

# Health checks conducted by nurses in primary care cost between £1.46 and £2.25 per patient per 1% reduction in coronary risk

Langham S, Thorogood M, Normand C, et al. **Costs and cost effectiveness of health checks conducted by nurses in primary care: the Oxcheck study.** *BMJ.* 1996 May 18;312:1265-8.

## Objective

To determine the costs and cost-effectiveness of health checks done by nurses in primary care (a cardiovascular risk factor screening and intervention programme).

## Design

Cost-effectiveness analysis of data taken from a randomised controlled trial with 3-year follow-up (Oxcheck Study).

## Setting

5 general practices in Luton and Dunstable, England.

## Patients

4121 patients aged 35 to 64 years who responded to a lifestyle questionnaire.

## Intervention

2205 patients were allocated to a health check in the first year of the

## Commentary

Recent results from the Oxcheck Study and the British Family Heart Study have shown that nurses who do health checks in a primary care setting can produce small but statistically significant reductions in coronary risk factors. These changes may be insufficient to justify widespread adoption of the intervention (1), but interventions that produce small results may be highly cost-effective if the costs of implementation are low. Data on the costs associated with the initial intervention trials are reported in the studies by Langham and Wonderling and their colleagues and cast further light on this issue.

The methods of the 2 studies differ. Langham and colleagues used a top-down approach, in which overall programme costs were calculated and then applied as averages to all patients. This approach gives accurate estimates of total costs, but does not reveal the variance around the average costs per patient that stem from actual differences in

study (1989 to 1990) (intervention group). 1916 patients were allocated to an initial health check in the fourth year of the study (1992 to 1993) (control group). Health checks took a mean time of 45 minutes and were done by nurses using a defined protocol, with health education and follow-up according to degree of risk for cardiovascular disease.

## Main cost and outcome measures

Outcomes (overall reduction in coronary risk, overall cost of the health check programme, and cost per 1% reduction in the relative risk [RR] for cardiovascular disease per patient, derived from the Dundee risk score) were measured after 3 years of follow-up. Cost data were extracted retrospectively from financial records or were estimated from subsamples.

## Main results

The health check programme reduced the RR for cardiovascular disease by 20% for attenders of the final examination only and by 13% if non-attenders were also included. The mean cost per patient attending for screening, with an average amount of

resources used, such as consultation times. The authors note that because costs were derived from actual expenditure records, there was in effect no uncertainty. Hence, it was not necessary to do extensive sensitivity analyses on the results. The choice in practice, however, is between sensitivity analysis and statistical handling of uncertainty and variance. Because the investigators report point estimates of cost per patient without any measures of statistical variance, they run the risk of falling between 2 stools.

By contrast, the cost data in the study by Wonderling and colleagues used a bottom-up approach based on prospectively collected resource and clinical data to which unit costs were then attached. As a result, it was possible to place CIs around the costs. For example, the estimated programme cost was £57.82 per woman, with a 95% CI of £54.69 to £60.95. However, when they added to the programme costs other health care costs associated with the intervention that were

follow-up, to the general practices of the health check programme was £29.27. The nurses' time made up 64% of the cost. The estimated cost of the health check programme to the practices per 1% reduction in the RR for cardiovascular disease per patient was £1.46, when calculated based on attenders only, and £2.25, when calculated for all patients scheduled to attend for re-examination. The mean cost per 1% reduction in coronary risk was lower for women (£1.22 for attenders, £1.72 for all patients scheduled) than for men (£1.63 for attenders, £4.18 for all patients scheduled).

## Conclusion

The estimated cost of the health check programme to the participating general practices was between £1.46 and £2.25 per 1% reduction in coronary risk per patient.

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averted or incurred, this figure changed to £12.85, indicating a substantial reduction in other costs, but with a 95% CI that ranged from -£45.04 to +£73.75. Therefore, the indication is that the study was not large enough to yield precise estimates of net costs. It would have been of interest to see some power calculations for the numbers required to show statistically significant differences. If the 2 studies had been more similar in design details, perhaps some data pooling could have overcome these problems.

In contrast with the quite detailed data on wider health service resources collected by Wonderling and colleagues, the baseline analysis and results of the study by Langham and colleagues do not include any health care costs that were incurred or averted by identifying or modifying cardiovascular risk factors. This could be misleading because information from a subsample showed that drug prescribing

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