

The influence of programme differences on crime reduction in opioid maintenance treatment. An analysis of regional patterns in Norway

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ABSTRACT

Background: Reduced criminal activity is an important outcome for opioid maintenance treatment (OMT).

Aims: Investigate possible differences in criminal convictions in four health regions in Norway among a national cohort of OMT-patients before, during, and after treatment: also investigate treatment retention and other factors that may be associated with treatment outcome.

Design: Official national criminal records were cross linked with all patients who started opioid maintenance treatment in Norway from 1997-2003 (n=3221), including patients from four different health regions in Norway; the Eastern region (n=1717), the Southern region (n=751), the Western region (n=586) and the Central-Northern region (n=167). Patients in each region were divided into separate groups according to whether they were retained or not retained in continuous treatment.

Findings: During opioid maintenance treatment, patients in all four treatment regions had a considerable reduction in criminal convictions compared to pre-treatment levels. Criminal convictions during treatment were associated with retention in treatment. Among patients in continuous treatment, significant differences were found in levels of criminal convictions among the four treatment regions during treatment. Compared to patients in the Eastern region, patients in the Southern and the Central-Northern region had respectively 44 and 81 percent less criminal convictions during treatment, and patients in the Western region had 60 percent more convictions. For patients not in continuous treatment, no statistically significant differences were found between the four regions during treatment.

Conclusions: Differences in criminal convictions during treatment may be related to regional differences in treatment practice within the national OMT system. In all regions, criminal convictions during OMT were higher for patients dropping out of treatment. It is suggested that clinical staff should offer more support to patients at risk of dropping out of treatment.

INTRODUCTION

Opioid maintenance treatment (OMT) has been shown to reduce both drug use (1,2) and criminal activity among heroin users (3-6). Several factors may affect treatment outcome, and research has attempted to identify and study those factors that may account for variability. The majority of studies predicting outcome have focused on patient characteristics (7,8). Individual characteristics such as severity of psychiatric symptoms, presence of an antisocial personality diagnosis, treatment drop out, poly-drug use and prior criminal history have consistently been linked to poor treatment outcome (2,9).

There is also evidence of the association between patient outcome and the manner in which programme services are delivered (10,11). Relapse to opioid use during methadone maintenance treatment has been found to be related to programme variables such as dosage level, the management of urine drug screening, methadone take-home privileges and to treatment plans (12).

Opioid maintenance treatment should not be assumed to be a single type of procedure: for many years it has been known that opioid maintenance treatment varies considerably between countries. In a study which compared methadone maintenance treatment in six different countries (Australia, Canada, France, the Netherlands, Thailand and the UK), marked variations between each country were found in terms of dosage level, staffing, entry criteria, frequency of programme attendance, and health counselling (13). Opioid maintenance treatment also differs within countries (10,11, 14). In Norway, opioid maintenance treatment has been available at a national level since 1998, and the system is based on specialised health care services at regional centres. The Norwegian programme comprises 14 centres that are all subject to the same national guidelines. Although regional centres are subject to the same national standards, research reports and annual assessments suggest that over a period of time the different Norwegian regional OMT-centres have

developed considerable variations in treatment strategies (10,14,15).

Differences between the Norwegian regions have been found in terms of choice of opioid agonist, control measures such as urine drug screening, degree of psychosocial rehabilitation, provision of long-term living arrangements, education and work (15). In a recent study, the effect of treatment organisation and practice on outcome was investigated (16). Findings revealed that centres organised treatment differently, and that patients did not have similar outcomes. Marked variations between centres were found according to caseload, choice of agonist, prescribing doctor, supervised dispersion and urine drug screening, despite all centres being subject to the same national guidelines. However, the effort of Gjersing *et al.* (16) to study the relationship between centre characteristics and treatment outcomes was hampered with the lack of access to individual patient data, as only aggregated/ecological data were available.

Such findings confirm that there may be marked regional differences in OMT treatment delivery. We have in another paper analyzed crime reductions in a national cohort comparing criminal convictions before and during treatment (17). In this present paper we use the health regions as proxy for prevailing regional treatment practices and analyse crime reductions in relation to factors that may be associated with treatment outcome.

