A systematic review of Markov models evaluating multi-component disease management programs

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Objectives

For patients with chronic conditions disease management programs (DMPs) have been implemented to improve the process and quality of care and to reduce expenditures. The aim here is to present a systematic overview of Markov models evaluating the cost-effectiveness of DMPs; the focus is on the modeling approach for the multiple interventions. Further, the quality of the models and how the differences in structure and data used affect cost-effectiveness was evaluated.

Methods

The databases Pubmed, Embase, Business Source Complete, and Econlit were systematically searched for Markov models evaluating DMPs in chronic heart diseases (CHD), diabetes, COPD, asthma, and breast cancer. The quality of the models was evaluated with the help of two different quality appraisals.

Results

15 studies met the inclusion criteria. Most models extrapolate costs and effects of multiple intervention in DMPs; only four studies combine clinical trials for single interventions to a DMP. In CHD, the results range from cost savings and a gain of quality-adjusted life years (QALYs) to additional costs of US$3,373 per QALY, in asthma from cost savings to additional costs of US$3,635 per QALY, and in diabetes from cost savings to additional costs of US$85,087 per QALY. In the Philips-quality appraisal the overall scores vary from 39% to 62%, and in the ISPOR-quality-appraisal from 31% to 58%.

Conclusions

Without restrictions to the data selection process, Markov models are adequate to determine the cost-effectiveness of DMPs. However, to allow prioritization of medical services, more flexibility in the models is necessary to enable the evaluation of single additional interventions. According to the results, it is difficult to say in which indication area DMPs are most cost-effective. More recently published models perform slightly better in both quality appraisals. Results are most sensitive to changes in transition probabilities and time horizon.

Literature: