Community mental health team management in severe mental illness: a systematic review†

SHAEDA SIMMONDS, JEREMY COID, PHILIP JOSEPH, SARAH MARRIOTT and PETER TYRER

Background Community mental health teams are now generally recommended for the management of severe mental illness but a comparative evaluation of their effectiveness is lacking.

Aims To assess the benefits of community mental health team management in severe mental illness.

Method A systematic review was conducted of community mental health team management compared with other standard approaches.

Results Community mental health team management is associated with fewer deaths by suicide and in suspicious circumstances (odds ratio=0.32, 95% CI 0.09–1.12), less dissatisfaction with care (odds ratio=0.34, 95% CI 0.2–0.59) and fewer drop-outs (odds ratio=0.61, 95% CI 0.45–0.83). Duration of in-patient psychiatric treatment is shorter with community team management and costs of care are less, but there are no gains in clinical symptomatology or social functioning.

Conclusions Community mental health team management is superior to standard care in promoting greater acceptance of treatment, and may also reduce hospital admission and avoid deaths by suicide. This model of care is effective and deserves encouragement.

Declaration of interest None.

Expanding community care for people with mental illness, despite recent concerns (Coid, 1994), remains formal policy in most countries in the world. The initial development of this was through psychiatric policy initiatives (MacMillan, 1963), often buttressed by community nurses. However, the major thrust has been the development of multi-disciplinary community mental health teams (CMHTs), which focus assessment and care away from hospital settings and offer a range of interventions tailored to the patients' specific needs (Thornicroft *et al*, 1999). This model of care, despite having a much lower profile than other models of community treatment, particularly assertive community treatment (ACT; Stein & Test, 1980; Marshall *et al*, 1999) is now pre-eminent and is the common form of liaison with primary care (Hafner & Klug, 1982). Despite this *de facto* recognition, there have been no systematic views on the effectiveness of this approach, an omission that has been corrected by this review.

METHOD

A comprehensive search of the relevant literature was undertaken using electronic databases (Biological Abstracts January 1982–January 1997, EMBASE 1980–1997, Medline 1966–1998 and PsycLIT 1974–1997), SCISEARCH (Science Citation Index), reference lists, searching and personal contact. Full details of the search strategy are detailed elsewhere (Tyrer *et al*, 2000). All randomised and quasi-randomised controlled trials of patients with severe mental illness (not formally defined in most studies, but defined here as "a psychiatric illness of sufficient severity to require intensive input and regular review") were included in the search. Using this definition it was assumed that at least half of the patients included would have a psychotic illness. For the purpose of the review, CMHT management was defined as generic care (i.e. care not supplemented by ACT, intensive case management or any other specific model) from a community-based multi-disciplinary team that provides a full range of interventions to adults aged 18–65 years with severe mental illness from a defined catchment area (Thornicroft *et al*, 1999). Standard care was defined as the usual care in the area concerned, provided that this care was not furnished by another community team. In most circumstances this was found to be hospital-based out-patient care.

Procedure

Two of the authors (S.S. and P.T.), both independently and in parallel, studied the abstracts, titles and descriptor terms of all downloaded material from the electronic searches; illegible reports were discarded and the selected original articles were retained. To check the completeness of the electronic search, references cited in all included papers were examined and personal contacts were written to in order to identify any other studies that might be appropriate. The same authors separately evaluated the acquired studies and matched them with the inclusion criteria defined above. Agreement was evaluated by the κ statistic and if overall agreement was less than 0.75 (the level regarded as excellent by Cicchetti & Sparrow, 1981) then the strategy of the selection was reviewed. Where disagreement occurred, a third reviewer (S.M.) was asked to resolve the dispute. When resolution was not possible, the study was added to those awaiting assessment and the authors were contacted for further data.

Outcome measures and analysis

The outcomes measured included:

(a) Death.

(b) Acceptability of management (measured by loss to follow-up, i.e. leaving the study early).

(c) General (global) improvement.

(d) Number of episodes of psychiatric hospitalisation and their duration.

(e) Psychopathology and social function.

