

National Cancer Control Plan of the Korea: Current Status and the Fourth Plan (2021-2025)

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Cancer management has become a major policy goal for the government of the Korea. As such, the government introduced the National Cancer Control Plan (NCCP) to reduce the individual and social burdens caused by cancer and to promote national health. During the past 25 years, 3 phases of the NCCP have been completed. During this time, the NCCP has changed significantly in all aspects of cancer control from prevention to survival. The targets for cancer control are increasing, and although some blind spots remain, new demands are emerging. The government initiated the fourth NCCP in March 2021, with the vision of “A Healthy Country with No Concerns about Cancer Anywhere at Any Time,” which aims to build and disseminate high-quality cancer data, reduce preventable cancer cases, and reduce gaps in cancer control. Its main strategies include (1) activation of cancer big data, (2) advancement of cancer prevention and screening, (3) improvement in cancer treatment and response, and (4) establishment of a foundation for balanced cancer control. The fourth NCCP has many positive expectations, similar to the last 3 plans; however, cross-domain support and participation are required to achieve positive results in cancer control. Notably, cancer remains the leading cause of death despite decades of management efforts and should continue to be managed carefully from a national perspective.

Key words: Health policy, Health planning, Policy making, Population health management

INTRODUCTION

Novel health-related problems have emerged in Korea with the advent of the 21st century. Changes in population are affecting disease patterns, and the importance of national management of major diseases, such as cancer, is increasing [1,2]. The proportion of older adults aged ≥ 65 years in Korea was only 2.9% in 1960, but it increased to 5.0% in 1990 and reached

5.9% in 1995 [3]. The proportion of older adults was expected to increase steadily and result in an aged society, a threshold reached in 2018 when the proportion reached $\geq 14\%$ [4]. The problems associated with population aging, including rising medical costs, have increased the importance of cancer management since its incidence rate has also steadily increased; in fact, cancer has consistently maintained the top position among causes of death since these statistics were first released in 1983 (73.6 deaths per 100 000 in 1983) [5]. Thus, controlling the incidence of cancer has become a major policy goal of the government of the Korea to extend the lifespan and improve the quality of life of its citizens, and such efforts were expected to be an important process for establishing a welfare state beyond simply improving the survival of the population. The large socioeconomic impact of cancer and its resource-intensive management necessitated management at the national level [6]. Furthermore, it was necessary to prepare a compre-

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hensive plan, including research and reporting on the causes, risk factors, and treatment techniques of cancer, instead of simply focusing on improving treatment outcomes.

Recognizing the need for long-term and comprehensive management at the national level, the government established a National Cancer Control Plan (NCCP) [7,8]. The first (1996-2005), second (2006-2015), and third (2016-2020) NCCPs have been completed, and the fourth NCCP (2021-2025) is underway. Each NCCP is a medium-term plan established to reduce the individual and social burdens caused by cancer and to contribute to the promotion of national health. They are designed to address the following policy directives: (1) innovation in cancer prevention, early diagnosis, treatment, and rehabilitation technologies to improve quality of life by reducing cancer incidence and mortality; (2) establishing a national cancer control system to maximize the efficiency and effectiveness of healthcare resources; and (3) encouraging cancer research by expanding investment, while promoting innovations in related technologies to ensure national competitiveness in cancer research and development.

TWENTY-FIVE YEARS OF THE NATIONAL CANCER CONTROL PLAN'S HISTORY AND ACHIEVEMENTS

The First National Cancer Control Plan (1996-2005)

The first NCCP focused primarily on securing resources for cancer care and building related infrastructure and systems. Its goals were to improve national health welfare, quality of life, and innovation in technology and related industries, and to establish a national cancer control system [8]. This NCCP had 5 main strategies: (1) establishing a plan to evaluate priorities for the cancer research system and investment development, (2) securing basic cancer statistics and establishing an early diagnosis system, (3) training professionals in cancer research, (4) identifying the current status of cancer research-related resources and its effective utilization, and (5) structuring the national cancer control system. This plan established a national and regional cancer control system, including the National Cancer Center (NCC), a government organization. It also enacted the Cancer Control Act and secured a basic statistics system for cancer. In addition, with the introduction of the National Cancer Screening Program (NCSP), a management system for cancer prevention and diagnosis was established, and

investment in cancer research expanded [9]. However, evaluations of the first plan showed that public awareness of early cancer screening remained low and that the overall quality of life in cancer patients was poor due to a lack of infrastructure, insufficient resources for cancer care, and regional disparities.

