Breast Cancer Screening among Women in Thailand: Analyses of Population-Based Household Surveys

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Objective: *The incidence of breast cancer is the highest among female cancers in Thailand and has been steadily increasing during the past few decades. The present study aimed to determine uptake rates of breast cancer screening including breast self-examination (BSE), clinical breast examination (CBE), and mammography screening, and to identify enabling factors and barriers associated with screening uptake.*

Material and Method: *Secondary data from two population-based household surveys were used, the 2007 Health and Welfare Survey that comprised 18,474 women aged 20 years and older, and the 2009 Reproductive Health Survey that comprised 26,951 women aged 30 to 59 years. Multivariate logistic regression analyses were performed to identify factors associated with screening.*

Results: *In 2007, the uptake rate of BSE was 40.1% (18.4% for monthly BSE), 29.0% for CBE, and 5.9% for mammography. In 2009, the uptake rate of any type of breast examination was 57.9%, while the mammography rate among women who had breast examinations was 29.6% (10.1% of all women in 2009). Frequency of CBE was found to be positively associated with BSE and mammography screening. Factors independently associated with screening uptake were having education at the bachelor's level or higher, being in the richest wealth quintile based on household asset index, and being covered by the Civil Servant Medical Benefit Scheme. Women living in Bangkok metropolis and in the municipal areas of other provinces had higher rates of mammography, while women living in the north and northeast regions and non-municipal areas were more likely to perform BSE and have CBE performed than those living in Bangkok and municipal areas, respectively. Common factors associated with less screening across the two surveys were age 55 and over, being single or widowed, being Muslim or Christian, and having no health insurance. Lack of knowledge and awareness of breast cancer screening were found to be barriers for screening among all women, especially those with low educational levels.*

Conclusion: *A low uptake of monthly BSE and mammography was observed. Early detection and awareness should be encouraged through proper BSE technique and effective CBE. Increased uptake of CBE should lead to a higher rate of mammography. Increased knowledge, awareness, and participation in screening activities for selected groups, such as older women, those who are not married, non-Buddhists, and those with low education are recommended.*

Keywords: *Breast cancer screening, Breast self-examination, Clinical breast examination, Mammogram, Mammography, Thailand*

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Breast cancer is the most common cancer affecting women worldwide[1]. Incidence rates remain highest in more developed regions, but mortality is relatively much higher in less developed countries due to lack of early detection and access to treatment facilities[2]. According to the most recent Thailand cancer registry report 2007 to 2009, breast cancer was the most common cancer among Thai women in 2008 with estimated age-standardized incidence rate of 26.4 per 100,000 women[3]. Cancer registries in Thailand reveal an increasing incidence of breast cancer, particularly for early stage disease, highlighting the effectiveness of breast cancer screening[4], and awareness campaigns[5].

Early detection and treatment of breast cancer in its early stages are considered the most promising approaches to reduce breast cancer mortality rates[6]. The American Cancer Society recommends early detection of breast cancer through breast self-examination (BSE), clinical breast examination (CBE), and mammography[7]. Mass population screening can be advocated for breast cancer using mammography screening in countries where resources are available for wide coverage of the population. However, CBE could be implemented in limited resource settings when the necessary evidence from ongoing studies becomes available[8]. Limited access to early detection and

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treatment, which is common in low and middle-income countries where no organized mammography screening exists, was found to be a major risk factor for breast cancer mortality[9].

There are many barriers to the establishment of a nationwide organized breast cancer screening program in Thailand. In this regard, it is desirable to assess the situation of breast cancer screening rates across the whole country. Furthermore, few studies have assessed breast cancer screening uptake rates at the population level in Thailand. The present study aimed to determine breast cancer screening rates and identify enabling factors and barriers associated with uptake of breast self-examination, clinical breast examination, and mammography among Thai women.

Material and Method

Surveys and study populations

The present study used data from two population-based household surveys, the 2009 Reproductive Health Survey (RHS) and the 2007 Health and Welfare Survey (HWS). Both surveys were conducted by the National Statistical Office of Thailand. The surveys adopted a stratified two-stage sampling method. At the first stage, province was selected as the strata while residential area (municipality and non-municipality) was selected as the second stage strata. The primary sampling units consisted of blocks (in municipal areas) or villages (non-municipal areas). The secondary sampling units consisted of households systematically selected from a household listing. In the 2007 HWS, 69,679 subjects were selected from 25,985 households. In the 2009 RHS, 42,875 subjects were selected from 30,117 households. Sampling weights were used to adjust for the different population distribution.

Data and variables measured

In the 2009 RHS survey, information on breast cancer screening was recorded in women aged 30 to 59 yielding 26,951 women available for analysis. In the 2007 HWS, 18,474 women aged 20 years and older were asked about breast screening. The following information was included in this secondary analysis: (a) respondents characteristics; age, marital status, religion, residential area (municipal or non-municipal), region (Bangkok metropolis, central, northern, north-eastern, southern), education, and health insurance; (b) household assets and housing characteristics for measuring household wealth status (lowest quintile, second to fourth quintiles and highest quintile).

Household wealth status of respondents was measured by using an asset index. The index was constructed from household characteristics and assets using principal component analysis (PCA)[10]. Construction of the index involved assigning a set of weights for each household asset based on the factor scores obtained from the PCA[11]. From this asset index, women were categorized into wealth quintiles, where the first quintile represents the poorest and quintile five the richest.

Three outcome measures were assessed, each related to having performed breast self-examination (BSE), clinical breast examination (CBE) by a health care provider, and having a mammogram performed within a certain time frame prior to the survey. The 2009 RHS contained two questions for women aged 30 to 59 years: "Within the past year have you performed a breast examination?". If they answered yes, they were asked to specify one of the following examination methods: (a) BSE, (b) CBE, or (c) both BSE and CBE. Women who specified (b) or (c) were asked the following question: "Within the past year have you had a mammogram?". The 2007 HWS contained two questions for women aged 20 years and older. The first question was "Have you performed a breast self-examination within the past year?" Women who answered "yes" were also asked to state the frequency, with possible options being monthly, every two months, every three months, or more than three months. The second question was "Have you had a clinical breast examination performed within the past five years?". Women who answered "yes" were also asked to state the frequency, with possible options being one time, two times, three times, four times, or more than five times. In addition, women aged 40 years and older were asked: "Have you had a mammogram in the past five years?". Women who answered "yes" were also asked to state the frequency with similar options as CBE. Those who answered "no" were asked to choose one of the following nine reasons for not having had a mammogram done: do not know about mammogram, feel it is not necessary, too expensive, feel nothing wrong with breast, fear of getting hurt, too embarrassed (to expose breast to a doctor), lack of time, medical facility is too far, not covered by insurance.

Statistical analysis

All analyses were conducted with the R language and environment version 2.14.2. Frequency counts with percentages were presented to describe the distribution of the study sample. To investigate

associations with the outcomes of interest, multivariate logistic regression models were fit to the data of both surveys separately. Adjusted odds ratios (OR) and 95% confidence intervals (CI) were calculated for each variable with appropriate reference groups selected. Trends in frequency of breast screening were tested by including them as continuous variables in separate models. Sampling weights were incorporated to make respondents statistically representative of all women in the country in accordance with the Thai population at that year of survey.

