Reviewer's report

Title: Breast cancer screening: evidence of benefit depends on the method used

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Reviewer: Lennarth Nyström

Reviewer's report:

Autier and Boniol question the use of case-control studies (CCS) and incidence-based mortality (IBM) studies in evaluation of the effectiveness of the service-screening programs with mammography and advocates the incidence of advanced breast cancer mortality (BCM).

CCS
The authors refer to panel 1 and 2 in the table but there they have panel A and B. It is also impossible to understand how the authors arrived at "a 44% reduction in BCM".

The authors state that "life expectancy of women participating to screening is longer than that of non-participating women, with the consequences that participating women have a greater chance to be selected as a control, what will bias the risk of death in favour of screening". This statement is incorrect with respect to the ways controls are selected in the CCS.

IBM
"In Sweden ....had no comparison areas where no screening existed during the entire period. That is correct for studies evaluating the effectiveness of inviting women 50-69y, but not for the studies evaluating the effectiveness of inviting women 40-49 and 70-74 as half of the counties invites women in these age groups and 50% does not invite women. For the 50-69y age group historical comparison cohorts were applied. Further, treatment in Sweden the treatment is planned at one of the 6 university hospitals and almost all women receive their radiotherapy there and most also receive their chemotherapy there.

Regarding Hellquist the authors have to clarify that the estimate 0.94 was for the reference period. Furhter where does the estimate 1.7-3 times greater come from (Reference)

Incidence of advanced BCM
The authors do not define advance BC (Stage II+???), but women diagnosed with a BC <stage II+ also die from BC???

Studies using the incidence of advanced BCM must be incidence-based and need a historical and or geographical comparison are similar to the IBM, and must thus suffer from the same weakness as the IBM studies or????

To summarise this paper criticise the CCS and IBM studies based on statements
not supported by a theory or data and advocates the advanced BC incidence
BCM which by design must be similar to the IBM. This does not make sense

**Quality of written English**: Acceptable

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

**Declaration of competing interests**:

I declare I have no competing interests