ECONOMIC EVALUATION

ECONOMIC EVALUATION OF MENTAL HEALTH CARE INTERVENTIONS. A REVIEW

S. M. A. A. EVERS1*, A. S. VAN WIJK2 AND A. J. H. A. AMENT1
1Department of Health Organization Policy and Economics, Maastricht University, The Netherlands
2Department of Epidemiology, Maastricht University, The Netherlands

SUMMARY

Due to rising costs, the economic aspects of the mental health care sector are receiving increasing attention. This article scrutinizes 91 published studies in the field of mental health care, applying methodological criteria drawn from epidemiology and economics. The purpose of this study is to provide some insight into the quality of economic evaluation in the field of mental health care. The article shows that few good full economic evaluation studies have been undertaken in the domain of mental health care. One reason for this could be that the measurement of effectiveness in mental health care is complicated because of the known difficulties with the reliability of psychiatric diagnosis and the lack of consensus about the etiology and appropriate treatment for many psychiatric illnesses. © 1997 by John Wiley & Sons, Ltd.


No. of Figures: 0. No. of Tables: 2. No. of References: 161.

KEY WORDS — mental health care; economic evaluation; review

INTRODUCTION

Since Conley et al.1 published their study on the cost of mental illness in 1967, the rising cost of mental health care has become an issue of paramount importance. Economic analysis can help care-givers and policy-makers in allocating scarce resources, by enabling them to compare health care practices and technologies in terms of their relative economic efficiencies in providing health benefits. A basic principle of economic analysis is that choices must be made between alternative resources and that these decisions must consider both costs and outcomes. Trade-offs and choices are inevitable.2 Several authors have observed a rapid increase in economic analyses in health care.3–8 In mental health care, there have been congresses, special issues of journals, reviews and books providing economic analyses.9–19 However, one can question whether this increase in volume also means a rise in the quality of these studies. This article considers the quality of economic evaluations in mental health care. Economic evaluation, if well performed, has great potential for improving the quality of decision-making and for making mental health programmes more effective and efficient. The purpose of this study is to provide insight into the status and quality of economic evaluation in the field of mental health care.

*Correspondence to: S. M. A. A. Evers, Department of Health Organization Policy and Economics, Maastricht University, P.O. Box 616, 6200 MD Maastricht, The Netherlands. Tel. +31 43 3881727; Fax +31 43 3670960.

Contract grant sponsor: Netherlands Health Research Promotion Programme.

CCC 1057-9230/97/020161-17 $17.50
© 1997 by John Wiley & Sons, Ltd.

Received 12 May 1995
Accepted 10 January 1997
Table 1. Main items of the checklist

General part
- country
- financed by
- perspective of analysis
- nature of the study
- disease category

Epidemiological part
- epidemiological design used
- design characteristics (prestratification/matching, randomization, population size, number of groups, loss-during follow-up)
- adequate measurement of effect (blinding)
- results

Economical part
- economic evaluation design used
- costs identification (direct, direct non-medical, indirect costs)
- costs measurement (sources direct, direct non-medical, indirect costs)
- costs valuation (valuation direct, indirect costs, allocation overhead costs)
- identification of consequences
- measurement of consequences
- valuation of consequences
- discounting, differential timing
- intangible costs mentioned
- opportunity costs mentioned
- sensitivity analysis
- incremental analysis

METHOD

Checklist

If one is going to examine the economic and the epidemiological aspects of a study, it is wise to review first the state of the art as it is described in the literature. Other researchers have also examined whether correct methods are used in economic evaluation studies.2,7,8,20–39

For this literature review, a checklist was developed. The checklist consists of three parts, a general part, an epidemiological part and an economic part (see Table 1). For detailed explanations of the definitions and criteria used we refer to the checklist.40

Selection of literature

Several strategies were combined to find literature in the field of the economic evaluation of mental health care. First, a MEDLINE CD-ROM (Silverplatter) literature search [thesaurus cost and cost-analysis (all subheadings)] combined with keywords: control(led), study, ment* and psy* was combined with a screening of the PSYCHLIT CD-ROM (Silverplatter) for the period 1966–95. Additional articles were found by citation tracking and through the economic evaluation bibliography.41 The search may not have been exhaustive, but by combining a MEDLINE/PSYCHLIT search with citation tracking we have tried to cover the field of economic evaluation in mental health care. We considered searching in additional databases (Embase, Health Economic Web Sites), but it seemed doubtful that the returns would be worth the effort.

Of the articles found, only those which were (a) written in English, (b) referring to an economic evaluation and (c) in the field of mental health care were considered further. Since it was intended to concentrate on mental health care for adults, studies on smoking, alcohol and drug abuse were excluded.