Results

The respondent's ages in the 2007 HWS and 2009 RHS ranged from 20 to 99 and 30 to 59 with a mean (SE) age of 44.6 (0.17) and 43.3 (0.08), respectively. The median age for all respondents in the same age range, 30 to 59, of both surveys was 43.0. The uptake rates of BSE and CBE by characteristics of respondents in the two surveys were presented in Table 1.

Factors associated with breast examination practices: the 2007 HWS and 2009 RHS

Table 2 shows the results of fitting multivariate logistic regression models to the data of the two surveys. The reference groups we chose are shown as the first level for all variables except for age group where women aged 40 to 44 was used to allow for comparison between surveys.

In the 2007 HWS, the significant demographic factors for having lower likelihood of practicing BSE was age 55 to 59 and age 60 or over, being not married (single/widowed), and being Muslim. Among regions, the likelihood of BSE was lower in the central region compared to Bangkok metropolis. The odds of BSE uptake was significantly higher for women living in non-municipal areas compared to municipal areas. Education, household wealth quintile, and health insurance were significant socio-economic factors associated with BSE. The likelihood of performing BSE increased with level of education and wealth quintile. Women covered by the civil servant medical benefit scheme (CSMBS) had a higher likelihood of BSE than women covered by the universal coverage (UC) scheme.

In the 2007 HWS, being aged 60 years or older and aged younger than 35, not married (single/widowed), and being Muslim, were demographic factors that reduced the likelihood of CBE. The odds of CBE were also significantly lower for women without health insurance and those with social health insurance (SHI) compared to women insured with UC. Women living in non-municipal areas and the north and northeast regions had a higher likelihood of CBE compared to women living in municipal areas and in the Bangkok metropolis, respectively. A strong positive association between levels of household wealth and CBE was shown. Women having a bachelor or higher level of education had higher likelihood of CBE compared to those with no formal education, as were women covered by CSMBS compared with UC.

In the 2009 RHS, women aged 55 to 59 and aged under 39 years were less likely to perform breast examinations (BSE and CBE) than those aged 40 to 44 years. Unmarried women (single/widowed/divorced), Muslims, those living in non-municipal areas and in the northern, north-eastern and southern regions, those having any formal education, and those in the lower middle to the richest wealth quintile were more likely to perform breast examinations than the respective reference groups. Uninsured women were less likely to perform breast examinations than women covered by the UC scheme.

Factors associated with mammography screening

As shown in Table 3, of the women aged 40 years and older in the 2007 HWS, 5.9% reported having had a mammogram in the past five years, while 10.1% of the women aged 30 to 59 years in the 2009 RHS reported having had a mammogram within the past year. In the 2007 HWS, of the demographic factors associated with mammography uptake, being aged 60 years or above, being single, Christian, living in non-municipal areas, and living in the central and northern regions were associated with less frequent mammography screening. Among the socio-economic factors considered in the 2007 HWS, education and wealth quintile were associated with mammography uptake; women with a college education (bachelor's or higher level) and women in a higher wealth quintile were more likely to undergo a mammogram. In the 2009 RHS, women aged 30 to 34 years, those who were divorced and those living in non-municipal areas and in the central, northern and north-eastern regions were less likely to have a mammogram, while women who were covered by CSMBS or SHI and those in the richest wealth quintile were more likely to have one.

Associations of breast cancer screening frequency with screening method

Table 4 presents associations of screening frequency with each breast cancer screening method.

Table 1. Breast cancer screening rates by characteristic of respondents, the 2007 Health and Welfare Survey (HWS) and the 2009 Reproductive Health Survey (RHS)

Demographic and socio-economic characteristics	2007 HWS			2009 RHS			
	Number of respondents	Had BSE in the past year n (%)	Had CBE in the past 5 years n (%)	Number of respondents	Had BSE in the past year n (%)	Had CBE in the past year n (%)	Had BSE & CBE in the past year n (%)
	15,457,553	6,192,191 (40.1)	4,482,892 (29.0)	15,074,124	3,568,293 (23.7)	3,045,736 (20.2)	2,118,015 (14.1)
Age							
20-24	1,134,791	335,859 (29.6)	203,846 (18.0)				
25-29	1,421,877	539,711 (38.0)	284,675 (20.0)				
30-34	1,854,365	852,931 (46.0)	503,842 (27.2)	2,705,321	706,160 (26.1)	387,403 (14.3)	262,461 (9.7)
35-39	1,925,894	938,027 (48.7)	685,372 (35.6)	2,855,983	718,724 (25.2)	513,311 (18.0)	393,321 (13.8)
40-44	1,980,748	958,608 (48.4)	729,965 (36.9)	2,853,442	725,966 (25.4)	629,159 (22.0)	450,199 (15.8)
45-49	1,767,034	869,947 (49.2)	649,800 (36.8)	2,633,874	626,989 (23.8)	637,130 (24.2)	390,174 (14.8)
50-54	1,565,965	694,681 (44.4)	602,218 (38.5)	2,274,151	471,898 (20.8)	520,079 (22.9)	378,659 (16.7)
55-59	1,143,967	462,205 (40.4)	380,811 (33.3)	1,751,353	318,556 (18.2)	358,654 (20.5)	243,201 (13.9)
60+	2,662,912	540,222 (20.3)	442,363 (16.6)				
Marital status							
Married	11,105,166	4,890,174 (44.0)	3,666,013 (33.0)	11,789,779	2,805,454 (23.8)	2,537,533 (21.5)	1,765,044 (15.0)
Single	1,616,010	502,971 (31.1)	198,611 (12.3)	1,358,313	353,549 (26.0)	144,357 (10.6)	129,293 (9.5)
Widowed	1,964,527	475,741 (24.2)	405,803 (20.7)	963,245	174,621 (18.1)	211,882 (22.0)	116,722 (12.1)
Divorced/separated	771,850	323,305 (41.9)	212,465 (27.5)	962,787	234,669 (24.4)	151,963 (15.8)	106,956 (11.1)
Religion							
Buddhist	14,534,299	5,913,134 (40.7)	4,297,259 (29.6)	14,271,466	3,374,716 (23.6)	2,930,448 (20.5)	2,053,475 (14.4)
Muslim	815,380	233,230 (28.6)	145,008 (17.8)	726,347	184,286 (25.4)	98,950 (13.6)	56,851 (7.8)
Christian	104,400	44,558 (42.7)	39,356 (37.7)	59,908	9,291 (15.5)	15,627 (26.1)	6,102 (10.2)
Other	3,474	1,269 (36.5)	1,269 (36.5)	16,403	-	711 (4.3)	1,588 (9.7)
Area							
Municipal	4,661,877	1,886,219 (40.5)	1,186,643 (25.5)	5,053,073	1,233,819 (24.4)	836,800 (16.6)	690,529 (13.7)
Non-municipal	10,795,676	4,305,973 (39.9)	3,296,249 (30.5)	10,021,051	2,334,474 (23.3)	2,208,935 (22.0)	1,427,486 (14.2)
Region							
Bangkok metropolis	1,450,878	637,352 (43.9)	308,683 (21.3)	1,926,726	470,502 (24.4)	254,019 (13.2)	199,458 (10.4)
Central	4,105,477	1,298,937 (31.6)	996,093 (24.3)	3,733,709	796,344 (21.3)	714,757 (19.1)	440,314 (11.8)
North	2,982,673	1,312,617 (44.0)	1,023,046 (34.3)	2,778,421	649,145 (23.4)	590,642 (21.3)	549,969 (19.8)
Northeast	4,899,423	2,148,577 (43.9)	1,681,068 (34.3)	4,781,148	1,117,094 (23.4)	1,190,938 (24.9)	713,454 (14.9)
South	2,019,102	794,708 (39.4)	474,003 (23.5)	1,854,120	535,209 (28.9)	295,380 (15.9)	214,820 (11.6)
Education							
None	1,123,186	235,523 (21.0)	232,923 (20.7)	674,794	81,390 (12.1)	109,724 (16.3)	59,027 (8.7)
Primary	9,697,358	3,732,902 (38.5)	2,960,755 (30.5)	9,616,220	2,173,137 (22.6)	2,025,952 (21.1)	1,327,376 (13.8)
Secondary	3,426,882	1,556,746 (45.4)	902,644 (26.3)	3,241,735	878,950 (27.1)	594,329 (18.3)	458,423 (14.1)
Bachelor	1,122,214	616,931 (55.0)	345,068 (30.7)	1,343,710	384,464 (28.6)	267,230 (19.9)	239,512 (17.8)
Master or higher	82,664	48,236 (58.4)	39,997 (48.3)	188,092	49,820 (26.5)	47,960 (25.5)	33,677 (17.9)
Other	5,249	1,854 (35.3)	1,505 (28.7)	9,573	532 (5.6)	540 (5.6)	-
Health insurance							
UC	11,242,111	4,357,843 (38.8)	3,317,023 (29.5)	10,916,674	2,533,416 (23.2)	2,264,186 (20.7)	1,525,266 (14.0)
CSMBS	1,628,732	860,536 (52.8)	625,611 (38.4)	1,282,544	324,616 (25.3)	303,401 (23.7)	261,847 (20.4)
SHI	1,949,726	736,139 (37.8)	403,774 (20.7)	2,233,525	580,819 (26.0)	379,966 (17.0)	265,621 (11.9)
Private insurance	210,560	101,976 (48.4)	59,733 (28.4)	232,040	54,027 (23.3)	49,313 (21.3)	41,051 (17.7)
No insurance	426,424	135,697 (31.8)	76,751 (18.0)	409,341	75,414 (18.4)	48,869 (11.9)	24,231 (5.9)
Wealth quintile							
Q1-poorest	3,436,995	1,016,320 (29.6)	832,524 (24.2)	4,373,182	890,543 (20.4)	840,311 (19.2)	534,000 (12.2)
Q2-lower middle	3,498,642	1,366,061 (39.0)	1,022,997 (29.2)	2,982,823	735,763 (24.7)	625,907 (21.0)	378,408 (12.7)
Q3-middle	3,516,094	1,414,199 (40.2)	1,033,082 (29.4)	2,883,315	707,708 (24.5)	607,962 (21.0)	400,987 (13.9)
Q4-upper middle	2,738,392	1,230,374 (44.9)	789,852 (28.8)	2,481,584	618,256 (24.9)	492,322 (19.8)	376,604 (15.2)
Q5-richest	2,267,430	1,165,237 (51.4)	804,437 (35.5)	2,353,220	616,022 (26.2)	479,234 (20.4)	428,017 (18.2)

BSE = breast self-examination; CBE = clinical breast examination; UC = universal coverage; CSMBS = Civil Servant Medical Benefit Scheme; SHI = social health insurance

Data derived from the 2007 HWS and 2009 RHS, weighted in accordance with the 2007 and 2009 Thai population

2007 HWS data include women aged 20 and older, whereas 2009 RHS data include women aged 30 to 59

After adjusting for characteristics of the women, monthly or less regular BSE was associated with having CBE but not with having a mammogram performed in the past five years. A significant trend was evident for frequency of BSE with having CBE performed in the past five years. There was no association between

Table 2. Adjusted odds ratios of performing breast self-examination and having clinical breast examination performed, the 2007 HWS and the 2009 RHS

Characteristics	Health and Welfare Survey (2007 HWS)				Reproductive Health Survey (2009 RHS)	
	BSE		CBE		Breast examinations (BSE | CBE | BSE & CBE)	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Age						
20-24	0.47 (0.36-0.62)	<0.001	0.51 (0.37-0.70)	<0.001		
25-29	0.67 (0.53-0.84)	0.001	0.53 (0.40-0.70)	<0.001		
30-34	0.94 (0.78-1.14)	0.542	0.71 (0.58-0.87)	0.001	0.55 (0.48-0.63)	<0.001
35-39	1.01 (0.85-1.21)	0.873	0.97 (0.81-1.16)	0.771	0.75 (0.66-0.85)	<0.001
40-44	1		1		1	
45-49	1.04 (0.87-1.24)	0.662	0.97 (0.81-1.15)	0.707	0.98 (0.86-1.12)	0.776
50-54	0.90 (0.75-1.08)	0.258	1.05 (0.87-1.26)	0.613	0.92 (0.80-1.04)	0.188
55-59	0.80 (0.66-0.97)	0.024	0.85 (0.70-1.04)	0.115	0.70 (0.61-0.80)	<0.001
60+	0.35 (0.29-0.42)	<0.001	0.37 (0.31-0.46)	<0.001		
Marital status						
Married	1		1		1	
Single	0.59 (0.49-.071)	<0.001	0.35 (0.28-0.43)	<0.001	0.54 (0.47-0.63)	<0.001
Widowed	0.73 (0.62-0.85)	<0.001	0.77 (0.65-0.91)	0.002	0.73 (0.63-0.85)	<0.001
Divorced/separated	0.94 (0.76-1.16)	0.579	0.80 (0.63-1.02)	0.072	0.74 (0.64-0.87)	<0.001
Religion						
Buddhist	1		1		1	
Muslim	0.55 (0.43-0.69)	<0.001	0.65 (0.49-0.85)	0.002	0.73 (0.61-0.87)	<0.001
Christian	1.10 (0.67-1.81)	0.720	1.41 (0.84-2.35)	0.191	0.89 (0.56-1.44)	0.646
Other	1.18 (0.12-11.8)	0.886	1.21 (0.11-12.7)	0.876	0.28 (0.07-1.07)	0.063
Area						
Municipal	1		1		1	
Non-municipal	1.15 (1.04-1.26)	0.005	1.14 (1.03-1.26)	0.010	1.14 (1.06-1.24)	0.001
Region						
Bangkok metropolis	1		1		1	
Central	0.60 (0.50-0.72)	<0.001	1.17 (0.96-1.44)	0.121	1.10 (0.95-1.27)	0.217
North	1.09 (0.90-1.31)	0.395	1.78 (1.44-2.19)	<0.001	2.04 (1.73-2.40)	<0.001
Northeast	1.08 (0.89-1.31)	0.452	1.78 (1.44-2.19)	<0.001	1.90 (1.62-2.22)	<0.001
South	1.02 (0.83-1.26)	0.837	1.21 (0.95-1.54)	0.120	1.42 (1.20-1.67)	<0.001
Education						
None	1		1		1	
Primary	1.62 (1.32-1.98)	<0.001	1.22 (1.00-1.50)	0.054	2.04 (1.67-2.49)	<0.001
Secondary	2.37 (1.86-3.01)	<0.001	1.26 (0.98-1.62)	0.075	2.58 (2.07-3.23)	<0.001
Bachelor	2.75 (2.05-3.69)	<0.001	1.40 (1.04-1.90)	0.027	3.50 (2.68-4.57)	<0.001
Master or higher	2.82 (1.53-5.21)	0.001	3.10 (1.59-6.02)	0.001	4.39 (2.81-6.84)	<0.001
Other	2.14 (0.57-8.11)	0.262	1.96 (0.54-7.14)	0.310	0.18 (0.05-0.74)	0.017
Health insurance						
UC	1		1		1	
CSMBS	1.48 (1.26-1.73)	<0.001	1.38 (1.17-1.63)	<0.001	1.16 (0.99-1.35)	0.071
SHI	0.86 (0.72-1.03)	0.099	0.79 (0.65-0.97)	0.023	1.02 (0.90-1.16)	0.757
Private insurance	1.25 (0.85-1.84)	0.264	1.03 (0.68-1.55)	0.887	1.14 (0.85-1.54)	0.373
No insurance	0.82 (0.62-1.10)	0.189	0.66 (0.44-0.98)	0.042	0.61 (0.46-0.80)	<0.001
Wealth quintile						
Q1-poorest	1		1		1	
Q2-lower middle	1.37 (1.17-1.60)	<0.001	1.24 (1.05-1.46)	0.010	1.26 (1.12-1.41)	<0.001
Q3-middle	1.34 (1.15-1.56)	<0.001	1.21 (1.02-1.42)	0.025	1.38 (1.22-1.55)	<0.001
Q4-upper middle	1.58 (1.34-1.85)	<0.001	1.18 (1.00-1.40)	0.055	1.45 (1.28-1.64)	<0.001
Q5-richest	1.75 (1.45-2.10)	<0.001	1.59 (1.29-1.95)	<0.001	1.69 (1.45-1.96)	<0.001

