Received: 18 August 2024 | Revised: 6 November 2024 | Accepted: 17 January 2025

DOI: 10.1002/pcn5.70062

PCN Reports
Psychiatry and Clinical Neurosciences
Open Access

ORIGINAL ARTICLE

Trends in uptake of cancer screening among people with severe mental illness before and after the COVID-19 pandemic in Japan: A repeated cross-sectional study

Yuto Yamada MD, PhD[1,2] | Masaki Fujiwara MD, PhD[3] | Naoki Nakaya PhD[4] | Koji Otsuki MD, PhD[5] | Taichi Shimazu MD, PhD[6] | Maiko Fujimori PhD[7] | Shiro Hinotsu MD, PhD[8] | Kiwamu Nagoshi MD, PhD[9] | Yosuke Uchitomi MD, PhD[10] | Masatoshi Inagaki MD, PhD[5]

[1]Department of Neuropsychiatry, Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences, Okayama, Japan

[2]Department of Psychiatry, Sekizen Hospital, Tsuyama, Japan

[3]Department of Neuropsychiatry, Okayama University Hospital, Okayama, Japan

[4]Tohoku Medical Megabank Organization, Tohoku University, Sendai, Japan

[5]Department of Psychiatry, Faculty of Medicine, Shimane University, Izumo, Japan

[6]Division of Behavioral Sciences, National Cancer Center Institute for Cancer Control, National Cancer Center, Tokyo, Japan

[7]Division of Survivorship Research, National Cancer Center Institute for Cancer Control, National Cancer Center, Tokyo, Japan

[8]Department of Biostatistics and Data Management, Sapporo Medical University, Sapporo, Japan

[9]Department of Environmental Medicine and Public Health, Faculty of Medicine, Shimane University, Izumo, Japan

[10]Department of Cancer Survivorship and Digital Medicine, The Jikei University School of Medicine, Tokyo, Japan

Correspondence
Masaki Fujiwara, MD, PhD, Department of Neuropsychiatry, Okayama University Hospital, 2-5-1 Shikata-cho, Kita-ku, Okayama, Japan.
Email: mfujiwara@okayama-u.ac.jp

Funding information
Ministry of Health, Labour and Welfare, Grant/Award Number: 21EA1013; Japan Society for the Promotion of Science, Grant/Award Number: JP23K09741

Abstract

Aim: The aim of this study was to investigate trends in cancer screening participation among people with severe mental illness (PSMI) from periods before and after the COVID-19 pandemic.

Methods: In this repeated cross-sectional study, we used anonymized datasets on municipal cancer screening participation among PSMI in Okayama City. The data covered fiscal year (FY) 2018 to FY2022; we used the municipal cancer screening database and Medical Payment for Services and Supports for Persons with Disabilities. PSMI were defined as those with schizophrenia or related psychotic disorders (F20–29) or bipolar disorder (F30 or F31), identified using *International Classification of Diseases*, Tenth Revision, codes. The analysis included men and women aged 40–69 years for colorectal and lung cancer screening; men and women aged 50–69 years for gastric cancer screening; women aged 40–69 years for breast cancer screening; and women aged 20–69 years for cervical cancer screening. Municipal cancer screening rates among PSMI were calculated for each FY.

Results: For all cancer types, cancer screening rates for PSMI in FY2020 (colorectal: 9.0%; lung: 11.6%; gastric: 4.9%; breast: 6.2%; and cervical: 6.1%) were lower than the rates in FY2019 (11.5%, 14.0%, 6.5%, 9.3%, and 8.3%, respectively). In FY2022, the rates (9.9%, 12.9%; 5.3%; 8.0%, and 6.9%, respectively) recovered, but remained low.
Conclusion: This study showed that cancer screening rates among PSMI were very low, both before and after the COVID-19 pandemic. Efforts to encourage participation in cancer screening in this population are urgently needed.

KEYWORDS
bipolar disorder, cancer screening, COVID-19, healthcare disparities, schizophrenia

INTRODUCTION

Cancer screening is an important tool for the early detection and treatment of cancer. However, cancer screening rates in people with severe mental illness (PSMI) are lower than those in the general population.[1] Several studies conducted prior to the COVID-19 pandemic suggest that cancer screening disparities in people with mental disorders have remained unchanged or have widened over time.[2–5] Thus, there is an urgent need to address these disparities.

After the onset of the COVID-19 pandemic, the number of participants in cancer screening declined worldwide.[6] In Japan, the number of participants in population-based cancer screening provided by municipalities decreased by approximately 10%–30% in fiscal year (FY) 2020 compared with FYs 2017–2019 (before the COVID-19 pandemic).[7] Subsequently, the number of participants increased in FY2021 compared with FY2020 but did not return to pre-pandemic levels.[8]

It is unknown whether the worldwide decline in cancer screening participation among PSMI has recovered since the COVID-19 pandemic. Our previous study showed that the population of PSMI exhibited a greater decline in the number of people participating in population-based cancer screening in FY2020, as compared with the general population.[9] Cancer screening disparities among PSMI may have widened after the start of the COVID-19 pandemic. Therefore, cancer screening rates should be monitored in this population.