RESULTS

After excluding editorials, letters, non-english
articles and reviews pertaining to previously published articles on economic evaluation in the field of mental health care, 113 articles were available for the review. Unfortunately, another 14 articles had to be dropped from the analysis when they had been read. In eight cases this was because, despite what was suggested in the title or abstract, they did not relate to an economic evaluation in the field of mental health care. One article proved to be an abstract submitted for a conference.

This left a sample of 99 articles. Some studies gave rise to two or three articles. Rost et al. and Smith et al. described the same study, but did separate analyses for patients with somatization disorders (DSM-diagnosis) and somatizing patients. Thus this review finally included 91 studies. For reasons of conciseness, the studies relevant to each criterion have not been listed. More detailed information is included in our working paper.

General characteristics

The majority of the studies were performed in the United States (62%); 11% were carried out in the United Kingdom and 7% in Canada.

Since the perspective of a study determines the categories of costs and consequences that will be examined and thus the conclusions drawn, economic analyses should explicitly mention the perspective of the study. Only six of the studies in our sample did so. Thus the perspective of analysis was not mentioned in 86 studies. However, it is likely that the external source financing the study gives some indication of the perspective of the study. Forty-one were financed by outsiders. The majority of these studies were subsidized by a government-related agency, especially the National Institute of Mental Health (17 studies) in the United States and the Department of Health and Social Security (6 studies) in the United Kingdom. Other studies received funds from Pharmaceutical Companies (4), other public funding (3), insurance companies (1) and banks (1).

Nature of economic appraisal

Full economic evaluation. After Drummond et al., four basic kinds of full economic evaluation are distinguished in this article: cost-minimization analyses (CMA), cost-effectiveness analyses (CEA), cost-benefit analyses (CBA) and cost-utility analyses (CUA). This review includes one CMA, which compares 'brief' with 'standard' hospitalization. The most frequently used full economic evaluation in our review (27 studies) is the CEA. The outcome measures used in these studies included burden on relatives, hospitalization, psychosocial and health functioning and work attitude. One of the major limitations of the CEA is that it does not permit comparisons with interventions evaluated in other studies, even within the mental health care sector, as the outcome measures are not the same.

A CUA, however, does express health improvement in one uniform measure, the quality-adjusted-life-years (QALY) gained. A QALY is a single comprehensive outcome measure that incorporates both effects in terms of quality of life and effects in terms of survival (life-years gained). This measure may be difficult to utilize in mental health care, as changes in quality of life are difficult to measure when interviewing psychiatric patients, e.g., patients with severe psychiatric problems sometimes regard themselves as healthy. Furthermore, the diagnoses in mental health care are largely chronic and not lethal, so that successful treatment is not likely to produce a gain in life years. Drummond et al. used the QALY measure to assess the care-giver's quality of life, as part of an economic evaluation of a support program for care-givers of the demented elderly. In the study of Kamlet et al., a markovian model was constructed to estimate the quality of life impact of maintenance treatment for recurrent depression.

Finally, a CBA tries to express the health improvement in monetary terms. Costs and benefits are then measured in the same unit and one can see immediately whether the benefits outweigh the costs. This concept was used in 11 studies. Some studies calculated a benefit/cost ratio. For example, Simmons et al. indicated the relation between the input and output of services.

Partial economic evaluations. The analysis of costs is common for economic evaluations, but in some partial evaluation studies the analysis is restricted to costs only. These analyses in which outcomes are not economically assessed, are classified as cost-analyses. Cost-analysis is a frequently-used tool (36 studies) in mental health
care where the goal is to get an impression of the financial inputs for various alternatives. Some studies proved to have been restricted to costs only, although the title and abstract of the articles suggested that both costs and outcomes had been evaluated.76–81

Finally, one can value the various consequences of a disease on an individual level (a case-study) or on a group level (cost-of-illness study). Although all of these partial evaluations assess costs, they are not considered to be proper economic evaluations. A cost-of-illness study tries to identify and estimate the health care costs of an illness in a certain country, in a certain year. Our review includes 14 cost-of-illness-studies.1,66,82–93 Most of these studies try to determine the total costs of mental illnesses for society, including productivity losses caused by absenteeism and early retirement. However the studies of Braddock83 and Hu and Jerell125 looked at mental illnesses in general, comparing them with costs of mental retardation95 or analysing the costs-of-illness by ethnicity.125 Jönsson and Bebbington88 performed a cost-of-illness study in addition to a cost-effectiveness analysis.

