



CHAPTER 1
PREVENTION AND
EARLY DETECTION
OF BREAST CANCER

CHAPTER 1 PREVENTION AND EARLY DETECTION OF BREAST CANCER

This chapter reviews the demographics and lifestyle of Hong Kong breast cancer patients in order to provide insight into potential factors that may increase the risk of breast cancer and may contribute to the increasing incidence rate of breast cancer observed in Hong Kong. The following chapter reviews the cumulative and representative lifestyle, demographic and socioeconomic

data collected from the HKBCR patient cohort, consisting of 9,804 patients.

Of the 9,804 patients in the HKBCR patient cohort, 6 patients were male. For this chapter only female patient data was used (9,798 patients).

KEY FINDINGS

- The mean and median ages of diagnosis of patients were 50.6 and 49.3 years respectively.
- Occurrence of breast cancer was highest between the ages of 40-49 in Hong Kong (39.6%).
- The top ten most common risk factors in the patient cohort were:
 - Lack of exercise (<3hrs / week) (75.6%)
 - No breastfeeding (65.4%)
 - High level of stress (>50% of time) (37.5%)
 - Being overweight / obese (36.5%)
 - No childbirth / First live birth after age 35 (24.3%)
 - Diet rich in meat/ dairy products (14.5%)
 - Family history of breast cancer (14.5%)
 - Early menarche (<12 years old) (13.4%)
 - Use of hormonal replacement therapy (6.9%)
 - Frequent night shift (4.7%)
- Screening Habits
 - Less than 50% of women in all age groups attended regular clinical breast examination.
 - Only a quarter or less of women in all age groups regularly conducted breast self-examination, mammography screening and ultrasound breast examination.
 - Screening that involved attending a medical facility (clinical breast examination, mammography screening and ultrasound breast examination) were used regularly by more women on Hong Kong Island (55%, 36.2% and 28.7% respectively) than Kowloon (35.8%, 19.9% and 15.6% respectively) and the New Territories (39.4%, 17.7% and 15.8% respectively).

1.1 Demographics

The importance of studying age distribution individually in each population group has been demonstrated by several studies. The breast cancer age distribution can differ significantly among population groups⁵⁻⁸.

Analysis of age distribution data revealed that while there was a large age range at diagnosis, ranging from 18.8-101.4, the relative frequency of breast cancer was highest between the ages of 40-49 in Hong Kong (39.6%), followed by the ages of 50-59 (30.5%) (Figure 1.1). Consistent with this, the mean age of diagnosis was 50.6 years old with a standard deviation of 10.3 years, and median age of diagnosis was 49.3 years old.

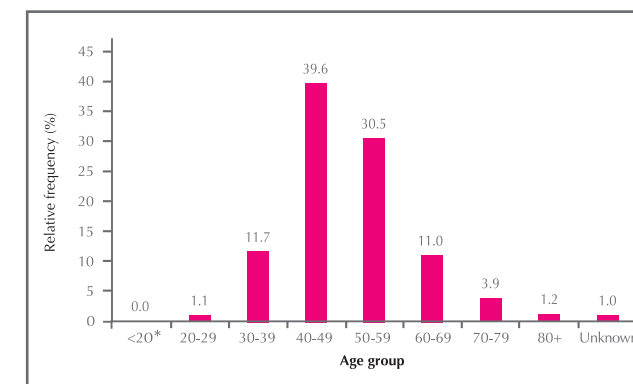


Figure 1.1 Distribution of age at diagnosis (N=9,798)

* 2 patients belonged to the <20 age group.

In the patient cohort, 58% were employed or had an occupation. The portion of patients with a professional/clerical occupation (33%) was higher than that with non-clerical/labour occupation (22%). The mean working hours was 46.4 hours per week with a standard deviation of 14.4 hours per week. Interestingly, housewives made the second largest group (31%) of patients in the cohort (Figure 1.2).

The potential effect of night shift work and breast cancer was first suggested in 1992⁹. Shift work causes disruption to the circadian rhythm and has been classified as “probably carcinogenic” to humans by the International Agency for Research on Cancer (IARC) in 2007.

Within the patient cohort, 8.3% (N=464) of patients were carrying out night shifts before diagnosis with a median frequency of night shifts on 84 nights per year.

