Evaluating the Success of Current Standard of Care in Breast Cancer Treatment: A Retrospective Study in Bangladesh

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Disclaimers

- This retrospective observational study was supported by Novartis (Bangladesh) Limited.
- All patient data utilized in this analysis is owned exclusively by the investigators. Novartis (Bangladesh) Limited has no claim to ownership or control over this data.
- The content and findings presented in this article are solely the responsibility of the investigators. Novartis (Bangladesh) Limited does not influence the conclusions or recommendations made within the article.
- Patient data was handled in accordance with applicable privacy regulations and ethical standards, ensuring the confidentiality and anonymity of all participants.
- The information provided in this article is intended for informational purposes only and should not be considered medical advice.

Breast Cancer Burden

Global Burden of Breast Cancer

- Leading cause of cancer-related morbidity and mortality among women.
- Accounts **for 25%** of all **new cancer cases** in women worldwide.[1]
- **2.3 million** cases and **685,000** deaths reported in **2020.**[1]
- Survival disparities exist between high-income and low- and middle-income countries (LMICs).

Breast Cancer in Bangladesh

- **Most common cancer** among **Bangladeshi women**, with a rapidly increasing incidence.[1]
- **Majority of cases diagnosed at advanced stages**, leading to poor survival outcomes.
- **Late-stage presentation** due to low awareness, sociocultural barriers, and lack of national screening programs.
- **Limited access** to specialized oncology care and advanced treatment options.

Reference: 1. Global Cancer Statistics 2020: GLOBOCAN

Unmet Need in Breast Cancer Treatment

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Challenges in Breast Cancer Management

- Inconsistent adherence to evidence-based treatment protocols.
- Mastectomy remains the dominant surgical approach due to late diagnosis and limited expertise in breast-conserving surgery.
- Lack of national treatment guidelines leads to variability in patient care.
- Molecular subtyping (HR, HER2, Ki67) is underutilized, affecting personalized treatment strategies.

Need for Real-World Data and Research

- Limited data on progression-free survival (PFS) and overall survival (OS) in Bangladesh.
- Research gaps hinder treatment optimization and policy development.
- Incorporating PFS metrics into routine practice could enhance treatment evaluation and decision-making.

Study Overview

Study Design: Retrospective observational study.

Study Location: Department of Oncology, Bangladesh Specialized Hospital.

Study Period: Patient data from **2018–2023**.

Objective: Evaluate the success of the **current standard of care** in breast cancer treatment in Bangladesh.

Data Source: Hospital databases containing patient medical records.

Inclusion Criteria:

- Patients aged 18 and older with a confirmed breast cancer diagnosis.
- Patients who followed national and international treatment guidelines.

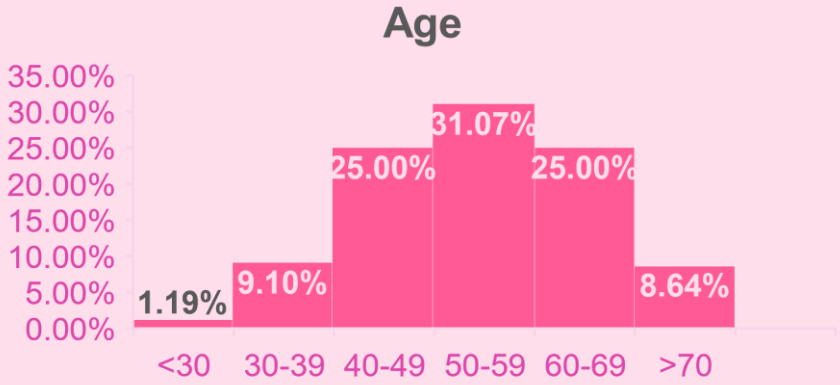
Exclusion Criteria:

- Patients with incomplete medical records.
- Those who did not receive treatment as per standard guidelines.

Ethical Considerations: Approval obtained from the institutional review board. Patient confidentiality strictly maintained.

Data Analysis: Conducted using SPSS version 26.

Baseline Characteristics



- Study participants were predominantly **females (98.99%),** with only 1.01% males.
- Most participants were **aged 50-59 years (31.07%),** followed by 40-49 years (25.00%) and 60-69 years (25.00%) at the time of diagnosis.
- The majority were married (86.58%), with 13.42% unmarried.
- Most participants had menarche between ages 11-15 (82.92%), and 64.16% had their first childbirth between 20-35 years. 71.44% married between 18-35 years.