(f) Costs.

Dichotomous and continuous data were analysed on an intention-to-treat basis because evaluation of CMHT management

†See invited commentary, pp. 503–505, this issue.

https://doi.org/10.1192/bjp.178.6.497 Published online by Cambridge University Press

is suitable for a pragmatic approach. Because a wide range of instruments is available to measure outcomes in community care, it was decided to include data from instruments that have been published in a peer review journal in which the validity and reliability had been demonstrated to the satisfaction of referees. Because many of the outcomes of community care are not normally distributed, the following standards were applied to all data before they could be combined in meta-analysis: standard deviations and means of reportage in the paper were obtainable from the authors; and standard deviations when multiplied by 2 were less than the mean (otherwise the mean was unlikely to be an appropriate measure of the centre of distribution) (Altman & Bland, 1996; Parmar *et al*, 1996).

All normally distributed data were entered into the RevMan software (the Cochrane Collaboration Statistical Program), which allowed data to be combined for meta-analysis. The odds ratio (OR) and 95% confidence intervals (CI) were calculated for each study as well as for combined data.

RESULTS

A total of 1200 citations were found using the search strategy, of which 65 were judged to be relevant and full details of the publications were obtained. Of these, five satisfied the inclusion criteria: one from Australia (Hoult *et al*, 1981), one from Canada (Fenton *et al*, 1979) and three from London, UK (Merson *et al*, 1992; Burns *et al*, 1993*a*,*b*; Tyrer *et al*, 1998) (Table 1). Of the remaining 60, 13 were rejected because they were trials based on specific forms of care such as ACT, 21 because they were not randomised trials, 25 because the interventions did not satisfy the requirements for CMHT treatment and one because the participant did not satisfy all the criteria for the review. The five studies included were reported in 15 journal articles, all published in peer review journals.

Deaths from all causes

Four out of the five studies had fewer deaths in the standard care group. Although the small numbers in individual

Table 1 Characteristics of included studies

Study	Methods	Participants	Intervention
Australia, 1981 (CMHT=60; standard=60)	Allocation: sealed, randomly mixed envelopes Follow-up: 12 months	Diagnosis: schizophrenia (58), paranoid psychosis (12), mania (10), neurosis (7), other (28) Age: <40 years=78 Gender: 55 male. History: 90 previous psychiatric contact Setting: inner city	1. Project team: multi-disciplinary 'project' team, drug treatment, counselling, training in social and basic living skills, family intervention, support and education, 24-h cover (*n*=60) 2. Standard hospital care and follow-up (*n*=60)
Canada, 1979 (CMHT=78; standard=84)	Allocation: randomisation method not described Blinding: unclear, raters 'independent of teams' Follow-up: 2 years	Diagnosis: schizophrenia, 42%; neurotic, 7.8%; other 30.3% Age: 85% 15–54 years Gender: 65 male History: 60% previous psychiatric contact Setting: inner city	1. Home care: multi-disciplinary team, drug and psychotherapy within family, clinical decisions by team consensus, referral to community agencies, 24-h cover (*n*=78) 2. Standard hospital treatment: follow-up after discharge (*n*=84)
London, 1992 (CMHT=48; standard=52)	Allocation: randomised, sealed envelopes, stratified by previous contacts with psychiatric services Duration: 3 months	Diagnosis: schizophrenia (38), mood disorders (32), mood disorders (32), neurotic (25), other (5) Age: median 32 years Gender: 40 male History: 51% previous psychiatric contact Setting: inner city	1. Early intervention service: multi-disciplinary team, open referral, swift response, case manager assigned, no 24-h cover (*n*=48) 2. Standard hospital care, usually out-patient department (*n*=52)
London, 1993 (CMHT=150; standard =182)	Allocation: randomised, using a random number sequence, before applying inclusion criteria Follow-up: 12 months Costs of care	Diagnosis: psychotic Age: mean=40 years Gender: 75 male History: 79 previous psychiatric history Setting: inner city	1. Community treatment teams: multi-disciplinary community teams, home-based assessment within 2 weeks of referral, joint visits (*n*=94 'entering' study) 2. Standard hospital treatment: usually out-patient department with occasional home visits (*n*=78 'entering' study)
London, 1998 (CMHT=82; standard=73)	Allocation: sealed, randomly mixed envelopes Follow-up: 12 months	Diagnosis: schizophrenia (86), bipolar affective disorder (20), depressive disorder (24), other (25) Age: 16–65 years History: >1 admission in the past 3 years Setting: urban	1. Community team: multi-disciplinary community-based team, keyworker allocated, care plans, treatment at home/other appropriate setting (*n*=82) 2. Standard hospital treatment: care plans and reviews organised from hospital base (*n*=55)

