Cancer Control Activities in the Republic of Korea

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South Korea has a population of 47.3 million. The whole population is covered by a mandatory social insurance system (the National Health Insurance Program) that is financed through the contributions paid by the insured and their employers. Cancer has been the leading cause of death in Korea since 1983. About 130,000 people develop cancer annually with 66,000 deaths in 2006. Cancer patients’ 5-year survival rates between 1998 and 2002 were 37.8 and 57.0% for men and women, respectively. The five leading primary cancer sites were stomach, lung, liver, colon and rectum, and bladder among males, whereas the most common cancers were stomach, breast, colon and rectum, uterine cervix and lung among females. With the rapidly aging population, reducing cancer burden at the national level has become one of the major political issues in Korea. The government formulated its first 10-year plan for cancer control in 1996. In 2000, the National Cancer Center was created and the Cancer Control Division was set up within the Ministry of Health and Welfare. The Cancer Control Act was legislated in 2003. Korea’s major national cancer control programs are anti-smoking campaigns, hepatitis B virus vaccination, cancer registration and networking, promotion of R&D activities for cancer control, education and training for cancer control and prevention, operation of the national cancer information center, operation of the mass screening program for five common cancers, management of cancer patients at home, financial support for cancer patients and designation of regional cancer centers.

Key words: Korea – cancer – cancer control program

INTRODUCTION

DEMOGRAPHIC DATA OF SOUTH KOREA

The Republic of Korea, also known as South Korea, is a country that occupies the southern portion of the Korean Peninsula, which extends about 1100 km southward from northeastern Asia. It lies between longitudes 124°11’ and 131°52’E and latitudes 33°06’40” and 38°00’N, and has an area of 99,500 km² including ~3000 islands. South Korea is a highly mountainous country with lowlands constituting only 30% of the total area. There are seven metropolitan cities with provincial status and nine provinces. The population of the Republic of Korea is 47.3 million (2005 estimates) (1).

Korea’s population density of 493 persons per square kilometer is one of the highest in the world. The annual population growth rate in South Korea has dropped steadily from more than 3% in the late 1950s to 0.38% in 2005. Owing to rapid urbanization, 80% of the population is now classified as urban. The aging of the population is also progressing rapidly in South Korea. The 2003 population estimate revealed that 8.3% of the total population was 65 years or older. The number of people in 15–64 age category accounted for 71.4%. The national language is Korean. Buddhism and Christianity are the largest religions in South Korea, but Confucianism is in many ways more prominent in Korean culture than any organized religion. In 2006, the economically active population was 23.9 million. Of this figure, 6.5% were engaged in agriculture, forestry, and fishing; 18% in industry; and 75.5% in services.

NATIONAL HEALTH INSURANCE PROGRAM

The National Health Insurance (NHI) program of Korea covers the whole population as a mandatory social insurance system (2). It is financed through the contributions paid by
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the insured and their employers, as well as government subsidies.

The benefits package consists of benefits in-kind and benefits in-cash on the whole. According to types of health care institution, there are complicated co-payment systems, which lead people to use medical services rationally.

Patients are given almost unlimited freedom in choosing medical service providers and can choose both western and oriental medicine. The third-party payment system has been adopted for providing medical services, and providers are primarily paid by fee-for-service.

With regard to the administration of the NHI program, NHI Corporation (NHIC), a single insurer, is responsible for operating the program. The Health Insurance Review Agency is in charge of reviewing claims of providers and the Ministry of Health and Welfare (MOHW) supervises its operation as a whole.

MEDICAL AID PROGRAM

The Medical Aid program is a public assistance scheme to secure the minimum livelihood of low-income households and increase their capability for self-help by providing medical services (3). The government, facing social problems such as health inequality arising from the divide between rich and poor, initiated this program to provide substantial medical services for low-income people in 1979 after its promulgation of the Medical Aid Act in 1977.

