Cost-effectiveness of a health intervention program with risk reductions for getting demented: results of a Markov model in a Swedish/Finnish setting

Zhang Y, Kivipelto M, Solomon A, Wimo A

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 assessed the cost-effectiveness of a preventative multi-domain preventive intervention programme in lowering the risk of dementia. The authors concluded that the intervention was less costly and had better dementia-related outcomes compared with usual care; it provided a promising outlook for future research on dementia preventative interventions. The quality of the study methodology was adequate. Although the study had a number of limitations, the authors’ conclusions reflected these and were appropriate given the study's scope.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of a preventative intervention programme to lower the risk of dementia.

Interventions
The intervention was a multi-domain cardiovascular disease progression used to lower the risk of dementia measured using the CAIDE (Cardiovascular Risk Factors, Aging and Incidence of Dementia) score. The intervention consisted of two main components, drug treatments for hypertension, hyperlipidaemia and diabetes, plus population health promotion measures such as visits to dieticians and grocery marking. The intervention was compared with usual care.

Location/setting
Sweden, Finland/primary care.

Methods
Analytical approach:
A Markov model, adapted to a Swedish population, was used to evaluate the cost and outcomes of the interventions; it combined data from databases and published studies. The time horizon was 20 years. The authors stated that a societal perspective was adopted.

Effectiveness data:
The effectiveness data were derived from several different sources including population-based cohort studies, and mortality registries. The main source of risk scores categories and risk probabilities was derived from the CAIDE population-based study undertaken in Finland (Kivipelto, et al. 2006, see ‘Other Publications of Related Interest’ below for bibliographic details).

Monetary benefit and utility valuations:
Utility estimates for dementia were derived from a Swedish cross-sectional observational study. Utility estimates for no dementia were derived from a population-based study undertaken in Stockholm, Sweden. Both studies evaluated quality of life using the European Quality of life questionnaire (EQ-5D).

Measure of benefit:
Quality-adjusted life-years (QALYs) gained, with future benefits, were discounted using an annual rate of 3%.
Cost data:
The direct costs included in the analysis were those for dementia care, care for elderly adults without dementia and the intervention. The costs of the intervention were drug treatments, screening (labour and laboratory) and population measures (such as dieticians, grocery marking, local authorities and study circles). The costs of informal care were also included. Formal and informal care costs, for adults with and without dementia, were derived from a report by the Swedish National Board of Health and Welfare. The costs of the intervention were derived from a community-based cardiovascular disease prevention programme in a Swedish county. As costs could be incurred over a 20-year period, future costs were discounted using an annual rate of 3%. The price year was 2005. All costs were reported in Swedish kronas (SEK).

Analysis of uncertainty:
A series of one-way sensitivity analyses were conducted to evaluate the robustness of the model to changes in single variables. A probabilistic sensitivity analysis was undertaken using Monte Carlo simulation; the results were displayed in an incremental cost-effectiveness scatter plot.

Results
The cost of the intervention per patient was SEK 599,026. The cost of usual care was SEK 621,000 per patient.

The QALYs gained per patient were 11.8950 in the intervention group and 11.8438 in the usual care group.

Costs and benefits were not combined as the intervention was found to be dominant over usual care (it was both more effective and less costly).

Results of the probabilistic sensitivity analysis showed that, at a willingness to pay of SEK 600,000 per QALY gained, the probability that the intervention was cost-effective was 67%.

Authors' conclusions
The authors concluded that multi-domain preventive intervention was less costly and had better dementia-related outcomes compared with usual care; it provided a promising outlook for future research on preventative interventions in dementia.

CRD commentary
Interventions:
The interventions were adequately reported, although more details of the components of the health intervention to reduce the risk of dementia could have been provided.

Effectiveness/benefits:
The effectiveness data were derived from a number of different sources. The main effectiveness measure (the risk of dementia at each CAIDE risk score) was derived from a population-based cohort study. The quality of the effectiveness data source could only be assessed by referring the original (referenced) paper. As a result, although the population-based cohort study was conducted in Finland, it was likely that the results were generalisable to the wider population. The measure of benefit appeared to be appropriate and adequate details of its derivation were provided.

Costs:
A societal perspective was adopted. Although all most categories of cost relevant to this perspective (formal and informal care costs) were included, it was not possible to determine if all relevant costs were included because the authors reported all care costs as an aggregate. The sources from which costs were derived from were adequately reported. The price year, time horizon, discount rate used and currency details were reported.

Analysis and results:
Cost and outcome information were synthesised appropriately using a decision analytic Markov model. Adequate details of the model structure were reported, including a diagram. The results were adequately described. Appropriate sensitivity analyses, including a probabilistic sensitivity analysis, were undertaken to assess the impact of uncertainty on the model results. The authors acknowledged that the results from their study should be viewed as a source for discussion about potential effects given the assumptions and limitations of their study.
Concluding remarks:
The quality of the study methods was adequate. Although the study had a number of limitations, the authors’ conclusions reflected these and were appropriate given the study's scope.

Funding
Unrestricted financial support from Swedish Brain Power (SBP).

Bibliographic details

PubMedID
21709377

DOI
10.3233/JAD-2011-110065

Original Paper URL
http://iospress.metapress.com/content/y4x8346j9x21v725/

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Aging /psychology; Cost-Benefit Analysis; Data Interpretation, Statistical; Dementia /economics /mortality /prevention & control; Early Medical Intervention /economics; Finland /epidemiology; Health Care Costs; Humans; Markov Chains; Models, Statistical; Monte Carlo Method; Quality-Adjusted Life Years; Risk Assessment; Risk Reduction Behavior; Sweden /epidemiology

AccessionNumber
22011001931

Date bibliographic record published
03/02/2012

Date abstract record published
30/04/2012