Other economic evaluations. Next to the analysis of observational studies as described above, models are being used as an integral part of health care evaluation and health care technology assessment.94 Models such as scenario analysis, decision models and meta-analysis, can be used when direct observation of the phenomenon is not available or cannot be collected. Sheldon94 suggested that modelling should be confined to the following uses: to identify gaps in knowledge, to conduct a subgroup analysis of a priori hypotheses and to carry out sensible combination of reliable information on effectiveness, costs and other parameters. In our review we did not include any study which used modelling as a method of economic evaluation of mental health care.

Diagnosis at stake

The field of mental health care is very comprehensive. A very large number of interventions and diagnoses were examined in the selected economic evaluation studies. More than a quarter of the studies (26 studies) focused on the treatment of schizophrenia. Other diagnoses included depression (13 studies), psychiatric cases in a normal population (4), anxiety and panic disorders (3) and treatment related to dementia (3). A nother 24 analyses covered a wide range of diagnoses.

Interventions compared

Since economics is about choice, a full economic evaluation should specify and compare at least two alternatives.95 The studies reviewed evaluated a wide range of different kinds of alternatives, including diagnostic procedures,96–98 preventive programmes,71 public policies,100–102 private institution programmes103. However two-thirds of the studies (62 studies) referred to a choice of therapies. In accordance with Chapman104 and O’Donnell et al.105 the therapies were subdivided into three subcategories: location of care, drug therapy and non-pharmaceutical therapy.

A relatively large number of these studies (17) were ‘location of care’ studies, studies which evaluated attempts to expand non-residential care. In most cases this involved comparing inpatient care with outpatient care.58,59 The alternative to conventional 24 hour care in a mental hospital can be either community care,51–53,56,57,106–111 day-care,64,65,72,112 home-based care,54,55,113 or 24 hour intermediate care for acute situations.114,115 Fourteen studies evaluated a drug therapy. A nother 20 studies referred to non-pharmaceutical therapies, comparing different therapies,116,117 such as behavioural therapy,118 liaison psychiatry119,120 and other therapies aiming at keeping the patient as long as possible out of the psychiatric circuit.121–128 Two studies looked at the effect of sending a consultation letter to the general practitioner.60,61,129

Epidemiological screening

In this review it is assumed that epidemiological aspects are as important as economic aspects, since only studies with a good epidemiological design can isolate the observed effect of an intervention. In general, randomized controlled trials afford the best control over the study situation, as they best enable the investigator to isolate the observed effect of the treatment. However, performing experiments in mental health care is often complicated. There are
problems, for example in maintaining randomization and locating subjects for follow-up. Because the interventions are introduced into the natural environment of the patient population, much of the control normally found in clinical trials is not present. Thirty per cent of the studies reviewed had an experimental or quasi-experimental design. Table 2 gives an overview of 27 randomized controlled clinical trials and their main characteristics. The majority of the studies reviewed had an observational cohort design. Of the articles reviewed, 45 studies defined inclusion and exclusion criteria. In general, these criteria include diagnoses, age criteria, health care consumers criteria and criteria relating to overall functioning.

The period studied has to be long enough to see whether the effect of an intervention is long-standing. The study period in the articles reviewed varied from 2 weeks to 4 years. The sample must also be large enough to enable a reliable estimate to be made of the effect of the intervention. The sample sizes in the studies varied depending on their design, from case study to scenario analysis. It was remarkable that almost none of the studies explained the reasons for the sample size.

The cast of characters in a clinical trial includes three main kinds of actors: those who give the treatment (clinicians), those who receive it (patients) and those who assess its effects (investigators). One or more of these groups may be ‘blinded’, i.e., kept in ignorance of which treatment patients have undergone. Only a few studies included in our review used blinding. This may be because blinding is not always practicable and may require considerable time and effort.

Even with good study design, the results can be affected by the number of drop-outs, especially in mental health care where the loss during follow-up can be extensive. Losses during follow-up can have various causes, such as patients who die, move, refuse treatment, discontinue treatment or patients who cannot be traced. Of the selected studies, 34 described the losses during follow-up. The highest loss rate was 57% of the suitable patients, in a study by Ginsberg et al.

Economic screening

Assessing consequences. In a full economic evaluation, both costs and consequences are identified. In the studies examined, a variety of disease-specific and generic instruments were used to measure these consequences, such as Beck's depression inventory, the Brief Psychiatric Rating Scale, Daily Living Rating Scale, Diagnostic Interview Schedule, General Health Questionnaire, (Children's) Global Assessment Scale, Hamilton Depression and Anxiety Scale, Present State Examination, the Psychiatric Evaluation Form, Rand Health Status Measures, Social Adjustment Scale, Symptom Checklist List-90, Social Adjustment Scale, State-Trait Anxiety Inventory and the Visual Analogue Scale. In addition, several studies also included a measurement of Burden on the Family, medication use and satisfaction with services. Other studies measured the changes in resource used in money terms. Five studies used an instrument to assess the changes in quality of life of both patients and their families. One way of measuring quality of life is by utility measurements. According to Guyatt et al., there are two fundamental approaches to utility measurements. One is to ask patients a number of questions about their functioning and to classify patients into one of a number of categories on the basis of the responses. The other approach is to make a single rating of all aspects of the subject's quality of life using, for instance, the standard gamble or time trade-off methods.

