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Citation	Kopans, Daniel B. 2012. "Do not jump too quickly to conclusions." <i>Breast Cancer Research</i> : BCR 14 (4): 108. doi:10.1186/bcr3213. http://dx.doi.org/10.1186/bcr3213 .
Published Version	doi:10.1186/bcr3213
Accessed	February 19, 2015 1:56:47 PM EST
Citable Link	http://nrs.harvard.edu/urn-3:HUL.InstRepos:11708684
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EDITORIAL

Do not jump too quickly to conclusions

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See related research by Nederend *et al.*, <http://breast-cancer-research.com/content/14/1/R10>

Abstract

A great deal of misinformation has been promulgated about mammography screening. For example, there is no biological or scientific support for the use of the age of 50 years as a threshold for screening. Mammography screening can reduce deaths from breast cancer even if the rate of advanced cancers is not decreased. The suggestion that screening results in massive amounts of overdiagnosis is based upon faulty methodology. The results reported in the recent study by Nederend and colleagues may be due to the screening interval and thresholds used for intervention. What is clear, however, is that they do not show that screening is ineffective.

The extreme response to the paper by Nederend and colleagues [1] is that screening for breast cancer is ineffective. This is, of course, not true. Arguments that would deny women access to screening services that have advanced for more than a decade [2,3] have been repeatedly refuted [4-7]. Indeed, more than 40 experts in breast health care have severely criticized these methods as 'scientifically unsound' [8].

The claim that if screening does not reduce the rate of advanced cancers, it is ineffective [9,10] is simply false. Mammography screening saves lives by finding cancers earlier within stages [11]. The fact that Nederend and colleagues did not find a decrease in the rate of advanced cancers in their southern Netherlands screening program does not mean that there will not be a decrease in deaths.

Since a decrease in advanced cancers has been shown to have occurred in randomized, controlled trials [12] and other screening programs [13], including in women aged 40 to 49 years [14], this paper raises questions about

the screening program employed, not about screening *per se*. The reasons for this are multifactorial.

First, they may have overlooked an actual decrease. The rate of advanced cancers reached almost 180 out of 100,000 before screening, and dropped over the screening period to 160 out of 100,000 for most of the years after screening began. In addition, the background rate of advanced cancers increased by almost 50% over the period among women who were not offered screening. Thus, the baseline for comparison was actually increasing, yielding screened women a relative decrease in advanced cancers.

Second, as an economic measure, many European screening programs screen only every 2 or more years. Periodic screening is not expected to have much effect on the fastest growing cancers (length bias). Interrupting moderate and even slower growing cancers save lives. The Swedish Two-County trial shows that mortality reduction begins about 5 to 7 years after the start of screening with decreased deaths occurring over more than 20 years [15].

Third, in this Netherlands' study a large number of the advanced cancers were detectable 2 years earlier. With annual screening, many of these - as well as some that were not evident 2 years earlier - might have been detected a year earlier at a smaller size and earlier stage.

Fourth, these results could also be due to the high threshold for intervention used by the radiologists. Many of the cancers were evident on the falsely negative screen 2 years earlier. With a lower threshold, these might have been diagnosed 2 years earlier and have been less advanced. In the US, where lower thresholds for intervention and higher recall rates have been criticized, there was a clear association between the onset of screening in the mid-1980s and the decline in breast cancer deaths that began in 1990 (for the first time in 50 years) [16], fulfilling the criterion by Autier and colleagues [17].

Fifth, the suggestion by some that 30 to 50% of cancers found by screening would 'melt away' had they not been found by mammography is, in my view, based upon faulty methodologies [18]. Accurate estimates of 'overdiagnosis' can only come from randomized, controlled trials and these suggest overdiagnosis rates that are less than 10%, and likely lower than 1% [19]. If overdiagnosis is as

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common as opponents would have us believe, why is there not one published series documenting breast cancers that have 'melted away' in the absence of therapy?

Sixth, when cancers are found earlier the mastectomy rate is lower, not higher [20], even among women aged 40 to 49 years [21]. Importantly, the authors failed to adjust for lead time, new prevalence cancers being added each year, or the increasing baseline incidence of breast cancer. The authors should also have looked at the mastectomy rates as a function of time period, since therapy has changed over time. Many lesions that used to be treated by mastectomy in the past are no longer treated in this manner.

Despite its suggested failure to reduce advanced cancers, the Netherlands screening program will, likely, still show a decrease in deaths. Medical oncology groups have not joined with recent efforts to reduce the use of mammography screening for one principal reason: because they know that therapies only save lives when breast cancers are found earlier.

Competing interests

The author declares that they have no competing interests.

Published: 23 July 2012

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doi:10.1186/bcr3213

Cite this article as: Kopans DB: Do not jump too quickly to conclusions. *Breast Cancer Research* 2012, **14**:108.