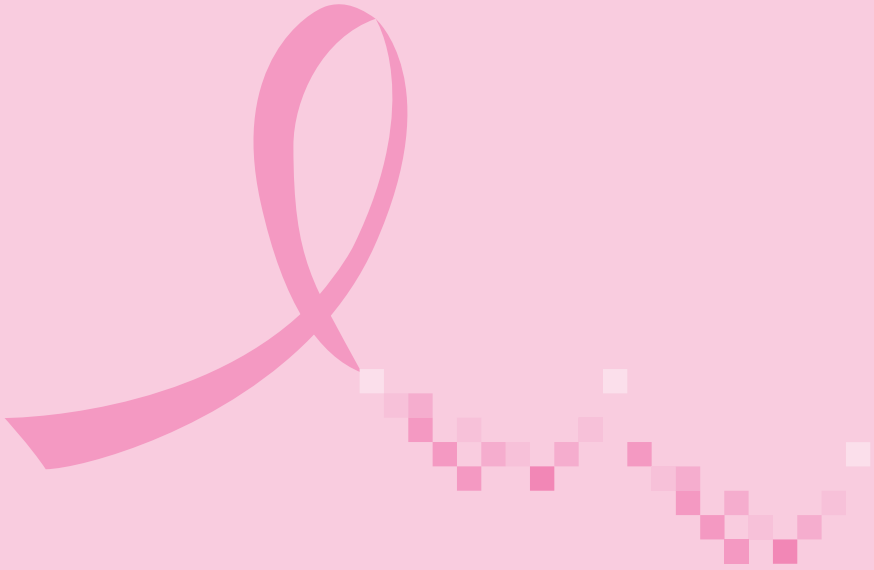

CHAPTER 1

# PREVENTION AND EARLY DETECTION OF BREAST CANCER

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# 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 19,723 Hong Kong breast cancer patients who were diagnosed between 2006 and 2018 and recruited in the Hong Kong Breast Cancer Registry (HKBCR), the distribution of these factors among patients in the local context was studied. Their breast screening habits, in particular, were also examined. These analyses aim to shed light on the causes of breast cancer in Hong Kong.

### HIGHLIGHTS

This chapter reports the patient characteristics of 19,723 patients who were diagnosed of breast cancer between 2006 and 2018 and recruited in the HKBCR.

- Two-thirds of the patients were aged between 40 and 59, with the median age at 52.2.
- More than two-thirds attained secondary school level or above.

#### Risk factors

- The 10 most common risk factors of breast cancer are listed below, with the respective proportions of risk exposure:

| | % |
|---|---|
| Lack of exercise (<3 hours / week) | 77.5 |
| No breastfeeding | 65.9 |
| Being overweight / obese | 38.6 |
| High level of stress (>50% of time) | 37.0 |
| No childbirth / first live birth after age 35 | 27.2 |
| Family history of breast cancer | 15.0 |
| Diet rich in meat / dairy products | 14.2 |
| Early menarche (<12 years old) | 14.1 |
| Habit of drinking alcohol | 5.3 |
| Use of hormone replacement therapy | 3.6 |

- In the cohort, 61.2% of the patients had three or more common risk factors, while 36.2% had one to two risk factors. Only 2.6% of the patients had none of the common risk factors studied.

#### Screening habits

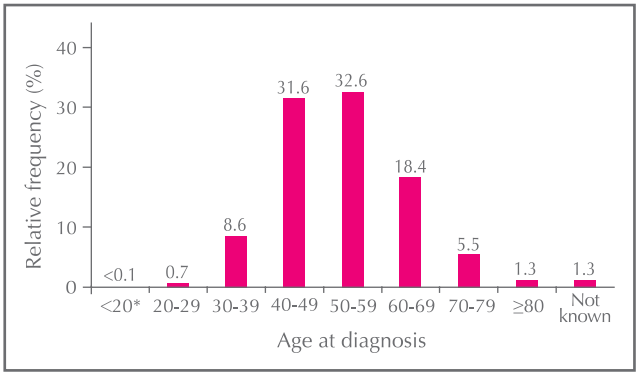
- Of the patients aged 40 or above, 66.7% had never undergone mammography (MMG), while less than a quarter had regular MMG.
- Patients with lower education levels had lower proportion of undergoing regular MMG.
- Patients with lower monthly household income had lower proportion of undergoing regular MMG.

## II. Demographics

### A. Age at diagnosis

1.2 The age at diagnosis ranged from 18 to 103 with two-thirds of the patients aged between 40 and 59 (Figure 1.1), and the median was 52.2 years. It was found that patients in different age groups had different habits of breast screening (Section IV below).

**Figure 1.1: Distribution of age at diagnosis (N=19,723)**



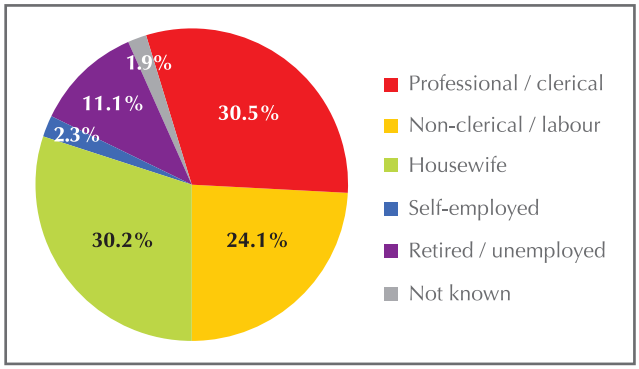

*Only one patient belonged to the <20 age group.

