Use of intensive case management to reduce time in hospital in people with severe mental illness: systematic review and meta-regression

Burns T, Catty J, Dash M, Roberts C, Lockwood A, Marshall M

CRD summary
This well-conducted systematic review uses meta-regression techniques to explore the effects of intensive case management on hospital use for people with severe mental illness. The authors’ conclusions, that intensive case management works best when patients tend to use a lot of hospital care and less well when they do not, should be treated with caution given the limitations of the statistical techniques used.

Authors’ objectives
To investigate why clinical trials of intensive case management for people with severe mental illness show inconsistent effects on use of hospital care, using meta-regression techniques.

Searching
CINAHL, the Cochrane CENTRAL Register, MEDLINE, EMBASE and PsycINFO were searched from inception to January 2007. The search strategy is available online (accessed 10/03/2008; see Web Address at end of abstract) and has been updated from two previous reviews (see Other Publications of Related Interest nos.1-2). The reference lists of all relevant studies and reviews were also screened. No language restrictions appear to have been applied.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion.

Specific interventions included in the review
Studies eligible for inclusion were those that compared intensive case management (caseload of 20 or fewer people) with standard care from an out-patient clinic or community mental health team, or low-intensity case management (caseload of more than 20 people). Studies of acute crisis teams, or where the control condition was hospital admission, remaining in hospital or an alternative form of intensive case management, were excluded from the review. The majority of the included studies had a caseload of 10 or fewer people.

Participants included in the review
Studies of people in the community with severe mental disorder, defined as schizophrenia, schizophrenia-like disorder, bipolar disorder or depression with psychotic features, were eligible for inclusion. Studies in which most people were aged under 18 or over 65 years, or had a primary diagnosis of organic brain disorder or learning disability, were excluded from the review. In the included studies, the participants’ mean age was 37.9 years, 37% were female, 66% had schizophrenia or schizophrenia-like disorder, and 37% were from ethnic minorities.

Outcomes assessed in the review
The primary outcome (dependent variable) in the review was time in hospital, defined as the mean number of days per month in hospital. To be eligible for inclusion, data had to be available for more than half of the trial participants and on an intention-to-treat basis. Data at 24 months’ follow-up were included where possible.

How were decisions on the relevance of primary studies made?
Two reviewers independently selected studies for inclusion. Any disagreements were resolved by discussion with a third reviewer.

Assessment of study quality
Two reviewers independently categorised each included trial for adequacy of allocation concealment (according to the Cochrane Collaboration handbook, see Other Publications of Related Interest no.3), and only trials rated A (adequate allocation concealment) or B (unclear) were included.
Data extraction
Two reviewers extracted the data independently and cross-checked data using double data entry methods. The dependent variable was collected at the 24-month follow-up where possible, or from the nearest follow-up point. If a trial reported a mean without a standard deviation, the standard deviation was imputed. Data were collected on the following covariates: degree of low-intensity case management in control group; country; baseline hospital use; year; trial size; and fidelity of intervention to assertive community treatment. Data for the latter were obtained from published and unpublished trial reports and directly from trialists. Data from multicentre trials were disaggregated into component centres.

Methods of synthesis
How were the studies combined?
A random-effects meta-analysis was carried out with meta-regression on days in hospital per month against covariates listed in the data extraction field.

How were differences between studies investigated?
Variation between centres and trials was quantified in the preliminary meta-analysis. The meta-regression included four sensitivity analyses: using mean of control group instead of baseline measure of hospital use as a covariate; modelling the means of the treatment group rather than the intervention effect; excluding trials with imputed standard deviations; and excluding trials where the Cochrane randomisation category was B.

Results of the review
Twenty-nine RCTs (n=5,961) were included.

The preliminary meta-analysis showed a small statistically significant effect in favour of intensive case management, but with significant heterogeneity in the result (pooled intervention effect -0.46, 95% confidence interval, CI: -0.84, -0.08, p=0.019; variation between centres 0.32, variation between trials 0.32). The meta-regression found a significant relationship between team organisation and mean numbers of days per month spent in hospital, indicating a decrease of 0.44 days (95% CI: -0.72, -0.17, p=0.002) for each 1-point increase on the index organisation scale. The decrease was negligible if the team organisation fidelity score was low. When the meta-regression model included only centres with data on baseline hospital use, a significant relationship was seen between hospital use at baseline and mean days in hospital (-0.23, 95% CI: -0.36, -0.09, p=0.001). Team organisation score was still significantly related to the dependent variable in this model, but the significance score was lower (p=0.029). Sensitivity analyses found strong correlations between treatment effect and control group mean when using the mean in the control group as a covariate (-0.44, 95% CI: -0.57, -0.31, p<0.001), and underlying level of hospital use when using the mean of treatment groups as a covariate (-0.31 bed-days for each mean bed-day difference between centres within studies, and -0.11 bed-days for each difference of 1 bed-day between studies, 95% CI not reported). Dropping centres with imputed standard deviations from the analysis resulted in the effects for team organisation and baseline hospital use becoming non significant; however, when an outlying centre was removed from the analysis, these effects became significant again.

Authors’ conclusions
Intensive case management works best when participants tend to use a lot of hospital care and less well when they do not. The effectiveness of intensive case management teams is increased as their organisation reflects the assertive community treatment model, but there is less evidence for the benefits of increased staffing levels.

CRD commentary
This was a well-conducted review with clearly identified inclusion criteria. The search strategy was comprehensive, and attempts were made to locate and include unpublished and individual patient data. The validity assessment was limited, being based on allocation concealment, and the results of this were not reported. A subsequent random-effects meta-analysis showed a positive effect of intensive case management but with significant heterogeneity: meta-regression techniques were then used to explore the effects of covariates. The interpretation of the findings of the meta-regression and sensitivity analyses seem appropriate, although the authors’ conclusions should have been stated more cautiously as the findings from meta-regression techniques are suggestive rather than definitive.

Implications of the review for practice and research
Practice: The authors stated that the introduction of intensive case management teams will not lead to substantial reductions in hospital use if average hospital use is already low. Teams can best reduce hospital use by organising themselves in the assertive community treatment model and by focusing on patients with a history of high hospital use. Replicating staffing requirements of assertive community treatment does not result in measurable benefit.

Research: The authors did not state any implications for further research.

**Funding**

**Bibliographic details**

**PubMedID**
17631513

**DOI**
10.1136/bmj.39251.599259.55

**Original Paper URL**
http://bmj.bmjournals.com/cgi/content/full/335/7615/336

**Other publications of related interest**


This additional published commentary may also be of interest.


**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Case Management /organization & administration; Humans; Length of Stay; Mental Disorders /therapy; Randomized Controlled Trials as Topic; Regression Analysis

**AccessionNumber**
12007008199

**Date abstract record published**
09/08/2008

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.