National Cancer Control Program 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)
### Health and Welfare Statistics
#### Republic of Korea

| Population | 49 M (south)  
| (ranked 18th in the world) | 23 M (north) as of 2008 |
| Life Expectancy | 75.7 yrs (M) / 82.4 yrs (F) |
| Aging (65+) | 9.0% (2005)  
| | 20.0% (2026) |
| Population IR | 0.33% (2008) |
| 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$200
Traditional medicine

Cause of death = cancer
Life expectancy = 79 yrs
Per capita GNI = US$20,000
Universal health insurance

Korea

1954

2010
Causes of Deaths in Korea

- Cancer: 28.0%
- Heart Disease: 11.3%

Source: Korea National Statistical Office, 2008
Relative Frequency of Incident Cancer Cases in Korea 2007

Source: Korea Central Cancer Registry, 2010
Trend in Major Cancer Mortality Rates

Age-standardized rate per 100,000

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>Year</th>
<th>Annual percent change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>68.4</td>
<td>62.8</td>
</tr>
<tr>
<td>Lung</td>
<td>51.9</td>
<td>48.1</td>
</tr>
<tr>
<td>Colon and rectum</td>
<td>27.0</td>
<td>44.5</td>
</tr>
<tr>
<td>Liver</td>
<td>48.5</td>
<td>39.6</td>
</tr>
<tr>
<td>Prostate</td>
<td>8.5</td>
<td>20.1</td>
</tr>
<tr>
<td>Thyroid</td>
<td>2.3</td>
<td>11.6</td>
</tr>
</tbody>
</table>

* P < .05

Source: Korea Central Cancer Registry, 2010
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

Source: Korea Central Cancer Registry, 2010
Trend in Age-standardized Incidence Rates of Cancer
Korea Central Cancer Registry, 1999-2007

Source: Korea Central Cancer Registry, 2010
Cumulative Risk of Cancer in Korea

<table>
<thead>
<tr>
<th>Life expectancy (2007)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>76 years</td>
<td>34.4%</td>
<td>28.9%</td>
</tr>
<tr>
<td>1 out of 3</td>
<td></td>
<td>1 out of 4</td>
</tr>
</tbody>
</table>

Source: Korea National Statistical Office, 2009
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>
Estimated Cancer Incidences and Cancer Deaths by 2015

45.8% increase in cancer incidences

30.0% increase in cancer deaths
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>1st Term 10-year Plan for Cancer Control</td>
<td>第1期癌征服推進事業</td>
</tr>
<tr>
<td>1999</td>
<td>National Cancer Screening Program</td>
<td>國家癌檢診事業</td>
</tr>
<tr>
<td>2000</td>
<td>Cancer Control Division, Health Promotion Bureau, Ministry of Health &amp; Welfare</td>
<td>保健福祉部 健康増進局 癌管理課</td>
</tr>
<tr>
<td>2001</td>
<td>National Cancer Center</td>
<td>國立癌センター(中心)</td>
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<tr>
<td>2003</td>
<td>National Cancer Act</td>
<td>癌管理法</td>
</tr>
<tr>
<td>2004</td>
<td>Regional Cancer Centers</td>
<td>地域癌センター(中心)</td>
</tr>
<tr>
<td>2006</td>
<td>2nd Term 10-year Plan for Cancer Control</td>
<td>第2期癌征服推進事業</td>
</tr>
</tbody>
</table>
# National Cancer Screening Program

<table>
<thead>
<tr>
<th>Target Population</th>
<th>Medicaid</th>
<th>NHI Beneficiaries&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Year</td>
<td>1999</td>
<td>2002</td>
</tr>
<tr>
<td>Target Cancer for Screening</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stomach</td>
<td>Stomach</td>
</tr>
<tr>
<td></td>
<td>Breast</td>
<td>Breast</td>
</tr>
<tr>
<td></td>
<td>Cervix</td>
<td>Cervix&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Liver&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Liver&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Colorectal&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Colorectal&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1. Lower 20-50% of premium of National Health Insurance
2. Included in the routine health check-up since 1988
3. Included in NCSP since 2003
4. Included in NCSP since 2004
Framework of Regional Cancer Center