The Second National Cancer Control Plan (2006-2015)

The first NCCP achieved considerable results, including a foundation for national cancer control. Cancer was still the leading cause of death, with a serious economic burden involving long-term treatment or advanced medical technology. An improved plan was needed, and the importance of common cancer control and the demand for a healthy life emerged, requiring strategic investment at the national level. The vision of the second NCCP was to drastically reduce the burden of cancer by minimizing incidence and mortality rates through comprehensive cancer control [10]. By expanding the plan's scope from a treatment-based approach to support for overall healthcare, including cancer prevention, the second NCCP had comprehensive aims, and it set the specific policy goals of a 19.4% reduction in cancer mortality and a 17.6% increase in cancer survival. This plan had 8 strategies, including 4 in cancer management, 3 in infrastructure, and 1 in research: (1) strengthening cancer prevention through intensive management of risk factors; (2) implementing nationwide early cancer screening; (3) strengthening coverage and support for cancer care; (4) strengthening support for rehabilitation and palliative care; (5) building infrastructure for active national cancer control; (6) developing world-class diagnostic and treatment technologies; (7) conducting education and promotion for public awareness; and (8) introducing systematic cancer registration, management, and evaluation. Building on the first NCCP's foundation, the second plan contributed significantly to cancer control, with more intensive management and the activation of national guidelines for prevention and screening programs [11,12]. It also improved patients' access to cancer care, achieved positive results in cancer research, and established a basis for current hospice and palliative care practices [13]. After the second NCCP's paradigm shift from prevention to post-treatment, the third NCCP needed to reflect changes in domestic and international policies, such as increased demands from patients and their families and expansions in financial concerns.

The Third National Cancer Control Plan (2016-2020)

The first 2 plans made significant quantitative improvements in national cancer control, but qualitative improvements were required. Based on the vision of protecting people from cancer and improving the quality of life of patients and their families throughout the cancer continuum, the third NCCP aimed to reduce the average cancer incidence to that of other Organization for Economic Cooperation and Development (OECD) countries, increase early detection and survival, improve quality of life for survivors and terminal patients, and develop an infrastructure of precision medicine. The third NCCP brought together the 4 basic components (prevention, early screening, diagnosis and treatment, and palliative care) of the World Health Organization's cancer policy and 4 additional components of surveillance, cancer survivorship, infrastructure, and research [14,15]. It consisted of 23 projects classified into 6 fields: (1) surveillance and prevention; (2) early detection; (3) diagnosis, treatment, and survivorship; (4) palliative care; (5) infrastructure; and (6) research and development. In particular, the third plan aimed to strengthen policies regarding cancer survivors, hospice and palliative care, and children and adolescents with cancer. The NCCP period was changed from 10 years to 5 years, and an annual implementation plan and monitoring system were implemented; the first plan had only a final evaluation, whereas the second plan was managed by an interim and a final evaluation. The third NCCP achieved significant advances by calculating cancer statistics at the international level, and laid the foundation for utilizing cancer data. It also continued support for cancer prevention through expanding early screening, increasing vaccination for human papillomavirus, and decreasing the cost burden of cancer management. In addition, the third plan added support for cancer patients or survivors and expanded investment into cancer research.

The Achievements of the First, Second, and Third National Cancer Control Plans

To reduce the burden of cancer, the Korean government has introduced comprehensive cancer control policies 3 times in approximately 25 years. With population aging, the number of cancer patients continues to increase, with an incidence rate of 275.4 per 100 000 people in 2019 (of note, this rate is lower than the OECD average of 301.1 in 2018); however, the 5-year relative survival rates improved from 42.9% in 1995 to 70.7% in 2019 [16,17]. In terms of cancer control, the national cancer

screening rate has increased to approximately 50%, and the national health insurance coverage rate for cancer patients has improved from 49.6% in 2004 to 78.5% in 2019. With the activation of hospice program, the hospice utilization rate has also increased to 1 in 5 cancer deaths (Figure 1) [18].

