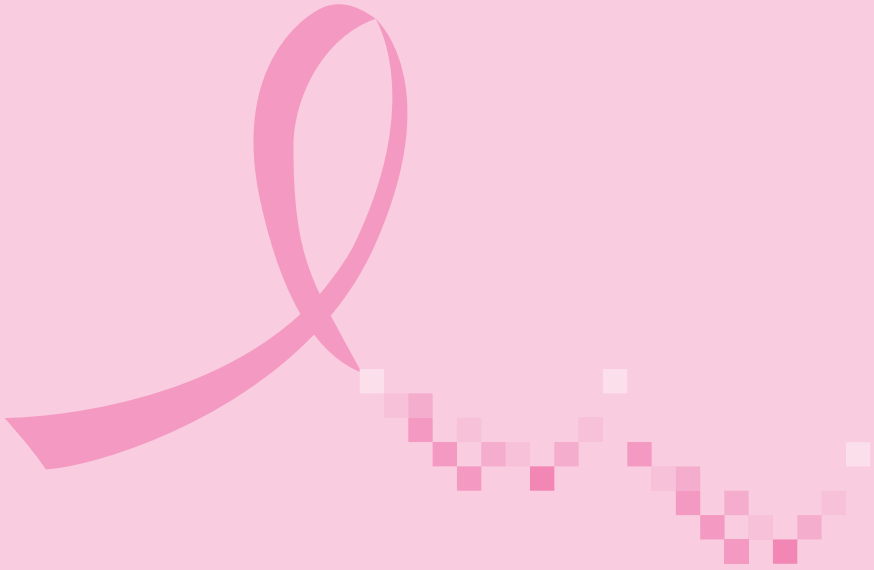


CHAPTER 1

PREVENTION AND EARLY DETECTION OF BREAST CANCER

CHAPTER 1 PREVENTION AND EARLY DETECTION OF BREAST CANCER

I. Introduction

1.1 It is well established that breast cancer is related to certain health factors and lifestyle behaviours. In this chapter, using the data collected on the demographics and socio-economic factors, lifestyle and health background from 18,663 Hong Kong breast cancer patients, the distribution of these factors among patients in the local context is studied. Their breast screening habits, in particular, are also examined. These analyses aim to shed light on the causes of breast cancer in Hong Kong.

KEY FINDINGS

The patients covered in this report, according to their year of cancer diagnosis, were divided into three cohorts (2006-2010, 2011-2015 and 2016-current) and analysed separately.

- The median ages of the patients at diagnosis were 50.2, 52.8 and 54.4 in the 2006-2010 cohort, 2011-2015 cohort and 2016-current cohort respectively.
- Around two-thirds (58.2%-69.1%) of the patients were aged between 40 and 59.

Risk factors

- The 10 most common risk factors for developing breast cancer and the respective percentage of patients having each risk factor in the patient cohort:

	%
Lack of exercise (<3hrs/week)	76.5-78.6
No breastfeeding	64.5-67.1
Being overweight/obese	37.1-39.3
High levels of stress (>50% of time)	36.0-37.2
No childbirth/first live birth after age 35	23.8-30.4
Family history of breast cancer	14.1-17.0
Diet rich in meat/dairy products	13.5-14.4
Early menarche (<12 years old)	13.4-14.3
Habit of drinking alcohol	4.8-7.3
Use of hormone replacement therapy	2.5-4.4

Screening habits

- The overall patients' breast screening habits were poor. Patients who underwent regular breast self-examination (19.3%-21.6%), mammography screening (18.8%-19.9%), or breast ultrasound screening (15.5%-19.0%) accounted for one-fifth or less.
- Breast screening habits decreased with increasing age.
- Patients who attained lower education level or had lower monthly household income were less likely to undergo regular breast screening than those with higher educational levels or higher incomes.
- A higher proportion (63.8%-69.3%) of the patients aged 40 or above had never undergone mammography screening prior to cancer diagnosis.

II. Demographics

A. Age at time of diagnosis

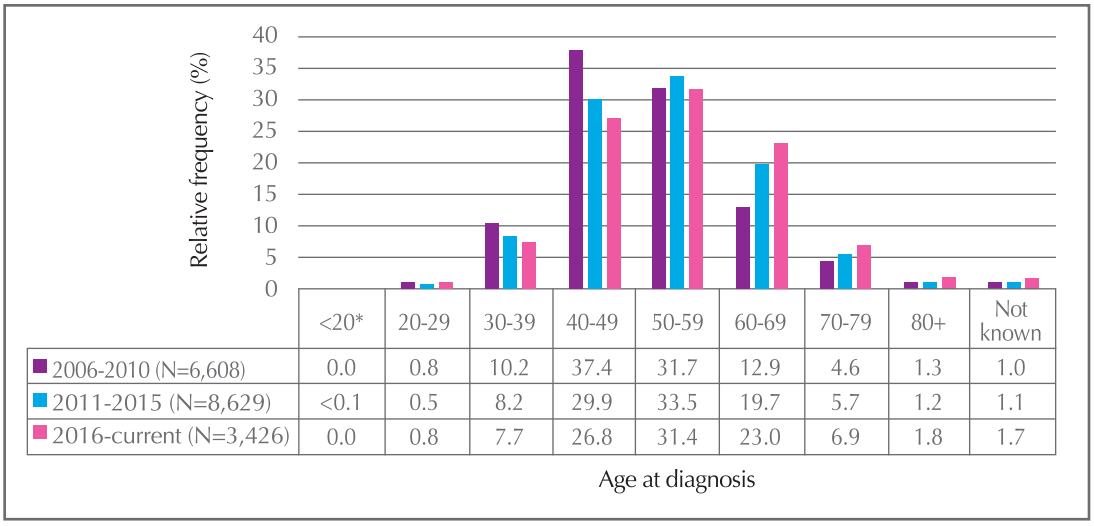
1.2 The chance of getting breast cancer generally increases with age.[1-2] Table 1.1 shows the lifetime risk of developing breast cancer for women in different age groups.[1]

1.3 The age at diagnosis ranged from 18 to 101 with about two-thirds (58.2%-69.1%) of the patients aged between 40 and 59 (Figure 1.1), and the median ages are 50.2, 52.8 and 54.4 in the 2006-2010 cohort, 2011-2015 cohort and 2016-current cohort respectively. It was found that patients in different age groups had different habits of breast screening (Section IV below).

Table 1.1: Lifetime risk of breast cancer of Hong Kong women (averaged data from 2010 to 2015)

Age	Lifetime risk
Before 30	1 in 2,818
Before 35	1 in 700
Before 40	1 in 243
Before 45	1 in 105
Before 50	1 in 56
Before 55	1 in 38
Before 60	1 in 29
Before 65	1 in 23
Before 70	1 in 19
Before 75	1 in 17

Figure 1.1: Distribution of age at diagnosis (N=18,663)



	<20*	20-29	30-39	40-49	50-59	60-69	70-79	80+	Not known
2006-2010 (N=6,608)	0.0	0.8	10.2	37.4	31.7	12.9	4.6	1.3	1.0
2011-2015 (N=8,629)	<0.1	0.5	8.2	29.9	33.5	19.7	5.7	1.2	1.1
2016-current (N=3,426)	0.0	0.8	7.7	26.8	31.4	23.0	6.9	1.8	1.7

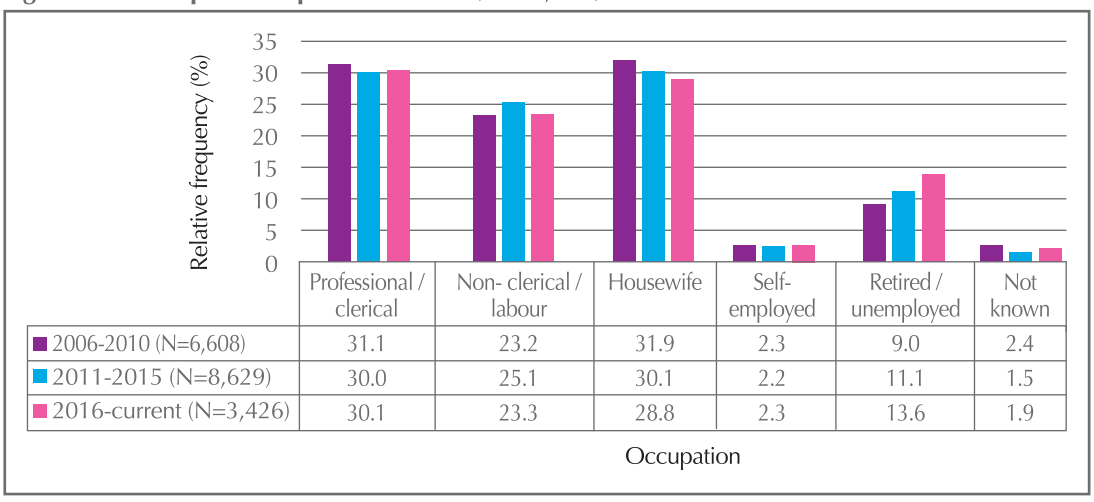
* Only one patient belonged to the <20 age group in the 2011-2015 cohort.

