted.

In the result of survey on experiences of getting recommendations for clinical trials, 93% of the patients responded that they had been recommended.

Experiences of Clinical Trials among Cancer Patients



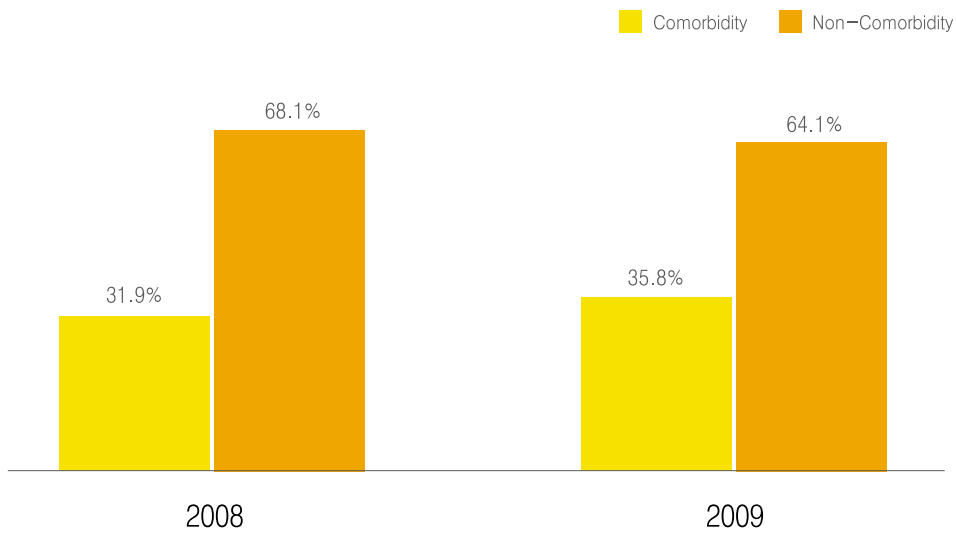
Source) National Cancer Center, 2009

Status of Cancer Patients with Comorbidity Management

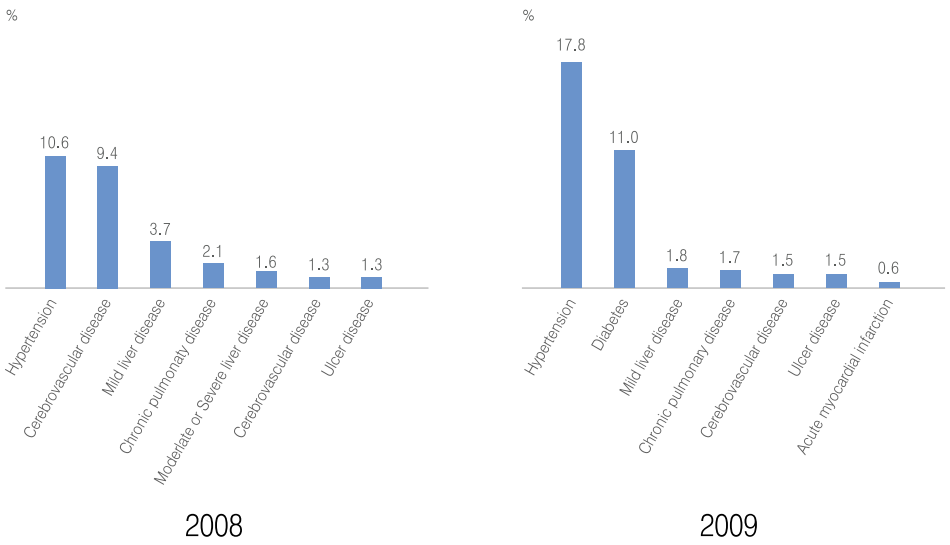
In the result of survey on comorbidities of cancer patients, patients with comorbidity were 31.9%, and 68.1% of patients had no comorbidity in 2008. And in 2009, patients with comorbidity were 35.8% and patients without comorbidity 64.1%.

Looking into the result on frequently occurring top 7 comorbidities among cancer patients in 2008, the highest was hypertension (10.6%), and 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%). And in 2009, hypertension (17.8%), diabetes (11.0%), mild liver diseases (1.8%), chronic pulmonary diseases (1.7%), cerebrovascular diseases (1.5%), ulcer diseases (1.5%), myocardial infarcts (0.6%).

Comorbidity among Cancer Patients



Frequently Occurring 7 Comorbidities among Cancer Patients



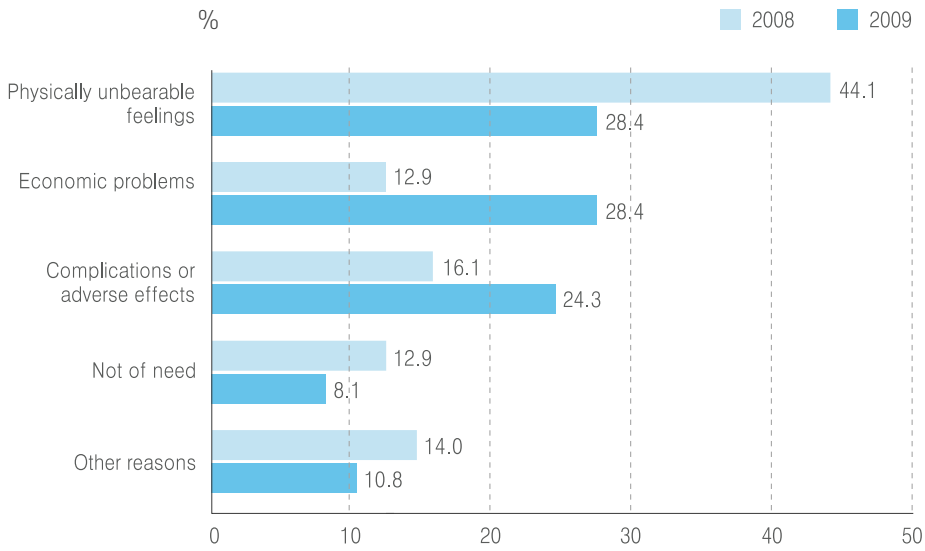
Source) National Cancer Center, 2008

Compliance with Treatment and Satisfaction of Service among Cancer Patients

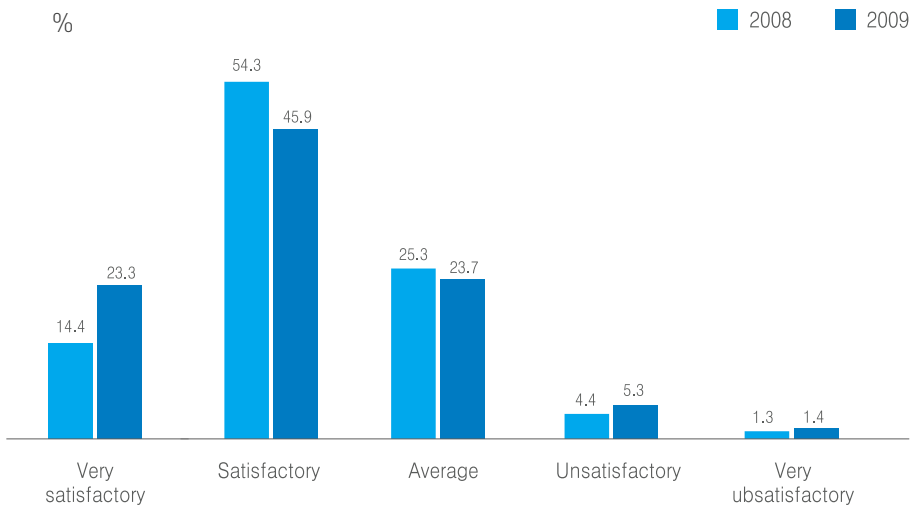
In the result of survey on reasons of rejecting parts of treatment recommended by doctors among cancer patients in 2008, physically unbearable feelings and economic problems were chosen as reasons by 28.4%, and complications or adverse effects by 24.5%, and 8.1% felt that they did not need them, and 10.8% had rejected for other reasons. In 2009, physically unbearable feelings were chosen by 44.1% chosen, quite increased compared to year 2008, and followed by 12.9% of the economic problems, 16.1% of complications or adverse effects, 12.9% of not needing treatments, and 14.0% of other reasons.

