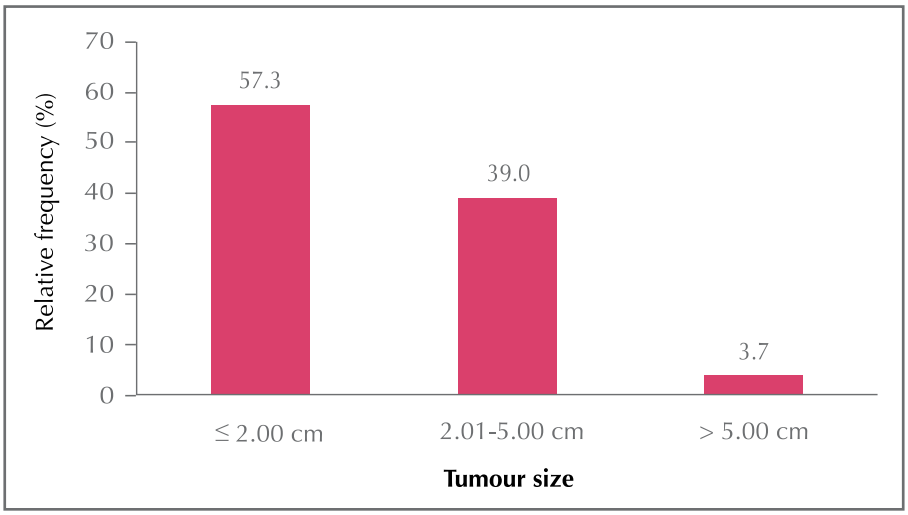
Characteristics of in situ breast cancer

Of all breast cancer cases, 422 (12.2%) were in situ breast cancer which was non-invasive in nature. The mean and median tumour sizes of in situ breast cancer were 2.2 cm and 1.7 cm respectively (range: 0.13 cm-9.0 cm).

Over 50% of tumours were smaller than 2.00 cm, 39.0% were 2.01-5.00 cm and only 3.7% were larger than 5.00 cm (Figure 2.2.7).

Figure 2.2.7 Distribution of tumour size of in situ breast cancer (N=422)



2.3 Histological and molecular characteristics

Invasive breast cancer

Of 2,956 invasive breast cancer cases, the five most common histological types were ductal (84.8%), lobular (4.5%), mucinous (3.6%), microinvasive (1.4%), tubular (1.0%) and papillary (0.9%). Grade 3 invasive breast cancer was found in 34.8% of the cases. Lymphovascular invasion was observed in 29.8% of the cases. About 13% were multifocal, with foci 5 mm apart in the same breast quadrant; only 3.1% were multicentric, defined as breast cancer occurring in more than one quadrant of the same breast (Table 2.3.1).

Table 2.3.1 Histological type, grading, multi-focality and multi-centricity of invasive breast cancer (N=2,956)

	Number	(%)
Histological type		
Ductal	2,469	(84.8%)
Lobular	130	(4.5%)
Mucinous (colloid)	105	(3.6%)
Microinvasive	40	(1.4%)
Papillary	27	(0.9%)
Tubular	29	(1.0%)
Medullary	24	(0.8%)
Mixed ductal and lobular	18	(0.6%)
Borderline / malignant phyllodes	13	(0.4%)
Metaplastic carcinoma	10	(0.3%)
Micropapillary	12	(0.4%)
Paget's disease of the nipple	3	(0.1%)
Apocrine carcinoma	7	(0.2%)
Adenoid cystic carcinoma	3	(0.1%)
Cribriform carcinoma	5	(0.2%)
Inflammatory	2	(0.1%)
Neuroendocrine carcinoma	2	(0.1%)
Others	12	(0.4%)
Lipid rich carcinoma	1	(0.0%)
Secretory carcinoma	1	(0.0%)
Unknown	43	
Grade		
Grade 1	486	(16.4%)
Grade 2	1,171	(39.6%)
Grade 3	1,028	(34.8%)
Unknown	271	(9.2%)
Lymphovascular invasion	**882**	**(29.8%)**
Multifocality	**371**	**(12.6%)**
Number of foci		
2	187	(59.6%)
3-4	85	(27.1%)
≥ 5	42	(13.4%)
Multicentricity	**91**	**(3.1%)**
Number of quadrants		
2	73	(83.0%)
3	8	(9.1%)
4	7	(8.0%)

In invasive breast cancer cases, 75.3% were estrogen receptor positive (ER+), 63.3% were progesterone receptor positive (PR+) and 23.7% were human epidermal growth factor receptor 2 positive (HER2+) (Table 2.3.2). The three most common molecular subtypes of invasive breast cancer were ER+PR+HER2- (46.9%), ER-PR-HER2- (11.6%) and ER+PR-HER2- (10.5%) (Table 2.3.3).