BSE = breast self-examination; CBE = clinical breast examination; OR = odds ratio; CI = confidence interval; UC = universal coverage; CSMBS = Civil Servant Medical Benefit Scheme; SHI = social health insurance
Models were adjusted for age, marital status, religion, area, region, education, health insurance, and wealth quintile

frequency of BSE and having a mammogram performed in the past five years, however there was a significant linear trend. Increasing frequency of CBE was highly associated with BSE. Similarly, having CBE at least once in the past five years was associated with having a mammogram. A significant trend was

Table 3. Distribution and adjusted odds ratios for having a mammogram by characteristics of women respondents, the 2007 HWS and the 2009 RHS

Characteristics	Health and Welfare Survey (2007 HWS)				Reproductive Health Survey (2009 RHS)			
	Number of respondents	Mammogram n (%)	Adjusted OR (95% CI)	*p*-value	Number of respondents	Mammogram n (%)	Adjusted OR (95% CI)	*p*-value
	9,120,626	536,415 (5.9)			15,074,124	1,525,919 (10.1)		
Age								
30-34					2,705,321	171,722 (6.3)	0.68 (0.52-0.89)	0.005
35-39					2,855,983	254,116 (8.9)	0.87 (0.68-1.11)	0.265
40-44	1,980,748	139,005 (7.0)	1		2,853,442	317,168 (11.1)	1	
45-49	1,767,034	114,366 (6.5)	0.92 (0.65-1.29)	0.617	2,633,874	313,385 (11.9)	1.04 (0.83-1.30)	0.745
50-54	1,565,965	111,138 (7.1)	1.14 (0.81-1.60)	0.453	2,274,151	277,527 (12.2)	1.07 (0.85-1.35)	0.548
55-59	1,143,967	78,511 (6.9)	1.13 (0.77-1.67)	0.527	1,751,353	192,001 (11.0)	1.14 (0.89-1.46)	0.312
60+	2,662,912	93,395 (3.5)	0.63 (0.41-0.97)	0.036				
Marital status								
Married	6,193,177	392,428 (6.3)	1		11,789,779	1,251,296 (10.6)	1	
Single	559,226	25,052 (4.5)	0.42 (0.26-0.67)	<0.001	1,358,313	116,605 (8.6)	0.98 (0.73-1.31)	0.898
Widowed	1,880,280	86,212 (4.6)	1.07 (0.73-1.56)	0.733	963,245	91,655 (9.5)	0.96 (0.72-1.30)	0.803
Divorced/separated	487,943	32,723 (6.7)	0.90 (0.55-1.49)	0.686	962,787	66,363 (6.9)	0.69 (0.51-0.93)	0.015
Religion								
Buddhist	8,650,418	512,722 (5.9)	1		14,271,466	1,470,883 (10.3)	1	
Muslim	411,698	23,397 (5.7)	0.82 (0.43-1.56)	0.547	726,347	48,032 (6.6)	0.87 (0.61-1.24)	0.431
Christian	55,391	296 (0.5)	0.08 (0.02-0.35)	0.001	59,908	6,059 (10.1)	0.44 (0.17-1.14)	0.091
Other	3,119	-	-	-	16,403	945 (5.8)	0.35 (0.02-5.18)	0.445
Area								
Municipal	2,627,757	251,908 (9.6)	1		5,053,073	672,005 (13.3)	1	
Non-municipal	6,492,869	284,508 (4.4)	0.77 (0.62-0.96)	0.019	10,021,051	853,914 (8.5)	0.71 (0.61-0.82)	<0.001
Region								
Bangkok metropolis	796,127	101,408 (12.7)	1		1,926,726	248,772 (13.0)	1	
Central	2,288,898	112,706 (4.9)	0.61 (0.42-0.87)	0.007	3,733,709	387,836 (10.4)	0.60 (0.45-0.80)	<0.001
North	1,949,232	84,927 (4.4)	0.65 (0.43-0.96)	0.029	2,778,421	263,591 (9.5)	0.44 (0.33-0.60)	<0.001
Northeast	2,953,845	153,195 (5.2)	0.90 (0.61-1.33)	0.609	4,781,148	446,153 (9.3)	0.51 (0.38-0.69)	<0.001
South	1,132,525	84,179 (7.4)	1.18 (0.77-1.82)	0.447	1,854,120	179,567 (9.7)	0.80 (0.58-1.10)	0.175
Education								
None	943,737	29,951 (3.2)	1		674,794	45,996 (6.8)	1	
Primary	6,823,985	319,946 (4.7)	1.09 (0.67-1.79)	0.732	9,616,220	786,809 (8.2)	0.74 (0.47-1.16)	0.192
Secondary	821,081	78,522 (9.6)	1.40 (0.77-2.52)	0.267	3,241,735	376,100 (11.6)	1.03 (0.63-1.67)	0.913
Bachelor	473,861	77,082 (16.3)	2.09 (1.12-3.89)	0.020	1,343,710	265,372 (19.7)	1.19 (0.71-2.01)	0.511
Master or higher	56,913	30,915 (54.3)	13.11 (5.69-30.2)	<0.001	188,092	51,102 (27.2)	1.58 (0.79-3.17)	0.196
Other	1,050	-	-	-	9,573	540 (5.6)	-	-
Health insurance								
UC	7,056,168	321,052 (4.5)	1		10,916,674	925,927 (8.5)	1	
CSMBS	1,337,475	141,209 (10.6)	1.08 (0.81-1.44)	0.605	1,282,544	273,018 (21.3)	1.40 (1.10-1.78)	0.007
SHI	427,293	45,375 (10.6)	1.34 (0.83-2.17)	0.237	2,233,525	261,075 (11.7)	1.29 (1.02-1.64)	0.037
Private insurance	90,166	14,684 (16.3)	1.22 (0.61-2.45)	0.574	232,040	38,082 (16.4)	1.11 (0.71-1.73)	0.654
No insurance	209,523	14,095 (6.7)	1.17 (0.55-2.47)	0.679	409,341	27,817 (6.8)	1.12 (0.65-1.95)	0.679
Wealth quintile								
Q1-poorest	2,102,022	55,402 (2.6)	1		4,373,182	305,223 (7.0)	1	
Q2-lower middle	1,973,060	73,922 (3.7)	1.31 (0.81-2.13)	0.276	2,982,823	225,871 (7.5)	0.99 (0.79-1.25)	0.951
Q3-middle	1,930,913	91,798 (4.8)	1.61 (1.00-2.59)	0.050	2,883,315	247,163 (8.5)	0.97 (0.77-1.22)	0.781
Q4-upper middle	1,637,070	110,217 (6.7)	2.13 (1.38-3.31)	0.001	2,481,584	265,995 (10.7)	1.06 (0.83-1.36)	0.618
Q5-richest	1,477,560	205,076 (13.9)	3.23 (2.06-5.06)	<0.001	2,353,220	481,667 (20.5)	1.94 (1.49-2.53)	<0.001