B. Occupation

1.4 Although international studies provided no evidence that occupation was related to breast cancer,[3] some studies suggested that a certain degree of association existed between night shift and breast cancer.[4] There were arguments that night shift work resulted in a disrupted circadian rhythm due to exposure to artificial light at night.[4]

1.5 A local study found that the average working hours among females in the general population was 43.2 per week.[5] Slightly more than one-half (55.7%-57.3%) of the patients registered with the Hong Kong Breast Cancer Registry (HKBCR) were working at the time of cancer diagnosis (Figure 1.2), with the median working hours ranging from 45.4 to 47.6 per week (2006-2010: 47.6 hours; 2011-2015: 46.4 hours; 2016-current: 45.4 hours). Among them, about one-tenth in each cohort had night shift duties (2006-2010: 9.1%; 2011-2015: 8.5%; 2016-current: 10.4%). The median number of nights they worked in a year was 76.3 for the 2006-2010 cohort, 54.7 for the 2011-2015 cohort and 56.0 for the 2016-current cohort.

Figure 1.2: Occupation of patient cohorts (N=18,663)



	Professional / clerical	Non- clerical / labour	Housewife	Self-employed	Retired / unemployed	Not known
2006-2010 (N=6,608)	31.1	23.2	31.9	2.3	9.0	2.4
2011-2015 (N=8,629)	30.0	25.1	30.1	2.2	11.1	1.5
2016-current (N=3,426)	30.1	23.3	28.8	2.3	13.6	1.9

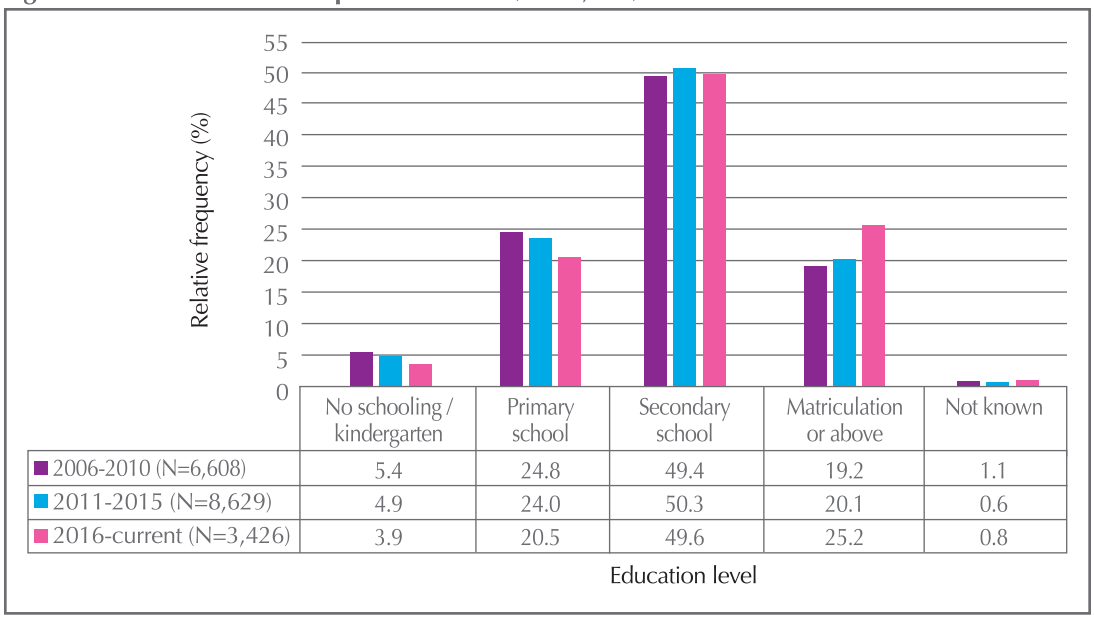
C. Education level and household monthly income

1.6 There were studies which suggested that lower education level and lower household income were linked to lower level of breast cancer awareness and poorer breast screening habits, even though they lived in the same city.[6,7]

1.7 About two-thirds (68.6%-74.8%) of the patients attained secondary school level or above and less than one-third (24.4%-30.2%) had primary school level or below education (Figure 1.3). The patients with lower education levels were less likely to undergo regular breast screening than those with higher education levels (Section IV below).

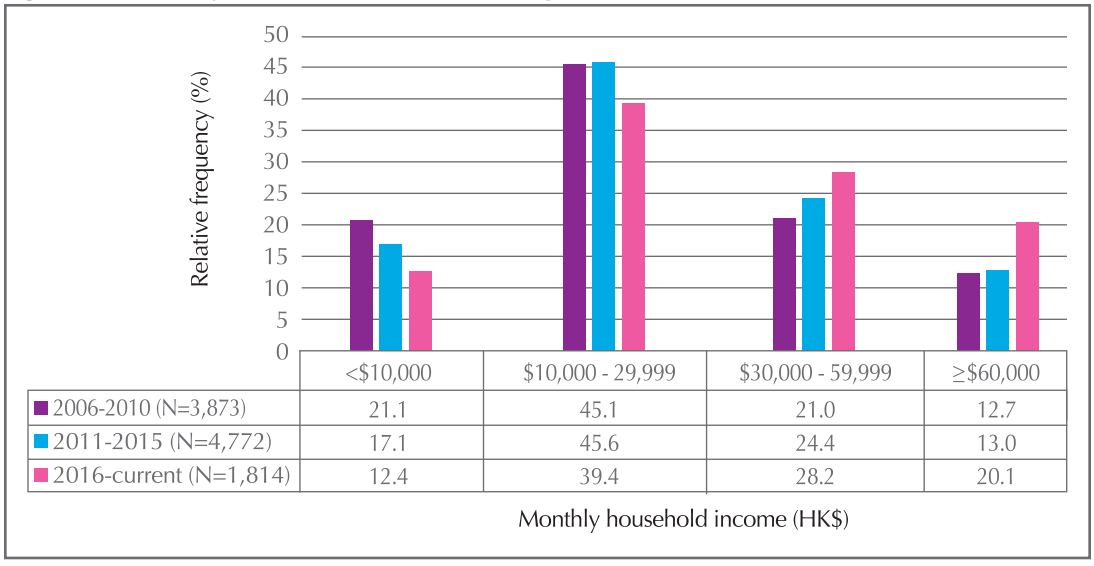
1.8 In the cohorts, the proportion of the patients who had a monthly household income of $30,000 or more ranged from 33.7% to 48.3% and the proportion of the patients with less than $10,000 ranged from 12.4% to 21.1% (Figure 1.4). The patients who had a lower household monthly income were less likely to undergo regular breast screening than those with higher income levels (Section IV below).