National Cancer Control and the Fourth National Cancer Control Plan (2021-2025)

Current status after 3 phases of NCCP

Despite governmental efforts during the 25 years of NCCPs, the numbers of both cancer patients and survivors have increased steadily due to early detection, improved treatment, and aging; however, most of the Korean population remains fearful of cancer. Though the first 3 NCCPs have changed all aspects of cancer control significantly compared to the 20th century, some blind spots remain, and new demands are emerging.

There is an increasing need for early intervention to prevent cancer, improve screening, and increase the efficiency of these processes. In addition, there has been a high demand for preventing the public from being indiscriminately exposed to unverified cancer-related information. Furthermore, relieving regional gaps in cancer care is important, considering that cancer patients are still concentrated in the capital area, and rates of incidence and mortality differ among regions. With the introduction of 3 laws on data (Personal Information Protection Act, Act on Promotion of Information and Communications Network Utilization and Information Protection, and Credit Information Use and Protection Act), demand has risen for active use of cancer big data in healthcare [19]. As for the blind spots, patients with rare or incurable forms of cancer cannot be provided optimal treatment due to limited support for the research and development of anticancer drugs and treatment techniques, and patients and their families are affected by the consequent burden. With the coronavirus disease 2019 (COVID-19) pandemic, new crises have arisen concerning the management of cancer patients and survivors. Therefore, the current policy implications of cancer control could be categorized as encouragement to use healthcare data actively for cancer care, improved control of the cancer continuum, and establishment of a balanced cancer-control system.

The Fourth National Cancer Control Plan (2021-2025)

The Korean government initiated the fourth NCCP with the vision of "A Healthy Country with No Concerns about Cancer

Key performance indicators in the National Cancer Control Plan

Performance indicators		Phase 1 (1996-2005)	Phase 2 (2006-2015)	Phase 3 (2016-2020)
Incidence	No. of patients newly diagnosed (person)	147 000 (2005)	218 000 (2015)	244 000 (2018)
	Age-standardized incidence rate (person per 100 000) ¹	260.8 (2005)	279.9 (2015)	290.1 (2018)
Mortality	No. of patients who died (person)	66 000 (2005)	77 000 (2015)	81 000 (2019)
	Age-standardized mortality rate (person per 100 000) ¹	112.2 (2005)	84.4 (2015)	74.2 (2019)
Survival	5 y relative survival rate (%)	54.1 (2001-2005)	70.7 (2011-2015)	70.3 (2014-2018)
	5 y relative survival rate (except for thyroid cancer) (%)	50.8 (2001-2005)	64.2 (2011-2015)	65.7 (2014-2018)
Prevalence	No. of patients (person)	-	1.6 Million (2015)	2.0 Million (2018)
	≥ 5 y survival rate (%)	-	49.4 (2015)	57.8 (2018)
Cancer screening	Cancer screening rate (%)	17.4 (2005)	41.7 (2015)	45.5 (2018)
Insurance coverage	Health insurance coverage rate for cancer patients (%)	49.6 (2004)	76.0 (2015)	78.5 (2019)
Hospice	Hospice use rate (among death from cancer) (%)	-	15.0 (2015)	22.9 (2018)

Figure 1. Key performance of the National Cancer Control Plan across 25 years. ¹Age standardized incidence rate/mortality rate: Population with resident registration number in Korea in 2000 was used as the standard population (population aging factor corrected).

Anywhere at Any Time” in March 2021. This program aims to build and disseminate high-quality cancer data, reduce preventable forms of cancer, and resolve a gap in cancer control [20]. The main strategies of the fourth NCCP are (1) activation of cancer big data, (2) advancement of cancer prevention and screening, (3) improvements in cancer treatment and response, and (4) establishment of a foundation for balanced cancer control (Figure 2).

