Cost-effectiveness of systematic depression treatment for high utilizers of general medical care


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.

Health technology
The health intervention examined in the study was a depression management programme (DMP), based on education and telephone care management, antidepressant pharmacotherapy (sertraline 50 mg/d as first-line therapy and nortriptyline 25 mg/d as second-line therapy), and psychiatric consultation if required.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients aged between 23 and 63 years of age, who were members in participating clinics and high-users of medical services, that is to say those whose number of outpatient medical visits exceeded the 85th percentile for each of the last two years (either 7 or 8 visits per year). Patients were excluded if they had received active depression treatment during the last 90 days, if the treatment offered was considered not to be appropriate, or if patients were reporting illicit drug use or harmful levels of alcohol use.

Setting
The setting of the study was a primary care clinic. The economic study was carried out at Dean Health Plan of Wisconsin in Dean, Harvard Pilgrim Health Care of Massachusetts (HPHC) in Boston, and Group of Health Cooperative of Washington (GHC) in Seattle, USA.

Dates to which data relate
The period of collection of data on effectiveness and resource use was not reported. The price year was presumably 1996.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not performed. Patients were selected from administrative databases from the three...
participating clinics. From 7,203 eligible members, those who met criteria for current major depression according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), as well as those reporting a recent major depression in partial remission were contacted and re-assessed using the 17-item Hamilton Depression Rating Scale (HDRS). Of the 1,295 patients completing the second-stage screening, 410 (32%) were included in the study and 407 subjects constituted the final sample: 218 patients (mean age (SD): 45.6 (8.6) years; 77% women) in the DMP group and 189 patients (mean age (SD): 45.4 (9.6) years; 78% women) in the usual care group.

Study design
This was a blind, randomised controlled trial carried out in three centres (Dean Health Plan of Wisconsin in Dean, HPHC in Boston, and GHC in Seattle). Computer-generated random numbers were used to allocate participating physicians to the study groups and sealed envelopes were used by interviewers to enrol patients into the trial. Patients underwent an evaluation visit immediately after enrolment and had follow-up visits at 1, 3, 6, and 10 weeks, while telephone contacts were scheduled at 2 and 10 weeks, with additional calls at 18, 30, and 42 weeks. Blinded telephone assessment was conducted at 6 weeks, and 3, 6, and 12 months after enrolment. The overall follow-up period was 12 months. Patients in the DMP received mailed written and videotaped educational materials before the initial visit, while no additional services were provided to patients and physicians in the usual care group. Due to loss to follow-up, the final study groups used in the analysis comprised 205 patients (DMP) and 169 patients (usual care). However, the authors noted that follow-up losses were not related to clinical or demographic characteristics.

Analysis of effectiveness
The analysis of the clinical study appears to have been based on treatment completers only. The primary health outcome was the number of depression-free days according to HDRS: clinical ratings for each interval between two blinded assessments were linearly interpolated and then summed to obtain the overall number of depression-free days in the 12-month period. The rates of antidepressant medications and prescriptions were also reported. Groups were shown to be generally comparable at baseline in terms of demographics, HDRS score, and total costs for the year preceding the study. Effectiveness was adjusted for age, sex study site, baseline depression severity and clustering of patients with physicians.

Effectiveness results
The number of depression-free days at 12 months was 229.3 days in the DMP group and 181.9 days in the usual care group. The difference was 47.4 days (95% CI: 26.6 - 68.2 days).

The rates of antidepressant medications and prescriptions were 82% and 69% in the DMP group and 32% and 18% in the usual care group, respectively, (p<0.001 for both).

Clinical conclusions
The DMP was highly effective in improving the number of depression-free days compared with usual care throughout the study period.

Measure of benefits used in the economic analysis
The benefit measure used in the economic analysis was the number of depression-free days, as assessed in the effectiveness analysis as well as Quality-Adjusted Life-Years (QALYs) estimated from utility weights derived from a literature review (see Other Publications of Related Interest below).

Direct costs
No discounting was carried out since the time horizon of the study was one year. Unit costs were not reported, but quantities of resources used were specified. The cost/resource boundary adopted reflected the perspective of the study. The cost items included in the analysis were screening and treatment co-ordinator (only for DMP group) and outpatient and inpatient intervention programme costs, such as specialty outpatient visits, antidepressant prescriptions, and other
prescriptions or services. The estimation of resources used was derived from actual data obtained from health plan administrative data systems and estimation of costs was based on actual data, derived from Medicare's Prospective Payment System for inpatient and outpatient services and from Red Book average wholesale prices for prescribed drugs. The period of collection of quantities of resources used was not reported. The price year was not explicitly reported but is presumed to have been 1996.

