

Methodology

Key observations

- Patients with a confirmed diagnosis of breast cancer who were registered at the two oncology centres between 2008 and 2017 were included in the retrospective study. Patients with recurrence detected at registration were excluded.
- The records of eligible patients registered during a 2-month period of each year between 2008 and 2017 were scanned, and data were abstracted to fill in a structured questionnaire. The bimonthly sampling cycle started in January and February for 2008, and was shifted to the next 2 months every year until 2017.
- Data were abstracted from the case records by trained investigators using a structured questionnaire.
- A total of 915 patients from CM-VI and 1205 patients from INO were included in the analysis.

2.1 Study settings

We selected as the study settings the two largest publicly funded regional oncology centres in Morocco: the Centre Mohammed VI pour le traitement des cancers (CM-VI) in Casablanca and the Institut National d'Oncologie Sidi Mohamed Ben Abdellah (INO) in Rabat. They were chosen because they provide comprehensive cancer care and have facilities for surgery, radiotherapy, and chemotherapy. They also had enough cases registered per year to enable us to include approximately 2000 treated cases of breast cancer in the study. In addition, they

are located in two different regions of Morocco (Casablanca-Settat and Rabat-Salé-Kénitra), enabling us to study the impact of geographical variations in the target populations.

2.2 Study objectives

This retrospective study was based on abstraction of data from the case record files of patients with breast cancer registered at CM-VI and INO. The study aimed to collect data for the 10-year period from 2008 until 2017. It had the following objectives:

- to document the sociodemographic characteristics of patients with breast cancer attend-

ing the two oncology centres and any change over a period of 10 years;

- to document the stage at diagnosis of patients with breast cancer attending the oncology centres, the pathological and molecular characteristics of the breast cancers, and any shift over time;
- to document the delays across the breast cancer care continuum by measuring the interval between onset of symptoms and first medical consultation (access delay), the interval between diagnosis and registration at the oncology centre, and the interval between diagnosis and

initiation of treatment (treatment delay), as well as their determinants and any change over time;

- to document the practices related to comprehensive treatment of patients with breast cancer using surgery, chemotherapy, radiotherapy, hormone therapy, and targeted therapy at the two oncology centres and any change in the practice pattern over the decade;
- to document the disease-free survival (DFS) of patients with breast cancer registered at the two oncology centres, its determinants, and any change over time; and
- to document the quality and completeness of documentation in the case records at the two oncology centres.

2.3 Selection of patients

The study included patients registered at the two oncology centres who had a confirmed diagnosis of breast cancer. Patients with recurrent breast cancer at the time of registration were excluded. Confirmation of diagnosis could have happened before or after registration at the centre. Patients were included even if treatment was performed fully or partially

at a hospital or clinic other than the oncology centre. Patients in whom breast cancer was not the primary cancer (other than non-melanoma skin cancer) were also excluded.

The records of eligible patients registered during a 2-month period of each year, starting from 2008 and ending in 2017, were scanned for information. The bimonthly sampling cycle started in January and February for 2008, was shifted to the next 2 months every year, and restarted in January and February after 6 years. In this way, the records were retrospectively collected from the medical records department of each oncology centre for the years and months shown in Table 2.1.

For a few patients, the pathology report confirming cancer diagnosis was not available in the case records, even though they had received cancer-directed treatment (radical surgery, chemotherapy, or radiotherapy) at the oncology centre. We decided to include such patients because it was impossible for any patient without pathological confirmation of diagnosis to receive cancer treatment at either centre. It is likely that the reports for these patients had gone missing from the case files during follow-up visits. Patients without pathological confirma-

tion of diagnosis who did not receive any cancer-directed treatment were excluded.

2.4 Data collection

A data collection form (Annex 1) was designed to reconstruct the trajectory of patients in the health-care system during the detection, diagnostic investigation, and treatment periods. The form collected basic personal information (age, education level, marital status, and occupation), medical history, investigations performed at the cancer centre or elsewhere, clinical and pathological staging, treatment (surgery, radiotherapy, chemotherapy, hormone therapy, targeted therapy, and palliative care), follow-up, and vital status data. The form was pretested and validated by a few oncologists dealing with breast cancer in Morocco.

