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The relationship between deinstitutionalization and quality of care in longer term psychiatric and social care facilities in Europe: A cross-sectional study

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Abstract

Background

The process of deinstitutionalization (community based care) has been shown to be associated with better quality of life for those with longer term mental health problems compared to long stay hospitals. This project aimed to investigate the relationship between national progress towards deinstitutionalization and 1) quality of longer term mental health care 2) service users' ratings of that care in nine European countries.

Methods

Quality of care was assessed in 193 longer term hospital- and community-based facilities in Bulgaria, Germany, Greece, Italy, the Netherlands, Poland, Portugal, Spain and the UK. Data on users' ratings of care were collected from 1,579 users of these services. Country-level variables were compiled from publicly available data. Multilevel models were fit to assess associations with quality of care and service user experiences of care.

Results

Significant positive associations were found between deinstitutionalization and 1) five of seven quality of care domains; and 2) service user autonomy. A 10% increase in expenditure was associated with projected clinically important improvements in quality of care.

Conclusions

Greater deinstitutionalization of mental health mental health services is associated with higher quality of care and better service user autonomy.

Keywords

Psychiatry in Europe; Quality of care; Social and cross-cultural psychiatry

1. Introduction

Deinstitutionalization is the movement of the locus of mental health care from hospitals to the community. It includes not only closing down mental hospitals but ensuring the availability of mental health services within the community to address service user needs through policy, legislation and human and financial resources. Evidence from the literature suggests that although mental health service users in receipt of community-based care show no significant difference in symptoms compared to those cared for in hospital [1], they are more likely to have better social relationships, higher quality of life [2], fewer needs [3] and better overall functioning [4] than those in hospital.

Although deinstitutionalization is a goal of many mental health policies, the majority of the world's psychiatric beds are still located in mental hospitals or other institutional settings [5, 6]. Critiques of deinstitutionalization include high numbers of individuals with mental health problems who are homeless or incarcerated, cycle of discharge and readmission (the "revolving door") and instances of service user abuse and neglect in community-based settings [7].

Much of the evidence used to support or oppose deinstitutionalization have largely focused on comparisons of hospital and community facilities or the outcomes of service users relocated to the community following the closure of a large mental hospital. Large-scale, country-level evaluations of the impact of deinstitutionalization are necessary to determine whether this type of service configuration results in positive outcomes for service users. The

DEMoBinc: Development of a European Measure of Best Practice for People with Long Term Mental Illness in Institutional Care
QuIRC: Quality Indicator for Rehabilitative Care
MENDit: Mental Health Service Deinstitutionalization Measure
WHO: World Health Organization
DISC: Discrimination and Stigma Scale
FTE: full-time equivalent
AICc: correct Akaike Information Criterion

aim of this study was to evaluate the relationship between the deinstitutionalization of mental health care at the country level and: (1) the quality of care provided in longer term psychiatric and social care facilities; (2) service user ratings of this care.

2. Methods

2.1. Participants and procedures

Hospital and community-based residential facilities for people with longer term mental health were recruited in ten European countries (Bulgaria, Czech Republic, Germany, Greece, Italy, the Netherlands, Poland, Portugal, Spain and the UK) participating in the development of a European measure of best practice for people with longer term mental illness in institutional care (DEMoBinc) project [8]. Facilities providing care exclusively to specific sub-groups of service users (e.g. older people, individuals with learning disabilities, forensic patients) were excluded. Facility managers participated in a face-to-face interview with a DEMoBinc researcher. Between five and 13 service users were randomly selected from each facility to complete a face-to-face research interview. Prior to participation, facility managers and service users provided written informed consent. Service users were excluded only if they were not present at the time of recruitment, lacked mental capacity to provide informed consent or were unable to complete the interview. A detailed description of the sampling process is provided by Killaspy and colleagues [8]. The DEMoBinc project was approved by the relevant ethics committee in each country.

2.2. Variables

Quality of care was assessed using the Quality Indicator for Rehabilitative Care [QuIRC; 9]. Quality scores for each of the seven domains assessed (Living Environment; Therapeutic

Environment; Treatments and Interventions; Self-management and Autonomy; Social Interface; Human Rights; Recovery-based Practice) are presented as a percentage derived from the ratings from facility managers' responses to 88 items. Higher percentage scores indicate better quality of care in the relevant domain.