The COVID-19 pandemic may have affected whether individuals received detailed examination after cancer screening. However, few studies have reported on the uptake of detailed examination after cancer screening among PSMI. A Danish study showed that people with mental disorders have lower adherence to colonoscopy after a positive fecal immunochemical test than people without mental disorders.[10] Among PSMI in Japan, disparities in adherence to detailed examination after colorectal and other cancer screenings may also exist, which requires further investigation.

In this study, we investigated (1) trends in municipal cancer screening participation among PSMI from 2018 to 2022, and (2) trends in adherence to detailed examination after municipal cancer screening from 2018 to 2021, the periods before and after the start of the COVID-19 pandemic.

METHODS

Study design

This was a repeated cross-sectional study using medical and welfare data collected in Okayama City, Okayama Prefecture, Japan. We have previously described the study methods[9] and include further details here. The study was approved by the institutional ethics committee of Okayama University (KEN2204-009). In this study, the informed consent procedure was omitted because we used an anonymous dataset that does not allow for individual identification.

Setting

Okayama City is located in the Chugoku region of western Japan and is the capital of Okayama Prefecture. With an area of 789.95 km^2 and a population of approximately 713,000, it is one of the largest cities in the Chugoku region.

The Ministry of Health, Labour, and Welfare (MHLW) of Japan recommends the following types of cancer screening: annual fecal occult blood testing for colorectal cancer screening and chest X-ray for lung cancer screening in people aged ≥40 years; biannual upper gastrointestinal X-ray or upper endoscopy for gastric cancer screening in people aged ≥50 years; biannual mammography for breast cancer screening in women aged ≥40 years; and biannual Papanicolaou smear testing for cervical cancer screening in women aged ≥20 years.[11]

In Japan, population-based cancer screening is provided by local governments. Population-based cancer screening includes two types of screening system. One is implemented at large-scale facilities for large groups (mass screening), and the other is implemented at local medical facilities (individual screening). These municipal cancer screening programs are mainly aimed at unemployed people, employees of small to medium-sized companies, and self-employed individuals. In Okayama City, municipal cancer screening programs are provided from June to December in each FY.

Employees of large companies are expected to receive worksite-based cancer screening provided by business owners and insurers. Local governments cannot identify the target population for municipal cancer

screening because which residents have the opportunity for worksite-based cancer screening cannot be ascertained. Therefore, municipal cancer screening rates in the general population are unknown. Most PSMI do not have the opportunity to receive worksite-based cancer screening, and thus municipal cancer screening is the primary means of cancer screening among PSMI.

In Japan, the first COVID-19 case occurred in January 2020. The Japanese government declared a nationwide state of emergency from April 7 to May 25 in FY2020. However, strict lockdown was not implemented in Japan. Afterwards, a state of emergency was declared in Okayama Prefecture from May 16 to June 20, 2021 and from August 27 to September 12 in FY2021. Municipalities under a state of emergency were requested by the MHLW to suspend or postpone mass screenings but were allowed to conduct individual screenings after taking sufficient measures to prevent infection.[8]

Data sources

Anonymized datasets on municipal cancer screening participation among people with mental illness aged 20–69 years, created using the Medical Payment for Services and Supports for Persons with Disabilities (MPSS) database and municipal cancer screening data for each year from FY2018 to FY2022, were provided by Okayama City. The MPSS is a public medical care system that aims to reduce the self-pay burden of medical expenses related to medical services for patients with disabilities and covered ambulatory mental health services.[12] The MPSS for mental disorders is intended for persons with severe mental disabilities, and the application for this service is made in municipal offices. The anonymized datasets for analysis included the following items: age, sex, principal mental health diagnosis (*International Classification of Diseases*, Tenth Revision [ICD-10] code), participation in each cancer screening, need for a detailed examination, and whether a detailed examination was received by the following year after the primary screening. Data on detailed examinations for FY2022 were not yet available.