This study investigates criminal convictions among a national cohort of OMT-patients before, during, and after treatment in four different health regions in Norway; the study also investigates factors that may be associated with treatment outcome.

MATERIALS AND METHODS

Measures

Complete records on all patients (n=3221) who entered OMT in Norway were included. Additionally, official data from the Norwegian crime statistics (Statistics Norway) contained detailed information of all registered crime cases including date of the crime and offence details. Data from the national OMT-register and the crime statistics were linked using the unique 11-digit identification number, assigned by the Norwegian state for all citizens.

Setting and participants

Opioid maintenance treatment in Norway has been centrally planned and supervised by the government: as such it constitutes a national programme, with monopoly on admissions to OMT, and all regional treatment centres were subject to the same countrywide government standards (18). The programme is integrated into the general health and social security system, and patients apply to a regional centre via their general prac-

titioner or social service centre (19). During initiation of OMT in Norway and at the time of our observation period, the OMT guidelines were characterised as restrictive and high threshold. The criteria for admission to treatment were not rigid, but patients were supposed to be 25 years of age, to have been dependent on heroin for several years, and to have received prior abstinence-oriented treatment (18). Patients with severe somatic or psychiatric diseases were prioritized during the initial phase of the programme. New national guidelines presented in 2010 are however less strict and give no age limit. Currently the only absolute criterion for admission to treatment is opioid dependence, defined according to the ICD-10 or DSM-IV criteria. Throughout the last decade, opioid maintenance treatment in Norway has increased, and during 2010 it exceeded 6000 patients (20), which comprise approximately half of all those 8.600-12.600 estimated to be problematic opioid users in Norway (19).

The study population included all patients (n=3221) in Norway who started OMT from September 1997 until December 2003, creating a dynamic cohort. The study period consisted of individual and varying observation times; from entry to OMT until the last day of observation, set at 31 December 2003. Some patients (n=135) died between treatment start and the last day of observation (31.12.2003). Date of death was set as the end of observation for those who died.

The study sample was divided into four regions according to the administrative "Regional Health Enterprises". The Eastern region (n=1717) included patients from Oslo, Akershus, Hedmark, Oppland and Østfold. The Southern region (n=751) included Buskerud, Vestfold, Telemark, Aust-Agder and Vest-Agder. The Western region (n=586) included Rogaland, Hordaland and Sogn & Fjordane, and the Central-Northern region (n=167) included patients from Nord-Trøndelag, Sør-Trøndelag, Møre & Romsdal, Nordland, Troms and Finnmark.

Data for all patients were analysed according to whether they stayed in continuous (n=2046) or non-continuous (n=1175) treatment during the period of observation.

In addition, the period of observation was separated into different phases; *pre-treatment* included three years prior to treatment start, *in-treatment* included the actual number of days in OMT, and *post-treatment* included both the period between treatment episodes (for those who re-entered treatment) and the period after ending treatment.

The Norwegian crime statistics provided data on date of crime, penal code and 4 prosecuting decisions: 1) formal charge leading to conviction, 2) formal charge leading to acquittal, 3) fines and 4) other. All convictions are decisions finding a person guilty of a crime in the court of law. In our study, only formal charges leading to convictions were included in the analysis. Rates of convictions refer to the number of convictions that occurred per person year.

Table 1. Patient characteristics for each treatment region (n=3221).

	East n=1717	South n=751	West n=586	Central-North n=167	All patients n=3221
Women, % (n)	35.8 (615)	27.7 (208)	28.7 (168)	32.3 (54)	32.4 (1045)
Age, mean (SD)	37.2 (6.9)	36.9 (6.7)	36.4 (6.0)	38.0 (6.3)	37.0 (6.7)
Pre-treatment crime rate (CI)	2.2 (2.08-2.12)	2.3 (2.27-2.33)	2.4 (2.37-2.43)	2.3 (2.24-2.36)	2.2 (2.19-2.21)
Continuous treatment, % (n)	61.7 (1059)	62.6 (470)	65.4 (383)	80.2 (134)	63.5 (2046)
Years in-treatment, continuous, median (max)	2.4 (6.3)	2.0 (5.3)	1.1 (5.3)	1.9 (4.7)	2.0 (6.3)
Years in-treatment, non-continuous, median (max)	1.5 (5.8)	1.2 (4.6)	0.9 (4.9)	1.0 (4.0)	1.3 (5.8)
Months post-treatment, median (max)	6.0 (54.6)	16.3 (58.9)	13.3 (60.3)	10.6 (48.7)	10.3 (60.3)

Patients were divided into three groups according to levels of convictions three years prior to treatment start. Patients who did not have any convictions were defined as the “no-conviction group” (n=1375). Of those having convictions (n=1846); patients in the “high-conviction group” comprised the 90-percentile of patients (n=187) having the most convictions (≥ 28 convictions), and the rest of the patients (n=1659) were included in the “medium-conviction group” (1-27 convictions).

Ethics

The study was approved by the Regional Committees for Medical and Health Research Ethics, The Norwegian Social Science Data Services (NSD) and the Norwegian Directorate of Health. Files were merged and made anonymous by Statistics Norway.

Statistical analysis

Analyses were performed by STATA version 11.0 (21). Continuous variables were compared using t-tests and discrete variables using the chi-square test (95% CI). Incidence rates (IR: number of events/total person-years of observation) (22) with 95% confidence intervals (23) and rate ratios (RR: rate in exposed/rate in unexposed) (22) with 95% confidence intervals were calculated. All analysis were stratified according to whether patients were in continuous treatment or not.

The association of variables with criminal convictions during treatment was assessed using multivariate negative binomial regression models (NBRM) designed for count outcomes (24). In the present paper, three models were performed; one separate model for all patients and one for continuous and non-continuous respectively. The negative binomial regression model can be considered a generalization of Poisson regression and is often used for over-dispersed count data which is when the conditional variance exceeds the conditional mean (24). The effect sizes are reported as the incidence rate ratio (IRR). The IRRs are obtained by exponentiation of the regression coefficient. For interpretation of the IRR, the expression $100 \cdot (\exp[\beta] - 1)$ tells us the percentage change in the incidence risk for a one-unit increase of change in the explanatory variable given the other variables held constant in the

model (25). Exposure time (sum of person-years in treatment) is included in the models. In order to test for differences between each region, post-estimations following the NBRM analysis were conducted.

RESULTS

Patient characteristics

The cohort (n=3221) comprised 67.6% (2176) men and 32.4% (1045) women: women were slightly younger (mean age 35.5) than men (mean age 37.7) at entry to OMT. The proportions of women were distributed similarly between each of the four treatment regions and no statistically significant differences between regions were found. Age distributions and pre-treatment crime rates were also similar in the different regions (Table 1). Of all patients (n=3221), 63.5% (n=2046) were in continuous treatment from treatment start until the end of the observation period. The numbers of patients in continuous treatment differed across regions; in the Central-Northern region 80.2% (n=134) were in continuous treatment compared to 61.7% (n=1059) in the Eastern region, 62.6% (n=470) in the Southern region and 65.4% (n=383) in the Western region.

Years spent in treatment were calculated separately for patients in continuous treatment and for those who were not in continuous treatment. Patients who were in continuous treatment had almost twice as many years in treatment (median 2.0 years) compared to those not in continuous treatment (median 1.3 years). Among patients in continuous treatment, there were regional differences in years spent in treatment; in the Eastern region, patients spent a median of 2.4 years in treatment, compared to 1.1 years in the Western region (Table 1).

Regional differences in criminal convictions before and during treatment; patients in continuous treatment

Among patients who remained in continuous treatment, rates of criminal convictions during the three years prior to OMT were similar across regions (Figure 1). Rates of convictions during treatment however, were found to differ. Patients in the Central-Northern region had the fewest convictions during treatment (IR 0.14 [CI 0.18-0.46]), and compared to rates prior to treatment, patients had more than a 90% reduction in cri-

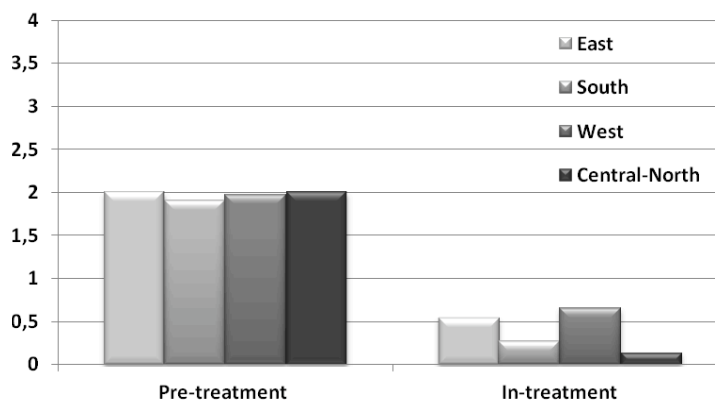


Figure 1. Criminal convictions prior to and during Opioid maintenance treatment (OMT) for patients in continuous treatment, by regions (n=2046). Y-axis: IR: Incidence rate (number of events/total person-years of observation).

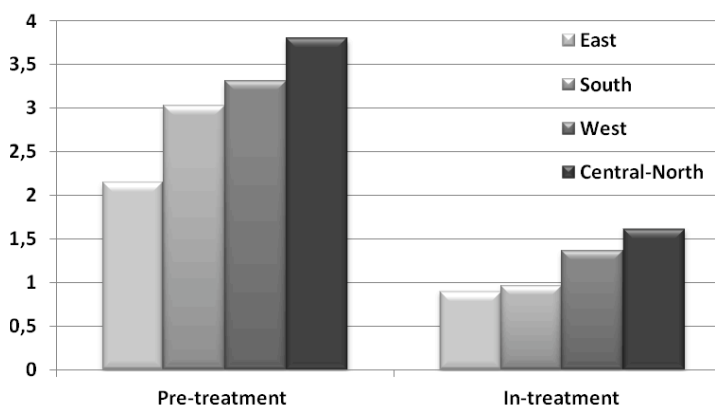


Figure 2. Criminal convictions prior to and during Opioid maintenance treatment (OMT) for patients in non-continuous treatment, by regions (n=1175). Y-axis: IR: Incidence rate (number of events/total person-years of observation).

riminal convictions (RR 0.07 [CI 0.05-0.10]). Patients in the Southern region also had few convictions during treatment and compared to pre-treatment levels these patients had more than a 80% reduction in criminal convictions (RR 0.14 [CI 0.12-0.16]).

Similar but slightly less evident reductions in convictions were found for patients in the Eastern and the Western region. Compared to pre-treatment levels (IR 2.0 [CI 1.98-2.02]), rates during treatment were reduced to 0.54 [CI 0.49-0.59] for patients in the Eastern region, giving a two-thirds reduction in convictions during treatment (RR 0.27 [CI 1.25-0.29]). Also patients in the Western region had almost a two-thirds reduction in convictions during treatment (RR 0.33 [CI 0.30-0.37]).

Regional differences in criminal convictions before, during, and after treatment; patients not in continuous treatment

Among those patients who were not in continuous treatment, rates of criminal convictions during the three years prior to OMT differed across regions (Figure 2). Patients in the Eastern region had the lowest rates of criminal convictions prior to treatment, and during treatment rates of convictions fell to more than half of pre-treatment levels (RR 0.42 [CI 0.39-0.45]). In contrast, patients in the Central-Northern region had the

highest levels of convictions both prior to (IR 3.8 [CI 2.70-3.90]) and during treatment (1.62 [CI 1.38-1.86]), but still had more than a 50% reduction in convictions (RR 0.43 [CI 0.33-0.56]) (Figure 2).

Rates of convictions increased in the post-treatment period, but differed between regions. Patients in the Southern region had the highest rates (2.25 [CI 2.19-2.31]) outside treatment, compared to 1.76 [CI 1.70-1.82] in the Eastern region, 1.48 [CI 1.37-1.59] in the Western region and 0.95 [CI 0.64-1.26] in the Central-Northern region.

Factors associated with criminal convictions during treatment

Table 2 shows the factors that were found to be associated with criminal convictions during treatment. When analysing criminal convictions among all patients (n=3221), significant differences were found across regions: compared to the Eastern region, patients in the Southern and Central-Northern region had correspondingly 32 and 58 percent less convictions during treatment. There were significant differences in criminal convictions when comparing the Southern region to the Western region (p<0.001) but not the Central-Northern region (P=0.063). Compared to the western region, the Central-Northern region was associated to significantly fewer (p<0.001) convictions during treatment.

