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WHEN EXPERTS in health-care are asked to give an opinion on so-called controversial themes, differences of ideas are restricted to personal appreciation of uncertainties and of imponderable pros and cons, or to personal predictions of future technical developments and/or social changes in the society. In fact, the messages of both the contributions of de Koning and Coebergh above are not too divergent.

Yet we have to give careful attention to the nuances in both views, to the subtle differences in their feelings, when decisions on the start or guidance of screening actions come up for discussion. Population-based screening programmes are very expensive and such complicated undertakings need great organisational skill and have complicated ethical aspects.

The decision making involved to start screening programmes or to continue financial support is often disturbed by improper political pressure. The medical world should have a standpoint based upon an unbiased interpretation of data and an ethical, sound view of the uncertainties. Thus, both the facts and hypotheses are important.

Coebergh challenges the benefits of screening considering other needs in health-care, which should have higher priority; he also suggests methods or mechanisms other than screening which might improve survival in breast cancer, such as better primary treatment or educational activities to increase the alertness of women on early self-detection. De Koning states that screening is cost-effective, but only if the population to be screened is carefully chosen (specific age categories—in countries with high incidence of breast cancer) and if the quality of the screening process is high. Coebergh questions the theoretical benefits of screening: with early diagnosis survival will be better, but he argues that the gains claimed by the screening programmes might not be that substantial, with a strong negative effect on the cost–benefit analysis.

Assessment of the components constituting cost and benefit is complicated. The benefit should be a decrease in breast cancer mortality. This has been demonstrated in several 'randomised' trials as indicated by de Koning. We should keep in mind that methodologically optimal randomisation techniques, such as those used in testing a new pharmaceutical compound, are not possible to prove the benefit of screening. These imperfections influence the magnitude of the effect of screening, yet differences in favour of screening are seen in all these studies.

The gain in the very 'civilised' countries will be less substantial than postulated because of increasing alertness of women and better structured surveillance in risk groups. This is mentioned by de Koning, but is emphasised (used as main argument) by Coebergh. One should not forget, however, that the increased alertness leading to earlier detection outside screening programmes might also be seen as an (indirect) effect of screening programmes with their intensive publicity, and this secondary effect might fade away again when screening stops!

Better breast cancer treatment for the whole population might be seen as an indirect positive effect of screening with its quality assurance programmes. This might result in a survival benefit to an extent that surpasses that of the screening itself. To quantify all the benefit and to state what is caused by what in these inter-related systems is impossible and this leads to individual interpretations.

The costs are even more difficult to measure. The psychological harm caused by more years of 'knowledge' in the detected breast cancer cases, by overtreatment of borderline cases and by the anxiety produced by a 'false alarm' or after detection of false negative cases ('missed' or mammographically occult lesions) is fairly imponderable and difficult to quantify. These points are stressed by Coebergh and were also recently carefully described by Baum in his eloquent comment on his change of view on breast cancer screening in the U.K. [1].

It is clear that these items are difficult to weigh in the cost–benefit analysis and are certainly seen with a magnifying glass by those who are opponents of breast cancer screening, but these aspects should never be neglected. Personal feelings determine the weight to be given to such factors in the balance of pros and cons.

The pure economic costs are more easily visualised, but even this is complicated. The 'cost' per gained life-year is influenced by many details in the set-up of screening programmes; very sophisticated models have been designed to quantify all this, as is described by de Koning. The chosen interval between the screening rounds, the age limits of the

invited population, the quality assurance measures and the expected compliance of the invited women all have an impact on the practical cost of a gained life-year. De Koning showed that the costs in breast cancer screening in The Netherlands are lower than in some other specialised health-care programmes. This may, however, be more a reflection of prosperity in The Netherlands, with the possibility of spending large amounts of money for highly advanced health-care, than a general argument that breast cancer screening is cost-effective. It might also be that the structure of the health-care in some countries is much better suited to implementation of screening than in others. The model developed by the Rotterdam group includes adaptation to these points when predictions for other countries are requested.

Both authors are clear in their statements that high quality is a *conditio sine qua non* for good screening results. Quality control activities are expensive, but should never be stopped. With poor quality of the mammograms or inadequate treatment of detected cases, the beneficial effect will rapidly disappear. Limiting the available budget or pressure to increase the 'productivity' of the workers in the screen programme threatens the delicate balance in cost-effectiveness.

Only in countries with a high incidence of breast cancer should screening be considered. De Koning has shown with the Rotterdam model that in countries such as Spain, with its relatively low incidence of breast cancer, screening is much more expensive if compared with the more Nordic European countries.

There is agreement in both articles that screening is most cost-effective for the age group 50–70 years and with an interval of not more than 2 years. It is worth noting the suggestion by Coebergh that, if screening is considered, the younger age groups should not be excluded; in the younger age categories, the individual gain consists of more important life-years. The real costs, however, increase steeply when screening the younger age groups with the lower incidence, possibly with a need for shorter interval between screening grounds, and a risk for missing abnormalities on the mammograms. Yet, at the recent Falun meeting, data were presented showing that screening should also be seriously considered for the age group 40 to 50 years. The interval of 2 years between the rounds is considered to provide optimal results. The observed and further expected reduction in breast cancer mortality in the U.K. where an interval of 3 years is used is probably caused more by secondary effects of the screening than by the early detection. The result in the U.K. would probably improve further if the 2 year interval principle was accepted.

From the two excellent papers written by experts in the field of breast cancer screening arise arguments in favour and against such programmes. Quality is the key word for successful breast cancer screening. The organisation is extremely difficult. Implementation of screening should only be considered for countries with a high incidence of breast cancer and only when the programme is extremely well organised. Then the cost–benefit analysis will probably be in favour of screening

1. Baum M. The breast screening controversy. *Eur J Cancer* 1996, **32A**, 9–11.