Strategy 1. Activation of cancer big data

Regarding big data, the top-priority goal is to build infrastructure using cancer data. Various cancer-related data will be networked, and the establishment of data warehouses in various fields (clinical, public, genome, and image) will encourage researchers to use and extrapolate from cancer data. A cancer data center to manage data projects at the national level will be designed and launched. The operational plan for the center includes 3 phases: establishment and construction of cancer data on a national level (2021), initial launch of the cancer data platform (2023), and activation of research and projects for maximizing the utilization of cancer data (2024). Along with the national cancer data center and networked data platform, an improved monitoring system will be intro-

duced through the expansion and diversification of cancer statistics and an automated management system. In addition, it will be possible to conduct cancer research about risk factors, prevention, new anti-cancer drugs, and artificial intelligence using cancer big data.

Strategy 2. Advancement of cancer prevention and screening

Steps will be taken to strengthen early interventions for preventable cancers, including *Helicobacter pylori* treatment, colonoscopy for primary screening, revisions to targets and screening periods, and vaccinations. National standards, including the targets and screening periods made during the 3 prior phases of the NCCP, will be revised by specialists in accordance with scientific evidence; moreover, their quality will be improved with the use of updated technology and a new evaluation and management system. The intensive management of high-risk groups will start with the establishment of a high-risk database using cancer data, which will enable customized management through evaluation and control of risk factors. For knowledge and information on cancer, the existing Korean National Cancer Information Center will be reorganized as the National Cancer Knowledge and Information Center. Moreover, an open

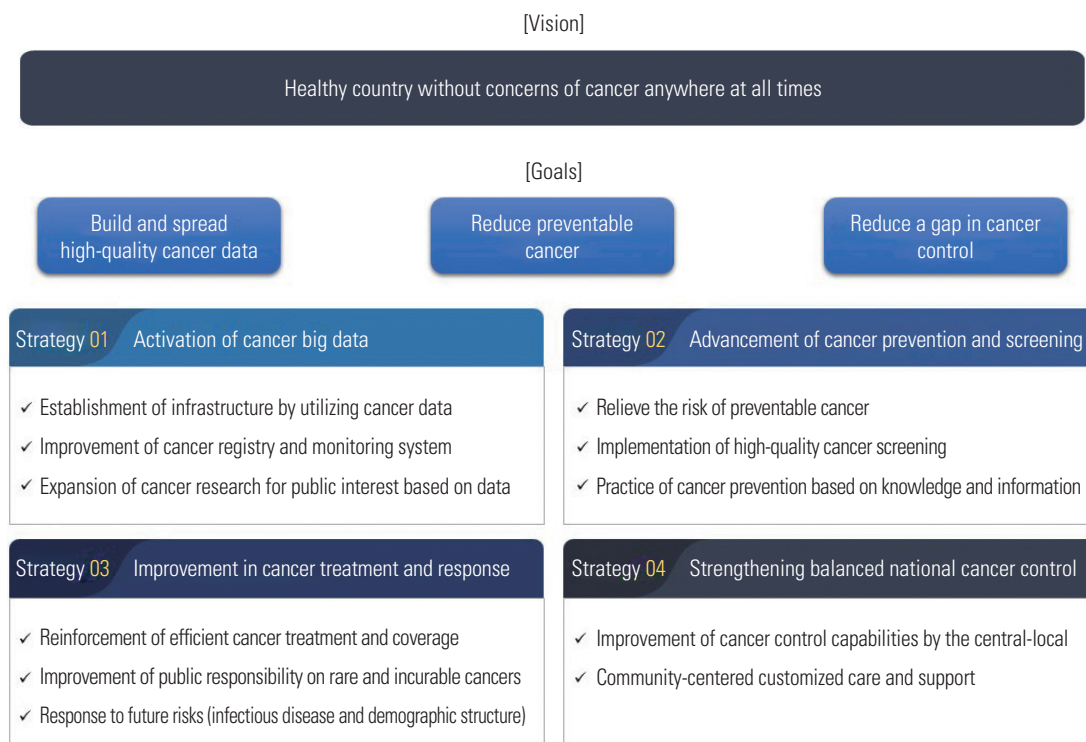


Figure 2. Vision, goals, and strategies of the fourth National Cancer Control Plan.

platform that provides cancer information organized by topic will be established to collect public opinions on cancer-related issues and offer accurate information in a timely manner. It will include an integrated information system that evaluates carcinogens based on big data and promotes research on carcinogen risks.

