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Breast cancer overall survival in France

Olivier Tredan[1], Laura Mansi[2], Yann Delpech[3], Manoel Moreau[4], Majda Le Foll-Elfounini[4], Danko Stamenic[4], Marie Lotz[5], Simona Bara[6]

[1]Oncology Department, Centre Leon Berard, Lyon, France; [2]Oncology Department, CHRU Jean Minjoz, Besançon, France; [3]Senology Surgery Department, Centre Antoine Lacassagne, Nice, France; [4]Medical Evidence & Data Science Department, Roche France, Boulogne-Billancourt, France; [5]Medical Affairs Department, Roche France, Boulogne-Billancourt, France; [6]Registre de la Manche, Centre Hospitalier du Cotentin, Cherbourg en Cotentin, France

Background

- The incidence of breast cancer (BC) in France is among the highest in the world.[1] In 2022–2023, female BC accounted for more than 61,200 new cancer cases and 12,700 deaths in France, making BC the most common cancer and leading cause of cancer death among women nationally.[2]
- Increased understanding of the molecular heterogeneity of BC has led to optimised treatment pathways and outcomes for some subgroups. Endocrine therapy is the standard of care for patients with hormone receptor–positive (HR+) BC, while the advent of anti–human epidermal growth factor receptor 2 (HER2) therapies has improved the prognosis of patients with HER2+ BC.[3] Targeted treatments remain limited for triple-negative BC (TNBC); however, immunotherapies have become a recent treatment option for these patients.[3]
- With these advances in BC management, this analysis of the GREASE study aimed to estimate real-world overall survival (OS) among French women with BC, both overall and grouped by molecular subtype.

Methods

- GREASE was a retrospective, observational analysis of data from the Echantillon du Système National des Données de Santé (ESND) database, which is a representative 2% sample of national healthcare data in the Système National des Données de Santé (French National Health Data System; SNDS). The SNDS contains pseudonymised data for approximately 67 million individuals covered by the by the French National Health Insurance System.[4]
- Eligible patients were women (aged ≥18 years) with evidence of BC between Jan 1, 2010, and Dec 31, 2023. Patients were included if they met two evidence criteria: (1) evidence of ≥1 hospitalisation for BC or active long-term disease related to BC (based on International Classification of Diseases [ICD-10] codes); and (2) evidence of receiving treatment specific to BC during this period (based on Anatomical Therapeutic Chemical [ATC] codes).
- The present analysis included women treated for an incident BC between Jan 1, 2010, and Dec 31, 2022 (Figure 1; Table 1).
  - The inclusion date was defined as the date of first evidence of BC; if available, the diagnosis date was date of first evidence of BC diagnosis (biopsy, cytology, or breast imaging; based on Classification Commune des Actes Médicaux [CCAM] codes) in the year preceding inclusion.
  - A lookback period from Jan 1, 2008, to the diagnosis/inclusion date (whichever was earliest or available) ensured that only incidence BC cases or new cases of BC were included.
  - Patients were followed from their diagnosis/inclusion date until death from any cause, loss to follow-up, or Dec 31, 2023.
- Patients included in the analysis population were grouped according to their BC molecular subtype, based on the treatment(s) received during follow-up (Table 1).

Figure 1. Study design.

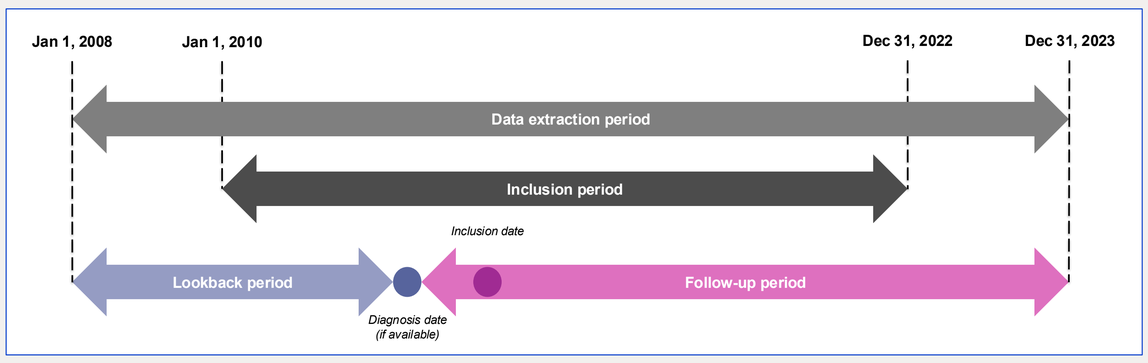


Table 1. Analysis population and subgroup definitions.

