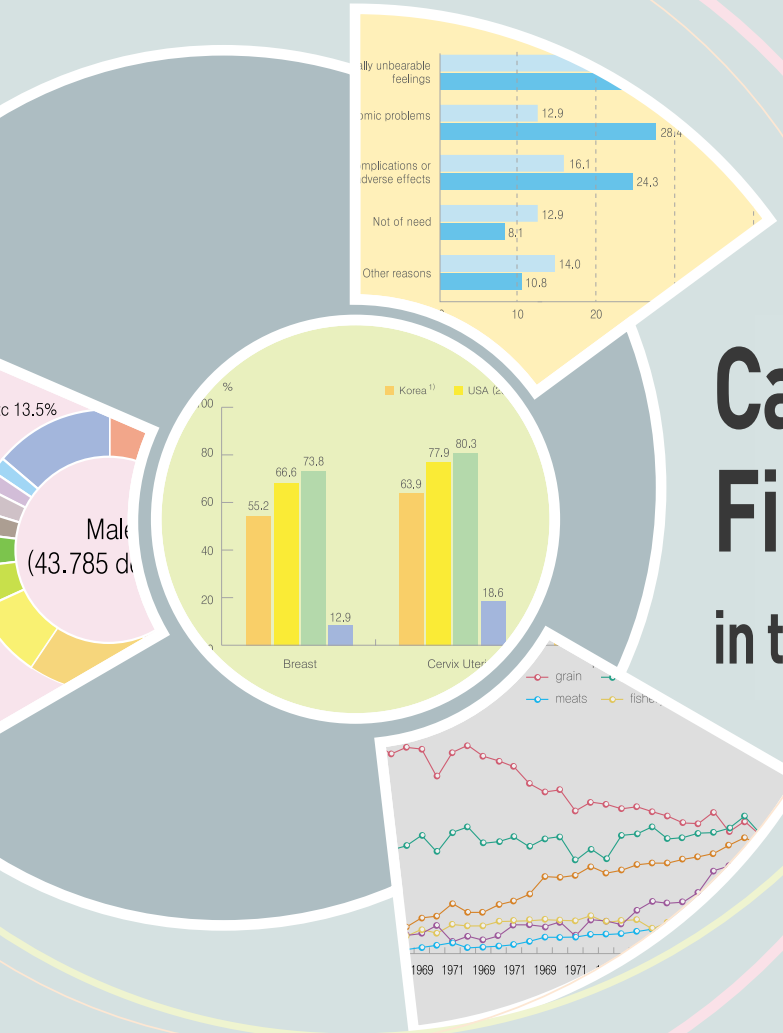


Cancer Facts & Figures 2010

in the Republic of Korea

MINISTRY OF HEALTH & WELFARE

NATIONAL CANCER CENTER

Cancer Facts & Figures 2010

Foreword

The burden of cancer is increasing worldwide. Cancer is already a common cause of death, and its incidence and mortality rates are expected to continue to rise in the future in Korea due to an increasingly Westernized lifestyle and aging society.

Based on a large body of evidence, the World Health Organization reported that one-third of cancers could be prevented by smoking cessation and vaccinations. Another one-third could be cured by early detection. The remaining one-third has yet to be overcome through research and other means, such as clinical advances.

Korea has a comprehensive 10-year plan for cancer control that was initiated in 1996, and the second term was formulated in 2006. This plan supports programs ranging from epidemiological assessments to development of state-of-the-art therapeutic technologies.

The National Cancer Center(NCC) Korea is playing an essential role as the national headquarters in the fight against cancer by conducting research, providing medical care, education, and training, and planning and evaluating national cancer control programs. The NCC in its extramural programs also plans, manages, and evaluates initiatives by funding research aimed at conquering cancer.

This monograph, entitled 'Cancer Facts and Figures 2010 in the Republic of Korea', includes comprehensive reports on the national cancer control programs carried out in Korea. I am pleased to share our experience and results with colleagues in Korea and abroad. I hope that these efforts will become a stepping-stone toward winning the war against cancer, especially in Asia.

Finally, I sincerely appreciate the efforts of the professional members and the support staff of the NCC in the publication of 'Cancer Facts and Figures 2010 in the Republic of Korea'.

June, 2010

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

Contents

Chapter 1.
Basic Facts

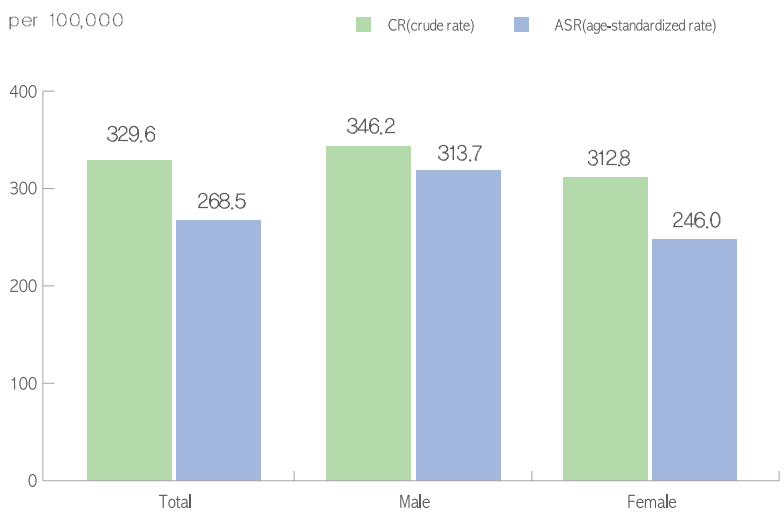
Cancer Facts & Figures 2010

1.1 Cancer Incidence

Cancer Incidence Rates

In Korea, the age-standardized cancer incidence rates in 2007 was 268.5 (male 313.7, female 246.0) per 100,000 persons.

Cancer Incidence Rates [2007]



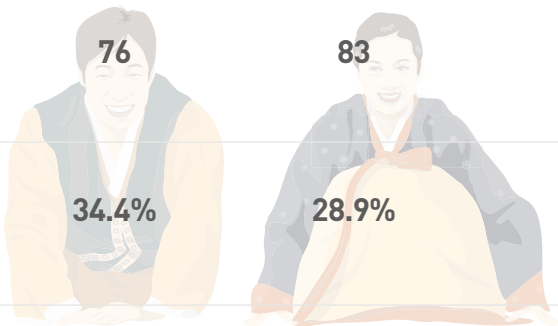
Source) MOHW (Ministry Of Health & Welfare), KCCR (The Korea Central Cancer Registry), 2009
Note) ASR(age-standardized rate) Standard population : Korean Mid-year population in 2000

Cumulative Risk of Cancer

The cumulative risk of cancer after living to the life expectancy was 32.6%. The risk for males was higher than that for females, 34.4% and 28.9%, respectively.

Cumulative Risk of Cancer

	Total	Male	Female
Life Expectancy (2007), years * KNSO (Korea National Statistical Office) 2007	80	76	83
Cumulative risk	32.6%	34.4%	28.9%
	3 out of 10	1 out of 3	1 out of 4



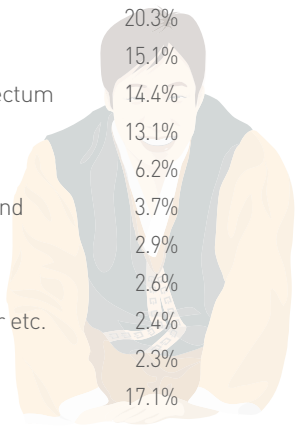
Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

Proportion of Cancer Incidence

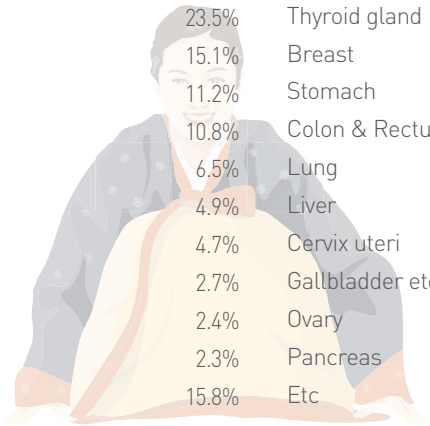
In males, stomach cancer occurred most frequently, accounting for 20.3% of all cases, followed in order by lung(15.1%), colon and rectum(14.4%) and liver cancer(13.1%).

In Females, thyroid gland cancer occurred most frequently, accounting for 23.5% of all cases, followed in order by breast(15.1%), stomach(11.2%), colon and rectum(10.8%) and lung cancer(6.5%).

Proportion of Cancer Incidence [2007]



Male		Female	
Stomach	20.3%	23.5%	Thyroid gland
Lung	15.1%	15.1%	Breast
Colon & Rectum	14.4%	11.2%	Stomach
Liver	13.1%	10.8%	Colon & Rectum
Prostate	6.2%	6.5%	Lung
Thyroid gland	3.7%	4.9%	Liver
Bladder	2.9%	4.7%	Cervix uteri
Pancreas	2.6%	2.7%	Gallbladder etc.
Gallbladder etc.	2.4%	2.4%	Ovary
Kidney	2.3%	2.3%	Pancreas
Etc	17.1%	15.8%	Etc



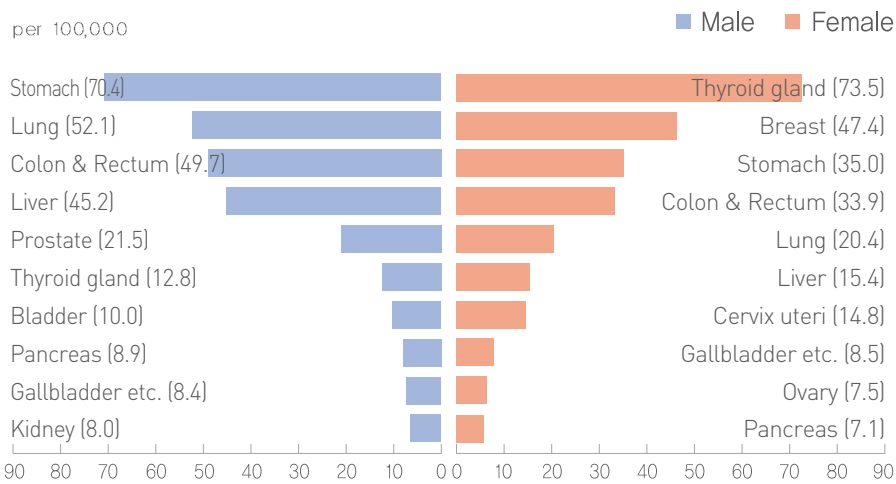
Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

Site-specific Cancer Incidence Rates by Sex

In males, the crude incidence rate[1)] of stomach cancer was 70.4 per 100,000 persons. The incidence rate for other cancer sites were 52.1, 49.7 and 45.2 for lung, colon & rectum and liver cancer, respectively.

In females, the crude incidence rate of thyroid gland cancer was 73.5. The incidence rate for other cancer sites were 47.4, 35.0, 33.9 for breast, stomach, colon & rectum, respectively

Site-specific Cancer Incidence Rates



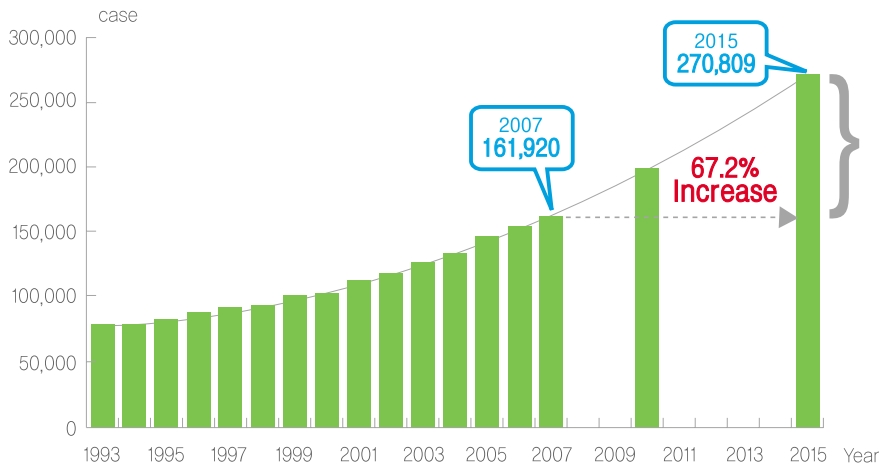
Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

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

Projection of Cancer Incident Cases

According to the projection, the total number of cancer cases is expected to increase from 161,920 in 2007 to 270,809 in 2015, showing a projected 67.2% increase over a eight-year period.

Projection of Cancer Incident Cases [1993-2015]



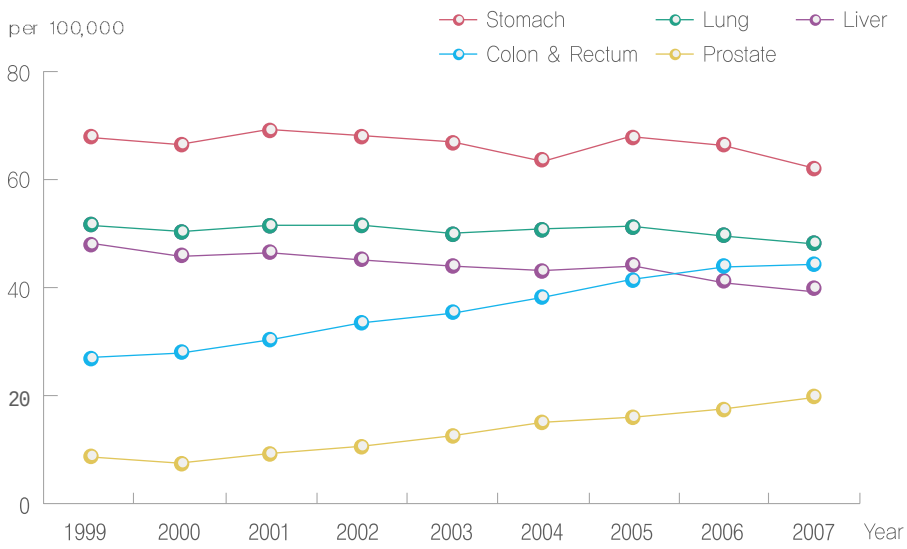
Source) National Cancer Center in Korea, 2009

Trends of Age-standardized Incidence Rates in Major Cancers

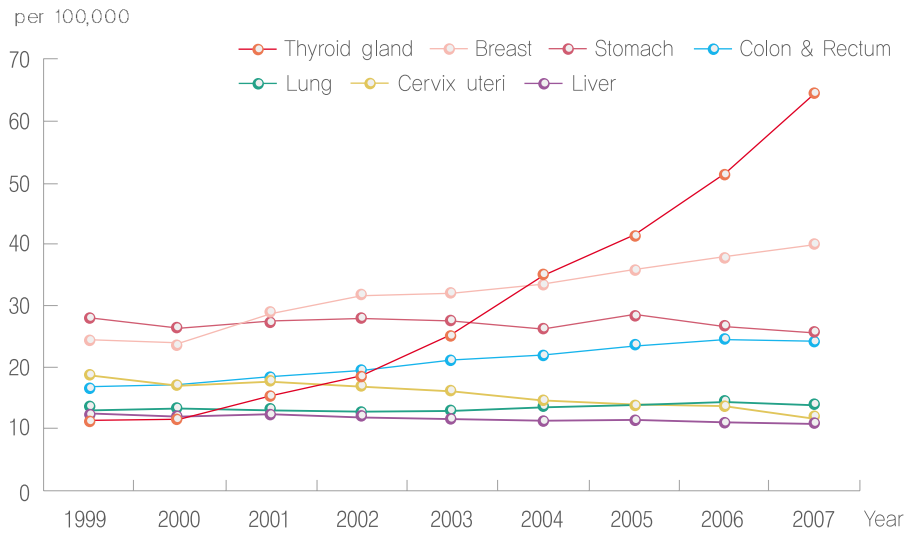
Incidence rate for all sites combined increased by 1.3% per year in males, and by 4.9% in females from 1999 to 2007. In males, stomach, liver, lung cancers decreased while the rates of prostate and colon & rectum cancers increased.

Females showed a decreasing tendency in the rates of cervical and liver cancers. But, the rates of thyroid gland cancer sharply increased by 26.0% per year and the rates of breast, colon & rectum 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



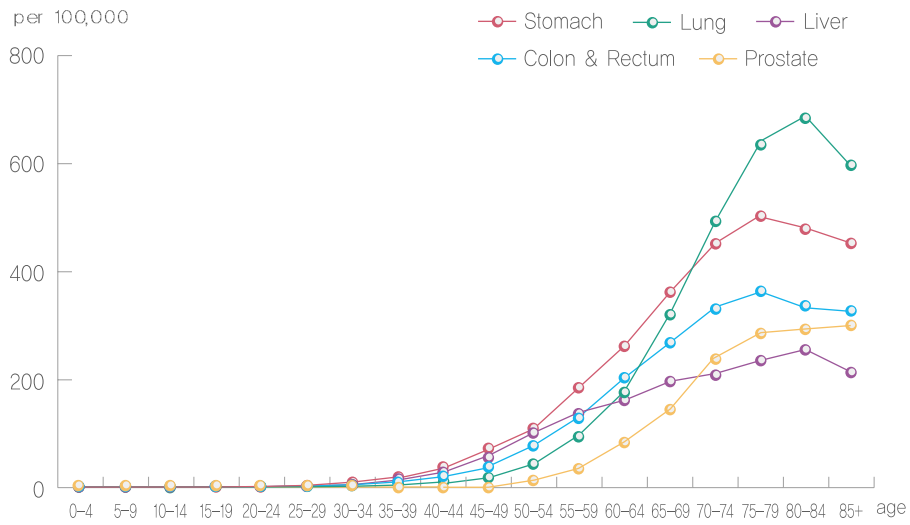
Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009
Note) Standard population : Korean Mid-year population in 2000

Incidence Rates of Major Cancer Sites by Age

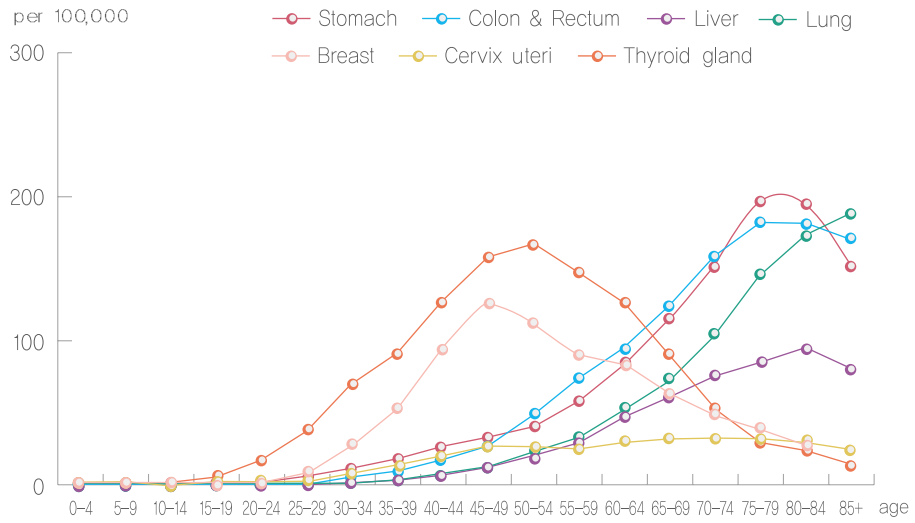
Among younger men(in the 40s), stomach and liver cancer were the most common, while lung cancer occurred most frequently in older men over 65 years.

Age specific cancer incidence trends in women are somewhat different from those in men. Thyroid gland and breast cancer occurred most frequently among women under 60 years, and colorectal and stomach cancer were most common among women over 65 years.