Figure 1.3: Education level of patient cohorts (N=18,663)



	No schooling / kindergarten	Primary school	Secondary school	Matriculation or above	Not known
2006-2010 (N=6,608)	5.4	24.8	49.4	19.2	1.1
2011-2015 (N=8,629)	4.9	24.0	50.3	20.1	0.6
2016-current (N=3,426)	3.9	20.5	49.6	25.2	0.8

Figure 1.4: Monthly household income (HK$) of patient cohorts (N=10,459)

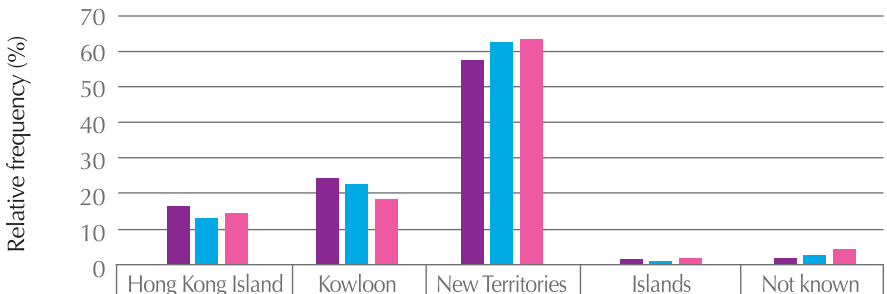


	<$10,000	$10,000 - 29,999	$30,000 - 59,999	≥$60,000
2006-2010 (N=3,873)	21.1	45.1	21.0	12.7
2011-2015 (N=4,772)	17.1	45.6	24.4	13.0
2016-current (N=1,814)	12.4	39.4	28.2	20.1

D. District of residence

1.9 In the three cohorts, the proportion of the patients who resided in the New Territories was between 57.4% and 62.0%, the proportion who resided in Kowloon was between 18.2% and 23.5%, and the proportion who resided on Hong Kong Island was between 12.4% and 15.3% (Figure 1.5). The patients who resided in Kowloon or the New Territories had less regular breast screening than those who resided on Hong Kong Island (Section IV below).

Figure 1.5: District of residence of patient cohorts (N=18,663)



	Hong Kong Island	Kowloon	New Territories	Islands	Not known
2006-2010 (N=6,608)	15.3	23.5	57.4	1.5	2.3
2011-2015 (N=8,629)	12.4	21.9	61.5	1.4	2.7
2016-current (N=3,426)	13.8	18.2	62.0	1.7	4.3

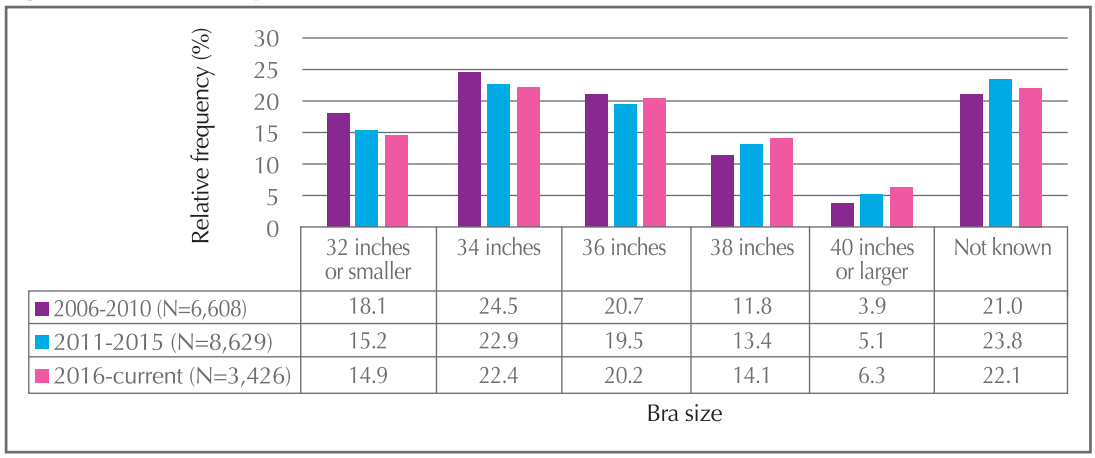
District of residence

E. Bra size and cup size

1.10 Some studies suggested that there was a certain degree of association between larger breast size and breast cancer.[8-10] Such studies were mainly conducted on women in Western countries and such evidence is lacking in Hong Kong.

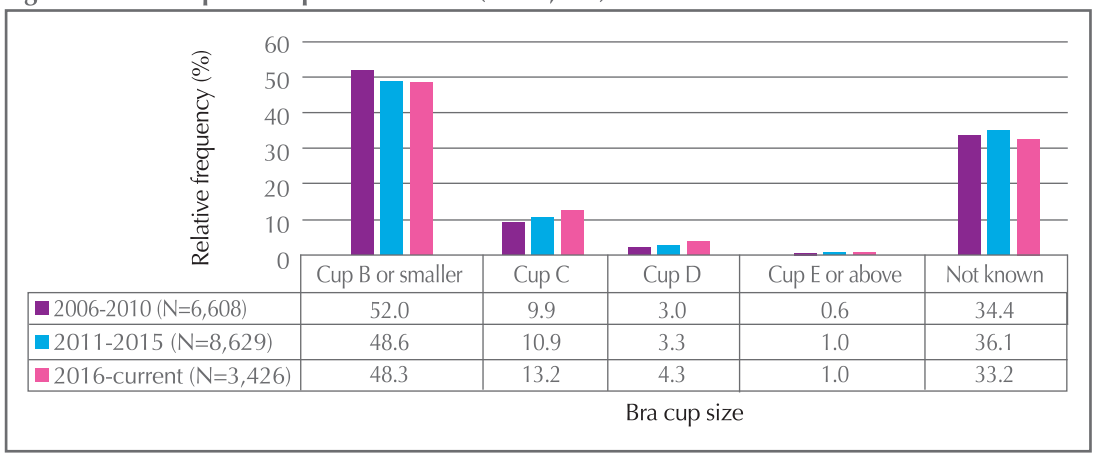
1.11 In the three patient cohorts, 60.9%-63.0% of the patients had bra size of 34 inches or more while 15.7%-20.4% had 38 inches or more (Figure 1.6). For breast cup size, about one-half (48.3%-52.0%) had cup B or smaller breasts while only a small proportion (3.6%-5.3%) had cup D or above (Figure 1.7).

Figure 1.6: Bra size of patient cohorts (N=18,663)



	32 inches or smaller	34 inches	36 inches	38 inches	40 inches or larger	Not known
2006-2010 (N=6,608)	18.1	24.5	20.7	11.8	3.9	21.0
2011-2015 (N=8,629)	15.2	22.9	19.5	13.4	5.1	23.8
2016-current (N=3,426)	14.9	22.4	20.2	14.1	6.3	22.1

Figure 1.7: Bra cup size of patient cohorts (N=18,663)



	Cup B or smaller	Cup C	Cup D	Cup E or above	Not known
2006-2010 (N=6,608)	52.0	9.9	3.0	0.6	34.4
2011-2015 (N=8,629)	48.6	10.9	3.3	1.0	36.1
2016-current (N=3,426)	48.3	13.2	4.3	1.0	33.2

III. Risk factors and health background

A. *Tobacco smoking*

1.12 The International Agency for Research on Cancer (IARC) has classified tobacco smoking as a probable cause of breast cancer.[4] A causal relationship between active or passive smoking and breast cancer, however, has yet to be established.[11] A study found that in 2016, 3.2% of Hong Kong women in the general population had daily smoking habit.[12]

1.13 In the three patient cohorts, a small proportion reported that they had smoked prior to cancer diagnosis (2006-2010: 4.5%; 2011-2015: 4.9%; 2016-current: 5.3%), and the proportions of these patients who were still smoking at the time of cancer diagnosis were 38.7% for the 2006-2010 cohort, 51.3% for the 2011-2015 cohort and 53.0% for the 2016-current cohort. Among those who had quit smoking for less than a year or were still smoking, the mean packs of cigarette consumed were between 3.6 and 4.1 across the three cohorts (2006-2010: 4.1 packs; 2011-2015: 3.6 packs; 2016-current: 3.7 packs).

B. *Alcohol drinking*

1.14 The World Health Organization (WHO) has classified alcohol consumption as Group 1 carcinogens for breast cancer for people of all ages.[4,13] The risk of breast cancer increases with the amount of alcohol consumed: Dose-relationship meta-analyses showed that for every 10g ethanol consumed per day (one standard drink, approximately equals to a 330 ml can of beer or a 100 ml glass of table wine or a 30 ml glass of high strength spirit), the risk of breast cancer is increased by 5% for premenopausal women and 9% for postmenopausal women.[13] A study found that in 2016, 10.4% of Hong Kong women in the general population drank alcoholic beverages at least once a week.[14]

1.15 Patients in the cohorts were asked about their alcoholic drinking habits prior to cancer diagnosis. Patients who consumed alcoholic beverages rarely or occasionally (i.e. less than five alcoholic drinks in a 12-month period) were not considered as habitual alcohol consumers in this report.