Population/subgroup	Definition
Analysis population	Women in the ESND with evidence of BC between Jan 1, 2010, and Dec 31, 2023, excluding those with: First evidence of BC before Jan 1, 2010, or after Dec 31, 2022 No specific treatment for BC during follow-up
HER2+ subgroup	Patients who received anti-HER2 therapy (± endocrine therapy)
HER2+/HR+ subgroup	Patients who received both anti-HER2 and endocrine therapy
HER2+/HR− subgroup	Patients who received anti-HER2 therapy without endocrine therapy
HER2−/HR+ subgroup	Patients who received endocrine therapy without anti-HER2 therapy
Undefined subgroup	Patients who received neither anti-HER2 nor endocrine therapy
Undefined with systemic therapy	Patients who received systemic therapy (± locoregional therapy)
Undefined with *in situ* BC with no systemic therapy	Patients with an *in situ* BC diagnosis who received locoregional therapy only

Echantillon Système National des Données de Santé; HER2, human epidermal growth factor receptor 2; HR, hormone receptor; ICD-10, International Classification of Diseases, Tenth Revision.

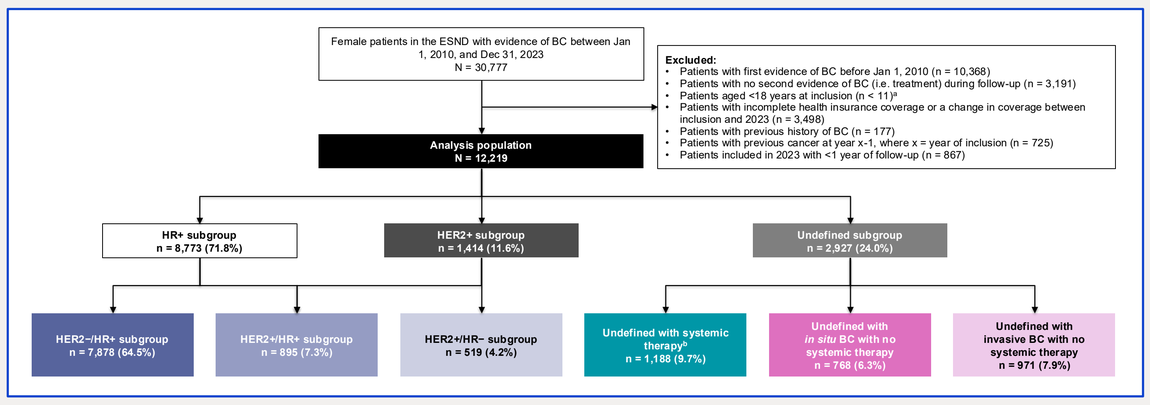
- Actuarial methodology with interval censoring was used to estimate OS rates and their corresponding 95% confidence intervals (CIs). OS rates were defined as the proportion of patients who were alive at 5, 10, and 12 years from their first BC treatment date (systemic, surgery, or radiotherapy).
- Mean age at first BC treatment and the proportion of patients in each age category at first BC treatment (≤39 years, 40–49 years, 50–69 years, ≥70 years) were estimated using descriptive statistics and were presented overall and by year.

Results

Population

- In total, 30,777 women with evidence of BC were identified in the ESND database between Jan 1, 2010, and Dec 31, 2023 (Figure 2); of these, 12,219 were included in the analysis population. The mean (interquartile range) age at first BC treatment was 61 (51–71) years, with 585 patients (4.8%) aged ≤39 years, 2,101 (17.2%) aged 40–49 years, 6,181 (50.6%) aged 50–69 years, and 3,352 (27.4%) aged ≥70 years.
- Based on treatments received during follow-up, 64.5% of patient had HER2−/HR+ disease, 7.3% had HER2+/HR+ disease, and 4.2% had HER2+/HR− disease (Figure 2). Molecular subtype was undefined in 2,927 patients (24.0%).

