Reply Letter to EPI-12-0033

Mammography Screening and Risk of Breast Cancer Death: A Population-Based Case–Control Study – Response

Authors

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We thank Drs. Autier and Boniol for their comment raised on the outcome of our case-control study on the impact of mammography screening on the risk of death from breast cancer, but we feel that the methodological limitations inherent to the case-control design are small.

Aarts et al. (1) indeed showed that the participation rate among women of high socioeconomic status (SES) is somewhat higher compared to those of low SES (87% vs. 79%), in the Netherlands mostly coinciding with women of non-western ethnic descent. The attendance rate is lower in this group of women (2), where breast cancer incidence is also considerably lower (3) as well as the risk of death from breast cancer compared to the native Dutch population (4).

Aarts et al. further report that low SES women are diagnosed with prognostically less favourable breast cancers. However, these differences in tumour stage and overall survival were observed among nonparticipants as well as participants, either screen-detected or symptomatically diagnosed interval breast cancer (1). Therefore, it is incorrect to deduce that participants and nonparticipants present with genuine differences in risk factors associated with dying from breast cancer or from other causes. Risk differences associated with SES groups would reflect only very partially in risk differences between participants and nonparticipants. Case-control studies that could adjust for SES showed no effect of this correction on the estimated odds ratios (5).

Autier and Boniol question the validity of the factor used for correction of self-selection bias, which is calculated as the relative risk (RR) of death from breast cancer among nonparticipants compared to uninvited women. We used individual data on breast cancer mortality in non-participants from the study period 1990-2003 and, due to privacy regulations,
aggregated data on uninvited women from the pre-screening period (1986-1989). Our RR of 1.11 was remarkably similar to the RR of 1.08 from another Dutch study (6) that used data on contemporaneous groups of non-participants and uninvited women in the implementation period for screening (1990-1995) from the same region. If breast cancer mortality after 1990 has been decreasing among nonparticipants (numerator of the RR) due to better treatment, than this would also apply for not invited women (denominator of the RR). The RR would then approach unity and resulting in a higher effect of screening on the risk of breast cancer mortality, adjusted for self-selection. There is no evidence of differential treatment. As screening is fully implemented in the Netherlands, estimation of a correction factor for more recent years is hampered, but given the stable attendance rate in the Netherlands, there is little reason to believe that this will change considerably. Thus, in organized breast cancer screening programs self-selection appears to be relatively minor.

In our case-control study, we minimized the biases inherent to an observational study design (e.g. identification and selection of cases and controls, equal access to screening during the exposure period, definition of exposure, source population). We demonstrated that breast cancer screening resulted in a 49% reduced risk of dying of breast cancer for women invited and attended mammography screening. Observational study designs are crucial for the evaluation of the effect of mammography screening in the actual female population.

References
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