Service users' experiences of care were measured using standardised instruments of quality of life [Manchester Short Assessment of Quality of Life; 10], autonomy [Resident Choice Scale; 11], experiences of care [Your Treatment and Care; 12], and the therapeutic milieu of the facility [Good Milieu Index; 13]. For all measures, higher scores indicated a more positive experience of care. Demographic information including age, gender, diagnosis and date of admission, was also sought from the service user and corroborated from case notes.

The degree of deinstitutionalization in each country was determined using the Mental Health Services Deinstitutionalization Measure [MENDit; 14]. The MENDit consists of five items which assess the closure of mental hospitals, availability of mental health care in primary care settings, availability of community residential care, presence of a national mental health budget and numbers of mental health professionals. Each item has a maximum score of one and the sum of scores for all items provides the country's MENDit score (range: 0-5); higher scores indicate greater progress towards deinstitutionalization. The tool was developed to be completed using publicly available data. Scores for all countries were based on country reports published within the WHO Mental Health Atlas 2005, a regular report of existing mental health care legislation, policy and provision within United Nation member states [15]. Details of the development and items of the MENDit have been previously published by the authors [14].

Potential confounding variables (based on the findings of studies conducted in similar user groups and treatment settings) at both facility and country level were also measured.

1. Facility-level variables were restricted to those collected as part of the DEMoBinc project. They included facility type (hospital or community residential mental health facilities), full-time equivalent (FTE) staff to service user ratio (above or below the sample mean) and whether the facility had an expected maximum length of stay (yes or no).
2. Country-level variables were limited to publicly available data:
    a. We used country level data on stigma associated with schizophrenia from a pan-European study by Thornicroft et al. [16]. The Discrimination and Stigma Scale (DISC) is a 36-item scale scored from 0-32 where increasing scores indicate greater stigma related to schizophrenia.
    b. The number of years to 2011 (the year the analysis was conducted) since the introduction of mental health policy was obtained by country reports published in the WHO Mental Health Atlas 2005.

2.3. Statistical analysis

Multilevel models were used as they allow for effects attributed to data clustering at the facility and country levels to be taken into consideration when examining the variation between outcomes (Luke 2004).

In order to examine the association between deinstitutionalization and the quality of care, four two-level models were developed.

1. Model A: QuIRC domain scores (living environment; therapeutic environment; treatments and interventions, self-management & autonomy; social interface; human rights; recovery-based practice) were included separately as dependent variables at the facility level (level 1). Progress towards deinstitutionalization was included as an independent, country-level (level 2) variable.
2. Model B: The independent variables facility type, FTE staff to service user ratio and having an expected maximum length of stay were added to the model as level 1 fixed effects.
3. Model C: The degree of national stigma and the number of years since the introduction of mental health policies were added as fixed effect, independent variables to level 2 in Model A.
4. Model D: Both facility and country independent variables were added to Model A as fixed effects.

Four, three-level models were developed to examine the association between deinstitutionalization and service user ratings of care.

1. Model E: The service user ratings of quality of life, autonomy, experiences of care and therapeutic milieu were included as dependent variables at the service user level (level 1). Deinstitutionalization score was included as a fixed effect at the country level (level 3).
2. Model F: The independent variables facility type, FTE staff to service user ratio and having an expected maximum length of stay were added to the model as facility level (level 2) fixed effects.

3. Model G: The degree of national stigma associated with schizophrenia and years since development of mental health policy were added to Model E as level 3 fixed effect, independent variables.
4. Model H: Both facility and country variables were added to Model F as fixed effects.

Models of best fit were selected using the correct Akaike Information Criterion (AICc). [17] An AICc value was calculated for each of the four models developed per dependent variable and the model with the lowest AICc value was deemed as having the best fit. All models were then checked to ensure assumptions of normality and homoscedasticity were not violated. Data were analysed using STATA release 11.