Figure 2. Patient disposition.

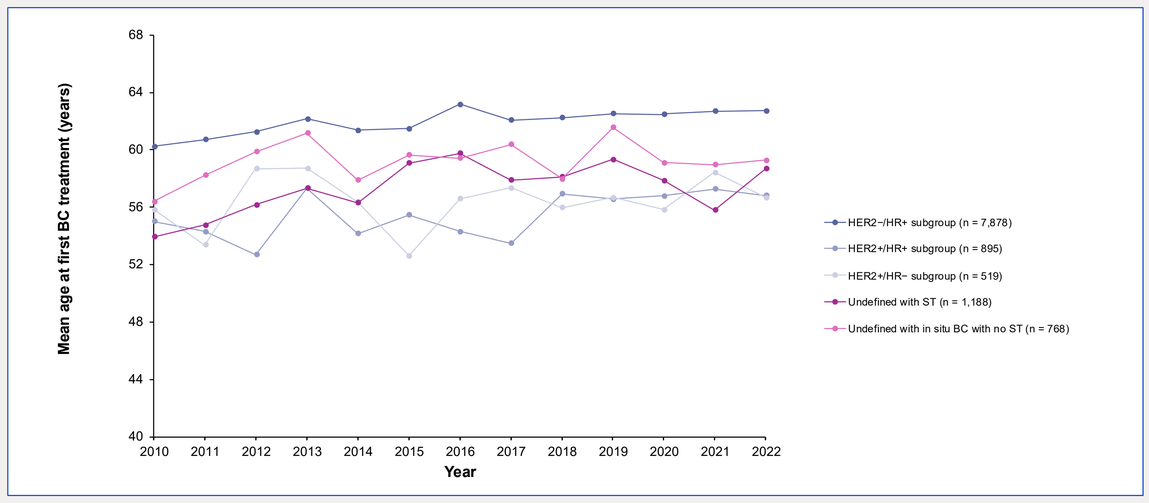


aDue to French SNDS data privacy regulations, data describing n ≤ 10 patients cannot be specified; bIncluded patients with *in situ* or invasive BC. BC, breast cancer; ESND, Echantillon Système National des Données de Santé; HER2, human epidermal growth factor receptor 2; HR, hormone receptor; SNDS, Système National des Données de Santé.

Age at first BC treatment

- In the overall population, approximately half of the patients received their first BC treatment between 50 and 69 years of age. Mean age at first BC treatment remained relatively stable over time, with a minor progressive increase observed between 2010 (mean ± SD 58.9 ± 12.6 years) and 2023 (61.9 ± 13.5 years). Relative to the overall analysis population, the proportion of patients who received their first treatment for BC at the age ≥70 years gradually increased between 2010 and 2023.
- When patients were grouped by molecular subtype, mean age at first BC treatment was typically greater in the HER2−/HR+ subgroup, with no apparent change in age at first BC treatment observed over time (Figure 3).

Figure 3. Mean age at first BC cancer treatment over time, by molecular subtype.

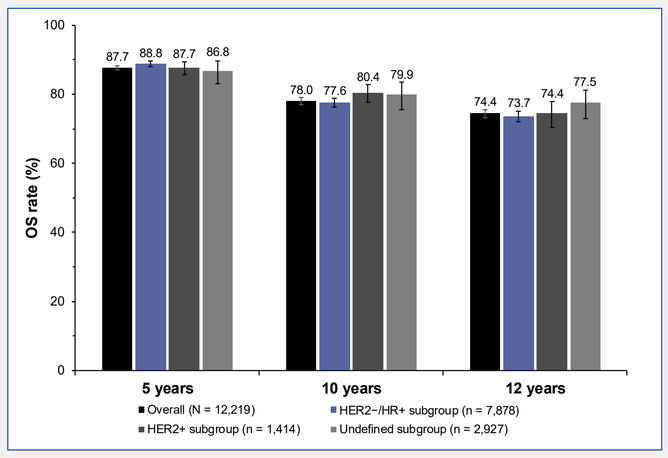


BC, breast cancer; HER2, human epidermal growth factor receptor 2; HR, hormone receptor; ST, systemic therapy.