Gender	n	%
Female	1077	**98.99**
Male	11	1.01
Marital Status	**n**	**%**
Married	942	**86.58**
Unmarried	146	13.42
Age of Menarche	**n**	**%**
<11	123	11.42
11-15	893	**82.92**
>15	61	5.66
Age of First Childbirth	**n**	**%**
<20	220	20.16
20-35	700	**64.16**
>35	171	15.67
Age of Marriage	**n**	**%**
<18	216	22.93
18-35	673	**71.44**
>35	53	5.63

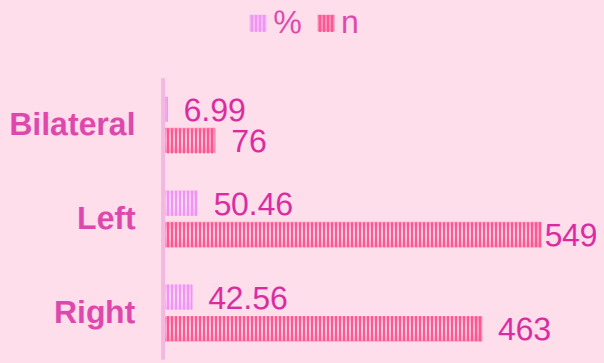
Baseline Characteristics

- BMI distribution showed **51.84% with normal BMI**, 27.30% overweight, and 20.86% underweight.
- Risk factors were infrequent. **Hormone replacement therapy (4.04%)**, **Family history of breast cancer (3.77%)**
- Comorbidities were present in **20.04%, primarily hypertension (12.13%)** and **diabetes (9.10%)**

BMI	n	%
Underweight (<18.5)	227	20.86
Normal (18.5-24.9)	564	51.84
Overweight (25-29.9)	297	27.30
History of known risk factors	**n**	**%**
H/O Alcohol Taking	20	1.84
H/O Smoking	12	1.10
H/O HRT	44	4.04
History of Contraception	15	1.38
Family History of Breast Cancer	41	3.77
Comorbidities	**n**	**%**
Bronchial Asthma	22	2.02
Hypertension (HTN)	132	12.13
Diabetes Mellitus (T2DM)	99	9.10
Hypo/Hyper Thyroidism	32	2.94
Chronic Kidney Disease (CKD)	1	0.09
Ischemic Heart Disease (IHD)	14	1.29
Others (unspecified/combined)	40	3.68
No Comorbidities	870	79.96

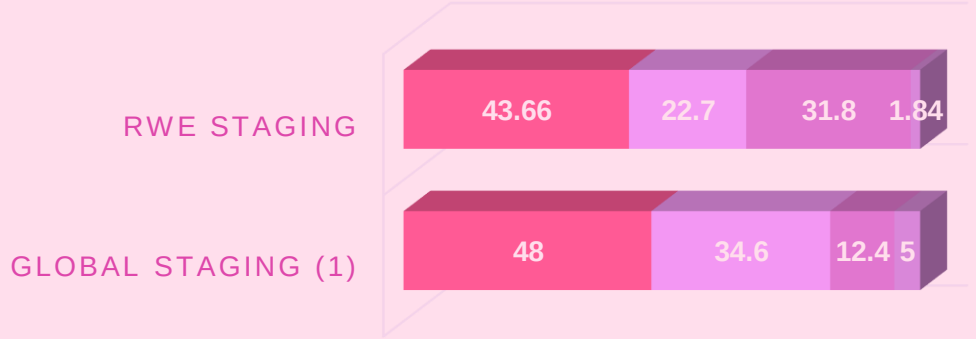
Tumor Characteristics

LATERALITY



- Most of the patients had unilateral breast cancer, **left breast (50.46%)** and **right breasts (42.56%),** while **6.99%** of cases were **bilateral.**

CLINICAL STAGING



	Global Staging (1)	RWE Staging
Stage I	48	43.66
Stage II	34.6	22.7
Stage III	12.4	31.8
Satge IV	5	1.84

Reference: 1. Iqbal J, et al. JAMA. 2015;313(2):165-173.

Tumor Characteristics

Clinical Staging	n	%
Stage IA	228	20.96
Stage IB	247	22.70
Stage IIA	148	13.60
Stage IIB	99	9.10
Stage IIIA	198	18.20
Stage IIIB	148	13.60
Stage IV	20	1.84

- Clinical staging showed the majority of patients in **early stages (84.56%).**
- **Advanced stages (15.44%)** included 13.60% in Stage IIIB, and only 1.84% in Stage IV.

(Staging were calculated at the time of Dx)

Metastatic Site	n	%
Local Metastasis	494	45.40
Distant Metastasis	209	19.21

- Metastatic involvement was observed in **45.40%** of patients with **local metastasis** and **19.21%** with **distant metastasis**.