3. Results

Two hundred and thirteen managers of psychiatric and social care facilities and 1,750 service users were interviewed as part of the DEMoBinc project (see Figure 1). However, Czech data were excluded from all analyses as national levels of stigma were not available. Therefore, data from the remaining 193 facilities and 1,579 service users were included in the analyses.

The majority of facilities were community-based (71.0%) and located in an urban area (51.0%). The mean number of beds per facility was 25 (SD = 20) with a mean of 23 (SD = 20) beds occupied at the time of recruitment. However, the number of beds varied substantially by country. In Bulgaria six facilities had more than 80 beds with the largest containing 120 beds.

The majority of service users interviewed were male (n = 999, 63.3%) and lived in community facilities (n = 1064, 67.4%). The mean age of participants was 46 years (SD =

12.6) while the mean duration of their current inpatient admission was 4.5 years (range = 0.1-50.1). Most participants had a diagnosis of schizophrenia or other psychosis (n = 1173, 74.3%) and described themselves as retired or unemployed (n = 1298, 82.2%). The mean stigma score for all countries was 4.9 (SD = 0.8). The highest level of stigma associated with mental health problems was reported in Portugal (5.9) while the lowest degree of stigma was found in Spain (3.4). Mental health policies were first introduced, on average, 19 years before 2011 (SD = 9). Mean deinstitutionalization and quality of care scores, and service user ratings of care for each country are presented in Table 1.

Associations between deinstitutionalization and quality and service user ratings of care

Increased deinstitutionalization of mental health service provision was significantly associated with higher QuIRC domain scores for Living Environment (coef = 6.14, 95% CI = 4.31, 7.97), Therapeutic Environment (coef = 3.58, 95% CI = 2.01, 5.15), Treatments and Interventions (coef = 3.36, 95% CI = 1.48, 5.25), Self-management and Autonomy (coef = 7.41, 95% CI = 2.16, 12.66) and Recovery-based Practice (coef = 4.88, 95% CI = 0.86, 8.90) in models of best fit (see Table 2). A one point increase in deinstitutionalization score was associated with an increase of 3.36 to 7.41 percentage points in QuIRC domain scores. A significant positive relationship was also found between national levels of deinstitutionalization and service user autonomy (coef = 7.11, 95% CI = 2.61, 11.61) in models of best fit (see Table 3). Associations between deinstitutionalization and the QuIRC Social Interface and Human Rights domains and service user ratings of quality of life, experiences of care and therapeutic milieu did not reach statistical significance. All models were homoscedastic and exhibited normality.

Clinical modelling

In order to understand better the clinical implications of increasing deinstitutionalization of mental health care, projected changes in QuIRC domain scores and service user ratings of care were calculated for MENDit scores equalling 3.25 (the sample mean) and 4.67 (the highest score among the nine countries). Improvement was defined as an increase that raised a country above the mean QuIRC domain score or service user rating for the sample. Prior to projections, four countries (Poland, Spain, Bulgaria and Greece) had MENDit scores below the sample mean with up to two countries scoring above the sample mean for any particular QuIRC domain (see Table 4). When QuIRC domain scores were re-calculated based on a hypothetical increase in MENDit scores to the sample mean, they improved by between 50 and 300%. All projected QuIRC domain scores, except Social Interface, rose above the mean for all countries when MENDit scores were adjusted to 4.67. This included the Human Rights domain which was not significantly associated with deinstitutionalization in the regression. In similar fashion, increased deinstitutionalization was associated with increases in projected service user ratings of quality of life, autonomy and satisfaction with care but not therapeutic milieu.

For the five countries with MENDit scores above the sample mean, the predicted impact of further increasing deinstitutionalization levels was mixed. The Self-management and Autonomy QuIRC domain score saw the greatest improvement with predicted scores for all five countries rising above the sample mean. However, for four of the other six QuIRC domains, no improvement was predicted. A similar result was found for service user ratings of care. Only quality of life ratings were predicted to improve with increased deinstitutionalization.

4. Discussion

Our work is the first to investigate the relationships between national deinstitutionalization and the quality of longer term psychiatric and social care facilities and service user ratings of care. Specifically, we investigated the association between the degree to which a country had deinstitutionalized its mental health care and a) the quality of care provided in its longer term hospital and community based facilities and b) service user outcomes. Our results expand upon previous facility-level findings that greater deinstitutionalization is associated with higher quality of care in longer term psychiatric and social care facilities [1-4]. Specifically, we found that greater deinstitutionalization was associated with higher ratings for five of the seven domains of care assessed (promotion of self-management and autonomy, incorporation of recovery-based practice, availability of treatments and interventions and better built and therapeutic environments) in longer term facilities at the country level. Social interface and human rights were not statistically associated with deinstitutionalization in regression analyses. However, increased deinstitutionalization was associated with predicted clinical improvements in upholding service users' human rights. Deinstitutionalization was also positively associated with service user ratings of autonomy. However, ratings of quality of life, experiences of care and therapeutic milieu were not significantly associated with national levels of deinstitutionalization.

As deinstitutionalization gathers pace, mental health services diversify and fewer hospital beds and more types of supported accommodation are provided (e.g. residential care homes, staffed supported tenancies and 'floating outreach' support provided to people living in independent tenancies) [18]. This raises the expectation that service users will continue to recover and develop skills for more independent community living. Thus, it follows that countries that are further along in the development of community based mental health care may be more focussed in supporting service users towards this goal, resulting in greater availability of treatments and interventions and promotion of autonomy and recovery-based

practice. In countries where deinstitutionalization is more established, such as the UK, psychiatric reform has expanded to include greater service user engagement in treatment decisions and ways to improve community integration [19, 20]. Our findings show that increased focus on the provision of mental health care in the community for countries, regardless of their current level of deinstitutionalization, is associated with an overall improvement in the treatment and outcomes of individuals with longer term mental health problems.

The QuIRC social interface domain assesses the facility's links with service users' families and the wider community. Paradoxically, community rather than hospital-based facilities were associated with *lower* social interface domain scores. This finding contradicts other evidence [1] and, worryingly, suggests that facilities based in the community can become isolated from their local communities. Given the recent UK scandal of abuses of care reported in one stand alone, community based unit for people with mental health problems and learning disabilities [21], senior clinicians and managers must not assume that community based units will automatically lead to community integration. In fact, they may be more vulnerable to stigma which has been suggested to act as a barrier to participation in community activities [16]. Despite this finding, in our multilevel model, facilities with an expected maximum length of stay had an almost 10 percentage point advantage in this domain. An expected maximum length of stay presumes that service users may move beyond the current facility, a concept encompassed in the "whole system approach", which highlights the interplay between families, communities and health and social care services which are necessary to the recovery process, that is encouraged in mental health rehabilitation services [22]. When service users are expected to move on within a defined timeframe, they and their staff can be clear about the goals of treatment and support. These are likely to include a focus on building links with family and the wider community.

Our study found no significant relationship between deinstitutionalization and service user rated quality of life. It may be that other variables such as social networks [23] and employment [24], linked to deinstitutionalization but not measured in our study, are more important to quality of life for this group. Previous studies have found an improvement in quality of life among service users living in the community [25-29]. As this study was cross-sectional, we were unable to evaluate change in quality of life.

Although increased deinstitutionalization was associated with greater quality of care and more positive service user ratings of care, countries with less deinstitutionalization of care still scored highly on some domains. These anomalies may be a reflection of cultural differences between the countries included in the sample. Countries with stronger familial ties, like Spain, had higher Social Interface QuIRC domain scores. In Greece, higher QuIRC domain ratings and service user ratings of care may also be a result of improved enforcement of care standards implemented following national attention to abuses in its mental health care system in the late 1980s [30]. These inconsistencies suggest that we were unable to include all the factors that determine the success of mental health care. Furthermore, countries deemed 'more advanced' may have lessons to learn from countries with less deinstitutionalized services as we work toward international provision of high quality mental health care and improved service user outcomes.

4.1. Strengths and limitations

We were able to use the most comprehensive information available internationally on quality of longer term mental health care facilities. The variables investigated were measured using objective, standardised measures which allowed for appropriate cross-country comparisons.

Despite the strengths of this work, there are several limitations which must be considered. The countries and facilities that participated were purposively recruited for the DEMoBinc project, limiting the generalisability of results. However, as each country was chosen to reflect European variations in national wealth and systems of mental health care provision, these results are likely to be relevant to other European countries.

Exclusion of Czech facilities due to the lack of data on stigma meant that the total number of facilities included in our analyses fell below the required number of facilities to reach 90% power. However, our sample is larger than that required for 80% power using the same parameters (N=168). Czech data (9.4% of the sampling frame) were excluded as we felt it important to explore stigma associated with mental health problems as a potential confounding variable. The stigma of mental illness might influence a country's enthusiasm for deinstitutionalization, quality of care and service users' perceptions of their care.

The data were cross-sectional. As a result, models of best fit were able to investigate associations between variables but could not provide evidence of causal relationships. The relationship between service provision and quality is complex and likely to be subject to a variety of influences. Furthermore, our research was constrained to facility and service user variables collected as part of the DEMoBinc project, as well as country variables reported in the literature, and could not evaluate the impact of deinstitutionalization on service users' longer term clinical outcomes. However, recent work by Killaspy and colleagues suggests that higher QuIRC domain scores are associated with improved service user outcomes [9]. These findings corroborate previous evidence from a longitudinal study on the closure of a large mental hospital in London [1] and studies comparing hospital and community-based longer term care [2-4] which found service users in receipt of longer term care in community-based facilities had better functioning than those in long stay hospital settings.

4.2. Conclusions

The findings of this study suggest that less institutionalised mental health care is associated with greater quality and service user ratings of care in longer term psychiatric and social care facilities in Europe. The implementation of deinstitutionalization and scaling up of community-based services is not a simple task and requires political will as well as the strategic alignment of financial resources, mental health policies and legislation, and mental health professionals. Although more work is needed to further understand the impact of deinstitutionalization on quality of care and service user outcomes, our findings support WHO recommendations for increased deinstitutionalization of mental health services. They add weight to existing evidence that service users with severe and enduring mental health problems can be successfully cared for in the community.

Vitae

Tatiana Taylor Salisbury

Tatiana Taylor Salisbury holds a joint lectureship in Global Mental Health at the Institute of Psychiatry, Psychology and Neuroscience, King's College London and the London School of Hygiene and Tropical Medicine. Her research focuses on mental health systems and service evaluation. She acted as a researcher and project manager on the Development of a European Measure of Best Practice for People with Long Term Mental Illness in Institutional Care (DEMoBinc) project. She is currently co-investigator on the CHAKA (Mental health among HIV infected Children and Adolescents in Kampala and Masaka, Uganda) project.

Helen Killaspy

Helen Killaspy is Professor of Rehabilitation Psychiatry based in the Division of Psychiatry in the Faculty of Brain Sciences at UCL. Her research focuses on services and interventions for people with complex mental health problems. From 2007 to 2010, she led a three year multicentre study funded by the European Commission (DEMoBinc) through which the Quality Indicator for Rehabilitative Care (QuIRC) was developed. She is currently Chief Investigator of the Quality and Effectiveness of Supported Tenancies (QuEST) project. The programme is investigating the quality and outcomes associated with specialist supported accommodation for people with mental health problems across England.

Michael King

Michael King is Professor of Primary Care Psychiatry based in the Division of Psychiatry in the Faculty of Brain Sciences at UCL. He is a psychiatric epidemiologist who has a particular interest in the design and conduct of randomised trials of complex mental health interventions in primary and secondary care. He also undertakes observational research which includes national surveys of mental health in the UK, and cohort studies in European populations to understand the risks for mental disorders. He uses analysis of large national clinical data bases to explore prevalence of psychiatric disorders, risk factors, treatment uptake and outcomes.