Overall survival

- In the overall analysis population, estimated OS rates were 87.7% (95% CI 87.0–88.3) at 5 years, 78.0% (77.1–79.0) at 10 years, and 74.4% (73.2–75.5) at 12 years (Figure 4). When patients were grouped by molecular subtype, 5-, 10-, and 12-year OS rates were generally similar between the HER2−/HR+, HER2+, and undefined subgroups.

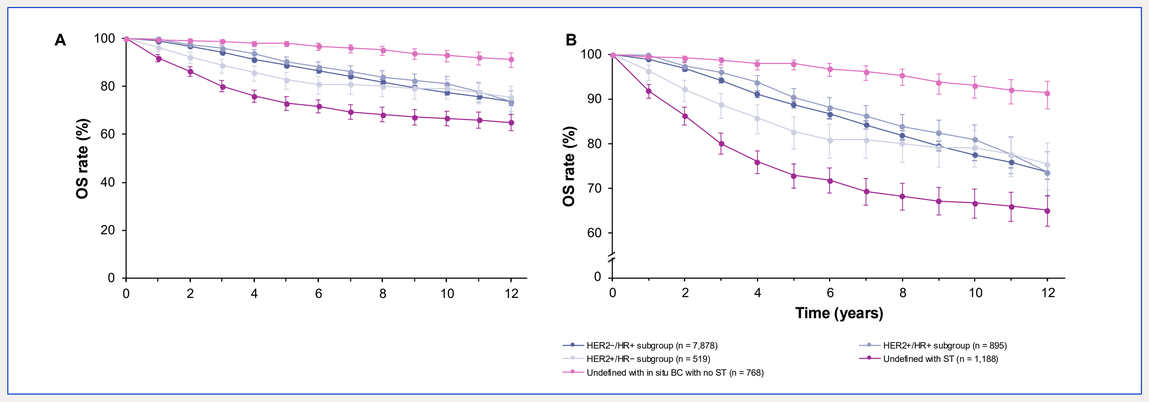
Figure 4. OS rates at 5, 10, and 12 years, overall and by molecular subtype.



Error bars represent 95% confidence intervals. HER2, human epidermal growth factor receptor 2; HR, hormone receptor; OS, overall survival.

- Within the undefined subgroup, however, OS rates over 12 years varied between patients who received systemic therapy, those with *in situ* BC (Figure 5).
- A good OS was expected in *in situ* patients as this is a group with a better prognosis. Patients with systemic treatments probably correspond to populations of TNBC or HR+ patients with visceral crises, both of which have a very poor prognosis.

Figure 5. OS rates over 12 years, plotted on a 0–100% scale (A) and 60–100% scale (B).



Error bars represent 95% confidence intervals. BC, breast cancer; HER2, human epidermal growth factor receptor 2; HR, hormone receptor; OS, overall survival; ST, systemic therapy.

Limitations

- Due to a lack of clinical data available in the ESND, patients were grouped into molecular subtypes based on the treatments ; as such, we were unable to estimate OS for patients with TNBC
- The exact date of death was not available at the individual level in the ESND and instead is reported in 1-year intervals; as such, we were unable to use Kaplan–Meier methodology to estimate OS.
- Our HR+ subgroup excluded patients with visceral crisis if they did not receive endocrine therapy during follow-up, which may have led to an overestimation of OS.
- Fewer data were available for 2023, as a smaller pool of patients met both the first evidence of BC criteria (screening/diagnosis) and the second evidence of BC criteria (treatment); as such, 2023 was excluded from the mean age of first BC treatment analysis.

Conclusions

- Our analysis of real-world OS in the GREASE study estimated that almost 75% of French women diagnosed with BC in 2010–2022 would be alive after 12 years.
- OS rates over 12 years were similar between HER2+ and HR+ subgroups, demonstrating that recent therapeutic advances have improved outcomes for patients with HER2+ BC.
- In comparison, patients who received systemic therapy without endocrine or anti-HER2 therapy—which may include patients with TNBC or those with visceral crisis—had lower rates of OS, highlighting potential unmet needs in these populations.
- A small increase in mean age of first BC treatment was observed over time, which could potentially be linked to a progressive increase in the mean age of the French population.[5]

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Conflicts of interest
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