

## Research and Theory

# Does mental health service integration affect compulsory admissions?

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## Abstract

**Background:** Over recent years, the number of compulsory admissions in many countries has increased, probably as a result of the shift from inpatient to outpatient mental health care. This might be mitigated by formal or collaborative relationships between services.

**Methods:** In a retrospective record linkage study, we compared two neighboring districts, varying in level of service integration. Two periods were combined: 1991–1993 and 2001–2003. We included patients aged 18–60, who had a first emergency compulsory admission (n=830). Their psychiatric history was assessed, and service-use after admission was monitored over a 12-month follow-up.

**Results:** Over a 10-year period, compulsory admission rates increased by 47%. Difference in relative increase between the integrated and non-integrated services was 14%. Patient characteristics showed different profiles in the two districts. Length of stay was >10 days shorter in the integrated district, where the proportion of involuntary readmissions decreased more, and where aftercare was swift and provided to about 10% more patients than in the non-integrated district.

**Conclusions:** Services outcomes showed better results where mental healthcare was more integrated. However, limited effects were found and other factors than integration of services may be more important in preventing compulsory admissions.

## Keywords

compulsory admission, service integration, continuity of care, case register

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## Introduction

Over recent decades, the configuration of mental health services in many Western countries has changed fundamentally. A reduction in the number of hospital beds was linked to the establishment of comprehensive, out-patient-oriented service systems that were responsible for circumscribed catchment areas. But the shift from hospital-based to community-based services raised critical issues relating to the quality of community treatment for the severely mentally ill; it also led to an increase in compulsory admissions [1–4]. Although an association between deinstitutionalization and involuntary hospitalizations was often observed in national trends, for instance in England [5, 6], France [7], Austria, Germany [8], and the Netherlands [9], it was seldom tested critically [10]. Salize and Dressing

[8] contradicted suggestions that there was an overall upward trend in the numbers of compulsory admission of mentally ill patients. They suggested that time series of percentages of involuntary admissions on all admissions, show that involuntary quotas in most member states were more or less stable. However, because compulsory admission is generally thought of as a last resort, stable proportions of involuntary admissions related to the increase in psychiatric hospitalizations are not preferred outcomes. From the perspective of patients, it could be argued that the shift to community care should not be associated with more compulsory admissions, following the example of Italy [11]. In fact, after the Italian psychiatric reforms in 1981, some districts with a comprehensive and well-integrated range of services had an 80% fall in the number of compulsory admissions [12].

Other studies have touched on the idea that service-characteristics affect the use of involuntary admission. In a comparative case register study, Hansson et al. [13] found an association between poor access to specialized services (in terms of formal referral procedure) and higher rates of compulsory admissions. Huxley and Kerfoot [14] concluded that higher emergency compulsory-admission rates can be expected in areas with high social deprivation, inadequate resources, and poorly organized emergency services. Bindman et al. [15] found that rates of compulsory admission in 34 geographical sectors were associated with indicators of service quality, such as delays in obtaining an acute bed or hostel place, or in obtaining home visits to acutely ill patients. In a review of research on service integration, Durbin et al. [16] found consistent and positive results for continuity indicators, e.g. follow-up after hospital discharge.

These studies suggest that fewer compulsory admissions and a high quality of aftercare can be expected in areas where services have formal or collaborative relationships. In a retrospective case register study, variance in data of psychiatric services was used in naturalistic comparative analyses evaluating the effects of integration of local mental healthcare [17]. We expected to find lower compulsory admission rates, shorter stays, fewer involuntary readmissions, and swift psychiatric follow-up.

## Methods

### Setting

The Netherlands' second largest city is Rotterdam, which is one of the world's largest seaports. The city has a population of ~550,000, a total of 1.2 million for the greater urban area. In reflection of the nation trends in mental healthcare, the shift away from inpatient care in Rotterdam was mainly a major expansion in outpatient services and sheltered living [18]. In the northern Rotterdam district, admission capacity was transferred from a psychiatric hospital outside the region, and spread across the new catchment area in smaller, mainly multi-functional service-units. The hospital already had a strong tradition of sheltered housing [19] and community psychiatry [20]. This finally resulted in a merger between the psychiatric hospital and outpatient services. In the period from 1993 to 2004, almost all general psychiatric hospitals in the Netherlands were involved in mergers with ambulatory mental healthcare institutions. Eventually, only three psychiatric hospitals out of a total of 41 failed to achieve a merger [4]. One of these was in the southern Rotterdam district, where mental healthcare is provided by a large psychiatric hospital that has several multi-functional units

throughout the region, and a separate healthcare organization for outpatient services covering the same catchment area. There was a radical 'incompatibilité des humeurs' concerning the issue of care for severely mentally ill patients, because the hospital took a biomedical approach to psychiatry, whereas the outpatient service supported a public mental healthcare perspective.