OR = odds ratio; CI = confidence interval; UC = universal coverage; CSMBS = Civil Servant Medical Benefit Scheme; SHI = social health insurance

- Insufficient data to calculate

Models were adjusted for age, marital status, religion, area, region, education, health insurance, and wealth quintile

In the 2007 HWS, mammogram data includes women aged 40 and older, the 2009 RHS includes women aged 30-59

also found for frequency of mammogram and having CBE performed in the past five years, but the trend was not significant for frequency of mammogram with having BSE in the past year.

Barriers related to mammography screening: the 2007 HWS

Table 5 presents the barriers of mammography screening among the women who did not undergo

Table 4. Adjusted odds ratios of breast cancer screening frequency with screening method, the 2007 Health and Welfare survey (HWS)

	Number of respondents n (%)	BSE in the past year		CBE in the past 5 years		Mammogram in the past 5 years	
		Adjusted OR (95% CI)	*p*-trend	Adjusted OR (95% CI)	*p*-trend	Adjusted OR (95% CI)	*p*-trend
Frequency of BSE in the past year (n = 15,457,553)					<0.001		0.004
Never	9,265,362 (59.9)	N/A		1		1	
Less than 4 times (every 4 months)	2,251,066 (14.6)	N/A		11.06 (9.13-13.39)*		1.03 (0.73-1.44)	
4 times (every 3 months)	574,985 (3.7)	N/A		12.33 (8.94-16.99)*		0.78 (0.43-1.42)	
6 times (every 2 months)	516,282 (3.3)	N/A		5.93 (4.22-8.33)*		0.90 (0.50-1.63)	
12 times (every month)	2,849,859 (18.4)	N/A		6.04 (5.08-7.18)*		1.33 (0.95-1.87)	
Frequency of CBE in the past 5 years (n = 15,457,553)			<0.001				<0.001
Never	10,974,661 (71.0)	1				1	
1 time	1,959,342 (12.7)	5.48 (4.52-6.65)*		N/A		14.15 (9.66-20.74)*	
2 times	918,364 (5.9)	6.39 (4.99-8.18)*		N/A		15.20 (9.97-23.17)*	
3 times	364,535 (2.4)	9.32 (6.29-13.80)*		N/A		13.74 (7.49-25.20)*	
4 times	92,761 (0.6)	17.90 (9.26-34.60)*		N/A		22.06 (7.36-66.14)*	
5 times	780,827 (5.1)	14.35 (10.70-19.23)*		N/A		18.15 (11.50-28.64)*	
More than 5 times	367,064 (2.4)	50.60 (28.84-88.79)*		N/A		16.99 (9.97-28.94)*	
Frequency of mammogram in the past 5 years (n = 9,120,626)			0.876		<0.001		
Never		1		1			
1 time	319,593 (3.5)	0.82 (0.58-1.18)		15.58 (9.84-24.66)*		N/A	
2 times	83,805 (0.9)	2.46 (1.24-4.89)*		8.90 (4.00-19.76)*		N/A	
3 times	26,579 (0.3)	1.03 (0.37-2.86)		20.89 (5.59-78.02)*		N/A	
4 times	15,578 (0.2)	2.16 (0.38-12.32)		-		N/A	
5 times	69,542 (0.8)	0.65 (0.26-1.66)		20.52 (6.06-69.46)*		N/A	
More than 5 times	21,319 (0.2)	1.04 (0.22-4.83)		38.50 (10.70-138.47)*		N/A	

BSE = breast self-examination; CBE = clinical breast examination; N/A = not applicable; OR = odds ratio; CI = confidence interval
* Statistically significant at *p*-value <0.05
- Insufficient data to calculate
All models were adjusted for age, marital status, religion, area, region, education, health insurance, wealth quintile, and frequency of other screening method (BSE, CBE, or mammogram)

Table 5. Reasons for not having mammogram by education level of respondents, the 2007 Health and Welfare Survey (HWS)

Reason for not having a mammogram	Education level			
	Secondary or lower n = 8,161,432	Bachelor n = 396,779	Master or higher n = 25,997	Total n = 8,584,208
Lack of knowledge about mammogram	4,949,547 (60.6)	91,189 (23.0)	4,439 (17.1)	5,045,175 (58.8)
Nothing wrong with breast	2,447,152 (30.0)	221,869 (55.9)	18,203 (70.0)	2,687,224 (31.3)
Lack of perceived need	548,884 (6.7)	46,962 (11.8)	1,371 (5.3)	597,217 (7.0)
Too expensive	76,121 (0.9)	6,902 (1.7)	676 (2.6)	83,699 (1.0)
Lack of time	50,098 (0.6)	9,410 (2.4)	-	59,508 (0.7)
Fear of getting hurt	30,786 (0.4)	17,210 (4.3)	1,261 (4.9)	49,257 (0.6)
Too embarrassed	27,162 (0.3)	865 (0.2)	-	28,027 (0.3)
Live too far from hospital	21,300 (0.3)	2,372 (0.6)	47 (0.2)	23,719 (0.3)
Not covered by health insurance	10,382 (0.1)	-	-	10,382 (0.1)

mammography screening in the past five years stratified by education level. Lack of knowledge about mammography was the most common reason overall (58.8%), followed by "feeling nothing wrong with breast (no symptoms)" and "lack of perceived need to have one performed" (38.3%). The most common reason for not having a mammogram performed among secondary or lower educated women was lack of knowledge (60.6%), while the most common reason stated by women with bachelor level and master or

higher level was "nothing wrong with their breast" (55.9% and 70.0%, respectively), followed by "lack of knowledge about mammography" (23.0% and 17.1%, respectively).