**Statistical analysis of costs**
A statistical analysis of total costs was carried out to test for statistical significance of the results. Estimated cost measures were compared using a two-part model (one equation estimating the probability of any cost and a gamma regression with log link estimating the level of cost), adjusting for the same confounders as for effectiveness.

**Indirect Costs**
In the paper, these were referred to as "time in treatment" costs. Each day lost for inpatient and outpatient visits was included in the analysis. It was estimated that time lost amounted to 16 hours per day. The source of indirect cost data was represented by wage rates based on sex, age, education, and baseline physical and mental health status, site, and treatment group. No price year was reported and discounting was not relevant as costs were incurred over a period of time shorter than two years. Unit costs were not reported. The number of visits was estimated using patients' claims.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analyses were conducted, but bootstrapping simulations with 1,000 replications were carried out for the cost-effectiveness ratios to assess for dominance of both interventions.

**Estimated benefits used in the economic analysis**
See effectiveness results above. The transition from HDRS score of 22 or higher to 7 or lower was associated with an improvement in health utility of 0.35. Combining this with a gain of 47 depression-free days gave approximately 0.05 QALYs.

**Cost results**
Total outpatient and inpatient services costs (mean) were $3,390 (95% CI: $2945 - $3835) and $2,033 (95% CI: $1166 - $2900) in the DMP group and $2,715 (95% CI: $2324 - $3106) and $1,194 (95% CI: $604 - $1784) in the usual care group, respectively.

The mean DNP cost was $135 (95% CI: $132 - $138) per patient.

Mean time in treatment costs were $1,636 (95% CI: $1356 - $1916) in the DMP group and $1,337 (95% CI: $1174 - $1499) in the usual care group.

**Synthesis of costs and benefits**
Costs and benefits were combined by performing an incremental cost-effectiveness analysis. The incremental cost per additional depression-free day was $21.12 (95% CI: $10.53 - $37.61) for outpatient services only, $41.34 (95% CI: $16.04 - $81.03) including inpatient services, and $51.84 (95% CI: $17.37 - $108.47) including "time in treatment" costs. The bootstrap analysis showed that dominance of DMP over usual care occurred only in 1 of 1,000 cases and dominance of usual care over DMP was never observed. Incremental cost per QALY was approximately $22,000 for outpatient services, $43,100 for total health services and $49,500 including "time in treatment".
Authors' conclusions
The authors concluded that the depression management programme increased the number of depression-free days and overall costs of the intervention among high-users of medical care in comparison with usual care.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear. Usual care was selected because it represented the standard intervention for patients suffering from depression. You, as a user of this database, should assess whether it represents a widely used intervention in your own setting.

Validity of estimate of measure of effectiveness
The analysis of effectiveness was based on a randomised controlled trial with a blind design. Study groups appeared to be comparable at baseline and statistical analyses were conducted to take into account potential bias, such as clustering of patients with physicians. These issues tend to enhance the internal validity of the study. In addition, enrollment was population-based, therefore the study sample should have been representative of the study population considered in the study.

Validity of estimate of measure of benefit
The benefit measure used in the economic analysis was the number of depression-free days and this was derived from the effectiveness analysis. The authors acknowledged that HDRS scores did not fully capture specific dimensions (social function and general health perception). Therefore, a more general benefit measure, Quality-Adjusted Life-Years (QALYs), was used, although the authors stated that there was a lack of an established method for translating depression symptom measures into health utilities or QALYs.

Validity of estimate of costs
The cost analysis included both direct and indirect costs, although the authors noted that costs to the employers or to society were not included in the study. Quantities of resources used were reported and appropriate statistical analyses were conducted on total costs and resources used. No price year was reported. The authors stated that cost estimates were based on standard prices and average costs, and therefore did not reflect true costs of providing services. As a result, pharmacy costs may have been overestimated.

Other issues
The authors made some comparisons of their findings with those from other studies. The issue of the generalisability of the study findings to other settings was not addressed and sensitivity analyses were not conducted, therefore the external validity of the study was somewhat limited and the study results might not generalise to other populations. The authors reported some limitations of their analysis: in particular, the selected time horizon (12 months) "may underestimate long-term effectiveness (which continued to increase throughout 12 months) and overestimate long-term cost (which might decline during maintenance treatment)".

Implications of the study
The authors found that the estimated cost per QALY appears to be similar to those generally accepted for other medical interventions, although, as the authors acknowledged, their calculations might have been a little speculatve.

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**Other publications of related interest**

**Indexing Status**
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