MOHW

NCC

Clinic
- Refer and consulting
- Developing Clinical Practice Guideline

Cancer Control Program
- Technical support and Cooperation for cancer control

Research
- Multi-center research and support

RCC
(National University Hospitals)
National/Regional Cancer Centers in Korea

- 9 RCCs were designated since 2004
- financial and technical support by the Central and Local government (USD 20 million for each RCC)

- to provide clinical services for cancer patients at the local level
- to facilitate national cancer control program including cancer prevention and screening
- to perform population-based researches on collaboration basis, i.e., multi-center trials, tumor banks and genome cohort
Cancer Registry System in Korea (since 1980)

Hospital Cancer Registries
- hospital-based since 1980
- headquarter: NCC
- coverage: 95% of all cancers

Regional Cancer Registries
- population-based
- Seoul / Busan
- Daegu / Gwangju
- Incheon / Daejeon
- Ulsan / Jeju
- coverage: 50% of population

Site-specific Cancer Registries
- Academic Societies: breast, uterine, cervix etc.
### Cancer Statistics in Korea

<table>
<thead>
<tr>
<th><strong>Mortality</strong></th>
<th>National Death Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>(戶籍法, 統計法)</td>
<td>National Statistical Office</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Incidence</strong></th>
<th>The Korea Central Cancer Registry: since 1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>(癌管理法)</td>
<td>nationwide hospital-based cancer registry</td>
</tr>
<tr>
<td>(國立癌センター法)</td>
<td>covers 90% of all cancer cases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Medical utilization</strong></th>
<th>Health Insurance: universal coverage since 1988</th>
</tr>
</thead>
<tbody>
<tr>
<td>(國民健康保険法)</td>
<td></td>
</tr>
</tbody>
</table>

**Korean ID** 13 digits 住民登録番号
2008 Cancer Facts & Figures

- Korean Cancer Fact Book (March 21, 2008)

- Cancer Burden
- Cancer Prevention
- Cancer Screening
- Cancer Care Costs
- Palliative Care / Cancer Survivor
- Cancer Infrastructure
- 10 year Cancer Control Plan
THE GLOBOCAN PROJECT

Welcome to the GLOBOCAN project. The aim of the project is to provide contemporary estimates of the incidence and mortality have been prepared separately for each sex and for ten broad age groups. Please note that:

1. The GLOBOCAN estimates for 2008 are based on the most recent data available at IARC and on information published.
2. Because the sources of data are continuously improving in quality and extent, estimates may not be truly comparable differences may be the result of a change in the methodology and should not be interpreted as a time trend effect.

Usage:

- For a quick access to a summary of the burden of cancer in a country or for a cancer, use the FACT SHEETS option. Fact Sheets were developed to provide a quick overview of frequently-requested cancer incidence and mortality statistics.
- If you want to perform simple analysis or create your own graphs using GLOBOCAN data, use the ONLINE ANALYSIS module.

Notes:

- The material extracted from this website is in the public domain. You may use it "as is" but must cite the corresponding references.
- The Cancer Information Section (CIN) of IARC reserves the right to update or change information contained in the database. IARC has proprietary rights to the materials on the Website. Systematic retrieval of data to create or compile, directly or indirectly, must be specifically authorized in writing by IARC.

Should you find any error, inconsistency or mistake, please contact the CIN section at IARC.
National Cancer Act, revised in 2006

- Central and regional government must establish the plan for cancer control every 5 years
- Establish National Cancer Control Committee
- Support cancer research
- Establish cancer registry & National Cancer Screening Program
- Start National Hospice-Palliative Care Program
- Amend cancer registration law based on "Statistics Law"
- Establish National Cancer Prevention Day – March 21th (3-2-1)
- Activate cohort study, regional cancer center
- Quality assessment of cancer screening program
- Support cancer burden of cancer patients
# 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
Plans for Activating Cancer Research

- increasing the government R&D budget for cancer to 300 million USD per annum
  → 0.3% of the total government budget

- strengthening infrastructure
  - cancer cohort, tumor bank, cancer information

- translational research: from bench to bedside

- activating clinical trial: multi-institutional clinical trials
Health Promotion Act (1995)

- major source: tobacco sales tax
  (KT&G: Korea Tobacco & Ginseng Co.)
  Korea Tomorrow & Global

  15 cents / 1.5 ~ 2.0 dollars / pack (～2004)
  35 cents / 1.9 ~ 2.5 dollars / pack (2005.1.1)

Health Promotion Fund: 1.9 billion USD (2008)
- infrastructure for health promotion
- social indirect investments for health
- genome cohort: 10 million USD (2006)
Began in Nov. 2004 (~2010)

90,000 from community-based model
160,000 from institution-based model
(250,000 Health Examinee)

12 geographic sites for model I
12 medical institutions for model II

130,000 persons enrolled (as of Dec. 2007)

- interviewer-administered questionnaire
- bio-repository: central / backup
- repeated measurements every 2 or 5 years

Asia Cohort Consortium (ACC) protocol

Source: Yoo et al. 2005
Cancer Screenee Cohort

National Center for Cancer Prevention and Early Detection

questionnaire
blood / urine
tumor bank

30,000 men & women (~2007)
target: 100,000 (5,000/yr)
Early Detection
by National Cancer Screening Program
Asian shows similar to higher mortality than the Western.
Cancer Survival in Asia population-based study

<table>
<thead>
<tr>
<th>Survival</th>
<th>Stomach</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.Korea</td>
<td>49</td>
</tr>
<tr>
<td>China</td>
<td>39</td>
</tr>
<tr>
<td>Singapore</td>
<td>27</td>
</tr>
<tr>
<td>Thailand</td>
<td>12</td>
</tr>
<tr>
<td>India</td>
<td>6</td>
</tr>
<tr>
<td>Gambia</td>
<td>3</td>
</tr>
<tr>
<td>Uganda</td>
<td>0</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>.</td>
</tr>
<tr>
<td>Pakistan</td>
<td>.</td>
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<tr>
<td>Philippines</td>
<td>.</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>.</td>
</tr>
<tr>
<td>Turkey</td>
<td>.</td>
</tr>
</tbody>
</table>

Sankaranarayanan et.al. Lancet Oncol 2010;11:165-73
### Breast Cancer

<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Male %</th>
<th>Female %</th>
<th>5-Year Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
<td>1999-1999</td>
<td>98.8</td>
<td>83.7</td>
<td>0.5</td>
<td>84% (F)</td>
<td></td>
</tr>
<tr>
<td>Miyagi</td>
<td>1997-1999</td>
<td>88.1</td>
<td>86.3</td>
<td>1.4</td>
<td>84% (F)</td>
<td></td>
</tr>
<tr>
<td>Yamagata</td>
<td>1997-1999</td>
<td>98.0</td>
<td>86.4</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niigata</td>
<td>1997-1999</td>
<td>86.4</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fukui</td>
<td>1997-1999</td>
<td>93.7</td>
<td>88.2</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osaka</td>
<td>1997-1999</td>
<td>97.5</td>
<td>83.6</td>
<td>0.6</td>
<td>84% (F)</td>
<td></td>
</tr>
<tr>
<td>Nagasaki</td>
<td>1997-1999</td>
<td>86.6</td>
<td>1.2</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manila &amp; Rizal</td>
<td>1993-2002</td>
<td>58.6</td>
<td>4.1</td>
<td>1.0</td>
<td></td>
<td></td>
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<tr>
<td>Taiwan</td>
<td>1997-1999</td>
<td>99.9</td>
<td>79.7</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Initiation of National Cancer Screening Program
NCSP in Korea

- NCSP program was needed for the low SES group to improve their usage of medical resources.