Strategy 3. Improvement in cancer treatment and response

Because of efforts to strengthen insurance coverage for cancer over the past 25 years, coverage has improved sufficiently, but blind spots remain, and side effects have occurred from excessive insurance coverage. Accordingly, the efficiency of cancer treatment and insurance coverage will be enhanced. Support programs for cancer patients have been revised to alleviate financial burdens through a practical review of the clinical and cost effectiveness of expensive anticancer drugs. Considering the current issues and research results about how best to evaluate cancer treatment options, reviews will be conducted regarding whether the evaluation is effective in improving the quality of treatment, and patient-oriented and performance-oriented evaluations of the overall cancer treatment will be introduced. In terms of clinical research, infrastructure will be established to support clinical trials and oper-

ating systems for rare or incurable cancers, and research projects will be expanded to collect clinical resources, collaborate with clinical trials at other institutions, and evaluate new anti-cancer drugs. To respond to future risks (infectious diseases and demographic changes), alternatives will be prepared to minimize negative effects on cancer control, including a decline in cancer screening rates, the avoidance of face-to-face care by patients or survivors, and issues specific to managing cancer in adolescents and older adults. For mid-term to long-term planning for new pandemics, research will be conducted on cancer risk prediction and prioritization of cancer screening, in order to identify cancer-management alternatives for vulnerable individuals during a pandemic.

Strategy 4. Strengthening balanced national cancer control

The final strategy of the fourth NCCP is to build a balanced cancer control foundation. The first goal is to strengthen its role in the NCC. The NCC should play a key role in national cancer control policies, including prevention, screening, cancer awareness, survivor management throughout the cancer continuum, policy promotion and evaluation, and government support. Furthermore, the NCC should lead cancer control policies, such as suggesting a standard for cancer treatment, and

lead cancer research by supporting in-depth investigation and developing new anticancer drugs. It should become a global cancer education institution by training experts and establishing a network. From a regional cancer control perspective, improving regional cancer centers (RCCs) is a major goal for balanced cancer control, and doing so will support policies that address regional goals and priorities. By managing cancer information at the regional level, RCCs will relieve the regional healthcare gap. Furthermore, implementing an integrated support system and programs to promote the health and rehabilitation of cancer survivors will offer community-based, individualized cancer care, and customized support for vulnerable populations will be supported by making cancer screenings more accessible and relieving gaps in cancer treatment or information.

CONCLUSION

The 4 major strategies in the fourth NCCP have been established to improve the cancer control system that has been in place for the past 25 years and to respond to new crises and demands related to cancer care. For developing fields, such as cancer big data, the NCCP should offer novel solutions and provide new insights, so that the system will both continue offering effective prevention programs and support survivors efficiently. Ongoing efforts for early interventions that resolve preventable issues and reflect environmental concerns, in contrast to the first NCCP, are expected to improve national cancer control outcomes. In addition, efforts to solve inefficient support systems concerning cancer coverage and strengthen their use to address current gaps, such as expensive new drugs and rare or incurable cancers, are expected to improve current cancer survival rates to near perfection. Over the past few years, all cancer patients and providers have experienced significant difficulties in cancer management amidst the coronavirus disease 2019 pandemic. Identifying high-risk groups and preparing effective alternatives as part of planning for future risks would support the development of sustainable cancer control policies. An overall review of the national cancer control system will redefine existing central-regional roles and provide regional support to meet growing patient demand. Furthermore, community-based customized care may offer different options.

Similar to the previous NCCP, the fourth NCCP has many positive expectations; however, while cancer control has

greatly improved, there has been a degree of negligence in prioritizing national healthcare. Nevertheless, various positive outcomes have been noted in the cancer continuum, such as cancer prevention, screening, treatment, and survival, as a result of the last 3 NCCPs, and these achievements would not have been possible without cross-domain support and participation. Notably, cancer remains the leading cause of death in Korea despite decades of efforts to manage it effectively. Thus, the desired level of improvement is far from achieved, and cancer should be carefully managed from a national perspective through ongoing efforts.

Ethics Statement

This paper is exempt from institutional review board approval because it is a special article based on a literature review.

CONFLICT OF INTEREST

The authors have no conflicts of interest associated with the material presented in this paper.

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