Use of community treatment orders and their outcomes: an observational study

Scott Weich,[1,2*] Craig Duncan,[3] Liz Twigg,[3] Orla McBride,[4] Helen Parsons,[2] Graham Moon,[5] Alastair Canaway,[2] Jason Madan,[2] David Crepaz-Keay,[6] Patrick Keown,[7] Swaran Singh[2] and Kamaldeep Bhui[8]

[1]School of Health and Related Research, University of Sheffield, Sheffield, UK
[2]Warwick Medical School, University of Warwick, Coventry, UK
[3]Department of Geography, University of Portsmouth, Portsmouth, UK
[4]School of Psychology, Ulster University, Londonderry, UK
[5]School of Geography and Environmental Science, University of Southampton, Southampton, UK
[6]Mental Health Foundation, London, UK
[7]Institute of Neuroscience, Newcastle University, Newcastle upon Tyne, UK
[8]Centre for Psychiatry, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK

*Corresponding author s.weich@sheffield.ac.uk

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Scientific summary

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Background

Community treatment orders were introduced to the Mental Health Act (2007) (Great Britain. *Mental Health Act*. London: The Stationery Office; 2007) in England in November 2008. They allow patients with serious mental disorders who are detained in hospital on treatment orders to continue treatment in the community under specific conditions. The community treatment order states these conditions and gives the nominated responsible clinician the power to recall the patient to hospital in the event of their breach. Community treatment orders have been used more extensively than expected and evidence suggests that their use varies between patients, places and mental health services.

There were two motivations for introducing community treatment orders in England: to provide treatment in the least restrictive setting, consistent with the Human Rights Act (1988) (Great Britain. *The Human Rights Act*. London: The Stationery Office; 1988), and to reduce 'revolving door' admissions associated with non-compliance with care among a small group of patients. Community treatment orders tend to be applied most commonly at the end of an admission, following remission, to optimise treatment adherence in those likely to disengage from care.

Community treatment orders have been adopted in > 75 other jurisdictions around the world, taking different forms in different places. In some places they are initiated by courts, whereas elsewhere, as in England, they remain a matter for health-care providers. Despite widespread use, community treatment orders remain controversial. Although popular with many clinicians and carers, patients often view them as coercive and the results of outcome studies are mixed. Although some observational studies have reported significant benefits in terms of reduced time in hospital, randomised controlled trials, of which there have been three globally, have failed to demonstrate evidence of clinical effectiveness. Given the ethical challenges associated with randomisation in the context of community treatment orders, it is unlikely that further trials will be commissioned. Randomised controlled trials are also limited by the cost of follow-up beyond the short term.

Objectives

The four aims of the study were to:

- examine variation in the use of community treatment orders between patients, local areas and service providers
- estimate associations between the use of community treatment orders and key patient outcomes
- explore variation in these associations between patients, places and service providers
- estimate the health-care costs associated with community treatment orders.

Our first objective was to use multilevel statistical approaches to estimate (1) the extent of variation in the use of community treatment orders in England; (2) the length of time that eligible patients were subject to community treatment orders; and (3) to assess the extent to which this variation was explained by patient- and area-level characteristics. The second objective was to use the same types of model to compare eligible patients who had been placed on a community treatment order with those who had not on three outcomes: (1) time to first re-admission to hospital (defined as a further admission to a mental illness bed, including for the purposes of community treatment order recall), (2) total time spent in hospital, and (3) mortality (from any cause, at any time during the follow-up period and in any setting) after being placed on a community treatment order. The third objective was

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to extend our models to assess variation in associations between community treatment order use and patient outcomes between service providers. The final objective was to estimate health-care costs associated with the use of community treatment orders based on differences in patient outcomes between those who had and had not been placed on a community treatment order following an episode of compulsory hospital treatment.

Methods

Design, setting and data source

This was an observational, secondary study based on analysis of 4 years of data from the Mental Health Services Data Set, the mandatory data return for all providers of NHS-funded specialist mental health services in England. The setting was England and the data set included 69,832 patients who were eligible to be placed on a community treatment order at the time of discharge from hospital after being subject to a compulsory Mental Health Act (2007) (Great Britain. *Mental Health Act*. London: The Stationery Office; 2007) treatment order between 1 April 2011 and 31 March 2015.

Variation in use and outcomes of community treatment orders were considered at three levels: between patients, between local areas where they lived and between mental health services. Middle-layer super output areas, small areas designed for the estimation and dissemination of national census data [URL: www.ons.gov.uk/methodology/geography/ukgeographies/censusgeography (accessed December 2019)], were used to operationalise the local area in which patients lived. Mental health services were delivered to patients by provider trusts; only those operated by the NHS were considered.

