Reviewer's report

Title: Comparative benefit from small tumour size and adjuvant chemotherapy: clues for explaining breast cancer mortality decline

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Reviewer: Silvia Ess

Reviewer's report:

The aim of the analysis is to disentangle the role of improved therapies and of early detection on the decline of breast cancer mortality seen in many countries especially in Europe and the USA in the last 20 years. The authors found that the benefit from detecting smaller tumour size at diagnosis is limited to the early post-surgery time in a special population of women, those with nodal positive disease. Given the ongoing discussion on harms and benefits of mammography screening, this paper adds to our knowledge on the dynamics of recurrence of breast cancer, even if this findings cannot be translated to the population of women with nodal negative disease. This is from my point of view the most important limitation of the study and should be more emphasized in the discussion, as mammography screening aims to detect BC before it has spread beyond the breast.

The article is well written and the data analysis is appropriate

Discretionary Revisions

It would be interesting to show the cumulative incidence function curves derived from the Fine and Gray model and to know which software the authors used for the analysis.

Minor Essential Revisions

According to the formula in the legends 1 and 2 all curves should show negative values. The formula given in the legends are in two cases inverted. This has to be corrected. The figures would be easier to understand if all values of absolute risk reduction would be positive.

In the introduction section (page 3 line 66 and line 69) the authors shift from decrease in BC mortality to improvements in survival as central point to disentangle in the present analysis. Because of potential of lead time bias in any screening procedure, survival improvement is not an argument to favour mammography screening. The authors should stick to the argument of reduction of BC mortality.

In the original study, Bonadonna et al (NEJM; 1995) reported statistic significant differences (p<0.001) for relapse free survival in the CMF group. However the 95% CI for the different groups reported in table 1 and to a less extent in table 2
almost overlap. What is the reason for the discordant results?

Major Compulsory Revisions
none

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests