We were struck by the large reduction in breast cancer mortality reported by Coldman et al. in association with participation in Canadian mammography screening programs (1), in particular with the consistency in the sizes of the observed reductions across all provinces and across all age groups. Overall, they reported a 40% reduction in breast cancer mortality associated with ever participating in a provincial breast screening program.

We conducted a cohort-based analysis of women enrolled in the Canadian National Breast Screening study (CNBSS) and found that screening initiated before age 50 years was not associated with a decline in mortality before age 60 years (2). In our study, the hazard ratio for death from breast cancer associated with entry into the screening program was 1.10 (95% confidence interval [CI] = 0.86 to 1.40). The screening period in our study was earlier (1980 to 1985) than in the Coldman study (1990 to 2009) and the age groups were different, but most importantly, in the CNBSS, screening was assigned at random, whereas in the Coldman study the screened women were volunteers. The reduction in mortality cannot readily be explained by confounding (‘healthy screening’ bias) because comorbidity and lifestyle do not have sufficient impact on outcome after a diagnosis of breast cancer such that they could explain such a profound mortality difference. Selection bias is a greater concern (3). We excluded women with a past history of breast cancer from both subcohorts, and we excluded women who had a recent mammogram. If a woman has been diagnosed with breast cancer in the past she will not be a candidate to enroll in a breast cancer screening program. For example, a woman might have been diagnosed in 1989 and die in 1995. In an observational study, her person-years (from 1990 to 1995) and death (in 1995) would be counted among the unscreened women, unless women with prior cancer were specifically excluded.

Consider a woman who had breast screening prior to 1990; if she had cancer she would then be counted in the nonscreened cohort, and if she didn’t have cancer she would be eligible to participate in the screening program. In the latter case, her a priori risk of cancer would be reduced, as would her risk of dying of cancer. For this reason, we excluded women who had a recent screen from the CNBSS study from the outset. Of note, in the Pan-Canadian study, 45% of Ontario nonparticipants had a screen outside the program and yet the hazard ratio was still strongly protective (hazard ratio = 0.73, 95% CI = 0.68 to 0.78). We do not know how many women had a mammogram prior to entry. To alleviate our concern that selection bias influenced the results of their study, it would be helpful if Coldman et al. (1) would provide the dates of diagnosis of breast cancer for the women who died of cancer during the study period. Also, if bias were present, we should see a more extreme protective effect for the first decade (1990–1999) than for the second decade (2000–2009).

References