

INTRODUCTION

Nilai Medical Centre (formerly known as NCI) was first established in 1999 in Nilai, Negeri Sembilan. In a partnership with the Malaysian Health Travel Council (MHTC), data was collected prospectively using the Healthcare Performance Measurement & Reporting System (HPMRS) platform, which is a locally developed database system to measure health care performance and reporting. For the purpose of measuring breast cancer performances, we mostly adopted the performances measures developed and used by Quality Oncology Practice Initiative, American Society of Clinical Oncology/National Comprehensive Cancer Network and National Accreditation Program for Breast Cancer.

DATA

Data was reported to HPMRS by year of reporting according to the centre participating in MHTC's Partnership for Healthcare Travel Excellence (PHTE) programme. A total of 266 patients were identified from 2010 till 2014, and consist of patients with pathologically confirmed BC diagnosed between year 2008 and 2014, and treated with at least one treatment modality at Nilai Medical.

STUDY POPULATION

A total of 266 BC were identified through the hospital register as well as operative surgery, chemotherapy and radiotherapy records. Case ascertainment was independently verified to be complete (100%). The 2008-2014 period was selected to ensure adequate sample size and duration of follow-up for analysis of long term survival outcome.

DATA COLLECTION AND DEFINITIONS

Data were abstracted from patients' medical and histo-pathology (HPE) reports by trained data collectors. Demographic data abstracted include age, sex, race and nationality; tumour characteristics include histologic type, grade, location, extent, and size; lymph node and distant organ metastases. Staging of disease was based on the American Joint Committee on Cancer (AJCC 7th Edition) criteria. AJCC stage I or II disease were considered early cancer (EC), stage III locally advanced cancer (LAC) and stage IV metastatic cancer (MC). After enrolment, all patients were followed up for 12 months to collect data on their subsequent exposure to cancer-directed therapies, which were abstracted from medical, operative surgery, chemotherapy and radiotherapy records. For the purpose of measuring cancer care performance, we adopted and modified the cancer care performance measures developed by Quality Oncology Practice Initiative (QOPI) and American Society of Clinical Oncology/ National Comprehensive Cancer Network (ASCO-NCCN)

INDEPENDENT DATA AUDIT

A copy of the HPE report was retrieved for all patients enrolled from all sites to verify tumour diagnosis and characteristics. In addition, patients' demographic and treatment data were also subjected to independent data verification against source documents on site. The accuracy of the collected data with respect to demographics, surgery, radiotherapy, chemotherapy, hormonal therapy and trastuzumab treatment were all >95%.

MORTALITY ASCERTAINMENT AND IMPUTATION

1. Case ascertainment was initially independently verified to be complete (100%). This was to avoid exclusion of deceased patients especially those who die soon after diagnosis.
2. Mortality outcomes were noted during data extraction for the study (BC=0 deaths identified).
3. All cases enrolled were matched in 2017, based on their names and national identity card number against the national mortality database maintained by the National Registration Department to ascertain their mortality outcome (total BC=44 deaths identified).
4. Remaining cases were matched based on their names and hospital number against the hospital register (which records all visits to the hospital). Patients who had a visit after the end of the study period (BC: 31 Dec 2016) were considered alive (BC=29 ascertained alive).
5. A sample of the remaining cases – BC=39 patients with Stage I or II & BC 96% (25 patients) of cases with Stage III or IV were contacted by phone or home visit to ascertain mortality outcomes. BC: 0 patients out of 15 with Stage I or Stage II had died, likewise for BC: 0 out of 6 Stage III and BC: 0 out of 0 Stage IV patients.
6. For the purpose of survival analysis, we therefore assumed all patients with Stage I or Stage II who were uncontactable (BC: 30 cases) to have a death risk of 10%. We further assumed all remaining uncontactable patients with Stage III (BC: 18 cases) or IV (BC: 2 cases) to be dead. Thus, any bias in the survival estimates arising from missing information on mortality outcome is conservative (that is, the survival estimates can only be worse than they actually are).

RESULTS

Final analysis set has a total of 149 BC patients. A total of 117 BC patients were excluded from analysis; 15 (BC) because they have recurrent cancers, 19 (BC) for pre-cancer, 58 (BC) were outsourcing patients, and 25 (BC) patient without HPE report. Patients age ranged from 33 to 79 years old, with a mean of 51 years old. 41% were diagnosed with Early Breast Cancer, 35% with Locally Advanced Breast Cancer and 16% with Metastatic Breast Cancer. Receptor states were 55% positive for ER, 43% for PR and 31% for HER2. 19% had Triple negative breast cancer.

