Cancer Epidemiology in Korea

Keun-Young Yoo

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H. President National Cancer Center, Korea (NCC-K)
Secretary-General Asian Pacific Organization for Cancer Prevention (APOCP)
Republic of Korea (KOR)

http://www.korea.net

A Land of Morning Calm
Rabindranath Tagore (1861–1941)

Land area
222,154 km² (≈Britain)
99,000 km² (south)
147,000 km² (Nepal)
5000 years of Korean History

World Cultural Heritage
by
UNESCO

This gourd-shaped vase, National Treasure No.116, is one of the most famous celadon pieces of the Goryeo Dynasty.
What Do You Know About Korea?

Korean war (1950–1951)

poverty and starvation
What Do You Know About Korea?

Export-Driven Economic Development since 1960s

urbanization
industrialization
westernization
What Do You Know About Korea?

Semiconductors, automobiles
What Do You Know About Korea?

Semiconductors, automobiles, ships, mobile telecoms,
What Do You Know About Korea?

Semiconductors, automobiles, ships, mobile telecoms, chemicals, steels, consumer electronics
What Do You Know About Korea?

Seoul Olympiad (1988)

World Cup (2002)
Health and Welfare Statistics
Republic of Korea

population: 49 M (south)
(ranked 18th in the world) 23 M (north) as of 2007

life expectancy: 75.7 yrs (M) / 82.4 yrs (F)

aging (65+): 9.0% (2005) 20.0% (2026)

population IR: 0.33% (2007)

health insurance: universal coverage

per capita GNI: USD 20,045 (2007)

major industries: semiconductors, automobiles, ships, mobile telecoms, chemicals, steels, consumer electronics
Incredible Changes in Korean Society from Agricultural to Highly Advanced Industrial Country

Cause of death = infections
Life expectancy < 45 yrs
Per capita GNI < US$20
Traditional medicine

Cause of death = cancer
Life expectancy = 78 yrs
Per capita GNI = US$20,000
Universal health insurance

Korea

1911

2009
Causes of Deaths in Korea

Source: Korea National Statistical Office, 2008
Trend in Age-standardized Incidence Rates of Cancer
Korea Central Cancer Registry, 1999-2007

<table>
<thead>
<tr>
<th>Sex</th>
<th>Annual Percent Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2.9 *</td>
</tr>
<tr>
<td>Male</td>
<td>1.3 *</td>
</tr>
<tr>
<td>Female</td>
<td>4.9 *</td>
</tr>
</tbody>
</table>

* P < .05
Relative Frequency of Incident Cancer Cases in Korea 2003~2005

Source: Korea Central Cancer Registry, 2008
Ten Major Sites of Cancer in Korea 1999-2002

The Korea Central Cancer Registry, 2007

**Male**
- Stomach (59.8)
- Lung (43.0)
- Liver (42.5)
- Colorectal (26.2)
- Bladder (7.7)
- Esophagus (7.2)
- Gallbladder, etc (6.8)
- Pancreas (6.8)
- Prostate (6.6)
- Lip, oral cavity, pharynx (5.9)

**Female**
- Stomach (31.4)
- Breast (27.8)
- Colorectal (20.7)
- Cervix uteri (18.5)
- Lung (15.5)
- Thyroid (14.5)
- Liver (14.0)
- Gallbladder, etc (6.9)
- Ovary (5.6)
- Pancreas (5.0)

Crude incidence rate /100,000
Trend in Major Cancer Mortality Rates

Source: Annual Report of Causes of Death, Korea National Statistical Office
(age-standardized rates on the 2000 Korea registration population)
Trend in Age-standardized Incidence Rates of Cancer
Male, Korea Central Cancer Registry, 1999-2007

<table>
<thead>
<tr>
<th>Site</th>
<th>1999</th>
<th>2007</th>
<th>Annual percent change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>68.4</td>
<td>62.8</td>
<td>-0.7</td>
</tr>
<tr>
<td>Lung</td>
<td>51.9</td>
<td>48.1</td>
<td>-0.6</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>27.0</td>
<td>44.5</td>
<td>7.0 *</td>
</tr>
<tr>
<td>Liver</td>
<td>48.5</td>
<td>39.6</td>
<td>-2.2 *</td>
</tr>
<tr>
<td>Prostate</td>
<td>8.5</td>
<td>20.1</td>
<td>13.2 *</td>
</tr>
<tr>
<td>Thyroid</td>
<td>2.3</td>
<td>11.6</td>
<td>24.5 *</td>
</tr>
</tbody>
</table>