Cancer Incidence Rates by Age : Male [2007]



Cancer Incidence Rates by Age : Female [2007]

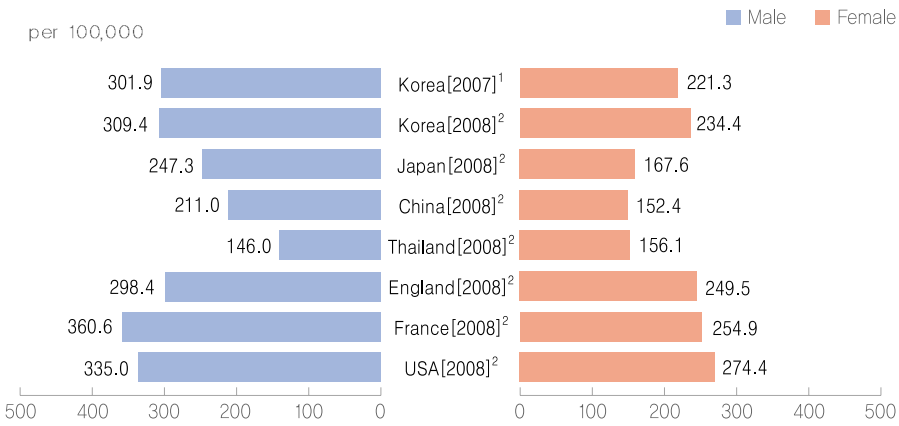


Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

International Comparison of Age-standardized Cancer Incidence Rates[2)]

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

International Comparison of Cancer Incidence Rates



Source) 1. MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009
2. GLOBOCAN 2008, IARC(International Agency for Research on Cancer), 2010
Note) age-standardized incidence rates using the world standard population, exclused other malignant neoplasms of skin (C44)

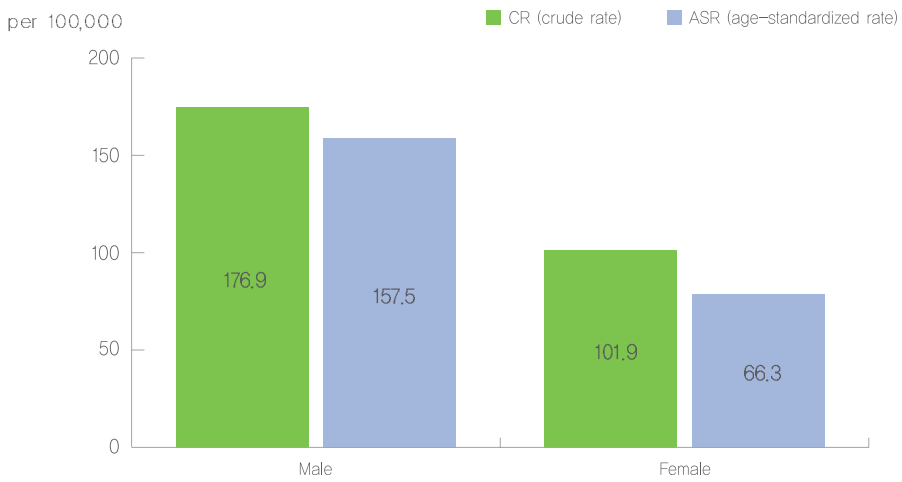
2) Age-standardized cancer incidence rate : The weighted average incidence rate was calculated based on an international standardized population. It is used to compare the cancer incidence rates between areas or periods with different age structures.

1.2 Cancer Mortality

Cancer Mortality Rates

The age-standardized cancer mortality rates in Korea in 2008 were 157.5 per 100,000 men and 66.3 per 100,000 women.

Cancer Mortality Rates in 2008

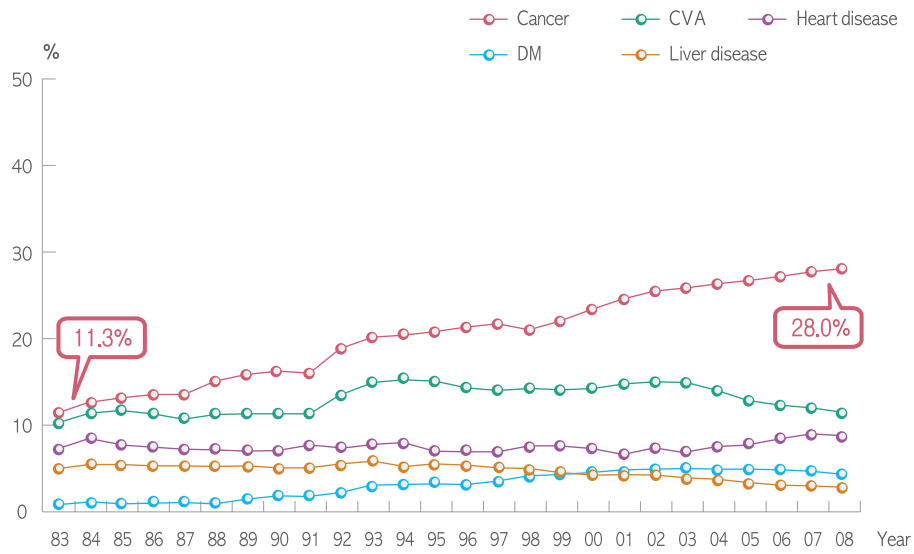


Source) KNSO (Korea National Statistical Office), 2009
Note) Standard population : Korean Mid-year population in 2000

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 28.0% of the total 246,113 deaths in 2008.

Trends of Causes of Death [1983-2008]



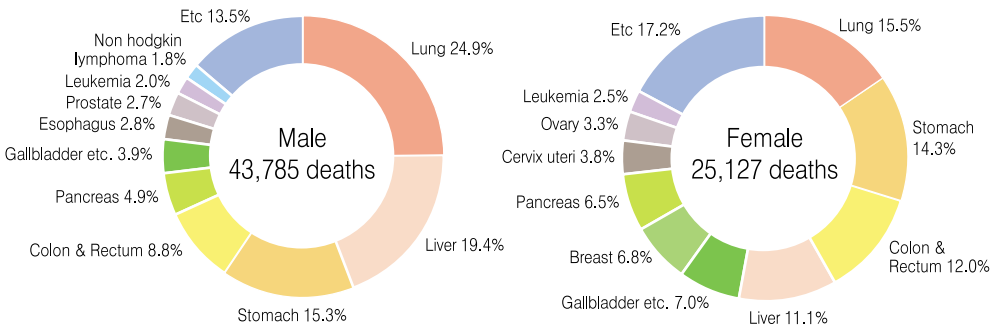
Source) KNSO (Korea National Statistical Office), 2009

Relative Frequency of Cancer Deaths

For the relative frequency of cancer deaths by sex in 2008, lung, liver, stomach and colon & rectum cancer accounted for 24.9%, 19.4%, 15.3% and 8.8% of cancer deaths in males, respectively.

In females, lung, stomach, colon & rectum and liver cancer accounted for 15.5%, 14.3%, 12.0% and 11.1% of cancer deaths, respectively.

Relative Frequency of Cancer Deaths in 2008



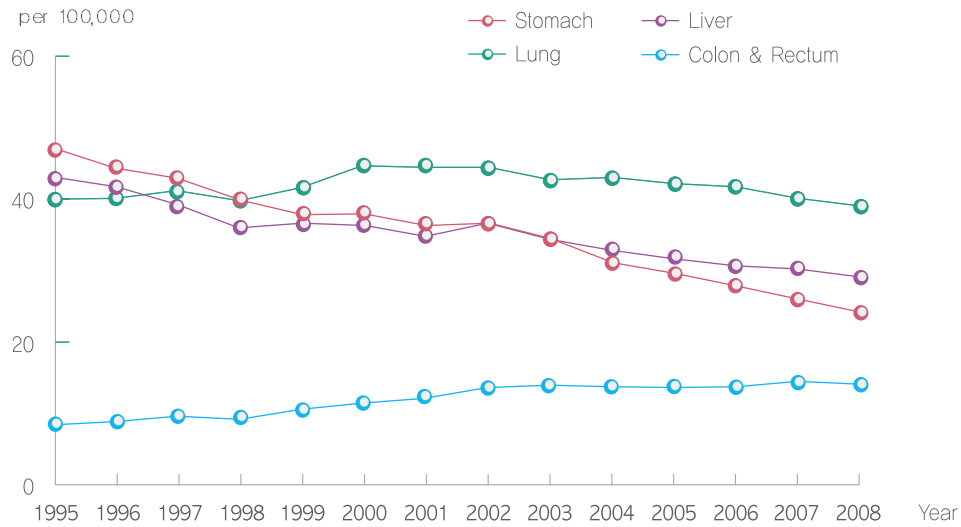
Source) KNSO (Korea National Statistical Office), 2009
Note) Colon& Rectum C18-C21(International Classification of Diseases for Oncology, ICD-10),
Non fodgkin lymphoma C82-C85((International Classification of Diseases for Oncology, ICD-10),

Trends of Age-standardized Mortality Rates in Major Cancers

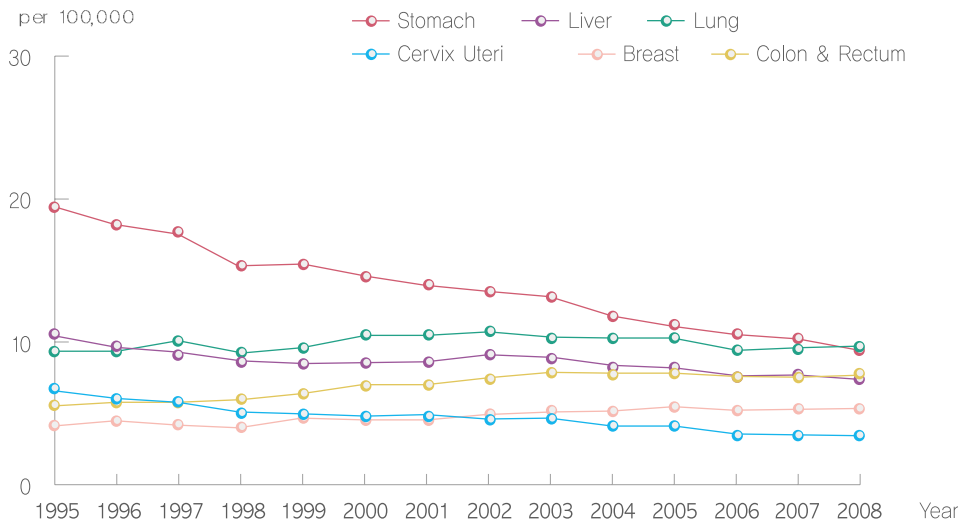
Regarding the trends of age-standardized mortality rates in males, the rates of stomach and liver cancer tended to fall but the rate of colon & rectum cancer has increased consistently. On the other hand, the rate of lung cancer in males has been decreasing since 2000.

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 colon & rectum 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

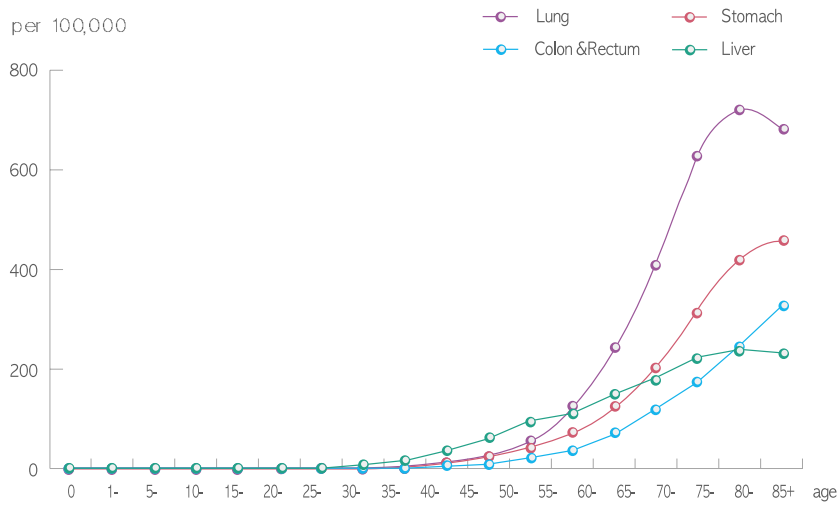


Source) KNSO (Korea National Statistical Office), 2009
Note) standard population : Korean mid-year population in 2000
Colon & Rectum C18-C21 (International Classification of Diseases , ICO-10)

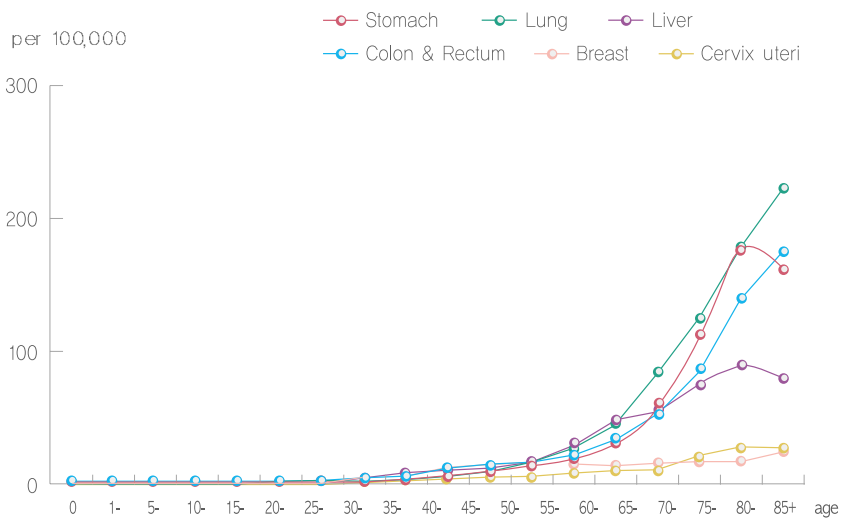
Age-specific Cancer Mortality Rates

Age-specific mortality rates of major cancer sites increased with age up to the eighties and leveled off at ages above that.

Age-specific Cancer Mortality Rates : Male [2008]



Age-specific Cancer Mortality Rates : Female [2008]

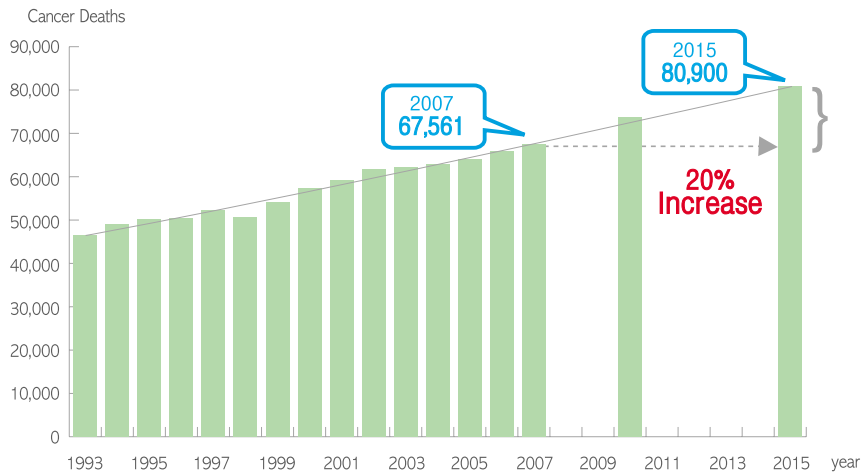


Source) KNSO (Korea National Statistical Office), 2009
Note) Colon & Rectum C18-C21 (International Classification of Diseases , ICO-10)

Projection of Cancer Deaths

According to the projection, the total number of cancer deaths is expected to increase from 67,561 in 2007 to 80,900 in 2015, indicating 20% increase in the next eight-year period .

Projection of Cancer Deaths [1993-2015]



Source) National Cancer Center, Korea, 2008

1.3 Cancer Survival

Five-year Cancer Relative Survival Rates[3)]

The five-year relative survival rates for cancer patients increased from 31.7% in 1993-1995 to 48.3% in 2003-2007 by 16.6% points in males and from 53.4% in 1993-1995 to 67.1% in 2003-2007 by 13.7% points in females.

Five-year Cancer Relative Survival Rates [1993-2007]

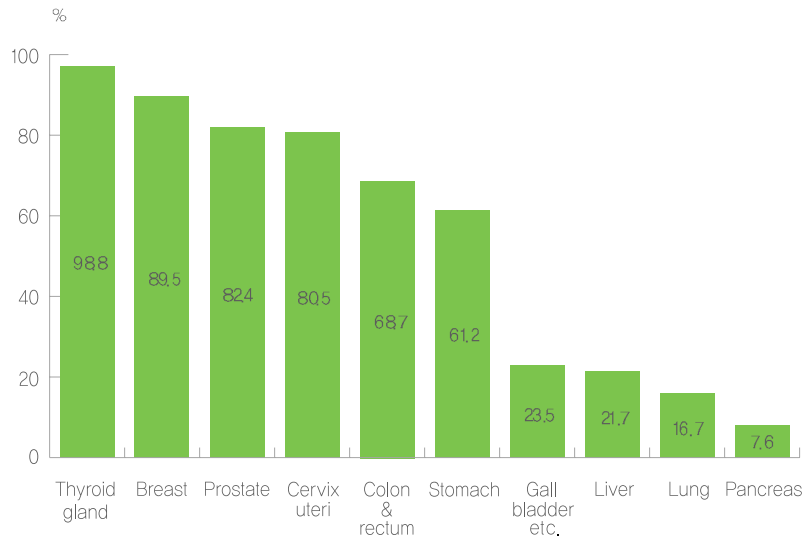
Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

3) 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 of major cancer sites were 98.8%, 89.5%, 82.4%, 80.5% and 68.7% for thyroid gland, breast, prostate, cervical and colorectal cancers, respectively.

Five-year Relative Survival Rates by Major Cancer Sites [2003-2007]



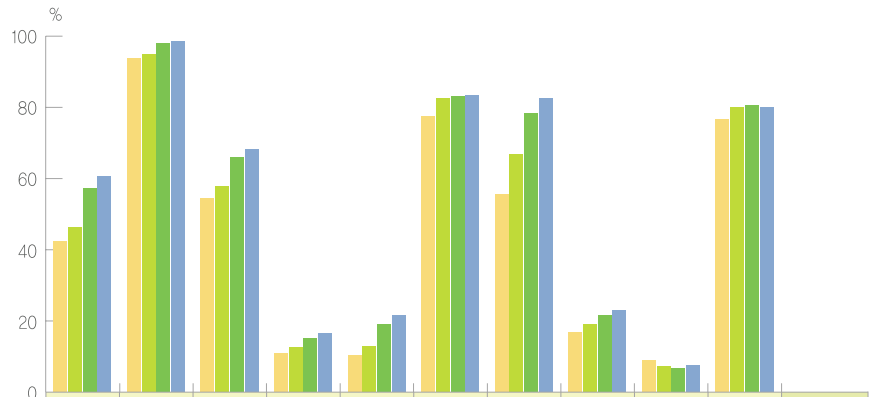
Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

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 57.1% in 2003-2007 by 15.9% points.

Prostate cancer showed the greatest improvement in the survival rates with 26.5% points increase in 2003-2007 compared to 1993-1995 followed by stomach and colorectal cancers recording the improvement of 18.4% points and 13.9% points, respectively. The relative survival rates of all major cancers improved, except for pancreas.

Comparison of Five-year Relative Survival Rates [1993-2007]



	Stomach	Tyroid gland	Colon&rectum	Lung	Liver	Breast	Prostate	Gallbladder	Pancreas	Cervix uteri	All Cancer
1993–1995	42.8	94.2	54.8	11.3	10.7	77.9	55.9	17.3	9.4	77.5	41.2
1996–2000	46.6	94.9	58.0	12.7	13.2	83.2	67.2	19.7	7.6	80.0	44.0
2001–2005	57.3	98.0	66.1	15.6	19.4	88.0	78.6	22.1	7.4	80.9	53.1
2003–2007	61.2	98.8	68.7	16.7	21.7	89.5	82.4	23.5	7.6	80.5	57.1
variation	18.4	4.6	13.9	5.4	11.0	11.6	26.5	6.2	−1.8	3.0	

Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

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 Europe.

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

(unit : %)

Site	Korea ('96-'00)	Korea ('01-'05)	Korea ('03-'07)	USA[1] ('99-'05)	Canada[2] ('98-'00)	Japan[3] ('97-'99)
All cancers	44.0	53.1	57.1	66.1	60	54.3
Stomach	46.6	57.3	61.2	25.7	22	62.1
Liver	13.2	19.4	21.7	13.1	14	23.1
Cervix uteri	80.0	80.9	80.5	70.6	75	71.5
Colon and rectum	58.0	66.1	68.7	65.2	59/61[4]	65.2
Thyroid	94.9	98.0	98.8	96.9	97	92.4
Breast	83.2	88.0	89.5	89.1	87	85.5
Lung	12.7	15.6	16.7	15.6	15	25.6
Pancreas	7.6	7.4	7.6	5.5	6	6.7
Prostate	67.2	78.6	82.4	99.7	94	75.5

Source) 1) Horner MJ, Ries LAG, Krapcho M, Neynam N, Aminou R, Howlader N, et al (eds). SEER Cancer Sratistics Review, 1975-2006, National Cancer Institute. 2009
2) Statistics Canada. Cancer Survival Statistics 1992-2000
3) National Cancer Center in Japan. Cancer Statistics in Japan, 2008
4) Colon/Rectum

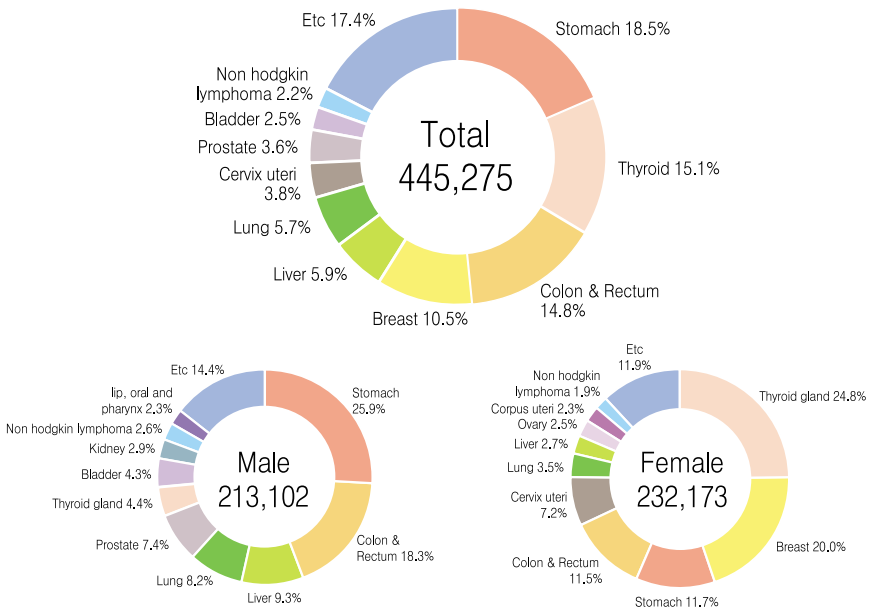
1.4 Cancer Prevalence

Five-year Cancer Prevalent Cases

The number of patients of five-year prevalence in 2007 were 445,275. The frequent rates were shown in the following order: stomach, thyroid gland, colon-rectum, breast, liver, and lung cancer.