CHMT, community mental health team.

https://doi.org/10.1192/bjp.178.6.497 Published online by Cambridge University Press

studies seldom provoked comment, collectively they amounted to a difference that was significant (Fig. 1): 1.7% of people treated by CMHTs died during the course of the studies, compared with 3.8% of the control group. This difference was even greater when deaths by suicide or suspicious circumstances were compared (OR=0.32; CI 0.09–1.12). Deaths due to physical causes also were less frequent in the CMHT group, but not to a marked extent (OR=0.63; CI 0.22–1.82).

Leaving the study early

All of the five studies provided data. Results relating to the 854 people showed that a significantly smaller proportion (33%) dropped out of CMHT management early compared with 45% in those receiving standard care (OR=0.61, CI 0.45–0.83) (Fig. 2). Individuals dying of natural causes were excluded from this outcome measure.

Hospitalisation

The mean duration of psychiatric hospital admissions showed that less time was spent in hospital following CMHT management (Table 2) but the data were not homogeneous (χ^2=21.3, d.f.=3, $P<0.001$). This is mainly because one study (Hoult & Reynolds, 1984) randomised patients at the point of admission to hospital and, as there were no special provisions to prevent admissions in the standard care group, 56 of the 58 patients concerned were admitted. However, the duration of hospital treatment was also significantly less in patients from CMHT management in other settings and, despite the skewed data, it is reasonable to conclude that such management reduces hospital stay.

Clinical psychopathology and social functioning

The results of the five studies are shown in Table 3. Because studies used different rating scales and these showed larger than acceptable standard deviations, it was not possible to combine these in a meta-analysis. However, the data taken separately suggest no convincing differences in favour of either form of management for clinical symptoms or social functioning.