Participants

In this study, PSMI were defined as individuals with schizophrenia or other related psychotic disorders (F20–29) or bipolar disorder (F30 or F31), as identified by ICD-10 codes recorded in the MPSS in Okayama City. The analysis for each type of cancer screening was as follows: men and women aged 40–69 years for colorectal and lung cancer screening; men and women aged 50–69 years for gastric cancer screening; women aged 40–69 years for breast cancer screening; and women aged 20–69 years for cervical cancer screening. These individuals are defined by the MHLW as those who are specifically recommended to receive each of these screenings.[13]

Descriptive statistics

We described the characteristics of PSMI for each type of cancer screening for data in every FY. The municipal cancer screening rates among PSMI were calculated for each FY. Additionally, to identify populations in need of more support for cancer screening participation, we calculated screening rates stratified by age. The proportion of individuals who required detailed examination after the primary screening and the proportion who actually received detailed examination were calculated for each PSMI. For this study, FY2018 and FY2019 were considered to represent the period before the start of the COVID-19 pandemic, and FY2020 and beyond were considered the period after the start of the COVID-19 pandemic.

RESULTS

Table 1 shows the background of PSMI who were eligible for each cancer screening in FY2018. From FY2018 to FY2022, the total number of PSMI, sex ratio, proportion of F2 diagnoses (ICD-10), and age distribution remained mostly constant (data not shown).

Figure 1 shows the trends in municipal cancer screening rates among PSMI. For all types of cancer, the municipal cancer screening rates for PSMI were the lowest in FY2020, the year the COVID-19 pandemic began (Figures 1a–e). The screening rates in FY2022 were higher than those in FY2020 but did not exceed the pre-COVID-19 pandemic screening rates. As an external reference, cancer screening rates for the general population of Okayama City were calculated using data from the Comprehensive Survey of Living Conditions

TABLE 1 Background of people with severe mental illness who were eligible for municipal cancer screening during fiscal year 2018 in Okayama City (before the COVID-19 pandemic).

	Colorectal and lung		Gastric		Breast		Cervical	
	n	%	*n*	%	*n*	%	*n*	%
Total	3355		2121		1665		2225	
Sex								
Women	1665	49.6	1061	50.0	1665	100	2225	100
Diagnosis								
F20–F29	2542	75.8	1616	76.2	1228	73.8	1601	72.0
F30, F31	813	24.2	505	23.8	437	26.2	624	28.0
Age (years)								
20–29							168	7.6
30–39							392	17.6
40–49	1234	36.8			604	36.3	604	27.1
50–59	1151	34.3	1151	54.3	576	34.6	576	25.9
60–69	970	28.9	970	45.7	485	29.1	485	21.8

