

Article extract: “Mammograms don’t diagnose breast cancer, but have been promoted to the public with three promises that all seem to be wrong. The first is that they save lives, the second is that they save breasts, and the third is that they catch cancer early. Americans might not choose to be screened if they knew the whole story, but unfortunately, 90 percent aren’t getting that information.

Two main concerns of mammography are radiation exposure and overdiagnosis. The female breast is known to be highly susceptible to the cancer-causing effects of radiation. A mammogram is directing this radiation not only at the breast but also at the other organs inside the chest, such as the heart and lungs. Women who had received radiation treatment for breast cancer (high energy x-rays) had a significant increase in heart disease and lung cancer in the decades after their treatment.

Overdiagnosis was estimated at 52 percent and it’s now recognized as the most serious downside. Mammogram screening is most likely to find the slow-growing or dormant cancers that are least likely to harm us, and less likely to find the aggressive, fast-growing cancers that cause cancer mortality. Switzerland’s Medical Board recommends phasing them out entirely.”

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The Business of Breast Cancer: Mammogram Risks

An epidemic of low-value screenings is driving millions of women to get unnecessary tests, treatments

[Emma Suttie, D.Ac. AP](#)

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Getting older is a complicated business. As we age, trips to the doctor increasingly conclude with requisitions for different screenings—tests meant to help diagnose potential problems and keep us healthy for the long haul.

Although many tests used to detect cancer have been hailed as lifesaving miracles of modern medicine, some have a dark side. Concerns over the prolific use of mammograms for detecting breast cancer have been growing in the scientific community as journals publish research revealing that these tests come with their own risks. With roughly [70 percent of women](#) in the United States older than 40 having mammograms at least every two years, it raises questions about their safety, whether information about potential dangers is being obscured, and who might really be benefitting from this widespread testing.

What if millions of women are fueling a billion-dollar industry with ever-increasing profits by using screenings that not only haven't improved outcomes but may be harming the women it's supposed to save?

Cancer in Our Society

Cancer is pervasive and widely feared because of its relentlessness and brutality and also because of the grueling nature of many cancer treatments. The National Cancer Institute [spends billions](#) of dollars on cancer research each year and cancer fundraisers are a perennial activity in our communities. Virtually every cancer has a [month dedicated to its awareness](#). [October](#) is breast cancer awareness month, which it politely shares with liver cancer awareness in the United States.

As we get older, cancer is something we think about more, and our doctors push us to get tests and screenings to make sure cancer cells haven't been seeded in our bodies.

Breast Cancer

Breast cancer deeply frightens many women (and yes, [men can get it too](#)). If you happen to be considered high-risk, screenings may start when you're in your early 20s. In the United States, mammograms are considered to be the gold standard of testing for breast cancer, and there are now 2D and 3D varieties for women to choose from.

Mammograms use X-rays (a form of [ionizing radiation](#)) to take pictures of the breast. A machine is used in which a woman places her breast between two plates or paddles. It's then compressed, and x-ray images are captured.

Information from Industry

In a 2D mammogram, two images are taken, one from the top and one from the side, creating a 2D picture.

In 3D, or tomosynthesis, the process is largely the same, using slightly more radiation and capturing additional images, creating a three-dimensional picture of the breast.

Radiologists use the images to look for abnormalities, with breast cancer usually appearing as a white mass. If abnormalities are found, the patient is asked to come back for more tests, often an MRI, or to have a biopsy. [Mammograms don't diagnose breast cancer.](#) The only way to diagnose breast cancer after an abnormality is seen is to do a biopsy.

Mammography: What You Should Know

Mammography does have risks, which all women should be aware of. [The two main concerns of mammography are radiation exposure and overdiagnosis.](#)

Because mammography uses a type of [ionizing radiation](#), it comes with an inherent risk. We're all exposed to radiation every day. Some of that radiation, such as the ultraviolet and infrared rays of the sun, is essential to our health (in appropriate doses). But we're well adapted to these natural, low levels of radiation. The same isn't true of man-made radiation.

The ionizing radiation used in mammograms is much stronger than that emitted by natural sources. At high levels, ionizing radiation can harm our tissues and organs and lead to cancer.

According to the American Cancer Society, the [dose of radiation](#) a person receives from a mammogram is about the same amount of radiation people get from their natural surroundings in a three-month period.

This is of concern because there are parts of the body that are particularly sensitive to radiation, and we should limit our exposure whenever possible. In fact, Cornell University's Program on [Breast Cancer and Environmental Risk Factors](#) states that "the female breast is known to be highly susceptible to the cancer-causing effects of radiation when exposure occurs before menopause." A mammogram is directing this radiation not only at the breast but also at the other organs inside the chest, such as the heart and lungs.

A cohort [study published](#) in the British Journal of Cancer in 2012 followed more than 500,000 women from 1973 until 2009. The study found that women who had received radiation treatment for breast cancer (high energy x-rays) had a significant increase in heart disease and lung cancer in the decades after their treatment.

The study clearly demonstrates a progressive increase in both risk and mortality from radiation-related heart disease and lung cancer with time (into the third decade) after exposure to radiation.

The study is one of many to raise questions about routine mammograms for women at low risk of breast cancer.

Overdiagnosis

The other issue with mammography is overdiagnosis. Overdiagnosis is a concern because mammograms can detect abnormalities that may not be cancer or that are cancers that would have regressed on their own but are treated once they're discovered. That means that many women are exposed to chemotherapy, radiation therapy, and surgery that may not have been needed.

An article published in Public Health Research and Practice titled "[What Is Overdiagnosis and Why Should We Take It Seriously?](#)" offers a very good explanation of what overdiagnosis is and why it's a problem, defining overdiagnosis this way:

"In cancer screening, overdiagnosed cancers are those that did not need to be found because they would not have produced symptoms or led to premature death.

"Overdiagnosis in cancer screening arises largely from the paradoxical problem that screening is most likely to find the slow-growing or dormant cancers that are least likely to harm us, and less likely to find the aggressive, fast-growing cancers that cause cancer mortality (inserted by Tirza: , which are more easily observed by advanced thermography). This central paradox has become clearer over recent decades. The more overdiagnosis is produced by a screening program, the less

likely the program is to serve its ultimate goal of reducing illness and premature death from cancer.”

An [article](#) published in The Lancet in 2013 argued that two 30- to 35-year-old randomized studies underestimated when they concluded that there was a 19 percent rate of overdiagnosis when screening with mammography.

The article’s author, Per-Henrik Zahl, a researcher with the Norwegian Institute of Public Health who has studied breast cancer overdiagnosis, argued that detection rates and the level of overdiagnosis have increased 100 percent or more as the sensitivity of mammograms has improved.

Zahl noted that when screening was introduced in [Sweden](#) and [Norway](#), there was a 50 percent increase in invasive breast cancer. The total increase in diagnoses in Norway was 75 percent. He concluded that almost all of the increase in cancer detection through screening was due to lesions that normally go into [spontaneous regression](#).

A [comparative study](#) published in the journal BMC Women’s Health in 2009 set out to quantify overdiagnosis in the Danish mammography screening program. Denmark is unique because only 20 percent of the population has been offered mammography over an extended period. Incidence rates of carcinoma in situ (stage 0 breast cancer) and invasive breast cancer were collected in areas with and without screening over 13 years, and 20 years before its introduction. The study found that in the screened women, the overdiagnosis rate was 33 percent.

A [systematic review](#) published in the British Medical Journal in 2009 tracked the incidence of breast cancer before and after the introduction of mammography screening in specific areas—the UK; Manitoba, Canada; New South Wales, Australia; Sweden; and parts of Norway—both seven years before and seven years after public breast cancer screening programs were implemented. The review found that **overdiagnosis was estimated at 52 percent** and concluded that one in three breast cancers detected in a population that was offered screenings were overdiagnosed.

As [evidence](#) of overdiagnosis has accumulated, **it’s now recognized as the most serious downside of population-wide breast screening**.

What Women Think

One of the main concerns with mammograms is that women may not be warned about the potential risks of and all the factors involved in breast cancer screenings. A [cross-sectional survey](#) of 479 women in the United States aged 18 to 97 published in the British Journal of Medicine set out to understand women’s attitudes to and knowledge of false-positive mammography results, as well as the detection of ductal carcinoma in situ (a type of stage 0 breast cancer) after screening mammography.