* P < .05
Trend in Age-standardized Incidence Rates of Cancer
Female, Korea Central Cancer Registry, 1999-2007

<table>
<thead>
<tr>
<th>Site</th>
<th>1999</th>
<th>2007</th>
<th>Annual percent change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroid</td>
<td>11.9</td>
<td>64.8</td>
<td>26.0 *</td>
</tr>
<tr>
<td>Breast</td>
<td>24.5</td>
<td>39.9</td>
<td>6.6 *</td>
</tr>
<tr>
<td>Stomach</td>
<td>28.3</td>
<td>25.7</td>
<td>-0.7</td>
</tr>
<tr>
<td>Colon and Rectum</td>
<td>17.1</td>
<td>24.3</td>
<td>5.3 *</td>
</tr>
<tr>
<td>Lung</td>
<td>12.9</td>
<td>13.7</td>
<td>1.2 *</td>
</tr>
<tr>
<td>Cervix uteri</td>
<td>18.6</td>
<td>12.2</td>
<td>-4.9 *</td>
</tr>
<tr>
<td>Liver</td>
<td>12.6</td>
<td>10.9</td>
<td>-1.6 *</td>
</tr>
</tbody>
</table>

* P < .05
Cumulative Risk of Cancer in Korea

Life expectancy (2007)
- Male: 76 years
- Female: 83 years

Cumulative risk
- Male: 34.4% or 1 out of 3
- Female: 28.9% or 1 out of 4

Source: Korea National Statistical Office, 2009
Lung Cancer

폐의 구조

폐는 숨을 쉬도록 배우는 기관이다. 가슴 양 땀에 하나씩 두 개의 폐가 있다. 각각의 폐 는 기관이라고 부르며 기관에 의해 기관으로 연결되어 있다. 폐는 부드럽고 평장한 조직으로 되어 있어서 호흡할 때 갑자기 가릴 수도, 노년기에 될 수도 있다. 백주리고 불리는 긴 흉이 폐를 잡으로 나눈 다. 오른쪽 폐에는 두 개의 염구 가 있으며, 왼쪽 폐에는 얕게만 있다.

前所未有

Lung Cancer

서울대학교

SEOU NATIONAL UNIVERSITY
Anti-Smoking Program of Korea

- increase in tax on cigarettes
- ban on smoking in public places, health education, etc.
- limit cigarette advertising
- prohibit promoting the sale of tobacco
- warning on cigarette packets
- expand public anti-smoking campaign & education
- limit sales to minors
Smoking Rate in OECD Countries

Source: OECD health data, 2005
Initiatives to Reduce the Tobacco Use

- Major TVs, Newspapers Banish Tobacco 2002-2004
  - KBS
  - SBS
  - MBC
- Increase in Tax on Cigarettes
- Ban on smoking in public places, health education, etc.
- Ban by legislation on the manufacture and sale of tobacco products
  (Tobacco Free World Alliance: ToFWA)
Quitline Service for Smoking Cessation at NCC

since April 2006 by telephone & website providing smoking cessation coaching releasing knowledge on hazards of smoking collaboration with 248 Health Centers for pharmacotherapy: NRT and bupropion by all the health centers charge free
Smoking Prevalence: Adults

Source: Ministry of Health & Welfare, Korean Association of Smoking & Health
Stomach Cancer

nitrite (salts, foods, additives, etc.)

\[ \text{enzymatic blockage (비타민C, 냉장고)} \]

\[ \text{nitrate} \rightarrow \text{nitrosamine (carcinogenic)} \]

+ \[ \text{amine (foods, drugs)} \]

Helicobacter pylori
2–7mm X 5,300

MNNG

Post MNNG 37wks
CagA-producing Helicobacter pylori
Increased Risk of Stomach Cancer in Korea

Short Communication
CagA-producing Helicobacter pylori and increased risk of gastric cancer: a nested case-control study in Korea

J Gwack1, A Shin1, C-S Kim1, K-P Ko1, Y Kim1, JI Jan1, J Bae1, SK Park1, Y-C Hong1, D Kang1, S-H Chang2, H-R Shin3 and K-Y Yoo1,3

1Department of Preventive Medicine, Seoul National University College of Medicine, 22 Yangon-dong, Gwang-ju Seoul, 110-799, Korea. 2Center for Health Services Research, Vanderbilt University Medical Center, Nashville, TN, USA. 3Department of Preventive Medicine, Konkuk University College of Medicine, 332 Danwon-dong, Chung-gu, Chungnam, 380-701, Korea. 4Research Institute for National Cancer Control and Evaluation, National Cancer Center, 809 Mack-dong, Bundang-gu, Gyeonggi-do 410-798, Korea. 5National Cancer Center, 809 Mack-dong, Bundang-gu, Gyeonggi-do 410-798, Korea.

In a nested-case control study of 100 cases of gastric cancer and 400 matched controls in relation to virulence factors of Helicobacter pylori in a Korean cohort, CagA seropositivity was significantly associated with a higher risk of gastric cancer among H. pylori-infected subjects (OR = 3.57, 95% CI 1.05 – 12.14).

Published online 8 August 2006
© 2006 Cancer Research UK

Keywords: gastric cancer; Helicobacter pylori; CagA; Cohort study; Korea

Gastric cancer is the first major incident cancer with an age-standardized incidence rate of 69.6 in males and 26.8 in females per 100,000 in Korea, the highest in the world (Ferlay et al. 2004; et al., 2002). Participants over age 30 years were recruited from 1993 through 2004. A detailed standardized questionnaire on general lifestyle, physical activity, dietary habit, reproductive Gwack et al. Brit J Cancer 2006
<table>
<thead>
<tr>
<th>Code</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Don’t smoke and avoid smoke-filled environments</td>
</tr>
<tr>
<td>2</td>
<td>Consume sufficient amounts of fruits and vegetables and balance your diet with a wide range of healthy foods</td>
</tr>
<tr>
<td>3</td>
<td>Limit your salt intake from all sources, and avoid burnt or charred foods</td>
</tr>
<tr>
<td>4</td>
<td>Limit your consumption of alcoholic beverages to one or two drinks per day</td>
</tr>
<tr>
<td>5</td>
<td>Engage in at least 30 minutes of regular, moderate-intensity physical activity on most days of the week</td>
</tr>
<tr>
<td>6</td>
<td>Maintain your body weight within a healthy range</td>
</tr>
<tr>
<td>7</td>
<td>Ensure vaccination against Hepatitis B virus following the HBV vaccination schedule</td>
</tr>
<tr>
<td>8</td>
<td>Engage in safe sexual behavior to avoid sexually transmitted diseases</td>
</tr>
<tr>
<td>9</td>
<td>Follow all health and safety instructions at work places aimed at preventing exposure to known cancer-causing agents</td>
</tr>
<tr>
<td>10</td>
<td>Undergo routine check-ups following the cancer screening programs</td>
</tr>
</tbody>
</table>
Intake of Vegetables/Fruits, Use of Refrigerator and Stomach Cancer Mortality in Korea, 1973-2005

(Refrigerator) Korea Power Exchange. The number of refrigerators in use in Korea.
Liver Cancer

- HBV
  - Acute hepatitis
    - 1-10% adults
    - 80-90%
  - Chronic carrier
    - 30-40%
    - 20-30%
  - Chronic cirrhosis
    - 1.5-4%/yr
    - 3-6.5%/yr
  - Liver cancer

- HCV

90% Vertical transmission

Vertical transmission

30-40%

20-30%

1.5-4%/yr

3-6.5%/yr

Adults in a vertical transmission scenario.
HBsAg seropositivity

<HBsAg seropositivity among blood donors>

- National vaccination program for infants and children
- Vaccination against vertical transmission
- HBV vaccination introduced in Korea
Liver Cancer Mortality Rates in Young Koreans

[Graph showing trend over years with annotations for national vaccination program for infants and children and vaccination against vertical transmission]

Korea National Statistical Office 2008
Change in Breast Cancer Mortality
Ages 25-49, % Change during 1985-87 to 1995-97

