

Impact of Screening on Breast Cancer Mortality—Letter

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The difficulties of evaluating the efficacy of screening are not yet fully appreciated. The case-control study recently published by Massat and colleagues (1) on the efficacy of the UK mammographic screening program suggests that the program has been very effective: attendance at breast cancer screening would have resulted in a breast cancer mortality reduction of 36%, and attendance in the last 3 years prior to diagnosis in a mortality reduction of 61%, with 95% confidence interval 50%–70%. The latter estimate is hardly credible. In fact, the estimate is wrong, and the error is due to the so-called healthy screenee bias, first described by Morrison in 1985 (2): breast cancer patients cannot have been screened as frequently as controls in a short period before diagnosis, when the sensitivity of mammography is high,

otherwise their cancer would have been detected before. Control women have no such limitation. As a consequence, screening density is necessarily greater in the control women than in the cases even in the absence of any efficacy. The same bias may also have affected the estimated 36% reduction in mortality when cases and controls were simply classified as ever or never exposed to screening. An unbiased estimate could theoretically be obtained excluding the examinations performed in the preclinical period in which breast cancer is detectable by mammography, for example, about 3 years before diagnosis, and in the corresponding period for controls, that is, comparing cases and controls in terms of propensity to accept to be screened. Using the frequencies of attendance to the first invitation shown in Table 1 (cases 62.8%, controls 70.5%) as an indicator of propensity to accept to be screened, the crude OR would be 0.71, a still impressive 29% mortality reduction.

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doi: 10.1158/1055-9965.EPI-16-0014

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Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

Received January 13, 2016; accepted February 3, 2016; published online May 2, 2016.

References

1. Massat NJ, Dibden A, Parmar D, Cuzick J, Sasieni PD, Duffy SW. Impact of screening on breast cancer mortality: the UK program 20 years on. *Cancer Epidemiol Biomarkers Prev* 2016;25:455–62.
2. Morrison A. *Screening in chronic diseases*. Oxford, UK: Oxford University Press; 1985.