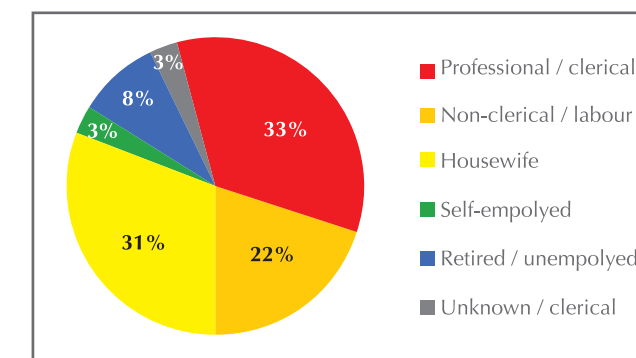


Figure 1.2 Occupation of the patients (N=9,798)

Almost half (49%) of the patients were educated to secondary school level and more than half (55%) of the patients lived in the New Territories (Figures 1.3 and 1.4). Less than half (44%) of patients had monthly household income between 10,000 and 29,999 HKD, while 20% of patients had monthly household income less than 10,000 HKD (Figure 1.5).

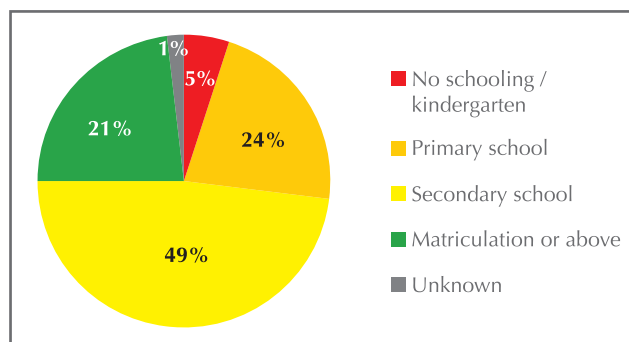


Figure 1.3 Education level of the patients (N=9,798)

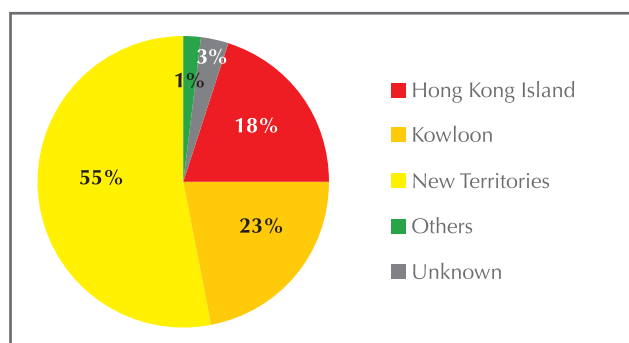


Figure 1.4 Distribution of residential districts of the patients (N=9,798)

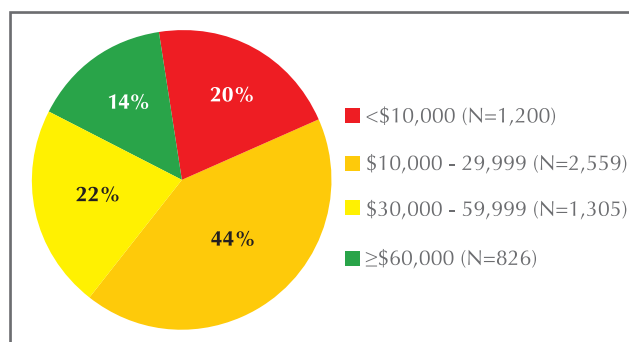


Figure 1.5 Monthly household income of the patients (N=5,890)

Patient bra size varied, with the most frequent size being 34 inches (25.8%) (Figure 1.6) and the most common cup size was B or smaller (54.5%) (Figure 1.7).

