Current Status of and Future Outlook for Cancer Screening in Japan

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Abstract

A new healthcare service for the elderly began in Japan in 1983, with the national government subsidizing screening for stomach and uterine cancer. Following this, government subsidies were also introduced for lung, colon, and breast cancer screening. At that time, no other countries provided publicly funded cancer screening, and cancer screening in Japan spread more widely than in any other country in the world. However, the incorporation into general revenue of cancer screening costs in 1998 impacted cancer screening tremendously. As funding for cancer screening becomes increasingly vague, the number of people undergoing screening has diminished and concerns are held for the quality (accuracy) of screenings.

In contrast, in Europe and the Unites States, cancer screening systems were created as a national policy beginning in the 1990s. Consequently, these screening systems are showing results. For example, in many countries the screening rate for breast cancer has reached a level of 50% or higher, and the breast cancer mortality rate has declined as a result. In contrast, the screening rate for breast cancer in Japan has remained at around 10%, and the breast cancer mortality rate continues to increase.

In order to achieve two objectives—a significant increase in cancer screening rates and improvement of quality control—I propose that health insurers provide cancer screening for insured people.

Key words Cancer screening, Screening trends, Costs, Accuracy control, Decline in cancer mortality rate

Introduction

The expression "the lost 10 years" may also be applicable to caner screening in Japan. In the past, Japan was a "cancer-screening superpower." Healthcare services for the elderly began in Japan in 1983, with the national government subsidizing screening for stomach and uterine cancer. Following this, government subsidies were also introduced for lung, colon, and breast cancer screening. At that time, no other countries provided publicly funded cancer screening, and Japan was the world leader in cancer screening. However, the incorporation into general revenue of cancer screening costs in 1998 impacted cancer screening tremendously. As funding for cancer screening becomes increasingly vague, the number of people undergoing screening has diminished and concerns are held for the quality (accuracy) of screenings.

In contrast, in Europe and the Unites States, cancer screening systems were created as a national policy beginning in the 1990s. As a result, screening rates have increased dramatically and cancer mortality rates have decreased. For example, the screening rate (two-year rate) for breast cancer amongst women age 50 or over in the United States rose from 25% in 1987 to 51% in 1992, the rate doubling in only 5 years, and the breast cancer mortality rate has consequently begun to decline. In contrast, the breast cancer mortality rate continues to increase in Japan, where the screening rate for breast cancer remains at around 10%. Japan has fallen behind the rest of

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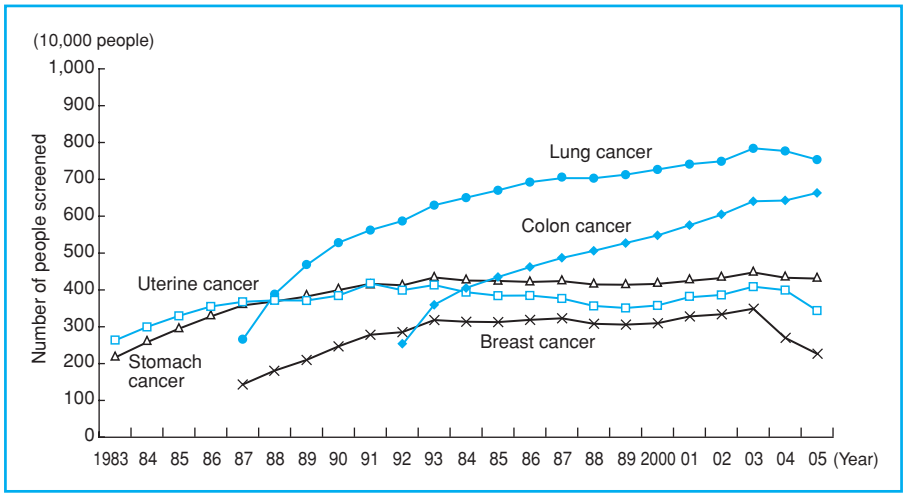

[Ministry of Health and Welfare: Report on Healthcare Services for the Elderly (until 1998)/Ministry of Health, Labour and Welfare: Report on Community Healthcare and Healthcare Services for the Elderly (from 1999).]

Fig. 1 Trends in the number of cancer screening participants under health services for the elderly

Table 1 Number of people screened (rate) for each form of cancer

Form of cancer	Target age range	Male		Female	
		Number of people screened (10,000 people)	Rate (%)	Number of people screened (10,000 people)	Rate (%)
Stomach cancer	40 years or above	863.9	26.6	792.0	21.6
Cervical cancer	20 years or above	—	—	1,055.7	19.7
Lung cancer	40 years or above	522.5	16.1	474.8	13.0
Breast cancer	30 years or above	—	—	823.1	18.0
Colon cancer	40 years or above	694.6	21.4	653.6	17.8

(Ministry of Health, Labour and Welfare: National Livelihood Survey 2004.)

the world.