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Table 1. Included country characteristics

		Country								
	Sample	**Portugal**	**Bulgaria**	**Poland**	**Italy**	**Spain**	**Netherlands**	**UK**	**Greece**	**Germany**
MENDit[a] score (SD)	3.25 (1.18)	3.67	2.16	1.16	4.00	1.83	4.33	4.67	2.67	4.33
QuIRC domain mean score (SD)	N=193									
Living Environment	60.59 (15.32)	59.18 (15.64)	54.10 (18.06)	49.02 (12.87)	64.75 (9.57)	46.48 (16.81)	70.14 (13.95)	67.05 (10.75)	58.05 (7.60)	73.81 (7.92)
Therapeutic Environment	52.15 (9.58)	47.82 (10.55)	45.56 (12.17)	47.47 (8.58)	52.60 (6.83)	55.72 (8.04)	51.58 (4.86)	64.52 (6.03)	52.13 (8.59)	51.78 (7.22)
Self-management and Autonomy	56.16 (15.38)	49.63 (16.47)	44.95 (19.19)	44.06 (9.61)	53.18 (9.11)	46.86 (10.28)	65.98 (9.83)	68.69 (11.03)	59.92 (11.21)	71.85 (8.28)
Social Interface	48.45 (14.86)	51.96 (19.33)	45.76 (17.68)	40.09 (14.04)	49.98 (11.85)	59.55 (16.38)	47.01 (33.38)	53.95 (12.74)	47.31 (11.24)	40.32 (11.52)
Treatments and Interventions	50.74 (9.13)	46.49 (10.13)	48.48 (11.37)	46.24 (7.72)	50.55 (6.69)	53.97 (9.55)	52.74 (7.06)	59.50 (8.03)	47.37 (6.39)	51.57 (8.46)
Human Rights	56.86 (13.02)	48.70 (11.85)	52.36 (14.39)	52.97 (10.41)	48.11 (9.60)	53.73 (9.10)	70.78 (6.44)	69.7 (9.19)	52.94 (11.75)	65.74 (5.71)
Recovery-based Practice	52.72 (12.72)	44.16 (13.41)	45.48 (15.94)	46.08 (10.26)	48.43 (8.12)	55.42 (8.80)	51.71 (8.65)	65.92 (9.67)	56.04 (11.71)	62.39 (8.77)
Mean service user rating scores (SD)	N=157 9									
Quality of Life	4.64 (0.91)	4.63 (0.87)	4.19 (0.89)	4.60 (0.85)	4.61 (0.75)	4.63 (0.94)	4.79 (0.89)	4.52 (0.86)	4.92 (1.02)	4.88 (0.89)
Autonomy	60.15 (12.31)	52.41 (11.90)	47.93 (9.72)	51.28 (7.46)	65.30 (7.17)	55.59 (10.92	72.65 (7.45)	67.13 (8.29)	67.18 (11.06)	64.54 (7.54)
Experiences of Care	17.45 (4.82)	15.71 (4.79)	16.12 (4.61)	17.18 (5.17)	18.56 (4.53)	16.58 (4.84)	18.96 (4.60)	18.90 (5.36)	17.26 (4.19)	18.08 (4.14)
Therapeutic Milieu	17.58 (4.23)	17.39 (4.31)	17.05 (4.04)	18.01 (4.08)	18.01 (4.11)	16.83 (4.36)	17.34 (4.06)	16.91 (4.40)	19.68 (3.91)	17.38 (4.13)

