

Age-related prognoses in a Luxembourg breast cancer cohort: The RELIANCE Study

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Background: The correlation between age and breast cancer risk is well-established, yet the influence of age at diagnosis on survival outcomes remains inconsistent.

Aim: This study aimed to evaluate the prognostic consequences of age at diagnosis in breast cancer.

Methods: This retrospective cohort study is part of the RELIANCE study (REaL-life cANCER epidemiology aims to identify risk factors for Breast Cancer with particular focus on prevention and care) and utilized high resolution data from the National Cancer Registry of Luxembourg, including female primary breast cancer cases diagnosed from 2013 to 2018. Stratification was performed across six age-based groups (<40, 40-49, 50-59, 60-69, 70-90, ≥80). Survival analysis was conducted employing Kaplan-Meier estimations and Cox proportional hazards modeling. Comparative survival assessments were performed among three distinct age categories (<50, 50-69 and ≥70). Multivariate analysis based on various clinical factors, , and therapeutic interventions.

Results: The study included 3,012 female patients, with 6.2% diagnosed prior to age 40. An analysis of tumor grades and subtypes revealed that younger patients (<40 years) were significantly more likely to present with poorly differentiated or undifferentiated grades and triple-negative tumors than older patients (Fig 1 & 2; p<0.001). The 5-year survival rates were as follows Fig. 3: <40 years (91.0%), 40–49 years (95.3%), 50–59 years (93.7%), 60-69 years (90.6%), 70-79 years (75.4%), and >80 years (47.1%). Notably, the age group of 50-69 years demonstrated a statistically significant superior overall survival in comparison to the other age groups (<50 and ≥70, Fig. 4; p<0.001). Additionally, multivariate analysis showed 50-69 and ≥70 age groups were significantly associated with better survivals than <50 patients.