Republic of Korea
China: rural areas
Japan

Bray et al. Breast Cancer Res 2004
Source: WHO Mortality database
http://www-depdb.iarc.fr/
# Age-Incidence Curves of Breast Cancer in selected Asian Countries

![Graph showing age-incidence curves of breast cancer in selected Asian countries.](image)

<table>
<thead>
<tr>
<th>Countries</th>
<th>All ages</th>
<th>ASR (World)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>35.6</td>
<td>50.1</td>
</tr>
<tr>
<td>Singapore</td>
<td>58.9</td>
<td>48.7</td>
</tr>
<tr>
<td>Philippines</td>
<td>33.5</td>
<td>46.6</td>
</tr>
<tr>
<td>Japan</td>
<td>49.6</td>
<td>32.7</td>
</tr>
<tr>
<td>Malaysia</td>
<td>26.2</td>
<td>30.8</td>
</tr>
<tr>
<td>Indonesia</td>
<td>23.3</td>
<td>26.1</td>
</tr>
<tr>
<td>Turkey</td>
<td>19.9</td>
<td>22.0</td>
</tr>
<tr>
<td>Nepal</td>
<td>15.6</td>
<td>21.8</td>
</tr>
<tr>
<td>Korea</td>
<td>23.5</td>
<td>20.4</td>
</tr>
<tr>
<td>India</td>
<td>16.5</td>
<td>19.1</td>
</tr>
<tr>
<td>China</td>
<td>20.1</td>
<td>18.7</td>
</tr>
<tr>
<td>Iran</td>
<td>13.4</td>
<td>17.1</td>
</tr>
<tr>
<td>Thailand</td>
<td>16.3</td>
<td>16.6</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>13.1</td>
<td>16.2</td>
</tr>
<tr>
<td>Mongolia</td>
<td>4.9</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Source: Globocan 2002
Trend of Age-standardized Incidence Rate by Site Female, 1999-2005, Korea

<table>
<thead>
<tr>
<th>Site</th>
<th>Annual Percent Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroid</td>
<td>25.5</td>
</tr>
<tr>
<td>Breast</td>
<td>6.8</td>
</tr>
<tr>
<td>Stomach</td>
<td>-0.4</td>
</tr>
<tr>
<td>Colorectum</td>
<td>5.5</td>
</tr>
<tr>
<td>Lung</td>
<td>0.8</td>
</tr>
<tr>
<td>Cervix uteri</td>
<td>-5.2</td>
</tr>
<tr>
<td>Liver</td>
<td>-1.7</td>
</tr>
</tbody>
</table>

* ASR (standardized by Korean population in 2000)
Selected Food Intake in Korea (1969-2005)

Lifestyle Changes in Korea

- mean age at first marriage

- total fertility rate

- age at menarche*

- total calorie supply (per capita per day)

Source: National Statistical Office. 2007
* Cho et al. 1999
Breastfeeding Trend Among Korean Women

Projection of Breast Cancer Mortality
Korea, all ages, 2005-2020

Mortality rates, per a hundred thousand

Year: 2000
FEMALE BREAST CANCER

Source: National Statistical Office 2002

National Cancer Screening Program

Based on Poisson regression model

3.9 times
2.8 times
2.34
2.83
3.81
4.18
5.12
6.30
7.61
9.19

자궁 질 세포검사 (Pap smear)

• 1928, George N. Papanicolaou
• 자궁경부에서 세포를 채취, 도말 후 현미경으로 관찰
• 민감도 50 – 70%, 특이도 60 – 90%
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>1st Term 10-year Plan for Cancer Control</td>
</tr>
<tr>
<td>1999</td>
<td>National Cancer Screening Program</td>
</tr>
<tr>
<td>2000</td>
<td>Cancer Control Division, Health Promotion Bureau, Ministry of Health &amp; Welfare</td>
</tr>
<tr>
<td>2001</td>
<td>National Cancer Center</td>
</tr>
<tr>
<td>2003</td>
<td>National Cancer Act</td>
</tr>
<tr>
<td>2004</td>
<td>Regional Cancer Centers</td>
</tr>
<tr>
<td>2006</td>
<td>2nd Term 10-year Plan for Cancer Control</td>
</tr>
</tbody>
</table>
NCIC provides a comprehensive cancer information services through website, telephone, and on-site education.