1.16 In the three cohorts, a small proportion of the patients who were habitual alcohol consumers at some point in their lives (2006-2010: 4.8%; 2011-2015: 4.8%; 2016-current: 7.3%), and 31.7%-44.6% (2006-2010: 31.7%; 2011-2015: 42.5%; 2016-current: 44.6%) of these patients were still drinking at the time of cancer diagnosis. Among those who had stopped drinking alcoholic beverages for less than a year or were still drinking alcohol habitually, the mean glasses of alcoholic beverages consumed were between 5.4 and 6.1 (2006-2010: 6.1 glasses; 2011-2015: 5.7 glasses; 2016-current: 5.4 glasses) per week in the preceding 12 months prior to cancer diagnosis. The two most commonly consumed alcoholic beverages were red wine and beer across the three cohorts.

C. *Dietary and exercise habits and stress level*

1.17 Most findings on the effect of dietary factors on breast cancer risk were inconclusive and inconsistent. However, a link between physical activity and prevention of postmenopausal breast cancer was found.[13] Given that increase in body fat is also found to increase breast cancer risk in postmenopausal women, women are encouraged to reduce lifetime weight gain by limiting calories intakes and participate in regular physical exercise to maintain a healthy weight and level of body fat.

1.18 In each cohort, slightly more than two-thirds (67.8%-70.7%) of the patients had a balanced diet, while slightly more than one-tenth (13.5%-14.4%) ate a diet rich in meat or dairy product (Figure 1.8). About one-quarter (21.0%-23.1%) of the patients exercised three hours or more per week while 35.1%-49.9% never exercised in the year prior to the time of diagnosis (Figure 1.9).

1.19 Current studies on stress as a risk factor for breast cancer are non-conclusive and the subject requires further investigation. Some researchers, however, suggested that people with prolonged stress exposure might also adopt other risky habits such as smoking or drinking alcohol, which might increase their risk of cancer. In each patient cohort, slightly more than one-third (36.0%-37.2%) said that they had experienced high level of stress in the year prior to cancer diagnosis (Figure 1.10).

Figure 1.8: Dietary habits at diagnosis (N=18,663)

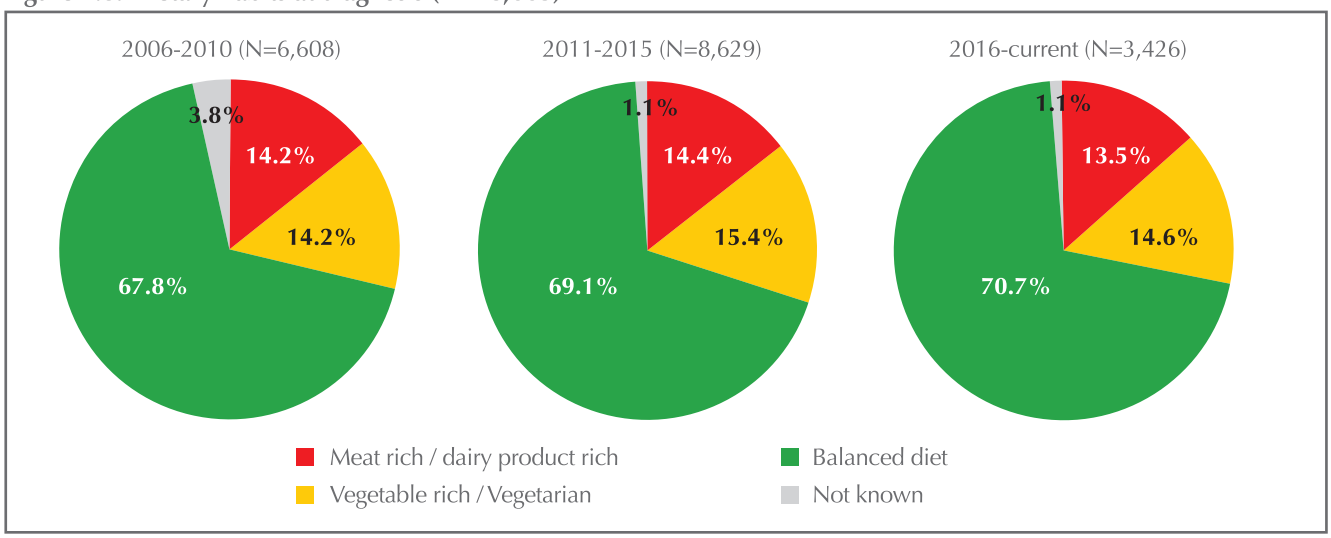


Figure 1.9: Exercise habits at diagnosis (N=18,663)

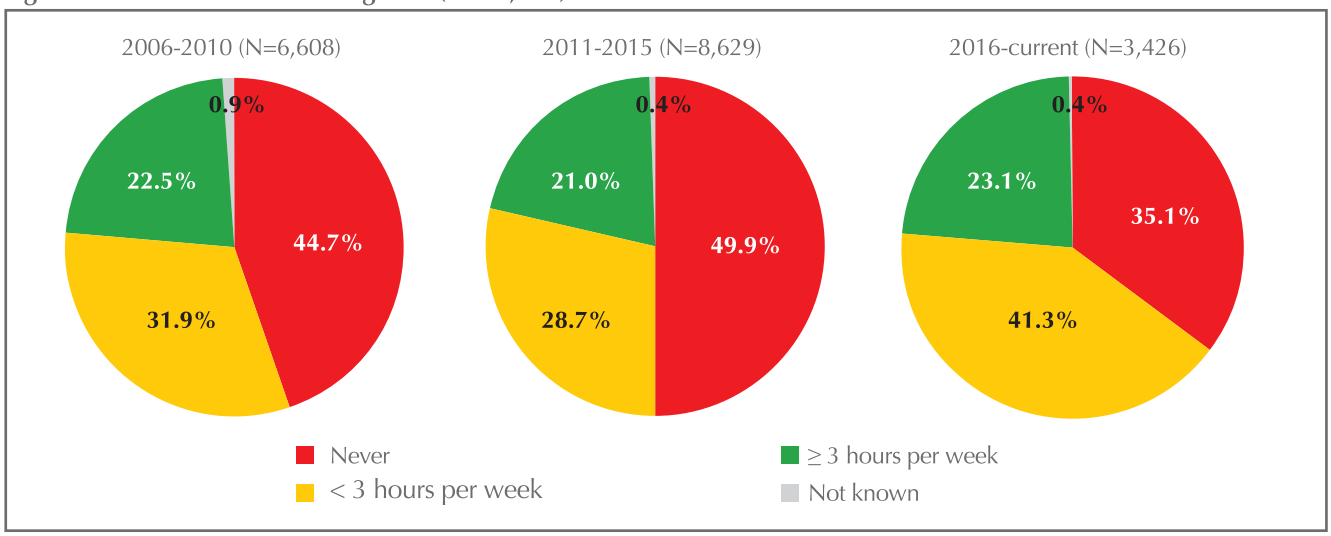
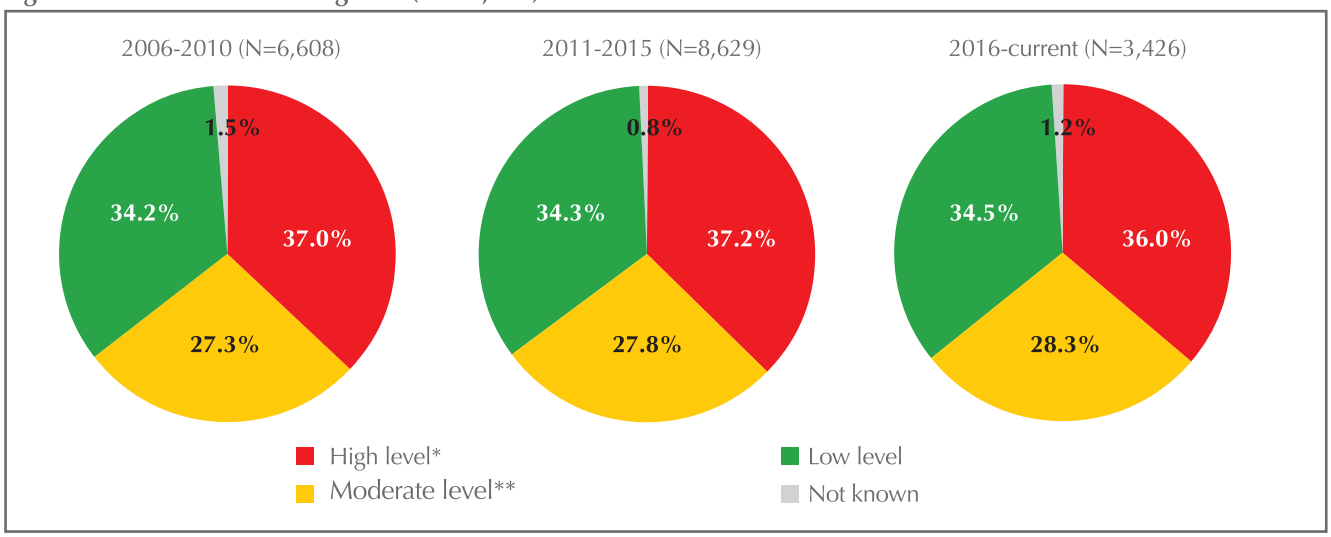


