Cost-effectiveness of a cardiovascular disease primary prevention programme in a primary health care setting. Results of the Polish part of the EUROACTION project


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study evaluated the cost-effectiveness of a nurse-led, comprehensive, programme for healthy people to prevent cardiovascular disease. The authors concluded that the programme appeared to be highly cost-effective for high-risk Polish male patients, and cost-effective for women, with some uncertainty. There were a few limitations in the reporting of the study. The authors acknowledged some limitations and uncertainty, but it is unclear if their conclusions adequately accounted for the uncertainty in the results.

Type of economic evaluation
Cost-utility analysis

Study objective
This study aimed to evaluate the cost-effectiveness of a nurse-led, comprehensive, programme for healthy people to prevent cardiovascular disease.

Interventions
The nurse-led, primary prevention programme, part of the EUROACTION project (2003 to 2006), was compared with usual care. The project promoted the control of risk factors, lifestyle changes and therapeutic goals.

Location/setting
Poland/secondary care.

Methods
Analytical approach:
A Markov model was developed to model the ongoing risks of cardiovascular events, given patient risk factors, which were from one clinical study. The time horizon was 10 years, after one year of intervention. The authors stated that the study perspective was that of the health insurer.

Effectiveness data:
The main clinical data were the changes in cardiovascular disease risk factors after one year. These came from a cluster randomised controlled trial of the primary prevention programme in Poland, compared with usual care. The likelihood of cardiovascular events, for each risk factor, was determined using the Framingham risk function. It was assumed that change in risk factors after the year of intervention persisted over the next 10 years. Age- and gender-dependent incidences of primary events, and transition probabilities for secondary events, were from British registries. Other transition probabilities were from published literature.

Monetary benefit and utility valuations:
Utilities were applied to the states of stable angina in the first year; acute myocardial infarction; stable angina in subsequent years; and myocardial infarction in subsequent years. The utility weights for the first year were from published studies. They were adjusted for the decline in utility by age, and the increase in utility in patients with coronary heart disease, over time. These adjustments were based on data from published studies.

Measure of benefit:
The measure of benefit was quality-adjusted life-years gained. Health benefits were discounted at a rate of 3.5% per
year.

Cost data:
The costs of the intervention, usual care, resource use after one year without a cardiovascular event, and cardiovascular events were analysed. The programme costs included set-up, such as nurse training; delivery; final assessment; and pharmacotherapy. Usual care was one doctor's consultation and one set of blood tests per year, with no change over the year. The unit costs were from Polish National sources. All costs were reported in Polish zlotych (PLN); the price year was 2010; and they were discounted at a rate of 5% per year.

Analysis of uncertainty:
One-way sensitivity analyses were conducted to evaluate the impact on the results, of changes in several parameter estimates.

Results
For non-smoking men, the prevention programme, compared with usual care, had an incremental cost of PLN 255,164, and incremental QALYs of 13.07. The incremental cost-effectiveness ratio (ICER) was PLN 19,524 per QALY gained.

For non-smoking women, the incremental cost was PLN 319,289 and the incremental QALYs were 3.88. The ICER was PLN 82,262 per QALY gained.

For men who smoked, the ICER was PLN 12,377 per QALY gained, and for women who smoked it was PLN 53,471 per QALY gained.

The sensitivity analyses showed that the model was most sensitive to changes in the health state utilities and the duration of intervention effectiveness. Reducing the duration of intervention effectiveness to five years, in women, resulted in an ICER of twice the World Health Organization's recommended threshold of three times the gross domestic product (GDP) per capita (PLN 99,543 per QALY gained).

Authors' conclusions
The authors concluded that a nurse-led primary prevention programme for cardiovascular disease appeared to be highly cost-effective for high-risk Polish male patients and cost-effective for women, with some uncertainty.

CRD commentary
Interventions:
The interventions were not described in detail. Usual practice was included as a comparator, which is useful for local decision makers.

Effectiveness/benefits:
The clinical trial was not described in detail; a publication was referenced. It was not clear how well the trial was conducted. A well-reviewed equation was used to calculate the risk of cardiovascular events for each patient risk factor, established at the end of the trial. The health outcomes appear to have been appropriately evaluated, except for the first year of the intervention, which was unclear. Some baseline utility values were from UK studies rather than Polish studies. Few details about the utilities were reported. The initial patient characteristics were not reported. As acknowledged by the authors, the usual care group was very small.

Costs:
It was not stated if the resource use for the nurse-led intervention was prospectively collected, but it appears to have been. There was no indication that the resource use for usual care was collected prospectively, and various assumptions were stated. The detail on the intervention resources and unit costs was useful, and the cost adjustments were well reported.

Analysis and results:
The model was adequately described, except for the first year of intervention. The health outcomes during the first year were unclear. It was not clear if the time horizon was 10 or 11 years, as the intervention lasted for one year before the Markov model was run. It was unclear if the intervention costs were considered for this year, but not the health utilities.
The authors acknowledged some uncertainty in the duration of the intervention effects, and conducted appropriate sensitivity analyses. They acknowledged that there may have been health effects and costs for conditions other than coronary heart disease, that were not included. Given the small sample, considerable uncertainty was likely. A probabilistic sensitivity analysis could have given a better representation of the uncertainty in the study conclusions.

Concluding remarks:
There were a few limitations in the reporting of the study. The authors acknowledged some limitations and uncertainty, but it is unclear if their conclusions adequately accounted for the uncertainty in the results.

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