Stomach cancer was most prevalent in male partients, followed by colorectal, liver, lung, thyroid gland cancer. In Female patients, thyroid gland cancer was most prevalent followed by, breast, stomach, colon-rectum, and uterine cervical cancer.

Five-year Cancer Prevalent Cases (2007)

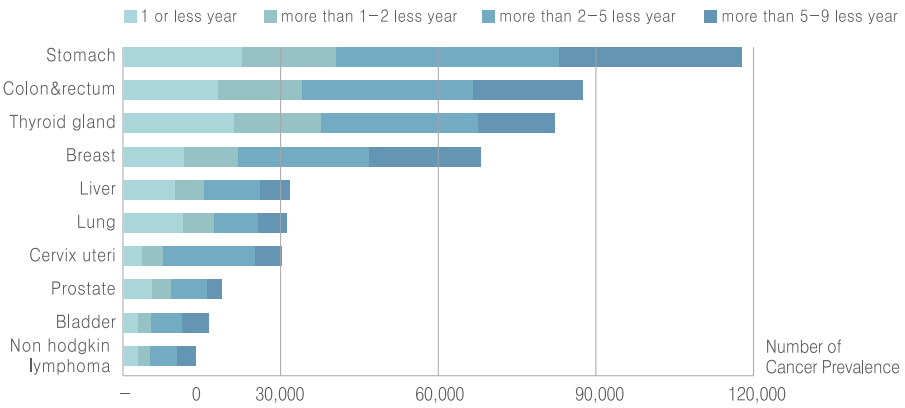


Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

Number of Major Cancer Prevalent Cases by Prevalence Period

The number of Cancer Prevalence by prevalence period in 2007 is as follows. The number of stomach cancer patients (35,483) was the largest in those who survived over 5 years. The number of colon-rectum and breast cancer patients who survived over 5 years was 21,911 and 21,534, respectively.

Cancer Prevalence by prevalence period



	Stomach	Colon and rectum	Thyroid	Breast	Liver	Lung	Cervix uteri	Prostate	Bladder	Non-Hodgkin lymphoma	All cancers
Under 1 year	21,983	18,486	21,020	11,441	9,572	11,075	3,437	5,063	2,812	2,653	131,764
1-2 years	18,656	15,603	16,157	10,348	6,174	6,009	3,497	3,881	2,445	2,176	102,364
2-5 years	41,755	31,623	29,867	24,813	10,444	8,435	9,895	6,922	5,911	4,984	211,147
5-9 years	35,483	21,911	15,156	21,534	5,761	5,464	13,210	2,964	5,162	4,169	161,529
Total	117,877	87,623	82,200	68,136	31,951	30,983	30,039	18,830	16,330	13,982	606,804

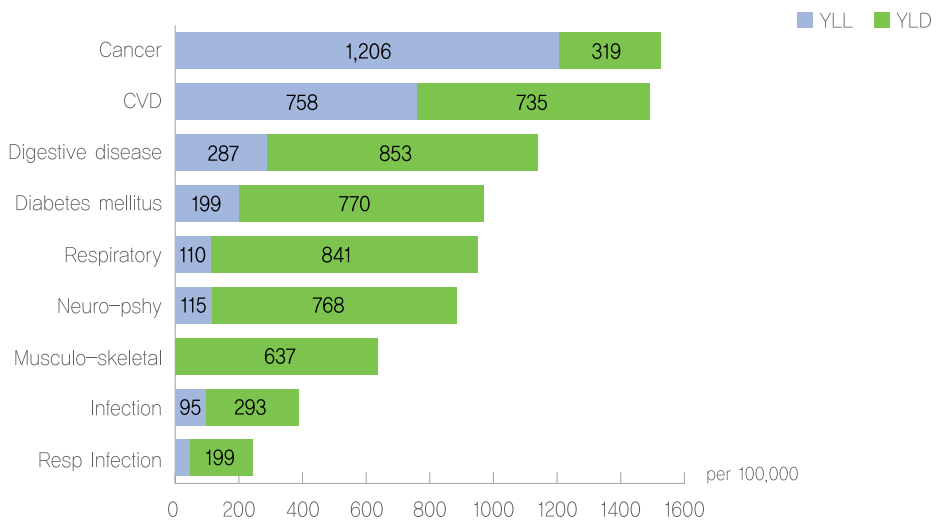
Source) MOHW (Ministry of Health & Welfare), KCCR(The Korea Central Cancer Registry), 2009

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

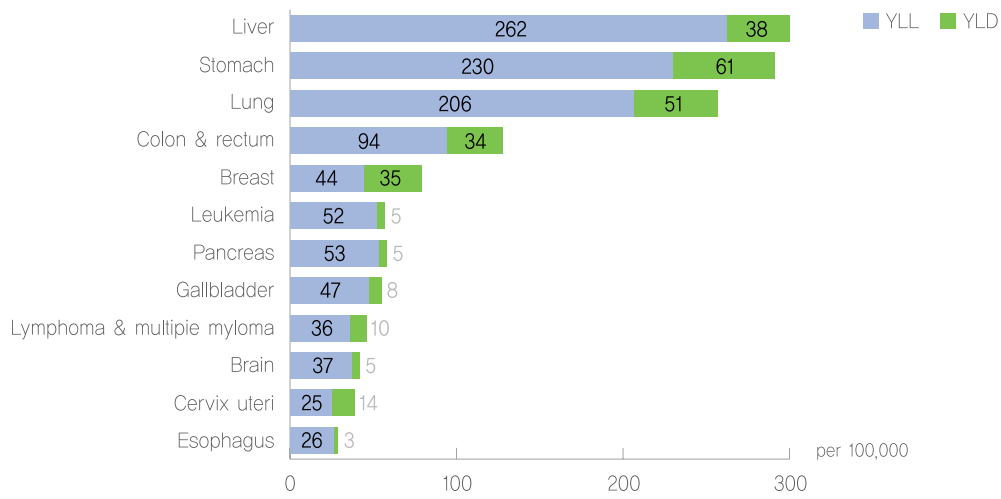


Source) Ministry of health and welfare, 2006
Note) YLL (Years Life Lost due to premature death), YLD (Years of Lived with Disability)

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 2010

2.1 General Outline

The Awareness on the '10 Codes of Conduct for Cancer Prevention' in 2009

When the awareness and practice on '10 codes of conduct for cancer prevention' was investigated with 1,004 adult males and females of age 19 or older, 91.3%, 69.6% and 67.3% avoided burnt foods, salty foods and smoking, respectively.


Don't smoke and avoid smoke-filled environments


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


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


Limit your consumption of alcoholic beverages to one or two drinks per day


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


Maintain your body weight within a healthy range

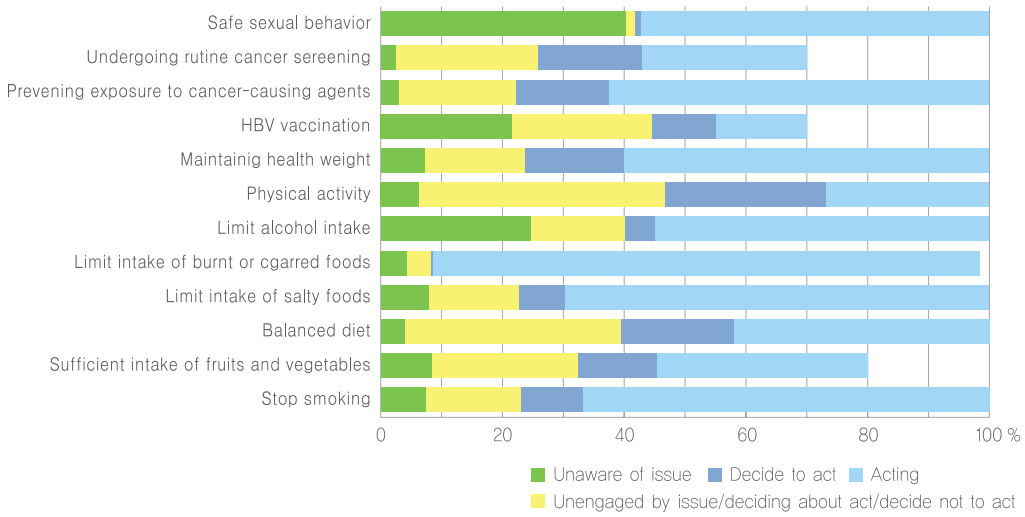

Ensure vaccination against hepatitis B virus following the HBV vaccination schedule


Engage in safe sexual behavior to avoid sexually transmitted diseases


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


Undergo routine check-ups following the cancer screening programs

The Awareness on the '10codes of Conduct for Cancer Prevention' in 2009



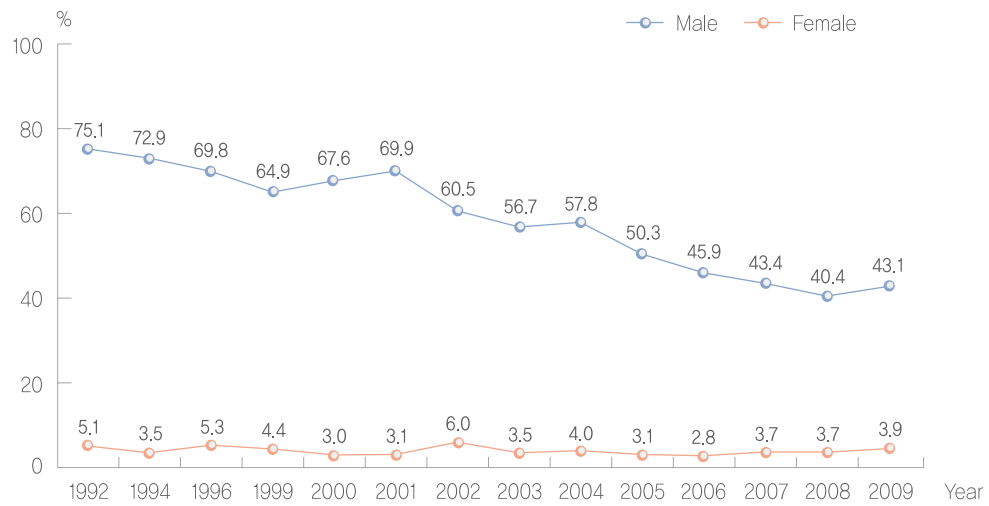
Source) The Survey on Awareness and Behavior for Cancer Prevention,National Cancer Center Korea, 2009

2.2 Smoking

Trends of Smoking Rates

In Korea, smoking rates of males have tended to be decreased from 75.1% in 1992 to 43.1% in 2009, although it is still high comparing with other hight-resource country.

Trends on Smoking Rates 1992-2009

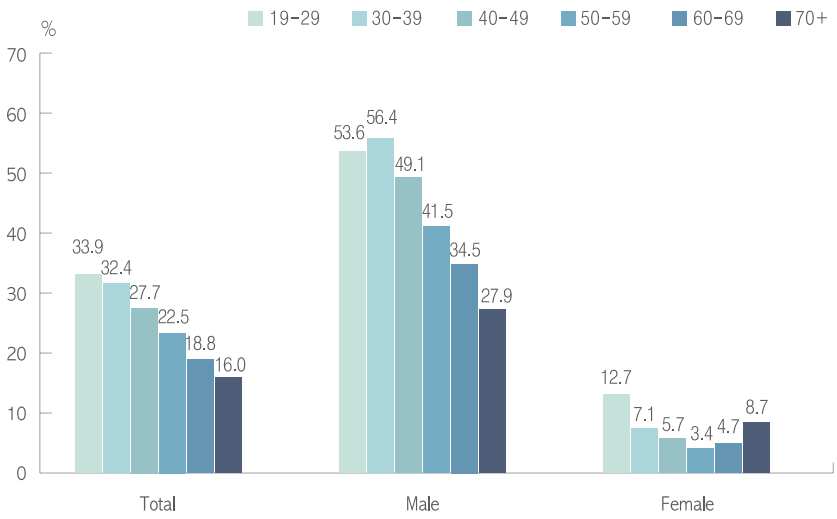


Source) Korean Association of Smoking and Health, 2009

Current Smoking Rates

Current smoking rates of people who were over 19 years old in 2008 were 27.7% (male 47.7% and female 7.4%). The highest rate by age of male and female is the 30s and the 20s, respectively. As their age was lower, their smoking rates were higher.

Current Smoking Rates by Age in 2008

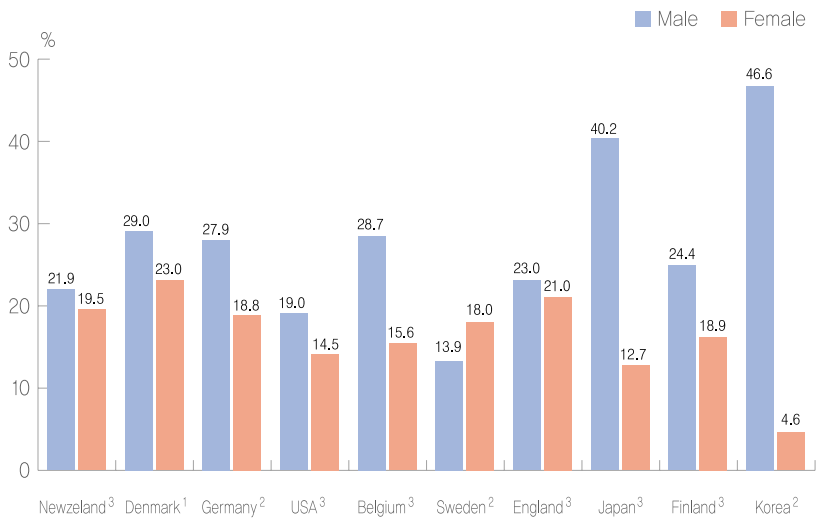


Source) Korean National Health and Nutrition Examination Survey, 2009

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

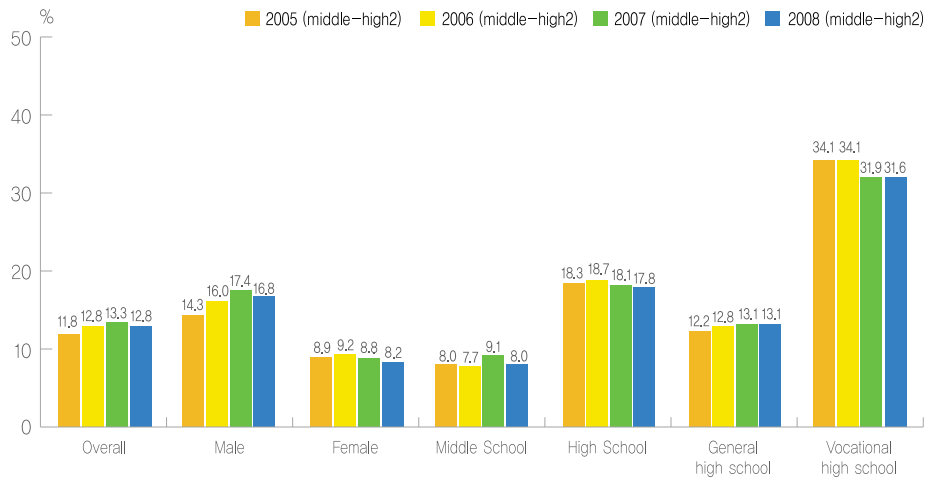


Source) OECD Health Data, OECD 2009
Note) 1. [1]: 2005 [2] : 2006 [3] : 2007
2. age : 15 or older

The Rate of Current Smoker : Adolescents

The rate of current smoker was higher in male(16.8%) than female(8.2%). In addition, Vocational high school students showed high level of smoking rate, approximately 3 fold higher than in general high school students.

Current Smoking Rates by Education : Adolescents [2005-2008]



Source) Youth Behavior Risk Factor Surveillance, Korea Center for Disease Control and Prevention, 2008

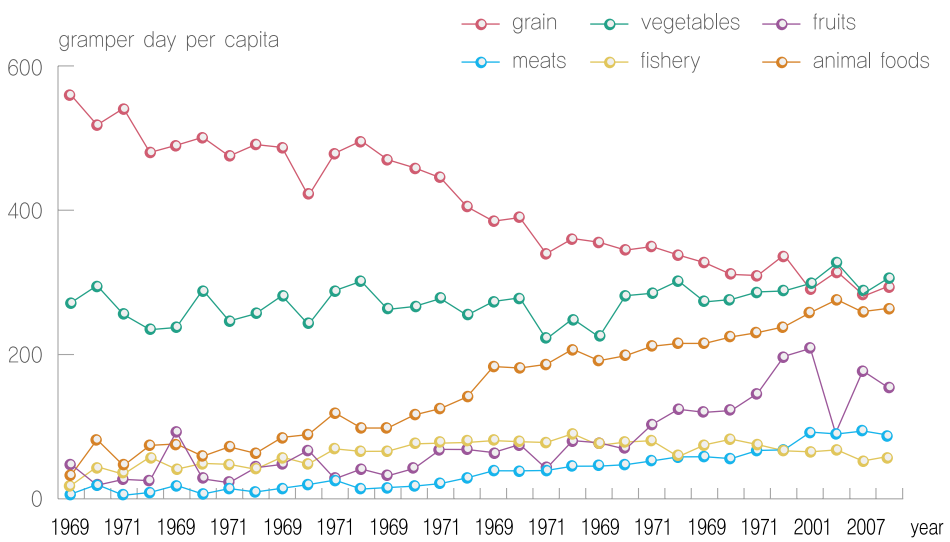
2.3 Intake of Vegetables and Fruits

Average Amount of Vegetable and Fruit Intake

The average amount of vegetable intake had a certain trend as a whole, but showed no significant difference by year.

The average amount of fruit intake tend to increase. It was decreased from approximately 200g to 87.6g in 1998 and 2001, but increased to 158.4g again in 2008. The above variation of average amount was explained by seasonal effect.

Trends on Average amount of selected Food Intake



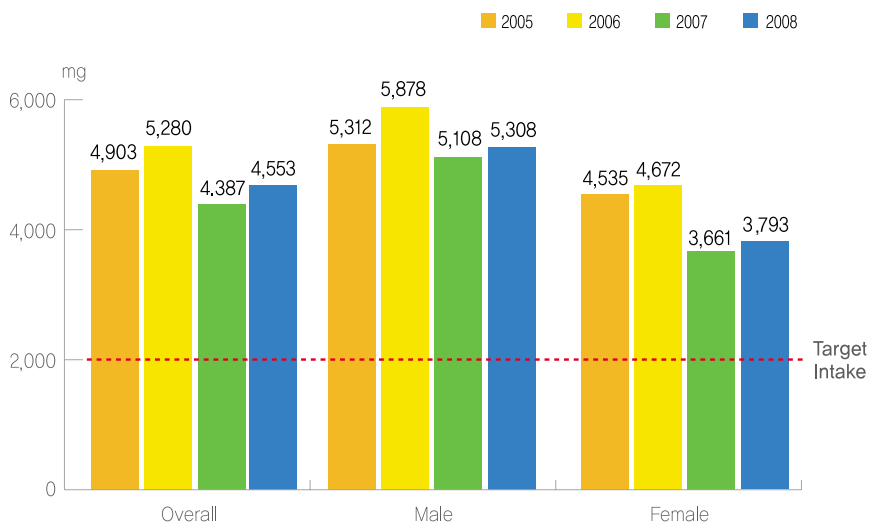
Note) Survey period : Nov.~Dec. of 1998, 2007 / Apr.~May of 2005 / Jan. of 2007 ~ Jul. of 2008 / Jan.~Dec. of 2008
* :As the survey conducted at different season, the amount of fruits intakes can be different by annual. (In winter, intakes of mandarin are increasing).

2.4 Intake of Sodium

Average amount of Sodium Intake

In 2008, the average daily sodium intake per capita(4,553mg) was slightly decreased to compare with the intake in 2006 and it was higher in male than female.