NCIC provides some booklets and leaflets on various aspect of cancer.

NCIC have supported health professionals with information on cancer research relates and have developed educational booklets and leaflets on most aspects of cancer.
# Screening Guideline of NCSP

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Eligible</th>
<th>Frequency</th>
<th>Test / Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>40 &amp; over adults</td>
<td>every 2 yrs</td>
<td>endoscopy or UGI</td>
</tr>
<tr>
<td>Breast</td>
<td>40 &amp; over women</td>
<td>every 2 yrs</td>
<td>mammography &amp; CBE</td>
</tr>
<tr>
<td>Cervix</td>
<td>30 &amp; over women</td>
<td>every 2 yrs</td>
<td>Pap smear</td>
</tr>
<tr>
<td>Liver</td>
<td>40 &amp; over high risk group*</td>
<td>every 6 mo</td>
<td>sonography &amp; AFP</td>
</tr>
<tr>
<td>Colorectal</td>
<td>50 &amp; over adults</td>
<td>every 1 yr</td>
<td>FOBT → colonoscopy or barium enema</td>
</tr>
</tbody>
</table>

* 40 & over with HBsAg positive or anti-HCV positive or liver cirrhosis
<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>No. of participants (1,000)</th>
<th>No. of cancer detected (detection rate, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>1,150</td>
<td>1,525</td>
</tr>
<tr>
<td>Breast</td>
<td>729</td>
<td>946</td>
</tr>
<tr>
<td>Cervix</td>
<td>73</td>
<td>70</td>
</tr>
<tr>
<td>Liver</td>
<td>100</td>
<td>117</td>
</tr>
<tr>
<td>Colorectum</td>
<td>537</td>
<td>692</td>
</tr>
<tr>
<td>Total</td>
<td>2,589</td>
<td>3,350</td>
</tr>
</tbody>
</table>
## Screening rates, All Combined, Korea

<table>
<thead>
<tr>
<th>Cancers</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>39.2</td>
<td>39.4</td>
<td>43.3</td>
<td>45.6</td>
<td>53.5</td>
</tr>
<tr>
<td>Liver</td>
<td>20.0</td>
<td>16.3</td>
<td>16.5</td>
<td>22.7</td>
<td>19.7</td>
</tr>
<tr>
<td>Colon</td>
<td>19.9</td>
<td>25.4</td>
<td>29.4</td>
<td>34.1</td>
<td>39.7</td>
</tr>
<tr>
<td>Breast</td>
<td>33.2</td>
<td>38.4</td>
<td>40.6</td>
<td>45.8</td>
<td>49.3</td>
</tr>
<tr>
<td>U. cervix</td>
<td>58.3</td>
<td>38.4</td>
<td>54.9</td>
<td>57.0</td>
<td>59.9</td>
</tr>
</tbody>
</table>

Unit: %

Source: National Cancer Center. Nationwide Survey for Health Screening Performance Rate, 2004~2007

Note: Cancer screening performance rate by any programs in a given year under the screening guideline recommended by the National Cancer Center and the Ministry of Health & Welfare
Stage Frequency of Breast Cancer

Source: Korea Central Cancer Registry, Korean Breast Cancer Society
### Five Year Survival of Cancer Sites of National Screening Program

#### MEN

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>'93-'95</th>
<th>'96-'00</th>
<th>'01-'05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>43.0</td>
<td>46.9</td>
<td>57.0</td>
</tr>
<tr>
<td>Liver</td>
<td>9.9</td>
<td>12.9</td>
<td>18.8</td>
</tr>
<tr>
<td>Colorectum</td>
<td>55.3</td>
<td>59.0</td>
<td>66.7</td>
</tr>
</tbody>
</table>