Use of community treatment orders was described according to whether or not eligible patients had ever been subject to a community treatment order during the study period. We modelled the amount of time that patients had been subject to community treatment orders over the 4 years. Three outcomes associated with community treatment order use were considered: time to first re-admission, total time in admission and mortality. Outcomes were assessed for a subsample of patients subject to a single community treatment order episode (with a validated start date) during the study period ($n = 6329$), and a temporally matched sample of patients who were eligible but had not been subject to a community treatment order ($n = 16{,}842$). The final research aim was achieved through comparison of treatment costs between these two groups (and specifically the costs associated with subsequent inpatient care) over the study period.

Mortality data were obtained from the Office for National Statistics national death registration system [URL: www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/methodologies/userguidetomortalitystatisticsjuly2017 (accessed December 2019)]. Data on explanatory variables characterising patient and local area levels were obtained from the Mental Health Services Data Set and through linkage to the Department of Communities and Local Government Index of Multiple Deprivation. Four key patient characteristics were considered: gender, age, ethnicity and Payment by Results Care Cluster (a proxy for diagnosis and illness severity). Local area characteristics were considered using the Index of Multiple Deprivation score at middle-layer super output areas level. Owing to time constraints and the findings from previous research, we did not include covariates at service provider (trust) level.

Analysis

Analyses of community treatment order use were based on the full study sample and began with 'null' models in which total variance was estimated without explanatory variables. Explanatory variables were then entered into models to estimate their associations with community treatment order use, and to establish the degree of variation that remained at each level.

Analysis of associations between community treatment order use and patient outcome were based on a subsample of community treatment order patients and a matched control group of non-community treatment order patients. The treatment group consisted of patients who had been subject to a single community treatment order episode that started and finished during the study period. Each of these patients on community treatment orders was matched with three patients who were eligible for community treatment order and who were discharged at approximately the same time ($\pm$ 42 days) but not placed on community treatment orders (controls).

Estimates of associations between the use of community treatment orders and patient outcomes were derived from multilevel models, adjusted for the same covariates as in analyses of community treatment order use (i.e. gender, age, ethnicity, care cluster group and local area deprivation). However, the modelling strategy was slightly different. First, an additional covariate was included indicating patients' treatment status, (i.e. community treatment order or non-community treatment order). Second, base models were estimated that included only treatment status. This allowed us to estimate the effect of community treatment order use on patient outcomes before and after adjusting for covariates. Random-effects models were also estimated in which treatment status effect was allowed to vary across provider trusts through inclusion of extra variance and co-variance terms at provider trust level. For analyses of time subject to community treatment order and total time in admission, models included an offset variable to account for varying amounts of time (in days) patients were 'at risk' of the outcome. Estimates from these models, therefore, constitute daily rates rather than numbers of days, and are reported as rate ratios.

Health-care costs associated with community treatment order use were examined by comparing costs for community treatment order and non-community treatment order patients based on the modelled estimates of total time in admission in the matched subsample. Costs were calculated over a 1-year period in conjunction with 95% confidence intervals. We measured health-care resource used by both groups and attached unit costs to calculate total cost before assessing difference in costs between the two groups. We obtained expert advice to assist in estimating costs associated with additional burden of care and administration associated with community treatment orders.

User involvement

Two groups of experts were consulted in the course of the study: people who either had been on community treatment orders or had provided informal care (as a family member or friend) to someone who had, and an expert group of professionals (clinicians, service managers and other health and social care professionals) involved in the delivery of mental health services.

Results

Most variation in community treatment order use was observed between patients. There was, however, statistically significant independent (covariate adjusted) variation between provider trusts and local areas. Although most of the between-provider trust variation appeared to arise from substantially different practice in a small number of trusts, this remained statistically significant even after removing the two most obvious outliers.

Significant variation in community treatment order use between provider trusts (median odds ratio 3.21, 95% credible interval 2.61 to 4.10) and local areas (median odds ratio 1.68, 95% credible interval 1.62 to 1.75) remained after taking account of patient-level covariates, including age, ethnicity and care cluster. The most significant individual-level association was with care cluster; those in the 'less severe psychotic' group were more than one and a half times more likely (odds ratio 1.61, 95% credible interval 1.47 to 1.77) and those in the 'severe psychotic' group almost four times more likely (odds

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ratio 3.76, 95% credible interval 3.45 to 4.11) than non-psychotic patients to have been on a community treatment order. Women were much less likely, and black patients more likely, to have been subject to a community treatment order than men and white patients, respectively.

We found statistically significant variation between provider trusts (median odds ratio 1.25, 95% confidence interval 1.20 to 1.30) and between local areas (median odds ratio 1.43, 95% confidence interval 1.41 to 1.45) in the time patients were subject to community treatment orders. The most significant association with time subject to a community treatment order was for care cluster, with patients in the 'severe psychotic' group having the highest daily rate of being subject to a community treatment order.

