Current Status and Issues with Cancer Screenings

Shinji Takashimizu¹,² Chizumi Yamada¹,³ Yumi Masuda¹ Seiichiro Kojima⁴ Kengo Moriyama¹,⁴ Koichi Shiraishi¹ Noriaki Kishimoto¹,³ Yutaka Shina¹,² Norihito Watanabe⁴ Yasuhiro Nishizaki¹,³

¹Department of Clinical Health Science, Tokai University School of Medicine
²Tokai University Hospital
³Tokai University Tokyo Hospital
⁴Tokai University Hachioji Hospital

ABSTRACT
Japan carries out more medical screenings than anywhere else in the world. This article will explain typical “cancer screenings” based on age groups.

Examinations are a shorter version of “medical examinations” and have been explained as “confirmations of a person’s health.” The Committee specified that these were for the purpose of “not necessarily confirming the existence of disease, but rather understanding values over time from the perspective of promoting health, by giving health guidance and aiming to change behavior and reduce risks in accordance to risk levels identified for future disease based on these values.”

Screenings are a shorter way of saying “inspection and diagnosis”, and have been explained as “performed for the purpose of discovering a specific disease.” According to the Committee, these are “performed for the purpose of confirming the existence of disease. Therefore, when the result is “positive,” a detailed inspection is performed and if the presence of the disease is diagnosed it is treated. When the result is negative, follow-ups are performed until the next screening.” A typical example of these screenings is “cancer screenings.” Cancer screenings are extremely important for the prevention and early detection of “cancer,” the leading cause of death in Japanese people. (HEP. 2020; 47: 519-522.)

Key words cancer screenings, Specific Health Checkups, Ningen Dock (Multiphasic Health Examination)

Introduction
Japan carries out more medical screenings than anywhere else in the world. Almost all of the screenings which measure and evaluate various aspects of the human body are backed by law. The Japanese people are also subject to some types of screenings at certain ages.

Here, I have been given the theme of “the significance and necessity of screenings by age group.” In recent years, the setting of age groups for screenings have needed to be made on the grounds of evidence being required for all medical procedures. Based on such a background, this article will explain typical “cancer screenings” based on age groups.

1. Screenings
(1) What are Screenings?
Screenings are a shorter way of saying “inspection and diagnosis”, and have been explained as “performed for the purpose of discovering a specific disease.” These are “performed for the purpose of confirming the existence of disease. Therefore, when the result is “positive,” a detailed inspection is performed and if the presence of the disease is diagnosed it is treated. When the result is negative, follow-ups are performed until the next screening.” For the government to perform screenings for a specific group it requires grounds and budget, so such screenings are used for all except for metabolic syndrome examinations. A typical example of these screenings is “cancer screenings”.

Organized Cancer Screenings and Opportunistic Cancer Screenings¹.

(2) i. Organized Cancer Screenings
These are performed to lower the mortality rate of the entire population as part of the health promotion projects of municipalities for citizen medical examinations under the Health Promotion Act. These are performed as public preventive measures which are subsidized by the public, and therefore they are available for free or for a small fee. On the other hand, there is a problem of efficiency, given that it is necessary to visit a medical institution for a small inspection for each type of cancer.

ii. Opportunistic Cancer Screenings
These are received by individuals to reduce their risk of death, and a typical example of these screenings are Comprehensive Medical Examinations. These Comprehensive Medical Examinations are carried out under the Health Insurance Act and are performed in a format determined by a Committee of Medical Examination Groups made up from the Japan Society of Health Evaluation and Promotion, Japan Society of Ningen Dock (Multiphasic Health Examination), Japan Hospital Association, All Japan Hospital Association and National Federation of Health Insurance Societies (Kenporen). These are often subsidized by a person’s health insurance association or mutual aid association or by the local governments, but there are differences in the cost and the self-pay portion is larger than that with group medical exam-
inations. However, these examinations cover not just cancer but also lifestyle-related diseases, and thus they can screen for multiple diseases with high death rankings for Japanese people in a single visit. Occupational health examinations can often be exempted by submitting the results as these also cover items set out in statutory metabolic examinations and under the ISHA.

2. Significance and Necessity of Screenings by Age Group

(1) Cancer Screenings

Cancer screenings are extremely important for the prevention and early detection of “cancer,” the leading cause of death for Japanese people, and for this reason municipalities carry out Health Promotion Projects based on Article 19–2 of the Health Promotion Act of 2002. In 2013, the Ministry of Health, Labor and Welfare established the “Guidelines for Health Education and Cancer Screenings with a Focus on Cancer Prevention” (Ministry of Health, Labour and Welfare Health Bureau Director Notice), and education and screening activities are being promoted based on these guidelines.

i. Gastric Cancer Screening

The target age was basically raised to 50 years or older from April 2016, but with respect to stomach x-ray examinations (barium) “at the moment they may be performed for persons 40 years or older.” Also, consultation intervals are in principle set at once every two years, but “stomach x-ray examinations may be performed once a year.” This is based on the conclusions of the “Study Group on Cancer Screenings” that the risk of stomach cancer in persons under 50 was low due to the low H. pylori infection rate, and the target age being raised from 40 to 50 and the frequency from every year to once every two years. In terms of screening methods, “stomach x-ray or esophagogastroduodenoscope; EGD” are used, but since barium examinations are carried out by a radiologist while EGD can only be performed by a doctor, in the case of barium there is potential for this to be performed every year. There were many objections made with respect to this change, but the decision was made on the basis of reducing the burden on endoscopic doctors who cannot neglect those with symptoms, as the number of applicants for screening has been increasing and from the perspective of cost reduction.

ii. Cervical Cancer Screening

The screening items for cervical cancer screenings include consultation, visual examination cervical cytology and pelvic examination, and a colposcope examination where necessary. The target age is 20 years or over (females only), and in principle, the consultation intervals are once every two years. Cervical cancer tends to occur in younger people more than endometrial cancers, peaking before the age of 50. Its development is related to infection with Human Papillomavirus (HPV), with HPV detected in more than 90% of patients. HPV is a sexually transmitted infection, but in many cases, it is eliminated without any symptoms. This age setting seems to be reasonable.

iii. Lung Cancer Screening

More than 370,000 people lost their lives to lung cancer in 2017, making it the number one cancer mortality rate by site for men, and number two for women, and the site cancer incidence was number 2 for men and number 4 for women. What does this mean? The reversal of this ranking is seen to strongly require prevention of primary causes such as smoking, not to mention early detection and early treatment, given that it is more difficult to save lives in the case of lung cancer when compared to stomach, breast or colon cancers. The target age for lung cancer screenings is 40 years or over, and the consultation intervals are in principle once a year, and along with the consultation and chest x-ray examination, sputum cytology is also performed for persons 50 years or over with a smoking index (cigarettes per day x number of years) of 600 or higher. For women, the incidence increases with age, peaking in their 70s, but while men also peak in their 70s there is no constant trend in terms of different ages, with the main difference thought to be that of smoking lifestyles. There is a feeling that the age setting for cancer screenings may be a little high when considering the actual ages of patients, but it is thought that many people will already have received chest x-ray examinations as part of medical examinations even before their 30s under the ISHA and the School Health and Safety Act. Incidentally, looking at Table 2 you can see that no countries perform chest x-ray examinations or sputum cytology for lung cancer screenings. This is based on the judgement that the level of uncertainty of both tests is not worth the cost and labor.

iv. Breast Cancer Screening

The target age for breast cancer screenings is 40 years or over, and in principle the consultation intervals are once every two years. Breast cancer has the greatest morbidity rate of all cancers for women at all ages and is the fifth largest cause of death. This shows that this is a cancer that can be fought relatively well, and more than primary prevention, secondary prevention is consid-

| Table 1 Cancer Screenings and Target Ages |
|------------------------------------------|
| **Type**                      | **Inspection Items**                              | **Targets**                  | **Screening Interval**        |
|---------------------------------|-------------------------------------------------|-----------------------------|-----------------------------|
| Gastric Cancer Screening       | Consultation and stomach x-ray examination or gastroscopy | 50 years or older*1         | Once every 2 years*2         |
| Cervical Cancer Screening      | Consultation, visual inspection, cervical cytology, and internal examination | 20 years or older           | Once every 2 years           |
| Lung Cancer Screening          | Consultation, chest x-ray examination and sputum cytology | 40 years or older           | Once a year                  |
| Breast Cancer Screening        | Consultation and breast x-ray examination (mammography) *Visual inspection and palpation not recommended | 40 years or older           | Once every 2 years           |
| Colon Cancer Screening         | Consultation and fecal occult blood test         | 40 years or older           | Once a year                  |

*1 Stomach x-ray examinations are available for ages 40 or higher.
*2 Stomach x-ray examinations are available once a year.
erected the most important. Consultations and breast x-ray examinations (mammography) are carried out but together with the changes to stomach cancer examinations, physical examinations and palpations have not been recommended since 2016. The target age is low in Japan in comparison with other countries, but this age setting is considered to be extremely reasonable given the importance of secondary prevention with this form of cancer accounting for 1/3 of all cancers for women in their 40s.

v. Colon Cancer Screening

Colon cancer is the leading cause of death among women and the third for men, and the number of patients has increased remarkably in recent years. Statistically rectal cancer is divided from other colonic cancers, but the two are combined into colon cancer. Screenings involve consultations and fecal occult blood tests, and in principle these are performed every year for men and women aged 40 or over. There is a clear increase in women as they get older, but for men the peak morbidity is in the 50s, and the number of patients has increased slowly other diseases are more likely to end life before the symptoms even appear. It can thus be suggested that it may be of little advantage to perform early cancer diagnosis and to provide subsequent treatment in elderly people that already have a relatively short life expectancy. This is certainly a sympathetic idea, and it seems that there needs to be a discussion in the future on placing upper limits for ages in which the frequency of incidence of cancer is clearly declining as shown in Table 1.

b) Other Issues

I will discuss issues other than age in another paper, but some of these issues include the low rate of cancer screenings, the issues of accurate screening consultation rates and the capacity of medical institutions to perform them, and the low understanding of people receiving screenings.

