

# **Google AI system can surpass human experts in spotting breast cancer, study finds**

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Three-dimensional culture of human breast cancer cells, with DNA stained blue and a protein in the cell surface membrane stained green. Image created in 2014 by Tom Misteli, Ph.D., and Karen Meaburn, Ph.D. at the NIH IRP.

Google's artificial intelligence system can identify breast cancer more accurately than radiologists, according to a study published in Nature on Wednesday.

The model, created in collaboration with cancer researchers and Google Health, was trained on X-ray images, known as digital mammography, from women in the U.K. and U.S. to spot signs of [breast](#) cancer in the scans. Researchers used [mammograms](#) from 76,000 women in the U.K. and more than 15,000 women in the U.S., according to Google Health.

Shravya Shetty, technical lead at Google Health who co-authored the study, said the results "exceeded expectations" and revealed possibilities that the AI could assist in workload reduction by being employed as a second reader with breast cancer screenings.

Researchers noted that the model received less information than human experts, only processing the most recent of an anonymized mammogram. With this, the model was able to surpass radiologists in spotting breast cancer and reducing [false positives](#) and negatives.

The system produced a 1.2% reduction of false positives in the U.K. and a 5.7% reduction in the U.S. It was able to reduce [false negatives](#) by 2.7% in the U.K. and 9.4% in the U.S.

Mammograms are the lead method for screening breast cancer but fail to be 100% accurate in showing if a woman has breast cancer. Screening mammograms do not find about 1 in 5 breast cancers, according to the American Cancer Society.

False-positive mammograms can cause anxiety for patients as results show abnormalities even though no cancer is present. While false-negative mammograms can cause a false sense of security with results looking normal even though breast cancer actually is present.

"There are some promising signs that the model could potentially increase the accuracy and efficiency of screening programs, as well as reduce wait times and stress for patients," said Google Health in a blog post.

This is the latest in AI research from Google to assist with issues in healthcare. Last year, the tech giant released a study reporting its developments in using AI to predict lung cancer in patients. Another study revealed how AI can improve eye care and make ophthalmologists more effective.

The tech giant made its first entry into the \$3.5-trillion healthcare market, with its planned acquisition of Fitbit, the wearable exercise, [heart rate](#), and sleep tracking device.

Daniel Tse, product manager at Google Health and research co-author, says next steps for the AI include working with even more groups around the world.

"We'd love to continue to work with our existing research partners, find new ones, as well as engaging in conversations with patients, providers and regulatory groups," said Tse. "We can begin to get a sense of telling them the story of how we got to this point, learn from their experience and build tools that will ultimately help each of these groups."

Breast cancer remains the second leading cause of [cancer](#) death in women in the U.S., with nearly 40,000 women dying each year, according to the CDC. About 1 in 8 [women](#) in the U.S. will develop [breast cancer](#) in their lifetime.

**More information:** Scott Mayer McKinney et al. International evaluation of an AI system for breast cancer screening, *Nature* (2020). [DOI: 10.1038/s41586-019-1799-6](https://doi.org/10.1038/s41586-019-1799-6)

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