Costs

In all five studies the total cost of care was less for those treated with CHMT

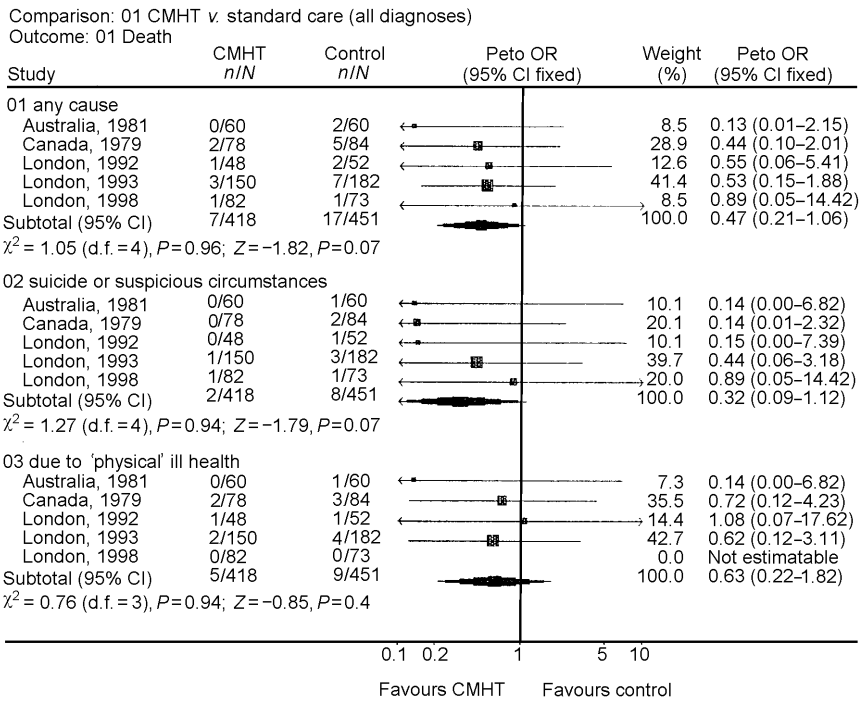

Fig. 1 Comparison of community mental health team (CMHT) management and standard care with respect to death as an outcome. When the boundaries of the diamond-shaped lozenge do not cross the vertical line, there are significant differences between the two models of care.

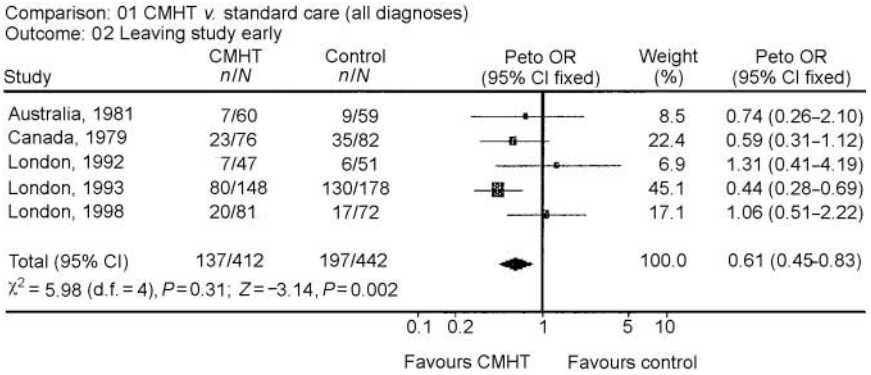

Fig. 2 Comparison of those leaving the study early (loss to follow-up) with community mental health team (CHMT) management and standard care.

Table 2 Comparison of community mental health and standard teams in use of psychiatric beds

Study	Duration of hospital care (mean bed days)	
	Community mental health team	Standard
Australia, 1981	8.4 (s.d. not available)	53.5 (s.d. not available)
Canada, 1979	14.5 (s.d.=35.7)	41.7 (s.d.=50.3)
London, 1992[1]	1.2 (s.d.=3.6)	9.3 (s.d.=20.1)
London, 1993	No data available	No data available
London, 1998	27.9 (s.d.=53.9)	28.7 (s.d.=49.3)

1. Duration of study was 3 months only.

https://doi.org/10.1192/bjp.178.6.497 Published online by Cambridge University Press

Table 3 Mean psychiatric symptoms and social function at end of studies (ranging from 3 to 12 months)

Study	Mean (mn) or median (md) symptom severity at end of study		Rating instrument[1]	Reference
	CMHT	Standard		
Psychiatric symptoms scales				
Australia, 1981	9.8 (mn)	15.4 (mn)	Present State Examination (Wing *et al*, 1974)	Hoult & Reynolds, 1984
London, 1992	23 (mn) (s.d.=11)	25 (mn) (s.d.=14)	Comprehensive Psychopathological Rating Scale (Åsberg *et al*, 1978)	Merson *et al*, 1992
London, 1993	19 (md)	18 (md)	Brief Psychiatric Rating Scale (Overall & Gorham, 1962)	Burns *et al*, 1993*a*
London, 1998	12.5 (md)	15.0 (md)	Comprehensive Psychopathological Rating Scale (Åsberg *et al*, 1978)	Tyrer *et al*, 1998
Social functioning scales				
Australia, 1981	50 (mn)	46 (mn)	Health Sickness Rating Scale (Luborsky, 1962)	Hoult & Reynolds, 1984
Canada, 1979	2.1	2.9	Psychiatric Evaluation Form (Endicott & Spitzer, 1972)	Fenton *et al*, 1979
London, 1992	9.7 (mn) (s.d.=5)	9.0 (s.d.=4)	Social Functioning Questionnaire (Tyrer, 1990)	Merson *et al*, 1992
London, 1993	3 (md)	5 (md)	Social Functioning Schedule (Remington & Tyrer, 1979)	Burns *et al*, 1993*a*
London, 1998	9 (mn) (s.d.=7)	10 (mn) (s.d.=6)	Social Functioning Questionnaire (Tyrer, 1990)	Tyrer *et al*, 1998