### B. Occupation

1.3 Although international studies provided no evidence that occupation was related to breast cancer,[2] some studies suggested a certain degree of association between night shift and breast cancer.[3] There were arguments that night shift work interacted with chronotype and resulted in a disrupted circadian rhythm due to exposure to artificial light at night.[3,4]

1.4 A local study found that the average working hours among women in the general population was 42.0 hours per week.[5] The findings of the Hong Kong Breast Cancer Foundation (HKBCF) were consistent with the finding of the local study. In this report, slightly more than half of the patients were working at cancer diagnosis (Figure 1.2), and the median working hours was 45 per week. Of the patients, 9% had night shift duties, and the median number of nights they worked in a year was 60.

**Figure 1.2: Occupation of patient cohort (N=19,723)**




### C. Education level and monthly household income

1.5 Studies conducted in Western countries found that lower education level and household income were associated with lower level of breast cancer awareness and less regular breast screening habits of women, even though they lived in the same city.[6-8] A study of the HKBCF produced similar findings.[9]

1.6 In this report, 70.8% of the patients attained secondary school level or above, while the remainder had primary school level or below (Figure 1.3). Patients who attained lower education level were less likely to undergo regular breast screening than those with higher education levels (Section IV below).

1.7 About 40% of patients had a monthly household income of $30,000 or more, while 17.6% had less than $10,000 (Figure 1.4). Patients who had lower monthly household income were less likely to undergo regular breast screening than those with higher income (Section IV below).

Figure 1.3: Education level of patient cohort (N=19,723)

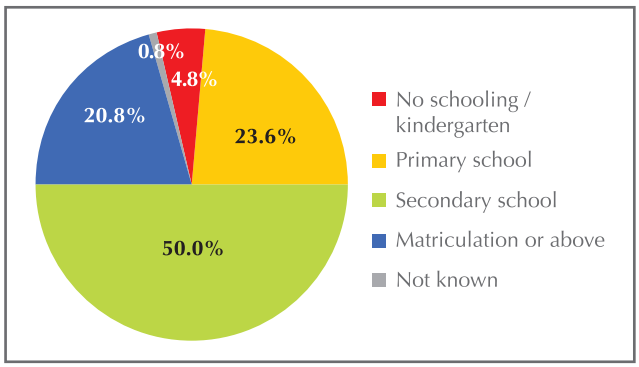
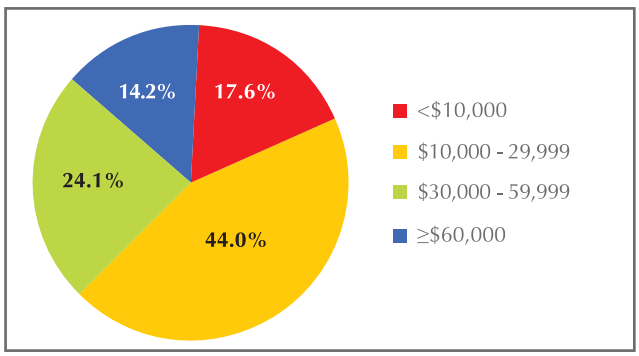


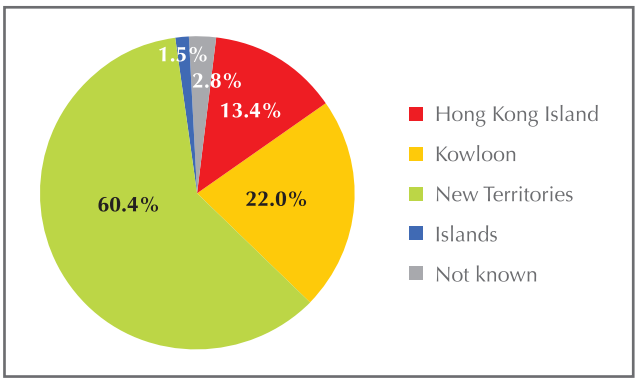

Figure 1.4: Monthly household income (HK$) of patient cohort (N=10,811)




## D. District of residence

1.8 In the cohort, 60.4% of the patients resided in the New Territories, 22.0% resided in Kowloon, and 13.4% resided on Hong Kong Island (Figure 1.5). Patients living in the New Territories or Kowloon had less regular breast screening than those living on Hong Kong Island (Section IV below).

Figure 1.5: District of residence of patient cohort (N=19,723)




## E. Bra band size and bra cup size

1.9 Some studies suggested that there was a certain degree of association between larger breast size and breast cancer.[10-12] A recent study found that the genetic correlation between body mass index (BMI) and breast size was positive while that between BMI and breast cancer risk was negative, in that genetic predisposition to high BMI was associated with larger breast size and a reduced risk of breast cancer.[13] Nonetheless, these studies were mainly conducted on women in Western countries and such findings may not be applicable to Asian women, whose breast size could not account for breast density[14] which has a role in breast cancer risk.[15]

1.10 In the cohort, the median bra band size was 34 inches and 49.2% of the patients were above the median (Figure 1.6). For breast cup size, about three-quarters had cup B or smaller breasts, while only a small proportion had cup D or above (Figure 1.7).

