



Research Brief: 25 Year Follow-up for Breast Cancer Incidence and Mortality of the Canadian National Breast Screening Study: Randomized Screening Trial

Large Canadian study with 25 years of follow-up finds no mammography screening benefit for women aged 40 to 59 compared to clinical breast exam and routine care while exposing average-risk women to overdiagnosis and overtreatment.

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February 12, 2014 — One of the largest studies of screening mammography, the Canadian National Breast Screening Trial, is a randomized controlled trial (RCT) that compared breast cancer incidence and mortality for women ages 40 to 59 who did, or did not, have an annual screening mammogram. The study followed nearly 90,000 women for up to 25 years. It found that, compared with clinical exam or routine care, annual mammograms did **not** reduce breast cancer deaths.

A **randomized controlled trial** (RCT) is a study where people are randomly assigned to receive (or not to receive) a particular intervention (i.e., this could be comparing two different treatments, one treatment and a placebo, or a screening group and non-screening group). RCTs are the most reliable type of study design to determine whether an intervention is effective.

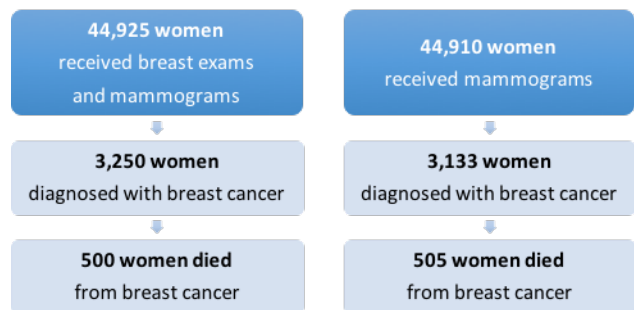
The Canadian study involved 15 screening centers in six Canadian provinces (Nova Scotia, Quebec, Ontario, Manitoba, Alberta, and British Columbia). The women were randomly assigned to the mammography group (five annual mammography screens from 1980-1985) or to the control group (no mammography).

For the women in their 50s, both groups (mammography and control) received annual physical breast examinations by a trained examiner. The women were then followed for **25 years** by the Center coordinators and the study’s central office. The data was also linked to cancer registries and statistics databases.

Study Results

The study found no mammography screening benefit for women aged 40 to 59.

There were 44,925 women in the mammography arm and 44,910 in the control arm. During the study period, 3,250 women in the mammography group were diagnosed breast cancer compared to 3,133 in the control. The death rate was essentially the same in both groups, with 500 in the mammography group and 505 in the control.



After 25 years of follow-up, annual mammography did not result in any greater reduction in breast cancer mortality for women aged 40 to 59 than physical examination alone. The researchers concluded that these data support reassessment of the value of mammography screening programs.

Implications

Instead of comparing mammography screening to “no screening” as other studies have done, the Canadian study compared women in the mammography arm to a group of similar women who did not have annual mammograms but did receive comprehensive breast exam along with routine care. In fact, women over age 50 in both arms had a comprehensive breast exam. This suggests that screening mammograms conferred no added benefit to adequate health care and routine clinical breast exam in terms of reducing breast cancer deaths.

The data confirms results from other screening trials that found limited benefit for screening. Some studies put the screening-associated mortality reduction at [about 15 percent](#), others as low as [2 percent](#). What these studies suggest, as does the Canadian study, is that quality treatment rather than annual mammography screening is responsible for reducing the overall number of breast cancer deaths post-diagnosis.

The Canadian study also shows no benefit of annual screening over time. At ten years of follow-up, there were already similar numbers of deaths in the screening and control groups. Additionally, there were 30 percent more surgeries and treatments in the mammography group despite no reduction in deaths. At 25 years, the number of cases in the screening and control groups were also similar, as were the number of deaths. Moreover, it was determined that 1 in 424 women in the mammography group received treatment for a cancer that would not have been life threatening, suggesting both overdiagnosis and overtreatment due to screening.

Ultimately, this study confirms earlier findings that screening populations of women of average risk at a particular age has little benefit, while it exposes women to radiation and unnecessary treatment. What is new here, is that this large, 25-year study found that the addition of annual mammography screening to routine care and clinical breast exam was not a value added in the short- or long-term. It appears instead that improvements in treatment, including targeted and less toxic therapies, are the critical factors for reducing the breast cancer death rate overall.

Source: Miller AB, Wall C, Baines CJ, Sun P, To T, Narod SA et al. Twenty Five Year Follow-up for Breast Cancer Incidence and Mortality of the Canadian National Breast Screening Study: Randomized Screening Trial. *BMJ*. 348:g366. doi: 10.1136/bmj.g366.

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