Breast Cancer Patient Pathway: Direct Costs for the Portuguese NHS of a Breast Cancer Patient

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1 – Introduction

Breast Cancer (BC) is the most prevalent cancer among Portuguese women, being responsible for a significant socio-economic burden. Every year, there are 7.500 new cases and over 1.700 women die from this disease[1].
BC is a heterogeneous and complex disease, with several biological subtypes that have different treatment responses and associated prognosis[2].
Disease prognosis and therapeutic approach differs considering not only the cancer subtype but also cancer staging. The choice of treatment has a significant impact on patient outcomes and generates distinct costs for the NHS. Thus, it is important to understand the economic impact of the different BC treatments, considering the subtype and staging at diagnosis.

2 – Methods

A patient pathway was developed to design the patient flow in the Health System, from initial symptoms to follow-up. A model was built based on this patient pathway to estimate the direct costs of a BC patient for the Portuguese NHS.

- **Desk Research**
  - Literature review was conducted considering existing scientific articles and available guidelines for breast cancer prevention, diagnosis and treatment in Portugal and in Europe
- **Validation by Oncology Experts**
  - A Group of Portuguese Oncology Experts validated the Patient Pathway, ensuring its suitability to the Portuguese reality; experts also validated the epidemiology and assumptions on share of patients referred in the pathway
- **Patient Pathway**
  - The Patient Pathway was adjusted considering the inputs of experts
- **Cost Assessment**
  - Direct costs (e.g., costs of appointments, exams, surgery, treatments and other relevant interventions) were retrieved from the available public sources, the most relevant related to NHS healthcare contracting[3,4]
- **Cost Estimation Model**
  - BC patient cost was calculated considering the different ramifications of the patient pathway and the share of patients undergoing each of these paths, to accurately estimate the cost of an average BC patient for the Portuguese NHS

Assumptions used to enable the patient journey design:

- The patient journey was developed for the Luminal B-like and HER2-positive (HER2+) breast cancer subtypes, for being the ones that may have a higher number of treatment modalities;
- HER2+ BC was recoded into four categories: very early (tumors <2cm and without node involvement), early and locally advanced (tumors ≥2cm or with node involvement) and metastatic (distant metastases);
- Luminal B-like BC was categorized into four categories: very early (tumors <2cm and without node involvement), early (tumors ≥2cm and <5cm or N1), locally advanced (tumors ≥5cm or N2-3) and metastatic (distant metastases).

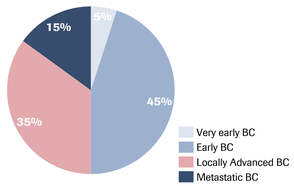
3 – Results

Every year, new BC cases account for up to 285 million euros of total direct cost for the NHS.

HER2+

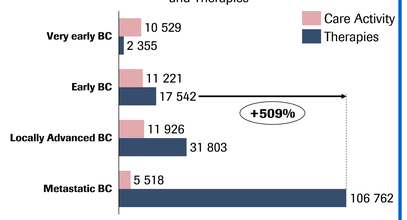
Half of the diagnoses occur at locally advanced and metastatic stages

Figure 1. Percentage of HER2+ BC patients diagnostic stages



Most treatment costs of patients with BC HER2+ are related to therapies

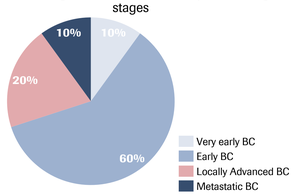
Figure 2. Cost (in euros) of BC HER2+ patients' Care Activity and Therapies



Luminal B-like

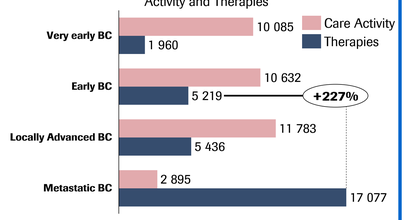
BC Luminal B-like patients are predominantly diagnosed at early stages

Figure 3. Percentage of Luminal B-like BC patients diagnostic stages

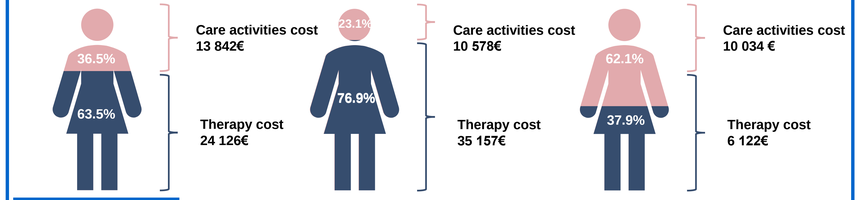


Overall, most treatment costs of patients with BC Luminal B-like are related to Care Activity.

Figure 4. Cost (in euros) of BC Luminal B-like patients' Care Activity and Therapies

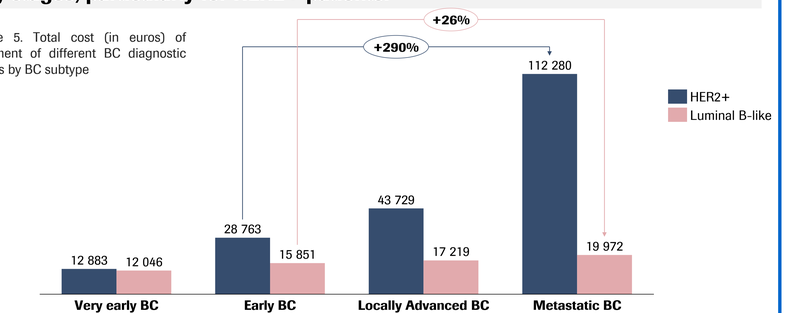


The average direct cost for the NHS per BC patient is 37 968 €. On average, most of these are **treatment-related costs**.



The total cost for the NHS per Luminal B-like and HER2+ BC patient by stage is shown in Figure 5. **Treatment costs for metastatic cancer are significantly higher for the early stages, particularly for HER2+ patients.**

Figure 5. Total cost (in euros) of treatment of different BC diagnostic stages by BC subtype



4 – Conclusion

BC is associated with a very high economic impact, as well as considerable health and social burden for patients. The patient pathway model is an important tool to assess BC impact, aiding the NHS in the management of resources and budget allocation in the fight against BC. The insights gained from the model, such as the high treatment costs and resources needed to treat advanced cases of BC, reflect the importance of prevention and early detection of BC.
Therefore, the NHS should place a greater focus on early detection and treatment. This effort will maximize health gains while helping mitigate the economic impact of BC patients.

5 – Bibliography

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