

COMMENTARY

Midcourse Evaluation of the Second-term 10-year Plan for Cancer Control in Korea

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Abstract

The Korean Ministry of Health and Welfare and the Korean National Cancer Center (NCC) developed the Second-term 10-year Plan for Cancer Control, 2006-2015, on the basis of an evaluation of progress of the First-term Plan for Cancer Control (10-yr PCC) from 2005-2006. The second-term 10-yr PCC started with two main objectives and 35 specific aims in eight focus areas, with the overall goal of reducing the economic burden of cancer. We here assessed the status of the 10-yr PCC objectives by midcourse evaluation in 2010, mid-way through the second term. Based on our evaluation and comments received from the government and the NCC, the Cancer Control 2015 objectives were modified. Of the original two main and 35 specific objectives in eight focus areas, four specific objectives were deleted because they were not relevant to the focus areas and three were revised to reflect changes in data sources or projects. In addition, four new objectives were introduced to reflect new data sources or emerging projects. The 2015 targets of 13 objectives were also modified to reflect the midcourse evaluation. This mid-term exercise provided an opportunity to assess the progress made during the first half of the decade and thereby accurately characterize the current and future status of cancer control and effectively manage cancer-control programs.

Keywords: Cancer control - long-term plan - program evaluation - Korean National Plan 2006-2015

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Introduction

Cancer-control or health-promoting programs are instituted to reduce the incidence of cancer and to improve mortality rates and quality of life. Effective programs require long-term planning (World Health Organization, 2008), so a number of governments have instituted national health-promotion programs by decade, including the American 'Healthy People 2010' (U.S. Department of Health and Human Services., 2000) and the Korean 'Health Plan 2010' (Management Center For Health Promotion, 2005) and the '10-year Plan for Cancer Control' (10-yr PCC).

The Korean government first implemented a 10-yr PCC in 1996 (Yoo, 2008). The objective during the first term was to develop infrastructures including capacity building and to establish cancer-control programs such as the Cancer-control Law, the National Cancer Center, and nine regional cancer centers (National Cancer Center, 1996).

The main objective during the second term of the plan (2006-2015) was to strengthen cancer-control efforts at the government level (National Cancer Center, 2005). The second-term 10-yr PCC is intended to reduce the economic burden of cancer significantly by minimizing

the incidence of cancer and deaths from cancer through systemic cancer management. It includes the following strategies: strengthening cancer prevention by managing cancer risk factors; achieving early cancer screening among all Koreans by improving medical coverage 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 to improve understanding about cancer; and registering cancer patients and evaluating their care systematically.

Because many cancer control plans are set by decade, they may not fully reflect interim changes such as developments in technology, available data, barriers, opportunities, or current resources. It is often necessary to supplement or modify an original initial plan to reflect these changes. For this reason, the United States conducted a midcourse evaluation of its Healthy People 2010 plan. This evaluation identified current resources and led to changes in the Healthy People 2010 objectives and sub-objectives (U.S. Department of Health and Human Services, 2007).

The objectives of the current study were to assess the current status of the second-term 10-yr PCC objectives

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by a midcourse evaluation and to modify these objectives to ensure that the 10-yr PCC remains current, accurate, and relevant.

Materials and Methods

We conducted a midcourse evaluation to evaluate whether 10-yr PCC objectives were being met by assessing data trends during the first half of the decade (National Cancer Center, 2010). Baseline values had been established for each objective at the beginning of the plan, and specific targets were set to be achieved by the year 2015.

Measuring progress toward target attainment

We assessed progress toward meeting objectives based on tracking data (including baseline data and more recent data). A progress quotient is a relative measure of change over time and measures the percentage of the targeted change that has been achieved. The formula for determining a progress quotient is:

$$\text{Percent of targeted change achieved (\%)} = \frac{\text{most recent value} - \text{baseline value}}{\text{year 2015 target} - \text{baseline value}} * 100$$

A progress quotient is positive when the rate has moved toward the target, and a negative value indicates that the rate has moved away from the target. A progress quotient can also be used to compare progress for one objective relative to its baseline with progress for other objectives relative to their baselines.

Modifications to objectives

Based on our midcourse evaluation, we modified the 10-yr PCC objectives. Changes included establishing baselines and targets for developmental objectives, modifying the wording of objectives, deleting objectives, adding new objectives, and revising baselines and targets. The target-setting methods were based on the following: 1) annual percentage change; 2) linear regression; 3) consistency with another national program (e.g., national education goals); 4) peer communities; 5) total coverage/total elimination; 6) better than the best; 7) retain year 2015; and 8) expert judgment (U.S. Department of Health and Human Services, 2007).