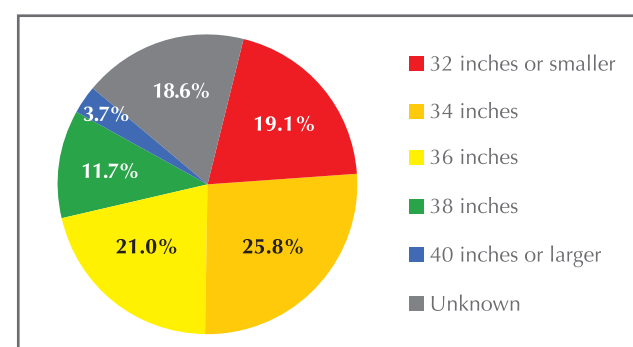


Figure 1.6 Bra size of the patients (N=9,798)

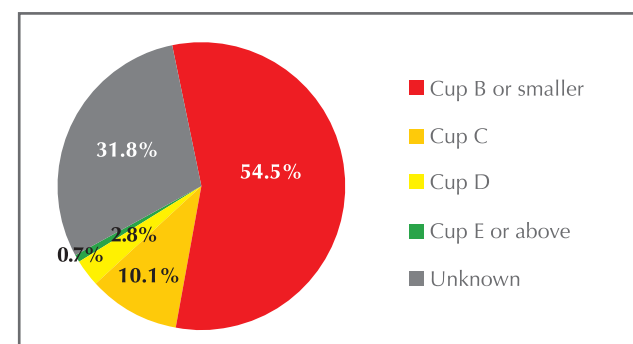


Figure 1.7 Bra cup size of the patients (N=9,798)

1.2 Risk factors and health background

Smoking and alcohol drinking are known risk factors for breast cancer.

1.2.1 Smoking

Of the patient cohort 4.5% (N=444) smoked for an average duration of 18.8 years at a rate of 3.7 cigarette packs per week. Among those who smoked, 46.8% (N=208) had quit smoking for an average of 6.9 years at the time of diagnosis.

1.2.2 Alcohol drinking

Only 4.9% (N=485) were alcohol drinkers who on average drank for a mean duration of 14.9 years with an approximate consumption of 5.6 glasses of alcoholic beverages per week. Among these patients who drank alcohol, the most commonly consumed alcoholic beverages were red wine (27.2%), beer (23.5%) and beer/wine (13.8%). 12.2% of patients who drank had stopped drinking at the time of diagnosis.

1.2.3 Dietary habits, exercise and stress level

67.5% of the patients ate a balanced diet, however 75.5% had less than 3 hours exercise per week and 37.5% had high levels of stress at the time of diagnosis (Table 1.1).

Table 1.1 Dietary habits, exercise habits and stress level at the time of diagnosis (N=9,798)

	Number	(%)
Dietary habit		
Meat rich / dairy product rich	1,422	(14.5)
Vegetable rich / Vegetarian	1,325	(13.5)
Balanced diet	6,615	(67.5)
Unknown	436	(4.4)
Exercise		
Never	4,060	(41.4)
< 3 hours per week	3,344	(34.1)
≥ 3 hours per week	2,303	(23.5)
Unknown	91	(0.9)
Stress level		
High level*	3,677	(37.5)
Moderate level**	2,757	(28.1)
Low level	3,211	(32.8)
Unknown	153	(1.6)

* High level: defined as more than 50% of the time

** Moderate level: defined as 25-50% of the time

1.2.4 Body mass index

Diet, exercise and stress are all factors that affect patients' weight. Body Mass Index (BMI) is a heuristic method of estimating human body fat based on an individual's height and weight.

Increased BMI has been shown to be a risk factor for breast cancer particularly in postmenopausal women^{10, 11}. For Asian adults, a BMI of 23-24.9 is considered overweight, and a BMI of 25 and over is considered obese (WHO classification)¹². 36.4% of the patient cohort was overweight or obese (Table 1.2).

The average height and weight of the patient cohort were 157.8cm and 56.6kg respectively with standard deviations of 5.5cm and 8.9kg respectively. The median height and weight of the patient cohort were 157.7cm and 55.0kg respectively.

Table 1.2 Body mass index at the time of diagnosis (N=9,798)

	Number	(%)
BMI		
≥ 25.0 (Obese)	1,933	(19.7)
23.0-24.9 (Overweight)	1,641	(16.7)
18.5-22.9 (Normal weight)	4,290	(43.8)
< 18.5 (Underweight)	686	(7.0)
Unknown	1,248	(12.7)

1.2.5 Family history of breast cancer

Family history is an important risk factor for breast cancer. Individual risk has been shown to increase with increasing number of relatives with breast cancer. 14.5% of patients had a family history of breast cancer, while most patients (84%) had no family history of breast cancer at the time of diagnosis (Table 1.3).

