



## Breast cancer screening: Where have we been and where are we going? A personal perspective based on history, data and experience



### ARTICLE INFO

#### Keywords:

Breast cancer  
Screening  
Mammography

### ABSTRACT

It is important to understand the history of breast cancer screening to better understand the continuing effort to reduce access to screening. Since the randomized, controlled trials have shown a statistically significant mortality reduction for women ages 40–74, the appropriate threshold for initiating screening is age 40 with no data to support the use of the age of 50 as a threshold for screening. All women are at risk for developing breast cancer and all women should have access to screening.

“Those who cannot remember the past are condemned to repeat it”.

[1]

### 1. Introduction

Most physicians do not have the time nor the interest to understand the details surrounding the efficacy of breast cancer screening. This has allowed a handful of individuals to create scientifically invalid arguments in an effort to reduce access to screening. The death rate from breast cancer was unchanged for 50 years prior to 1990 [2]. Mammography screening began in the mid 1980s [3] and deaths began to fall in 1990 [4]. The death rate has continued to decline. Each year there are now almost 40% fewer women dying from breast cancer [5]. Thus, screening mammography should have, long ago, become a standard annual event for women ages 40 and over. Instead misinformation (“alternative facts” and “post truths”) has been promulgated and refuted [6] over decades resulting in a pseudo debate and tenuous access for women [7,8]. Revisionism has replaced historical facts. The purpose of this piece is to shed light on the past so that it is not repeated.

### 2. Where have we been?

Industrial film and techniques standardized by Egan [9] were used by Shapiro and Strax in the first screening mammography randomized controlled trial (RCT) (HIP, New York, 1963), proving that earlier detection leads to a significant reduction in breast cancer specific mortality [10] even despite poor (by current standards) images. Advanced by Wolfe [11] who, although greatly overestimating the risk, was the first to link breast tissue (parenchymal) patterns with breast cancer risk [12], film mammograms of the 1960s were replaced by Xeroradiography of the 1970s. The electrostatic image used in Xeroradiography is the foundation of many modern selenium based digital detectors. The Breast Cancer Detection Demonstration Project (BCDDP) in the 1970s proved that screening could be performed efficiently and effectively for large numbers of women [13].

Film/screen combinations dramatically lowered the radiation dose in response to a highly-publicized overestimate of radiation risk by Bailar in 1976 [14] claiming that screening would cause more cancers than would be cured. Stephen Feig's careful and clear analyses of radiation risk [15] reduced the concerns among radiologists, who continued to argue in support of screening. In fact, radiation risk to the breast decreases rapidly with age [16]. There is no demonstrable risk from mammograms for women age 40 and over. Even the extrapolated risk is well below the smallest benefit [17]. It is now clear that there is little if any risk for women ages 40 and over [18,19] and even efforts to reduce access to screening no longer emphasize radiation risk.

In the 1990s, the Canadian National Breast Screening Study (CNBSS) caused major concerns when there were many more deaths among the screened women ages 40–49 than those in the control group not invited to screening mammography [20], and they raised false concerns that mammography was leading to earlier deaths [21]. RCTs performed in the United Kingdom, and Sweden showing declines in death among screened women were by random invitation. In contrast, the CNBSS recruited volunteers, and violated the basic requirements of an RCT with data strongly suggesting that women were not randomly assigned [22]. Additionally, the mammography was demonstrably poor [23]. Thus, unlike the other RCTs [24], the CNBSS showed no benefit from screening for women at any age 40–59. Completely compromised, the CNBSS data should not be used to develop screening guidelines [25]. This is the same conclusion reached by an independent review in Europe [26]. Ignoring the excess deaths previously reported and their implications, a long-time opponent of screening mammography recently challenged critics of the CNBSS by falsely

stating “The rate of death in the two groups was exactly the same, every year, for 25 years [27]”. This is one of many examples of the use of “alternative facts” in the history of screening mammography.

In 1993, in further efforts to reduce access to screening mammography, it was claimed there was no benefit for screening women ages 40–49 [28], and based on the inappropriate use of retrospective subgroup analysis lacking statistical power [29] the U.S. National Cancer Institute dropped support for screening these women. In 1997 a subsequent meta-analysis of women ages 40–49 in the RCTs, with longer follow-up to provide sufficient power, demonstrated a 29%, statistically significant, reduction in deaths in the 5 Swedish trials by invitation, and an 18% decrease in breast cancer specific mortality in all 8 trials including the CNBSS [30]. The American College of Radiology (ACR) and Society of Breast Imaging (SBI), the American College of Physicians (ACP) [31], the US Preventive Services Task Force (USPSTF) [32], and the American Cancer Society (ACS) [33] all agree that the most lives are saved by annual screening starting at the age of 40. Why, then, are organizations other than the ACR/SBI recommending women delay the onset of screening and increase the interval between screening?

Tabar's landmark “Two County” RCT showed mammography alone could result in major reductions in breast cancer specific mortality [34], and both Moskowitz [35] and Tabar [36], showed that younger women needed to be screened more frequently. The 1989 US Consensus guidelines in fact supported screening women ages 40–49 [37], but some at the National Cancer Institute (NCI) did not support screening younger women. Thus, the NCI convened what was widely regarded as a biased workshop (due to unequal representation of both sides of the issue, among other things), and based on data from the compromised CNBSS and retrospective unplanned subgroup analysis noted earlier of the RCTs, claimed that there was no benefit from screening women ages 40–49 [38]. This led the NCI to drop support for screening younger women at the end of 1993. Even a Congressional Review documenting the corrupted NCI analysis [39] was to no avail until a new NCI Director, Richard Klausner, convened a Consensus Development Conference (CDC) in 1997 to review the 1993 decision. Similarly organized with a preponderance of known opponents of screening mammography, the CDC ignored clear proof of benefit for women ages 40–49 [40], falsely claiming a lack of evidence to support screening women in this age group [41]. However, a surprised Dr. Klausner had the National Cancer Advisory Board review the data and, once again, NCI supported screening starting at the age of 40 [42].

I believe that, in an effort to save money, European and other countries with government run health care systems have ignored the scientific evidence and delayed screening until the age of 50 and no more frequently than biennially. However, in the United States, women continued to be advised to participate in screening starting at the age of 40 until opponents of screening mammography at the American College of Physicians (ACP), despite agreeing that lives are saved by screening starting at the age of 40 [43], led the ACP to drop support for screening women ages 40–49 in 2007 [44], followed by the USPSTF (which is supported by the ACP) dropping support in 2009 and again in 2016 [45,46].

Thus, trying to delay the onset of screening mammography until after 40 is by no means new. In effect, this has been going on for over fifty years. Thinking that hormones affected screening (they do not), the age of 50 was chosen as a surrogate for menopause and the data were analyzed for women 40–49 and 50 and over. Ignoring that periodic screening is not expected to reduce deaths immediately, the preliminary data in the 1960s Health Insurance Plan of New York (HIP) trial showing an immediate decline in deaths for women ages 50–65 was falsely claimed to suggest greater efficacy than for women ages 40–49, where deaths did not decline for 5–7 years (actually what should have been expected) [47]. This spawned the false idea that the age of 50 is a biologically supported threshold for screening. This was reinforced by the erroneous claim that there was a sudden change in cancer detection that occurred at age 50 [48], when this was simply the result of data manipulation making a steadily increasing cancer detection rate appear to change suddenly at the age of 50. In fact, there are no ungrouped data that show any abrupt change at any age [49] and absolutely no data that support the use of age 50 as a threshold for screening [50,51]. The RCTs have shown that lives are saved by screening starting at the age of 40 [52,53] which is the only scientifically based threshold. This has been reinforced by numerous observational studies that show that women who participate in screening from age 40 on up have superior survival to those who do not [54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69]. Furthermore, in a major review in the Harvard hospitals, more than 70% of the women who died from breast cancer were among the 20% of women who had not participated in screening [70]. All these women had access to the latest therapies. Therapy has improved, but therapy saves lives when breast cancers are treated early.

“Alternative facts,” although new in politics, have been deployed for decades in an effort to reduce access to screening and “post truths” have been promulgated in some of the most prestigious medical journals due to poor peer review [71]. Unfortunately, these are passed on to the public by the lay media when the scientific papers are too complex for them to sort out. A recent example is the false claim of massive overdiagnosis, with known opponents of screening mammography claiming overdiagnosis of nearly a third of all newly diagnosed breast cancers in the *New England Journal of Medicine* [40] based on faulty methods. This has subsequently been repeated as fact, despite numerous reviews showing the errors in the analysis [72,73,74]. Consequently, women have been advised that if they delay screening until age 50 and then participate every two years this will reduce the “harm” of overdiagnosis. Since screening mammography detected cancers do not spontaneously regress or disappear [75], delaying screening or increasing the intervals between screens will not minimize overdiagnosis. Thus, delaying screening because of the “harm” of overdiagnosis is just another myth endangering women.

The only “harm” that is reduced by delaying screening is a reduction in the number of women recalled for additional evaluation. Pejoratively called “false positives,” this verbiage suggests that women are being told that they have breast cancer when they do not - another “post truth” since the vast majority of women recalled from screening will have a few extra pictures or an ultrasound and will be told that everything is fine. The real “harm” is that inexpert panels of individuals in major national health care organizations who do not provide care for women with breast cancer have imposed their own values and preferences to create deadly guidelines. A recent analysis of the consequences of the various guidelines shows that tens of thousands of lives will be lost by delaying screening that could be saved by annual screening starting at the age of 40 [76]. Several organizations issuing limiting screening mammography recommendations claim to have weighed “harms” and benefits, yet they have never provided the scale to explain how many fewer recalls balance allowing one avoidable death. Along the same lines, such organizations have declared the importance of women making informed decisions, yet they do not inform women that the major “harm” of delaying screening is tens of thousands of unnecessary deaths. The NCI/CISNET models, used by the various health care organizations, show that if women now in their thirties followed the USPSTF guidelines, as many as 100,000 lives would be lost that could be saved by annual screening starting at the age of 40 [77].

### 3. Where are we today?

Despite the fact that screening has resulted in a major decline in breast cancer deaths, the fight to preserve access to mammography screening continues to counter the misinformation that has made its way past poor peer review [78]. Scientific evidence still supports annual screening starting at the age of 40, the longstanding recommendation of the ACR/SBI [79]. FFDM has replaced film/screen systems, and Digital Breast Tomosynthesis

Download English Version:

<https://daneshyari.com/en/article/8821523>

Download Persian Version:

<https://daneshyari.com/article/8821523>

[Daneshyari.com](https://daneshyari.com)