Figure 1.10: Stress level at diagnosis (N=18,663)



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

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

D. Height, weight and body mass index

1.20 Body mass index (BMI) is a heuristic method of estimating human body fat based on an individual's height and weight. It is calculated by dividing weight in kilograms by height in metres squared (i.e. kg/m^2). Overweight and obesity for Asian women were defined as having BMI of 23.0 to 24.9 and 25.0 or over respectively. Obesity is considered a risk factor for breast cancer.[15] A study found that in 2016, 16.3% and 14.2% of Hong Kong women in the general population were classified as overweight and obese respectively.[16]

1.21 The average height and weight of the patients in the three cohorts were similar, with an average height of 157.9 cm and an average weight of 56.8kg-58.0kg. The distribution of body mass index at diagnosis was also similar across the three cohorts, with about two-fifths (37.1%-39.3%) of the patients being overweight or obese (Table 1.2).

Table 1.2: Body mass index at diagnosis (N=18,663)

	2006-2010 (N=6,608) %	2011-2015 (N=8,629) %	2016-current (N=3,426) %
≥ 25.0 (Obese)	20.3	22.1	23.7
23.0-24.9 (Overweight)	16.8	17.2	15.3
18.5-22.9 (Normal weight)	42.3	40.1	39.8
< 18.5 (Underweight)	7.1	6.2	5.5
Not known	13.5	14.4	15.8

E. Family history of breast cancer

1.22 Breast cancer risk is found to be higher among women who have one first-degree relative with breast cancer, compared to women with no first-degree relatives with the disease. The risk is even higher among women having more first-degree relatives affected by breast cancer, or having relatives who are affected before the age of 50.[17,18] The proportions of patients having family histories of breast cancer ranged from 14.1% to 16.9% in the three cohorts (Table 1.3).

F. Personal history of other tumours

1.23 International studies found that breast cancer risk was higher in women with previous history of certain types of cancer, including Hodgkin lymphoma, melanoma, lung adenocarcinoma, bowel cancer, uterus cancer and chronic lymphocytic leukaemia, or any type of cancer in childhood.[19-24] On the other hand, breast cancer risk was found to be lower in cervical squamous cell carcinoma survivors.[23,24] In the cohorts, 1.6%-2.0% of the patients suffered from other types of malignant tumours prior to breast cancer diagnosis (Table 1.4). Among them, the most common tumour was thyroid cancer (16.4%-20.9%) (Table 1.5).

Table 1.3: Family history of breast cancer at diagnosis (N=18,663)

	2006-2010 (N=6,608) %	2011-2015 (N=8,629) %	2016-current (N=3,426) %
No	84.6	84.5	82.1
Yes			
First-degree relative(s)	9.8	10.4	12.4
Non first-degree relative(s)	4.0	4.0	4.4
Details not known	0.3	0.1	0.1
Family history not known	1.3	1.0	0.9

Table 1.4: Personal history of other cancer at diagnosis (N=18,663)

	2006-2010 (N=6,608) %	2011-2015 (N=8,629) %	2016-current (N=3,426) %
No	81.8	81.7	81.1
Benign tumour	13.7	15.3	15.8
Malignant tumour	1.9	1.6	2.0
Nature of previous tumours not known	0.5	0.3	0.3
History of tumours not known	2.1	1.1	0.9

Table 1.5: Origins of malignant tumours reported by patients (N=327)

	2006-2010 (N=126)		2011-2015 (N=134)		2016-current (N=67)	
	Number	%	Number	%	Number	%
Thyroid	21	16.7	22	16.4	14	20.9
Colorectum	18	14.3	20	14.9	9	13.4
Uterine	9	7.1	23	17.2	14	20.9
Cervix	11	8.7	10	7.5	2	3.0
Ovaries	6	4.8	7	5.2	6	9.0
Lung	2	1.6	12	9.0	5	7.5
Nasopharynx	9	7.1	3	2.2	2	3.0
Small intestine	2	1.6	6	4.5	5	7.5
Blood	1	0.8	1	0.7	0	0.0
Lymphomas	3	2.4	4	3.0	2	3.0
Liver	1	0.8	4	3.0	2	3.0
Bone	1	0.8	2	1.5	0	0.0
Esophagus	1	0.8	3	2.2	0	0.0
Skin	2	1.6	2	1.5	1	1.5
Stomach	3	2.4	0	0.0	1	1.5
Urological sites	1	0.8	3	2.2	0	0.0
Muscle	1	0.8	1	0.7	1	1.5
Brain	0	0.0	2	1.5	0	0.0
Tongue	1	0.8	1	0.7	0	0.0
Cavum pelvis	0	0.0	1	0.7	0	0.0
Others	3	2.4	3	2.2	1	1.5
Not known	38	30.2	9	6.7	5	7.5

*Others include: fallopian tube, neck, oral cavity, salivary gland and parotid gland.

G. History of benign breast condition and precancerous breast lesion

1.24 Several studies found that women with some types of benign breast condition or precancerous breast lesion would have an increased risk of breast cancer. Benign breast condition can be classified into three categories: non-proliferative lesions, proliferative lesions without atypia and atypical hyperplasia. Non-proliferative lesions, such as fibroadenoma or other fibrocystic diseases, are generally not associated with increasing the risk of breast cancer.[25] On the other hand, proliferative lesions without atypia, such as papilloma or papillomatosis and atypical ductal or lobular hyperplasia, are linked to an increased risk of breast cancer.[25] Lobular carcinoma in situ (LCIS) is a form of precancerous breast lesion that also increases a woman's risk of breast cancer.

1.25 Across the cohorts, 12.1%-14.9% of patients had previous history of benign breast disease (Table 1.6). Fibroadenoma, which does not increase the risk of breast cancer, was the most common (44.8%-51.3%). Among the patients, only 10 patients suffered from atypical ductal hyperplasia. In addition, two patients suffered from LCIS prior to breast cancer diagnosis (Table 1.6).

Table 1.6: History of breast condition / disease at diagnosis (N=18,663)

	2006-2010 (N=6,608) %	2011-2015 (N=8,629) %	2016-current (N=3,426) %
Have history of previous breast disease	**14.0**	**14.9**	**12.1**
Type of previous breast disease			
Fibroadenoma	44.8	48.6	51.3
Fibrocystic disease	17.6	15.0	14.2
Papilloma	2.3	0.9	1.7
Papillomatosis	0.4	0.1	0.2
Atypical ductal hyperplasia	0.6	0.3	0.0
Lobular carcinoma in situ	0.0	0.2	0.0
Others (Gynaecomastia, other benign tumours)	28.1	30.1	23.4
Not known	8.7	6.7	11.1

H. Early menarche, late menopause and reproductive history

1.26 Life events such as early menarche (<12 years old), late natural menopause (>55 years old), not bearing children and late first childbirth (>35 years old) all increase the lifetime exposure to the hormone estrogen, thus increasing the risk of breast cancer. On the other hand, late menarche, early menopause, bearing children and early pregnancy all reduce the risk of breast cancer.[13]

1.27 The mean age at menarche was about 13 across the three patient cohorts, and 13.4%-14.3% of the patients experienced early menarche (Table 1.7). About one-half of the patients were post-menopausal in each cohort (2006-2010: 49.3%; 2011-2015: 53.4%; 2016-current: 57.9%). Among them, a small proportion (4.8%-5.9%) experienced late menopause and the mean age at menopause was about 50. The proportions of these patients being nulliparous ranged between 20.3% and 25.6%. In addition, only a small proportion of the patients (3.5%-4.8%) had their first childbirth after the age of 35 (Table 1.7). Among those who experienced childbirth(s), about three-quarters (69.3%-72.7%) had two or more children (Table 1.8), and the mean age at which they had their first childbirth was about 27 across the three patient cohorts.