Central and local governments as joint insurers fund the Medical Aid program. Each local government selects beneficiaries who meet the conditions set by the Ministry of Health and Welfare. According to their income level and other factors, beneficiaries are grouped into two categories. The Medical Aid program provides beneficiaries with the same benefit package as that of the people insured by the NHI program.

NHIC, responsible for operating the program on behalf of the government, reimburses providers for medical services provided.

FRAMEWORK FOR CANCER CONTROL IN KOREA

BACKGROUND

Cancer has been the leading cause of death in Korea since 1983 (1). Approximately 130,000 people develop cancer annually with 66,000 deaths in 2006 (4). The Korean cancer patients’ 5-year Relative Survival Rates between 1998 and 2002 were 37.8 and 57.0% for men and women, respectively (5). Reducing the cancer burden at the national level is sure to become a more critical issue in the near future, especially considering that Korea’s rapidly aging population is likely to cause a major increase in the cancer burden.

ESTABLISHMENT OF THE CANCER CONTROL DIVISION IN MOHW AND THE NATIONAL CANCER CENTER

The Korean government’s first cancer control policy was developed by MOHW when it formulated a plan to establish the National Cancer Center (NCC) in 1989. In 1996, the government initiated a comprehensive ‘10-year Plan for Cancer Control.’ As part of this plan, the Division of Cancer Control was set up within MOHWs Bureau of Health Promotion in 2000 (6).

In response to the public need to create a national institution devoted to research, clinical care, and education and training related to cancer, the NCC was founded in March 2000 under the NCC Act (7). The NCC, in close cooperation with MOHW, has been playing a key role in formulating and implementing national cancer control programs, such as the development of the cancer prevention programs and national cancer screening guidelines. The NCC consists of three main divisions: the Research Institute, Hospital and National Cancer Control Research Institute (NCCRI). The NCCRI pursues excellence in cancer research by concentrating on translational research that produces promising results, which can be applied directly to cancer patients and people at risk of developing cancer. Staffed by high-caliber medical personnel, the most up-to-date medical equipment, and an optimal operation system, the 500-bed NCC Hospital provides cancer patients with the best clinical care services. The NCCRI was recently set up to assist the government in implementing the evidence-based national cancer control policies effectively.

The Cancer Control Act, a legal framework for controlling cancer in Korea, was legislated in 2003. This law authorizes the Ministry for Health and Welfare to formulate and implement cancer control programs and promote international collaboration. In early 2006, the comprehensive second-term cancer control plan for the next 10 year (2006–15) was forged to strengthen the cancer control efforts at the government level within the following framework (Fig. 1) (8).

NATIONAL CANCER CONTROL PROGRAMS

ANTI-SMOKING PROGRAM

The National Health Promotion Act of 1995 stipulates that all public facilities must designate smoking and non-smoking areas. The Act has restricted the installation of cigarette vending machines and prohibited selling cigarettes to minors under 19. In 2001, the government initiated anti-smoking programs with the aim of reducing the male and female smoking rates to 30 and 5.0%, respectively, by 2010 (9). The smoking prevalences are 44.1% for men and 2.3% for women in 2006. The government will revise the National Health Promotion Act, if necessary, for the successful implementation of the anti-smoking programs. Several
ministries and agencies of the government are involved in the anti-smoking programs.

(i) The MOHW will/has
(a) limit cigarette advertising to 30 times a year in domestic periodical magazines,
(b) oblige tobacco industries to label the ingredients such as nicotine, tar, and major carcinogens,
(c) oblige tobacco companies to display the warning, ‘Smoking causes lung cancer and other diseases and is especially hazardous to the health of adolescents and pregnant women.’ on cigarette packets with a pictogram,
(d) expand medical examinations of smoking-related diseases,
(e) prohibit local government from promoting the sales of tobacco,
(f) expand public anti-smoking campaign activities,
(g) launched the Quitline Service in 2006: The Quitline service is operated by the NCC with the entrustment of the MOHW that sponsors Quitline with funding raised from cigarette taxes. It provides private counseling and supporting to help people quit smoking. Quitline is cooperating with 248 Smoking Cessation Clinics in the Public Health Centers across the nation, offering the people, who want to quit smoking, with counseling and pharmacotherapy (NRT and bupropion) free of charge.

(ii) The Ministry of Education and Human Resources Development will
(a) crack down on the sale of cigarettes to minors in collaboration with other government-agencies.

(iii) Other ministries’ activities
(a) The Ministry of Government Administration and Home Affairs will strengthen the crackdown on the sale of cigarettes to minors, failure to designate smoking and non-smoking areas in buildings and smoking in non-smoking areas.
(b) The Ministry of National Defense provides anti-smoking education for military personnel and will forbid selling tax-free cigarettes by 2009.

HBV Vaccination for Hepatitis B Control
Korea was previously classified as an area of high endemicity for hepatitis B virus (HBV), but, plasma-derived HBV vaccines, introduced in 1983, has shifted the risk towards intermediate endemicity. In Korea, the first national HBV vaccination program began in 1985 for newborn infants whose mothers were HBsAg carriers. The program was extended to all health insurance beneficiaries and school children in 1988, and all newborn infants in 1991. In 1995, HBV vaccination was integrated into the routine childhood immunization schedule. The prevalence of HBsAg among Koreans aged 10 years and over was 4.4% in males and 3.0% in females with a lower prevalence in those under 20 years (2.2% in males and 0.3% in females old) according to the 2005 National Health and Nutrition Survey (10).

Cancer Registration and Networking
The Cancer registry is an essential part of any national program for cancer control. In Korea, a hospital-based nationwide cancer registry (The Korea Central Cancer Registry (KCCR)) was established as a project of MOHW in 1980. The headquarters, originally located in the National Medical Center during 1983–2000, later moved to the NCC in 2000. The number of participating hospitals and registered malignancies has been increasing year by year, with more than 150 hospitals currently participating in KCCR.

The KCCR data covers ~90% of new cancer cases in Korea. To accurately measure the national cancer incidence and to construct a useful database warehouse for conducting basic cancer research and treatment planning, population-based regional cancer registries were established in 1995 with financial and technical support from the KCCR. These registries were started in Seoul (1991), Busan (1995), Daegu (1996) and other metropolitan cities, followed by Jeju Island in 2001. The population-based cancer registries now cover ~50% of the Korean population. A network for all the
cancer registries, including the site-specific cancer registries provided by the specialists (for example, breast, uterus, liver and oral cavity cancer), was constructed. Nationwide and eight regional cancer incidence statistics from 1999 to 2002 were officially included in the Cancer Incidence in Five Continents, Volume IX, which was published online in November 2007. The total number of cancer cases in 1999–2002 was 429,248 (243,346 males and 185,902 females) (11). The overall crude incident rates (CR) were 254.2 and 195.7 per 100,000 for males and females, respectively, and age-standardized incidence rates (ASR) were 284.5 and 164.7 per 100,000 for males and females, respectively. Among males, the five leading primary cancer sites were stomach (CR 59.8, ASR 65.9), lung (CR 43.0, ASR 51.1), liver (CR 42.5, ASR 44.9), colon and rectum (CR 26.2, ASR 29.1) and bladder (CR 7.7, ASR 9.1) (Fig. 2). Among females, the most common cancers were stomach (CR 31.4, ASR 25.9), breast (CR 27.8, ASR 23.3), colon and rectum (CR 20.7, ASR 17.4), uterine cervix (CR 18.5, ASR 15.4) and lung (CR 15.5, ASR 12.5). The total number of cancer cases in Korea is expected to rise continuously due to the rapidly aging.

NATIONAL R&D PROGRAM FOR CANCER CONTROL

Initiated in 1996 by the MOHW as part of the 10-year Plan for Cancer Control, which aimed to address the growing cancer burden through research, the National R&D Program for Cancer Control (NRDPCC) has been providing industry, academia and research institutes with grants for a wide range of research projects (6). NRDPCC is focused on identifying cancer etiology, developing new cancer prevention, diagnosis and treatment methods for the common cancers in Korea, finding more efficient ways to improve quality of life of cancer patients, and developing practical technologies in cancer registration and statistics.

