The cost-utility of screening for depression in primary care
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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.

Health technology
A screening programme for depression was compared with no screening.

Type of intervention
Screening.

Economic study type
Cost-utility analysis.

Study population
The study population comprised patients in primary care who were aged between 40 and 90 years.

Setting
The setting was primary care. The economic study was conducted in the USA.

Dates to which data relate
The estimates of effectiveness and resource use were obtained from comprehensive reviews of the literature, but the dates were not provided. The prices were from 1999.

Source of effectiveness data
The estimates of effectiveness were derived from a review of completed studies.

Link between effectiveness and cost data
Not applicable.

Modelling
A Markov state transition model was used to synthesise the effectiveness and cost estimates.

Outcomes assessed in the review
Eight major health states were incorporated in the model:

never depressed;

a history of depression;

a history of depression, still in treatment;
significant depressive symptoms;

significant depressive symptoms, in treatment;

major depression;

major depression, in treatment; and

deceased.

The outcomes that were used as input variables for the model were classified under the following headings:

the point prevalence (related to depression);

the incidence of depression among sub-groups, according to the medical history;

the sensitivity of the screening instrument;

the specificity of the screening instrument;

detection (of depression by method);

referrals to a mental health specialist;

the response to treatment in patients with major depression;

patient utilities for health states;

disutility of antidepressant medication;

the suicide rate; and

the hospitalisation rate.

Sources searched to identify primary studies
MEDLINE was searched for relevant literature.

Criteria used to ensure the validity of primary studies
Not reported.

Methods used to judge relevance and validity, and for extracting data
Not reported.

Number of primary studies included
A total of 82 references were used to derive estimates for the model’s parameters. The authors also reported that they reviewed 2,800 abstracts of studies and read 350 articles in detail.

Methods of combining primary studies
Estimates from the literature were primarily combined through a narrative method. Extreme values were used in sensitivity analyses.
Investigation of differences between primary studies
Not reported.

Results of the review
A vast number of probabilities were derived to populate the model. A detailed overview of these is provided in the paper. However, key estimates included the prevalence and incidence of depression, and the sensitivity and specificity of the screening instrument. The prevalence was estimated to be 0.08 (range for sensitivity analysis: 0.04 - 0.18) for major depression and 0.10 (range: 0.03 - 0.16) for significant depressive symptoms. The sensitivity of the screening instrument was 0.84 (range: 0.67 - 0.99) for major depression and 0.35 (range: 0.20 - 0.84) for significant depressive symptoms. The specificity of the instrument was 0.85 (range: 0.8 - 0.95).

Methods used to derive estimates of effectiveness
The estimates were predominantly based on the authors' assumptions, which were supported in the literature.

Estimates of effectiveness and key assumptions
The authors did not specify a particular depression screening instrument in the analysis. Their assumptions on the specificity and sensitivity of a hypothetical instrument were made using the average sensitivity and specificity of the nine most commonly used instruments. The authors assumed that treatment would decrease hospitalisation and completed suicide to a similar extent. As suicide is rare among primary care patients, a differential rate was not structured into the model. The model also incorporated a 20% decrease in hospitalisation among patients with major depressive disorder who received treatment.

Measure of benefits used in the economic analysis
The analysis used the quality-adjusted life-years (QALYs) saved as the measure of benefit in the analysis. The utilities used in this model were obtained from reviews of studies where the utilities were derived using standard gamble and time trade-off techniques. In the base-case model, the authors assumed utilities of 0.63 for major depression, 0.70 for significant depressive symptoms, and 0.89 for full remission. Therapy with antidepressants was assumed to have a disutility of 0.02 for patients in remission and 0.01 for depressed patients.

Direct costs
The direct costs were included in both evaluations. These were the costs of the depression screening instrument, patient's time to complete the instrument, and the nurse and physician's time required to score the instrument and assess the patient. The unit costs and the resource use were presented in a disaggregated fashion. All the costs were discounted at a rate of 3%. The price year was 1999.

