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 study examined privately managed care for depression. This constituted the introduction of carveout contracts limiting drugs to those on formularies and initiating processes for utilisation, such as including re-authorisation after the 5th mental visit.

Type of intervention
Other (public health policy).

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised the medically indigent population (i.e. those with annual household incomes at 200% or below the poverty level) and the uninsured population who qualified for provision of health, mental health and substance abuse care.

Setting
The setting appears to have been primary and tertiary care. The economic study was carried out in Puerto Rico.

Dates to which data relate

Source of effectiveness data
The effectiveness data were derived from a single study that had been published already (Alegria et al. 2002, see ‘Other Publications of Related Interest’ below for bibliographic details).

Link between effectiveness and cost data
The costing was undertaken on the same patient sample as that used in the effectiveness study. It appears to have been undertaken retrospectively.

Study sample
The sample size was not determined in the planning stages of the study. Data came from a random sample of adults (aged 18 to 69) who were living in the low-income areas of Puerto Rico. The study population included everyone who would be affected by the introduction of managed care. The authors reported that a 90.6% response rate was achieved in wave 1 (3,504 individuals interviewed), 93.1% in wave 2 (3,263 individuals interviewed) and 81.5% in wave 3 (2,928...
Individuals interviewed). Excluding deaths, 81.5% of the original sample completed all three waves. The authors reported that respondents who dropped out in waves 2 and 3 were more likely to be males, from urban areas, who had previously self-identified as returned migrants. The authors did not report whether anyone was excluded from the study. There was no evidence that the study sample was representative of the study population.

**Study design**

This appears to have been a retrospective cohort study in which within-group comparisons were also performed. Data were collected in three waves for both experimental regions and control regions: 1992 - 1993, 1993 - 1994 and 1996 - 1998. Loss to follow-up was not reported. There were three waves of data collection in the study. These enabled an assessment of changes in depression treatment between study groups (i.e. intervention versus control) and for study groups across 3 time waves:

- 1992 - 1993 (wave 1), before managed care was implemented;
- 1993 - 1994 (wave 2), when managed care was implemented in the experimental regions (i.e. two thirds of the islands, with one third remaining as a control); and
- 1996 - 1998 (wave 3), two years after managed care went into effect in the experimental regions.

**Analysis of effectiveness**

The effectiveness outcome reported was the percentage of respondents effectively treated for depression. Respondents were classified as having:

- last year depression (i.e. meeting last years Diagnostic and Statistical Manual of Mental Disorders, 3rd edition (DSM-III-R) criteria for major depression or dysthymia),
- sub-threshold depression (i.e. those who did not meet the Composite International Diagnostic Interview (CIDI) criteria for last year DSM-III-R criteria with either major depression or dysthymia, but who scored 23 or more in the Centre for Epidemiological Studies-Depression (CES-D) scale), or
- no depression (i.e. those who did not meet CIDI criteria and did not have a score higher than 22 on the CES-D scale).

Effectiveness of treatment was defined as having four or more counselling visits and/or antidepressant medication for at least one month with medical supervision. Alternatively, three other definitions of treatment effectiveness were considered in the paper.

Difference-in-Difference (D-in-D) methods were used to control for baseline differences in regression analyses and exogenous changes over time, assuming that non-reformed regions were comparable to reformed regions. In addition, adjustments for regional differences were performed. Global Evaluation of Efficacy methods were used to adjust for within-subject correlations. Propensity scores (i.e. the likelihood that an observation came from an experimental region) were used to match observations in the experimental and control regions in order to deal with potential imbalances in unobserved variables.

At baseline there were some differences between the regions. There was a higher number of people with 12-month depression that went untreated in the control regions (70.2% versus 47.4% in the experimental regions) and a higher initial use of antidepressants in the experimental regions.

**Effectiveness results**

Among patients with last year depression, 19.1% (wave 1), 23.6% (wave 2) and 25.8% (wave 3) were treated effectively from a total of 29.8%, 33.1% and 43%, respectively, of patients treated within the control group. For the experimental group, 34.5% (wave 1), 37.5% (wave 2) and 45% (wave 3) of patients were treated effectively from a total of 52.6%, 51.2% and 55.6%, respectively, of patients treated.
For patients with last year depression, the estimated impact of managed care was an increase in effective treatment of +4.5% and a decrease in ineffective treatment of -12.4% in wave 3 compared with the average of waves 1 and 2, which led to a decrease in total treatment of -7.9%.

Among patients with sub-threshold depression, 14.5% (wave 1), 15.3% (wave 2) and 14.1% (wave 3) were treated effectively from a total of 22%, 26.3% and 25.8%, respectively, of patients treated within the control group. For the experimental group, 19.5% (wave 1), 22.5% (wave 2) and 19.1% (wave 3) of patients were treated effectively from a total of 25.7%, 30.6% and 25.7%, respectively, of patients treated.

For patients with sub-threshold depression, the estimated impact of managed care was a decrease in effective treatment of -1.1% and a decrease in ineffective treatment of -3.0% in wave 3 compared with the average of waves 1 and 2, which led to a decrease in total treatment of -4.1%.

The proportions of patients with no depression that were treated in waves 1, 2 and 3 (and, therefore, received ineffective treatment because they did not need it) were 6.9% (wave 1), 4.9% (wave 2) and 5.9% (wave 3) in the control group, versus 6.4%, 3.9% and 4.7%, respectively, in the experimental group.

For patients with no depression, managed care was found to have no estimated impact on effective treatment and to have resulted in a decrease in ineffective treatment of -0.5% in wave 3 compared with the average of waves 1 and 2.