Although slightly more community treatment order patients were readmitted than non-community treatment order patients (36.9% compared with 35.6%), there was no significant difference in time to first re-admission between community treatment order and non-community treatment order patients. For both groups, the first re-admission occurred, on average, around 32 months after being placed on community treatment order. Rate of re-admission was significantly higher for community treatment order patients in the cognitive impairment care cluster group compared with non-community treatment order patients in the same group. Women had a slightly higher rate of re-admission than men and Asian patients had a lower rate than white patients. There was no significant association with age or local area deprivation. There was significant variation between both provider trusts (median odds ratio 1.18, 95% credible interval 1.14 to 1.24) and middle-layer super output areas (median odds ratio 1.21, 95% credible interval 1.05 to 1.30) in the rate of re-admission after taking account of patient- and local area-level characteristics.

Community treatment order patients spent 7.5 days longer, on average, in admission than non-community treatment order patients over the course of the study. This difference remained after other patient and local area characteristics were taken into account and was reflected in community treatment order patients having a significantly higher daily rate of admission than non-community treatment order patients after taking account of these characteristics (rate ratio 1.20, 95% confidence interval 1.10 to 1.30). The effect of being on a community treatment order on the daily rate of admission did not differ by care cluster. The daily rate of admission was lower for Asian patients and for patients in the less severe psychosis or cognitive impairment care cluster code groups. There was no significant patterning in the daily rate of admission on the basis of age, gender or local area deprivation. There was significant variation between provider trusts in the daily rate of admission (median rate ratio 1.24, 95% confidence interval 1.15 to 1.31). This variation could not be accounted for by patient- and local area-level characteristics.

Community treatment order patients were less likely to die than non-community treatment order patients, both before (odds ratio 0.37, 95% credible interval 0.32 to 0.43) and after (odds ratio 0.69, 95% credible interval 0.60 to 0.81) taking account of other patient and local area characteristics including age, gender, ethnicity and care cluster group. There was a clear association between the likelihood of death and age. There was also a higher likelihood of death among patients with cognitive impairment. Women, however, had a lower likelihood of death than men, as did patients in all the main ethnic minority groups compared with white patients. The effect of being on a community treatment order on the likelihood of death did not differ according to a patient's care cluster group. There was no clear patterning in the association with local area deprivation. There was some variation between both provider trusts and local areas in mortality, although this was much reduced after taking account of patient- and local area-level characteristics.

There was no evidence of significant variation between provider trusts in the effect of treatment status on total time in admission.

Health-care costs associated with inpatient admission over a 1-year period were greater for community treatment order patients (£10,941.53, 95% confidence interval £10,876.14 to £11,006.93) than for non-community treatment order patients (£8272.51, 95% confidence interval £8233.53 to £8311.48).

Conclusions

Among a nationally representative sample of almost 70,000 patients in England who were eligible to be subject to community treatment orders over a 4-year period, we found that community treatment order use varied to a significant degree between patients, provider trusts and local areas. Community treatment order use was not associated to a statistically significant degree with shorter time to re-admission or reduced time in hospital. Although admission rates and length of stay varied between provider trusts, we found no evidence of variation between services in the effectiveness of community treatment orders. Likewise, community treatment order use was not associated with reduced mental health treatment costs. Our findings are consistent with the results of the Oxford Community Treatment Order Evaluation Trial (OCTET) trial [Burns T, Rugkåsa J, Molodynski A, Dawson J, Yeeles K, Vazquez-Montes M, *et al.* Community treatment orders for patients with psychosis (OCTET): a randomised controlled trial. *Lancet* 2013;**381**:1627–33] and support the view that the use of community treatment orders in England is not effective in reducing future admissions or time spent in hospital. We provide preliminary but compelling evidence of an association between community treatment order use and reduced mortality.

Recommendations for further research

These findings need to be replicated among patients who are subject to a community treatment order more than once, as benefits may perhaps accrue later, following the first re-admission to hospital. The association between community treatment order use and reduced mortality needs further and urgent investigation and replication over a longer period of time among all patients subject to community treatment orders, and to allow subgroup analysis by cause of death and care cluster. Further mixed-methods investigation is needed to explore the extreme variation in practice in the use of community treatment orders between provider trusts, and in particular where almost all eligible patients are subject to these orders (often for short periods). Additional subgroup analyses are required to explore the potential benefits of community treatment orders in non-psychotic care clusters.

Study registration

The study was approved by the University of Warwick's Biomedical and Scientific Research Ethics Committee (REGO-2015-1623).

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