Utilising survey data to inform public policy: comparison of the cost-effectiveness of treatment of ten mental disorders

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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
Optimal and routine ("current") treatments for 10 mental health disorders in Australia were assessed. The mental disorders considered were depression, dysthymia, bipolar disorder, panic disorder/agoraphobia, social phobia, generalised anxiety disorder (GAD), post-traumatic stress disorder (PTSD), harmful use of alcohol, alcohol dependence and schizophrenia.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised all patients suffering from mental disorders in Australia. More specifically, the analysis included patients who had used mental health services and received treatments over a 1-year period for (at least) one of the mental disorders considered. These were depression, dysthymia, bipolar disorder (affective disorders), panic disorder/agoraphobia, social phobia, GAD, PTSD (anxiety disorders), harmful use of alcohol, alcohol dependence (alcohol use disorders) and schizophrenia.

Setting
All health care settings providing treatment for the 10 mental disorders examined were included in the analysis. The economic study was conducted in Australia.

Dates to which data relate
The effectiveness evidence was derived from studies published between 2000 and 2003. The resources use data were derived from literature published between 1998 and 2003. Year 1997 prices were used.

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

Modelling
A model was used to evaluate the cost-effectiveness of current and optimal treatment for mental disorders and the proportion of burden avertable by treatment. Optimal treatment was modelled using three scenarios. These were optimal treatment at current coverage (scenario 1), optimal treatment at optimal coverage (scenario 2), and optimal treatment at 100% coverage (scenario 3). Coverage was defined as the proportion of people having at least one consultation for a mental disorder. All scenarios were modelled for varying levels of severity for each mental disorder.
Under scenario 1, severity levels were assumed to remain constant. Under scenario 2, optimal coverage was arbitrarily defined as 100% for schizophrenia, 70% for anxiety and affective disorders and for harmful use of alcohol, and 30% for alcohol dependence (the average coverage for all mental disorders was 67%). Severity levels were kept constant for those currently under treatment, but were varied for the "extra cases" in treatment under optimal coverage, to reflect the severity one would expect if those not currently in contact with services were covered. Under scenario 3, 100% coverage was assumed, keeping optimal treatment strategies constant and defining severity on the basis of that observed among all cases in current treatment. The time horizon was one year.

Outcomes assessed in the review
The outcomes assessed were:

- the prevalence of schizophrenia, anxiety, affective and alcohol use disorders in Australia;
- the percentage of current coverage and effective current coverage related to each disorder; and
- the burden of disease observed in the population under study.

The true burden of each disorder, defined as the burden in the absence of treatment, was then calculated by adding the burden observed plus the burden averted by current treatment and coverage. Most of the results presented in the paper were a summary of findings already published in parental studies. Further details can be found elsewhere (see Other Publications of Related Interest).

Study designs and other criteria for inclusion in the review
All data were based on Australian national mental health surveys.

Sources searched to identify primary studies
Not stated.

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

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

Number of primary studies included
Two primary studies (national surveys) were included in the review.

Methods of combining primary studies
The results of the primary studies were not combined.

Investigation of differences between primary studies
Not applicable, as the data were based on two national mental health surveys, each collecting data on different mental health disorders.

Results of the review
The number of prevalent cases in Australia with the mental disorders examined was: depression 648,375; dysthymia...
78,209; bipolar disorder 71,308; panic disorder/agoraphobia 175,994; social phobia 206,976; GAD 376,290; PTSD 327,071; harmful use of alcohol 251,911; alcohol dependence 227,431; and schizophrenia 39,048. The total number of patients suffering from any of these mental disorders was 2,402,613.

The total burden associated with each mental disorder, expressed in number of years lived with disability (YLDs), was: depression 143,018; dysthymia 37,781; bipolar disorder 13,363; panic disorder/agoraphobia 25,338; social phobia 30,058; GAD 85,341; PTSD 60,810; harmful use of alcohol 5,304; alcohol dependence 43,439; and schizophrenia 28,671. The overall burden of mental disorders in the population was 473,123 YLDs.

The coverage (% effective coverage) for each of the mental disorders was: depression 60.2% (31.7%); dysthymia 50.9% (33.3%); bipolar disorder 66.1% (46.2%); panic disorder/agoraphobia 39.1% (23.8%); social phobia 20.8% (6.7%); GAD 37.6% (20.5%); PTSD 39.5% (25.1%); harmful use of alcohol 8.1% (3.6%); alcohol dependence 13.6% (7.8%); and schizophrenia 100% (100%). The overall coverage was 39.5%, of which 22.8% was deemed effective.