Assessing costs

Identification of costs: For each alternative it is necessary to identify, measure and value each cost. Costs are not restricted to the health care sector itself. There are also psychological costs to the patient and their relatives and consequences for society as a result of absence from work, disablement and premature death. In economic evaluation studies, a distinction is often made between direct and indirect costs. Direct costs are the actual dollar expenditures relating to an illness or disorder, including money spent on hospital and nursing home care, the services of physicians and other medical professionals, drugs
<table>
<thead>
<tr>
<th>First author and Ref. No.</th>
<th>Intervention</th>
<th>Nature study</th>
<th>Study period</th>
<th>(final) N</th>
<th>Number groups matching</th>
<th>Prestratification/ Blinding</th>
<th>Main outcome measures</th>
<th>Discounting/ Sensitivity</th>
<th>Marginal Costs</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond, 1988 [121]</td>
<td>Therapy</td>
<td>CBA</td>
<td>6 mths</td>
<td>E = 83</td>
<td>2 no no</td>
<td>Quality-of-life</td>
<td>not relevant</td>
<td>no no</td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C = 84</td>
<td></td>
<td>Medication compliance</td>
<td></td>
<td></td>
<td>Indirect costs</td>
<td></td>
</tr>
<tr>
<td>Burns, 1991; Location of care 1993 [54, 55]</td>
<td>CEA</td>
<td>1 yr</td>
<td>E = 94</td>
<td>2 no no</td>
<td>Present state examination Brief psychiatric rating scale Social functioning schedule Family burden scale Clinical interview yes, inflation correction</td>
<td>no no</td>
<td></td>
<td></td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td>Dickey, 1986 [115]</td>
<td>Location of care/therapy</td>
<td>CA</td>
<td>2 yrs</td>
<td>E = 13</td>
<td>2 no yes</td>
<td>—</td>
<td>no no</td>
<td></td>
<td>Direct costsa</td>
<td></td>
</tr>
<tr>
<td>Drummond, 1991 [73]</td>
<td>Therapy</td>
<td>CUA</td>
<td>6 mths</td>
<td>E = 22</td>
<td>2 no no</td>
<td>Depressive and anxious symptomatology Caregivers quality of life</td>
<td>not relevant</td>
<td>no yes</td>
<td>Direct costsa</td>
<td></td>
</tr>
<tr>
<td>Endicott, 1978 [72]</td>
<td>Location of care/therapy</td>
<td>CMA</td>
<td>2 yrs</td>
<td>E1 = 51</td>
<td>3 no no</td>
<td>Psychopathology Role functioning Effect on the family</td>
<td>no no</td>
<td>yes</td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td>Fenton, 1982; 1984 [56, 57]</td>
<td>Location of care/therapy</td>
<td>CA</td>
<td>2 yrs</td>
<td>E = 76</td>
<td>2 no no</td>
<td>—</td>
<td>no no</td>
<td>no no</td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td>Ginsberg, 1984 [130]</td>
<td>Location of care/therapy</td>
<td>CBA</td>
<td>1 yr</td>
<td>E = 22</td>
<td>2 no yes</td>
<td>Reduction in expenses yes, 1981 prices</td>
<td>yes no</td>
<td>no no</td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td>Glick, 1986 [123]</td>
<td>Therapy</td>
<td>CBA</td>
<td>1 yr</td>
<td>E = 36</td>
<td>2 no no</td>
<td>—</td>
<td>not relevant</td>
<td>no no</td>
<td>Direct costsa</td>
<td></td>
</tr>
<tr>
<td>Hyde, 1987 [78]</td>
<td>Location of care/therapy</td>
<td>CA</td>
<td>2 yrs</td>
<td>E = 8</td>
<td>2 yes no</td>
<td>—</td>
<td>yes, 5%</td>
<td>no no</td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td>Jerrell, 1989 [126]</td>
<td>Therapy</td>
<td>CEA</td>
<td>2 yrs</td>
<td>32</td>
<td>2 no no</td>
<td>Psychosocial and mental health functioning Satisfaction Involvement criminal justice system</td>
<td>no no</td>
<td>no no</td>
<td>Direct costs</td>
<td></td>
</tr>
<tr>
<td>Jones, 1994 [127]</td>
<td>Therapy</td>
<td>CEA</td>
<td>18 mths</td>
<td>E = 28</td>
<td>2 no no</td>
<td>Housing, nights not homeless</td>
<td>no no</td>
<td>no no</td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td>Kamlet, 1995 [74]</td>
<td>Drug therapy</td>
<td>CUA</td>
<td>3 yrs</td>
<td>E1 = 26</td>
<td>3 no no</td>
<td>Hamilton rating scale for depression Raskin severity for depression Utilities by Markov modelling</td>
<td>yes yes</td>
<td>no no</td>
<td>Direct costsa</td>
<td></td>
</tr>
<tr>
<td>Kuldau, 1977 [144]</td>
<td>Therapy</td>
<td>CEA</td>
<td>18 mths</td>
<td>E = 41</td>
<td>2 no no</td>
<td>—</td>
<td>no no no</td>
<td>no no</td>
<td>Direct costsa,b</td>
<td></td>
</tr>
<tr>
<td>First author year and Ref No.</td>
<td>Intervention</td>
<td>Nature study</td>
<td>Study period</td>
<td>(final) N</td>