Differences in level of service integration are highlighted in the procedure for emergency compulsory admission, which involves both inpatient services and the 7×24 h crisis intervention teams assigned to the ambulatory mental healthcare institutions. Dutch law stipulates that, in emergency situations, a town's mayor decides whether legal conditions for compulsory admission have been met; within a few days, a judge must decide whether the involuntary admission is to be continued. In the event of an emergency compulsory admission, a written medical report is obligatory. This medical report will contain information on psychiatric diagnosis and the dangerousness criterion assessed by an independent psychiatrist, who is not the current therapist. To comply with these regulations, assessments for emergency compulsory admission are generally carried out by the crisis intervention teams of outpatient services.

Levels of service integration in mental healthcare in Rotterdam diverged within the same administrative and legal framework for compulsory admission. Local administrators and magistrates involved in the procedure cover both the northern and southern district. Adjacent services such as social services or primary care are mainly organized on a regional basis so that any variations in referrals to and from psychiatric services would be found in both areas. Therefore, in this setting, differences in mental healthcare service-use indicators in the context of compulsory admissions can largely be attributed to differences between districts in the organization of (public) mental healthcare.

### Psychiatric case register

In this study, we linked data from the medical reports with the psychiatric case register for the Rotterdam region, which since 1990 has covered all contacts of the local inpatient and outpatient mental health services with inhabitants in the catchment area [21]. For 1991–1993 and 2001–2003, we selected all first compulsory admissions to one of the region's psychiatric hospitals of patients aged 18–60 years, living in Rotterdam. Patients' records were matched by means of computerized record linkage [22], using a limited number of identifiers; 146 patients were excluded because of missing data (total n=830). Ethics approval was secured from a review board that represents all institutions participating in the case register. [Figure 1](#)

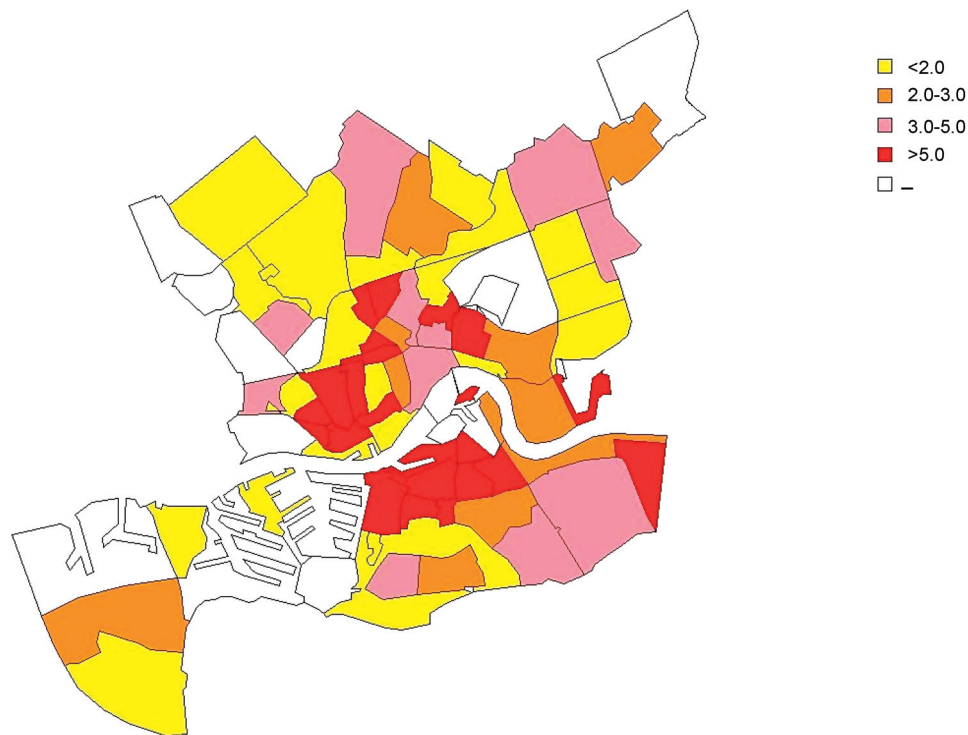


Figure 1. Emergency compulsory admissions per 10,000 inhabitants by neighborhoods in Rotterdam (2000).

illustrates the northern and southern districts and rates of compulsory admission at neighborhood level. The map shows higher rates in the older, inner-city neighborhoods and similar variations in both districts.

