Cost-utility of brief psychological treatment for depression and anxiety

LEONA HAKKAART-VAN ROIJEN, ANNEMIEKE VAN STRATEN, MAIWENN AL, FRANS RUTTEN and MARIANNE DONKER

Background The cost-utility of brief therapy compared with cognitive–behavioural therapy (CBT) and care as usual in the treatment of depression and anxiety has not yet been determined.

Aims To assess the cost-utility of brief therapy compared with CBT and care as usual.

Method A pragmatic randomised controlled trial involving 702 patients was conducted at 7 Dutch mental healthcare centres (MHCs). Patients were interviewed at baseline and then every 3 months over a period of 1.5 years, during which time data were collected on direct costs, indirect costs and quality of life.

Results The mean direct costs of treatment at the MHCs were significantly lower for brief therapy than for CBT and care as usual. However, after factoring in other healthcare costs and indirect costs, no significant differences between the treatment groups could be detected. We found no significant differences in quality-adjusted life-years between the groups.

Conclusions Cost-utility did not differ significantly between the three treatment groups.

Declaration of interest None. Funding detailed in Acknowledgements.

Time-limited psychotherapy has been introduced partly in response to economic considerations and partly because of patient preferences for brief interventions (Jarrett & Rush, 1994). In addition, the demand for psychological treatment appears to have been motivated by concerns about the side-effects of medication and about potential drug dependency, and by a reluctance to use biochemical therapy to resolve psychological problems (Churchill *et al*, 2001). In The Netherlands, psychological treatment is generally provided by out-patient mental healthcare centres (MHCs, the former Regional Institutes for Ambulatory Mental Health).

At these MHCs, an approach known as brief therapy, namely a short-term psychological treatment consisting of a maximum of seven sessions, is currently growing in popularity. The aim of this study was to assess the long-term cost-effectiveness of brief therapy compared with cognitive–behavioural therapy (CBT) and care as usual as a first-line treatment in an MHC out-patient population. We used a pragmatic trial design to enhance external validity.

METHOD

Study sample

The study was a large multicentre randomised trial conducted in MHCs in The Netherlands. The MHCs are specialised mental healthcare institutes to which patients must be referred by a general practitioner (GP). Seven MHCs (Altrecht, Eleos, Emergis, Gelderse Roos, Mentrum, Zaanstreek/Waterland and Adhesie) participated in the study and were representative of the patient population. Patient selection was undertaken in two steps. Enrolment took place between February 2000 and October 2001, and follow-up data were collected until March 2003. First, during this period a total of 6095 new clients presented to the MHCs and were screened with regard to inclusion criteria (age 18–65 years, eligible for out-patient mental healthcare, not treated by the same MHC in the past year) and exclusion criteria (psychotic or bipolar disorder, cognitive impairment, high suicide risk, poor command of the Dutch language, hard drug misuse/dependence). Comorbidity associated with other psychiatric diagnoses (with the exception of psychotic or bipolar disorder) was allowed, and this included personality disorders, alcohol misuse/dependence and somatic disorders. Second, all of the remaining patients were assessed with the Composite International Diagnostic Interview (CIDI; Wittchen, 1994). Patients with the following DSM–IV diagnoses (American Psychiatric Association, 1994) were included: major depressive disorder (single episode or recurrent); dysthymic disorder; panic disorder (with or without agoraphobia); social phobia; or generalised anxiety disorder. Over a fifth of the interviewed patients were excluded ($n=1338$; 22%) or else failed to meet the inclusion criteria ($n=1257$; 21%). Nearly a third of the patients ($n=1995$; 33%) refused to participate, and 803 (13%) were not included for other reasons (e.g. not contactable because telephone number was incorrect, on holiday). In total, 702 patients gave their informed consent and were included in the study. This sample was somewhat smaller than the pre-set sample size of 750 patients.

A follow-up period of 1.5 years was chosen to establish the long-term effects on health status and costs. Measurements were recorded at baseline and then every 3 months. Patients were permitted to switch to an alternative treatment arm if their medical condition rendered this necessary. We applied intention-to-treat analyses.

Interventions

Brief therapy is a formalised 'stepped-care' approach. The therapy focuses mainly on the present, and emphasises abilities rather than disabilities. Brief therapy is expected to reduce costs and increase efficiency in the short term. Its claim to long-term cost-effectiveness in the Dutch mental healthcare setting for a broad range of psychiatric problems has not yet been confirmed by scientific evidence. Problems may recur at a later date, or patients may require additional treatment in mental healthcare services or other parts of the healthcare

sector and consequently generate additional costs. In the present study, patients who were undergoing brief therapy for depression or anxiety were compared with those who were receiving CBT, which had been shown by earlier studies to be an effective approach (Black *et al*, 1993; Cloaguan *et al*, 1998; Dorrepaal *et al*, 1998). In this study, CBT was formalised and the main focus was on altering irrational cognitions by challenging them. The maximum number of sessions was 15. In the same way as for brief therapy, a 'stepped-care' approach was adopted for CBT, in which all patients initially received a first-line treatment, and they were only switched to another therapy if the first therapy proved to be inadequate. In The Netherlands, care as usual is not formalised, and a multidisciplinary team is free to assign a therapy from a wide range of therapeutic options. The treatment decision is based on professional experience, taking into account the specific problems and characteristics of the individual patient. The number of sessions depends on the therapy that is offered. Evidence on the (cost-)effectiveness of care as usual is lacking. However, this type of 'matched care' is claimed to be more effective than a 'stepped-care' approach, in which one form of (relatively brief) therapy is started for all patients indiscriminately, and patients are switched to other options if there is no subsequent improvement or if side-effects occur.

Measures

At baseline, several demographic characteristics (e.g. age, gender, educational level and employment status) were assessed. In all interviews that were conducted during treatment, we assessed health-related quality of life, use of medical resources and productivity loss using the EuroQol Questionnaire (EQ–5D) (Essink-Bot *et al*, 1993) and the Trimbos and iMTA Questionnaire on Costs Associated with Psychiatric Illness (TiC–P; Hakkaart-van Roijen, 2002).

Quality of life

Quality of life was assessed with the EQ–5D, which is a validated tool for measuring general health-related quality of life. It consists of five items (mobility, self-care, usual activities, pain/discomfort and anxiety/depression), each of which is rated as causing 'no problems', 'some problems' or 'extreme problems'. The health descriptions can be linked directly to empirical values for health states of the general public, which allows utilities to be computed (Essink-Bot *et al*, 1993). The patient mean utility scores were estimated by applying the area-under-the-curve method, which involves summing the areas of the geometrical shapes obtained by linearly interpolating between utility scores over the study period (Matthews *et al*, 1990).

Direct and indirect costs

The economic evaluation was undertaken from a societal perspective, and included costs due to medical resource utilisation (direct medical costs) and costs attributable to production losses (indirect costs).

We used the TiC–P to collect data on direct and indirect costs from the patients (Hakkaart-van Roijen, 2002). The first part of the Tic–P measures medical resource utilisation by asking for the number of contacts with different (medical and psychological) healthcare providers (e.g. GP, psychiatrist, medical specialist, physiotherapist, alternative health practitioner, day care/hospital length of stay, and medication) during the past 4 weeks. We assumed that the number of contacts and/or days in those 4 weeks were representative of the total period between assessment points (an average of 3 months). Data on the number of contacts at the MHCs were collected directly from the participating centres. Subsequently, the number of medical contacts was multiplied by the unit costs for 2002 (Oostenbrink *et al*, 2000; College for Health Insurance (CVZ), 2002). All costs were estimated for the year 2002 and are presented in euros.

The second part of the TiC–P measures productivity losses and includes a short version of the Health and Labour Questionnaire (van Roijen *et al*, 1996; Dam *et al*, 1998). Data on the number of days of absence from work were divided into short-term and long-term absence from work. Short-term absence referred to periods of less than 2 weeks. When calculating the indirect costs due to short-term absence from work, we assumed that the number of days lost over the past 2 weeks was representative of the total period between the measurement points (an average of 3 months). However, if respondents indicated that they had been absent for the whole of the past 2 weeks, we collected additional information concerning when this period of long-term absenteeism had begun, as the recall period for long-term absence from work was determined by the start of this period. This additional information was used to value the production losses according to the friction cost method (Koopmanschap *et al*, 1995; Koopmanschap & Rutten, 1996). The period of time needed to replace a worker (the so-called 'friction period') in 2002 is estimated to be 154 days. Absenteeism among workers was valued by the average production value by age and gender per day or per hour.

Patients may go to work despite being ill, which may impair job performance. Therefore all patients who had worked were asked if they had experienced 'no impediment' or 'some/considerable impediments'.

Data analysis

Costs and quality-adjusted life-years

The results of the cost and quality-adjusted life-year (QALY) analyses are presented as mean values with standard errors. Data on the number of contacts at the MHC were collected directly at the centres, and therefore data were available for nearly all patients (n=611; 87%). However, data on healthcare utilisation and absence from work for estimating other health costs and indirect costs and quality of life were collected by means of a questionnaire. At baseline, data from the TiC–P and the EQ–5D were available for 646 (92%) of the participants in all treatment groups. At the 1-year follow-up and 1.5-year follow-up, data from the TiC–P and the EQ–5D were available for 423 (60%) and 394 (56%) of the respondents respectively. Data with regard to individual resource-use items were unavailable for a small proportion (3%) of patients.

To account for the missing data and the additional uncertainty that they introduce, we used the multiple imputation technique in which each missing value is replaced by $m > 1$ simulated values (Rubin, 1987; Rubin & Schenker, 1991; Lavori *et al*, 1995). After the multiple imputations have been created, m plausible versions of the complete data exist, each of which is analysed by standard methods. The results of the multiple imputation analyses are then combined to produce a single result that includes uncertainty owing to the missing data (Rubin & Schenker, 1991; Rubin, 1996; Schafer, 1997). For the proportion of missing data in the present study, m=10 was found to be sufficiently large to stabilise the outcomes in terms of the

standard errors for all analyses (Schafer, 1997). The overall mean costs are simply calculated as the mean of the mean costs in each data-set. The overall associated variance is determined by combining the variance within data-sets with the variance between data-sets (Schafer, 1997). We used the Monte Carlo Markov Chain approach to impute the missing values. This approach assumes that the underlying distribution is multivariate normal. However, it has been shown in a large simulation study that even with skewed data this method often performs well (Oostenbrink & Al, 2005).

Standard errors were derived both by the parametric approach as suggested by Rubin (1996) and by a (non-parametric) bootstrap procedure (Rubin & Schenker, 1991). However, because these two methods yielded equivalent results, only the parametric standard errors are presented here.

Cost-utility

Cost-utility was evaluated by relating the difference in direct medical costs per patient who received either brief therapy or the control treatment (CBT or care as usual) to the difference in terms of QALYs gained, which yielded an estimate of cost per QALY. In addition, we estimated the cost per QALY including the indirect costs.

Uncertainty was assessed by means of bootstrapping, and the results are presented as acceptability curves (van Hout *et al*, 1994). Since we were dealing here with three interventions instead of two, we used an adjusted version of the acceptability curve, which leads to a cost-effectiveness frontier that indicates which treatment is optimal for various threshold incremental cost-effectiveness ratios (Fenwick *et al*, 2001).

Sensitivity analyses

The way in which missing data are handled is vitally important when assessing the results of economic evaluations (Oostenbrink *et al*, 2003; Oostenbrink & Al, 2005). Therefore two alternative methods for imputing missing data, namely linear extrapolation and complete case analysis, were applied in the sensitivity analysis. Applying linear extrapolation, the other healthcare costs and costs due to short-term absence from work were extrapolated to 1.5 years by dividing the observed costs of each patient by the number of observed days for which the patient remained in the study, and multiplying the results by 548.

The complete case analysis excluded the data for all patients who dropped out of the study before the 1.5-year follow-up.

Statistical analysis

Multiple imputation analysis was performed using PROC 'MI' in SAS for Windows (available in version 8.02 and higher). All other statistical analyses were performed using SPSS version 10.1 for Windows.

RESULTS

The initial characteristics of the patients in the three treatment arms were fairly similar with regard to key variables (Table 1). In total, 41% of the patients had both a mood disorder and an anxiety disorder, 47% had a mood disorder only and 12% had an anxiety disorder only. Over half of the patients who were in paid employment had been absent for a period of over 2 weeks at baseline. More than 40% of the patients who were not in paid employment indicated that this was a result of health problems. At baseline, the mental health functioning of the patients in the CBT group was significantly lower than that of patients in the brief therapy group (Table 1).

At baseline, there were no statistically significant differences in demographic data, health status or costs between the group for which there was a complete data set and the respondents who were lost to follow-up.

