

Short communication

Effects of the COVID-19 pandemic on breast cancer screening in Taiwan

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ABSTRACT

The breast cancer screening program has continued in Taiwan during the COVID-19 pandemic. Our nationwide data showed that the total number of screenings decreased by 22.2%, which was more pronounced for in-hospital examinations (−37.2%), while outreach showed a 12.9% decrease. This decline in screening participation happened at all levels of hospitals, more significantly at the highest level. Our report revealed that outreach services could maintain relatively stable breast cancer screening under this kind of public health crisis. Building a flexible, outreach system into the community might need to be considered when policymakers are preparing for future possible pandemics.

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1. Introduction

Regular breast cancer screening can reduce breast cancer deaths by 60% within 10 years after diagnosis [1]. Many countries have implemented breast cancer screening programs for decades; however, since the outbreak of the coronavirus disease-2019 (COVID-19) [2], routine screening has been postponed in many areas for prevention of spread of infection or for preservation of healthcare capacity [3,4].

The Health Promotion Administration of Taiwan decided to continue the cancer screening program because the COVID-19 infection has been relatively well-controlled in Taiwan [5,6]. For

safe mammography examination, recommendations such as screening the participants for COVID-19 by symptoms and TOCC histories (travel, occupation, contact, and cluster), keeping social distance between participants, using personal protective equipment, and cleaning and disinfecting the examination room and mammography equipment were followed, and up to June 28, no COVID-19 infection had occurred in Taiwan due to mammography examination.

For promotion of in-hospital breast cancer screening in Taiwan, hospitals use posters, in-hospital broadcast, and out-patient department referral. District public health centers arrange outreach screening sessions and telephone eligible women in their district to encourage enrolment. During the pandemic, hospitals have been free to make their own screening policies, while district public health centers have decided on whether outreach sessions are held as scheduled or postponed, and eligible women are free to choose when and where to receive regular screening.

The aim of this report is to present our experience of breast

Abbreviations: COVID-19, coronavirus disease.

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cancer screening during the COVID-19 pandemic using nationwide data.

2. Materials and methods

2.1. The breast cancer screening program

The Taiwan government started a nation-wide breast cancer screening program in 1999. Women aged 45–69 years are encouraged to have a government-subsidized mammography every two years, and women aged 40–44 years with second-degree relatives ever diagnosed with breast cancer are also included. The Ministry of Health and Welfare has provided special funding to increase screening capacity since 2010, and this funding has encouraged hospitals to promote in-hospital screening and provide hospital-based outreach using mobile mammography units. A mobile mammography unit includes mammography equipment in a van and certificated radiographers who work together with physicians, nurses, and administration staff to provide community-based adult health examinations as well as cancer screening. According to the Health Promotion Administration Annual Report 2019 [7], the latest reported number of breast cancer screenings is 860,000 in 2018 and the screening rate is 39.9%.

2.2. Screening data

A national screening database is available for data mining and here we report the numbers of screenings and recall rates for January–April 2020, compared to those of the same period in 2019. There are four levels in the hierarchy of hospitals in Taiwan, being medical centers, regional hospitals, local hospitals, and clinics. Data has been stratified by the level of hospitals as well as by location where the mammography was carried out (in-hospital or outreach) and age of participants.

2.3. Statistics

The two-sample test for proportion was used to examine the differences of screening rates and recall rates in the two years selected for study, while the chi-square test was used to examine the relationship between the variables with stratified data and the screenings, with $p < .05$ being defined as statistically significant.

3. Results

Table 1 shows the overall conditions in 2019 and 2020, where the total number of screenings decreased by 22.2%. The decline was more pronounced for in-hospital examinations (37.2%, $p < .001$), where the proportion of in-hospital screenings decreased from 38.2% to 30.8%. The recall rates increased in 2020, both in the in-

hospital and outreach groups ($p < .001$).