Figure 1.6: Bra band size of patient cohort (N=15,272)

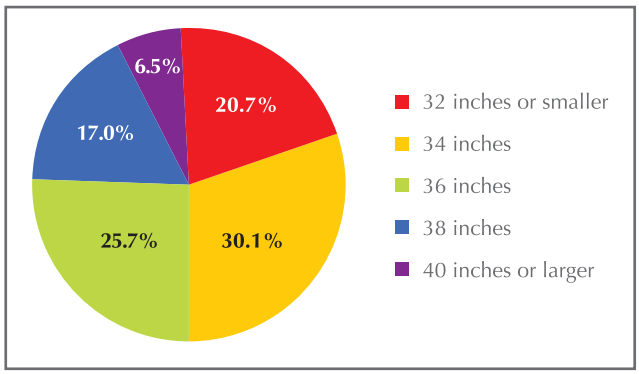
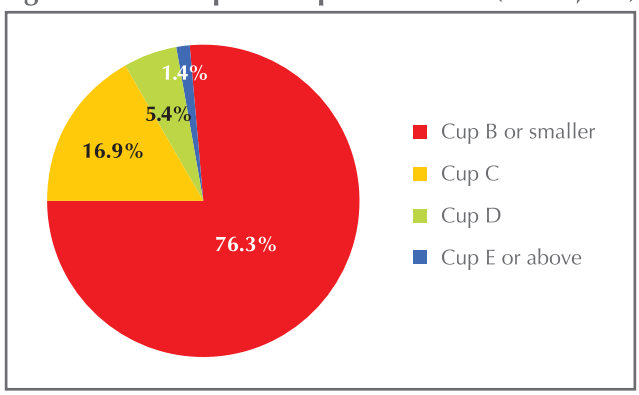



Figure 1.7: Bra cup size of patient cohort (N=12,844)




## III. Risk factors and health background

### *A. Tobacco smoking*

1.11 The International Agency for Research on Cancer (IARC) has classified tobacco smoking as a probable cause of breast cancer.[3] A study found that in Hong Kong, 3.0% of women had daily smoking habit.[16] Although the relationship between active or passive smoking and breast cancer has yet to be established,[17] the HKBCF found that current or ex-smoker had a higher breast cancer risk.[18]

1.12 In this report, 4.8% of the patients reported that they had smoked prior to cancer diagnosis, and 47.9% of these smokers were still smoking at diagnosis. The mean packs of cigarette consumed by current or ex-smokers who had quit smoking for less than a year were 3.8 per week in the preceding 12 months prior to cancer diagnosis.

### *B. Alcohol drinking*

1.13 The World Health Organization (WHO) has classified alcohol consumption as Group 1 carcinogens for breast cancer for people of all ages.[3,19] The risk of breast cancer increases with the amount of alcohol consumed, i.e. for every 10 g ethanol (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) consumed per day, the risk of breast cancer is increased by 5% for premenopausal women and 9% for postmenopausal women.[19] A study found that in 2016, 10.4% of Hong Kong women in the general population drank alcoholic beverages at least once a week.[20]

1.14 In this report, 5.3% of the patients reported that they had been alcohol consumers (i.e. consuming five alcoholic drinks or more in a 12-month period) at some point in their life, and 40.4% of these drinkers were still drinking at diagnosis. Among those who had stopped drinking alcoholic beverages for less than a year or were still drinking at diagnosis, the mean glasses of alcoholic beverages consumed per week were 5.6 in the preceding 12 months prior to cancer diagnosis. The two most commonly consumed alcoholic beverages were red wine (45.4%) and beer (39.6%).

## C. *Dietary and exercise habits and stress level*

1.15 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.[19] The HKBCF also found a negative association between physical exercise and breast cancer risk, in that working out for three hours or more per week would help reduce breast cancer risk not only among postmenopausal women but also among premenopausal women.[18]

1.16 In this report, 68.8% of the patients had a balanced diet, while 14.2% ate a diet rich in meat or dairy product (Figure 1.8). About one-fifth of the patients exercised three hours or more per week, while about two-fifths never exercised in the year prior to diagnosis (Figure 1.9).

1.17 Current studies on stress as a risk factor for breast cancer are non-conclusive and the subject requires further investigation. The HKBCF, nevertheless, found increased risk in women with a perceived high level of psychological stress, when it is measured at a global level with all the possible stressors included.[18] In this report, 37.0% of the patients 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=19,723)**