Table 1 General characteristics of the respondents at baseline (*n*=702)

	Care as usual (*n*=266)	CBT (*n*=232)	Brief therapy (*n*=204)	Total (*n*=702)
Age (years): mean (s.d.)	36 (10)	36 (10)	37 (10)	36 (10)
Gender (% male)	35	40	43	39
DSM–IV diagnosis[1] (%)				
First depression, mild	12	12	10	11
First depression, moderate	16	14	13	15
First depression, severe	23	28	20	24
Recurrent depression, mild	14	14	20	16
Recurrent depression, moderate	10	10	10	10
Recurrent depression, severe	11	8	12	11
Dysthymia	24	28	28	27
Panic disorder without agoraphobia	13	12	15	13
Panic disorder with agoraphobia	23	21	23	22
Social phobia	26	29	26	27
Generalised anxiety	3	6	3	4
Respondents in paid employment (%)	62	68	70	66
Paid employment (hours/week): mean (s.d.)	29 (11.3)	31 (10.4)	32 (10.7)	31 (10.9)
Respondents in paid employment[2]				
No impediments at work (%)	13	12	16	14
Impediments at work (%)	30	30	33	31
Absent for ⩽2 weeks (%)	16	11	12	13
Absent for >2 weeks (%)	57	57	50	55
Respondents not in paid employment				
Care for household (%)	38	43	34	38
Health problems (%)	48	43	39	44
Receiving pension (%)	3	1	1	2
Student (%)	4	8	6	6
Other[3] (%)	8	5	20	11
EQ–5D utility score	0.51	0.52	0.53	0.52

CBT, cognitive–behavioural therapy; EQ–5D, EuroQol Questionnaire.
1. Patient may have more than one diagnosis.
2. Patient may have reported impediments at work and short-term absence from work.
3. For example, unemployed, voluntary worker.

Direct and indirect costs

Table 2 shows the estimated total mean direct medical costs and indirect costs per patient over a period of 1.5 years. As was expected, the mean number of contacts and the associated costs in the MHCs were significantly lower in the brief therapy group than in the CBT group (95% CI €169 – €741) or the usual care group (95% CI €14 – €464). However, no significant difference was found between the three treatment groups with regard to the mean total direct medical costs per patient (i.e. including the costs due to resource utilisation in other parts of the healthcare service), nor was there a significant difference in indirect costs between the three treatment groups.

Over time, for all treatment groups the percentage of patients in paid employment who had long-term absence from work declined, and conversely the percentage of patients who had no impediments increased (Table 3).

Table 2 Mean direct medical costs and indirect costs[1]

	Care as usual	CBT	Brief therapy
Number of patients	245	241	187
Number of sessions: mean (s.d.)	12 (14)	10 (7)	8 (11)
Costs (€): mean (s.e.)			
MHC	1396 (107)	1180 (58)	941 (99)
Other medical care	1964 (235)	1947 (239)	2738 (395)
Total direct medical costs	3360 (251)	3127 (255)	3679 (417)
Indirect costs	6151 (551)	6621 (683)	6537 (675)
Total costs (direct and indirect)	9511 (607)	9748 (747)	10216 (816)

CBT, cognitive–behavioural therapy; MHC, mental healthcare centre.
1. Using 2002 values.

Table 3 Percentage of respondents in paid employment with impediments, and short-term and long-term absence from work by treatment group[1]

	Care as usual	CBT	Brief therapy	Total
Baseline				
n	149	141	130	420
No impediments at work (%)	13	12	16	14
Impediments at work (%)	30	30	33	31
Absent from work for <2 weeks (%)	15	11	12	13
Absent from work for ≥2 weeks (%)	56	57	50	55
One-year follow-up				
n	95	80	90	265
No impediments at work (%)	46	46	48	47
Impediments at work (%)	29	38	30	32
Absent from work for <2 weeks (%)	8	15	11	11
Absent from work for ≥2 weeks (%)	20	16	19	18
End of study (1.5 years)				
n	86	80	77	243
No impediments at work (%)	52	63	43	53
Impediments at work (%)	33	30	40	35
Absent from work for <2 weeks (%)	17	14	16	16
Absent from work for ≥2 weeks (%)	12	8	17	12

CBT, cognitive–behavioural therapy.
1. The total percentage may be more than 100% because respondents may have been absent from work (short term) and had impediments or no impediments while working during the past 2 weeks.

Quality of life

The utility scores for the three treatment groups also showed significant improvement during the study period and did not differ significantly between the groups (Table 4). The improvement in utility scores was moderate during the first year, but was low during the final 6 months of follow-up (Cohen, 1988). At the end of the study period, the patients' quality of life was still significantly lower than the average utility score of the general population (0.88) (Table 4).