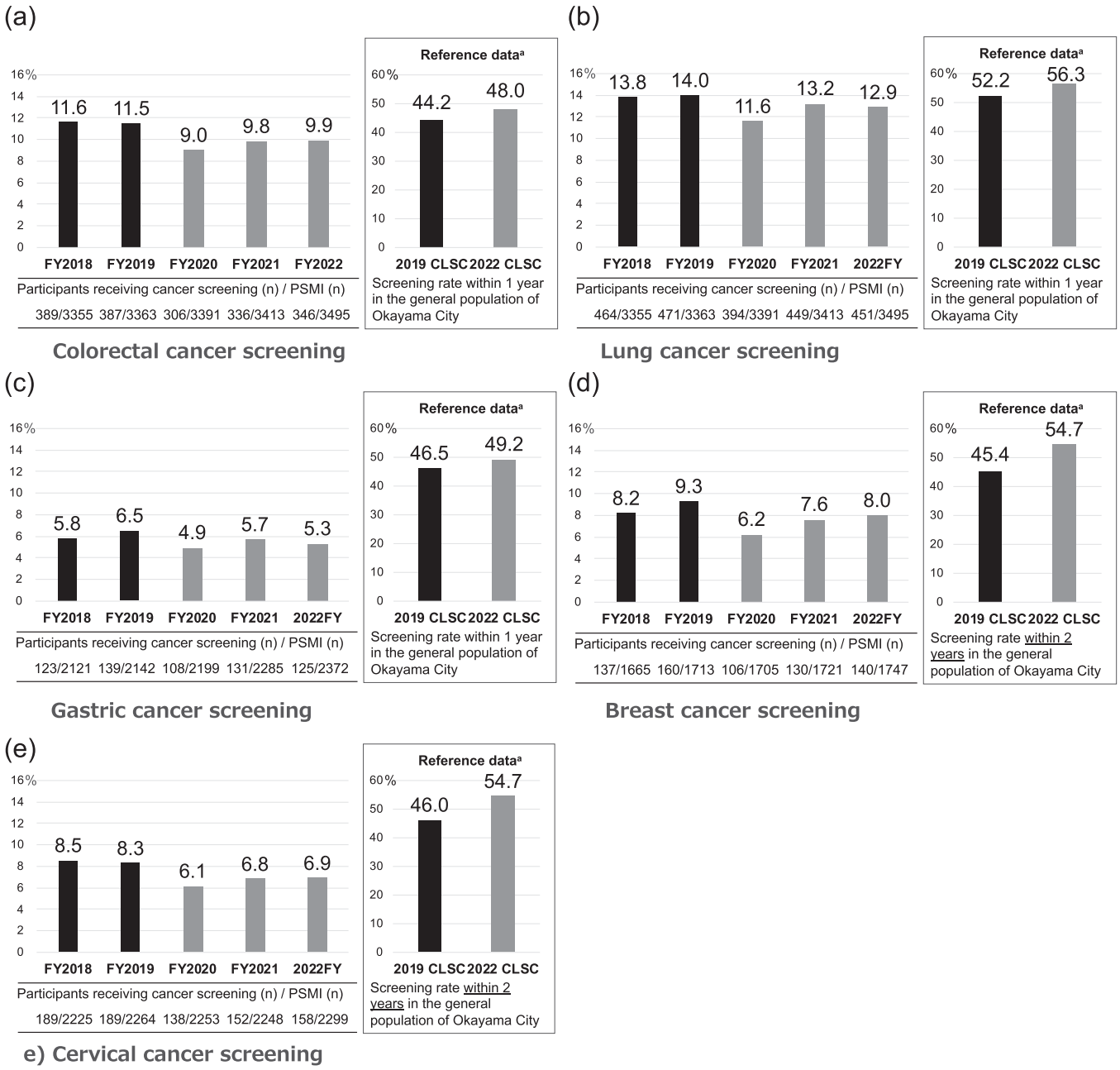

FIGURE 1 Trends in municipal cancer screening rates among people with severe mental illness (PSMI) for (a) colorectal, (b) lung, (c) gastric, (d) breast, and (e) cervical cancer. [a]Cancer screening rates among the general population of Okayama City. We calculated these rates using published official statistics data from the Comprehensive Survey of Living Conditions (CSLC) by the Ministry of Health, Labour, and Welfare (https://www.e-stat.go.jp/). In the CSLC, cancer screening rates are assessed in a large-scale survey conducted every 3 years. The survey focused on self-reported participation in cancer screenings, which included municipal cancer screening as well as worksite-based cancer screening. It should be noted that for breast and cervical cancer screening, participation rates were calculated within the past 2 years. FY = fiscal year.

conducted by the MHLW (shown in Figure 1). Among the general population of Okayama City, cancer screening rates for all types of cancer were increased in the 2022 survey compared with the 2019 survey.

Table 2 shows the cancer screening rates among PSMI, stratified by age. For all cancers, regardless of age group, the screening rates in FY2020 were lower than those in FY2019. Furthermore, the screening rates in FY2022 did not exceed levels in FY2019. Colorectal and lung cancer screening had particularly low rates in the age group 40–54 years. Gastric and breast cancer screening showed low rates in both younger and older age groups, with little difference between them. For cervical cancer screening, the rate was strikingly low at 2.7% in the age group 20–39 years during FY2022. According to reference data for the general population, the cervical cancer

TABLE 2 Municipal cancer screening rates stratified by age among people with severe mental illness in Okayama City.

People with severe mental illness						Reference data[a]	
Age (years)	FY2018 (%)	FY2019 (%)	FY2020 (%)	FY2021 (%)	FY2022 (%)	2019 CSLC (%)	2022 CSLC (%)
Colorectal							
40–54	9.9	9.1	6.0	7.2	7.0	41.4	48.1
55–69	13.7	14.6	12.8	13.1	13.3	47.6	47.9
Lung							
40–54	11.4	10.8	8.2	9.7	9.5	49.3	54.9
55–69	16.9	18.0	15.8	17.3	16.8	55.6	57.6
Gastric							
50–59	5.5	6.0	4.7	4.8	4.9	51.2	53.6
60–69	6.2	7.1	5.3	7.1	5.8	41.9	44.8
Breast							
40–54	9.7	10.1	6.0	8.5	8.9	50.6	59.7
55–69	6.5	8.4	6.5	6.5	7.0	39.1	50.0
Cervical							
20–39	3.9	4.0	2.2	3.6	2.7	45.7	39.7
40–54	10.3	9.3	7.1	7.4	8.0	53.2	62.7
55–69	9.7	10.4	7.7	8.1	8.4	37.5	44.4

Abbreviations: CSLC, Comprehensive Survey of Living Conditions; FY, fiscal year.

[a]Details of reference data for the general population are given in the Figure 1 legend. Note that the general population data are screening rates, which also include worksite-based cancer screening. It should also be noted that for breast and cervical cancer screening, participation rates were calculated within the past 2 years.

screening rate for the age group 20–39 years in the 2022 survey was 39.7%, down from 45.7% in 2019.

Table 3 shows the percentage of individuals who required detailed examination following municipal cancer screening (positive primary screening results), and the percentage of those with positive results who actually received a detailed examination, for both PSMI and the general population. There were no consistent trends observed in the proportions undergoing detailed examination before and after the COVID-19 pandemic. For cervical cancer screening, the proportion of PSMI receiving detailed examination consistently showed a tendency to be lower than that of the general population.