<td>Number groups</td>
<td>Pretreatment matching</td>
<td>Blinding</td>
<td>Main outcome measures</td>
<td>Discounting/ Sensitivity Marginal Costs</td>
<td>Marginal incremental analysis</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
<td>--------------</td>
<td>--------------</td>
<td>-----------</td>
<td>---------------</td>
<td>---------------------</td>
<td>---------</td>
<td>----------------------</td>
<td>-------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Knapp, 1994 [113]</td>
<td>Location of care</td>
<td>CEA</td>
<td>20 mths</td>
<td>E = 97, C = 92</td>
<td>2</td>
<td>no yes</td>
<td>Global assessment scale Present state examination Brief psychiatric rating scale Social adjustment scale Daily living skills rating Satisfaction services</td>
<td>no no yes</td>
<td>Direct costs ^a, Direct costs ^b</td>
<td>Indirect costs</td>
</tr>
<tr>
<td>Linn, 1979 [155]</td>
<td>Drug therapy</td>
<td>CA</td>
<td>2 yrs</td>
<td>E = 80, C = 82</td>
<td>2</td>
<td>no no —</td>
<td>—</td>
<td>no no no no</td>
<td>Direct costs ^a</td>
<td></td>
</tr>
<tr>
<td>Linn, 1985 [110]</td>
<td>Location of care/therapy</td>
<td>CA</td>
<td>1 yr</td>
<td>E1 = 146, E2 = 109, E3 = 43, E4 = 75</td>
<td>no no —</td>
<td>no no no no</td>
<td>Direct costs ^a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mangen, 1983 [145]</td>
<td>Location of care/therapy</td>
<td>CEA</td>
<td>18 mths</td>
<td>E = 35, C = 36</td>
<td>2</td>
<td>yes no</td>
<td>Symptoms Social role functioning, family burden Consumers satisfaction</td>
<td>yes, 1977 price level</td>
<td>no no</td>
<td>Direct costs ^a, Indirect costs</td>
</tr>
<tr>
<td>May, 1971 [147]</td>
<td>Drug therapy</td>
<td>CA</td>
<td>12 mths</td>
<td>E1 = 48, E2 = 44, E3 = 47, E4 = 43, E5 = 46</td>
<td>5</td>
<td>no no —</td>
<td>not relevant</td>
<td>no no no no</td>
<td>Direct costs ^a</td>
<td></td>
</tr>
<tr>
<td>Prien, 1973 [131]</td>
<td>Drug therapy</td>
<td>CA</td>
<td>16 wks</td>
<td>E = 375</td>
<td>5</td>
<td>no yes —</td>
<td>not relevant</td>
<td>no no no no</td>
<td>Direct costs ^a</td>
<td></td>
</tr>
<tr>
<td>Quinlivan, Therapy, 1995 [108]</td>
<td>Therapy</td>
<td>CA</td>
<td>2 yrs</td>
<td>E1 = 30, E2 = 30, C = 30</td>
<td>3</td>
<td>no no —</td>
<td>no no no no</td>
<td>Direct costs ^a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rappaport, Location of care/therapy, 1987 [114]</td>
<td>CEA</td>
<td>1 yr</td>
<td>E = 195, C = 595</td>
<td>2</td>
<td>no no Severity-of-illness</td>
<td>not relevant</td>
<td>no no</td>
<td>Direct costs ^a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rost, Smith, Therapy/psychiatric consultation letter, 1994; 1995 [60, 61]</td>
<td>CEA</td>
<td>2 yrs propr. 2.5 yrs retro</td>
<td>E = 40, C = 33</td>
<td>2</td>
<td>no yes Diagnostic interview schedule yes, 7.3% Clinical interview for diagnosis R and health status measures</td>
<td>no no</td>
<td>Direct costs ^a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scott, 1992 [132]</td>
<td>Location of care/therapy</td>
<td>CA</td>
<td>16 wks</td>
<td>E1 = 26, E2 = 29, E3 = 29, E4 = 29</td>
<td>4</td>
<td>no yes —</td>
<td>not relevant</td>
<td>no no no no</td>
<td>Direct costs ^a</td>
<td></td>
</tr>
<tr>
<td>Shapiro, Therapy, 1982 [133]</td>
<td>Therapy</td>
<td>CA</td>
<td>10 wks</td>
<td>E1 = 10, E2 = 13, E3 = 12</td>
<td>3</td>
<td>no yes —</td>
<td>not relevant</td>
<td>no no no no</td>
<td>Direct costs ^a</td>
<td></td>
</tr>
<tr>
<td>First author</td>
<td>Intervention</td>
<td>Nature Study (final)</td>
<td>Number</td>
<td>Prestratification/Blinding</td>
<td>Main outcome measures</td>
<td>Discounting/ Sensitivity</td>
<td>Marginal Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>----------------------</td>
<td>--------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
<td>-------------------------</td>
<td>---------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinokur, Prevention</td>
<td>CBA</td>
<td>32 mths</td>
<td>E = 606</td>
<td>2</td>
<td>no</td>
<td>no</td>
<td>Wages</td>
<td>1989</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C = 322</td>
<td>Hours worked</td>
<td>dollars</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C = 55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiersma, Location of CA</td>
<td>2 yrs</td>
<td>E = 34</td>
<td>2</td>
<td>no</td>
<td>no</td>
<td>—</td>
<td>no</td>
<td>—</td>
<td>1991, 1995 care/therapy</td>
<td>C = 16</td>
</tr>
</tbody>
</table>