#### WOMEN

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>'93-'95</th>
<th>'96-'00</th>
<th>'01-'05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>42.6</td>
<td>46.0</td>
<td>55.1</td>
</tr>
<tr>
<td>Liver</td>
<td>13.6</td>
<td>14.2</td>
<td>19.0</td>
</tr>
<tr>
<td>Colorectum</td>
<td>54.2</td>
<td>56.8</td>
<td>62.4</td>
</tr>
<tr>
<td>Breast</td>
<td>78.0</td>
<td>83.2</td>
<td>87.3</td>
</tr>
<tr>
<td>Cervix uteri</td>
<td>77.5</td>
<td>80.0</td>
<td>81.1</td>
</tr>
</tbody>
</table>
## International Comparison of Five Year Relative survival

(Unit: %)

<table>
<thead>
<tr>
<th></th>
<th>Korea ('01–'05)</th>
<th>USA 1) ('96–'04)</th>
<th>Japan 2) ('97–'99)</th>
<th>Eurocare 2) ('95–'99)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>56.4</td>
<td>24.7</td>
<td>62.1</td>
<td>24.1</td>
</tr>
<tr>
<td>Lung</td>
<td>15.5</td>
<td>15.2</td>
<td>25.6</td>
<td>12.6</td>
</tr>
<tr>
<td>Colorectum</td>
<td>64.8</td>
<td>64.4</td>
<td>65.2</td>
<td>53.5</td>
</tr>
<tr>
<td>Liver</td>
<td>18.9</td>
<td>11.7</td>
<td>23.1</td>
<td>8.6</td>
</tr>
<tr>
<td>Thyroid</td>
<td>98.1</td>
<td>96.9</td>
<td>92.4</td>
<td>86.5</td>
</tr>
<tr>
<td>Breast</td>
<td>87.3</td>
<td>88.7</td>
<td>85.5</td>
<td>81.1</td>
</tr>
<tr>
<td>Cervix uteri</td>
<td>81.1</td>
<td>71.2</td>
<td>71.5</td>
<td>66.5</td>
</tr>
<tr>
<td>Prostate</td>
<td>76.9</td>
<td>98.9</td>
<td>75.5</td>
<td>77.0</td>
</tr>
<tr>
<td>All Cancers</td>
<td>52.2</td>
<td>65.3</td>
<td>54.3</td>
<td>51.9</td>
</tr>
</tbody>
</table>

2) National Cancer Center in Japan. Cancer Statistics in Japan, 2008
# National R&D Program for Cancer Control (since 1996~)

## Causes and Mechanisms of Common Cancers
- Cancer etiology
- Cancer metastasis and progression
- Tumor immunology
- Functions of tumor suppressors

## Cancer Therapeutic Technologies
- Surgical, radiological chemo-therapeutics
- Anticancer drug candidates
- Bone marrow transplantation
- Molecular/cellular therapeutics for cancer
- Alternative medicine for cancer
- Multi-institutional clinical trials for cancers

## Cancer Diagnostic Technologies
- Diagnosis of precancerous lesions
- Discovery of new tumor markers
- Development of new diagnostic technologies using novel targets or tools
- Studies on the movement, storage and reproduction of diagnostic media

## Cancer Prevention and Control
- Intervention studies on risk factors for cancer prevention
- Cancer education, awareness, and information
- Enhancing the quality of cancer screening
- Improving of life for cancer patients and palliative care
- Cancer control policies
Cancer Facts in Korea, Today

**United States**
- War against Cancer, 1971
- Decline in cancer mortality, 1991

**Japan**
- NCC, 1962
- NCCP, 1965
- NCSP, 1966(stomach)-92(colon)

**Korea**
- NCC, 2001
- 1st NCCP, 1996
- NCSP, 1999(stomach)-04(colon)

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**Death rate from all sites of cancer in Japan**


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**Overall Cancer Mortality Rates**

- Male: annual % change: -1.13%
- Female: annual % change: -0.80%
Cancer Incidence, 2003~2005

Numbers of Cancer cases

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (Thousands)</th>
<th>Male (Thousands)</th>
<th>Female (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>124</td>
<td>69</td>
<td>55</td>
</tr>
<tr>
<td>2004</td>
<td>132</td>
<td>72</td>
<td>60</td>
</tr>
<tr>
<td>2005</td>
<td>143</td>
<td>78</td>
<td>65</td>
</tr>
</tbody>
</table>