DISCUSSION

This study reaffirmed that PSMI had very low municipal cancer screening rates for all types of cancer even before the COVID-19 pandemic. It was revealed that the cancer screening rates for PSMI further declined in FY2020, when the COVID-19 pandemic began, and had not returned to FY2019 levels by FY2022. The trend in cancer screening rates for PSMI after the COVID-19 pandemic differed from that of the general population, suggesting that the recovery in screening rates for PSMI has been slower. These results indicate the need for support in cancer screening participation for PSMI.

To our knowledge, no studies have investigated the trends in cancer screening participation among PSMI before and after the COVID-19 pandemic. Although not focused on mental illness, a study from the United States suggested that the effect of disability status widened the disparities in adherence to breast and cervical cancer screening during the COVID-19 pandemic.[14] Additionally, numerous studies have examined the impact of socioeconomic factors on cancer screening participation during the COVID-19 pandemic. Some of these studies have reported that disparities in screening rates among socially vulnerable people widened,[14–16] whereas others found that the disparities remained unchanged.[17,18] Many PSMI not only have disabilities but are also in socioeconomically disadvantaged situations, making them a population whose cancer screening participation disparities should be closely monitored.

Using Comprehensive Survey of Living Conditions data as an external reference, we calculated the cancer screening rate among the general population of Okayama City and found that the rate had increased. In January 2022, the MHLW released a YouTube video to reiterate that cancer screening is essential, even during the COVID-19 pandemic.[19] These efforts may have led to an increase in the cancer screening rates in 2022. However, the cancer screening rates

TABLE 3 Percentage of people receiving detailed examination during municipal cancer screening in Okayama City.

	People with severe mental illness			Reference data[a]
	No. of participants in primary screening	Percentage of individuals requiring detailed examination (%)	Percentage of individuals receiving detailed examination (%)	Percentage of individuals receiving detailed examination (%)
Colorectal				
FY2018	137	6.6	100.0	74.5
FY2019	160	9.4	86.7	76.7
FY2020	106	7.5	62.5	77.2
FY2021	130	6.2	87.5	—
Lung				
FY2018	464	2.4	63.6	79.0
FY2019	471	2.5	66.7	82.6
FY2020	394	1.8	100.0	75.7
FY2021	449	1.8	87.5	—
Gastric				
FY2018	123	10.6	76.9	70.8, 93.4 (UGI, endoscopy)
FY2019	139	2.9	75.0	86.5, 97.3
FY2020	108	10.2	90.9	84.5, 98.1
FY2021	131	5.3	100.0	—
Breast				
FY2018	137	6.6	100.0	93.8
FY2019	160	9.4	86.7	92.4
FY2020	106	7.5	62.5	95.9
FY2021	130	6.2	87.5	—
Cervical				
FY2018	189	2.1	50.0	87.0
FY2019	189	1.6	66.7	91.6
FY2020	138	2.9	75.0	92.7
FY2021	152	1.3	0.0	—

Abbreviations: FY, fiscal year; UGI, upper gastrointestinal X-ray.

[a]Percentage of individuals receiving detailed examination after municipal cancer screening among the general population of Okayama City (under age 75 years). These data were taken from the Cancer Screening Performance Measures Data Book of the Cancer Information Service, National Cancer Center, Japan (https://ganjoho.jp/public/qa_links/report/scr_databook.html).

among PSMI did not return to pre-COVID-19 levels, even in FY2022. This suggests that awareness campaigns targeting the general population may not have been effective for this group. It is presumed that the use of digital means, such as YouTube and social media, for promoting cancer screening increased during the COVID-19 pandemic. However, for PSMI, who experience digital exclusion, the disparity in access to health information may have widened.[20] More inclusive and accessible health communication strategies may be needed to reach PSMI. Additionally, public statistics should be established to continuously monitor the disparity in cancer screening.

Regardless of cancer type, the trend in cancer screening rates among PSMI showed similar patterns before and after the COVID-19 pandemic. However, it was suggested that the impact of the pandemic may differ by age group. While generally low, the screening rates for colorectal and lung cancers were consistently higher among older people than in younger age groups from FY2018 to FY2022. This may be owing to increased knowledge about cancer and screening or greater health awareness with older age. Considering this, encouraging colorectal and lung cancer screening might be effective. In contrast, the screening rates for gastric, breast, and

cervical cancers among those aged 40 years and older showed little variation by age. These types of screening are relatively invasive, potentially posing greater barriers to PSMI regardless of age. Ideally, educational and navigational interventions for cancer screening should be provided[21] when individuals reach the eligible age so as to support them in receiving regular cancer screening.