and appliances and rehabilitation. Indirect costs reflect the value of changes in health status and productivity that result from the health care intervention.143

All the studies in our review included the direct medical costs and 15 studies included the direct non-medical costs.1, 51, 53, 56, 57, 60, 61, 66, 68, 70, 78, 82, 84–86, 89, 92, 93, 107, 113, 118, 127, 130, 135, 142, 145, 147, 156 Generally covering law enforcement costs,1, 51, 53, 56, 57, 78, 80, 90, 121, 125 transportation costs,1, 54, 55, 118, 125, 135, 145 house-keeping costs,1, 56, 57, 118 and care provided by family and friends.1, 51, 53, 72, 90, 113, 135 Indirect costs were measured by the patient's lost productivity in 27 studies.1, 51, 53, 56, 57, 60, 61, 66, 68, 70, 78, 82, 84–86, 89, 92, 93, 107, 113, 118, 127, 130, 135, 142, 145, 147, 156 While one study125 measured lost productivity in the patient's family. Other indirect costs considered were mortality,66, 85, 121 and foregone leisure time.118

A though intangible costs are not quantifiable in monetary terms, they can be very important. Especially in mental health care, psychosocial costs such as grief and loss of well-being play a major role. Seven studies1, 56, 72, 78, 86, 118, 130, 145 mentioned these costs as being relevant and tried to fit them into the analysis.

**Measurement of costs:** There are several ways to collect cost data. One can use records available through health service providers,1, 56, 57, 68, 69, 76, 79, 102, 106, 110, 116, 121, 122, 127, 130, 144–147 In addition, case registers or other macro-level records (e.g. Medicaid records, California County Public Mental Health Information System) can be employed to glean information from several institutions.58, 59, 77, 92, 106, 114, 117, 125, 128, 136, 148, 149 Several problems may arise in using these resources. First, it may not be possible to record total medical consumption, as both suppliers and insurance companies register only a part of the service system. Second, using these sources it is not possible to measure costs borne by patients and their families. Finally, information is only available at an aggregate level and not on a patient level.

To measure information at a patient level one can also record the resources used1, 54, 55, 64, 65, 72, 73, 119, 120, 150 or time spent in treatment74, 75, 78, 96, 119, 123, 124, 132, 133 by each patient. In some studies special forms or charts are used to register the services used.51, 53, 72, 115, 121, 125, 136, 137, 151 This assessment is sometimes done by the researcher, using specially designed instruments.136, 145 A nother possibility is to contact all providers and payers of health care facilities and use their medical and billing records.60, 61 Often several sources are used, especially in cost-of-illness studies.

