Long-Term Impact of Early-Onset Breast Cancer in Brazilian Women: A Real-World Study of Years of Life Lost and Clinical Outcomes

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Background

Breast cancer is the leading cause of cancer-related death among women in Brazil and worldwide. However, its impact is not evenly distributed, with significant variations in incidence, mortality, and survival across different countries and regions. The incidence of breast cancer among young adults under the age of 50 has been increasing globally. This rise carries important implications both at the individual and societal levels, including a greater disease burden, reduced economic productivity, and an increased risk of long-term adverse clinical outcomes. There is a scarcity of data in the literature regarding this trend in Brazilian and Latin American populations.

We aimed to investigate the distribution profile of breast cancer diagnoses in adults under 50 years of age at two tertiary cancer centers in Brazil, as well as to compare it with the profile of patients aged 50 years and older, with a focus on clinical presentation and outcomes.

Methods

We used real-world data from Einstein Hospital Israelita and Hospital Municipal Vila Santa Catarina between 2018 and 2023, including patients diagnosed with malignant breast neoplasms, according to the International Classification of Diseases – 10th Revision (ICD-10). Early-onset breast cancer was defined as a diagnosis in adults aged 18 to 49 years. Data extraction was automated using electronic medical record (EMR) systems and big data sources to obtain information related to ICD codes, demographic data, and medical history.

- Years of Life Lost (YLLs): projected life expectancy - patient's age at death (negative values truncated at zero.)
- For the calculation of YLLs, projected life expectancy was estimated for each individual based on: **adjusted year of birth, sex and place of residence;**
- Years Lived with Disability (YLDs): duration of illness x disability weight according to clinical stage (0.1 stages I–III; 0.8 stage IV);
- Disability-Adjusted Life Years (DALYs): YLLs + YLDs.

Results

Table 1: Demographic and clinical characteristics of patients diagnosed with breast cancer stratified by age group.

Variables	N	< 50 N = 1,308[1]	≥ 50 N = 1,782	p-value[2]
Sex	3,102			0.02
Female		1,346 (100%)	1,735 (99%)	
Male		4 (0.3%)	17 (1.0%)	
Alcoholism	3,102	578 (58%)	961 (55%)	0.12
Ethnicity	3,102			0.07
Asian		17 (1.3%)	28 (1.6%)	
Black		24 (1.8%)	23 (1.3%)	
Mixed race		62 (4.6%)	85 (4.9%)	
Uninformed		975 (72%)	1,195 (68%)	
White		272 (20%)	421 (24%)	
Staging	3,102			0.14
I, II, III		827 (61%)	1,027 (59%)	
IV		523 (39%)	725 (41%)	
BMI	1,940			<0.01
Mean (Q1, Q2, Q3)		306.3 (22.0, 24.6, 28.3)	27.3 (23.5, 26.1, 29.4)	
Min, Max		13.9, 242,215.0	15.4, 292.7	
Germline Test	3,102	287 (21%)	187 (11%)	<0.01
Somatic Test	3,102	6 (0.4%)	8 (0.5%)	>0.9
YLD	3,102			0.2
Sum		1,304.44	1,682.29	
YLL	3,102			0.07
Sum		3,205.7	2,714.0	
DALY	3,102			0.7
Sum		4,510.1	4,396.3	

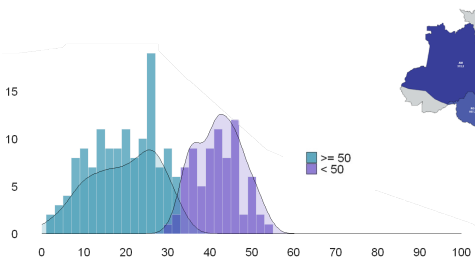
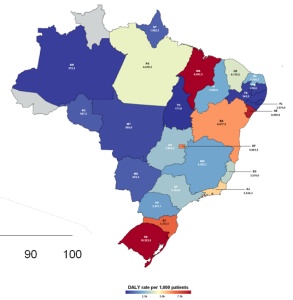


Figure 1: Distribution of Years of Life Lost (YLL) by age group.

Figure 2: DALY rates per 1,000 patients across Brazilian states.



- 10% increase in breast cancer diagnoses (<50): from 44.7/100,000 (2018) to 49.2/100,000 (2023).
- 7.1% decrease in diagnoses (≥50): from 119.7/100,000 (2018) to 111.1/100,000 (2023).

- YLL (median): 42 years (<50) vs. 21 years (≥50).
- Total DALYs: 4,467 (<50) vs. 4,297 (≥50).
- DALYs per 1,000 individuals: 3,309 (<50) vs. 2,452 (≥50).

Conclusions

In line with global trends, the apparent increase in breast cancer cases among individuals under 50 years of age in Brazil raises hypotheses regarding both the rise in incidence and the possibility of distinct characteristics compared to those aged 50 and older. This pattern highlights the need for further investigations to better understand risk factors and to improve screening and management strategies for this age group.

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Authors declare no conflict of interest.

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