Results

We assessed the status of two main objectives and 35 specific objectives in eight focus areas. Detailed results of the midcourse evaluation are included in the Table.

We excluded 12 objectives from evaluation because they were not relevant or data were not available, and used the available tracking data to assess the progress of the remaining 25 objectives. Of these, seven (28%) had met or exceeded their targets; six (24%) had moved toward their targets and could meet their targets by 2015; seven (28%) had moved toward their targets but could not meet their targets by 2015; two (8%) exhibited no change from the baseline; and three (12%) moved away from their target (Figure 1).

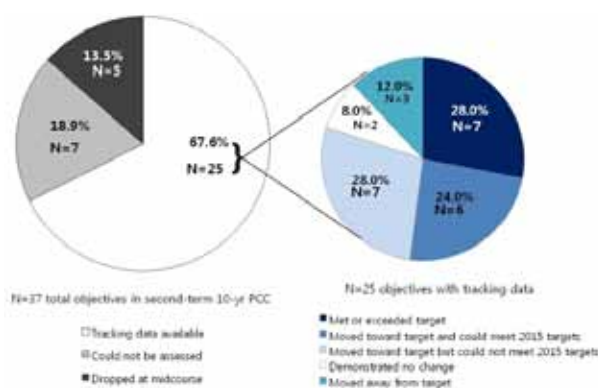


Figure 1. Cancer Control 2015 Objectives. Status at midcourse and summary of progress toward target attainment.

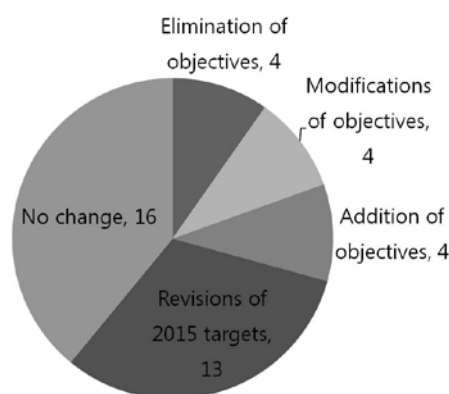


Figure 2. Cancer Control 2015 Objectives. Modification of 2015 objectives based on the midcourse evaluation.

The death rate had moved toward its target and could achieve its 2015 target. Survival rates also increased, probably as a result of both increased and earlier detection of cancers and improved care. The four objectives related to cancer registry and monitoring of cancer control areas had exceeded their targets. Cancer screening had improved, but more effort will be required in this area to meet the 2015 target. Basic, transitional, clinical, and practical research to identify the mechanism of carcinogenesis and to develop new diagnosis and treatment techniques had also all improved. Cancer prevention, establishment of infrastructure for cancer control, palliative care for cancer patients, and survival rates had attained various levels of progress.

Based on our evaluation of each objective and comments received from the government and NCC, we modified the 10-yr PCC objectives. Of the two main objectives and 35 specific objectives in eight focus areas, we deleted four objectives because they were not relevant to the focus areas. We revised four objectives to reflect changes in the data source or project, and developed four new objectives to reflect new data sources or emerging projects in the focus area. Overall, the 2015 targets for 13 objectives were modified based on our midcourse evaluation (Figure 2).

We increased the original 2015 targets for two policy objectives, a 19.4% reduction in cancer mortality and a 17.6% improvement in cancer survival rates, to a 21.5% reduction in cancer mortality and a 33.5% improvement

Table 1. Policy and Specific Objectives in Eight Focus Areas of the Second-term 10-year Plan for Cancer Control in Korea