1.28 Breastfeeding is considered to be protective against breast cancer at all ages.[13] In each cohort, about one-third (31.3%-33.7%) of the patients had breastfed their children and the mean total duration of breastfeeding was between 13.5 and 16.4 months (Table 1.7).

Table 1.7: Early menarche, late menopause and reproductive history at diagnosis

	2006-2010 %	2011-2015 %	2016-current %
Menarche (N=18,663)	(N=6,608)	(N=8,629)	(N=3,426)
Early menarche (<12 years old)	13.4	14.3	14.2
Normal menarche (≥12 years old)	79.5	77.3	76.7
Not known	7.1	8.5	9.1
Menopause (N=9,843)	(N=3,255)	(N=4,605)	(N=1,983)
Late menopause (>55 years old)	4.8	5.9	5.0
Normal menopause (≤55 years old)	82.6	81.5	79.9
Age at menopause not known	12.6	12.6	15.1
Reproductive history (N=18,663)	(N=6,608)	(N=8,629)	(N=3,426)
No childbirth	20.3	23.8	25.6
First childbirth at early age (≤35 years old)	69.9	69.4	66.7
First childbirth at late age (>35 years old)	3.5	4.4	4.8
Age at first live birth not known	2.6	2.2	2.4
Reproductive history not known	3.7	0.2	0.6
Breastfeeding (N=18,663)	(N=6,608)	(N=8,629)	(N=3,426)
Yes	31.3	32.5	33.7
No (had childbirth)	43.7	43.2	39.9
No (no childbirth)	20.3	23.8	25.6
No (reproductive history not known)	0.5	0.1	0.1
Not known	4.2	0.4	0.8

Table 1.8: Number of live births reported by patient cohorts (N=14,106)

	2006-2010 (N=5,022) %	2011-2015 (N=6,554) %	2016-current (N=2,530) %
1	26.6	28.8	30.2
2	44.6	44.6	46.0
3	17.5	16.7	16.7
4	6.3	6.0	4.5
5	2.4	2.0	0.9
6	1.3	1.0	0.9
7	0.5	0.4	0.2
8	0.1	0.2	<0.1
9+	0.1	0.1	0.0
Not known	0.7	0.3	0.5

I. Use of hormonal contraceptives

1.29 Hormonal contraceptives contain synthetic sex hormones and are administered in the form of oral tablets, injections, implants and transdermal contraceptive patches. Although the IARC has classified current or recent use of combined estrogen-progestogen oral contraceptives as a risk factor for breast cancer, recent studies suggested discontinuing use for 10 years or more resulted in the risk being reduced to that of non-users.[4] Conflicting results were also obtained when studying the correlation between breast cancer risk and injectable contraceptives or implants.[26-30] Further investigation is therefore needed to ascertain the correlation between hormonal contraceptives and breast cancer risk.

1.30 The proportions of the patients who had never used hormonal contraceptives ranged between 65.1% and 73.2% in the three cohorts (Table 1.9). Of the hormonal contraceptive users, the majority had stopped using it at diagnosis (2006-2010: 69.4%; 2011-2015: 87.4%; 2016-current: 80.8%) and the mean years that they had stopped using it ranged between 17.5 and 20.3 across the three cohorts (2006-2010: 17.5 years; 2011-2015: 19.4 years; 2016-current: 20.3 years).

Table 1.9: Use of hormonal contraceptives at diagnosis (N=18,663)

	2006-2010 (N=6,608) %	2011-2015 (N=8,629) %	2016-current (N=3,426) %
Non-user	65.1	69.0	73.2
OC use < 5 years	14.5	15.1	12.3
OC use 5-10 years	8.2	7.5	5.9
OC use > 10 years	3.8	3.0	2.2
Length of OC use not known	5.2	4.7	5.4
Not known if OC was used	3.3	0.7	1.0

OC: Hormonal contraceptives

J. Use of hormone replacement therapy

1.31 Hormonal replacement therapy (HRT) contains synthetic sex hormones and is used to relieve post-menopausal symptoms. The IARC has classified current use of combined estrogen-progestogen HRT for menopausal symptoms as a risk factor for breast cancer.[4] Of the post-menopausal patients, 4.3%-8.8% had used HRT and only 1.8%-3.1% of them had used it for over five years across the three cohorts (Table 1.10).

Table 1.10: Use of hormone replacement therapy (in post-menopausal patients) at diagnosis (N=9,843)

	2006-2010 (N=3,255) %	2011-2015 (N=4,605) %	2016-current (N=1,983) %
Non-user	87.3	92.9	94.7
HRT use < 5 years	4.7	3.5	2.0
HRT use 5-10 years	2.5	2.0	1.4
HRT use > 10 years	0.6	0.5	0.4
Length of HRT use not known	1.0	0.4	0.5
Not known if HRT was used	3.8	0.7	1.1

HRT: Hormone replacement therapy

K. Ten most common risk factors associated with breast cancer in Hong Kong

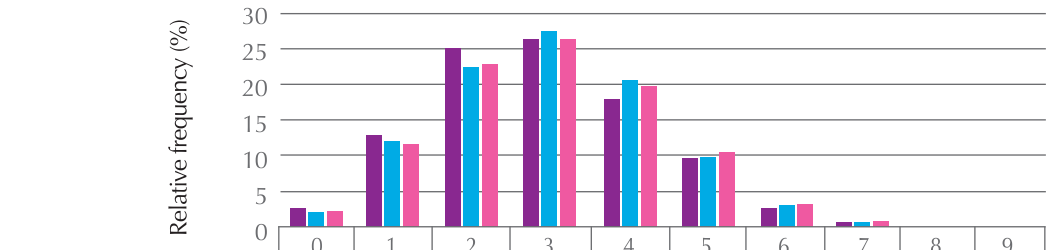
1.32 In each cohort, lack of exercise was the most common risk factor, followed by not having breastfeeding experience and being overweight or obese (Table 1.11). The accumulation of multiple risk factors increases the risk of getting breast cancer.

In each cohort, about three-fifths (58.5%-62.7%) of the patients had three or more risk factors, while slightly more than one-third (35.1%-38.2%) had one to two risk factors. A small proportion (2.2%-3.1%) of the patients had none of the common risk factors studied (Figure 1.11).

Table 1.11: Ten most common risk factors for breast cancer in patient cohorts (N=18,663)

	2006-2010 (N=6,608) %	2011-2015 (N=8,629) %	2016-current (N=3,426) %
Lack of exercise (<3hrs / week)	76.5	78.6	76.5
No breastfeeding	64.5	67.1	65.5
Being overweight / obese	37.1	39.3	39.0
High level of stress (>50% of time)	37.0	37.2	36.0
No childbirth / First live birth after age 35	23.8	28.2	30.4
Family history of breast cancer	14.1	14.5	17.0
Diet rich in meat / dairy products	14.2	14.4	13.5
Early menarche (<12 years old)	13.4	14.3	14.2
Habit of drinking alcohol	4.8	4.8	7.3
Use of hormone replacement therapy	4.4	3.4	2.5

Figure 1.11: Distribution of risk factors among patients at diagnosis (N=18,663)



	0	1	2	3	4	5	6	7	8	9
2006-2010 (N=6,608)	3.1	13.2	25.0	26.4	18.6	9.6	3.0	0.8	0.1	0.0
2011-2015 (N=8,629)	2.2	12.2	22.9	27.5	20.7	9.7	3.8	0.9	0.1	<0.1
2016-current (N=3,426)	2.7	11.8	23.6	26.5	19.8	10.6	3.9	1.0	0.1	0.0

Number of risk factors

IV. Breast screening habits

A. Breast screening methods

1.33 Breast screening is a method of checking a woman's breasts when there are neither signs nor symptoms of breast cancer in an attempt to enable earlier detection. Early detection reduces mortality from breast cancer. The three screening tests used for breast cancer screening are breast self-examination (BSE), clinical breast examination (CBE), and mammography screening (MMG). BSE is done by the woman herself in that she checks for lumps, changes in size or shape of the breast, or any other changes in the breasts or underarm. CBE is conducted by a medical professional, such as a doctor or nurse, who uses his or her hands to feel for lumps or other changes. MMG is the current standard test for breast cancer screening which uses a low-energy X-ray to examine a woman's breasts.