This paper presents a comparison of Japan and the United States and the United Kingdom with regard to trends in cancer screening participation and accuracy control, and then discusses strategies for taking back the "lost 10 years."

Current Status of Trends in Cancer Screening Participation

Trends in cancer screening participation in Japan at present can be estimated from two surveys. The first of these is the "Report on Community Healthcare and Healthcare Services for the Elderly" prepared by the Ministry of Health, Labour and Welfare. Figure 1 shows trends in the number of people screened for cancer since the introduction of healthcare services for the elderly based on this report. In 2005, the number of people screened was 4.3 million for stomach cancer, 3.4 million for uterine cancer, 7.5 million for lung cancer, 2.3 million for breast cancer, and 6.6 million for colon cancer. Over the period shown in the graph, the number of people screened for stomach cancer remained at the same level, but the number of people screened for colon cancer increased. The number of people screened for lung, breast, and uterine cancer peaked in 2003 and has since declined. This is thought to be due to the expansion of intervals between screening for breast and uterine cancer in particular.

The other study is the "National Livelihood Survey," also conducted by the Ministry of Health, Labour and Welfare. This survey targeted all

households (approximately 280,000) and household members (approximately 750,000 people) in approximately 5,000 areas selected randomly from national census enumeration districts and surveyed such items as status of subjective symptoms, treatment, and impact on everyday life. As part of this survey, respondents were asked about their participation in health checks (health checkups and health examinations) and comprehensive medical examinations. The number of people undergoing cancer screening nationwide as estimated from the results of the National Livelihood Survey 2004 is shown in Table 1. Note that the National Livelihood Survey Report records the number of people aged 20 years or above who have been screened, but here the range has been limited to the age group targeted for cancer screening under healthcare services for the elderly, showing the number of people screened (percentage of population recorded in the 2005 national census) and the screening rate. Stomach cancer screenings had the highest screening rate for both males and females. From this table we can see that the number of people screened for lung cancer is lower than that recorded in the "Report on Healthcare Services for the Elderly."

In contrast, screening in the United States for uterine cancer, breast cancer, and colon cancer is widespread. As already mentioned, the screening rate for breast cancer doubled in the 5 years since 1990. Behind this are such factors as the national government making breast and uterine cancer eligible for benefits under Medicare (public medical insurance for the elderly), the national government requiring private insurers to provide the same benefits, and the public and private sectors securing funds to enable uninsured people to also undergo screening, as well as public and private sector promotion of campaigns encouraging screening. Moreover, both researchers and administrators have been sensitive to trends, with a paper expressing concern over the decrease in the screening rate for breast cancer from 70% to 66% between 2000 and 2005 recently publishing in Cancer.[1]

Status of Accuracy Control in Cancer Screening

The best method of evaluating the accuracy of cancer screening is to cross-check regional cancer registration data against data on people screened and calculate sensitivity (percentage of cancer patients who were diagnosed through screening as requiring further assessment) and specificity (percentage of people who do not have cancer who were diagnosed through screening as not requiring further assessment). However, this is difficult under the present circumstances, and so the accuracy of cancer screening has to be considered based on intermediate indicators such as rate of requirement of further assessment (recall rate) and cancer detection rate. Based on the "Report on Healthcare Services for the Elderly 1996," prepared by the Ministry of Health and Welfare, the author and colleagues have reported wide variability between prefectures with regard to recall rate, cancer detection rate, and positive predictive value.[2] For example, there was an approximately three-fold difference between the prefecture with the highest recall rate (20.6%) and the prefecture with the lowest rate (7.6%) for stomach cancer (national average: 13.3%). This difference was approximately seven-fold for uterocervical cancer screening (highest rate: 2.0%; lowest rate: 0.3%; average: 0.9%), 40-fold for lung cancer screenings (highest rate: 7.9%; lowest rate: 0.2%; average: 2.7%), four-fold for breast cancer screenings (highest rate: 7.0%; lowest rate: 1.6%; average: 3.9%), and three-fold for colon cancer screening (highest rate: 11.9%; lowest rate: 4.3%; average: 7.5%).

Furthermore, the difference between the prefecture with the highest and the prefecture with the lowest cancer detection rate was approximately eight-fold for stomach cancer screening (highest rate: 0.25%; lowest rate: 0.03%; average: 0.15%), four-fold for cervical cancer screening (highest rate: 0.11%; lowest rate: 0.03%; average: 0.06%), five-fold for lung cancer screening (highest rate: 0.10%; lowest rate: 0.02%; average: 0.05%), five-fold for breast cancer screening (highest rate: 0.19%; lowest rate: 0.04%; average: 0.08%), and four-fold for colon cancer screening (highest rate: 0.31%; lowest rate: 0.08%; average: 0.16%).