Measure of benefits used in the economic analysis
The benefits were expressed as the YLDs averted by current or optimal treatment. They were estimated using data from the Australian national mental health surveys. The YLDs observed were calculated as the prevalence of the only or principal complaint, weighted by the disability weighting associated with that disorder. The YLDs were adjusted for time spent symptomatic using the ratio between current and 12-month cases. The YLDs averted because of treatment were estimated from prevalent cases having received effective treatment. It was assumed that the degree of change in symptoms resulting from effective treatment (measured in effect size units) reflected the degree of change in disability weightings used in the YLD calculations. Health state preference values were adopted from a published study that reported values provided by general practitioners for vignettes of people with each mental health disorder. The total YLDs due to mental disorders in the absence of any treatment were the sum of YLDs observed plus YLDs averted because of treatment.

Direct costs
The direct costs consisted of all health service costs associated with service use and treatment for the patients’ only or principal complaint, for the 10 mental disorders examined in the analysis. No further analysis of the costs was provided. The costs and the quantities were not reported separately. Resources used under current treatment were based on patient self-reports, derived from Australian national mental health surveys conducted between 2000 and 2002. Resources used under optimal treatment were based on literature published between 1998 and 2003. The unit costs for both public and private sector were derived from published sources. The total costs for optimal treatment were derived using modelling. All the costs were estimated for 1-year time horizon, therefore discounting was not necessary and was not carried out. All the costs were converted to 1997 prices. It is likely that further details of the costs are provided in the parent studies (see Other Publications of Related Interest).

Statistical analysis of costs
The costs were presented deterministically. However, it was reported that a sensitivity analysis provided confidence intervals (CIs) around the total cost of treatment. The results of the sensitivity analysis were not reported.

Indirect Costs
The indirect costs were not included in the analysis.

Currency
Australian dollars (Aus$).

Sensitivity analysis
A sensitivity analysis was carried out to investigate the impact of variability in the data on the cost-effectiveness results.
CIs around the costs, benefits and cost-effectiveness ratios were calculated. Univariate analyses assessed the impact of changing various investigator-modelled parameters on the cost-effectiveness estimates. In addition, multivariate stepwise linear regressions were conducted for each mental disorder examined, to identify the important contributors to variance around the cost-effectiveness ratios.

**Estimated benefits used in the economic analysis**

The YLDs averted by current coverage/current treatment (% total YLDs due to mental disorders that were averted by treatment) were: depression 22,559 (16%); dysthymia 4,982 (13%); bipolar disorder 2,536 (19%); overall, all affective disorders 30,078 (15%); panic disorder/agoraphobia 2,375 (9%); social phobia 2,530 (8%); GAD 14,469 (17%); PTSD 6,687 (11%); overall, all anxiety disorders 26,059 (13%); harmful use of alcohol 95 (2%); alcohol dependence 650 (2%); overall, all alcohol use disorders 745 (2%); schizophrenia 3,774 (13%). The overall YLDs averted by current coverage/current treatment were 60,655 (13%).

The YLDs averted by current coverage/optimal treatment were: depression 32,583 (23%); dysthymia 7,446 (20%); bipolar disorder 4,529 (34%); overall, all affective disorders 44,557 (23%); panic disorder/agoraphobia 3,304 (13%); social phobia 3,885 (13%); GAD 23,424 (27%); PTSD 9,489 (16%); overall, all anxiety disorders 40,101 (20%); harmful use of alcohol 191 (4%); alcohol dependence 2,061 (5%); overall, all alcohol use disorders 2,253 (5%); schizophrenia 6,217 (22%). The overall YLDs averted by current coverage/optimal treatment were 93,128 (20%).

The YLDs averted by optimal coverage/optimal treatment were: depression 37,518 (26%); dysthymia 10,032 (27%); bipolar disorder 4,626 (35%); overall, all affective disorders 52,176 (27%); panic disorder/agoraphobia 5,244 (21%); social phobia 10,201 (34%); GAD 23,424 (27%); PTSD 9,489 (16%); overall, all anxiety disorders 70,784 (35%); harmful use of alcohol 1,059 (20%); alcohol dependence 4,537 (10%); overall, all alcohol use disorders 5,971 (11%); schizophrenia 6,217 (22%). The overall YLDs averted by optimal coverage/optimal treatment were 134,774 (28%).