In the result of survey on satisfaction of treatment services among cancer patients, 14.4% responded very satisfactory, 54.3% satisfactory, 25.3% average, 4.4% unsatisfactory, and 1.3% very unsatisfactory in 2008. And in 2009, satisfaction of the treatment services had been improved compared to last year by responses of 23.3% very satisfactory, 54.3% satisfactory, 23.7% average, 5.3% unsatisfactory, 1.6% very unsatisfactory.

Reasons of Rejecting Parts of Treatment Recommended by Doctors among Cancer Patients



Satisfaction of Treatment Services among Cancer Patients



Source) National Cancer Center, 2008

Chapter 5.
Palliative Care /Management of Cancer Survivors

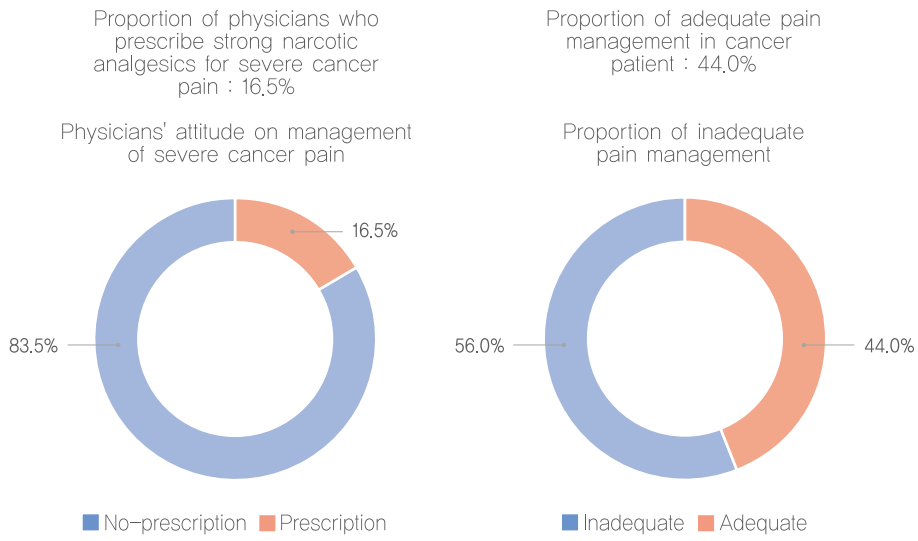
5.1 Palliative Care

Current Situation of Cancer Pain Management and Physicians' Experience about Cancer Pain Management

This survey conducted in 2000, which included medical workers, found that when patients complained of severe cancer pain, 16.5% of physicians prescribed strong narcotic analgesics. While 56.0% of patients were treated using inadequate methods, only 44.0% received dequate pain management.

To manage cancer pain, the Visual Analog Scale & Numeric Rating Scale(VAS & NRS) was used by 10.8% of family doctors and 44.0% of oncologists. In addition, the WHO three step ladder was used by 10.9% of family doctors and 59.1% of oncologists. 8.8% of family doctors and 78.5% of oncologists treated cancer patients suffering from pain more than once week.

Current Situation of Cancer Pain Management



Source) National Cancer Center Korea, 2006

Physicians' Experience about Cancer Pain Management

Experience items	Family doctor (n=379)	Oncologist (n=150)
Use of pain scale(VAS & NRS)	10.8%	44.0%
Use of WHO three step ladder	10.9%	59.1%
Frequencyof seeing cancer patients suffering from pain more than once a week	8.8%	78.5%

Source) YunYH et al, J Korea AcadFamMed, 2005

Survey on National Recognition of Hospice Service

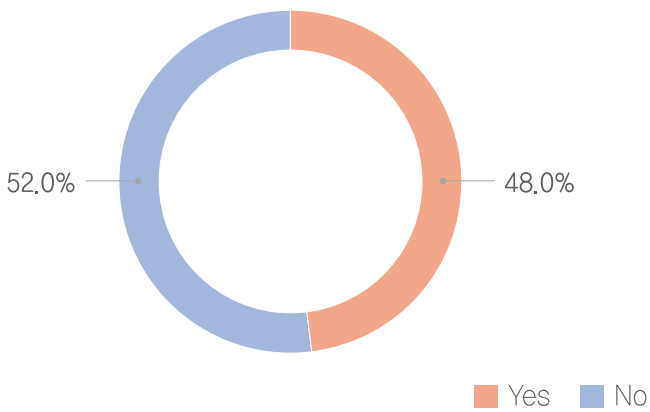
A telephone survey was conducted on adult males and females aged 20 years and above(1,055 subjects) in 16 cities based on the 2000 Census from 24 Feb 2004 to 25 Feb 2004.

Among the subjects, 48.0% had heard about the discontinuance of futile treatments and 84.0% answered that futile treatments should be stopped if they were clinically ineffective.

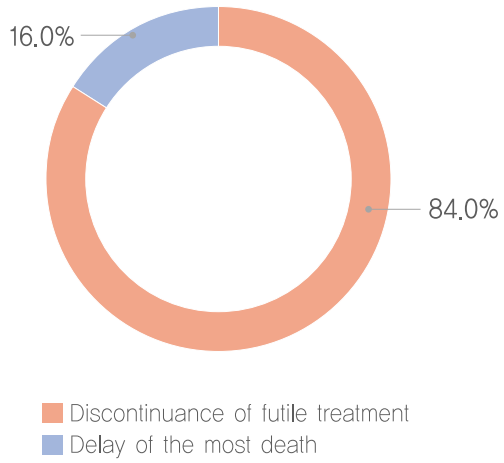
More than the half of the samples preferred their home as the place of death(55.0%) with 28.0%, 8.0% and 7.0% choosing hospital, hospice and nursing homes, respectively. Regarding the ideal place of death according to the patients' wishes, the home(41.9%) was ranked first followed in order by hospital(23.9%) and hospice(16.8%). On the other hand, the family preferred the hospital(43.4%) followed in order by the home(30.3%) and hospice(19.7%)

The most important conditions for dying with dignity according to the patients' views were 'not being a burden to other people'(27.8%) followed in order by 'being with family or meaningful people'(26.0%) and 'finishing arranging all things before death' (17.4%)