1. For all instruments apart from the Health Sickness Rating Scale, a higher score indicates greater pathology. All studies show greater improvement in community mental health team (CMHT) management, apart from London 1993 on the symptoms scale and London 1992 on the social functioning scale.

management (Table 4). Because of the gross skewing of data it was not possible to use meta-analysis to combine the data, but all studies reported lower costs with CMHT management, with differences of between 12 and 53% across the five studies. Because these differences are substantial, it is fair to conclude that the published studies showed clear evidence of CMHT management being cheaper than standard care, even allowing for the limitations of the data across a span of 17 years.

Table 4 Mean costs of care over duration of studies ranging from 3 to 12 months (markedly skewed data cannot be combined by meta-analysis)

Study	Mean cost (0–12 months)[1]		Percentage mean saving with CMHT	Reference
	CMHT	Standard		
Australia, 1981	£2225	£2845	22	Hoult & Reynolds, 1984
Canada, 1979	£1468	£3068	52	Fenton *et al*, 1979
London, 1992	£1167	£2500	53	Merson *et al*, 1996
London, 1993	£1429	£1696	16	Burns *et al*, 1993*b*
London, 1998	£16 765	£19 125	12	Tyrer *et al*, 1998

1. Costs should not be regarded as equivalent because no allowance has been made for inflation and London 1992 only included 3 months of treatment.
CMHT, community mental health team.

DISCUSSION

Benefits of CMHT management

The results of this review show that CMHT management is effective in comparison with standard care with respect to acceptance of treatment, reduction of hospital admissions, maintaining care, reducing death by suicide and suspicious circumstances and in reducing costs. Although changes in psychopathology showed no difference between CMHT management and standard care, there are no outcomes for which standard care is superior to care delivery from a CMHT.

Before discussing the implications of these positive conclusions, it needs to be acknowledged that the studies do not necessarily reflect the exercise of both of these models of care in practice. The Australian study had a specific research focus, and in all studies there was a level of enthusiasm for community care in the mental health teams that could well be greater than the average for such services. However, there is no evidence that enthusiasm alone has any significant impact on the care of patients with severe mental illness, and the inclusion of patients in any research study tends to be associated with a Hawthorne effect that applies across all treatment arms. In recent years the practices employed by the CMHTs in this study have been more widely spread and are generally becoming the norm.

Effects on psychiatric bed use

The evidence that duration of psychiatric care is reduced with CMHT management is strong but not overwhelming. The figures lie between those studies, mainly published in the USA, that suggest that the ACT model has a major impact on reducing admissions (Marshall *et al*, 1999) and formal case management (allocation to a formal process of regular assessment and review), which creates the opposite effect with greater hospital admissions (Tyrer *et al*, 1995; Marshall *et al*, 1998). The results also need to be tempered with some caution. The findings apply only when sufficient beds are available for admission. When there is a significant shortage of beds, as in the later study (Tyrer *et al*, 1998), admissions were still reduced but the duration of hospital admissions may become longer because of the disruption

https://doi.org/10.1192/bjp.178.6.497 Published online by Cambridge University Press

created by transfer of patients to distant hospitals. The lower rate of drop-out from care with CHMT management supports the findings of case management (Marshall *et al*, 1998) and assertive approaches (Marshall *et al*, 1999) and is perhaps partly expected, because one of the main functions of such teams is to maintain contact with patients and to see them in settings that are most appropriate for their care, including home treatment.

