

# Personalized breast cancer screening could improve cancer survival and reduce overdiagnosis

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Researchers have created a model for predicting individual breast cancer risk that could be used to create personalized breast screening strategies.

The research, presented today (Wednesday) at the 13th European Breast Cancer Conference, could make breast screening programs more effective and ultimately improve survival rates.

It could also mean fewer people experiencing false positives—when screening indicates [cancer](#), but further tests show there is no cancer—and overdiagnosis—when people are diagnosed and treated for a cancer that is extremely slow-growing and would not have caused any problems during their lifetime.

The study used data from the Cancer Registry of Norway (Oslo) and was a collaboration between researchers from the Cancer Registry of Norway and the Hospital del Mar Medical Research Institute in Barcelona, Spain.

It was presented by Dr. Javier Louro from Hospital del Mar. He said, "We know about many of the factors that influence breast cancer risk. For example, getting older, having a family history of breast cancer and some types of benign breast disease can all increase the risk. We can't do much about those risk factors, but we can use this information to predict the risk of breast cancer."

The research included data from about 50,000 women who were taking part in BreastScreen Norway between 2007 and 2020. BreastScreen Norway is a national program that invites all women aged 50–69 to have a mammogram (a breast X-ray) every two years. Breast screening programs can help improve survival rates by ensuring cancers are discovered as early as possible.

The researchers used data on ten known risk factors to estimate individual women's risks of developing breast cancer over a period of four years. These included age, family history of breast cancer, previous benign breast disease, breast density (a measure of the glands and fibrous tissue in the breast), body mass index and drinking alcohol.

They compared these [risk factors](#) in women with and without a breast cancer diagnosis to assess the impact of each individual risk factor, to develop the model and to check whether the model was broadly accurate.

They found that the risk of developing breast cancer over a period of four years ranged from as low as 0.22% for some people up to 7.43% for others, with an average (median) risk of 1.10%.

The research also indicated that some factors were more important than previously thought, for example the protective effect of how many hours of exercise a woman takes per week. This is a factor that is not usually included in breast cancer risk prediction models.

Dr. Louro said, "We have successfully developed and validated a model to estimate breast cancer risk in women participating in BreastScreen Norway, the national breast cancer screening program in Norway. Several breast cancer risk prediction models have been created, but we believe this is one of the first models designed to guide breast screening strategies over a person's lifetime using real data from a screening program. It is also the first model developed using data from BreastScreen Norway.

"Our model might be considered a key for designing personalized screening aimed at reducing the harms and increasing the benefits of mammographic screening. For example, someone with low risk, might be offered screening with standard mammography every three or four years instead of two years. Someone with medium risk might be offered screening with advanced 3D mammography every two years, while those at a high risk might be offered a new screening test with mammography or MRI every year. All of these strategies are still theoretical and should be studied with regard to their effectiveness."

The researchers caution that their findings so far are based on a

screening program in one country. The risk prediction technique now needs further work, such as a similar study in a different setting or a computer simulation, to understand the impact of personalized breast screening.

Dr. Laura Biganzoli is Co-Chair of the European Breast Cancer Conference and Director of the Breast Center at Santo Stefano Hospital, Prato, Italy, and was not involved in the research. She said, "We know that breast screening programs are beneficial, but we also know that some people will experience potential harms caused by [false positives](#) or overdiagnosis. A screening program that is tailored to each person's risk could reduce these harms and increase the benefits.

"This research shows how we might be able to identify people with a high risk of [breast cancer](#), but equally how we could identify those with a low risk. So it's an important step toward personalized [screening](#)."

**More information:** Abstract no: 22, "An individualized breast cancer risk assessment model for women attending screening in BreastScreen Norway," by J. Louro, Spain. Wednesday 16 November, Poster in the spotlight session, 13.50–14.00 hrs, Exhibition Hall.

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