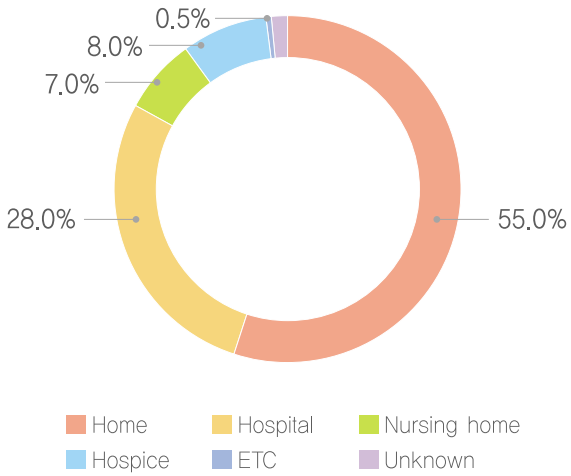
Awareness, Discontinuation of Futile Treatment



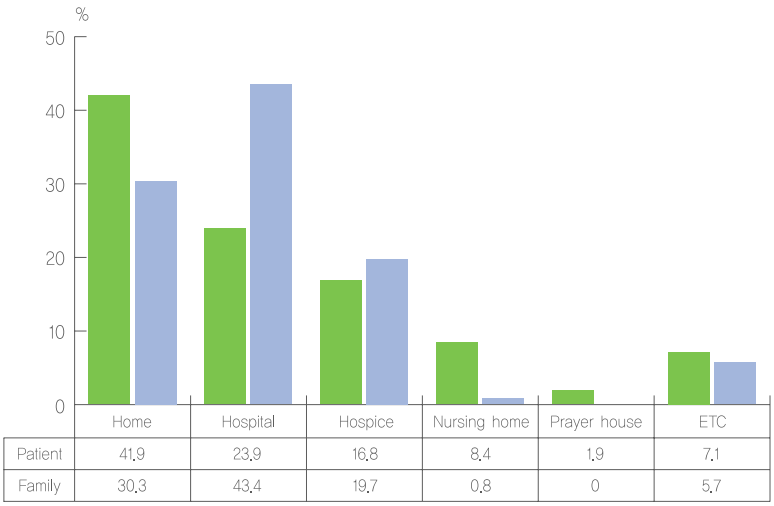
Attitude toward the Medically Futile Life-sustaining Treatment



Preference for Death Place of Patient

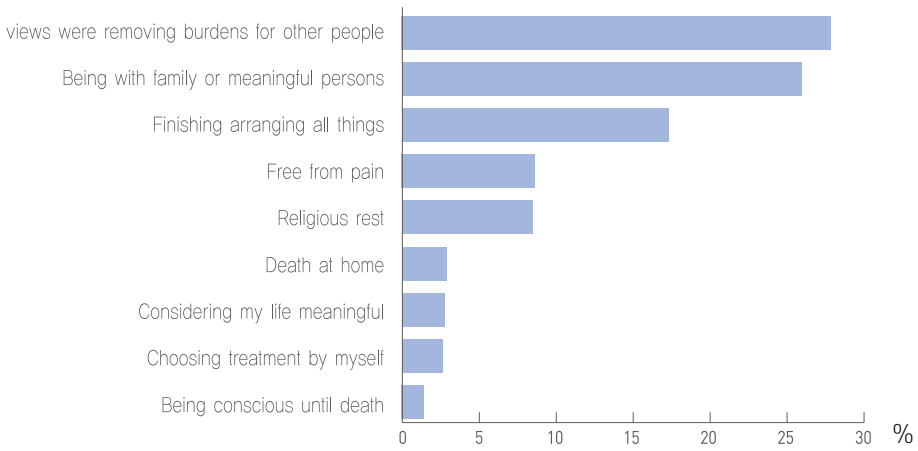


Desired Place of Death



	Home	Hospital	Hospice	Nursing home	Prayer house	ETC
Patient	41.9	23.9	16.8	8.4	1.9	7.1
Family	30.3	43.4	19.7	0.8	0	5.7

Attitude toward the Most Important Thing for Dying with Dignity



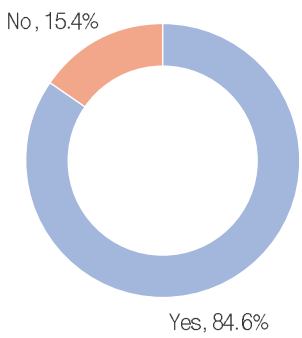
Source) Yun YH et al, Korean J Hosp Palliat Care, 2004

Awareness of Hospice Services and the Intention of Using that Service

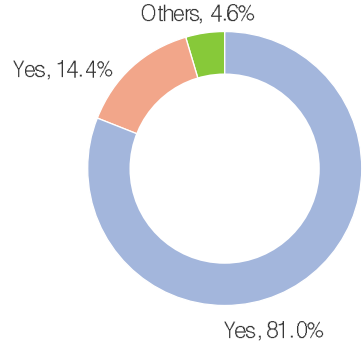
A telephone survey was conducted on adult males and females aged 20 years and above(1,006 subjects) in 16 cities based on the 2000 Census in 2008.

According to the results, 84.6% of subjects have intention of using hospice services and 81% of subjects said they had willings to pay more the health insurance fee for covering hospice services.

Intention of Using Hospice Service



Willings to pay more the health insurance fee for covering hospice services



Source) Yun YH et al, Korean J Hosp Palliat Care, 2004

Statue of Using Hospice and Palliative Care Centers in 2010

The overall number of patients who used hospice and palliative care centers was 6,566, and it varied from 36 to 465 according to center. About 9% of patients who dead from cancer(about 70,000 person) used Hospice and Palliative Care Centers in 2010.

The highest cancer incidence rate was shown in lung cancer (1,257 persons, 19.1%), followed in the order of stomach cancer (1,068 persons, 16.3%), liver cancer (672 persons, 10.2%), and colon-rectum cancer (636 persons, 9.7%).

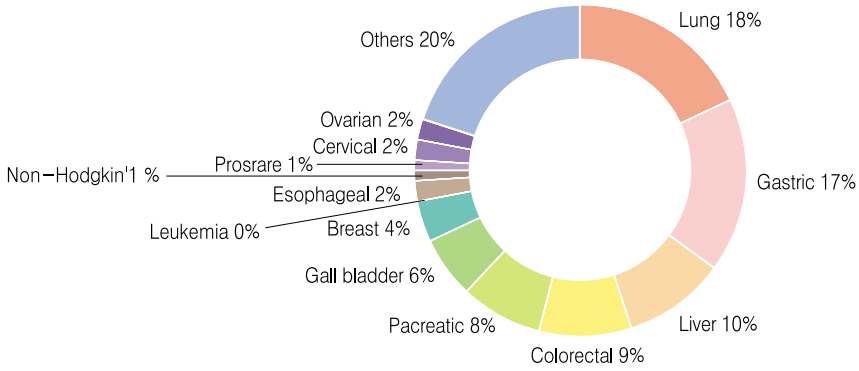
For the statue of being equipped with terminal cancer diagnostics or doctor's opinion, the number of patients who possessed diagnostics from more than two doctors and from one doctor and who did not possess any diagnostics is 2,415 (47.8%), 1,821 (36.0%) and 821 (16.2%), respectively.

The number of patients for cancer denial and terminal cancer denial who used hospice and palliative care centers in 2010 was 4,470 (88.8%) and 3,423 (67.9%), respectively. This was lower, compared to guardians' cancer denial (4,483 persons, 99.2%) and terminal cancer denial (4,397 persons, 97.3%).

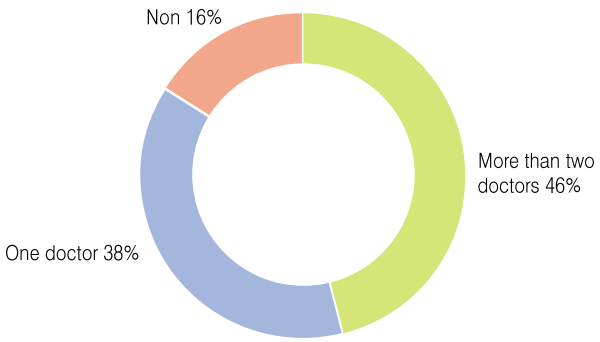
For admission routes of patients who sued hospice and palliative care centers, the number of patients who visited the relevant center by themselves without any official request was largest (2,221 persons, 44.0%), followed in the order of patients who received a request from the general patient's room of the identical center (1,290 persons, 25.6%) and from other care center or ward (809 persons, 16.0%).

The largest number of reasons for a discharge at the first admission was shown in death (3,940 persons, 67.6%), followed in the order of normal discharge (1,312 persons, 22.5%) and transfer from other care center (249 persons, 4.3%).

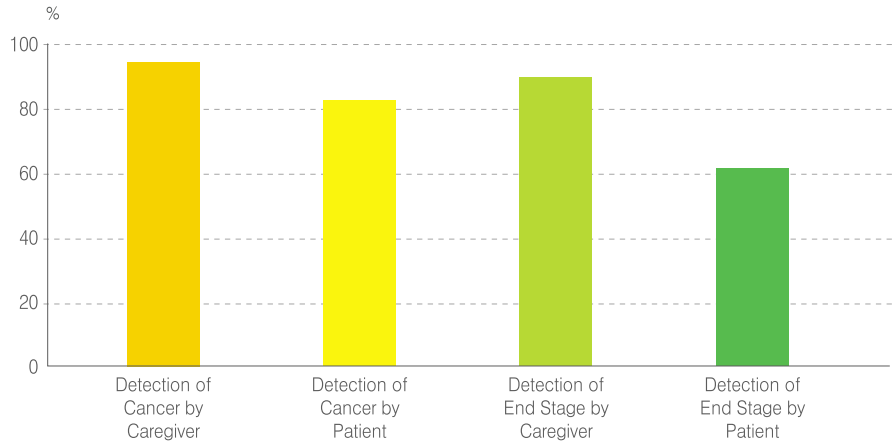
Distribution Chart of Different Types of Cancer



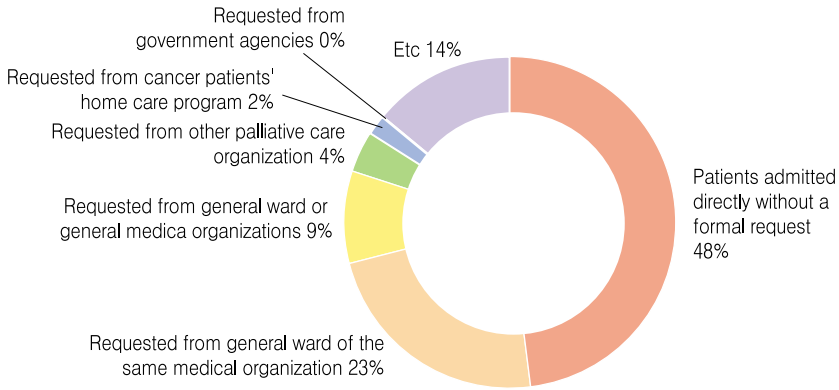
Status on Availability of End Stage Diagnosis



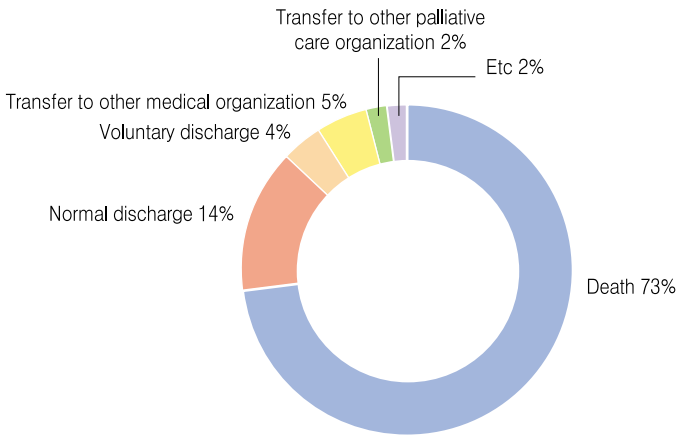
Detection of Cancer and End Stage by End Stage Cancer Patient and Guardian



Admission Routes of End stage Cancer Patients



Reason for Discharge from the first hospitalization



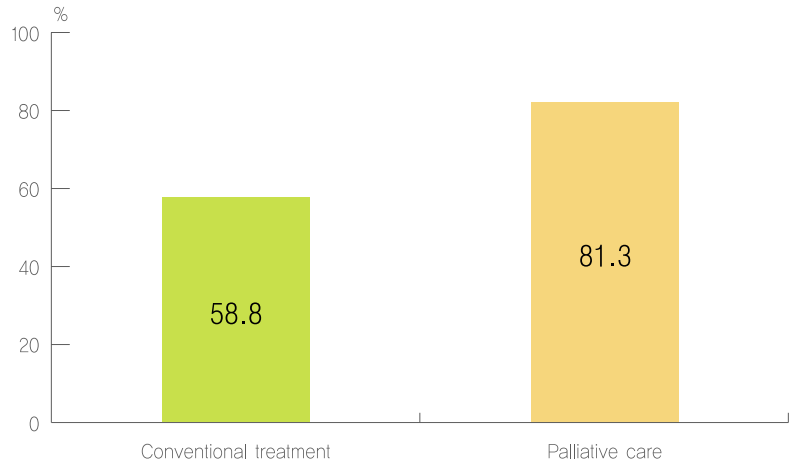
Source) National Cancer Center in Korea, 2009

Overall Satisfaction with the Treatments and Satisfaction with Medical Service by Occupation

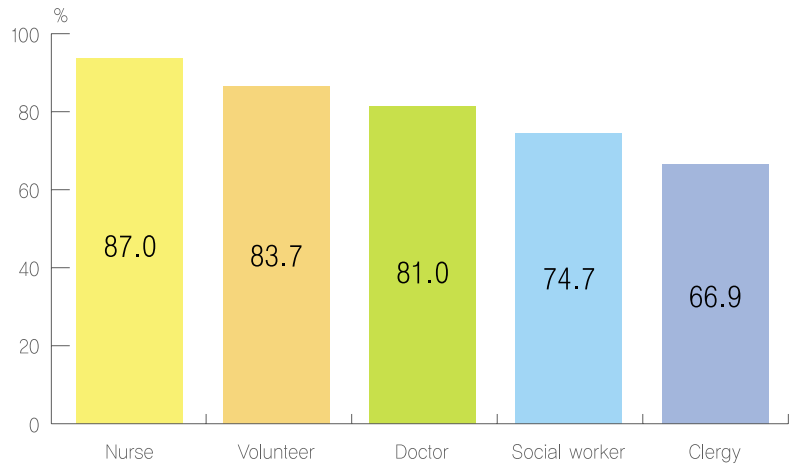
In a survey of the overall patients' satisfaction with treatments before and after the admission to palliative care unit, the level of satisfaction with conventional treatment prior to the admission was 58.8%. On the other hand, the level of satisfaction with palliative care was higher at 81.3%.