The rate of cervical cancer screening among PSMI aged 20–39 was notably low and had also declined among the general population in the 2022 survey. Whereas low rates of cervical cancer screening in this age group are a challenge even in the general population,[22,23] there may be unique barriers for PSMI, which warrants further investigation.

The proportion of PSMI receiving detailed examination did not consistently show a tendency to be lower than that of the general population, except for cervical cancer screening. As a process indicator in cancer screening programs, the MHLW has set the acceptable rate for detailed examinations at 70% or higher (80% or higher for breast cancer), with a target rate of 90% or higher.[24] For PSMI, these proportions have fallen below 70% in some years. Particularly for cervical cancer, the proportion has remained low, but the reasons for this are unclear from this study. Interventions to encourage cancer screening participation among PSMI should include support for undergoing these screenings.[25,26]

Clinical implications

There is a possibility that disparities in cancer screening among PSMI have widened since the COVID-19 pandemic, necessitating efforts to improve the cancer screening rates for this population. In Japan, most PSMI visit psychiatric clinics, where providing encouragement through patient education and navigation for cancer screening is effective, and its implementation in daily practice is desirable.[21,27] By having outpatient staff directly approach patients, cancer screening recommendations can be offered even to those with barriers to accessing health information.

Since 2017, Japan has promoted the development of a comprehensive community-based integrated care system for mental disorders at the basic local government level.[28] Given the low cancer screening rates among PSMI demonstrated in this study, this system may still be insufficient in addressing the physical health care needs of this population. Because cancer screening is a form of preventive health care, it is likely to be overlooked. In Japan's 2024 medical fee revision, a new system was introduced to evaluate the establishment of psychiatric care systems in the community, including encouragement to participate in screenings.[28] Psychiatric health care providers are expected to play a role in promoting the health of PSMI.

Limitations

This study has some limitations. First, among PSMI who did not receive municipal cancer screening, some may have received worksite-based or individual opportunistic cancer screening. This may lead to an underestimation of the cancer screening rates for PSMI. Additionally, the municipal cancer screening rate for the general population is unknown. Therefore, a direct comparison of cancer screening rates between PSMI and the general population could not be made in this study. However, previous studies have shown that the cancer screening rates for PSMI, including worksite-based and individual opportunistic cancer screenings, were significantly lower than those for the general population.[29] Second, this study was a consecutive cross-sectional survey of different target populations by year, and individual tracking was not possible. Therefore, it is unknown whether individuals are continuously receiving cancer screening. Third, the screening rates for gastric cancer, breast cancer, and cervical cancer should have been evaluated within the previous 2 years, but these could not be calculated in this study. Fourth, cancer screening rates in the Comprehensive Survey of Living Conditions are only surveyed every 3 years. Therefore, data for FY2020–2021 were unavailable, and the impact of the pandemic during this period could not be compared between PSMI and the general population. Fifth, the number of PSMI requiring detailed examination as determined in primary cancer screening was very small. Owing to the large margin of error in the proportions of detailed examinations in this study, a larger definitive survey is needed. Lastly, this study used data from a single city in Japan, which limits the generalizability of the findings.

Conclusion

The present study demonstrated that the cancer screening rates among PSMI in Japan have remained very low, even before the COVID-19 pandemic. The COVID-19 pandemic may have widened this gap in cancer screening, and efforts to eliminate these disparities are urgently needed.

AUTHOR CONTRIBUTIONS

Conceptualization: All authors. *Data curation*: Masaki Fujiwara. *Formal analysis*: Masaki Fujiwara. *Funding acquisition*: Masatoshi Inagaki. *Investigation*: Yuto Yamada and Masaki Fujiwara. *Methodology*: All authors. *Project administration*: Masaki Fujiwara and Masatoshi Inagaki. *Supervision*: Masatoshi Inagaki. *Visualization*: Yuto Yamada and Masaki Fujiwara. *Writing—original draft*: Yuto Yamada and Masaki Fujiwara. *Writing —review and editing*: All authors.

ACKNOWLEDGMENTS

We thank the staff of Okayama City Health Center (Hiroaki Matsuoka and their staff) and the Mental Health and Welfare Center of Okayama City (Junichiro Ota and their staff) who provided anonymized datasets for this study. We would like to thank Sakura Hino for her logistic assistance. We thank Analisa Avila, MPH, ELS, of Edanz (https://jp.edanz.com/ac) for editing a draft of this manuscript. This work was supported by the Research for Promotion of Cancer Control Programs from the Japanese Ministry of Health, Labour, and Welfare (21EA1013, PI: M. Inagaki) and JSPS KAKENHI (grant

number JP23K09741; PI: M. Fujiwara). The funders had no role in the study design, data collection, data analysis, data interpretation, writing of the manuscript, or decision to submit it for publication.