Cost utility

Table 5 shows the incremental cost-effectiveness ratios both for direct medical costs per QALY gained and for total costs per QALY gained. As we are comparing three treatment options, we have reported the results in the format suggested by Karlsson & Johannesson (1996). The treatments are ordered from least to most effective. Comparison of the direct medical costs of care as usual and CBT shows that CBT is superior to usual care (with lower costs and better outcomes), so an incremental cost-effectiveness ratio is only calculated for brief therapy v. CBT, yielding a value of €262 857 per QALY gained. With regard to total costs the same relationship applies (CBT could achieve the same number of QALYs at lower costs), so again only the incremental cost-effectiveness ratio for brief therapy v. CBT is calculated, yielding a value of €222 956 per QALY gained.

To assess the uncertainty, we constructed acceptability curves for each treatment by calculating the proportion of bootstrap replicates for which that treatment is optimal, for a number of threshold incremental cost-effectiveness ratios (Fig. 1) (Fenwick et al, 2001). Figure 1 relates to the direct medical costs per QALY, and it indicates that, taking uncertainty into account, CBT is optimal. However, the preference for CBT becomes less strong as the threshold incremental cost-effectiveness ratio increases. The same is true if all costs are considered (data not shown).

Sensitivity analyses

In the sensitivity analyses of the missing data, we recalculated the costs and QALYs by performing linear extrapolation and complete case analysis (Table 6). Again no significant difference was found between the groups in overall mean costs and

Table 4 Utility scores by treatment arm at baseline, at 1 year and at the end of the study (1.5 years), and QALYs per patient at the end of the study

	Care as usual	CBT	Brief therapy
Number of patients	245	214	187
Baseline			
Utility score (s.e.)	0.51 (0.02)	0.52 (0.02)	0.53 (0.02)
Number of patients	165	127	131
One-year follow-up			
Utility score (s.e.)	0.64 (0.02)	0.68 (0.02)	0.64 (0.03)
Number of patients	147	111	126
End of study (1.5 years)			
Utility score (s.e.)	0.69 (0.04)	0.65 (0.04)	0.71 (0.04)
QALYs (s.e.)	0.909 (0.03)	0.936 (0.03)	0.939 (0.03)

CBT, cognitive–behavioural therapy; QALYs, quality-adjusted life-years.

Table 5 Costs, effects and incremental cost-effectiveness ratio for the three treatment groups

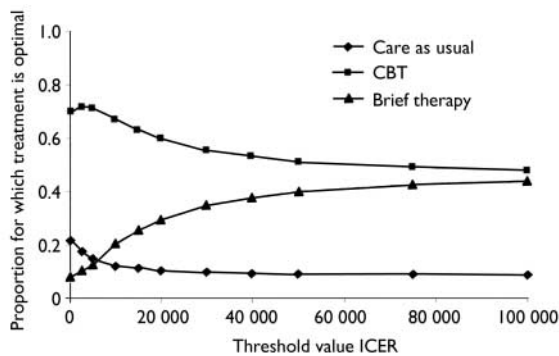| Treat-ment	QALYs	Direct medical costs (€)	ICER	Total costs (€)	ICER
Care as usual	0.91	3360	CBT could achieve the same number of QALYs at lower cost than treatment as usual	9511	CBT could achieve the same number of QALYs at lower cost than treatment as usual
CBT	0.94	3127		9748	
Brief therapy	0.94	3679	262 857	10 216	222 956

QALYs, quality-adjusted life-years; ICER, incremental cost-effectiveness ratio; CBT, cognitive–behavioural therapy.

QALYs. When only 48% of the participants were used for the complete case analysis this resulted in comparable findings to those of the linear extrapolation analysis, but with much larger standard errors.

DISCUSSION

To our knowledge, this study is the first long-term cost-utility analysis of brief therapy in the Dutch mental healthcare setting to be conducted from a societal perspective. It demonstrated that brief therapy was less costly to the MHCs than CBT or care as usual. Taking into account the direct medical healthcare costs in other parts of the healthcare system, we found no significant differences in costs between the treatment groups, nor were there any significant differences in utility scores between the groups. These findings suggest that the cost savings resulting from brief therapy were cancelled out by higher costs in other areas of healthcare. Inclusion of the indirect costs due to productivity losses did not change our conclusion. In addition, our study confirmed that the indirect costs due to productivity losses were responsible for the majority of the costs of depression and anxiety to society. Over time, the indirect costs declined significantly and there was a significant improvement in health-related quality of life for all three treatment groups.