Trained project staff collected the case records of patients with breast cancer from the medical records department at each hospital. A PhD student collected data at CM-VI, and a research nurse collected data at INO. They first screened the records for inclusion and exclusion criteria, and then used the data collection form to extract information. They looked for missing data in the

Table 2.1. Period of data collection (months)

Year of data collection	Months for which data were collected (shaded)					
	January and February	March and April	May and June	July and August	September and October	November and December
2008; 2014						
2009; 2015						
2010; 2016						
2011; 2017						
2012						
2013						

registers or the databases of the departments of surgery, medical oncology, and radiation oncology. The project staff were supervised at each hospital by the institutional principal investigator.

The study was monitored by IRC, Fes, Morocco and IARC, Lyon, France. The filled-in data collection forms were checked for completeness, consistency, and validity by the principal investigators. The validated forms were entered in an online database specifically designed for this study, after de-identifying any personal information such as name, address, or phone number. The inves-

tigators at IARC checked the online forms for completeness and quality on a regular basis.

2.5 Selection of cases for analysis

Data were abstracted from the medical records of 2184 patients registered with a diagnosis of breast cancer at the oncology centres at CM-VI and INO over a consecutive 2-month period every year, starting from 2008 and continuing until 2017 (Table 2.2). The records of patients with the following characteristics were excluded at the time of analysis:

- patients with recurrent breast cancer at the time of registration ($n = 4$);
- patients who had no diagnosis of breast cancer confirmed on cytology or histopathology and who did not receive any cancer-directed treatment (surgery other than lumpectomy alone, radiotherapy, or chemotherapy) either before or after registration at the hospital ($n = 28$); and
- patients with a benign diagnosis confirmed on histopathology who did not receive any cancer-directed treatment (surgery other than lumpectomy alone, radiotherapy, or chemotherapy) either before or after registration at the hospital ($n = 32$).

The final analysis was performed with data obtained from the records of 915 patients registered at CM-VI and 1205 patients registered at INO. The distributions of the patients by month and year of registration are shown in Table 2.3 (CM-VI) and Table 2.4 (INO). The analytic cohort included 43 patients at CM-VI and 17 patients at INO whose records did not include any histopathology report showing a cancer diagnosis. They were included because they received at least radical surgery, chemotherapy, or radiotherapy at the oncology centres.

Table 2.2. Number of cases excluded and reasons for exclusion

	CM-VI	INO	Total
Patient data collected	955	1229	2184
Overall number of cases excluded	40	24	64
Reasons for exclusion			
Recurrent breast cancer	1	3	4
No cancer-directed treatment	32	13	45
No diagnosis confirmed on histopathology or cytology	20	8	28
Benign	12	5	17
Benign, treated with lumpectomy alone	7	8	15
Patients included in final analysis	915	1205	2120

CM-VI, Centre Mohammed VI pour le traitement des cancers; INO, Institut National d'Oncologie Sidi Mohamed Ben Abdellah.

Table 2.3. Number of patients with breast cancer by month and year of registration at the Centre Mohammed VI pour le traitement des cancers (CM-VI)

Month of registration	Year of registration										Total
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
January	35						54				89
February	46						54				100
March		38						41			79
April		53						79			132
May			37						53		90
June			5 ^a						48		53
July				30						66	96
August				44						54	98
September					46						46
October					49						49
November						40					40
December						43					43
Total	81	91	42	74	95	83	108	120	101	120	915

^a The number was low because the hospital was undergoing renovation at the time.

Table 2.4. Number of patients with breast cancer by month and year of registration at the Institut National d’Oncologie Sidi Mohamed Ben Abdellah (INO)

Month of registration	Year of registration										Total
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
January	55						43				88
February	48						49				97
March		50						82			132
April		64						76			140
May			56						79		135
June			50						81		131
July				47						96	143
August				42						65	107
September					36						36
October					59						59
November						65					65
December						72					72
Total	93	114	106	89	95	137	92	158	160	161	1205