	Baseline (2005) (A)	Current measures (year) (B)	2015 Target (C)	Percent achieved (C) $(\frac{B-A}{C-A}) \times 100$	Status at the midcourse review	Modification from midcourse review	Target- setting method
Policy objectives: reduce the overall cancer death rate and increase cancer survival							
Reduction in overall cancer death rate	112.2	103.8 (2008)	94.1	46.4	Moved toward target	Revision of 2015 target (94.1→88.0)	Linear regression ^{T1}
Increase in the overall cancer survival rate	50.8	57.1 (2008)	54.0	196.9	Exceeded target	Revision of 2015 target (54.0→67.8)	Linear regression ^{T1}
(1) Strengthening cancer prevention by managing the cancer risk factors							
1-1. Reduction in tobacco use by adults							
Men (%)	50.3	43.1 (2009)	15.0	20.4	Moved toward target	Revision of 2015 target (15→30)	Annual percent change
Women (%)	3.1	3.9 (2009)	2.0	-72.8	Moved away from target	Revision of 2015 target (2→less than 5%)	Annual percent change
1-2. Increase in optimal fat intake rate of population (%)	40.4	37.9 (2008)	55.0	-17.2	Moved away from target	Revision of 2015 target (55-42)	Expert judgment
1-3. Increase in fruit and vegetable intake rate of population (%)	48.1	51.8 (2008)	60.0	31.1	Moved toward target	No change	Annual percent change
1-4. Decrease in rate of population aged over 10 years seropositive to past or chronic infection with Hepatitis B virus (%)	3.7	3.7 (2007)	<1.0	0	Demonstrated no change	Revision of 2015 target (<1.0→2.7)	Annual percent change
1-5. Prevention of Human Papillomavirus (HPV)	-	Load	Method	-	Could not be assessed ^{S1}	No change	^{T2}
1-6 Monitoring the extent of occupational exposure to carcinogens (%)	-	-	100	-	Could not be assessed	Elimination of objective	
(2) Achieving early cancer screening of all Koreans enhancing coverage of medical services							
2-1. Increase in cancer screening rate (%)	40.3	53.3 (2009)	80	32.9	Moved toward target	Revision of 2015 target (80→70)	Linear regression
2-2. Increase in the rate of participation in National Cancer Screening Program (%)	19.6	27.8 (2008)	60	20.3	Moved toward target	Modification of objective ^{M1}	Linear regression
2-3. Decrease in regional differences in National Cancer Screening Program (%p)	9.4	8.3 (2008)	7			Addition of objective	Annual percent change
2-3. Increase in quality control rate in cancer screening units (%)	26.8	86.2 (2009)	100	81.1	Moved toward target	No change	Better than the best
2-4. Increase in satisfaction with National Cancer Screening Program (%)	59.0	68.1 (2010)	80	43.3	Moved toward target	No change	Consistent with

Table 1 (continued). Policy and Specific Objectives in Eight Focus Areas of the Second-term 10-year Plan

2-5. Cancer detection rate in organized cancer screening program (per 1,000 screens)	1.05	-	1.65			Addition of objective	Consistent with
(3) Expanding support for cancer patients							
3-1. Increase in coverage rate of cancer patients (%)	64.4	69.8 (2008)	80	34.6	Moved toward target	No change ^{M2}	Consistent with
3-2. Increase in cancer patients receiving medical expense benefits (1,000 persons)	28	54 (2009)	60	81.3	Moved toward target	No change ^{M3}	Expert judgment
3-3. Increase in bone marrow donors (10,000 persons)	10	19 (2009)	30	45.0	Moved toward target	No change ^{M4}	Annual percent change
(4) Strengthening support for rehabilitation and palliative care for cancer patients							
4-1. Increase in palliative care beds for terminal cancer patients	307	628 (2010)	2,500	14.6	Moved toward target	No change	Consistent with
4-2. Increase in uptake rate of palliative care services (%)	3,300	5,900 (2009)	40,000 (50)	7.1	Demonstrated no change	Revision of 2015 target (50→25)	Expert judgment
4-3. Increase in rate of population provided with pain control (%)	46	-	90	-	Could not be assessed	No change	Consistent with
4-4. Increase in uptake of home-care cancer patients (1,000 persons)	5	50 (2010)	25	250	Dropped at midcourse	Elimination of objective	
4-5. Increase in participation rate for second cancer among cancer patients (%)	-	42 (2007)	80	-	Could not be assessed ^{S2}	No change ^{M5}	Consistent with
4-6. Increase in education-experiences for palliative management	-	56 (2009)	100	-	Could not be assessed ^{S2}	Revision of 2015 target (100→80)	Expert judgment
4-7. Operation of support center for cancer survivors (numbers)	-	-	9			Addition of objective	Expert judgment, ^{T2}
(5) Building infrastructure for active national cancer control							
5-1. Increase in utilization rate of regional medical institutions among cancer patients (%)	57.4	56.9 (2007)	70	-4	Moved away from target	No change ^{M6}	Consistent with
5-2. Designation of specialized regional cancer center (number)	-	-	34	-	Could not be assessed	Modification of objective ^{M7}	^{T2}
5-3. Increase in manpower for cancer control in community health center (persons)	1.5	2.8 (2010)	4	52.0	Moved toward target	No change	Annual percent change
(6) Developing world class medical treatments and techniques							
6-1. Development of new drugs for cancer diagnosis and treatment	Import	-11 diagnostic agents -5 targeted therapy agents -15 preclinical candidates (2009)	-More than 15 agents -10 preclinical candidates, 5 phase I clinical trials	-Diagnostic agent 66.7% -Preclinical and Phase I clinical trial ¹	Could not be assessed (Not a quantitative objective)	Revision of 2015 target ^{M8}	Expert judgment
6-2. Improvement of the ability in cancer diagnosis	Radio	17 Patent applications of molecular imaging (2009)	-Technique dissemination of radiologic diagnostic method for cellular, molecular and genetic levels	Quantitative ¹ Qualitative ²	Not assessed (Not a quantitative objective)	Revision of 2015 target ^{M8}	Expert judgment