The Average amount of Daily Sodium Intake



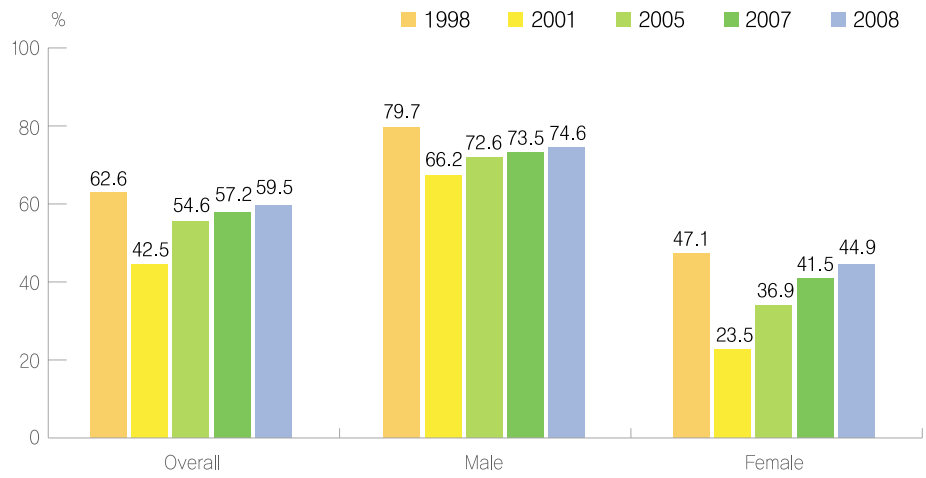
Source) Korea National Health and Nutrition Examination Survey, 2009
Note) * : Suggested by Korean Nutrition Society, 2005

2.5 Alcohol Drinking

The Rate of Alcohol Drinkers by Month[4)]

The 74.6% (standardized over the age of 19) of monthly drinking rate in male at 2008 were similar to the rate at 2007. However, for female the monthly drinking rate at 2008 was increased to 44.9%, compared to the rate at 2001.

The Rate of Alcohol Drinkers by Month



Source) Korean National Health and Nutrition Examination Survey, 2009

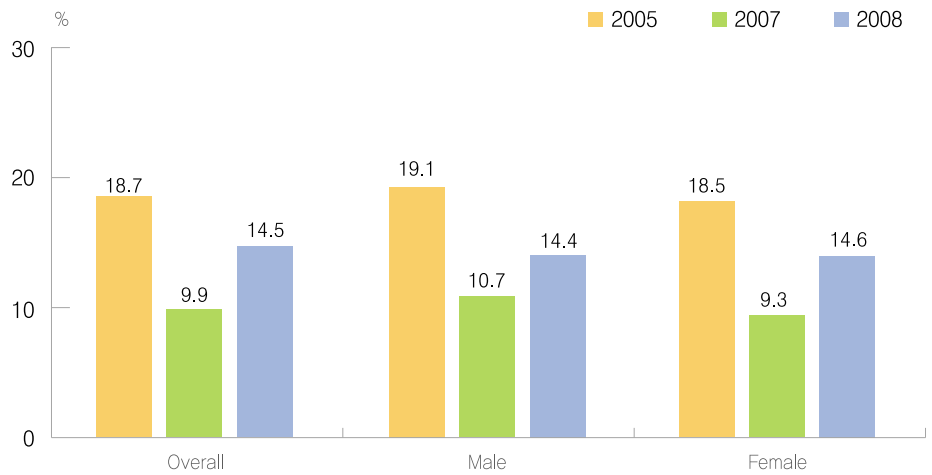
4) The rate of alcohol drinkers by month : A rate of adults aged 19 or more years who have drunk one or more glasses every month for the last one year.

2.6 Physical Activity

Moderate-intensity Physical Activity Rates by Week[5)]

The 2008's moderate-intensity physical activity rate (14.5%) was higher than the 2007's (9.9%) and lower than the 2005's (18.7%).

Moderate-intensity Physical Activity Rates



Source) Korea National Health and Nutrition Examination Survey, 2009
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

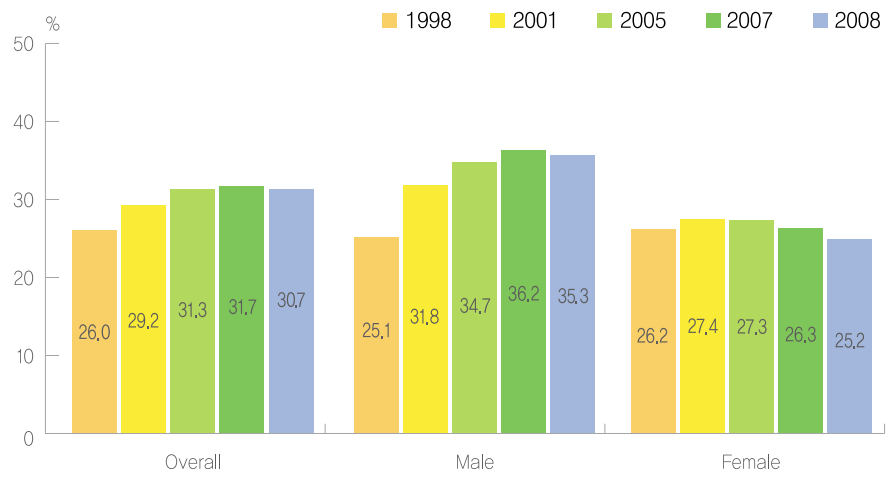
5) Moderate-intensity Physical Activity Rate : The rates for people who performed moderate-intensity physical activities more than 30 mins per once or 5 days per week with breathe fast or harder than normal conditions. (age: 19 or older)

2.7 Obesity

Prevalence of Obesity

Prevalence of obesity (standardized over the age of 18) tended to increase from 26.0% in 1998 to 31.7% in 2007. But, there were not much difference on the obesity prevalence for last 4 years.

Prevalence of Obesity



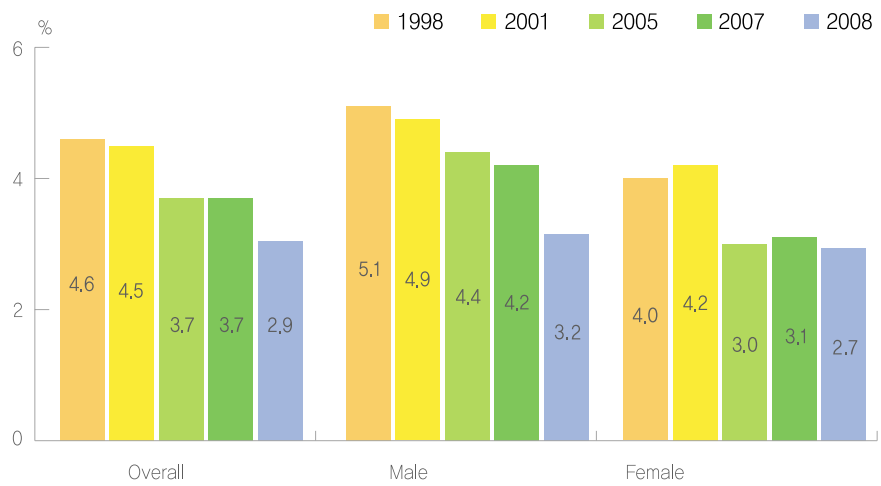
Source) Korea National Health and Nutrition Examination Survey, 2009
Note) 1. Age-standardized rates based on the 2005 Korean population
2. obesity: Body Mass index(BMI) ≥ 25

2.8 Hepatitis B Virus Infection

HBsAg Sero-Positivity

The age-standardized rate of positivity to hepatitis B surface antigens decreased from 4.6% in 1998 to 2.9% in 2008. The rate was higher in males (3.2%) than in females(2.7%).

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



Source) Korea National Health and Nutrition Examination Survey, 2009
Note) Age standardized rates based on the 2005 Korean population

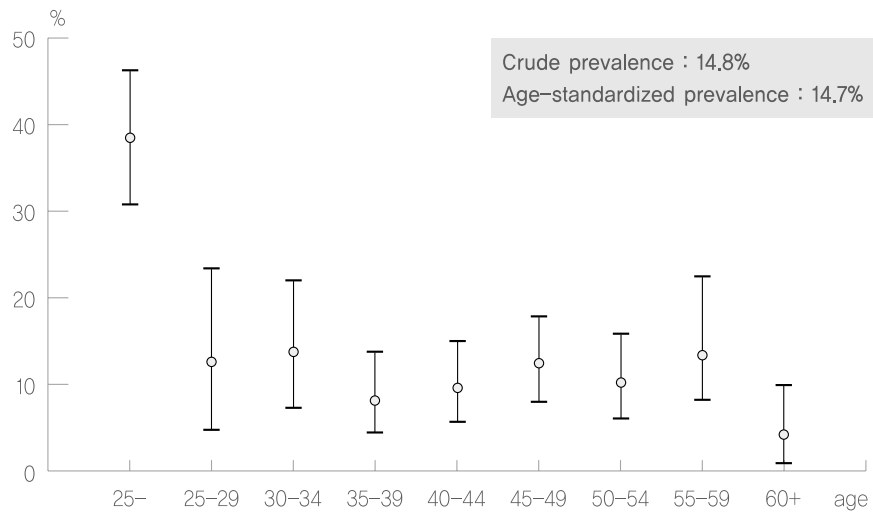
2.9 Human Papillomavirus (HPV) Infection

Prevalence of HPV Infection

The 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 pharyngolaryngeal 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

Chapter 3.
Cancer Screening Program

Cancer Facts & Figures 2010

3.1 Cancer Screening Rates

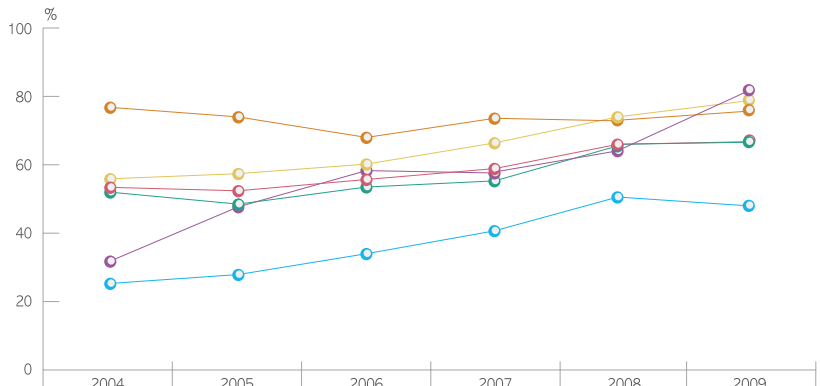
- Korea National Cancer Screening Survey 2004~2009 -

Cancer Screening Rates

The lifetime screening rate of the 5 major cancers of the National Cancer Center Programs in 2009 was 66.9%. The cancer screening rate for fulfilling recommendations was 53.3%. The cancer screening rates of the 5 major cancers had increased (1.37 times versus 2004).

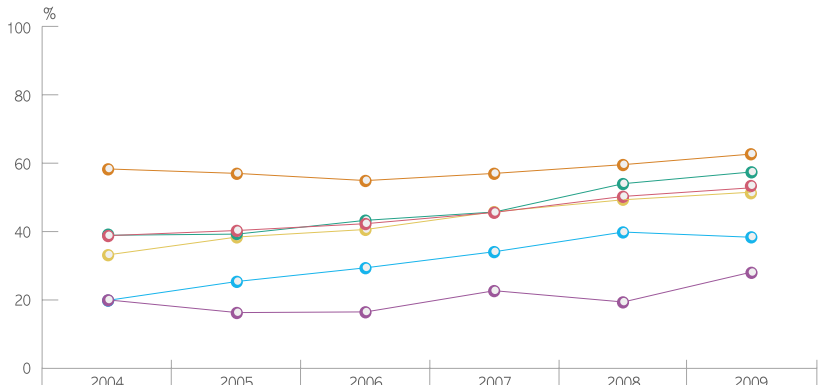
In addition, the screening rates for fulfilling recommendations were shown in the following order: cervical cancer (63.9%), stomach cancer (56.9%), breast cancer (55.2%), colon & rectum cancer (36.7%), and high-risk group of liver cancer (31.3%).

Lifetime Cancer Screening Rates [2004-2009]



	2004	2005	2006	2007	2008	2009
Mean	53.4	52.4	55.7	58.9	65.7	66.9
Stomach	52.0	48.5	53.5	55.3	65.0	65.1
Liver	31.8	47.7	58.3	57.6	64.8	81.3
Colon & Rectum	25.8	27.9	34.0	40.7	50.4	48.1
Breast	55.9	57.4	60.2	66.4	72.7	78.1
Cervix uteri	76.8	74.0	68.0	73.6	74.4	76.1

Cancer Screening Rates with Recommendations [2004-2009]



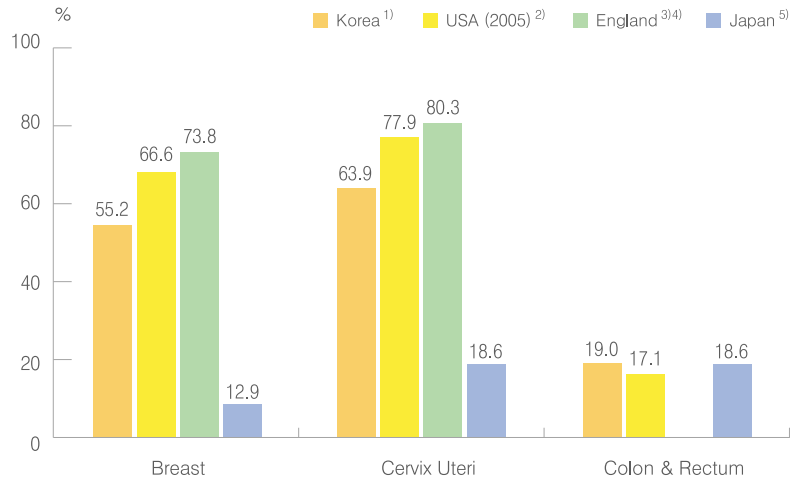
	2004	2005	2006	2007	2008	2009
Mean	38.8	40.3	42.3	45.6	50.7	53.3
Stomach	39.2	39.4	43.3	45.6	53.5	56.9
Liver	20.0	16.3	16.5	22.7	19.7	31.3
Colon & Rectum	19.9	25.4	29.4	34.1	37.9	36.7
Breast	33.2	38.4	40.6	45.8	49.3	55.2
Cervix uteri	58.3	57.0	54.9	57.0	59.9	63.9

Source) Korea National Cancer Screening Survey, 2004-2009

International Comparison of Cancer Screening Rates

A comparison of the cancer screening rate with recommendations in Korea with those in other countries showed that the rates of breast(55.2%) and cervix uteri cancer(63.9%) in Korea were lower than those of England and the USA; 73.8%, and 80.3% in England, and 66.6%, and 77.9% in USA, respectively.

Cancer Screening Rates: International Comparison



Cacner		Korea 1)	USA 2)	England 3)4)	Japan 5)
Breast	Cancer Screening Rates	55.2%	66.6%	73.8%	12.9%
	Target Population	40 & over	40 & over	50-70	40 & over
	Frequency	every 2 years	every 2 years	every 3 years	every 2 years
	Test or Procedure	Mammography & CBE	Mammography	Mammography	Mammography & CBE
Cervix Uteri	Cancer Screening Rates	63.9%	77.9%	80.3%	18.6%
	Target Population	30 & over	18 & over	50-64	20 & over
	Frequency	every 2 years	every 3 years	every 5 years	every 2 years
	Test or Procedure	Pap smear	Pap smear	Pap smear	Pap smear
Colon & Rectum	Cancer Screening Rates	19.0%	17.1%	-	18.6%
	Target Population	50 & over	50 & over	60-69	40 & over
	Frequency	every 1 year	every 2 years	every 2 years	every 1 year
	Test or Procedure	FOBT or DCEB	FOBT	FOBT	FOBT

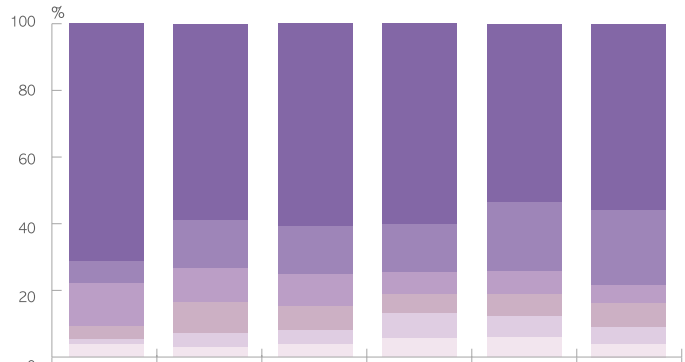
Source) 1) Korea National Cancer Screening Survey, 2004-2009
2) National Cancer Institute. Cancer Trends Progress Report, 2007
3) NHS Cancer Screening Programmes. NHS Breast Screening Programme Annual Review, 2008
4) NHS Cancer Screening Programmes. NHS Cervical Screening Programme Annual Review, 2008
5) Health Statistics in Japan, 2007

Note) CBE(Clinical breast examination), FOBT(Fecal occult blood test), DCBE(Double-contrast barium enema)

Reason 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 more than half on the total subjects but their rate tended to decrease(71.2% in 2004 to 56.9% in 2009). However, the rates of subjects answering 'time constraints to be screened' showed an increasing tendency.

Reason for non-attendance for cancer screening [2004-2009]



	2004	2005	2006	2007	2008	2009
Belief of healthiness	71.2	59.0	60.7	60.1	53.6	56.9
Time constraints to be screened	6.8	14.2	14.5	14.4	20.6	22.2
Too expensive	12.9	10.2	9.5	6.7	6.8	5.6
Too painful, unpleasant	3.7	9.4	7.3	5.8	6.8	6.8
Fear of detection	1.7	4.2	4.3	7.5	6.3	4.0
Others	3.8	2.9	3.7	5.5	5.9	4.5

Source) Korea National Cancer Screening Survey, 2004-2009

3.2 National Cancer Screening Program

- Performance from 2002 to 2008 -

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 (CBE carried out by a clinician is recommended)
Cervix Uteri	Age 30 & over women	2 years	Pap smear

Source) National Cancer Center, 2001

Note) UGI(Upper gastro-intestinal series), AFP(Serum alpha-feto protain test), FOBT(Fecal occult blood test), DCBE(Double-contrast barium enema), CBE(Clinical breast examination)

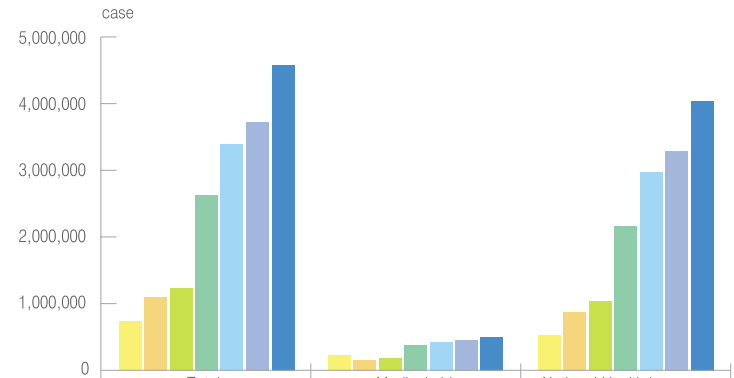
*High risk group: HBsAg positive or anti-HCV positive or liver cirrhosis

Number of Screening Attendances of the National Cancer Screening Program

The target population of the National Cancer Screening Program(NCSP) constitutes people insured by Medical Aid and the National Health Insurance program. The number of screening attendances insured by Medical Aid increased from 238,762 cases in 2002 to 507,797 in 2008. The number of screening attendances insured by National Health Insurance Program increased from 533,343 in 2002 to 4,090,171 in 2008.

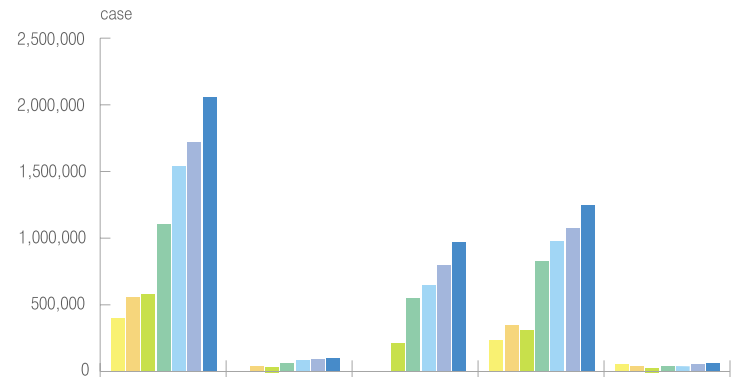
Among the five cancers in the National Cancer Screening Program, the number of recipients was the highest in those with stomach cancer recording 2,085,978, followed by breast cancer 1,295,152 in 2008.