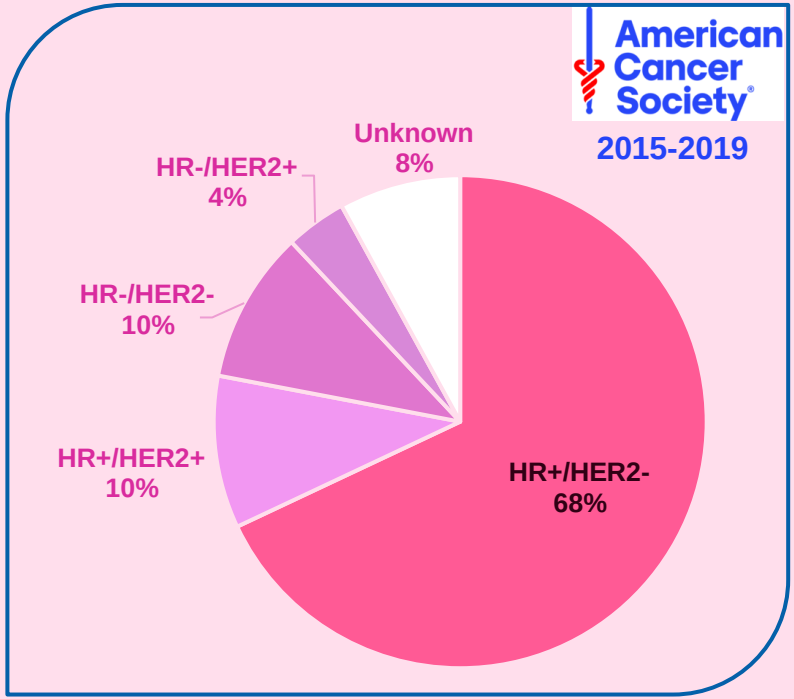
Tumor Characteristics

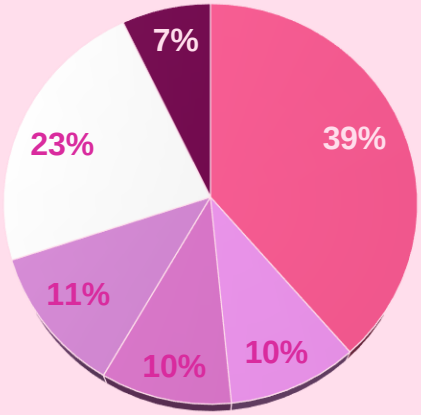
- Tumor grading was distributed as:
  - Grade I (29.96%),
  - Grade II (29.96%),
  - Grade III (25.00%), and
  - Grade IV (14.98%).

- Histopathological analysis revealed that **invasive ductal carcinoma** was the most common type **(61.03%)**, followed by **invasive lobular carcinoma (15.99%) and ductal carcinoma in situ (10.02%).**

Grade	n	%
Grade I	326	29.96
Grade II	326	29.96
Grade III	272	25.00
Grade IV	163	14.98
Histopathology	**n**	**%**
Invasive Ductal Carcinoma	664	61.03
Invasive Lobular Carcinoma	174	15.99
Ductal Carcinoma In Situ	109	10.02
Mucinous Carcinoma	54	4.96
Medullary Carcinoma	33	3.03
Tubular Carcinoma	22	2.02
Papillary Carcinoma	22	2.02
Metaplastic Carcinoma	11	1.01

Luminal Subtype





- Luminal A
- Luminal B (Her-2 Positive)
- Luminal B (Her-2 Negative)
- HER-2 Positive

RWE Analysis Subtype:

- **HR+/HER2-**: **48.53%**
- HR+/HER2+: 9.83%
- **HER2+ : 21.41%**
- **HR-/HER2- (TNBC)**: **22.89%**
- Unknown: 7.17%

Reference: 1. North American Association of Central Cancer Registries (NAACCCR), 2022.

Treatment Protocols

- **50.55%** of patients received **Radiation Therapy**, **40.44%** underwent **Chemotherapy**, and **30.33%** received **Hormonal Therapy.**

- Surgical interventions were diverse, with **lumpectomy** being the most common **(38.97%),** followed by **mastectomy (21.23%).**
- **Sentinel lymph node biopsy** was performed in **7.08%** of cases, while **3.58%** underwent **axillary lymph node dissection**.

- Overlapping treatment modalities were observed in many patients.