Table 1 (continued). Policy and Specific Objectives in Eight Focus Areas of the Second-term 10-year Plan

6-3. Improvement of the ability in cancer treatment	Surgery, chemo and radio-therapy	-23 targeted chemotherapies and radiotherapies -7 customized therapies (2009)	-Dissemination of genetic and antibody therapies -Realization of customized therapies	Quantitative ¹ Qualitative ³	Could not be assessed (Not a quantitative objective)	Revision of 2015 target ^{M8}	Expert judgment
6-4. Improvement of skills in cancer related studies	15 th world rank in SCI	9 th world rank in SCI (2009)	5 th world rank in SCI	60	Moved toward target	No change	Annual percent change
(7) Educating and advertising to familiarize people							
7-1. Increase in the number of cancers in cancer information database in National Cancer Information Center (cancer information database number)	30	75 (2009)	200	26.5	Moved toward target	Revision of 2015 target (200→100)	Expert judgment
7-2. Increase in telephone consultation per cancer incidence (%)			80		Could not be assessed	Elimination of objective	
7-3. Increase in service satisfaction with National Cancer Information Center (%)	86	91.2 (2009)	95	62.6	Moved toward target	No change	Consistent with
7-4. Increase in awareness of benefit of cancer screening (%)	78	96.8 (2009)	90	156.7	Exceeded target	Modification of objective ^{M9}	Annual percent change
7-5. Opening of Cancer Information & Education Center	-	-	Open	-	Could not be assessed	Elimination of objective	
(8) Registering cancer and evaluating the management systematically							
8-1. Reducing computation period for National Cancer Statistics	2 years	2 years (2007)	2 years	100	Met target	No change	T ²
8-2. Including Korea National Cancer Statistics in Cancer Incidence in Five Continents of IARC	Including four regional cancer statistics (2002)	Including natl&-8 regional cancer statistics (2007)		100	Met target	No change	T ²
8-3. Monitoring and evaluation of national cancer-control program	-	Publication	-	100	Met target	Modification of objective ^{M10}	T ²
8-3. Construction of a surveillance system for national cancer registry program	-	-	Under construction			Addition of objective	T ²

Load, Prevalence estimation of HPV (2009); Method, Development of prevention methods; Import, importation of drugs in large quantities; Radio, Radiologic diagnostic method for organic level; ¹ Could not be assessed; ²Development phase; ³Targeted chemotherapies and radiotherapies: maturation phase; Customized therapies: introduction phase; ^{S1}Qualitative evaluation; ^{S2}Developmental objective; baseline and 2015 target coming soon; ^{M1}Increase in the rate of participation in the National Cancer Screening Program → Increase in the screening rate of organized cancer screening program; ^{M2}Coverage rate → health insurance coverage rate; ^{M3}1,000 persons → 1,000 persons/year; ^{M4} Bone marrow → stem cell; ^{M5}Participation rate → screening rate; ^{M6}Increase in regional self-sufficiency; ^{M7}Designation of specialized regional cancer center → Designation of regional cancer center; ^{M8}Quantification; ^{M9} Increase in awareness of benefit of cancer screening → Increase in awareness of benefits of cancer prevention; ^{M10}Monitoring and evaluation of national cancer-control program → Publication of 'Cancer Facts & Figures 2010 in the Republic of Korea' for monitoring and evaluation of national cancer-control program; ^{T1}Age-Period-Cohort model; ^{T2}Total coverage/Total elimination

in cancer survival rates. We decreased the original 2015 targets for seven objectives. We modified the 2015 targets for three objectives to make them more quantifiable. We left 18 objectives unchanged or only slightly changed and changed the wording of six objectives to provide a more accurate description of what is being measured.