Sample selection

We conducted a large-scale multicentre randomised trial in the setting of general mental healthcare services in The Netherlands. External validity may have been affected by selection bias resulting from patients either refusing to enter the study or being lost to follow-up. Our data on refusal and our missing data seem to be comparable to those of other important trials (Lambert & Ogles, 2004). Moreover, treatment drop-out in this study was comparable to that in the general population of MHC patients (van der Sande et al, 1992). We recruited patients with a wide range of mood and anxiety disorders, comparable to a normal population of out-patient mental healthcare patients. Furthermore, the patients in our trial reported more (severe) psychological symptoms at baseline (mean score of 223 on the 90-item Symptom Checklist (SCL–90) (Derogatis, 1977)) than did a reference population of arbitrarily selected Dutch psychiatric out-patients (mean SCL–90 score=204) (Arrindell & Ettema, 2003). There was no indication of any selection bias leading to the enrolment of only 'mild' cases in the study. Furthermore, we found no significant differences in baseline characteristics or mental health status between patients who completed the study and those who did not. Therefore there is no compelling reason to believe that selection bias affected the external validity of the study.

Study design

Unfortunately, this study did not provide an opportunity to evaluate the cost-effectiveness of psychological treatment compared with natural recovery of the patient. The potential effect of antidepressant medication, which was allowed in addition to the treatment to which patients were randomised, is also unclear. At baseline, 36% of the respondents used antidepressant medication,

Fig. 1 Acceptability curves for the three treatment options, for direct medical costs per QALY gained. CBT, cognitive–behavioural therapy; ICER, incremental cost-effectiveness ratio; QALY, quality-adjusted life-year.

Table 6 Cost per QALY after applying multiple imputation, linear extrapolation and complete cases analysis of the missing data for the three treatment groups

	Care as usual	CBT	Brief therapy
Multiple imputation			
Direct medical costs (€): mean (s.e.)	3360 (251)	3127 (255)	3679 (417)
Indirect costs per patient (€): mean (s.e.)	6151 (551)	6621 (683)	6537 (675)
QALY: mean (s.e.)	0.909 (0.03)	0.936 (0.03)	0.939 (0.03)
Linear extrapolation			
Direct medical costs (€): mean (s.e.)	3573 (295)	3191 (240)	3605 (327)
Indirect costs per patient (€): mean (s.e.)	6331 (567)	6383 (672)	6061 (693)
QALY: mean (s.e.)	0.895 (0.03)	0.931 (0.03)	0.906 (0.03)
Complete cases analysis			
Direct medical costs (€): mean (s.e.)	3770 (392)	2924 (360)	3792 (594)
Indirect costs per patient (€): mean (s.e.)	5767 (717)	6135 (925)	6263 (928)
QALY: mean (s.e.)	0.914 (0.03)	1.009 (0.03)	0.920 (0.04)

CBT, cognitive–behavioural therapy; QALY, quality-adjusted life-year.

and there were no significant differences between the treatment groups.

Direct costs

It was not possible to distinguish between healthcare utilisation for depression and/or anxiety disorders and that for eventual other general healthcare problems which relied on other areas of the healthcare system. However, this was equally true for all three treatment groups. Furthermore, data were collected on healthcare utilisation, which it was expected would be relevant to the treatment of psychological problems. Data on healthcare utilisation other than sessions at the MHCs were collected by self-report. A previous study has indicated that such patients' self-reports are a valid source of data on days of hospitalisation and out-patient visits. However, costs of medication may be underestimated (van den Brink *et al*, 2004).

Indirect costs

Our study indicated that inclusion of the indirect costs for patients with depression and/or anxiety was highly relevant. We did not assess productivity losses resulting from reduced efficiency at work and from unpaid work (e.g. household work), because of the practical and methodological difficulties involved in measuring these losses. Consequently, the actual productivity losses to society were probably underestimated.

In a population that has social insurance it is unlikely that respondents include the societal impact of ill health in quality-of-life measures, because they do not bear the full consequences of their reduced productivity (Brouwer *et al*, 1997; Meltzer & Johannesson, 1999). Recently, an empirical study by Sendi & Brouwer (2005) indicated that respondents do not include the effect of ill health on income if the instrument used does not explicitly ask about this effect (as is the case for the EQ–5D).

Cost-effectiveness

The results of our study are consistent with the findings of a systematic review on the effectiveness and cost-effectiveness of brief psychological treatments for depression (Churchill *et al*, 2001). The review suggested that some forms of brief psychological treatment, particularly those derived from cognitive–behavioural models, are beneficial in the treatment of people with depression who are being managed outside the hospital setting (Churchill *et al*, 2001).

A cost-effectiveness study by Pyne *et al* (2003) estimated the cost per QALY of a primary care intervention for women with depression. Its findings suggested that enhanced care for women with depression was more expensive and more effective than usual primary care, the additional cost being US$5244 per QALY.