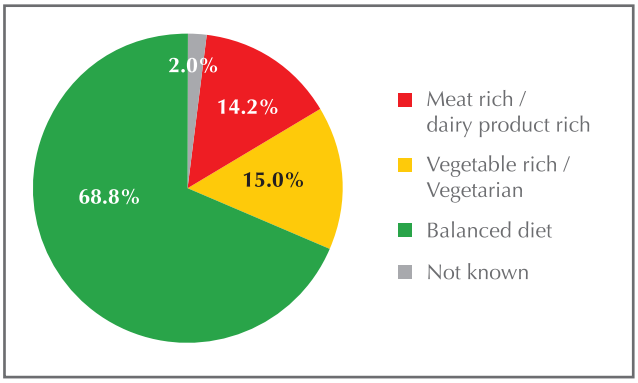



**Figure 1.9: Exercise habits at diagnosis (N=19,723)**

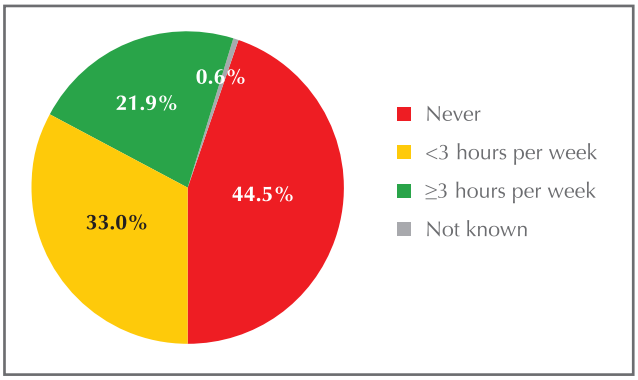
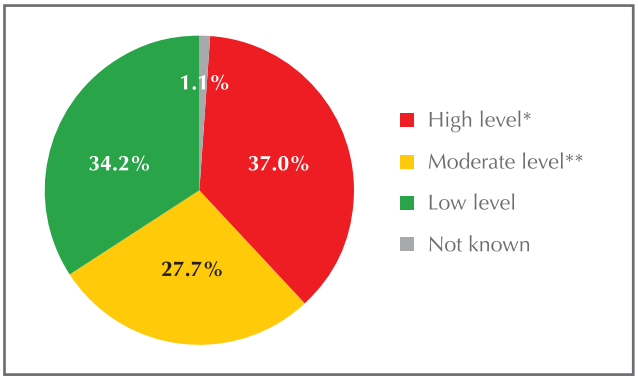



**Figure 1.10: Stress level at diagnosis (N=19,723)**




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

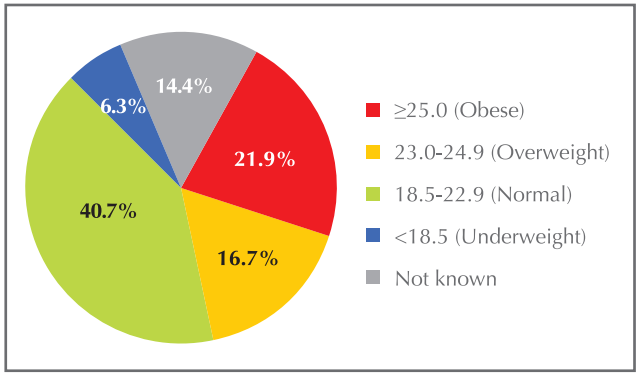
** Moderate level is defined as 25%-50% of the time

## D. Height, weight and body mass index

1.18 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 ($kg/m^2$). 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.[18,21] 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.[22]

1.19 In this report, the patient cohort had an average height of 157.9 cm and an average weight of 57.5 kg. About two-fifths of the patients were overweight or obese (Figure 1.11).

**Figure 1.11: Body mass index at diagnosis (N=19,723)**




## E. Family history of breast cancer

1.20 Breast cancer risk is found to be higher among women who have one first-degree relative with breast cancer, when 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.[23,24] In the cohort, 15.0% of the patients had family histories of breast cancer (Table 1.1).

**Table 1.1: Family history of breast cancer at diagnosis (N=19,723)**

| | Number | % |
|---|---|---|
| No | 16,554 | 83.9 |
| Yes with first-degree relative(s) | 2,110 | 10.7 |
| Yes with non first-degree relative(s) only | 808 | 4.1 |
| Yes but details not known | 36 | 0.2 |
| Family history not known | 215 | 1.1 |

## F. Personal history of other tumours

1.21 International studies and studies on Hong Kong Chinese cohort estimated that 5% to 10% of breast cancer patients are genetically predisposed.[25,26] Breast cancer risk was higher in women with previous histories of germline-mutation-related types of cancer, including Hodgkin lymphoma, melanoma, lung adenocarcinoma, bowel cancer, uterine cancer and chronic lymphocytic leukaemia, or any type of cancer in childhood.[27-32] On the other hand, breast cancer risk was found to be lower in cervical squamous cell carcinoma survivors.[31,32] In this report, 1.8% of the patients suffered from other types of malignant tumours prior to breast cancer diagnosis (Table 1.2), and the most common tumour was thyroid cancer (Table 1.3).