Number of Screening Attendances of the National Cancer Screening Program (2002-2008)



	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

Number of Screening Attendances of the National Cancer Screening Program by Cancer Sites [2002-2008]



	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	698,445	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

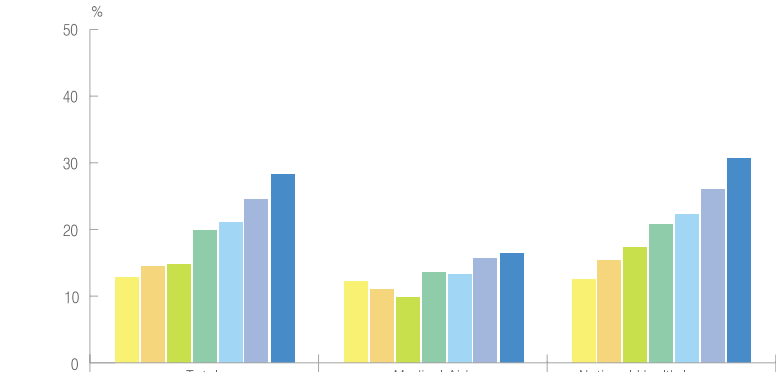
Source) National Cancer Center in Korea, 2009

Participation Rates in the National Cancer Screening Program

Cancer screening participation rate in the National Cancer Screening Program was 27.8% in 2008; 16.8 of Medical Aid and 30.2% of the National Health Insurance program. Cancer screening participation rates for five cancers have been increased since 2002.

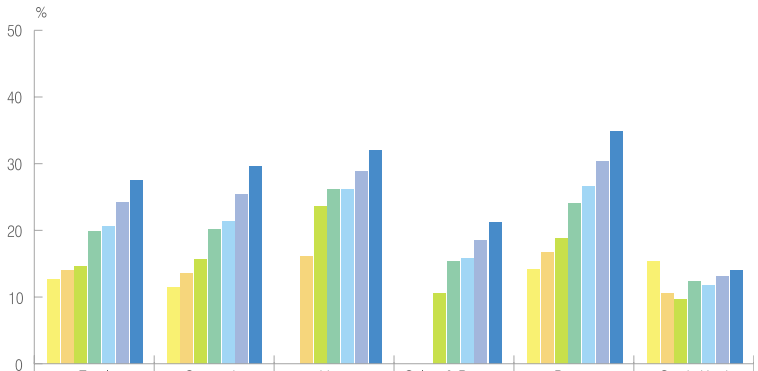
For the screening participation rates in the National Cancer Screening Program according to cancer sites, the rate of breast cancer was highest(34.9%) followed by liver cancer(32.7%), stomach cancer(29.2%) in 2008.

Cancer Screening Participation Rates in the National Cancer Screening Program [2002-2008]



	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

Cancer Screening Participation Rates in the National Cancer Screening Program by Cancer Sites [2002-2008]



	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

Source) National Cancer Center in Korea, 2009

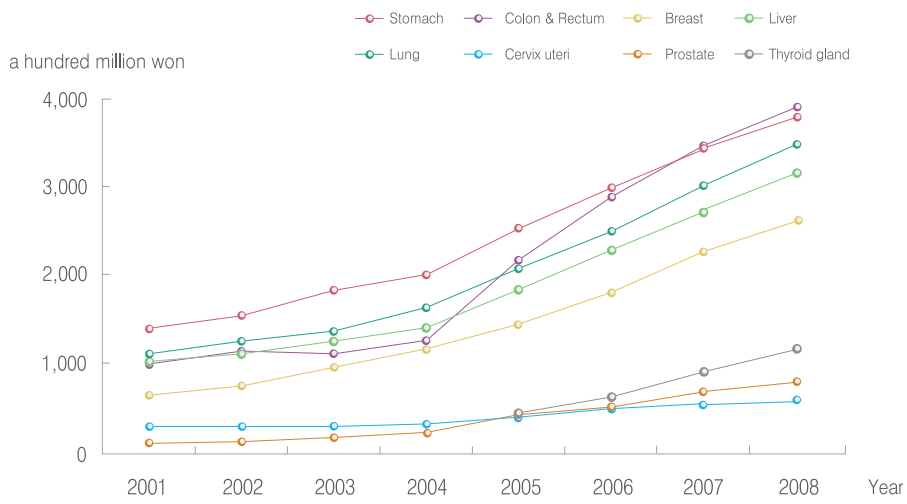
Chapter 4.
Cancer Diagnosis and Treatment

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 8.5 (from 9.4 billion won to 80.0 billion won) and 4.3(from 63.6 billon won to 271,6 billion won) times respectively.

Medical Costs of Major Cancers [2001-2008]

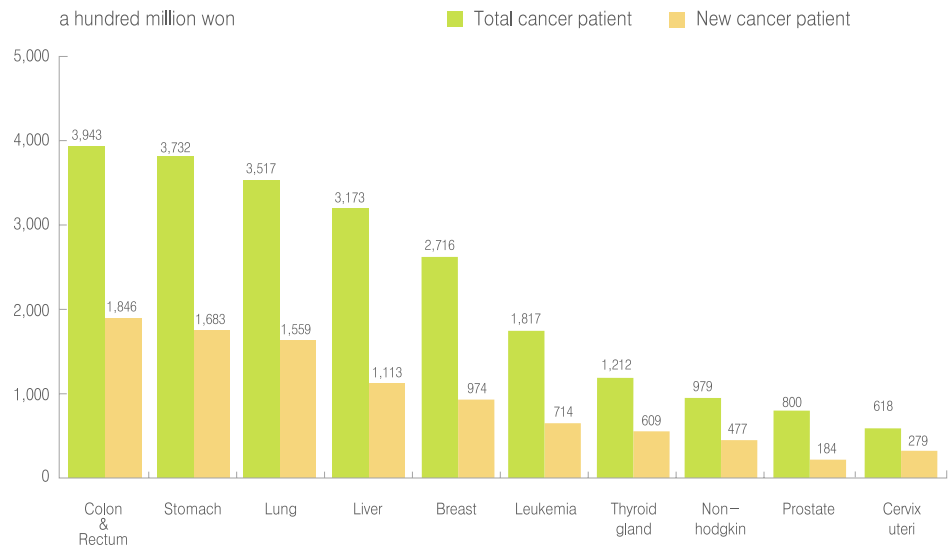


Source) National Health Insurance Corporation 2009

Expenses Paid by Insurer on Major Cancers

The medical costs covered by health insurance in 2008 was 2.9 trillion won for major cancers(with excepting uncovered medical cost). The colon & rectum cancer (394 billion won) accounts for the largest costs of the total budget, followed by stomach cancer 373 billion won), lung cancer(352 billion won) and liver cancer (317 billion won).

Medical Costs from Health Insurance of Major Cancers [2008]



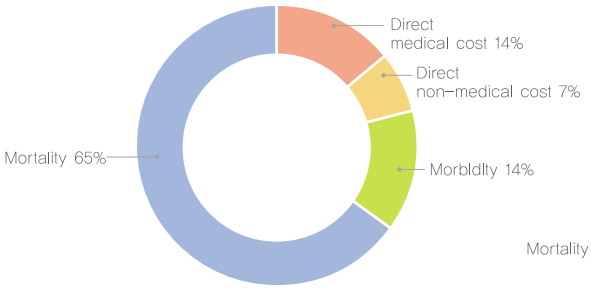
Source) National Health Insurance Corporation 2009

4.2 Socioeconomic Costs

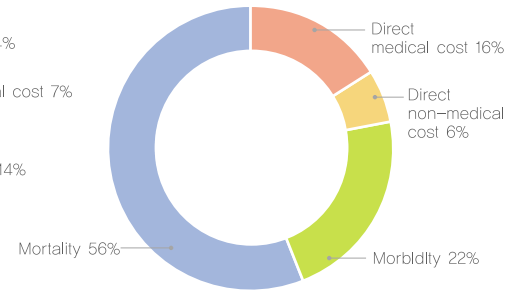
Socioeconomic Burden of Cancer

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〉

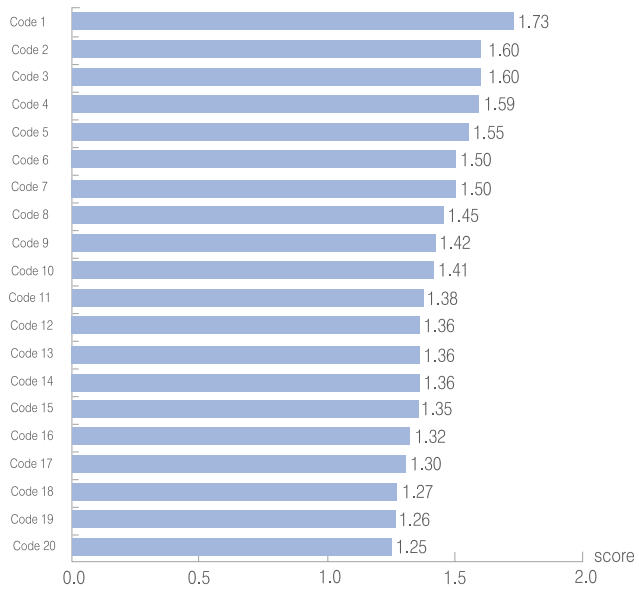
Source) KIM SG et al. Eur J Cancer Care, 2008, National Cancer Center, 2005

4.3 Needs and Experiences of Cancer Patients

A survey on needs and cancer-related experiences of cancer patients was conducted at 9 regional cancer centers and National Cancer Center with 2,661 cancer patients from July to August in 2008 and 2009.

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 [2008]



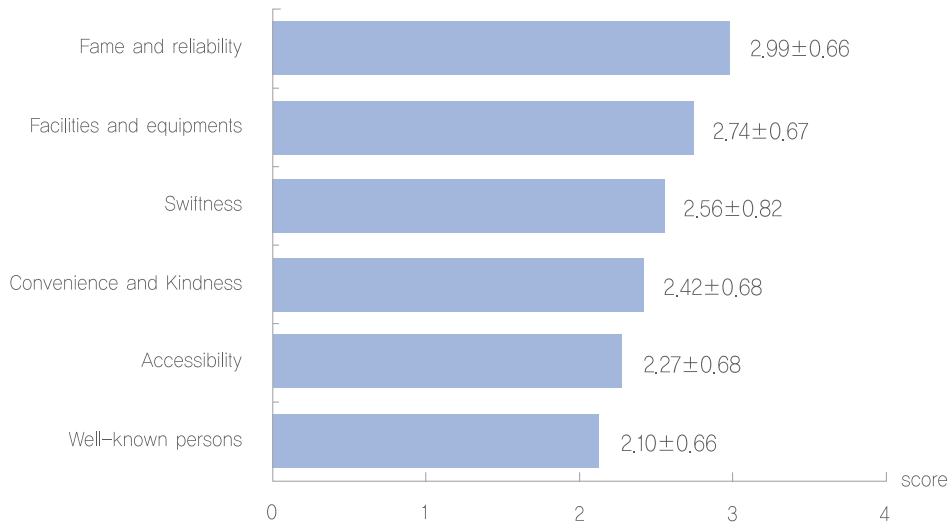
Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

Note) Code 1: Information on governmental or private financial support
Code 2: Help for medical costs and income loss related to cancer
Code 3: A short waiting time from reservation to consultation with a doctor
Code 4: A fast and easy contact with a doctor if necessary
Code 5: Information on a current status and a prognosis of disease
Code 6: An easy and detailed explanation by a doctor
Code 7: Information on examinations and treatments
Code 8: Information on diet (recommended and avoided foods)
Code 9: Information on symptoms needing a visit to a hospital
Code 10: A comfortable environment for treatment
Code 11: Help to cope with weakness and fatigue
Code 12: Consultation and guide for necessary all services after diagnosis of cancer
Code 13: Fast nursing care when discomfortable or painful
Code 14: Information and education on health management at home
Code 15: Help for dealing with fear of recurrence
Code 16: An active cooperation and communication between medical staffs
Code 17: Explanation on nursing care related to cancer
Code 18: A sincere concern and empathy of nurses
Code 19: Help to cope with side effects following treatments
Code 20: Participating on decision process about examinations or treatments

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', 'covenience and kindness', 'accesibility' and 'well-known persons' followed it in order.

Priority among Factors Affecting Cancer Patients' Choice of Medical Institutions [2008]

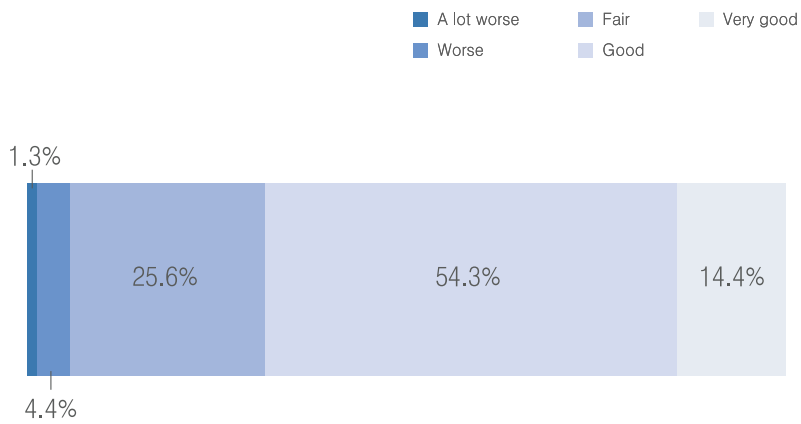


Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

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]

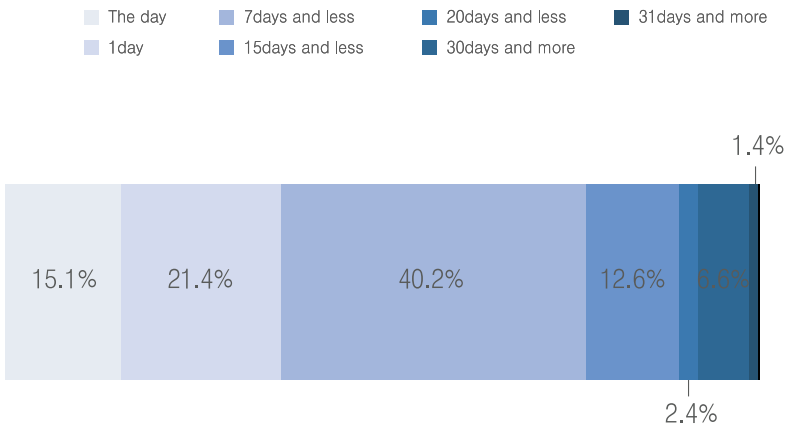


Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

Time from First Reservation to Consultation with 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.

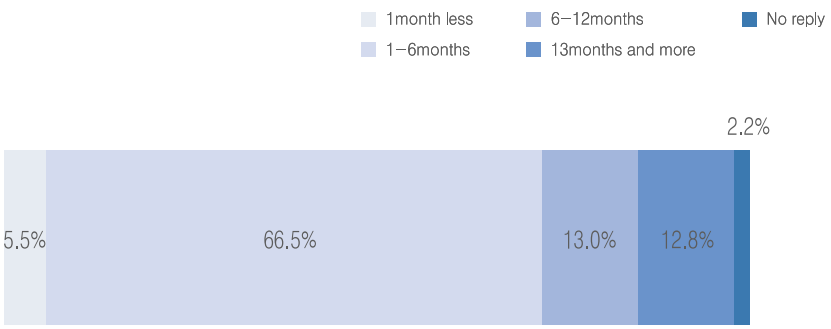
Mental Health of Cancer Patients [2008]

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

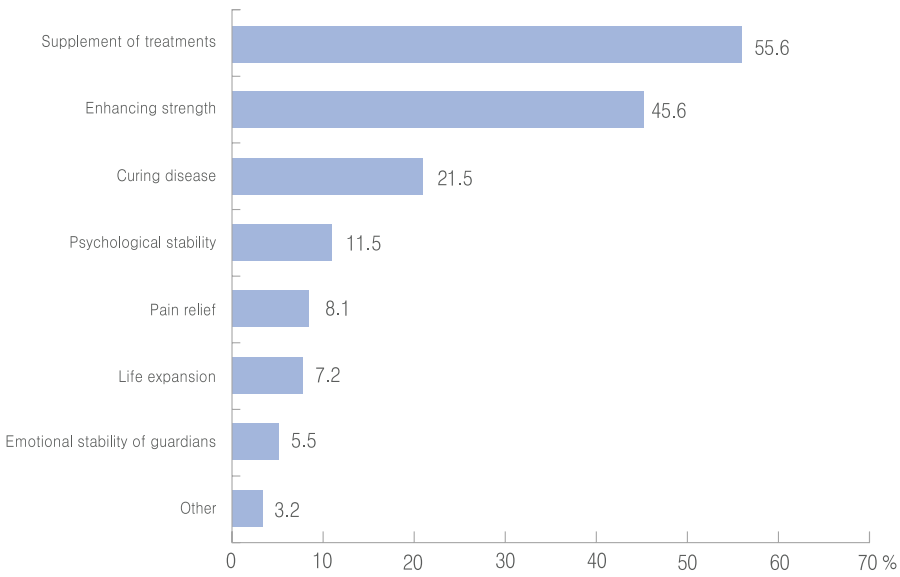
Complementary and Alternative Medicine(CAM) of Cancer Patients

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]



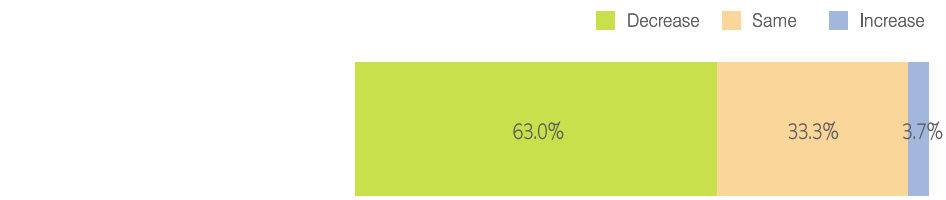
Source) Development of Cancer Care Quality Assurance and Cancer Patients' Welfare System 2009

Return to Workplace after Loss of Job and Change of Income

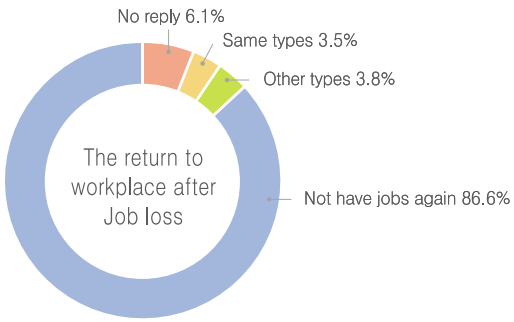
Among subjects who answered that they lost job after diagnosis of cancer, overwhelmingly 86.6% could not return to workplace. In addition, the number of subjects returning to other types of job(3.8%) was slightly higher than of subjects came back to the same types of job.

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]



Change of income after the return to workplace



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

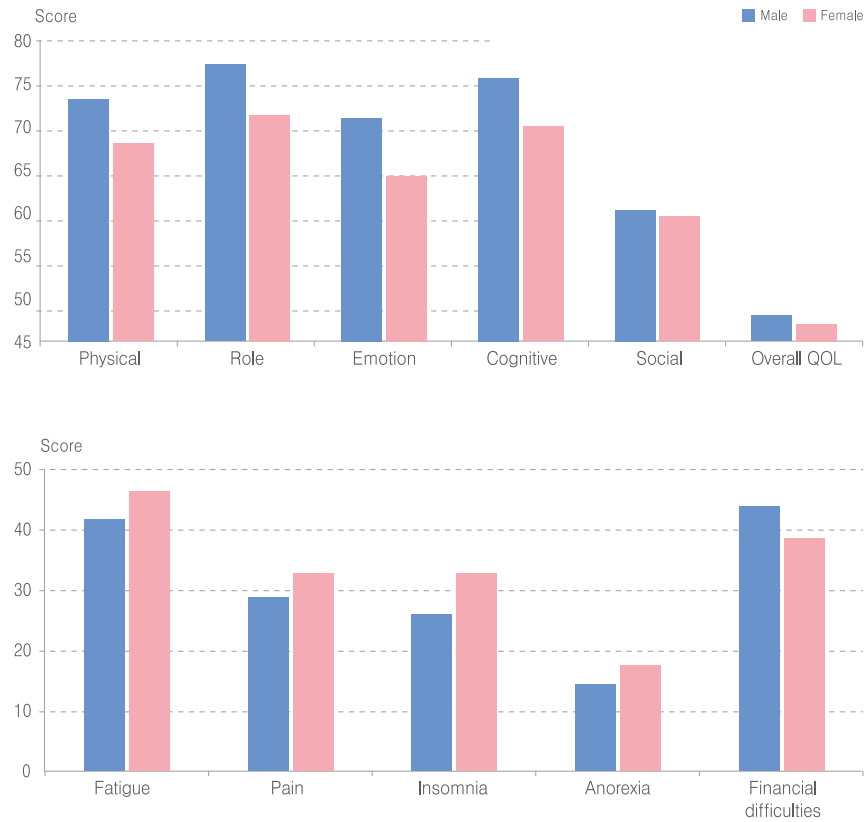
Quality of Life among Cancer Patients according to Gender, Type of Cancer, Income

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.

