Cost-effectiveness of diabetes case management for low-income populations

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
The aim was to assess the cost-effectiveness of Project Dulce, a diabetes case management and self-management training programme, in four cohorts of low-income individuals defined by their insurance status. The Project Dulce diabetes case management programme improved clinical outcomes at a cost that might be acceptable to a third-party payer in the USA. Despite some limited reporting of clinical and economic sources, the study methodology was robust and the authors’ conclusions should be valid.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to assess the long-term cost-effectiveness of Project Dulce, a diabetes case management and self-management training programme, in four cohorts of low-income individuals defined by their insurance status.

Interventions
Project Dulce consisted of visits and contacts made by a bilingual or bicultural multidisciplinary team providing counselling aimed at achieving improvements in levels of glycosylated haemoglobin (A1c), blood pressure, and lipid parameters. Patients were also encouraged to participate in a group self-management training programme. The four insurance cohorts, from the San Diego County, were patients who were uninsured, those covered by County Medical Services (CMS), those who had Medi-Cal coverage (California’s Medicaid Program), and those who had commercial insurance. Project Dulce was compared with usual care for each cohort.

Location/setting
USA/primary care.

Methods
Analytical approach:
This economic evaluation was based on the Center for Outcomes Research (CORE) model, a published Markov model which simulated the complications of diabetes. The time horizon of the analysis was 40 years and the authors stated that the perspective of the third-party payer was adopted.

Effectiveness data:
The clinical data were mainly derived from a sample of 3,893 people with diabetes participating in Project Dulce; 760 were in the uninsured cohort, 1,345 were in the CMS cohort, 1,213 were in the Medi-Cal cohort, and 575 were in the commercial cohort. The patients were followed for a 3 to 18 month period, with data closest to the 12 month evaluation used as the post-intervention effectiveness assessment point. The control data were derived from a previous study details of which were not given. The short-term impact of the programme was assumed to be maintained over time. The long-term risk of diabetes complications was taken directly from the CORE model and the primary clinical outcome was the improvement in levels of A1c.

Monetary benefit and utility valuations:
The utility values were taken from the CORE model and the sources of utility valuations used in this model were not reported.

Measure of benefit:
Quality-adjusted life-years (QALYs) and life-years (LYs) were used as the summary benefit measure. An annual discount rate of 3% was applied.

Cost data:
The health services included in the analysis were the costs of nurse case management, visits to specialists, participation in group classes, administrative overheads (including visit scheduling, coordination of care with the primary care physician, management of referrals, and support of the database registry), pharmaceuticals and supplies, hospital and emergency room expenditures, and diabetes-specific costs of complications. The data on costs and resource consumption were derived from published studies and the experience of Project Dulce. All costs were in US dollars ($). Future costs were discounted at an annual rate of 3% and the price year was 2003.

Analysis of uncertainty:
A deterministic sensitivity analysis was undertaken by varying key clinical and economic inputs, the time horizon, and the discount rate. Cost-effectiveness acceptability curves were calculated using a non-parametric bootstrapping approach.

Results
In the uninsured cohort, Project Dulce led to an improvement of 1.1 LYs and 0.9 QALYs, and additional costs of $8,991, resulting in incremental costs of $7,933 per LY gained and $10,141 per QALY gained.

In the CMS cohort, Project Dulce led to an improvement of 0.6 LYs and 0.4 QALYs, and additional costs of $10,921, resulting in incremental costs of $18,976 per LY gained and $24,584 per QALY gained.

In the Medi-Cal cohort, Project Dulce led to an improvement of 0.3 LYs and 0.3 QALYs, and additional costs of $11,792, resulting in incremental costs of $36,056 per LY gained and $44,941 per QALY gained.

In the commercial cohort, Project Dulce led to an improvement of 0.2 LYs and 0.2 QALYs, and additional costs of $12,368, resulting in incremental costs of $57,587 per LY gained and $69,587 per QALY gained.

The cost-effectiveness acceptability curve showed that, at a willingness to pay of $50,000 per QALY gained, Project Dulce had a 100% probability of being cost-effective in the uninsured cohort, a 92% probability in the CMS cohort, a 57% probability in the Medi-Cal cohort, and a 31% probability in the commercial cohort.

The deterministic sensitivity analysis suggested that reducing the A1c treatment effect by 50% substantially reduced the cost-effectiveness of the intervention in all groups. Variations in other model inputs did not substantially alter the base-case findings, which always remained below a threshold of $100,000 per QALY.

Authors' conclusions
The authors concluded that the Project Dulce diabetes case management programme improved clinical outcomes at a cost that might be acceptable from the perspective of the third-party payer, especially among uninsured, low-income individuals.

CRD commentary
Interventions:
The selection of the interventions under examination was appropriate because the new case management programme was compared against usual care, in which no specific intervention was delivered. The main characteristics of Project Dulce were reported.

Effectiveness/benefits:
The key clinical data on the impact of the intervention under examination were derived from the implementation of the programme in different groups of individuals. This approach reflected the real-world experience with Project Dulce in a relatively large sample of patients. A potential limitation of the analysis was the indirect comparison with the control group. The control group characteristics and results were derived from a separate cohort of patients included in a previous study. The issue of ‘matching’ the intervention and control groups with respect to clinical and demographic
features might have affected the results of the analysis. The data on diabetes-related complications were based on the published CORE model. This represents a valid instrument with which to assess the effectiveness of diabetes-related interventions. The use of LYs and QALYs was appropriate to determine the impact of the treatment on patients’ health. Both benefit measures can be compared with the benefits of other health care programmes.

Costs:
The analysis of costs was consistent with the perspective. The costs were mainly derived from published sources. Macro-categories of costs were presented, but a detailed breakdown of cost items was not given. This might reduce the transparency of the economic analysis. The resource use for Project Dulce in the long-term was based in part on authors’ assumptions. The price year and the use of discounting were reported.

Analysis and results:
The synthesis of costs and benefits was appropriately performed and presented for all cohorts of patients. The sensitivity analysis clearly addressed the issue of uncertainty and key findings were reported both graphically and in tables. The authors noted that the use of observational data might limit the validity of the analysis and that participants were motivated people who may not have been representative of the more general population of diabetic patients. They also noted that the use of assumptions required for a long-term model, introduced further uncertainty in the analysis.

Concluding remarks:
The study was based on a sound methodology although some of the sources used were not described in detail. Nevertheless, the authors’ conclusions are likely to be robust as demonstrated by the sensitivity analysis.

Funding
Supported by a grant from Novo Nordisk Inc.

Bibliographic details

PubMedID
17850527

DOI
10.1111/j.1475-6773.2007.00701.x

Original Paper URL

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

**MeSH**
- Adult; Aged; California; Case Management /economics; Cohort Studies; Cost-Benefit Analysis /statistics & numerical data; Cultural Diversity; Diabetes Mellitus /economics; Female; Humans; Insurance, Health, Reimbursement /economics; Male; Middle Aged; Models, Theoretical; Poverty; Program Evaluation; Self Care /economics

**AccessionNumber**
22008100560

**Date bibliographic record published**
01/09/2008

**Date abstract record published**
02/03/2009