For all three groups of patients, the equivalence of changes between wave 1 and wave 2 for the experimental and control populations were not significantly different from those receiving effective or ineffective treatment.

Using population weights (i.e. 9% for depression, 12% for sub-threshold depression and 79% for no depression), the overall impact of managed care per 100 people was to increase the number effectively treated for depression by 0.33.

**Clinical conclusions**

There was some evidence that the introduction of managed care increased effective treatment for those with last year depression and decreased ineffective treatment for all three groups of patients, although effective treatment in the sub-threshold depression group was slightly reduced.

**Measure of benefits used in the economic analysis**

The authors did not derive a summary measure of benefit. In effect, a cost-consequences analysis was performed.

**Direct costs**

The direct costs of the health care provider (i.e. Medicaid) were considered in the economic analysis. These included visits to the general medical sector for mental health treatment, visits to the specialty mental health sector, antidepressant medication and other psychoactive medication. D-in-D methods were additionally used to compare the costs of wave 3 with the average cost of waves 1 and 2. The prices used were taken from Florida Medicaid. No cost-to-prices adjustments were reported to have been performed. The cost per patient per study group and per wave was calculated as the sum of the quantity of inputs weighted by the price. In addition, the costs per patient for effective versus ineffective treatment were estimated. Resources and quantities were not reported separately. The price year appears to have been 1999 - 2000. Discounting does not appear to have been undertaken.

**Statistical analysis of costs**

The cost data were treated deterministically.

**Indirect Costs**

The indirect costs were not included in the study.
Currency
US dollars ($).

Sensitivity analysis
There were four definitions of effectiveness. Three alternative definitions of treatment effectiveness were evaluated in the sensitivity analysis, and were justified with reference to the medical literature.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The costs per patient with last year depression in waves 1, 2 and 3, respectively, were $143.1, $180.6 and $228.6 in the control regions versus $278.3, $303 and $340.8 in the experimental regions.

The costs per patient with sub-threshold depression in waves 1, 2 and 3, respectively, were $107.6, $137.5 and $109.2 in the control regions versus $123.8, $170.5 and $142.8 in the experimental regions.

The costs per patient without depression in waves 1, 2 and 3, respectively, were $19.5, $16.9 and $18.1 in the control regions versus $19.1, $13.6 and $14.7 in the experimental regions.

The D-in-D analysis showed that the costs were reduced per case (by $16.5) for those with last year depression, were increased (by $8.9) for those with sub-threshold depression, and were reduced (by $1.6) for the population who were treated but who had no depression diagnosis or elevated symptoms.

Using the weights described (see 'Effectiveness Results' section), the impact of managed care per 100 people is to decrease spending per person on depression treatment by $1.67 per year.

Synthesis of costs and benefits
The costs and benefits were not combined.

The authors reported that the sensitivity analyses on effectiveness found no material differences in findings, although the data were not shown in the paper.

Authors’ conclusions
The introduction of managed care into Puerto Rico resulted in changed patterns of treatment and cost, with a minimal impact on effective treatment but that moved in the direction of improving efficacy. There was also a reduction in costs for the treatment of persons with depression (although this was partly due to savings in the rate of treatment for people without depression).

CRD COMMENTARY - Selection of comparators
The comparator was justified on the grounds that it was current practice when the study began. You should decide if this is a widely used method of delivering depression treatment.

Validity of estimate of measure of effectiveness
The analysis was based on a comparative study with historical controls. This might have been appropriate for the study question, given the type of data available, although it is subject to biases. The study sample might have been representative of the study population. The patient groups were shown to be non-comparable at analysis in terms of the rates of untreated depression and use of antidepressants, which appeared to favour the experimental regions at baseline.
D-in-D methods were conducted and appropriate statistical analyses were undertaken to take potential biases and confounding factors into account. These suggest that the study is likely to be internally valid.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The study was therefore categorised as a cost-consequences analysis. The reader is referred to the comments in the ‘Validity of estimate of measure of effectiveness’ field (above) since the health benefits are reflected in the disaggregated effectiveness outcomes.

Validity of estimate of costs
Although the authors reported that the perspective used in the study was that of the population, the indirect costs were not included. It was unclear whether all the relevant costs were included in the analysis and whether omissions would have affected the authors’ conclusions. The costs and the quantities were not reported separately, and sensitivity analyses of the quantities and prices were not conducted. The authors did not report whether discounting was undertaken. The price date appears to have been reported.

Other issues
The authors mentioned that the study results were consistent with those of another study. The issue of generalisability was addressed, with the authors commenting that the results may not be generalisable as the population studied was low-income Puerto Ricans. The authors do not appear to have presented their results selectively. The authors reported a number of limitations of their study. For instance, the service data relied on patient self-report (which is likely to have been subject to recall bias) and there was an absence of provider supply variables from the model.

Implications of the study
The findings of this study suggest that contract stipulation may increase outreach or screening and encourage depressed but untreated patients to enter care. Further research on the implementation of evidence-based depression treatment in usual practice, and to assess the use of low-cost alternative treatments for those with no depression, was recommended.

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Bibliographic details

PubMedID
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Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Aged; Cost-Benefit Analysis; Depression /diagnosis /economics /therapy; Female; Humans; Male; Managed Care Programs /economics /statistics & numerical data; Medicaid /economics /statistics & numerical data; Middle Aged; Poverty; Practice Guidelines as Topic; Psychiatric Status Rating Scales; Puerto Rico; Treatment Outcome

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