Table 2. Criminal convictions during treatment, by gender, age, pre-treatment convictions, years in treatment and treatment region (n=3221)^a.

	All patients (n=3221)		Continuous treatment (n=2046)		Non-continuous treatment (n=1175)	
	IRR (95% CI)	P-value	IRR (95% CI)	P-value	IRR (95% CI)	P-value
Gender						
Men (reference)	1		1		1	
Women	0.68 (0.55-0.85)	0.001	0.83 (0.61-1.15)	0.263	0.56 (0.40-0.76)	<0.001
Age						
	0.97 (0.95-0.98)	<0.001	0.97 (0.95-0.99)	0.012	0.96 (0.94-0.99)	0.004
Pre-treatment convictions						
No convictions (reference)	1		1		1	
Medium level convictions	4.97 (3.87-6.00)	<0.001	4.79 (3.54-6.49)	<0.001	5.69 (4.03-7.91)	<0.001
High level convictions	18.11 (11.39-26.05)	<0.001	22.98 (12.10-43.63)	<0.001	17.81 (10.41-30.47)	<0.001
Years in treatment						
< 1 yr (reference)	1		1		1	
1-2 yrs	0.82 (0.62-1.09)	0.169	0.94 (0.62-1.43)	0.781	0.89 (0.62-1.28)	0.528
2-3 yrs	0.63 (0.47-0.86)	0.003	0.93 (0.59-1.46)	0.751	0.59 (0.39-0.88)	0.01
> 3 yrs	0.53 (0.40-0.70)	<0.001	0.85 (0.58-1.26)	0.431	0.46 (0.30-0.72)	0.001
Treatment region						
East (reference)	1		1		1	
South	0.68 (0.53-0.88)	0.003	0.56 (0.40-0.80)	<0.001	0.81 (0.56-1.16)	0.241
West	1.19 (0.90-1.57)	0.223	1.60 (1.09-2.34)	0.016	0.87 (0.58-1.32)	0.517
Central-North	0.42 (0.26-0.68)	<0.001	0.19 (0.10-0.38)	<0.001	0.99 (0.43-2.29)	0.982

^a Multivariate negative binominal regression model.

^b IRR: Incidence rate ratio (estimated rate ratio for a one unit increase of change in the explanatory variable given the other variables held constant in the model).

When stratifying patients according to retention in treatment, significant differences in criminal convictions across regions were found for patients in continuous treatment (n=2046). Compared to patients in the Eastern region, those in the Southern and the Central-Northern region had respectively 44 and 81 percent less criminal convictions during treatment. In contrast, patients in the Western region had 60 percent more convictions. Further, we found significant differences in criminal convictions when comparing the Southern region to the Western region (p<0.001) and the Central-Northern region (P=0.003), and compared to the western region, the Central-Northern region was associated to significantly fewer (p<0.001) convictions during treatment.

For patients not in continuous treatment, no statistical differences were found in criminal convictions across the four treatment regions (Table 2). Gender differences were found; women had 44 percent fewer convictions during treatment compared to men. Years spent in treatment were also associated with reductions in convictions; patients who had spent three years or more in treatment had 54 percent fewer convictions during treatment compared to patients who only spent a year or less in treatment.

Among all patients, whether retained in continuous treatment or not, younger age and pre-treatment convictions were significantly associated to more convictions during treatment (Table 2).

DISCUSSION

This study looked at changes in criminal behaviour (as measured by conviction rates) among patients receiving opioid maintenance treatment in four health regions. Our results show important reductions in criminal convictions during OMT but with substantial variations in criminal convictions in the four different regions for patients in continuous treatment. This regional variation cannot be attributed to pre-treatment differences in patient characteristics. Prior to treatment entry, levels of criminal activity and individual patient characteristics were comparable across the four geographical regions, suggesting that a similar population of patients was entering OMT on a national scale, likely reflecting relatively similar adherence to the national guidelines on the inclusion criterion issue.