Data stratification by hierarchy of hospitals is presented in Fig. 1. The medical centers provided more screenings than other hospitals in both 2019 and 2020. During the pandemic, the number of screenings decreased more in medical centers. Fig. 2 shows the data stratification by age, and decrease of screening number and increase of outreach proportion occurred across nearly all age groups, with statistical examination showing that the difference of screenings in the two years were associated with age and the hierarchy of hospitals ($p < .001$).

4. Discussion

Results for the nation-wide breast cancer screening program during the COVID-19 pandemic in Taiwan showed significant decrease in in-hospital screening while outreach with mobile mammography units maintained relatively stable services.

There are several possible explanations for the in-hospital examination decrease. Firstly, restriction on hospital visits [8,9] and triage of patients with COVID-19 infection risks to outdoor visiting areas both limited the number of people entering hospitals. Secondly, people hesitated to go to hospitals during the pandemic. Thirdly, the hospitals did not promote cancer screening as actively as they did before the outbreak.

Accessibility is one of the important factors associated with breast cancer screening participation [10–12]. Outreach programs increase accessibility for community residents to receive a mammography. The data showed that with proper measures, community screening remained a safe and reliable way to maintain regular breast examinations during the pandemic.

The effect of COVID-19 on breast cancer screening was observed across all levels of hospitals and was more pronounced for medical centers. Because hospitals followed the direction of the Central Epidemic Command Center (CECC), they tended to have similar policies to prevent spread of infection; however, the medical centers might have stricter policies leading to higher degree of screening rate decline. Age is one of the influencing factors for women participating in breast cancer screening [13] or adhering to guidelines for screening mammography [14], and the data showed a similar degree of reduced screening participation across nearly all age groups. Although statistical significance is present, it might be due to the very large sample size in the study [15].

Healthcare practices have changed since the COVID-19 pandemic struck. Our report confirms that outreach services can maintain relatively stable breast cancer screening rates under this kind of public health crisis. In contrast to restriction of healthcare and cancer screening in the hospitals, building a flexible, outreach system into the community might need to be considered when policymakers are preparing for possible future pandemics.

Table 1

Comparison of the number of screening mammograms and recall rates in the same period of 2019 and 2020.

		2019 (Jan.–Apr.)		2020 (Jan.–Apr.)		Difference	p-value
		Numbers	Proportion ^c	Numbers	Proportion ^c		
Number of screenings	Total	396,371	100%	308,463	100%	–87,908 (–22.2%)	<0.001 ^a
	In-hospital	151,343	38.2%	95,082	30.8%	–56,261 (–37.2%)	<0.001 ^a
	Outreach	245,028	61.8%	213,381	69.2%	–31,647 (–12.9%)	<0.001 ^a
Recall rate	In-hospital		8.3%		8.7%	0.4%	<0.001 ^b
	Outreach		6.6%		6.9%	0.3%	<0.001 ^b

^a Two-sample test for proportion to examine the screening rate differences. We used the screening rate of 39.9% in 2018 to estimate the number of eligible women and presumed they are the same in 2019 and 2020. The calculation was made by using approximate values.

^b Two-sample test for proportion to examine the recall rate differences.

^c The proportion of in-hospital screenings decreased and the proportion of outreach increased in 2020. The difference was examined using Chi-square test and showed significant difference ($p < .001$).