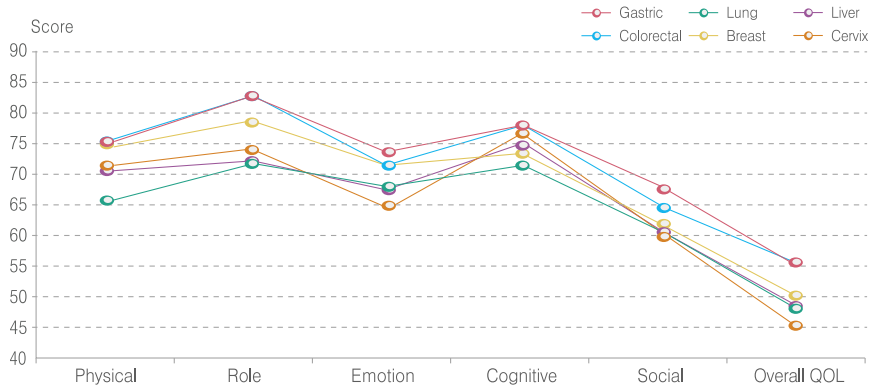
According to the result of comparison by different types of cancer, the social function was marked the lowest in 6 types of cancers. The score of social function was the highest in gastric cancer and followed by colorectal, breast, liver, lung, cervix cancer. The highest score in physical function was found in colorectal cancer while the lowest in lung cancer. And the 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.

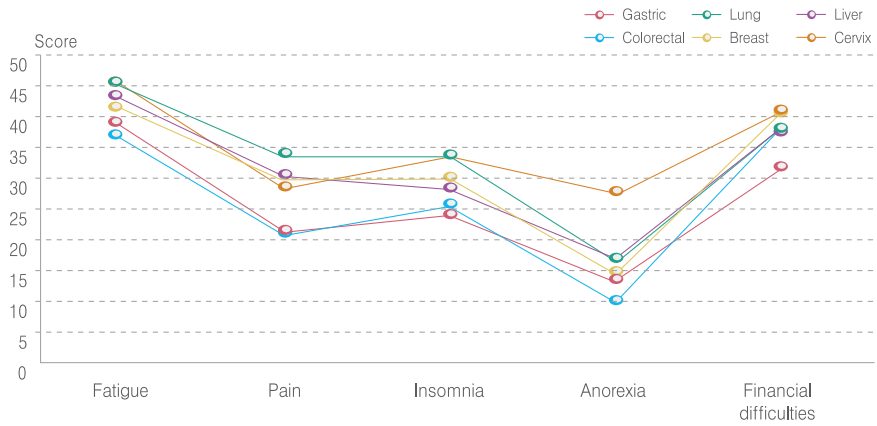
When cancer patients were compared by the average of monthly income, a group whose income was less than 3,000,000 won appeared to have lower quality of life in functional status, symptoms, and overall compared to a group whose income was more than 3,000,000 won. And they had high appeal in financial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

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

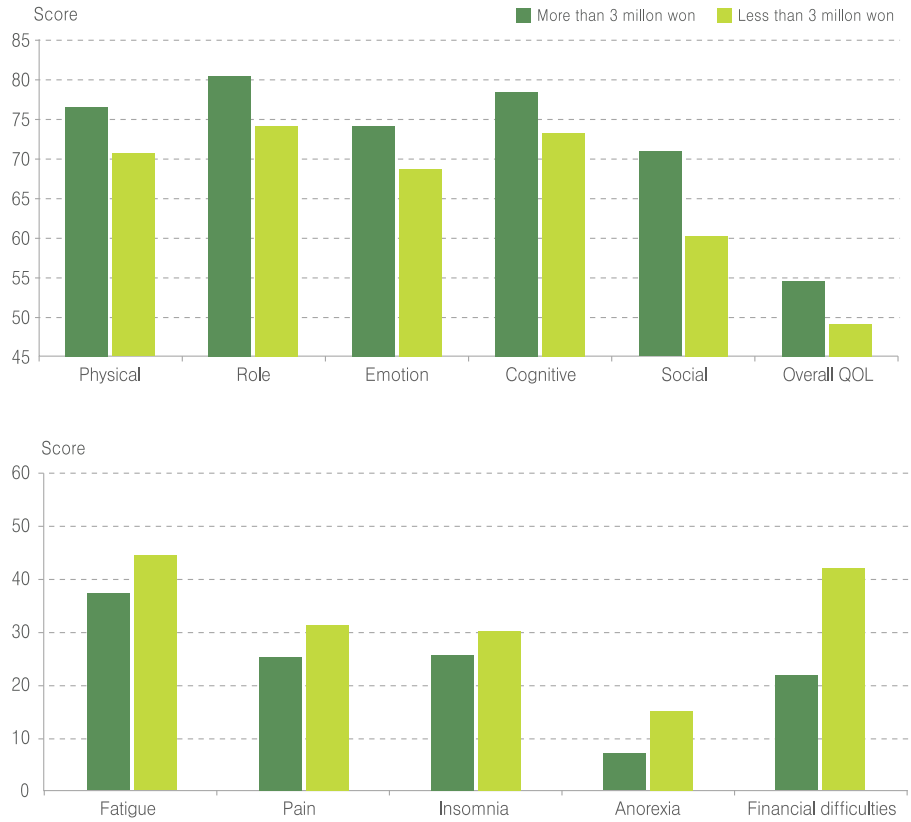


Secondary Gastric and Colorectal Cancer Screening





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

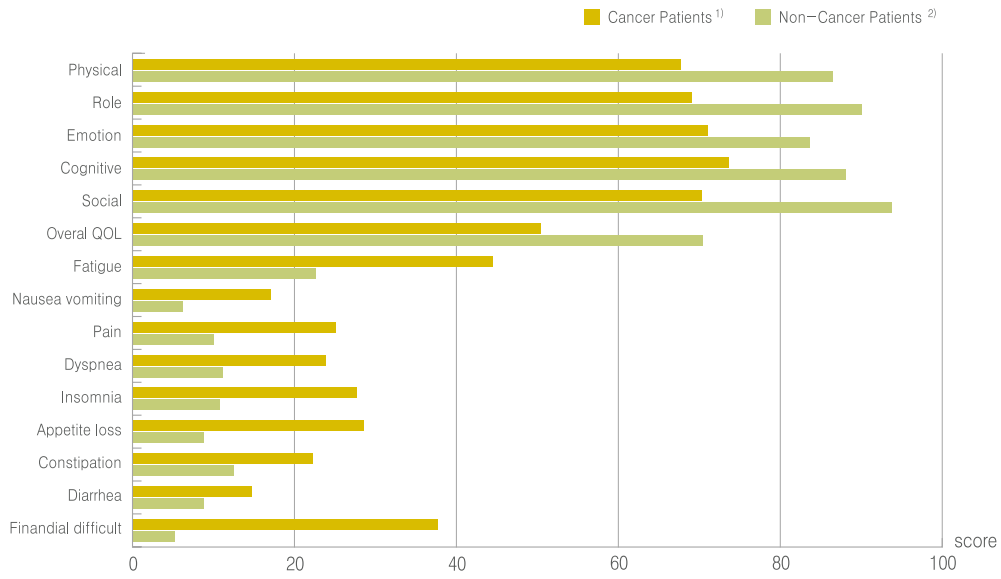
Comparison of Quality of Life between Non-Cancer Patients and Cancer Patients

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 Cancer type, 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.

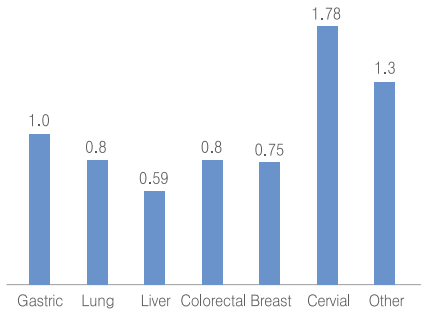
When the score of comorbidity was 2 points compared to the absence of comorbidity, risk of depression was increased significantly by 2.173 times.

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.

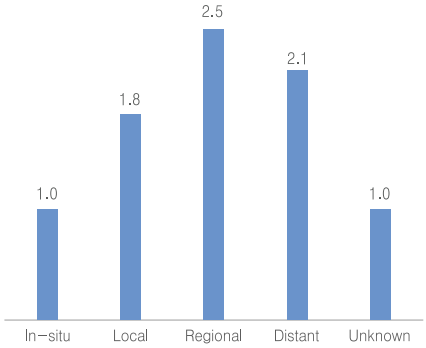
In a group of cancer patient with severe pain causing disability, the risk of depression was very significantly 7.552 times higher compared to a group with less pain.

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.

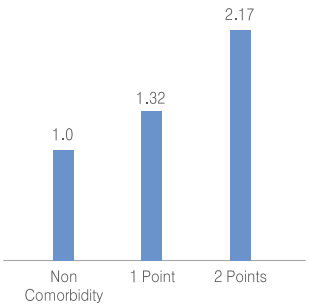
Depression according to Types of Cancer



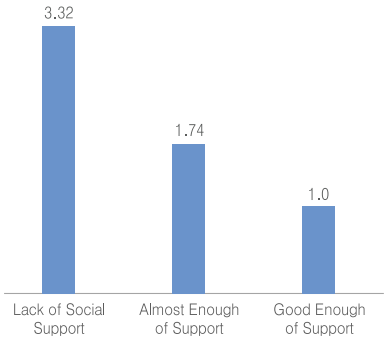
Depression according to Stages of Cancer



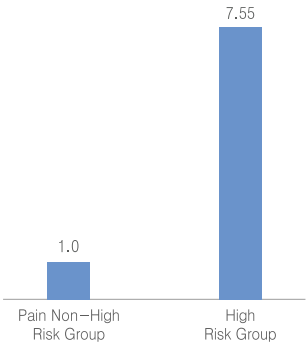
Depression according to Comorbidity



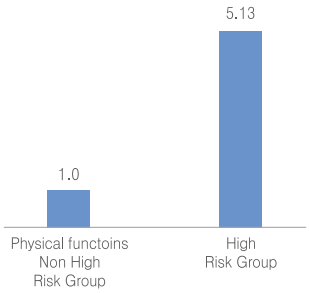
Depression according to Social Supports



Depression according to Pain



Depression according to Physical functions



Source) National Cancer Center in Korea, 2009

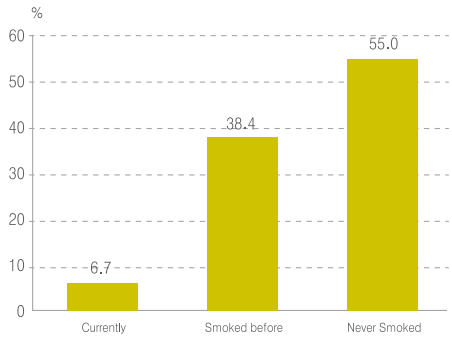
Smoking · Drinking Status among Cancer Patients

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.

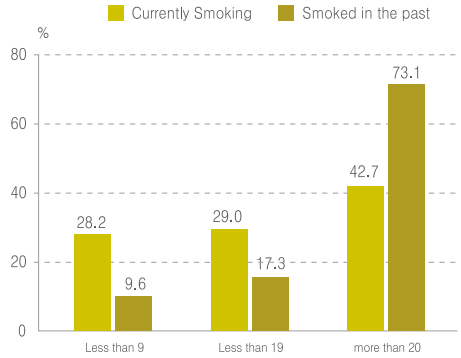
Looking into the average of daily smoking amount of cancer patients in present and in past, past smokers responded that 73.1% was 20 sticks of cigarettes or more, 17.3% was 19 sticks or less, and 9.6% was less than 9 sticks. Smokers of 20 sticks or more were predominantly high in number. And for the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

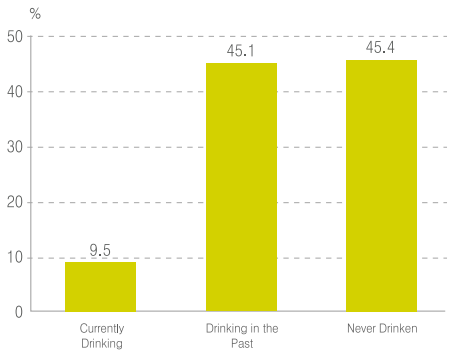
Smoking Experiences among Cancer Patients



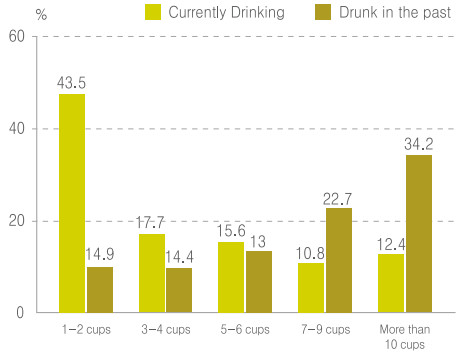
Average of Daily Smoking Amount of Smoking Cancer Patients in present



Drinking Experiences among Cancer Patients



Average of Daily Drinking Amount of Drinking Cancer Patients in present



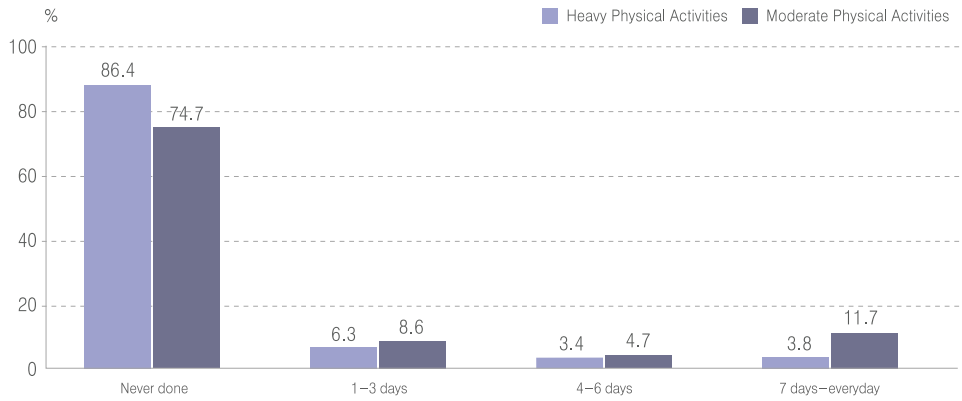
Source) National Cancer Center in Korea, 2009
Note) 1. Among total of 1,958 subjects, 131 was currently smoking and 751 had smoked in the past
2. Among total of 1,958 subjects, 186 was currently drinking and 883 had drunk in the past

Physical Activity among Cancer Patients

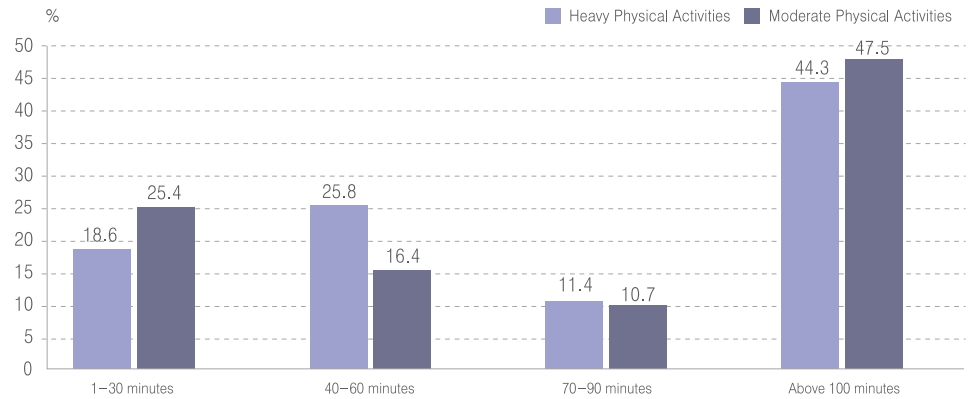
As the result of survey on physical activity among cancer patients, they responded that 86.4% was not doing heavy physical activities and 74.7% was not doing moderate physical activities at all. Meanwhile, moderate physical activities were done by 11.7% everyday, 8.6% in 1~3 days, and 3.4% in 4~6 days.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

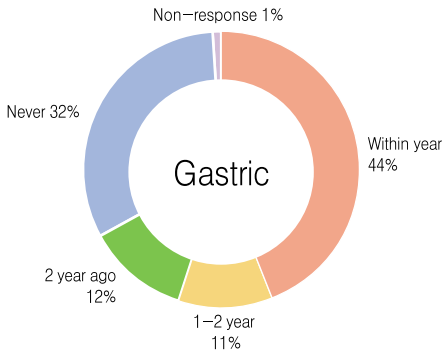
In the result of the survey on gastric cancer screening services for prevention of secondary cancer among cancer patients, 44% of respondents had screening services within 1 year, and 11% in 1~2 years for the last time, and 12% 2 years ago. And 32% never had secondary gastric cancer screening

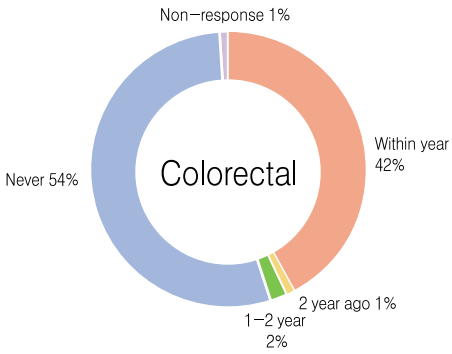
In the result of the survey on colorectal cancer screening services for prevention of secondary cancer, 42% of respondents had screening services within 1 year.

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.

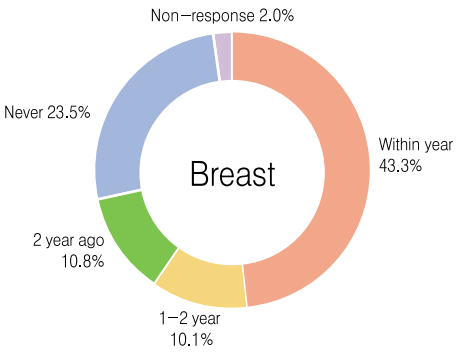
In the result of survey on cervix cancer screening services, excluding male and patients undergone hysterectomy, 44.3% of the respondents the screening services within 1 year, and 12.1% in 1~2 years, 13.1% 2 years ago. And 24.9% never had secondary cervix cancer screening.