1.34 The Hong Kong Breast Cancer Foundation recommends women aged 40 or above to conduct monthly BSE as a measure of raising breast self-awareness, and also regularly undergo CBE and MMG. In addition, breast ultrasound screening (USG) is used along with MMG for women with dense breasts. In Hong Kong, there is no population-based breast screening programme for women.

B. Breast screening habits and age

1.35 The breast screening habits of the patient cohorts, i.e. self-initiated breast screening habits prior to cancer diagnosis, were studied by age group (Table 1.12). Less than one-quarter of the patients of all ages underwent regular BSE, MMG and USG. Regular CBE was performed by about 30%-40% of the patients aged below 60, but the proportions dropped for those patients aged between 60 and 69 (24.7%-26.5%) as well as 70 or above (9.1%-11.5%) (Table 1.12). With the exception of those aged below 40, the proportion of the patients who had never performed BSE or had never undergone CBE and USG was positively correlated with age. In addition, high proportions (58.0%-85.6%) of the patients aged 40 or above had never undergone MMG (Table 1.12).

Table 1.12: Breast screening habits by age group (N=18,450)

	Age group % for 2006-2010, % for 2011-2015, % for 2016-current														
	<40			40-49			50-59			60-69			70+		
BSE															
Never	35.8	38.2	39.7	34.6	37.2	30.9	40.9	36.7	36.2	47.6	42.5	43.9	66.4	54.2	57.8
Occasional	43.1	43.2	37.9	39.4	42.1	46.1	33.5	41.9	42.0	29.8	37.5	37.0	21.5	30.3	26.4
Monthly	19.4	17.8	21.7	24.1	20.3	21.6	23.3	20.1	20.3	20.6	19.1	18.1	10.1	14.7	15.2
Not known	1.6	0.8	0.7	1.9	0.4	1.4	2.2	1.2	1.5	2.0	0.9	1.0	2.0	0.8	0.7
CBE															
Never	45.8	53.0	54.5	38.3	44.8	43.2	45.7	44.2	45.4	60.3	57.3	55.3	80.1	77.3	76.6
Occasional	13.0	14.0	14.8	13.0	14.9	18.9	11.7	16.8	18.7	11.5	14.7	19.0	8.3	9.5	13.2
Regular*	39.4	32.6	29.7	47.1	39.5	36.6	40.4	38.0	34.9	25.9	26.5	24.7	9.1	11.5	9.2
Not known	1.8	0.4	1.0	1.5	0.8	1.3	2.1	1.0	1.1	2.3	1.6	1.0	2.5	1.7	1.0
MMG#															
Never		—		67.0	71.1	63.5	64.3	63.1	58.0	70.5	66.9	62.7	85.6	85.2	81.4
Occasional		—		10.4	10.9	15.8	10.8	13.3	16.1	10.9	12.4	16.9	6.6	7.0	12.2
Regular*		—		20.6	17.3	19.9	22.6	22.6	24.7	16.5	19.2	18.6	5.1	6.0	6.1
Not known		—		2.0	0.7	0.9	2.2	1.1	1.2	2.1	1.4	1.8	2.8	1.8	0.3
USG#															
Never		—		66.9	69.4	60.1	69.9	68.4	60.3	76.9	75.5	70.6	85.1	88.5	82.4
Occasional		—		10.1	10.5	15.7	9.3	11.9	14.9	8.7	9.2	13.9	6.6	5.2	11.1
Regular*		—		18.7	19.4	23.2	16.5	18.6	23.2	10.0	13.1	13.8	4.0	5.2	5.1
Not known		—		4.3	0.8	1.0	4.3	1.1	1.6	4.5	2.2	1.6	4.3	1.2	1.4

Total number of patients for BSE and CBE in each group:

<40: 731 (for 2006-2010), 757 (for 2011-2015), 290 (for 2016-current)

40-49: 2,470 (for 2006-2010), 2,583 (for 2011-2015), 919 (for 2016-current)

50-59: 2,094 (for 2006-2010), 2,893 (for 2011-2015), 1,076 (for 2016-current)

60-69: 853 (for 2006-2010), 1,704 (for 2011-2015), 789 (for 2016-current)

70+: 396 (for 2006-2010), 600 (for 2011-2015), 295 (for 2016-current)

Total number of patients for MMG and USG in each group:

40-49: 2,470 (for 2006-2010), 2,583 (for 2011-2015), 919 (for 2016-current)

50-59: 2,094 (for 2006-2010), 2,893 (for 2011-2015), 1,076 (for 2016-current)

60-69: 853 (for 2006-2010), 1,704 (for 2011-2015), 789 (for 2016-current)

70+: 396 (for 2006-2010), 600 (for 2011-2015), 295 (for 2016-current)

BSE: Breast self-examination; CBE: Clinical breast examination; MMG: Mammography screening; USG: Breast ultrasound screening

* "Regular" is defined as having the breast screening every 1-3 years. # Included patients aged 40 or above only

C. Breast screening habits and education level

1.36 Breast screening habits were further studied by patients' education level (Table 1.13). The findings suggested that the patients with lower education levels had undergone less breast screening prior to cancer diagnosis. In the cohorts, 59.8%-72.9% of the patients who had kindergarten level or no schooling had never performed BSE, compared to 24.5%-29.6% of the patients who attained matriculation level or above. The corresponding figures are 74.9%-78.2% compared to 29.6%-33.3% for CBE, 85.6%-88.1% compared to 47.0%-53.2% for MMG, and 87.9%-90.5% compared to 46.5%-55.1% for USG.

Table 1.13: Breast screening habits by education level (N=18,507)

	Education level % for 2006-2010, % for 2011-2015, % for 2016-current											
	No schooling / kindergarten			Primary school			Secondary school			Matriculation or above		
BSE												
Never	67.9	59.8	72.9	51.8	45.8	49.9	38.0	38.4	37.4	24.5	29.6	26.4
Occasional	20.4	26.6	18.8	26.7	35.5	32.5	35.8	39.4	40.0	50.7	52.0	51.2
Monthly	10.3	13.2	8.3	20.4	18.0	16.7	24.4	21.5	21.6	21.9	17.3	20.6
Not known	1.4	0.5	0.0	1.2	0.7	0.9	1.8	0.8	1.1	2.8	1.1	1.8
CBE												
Never	74.9	75.3	78.2	62.2	62.0	65.3	42.7	48.9	50.8	29.6	33.3	33.1
Occasional	8.9	10.8	9.8	9.6	13.1	17.1	11.8	15.0	17.8	17.3	18.5	20.9
Regular*	14.5	13.4	12.0	27.1	24.3	16.8	43.3	35.1	30.7	51.2	46.8	43.8
Not known	1.7	0.5	0.0	1.1	0.6	0.7	2.2	1.0	0.7	1.9	1.4	2.2
MMG#												
Never	87.1	85.6	88.1	78.7	75.7	70.7	66.2	68.1	63.7	47.0	53.2	49.1
Occasional	3.4	7.8	6.3	8.2	9.7	16.0	10.4	11.5	15.2	16.5	17.3	19.0
Regular*	8.6	5.9	4.8	11.6	13.9	12.4	21.1	19.2	20.2	34.0	28.6	29.8
Not known	0.9	0.7	0.8	1.5	0.7	0.9	2.3	1.2	0.9	2.5	1.0	2.1
USG#												
Never	87.9	88.0	90.5	80.9	81.1	75.7	69.5	71.4	66.3	51.2	55.1	46.5
Occasional	2.3	5.4	6.3	6.7	7.3	13.4	9.4	10.4	13.5	16.0	16.0	19.3
Regular*	8.3	5.9	2.4	9.3	10.6	9.9	17.1	17.0	19.0	25.4	27.4	32.0
Not known	1.4	0.7	0.8	3.1	1.0	1.0	4.0	1.2	1.1	7.4	1.6	2.2

Total number of patients for BSE and CBE in each group:

No schooling/kindergarten:	358 (for 2006-2010), 425 (for 2011-2015), 133 (for 2016-current)
Primary school:	1,640 (for 2006-2010), 2,074 (for 2011-2015), 701 (for 2016-current)
Secondary school:	3,264 (for 2006-2010), 4,340 (for 2011-2015), 1,701 (for 2016-current)
Matriculation or above:	1,271 (for 2006-2010), 1,735 (for 2011-2015), 865 (for 2016-current)

Total number of patients for MMG and USG in each group:

No schooling/kindergarten:	348 (for 2006-2010), 410 (for 2011-2015), 126 (for 2016-current)
Primary school:	1,596 (for 2006-2010), 2,041 (for 2011-2015), 686 (for 2016-current)
Secondary school:	2,862 (for 2006-2010), 3,913 (for 2011-2015), 1,568 (for 2016-current)
Matriculation or above:	942 (for 2006-2010), 1,366 (for 2011-2015), 677 (for 2016-current)

BSE: Breast self-examination; CBE: Clinical breast examination; MMG: Mammography screening; USG: Breast ultrasound screening
* "Regular" is defined as having the breast screening every 1-3 years. # Included patients aged 40 or above only

D. Breast screening habits and household income

1.37 Breast screening habits were also studied by patients' monthly household income level (Table 1.14). Figures show that the patients with lower income had undergone less breast screening prior to cancer diagnosis. In the cohorts, 40.9%-45.7% of the patients with monthly household income of less than $10,000 had never performed BSE, compared to 19.1%-23.2% of the patients who had income of $60,000 or more. The corresponding figures are 58.2%-59.2% compared to 17.4%-21.5% for CBE, 64.9%-76.9% compared to 35.3%-42.9% for MMG, and 71.1%-80.6% compared to 41.5%-46.2% for USG.