Table 2.3.2 Molecular characteristics of invasive breast cancer

	Number (%)
Estrogen receptor (ER) (N=2,843)	
Positive	2,142 (75.3%)
Negative	701 (24.7%)
Progesterone receptor (PR) (N=2,834)	
Positive	1,795 (63.3%)
Negative	1,039 (36.7%)
c-erbB2 / HER2 (N=2,758)	
Positive	655 (23.7%)
Weakly positive (Score 2)	733 (26.6%)
Negative	1,390 (50.4%)
Ki-67 index (N=1,619)	
< 14%	753 (46.5%)
14-49%	675 (41.7%)
≥ 50%	191 (11.8%)

HER 2: Human epidermal growth factor receptor 2

Table 2.3.3. Molecular subtypes of estrogen receptors, progesterone receptors and HER2 receptors in 2,956 invasive breast cancer cases

	Number (%)
ER+PR+HER2+	270 (9.1%)
ER+PR+HER2-	1,386 (46.9%)
ER+PR-HER2+	106 (3.6%)
ER+PR-HER2-	310 (10.5%)
ER-PR+HER2+	28 (0.9%)
ER-PR+HER2-	55 (1.9%)
ER-PR-HER2+	248 (8.4%)
ER-PR-HER2-	342 (11.6%)
Unknown	211 (7.1%)

ER+: Estrogen receptor positive ER-: Estrogen receptor negative
PR+: Progesterone receptor positive PR-: Progesterone receptor negative
HER2+: Human epidermal growth factor receptor 2 positive HER2-: Human epidermal growth factor receptor 2 negative

In situ breast cancer

The most common histological type of in situ breast cancer was ductal (93.9%). Over 60% had necrosis and 42.9% was of high nuclear grade. Multifocality and multicentricity were found in 13.3% and 2.6% respectively of in situ breast cancer (Table 2.3.4). The mammographic detection of micro-calcifications was found in 53.1% of in situ breast cancer. Among in situ breast cancer, 76.6% was ER+; 66.8% was PR+; 32.0% was HER2+ (Table 2.3.5).

Table 2.3.4 Histological type, grade, multifocality and multicentricity of in situ breast cancer

	Number	(%)
Histological type		
Ductal	387	(93.9%)
Mixed	6	(1.5%)
Others	13	(3.2%)
Necrosis	**210**	**(66.9%)**
Nuclear Grade		
Grade 1	90	(22.8%)
Grade 2	135	(34.3%)
Grade 3	169	(42.9%)
Multifocality	**56**	**(13.3%)**
Number of foci		
2	30	(78.9%)
3	4	(10.5%)
4 or more	4	(10.6%)
Multicentricity	**11**	**(2.6%)**
Number of quadrants		
2	7	(87.5%)
3	1	(12.5%)

Table 2.3.5 Molecular characteristics of in situ breast cancer

	Number (%)
Estrogen receptor (ER) (N=312)	
Positive	239 (76.6%)
Negative	73 (23.4%)
Progesterone receptor (PR) (N=310)	
Positive	207 (66.8%)
Negative	103 (33.2%)
c-erbB2 / HER2 (N=297)	
Positive	95 (32.0%)
Weakly positive (Score 2)	73 (24.6%)
Negative	129 (43.4%)
Ki-67 index (N=248)	
<14%	166 (66.9%)
14-49%	72 (29.0%)
≥50%	10 (4.0%)

2.4 Treatment methods

Surgical treatment

Of the 3,467 breast cancer patients, the vast majority (98.4%) underwent surgical operations, of these, 38.6% had breast conserving surgery and 60.0% had mastectomy. 62.0% of the patients used private medical service and 38.0% in public medical service.

Total mastectomy (92.6%) was the most common type of mastectomy, followed by skin-sparing mastectomy (6.4%) (Table 2.4.1).

Of 2,076 mastectomy patients, 17.5% underwent breast reconstruction surgery, of which Transverse Rectus Abdominis Myocutaneous Flap (TRAM flap) (56.3%) and implant (26.4%) were the two most common techniques employed (Table 2.4.1).