If one wants to get a full picture of the costs and especially if one wants to include the out-of-pocket expenses and indirect cost, one can interview the patient and/or the patient's family.51, 53, 56, 57, 64, 65, 68, 70, 102, 107, 113, 121, 125, 127, 135, 138, 145 or send a questionnaire to them.68, 118, 130 A number of researchers supplemented the cost data which they had obtained themselves by adapting data from other studies.74, 86, 93, 97, 131, 134, 141, 152–154 or by making a model to discover how large the costs are.99, 111 If data are not available from any of these sources, one can estimate the cost.1, 66, 86, 101, 103, 112, 140, 155 A number of studies did not describe how costs were actually measured.57, 71, 80, 93, 109, 139, 156

**Valuation of costs:** Only a few studies calculated the actual cost prices.68, 125, 136 As is common in economic evaluation studies, charges were used as a proxy for the costs in many studies.56–61, 70, 73, 74, 84, 86, 87, 91, 98, 102, 106, 107, 111, 113, 116, 128, 135, 140, 142, 150 Charges are not costs but rather ‘negotiated prices’. In a perfect market, prices equal the opportunity costs. In the health care market, prices are distorted by a variety of forces, including cross-subsidization and cost-shifting. Therefore charges are not an appropriate way of estimating costs.157 M any studies also used average costs.

To attribute monetary values to the cost items, a wide range of sources are available, such as surveys, time and motion studies, national statistics, other studies and insurance claims.158 Information available from other studies or through other institutions was used in 11 studies.93, 97, 117, 127, 131, 134, 141, 147, 151, 153 Burton et al.101 calculated the additional costs only for psychiatric consultation, as costs for other aspects are already available. The remaining studies specified the evaluation of only part of the costs.79, 96, 118, 123, 130, 151 Estimated the costs,64–66, 112, 140, 152 or their method of evaluation was unclear.64, 65, 66, 67, 71, 75, 96, 100, 109, 119, 127 About 9% of the studies reviewed explicitly mention the valuation of indirect costs. All the studies which actually gave a value to indirect costs used earnings.51–53, 68, 86, 118, 125, 130, 145, 156 Hence only a few studies included production.
losses. This may be because measurable productivity would not be expected to increase or decrease, because patients with a psychiatric diagnosis are not likely to have a job.26

Marginal costs and opportunity costs: To conclude this section, two concepts which lie at the heart of all economic analysis are addressed: marginal analysis and opportunity costs.26

In a marginal analysis, the additional incremental investment in resources to obtain additional benefits is studied.26 Of the studies surveyed, six22,73,101,113,117,152 examined the additional costs and savings.

The opportunity cost of an activity is the value of the alternative endeavours that might have been undertaken with the same resources. Most decisions are made within a budgetary context: not every intervention can be performed, so choosing one alternative entails forgoing the benefits which might have been derived from the next best alternative. Full economic evaluations are built on the basic economic concept of opportunity costs and deal with these costs at least implicitly. A number of the studies examined here also explicitly noted the opportunity costs of the intervention studied.51–53,113

Discounting and sensitivity analysis

The costs and outcomes of health care interventions will accrue over time. An individual will usually prefer benefits today to benefits tomorrow and costs tomorrow rather than costs today. This time preference has to be built into estimates of both costs and outcomes to reflect their current values.159 Discounting is the process of calculating the present value of future costs and benefits. Where the expenditures and benefits of the intervention will arise at different times in the future, the costs and benefits have to be discounted at some rate to find their present value. In general, programmes that require current investments to achieve benefits far in the future are most strongly affected by the choice of a discount rate.95 Discounting is not relevant if the study period is less than 1 year.73,75,77,92,114,119–121,123,131–133,147,150,151 In our review, 22 studies54,55,58–61,66,69–71,74,78,88,90,93,102,113,118,130,134–136,141,145 discounted or indexed the results to a certain year, with discount rates usually varying between 2.5 and 6%. The most frequently used rates were 5% and 6%.71,78,90,93,134 In one study varying rates were used for the purpose of sensitivity analysis.71

Finally it is important to perform a sensitivity analysis to check the influence of the assumptions made and the robustness of the conclusions. A sensitivity analysis usually tests the highest, median and lowest estimate of relevant factors (such as costs, the effectiveness of the treatment and the discount rate) to highlight sensitive components of the calculation. If the results of such manipulations are minor, the results may be held with greater confidence. If the sensitivity analysis produces large changes in the results, then greater caution is necessary when interpreting the data. A sensitivity analysis was performed in nine of the studies.54,55,66,74,86,88,134,136,138,151

