

## Breast Cancer: Tumor Size and Overdiagnosis

The full report is titled "Breast Cancer Screening in Denmark: A Cohort Study of Tumor Size and Overdiagnosis." The authors are K.J. Jørgensen, P.C. Gøtzsche, M. Kalager, and P. Zahl.

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### What is the problem and what is known about it so far?

Mammograms are special x-rays of the breast that can find tumors before they cause symptoms or can be felt on examination. Women are advised to get routine mammography to diagnose breast cancer earlier, when it is more easily treated. This is called screening mammography. However, there is debate about how well screening mammography works. Some cases of breast cancer found with screening mammography represent "overdiagnosis," which means that the cancer found on the mammogram would never have caused a problem for a woman during her lifetime and would not have led to death. In addition, there are doubts about whether mammography detects breast cancer early enough to reduce death.

### Why did the researchers do this particular study?

To find out whether breast cancer screening with mammography reduces advanced tumors, which are bigger and can be more difficult to treat, and to estimate the amount of breast cancer overdiagnosis that occurs with screening mammography.

### Who was studied?

Women in Denmark who lived in areas covered by Danish breast cancer screening programs from 1991 to 2010 were compared with those who lived in areas of Denmark that did not offer mammography screening.

### How was the study done?

In Denmark, screening mammography was introduced over time in different regions of the country. The researchers compared the size of diagnosed breast tumors in regions of Denmark with and without screening in the same time period. Advanced tumors were bigger than 20 mm, and nonadvanced tumors were 20 mm or smaller. Next, the researchers estimated overdiagnosis in 2 ways. They compared the occurrence of cancer in women aged 50 to 84 years in areas with and without screening and compared trends for women aged 35 to 49, 50 to 69, and 70 to 84 years in areas with and without screening.

### What did the researchers find?

Screening was not associated with less advanced cancer. The researchers estimate that between one quarter to one third of breast tumors diagnosed in women who were offered screening mammography were overdiagnosed. In other words, these tumors would never have caused a noticeable health problem or led to death.

### What were the limitations of the study?

The technology for doing mammography has changed since 1980 when this study began.

### What are the implications of the study?

Screening mammography does not seem to have delivered its promised benefit of earlier diagnosis. For many women, screening mammography may lead to a diagnosis of breast cancer based on tumors that would never have been noticed or become harmful during their lifetime. These women are unnecessarily treated with therapies, including surgery, radiation, and chemotherapy, that have adverse effects. Women and policymakers need to be aware of the shortcomings of screening mammography.

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