

## **Beneficial Effect of Repeated Participation in Breast Cancer Screening on Survival**

### **PURPOSE**

The benefit of mammography screening in reducing mortality from breast cancer is established, but less so the benefit of repeated participation at scheduled screening on case survival. The purpose of this study was to investigate the effect of regular attendance to mammography screening.

### **METHODS AND MATERIALS**

Data on screening history and subsequent survival from 1992 to 2016 were available for 37,079 breast cancer patients in whom 4,564 breast cancer deaths occurred. We obtained data on screening history and subsequent death from breast cancer and extracted data on participation to the five (or fewer) most recent invitations prior to breast cancer diagnosis. Breast cancer incidence data was obtained from the regional oncology centers and breast cancer death data was obtained from the Swedish Cause of Death Register. These data were linked to population screening invitation and attendance data. Formal comparisons of survival with respect to numbers of screens attended utilized Cox proportional hazards regression with time-varying covariates, i.e., cumulative numbers of screens, yielding hazard ratios and 95% confidence intervals.

### **RESULTS**

Depending on number of invitations, 58-73% participated in all scheduled mammography screening exams, and 73-96% participated in at least one. For those participating in all screening exams, survival rates ranged from 82.7% to 86.9%. For those participating in no screening, survival ranged from 59.1% to 77.6%. In those with five prior invitations to mammography screening, the relative hazard of breast cancer death for those attending all five screens was 0.28 (95% CI 0.25-0.33) compared to women who had participated in none, a 72% reduction in the risk of dying from breast cancer. Even after conservative adjustment for potential self-selection factors, there was a highly significant 66% reduction in hazard, with a hazard ratio of 0.34 (95% CI 0.26-0.43).

### **CONCLUSIONS**

We found a greater reduction in the hazard of breast cancer death with increasing number of screening exams attended. In terms of limitations, these results are for case survival, not population mortality, although results are consistent with recent findings of a greater mortality reduction for those who participated in both their most recent scheduled screens. These results indicate that for those who develop breast cancer, regular participation in screening considerably improves the probability of surviving it. The importance of regular attendance in mammography screening should be clearly articulated in breast cancer screening messaging.

### **CLINICAL RELEVANCE/APPLICATIONS**

Irregular mammography screening is common. There is a need to stress the importance in regular mammography as a key factor in reducing the risk of breast cancer death.