Table 1.3 Family history of patient cohort at the time of diagnosis (N=9,798)

	Number	(%)
No	8,234	(84.0)
Yes		
First-degree relative(s)	967	(9.9)
Non first-degree relative(s)	417	(4.3)
Details unknown	33	(0.3)
Unknown family history	147	(1.5)

1.2.6 Personal history of tumours

Majority (79.9%) of patients had no previous history of tumours. Only 2.2% had previous history of malignant tumours at the time of diagnosis (Table 1.4). The type of malignant tumour varied greatly, the most common being thyroid cancer (12.3%) (Table 1.5).

Table 1.4 Personal histories of tumours of the patient cohort at the time of diagnosis (N=9,798)

History of tumours	Number	(%)
No	7,825	(79.9)
Benign tumour	1,414	(14.4)
Malignant tumour	211	(2.2)
Unknown nature of previous tumours	54	(0.6)
Unknown history of tumours	294	(3.0)

Table 1.5 Types of malignant tumours reported by the patients (N=211)

Type of malignant tumours	Number	(%)
Thyroid cancer	26	(12.3)
Colorectal cancer	20	(9.5)
Cervical cancer	11	(5.2)
Uterine cancer	10	(4.7)
Lymphoma	7	(3.3)
Nasopharyngeal cancer	6	(2.8)
Ovarian cancer	6	(2.8)
Lung cancer	4	(1.9)
Intestinal cancer	3	(1.4)
Skin cancer	3	(1.4)
Stomach cancer	3	(1.4)
Esophagus cancer	2	(0.9)
Leukemia	2	(0.9)
Liver cancer	2	(0.9)
Medullary cancer	2	(0.9)
Tongue cancer	2	(0.9)
Urological cancer	2	(0.9)
Others*	7	(3.3)
Unknown	98	(46.4)

* Others include: bone cancer, fallopian tube cancer, nasal cancer, neck cancer, parotid gland cancer, salivary gland cancer, sigmoid cancer.

1.2.7 History of benign breast disease

Benign breast disease is common among women of reproductive age. Conditions such as atypia and papillomatosis are known risk factors of breast cancer. The magnitude of association with risk of breast cancer varied with the type of the lesion¹³⁻¹⁵. Of the patients with history of benign breast disease, only 1.2% had atypia and 0.1% had papillomatosis (Table 1.6).

Table 1.6 History of breast disease at the time of diagnosis

	Number	(%)
History of previous breast disease	1,437	(14.7)
Type of previous breast disease		
Fibroadenoma	633	(44.0)
Fibrocystic disease	115	(8.0)
Papilloma	27	(1.9)
Papillomatosis	2	(0.1)
Atypia	17	(1.2)
Others (Gynaecomastia, other benign tumours)	650	(45.2)

1.2.8 Early menarche, late menopause and reproductive history

Reproductive factors such as early menarche, late age at menopause, delayed or no childbirth, no breastfeeding and parity all play a role in the increased risk factors of breast cancer¹⁶⁻¹⁷. The complex interplay between these factors results in accumulative effect of these risk factors. 13.4% of the patient cohort experienced early menarche, while only 4.2% of the menopausal patients experienced late menopause (Table 1.7). The reported mean and median ages at menarche were 13.2 years and 13.0 years respectively. The reported mean and median ages of menopause were 49.1 years and 50.0 years respectively.

Table 1.7 Early menarche, late menopause and reproductive history at the time of diagnosis

	Number	(%)
Menarche (N=9,798)		
Early menarche (<12 years of age)	1,312	(13.4)
Normal menarche (≥ 12 years of age)	7,830	(79.9)
Unknown	656	(6.7)
Menopause (N=4,730)		
Late menopause (>55 years of age)	199	(4.2)
Normal menopause (≤ 55 years of age)	3,893	(82.3)
Unknown age at menopause	638	(13.5)
Reproductive history (N=9,364)		
No childbirth	2,013	(21.5)
First childbirth at ≤ 35 years of age	6,770	(72.3)
First childbirth at >35 years of age	367	(3.9)
Unknown age at first live birth	214	(2.3)
Breastfeeding (N=9,798)		
Yes	2,922	(29.8)
No (Had childbirth)	4,327	(44.2)
No (No childbirth)	2,012	(20.5)
No (Unknown reproductive history)	64	(0.7)
Unknown	473	(4.8)

One-fifth (21.5%) of patients did not experience pregnancy, while 3.9% had first childbirth at late age (>35 years of age) and 65.4% of patients did not breast feed (Table 1.7). Numbers of live births are shown in Table 1.8. The mean age at first live birth was 26.8 years. Around one-third of the patients (29.8%) had breastfed their children, with a mean duration of 15.1 months (SD: 20.7 months, range: 0.1-216.0 months) (Table 1.7).