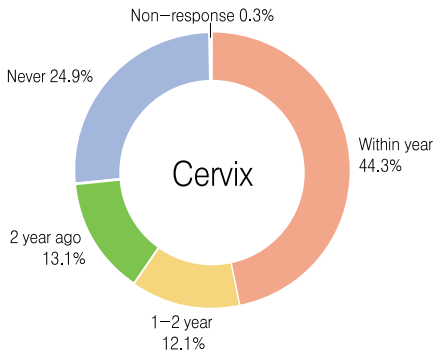
Secondary Gastric and Colorectal Cancer Screening





Secondary Breast and Cervix Cancer Screening





Source) National Cancer Center, 2009

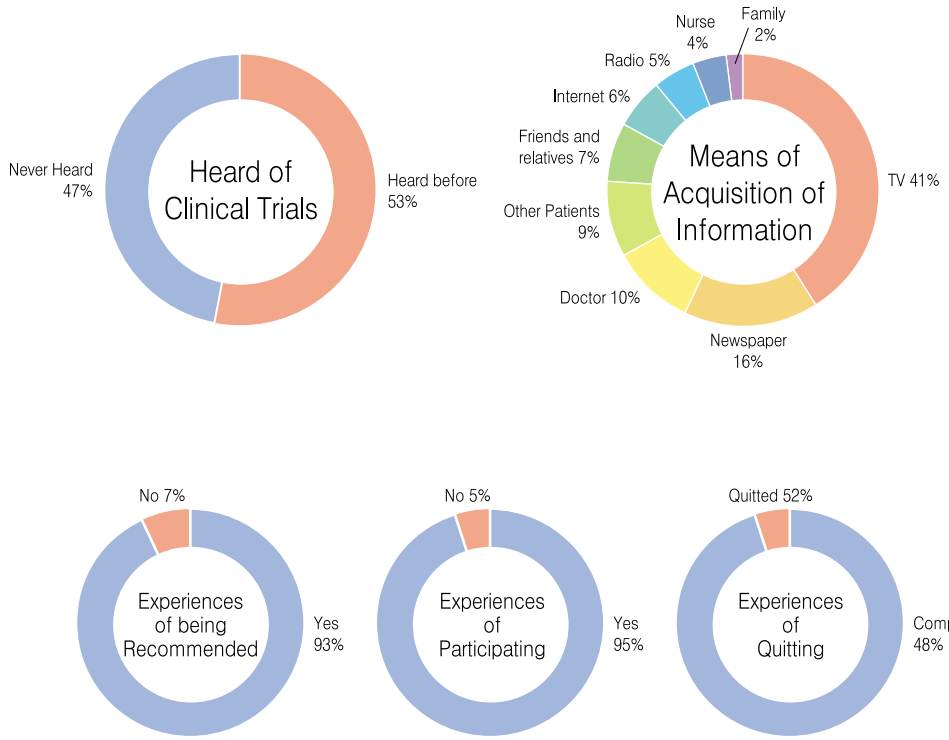
Experiences of Clinical Trials among Cancer Patients

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



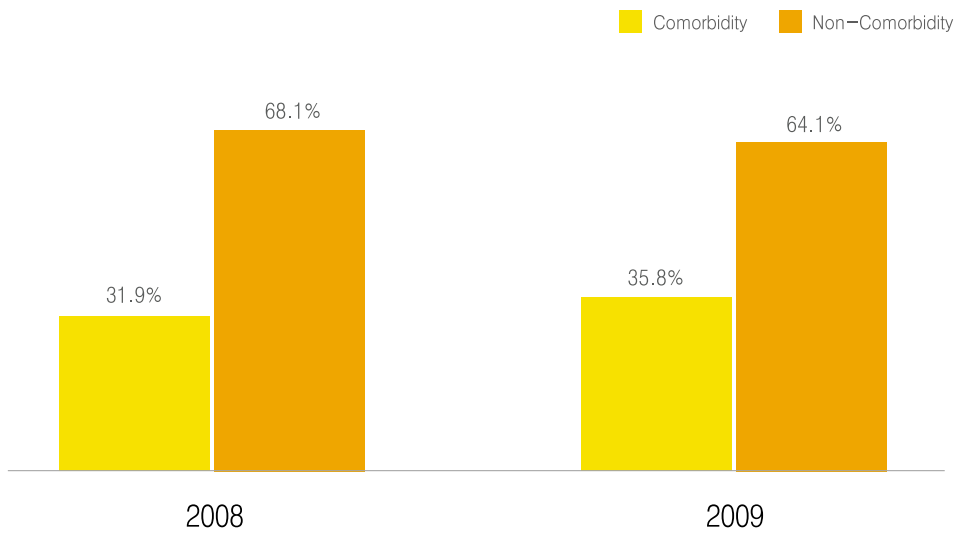
Source) National Cancer Center, 2009

Status of Cancer Patients with Comorbidity Management

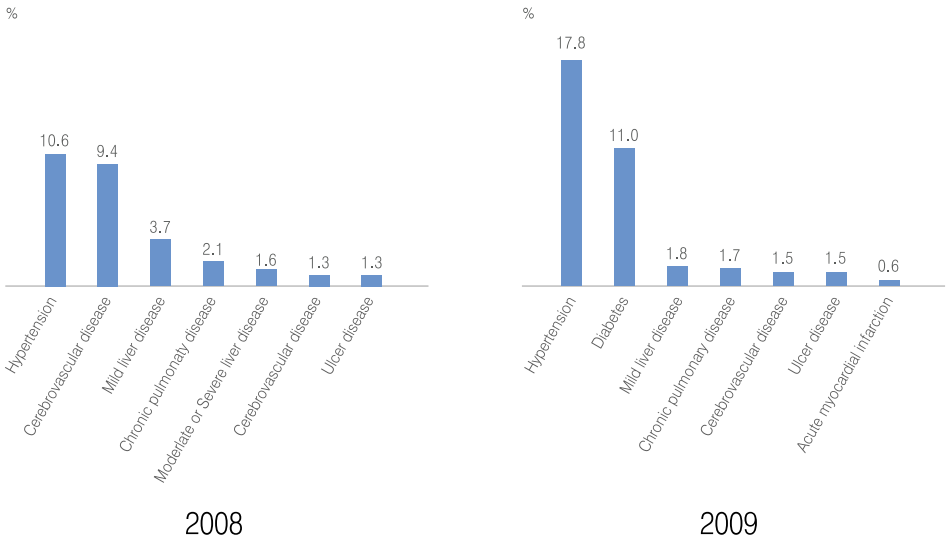
In the result of survey on comorbidities of cancer patients, patients with comorbidity were 31.9%, and 68.1% of patients had no comorbidity in 2008. And in 2009, patients with comorbidity were 35.8% and patients without comorbidity 64.1%.

Looking into the result on frequently occurring top 7 comorbidities among cancer patients in 2008, the highest was hypertension (10.6%), and followed by cerebrovascular diseases (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, 2009

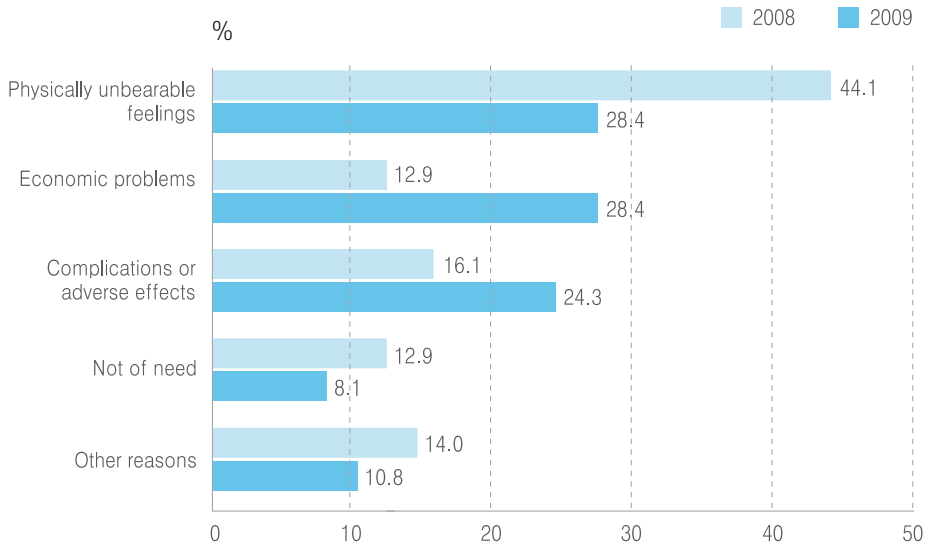
Compliance with Treatment and Satisfaction of Service among Cancer Patients

In the result of survey on reasons of rejecting parts of treatment recommended by doctors among cancer patients in 2008, physically unbearable feelings were chosen as reasons by 44.1%, and economic problems by 12.9%, and complications or adverse effects by 16.1%, and 12.9% felt that they did net need them, and 14.0% had rejcted for other reasons.

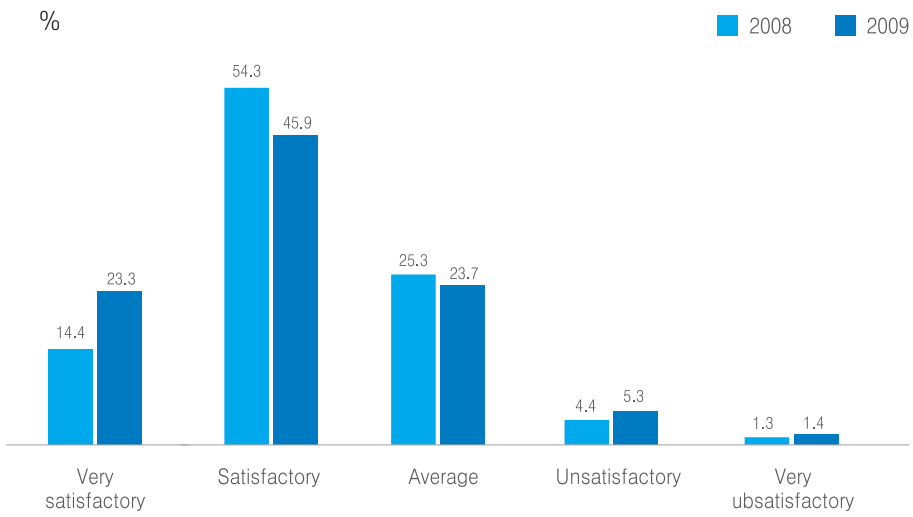
In 2009, physically unbearable feelings were chosen by 28.4% chosen, quite decreased compared to year 2008, and followed by 28.4% of the economic problems, 24.3% of complications or adverse effects, 8.1% of not needing treatments, and 10.8% of other reasons.

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, 45.9% satisfactory, 23.7% average, 5.3% unsatisfactory, 1.4% 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

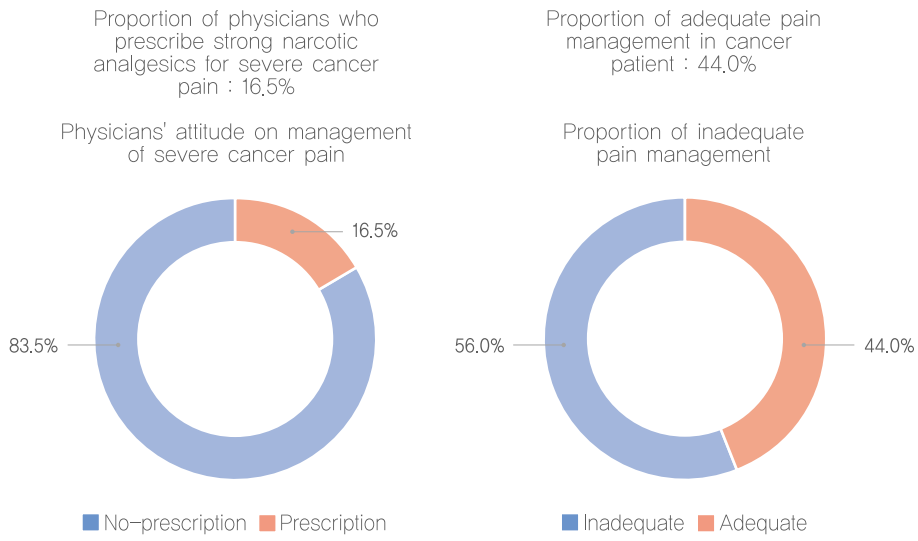
5.1 Palliative Care

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 a week.

Current Situation of Cancer Pain Management



Source) National Cancer Center, 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%
Frequency of seeing cancer patients suffering from pain more than once a week	8.8%	78.5%

Source) Yun YH et al, J Korean Acad Fam Med, 2005

Survey on National Recognition of Hospice Service

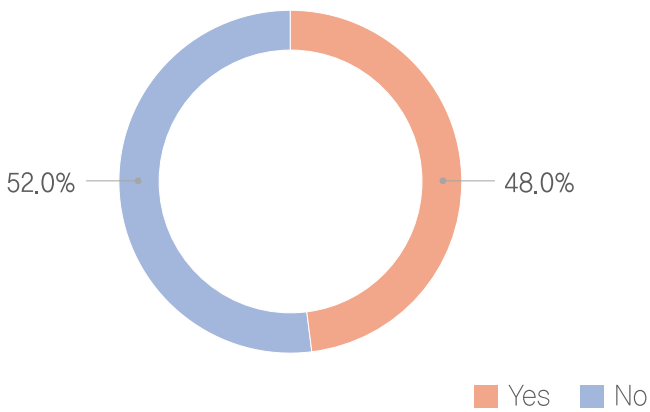
A telephone survey was conducted on adult males and females aged 20 years and above(1,055 subjects) in 16 cities based on the 2000 Census from 24 Feb 2004 to 25 Feb 2004.

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.

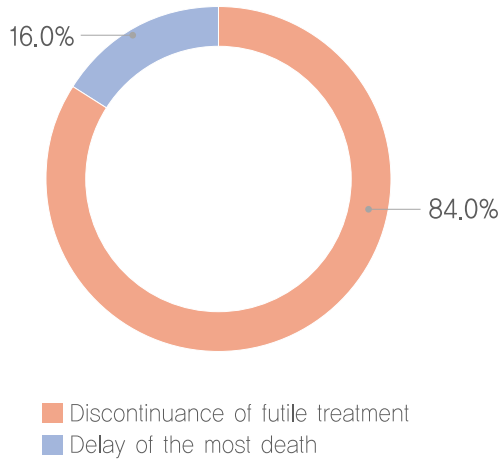
More than the half of the samples preferred their home as the place of death(55.0%) with 28.0%, 8.0% and 7.0% choosing hospital, hospice and nursing homes, respectively. Regarding the ideal place of death according to the patients' wishes, the home(41.9%) was ranked first followed in order by hospital(23.9%)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

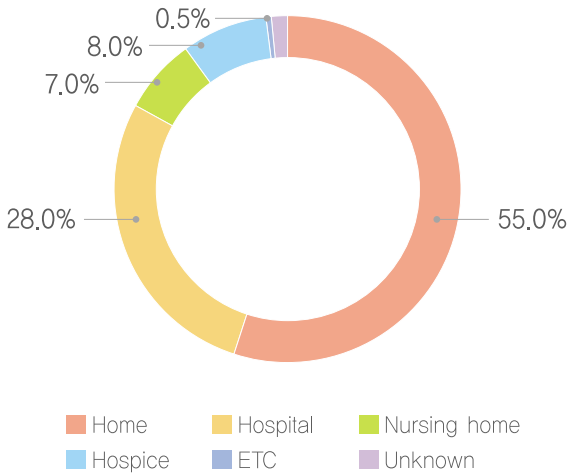
Awareness, Discontinuation of Futile Treatment



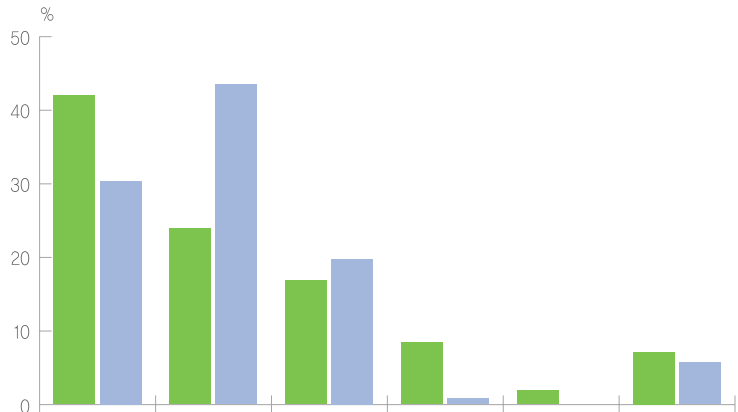
Attitude toward the Medically Futile Life-sustaining Treatment



Preference for Death Place of Patient

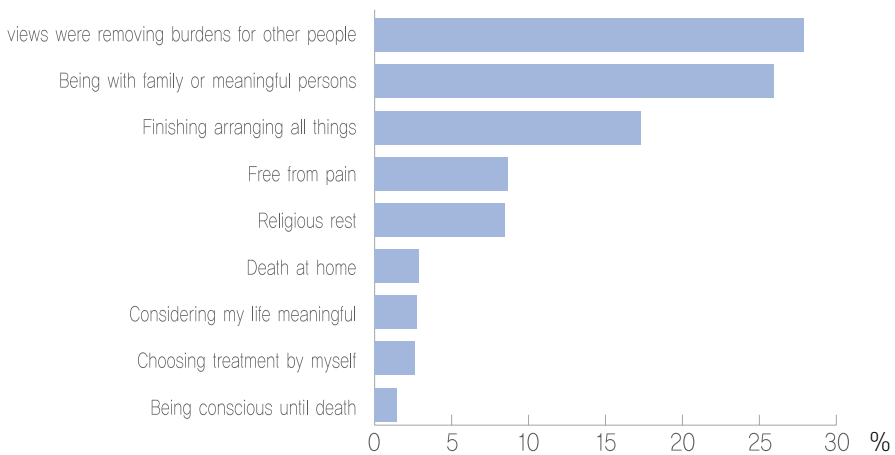


Desired Place of Death



	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



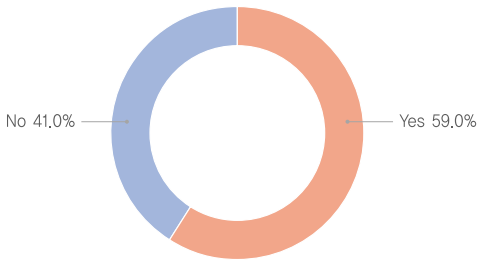
Source) Yun YH et al, Korean J Hosp Palliat Care, 2004

Awareness of Hospice Services and the Intention of Using that Service

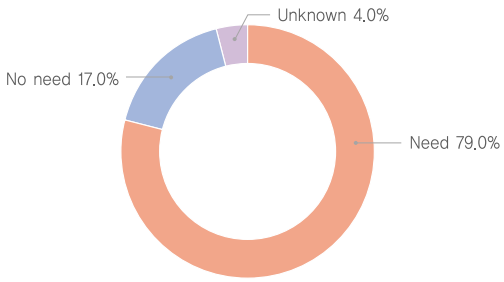
A telephone survey was conducted on adult males and females aged 20 years and above(1,055 subjects) in 16 cities based on the 2000 Census from 24 Feb 2004 to 25 Feb 2004.

According to the results, 59.0% of subjects were aware of hospice services and 79.0% responded that hospice service should be included in the Health Insurance System Coverage.

Awareness of Hospice Services



Including the Hospice Service in Health Insurance System Coverage



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

Statue of Using Hospice and Palliative Care Centers in 2009

The overall number of patients who used hospice and palliative care centers was 5,818, and it varied from 38 to 436 according to center.

The highest cancer incidence rate was shown in lung cancer (1,057 persons, 45.7%), followed in the order of stomach cancer (975 persons, 16.8%), liver cancer (561 persons, 9.6%), and colon-rectum cancer (503 persons, 8.7%).

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 2,656 (45.7%), 2,246 (38.6%) and 917 (15.7%), respectively.

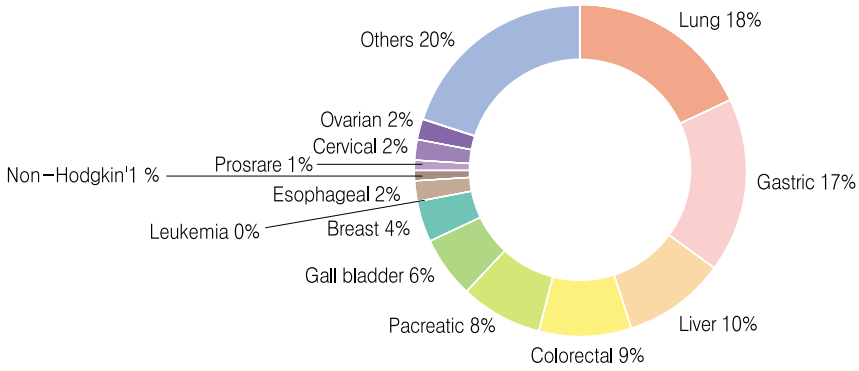
The number of patients for cancer denial and terminal cancer denial who used hospice and palliative care centers in 2009 was 3,380 (87.4%) and 2,594 (67.1%), respectively. This was lower, compared to caregiver's cancer denial (3,829 persons, 99.0%) and terminal cancer denial (3,684 persons, 95.3%).

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 (1,837 persons, 47.5%), followed in the order of patients who received a request from the general patient's room of the identical center (906 persons, 23.4%) and from other care center or ward (365 persons, 9.4%).

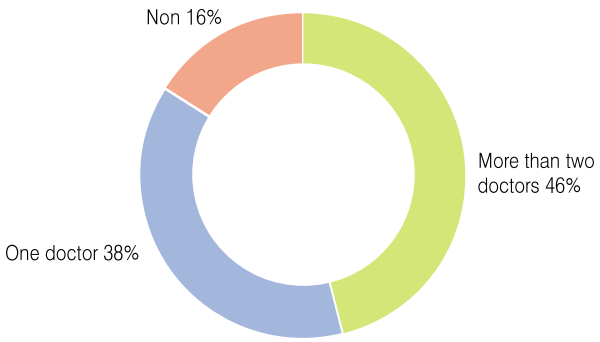
There were only few cases that patients received a hospital admission repeatedly in that 2,574 patients (73.2%) were discharged from a hospital at their first admission due to death. Patients who received an admission more than 3 times were only 3% of the overall patients. In addition, the rate of discharge from the center due to death decreased gradually as admission of patients were being done repeatedly.

The largest number of reasons for a discharge at the first admission was shown in death (2,574 persons, 73.2%), followed in the order of normal discharge (490 persons, 13.9%) and transfer from other care center (157 persons, 4.5%).