- Aim of the NCSP
  - Providing structured guideline with academic societies
  - Providing screening services to low SES people

- Implemented in 1999 and expanded target population and cancers through 2007

- Development of the national guideline protocols
  - Ministry of Health and Welfare
  - Supporting Committee for Cancer Screening Program in NCC
  - collaboration with the related academic societies
National Coverage for Cancer Screening in Korea

Source population for cancer screening: 24.4 million (women ≥ 30 yrs and men ≥ 40 yrs)

- 12.7 million (52%) covered by NHI
- 10.7 million (44%) covered by NHI
- 1.0 million (4%) covered by NCSP
- Medicaid recipients

NHI Beneficiaries (lower 50% income)
NHI Beneficiaries (upper 50% income)
<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
# National Cancer Screening Program (1999)

<table>
<thead>
<tr>
<th>Income levels of NHI Beneficiaries</th>
<th>Population covered by NCSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Medicaid</td>
</tr>
<tr>
<td>20%</td>
<td>Stomach</td>
</tr>
<tr>
<td>30%</td>
<td>Breast</td>
</tr>
<tr>
<td>40%</td>
<td>Ut. Cervix</td>
</tr>
<tr>
<td>50%</td>
<td>Liver</td>
</tr>
<tr>
<td>...</td>
<td>Colon</td>
</tr>
</tbody>
</table>

- National Cancer Screening Program (1999)
- Income levels of NHI Beneficiaries
- Population covered by NCSP
### National Cancer Screening Program (2002)

<table>
<thead>
<tr>
<th>Income levels of NHI Beneficiaries</th>
<th>Stomach</th>
<th>Breast</th>
<th>Ut. Cervix</th>
<th>Liver</th>
<th>Colon</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
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</tr>
<tr>
<td>50%</td>
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<tr>
<td>40%</td>
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<td>30%</td>
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<tr>
<td>20%</td>
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</tr>
<tr>
<td>10%</td>
<td>Map area</td>
<td>by NCSP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td></td>
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</tbody>
</table>
National Cancer Screening Program (2003)

Income levels of NHI Beneficiaries

<table>
<thead>
<tr>
<th>50%</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td></td>
<td></td>
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</tr>
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<td></td>
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</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>Stomach</td>
<td>Breast</td>
<td>Ut. Cervix</td>
<td>Liver</td>
</tr>
</tbody>
</table>

Population covered by NCSP
National Cancer Screening Program (2004)

Income levels of NHI Beneficiaries

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Stomach</th>
<th>Breast</th>
<th>Ut. Cervix</th>
<th>Liver</th>
<th>Colon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td></td>
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<tr>
<td>20%</td>
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<tr>
<td>30%</td>
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<tr>
<td>40%</td>
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</tr>
<tr>
<td>50%</td>
<td></td>
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<tr>
<td>...</td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Population covered by NCSP
# National Cancer Screening Program (2005)

<table>
<thead>
<tr>
<th>Income levels of NHI Beneficiaries</th>
<th>Stomach</th>
<th>Breast</th>
<th>Ut. Cervix</th>
<th>Liver</th>
<th>Colon</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>30%</td>
<td></td>
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</tr>
<tr>
<td>40%</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Population covered by NCSP
Organized Cancer Screening in Korea

- Nationwide organized cancer screening program
- Managed by two systems
  - Upper 50% contributors: National Health Insurance Screening Program
  - Lower 50% contributors & Medicaid: National Cancer Screening Program