CONFLICT OF INTEREST STATEMENT

Y. Yamada has received honoraria from Meiji, Sumitomo Pharma, Takeda, and Lundbeck. M. Fujiwara has received honoraria from Mochida and Eisai. K. Otsuki has received honoraria for lectures from Otsuka, Meiji, Sumitomo Pharma, Takeda, Nippon Shinyaku, and Yoshitomiyakuhin. M. Inagaki has received grants from Astellas, Eisai, Otsuka, Shionogi, Daiichi Sankyo, Sumitomo Pharma, Takeda, Mitsubishi Tanabe Pharma, Nihon Medi-Physics, Pfizer, Fujifilm, and Mochida and has received honoraria for lectures from EA Pharma, Meiji, MSD, Viatris, Eisai, Otsuka, Sumitomo Pharma, Takeda, Eli Lilly, Nippon Shinyaku, Pfizer, Mochida, Janssen and Yoshitomiyakuhin. The other authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

The datasets used in this study are not publicly available. However, anonymized datasets may be available after review by our institutional ethics committee. Proposals for use of the data should be submitted to the corresponding author.

ETHICS APPROVAL STATEMENT

The study was approved by the institutional ethics committee of Okayama University (KEN2204-009). Our study conforms to the provisions of the Declaration of Helsinki.

PATIENT CONSENT STATEMENT

In this study, the informed consent procedure was omitted because we used an anonymous dataset that does not allow for individual identification.

CLINICAL TRIAL REGISTRATION

N/A.

ORCID

Yuto Yamada http://orcid.org/0000-0001-8170-4795
Masaki Fujiwara http://orcid.org/0000-0002-6181-3166
Koji Otsuki http://orcid.org/0000-0002-0980-3614
Maiko Fujimori http://orcid.org/0000-0003-1639-3390

REFERENCES

1. Solmi M, Firth J, Miola A, Fornaro M, Frison E, Fusar-Poli P, et al. Disparities in cancer screening in people with mental illness across the world versus the general population: prevalence and comparative meta-analysis including 4 717 839 people. Lancet Psychiatry. 2020;7:52–63.
2. Shin DW, Lee JW, Jung JH, Han K, Kim SY, Choi KS, et al. Disparities in cervical cancer screening among women with disabilities: a national database study in South Korea. J Clin Oncol. 2018;36:2778–86.
3. Shin DW, Yu J, Cho J, Lee SK, Jung JH, Han K, et al. Breast cancer screening disparities between women with and without disabilities: a national database study in South Korea. Cancer. 2020;126:1522–9.
4. Shin DW, Chang D, Jung JH, Han K, Kim SY, Choi KS, et al. Disparities in the participation rate of colorectal cancer screening by fecal occult blood test among people with disabilities: a national database study in South Korea. Cancer Res Treat. 2020;52:60–73.
5. Fujiwara M, Higuchi Y, Nakaya N, Fujimori M, Yamada Y, Wada R, et al. Trends in cancer screening rates among individuals with serious psychological distress: an analysis of data from 2007 to 2016 Japanese national surveys. J Psychosoc Oncol Res Pract. 2020;2:e025.
6. Teglia F, Angelini M, Astolfi L, Casolari G, Boffetta P. Global association of COVID-19 pandemic measures with cancer screening: a systematic review and meta-analysis. JAMA Oncol. 2022;8:1287–93.
7. Machii R, Takahashi H. Japanese cancer screening programs during the COVID-19 pandemic: changes in participation between 2017-2020. Cancer Epidemiol. 2023;82:102313.
8. Machii R, Takahashi H, Miyazawa J, Nakayama T. Cancer screening in Japan 2 years after the COVID-19 pandemic: changes in participation, 2017-2021. Prev Med Rep. 2024;39:102649.
9. Fujiwara M, Yamada Y, Shimazu T, Nakaya N, Hinotsu S, Fujimori M, et al. Increasing disparities in cancer screening among people with severe mental illness during the COVID-19 pandemic. Schizophr Res. 2023;258:18–20.
10. Thomsen MK, Jørgensen MD, Pedersen L, Erichsen R, Sørensen HT, Mikkelsen EM. Mental disorders, participation, and trajectories in the Danish colorectal cancer screening programme: a population-based cohort study. Lancet Psychiatry. 2023;10:518–27.
11. Hamashima C. Cancer screening guidelines and policy making: 15 years of experience in cancer screening guideline development in Japan. Jpn J Clin Oncol. 2018;48:278–86.
12. Ministry of Health, Labour and Welfare. System of medical payment for services and supports for persons with disabilities. [cited 2024 Jul 12]. Available from: https://www.mhlw.go.jp/english/wp/wp-hw3/09.html
13. Ministry of Health, Labour and Welfare. Guidelines for priority education of cancer prevention and the implementation of cancer screening. 2022 [cited 2024 Jul 12]. Available from: https://www.mhlw.go.jp/content/10901000/000991054.pdf
14. Rolle LD, Chery MJ, Larson M, Lopez-Pentecost M, Calfa CJ, Schlumbrecht MP, et al. The effect of disability and social determinants of health on breast and cervical cancer screenings during the COVID-19 pandemic. Prev Chronic Dis. 2024;21:230234.
15. Labaki C, Bakouny Z, Schmidt A, Lipsitz SR, Rebbeck TR, Trinh QD, et al. Recovery of cancer screening tests and possible associated disparities after the first peak of the COVID-19 pandemic. Cancer Cell. 2021;39:1042–4.
16. Lofters AK, Wu F, Frymire E, Kiran T, Vahabi M, Green ME, et al. Cancer screening disparities before and after the COVID-19 pandemic. JAMA Network Open. 2023;6:e2343796.
17. Marcondes FO, Cheng D, Warner ET, Kamran SC, Haas JS. The trajectory of racial/ethnic disparities in the use of cancer screening before and during the COVID-19 pandemic: a large U.S. academic center analysis. Prev Med. 2021;151:106640.
18. Bright D, Hillier S, Song J, Huws DW, Greene G, Hodgson K, et al. Inequalities in colorectal cancer screening uptake in Wales: an examination of the impact of the temporary suspension of the screening programme during the COVID-19 pandemica retrospective register-based study. BMC Public Health. 2023;23:546.
19. Ministry of Health, Labour and Welfare. The MHLW promotes consultation with a doctor for early detection of cancer. A video has been released to raise awareness. 2022 [cited 2024 Jul 12]. Available from: https://www.mhlw.go.jp/stf/seiei_daijinhyosyo_00006.html
20. Spanakis P, Peckham E, Mathers A, Shiers D, Gilbody S. The digital divide: amplifying health inequalities for people with severe mental illness in the time of COVID-19. Br J Psychiatry. 2021;219:529–31.
21. Fujiwara M, Yamada Y, Shimazu T, Kodama M, So R, Matsushita T, et al. Encouraging participation in colorectal cancer screening for