The YLDs averted by 100% coverage/ optimal treatment were: depression 48,239 (34%); dysthymia 14,105 (37%); bipolar disorder 5,372 (40%); overall, all affective disorders 67,715 (35%); panic disorder/agoraphobia 7,090 (28%); social phobia 14,798 (49%); GAD 57,213 (67%); PTSD 19,289 (32%); overall, all anxiety disorders 98,390 (49%); harmful use of alcohol 1,479 (28%); alcohol dependence 15,124 (35%); overall, all alcohol use disorders 16,603 (34%); schizophrenia 6,217 (22%). The overall YLDs averted by optimal coverage/optimal treatment were 188,926 (40%). The benefits were estimated for a time horizon of one year.

**Cost results**

The total costs (Aus$ million) associated with current coverage/current treatment were: depression Aus$483.7; dysthymia Aus$70.8; bipolar disorder Aus$60.9; all affective disorders Aus$615.5; panic disorder/agoraphobia Aus$81.7; social phobia Aus$43.6; GAD Aus$112.3; PTSD Aus$158.2; all anxiety disorders Aus$395.7; harmful use of alcohol Aus$9.2; alcohol dependence Aus$63.7; all alcohol use disorders Aus$72.9; schizophrenia Aus$739.9.

The overall costs associated with current coverage/current treatment were Aus$1,824.0 million.

The total costs (Aus$ million) associated with current coverage/optimal treatment were: depression Aus$341.3; dysthymia Aus$28.7; bipolar disorder Aus$108.4; all affective disorders Aus$478.4; panic disorder/agoraphobia Aus$65.4; social phobia Aus$33.1; GAD Aus$118.2; PTSD Aus$149.2; all anxiety disorders Aus$366.1; harmful use of alcohol Aus$1.7; alcohol dependence Aus$118.6; all alcohol use disorders Aus$120.3; schizophrenia Aus$668.2.

The overall costs associated with current coverage/optimal treatment were Aus$1,633.1 million.

The total costs (Aus$ million) associated with optimal coverage/optimal treatment were: depression Aus$375.5; dysthymia Aus$35.3; bipolar disorder Aus$114.8; all affective disorders Aus$525.7; panic disorder/agoraphobia Aus$112.8; social phobia Aus$110.7; GAD Aus$205.1; PTSD Aus$242.2; all anxiety disorders Aus$670.8; harmful use of alcohol Aus$14.6; alcohol dependence Aus$243.2; all alcohol use disorders Aus$257.8; schizophrenia Aus$668.2.

The overall costs associated with optimal coverage/optimal treatment were Aus$2,122.5 million.
The total costs associated with 100% coverage/optimal treatment were not calculated.

**Synthesis of costs and benefits**
The costs and benefits were combined in the form of cost-effectiveness ratios. These expressed the cost per YLD averted by current or optimal treatment compared with no treatment.

The total cost/YLD averted by current coverage/current treatment was: depression Aus$21,442; dysthymia Aus$14,217; bipolar disorder Aus$24,031; all affective disorders Aus$20,463; panic disorder/agoraphobia Aus$34,389; social phobia Aus$17,218; GAD Aus$7,761; PTSD Aus$23,656; all anxiety disorders Aus$15,184; harmful use of alcohol Aus$96,813; alcohol dependence Aus$98,095; all alcohol use disorders Aus$97,932; schizophrenia Aus$196,070. The overall cost/YLD averted by current coverage/current treatment for all 10 mental disorders examined was Aus$30,072. In addition, 95% CIs around these cost-effectiveness ratios were provided.

The total cost/YLD averted by current coverage/optimal treatment was: depression Aus$10,475; dysthymia Aus$3,858; bipolar disorder Aus$23,934; all affective disorders Aus$10,737; panic disorder/agoraphobia Aus$19,820; social phobia Aus$8,531; GAD Aus$5,048; PTSD Aus$15,728; all anxiety disorders Aus$9,130; harmful use of alcohol Aus$8,861; alcohol dependence Aus$57,542; all alcohol use disorders Aus$53,412; schizophrenia Aus$107,482. The overall cost/YLD averted by current coverage/optimal treatment for all mental disorders was Aus$17,536. The 95% CIs around these ratios were also provided.