Fig 1. Distribution of histological grade among age groups

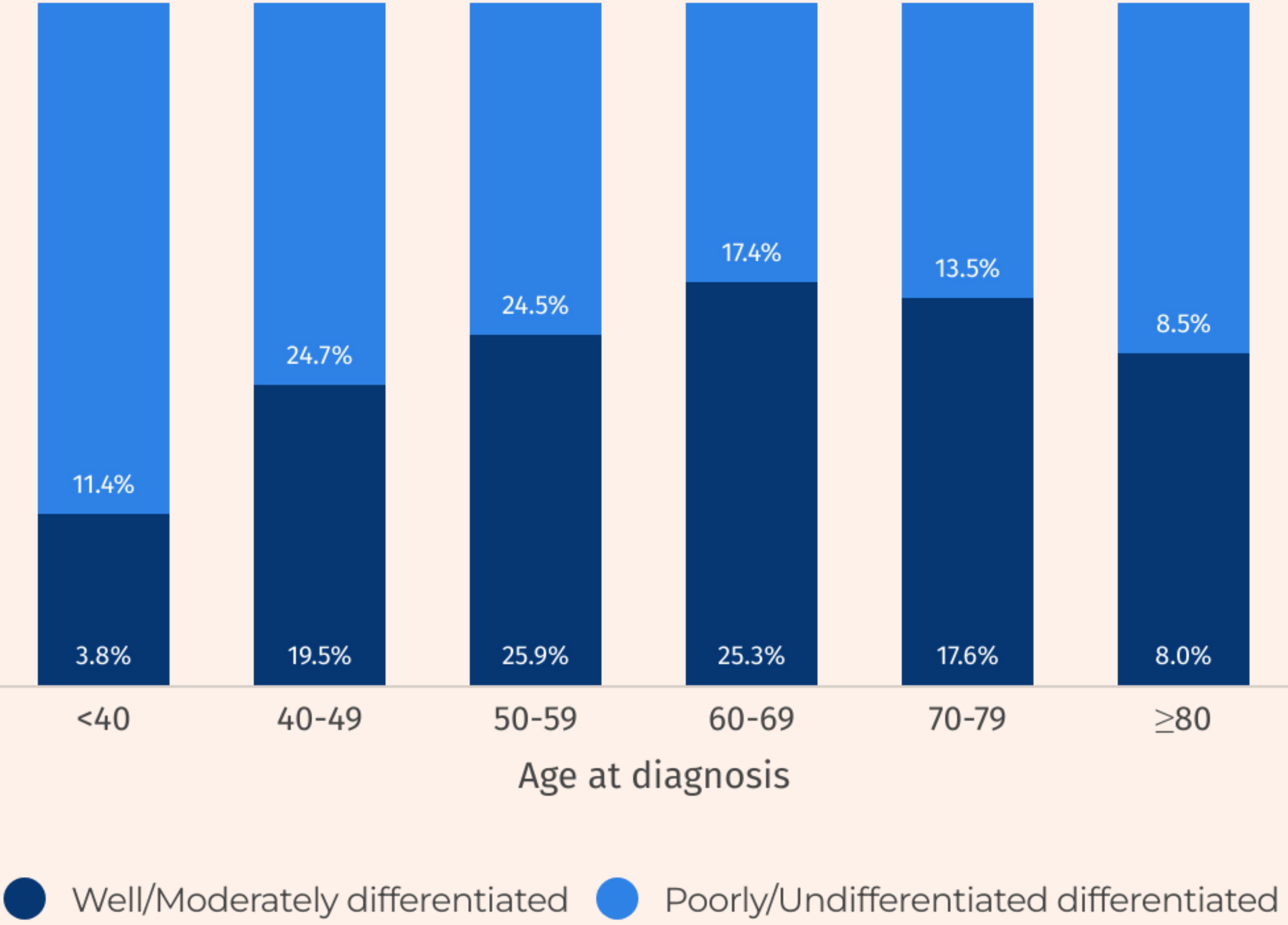


Fig 2. Distribution of molecular subtypes among age groups

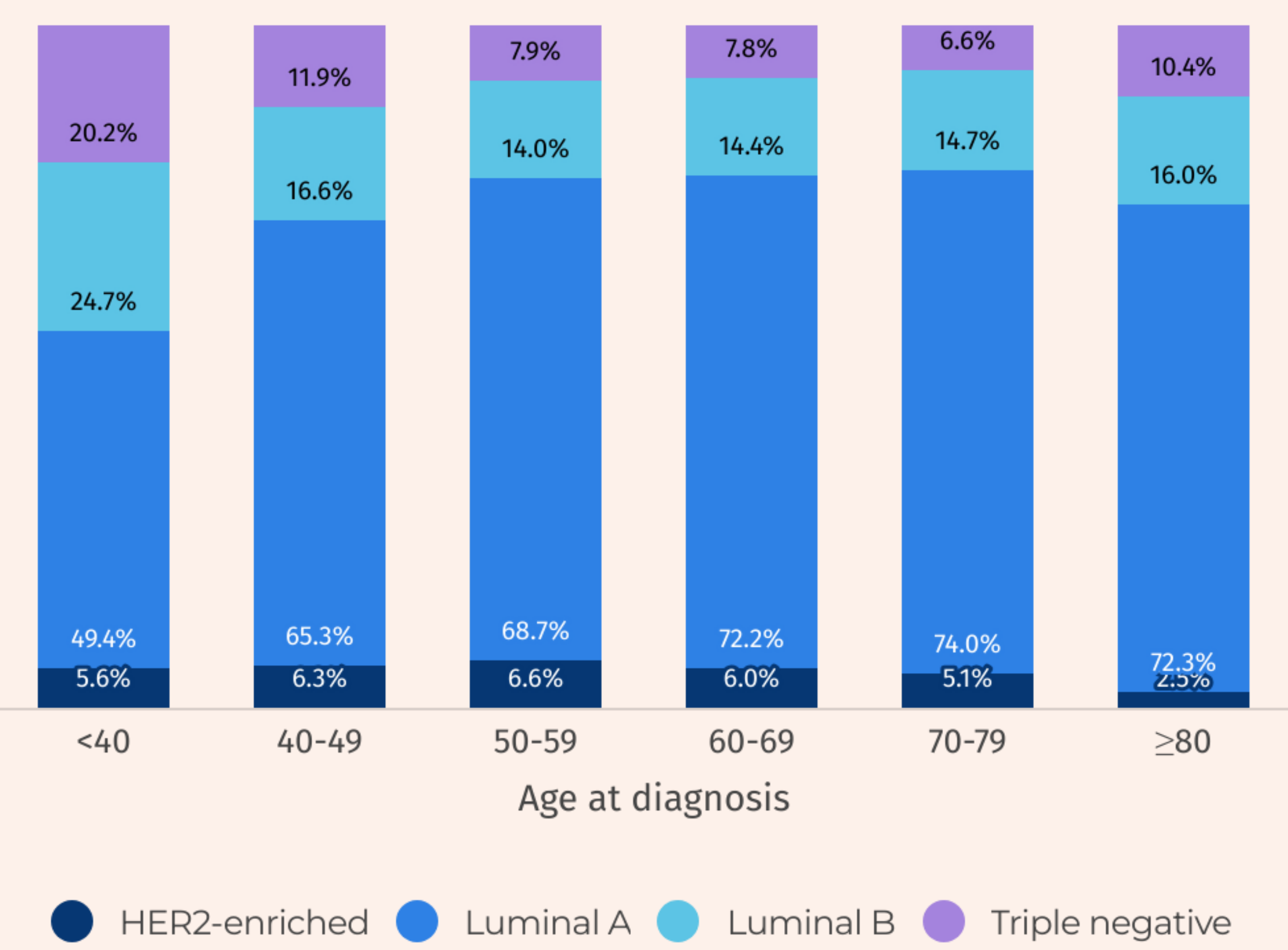


Fig 3. Survival across six age-based groups