Treatment Protocol	n	%
Radiation Therapy	550	50.55
Chemotherapy	440	40.44
Hormonal Therapy	330	30.33
Surgery	**n**	**%**
Lumpectomy	424	38.97
Mastectomy	231	21.23
Sentinel Lymph Node Biopsy	77	7.08
Axillary Lymph Node Dissection	39	3.58

Result (Progression Free Survival)

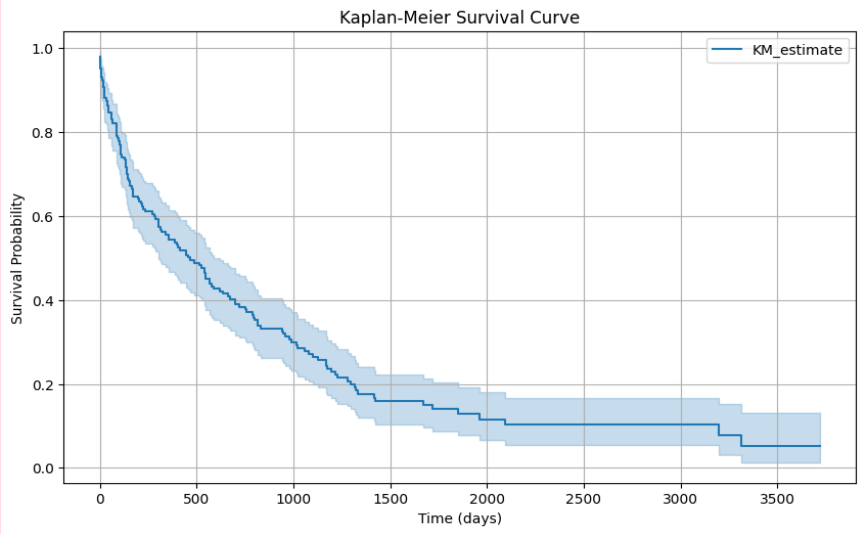
Disease Progression Status	n	%	Median PFS
Stable	302	27.76	407.5 days
Progressed	48	4.41	75.0 days
Censored	738	67.83	866.5 days

- **27.76%** of participants had stable disease, with a median progression-free survival (**PFS**) of **407.5 days.**
- **Disease progression** occurred in **4.41%** of participants, who exhibited a significantly lower median **PFS of 75.0 days**.
- The majority of participants (**67.83%**) were **censored,** indicating no progression at the time of analysis, with a **median PFS of 866.5 days.**

High loss to follow-up and mortality led to 67.83% censored data, with a median PFS of 866.5 days, affecting outcome assessment.

Result (Overall Survival)

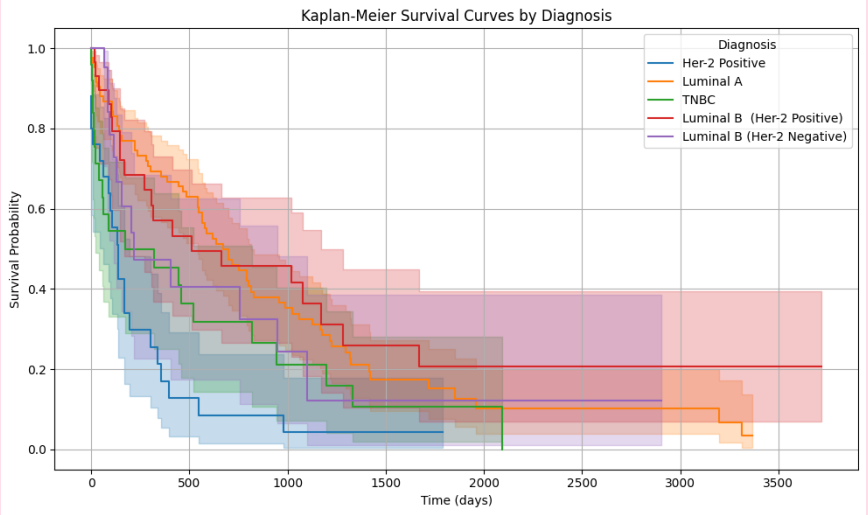
- The Kaplan-Meier survival curve illustrates a progressive decline in survival rates, with a sharp drop in the early period, likely reflecting high mortality among aggressive subtypes or advanced-stage cases.
- Over time, the decline slows, indicating longer survival for certain patients.
- However, a significant proportion (67.83%) of patients were censored due to loss to follow-up or death, which impacts the accuracy of long-term survival estimates.



This pattern underscores the variability in patient outcomes and highlights challenges in tracking disease progression in resource-limited settings.