[a] Mental Health Service Deinstitutionalization Measure

Table 2. Main effects of deinstitutionalization on quality of care

	Living Environment	Therapeutic Environment	Treatments and Interventions	Self-management and Autonomy	Social Interface	Human Rights	Recovery-based Practice
Model	B	D	D	D	B	D	D
Intercept, mean (s.e.)	33.62 (3.40)	68.15*** (8.14)	69.96*** (9.68)	39.84 (26.06)	49.42** (4.97)	75.18* (32.77)	67.77*** (20.10)
Fixed effects parameter estimate (s.e.)							
DI[a]	6.14*** (0.93)	3.58*** (0.80)	3.36*** (0.96)	7.41** (2.68)	0.13 (1.39)	6.62 (3.41)	4.87* (2.05)
Facility type[b]	12.05*** (2.01)	-2.64* (1.30)	-2.53 (1.40)	5.53* (2.21)	-5.14* (2.42)	0.84 (1.91)	0.40 (1.96)
Staff/service user ratio[c]	-1.85 (2.07)	1.51 (1.37)	0.55 (1.52)	0.81 (2.56)	0.88 (2.60)	2.26 (2.25)	0.24 (2.25)
Presence of max length of stay[d]	-3.35 (2.32)	8.88*** (1.52)	6.50*** (1.64)	1.69 (2.56)	9.63*** (2.79)	1.04 (2.21)	5.85** (2.27)
Mental Health legislation[e]		-0.13 (0.10)	-0.21 (0.12)	0.16 (0.37)		-0.35 (0.45)	0.08 (0.27 (0.28)
Stigma[f]		-5.28*** (1.65)	-5.22** (1.97)	-3.10 (5.35)		-7.01 (6.75)	-6.93 (4.12)
Random parameters variance (s.e.)							
Level 1 (country)	3.71 (5.77)	1.35 e-17 (2.41 e-16)	1.13 (2.65)	31.78 (24.32)	14.72 (13.36)	60.36 (41.25)	16.56 (13.87)
Level 2 (facility)	137.83 (14.45)	58.72 (6.09)	64.85 (6.80)	141.14 (14.82)	184.32 (19.36)	102.87 (10.81)	113.55 (11.92)

[a] deinstitutionalization (Mental Health Service Deinstitutionalization Measure, MENDit)
[b] hospital = 0; community = 1
[c] Full-time equivalent staff per service user
[d] no = 0; yes = 1
[e] Year since introduction of legislation
[f] Discrimination and Stigma Scale (DISC)
* $p < 0{\cdot}05$; ** $p \leq 0{\cdot}01$; *** $p \leq 0{\cdot}001$

Table 3. Main effects of deinstitutionalization on service user ratings of care

	Autonomy	**Quality of Life**	**Experiences of Care**	**Therapeutic Milieu**
Model	H	E	F	F
Intercept, mean (s.e.)	70.38*** (22.05)	4.48*** (0.21)	15.23*** (0.86)	17.54*** (0.80)
Fixed effects parameter estimate (s.e.)				
DI[a]	7.11** (2.30)	0.05 (0.06)	0.45 (0.25)	-0.10 (0.23)
Facility type[b]	2.99* (1.19)		0.92* (0.40)	0.75* (0.33)
Staff/service user ratio[c]	0.20 (1.42)		-0.05 (0.45)	0.15 (0.37)
Presence of max length of stay[d]	-0.37 (1.39)		0.91 (0.48)	-0.62 (0.39)
Mental Health legislation[e]	-0.16 (0.31)			
Stigma[f]	-6.43 (4.54)			
Random parameters variance (s.e.)				
Level 1 (country)	27.89 (19.00)	0.04 (0.03)	0.46 (0.39)	0.49 (0.36)
Level 2 (facility)	32.67 (4.23)	0.06 (0.02)	2.81 (0.57)	1.35 (0.36)
Level 3 (service user)	54.66 (2.08)	0.73 (0.03)	19.38 (0.74)	15.98 (0.61)

[a] deinstitutionalization (Mental Health Service Deinstitutionalization Measure, MENDit)
[b] hospital = 0; community = 1
[c] Full-time equivalent staff per service user
[d] no = 0; yes = 1
[e] Year since introduction of legislation
[f] Discrimination and Stigma Scale (DISC)
* $p < 0{\cdot}05$; ** $p \leq 0{\cdot}01$; *** $p \leq 0{\cdot}001$

Table 4. The clinical impact of a change in progress towards deinstitutionalization on projected national mean QuIRC domain scores