Cost-effectiveness and reduced deaths

The lower use of in-patient services is probably the main reason for the reduced cost of CMHT treatment (Table 4). Indeed, the savings here are substantial because a very large amount of money is saved by preventing relatively few admissions and it is perhaps this reason that has led to much of the savings created by the closure of mental hospitals not being transferred to acute services, where they appear to be most needed (Lelliott *et al*, 1993). The finding that CMHT management may reduce suicide and deaths under suspicious circumstances is of particular interest in view of the perceived failings of community care in some parts of the world, in particular the UK, where its failure has been stated clearly by government (Department of Health, 1998). Largely because of incorrect and tendentious reporting by the media, the policy of 'care in the community' for people with severe mental illness has become associated in the public mind with professional neglect and increased rates of homicide and suicide. It appears from our data that good CMHTs have the opposite effect and that if we are able to provide adequate resources then these serious adverse consequences arise rather less often than in other settings.

ACKNOWLEDGEMENTS

Information presented here has been available since 1997 in the Cochrane Library, in a review entitled 'Community mental health teams (CMHTs) for people with severe mental illnesses and disordered personality'. We thank colleagues in the Cochrane Library, particularly Clive Adams and Nancy Owens, for their help in this review. A grant was received from the North Thames R&D Responsive Funding Group.

CLINICAL IMPLICATIONS

- Community mental health team (CMHT) management is a cost-effective method of delivering care for people with severe mental illness because, compared with non-team care, it delivers similar clinical outcomes at reduced cost.
- Deaths from suicide and suspicious circumstances are reduced by CMHT management compared with standard hospital-oriented care and this should be taken into account when attribution of blame is made for such tragic events in community settings.
- Loss to care through drop-out is less with CMHT management then with standard care, probably because it is more acceptable to patients, and is therefore likely to grow further in importance.

LIMITATIONS

- The numbers of deaths in the studies was small and further studies are needed to determine whether this finding is robust.
- The review did not address the therapeutic activity of the CMHTs and endorsement of this approach is clearly dependent on sufficient skills being available within the teams to provide optimal interventions.
- Two of the reviewed studies were aimed specifically at avoiding hospital admission and so the findings of reduced bed use need to be tempered with caution.

SHAEDA SIMMONDS, BSc, Kensington, Chelsea and Westminster Health Authority, London; JEREMY COID, FRCPsych, Forensic Psychiatry Research Unit, St Bartholomew's Hospital, London, PHILIP JOSEPH, FRCPsych, SARAH MARRIOTT, MRCPsych, PETER TYRER, FRCPsych, Imperial College School of Medicine, Paterson Centre, London

Correspondence: Shaeda Simmonds, Kensington, Chelsea and Westminster Health Authority, 50 Eastborne Terrace, London W2 6LX, UK

(First received 11 July 2000, final revision 5 January 2001, accepted 9 January 2001)

REFERENCES

Altman, D. G. & Bland, J. M. (1996) Detecting skewness from summary information. *British Medical Journal*, **313**, 1200.

Åsberg, M., Montgomery, S. A., Perris, C., *et al* (1978) A comprehensive psychopathological rating scale. *Acta Psychiatrica Scandinavica Supplement*, **271**, 5–29.

Burns, T., Beadsmoore, A., Bhat, A. V. *et al* (1993*a*) A controlled trial of home-based acute psychiatric services. I. Clinical and social outcome. *British Journal of Psychiatry*, **163**, 49–54.

__, Raftery, J., Beadsmoore, A., *et al* (1993*b*) A controlled trial of home-based acute psychiatric services. II. Treatment patterns and costs. *British Journal of Psychiatry*, **163**, 55–61.

Cicchetti, D. V. & Sparrow, S. S. (1981) Developing criteria for the rating of specific items in a given inventory. *American Journal of Mental Deficiency*, **86**, 127–137.

Coid, J. (1994) Failure in community care: psychiatry's dilemma. *British Medical Journal*, **308**, 805–806.

Department of Health (1998) *Our Healthier Nation: A Contract for Health* (Cm. 3852). London: Stationery Office.

Endicott J. & Spitzer, R. L. (1972) What! Another rating scale! The Psychiatric Evaluation Form. *Journal of Nervous and Mental Disease*, **154**, 88–104.

