



## 1.3 Health background

### *Body mass index at the time of diagnosis*

Body mass index (BMI) is calculated as body weight in kilograms divided by the square of body height in metres.

$$\text{Body mass index (BMI)} = \text{Weight (kg)} / [\text{height (m)}]^2$$

#### WHO BMI classification for Asian adults:

Classification	BMI
Underweight	< 18.5
Normal weight	18.5-22.9
Overweight	23.0-24.9
Obese	≥ 25.0

The average height and weight of the patient cohort were 157.7 cm and 56.5 kg respectively. According to World Health Organization classifications for Asian adults, 35.2% of our patient cohort was overweight or obese at the time of diagnosis (Table 1.3.1).

The number of overweight or obese patients tended to increase as age increased. The proportion ranged from 22.7% in the age group of 20-29 to 54.2% in the age group of 70-79 (Figure 1.3.1).

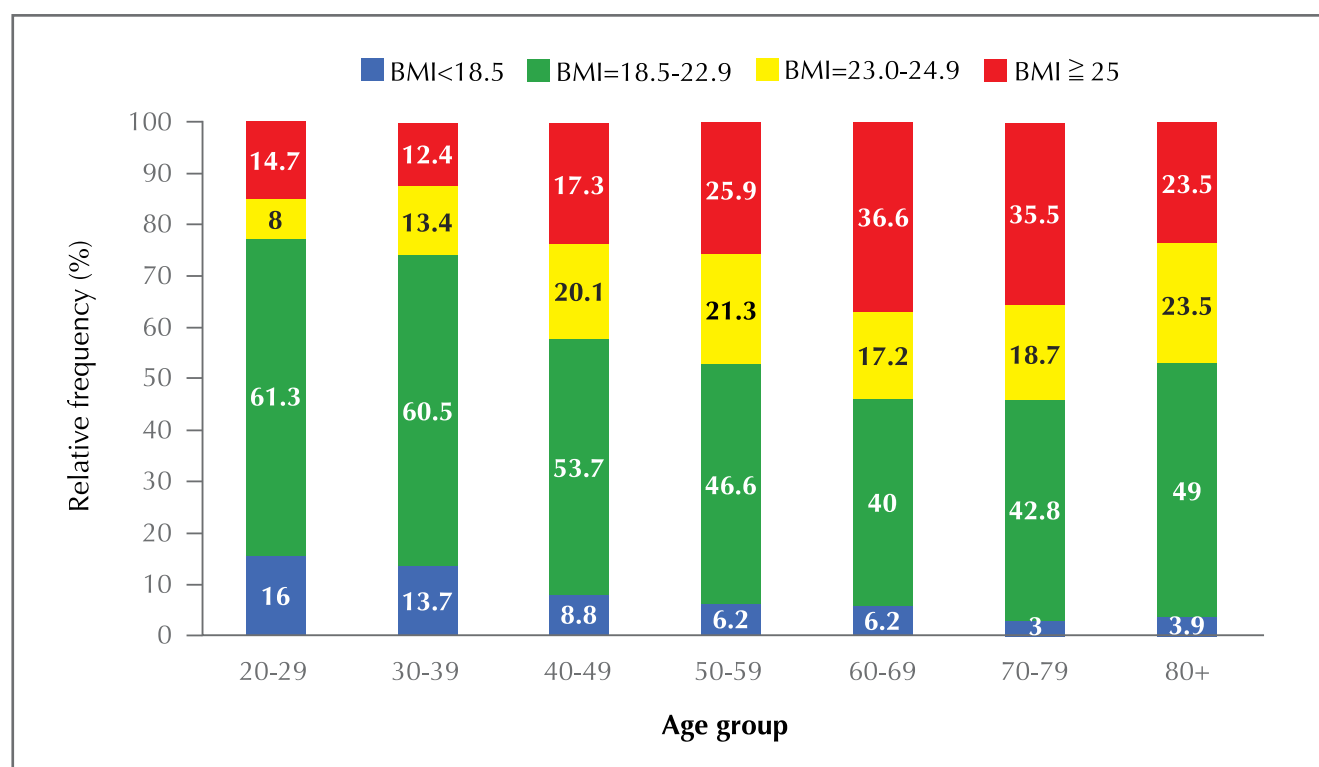
### *Bra size and cup size at the time of diagnosis*

In the patient group, 47.6% had a bra size of 34 inches or below and 57.5% had cup size B or smaller (Table 1.3.1).

**Table 1.3.1 Body mass index, bra size and cup size at the time of diagnosis (N=5,393)**

	Number	(%)		Number	(%)
<b>BMI</b>			<b>Bra size</b>		
< 18.5	403	(7.5)	32 inches or smaller	1,117	(20.7)
18.5-22.9	2,441	(45.3)	34 inches	1,450	(26.9)
23.0-24.9	897	(16.6)	36 inches	1,139	(21.1)
≥ 25.0	1,002	(18.6)	38 inches	592	(11.0)
Unknown	650	(12.1)	40 inches or larger	175	(3.2)
			Unknown	920	(17.1)
			<b>Cup size</b>		
			Cup B or smaller	3,100	(57.5)
			Cup C	554	(10.3)
			Cup D	160	(3.0)
			Cup E or above	38	(0.7)
			Unknown	1,541	(28.6)

Figure 1.3.1 Body mass index at the time of diagnosis by age group (N=5,271)



### Family history of breast cancer

82.2% of the patients had no family history of breast cancer. 9.2% reported a family history of breast cancer among their first-degree relatives and 4.7% reported that their non first-degree relatives had a history of breast cancer (Table 1.3.2).

### Personal history of tumours

In the patient cohort, 78.6% reported no personal history of tumours; 13.0% had benign tumours and 3.2% had malignant tumours at the time of diagnosis. Of the 3.2% of the patient cohort with malignant tumours, ovarian cancer (46.3%), thyroid cancer (25.7%) and colorectal cancer (9.1%) were the most commonly reported secondary tumours (Table 1.3.2).

### Previous breast disease

Of the patients, 14.6% had previous breast disease. Fibroadenoma was the most commonly recorded breast disease, presented in 40.7% of these cases (Table 1.3.2).



Table 1.3.2 Family history, personal history of tumours and history of breast disease at the time of diagnosis (N=5,393)

Number (%)	
Family history of breast cancer	
No family history	4,433 (82.2)
First-degree relatives (mother or sister only)	426 (7.9)
First-degree relatives (father or brother only)	7 (0.1)
2 or more first-degree relatives	67 (1.2)
Non first-degree relative (either paternal or maternal side or both)	254 (4.7)
Both first- and second-degree relatives	46 (0.9)
Had family history, but unknown details	27 (0.5)
Unknown family history	133 (2.5)
History of tumours	
No history of tumours	4,238 (78.6)
Benign tumour	699 (13.0)
Malignant tumour	175 (3.2)
Unknown nature of previous tumours	3 (0.1)
Unknown history of tumours	278 (5.1)
Type of malignant tumours (N=175)	
Thyroid cancer	45 (25.7)
Uterus cancer	5 (2.9)
Nasopharyngeal cancer	10 (5.7)
Colorectal cancer	16 (9.1)
Ovarian cancer	81 (46.3)
Breast cancer (>10 years)	37 (21.1)
Skin cancer	3 (1.7)
Lymphoma	1 (0.6)
Stomach cancer	4 (2.3)
Intestinal cancer	3 (1.7)
Lung cancer	2 (1.1)
Tongue cancer	1 (0.6)
Medullary cancer	1 (0.6)
Fallopian tube cancer	1 (0.6)
Bone cancer	1 (0.6)
Neck cancer	5 (2.9)
Unknown	52 (29.7)
History of previous breast disease	
	788 (14.6)
Type of previous breast disease (N=788)	
Fibroadenoma	321 (40.7)
Fibrocystic disease	40 (5.1)
Papilloma	20 (2.5)
Papillomatosis	3 (0.4)
Atypia	12 (1.5)
Unknown	151 (19.2)

### Early menarche

The reported mean and median ages at menarche were 13.2 years and 13.0 years respectively. Early menarche, defined as starting menarche before 12 years of age, was noted in 13.3% of the patient cohort (Table 1.3.3).

### Late menopause

The reported mean and median ages at menopause were 49.0 years and 50.0 years respectively. Late menopause, defined as having menopause after 55 years of age, was recorded in 3.7% of the patient cohort (Table 1.3.3).

### Childbirth and reproductive age

At the time of diagnosis, 21.0% had no childbirth; 72.4% had their first live birth before age 35; and 3.9% of the cohort had their first live birth after age 35 (Table 1.3.3). The mean age at first live birth was 27 years and the median number of live births was two.

### Breastfeeding

59.8% had never practised breastfeeding. Breastfeeding was reported in 30.6% of the cohort for a mean duration of 14.0 months with a standard deviation of 19.9 months (range: 0.1-168.0 months) (Table 1.3.3).

**Table 1.3.3 Early menarche, late menopause and reproductive history at the time of diagnosis**

	Number (%)	
<b>Menarche (N=5,393)</b>		
Early menarche (<12 years of age)	719	(13.3)
Normal menarche ( $\geq$ 12 years of age)	4,302	(79.8)
Unknown	372	(6.9)
<b>Menopause (N=2,798)</b>		
Late menopause (>55 years of age)	103	(3.7)
Normal menopause ( $\leq$ 55 years of age)	2,306	(82.4)
Unknown age at menopause	389	(13.9)
<b>Reproductive history (N=4,928)</b>		
No childbirth	1,035	(21.0)
Childbirth at early age ( $\leq$ 35 years of age)	3,567	(72.4)
Childbirth at late age (>35 years of age)	193	(3.9)
Unknown age at first live birth	133	(2.7)
<b>Breastfeeding (N=5,393)</b>		
Yes	1,651	(30.6)
No	3,225	(59.8)
Had childbirth	2,144	(39.8)
Did not have childbirth	1,018	(18.9)
Unknown reproductive history	63	(1.2)
<b>Unknown</b>	<b>517</b>	<b>(9.6)</b>



### *Use of exogenous hormones*

At the time of diagnosis, 61.9% had never used oral contraceptives (OC) and 82.9% had not received hormone replacement therapy (HRT) (Table 1.3.4).

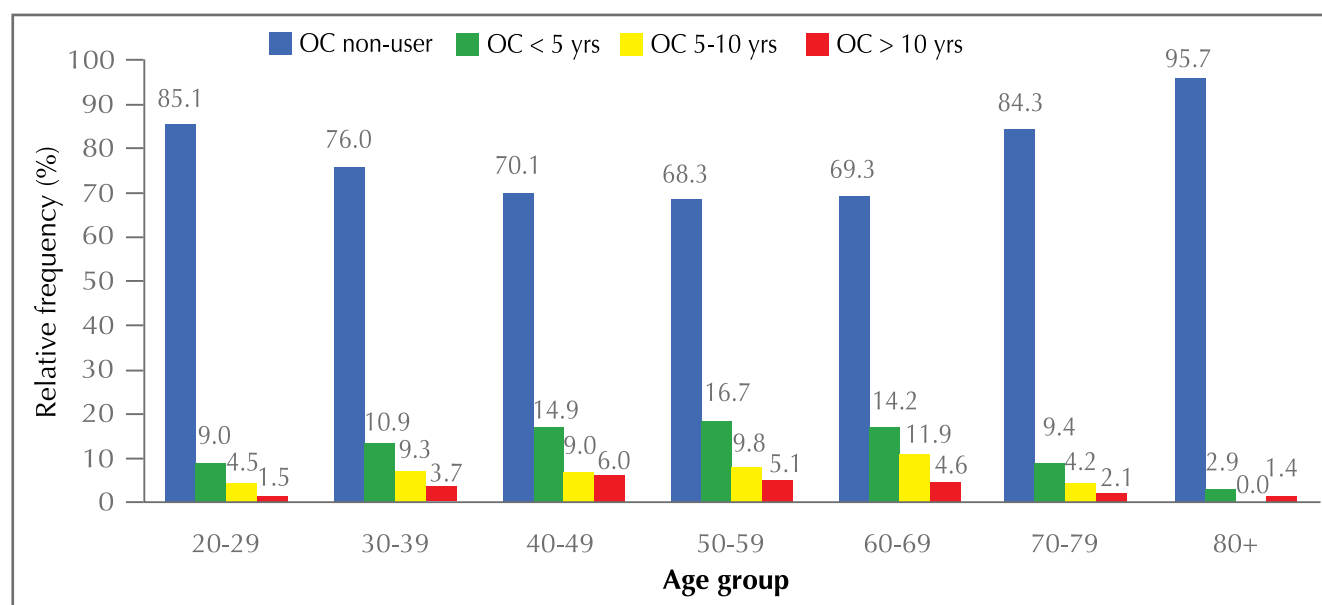
**Table 1.3.4 Use of exogenous hormones at the time of diagnosis (N=5,393)**

	Number (%)	
<b>OC use</b>		
Never	3,339	(61.9)
OC < 5 years	660	(12.2)
OC 5-10 years	429	(8.0)
OC > 10 years	232	(4.3)
Unknown length of OC use	325	(6.0)
Unknown if OC was used	408	(7.6)
<b>HRT use</b>		
Never	4,472	(82.9)
HRT < 5 years	212	(3.9)
HRT 5-10 years	122	(2.3)
HRT > 10 years	13	(0.2)
Unknown length of HRT use	67	(1.2)
Unknown if HRT was used	507	(9.4)