**Table 1.2: Personal history of other tumours at diagnosis (N=19,723)**

| | Number | % |
|---|---|---|
| No | 16,133 | 81.8 |
| Benign tumour | 2,903 | 14.7 |
| Malignant tumour | 354 | 1.8 |
| Nature of previous tumours not known | 59 | 0.3 |
| History of tumours not known | 274 | 1.4 |

**Table 1.3: Origins of malignant tumours reported by patients (N=354)**

| | Number | % |
|---|---|---|
| Thyroid | 59 | 16.7 |
| Colon / rectum | 52 | 14.7 |
| Uterus | 52 | 14.7 |
| Cervix | 25 | 7.1 |
| Lung | 22 | 6.2 |
| Ovary | 20 | 5.6 |
| Nasopharynx | 16 | 4.5 |
| Small Intestine | 14 | 4.0 |
| Lymphatic System | 11 | 3.1 |
| Liver | 7 | 2.0 |
| Skin | 5 | 1.4 |
| Bladder | 5 | 1.4 |
| Stomach | 4 | 1.1 |
| Bone | 3 | 0.8 |
| Brain | 3 | 0.8 |
| Esophagus | 3 | 0.8 |
| Muscle | 2 | 0.6 |
| Blood | 2 | 0.6 |
| Kidney | 2 | 0.6 |
| Tongue | 2 | 0.6 |
| Oral cavity (excluding tongue) | 2 | 0.6 |
| Others* | 12 | 3.4 |
| Not known | 50 | 14.1 |

*Others included fallopian tube, salivary gland, gallbladder, etc.

Note: The total percentages may exceed 100 as multiple body parts may be involved.

## G. History of benign breast disease

1.22 Several studies found that women with some types of benign breast disease would have an increased risk of breast cancer.[33] Benign breast disease can be classified into three categories: non-proliferative disease, proliferative disease without atypia, and proliferative disease with atypia. Non-proliferative diseases, such as fibroadenoma or other fibrocystic diseases, are generally not associated with increasing the risk of breast cancer.[33] On the other hand, proliferative diseases without atypia (e.g. papilloma and papillomatosis) and proliferative diseases with atypia [e.g. atypical ductal hyperplasia and lobular neoplasia, including atypical lobular hyperplasia and lobular carcinoma in situ (LCIS)] are linked to variably increased risk of breast cancer.[33]

1.23 The proportion of patients who had previous history of benign breast disease was 13.7% (Table 1.4). Fibroadenoma, which does not increase the risk of breast cancer, was the most common (47.9%). Among the patients, only eight patients suffered from atypical ductal hyperplasia. In addition, two patients suffered from LCIS prior to breast cancer diagnosis (Table 1.4).

**Table 1.4: History of benign breast disease at diagnosis (N=19,723)**

| | Number | % |
|---|---|---|
| **Have history of benign breast disease** | **2,706** | **13.7** |
| **Type of benign breast disease** | | |
| Fibroadenoma | 1,295 | 47.9 |
| Fibrocystic disease | 437 | 16.1 |
| Microcalcification | 49 | 1.8 |
| Inflammation | 73 | 2.7 |
| Papilloma | 40 | 1.5 |
| Papillomatosis | 5 | 0.2 |
| Hyperplasia | 284 | 10.5 |
| Lipoma | 20 | 0.7 |
| Atypical ductal hyperplasia | 8 | 0.3 |
| Lobular carcinoma in situ | 2 | 0.1 |
| Others (e.g. other benign tumours) | 342 | 12.6 |
| Not known | 215 | 7.9 |

Note: The total percentages may exceed 100 as multiple types of benign breast disease may be reported.

## H. Early menarche, late menopause and reproductive history

1.24 Life events such as early menarche (<12 years old), late natural menopause (>55 years old), not bearing children, and late first pregnancy (>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.[19]

1.25 The mean age at menarche of the patients was 13.2, and 14.1% experienced early menarche (Table 1.5). Of the patients, 53.0% were post-menopausal. Among them, a small proportion experienced late menopause and the mean age at menopause was 49.7. In addition, the proportion of patients being nulliparous was 22.9%, and only 4.3% had their first childbirth after the age of 35 (Table 1.5). Among those who experienced childbirth(s), about 70% had two or more children (Table 1.6), and the mean age at which they had their first childbirth was 27.

1.26 Breastfeeding is considered a protective factor against breast cancer at all ages.[18,19] In the cohort, about one-third of the patients had breastfed their children and the mean total duration of breastfeeding was 15.7 months (Table 1.5).

**Table 1.5: Menarche, menopause and reproductive history at diagnosis**

| | Number | % |
|---|---|---|
| **Menarche (N=19,723)** | | |
| Early menarche (<12 years old) | 2,774 | 14.1 |
| Normal menarche (≥12 years old) | 15,329 | 77.7 |
| Age at menarche not known | 1,620 | 8.2 |
| **Menopause (N=10,460)** | | |
| Late menopause (>55 years old) | 572 | 5.5 |
| Normal menopause (≤55 years old) | 8,521 | 81.5 |
| Age at menopause not known | 1,367 | 13.1 |
| **Reproductive history (N=19,723)** | | |
| No childbirth | 4,525 | 22.9 |
| First childbirth at early age (≤35 years old) | 13,609 | 69.0 |
| First childbirth at late age (>35 years old) | 840 | 4.3 |
| Age at first live birth not known | 456 | 2.3 |
| Reproductive history not known | 293 | 1.5 |
| **Breastfeeding (N=19,723)** | | |
| Yes | 6,376 | 32.3 |
| No (had childbirth) | 8,433 | 42.8 |
| No (no childbirth) | 4,525 | 22.9 |
| No (reproductive history not known) | 43 | 0.2 |
| Not known | 346 | 1.8 |

**Table 1.6: Number of live births reported by patients (N=14,905)**

| | Number | % |
|---|---|---|
| 1 | 4,248 | 28.5 |
| 2 | 6,701 | 45.0 |
| 3 | 2,519 | 16.9 |
| 4 | 851 | 5.7 |
| 5 or more | 519 | 3.5 |
| Not known | 67 | 0.4 |

## I. Use of hormonal contraceptives

1.27 Hormonal contraceptives contain synthetic sex hormones. They 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 five to 10 years or 10 years or more resulted in no excess risk compared to non-users.[3,34,35] Conflicting results were also obtained when studying the correlation between breast cancer risk and injectable contraceptives or implants.[36-40] Further investigation is therefore needed to ascertain the correlation between hormonal contraceptives and breast cancer risk.