Overall, we found no cost savings of brief therapy over CBT or care as usual. However, in terms of the MHCs, brief therapy was a cost-effective treatment and may help to reduce waiting lists. In routine practice, 'stepped care' is characterised not only by fewer sessions, but also by an earlier start after intake. Subsequently, the MHCs may increase the quality of care that they provide by a formalised approach, and be more successful in meeting the preferences of patients. This might allow redistribution of some resources to the group of patients who are not effectively treated. This treatment policy should be supported by a monitoring system for detecting inadequately treated patients to ensure that there is a timely switch to a more appropriate treatment option.

REFERENCES

American Psychiatric Association (1994) *Diagnostic and Statistical Manual for Mental Disorders* (4th edn) (DSM–IV). Washington, DC: APA.

Arrindell, W. & Ettema, J. (2003) *Symptom Checklist. Manual of a Psychopathological Indicator*. Enschede: Ipskamp.

Black, D. W., Wesner, R., Bowers, W., et al (1993) A comparison of fluvoxamine, cognitive therapy, and placebo in the treatment of panic disorder. *Archives of General Psychiatry*, **50**, 44–50.

Brouwer, W. B., Koopmanschap, M. A. & Rutten, F. F. (1997) Productivity costs measurement through quality of life? A response to the recommendation of the Washington Panel. *Health Economics*, **6**, 253–259.

Churchill, R., Hunot, V., Corney, R., et al (2001) A systematic review of controlled trials of the effectiveness and cost-effectiveness of brief psychological treatments for depression. *Health Technology Assessment*, **5**, 1–173.

Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences* (2nd edn). Hillsdale. NJ: Lawrence Erlbaum.

College for Health Insurance (CVZ) (2002) *Pharmaceutical Compass*. Amstelveen: College for Health Insurance (CVZ).

Dam, Q. D., Spijker, A., Arends, L. R., et al (1998) Cost-effectiveness of psychotherapy: a feasibility study (in Dutch). *Journal of Psychotherapy*, **24**, 5–22.

Derogatis, L. R. (1977) *SCL–90: Administrative, Scoring and Procedures Manual (Revised)*. Baltimore, MD: Clinical Psychometrics Research Institute, Johns Hopkins University School of Medicine.

Dorrepaal, E., van Nieuwenhuizen, Ch., Schene, A., et al (1998) The effectiveness of cognitive and interpersonal therapy in depressed patients: a meta-analysis (in Dutch). *Tijdschrift voor Psychiatrie*, **40**, 27–39.

Essink-Bot, M. L., Stouthard, M. E. & Bonsel, G. J. (1993) Generalizability of valuations on health states

collected with the EuroQol questionnaire. *Health Economics*, **2**, 237–246.

Fenwick, E., Claxton, K. & Sculpher, M. (2001) Representing uncertainty: the role of cost-effectiveness acceptability curves. *Health Economics*, **10**, 779–787.

Gloaguen, V., Cottraux, J., Cucherat, M., et al (1998) A meta-analysis of the effects of cognitive therapy in depressed patients. *Journal of Affective Disorders*, **49**, 59–72.

Hakkaart-van Roijen, L. (2002) *Manual Trimbos/iMTA Questionnaire for Costs Associated with Psychiatric Illness* (in Dutch). Rotterdam: Institute for Medical Technology Assessment.

Jarrett, R. B. & Rush, A. J. (1994) Short-term psychotherapy of depressive disorders: current status and future directions. *Psychiatry*, **57**, 115–132.

Karlsson, G. & Johannesson, M. (1996) The decision rules of cost-effectiveness analysis. *Pharmacoeconomics*, **9**, 113–120.

Koopmanschap, M. A. & Rutten, F. F. (1996) A practical guide for calculating indirect costs of disease. *Pharmacoeconomics*, **10**, 460–466.

Koopmanschap, M. A., Rutten, F. F. H., van Ineveld, B. M., et al (1995) The friction cost method for measuring indirect costs of disease. *Journal of Health Economics*, **14**, 171–189.

Lambert, M. & Ogles, B. (2004) The efficacy and effectiveness of psychotherapy. In *Berin and Garfields' Handbook of Psychotherapy and Behaviour Change* (ed. M. Lambert). New York: John Wiley & Sons.

Lavori, P., Dawson, R. & Shera, D. (1995) A multiple imputation strategy for clinical trials with truncation of patient data. *Statistics in Medicine*, **14**, 1913–1925.