Discussion

The present study has found increasing rates of breast cancer screening from the two national surveys in 2007 and 2009 as compared to previous surveys in Thailand[12-14]. Among women in the 2007 HWS, the BSE uptake rate was 40.1% (95% CI: 39.0-41.0) and the CBE uptake rate was 29.0% (95% CI: 28.0-30.0), while the mammography uptake rate was 5.9% (95% CI: 5.3-6.0). In the 2009 RHS, the uptake rates of any breast examination (BSE, CBE, BSE & CBE) was 57.9% (95% CI: 57.0-59.0). The mammography uptake rate among women who have breast examination was 29.6% (95% CI: 28.2-31.0) or about 10.1% of women in the 2009 RHS. Among the women who performed BSE in 2007 HWS, only half performed it monthly.

These screening rates among Thai women were similar to those reported in other studies in low and middle-income countries such as Iran, Malaysia, and Turkey[15-18]. The uptake rates of breast cancer screening in the present study were lower than those in Canada (regular BSE 61% and CBE 96.8%)[19] and Great Britain (mammography 93%)[20], which is in agreement with reviews of literature that breast screening rates are lower in Asian women compared to western countries. This difference is likely due to the health financing mechanisms in the country, household affordability, and existence of organized breast screening program. This is consistent with the study which reported that countries with population based breast cancer screening programs achieve higher rates of attendance than those with opportunistic screening programs[21]. However, the higher uptake rates of breast examinations (BSE, CBE) in the present study among women aged 40 to 54 and the high mammography rate among women in the similar age groups have been welcome results since women in these age groups have the highest risk of developing breast cancer based on cancer registry data.

From the presented study, frequent CBE was associated with woman's decision to practice BSE and was associated with mammography. The similar finding was reported by Dahlui[17]. Such the phenomenon might be explained by the influence of common factors such as accessibility to and good attitude for cancer screening. This might also have resulted partly from the fact that CBE, when an abnormality was identified, mammography was subsequently offered. Women who practice BSE regularly were more likely to have CBE performed than those who did not. Women who practice regular BSE could detect breast changes more quickly and this might lead to further checkups with healthcare workers when suspicious lumps are found. The present study found no significant association between regular BSE and having a mammogram (Table 4). This result was supported by a previous study suggesting that not recommending BSE was unlikely to influence mammography[19]. Frequent use of mammogram screening in our study was also found to be associated with having CBE performed. This was because in Thailand, CBE was always performed when a suspicious finding was spotted during mammography, as discussed in the previous section.

The odds of breast cancer screening uptake in 2007 were significantly lower among women aged 60 years and over compared with women aged 40 to 45 years (Table 2, 3). This result was the same as the previous study in India[22]. This may suggest that old women in low and middle-income countries are lack of knowledge or familiarity with the specific guidelines and screening methods. This study also found lower screening rates among women younger than 30 years. Such practice conformed with the low yield of cancer detection because of the technical difficulty associated with the ability to identify a suspicious lump in breasts with a high density of mammary tissue, which was common in young women[23].

Women who were not married (single/widowed/divorced) were less likely to perform BSE and have CBE performed than married women (Table 2), and single women were less likely to undergo mammography screening (Table 3). Married women were more likely to attend reproductive health services. They would therefore have higher perceived risk of cancer and be encouraged to have more frequent medical checkups. Previous studies suggested that being married was associated with higher rates of breast cancer screening[22,24]. There might be a perception among women that active sexual life was related to breast cancer[16].

The present study demonstrated that Muslims, who represented the second most common religious group in Thailand, were significantly less likely to practice BSE and have CBE performed than Buddhists, who represented the most common religious group (Table 2), while Christians were less likely to have a mammogram (Table 3). As reported in Turkey, there

were low rates of regular BSE and mammography among Muslim women[18]. Compared to Hindus, lower breast screening rates among Muslims were also found in India[22]. There might be religious reasons behind less frequent screening uptake rates among different religious groups of women. Lower uptake rates might also be related to cultural attitudes toward breast cancer screening and even social status among different religious groups.

CBE uptake was significantly lower among women living in the Bangkok metropolis and among women living in the municipal areas of other regions of Thailand. These findings might be partially due to the effects of health service utilization and economic factors in relation to geographic regions. Area-socioeconomic status was a significant predictor of breast screening behaviors in the study in Singapore[25]. The results indicated that uptake rates of mammogram screening were significantly higher in the Bangkok metropolis and in municipal areas than in other regions and non-municipal areas, respectively. A possible cause was that inequitable distribution of mammogram facilities and radiologists was widely existed. The finding from the previous study in Thailand regarding resource allocation of mammography screening showed most mammogram facilities were concentrated in the Bangkok metropolis, where half of all radiologists in Thailand worked, whereas the northern region contained the least number of facilities[26].

The survey results revealed similar findings consistent with those previously reported that women with high socioeconomic status had higher likelihood of breast cancer screening. Education was positively associated with breast cancer screening in the present study. Women with a college education (bachelor's, master's or higher level) were more likely to perform BSE and have CBE and mammogram performed. These results were supported by two previous studies[24,27]. Health care infrastructure of Thailand is set up better in rural than urban areas, thus, BSE and CBE are better provided to women in rural areas with lower level of education while it is the reverse for mammography to which educated women in urban areas have better access.

Screening uptake rates increased with increasing wealth quintile. A similar effect of higher rates of breast cancer screening with higher wealth status was found in other studies[20,22]. Women in the richest wealth quintile were more likely to have a screening mammogram in the past five years. Use of mammography screening was mostly self-paid, 2,000 to 3,000 baht per test (US$ 67-100 at exchange rate of 30 baht per US dollar) in the public sector and 8,000 to 12,000 baht (US$ 267-400) in the private sector. The high cost is unaffordable for the poor.

The odds of CBE were significantly lower for women without health insurance compared to women insured with the UC scheme. In Thailand, all three main public health insurance schemes (UC, CSMBS, SHI) cover clinical breast examination and UC covers more than 70% of Thais, thus women are more likely to access this service if they do not have to pay for it. After the introduction of UC in 2001, access to screening for breast cancer with clinical breast examinations performed by health workers slightly increased[13,14]. Women covered by CSMBS had a significantly higher rate of screening uptake than women with UC. This is consistent with another study from Thailand showing that women with CSMBS had better access to mammography than women in other health insurance schemes[28]. There may be other factors involved such as geographic and economic distribution of the population and high-technology medical services.

There were two major barriers reported by women to have a mammogram, lack of knowledge of screening method and feeling that nothing was wrong. Lack of knowledge of mammogram was the most common reason among the lower educated women, while 'feeling nothing was wrong with the breasts' was the most common reason among higher educated women. This may be partially due to lack of promoting information on breast cancer screening with mammography and cancer awareness among Thai society. A previous study in Malaysia showed that awareness of breast cancer and practice of screening procedures increased with higher education and urban living[29].

Conclusion

A high breast cancer screening uptake rates in high-risk women (according to age) was desirable, however a low uptake of monthly BSE and mammography was revealed. Since CBE was found to be associated with mammogram, it should be done frequently and effectively, while BSE should be advocated to increase awareness and prompt more women to have CBE. Strategies for improving screening uptake rates need to focus on woman with low education levels and characteristics related to lower screening uptake to reduce some barriers of lack of knowledge and awareness of breast cancer screening.

