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# Impact of Mammography on Late-Stage Diagnosis

Mammography screening is a central strategy for the early detection of breast cancer, particularly among older women. While its efficacy is well-established in reducing late-stage diagnosis and mortality, evidence remains inconsistent regarding its benefits for women aged 75 and older. The absence of conclusive recommendations for this age group has prompted further investigation into how screening history, defined by the presence and frequency of prior mammograms, influences outcomes. A recent cohort study using data from the Surveillance, Epidemiology and End Results (SEER)–Medicare database provides insights into the associations between prior screening and both stage at diagnosis and breast cancer–specific mortality in women aged 70 and above with screen-detected cancers.

**Screening History and Stage at Diagnosis**
The study included over 13,000 women aged 70 and older who had screen-detected, estrogen receptor–positive or HER2-negative breast cancer. A significant proportion of these women—77.5%—had received at least one screening mammogram in the five years preceding diagnosis. Analysis revealed that prior screening was strongly associated with early-stage diagnosis. Specifically, 82% of women with a history of screening were diagnosed with very early-stage cancer (T1N0), compared with only 56.6% of those without prior screening. The adjusted analysis showed that women who had undergone screening had 54% lower odds of being diagnosed with later-stage disease (T2+ or N1+) than those without any prior screening.

Further distinctions were observed based on the number of screenings. Women who had three or four mammograms within the five-year window had the lowest likelihood of later-stage diagnosis, suggesting a cumulative benefit of repeated screenings. These findings held true even after controlling for various demographic, clinical and socioeconomic factors. Additionally, women who were dual-eligible for Medicare and Medicaid, frail or living in areas with higher poverty and lower education levels, were less likely to have had prior screenings and more likely to be diagnosed at a later stage.

**Mortality Outcomes and Screening Frequency**
The mortality data mirrored the findings on stage at diagnosis. Overall, breast cancer–specific deaths occurred in 4.4% of the cohort, but the rate was significantly higher among women with no prior screening (8.0%) compared to those with prior screening (3.3%). After adjusting for potential confounders such as tumour grade, surgery and comorbidities, prior screening was associated with a 36% lower hazard of death from breast cancer.

***Must Read:*** ***Predicting Breast Cancer Using Sequential Mammogram Analysis***

A deeper analysis among women who had been screened found a dose-response relationship between the number of screenings and mortality risk. Women who had three to four screenings were significantly less likely to die from breast cancer than those with only one screening. Interestingly, the interval between the most recent screening and diagnosis did not significantly affect outcomes, possibly due to the limited variation in timing among the screened group—most had been screened within two years of their diagnosis.

Sensitivity analyses further validated these associations. Even among women older than 75, prior screening remained linked to both earlier stage at diagnosis and lower mortality. A separate analysis restricted to those who underwent surgery, representing a curative-intent population, confirmed these trends, underscoring the robustness of the findings.

**Health Access and Socioeconomic Correlates**
Access to healthcare and preventive services emerged as key determinants of whether women underwent regular screenings. Those with regular primary care visits or annual wellness checks were significantly more likely to have been screened. In contrast, women from socioeconomically disadvantaged backgrounds—indicated by dual eligibility for Medicare and Medicaid, living in high-poverty areas or residing in

communities with lower educational attainment—had reduced odds of prior screening.

Marital status also played a role, with married women being more likely to have received screening than their unmarried counterparts. Although race and ethnicity did not significantly affect the likelihood of screening in this cohort, the sample size for some subgroups may have limited the power to detect disparities.

While prior screening appears beneficial, the study acknowledged the possibility of residual confounding. Women who adhere to regular screening schedules may also be more proactive in managing their health overall, contributing independently to improved outcomes. Additionally, the potential for lead-time bias—where earlier detection merely increases the observed survival time without affecting the natural course of the disease—cannot be excluded.

The findings of the study suggest that regular mammography screening prior to the detection of breast cancer is associated with earlier stage at diagnosis and reduced disease-specific mortality in older women. These benefits extend even to those over 75, a group for whom screening guidelines remain inconclusive. Despite limitations such as potential residual confounding and misclassification from claims-based data, the results reinforce the potential value of continued screening in ageing populations. They also highlight the need to address disparities in access to preventive healthcare to ensure that the benefits of early detection are equitably distributed.

**Source:** **JAMA Network Open**

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