Regarding the level of satisfaction with Services by type of Health Service Providers, the percentage of 'good' or 'excellent' was the higher for the nurses(87.0%) followed by volunteers, doctors and social workers at 83.7%, 81.0% and 74.7%, respectively.

Overall Satisfaction with the Treatments Received in 2009



Satisfaction with Services by type of Health Service Providers in 2009



Source) National Cancer Center in Korea, 2009

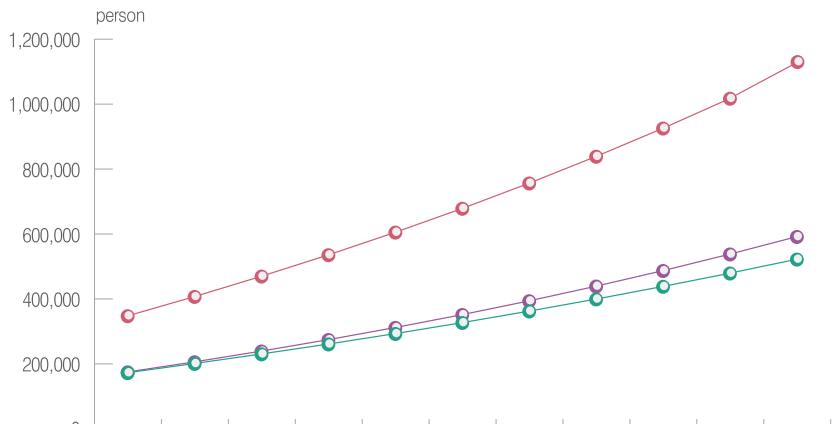
5.2 Management of Cancer Survivors

Estimated Number of Cancer Survivors and the trends of Cancer Survivors in the USA

The number of cancer survivors are expected to increase from 348,096 in 2005 to 1,114,833 in 2015; 172,872 in 2005 to 522,589 in 2015 for males and 175,224 in 2005 to 592,244 in 2015 for females. The percentage of cancer survivors in the total population is expected to increase from 0.72%(0.71% in males and 0.73% in females) in 2005 to 2.41%(2.12% in males and 2.41% in females) in 2015.

The number of cancer survivors in the USA increased from approximately 3 million in 1971 to more than 10 million in 2005.

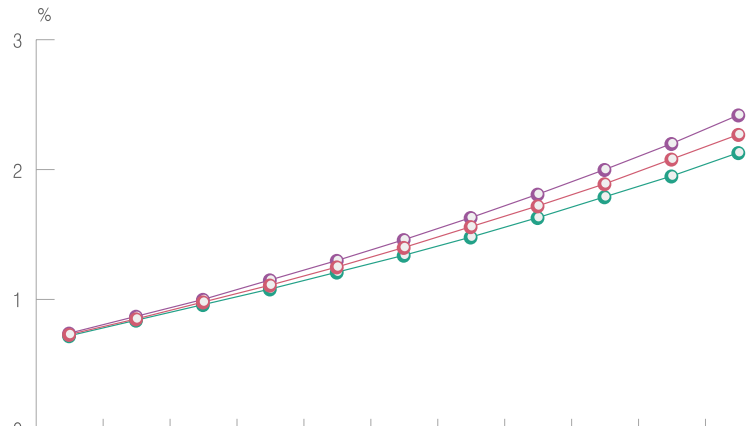
Estimated Number of Cancer Survivors



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total	348,096	407,607	470,274	536,042	605,655	679,102	756,998	839,348	926,147	1,017,971	1,114,833
Male	172,872	201,232	230,706	261,258	293,427	327,208	362,678	399,843	438,700	479,613	522,589
Female	175,224	206,375	239,567	274,783	312,228	351,894	394,320	439,505	487,447	538,357	592,244

Source) National Cancer Center in Korea, 2007
Note) Survivor : all people being alive after diagnosis with cancer

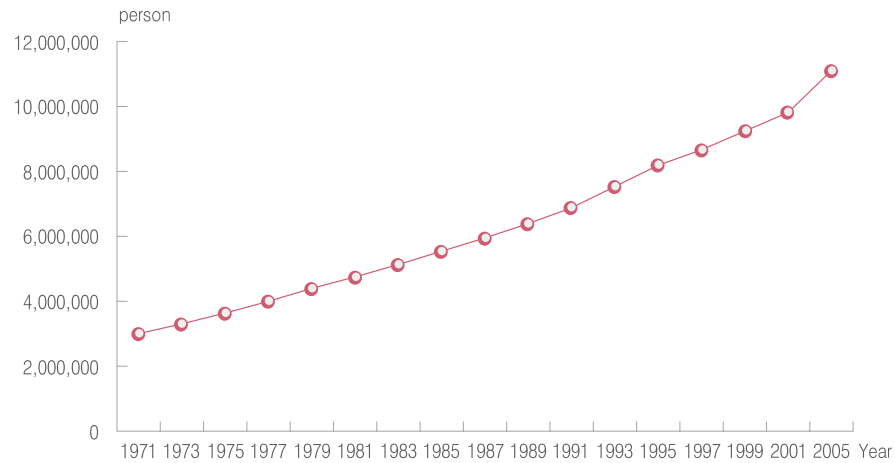
Percentage of Cancer Survivors in the Total Population



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total	0.72	0.84	0.97	1.1	1.24	1.39	1.55	1.71	1.88	2.07	2.26
Male	0.71	0.83	0.95	1.07	1.2	1.33	1.47	1.62	1.78	1.94	2.12
Female	0.73	0.86	0.99	1.14	1.29	1.45	1.62	1.8	1.99	2.19	2.41

Source) National Cancer Center, 2007
Note) Survivor: all people being alive after diagnosis with cancer

The Number of Cancer Survivors in the United States



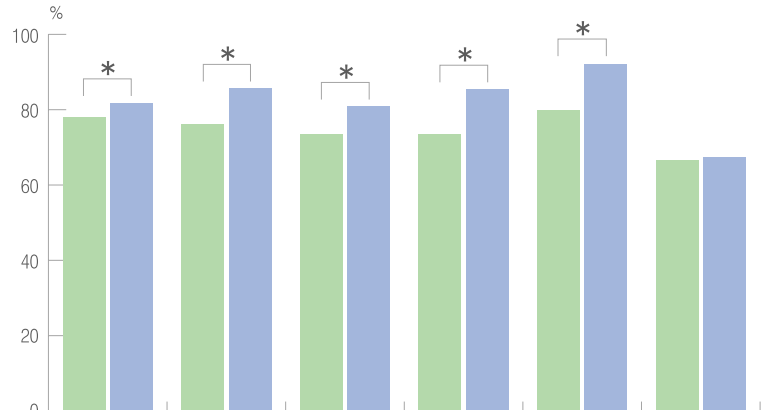
Source) National Cancer Institute in the United States, 2009

Comparison of Quality of Life by Function State and Symptom of Breast Cancer Survivors

Among 10,796 breast cancer patients undergoing primary curative surgery in 5 major hospital(National Cancer Center, Seoul National University Hospital, Yonsei University Health System, Samsung Medical Center and Asan Medical Center) from 1993 to 2002, the questionnaires completed by 1,933 cancer survivors were analyzed.