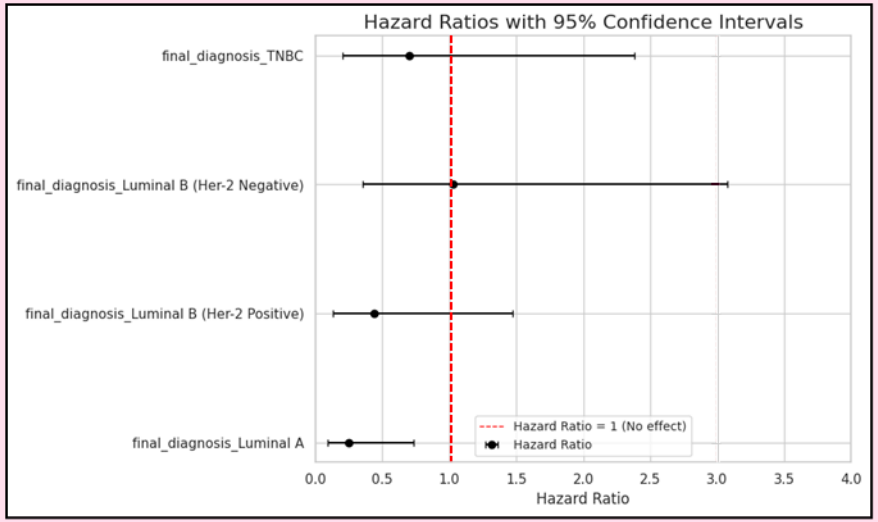
Result (Overall Survival)

- Luminal A patients exhibit the most favorable prognosis, maintaining a high survival probability of 68.06% at 365 days.
- Luminal B (HER2-positive) shows strong early survival but declines to 57.08% at 365 days.
- Luminal B (HER2-negative) starts with 100% survival at 30 days but drops significantly to 47.2% at 365 days.
- TNBC and HER2-positive subtypes demonstrate the poorest survival outcomes, with HER2-positive cases declining sharply to just 17% at 365 days.



Survival outcomes varied by subtype, with Luminal A showing the highest survival time, while TNBC and HER2-positive had the poorest prognosis

Results (Relative Risks of Event)



- Luminal A demonstrates a strong protective effect with a narrow confidence interval that does not cross the no-effect line.
- Luminal B (HER2-positive) shows a moderate reduction in risk (HR=0.44), but the confidence interval overlaps HR=1, indicating statistical uncertainty.
- Luminal B (HER2-negative) (HR=1.03) does not show a significant effect.
- TNBC (HR=0.70) suggests a slight risk reduction with a broad confidence interval.

Luminal A is the Most favorable prognostic factor

Limitations

1

Single-Center Study Bias: Since the study was conducted at a single institution, findings may not be generalizable to the entire Bangladeshi population due to limited patient diversity.

2

Incomplete Data & Loss to Follow-Up: Missing clinical data and high attrition rates introduce information and attrition bias, affecting survival estimates.

3

Limited Molecular & Biomarker Data: Lack of comprehensive genetic profiling limits personalized treatment insights.

4

Heterogeneity in Treatment Modalities: Inconsistent treatment protocols may cause selection bias in therapy effectiveness.

5

Lack of National Representation: Differences in rural vs. urban healthcare access and socioeconomic factors were not accounted for.

6

Survival Analysis Constraints: High censoring rates and short follow-up duration impact the reliability of survival outcomes.

Recommendation

Implement Nationwide Screening Programs: Early detection through population-wide screening initiatives could improve early-stage diagnosis and survival outcomes.

Develop Standardized Treatment Guidelines: Establishing and enforcing national breast cancer management protocols would enhance treatment consistency and adherence to evidence-based practices.

Enhance Molecular Testing Facilities: Increased accessibility to biomarker testing would facilitate more precise treatment selection, particularly for targeted therapies.

Expand Oncology Workforce and Infrastructure: Investment in oncology training and specialized cancer centers is necessary to address the shortage of skilled professionals and improve patient care.

Recommendation

Strengthen Research and Data Collection: Establish a National Breast Cancer Registry to systematically collect and analyze real-world data, enabling better research, policy planning, and personalized treatment approaches.

Tailor Treatment Approaches by Subtype: Given the survival disparities among luminal subtypes, personalized treatment strategies should be prioritized to optimize outcomes.

Improve Patient Awareness and Education: Community-based awareness programs should address sociocultural barriers and promote early healthcare-seeking behavior.

By addressing these challenges and implementing targeted interventions, we can improve breast cancer outcomes, reduce mortality, and bridge the disparity between resource-rich and resource-limited settings.

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Thank You...