Fenton, F. R., Tessier, L. & Struening, E. L. (1979) A comparative trial of home and hospital psychiatric care: one-year follow-up. *Archives of General Psychiatry*, **36**, 1073–1079.

Hafner, H. & Klug, J. (1982) The impact of an expanding community mental health service on patterns of bed usuage: evaluation of a four-year period of implementation. *Psychological Medicine*, **12**, 177–190.

Hoult, J., Reynolds, I., Charbonneau-Powis, M., *et al* (1981) A controlled study of psychiatric hospital versus community treatment – the effect on relatives. *Australian and New Zealand Journal of Psychiatry*, **15**, 323–328.

https://doi.org/10.1192/bjp.178.6.497 Published online by Cambridge University Press

___ & Reynolds, I. (1984) Schizophrenia: a comparative trial of community-oriented and hospital-oriented psychiatric care. *Acta Psychiatrica Scandinavica*, **69**, 359–372.

Lelliott, P., Sims, A. & Wing, J. (1993) Who pays for community care? The same old question. *British Medical Journal*, **307**, 991–994.

Luborsky, L. (1962) Clinicians' judgement of mental health. *Archives of General Psychiatry*, **33**, 407–417.

MacMillan, D. (1963) Recent developments in community mental health. *Lancet*, *i*, 567–571.

Marshall, M., Gray, A., Lockwood, A., *et al* (1998) Case management for severe mental disorders. *Cochrane Library*. Oxford: Update Software.

___, Lockwood, A., Gray, A., *et al* (1999) Assertive community treatment. *Cochrane Library*. Oxford: Update Software.

Merson, S., Tyrer, P., Onyett, S., *et al* (1992) Early intervention in psychiatric emergencies: a controlled clinical trial. *Lancet*, **339**, 1311–1314.

___, ___, Carlen, D., *et al* (1996) The cost of treatment of psychiatric emergencies: a comparison of hospital and community services. *Psychological Medicine*, **26**, 727–734.

Muijen, M., Marks, I. M., Connolly, J., *et al* (1992) Home based care and standard hospital care for patients with severe mental illness: a randomised controlled trial. *British Medical Journal*, **304**, 749–754.

Overall, J. E. & Gorham, D. R. (1962) The Brief Psychiatric Rating Scale (BPRS). *Psychological Reports*, **10**, 799–812.

Parmar, M. K., Stewart, L. A. & Altman, D. G. (1996) Meta-analyses of randomised trials: when the whole is more than just the sum of the parts. *British Journal of Cancer*, **74**, 496–501.

Remington, M. & Tyrer, P. (1979) The Social Functioning Schedule – a brief semi-structured interview. *Social Psychiatry*, **14**, 151–157.

Stein, L. I. & Test, M. A. (1980) Alternative to mental hospital treatment. I. Conceptual model, treatment program, and clinical evaluation. *Archives of General Psychiatry*, **37**, 392–397.

Thornicroft, G., Becker, T., Holloway, F., *et al* (1999) Community mental health teams: evidence or belief? *British Journal of Psychiatry*, **175**, 508–513.

Tyrer, P. (1990) Personality disorder and social functioning. In *Measuring Human Problems: A Practical Guide* (eds D. F. Peck & C. M. Shapiro), pp. 119–142. Chichester: John Wiley & Sons.

___, Morgan, J., Van Horn, E., *et al* (1995) A randomised controlled study of close monitoring of vulnerable psychiatric patients. *Lancet*, **345**, 756–759.

___, Evans, K., Gandhi, N., *et al* (1998) Randomised controlled trial of two models of care for discharged psychiatric patients. *British Medical Journal*, **316**, 106–109.

___, Coid, J., Simmonds, S., *et al* (2000) Community mental health team management for those with severe mental illness and disordered personality. *Cochrane Library*, issue 3. Oxford: Update Software.

Wing, J., Cooper, J. & Sartorius, N. (1974) *The Present State Examination* (9th revision). Cambridge: Cambridge University Press.

https://doi.org/10.1192/bjp.178.6.497 Published online by Cambridge University Press