CONCLUSION AND DISCUSSION

This article has reviewed 91 economic evaluation studies in mental health care. Although this review does not employ a criteria-based scoring system, a few remarks can be made about the quality of these economic evaluation studies. The first thing which is striking is that only a few full economic evaluation studies have been undertaken in the field of mental health care. Most of the studies were restricted to analyses of the costs only, that is, they are cost analyses or cost-of-illness studies. Regarding the epidemiological design, randomized controlled trials are generally regarded as the most scientifically rigorous method of hypothesis testing. However, the possibilities of randomization in mental health care are not always realistic. In our review, 30% of the studies were based on randomized controlled trials. Almost all of the studies used clinical outcome measures or an assessment of the consumption of (medical) resources to value the consequences of the treatment. Few studies use health-related quality of life measures, although quality of life is regarded as the broadest concept for valuing consequences. Especially in mental health care, where intangible costs such as psychosocial consequences play an important role, quality of life assessment and utility measurement should be used to quantify these effects.

Only a few studies explicitly measured overhead costs and indirect costs. The measurement and valuation of these costs was often unclear.
Almost all studies used charges as a proxy for costs. Owing to the small number of studies per subject and considerable differences in methodological issues, no conclusion can be drawn regarding any particular interventions. Epidemiological data-pooling is therefore also not possible.

The poor quality of the studies is not unique to mental health care: other authors have also found that very few studies adhere to the basic principles of economic evaluation. Only a few of the articles reviewed were, in our opinion, good examples of economic evaluation. A though it is difficult to judge, we do not have the impression that the studies have improved over time. This may be because some of the early studies were carried out in cooperation between economists and experts in the field of mental health care. For example, one of the objectives of the study of Weisbrod et al. was to illustrate the importance and feasibility of collaboration between economists and mental health experts. This seems to have worked out well since Weisbrod et al.’s study was one of the best included in our overview.

This review assessed the methodological aspects of economic and epidemiological analyses. Some authors state that there is little consensus on the importance of such issues. There is often controversy about which costs and consequences should be included. Regardless of the relevance of these factors, the overall impression is that the quality of economic evaluation in mental health care could be improved, especially in cost measurement. If the methodological quality of such studies is poor, the results cannot be used to underpin decisions. The quality could be improved to some extent simply by using the basic principles described by experts in the field of economic evaluation.

However, in mental health care one will always confront some additional problems, described by Conley as long ago as 1967. First, no precise measurement of the cost of mental illness is possible, as there are no appropriate criteria for defining the diseases. Varying the social tolerance as to acceptable behaviour may mean including or excluding several million people from the mentally ill population. Furthermore, the available data are sometimes grossly inadequate. There are several other reasons why economic evaluation is not yet so popular in mental health care. The measurement of effectiveness in mental health care is often complicated because of the known difficulties with the reliability of psychiatric diagnosis and frequent lack of consensus about the etiology and appropriate treatment for many psychiatric illnesses. Next to this effect measurement may be hindered by the patients’ lack of rationality and ability to express opinions and valuations. In addition, the treatments are sometimes compulsory, ill-defined and many have not been ‘proven’ effective. Furthermore, the success of treatment for any chronic disease may vary over time. For instance, how long must an alcoholic be alcohol-free in order to label the outcome of the treatment a success? For the indirect costs ‘foregone wages’ are an important item in economic evaluation, as a way of measuring productivity loss as a result of being under treatment. The mentally ill are less likely to be employable. Furthermore, psychiatric patients often lose their jobs in the prodromal phase, before they are actually diagnosed as being mentally ill. Lastly, mental illnesses are stigmatising and may result in considerable external effects, such as criminality and becoming homeless.

Finally, a researcher in the field of economic evaluation must bear a lot of epidemiological as well as economic aspects in mind. The checklist which was developed for this study can be used to examine the issues in a more systematic way, both when reviewing the literature and as a guideline for the development of future protocols.

ACKNOWLEDGEMENTS

The authors thank Richard Janssen and Mariëlle Goossens for reviewing earlier versions of the manuscript. The authors would also like to express their thanks to Jan-Willem Duyndam for entering the data, Jan van Emmerik and Maria Kalivas for their assistance in preparing the manuscript and two anonymous reviewers for comments on this paper. This study is supported in part by a grant from the Netherlands Health Research Promotion Programme.

REFERENCES

2. Eisenberg, J. M. Clinical economics; A guide to the economic analysis of clinical practices. Journal
of the American Medical Association 1989; 262: 2879–86.
20. Department of Clinical Epidemiology and Biostatistics, McMaster University Health Sciences Centre. How to read clinical journals: VII. To understand an economic evaluation (part A). Canadian Medical Association Journal 1984; 130: 1428–34.
ECONOMIC EVALUATION OF MENTAL HEALTH CARE INTERVENTIONS 173


90. Ross, C. A. and Duval, V. Psychiatric health care
117. Rupp, A. The economic consequences of not