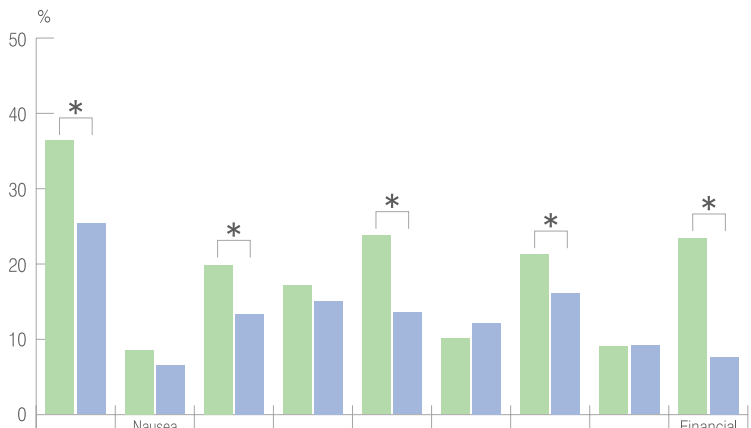
A comparison of the quality of life according to the functional state in breast cancer survivors(n=1,933) with that in the general population(n=500) revealed the survivors to have a poorer performance in terms of their physical, role, emotional, cognitive and social functioning as well as overall lower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

Comparison of Quality of Life (Function State) in Breast Cancer Survivors with the General Population



	Physical functioning	Role functioning	Emotional functioning	Coanitive functioning	Social functioning	Global health status/QOL
Breast cancer survivors	78.3	76.0	73.4	73.5	79.7	66.4
General population	81.6	85.5	80.8	85.3	92.0	67.4

Comparison of Quality of Life (Symptoms Problem) in Breast Cancer Survivors with the General Population



	Fatigue	Nausea & vominting	Pain	Dyspnea	Insomnia	Appetiteloss	Constipation	Diarrhea	Financial difficulties
Breast cancer survivors	36.3	8.5	19.8	17.1	23.7	10.0	21.2	9.0	23.3
General population	25.3	6.5	13.3	15.0	13.5	12.1	16.1	9.1	7.6

Source) Ahn SH et al, Annals of Oncology, 2007

Note) 1. Cancer survivor: patients without no recurrence or metastasis of cancer after treatments for complete recovery from cancer
2. *: P<0.001 from analysis of covariance with a generalized linear model and are for the comparison between breast cancer survivors and general population.

Behavior, Attitude, Knowledge and Opinion of Cancer Survivors for the Second Cancer Screening

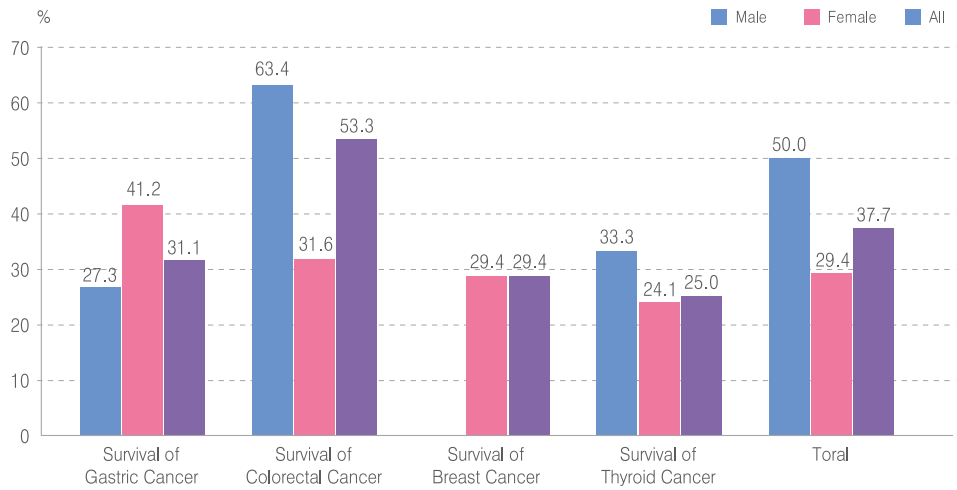
A survey on 326 disease-free cancer survivors who passed more than one year following a diagnostic for primary cancer in 2009 shows that only 123 patients(37.7%) received the overall necessary second cancer screening within a two years.

From the following two things, it can be derived that most of cancer survivors are very affirmative at the second cancer screening. First, they responded that other type's cancer screening is absolutely necessary (99.1%). Second, they said, "I will received a screening for other type's cancer if they decide to do by themselves or a doctor advises them to do it." Further, their recognition of the advantage of the second cancer screening can be inferred from their two responses: "If I receive a screening for other type's cancer, I will feel that my health care is well done." (95.4%) and "If I receive a screening for other type's cancer, it will be good for my family."(95.0%),

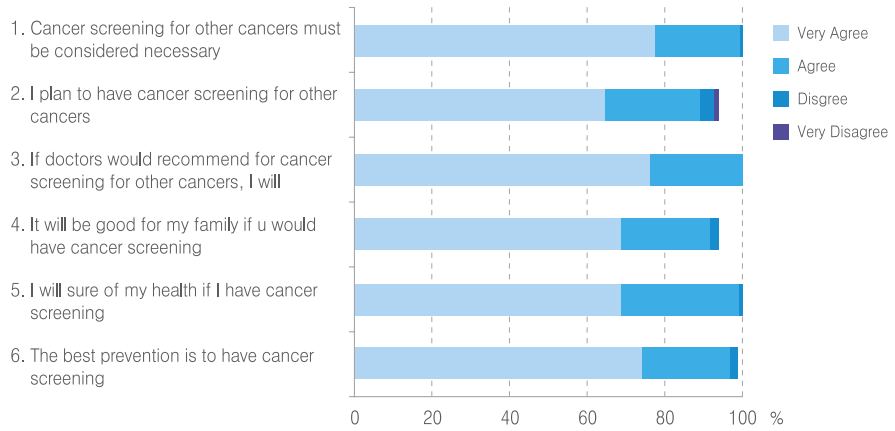
In addition, survivors understands the cancer screening properly as follows: "I think a person who suffered from a cancer once can catch other type's of cancer." (92.6%), "I think the possibility that a cancer patient will suffer from other type's cancer is higher than the one that a normal person will catch a cancer." (85.8%), "Cancer patients must receive a cancer screening targeted to normal people." (82.0%) However, the followings show that a fair number of survivors do not have a specific knowledge of the second screening: "All the disorders of body can be diagnosed by a blood-test or an x-ray injection at a hospital."(43.3%), "Periodical screening would not be necessary, if we receive a follow-up tests properly from a hospital." (41.7%)

Most of cancer survivors recognized the necessity of the extra recommendations for cancer screening (92.0%), but many of them responded that they did not receive extra recommendations for cancer screening from doctors. (78.0%)