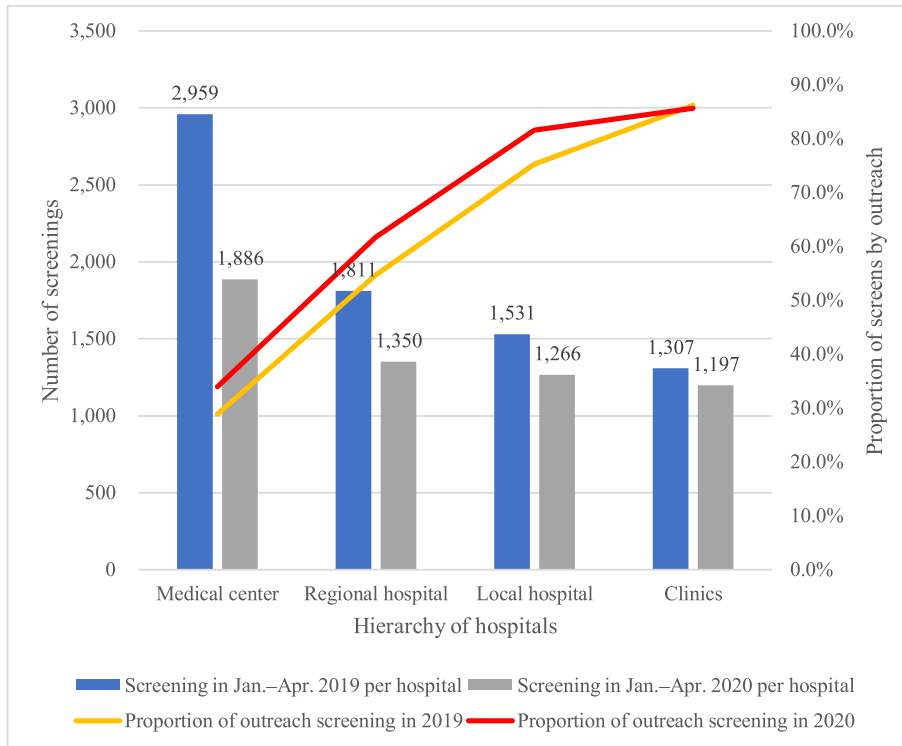


Fig. 1. Screening data stratification by the hierarchy of hospitals. During the COVID-19 pandemic, the number of screenings decreased in all the four levels of hospitals, more pronounced in medical centers. The lines show the proportion of outreach service increased in 2020 in the first three levels of hospitals.

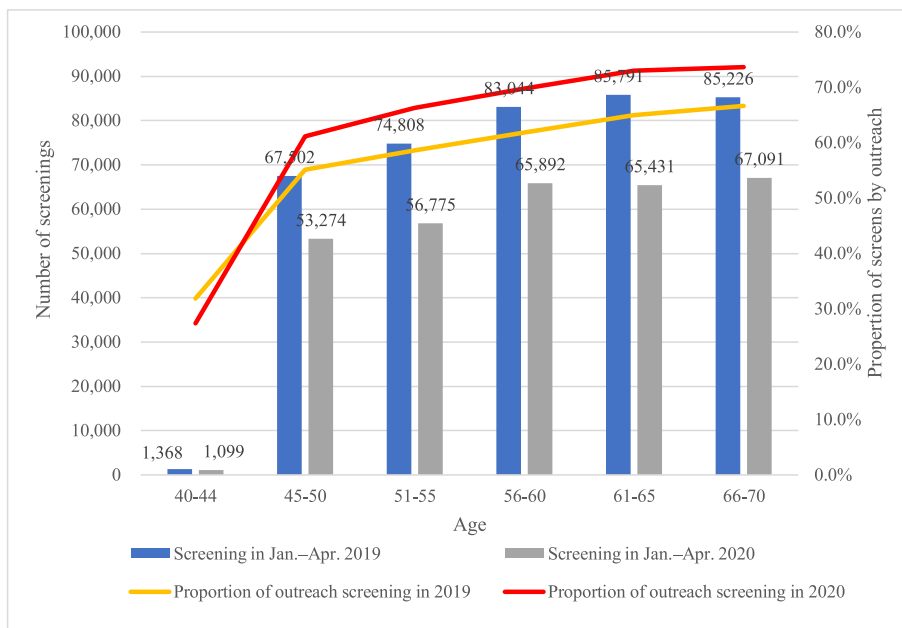


Fig. 2. Screening data stratification by age of the participants. During the COVID-19 pandemic, the number of screening mammographies decreased in all age levels and the proportion of outreach services increased.

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Ethical approval

Ethical approval was not required for this study.

Declaration of competing interest

None.

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