Low screening uptake among low socio-economic groups and different regions must be a high concern in cancer screening programs and in general public health policies. Further population-based studies are needed to determine incidence and mortality from breast cancer among women with different demographic profiles such as Muslims.

Strength and limitation

The present study benefited from the use of data collected from a large, well-designed surveys and the nature of population-based household surveys with standard sampling methods and quality control processes. Nonetheless, the cross-sectional design could show only associations and not causality. As with all household surveys, the data were collected on the basis of the household member's memory, which was prone to recall and other information biases.

What is already known on this topic?

Early detection of breast cancer through breast self-examination (BSE), clinical breast examination (CBE), and mammography are recommended. Effective breast cancer screening programs contribute to early detection lead to cure and save lives.

Thailand has limitation of establishing a nationwide organized breast cancer screening. Main health insurance schemes cover CBE, diagnostic and treatment but not mammography for screening purpose. After the introduction of universal health coverage in 2001, access to screening for breast cancer with CBE performed by health workers slightly increased.

The previous survey reports of National Statistical Office of Thailand (NSO) revealed the coverage of breast cancer screening had moderately increased over the past decade, though mammography uptake remains low. However, the reports can present only frequency counts with percentage to describe the distribution of the study population, and not associations. Therefore, research is needed by using data of NSO to assess the association between the factors and screening uptake for supporting evidence and implementation of activities to improve access to breast screening services of population.

What this study adds?

Increasing rates of breast cancer screening among Thai women in 2007 and 2009 as compared to previous surveys in Thailand were demonstrated, however, a low uptake of monthly BSE and mammography was observed. Increased uptake of CBE should lead to a higher rate of mammography and BSE since frequency of CBE was found to be positively associated with these two screening methods.

Socioeconomic disparities in breast cancer screening exist. The survey results revealed that women with a high socioeconomic status had higher likelihood of breast cancer screening. Higher educated were more likely to have screening, notably mammogram. Women in the poorest quintiles were less likely to screen breast than the richer women. Civil Servant Medical Benefit Scheme increased the propensity of having breast screenings, while having no insurance decreased the probability of breast screening.

Strategies for improving screening uptake such as participation in screening activities need to focus on woman with low education levels, older women, those who are not married and non-Buddhists. Lack of awareness and knowledge of breast cancer screening were main barriers contributed to less screening uptake. The awareness through proper BSE technique and effective CBE are recommended in the population. Health care officers should provide knowledge of breast screening and training in proper BSE.

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Potential conflicts of interest

None.

References

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. GLOBOCAN 2012 v1.0, Estimated cancer incidence, mortality and prevalence worldwide 2012: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013 [cited 2014 Jul 30]. Available from: http://globocan.iarc.fr/
2. International Agency for Research on Cancer (IARC). Latest world cancer statistics, global cancer burden rises to 14.1 million new cases in 2012: Marked increase in breast cancers must be addressed. Lyon, France: IARC Press; 2013.
3. Khuhaprema T, Attasara P, Sriplung H, Wiangnon S, Sangrajrang S, editors. Cancer in Thailand

volume VII, 2007-2009. Bangkok: Bangkok Medical Publisher; 2013.
4. Virani S, Sriplung H, Rozek LS, Meza R. Escalating burden of breast cancer in southern Thailand: analysis of 1990-2010 incidence and prediction of future trends. Cancer Epidemiol 2014; 38: 235-43.
5. Amranand N, Nagpal S, Nesterenko I, Rankova A, Tam K, Tangkijngamvong N. Promoting awareness and early detection of breast cancer in Thailand. Bangkok: Bangkok Breast Cancer Support Group and Queen Sirikit Centre for Breast Cancer; 2010.
6. International Agency for Research on Cancer (IARC). Mammography screening can reduce deaths from breast cancer. Press Release No.139, Volume 2003. Lyon, France: IARC Press; 2002.
7. Smith RA, Saslow D, Sawyer KA, Burke W, Costanza ME, Evans WP III, et al. American Cancer Society guidelines for breast cancer screening: update 2003. CA Cancer J Clin 2003; 53: 141-69.
8. World Health Organization. Breast cancer: prevention and control [Internet]. Geneva: WHO; 2014 [cited 2014 Jul 30]. Available from: http://www.who.int/cancer/detection/breastcancer/en/
9. Sankaranarayanan R, Swaminathan R, Jayant K, Brenner H. An overview of cancer survival in Africa, Asia, the Caribbean and Central America: the case for investment in cancer health services. IARC Sci Publ 2011; (162): 257-91.
10. Filmer D, Pritchett LH. Estimating wealth effects without expenditure data--or tears: an application to educational enrollments in states of India. Demography 2001; 38: 115-32.
11. Sahn DE, Stifel D. Exploring alternative measures of welfare in the absence of expenditure Data. New York: Department of Economics, Cornell University; 2001.
12. National Statistical Office. Report on reproductive health survey, 2006. Bangkok: Statistical Forecasting Bureau, National Statistical Office; 2006.
13. Porapakham Y, Bunyaratapun P. The third national health examination survey, 2003-4. Nonthaburi: Health System Research Institute; 2006.
14. Aekpalakorn W. Report on the fourth national health examination survey, 2008-9. Nonthaburi: Health System Research Institute; 2010.
15. Khalili AF, Shahnazi M. Breast cancer screening (breast self-examination, clinical breast exam, and mammography) in women referred to health centers in Tabriz, Iran. Indian J Med Sci 2010; 64: 149-62.
16. Tavafian SS, Hasani L, Aghamolaei T, Zare S, Gregory D. Prediction of breast self-examination in a sample of Iranian women: an application of the Health Belief Model. BMC Womens Health 2009; 9: 37.
17. Dahlui M, Gan DE, Taib NA, Pritam R, Lim J. Predictors of breast cancer screening uptake: a pre intervention community survey in Malaysia. Asian Pac J Cancer Prev 2012; 13: 3443-9.
18. Secginli S, Nahcivan NO. Factors associated with breast cancer screening behaviours in a sample of Turkish women: a questionnaire survey. Int J Nurs Stud 2006; 43: 161-71.
19. Jelinski SE, Maxwell CJ, Onysko J, Bancej CM. The influence of breast self-examination on subsequent mammography participation. Am J Public Health 2005; 95: 506-11.
20. Moser K, Patnick J, Beral V. Inequalities in reported use of breast and cervical screening in Great Britain: analysis of cross sectional survey data. BMJ 2009; 338: b2025.
21. Palencia L, Espelt A, Rodriguez-Sanz M, Puigpinos R, Pons-Vigues M, Pasarin MI, et al. Socio-economic inequalities in breast and cervical cancer screening practices in Europe: influence of the type of screening program. Int J Epidemiol 2010; 39: 757-65.
22. Grosse FK, Ramadas K, Anju GA, Mathew BS, Muwonge R, Sauvaget CS, et al. Determinants of participation in a breast cancer screening trial in trivandrum district, India. Asian Pac J Cancer Prev 2013; 14: 7301-7.
23. Checka CM, Chun JE, Schnabel FR, Lee J, Toth H. The relationship of mammographic density and age: implications for breast cancer screening. AJR Am J Roentgenol 2012; 198: W292-5.
24. Park MJ, Park EC, Choi KS, Jun JK, Lee HY. Sociodemographic gradients in breast and cervical cancer screening in Korea: the Korean National Cancer Screening Survey (KNCSS) 2005-2009. BMC Cancer 2011; 11: 257.
25. Wee LE, Koh GC, Chin RT, Yeo WX, Seow B, Chua D. Socioeconomic factors affecting colorectal, breast and cervical cancer screening in an Asian urban low-income setting at baseline and post-intervention. Prev Med 2012; 55: 61-7.
26. Putthasri W, Tangcharoensathien V, Mugem S, Jindawatana W. Geographical distribution and