	Mean QuIRC[a] domain score							
Country (mean MENDit[b] score)	Poland (1.16)	Spain (1.83)	Bulgaria (2.16)	Greece (2.67)	Portugal (3.67)	Italy (4.00)	Germany (4.33)	Netherlands (4.33)
Living Environment (60.59)								
2005 MENDit score	49.02	46.48	54.1	58.05	59.18	64.75*	73.81*	70.14*
MENDit = 3.25	61.85*	55.20	60.79*	61.61*				
MENDit = 4.67	70.57*	63.92*	69.51*	70.33*	65.32*	68.86*	75.90*	72.23*
Therapeutic Environment (52.15)								
2005 MENDit score	47.47	55.72*	45.56	52.13	47.82	52.60*	51.78*	51.58*
MENDit = 3.25	54.95*	60.80*	49.46	54.21*				
MENDit = 4.67	60.04*	65.89*	54.55*	59.29*	51.40	55.00*	53.00*	52.80*
Treatments and Interventions (50.74)								
2005 MENDit score	46.24	53.97*	48.48	47.37	46.49	50.55	51.57*	52.74*
MENDit = 3.25	53.26*	58.74*	52.14*	49.32				
MENDit = 4.67	58.03*	63.51*	56.91*	54.09*	49.85	52.80*	52.71*	53.88*
Self-management and autonomy (56.16)								
2005 MENDit score	44.06	46.86	44.95	59.92*	49.63	53.18	71.85*	65.98*
MENDit = 3.25	59.55*	57.38*	53.03	64.22*				
MENDit = 4.67	70.07*	67.90*	63.55*	74.74*	57.04*	58.14*	74.37*	68.50*
Social Interface (48.45)								
2005 MENDit score	40.09	59.55	45.76	47.31	51.96*	49.98*	40.32	47.01
MENDit = 3.25	40.36	59.73*	45.90	47.39				
MENDit = 4.67	40.55	59.92*	46.09	47.57	52.09*	50.07*	40.36	47.05
Human Rights (56.86)								
2005 MENDit score	52.97	53.73	52.36	52.94	48.7	48.11	65.74*	70.78*
MENDit = 3.25	66.81*	63.13*	59.58*	56.78				
MENDit = 4.67	76.21*	72.53*	68.98*	66.18*	55.32	52.55	67.99*	73.03*
Recovery-based Practice (52.72)								
2005 MENDit score	46.08	55.42*	45.48	56.04*	44.16	48.43	62.39*	51.71
MENDit = 3.25	56.26*	62.34*	50.79	58.86*				
MENDit = 4.67	63.17*	69.25*	57.70*	65.78*	49.03	51.69	64.05*	53.37*

[a] Quality Indicator for Rehabilitative Care
[b] Mental Health Service Deinstitutionalization Measure
*Denotes clinically important increase in country mean score

Table 5. The clinical impact of a change in progress towards deinstitutionalization on projected national mean service user ratings of care

Country (mean MENDit[a] score)	Poland (1.16)	Spain (1.83)	Bulgaria (2.16)	Greece (2.67)	Portugal (3.67)	Italy (4.00)	Germany (4.33)	Netherlands (4.33)
Quality of Life[b] (4.64)								
2005 MENDit score	4.60	4.63	4.19	4.92*	4.63	4.61	4.88*	4.79*
MENDit = 3.25	4.70*	4.70*	4.24	4.95*				
MENDit = 4.67	4.78*	4.77*	4.32	5.02*	4.68*	4.64*	4.90*	4.81*
Autonomy[c] (60.15)								
2005 MENDit score	51.28	55.59	47.93	67.18*	52.41	65.3*	64.54*	72.65*
MENDit = 3.25	66.14*	65.69*	55.68	71.30*				
MENDit = 4.67	76.24*	75.78*	65.78*	81.40*	59.52	70.06*	66.96*	75.07*
Experiences of Care[d] (17.45)								
2005 MENDit score	17.18	16.58	16.12	17.26	15.71	18.56*	18.08*	18.96*
MENDit = 3.25	18.12*	17.22	16.61	17.52*				
MENDit = 4.67	18.76*	17.86*	17.25	18.16*	16.16	18.86*	18.23*	19.11*
Therapeutic Milieu[e] (17.58)								
2005 MENDit score	18.01*	16.83	17.05	19.68*	17.39	18.01*	17.38	17.34
MENDit = 3.25	17.80*	16.69	16.94	19.62*				
MENDit = 4.67	17.66*	16.55	16.80	19.48*	17.29	17.94*	17.35	17.31

[a] Mental Health Service Deinstitutionalization Measure
[b] Manchester Short Assessment of Quality of Life
[c] Resident Choice Scale
[d] Your Treatment and Care
[e] Good Milieu Index
*Denotes clinically important increase in country mean score