The MOHW has notably increased its funding for the program since the Cancer Control Act was passed in 2003. Most of the leaders in the Korean cancer community agree that this initiative has made a great contribution to raising the level of cancer research in Korea by encouraging cancer scientists to expand their scientific horizon through a diversified funding mechanism.

As a funding agency, NCC plans, implements and evaluates the initiative through the National Cancer Control Planning Board, an independent granting organization set up within NCC by MOHW. Table 1 shows the research topics by field.

ENHANCING PUBLIC AWARENESS OF CANCER CONTROL AND PREVENTION THROUGH EDUCATION AND TRAINING AND CAMPAIGNS

Since 2001, the NCC has been offering education and training for health professionals, enabling them to promote and activate the cancer control programs at their regions. These programs have turned out to be especially effective in improving public awareness about the importance of the primary cancer prevention, early detection and palliative care activities.

The NCC has played a leading role in carrying out cancer prevention campaigns since it, along with MOHW, announced 10 Codes for Cancer Prevention in 2006 (Table 2). These include the guidelines the public should follow in their everyday lives, such as smoking cessation, diet, exercise and medical check-ups for early detection.

NATIONAL CANCER INFORMATION CENTER

The National Cancer Information Center (NCIC) was launched to provide the comprehensive cancer information.
services for cancer patients, their families, the general public and cancer professionals in June 2005.

The NCIC’s mission is to give the up-to-date, evidence-based information, as well as practical advice and support to relieve the people of the fear or uncertainty from cancer. The service is provided via telephone (Call Center 1577-8899), website (www.cancer.go.kr), and publications. The NCIC website (www.cancer.go.kr) currently has more than 100,000 hits per month. This web portal includes in-depth information on common cancers, FAQ, national cancer statistics, various kinds of educational materials and terminologies about cancer. Moreover, NCIC also offers the most up-to-date cancer research information for cancer professionals.

NATIONAL CANCER SCREENING PROGRAM

Ever since the Korean Government embarked on the National Cancer Screening Program (NCSP) in 1999, it has continued to expand its target population and target cancers. Between 1999 and 2001, the NCSP provided Medical Aid recipients with free cancer screening for three types of cancer—stomach, breast and cervix. In 2002, NHI beneficiaries within the lower 20% income bracket were eligible for the program. In 2003, the NCSP expanded its target population to 30% and added a liver cancer screening service. The program added colorectal screening in 2004. Currently, NCSP provides Medical Aid recipients and NHI beneficiaries within the lower 50% income bracket with free-of-charge screening services for five common cancers—stomach, liver, colorectum, breast and cervix uteri.

The MOHW and the Supporting Committee for Cancer Screening Program in the NCC have developed NCSP protocols in collaboration with related academic societies in Korea (Table 3). A total of NCSP screenings stood at 2,189,000 in 2005.

Table 1. Research topics

(i) Studies on the causes and mechanisms of common cancers in Korea
   (a) Cancer etiology
   (b) Cancer metastasis and progression
   (c) Tumor immunology
   (d) Functions of tumor suppressors
(ii) Development of cancer diagnostic technologies
   (a) Diagnosis of precancerous lesions
   (b) Discovery of new tumor markers
   (c) Development of new diagnostic technologies using novel targets or tools
   (d) Studies on the movement, storage and reproduction of diagnostic media
(iii) Development of cancer therapeutic technologies
   (a) Studies on Surgical-, radiological-, chemo-therapeutics
   (b) Discovery of anti-cancer drug candidates
   (c) Bone marrow transplantation
   (d) Molecular/cellular therapeutics
   (e) Studies on alternative medicine in cancer care
   (f) Multi-institutional cancer clinical trials
(iv) Studies on cancer prevention and control
   (a) Intervention studies on the risk factors to be targeted for cancer prevention
   (b) Studies on cancer education, awareness and information
   (c) Policy studies to enhance the quality of cancer screening
   (d) Improve the quality of life for cancer patients and palliative care
   (e) Studies on cancer control policies

