Cost-effectiveness of cardiovascular screening and intervention programmes

Wonderling D, McDermott C, Buxton M, Kinmonth A-L, Pyke S, Thompson S, Wood D. (Health Economics Research Group, Brunel University, Uxbridge, Middlesex; Primary Medical Care, Faculty of Medicine, University of Southampton; Medical Statistics Unit, London School of Hygiene and Tropical Medicine, London; Department of Clinical Epidemiology, National Heart and Lung Institute, London, United Kingdom.) Costs and cost effectiveness of cardiovascular screening and intervention: The British family heart study. BMJ 1996;312:1269–73.

SUMMARY
A reduction of 12% in coronary risk following a screening programme has been reported by the British Family Heart Study (BFHS).1 A similar reduction in risk has also been obtained in the OXcheck study.2 The BFHS measured the costs and cost-effectiveness of the programme from the health services perspective. The primary outcome measures of the study were the mean cost and the mean cost per 1% reduction in coronary risk.

The methodology of this study can be divided into two aspects: (i) screening programme, and (ii) costing methodology.

Screening programme. In 13 towns in Britain, one general practice was randomly allocated to the intervention and another served as the external control group. Within each intervention practice, all men aged 40–59 years along with their families were randomized to the intervention group and an internal comparison group. Families in the intervention group were invited for screening and lifestyle advice. A complete risk assessment was performed and the results conveyed to the man and his partner. The subjects were followed up for one year with the frequency of visits proportional to the risk score. Those in the top-tenths were invited for follow up every two months, whereas those in the bottom two-tenths were followed up at one year. Both the intervention group and the comparison group were assessed for coronary risk score at the end of one year.

Costing methodology. The fixed costs included the cost of equipment, overheads, initial and refresher training of nurses, quality assurance of equipment and administrative costs. The cost of initial screening and follow up included nurses time, consumables and laboratory tests. The cost of final screening was not included as it would serve as the screening for the second year in a regular screening programme.

The estimates of equipment required, initial training costs, time spent by nurses (45 minutes for initial screening and 30 minutes for follow up) and others were based on their experiences during the study. All the costs were for the year 1994–95 and a discount rate of 6% was used to get annual equivalent costs for items with a life of more than one year, such as equipment.

A non-attendance of 6.1% for initial appointments and 20.3% for follow up was also based on their experience. The time involved in the research component of the screening programme was excluded from the calculations. Information was also collected from all the subjects regarding the drugs they received from the general practitioners and the number of health visits in the study year. The sum of the costs of the screening programme, the incremental costs of drugs and extra health service visits would give the incremental cost of the programme in a real-life setting.

The average cost per individual screened was £63.14. This comprised fixed costs (£25.84) and the cost of initial screening and follow up (£37.30). Nurses time made up 66% of this cost, consumables 17%, and equipment 10%. If the research component costs were included the cost increased to £100.59 per person. Assuming that the equipment and space is already available (and, therefore, excluding their costs), the estimate decreases to £53.78. If the cost of the final screening is included the cost increases to £81.10. Subjects in the intervention group had been prescribed five more drugs per 100 subjects and this cost was estimated at £7 per person. On an average, the intervention group received fewer non-intervention health checks by general practitioners and nurses but more visits by others. The overall cost of the intervention was £51.63 per person initially screened. Assuming a 12% reduction in the coronary risk by the intervention, the annual cost of 1% reduction in coronary risk was £5.26 per person.
COMMENT

‘Prevention is better than cure’ is an oft-repeated statement. Its veracity has never been proved in practice as economic analyses of preventive programmes have seldom been carried out. This paper tries to assess the cost-effectiveness of a screening programme for coronary artery disease (CAD).

Also published in the same issue of the journal is the estimate of cost-effectiveness of the CAD screening programme in the Oxcheck study, again conducted in the United Kingdom.\(^3\) In fact, both the study groups, after mutual discussion, followed a somewhat similar approach in costing so that the estimates could be compared. The Oxcheck study reported the cost-effectiveness to be £1.46–£2.25 per participant.\(^3\) The cost was less than the BFHS as the follow up was less intensive. The cost-effectiveness improves if the duration of effectiveness of risk reduction is longer. The actual duration of protection was not studied adequately by both the studies, though the Oxcheck study indicated that it would be at least three years. Unless this information is available, the actual cost-effectiveness cannot be correctly estimated.

The cost-effectiveness of any screening programme is largely dependent upon the prevalence of the disease in question and the effectiveness of the intervention and its duration. The authors have not mentioned the baseline prevalence of CAD. However, an estimate of 5.5%–6.5% among males and 1%–2% among females was obtained from the original study.\(^1\) In India, the prevalence of CAD in the age group 40–59 years has been reported to be 6.5% among urban males, 4.8% among urban females, 0.5% among rural females and 0.7% among rural males.\(^4,5\) The nurses time accounted for two-thirds of the cost. As the salaries of nurses in India are much lower than those in western countries, the cost-effectiveness is also likely to be different.

The CAD screening programme in India will have to compete with other intervention programmes that are present for different cancers and infectious diseases. For this comparison, it would be necessary to have a common denominator like life-year gained, or Disability Adjusted Life Years (DALYs), or in monetary terms. In a commentary, written jointly by the authors of the BFHS and Oxcheck study, this was estimated at £34,800 per life-year gained for the BFHS and £29,300 for the Oxcheck study if the duration of risk reduction was assumed for one year.\(^6\) However, in the absence of information of duration of effectiveness of intervention, one cannot compare estimates.

Though this paper raises a very important issue, it answers it only partially. The paper also highlights the difficulties inherent in economic analysis. For example, despite abundant literature on CAD control, some key issues like duration of effectiveness of different interventions was not available. Similarly, difficulty in apportioning the cost to different heads is often encountered. However, in spite of limited and/or no information, carrying out an economic analysis facilitates the process of explicitness and systematic approach required for comparison of costs and outcome measures.

REFERENCES


K. ANAND
C. S. PANDAV
Centre for Community Medicine
All India Institute of Medical Sciences
New Delhi