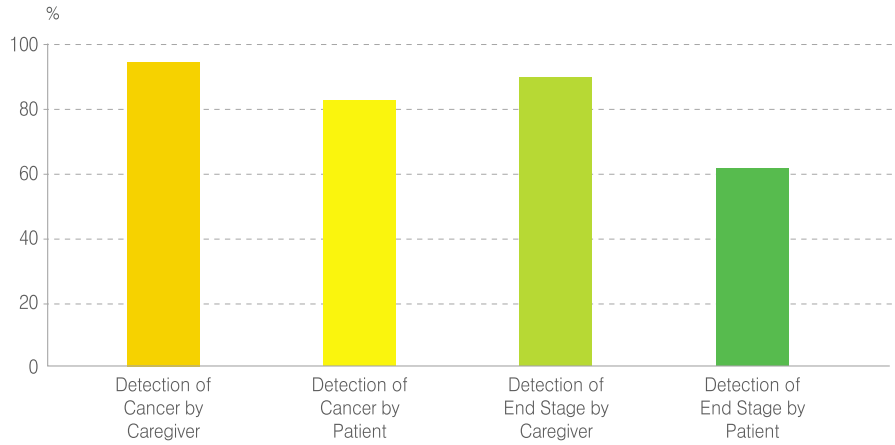
Distribution Chart of Different Types of Cancer



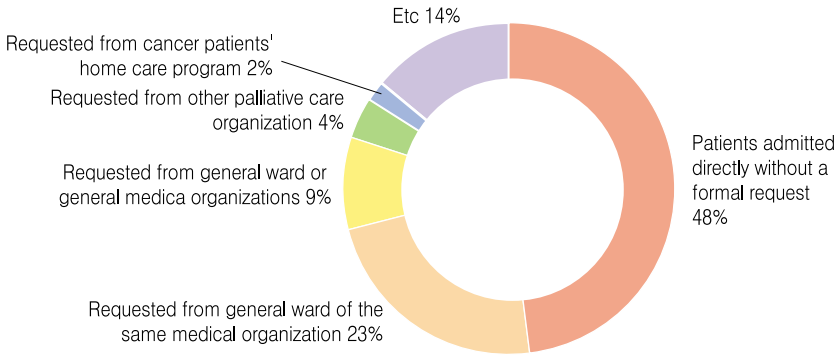
Status on Availability of End Stage Diagnosis



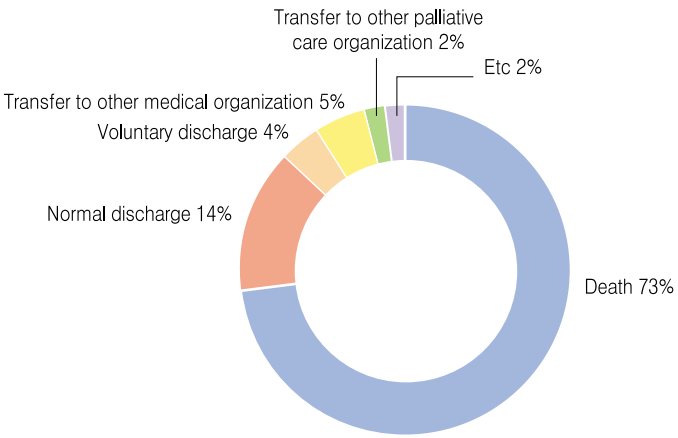
Detection of Cancer and End Stage by End Stage Cancer Patient and Caregiver



Admission Routes of End stage Cancer Patients



Reason for Discharge from the first hospitalization



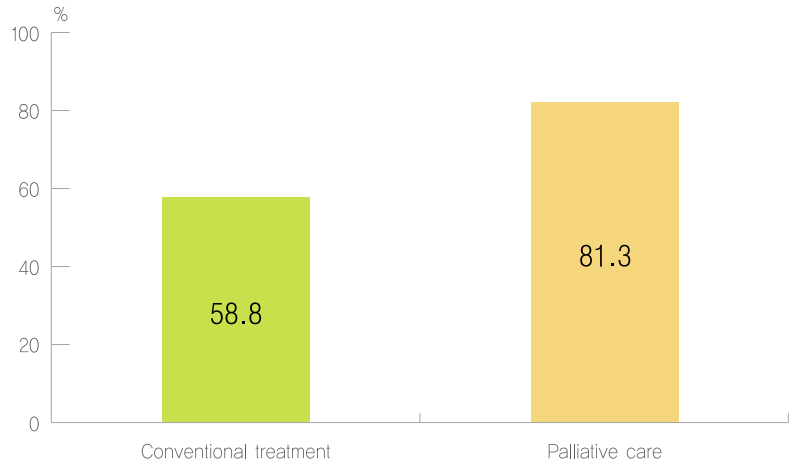
Source) National Cancer Center in Korea, 2009

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

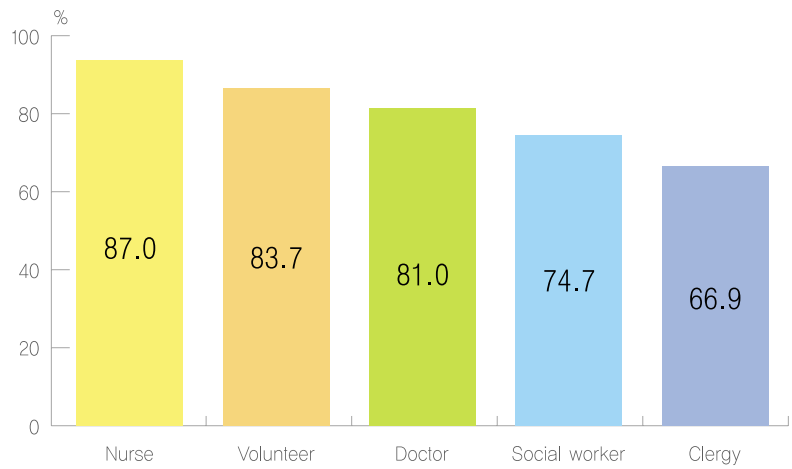
In a survey of the overall patients' satisfaction with treatments before and after the admission to palliative care unit, the level of satisfaction with conventional treatment prior to the admission was 58.8%. On the other hand, the level of satisfaction with palliative care was higher at 81.3%.

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

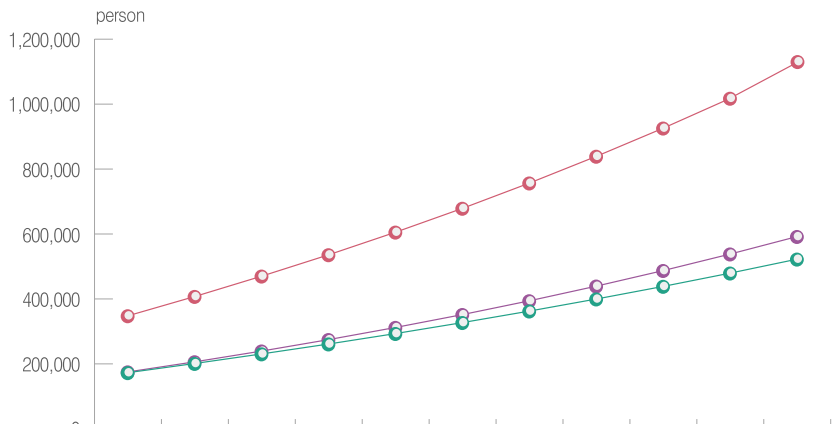
5.2 Management of Cancer Survivors

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.

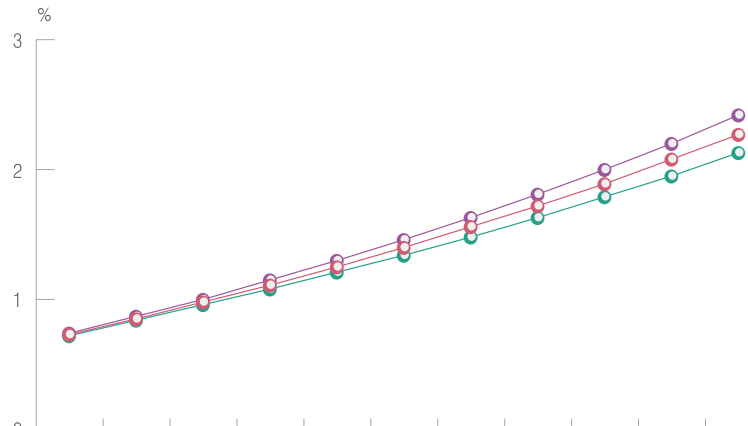
Estimated Number of Cancer Survivors



	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, 2007
Note) Survivor: all people being alive after diagnosis with cancer

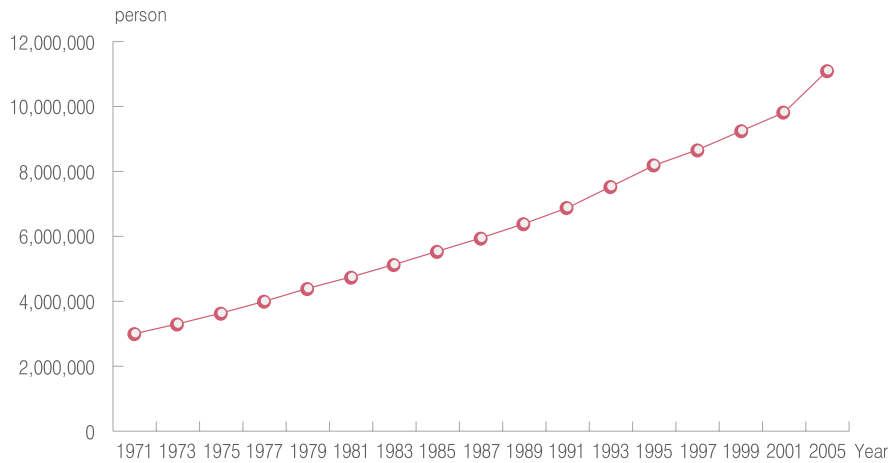
Percentage of Cancer Survivors in the Total Population



	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



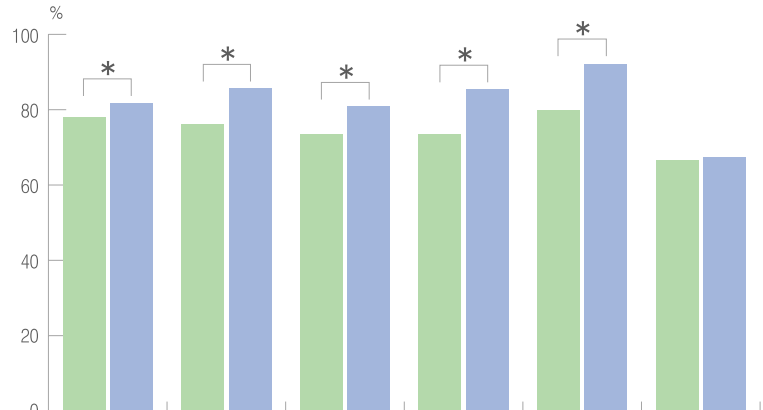
Source) National Cancer Institute in the united States, 2009

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.

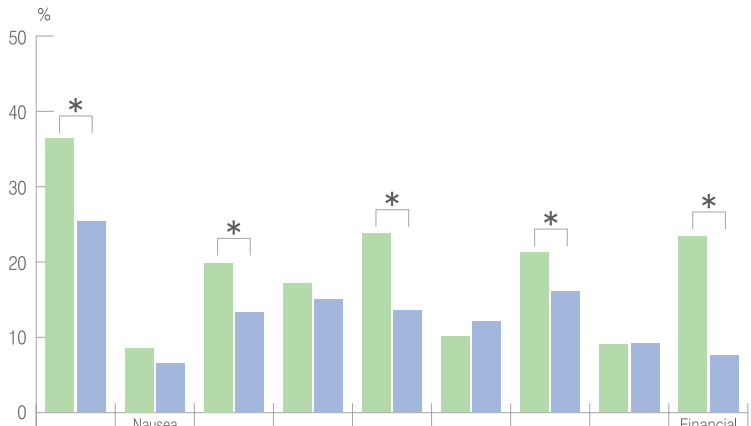
A comparison of the quality of life according to the functional state in breast cancer survivors(n=1,933) with that in the general population(n=500) revealed the survivors to have a poorer performance in terms of their physical, role, emotional, cognitive and social functioning as well as overall lower 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

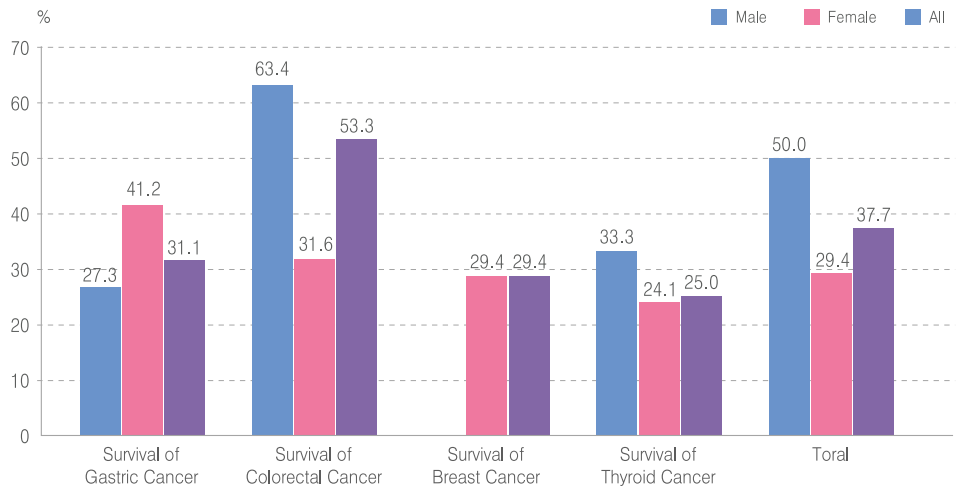
A survey on 326 disease-free cancer survivors who passed more than one year following a diagnostic for primary cancer in 2009 shows that only 123 patients(37.7%) received the overall necessary second cancer screening within a two years.

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%),

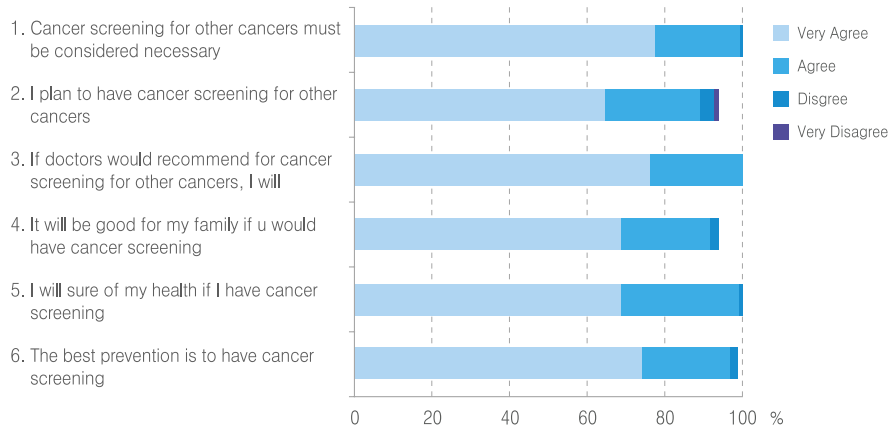
In addition, survivors understands the cancer screening properly as follows: "I think a person who suffered from a cancer once can catch other type's of cancer." (92.6%), "I think the possibility that a cancer patient will suffer from other type's cancer is higher than the one that a normal person will 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%)

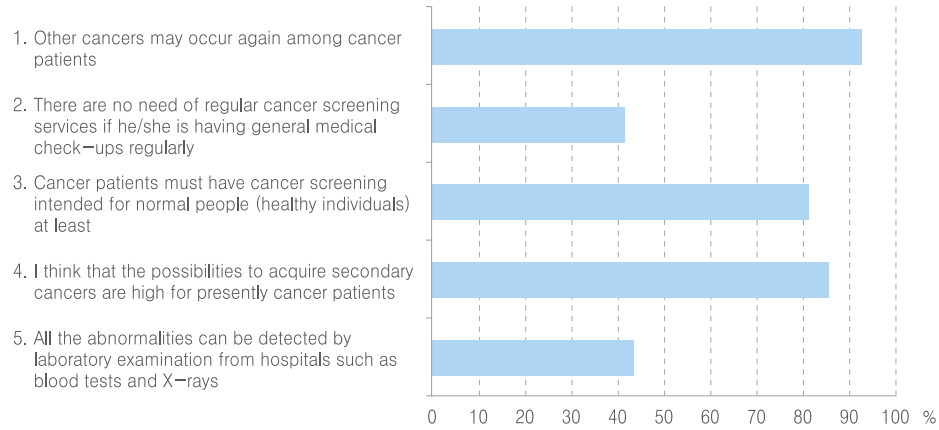
Secondary Cancer Screening Rate



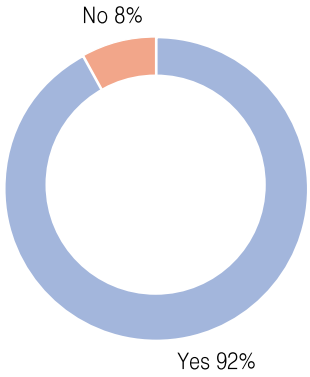
Attitude toward Secondary Cancer Screening Services



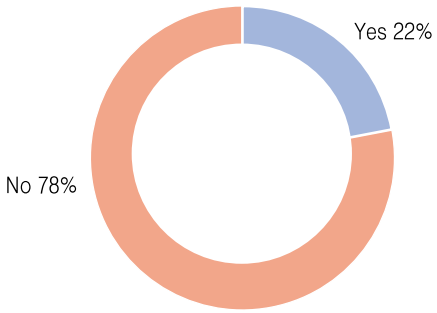
Knowledge of Secondary Cancer Screening Services



Necessity of Supplementary Cancer Screening for Cancer Patients



Cancer Screening Recommendations from Doctor



Source) National Cancer Center in Korea, 2009

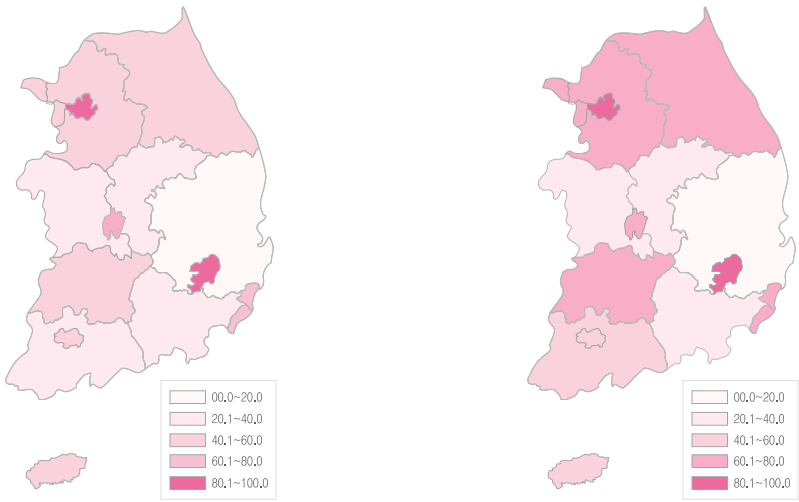
Chapter 6.
Regional Cancer Centers

Self-Sufficiency of Cancer Patients

The regional rates for Self-Sufficiency of Cancer Patients excepting Seoul in 2006 ~ 2007, Daegu recorded the most highest rates, and the lowest was Gyeong-Buk.

In addition, at the rate changes for Self-Sufficiency of 16 sites (major city & province) in 2007 comparing with 2006, Jeonnam recorded the most highest increasing rates and the next was Chungbuk. On the otherhand, Incheon 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

Chapter 7.

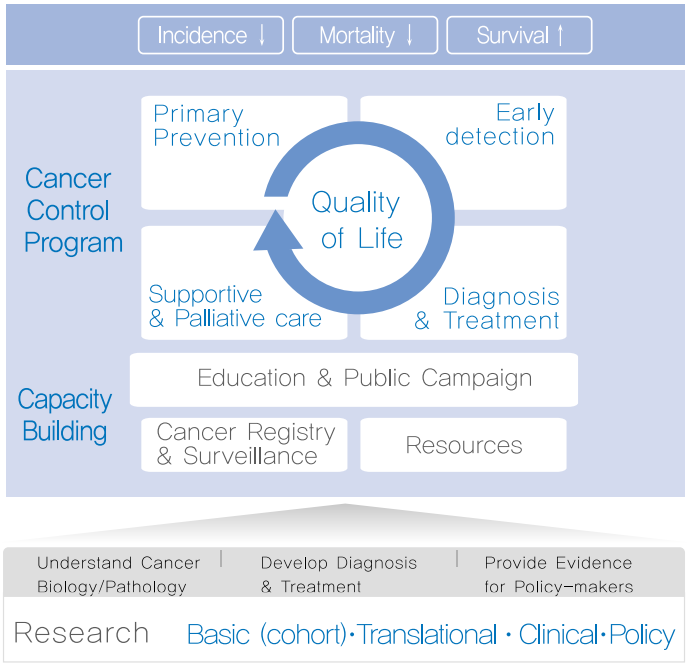
2nd term10-year Plan for National Cancer Control

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 a 2nd 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 signficantly 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

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National Cancer Control Institute

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Cancer Facts & Figures 2010 in the Republic of Korea

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