Table 2. Ten codes of conduct for cancer prevention

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

Table 3. Guideline of National Cancer Screening Program (NCSP)

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Target population</th>
<th>Frequency</th>
<th>Test or procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>40 and over (adults)</td>
<td>Every 2 years</td>
<td>Endoscope or Upper Gastrointestinal Series</td>
</tr>
<tr>
<td>Breast</td>
<td>40 and over (women)</td>
<td>Every 2 years</td>
<td>Mammography and Clinical Breast Examination</td>
</tr>
<tr>
<td>Cervix</td>
<td>30 and over (women)</td>
<td>Every 2 years</td>
<td>Pap smear</td>
</tr>
<tr>
<td>Liver</td>
<td>40 and over high risk group*</td>
<td>Every 6 months</td>
<td>Sonography and Alpha-Fetoprotein</td>
</tr>
<tr>
<td>Colorectal</td>
<td>50 and over (adults)</td>
<td>Every 1 year</td>
<td>Fecal Occult Blood Testing—or Colonoscopy or Barium enema</td>
</tr>
</tbody>
</table>

*Those who are HBsAg positive or anti-hepatitis C virus positive or have liver cirrhosis
CANCER PATIENTS MANAGEMENT PROGRAM

To achieve standardization in palliative care, the Supporting and Evaluation Board of the Hospice-Palliative Care Program has developed a national model of home-based and in-patient-based care in 2004. On the basis of these efforts, the Korean Government started supporting palliative care units in 2005 while simultaneously implementing the National Cancer Control Program for Terminal Cancer Care.

To provide systematic and appropriate medical care for the cancer patients in every community across the country, the Korean government has been running a Home-based Cancer Patient Management Program since 2001. The purpose of this program is to improve the quality of life for low-income cancer patients, thereby reducing the burden of their families. Public Health Centers are responsible for this initiative while the NCC is in charge of planning, monitoring and evaluation of the program, and offers training course on this program for health care providers (nurses, physicians and other health professionals) involved in this program.

PUBLICATION OF CANCER PAIN CONTROL GUIDELINES

The MOHW developed Cancer Pain Control Guidelines for health care providers and patients in 2004 and is disseminating these guidelines on an annual basis (12).

FINANCIAL AID PROGRAM FOR CANCER PATIENTS

The Financial Aid Program for Cancer Patients was designed to relieve the financial burden of cancer patients. Starting with leukemia patients under 18 in 2002, the program has expanded coverage to adult cancer patients within the following scheme (Table 4):

(i) Patients suffering from stomach, breast, cervical, liver and colorectal cancers who participated in the NCSPs as a NHI beneficiary within the lower 50% income bracket.

(ii) Lung cancer patients who are Medicaid recipients or NHI beneficiaries within the lower 50% income bracket.

(iii) Medicaid beneficiaries.

DESIGNATION OF REGIONAL CANCER CENTERS

In Korea, there have been inequalities between Seoul and regional provinces in terms of cancer-related resources such as medical facilities and physicians.

Many cancer patients living in areas other than Seoul and its vicinity prefer visiting hospitals located in metropolitan cities including Seoul, which incurs additional extra medical care expenses. In order to eliminate this problem, the government started to designate national university-affiliated hospitals in each province as regional cancer centers (RCCs) in 2004. Designated for a period of 5 years, RCCs are provided with financial support to strengthen their cancer care infrastructure and also are eligible for research grants. There were nine RCCs in Korea as of 2007 (Table 5).

Responsibilities of RCCs are (i) to provide comprehensive clinical services for cancer patients in their regions, (ii) to facilitate the implementation of the national cancer control programs at the regional level including cancer prevention and screening programs and (iii) to perform population-based clinical and basic research with their community residents and cancer patients.

The RCCs are expected to make significant contributions towards reducing cancer care inequalities in Korea, and advancing the cancer control activities in the regions.

Conflict of interest statement

None declared.
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2. http://www.nhic.or.kr/eng/