OC: Oral contraceptives

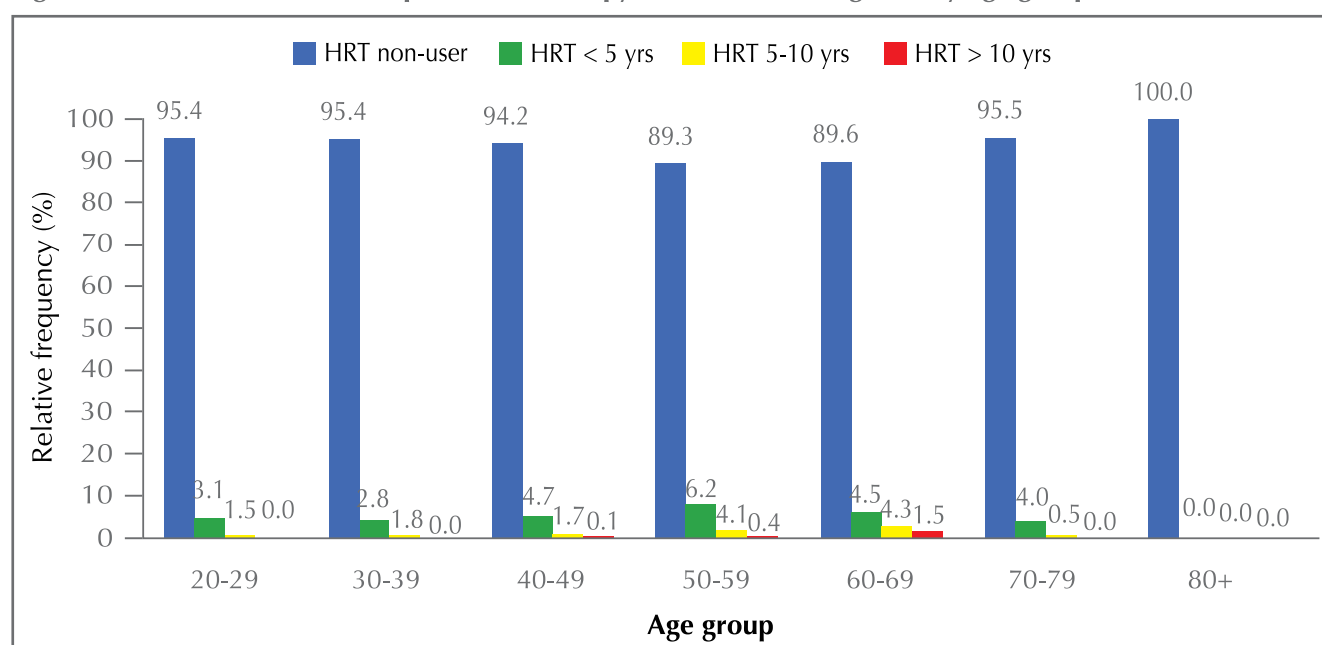
HRT: Hormone replacement therapy

Figure 1.3.2 Use of oral contraceptives at the time of diagnosis by age group



OC: Oral contraceptives

Figure 1.3.3 Use of hormone replacement therapy at the time of diagnosis by age group



HRT: Hormone replacement therapy



### Summary of risk exposures

- The ten most common risk factors for breast cancer are listed in Table 1.3.5. Lack of exercise, no breastfeeding and a high level of stress are the three most prevalent risk factors in these cases.
- Most of the cases (97.1%) carried at least one risk factor at the time of diagnosis. In summary, more than half of the patient cohort had more than 2 types of risk exposure at the time of diagnosis (Figure 1.3.4).

**Table 1.3.5 The ten most common risk factors in the patient cohort**

Rank	Risk factors	Number	(%)
1	Lack of exercise (<3hrs / week)	3,913	(72.5)
2	No breastfeeding	3,220	(59.8)
3	High level of stress (>50% of time)	1,951	(36.1)
4	Being overweight / obese	1,899	(35.2)
5	Use of oral contraceptives	1,646	(30.4)
6	No childbirth / First live birth after age 35	1,228	(22.6)
7	Family history of breast cancer	827	(15.3)
8	Previous breast disease	788	(14.6)
9	Early menarche (<12 years old)	719	(13.3)
10	Diet rich in meat / dairy products	704	(13.1)

**Figure 1.3.4 Distribution of patient cohort bearing different number of risk factors at the time of diagnosis (N=5,393)**