Indeed, looking at colon cancer, which has the highest number of newly diagnosed patients in Japan, while the age setting for colon cancer screenings is higher in Japan than it is in the United States, the number of deaths per 100,000 people in the US is declining whereas the number in Japan is rising. In actual numbers of people, the number of deaths in Japan from colon cancer was 28,300 people, which already exceeds the number in the US. On the other hand, the number of women was 24,700, which is equivalent to the US, but this number is trending upward in Japan while it is decreasing year by year in women in the US, so it is

---

**Table 2** Indicated Ages for Cancer Screening in Various Countries

| Country     | Breast Cancer Screening (Mammography) | Cervical Cancer Screening (Cervical Cytology) | Colon Cancer Screening (Fecal Occult Blood Test) | Gastric Cancer Screening (Stomach X-ray/Gastroscopy) | Lung Cancer Screening (Lung X-ray/Sputum Cytology) |
|-------------|--------------------------------------|---------------------------------------------|-------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|
| Australia   | 50–74 years                          | 18–69 years (until 2017)                     | In 2018, 50, 54, 58, 60, 62, 64, 66, 68, 70, 72 and 74 years (from 2020, 50–74 years) | –                                                   | –                                                |
| France      | 50–74 years                          | 25–64 years                                  | 50–74 years                                     | –                                                   | –                                                |
| Germany     | 50–69 years                          | 20 years or over No upper limit              | 50–74 years                                     | –                                                   | –                                                |
| Japan       | 40 years or over No upper limit       | 20 years or over No upper limit              | 40 years or over No upper limit                  | 50 years or over No upper limit                      | 40 years or over No upper limit                  |
| South Korea | 40 years or over No upper limit       | 20 years or over No upper limit              | 50 years or over No upper limit                  | 40 years or over No upper limit                      | –                                                |
| New Zealand | 45–69 years                          | 20–70 years                                  | 60–74 years                                     | –                                                   | –                                                |
| UK          | 50–70 years                          | 25–64 years (Persons that have not received a medical examination after the age of 50, persons that had an abnormality in their previous inspection, and persons that have never had a medical examination, 65 years or older) | 60–74 years                                     | –                                                   | –                                                |
| USA         | 50–74 years                          | 21–65 years                                  | 50–75 years                                     | –                                                   | –                                                |
only a matter of time before Japan exceeds these levels. By the way, the population of the US is about 2.55 times that of Japan. So where does this difference come from? Firstly, there is the low rate of occult blood testing as part of screenings (in 2016, this was 44.5% for men and 38.5% for women), and the flow of medical treatment is well established in the US, with early detection of colon cancer using endoscopes and removal while still small, while Japan’s treatment flow is not well developed and requires immediate attention.

**Conclusion**

Japan is now facing a super-aged society. In light of this, the time has come for medical screenings and examinations to contribute to the next era. Medical screenings and examinations are required by law and are expensive, but any doctor is able to provide it; however, there is no qualitative guarantee. Moreover, since examinations and medical care are not linked, it is necessary to avoid unnecessary overtreatment of the elderly with colon cancer examinations in which the number of deaths continues to increase, and cancer examinations without upper age limits.

The authors state that they have no conflicts of interest (COI).

**REFERENCES**

1) Miles A, Cockburn J, Smith RA, Wardle J. A perspective from countries using organized screening programs. Cancer 2004; 101:1201-13.

2) Ministry of Health, Labor and Welfare. Guidelines for health education focused on cancer prevention and cancer screening. [Internet]. MHLW; 2016. Accessed June 15, 2019, at https://www.mhlw.go.jp/file/06-Seisakujouhou-10900000-Kenkoukyoku/0000111662.pdf#search=%27 (in Japanese).

3) Nishizaki Y. Recent problem in cancer prevention as screening from general health check-up. Japan Association for Cancer Prevention News Letter 2015; (86): 3-4 (in Japanese).

4) Matsuda K. Current state of colorectal cancer screening using fecal occult blood test and related issue: The need for new screening method. HEP 2016; 43(5): 59-64 (in Japanese).

5) Ministry of Health, Labor and Welfare. International comparison of recommended ages for cancer screening (Reference 3) [Internet]. MHLW; 2018. Accessed June 17, 2019, at https://www.mhlw.go.jp/content/10901000/000342253.pdf (in Japanese).

6) Nishizaki Y. Significance and necessity of cancer screening by age group. The Japanese Journal of Clinical and Experimental Medicine 2019; 98(8): 877-83 (in Japanese).