Moreover, a significant correlation between recall rate and rate of cancer detection rate was observed only for colon cancer screenings. For other cancer screenings, cancer detection rate did not necessarily increase when the recall rate was high.

A little over 10 years have passed since this survey was conducted. Osaka et al. carried out a

Table 2 Standards for mammography screening in the United Kingdom (extract)

Objective	Criteria	Minimum standard	Target
1. To maximize the number of eligible women who attend for screening	The percentage of eligiblbe women who attend for screening	≥70% of invited women to attend for screening	80%
2. To maximize the number of cancers detected	(a) The rate of invasive cancers detected in eligible women invited and screened	Prevalent screen: ≥2.7 per 1,000 Incident screen: ≥3.1 per 1,000	Prevalent screen: ≥3.6 per 1,000 Incident screen: ≥4.2 per 1,000
	(b) The rate of cancers detected which are in situ carcinoma	Prevalent screen: ≥0.4 per 1,000 Incident screen: ≥0.5 per 1,000	
7. To minimize the number of women screened who are referred for further tests	The percentage of women who are referred for assessment	Prevalent screen: <10% Incident screen: <7%	Prevalent screen: <7% Incident screen: <5%
9. To minimize the number of unnecessary operative procedures	The rate of benign surgical biopsies (per 1,000)	Prevalent screen: <3.6 per 1,000 Incident screen: <2.0 per 1,000	Prevalent screen: <1.8 per 1,000 Incident screen: <1.0 per 1,000

[NHS Cancer Screening Programmes: Consolidated Guidance on Standards for the NHS Breast Screening Programme. NHSBSP Publication No.60 (Version 2), 2005; 6–7.]

survey of rates of requirement of further assessment and rates of cancer discovery in cancer screening in 2006 in 781 cities nationwide.[3] The results of this survey showed, for example, the average recall rate for breast cancer screening was 8.6%, but there was a large difference between cities, with rates ranging from 0% to 34%. Moreover, it was less than 1% in five cities and more than 20% in 14 cities. The results for other cancer screenings were similar, and the regional disparities for rates of requirement of further assessment and rates of cancer discovery have not been resolved. In order to standardize the cancer screening accuracy, it is necessary to clarify the factors behind the regional disparity as well as decide numerical targets for all quality indicators.

In Europe and North America, many countries have set numerical targets for recall rate, cancer detection rate, and the percentage of cancer detected at early stage. Examples of the targets set by the United Kingdom are shown in Table 2.[4] Objectives, Criteria, Minimum Standards, and Targets are shown for 16 items. Table 2 shows only four of these items, but a range of other items are also included, such as "To maximize the number of small invasive cancers (less than 15 mm in diameter detected)," "To achieve optimum image quality," "To limit radiation dose," and "To minimize the number of cancers in the women screened presenting between screening episodes (author's note: so-called "interval cancers," or a type of false negative) to 1.2 per 1,000 women screened." When breast cancer screening is performed within the framework of the UK National Health Service, all of these standards must be met, and this is strictly monitored and regulated by the central government.

Future Outlook: Cancer screening by insurers

Summarizing the trends in Europe and the United States over the past 10 years, screening rates have increased dramatically due to the implementation of cancer screening under health insurance, and efforts have been made to construct centralized screening accuracy control systems and maintain quality. These measures have produced remarkable results, with breast cancer mortality rates decreasing, for example.

What can Japan learn from the successful practices of the United States and Europe? The author wishes to propose that health insurers should provide cancer screenings for which evidence has been established that screening reduces mortality rates (or, at the very least, make screening eligible for heath insurance benefits) for the reason that cancer screening by

health calculated insurers can be expected to have the following merits. Firstly, screening rates can be accurately; and secondly, providing the same benefits for screenings as those for specific health examinations can add incentive for increasing screening rates. These two merits would enable the formulation and evaluation of appropriate measures for increasing cancer screening rates and effectively implementing cancer screening.

Thirdly, accuracy control would be dramatically improved. By utilizing receipt information, the incidence of further assessment and the details of final diagnoses and treatments can be known accurately and for minimum cost without problems related to personal information protection. The identification of interval cancers (false negatives) would also be possible. With an improvement in cancer screening accuracy control, the general public's trust in the quality of screening would also increase, and the screening rate would rise even further. From 2008, all insurers are required to provide specific health examinations and specific health guidance against metabolic syndrome. With the incidence of obesity and diabetes continuing to increase, measures against metabolic syndrome are certainly very important. However, the author is not the only one to be concerned about the fact that, of the numerous other disease prevention measures that exist, it is measures against metabolic syndrome that currently stand out. Measures against cancer are just as important as measures against metabolic syndrome. Accordingly, the author proposes that cancer screenings for which evidence has been established that screening reduces mortality rates should be provided by health insurers.

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