1.28 The proportion of patients who had never used hormonal contraceptives was 68.6% (Table 1.7). Of the hormonal contraceptive users, 79.6% had stopped using it at diagnosis and the mean years that they had stopped using it was 18.6.

**Table 1.7: Use of hormonal contraceptives at diagnosis (N=19,723)**

| | Number | % |
|---|---|---|
| Non-user | 13,536 | 68.6 |
| OC use <5 years | 2,822 | 14.3 |
| OC use 5-10 years | 1,457 | 7.4 |
| OC use >10 years | 607 | 3.1 |
| Length of OC use not known | 979 | 5.0 |
| Not known if OC was used | 322 | 1.6 |

OC: hormonal contraceptives

## J. Use of hormone replacement therapy

1.29 Hormone replacement therapy (HRT) contains synthetic sex hormones and is used to relieve postmenopausal symptoms. The IARC has classified current use of combined estrogen-progestogen HRT for menopausal symptoms as a risk factor for breast cancer.[3] Of the postmenopausal patients, a small proportion had used HRT and only 2.5% had used it for five or more years (Table 1.8).

**Table 1.8: Use of hormone replacement therapy at diagnosis (N=10,460)**

| | Number | % |
|---|---|---|
| Non-user | 9,581 | 91.6 |
| HRT use <5 years | 365 | 3.5 |
| HRT use 5-10 years | 213 | 2.0 |
| HRT use >10 years | 52 | 0.5 |
| Length of HRT use not known | 71 | 0.7 |
| Not known if HRT was used | 178 | 1.7 |

HRT: hormone replacement therapy

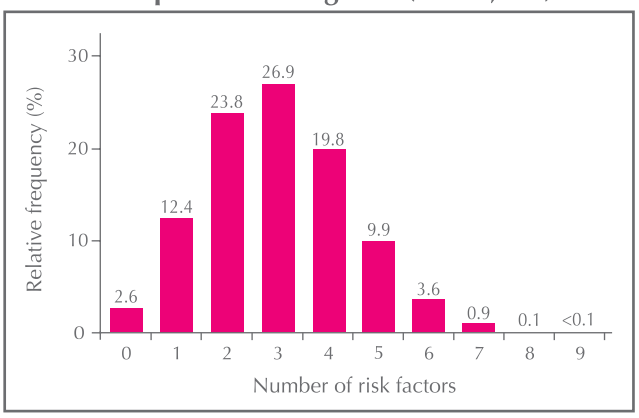
## K. Ten most common risk factors associated with breast cancer in Hong Kong

1.30 Among all the risk factors studied, the majority were exposed to the factor of lack of exercise, followed by no breastfeeding experience and being overweight or obese (Table 1.9). The combination of multiple risk factors increases the risk of getting breast cancer, with the single factor of stress contributing to more than three-fold breast cancer risk.[18] In the cohort, 61.2% of the patients had three or more common risk factors, while 36.2% had one to two risk factors. Only 2.6% of the patients had none of the common risk factors studied (Figure 1.12).

**Table 1.9: Ten most common risk factors for breast cancer in patient cohort (N=19,723)**

| | Number | % |
|---|---|---|
| Lack of exercise (<3 hours / week) | 15,288 | 77.5 |
| No breastfeeding | 13,001 | 65.9 |
| Being overweight / obese | 7,615 | 38.6 |
| High level of stress (>50% of time) | 7,288 | 37.0 |
| No childbirth / first live birth after age 35 | 5,365 | 27.2 |
| Family history of breast cancer | 2,954 | 15.0 |
| Diet rich in meat / dairy products | 2,792 | 14.2 |
| Early menarche (<12 years old) | 2,774 | 14.1 |
| Habit of drinking alcohol | 1,043 | 5.3 |
| Use of hormone replacement therapy | 701 | 3.6 |

**Figure 1.12: Distribution of risk factors among patients at diagnosis (N=19,723)**




## IV. Breast screening habits

### *A. Breast screening methods*

1.31 Breast screening is a method of checking 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 methods used for breast cancer screening include 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, while breast ultrasound screening (USG) could detect breast opacity using high-frequency sound waves.

1.32 The HKBCF recommends women aged 40 or above to perform monthly BSE as a measure of raising breast self-awareness, and also regularly undergo CBE and MMG. In addition, MMG plus USG is suggested for women with dense breasts. Although there is no population-based breast screening programme in Hong Kong, the Government has recommended risk-based population screening in average risk women since July 2020.[41] The breast screening habits prior to cancer diagnosis studied in the current report were self-initiated.