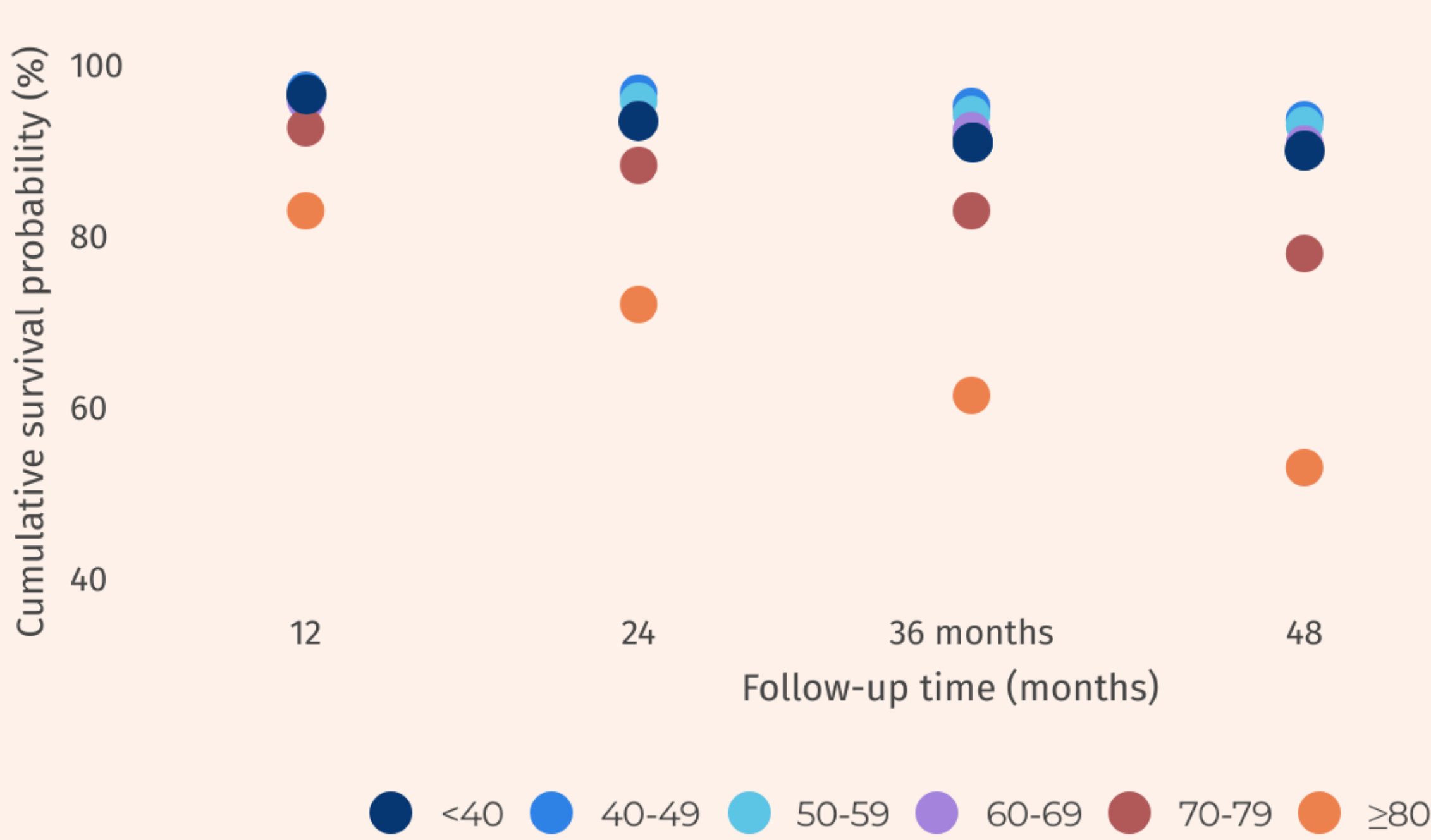
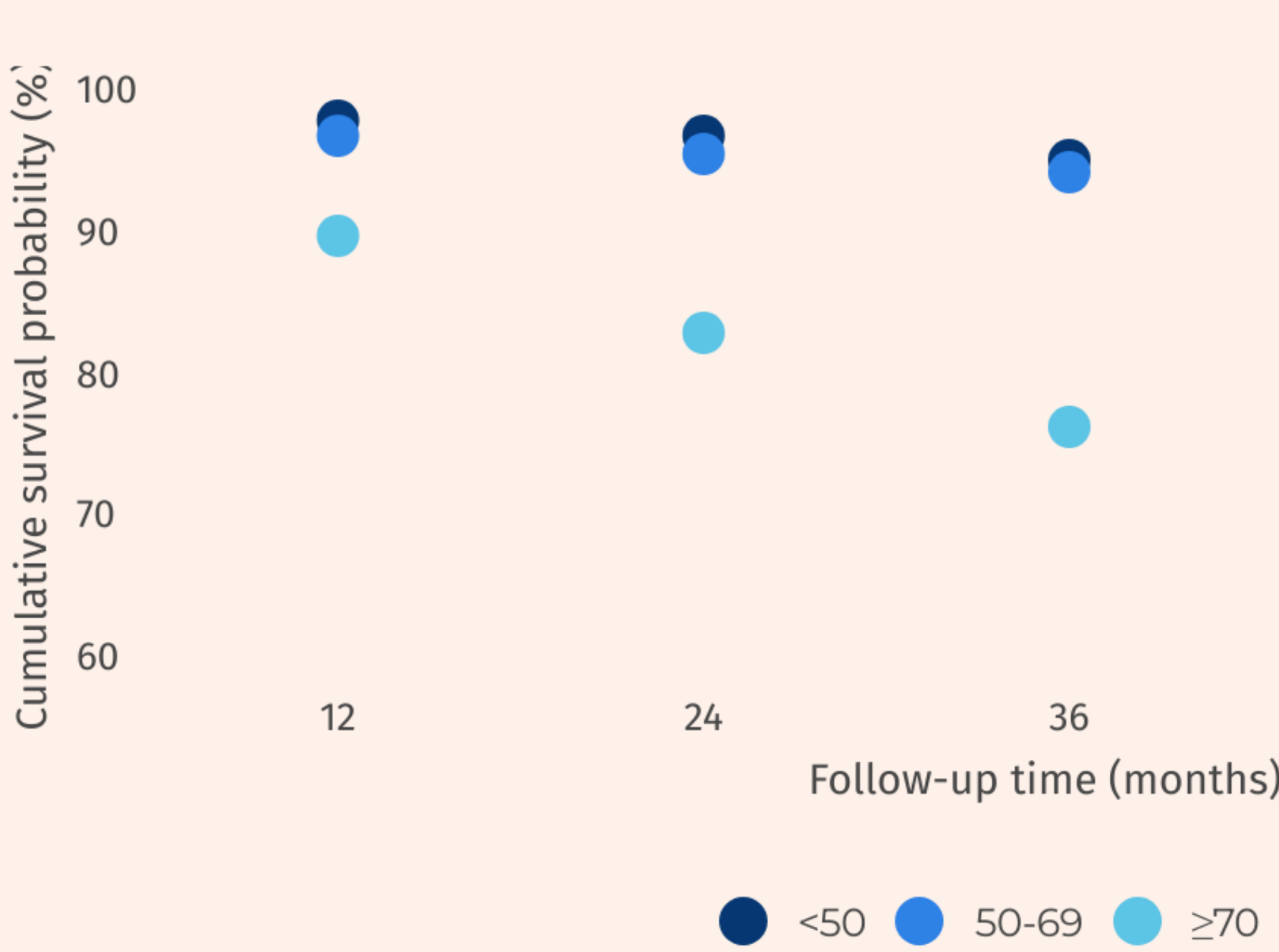


Fig 4. Survival across three age-based groups



Conclusion & Discussion: The findings of the study indicate that younger (<40 years) breast cancer patients tend to present with more aggressive disease profiles when compared with older age groups. Diagnoses occurring between the ages of 50-69 are associated with more favorable survival rates, compared to those under 50 or over 70, even after to adjustments for confounding variables.