Statistical analysis of costs
No statistical analysis of the costs was conducted.

Indirect Costs
The indirect costs included in the analysis from the societal perspective were the costs of decreased productivity and caregiver time.

Currency
US dollars ($).

Sensitivity analysis
A comprehensive range of one-way sensitivity analyses was carried out by varying all the parameters in the model within ranges that were considered plausible by the authors. In addition, a Monte Carlo probabilistic sensitivity analysis was conducted, in which values for all model variables were drawn randomly from the distributions of the model variables.

**Estimated benefits used in the economic analysis**
The incremental benefits of a depression screening programme under the base-case assumptions of the model were 82 quality-adjusted life-days gained per 1,000 patients.

**Cost results**
The cost of the screening process was estimated to be $5 per patient (range in sensitivity analysis: 3 - 10). The costs of additional general practitioner visits and for antidepressant medication were added to these costs. The average indirect costs of $1,041 over 3 months were added to the evaluation from the societal perspective. The base-case results of the model indicated that the incremental cost of achieving an incremental benefit of 82 quality-adjusted life-days per 1,000 patient was $50,730 from the health care providers’ perspective.

**Synthesis of costs and benefits**
The incremental cost-effectiveness estimate from the health care payers’ perspective for annual depression screening, compared with no screening, was $225,467 per QALY gained. Periodic screening every 3 or 5 years gave cost-utility ratio of $115,930 and $85,679, respectively; one-time screening has a cost-utility ratio of 45,298 per QALY gained compared with no screening. Opportunistic screening has a ratio of $2999,899 per QALY gained. From the societal perspective, the cost-utility ratio of annual screening was $192,444. Periodic screening every 3 or 5 years gave cost-utility ratios of $81,686 and $50,988, respectively. When screening every 5 years was compared with one-time screening, the incremental cost-utility ratio was $310,909 per QALY.

**Authors’ conclusions**
The authors concluded that "neither annual nor periodic screening for depression is likely to be a cost-effective intervention in primary care settings”. They went on to state that "annual screening is cost-effective compared with no screening only in settings with a high prevalence of major depression, very low screening costs and implausibly high remission rates”.

**CRD COMMENTARY - Selection of comparators**
The authors compared screening programmes of a range of frequencies with no screening, and made comparisons of different intensities of screening. The comparators used in this analysis therefore seem relevant and comprehensive.

**Validity of estimate of measure of effectiveness**
The effectiveness measures were derived from comprehensive reviews. The results from the individual studies were not presented in detail, presumably because of restrictions on space. However, the estimates appear to have been fair, and the authors do not seem to have presented findings from the review selectively. Extensive sensitivity analyses were also conducted to further enhance the validity of the results.

**Validity of estimate of measure of benefit**
The utilities were derived from a review of primary studies evaluating quality of life in depression. The authors seem to have used representative estimates for their analysis.

**Validity of estimate of costs**
The authors presented cost-effectiveness estimates from both the health care providers’ perspective and a societal
perspective. The costs and the unit prices were reported separately, which facilitates a judgement of the relevance of the estimates to other clinical settings. The resource use estimates were derived from several published studies, and seem fair and comprehensive. A sensitivity analysis was conducted on the basis of cost estimates. The ranges used appear to have been appropriate.

Other issues
The comprehensive range of sensitivity analyses inspires confidence in the results from the model evaluation and enhances the generalisability of the results. The findings indicated that screening for depression achieved acceptable cost-effectiveness estimates, but only under combinations of assumptions that were unlikely to occur in clinical practice. The perspective of the decision-maker was well catered for in the presentation of the overall findings. These can, given the use of QALYs, enable comparisons with other health care programmes.

Implications of the study
The authors recommend that the quality of treatment for depression should be improved before implementing screening strategies. The strategy that produced the most acceptable cost-utility ratio (falling below $50,000 per QALY) was that of one-time depression screening.

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