### Patient-characteristics

The information systems registered patient's age, gender, country of birth, marital state, and postal code. Socio-economic differences were scored using neighborhood-values of the Jarman-index [23], adjusted for the Dutch context (e.g. percentage of immigrants instead of percentage of households headed by a person born in the New Commonwealth). Mental healthcare contacts spanning a period of 12 months before and after the compulsory admission were used to classify patients as 'old acquaintances' (extensive contacts before and after admission), 'new comers' (no previous contacts, extensive follow-up), and 'passers-by' (few or no contacts before and after involuntary admission).

### Service-use indicators

Service-use indicators were calculated based on all contact-records, excluding information from sheltered living, which would inflate indicators of the use of mental healthcare. We calculated several service-use indicators as changes in service delivery will

affect different aspects of mental healthcare [6]. First, because a high admission threshold might create a different case-mix of patients in acute psychiatric wards, we looked at changes in patients' characteristics and admission criteria over time and between service-areas. Second, we compared the number of involuntary readmissions over a 12-month follow-up period after the first compulsory admissions. Next, we calculated the length of stay; the statutory maximum length is three weeks, but this period can be extended voluntarily, or on the basis of other judicial measures. Finally, because follow-up after discharge might affect a patient's motivation and chances of being readmitted, we calculated 'readiness of aftercare', operationalised as the time between hospital discharge and outpatient follow-up [24].

### Analysis

Compulsory admission rates for the 1991–1993 and 2001–2003 periods were calculated on the basis of the municipal health department's registration and of demographic data obtained from Statistics Netherlands. We evaluated changes in service-use indicators using  $\chi^2$ -tests and analyses of variance. Cox regression analysis was used to compare time intervals between involuntary admission (starting event) and aftercare (terminating event). Readmission and no outpatient follow-up after the first compulsory admission

were considered to be censored observations; in these cases, events were defined on the basis of the time between discharge and date of readmission, or of the number of days from date of discharge up to the end of the 12-month observation period, respectively. We constructed a Cox's proportional hazard model to relate 'readiness of aftercare' to differences in time and service district; patient-characteristics were included in the model to correct for differences in case-mix. Statistical analyses were performed using SPSS for Windows (version 15.0, SPSS Inc);  $p < 0.05$  was considered significant.

## Results

### Rates of compulsory admission

Between 1991–1993 and 2001–2003, there was approximately a 50% increase in the emergency

compulsory admission rate per 10,000 inhabitants aged 18–60. In the district with integrated services, the rate started at 3.8; 10 years later, it had risen to 5.5 (43% increase). The admission rate in the non-integrated district increased from 3.7 to 5.8 per 10,000 inhabitants (57% increase).

### Case-mix

Table 1 summarizes the differences and changes in case-mix of compulsory admissions in the study period. Although we found no main effect of service integration on changes in case-mix, there were some time and district interaction effects. There was a rise in emergency compulsory admission involving patients who were unmarried, male, born outside the Netherlands, had a psychiatric history, were diagnosed with psychosis or addiction, or who were a danger to themselves. However, while the proportional increase in the

**Table 1.** Patient characteristics and admission criteria for first emergency compulsory admissions by integration of psychiatric services\*, and by differences over the 1991–1993 and 2001–2003 periods (change % in brackets)

Item	Categories	Integrated services n=489		Non-integrated services n=341		1991–1993 vs. 2001–2003
Gender	Male	64.9%	(+9.6%)	67.1%	(+7.1%)	$\chi^2(1)=6.41$ p=0.011
	Female	35.1%		32.9%		
Age	Average/S.D.	34.7/10.5		34.4/10.4		n.s.
Country of birth	The Netherlands	57.2%	(–0.7%)	49.4%	(–12.4%)	$\chi^2(5)=13.39$ p=0.020
	Suriname	11.7%	(–2.5%)	11.7%	(+0.8%)	
	Dutch Antilles	6.4%	(+0.6%)	10.0%	(+5.5%)	
	Morocco	4.3%	(+2.2%)	6.9%	(+6.0%)	
	Turkey	4.0%	(+1.9%)	7.8%	(+3.3%)	
	Other	16.4%	(+1.5%)	14.3%	(+3.0%)	
Marital status	Unmarried	78.9%	(+21.0%)	74.9%	(+8.5%)	$\chi^2(2)=26.65$ p=0.000
	Married	13.4%	(+11.9%)	19.0%	(–1.9%)	
	Divorced/widowed	7.7%	(+9.1%)	6.1%	(–6.6%)	
Deprivation (Jarman-index)	<–0.10	38.8%	(+5.6%)	39.0%	(+4.5%)	n.s.
	–0.10+	61.2%		61.0%		
Psychiatric history	Old Acquaintances	76.3%	(+10.0%)	71.9%	(+4.6%)	$\chi^2(3)=8.82$ p=0.012
	Newcomers	16.7%	(–3.3%)	21.2%	(–0.6%)	
	Passers-by	7.0%	(–6.7%)	6.9%	(–4.0%)	
Diagnoses**	Schizophrenia	27.4%	(+1.8%)	22.8%	(+1.4%)	$\chi^2(3)=18.83$ p=0.001
	Other psychoses	41.2%	(+11.2%)	43.8%	(+9.5%)	
	Affective disorders	16.9%	(–14.3%)	21.4%	(–8.5%)	
	Addiction	5.1%	(+1.1%)	7.1%	(+7.0%)	
	Other diagnoses	9.5%	(+0.7%)	4.9%	(+11.5%)	
Type of danger**	Suicide	34.8%	(+3.3%)	33.5%	(+5.4%)	$\chi^2(3)=11.21$ p=0.011
	Self-neglect	20.9%	(+8.8%)	20.5%	(–2.9%)	
	To others	34.8%	(–6.3%)	39.3%	(+9.6%)	
	Public safety	9.5%	(–5.8%)	6.7%	(–12.1%)	

\*No main effects \*\*n=714 due to missing data before 1994 n.s.=not statistically significant.

number of unmarried men applied only in the district where services were integrated, the increase in the percentage of immigrants was found only in the district where services were not integrated. In the integrated district, changes in type of danger showed an increase in self-neglect, and fewer admissions were based on 'danger to others'. In contrast, in the non-integrated district, the percentage of admissions related to 'danger to others' increased.

## Hospital days

Length of stay of patients admitted compulsorily increased from an approximate average of 65 days in the 1991–1993 period to almost 87 days in 2001–2003 [F(1826)=7.70, p=0.009]. Although the difference between districts decreased from 53 vs. 77 days in 1991–1993 to 81 vs. 92 days in 2001–2003, overall hospitalization episodes were >10 days shorter for patients admitted to integrated services [F(1826)=5.32, p=0.021].

## Compulsory re-admissions

Between 1991–1993 and 2001–2003, the percentage of patients readmitted involuntarily decreased from 32.1% to 17.7% in the integrated district, and from 30.9% to 19.5% in the non-integrated district.

There was a main effect only for changes over time ( $\chi^2(1)=18.64$ , p=0.000).

## Readiness of aftercare

Figure 2 shows the number of days after discharge (x-axis) and the proportion of patients without follow-up (y-axis), excluding 'passers-by'. The curves for the two districts show that, for about two-third of the discharges (63.8%), aftercare started within two weeks. The average number of days between discharge and aftercare was 29 days (S.D.=53) and did not change over time. Figure 2 indicates that, after the first two weeks, integrated services had favorable scores for 'readiness of aftercare', with about 10% more patients receiving psychiatric follow-up. The Cox's proportional hazard model relating the time between discharge and outpatient follow-up to service-integration, periods of observation, and patient-characteristics (age, sex, marital status), showed a significant effect for service-integration only (hazard ratio=1.39, CI 95%=1.14–1.68).

## Conclusions

### Main findings

Our results suggest that service integration had limited effects on the use of emergency compulsory

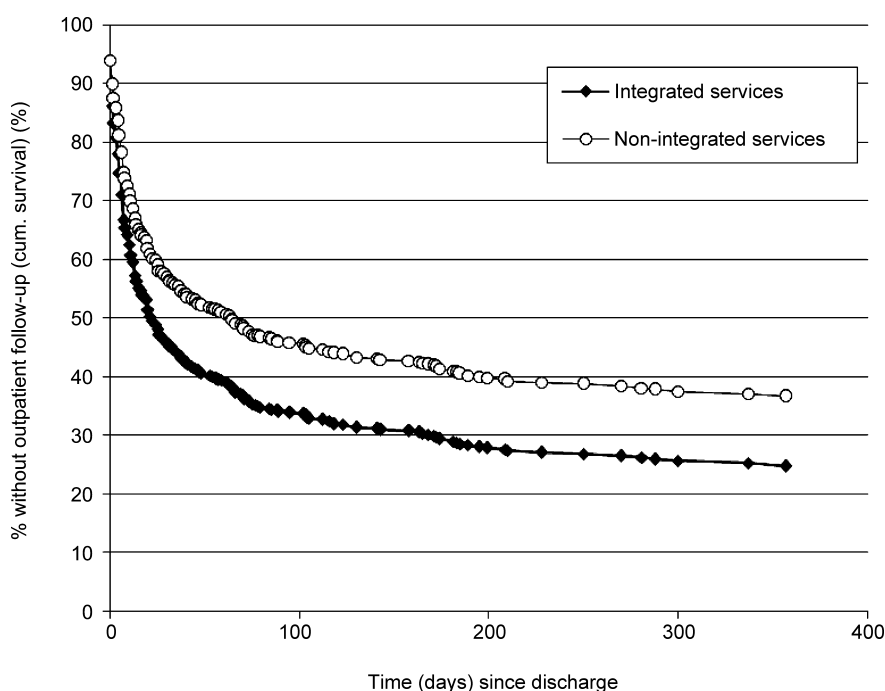


Figure 2. Number of days between hospital discharge and the next outpatient contact (in a one year follow-up period).

admissions. The increase in involuntary admissions in the study area is broadly consistent with the national trend in the Netherlands over recent decades [9]. Admission rates and the relative increase were somewhat lower in the district where mental health services were more integrated. We found that the increase in emergency compulsory admission involved patients who were likely to have less social support, and who are severely ill. The different case-mixes in the integrated and non-integrated district suggest differences in case-finding profiles, which might be labeled as 'need for treatment' vs. 'public order'. The integrated approach seemed to target a difficult-to-reach patient group (self-neglect), whereas the clinic-based service was probably more orientated towards conventional procedures, such as the local police reporting patients (danger to others). Contrary to expectations, we found that the number of patients readmitted involuntarily had decreased by >10%. This trend could be interpreted as the outcome of longer admission episodes and swift outpatient follow-up. The average length of admissions increased from two months to almost three months and, in most cases, aftercare contact took place within two weeks. Length of stay was at least 10 days shorter and about 10% more patients received aftercare in the integrated district than in the non-integrated district.

## Study limitations

Differences in level of service integration were perceived here as differences in organizational structure, as opposed to processes and outcomes of service delivery [25]. We lacked information on other service-characteristics that might affect the use of involuntary admission. Another limitation in our study is that, despite the differences between the two districts, the city's mental healthcare system is not characterized by absolute contrasts comparable to (quasi-) experimental conditions. Due to the presence of an independent outpatient service for northwestern Rotterdam, the northern district is not fully integrated. Similarly, because the psychiatric hospital in the southern district has multi-functional centers—such as a lithium-policlinic which is involved in patient follow-up—this district is also partly integrated. Various additional services cover the entire catchment area. However, the services involved in the comparison cover about 80% of all contacts in this study. A further limitation is that comparison of the integrated and non-integrated services may have been biased by cross-over between districts. As this problem involves about 12% of the patients, distortion of our main findings seems unlikely.

## Discussion

While our study provides some support for the idea that integrated services advance the quality of mental healthcare, the strength of the association does not seem to be in proportion to the amount of time and effort spent implementing integration strategies. This is consistent with the findings of the ACCESS program (Access to Community Care and Effective Services and Support) in the US, which demonstrated that such strategies have little effect on individual-level outcomes [26].

Service integration involves a range of activities such as reorganization, new support and consultation structures, and the regrouping of information systems, all of which can distract the attention of those involved from formulating a comprehensive plan of action for reducing the number of compulsory admissions. For there is a range of interventions that can help prevent the use of involuntary admission. For example, management of a more difficult case-mix of patients might be supported by treatment adherence therapy [27]. Similarly, early discharge can be made feasible by the use of intensive case management, Dekker et al. [28] reporting that three out of four projects showed a drop in the number of compulsory admissions. The risk of compulsory readmission might also be outbalanced by patients indicating preferences for care in the event of relapse; Henderson et al. [29] demonstrated the reduction of compulsory treatment through the use of joint crisis plans. And finally, there is some indication that involuntary admission can be prevented by the early detection of problems and coordinated action on the part of primary care services and emergency psychiatric teams [30]. Research that goes beyond service-structures is needed to find processes in mental healthcare that create effective alternatives to compulsory admission.

## Reviewers

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