Table 1  Observed number of TB cases in cohorts of children aged 0–11 years and 12–24 years and estimated rate per 100,000 in areas A and B

<table>
<thead>
<tr>
<th>Age group 0–11 years</th>
<th>Area A</th>
<th>Area B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases observed</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>PYAR</td>
<td>137 373.6</td>
<td>1 611 402.2</td>
</tr>
<tr>
<td>Estimated rate/100 000 (95% CL)</td>
<td>5 (2–11)</td>
<td>2 (1–6)</td>
</tr>
<tr>
<td>RR (95% CL)</td>
<td>2.73 (0.71–10.58)</td>
<td>[0.68 (0.20–2.25)]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age group 12–24 years</th>
<th>Area A</th>
<th>Area B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases observed</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>PYAR</td>
<td>80 106.2</td>
<td>108 766.2</td>
</tr>
<tr>
<td>Estimated rate/100 000 (95% CL)</td>
<td>5 (2–13)</td>
<td>7 (4–15)</td>
</tr>
<tr>
<td>RR (95% CL)</td>
<td>0.68 (0.20–2.25)</td>
<td>[0.68 (0.20–2.25)]</td>
</tr>
</tbody>
</table>

95 per cent CLs 0.20–2.25). Although the lower 95 per cent CL suggests that the risk may be as much as 80 per cent lower this does not differ significantly from unity \(p = 0.52\).

In the children under 12 years old the risk appears higher in area A (RR = 2.73), although not significantly so. The fact that compared with the non-BCG operating area (B) the incidence is higher in the pre-BCG group (i.e. under 12 years) and lower in the post-BCG group in the BCG operating area (A) may be interpreted as the effect of school BCG immunization, and the way the pre- and post-12 rates differ is significant at 5 per cent level \(p < 0.03\). However, studies in populations of this size cannot be taken as conclusive when the rates being compared are so small. It would appear that more extensive national results are needed before the health authorities can make an evidence-based decision about the future of the programme.

References


Accepted on 9 June 1998

Yours faithfully,

A. K. Mukerjee
Consultant Communicable Disease Control
Bro Taf Health Authority, Cathays Park, Cardiff CF1 3NW

N. Soltanpoor
Statistician
Bro Taf Health Authority, Cathays Park, Cardiff CF1 3NW

Tony Swan
Chief Statistician
CDSC, Colindale

Does breast cancer screening depend on a wobbly hypothesis?

Sirs,

Although Watmough et al.\(^1\) make some valid points about breast screening, we find many of their arguments unhelpful. They state that the high rate of interval cancers in the North Western Regional Health Authority (NWRHA) is ascribed to lower than expected sensitivity of the test.\(^2\) However, they do not distinguish between low test sensitivity, which results in true false negatives, and true interval cancers, which only start to form in the interval between screens and could therefore not be detected previously with any conventional test, however sensitive. It was the main conclusion of the paper from the NWRHA that the screening interval was too long.

The Forrest Committee\(^3\) did not emphasize ‘that a precondition for successful screening required a clear understanding of the natural history of the disease’, but rather considered ‘the extent to which breast cancer meets these [Wilson and Jungner] criteria’. Although knowing the natural history is helpful, it is probably the least important of the Wilson and Jungner criteria, provided that the benefits of the test are otherwise demonstrated.

The graphical analyses presented within this paper are interesting and seem to give weight to the arguments discussed. However, basic statistical analysis of Fig. 1(a) displaying cancer detection rates for various studies shows that the 1963 study may be an outlying result, and exclusion of this result would demonstrate that study year and detection rate have little association. This highlights the problems of performing least-squares linear regression on such a small number of studies. In addition, because of the wide confidence intervals for the quoted individual studies, a contrary interpretation of the data presented would be equally possible. The authors point out that the studies are heterogeneous, but they make no attempt to adjust for this in plotting the data from the different studies on the graph.