[Ductal carcinoma in situ](#) (DCIS) is defined as the presence of abnormal cells inside the milk duct in the breast. DCIS, which is considered an early form of breast cancer, is noninvasive, meaning that it’s still isolated, hasn’t spread out of the milk duct, and has a low risk of becoming invasive.

The [survey](#) concluded that women were aware of false positives, seeming to view them as an acceptable consequence of screening mammography. In contrast, most women were unaware that

screening can detect cancers that may never progress (ductal carcinoma in situ) and felt that that information was relevant.

The study also found that only 8 percent of women thought mammography could harm a woman without breast cancer and 94 percent didn't realize (doubted) that mammograms could detect cancers that might not progress. Few of the women in the study knew about DCIS, but 60 percent of the women wanted to take into account the possibility that any cancer detected may not progress.

Another [study](#) published in the Journal of the American Medical Association in 2013 looked at overdiagnosis and overtreatment of breast cancer and what physicians were telling patients about the risks of screening, specifically the possibility of overdiagnosis and overtreatment.

Less than 10 percent said they were told about the risks of mammograms by their physicians. Little more than half (51 percent) said they wouldn't agree to a screening if it resulted in one overtreated person per one life saved. These numbers imply that millions of **Americans might not choose to be screened if they knew the whole story, but unfortunately, 90 percent aren't getting that information.**

The Cancer Industry Recommendations

In the United States, mammograms are the standard screening used to detect breast cancer, and doctors usually begin speaking to their women patients about mammograms at about age 40.

Both [the American College of Radiology](#) and [The American Congress of Obstetricians and Gynecologists](#) recommend women begin annual mammograms at age 40. The [American Cancer Society](#) recommends that annual screenings begin at 45 (then once every other year after 55), and [the U.S. Preventative Services Task Force](#) recommends women begin mammograms every other year at age 50.

[Mammograms are approved by the Food and Drug Administration \(FDA\)](#), which regulates the standards for mammography machines and the people who provide them. The FDA has also released several [warnings](#) about using thermography instead of mammograms, reminding the public that mammography is still the most effective primary breast cancer screening test.

Do Regular Mammograms Lead to Better Outcomes?

The question becomes, do regular mammograms lead to better outcomes? Well, it would depend on how you define better outcomes. If we're talking about detecting breast cancer, it seems the answer is most certainly yes. Mammograms seem to be an excellent tool for detecting breast cancer. But if we define better outcomes as fewer women dying of breast cancer, then we seem to have entered a different territory.

An [article](#), "Mammograms and Mortality: How Has the Evidence Evolved?" published in 2021 noted that a previous meta-analysis of mammogram studies revealed that **mammograms have led to no significant reduction in all-cause mortality** (death from any cause) for women of any age group. The article, by Amanda Kowalski, a health economist and the Gail Wilensky professor of applied economics and public policy at the University of Michigan Department of Economics, also noted that some trials even show imprecise increases in all-cause mortality across all age groups or within an

age group. These findings were based on eight large randomized controlled trials that, combined, included more than 600,000 women.

A very large Canadian [randomized screening trial](#) published in the British Medical Journal followed nearly 90,000 women aged 40 to 59 over 25 years who were considered at average risk for breast cancer. One group of women received routine mammograms and the other didn't. The somewhat surprising results were that mortality rates in both groups were almost identical. The overall conclusion of the study was that annual mammography in women aged 40 to 59 doesn't reduce mortality from breast cancer any more than a physical examination. The study also noted that they found that the overdiagnosis rate among the mammography participants was 22 percent.

An [analysis](#) published in the Journal of the Royal Society of Medicine in 2015 concluded that [mammograms have been promoted to the public with three promises that all seem to be wrong. The first is that they save lives, the second is that they save breasts, and the third is that they catch cancer early.](#) The author, Peter C. Gotzsche, formerly with the Nordic Cochrane Center and co-founder of the influential Cochrane Collaboration, said [mammogram screenings don't help women live longer](#), that [they increase mastectomies](#), and that [many cancers are still caught at a very late stage](#).