<table>
<thead>
<tr>
<th>Level of Contribution</th>
<th>National Health Insurance Beneficiaries</th>
<th>Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income upper 50%</td>
<td>NHI Cancer Screening</td>
<td></td>
</tr>
<tr>
<td>Income lower 50%</td>
<td>National Cancer Screening Program (NCSP)</td>
<td></td>
</tr>
</tbody>
</table>

- Stomach
- Liver
- Colorectum
- Breast
- Cervix
## Performance of NCSP by Cancer Type

<table>
<thead>
<tr>
<th></th>
<th>No. of participants (1,000)</th>
<th>No. of cancer detected (detection rate, %)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>1,150</td>
<td>1,525</td>
<td>1,724</td>
<td>1,383 (0.12)</td>
<td>1,717 (0.11)</td>
</tr>
<tr>
<td>Breast</td>
<td>729</td>
<td>946</td>
<td>1,064</td>
<td>112 (0.02)</td>
<td>124 (0.01)</td>
</tr>
<tr>
<td>Cervix</td>
<td>73</td>
<td>70</td>
<td>80</td>
<td>28 (0.04)</td>
<td>27 (0.04)</td>
</tr>
<tr>
<td>Liver</td>
<td>100</td>
<td>117</td>
<td>111</td>
<td>145 (0.15)</td>
<td>152 (0.13)</td>
</tr>
<tr>
<td>Colorectum</td>
<td>537</td>
<td>692</td>
<td>783</td>
<td>207 (0.04)</td>
<td>289 (0.04)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,589</td>
<td>3,350</td>
<td>3,750</td>
<td>1,875 (0.07)</td>
<td>2,309 (0.07)</td>
</tr>
</tbody>
</table>
Payment System and Proportion for Usage of Cancer Screening Program in Korea

Source: Korea National Cancer Screening Survey 2007
# 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>

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
Participation Rates of National Cancer Screening Program in Korea?
Schematic Procedure for NCSP

1. Planning and funding the program
2. Select the target population and send invitation letter
3. Visit and take screening
4. Send the results
5. Send the results and claim the bill
6. Pay for the bill

Ministry of Health, Welfare and Family Affairs

The supporting and Evaluation Board of NCSP, NCC

- Provides national guidance on screening
- Training for health professional
- Public education and promotion
- Evaluation and monitoring of the program

Public Health Centers n=248

National Health Insurance Corporation

Target population

Screening Unit in hospital or clinic

Monitor & Encourage

Public Health Centers
National Health Insurance Corporation

Ministry of Health, Welfare and Family Affairs

The supporting and Evaluation Board of NCSP, NCC

Target population

Screening Unit in hospital or clinic

Monitor & Encourage
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**
- Stomach: 43.0, 46.9, 57.0
- Liver: 9.9, 12.9, 18.8
- Colorectum: 55.3, 59.0, 66.7

**WOMEN**
- Stomach: 42.6, 46.0, 55.1
- Liver: 13.6, 14.2, 19.0
- Colorectum: 54.2, 56.8, 62.4
- Breast: 78.0, 83.2, 87.3
- Cervix uteri: 77.5, 80.0, 81.1
### International Comparison of Five Year Relative survival

<table>
<thead>
<tr>
<th>Cancer Type</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
Challenging Issues in NCSP of Korea

- improving quality of screening
- increasing participation rate in NCSP
- assessment of effectiveness
- providing cost-effective program
National Cancer Act, 2003

- Central and regional government must establish **cancer control plan** in every 5 years
- National Cancer Control Committee
- R&D for cancer research
- Cancer Registration
- National Cancer Screening Program
- National Hospice-Palliative Care Program
The 2nd Term of 10-Year National Cancer Control Plan

Cancer Prevention
Global Distribution of Cancer Incidence
ASIR, all cancers, both sexes, all ages

Estimated age-standardised incidence rate per 100,000
All cancers excl. non-melanoma skin cancer: both sexes, all ages