Patient Characteristics	Statistics	Breast Cancer
Number of patients	Number	149
Age, years	Mean (SD)	51 (10)
	Median (IQR)	50 (44, 57)
	(Min, Max)	(29, 81)
Age distribution	No. (%) Age<40	17 (11)
	No. (%) Age 40 to 49	54 (36)
	No. (%) Age 50 to 59	54 (36)
	No. (%) Age>=60	24 (16)
	No. (%) Male	1 (1)
Sex	No. (%) Female	148 (99)
	No. (%) Malay	48 (32)
Race	No. (%) Chinese	65 (44)
	No. (%) Indian	29 (19)
	No. (%) Foreigners	5 (3)
	No. (%) Others	2 (1)

Table 1: Patient Characteristics at Diagnosis, Nilai Medical 2008-2014

Patient Characteristics	Statistics	Breast Cancer
Stage at Diagnosis	No. (%) Stage I	21 (14)
	No. (%) Stage II	59 (39)
	No. (%) Stage III	49 (33)
	No. (%) Stage IV	19 (13)
	No. (%) No data	1 (1)
BC Tumor histology	No. (%) Infiltrating duct carcinoma	119 (80)
	No. (%) Intraductal carcinoma, non-infiltrating	8 (5)
	No. (%) Other Carcinomas	20 (13)
	No. (%) No data	2 (1)
	No. (%) ER+	84(56)
BC Biomarkers	No. (%) PR+	73(49)
	No. (%) ER+/PR+	88 (59)
	No. (%) HER2+ (ISH or IHC)	51(46)
	No. (%) Triple negative	25(17)

Table 2: Tumour Characteristics at Diagnosis, Nilai Medical 2008-2014

Breast Cancer Care Performances

The overall Breast Cancer care results was 98%. A 98% composite score means that the centre provided an evidence based Breast Cancer Treatment 98 times for ever 100 opportunities. Performances varied from as low as 50% (Trastuzumab treatment) to a perfect score of 100% (Pathology report confirming malignancy, surgical treatment and radiotherapy).

#	Performance measures for Breast Cancer Treatment services	No. of patients eligible for inclusion (Denominator)
1	Patients with Pathology report confirming malignancy	146
2	Patients under age 70 with Stage I to III Breast cancer who received Surgery within 2 months of diagnosis	60
3	Patients under age 70 with Stage I to III ER/PR negative Breast cancer who received Chemotherapy within 4 months of diagnosis	6
4	Patients under age 70 with Stage I to III Breast cancer who received Radiation therapy after breast conserving surgery within 1 year of diagnosis	41
5	Patients under age 70 Node+ Breast cancer who received Radiation therapy after mastectomy within 1 year of diagnosis	12
6	Patients under age 70 with Stage I to III ER or PR positive Breast cancer who received Tamoxifen or AI within 1 year of diagnosis	40
7	Patients under age 70 with Stage I to III HER2 positive Breast cancer who received Trastuzumab within 1 year of diagnosis	5

Table 3: Performance of cancer care services for patients with BC treated at Nilai Medical in year 2008 to 2014

Cancer Survival Outcome Performances

Among patients with BC treated at Nilai Medical between 2008 and 2014, the overall survival (Figure 1) at 5 years was 99% for patients with Stage I disease, 83% for Stage II disease, 38% for Stage III disease and decreasing to 28% for Stage IV disease. The relative survival (Figure 2) at 5 years was 99% for patients with Stage I and 97% in Stage II, indicating these patients were practically cured of their disease. In the other stages, patients' survival was at 81.9% in Stage III and 50.4% in Stage IV.

Figure 1: Overall Survival of Patients with BC Treated at Nilai Medical 2008-2014

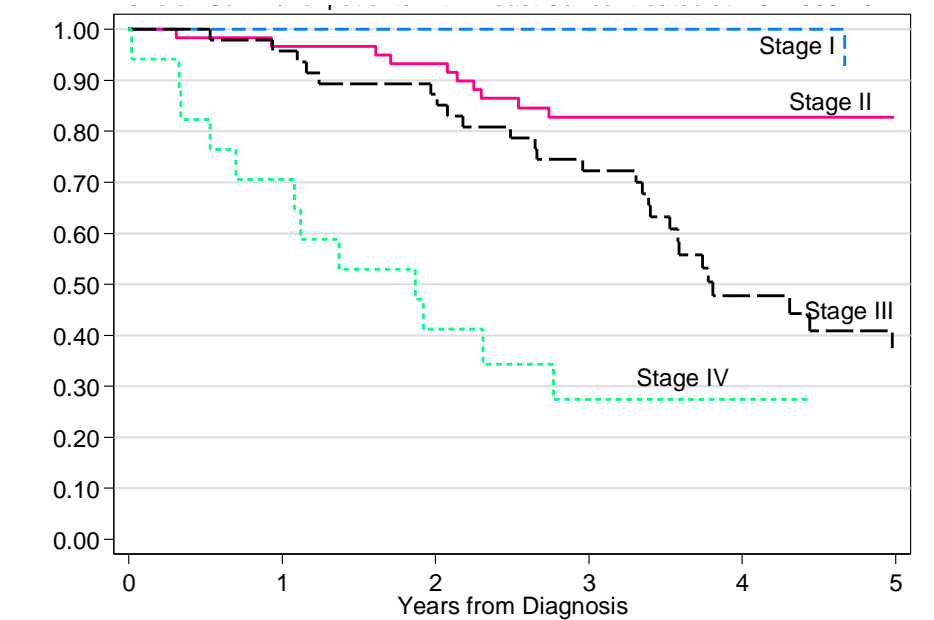
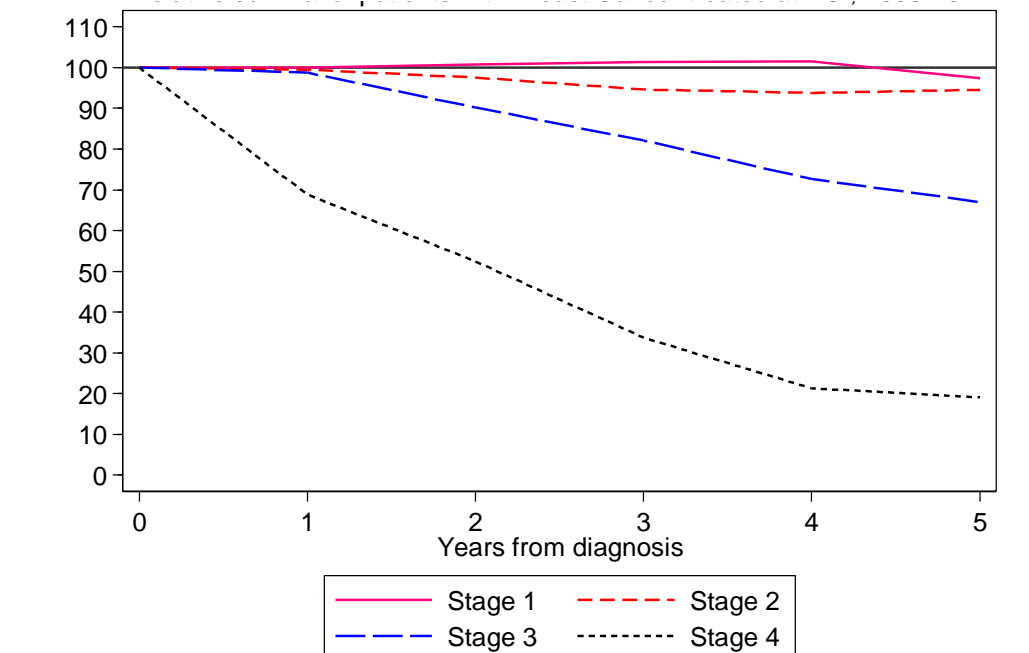


Figure 2: Relative Survival of Patients with BC Treated at Nilai Medical 2008-2014



CONCLUSION

Nilai Medical was a pioneer hospital in Malaysia to embark on routine measurements of the performance of its cancer care services since 2008. The cancer survival outcome performance was far better than the results reported in the Malaysian Study on Cancer Survival (87% in Stage I, 80% in Stage II, 59% in Stage III, and 23.3% in Stage IV). The study results were compatible with the Surveillance, Epidemiology and End Results (SEER) 2008 till 2014 as Early Stage 99%, Localised Stage 85% and Distant Stage 27%.

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FUNDING AND CONFLICT OF INTEREST

In relation to this poster presentation, the authors declare that there are no conflicts of interest. No commercial relationships relevant to the subject matter of the presentation. The first author can be contacted via email at kana@nilaimc.com