people with schizophrenia: a randomized controlled trial. Acta Psychiatr Scand. 2021;144:318–28.
22. Kirubarajan A, Leung S, Li X, Yau M, Sobel M. Barriers and facilitators for cervical cancer screening among adolescents and young people: a systematic review. BMC Womens Health. 2021;21:122.
23. Saitoh E, Saika K, Morisada T, Aoki D. Status of cervical cancer screening among adolescents and young adults (AYA) in Japan. Int J Clin Oncol. 2022;27:473–80.
24. Ministry of Health, Labour and Welfare. Committee on the Evaluation of Cancer Screening Program. Report on the future evaluation of cancer screening programs in Japan. 2008 [cited 2024 July 12]. Available from: https://www.mhlw.go.jp/shingi/2008/03/s0301-4.html
25. Fujiwara M, Inagaki M, Shimazu T, Kodama M, So R, Matsushita T, et al. A randomised controlled trial of a case management approach to encourage participation in colorectal cancer screening for people with schizophrenia in psychiatric outpatient clinics: study protocol for the J-SUPPORT 1901 (ACCESS) study. BMJ Open. 2019;9:e032955.
26. Yamada Y, Fujiwara M, Shimazu T, Etoh T, Kodama M, So R, et al. Patients' acceptability and implementation outcomes of a case management approach to encourage participation in colorectal cancer screening for people with schizophrenia: a qualitative secondary analysis of a mixed-method randomised clinical trial. BMJ Open. 2022;12:e060621.
27. Fujiwara M, Yamada Y, Etoh T, Shimazu T, Kodama M, Yamada N, et al. A feasibility study of provider-level implementation strategies to improve access to colorectal cancer screening for patients with schizophrenia: ACCESS2 (N-EQUITY 2104) trial. Implement Sci Commun. 2024;5:2.
28. Ministry of Health, Labour and Welfare. Overview of the 2024 revision of medical fees [cited 2024 October 28]. Available from: https://www.mhlw.go.jp/content/12400000/001238907.pdf
29. Fujiwara M, Inagaki M, Nakaya N, Fujimori M, Higuchi Y, Hayashibara C, et al. Cancer screening participation in schizophrenic outpatients and the influence of their functional disability on the screening rate: a cross-sectional study in Japan. Psychiatry Clin Neurosci. 2017;71:813–25.

How to cite this article: Yamada Y, Fujiwara M, Nakaya N, Otsuki K, Shimazu T, Fujimori M, et al. Trends in uptake of cancer screening among people with severe mental illness before and after the COVID-19 pandemic in Japan: a repeated cross-sectional study. Psychiatry Clin Neurosci Rep. 2025;4:e70062. https://doi.org/10.1002/pcn5.70062