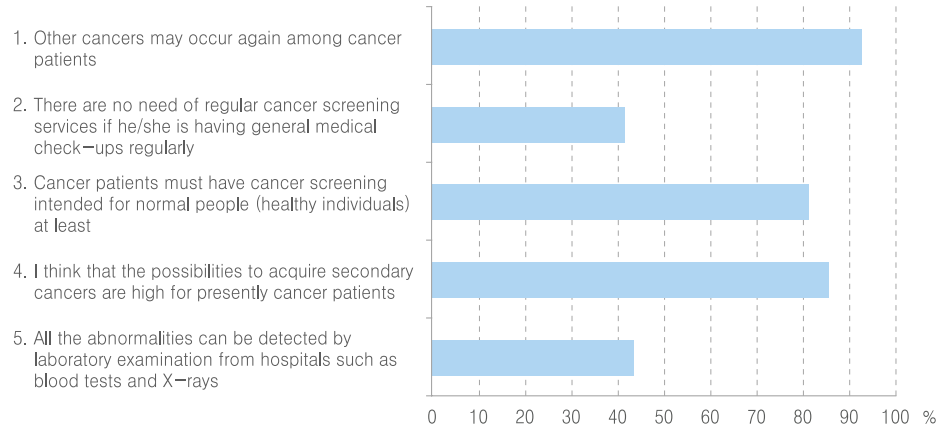
Secondary Cancer Screening Rate



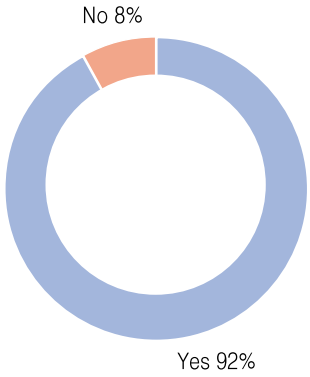
Attitude toward Secondary Cancer Screening Services



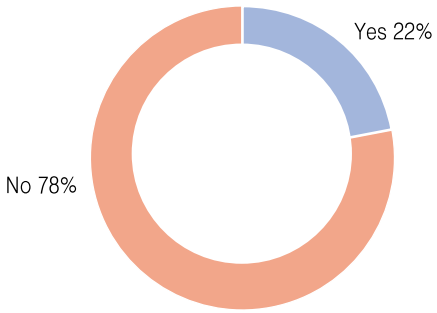
Knowledge of Secondary Cancer Screening Services



Necessity of Supplementary Cancer Screening for Cancer Patients



Cancer Screening Recommendations from Doctor



Source) National Cancer Center in Korea, 2009

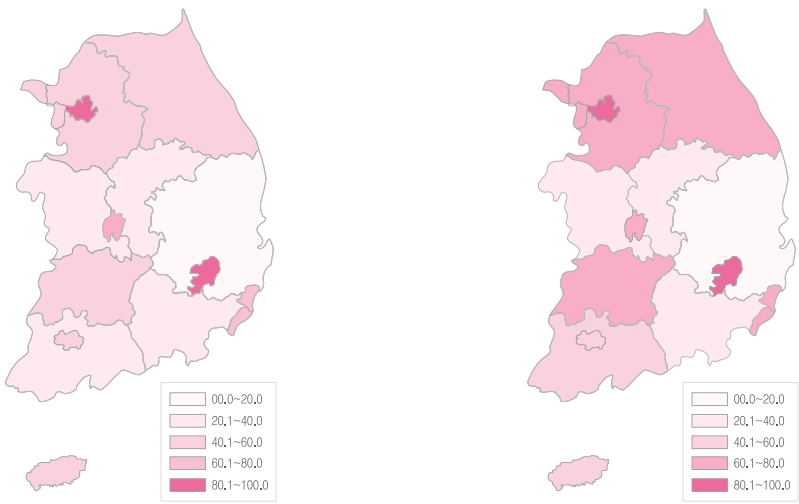
Chapter 6.
Regional Cancer Centers

Self-Sufficiency of Cancer Patients

Except for Seoul, Daegu was the region that recorded the highest rates and Gyeong-Buk was the region that recorded the lowest rates out of regional rates for Self-Sufficiency of Cancer Patients in 2008-2009.

In addition, at the rate changes for Self-Sufficiency of 16 sites (major city & province) in 2009 comparing with 2008, Chungnam recorded the most highest increasing rates followed by Jeju and Gyeongnam. On the other hand, Busan recorded the most highest decreasing rates in this period.

Self-sufficiency of Cancer Patients



2006 2007

Source) National Cancer Center in Korea, 2009

Geographic Location of Regional Cancer Centers

Three regional cancer centers per year or a total of 9 centers for three years from 2004 to 2006 were designated among local national university hospitals.

- 2004 : Jeon-Buk, Jeon-Nam, Gyeong-Nam Cancer Center
- 2005 : Busan, Dae-Jeon, Daegu/Gyeong-Buk Cancer Center
- 2006 : Kangwon, Chung-Buk, Jeju Cancer Center

Regional Cancer Centers

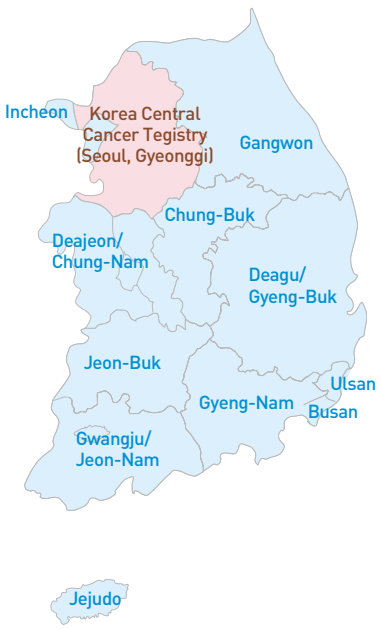
Source) National Cancer Center in Korea, 2009

Cancer Registration System in Korea

The Korea Ministry of Health and Welfare (KMOHW) started a nationwide, hospital-based cancer registry called the Korea Central Cancer Registry (KCCR) in 1980. Population-based regional cancer registry (PB-RCR) have been established since early 1990. After the Cancer Act was enacted in 2003, the KCCR and existing eight PB-RCRs were designated officially by KMOHW in 2004.

The KCCR constructed the Korea National Cancer Incidence DataBases (KNCIDB) by merging the KCCR databases and PB-RCRs databases, the site-specific cancer registry databases (breast, ovary, uterus, and liver cancer) and additional data from medical record review surveys. Using the KNCIDB and other national data such as mortality data from National Statistical Office, it became possible to produce national cancer statistics since 2005.

Cancer Registry



Source) Ministry of Health & Welfare, The Korea Central Cancer Registry, 2010

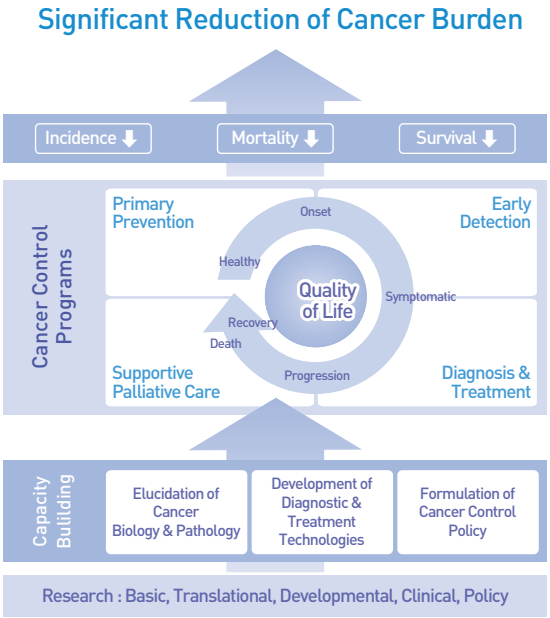
Chapter 7.
2nd term10-year Plan for National Cancer Control

2nd term 10-year Plan for National Cancer Control

As the first term 10-year plan for national cancer control(1996-2005) had ended, the necessity for the second term 10-year plan for national cancer control has been suggested. The 2nd term was set through a hearing of specialists, in including oncologists from the NCC, and discussions between related organizations.