It's a sentiment other researchers have also expressed.

"The time has come to reassess whether universal mammographic screening should be recommended for any age group because the declines in breast cancer mortality can be ascribed mainly to improved treatments and breast cancer awareness; currently, we see that screening has only a minor effect on mortality (if any)," [researchers from the Nordic Cochrane Centre wrote in the journal Radiology in 2011](#).

In 2013, the Swiss Medical Board—an independent health technology assessment initiative—was asked to prepare a [review](#) of mammography screening. After a panel reviewed the available evidence—and contemplated its implications in detail—they were extremely concerned. The [Swiss Medical Board's report](#) was released on Feb. 2, 2014, and acknowledged that systematic mammography screening might prevent about one death from breast cancer for every one thousand women screened, even though there was no evidence that overall mortality was affected.

It also emphasized the harm caused by mammography, specifically false-positive test results and the risk of overdiagnosis. The report cites the following statistics from a [study](#) published in the Journal of the American Medical Association:

"For every breast-cancer death prevented in U.S. women over a 10-year course of annual screening beginning at 50 years of age, 490 to 670 women are likely to have a false positive mammogram with repeat examination; 70 to 100, an unnecessary biopsy; and 3 to 14, an overdiagnosed breast cancer that would never have become clinically apparent."

Based on their findings, the board [recommended that no new systematic mammography screening programs be introduced in Switzerland](#) and that a time limit be placed on existing programs in the country, [phasing them out entirely](#).

[\(On The New England Journal of Medicine's website, you can listen to an interview the](#) journal conducted with Dr. Mette Kalager on the Swiss Board's recommendation and learn more about why they recommended phasing out routine mammography screening.)

The [Nordic Cochrane Centre](#), which is thought to be one of the world's best and least-biased research institutions, conducted a systematic review to assess the effect of screening for breast cancer with mammography on mortality and morbidity. The trials they looked at included 600,000 women aged 39 to 74. The conclusions, published in 2013, are as follows:

“If we assume that screening reduces breast cancer mortality by 15 percent and that overdiagnosis and overtreatment is at 30 percent, it means that for every 2,000 women invited for screening throughout 10 years, one will avoid dying of breast cancer and 10 healthy women, who would not have been diagnosed if there had not been screening, will be treated unnecessarily. Furthermore, more than 200 women will experience important psychological distress including anxiety and uncertainty for years because of false positive findings.”

The study's authors, Gotzsche and Karsten Juhl Jorgensen, said women should be fully informed of both the benefits and harms. They went so far as to write [an evidence-based leaflet](#) in several languages to help women understand the risks.

The Mammography Industry-Projected Earnings

What might perhaps be interesting to know is that mammography is a multibillion-dollar industry. In September 2022, Vantage Market Research released a [report](#) that projected that earnings for the mammography market would be up to \$3.2 billion by 2028 from \$1.8 billion in 2021.

Growing markets in Asia are expected to provide most of that expansion. The report attributes the huge growth in the region to the existence of a significant number of mammography companies, the high adoption rate due to government measures that stimulate the industry, and increasing collaborations between the mammography industry and governments in the region.

Final Thoughts

Success when it comes to breast cancer really depends on the outcome we're trying to achieve. If it's early detection, then we seem to be doing a stellar job. But if our goal is lowering mortality rates, we seem to be in a gray zone and possibly moving backward. With the present technology—and its increasing sensitivity—we seem to have created many more cancer patients, perhaps unnecessarily, and are keeping women in the dark about the dangers.

Michael Baum, a professor emeritus of surgery and a visiting professor of medical humanities at University College London, is a British surgical oncologist specializing in breast cancer treatment and one of the architects of the UK's national breast screening program.

Baum went from being one of the most determined supporters of breast cancer screening to one of its most vocal opponents.

In his book “The History and Mystery of Breast Cancer,” he explained why: “The largest threat posed by American medicine is that more and more of us are being drawn into the system not because of an epidemic of disease, but because of an epidemic of diagnoses. The real problem with the epidemic of diagnoses is that it leads to an epidemic of treatments. Not all treatments have important benefits, but almost all can have harms.”

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