utilization of mammography in Thailand. Regional Health Forum 2004; 8: 84-91.
27. Damiani G, Federico B, Basso D, Ronconi A, Bianchi CB, Anzellotti GM, et al. Socioeconomic disparities in the uptake of breast and cervical cancer screening in Italy: a cross sectional study. BMC Public Health 2012; 12: 99.
28. Putthasri W, Tangcharoensathien V, Mugem S, Jindawatana W. Equity of access to mammography service among beneficiaries of different health insurance schemes in Thailand. Chula Med J 2004; 48: 455-64.
29. Kanaga KC, Nithiya J, Shatirah MF. Awareness of breast cancer and screening procedures among Malaysian women. Asian Pac J Cancer Prev 2011; 12: 1965-7.

การตรวจคัดกรองมะเร็งเต้านมของสตรีไทย: วิเคราะห์ข้อมูลประชากรจากการสำรวจครัวเรือนทั่วประเทศ

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วัตถุประสงค์: *โรคมะเร็งเต้านมเป็นมะเร็งที่มีอุบัติการณ์ที่สูงที่สุดในสตรีไทยและอุบัติการณ์ของโรคนี้เพิ่มขึ้นอย่างต่อเนื่องในช่วงทศวรรษที่ผ่านมา การศึกษานี้มีวัตถุประสงค์เพื่อวิเคราะห์อัตราการตรวจคัดกรองมะเร็งเต้านมได้แก่ การตรวจเต้านมด้วยตนเอง การตรวจโดยแพทย์ และการตรวจด้วยเครื่องถ่ายภาพรังสีเต้านม และเพื่อระบุปัจจัยที่มีความสัมพันธ์และอุปสรรคที่เกี่ยวข้องกับการตรวจคัดกรองมะเร็งเต้านมของสตรีไทย*

วัสดุและวิธีการ: *ศึกษาวิเคราะห์ข้อมูลทุติยภูมิจากการสำรวจประชากรตามครัวเรือนตัวอย่าง ได้แก่ การสำรวจอนามัยและสวัสดิการ พ.ศ. 2550 ข้อมูลประกอบด้วยผู้หญิงอายุ 20 ปีขึ้นไป จำนวน 18,474 คน และข้อมูลการสำรวจอนามัยการเจริญพันธุ์ พ.ศ. 2552 ประกอบด้วยผู้หญิงอายุ 30-59 ปี จำนวน 26,951 คน โดยวิเคราะห์การถดถอยโลจิสติกหลายตัวแปรเพื่อหาปัจจัยที่สัมพันธ์กับการตรวจคัดกรองมะเร็งเต้านม*

ผลการศึกษา: *การสำรวจ พ.ศ. 2550 พบอัตราการตรวจคัดกรองมะเร็งเต้านมด้วยตนเองร้อยละ 40.1 (ตรวจด้วยตนเองเป็นประจำทุกเดือนร้อยละ 18.4) ตรวจโดยแพทย์ร้อยละ 29 และตรวจด้วยเครื่องถ่ายภาพรังสีเต้านมร้อยละ 5.9 ผลการสำรวจ พ.ศ. 2552 การตรวจเต้านมทั้งวิธีการตรวจด้วยตนเองหรือตรวจโดยแพทย์มีอัตรารวมร้อยละ 57.9 ส่วนอัตราการตรวจด้วยเครื่องถ่ายภาพรังสีเต้านมในกลุ่มผู้หญิงที่ทำการตรวจเต้านมด้วยตนเองหรือตรวจโดยแพทย์พบร้อยละ 29.6 (คิดเป็นร้อยละ 10.1 ของผู้หญิงใน พ.ศ. 2552) การตรวจเต้านมโดยแพทย์เป็นประจำพบว่ามีความสัมพันธ์เชิงบวกกับการตรวจเต้านมด้วยตนเองและการตรวจด้วยเครื่องถ่ายภาพรังสีเต้านม ปัจจัยที่มีความสัมพันธ์กับการตรวจคัดกรองมะเร็งเต้านม ได้แก่ การศึกษาระดับปริญญาตรีหรือสูงกว่ากลุ่มที่รวยสุดร้อยละ 20 พิจารณาจากดัชนีความมั่งคั่งตามสินทรัพย์ของครัวเรือน และกลุ่มสิทธิสวัสดิการรักษาพยาบาลข้าราชการ ผู้ที่อาศัยอยู่ในเขตกรุงเทพมหานครและในเขตเทศบาลของจังหวัดอื่น ๆ มีอัตราการตรวจเต้านมด้วยเครื่องแมมโมแกรมสูงกว่าพื้นที่อื่น ในขณะที่ผู้หญิงที่อาศัยอยู่ในภาคเหนือ และภาคตะวันออกเฉียงเหนือ และพื้นที่นอกเขตเทศบาลมีแนวโน้มที่จะตรวจเต้านมด้วยตนเองและรับการตรวจโดยแพทย์สูงกว่าผู้ที่อาศัยอยู่ในกรุงเทพมหานครและเขตเทศบาล จากผลการสำรวจทั้งสองปี ปัจจัยที่เกี่ยวข้องกับการตรวจคัดกรองมะเร็งเต้านมที่ลดลงได้แก่ อายุ 55 ปีขึ้นไป สถานภาพสมรสเป็นโสดหรือม่าย เป็นมุสลิมหรือคริสเตียน และการไม่มีสิทธิหรือสวัสดิการสุขภาพใด ๆ การขาดความรู้และความตระหนักในเรื่องการตรวจคัดกรองมะเร็งเต้านมพบว่าเป็นอุปสรรคในการตรวจเต้านมของผู้หญิงโดยเฉพาะในกลุ่มที่มีระดับการศึกษาต่ำ

สรุป: *การตรวจคัดกรองมะเร็งเต้านมด้วยตนเองเป็นประจำทุกเดือนและการตรวจด้วยเครื่องแมมโมแกรมที่มีอัตราค่อนข้างต่ำควรเพิ่มด้วยการส่งเสริมการตรวจเต้านมด้วยตนเองอย่างถูกวิธีและการตรวจโดยแพทย์ที่มีประสิทธิผล การเพิ่มอัตราการตรวจเต้านมโดยแพทย์จะส่งผลต่อการเพิ่มอัตราการตรวจด้วยเครื่องถ่ายภาพรังสี ควรส่งเสริมความรู้ ความตระหนัก และการเข้าร่วมกิจกรรมการตรวจคัดกรองมะเร็งเต้านมในผู้หญิงกลุ่มต่าง ๆ ได้แก่ กลุ่มที่มีอายุมาก กลุ่มที่ไม่ได้มีสถานภาพสมรส กลุ่มที่ไม่ได้นับถือศาสนาพุทธ และกลุ่มที่มีการศึกษาต่ำ*