The 2nd term 10-year plan for national cancer control has a vision of reducing the cancer burden significantly by minimizing the incidence of cancer and deaths from cancer through systemic cancer management, and includes the following strategies: strengthening cancer prevention by managing the cancer risk factors; achieving early cancer screening of all Koreans enhancing coverage of medical services and expanding support for cancer patients; strengthening support for rehabilitation and palliative care for cancer patients building infrastructure for active national cancer control; developing world class medical treatments and techniques; educating and advertising familiarly for people and registering cancer and evaluating the management systematically.

2nd term 10-year Plan for National Cancer Control [2005-2015]



Source) National Cancer Center in Korea, 2007

References

Ahn SH et al. Health-related quality of life in disease-free survivors of breast cancer with the general population. Annals of oncology 2006 2007; 18: 173-182

Health Statistics in Japan. National Cancer Center in Japan 2008

International Agency for Research on Cancer(IARC). Globocan 2008 2010

KIN SG et al. The economic burden of cancer in Korea in 2002. European Journal of Cancer Care 2008; 17: 136-144

Korean Association Smoking and Health http://www.kash.or.kr 2009

Korea Central Cancer Registry Office(KCCR) 2009

Korea National Statistical Office(KNSO) 2009

Ministry of Health and Welfare 2009

Ministry of Health and Welfare. Korea Center for Disease Control & Prevention. Youth Behavior Risk Factor Surveillance 2008

Ministry of Health and Welfare. Korea National Health & Nutrition Examination Survey(?-?) 1998-2008(Korean)

Ministry of Health and Welfare. Disease Burden of Korea 2005(Korean)

Ministry of Health and Welfare. Health Plan 2010 2015(Korean)

Ministry of Health and Welfare. Inequality on Medical Service Utilization among Cancer Patients across Income Groups 2006 (Korean)

National Cancer Center. Development of cancer care quality assurance and cancer patients' welfare system 2008(Korean)

National Cancer Center. Korea National Cancer Screening Survey 2004-2009(Korean)

National Cancer Center. The survey on Awareness and Behavior for Cancer Prevention 2009(Korean)

National Health Insurance Corporation. The analysis on cost of cancer patients 2008

NCI. http://progressreport.cancer.gov 2008

NCI. U.S. estimated pervalence counts. SEER9 2005.

http://cancercontrol.cancer.gov/ocs/prevalence/precalence.html 2009

NHS. www.cancerscreening.nhs.uk 2008

OECD health data. OECD 2009

Ries LAG et al (eds). SEER Cancer Statistics Review, 1975-2005, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2005/, based on November 2007 SEER data submission, posted to the SEER web site 2008

Shin HR et al. Prevalence and determinants of genital infection with papillomavirus in female and male university students in Busan, South Korea. J Infect Dis 2004; 190: 468-76

Shin HR et al. Prevalence of Human Papillomavirus Infection in Women in Busan, South Korea. Int J Cancer 2003; 103: 413-21

Yoon SJ et al. Estimation of the burden of major cancers in Korea. J Korean Med Sci 2002; 17: 604-10

Yun YH et al. Knowledge and Attitudes of Family Physician and Oncologist toward Cancer Pain Management in Korea. Korean J Fam Med 2005 ; 26(7): 397~403

Yun YH et al. multicenter study of pain and its management in patients with advanced cancer in Korea. Journal of pain and symptom management. 2003; 25(5): 430-437

Yun YH et al. Public Attitudes Toward Dying with Dignity and Hospice Palliative Care. Korean J of Hospice and Palliative care 2006; 17-28 (Korean)

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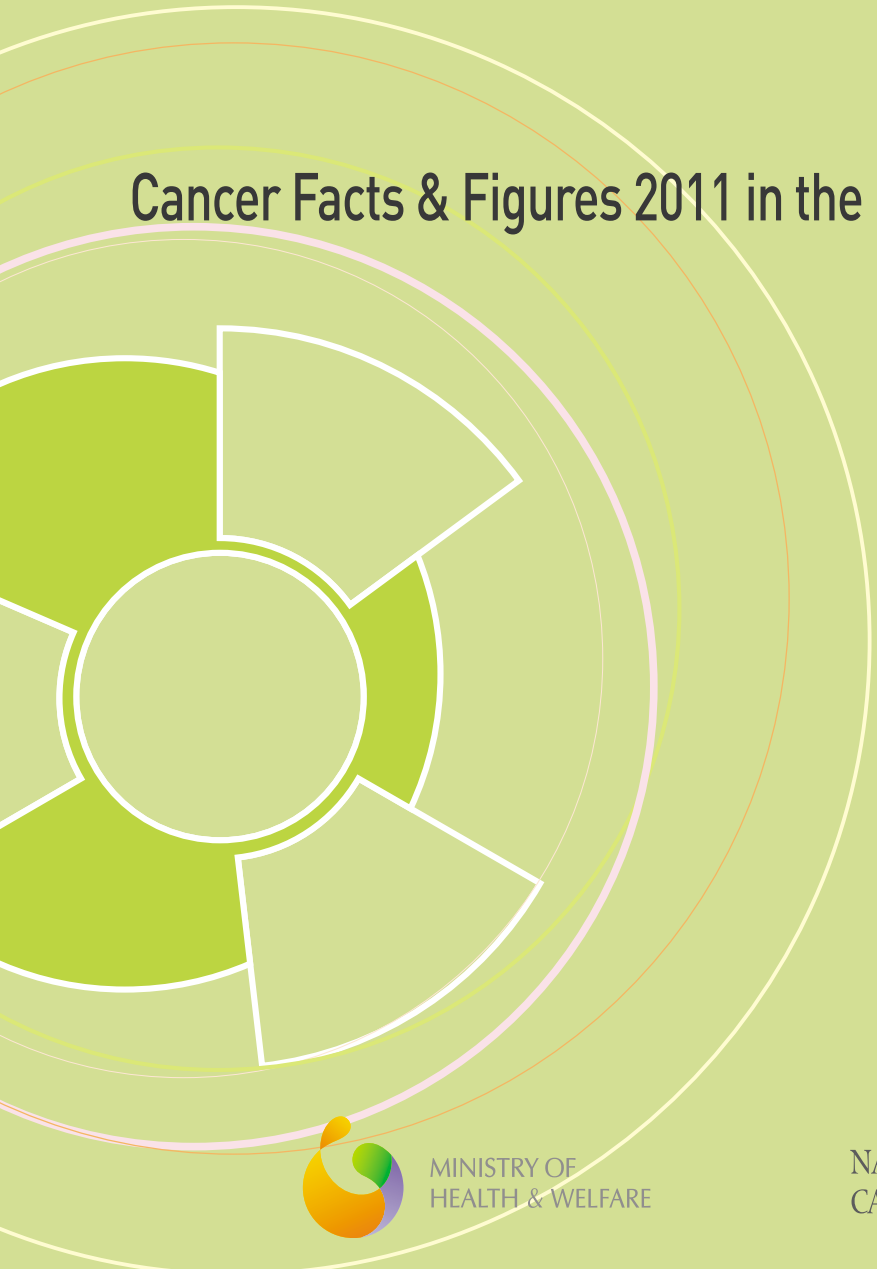

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