A national hypertension treatment program in Germany and its estimated impact on costs, life expectancy, and cost-effectiveness

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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 hypertension treatment programme in Germany, for hypertensive patients without cardiovascular disease. The authors concluded that the cost-effectiveness of lifetime antihypertensive treatment compared favourably with other accepted interventions. The study methods were satisfactory except that it was not clear whether or not the authors compared the intervention with current practice.

Type of economic evaluation
Cost-utility analysis

Study objective
This study assessed the cost-effectiveness of a national hypertension treatment programme for hypertensive patients who did not have cardiovascular disease and who were insured under German statutory health insurance (SHI).

Interventions
The intervention consisted of a national programme of patient education and financial incentives to physicians for providing appropriate care. The care was thiazide diuretics as first line therapy, and, in the case of non-compliance with this therapy, other monotherapies or combination of medications as second line therapy. The 'no programme' option was used as comparator.

Location/setting
Germany/primary care.

Methods
Analytical approach:
The authors constructed a Markov model to compare the cost-effectiveness of the national hypertension treatment programme with no programme by combining data from different sources. Hypothetical patients entered the model in three age groups (40 to 49, 50 to 59, and 60 to 69 years) and were followed until the age of 100 years resulting in three time horizons for the analysis of 55, 45 and 35 years. The authors stated that the perspective was that of German SHI or the third party payer.

Effectiveness data:
The effectiveness data were obtained from a literature review. The criteria applied for the selection of the estimates, the process used to identify the data, and the sources searched were clearly reported. The main clinical parameters were compliance with medication treatment, relative risk of stroke, myocardial infarction (MI) and death under medication.

Monetary benefit and utility valuations:
The utility weights were derived using the time trade-off technique and were obtained from published literature.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs).

Cost data:
The cost categories included the costs of medication, doctor visits, the annual costs of MI, stroke and renal failure, and
programme implementation costs including development and evaluation, patients’ education, quality assurance, and physicians’ financial incentives for documentation. All costs were reported in Euros (EUR) for the price year 2004 and were discounted at an annual rate of 3%.

Analysis of uncertainty:
One-way sensitivity analyses were conducted on all model parameters and on the discount rate. The parameter uncertainty was further investigated through probabilistic sensitivity analysis using Monte Carlo simulations. All the parameters in the model were assigned prior probability distributions which were fully reported.

Results
The incremental cost-effectiveness ratio (ICER) of those treated compared with those who were not treated ranged from EUR 757 per QALY gained for high-risk men aged 60 to 69 years to EUR 10,315 for low-risk men aged 40 to 49 years. In low-risk women, the ICER ranged from EUR 9,130 for women aged 40 to 49 years to EUR 11,746 for women aged 60 to 69 years. For high-risk women, the treatment programme was the dominant strategy (resulted in cost savings and was more effective).

A budget impact assessment estimated that the programme implementation cost, at a 20% patient participation, would be EUR 290 million, which would not be counterbalanced by the savings due to avoided adverse events from long-term hypertension.

The one-way sensitivity analysis demonstrated that the ICERs were most sensitive to variation in the discount rate and the relative risk of MI under treatment. The probabilistic analysis demonstrated that the programme always resulted in incremental benefits and the probability that it resulted in cost savings was 72% in high-risk women aged 60 to 69 years and 100% in those aged 40 to 59 years, but only around 30% in men of all age groups.

Authors’ conclusions
The authors concluded that the cost-effectiveness of lifetime antihypertensive treatment compared favourably with other accepted interventions.

CRD commentary
Interventions:
The description of the interventions was sparse. Dosages and drug details were not reported and no details were provided of the medication used as second-line therapy due to non-compliance. No current practice appeared to be included in the analysis. The comparator was no treatment, while, in current practice, some people do receive some treatment. The cost-effectiveness of introducing the programme was not assessed.

Effectiveness/benefits:
Most of the treatment effect parameters were obtained from published meta-analyses, which potentially have the greatest level of internal validity. The sources searched and the criteria applied for the selection of the estimates were fully reported. The uncertainty in the model parameters was investigated using one-way and probabilistic sensitivity analyses, and the results were adequately reported, which enhances the generalisability of the study findings. The measure of benefit was appropriate. Limited details were provided on the methods used to identify and derive the utility estimates.

Costs:
The costs appear to reflect the perspective stated. The annual costs of treatments and events were reported along with references. However, limited detail was provided on the approach used to identify costs, the assumptions used, and the relevance of the cost estimates to the setting. The discount rate and the price year were reported, but the method used to adjust prices was not. Some one-way sensitivity and probabilistic analyses were conducted around the cost parameters and the discount rate, but only the results of the probabilistic analysis were reported in full.

Analysis and results:
The model structure was presented graphically along with all relevant details and the modelling assumptions. The authors conducted an incremental analysis and the results were adequately reported. A sensitivity analysis was
conducted on model parameters, enhancing the generalisability of the study findings and the robustness of the authors’ results. The authors outlined a number of limitations to their study and the impact of these on their results.

**Concluding remarks:**
The methods were satisfactory except that it was not clear whether or not the authors compared the intervention with current practice.

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