Table 1.14: Breast screening habits by monthly household income (HK$) (N=10,459)

	Monthly household income ($) % for 2006-2010, % for 2011-2015, % for 2016-current											
	<10,000			10,000-29,999			30,000-59,999			≥ 60,000		
BSE												
Never	45.7	43.3	40.9	36.0	37.0	39.9	28.2	31.7	27.8	19.1	23.2	22.5
Occasional	33.6	37.9	41.3	37.1	43.9	36.6	47.6	48.5	50.9	56.4	57.9	55.2
Monthly	18.3	18.2	16.9	25.3	18.3	22.7	21.9	19.4	20.4	22.1	17.4	21.2
Not known	2.4	0.6	0.9	1.5	0.7	0.8	2.3	0.5	1.0	2.4	1.5	1.1
CBE												
Never	59.2	59.0	58.2	41.3	44.1	52.2	29.8	32.6	35.2	17.4	21.5	21.4
Occasional	12.2	14.5	17.8	12.2	16.6	15.4	14.8	18.5	20.2	16.2	19.7	25.3
Regular*	26.7	25.6	22.7	45.0	38.7	31.5	53.5	48.0	43.8	64.3	56.3	51.9
Not known	1.8	0.9	1.3	1.5	0.6	1.0	2.0	0.9	0.8	2.0	2.6	1.4
MMG#												
Never	76.9	73.7	64.9	68.1	67.4	63.8	52.9	54.7	50.9	35.3	42.6	42.9
Occasional	8.2	10.0	16.6	11.0	13.0	13.5	15.5	16.0	19.0	18.9	19.5	21.6
Regular*	12.9	15.3	16.6	18.9	18.8	21.3	29.3	28.4	29.2	44.4	36.1	35.6
Not known	2.0	1.1	1.9	2.1	0.7	1.4	2.3	0.8	1.0	1.4	1.9	0.0
USG#												
Never	80.6	79.7	71.1	71.6	70.4	65.0	56.1	58.1	50.1	41.5	46.2	42.2
Occasional	7.1	7.8	14.7	9.5	11.8	12.3	13.9	14.8	18.5	19.3	18.5	22.5
Regular*	8.4	11.7	11.8	15.1	16.9	21.1	25.1	26.3	30.7	31.0	33.0	34.3
Not known	3.8	0.8	2.4	3.8	0.9	1.6	4.9	0.8	0.7	8.1	2.3	1.0

Total number of patients for BSE and CBE in each group:

<$10,000: 819 (for 2006-2010), 815 (for 2011-2015), 225 (for 2016-current)
$10,000-29,999: 1,748 (for 2006-2010), 2,175 (for 2011-2015), 714 (for 2016-current)
$30,000-59,999: 813 (for 2006-2010), 1,162 (for 2011-2015), 511 (for 2016-current)
≥$60,000: 493 (for 2006-2010), 620 (for 2011-2015), 364 (for 2016-current)

Total number of patients for MMG and USG in each group:

<$10,000: 758 (for 2006-2010), 752 (for 2011-2015), 211 (for 2016-current)
$10,000-29,999: 1,512 (for 2006-2010), 1,915 (for 2011-2015), 634 (for 2016-current)
$30,000-59,999: 618 (for 2006-2010), 961 (for 2011-2015), 411 (for 2016-current)
≥$60,000: 419 (for 2006-2010), 524 (for 2011-2015), 315 (for 2016-current)

BSE: Breast self-examination; CBE: Clinical breast examination; MMG: Mammography screening; USG: Breast ultrasound screening
* "Regular" is defined as having the breast screening every 1-3 years. # Included patients aged 40 or above only

E. *Breast screening habits and district of residence*

1.38 Breast screening habits were further stratified by patients' district of residence (Table 1.15). Higher proportions of the patients who resided in Kowloon (2006-2010: 34.7%; 2011-2015: 30.3%; 2016-current: 28.8%) or the New Territories (2006-2010: 28.6%; 2011-2015: 26.2%; 2016-current: 29.7%) had never undergone any breast screening (including BSE, CBE, MMG, and USG) than those who resided on Hong Kong Island (2006-2010: 14.8%; 2011-2015: 20.8%; 2016-current: 18.8%). In addition, higher proportions (26.1%-33.4%) of the patients who resided on Hong Kong Island had regular MMG than those who resided in Kowloon (17.5%-20.6%) and the New Territories (16.3%-17.7%) (Table 1.15).

Table 1.15: Breast screening habits by district of residence (N=17,852)

	District of residence % for 2006-2010, % for 2011-2015, % for 2016-current								
	Hong Kong Island			Kowloon			New Territories		
BSE									
Never	28.1	34.6	30.2	45.1	40.2	37.2	41.8	40.1	41.3
Occasional	47.0	46.1	48.8	33.6	38.5	46.2	33.4	40.0	36.5
Monthly	21.4	17.6	19.5	18.7	20.5	14.5	23.7	19.3	21.4
Not known	3.5	1.6	1.5	2.6	0.8	2.1	1.2	0.6	0.8
CBE									
Never	30.4	35.7	38.1	51.5	55.7	50.3	49.4	51.4	53.6
Occasional	14.3	19.0	18.8	12.6	13.1	18.8	11.7	14.7	17.5
Regular*	52.0	42.5	41.6	33.1	30.5	29.2	37.7	33.2	28.2
Not known	3.3	2.8	1.5	2.8	0.7	1.6	1.2	0.7	0.8
MMG#									
Never	46.5	55.3	53.4	70.1	71.0	62.4	72.8	70.5	66.1
Occasional	16.2	16.5	17.9	9.3	10.7	15.2	9.4	11.3	15.3
Regular*	33.4	26.1	27.5	17.9	17.5	20.6	16.3	17.5	17.7
Not known	3.9	2.2	1.2	2.6	0.8	1.8	1.5	0.7	0.8
USG#									
Never	51.9	59.8	53.1	73.4	75.1	64.5	75.0	73.8	68.2
Occasional	15.0	14.4	16.2	8.4	9.8	14.7	8.3	9.7	13.9
Regular*	23.8	22.4	29.5	13.5	14.3	19.1	14.1	15.8	16.7
Not known	9.3	3.4	1.2	4.7	0.8	1.6	2.6	0.7	1.2

Total number of patients for BSE and CBE in each group:

Hong Kong Island: 1,009 (for 2006-2010), 1,071 (for 2011-2015), 473 (for 2016-current)

Kowloon: 1,551 (for 2006-2010), 1,892 (for 2011-2015), 625 (for 2016-current)

New Territories: 3,795 (for 2006-2010), 5,311 (for 2011-2015), 2,125 (for 2016-current)

Total number of patients for MMG and USG in each group:

Hong Kong Island: 881 (for 2006-2010), 966 (for 2011-2015), 414 (for 2016-current)

Kowloon: 1,373 (for 2006-2010), 1,705 (for 2011-2015), 563 (for 2016-current)

New Territories: 3,350 (for 2006-2010), 4,819 (for 2011-2015), 1,933 (for 2016-current)

BSE: Breast self-examination; CBE: Clinical breast examination; MMG: Mammography screening; USG: Breast ultrasound screening

* "Regular" is defined as having the breast screening every 1-3 years. # Included patients aged 40 or above only