Implications for the 10-yr PCC

The Korean government implemented its Second-term 10-year Plan (2006–2015) with two policy objectives: 1) to minimize the incidence of cancer; and 2) to reduce deaths from cancer through systemic cancer management. We evaluated its progress with a focus on effective implementation and identified a need for increased effort with regard to cancer control. Identifying the current status of the long-term plan is a first step in creating policies to improve cancer control. These objectives can guide public and private agencies in prioritizing the allocation of resources.

As discussed above, we assessed the progress of 25 objectives based on available tracking data. Of these, seven (28%) had met or exceeded their targets; six (24%) had moved toward their targets and could meet their targets by 2015; seven (28%) had moved toward their targets but could not meet their targets by 2015; two (8%) exhibited no change from the baseline; and three (12%) moved away from their target.

The original 10-yr PCC had set a target of a 19.4% reduction in cancer mortality and a 17.6% improvement in cancer survival rates. Our midcourse evaluation revealed that cancer survival had already exceeded its 2015 target and that the reduction in the cancer mortality rate had already reached 46.4% of the 2015 target. These rapid changes may be a result of rapid demographic changes, increased cancer incidence (particularly in several types of cancer), recent increases in cancer screening rates, improved cancer therapy, and the active cancer control program in Korea.

Korea has recently undergone an aging process as rapid as its economic development. It is likely to experience one of the most rapid demographic transitions from an aging to an aged society. Korea is now classified as an aging society: in 1999, more than 7% of its population was aged 65 and older. By 2020, Korea will likely be classified as an aged society, with more than 15% of its population aged 65 and older (Korea National Statistical Office, 2001). This rate of change is extraordinary compared with Western societies. France took 115 years to move from an aging to an aged society, and the United States took 75 years. Among industrialized countries, Japan has experienced the fastest transition to an aged society, but the transition in Korea is expected to be even faster (Korea National Statistical Office, 1998).

The overall incidence rate for all types of cancer in Korea increased by 2.8% annually from 1999–2007. During the same period, the overall incidence rate for all types of cancer increased annually by 1.3% for men and by 4.7% for women. Incidence rates have continued to increase for colorectal and thyroid cancer in both sexes, along with breast cancer in females and prostate cancer

in males (Jung et al., 2010). The increased incidence of cancer may be related to increased longevity and a larger proportional increase in the incidence of cancer in the elderly population relative to that in the general population.

One notable change is the sharp increase (25.7% annually) in the incidence of female thyroid cancer in Korea. Diagnostic techniques for thyroid cancer have become more sensitive (e.g., ultrasound and fine-needle aspiration) and can now detect subclinical disease. Therefore, the increased incidence of thyroid cancer might reflect the improved diagnostic techniques for previously undetected disease, rather than an actual increase in the occurrence of thyroid cancer. The five-year relative overall survival rates for all types of cancer have also improved considerably; these improvements can be partly explained by the high frequency of cancers that have relatively good prognoses (e.g., thyroid, breast, and cervix; Jung et al., 2010).

The original 2015 targets were set based on various projection methods considering baseline and future status. However, death and survival rates changed due to rapid changes in cancer incidence and demographics, as discussed above. Therefore, modification of targets based on more accurate predictions will help control the economic burden of cancer.

An ongoing challenge to controlling cancer is integrating the various objectives and improving coordination with the organizations working on them. Collaborative effort is required to meet target objectives. The recent improvements are the result of activities implemented by a wide range of public- and private-sector organizations at the national and local levels: several governmental agencies, local health departments, primary care associations, and other organizations are working to implement the 10-yr PCC to improve cancer care in under-served communities and to reduce disparities. Further progress will depend on improving coordination of these activities and implementing evidence-based cancer prevention and control strategies nationwide to improve prevention, screening, diagnosis, and treatment.

It should be noted that our interpretation of progress quotients had some limitations. First, the progress quotient only measures the difference between the baseline year and the most recent year; it does not reflect fluctuations during the intervening years. In addition, the number of years between the baseline and the most recent data, and the number of years between the baseline and the year 2010 varied between objectives. When progress quotients are compared across objectives, it is important to remember that they may be based on different time periods. To help interpret these comparisons, we included the baseline year and the most recent data year when comparing progress quotients across objectives. Finally, the progress quotient is based on the actual change between the baseline and the most recent data value, without any consideration of variability in the data that may substantially affect the size of the progress quotient from year to year.

Our midcourse evaluation of the 10-yr PCC offers a useful snapshot of trends in key areas of cancer control. Notable progress has been made in several areas; most

other areas exhibited either minor improvement or movement away from their 2015 targets. This midcourse evaluation allowed us to re-establish the 10-yr PCC goals and should improve national cancer control activities.

Acknowledgments

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