The total cost/YLD averted by optimal coverage/optimal treatment was: depression Aus$10,010; dysthymia Aus$3,517; bipolar disorder Aus$24,827; all affective disorders Aus$10,075; panic disorder/agoraphobia Aus$21,518; social phobia Aus$10,851; GAD Aus$5,004; PTSD Aus$16,867; all anxiety disorders Aus$9,476; harmful use of alcohol Aus$13,775; alcohol dependence Aus$53,603; all alcohol use disorders Aus$46,064; schizophrenia Aus$107,482. The overall cost/YLD averted by optimal coverage/optimal treatment for all mental disorders was Aus$15,748. The 95% CIs around these ratios were not provided.

No cost-effectiveness ratios were calculated for 100% coverage/optimal treatment.

The results of the univariate sensitivity analyses and regression analyses were not provided. However, they have been reported in the parental specific-disorder studies (see Other Publications of Related Interest).

**Authors’ conclusions**
Optimal treatment would avert a greater proportion of the burden of mental disorders and, even though more comprehensive, would cost no more than current treatment. This is because of fewer inpatient stays and no use of treatments that generated costs without benefits. Optimal treatment for affective disorders, especially dysthymia, was cost-effective. In terms of anxiety disorders, even with perfect coverage and treatment, half of the associated burden would remain unavertable. The average cost per year lived with disability (YLD) averted for alcohol disorders and schizophrenia was high, especially for the latter. Even with 100% coverage and optimal treatment, 60% of the burden was still unavertable in the light of existing knowledge. Although coverage of some of the more efficient treatment should be extended, other factors justified the continued use of less efficient treatment for some disorders.

**CRD COMMENTARY - Selection of comparators**
The comparator of both current and optimal treatment was no treatment. Although this choice was not explicitly justified, it allowed the active value of treatment to be evaluated.

**Validity of estimate of measure of effectiveness**
The authors did not undertake a systematic review of the literature. In contrast, they chose to use data reported in two national population surveys in Australia. One limitation of this approach was that all the data were based on self-reported symptoms to establish diagnosis and burden associated with the disorders. However, the choice of the data source allowed the authors to draw conclusions on both the clinical and cost-effectiveness of treatments for mental...
disorders at a national level.

Validity of estimate of measure of benefit
The estimation of benefits was modelled. The model used was appropriate for this purpose, as it allowed the burden averted by treatment to be evaluated for a variety of assumptions about clinical effectiveness and treatment coverage. The authors considered measures of benefit (i.e. YLD) that appear to have been relevant for the treatments evaluated. They also noted that the disability-adjusted life-years lost could not be assessed since the treatment intervention studies did not use death as an outcome.

Validity of estimate of costs
The perspective of the study was that of the health service (public and private providers). It was likely that all categories of cost were included in the analysis, although the authors did not provide any cost details. Further information was probably provided in the parent studies (see Other Publications of Related Interest). Although the resources used were identified, the quantities were not reported, and neither were the unit costs. This may hinder the generalisability of the authors' results in other settings. One additional limitation of this approach was that the cost data were based on self-reported treatments. A sensitivity analysis was undertaken, but the results were not given. Discounting was not undertaken, which was appropriate as the costs were incurred during a time horizon of one year. The date to which the costs referred was reported, and this improves the reproducibility of the results.

Other issues
The authors did not compare their results with those of other studies. However, their results consisted of summaries and comparisons across findings of other parent studies. The issue of generalisability to other settings was addressed. The authors reported their results in full. However, they did not perform an incremental analysis, to demonstrate the additional total cost per YLD averted resulting from replacing current treatment by optimal treatment, or from increasing the level coverage; such an approach might have influenced the final conclusions. A number of further limitations of the study were reported. First, the short time horizon of the analysis, which might have underestimated the benefits of treatment in terms of burden averted. Second, the uncertainty in some parts of the analysis was reflected in wide CIs for the cost-effectiveness ratios. Finally, the method used to estimate the YLDs had not been validated. Nevertheless, the authors' conclusions reflected the scope of the analysis.

Implications of the study
The authors recommended that the coverage of anxiety and affective disorders should be extended. They also recommended that clinicians be encouraged to practise evidence-based medicine, even if the budgetary and organisational requirements of implementation are considerable. They suggested that issues such as equity, need and societal demand, as well as efficiency, be given more consideration in light of their results when setting priorities for service delivery. In general, further research on both the prevention and the mechanisms of the mental disorders examined was recommended.

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