## B. Breast screening habits and age

1.33 The breast screening habits of the patient cohort were studied by age group (Table 1.10). For each age group in the cohort, the respective proportions who underwent regular BSE, MMG and USG were less than a quarter (Table 1.10). Regular CBE were performed by about 40% of the patients aged below 60, but the proportions dropped for patients aged between 60 and 69 and aged 70 or above (Table 1.10). With the exception of patients aged below 40, the proportion of patients who had never performed BSE or had never undergone CBE and USG was positively correlated with age. In addition, 66.7% of the patients aged 40 or above had never undergone MMG.

**Table 1.10: Breast screening habits by age group**

| | Age group, % | | | | |
|---|---|---|---|---|---|
| | **<40** | **40-49** | **50-59** | **60-69** | **≥70** |
| **BSE (N=19,463)** | **(N=1,838)** | **(N=6,229)** | **(N=6,424)** | **(N=3,627)** | **(N=1,345)** |
| Never | 37.7 | 35.4 | 37.9 | 43.7 | 58.8 |
| Occasional | 42.0 | 41.5 | 38.9 | 35.7 | 26.8 |
| Monthly | 19.2 | 22.0 | 21.7 | 19.4 | 13.2 |
| Not known | 1.1 | 1.1 | 1.6 | 1.1 | 1.2 |
| **CBE (N=19,463)** | **(N=1,838)** | **(N=6,229)** | **(N=6,424)** | **(N=3,627)** | **(N=1,345)** |
| Never | 50.5 | 42.0 | 44.8 | 56.6 | 77.9 |
| Occasional | 13.9 | 14.9 | 15.8 | 15.7 | 10.1 |
| Regular* | 34.5 | 41.9 | 38.1 | 26.1 | 10.3 |
| Not known | 1.0 | 1.1 | 1.4 | 1.5 | 1.7 |
| **MMG# (N=17,625)** | | **(N=6,229)** | **(N=6,424)** | **(N=3,627)** | **(N=1,345)** |
| Never | — | 68.0 | 62.2 | 66.0 | 84.1 |
| Occasional | — | 11.7 | 13.3 | 14.0 | 8.3 |
| Regular* | — | 19.1 | 23.0 | 18.4 | 5.9 |
| Not known | — | 1.2 | 1.5 | 1.6 | 1.7 |
| **USG# (N=17,625)** | | **(N=6,229)** | **(N=6,424)** | **(N=3,627)** | **(N=1,345)** |
| Never | — | 66.6 | 67.0 | 73.8 | 86.0 |
| Occasional | — | 11.4 | 11.9 | 11.1 | 7.0 |
| Regular* | — | 19.8 | 18.8 | 12.7 | 5.0 |
| Not known | — | 2.2 | 2.2 | 2.4 | 2.0 |

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

## C. Breast screening habits and education level

1.34 Breast screening habits were further studied by patients' education level (Table 1.11). The findings suggested that patients with lower education levels had undergone less breast screening prior to cancer diagnosis. In the cohort, 65.0% of the patients who had kindergarten level or no schooling had never performed BSE, compared to 27.7% of the patients who attained matriculation level or above. The corresponding figures are 75.3% compared to 32.1% for CBE, 86.2% compared to 50.4% for MMG, and 88.1% compared to 51.8% for USG.

**Table 1.11: Breast screening habits by education level**

| | Education level, % | | | |
|---|---|---|---|---|
| | No schooling / Kindergarten | Primary school | Secondary school | Matriculation or above |
| **BSE (N=19,559)** | **(N=943)** | **(N=4,654)** | **(N=9,856)** | **(N=4,106)** |
| Never | 65.0 | 48.3 | 38.1 | 27.7 |
| Occasional | 22.7 | 32.0 | 38.0 | 51.2 |
| Monthly | 11.6 | 18.8 | 22.7 | 19.4 |
| Not known | 0.7 | 0.9 | 1.2 | 1.7 |
| **CBE (N=19,559)** | **(N=943)** | **(N=4,654)** | **(N=9,856)** | **(N=4,106)** |
| Never | 75.3 | 62.1 | 47.2 | 32.1 |
| Occasional | 10.3 | 13.0 | 14.7 | 19.0 |
| Regular* | 13.6 | 24.2 | 36.7 | 47.2 |
| Not known | 0.8 | 0.8 | 1.3 | 1.6 |
| **MMG# (N=17,481)** | **(N=907)** | **(N=4,552)** | **(N=8,846)** | **(N=3,176)** |
| Never | 86.2 | 75.3 | 66.3 | 50.4 |
| Occasional | 6.4 | 10.7 | 12.2 | 17.6 |
| Regular* | 6.6 | 13.0 | 20.0 | 30.5 |
| Not known | 0.8 | 1.0 | 1.5 | 1.5 |
| **USG# (N=17,481)** | **(N=907)** | **(N=4,552)** | **(N=8,846)** | **(N=3,176)** |
| Never | 88.1 | 79.6 | 69.4 | 51.8 |
| Occasional | 4.7 | 8.7 | 11.0 | 17.1 |
| Regular* | 6.2 | 10.1 | 17.5 | 27.8 |
| Not known | 1.0 | 1.6 | 2.1 | 3.3 |

BSE: breast self-examination; CBE: clinical breast examination; MMG: mammography screening; USG: breast ultrasound screening

* "Regular" is defined as having the breast screening test every 1-3 years

# Included patients aged 40 or above only

## D. Breast screening habits and household income

1.35 Breast screening habits were also studied by patients' monthly household income level (Table 1.12). Figures show that patients with lower income had undergone less breast screening prior to cancer diagnosis. In the cohort, 43.9% of the patients with monthly household income of less than $10,000 had never performed BSE, compared to 22.0% of the patients who had income of $60,000 or more. The corresponding figures are 59.0% compared to 20.3% for CBE, 73.7% compared to 40.4% for MMG, and 78.8% compared to 43.6% for USG.

**Table 1.12: Breast screening habits by monthly household income (HK$)**

| | Monthly household income (HK$), % | | | |
|---|---|---|---|---|
| | **<10,000** | **10,000 – 29,999** | **30,000 – 59,999** | **≥ 60,000** |
| **BSE (N=10,811)** | **(N=1,905)** | **(N=4,761)** | **(N=2,608)** | **(N=1,537)** |
| Never | 43.9 | 37.0 | 29.9 | 22.0 |
| Occasional | 36.5 | 40.3 | 48.1 | 56.7 |
| Monthly | 18.2 | 21.6 | 20.7 | 19.7 |
| Not known | 1.4 | 1.0 | 1.2 | 1.6 |
| **CBE (N=10,811)** | **(N=1,905)** | **(N=4,761)** | **(N=2,608)** | **(N=1,537)** |
| Never | 59.0 | 44.3 | 32.4 | 20.3 |
| Occasional | 13.9 | 15.0 | 17.6 | 19.8 |
| Regular* | 25.9 | 39.7 | 48.8 | 57.8 |
| Not known | 1.3 | 0.9 | 1.2 | 2.0 |
| **MMG# (N=9,330)** | **(N=1,765)** | **(N=4,163)** | **(N=2,089)** | **(N=1,313)** |
| Never | 73.7 | 66.6 | 53.1 | 40.4 |
| Occasional | 10.1 | 12.8 | 16.6 | 19.4 |
| Regular* | 14.6 | 19.3 | 29.0 | 38.9 |
| Not known | 1.6 | 1.2 | 1.3 | 1.3 |
| **USG# (N=9,330)** | **(N=1,765)** | **(N=4,163)** | **(N=2,089)** | **(N=1,313)** |
| Never | 78.8 | 69.7 | 55.5 | 43.6 |
| Occasional | 8.6 | 11.3 | 15.5 | 19.6 |
| Regular* | 10.5 | 16.9 | 27.0 | 33.0 |
| Not known | 2.2 | 2.1 | 2.0 | 3.8 |

BSE: breast self-examination; CBE: clinical breast examination; MMG: mammography screening; USG: breast ultrasound screening

* "Regular" is defined as having the breast screening test every 1-3 years

# Included patients aged 40 or above only

## *E. Breast screening habits and district of residence*

1.36 Breast screening habits were further stratified by patients' district of residence (Table 1.13). For each breast screening method, higher proportions of patients living in Kowloon or the New Territories had never undergone that breast screening than those living on Hong Kong Island. In addition, a higher proportion (29.2%) of patients living on Hong Kong Island had regular MMG than those living in Kowloon (18.0%) and the New Territories (17.4%).

**Table 1.13: Breast screening habits by district of residence**

| | District of residence, % | | |
|---|---|---|---|
| | **Hong Kong Island** | **Kowloon** | **New Territories** |
| **BSE (N=18,877)** | **(N=2,639)** | **(N=4,330)** | **(N=11,908)** |
| Never | 31.5 | 41.6 | 40.8 |
| Occasional | 46.7 | 38.0 | 37.0 |
| Monthly | 19.4 | 18.9 | 21.4 |
| Not known | 2.3 | 1.6 | 0.8 |
| **CBE (N=18,877)** | **(N=2,639)** | **(N=4,330)** | **(N=11,908)** |
| Never | 34.2 | 53.5 | 50.8 |
| Occasional | 17.1 | 14.2 | 14.7 |
| Regular* | 45.9 | 30.7 | 33.7 |
| Not known | 2.8 | 1.6 | 0.8 |
| **MMG# (N=16,926)** | **(N=2,325)** | **(N=3,883)** | **(N=10,718)** |
| Never | 51.4 | 69.2 | 69.7 |
| Occasional | 16.6 | 11.3 | 12.0 |
| Regular* | 29.2 | 18.0 | 17.4 |
| Not known | 2.8 | 1.5 | 0.9 |
| **USG# (N=16,926)** | **(N=2,325)** | **(N=3,883)** | **(N=10,718)** |
| Never | 55.2 | 72.6 | 72.5 |
| Occasional | 15.1 | 10.4 | 10.6 |
| Regular* | 24.5 | 14.8 | 15.6 |
| Not known | 5.2 | 2.2 | 1.4 |

BSE: breast self-examination; CBE: clinical breast examination; MMG: mammography screening; USG: breast ultrasound screening

* "Regular" is defined as having the breast screening test every 1-3 years

# Included patients aged 40 or above only