Table 1.8 Number of live births reported by patients (N=7,351)

No. of live births	Number	(%)
1	1,951	(26.5)
2	3,312	(45.1)
3	1,283	(17.5)
4	446	(6.1)
5	169	(2.3)
6	85	(1.2)
7	30	(0.4)
8	9	(0.1)
10+	5	(0.1)
Unknown	61	(0.8)

1.2.9 Use of oral contraceptives

Use of oral contraceptives as a risk factor for breast cancer is an area of controversy. More information is needed before a conclusion can be drawn. However data is still collected for potential future analysis. 32.1% of patients in the cohort used oral contraceptives, 12.4% of patients used oral contraceptives for 5 years or more (Table 1.9).

Table 1.9 Use of oral contraceptives at the time of diagnosis (N=9,798)

OC use	Number	(%)
Non-user	6,253	(63.8)
OC use < 5 years	1,434	(14.6)
OC use 5-10 years	844	(8.6)
OC use > 10 years	374	(3.8)
Unknown length of OC use	490	(5.0)
Unknown if OC was used	403	(4.1)

OC: Oral contraceptives

1.2.10 Use of hormone replacement therapy

Hormone replacement therapy (HRT) is used to provide relief from symptoms of menopause. The use of HRT is shown to increase the risk of breast cancer in women^{18,19}. Only 10.4% of menopausal patients in the patient cohort used HRT (Table 1.10).

Table 1.10 Use of hormone replacement therapy (by post-menopausal patients) at the time of diagnosis (N=4,730)

HRT use	Number	(%)
Non-user	4,014	(84.9)
HRT use < 5 years	264	(5.6)
HRT use 5-10 years	143	(3.0)
HRT use > 10 years	29	(0.6)
Unknown length of HRT use	59	(1.2)
Unknown if HRT was used	221	(4.7)

HRT: Hormone replacement therapy

1.2.11 The ten most common risk factors in the patient cohort

Among the risk factors, lack of exercise is the most common risk factor among patients within the cohort. No breastfeeding is the second most common risk factor, closely followed by high levels of stress (Table 1.11).

Most patients had at least one of the known risk factors and 82.8% had two or more risk factors. 3.0% patients had no known risk factor (Figure 1.8).

Table 1.11 The ten most common risk factors in the patient cohort (N=9,798)

Risk factor	Number	(%)
Lack of exercise (<3hrs / week)	7,404	(75.6)
No breastfeeding	6,403	(65.4)
High level of stress (>50% of time)	3,677	(37.5)
Being overweight / obese	3,574	(36.5)
No childbirth / First live birth after age 35	2,380	(24.3)
Diet rich in meat / dairy products	1,422	(14.5)
Family history of breast cancer	1,417	(14.5)
Early menarche (<12 years old)	1,312	(13.4)
Use of hormonal replacement therapy	677	(6.9)
Frequent night shift	464	(4.7)

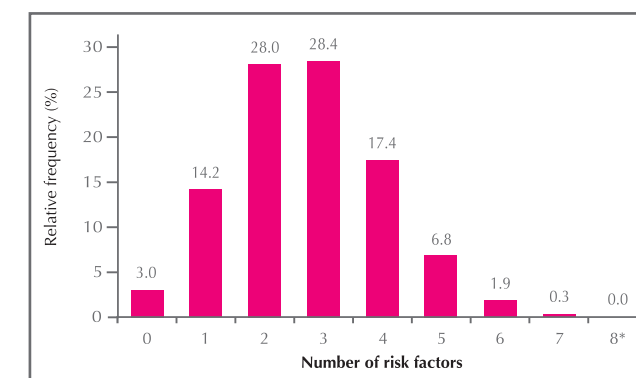


Figure 1.8 Number of risk factors for breast cancer at the time of diagnosis (N= 9,798)

*2 patients had 8 known risk factors only

1.3 Breast screening habits

Regular breast screening is the best method available for early detection of breast cancer. Early detection reduces mortality from breast cancer. The Hong Kong Breast Cancer Foundation recommends women aged 40 and over to conduct monthly breast self-examination (BSE) as a measure of raising breast self awareness, and regularly attend clinical breast examination (CBE) and mammography screening (MMG). Ultrasound breast examination (USG) can be used in addition to MMG for women with dense breasts.

Overall, however, BSE, MMG, and USG were regularly conducted by around one quarter or less of women across all age groups, and less than half of the women in all age groups attended regular CBE (Table 1.12).

Analysis of breast screening habits by age group revealed that the age groups of 60-69 and 70+ had a higher percentage of women who never conducted BSE, attended CBE, MMG or USG (Table 1.12). Women in the 40-49 age group were most regular in conducting BSE or attending CBE and USG among all age groups. As expected, women in the 50-59 age group were most regular in attending MMG (Table 1.12).

Table 1.12 Breast screening habits by age group

Breast examination	Age Group (years), Number (%)				
	<40	40-49	50-59	60-69	70+
BSE					
Never	440 (35.9)	1,372 (36.1)	1,202 (41.4)	509 (48.5)	316 (65.7)
Occasional	508 (41.5)	1,438 (37.8)	978 (33.7)	296 (28.2)	119 (24.7)
Monthly	277 (22.6)	990 (26.1)	720 (24.8)	245 (23.3)	46 (9.6)
CBE					
Never	526 (42.7)	1,512 (39.7)	1,292 (44.4)	607 (58.4)	367 (77.3)
Occasional	166 (13.5)	497 (13.0)	373 (12.8)	135 (13.0)	46 (9.7)
Regular*	540 (43.8)	1,801 (47.3)	1,244 (42.8)	298 (28.7)	62 (13.1)
MMG					
Never		2,578 (67.9)	1,852 (63.7)	718 (68.8)	401 (84.6)
Occasional		366 (9.6)	344 (11.8)	118 (11.3)	33 (7.0)
Regular*		850 (22.4)	711 (24.5)	207 (19.8)	40 (8.4)
USG					
Never		2,559 (69.4)	2,003 (70.7)	785 (77.5)	402 (86.5)
Occasional		361 (9.8)	298 (10.5)	91 (9.0)	32 (6.9)
Regular*		765 (20.8)	533 (18.8)	137 (13.5)	31 (6.7)

BSE: Breast self-examination; CBE: Clinical breast examination; MMG: Mammography screening; USG: Breast ultrasound screening
* "Regular" is defined as having the screening test every 1-3 years

Analysis of breast screening habits by residential district showed that there were more women in the patient cohort living in Kowloon that have never conducted BSE than any other areas, while more women living in the New Territories conducted regular BSE than any other areas. Unlike BSE, screening that involved attending a clinic or medical facility such as CBE, MMG and USG

showed a clear pattern by residential district, showing that a much higher percentage of women on Hong Kong Island regularly attended CBE, MMG and USG, while a much higher percentage of patients living in Kowloon and the New Territories never attended CBE, MMG and USG (Table 1.13).

Table 1.13 Breast screening habits by residential district

Breast examination	Residential District, Number (%)					
	Hong Kong Island		Kowloon		New Territories	
BSE						
Never	493	(30.0)	969	(44.6)	2,262	(42.5)
Occasional	778	(47.4)	762	(35.1)	1,664	(31.3)
Monthly	371	(22.6)	443	(20.4)	1,394	(26.2)
CBE						
Never	488	(29.8)	1,118	(51.4)	2,571	(48.3)
Occasional	249	(15.2)	280	(12.9)	655	(12.3)
Regular*	899	(55.0)	778	(35.8)	2,098	(39.4)
MMG						
Never	666	(48.1)	1,321	(70.3)	3,371	(73.0)
Occasional	217	(15.7)	183	(9.7)	428	(9.3)
Regular*	501	(36.2)	374	(19.9)	816	(17.7)
USG						
Never	723	(56.2)	1,379	(75.1)	3,456	(75.8)
Occasional	194	(15.1)	171	(9.3)	384	(8.4)
Regular*	370	(28.7)	287	(15.6)	721	(15.8)

BSE: Breast self-examination; CBE: Clinical breast examination; MMG: Mammography screening; USG: Breast ultrasound screening
* "Regular" is defined as having the screening test every 1-3 years