\(^1\) Watmough et al.
\(^2\) Wilson and Jungner
\(^3\) Forrest Committee
Having criticized the effectiveness of breast screening by mammography, it then seems inconsistent to advocate the use of palpation to detect asymptomatic cancers without producing evidence for palpation as an effective intervention for reducing mortality from breast cancer.

Although the benefits of mammography in decreasing breast cancer mortality have been demonstrated by a number of RCTs, it is true that the effects of the NHS Breast Screening Programme on mortality are not yet certain. These data must be interpreted carefully and the programme reviewed in the light of them. The authors are correct to question the benefits of breast screening. However, we doubt that the arguments used take the debate any further forward.

**References**


Yours faithfully,

J. Clowes
Senior Registrar in Public Health Medicine

J. Varlow
Health Statistician
Calderdale and Kirklees Health Authority,
St Luke’s House, Blackmoorfoot Road,
Huddersfield, West Yorkshire HD4 5RH

**Reply**

Sirs,

Clowes and Varlow fail to recognize our central point that, in the period of over 30 years since 1960, screening mammography has improved out of all recognition and detects more than twice as many cancers now than it did then. The RCT data do not show a corresponding improvement (or indeed any improvement) in mortality from breast cancer, which would be expected on the hypothesis that early detection necessarily leads to longer survival times. Present-day mammography also detects many more smaller invasive and non-invasive cancers, which, if the hypothesis were correct, one would have expected to improve disproportionately the outcome of screening. The suggestion, by our critics, to exclude the data deriving from the (1960) HIP Breast Cancer Screening Trial, which achieved a 30 per cent reduction in mortality from breast cancer with the aid of improvised mammography equipment has no rationale. We could see no way to adjust the data from RCTs for the fact that clinical examination was used in some studies but not in others.

The authors challenged us over our remarks about the natural history of a disease, in this case breast cancer, being a precondition for starting a screening programme. The report entitled *Breast cancer screening 1991; evidence and experience since the Forrest report* states on p. 23: ‘Two essential prerequisites for screening are that the natural history of the disease should be understood and that it should have a recognisable early stage. Paragraphs 2.3 and 2.4 in the Forrest Report’s chapter on principles of screening and their application to breast cancer discussed these two points.’ The same report goes on to say: ‘However, although the natural history of breast cancer is not fully understood, it is not considered that an acceptable option for management is “watchful waiting” but that some intervention is justified and the trial will study the effects of local excision plus or minus radiotherapy and tamoxifen.’

Clowes and Varlow do not dispute that there is a problem with a diagnosis of DCIS and the dilemma of how to treat these cases or the concern that some lesions might never have progressed to become clinically apparent if left alone. These difficulties, which are a foreseeable possibility for every woman invited into the programme, mean that informed consent should be sought at the outset. Given this information, some women might choose not to participate in screening and thus avoid finding themselves in such a difficult situation. According to Foucar, even expert pathologists have difficulty recognizing the threshold separating carcinoma-*in situ* from atypia.

Baum has pointed out many other down-side risks, such as difficulties of raising mortgage finance and of taking out life and health insurance, after a diagnosis of a lesion which, without screening, might not have appeared until years later, if at all. Another negative aspect is the anxiety generated in the majority of women who are not destined to suffer from the disease. Invitations to screening and constant media references to breast cancer must constantly reinforce these concerns.

Another worry about screening, stemming from a belief in the hypothesis, is that as smaller and smaller lesions are suspected from the X-ray films, stereotactic mammography and needle biopsy become essential to achieve a firm diagnosis. One radiologist has reported making 60 passes with a 14-gauge needle through the site of a suspected cancer. Dissemination of cancer cells as a result of this procedure would be unsurprising and might explain local recurrences after lumpectomy for minimal cancers.

The reason that we advocate clinical examination in addition to mammography is that without it some cancers which are large but radiologically occult will be missed, as will other tumours that are recorded on film but misreported by the