Asian shows moderate to lower incidence than the Western.
Trend in Age-standardized Incidence Rates of Cancer
Korea Central Cancer Registry, 1999-2007

% increase in cancer incidence = 2.9% per year
Trend in Cancer Mortality Rates

Age-standardized rate per 100,000

Annual Percent Change
Male: -1.13%
Female: -0.80%

Date Source: Annual Report of Causes of Death, Korea National Statistical Office
Age-standardized rates on the 2000 Korea registration population
Increase in Cancer Survival *ultimately* induces Increase in Cancer Prevalence

Mortality (2007)

- Non-Hodgkin Lymphoma: 17.5%
- Leukemia: 7.0%
- Breast: 2.3%
- Pancreas: 2.6%
- Gallbladder: 3.0%
- Other: 21.8%

Incidence (2007)

- Lung: 20.6%
- Stomach: 17.4%
- Liver: 18.9%
- Colorectum: 9.0%
- Cervix Uteri: 4.1%
- Breast: 6.2%
- Thyroid: 3.7%

Prevalence (2007)

- Lung: 13.0%
- Stomach: 20.3%
- Breast: 23.2%
- Colorectum: 12.3%
- Oral cavity: 1.9%
- Non-Hodgkin lymphoma: 2.3%
- Bladder: 3.0%
- Thyroid: 5.8%
- Liver: 6.3%
- Cervix Uteri: 7.2%

- 67,559 deaths
- 161,920 cases
- 606,804 persons

- Incidence ↓
- Mortality ↓
- Survival ↑

Cancer Control Program
- Primary Prevention
- Early Detection
- Supportive & Palliative care
- Diagnosis & Treatment

Capacity Building
- Education & Public Campaign
- Cancer Registry & Surveillance
- Resources

Understand cancer biology/pathology
Develop new diagnosis & treatment
Provide evidence for policy-makers

Research
Basic (Cohort) / Translational / Clinical / Policy

- Provide evidence for policy-makers
- Understand cancer biology/pathology
- Develop new diagnosis & treatment

Quality of Life
National Cancer Act, revised in 2006

- Central and regional government must establish the plan for cancer control every 5 years
- Establish National Cancer Control Committee
- Support cancer research
- Establish cancer registry & National Cancer Screening Program
- Amend cancer registration law based on “Statistics Law”
- Establish National Cancer Prevention Day — March 21th (3-2-1)
- Activate cohort study, regional cancer center
- Quality assessment of cancer screening program
- Start National Hospice-Palliative Care Program
- Financial support for cancer patients
2007 - Year of Cancer Prevention

Inauguration Ceremony (2007. 6. 19)

Message from President of Korea
Main Activities for Cancer Prevention

- **Cancer Prevention Day** for public awareness
  (celebration, event, campaign, seminar, etc.)
- **10 codes and practical guidelines** for cancer risk reduction
- Standardized information on cancer prevention, i.e., **dietary factors**
- Education and campaign
- Policies and program for **tobacco control**
- Strategic plan for prevention of cancer caused by **infection**
- Surveillance system for **occupational exposure** on carcinogens
2007 Cancer Prevention Day
2008 Cancer Prevention Day
<table>
<thead>
<tr>
<th>Code</th>
<th>Recommendation</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>

Cancer is Preventable & Avoidable!!
10 Action Codes of Cancer Prevention

1. Quit smoking
2. Limit alcohol consumption
3. Maintain a healthy weight
4. Eat a nutritious diet
5. Exercise regularly
6. Protect yourself from the sun
7. Get regular check-ups
8. Use protective gear
9. Know your body
10. Act on any unusual signs
NCSP Information System 

http://ncs.ncc.re.kr 

 국가 암 조기 검진이란?

보건복지부는 희망 조기에 발견함으로써 암의증상을 높이고 급격히 증가하는 암발병률과 사망률을 감소시키기 위해 국가 암 조기검진사업을 실시하고 있습니다. 

2004년에 국가암조기검진사업을 통해 대상받은 전국 50% 보건소, 국립암센터에 의해 실시된 암검진을 받을 수 있으며, 암검진비율이 21% 억지검진 및 지방정부, 국민건강보험공단에서 부담합니다. 국가암조기검진으로 암이 발견되면 치료비용도 지원받습니다.

2001년 보건복지부는 우리나라의 암표준 perm을 바탕으로 암검진을 위한검진비율이 분부부담 없이 암검진을 받을 수 있습니다.

1. 암검진대상자확인
   암검진표에 "대상"으로 표기된 검사항목은 본부 부담 없이 암검진을 받을 수 있습니다.

2. 검진기관 확인
   본부의 방법 허가된 검진기관을 확인하시오.

3. 검진기관 방문 검진
   암검진표와 신분증을 가지고 검진기관을 방문하여 암검진을 받습니다.

4. 암검진결과 통보
   검진기관에서 5일 이내에 검진결과 본부 수소처, 발송해 드립니다.
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.
Primary Cancer Prevention

Smoking cessation

Vaccination

HBV
HPV

Dietary change
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
癌! 바로 알기

코미디언 이주일 2002년 타계 (62세)

“담배 맛있습니까? 그거 독약입니다!”
### Smoking Rate in OECD Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Males</th>
<th>Females</th>
<th>Source: OECD health data, 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newziland</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>31</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>29.8</td>
<td>19.1</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>19.4</td>
<td>15.7</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>30</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>16.7</td>
<td>18.3</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>28</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>48.3</td>
<td>13.6</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>25.7</td>
<td>19.3</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>49.3</td>
<td>4.8</td>
<td></td>
</tr>
</tbody>
</table>
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)
Smoke-free Zone based on Health Promotion Act
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
National Vaccination against HB has been implemented in:

- Taiwan (1984)
- Thailand
- Malaysia (1989)
- Singapore
- Korea (1985)
- China
- Mongolia (1991)
HBsAg seropositivity

<HBsAg seropositivity among blood donors>

![Graph showing the seropositivity of HBsAg over years, with significant events marked: HBV vaccination introduced in Korea, National vaccination program for infants and children, and Vaccination against vertical transmission.]

Korea Center for Disease Control & Prevention
Liver Cancer Mortality Rates in Young Koreans

- National vaccination program for infants and children
- Vaccination against vertical transmission
Decline in Gastric Cancer - An Unplanned Triumph
(Howson et al. 1986)
Reducing Salt Intakes
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.
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
2007 Pink Ribbon Love Marathon
Seoul World Cup Park, Oct. 2007

The Public Relations Officer
Surgeon’s Concert for Breast Cancer Survivors

http://www.kbcs.or.kr/
Korean Breast Cancer Patients Society 韩国乳房癌患友联合會

- **Foundation**
  - Aug 22. 2006
  - Alliance of survival groups from 20 hospitals
  - Members: 1,158

- **Staff**
  - President
  - 2 vice-president
  - Manager
Supportive & Palliative Care
Hospice-palliative Care Program

- support **palliative care units** in hospital
- provide **home-based** cancer patient management program through public health center
- provide **education** program to the health care providers
- publish cancer **pain control guideline**
Terminal Cancer Patient Management Plan

Tertiary Hospital

\[ \text{Palliative care units} \]

\[ \Downarrow \]

Regional Hospital Palliative care units

Community

Home care

Refer

Home-based cancer patient management

Community Health Center
Cancer Pain Control Guideline
(2nd edition, 2007)

for Health Care Providers

for Patients
# Cancer Patient Financial Aid Program

<table>
<thead>
<tr>
<th>population</th>
<th>Inclusion criteria</th>
<th>Type of cancer</th>
<th>Financial aid/ out of pocket medical expenditure (%)</th>
<th>Starting Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>Beneficiaries(^1) Who participated NCSP(^2)</td>
<td>Stomach, Breast, Cervix, Liver, Colorectal</td>
<td>27-32%</td>
<td>2005</td>
</tr>
<tr>
<td>Adults</td>
<td>Medicaid</td>
<td>All cancer</td>
<td>35-65%</td>
<td>2005</td>
</tr>
<tr>
<td>Adults</td>
<td>Beneficiaries(^1) &amp; Medicaid</td>
<td>Lung cancer</td>
<td>20-30%</td>
<td>2005</td>
</tr>
<tr>
<td>Under 18 years olds</td>
<td>Beneficiaries(^1) &amp; Medicaid</td>
<td>All cancer(^3)</td>
<td>Leukemia: 75%, Other cancer: 73-83%</td>
<td>2002</td>
</tr>
</tbody>
</table>

1. Lower 50 % of premium of National Health Insurance
2. National Cancer Screening Programs
3. 2002-2004: Only for Leukemia
Financial Aid Program for Bone Marrow Transplantation

Registration

Donors

Blood sample

Clinics

Result of HLA typing

Korean Network for Organ sharing (KONOS)

Searching

Hospitals

BM Transplantation

Recipients
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**

### Yearly Breakdown

- **2006**: Total budget 96.2 million USD
- **2007**: Total budget 110.4 million USD
- **2008**: Total budget 125.9 million USD
- **2009**: Total budget 151.9 million USD
- **2010**: Total budget 174.4 million USD
- **2011**: Total budget 207.9 million USD
- **2012**: Total budget 239.9 million USD
- **2013**: Total budget 273.3 million USD
- **2014**: Total budget 313.8 million USD
- **2015**: Total budget 355.1 million USD

### Breakdown by Category
- **Primary Prevention**
- **Research**
- **Cancer registry & Surveillance**
- **Resources**
- **Education & Public Campaign**
- **Supportive & Palliative Care**
- **Diagnosis & Treatment**
- **Early Detection**
2nd 10-Year Plan for Cancer Control Korea, 2006-2015

Cancer mortality reduction

- Expected Objective: 69,154 (2005)
- Objective: 89,934 (2015)

- Cancer mortality reduction: 94.1 /100,000 (2015)
- 30.0% increase

- Cancer mortality reduction: 116.7 /100,000 (2005)
- 19.4% decrease
Improvement in 5-years survival rate

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

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

17.6% increase
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**

- Crude(M)
- Crude(F)
- AgeAdj(M)
- AgeAdj(F)


**Overall Cancer Mortality Rates**

- Male: -1.13%
- Female: -0.80%

Annual % change:

- '95 to '96: 210
- '96 to '97: 180
- '97 to '98: 150
- '98 to '99: 120
- '99 to '00: 90
- '00 to '01: 60
- '01 to '02: 30
- '02 to '03: 0
- '03 to '04: 0
- '04 to '05: 0
- '05 to '06: 0
- '06 to '07: 0

Year:
- 1950
- 1955
- 1960
- 1965
- 1970
- 1975
- 1980
- 1985
- 1990
- 1995
- 2000
International Cooperation

Agreements of cooperation for joint research, exchange of personnel and information, and etc
- National Cancer Institute, U.S.A. in 2001
- National Cancer Center, Japan in 2001

Cooperative activities
- International Union Against Cancer (UICC / UICCARO)
- World Health Organization (WHO / WPRO)
- Tobacco Free World Alliance: ToFWA
- WHO collaborating center for cancer registration, prevention and early detection
- Asian National Cancer Center Alliance (ANCCA)
- International Agency for Research on Cancer (IARC)
- Asian Pacific Organization for Cancer Prevention (APOCP)
Asia, Today & Tomorrow

DREAM on CANCER CONTROL is NO WHERE in ASIA!
Welcome to Korea!
Dynamic Korea

See you in 2011