Matthews, J. N., Altman, D. G., Campbell, M. J., et al (1990) Analysis of serial measurements in medical research. *BMJ*, **300**, 230–235.

Meltzer, D. & Johannesson, M. (1999) Inconsistencies in the 'societal perspective' on costs of the Panel on Cost-Effectiveness in Health and Medicine. *Medical Decision Making*, **19**, 371–377.

Oostenbrink, J. B. & Al, M. J. (2005) The analysis of incomplete cost data due to dropout. *Health Economics*, **14**, 763–776.

Oostenbrink, J. B., Koopmanschap, M. A. & Rutten, F. F. H. (2000) *Manual for Research on Costs* (in Dutch). Amstelveen: College for Health Insurance (CVZ).

Oostenbrink, J. B., Al, M. J. & Rutten-van Molken, M. P. (2003) Methods to analyse cost data of patients who withdraw in a clinical trial setting. *Pharmacoeconomics*, **21**, 1103–1112.

Pyne, J. M., Smith, J., Fortney, J., et al (2003) Cost-effectiveness of a primary care intervention for depressed females. *Journal of Affective Disorders*, **74**, 23–32.

Rubin, D. B. (1987) *Multiple Imputation for Nonresponse in Surveys* (1st edn). New York: John Wiley & Sons.

Rubin, D. B. (1996) Multiple imputation after 18+ years. *Journal of the American Statistical Association*, **91**, 473–489.

Rubin, D. B. & Schenker, N. (1991) Multiple imputation in healthcare databases: an overview and some applications. *Statistics in Medicine*, **10**, 595–598.

Schafer, J. (1997) *Analysis of Incomplete Multivariate Data* (1st edn). London: Chapman & Hall.

Sendi, P. & Brouwer, W. (2005) Is silence golden? A test of the incorporation of the effects of ill health on income and leisure in health state valuations. *Health Economics*, **14**, 643–647.

van den Brink, M., van den Hout, W. B., Stiggelbout, A. M., et al (2004) Cost measurement in economic evaluations of health care: whom to ask? *Medical Care*, **42**, 740–746.

van der Sande, R., van Hoof, F. & Hutschemaekers, G. (1992) *Demand and Supply in the MHC.* Utrecht: NcGv.

van Hout, B. A., Al, M. J., Gordon, G. S., et al (1994) Costs, effects and c/e ratios alongside a clinical trial. *Health Economics*, **3**, 309–319.

van Roijen, L., Essink-Bot, M. L., Koopmanschap, M. A., et al (1996) Labor and health status in economic evaluation of health care. The Health and Labor Questionnaire. *International Journal of Technology Assessment in Health Care*, **12**, 405–415.

Wittchen, H. U. (1994) Reliability and validity studies of the WHO–Composite International Diagnostic Interview (CIDI): a critical review. *Journal of Psychiatric Research*, **28**, 57–84.

CLINICAL IMPLICATIONS

- Care as usual ('matched care') was not more cost-effetive than brief psychological therapy or cognitive–behavioural therapy ('stepped care').

- Brief psychological therapy may help to reduce the waiting lists of mental health care centres.

- Brief psychological therapy reduces the costs of mental healthcare centres and may allow redistribution of resources to the group of patients who are ineffectively treated.

LIMITATIONS

- Data on the use of other healthcare services and on short-term absence from work were collected from patients with a limited recall period.

- Complete service use data for other healthcare services and data on absence from work for the total follow-up period (1.5 years) were available for less than half of the respondents.

- The study provided no opportunity to evaluate the cost-effectiveness of psychological treatment compared with natural recovery of the patient.

LEONA HAKKAART-VAN ROIJEN, PhD, Institute for Medical Technology Assessment, Erasmus Medical Centre, Rotterdam; ANNEMIEKE VAN STRATEN, PhD, Department of Health Policy and Management, Erasmus Medical Centre, Rotterdam and Trimbos Institute, Utrecht; MAIWENN AL, PhD, FRANS RUTTEN, PhD, Institute for Medical Technology Assessment, Erasmus Medical Centre, Rotterdam; MARIANNE DONKER, PhD, Department of Health Policy and Management, Erasmus Medical Centre, Rotterdam, The Netherlands

Correspondence: Dr Leona Hakkaart-van Roijen, Institute for Medical Technology Assessment, PO Box 1738, 3000 DR Rotterdam, The Netherlands. Tel: +31 10 4088567; fax: +31 10 4089081; e-mail: l.hakkaart-vanroijen@erasmusmc.nl