Crude Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (Rate per 100,000)</th>
<th>Male (Rate per 100,000)</th>
<th>Female (Rate per 100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>257.1</td>
<td>272.3</td>
<td>246.5</td>
</tr>
<tr>
<td>2004</td>
<td>292.9</td>
<td>297.9</td>
<td>268.0</td>
</tr>
<tr>
<td>2005</td>
<td>317.8</td>
<td>301.6</td>
<td>218.5</td>
</tr>
</tbody>
</table>

Age-standardized Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (Rate per 100,000)</th>
<th>Male (Rate per 100,000)</th>
<th>Female (Rate per 100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>235.5</td>
<td>242.1</td>
<td>206.3</td>
</tr>
<tr>
<td>2004</td>
<td>252.5</td>
<td>298.8</td>
<td>218.5</td>
</tr>
<tr>
<td>2005</td>
<td>310.7</td>
<td>196.6</td>
<td>218.5</td>
</tr>
</tbody>
</table>
Five Year Survival of Ten Major Cancer Sites (2001-2005)

- Thyroid: 98.1%
- Breast: 87.3%
- Cervix Uteri: 81.1%
- Prostate: 76.9%
- Colorectum: 64.8%
- Stomach: 56.4%
- Gallbladder etc.: 22.3%
- Liver: 18.9%
- Lung: 15.5%
- Pancreas: 7.8%
Economic Burden of Cancer
Korea, 2005

Total: 14 billion USD (1.7% of GDP)

Source: Kim et al. Eu J Cancer Care 2007
### Age Tsunami: Baby Boomer born 1953-1958

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (10,000 persons)</th>
<th>15~64 years (10,000 persons)</th>
<th>65+ years (10,000 persons)</th>
<th>Old Dependency Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>3,812</td>
<td>2,372</td>
<td>146</td>
<td>6.2</td>
</tr>
<tr>
<td>2005</td>
<td>4,814</td>
<td>3,453</td>
<td>437</td>
<td>12.7</td>
</tr>
<tr>
<td>2018</td>
<td>4,934</td>
<td>3,598</td>
<td>707</td>
<td>19.6</td>
</tr>
<tr>
<td>2030</td>
<td>4,863</td>
<td>3,123</td>
<td>1,181</td>
<td>37.8</td>
</tr>
<tr>
<td>2050</td>
<td>4,234</td>
<td>2,242</td>
<td>1,616</td>
<td>72.1</td>
</tr>
</tbody>
</table>

- **Age 15**: Baby Boomer born 1953-1958
- **Age 65**: Earliest year of retirement in many countries.

The chart shows the projected population distribution and dependency ratio from 1980 to 2050, highlighting the impact of the Baby Boomer generation on the workforce and the support needed for the elderly.
Estimated Cancer Incidences and Cancer Deaths by 2015

- 45.8% increase in cancer incidences
- 30.0% increase in cancer deaths
2nd 10-Year Plan for Cancer Control
Korea, 2006-2015

Cancer mortality reduction

- Expected Objective: 69,154 (2005)
- Objective: 116.7 /100,000
- Expected Objective: 89,934 (2015)
- Objective: 94.1 /100,000

30.0% ↑
116.7 /100,000
94.1 /100,000

19.4% ↓
2nd 10-Year Plan for Cancer Control Korea, 2006-2015

Improvement in 5-years survival rate

- 2000: 41.8%
- 2005: 45.9%
- 2010: 49.9%
- 2015: 54.0%

17.6% ↑
National Budget for 1st Term NCSP (1996-2005)

Total budget: 579.7 million USD

USD, million

1995  1997  1999  2001  2003  2005

Prevention  Supportive & Palliative care  Research  Regional Cancer Center  National Cancer Center
2nd Term Ten-year Plan for National Cancer Control (2006-15)

Total budget: 5.81 billion USD
National budget: 3.48 billion USD
Health promotion fund: 2.33 billion USD

USD, million

Year

- Primary Prevention
- Research
- Cancer registry & Surveillance
- Resources
- Education & Public campaign
- Supportive & Palliative care
- Diagnosis & Treatment
- Early detection

2006: 90.2
2007: 110.4
2008: 129.8
2009: 151.9
2010: 174.4
2011: 207.9
2012: 239
2013: 273.3
2014: 313.8
2015: 355.1
감사합니다!

Thank You for Your Attention!