When adjusting for age, gender and years in treatment, we found that patients in the Western and Eastern region had significantly more criminal convictions during treatment, compared to patients in the Southern and the Central-Northern regions. Our finding is in accordance with prior studies finding that patients in the Central-Northern region had lower arrest-rates (2%) compared to patients in the Western region (12%), the Southern region (12%) and the Eastern region (7%) during 2003 (15). As the OMT programme in Norway is centrally planned and subject to the same central regulation, this might be expected to reduce variations

in the delivery of treatment. Prior studies have found that differences in treatment programmes develop despite of national regulations, policies and guidelines (11,16), which may be supported by our findings.

Several factors might explain the differences in criminal convictions across regions. Treatment outcome has been linked to programme size (8,12). The Eastern region has the highest number of patients, dominated by the population in the capital city, Oslo. Larger programme capacity may suggest more resources and more benefits for clients, and studies have found that larger clinics and more counsellors were associated with lower relapse rates (12). However, this effect for programme sizes is not consistent: other studies have reported that programmes with more clients or larger counsellor caseloads have obtained poorer outcomes (8,26). For clients, the chances of getting "lost in the shuffle" increased, and the greater workload among staff may outweigh the potential advantage associated with increased size (8). The Central-Northern region has the smallest number of patients. Provided that staffing levels are adequate, treatment centres with fewer patients may be able to give more attention to each individual patient.

The levels of social rehabilitation in methadone maintenance treatment have been found to be associated with improved treatment outcomes compared to the provision of methadone alone (2,27-29). The Norwegian OMT model is psychosocially oriented (18), however prior reports have documented that the degree of psychosocial assistance varied between treatment regions; in 2003 81% of patients in the Central-Northern region had contact with their OMT-consultant within the last 30 days, compared to 40% in the Eastern region, 37% in the Southern region and 32% in the Western region (15). Proportions of patients in long-term living arrangements have also been found to differ between regions. During 2002, 90% of patients in the Central-Northern region were in long-term living arrangements, compared to 71% in the Eastern region (15). Further differences have been found in the proportion of patients in work or education. The southern and Central-Northern regions had employment rates of 25 and 32 percent respectively, compared to 17 percent in the Eastern region (15). Moreover, during 2002, 43% of patients in the Eastern region had social security benefits as their main income, compared to only 24% in the Western region (15). The differences between the treatment regions have been explained by different staff attitudes towards harm reduction (30), as the Central-Northern region has been found to give higher emphasis on programme structure, requirements for rehabilitation, close monitoring, and discharge in cases of inadequate treatment results, while the Eastern region and especially Oslo have established a more harm reduction perspective.

Using heroin or other types of drugs during treatment may affect treatment outcome. Prior studies have shown that the proportion of patients using heroin while

in treatment, was twice as high in Oslo (the Eastern region) compared to the other regions in Norway (14). In another Norwegian study where clinicians were to describe patients' drug use during OMT, it was found that only 39% of patients in the Eastern region were described as having no drug use during the past four weeks, compared to 77% in the Central-Northern region (15). There might be reason to believe that illegal drugs are more available in Oslo compared to the more decentralized locations (14). The city of Oslo has worrying drug problems, particularly related to number of overdose deaths and an open drugs scene in the surrounding area of the central railway station called "Plata" (31). An open drug scene may attract drug users from all over the country, and in a recent report describing fatal overdoses in Oslo, it was found that nearly a third (73 of 232 persons) of those who died from a fatal overdose were persons who had their residential address outside of Oslo (32). The open drug scene in Oslo might also have become a gathering place for OMT patients. In the lack of new social networks, patients in OMT might have continued coming to Plata for the purpose of spending time with old friends and thus become exposed to drug use. In a recent study, spending time with other drug users were found to be associated with higher levels of heroin use during methadone treatment (33).

The Western region has had the highest use of buprenorphine as the maintenance medication rather than methadone. During 2003, 61% of OMT patients in the Western region received buprenorphine, compared to only 9% in the Eastern region, 22% in the Southern region and 13% in the Central-Northern region (15). It is unclear whether type of opioid medication is related to the observed outcomes. A Cochrane report concluded that methadone maintenance treatment at high dose or flexible doses was associated with better suppression of heroin use than buprenorphine maintenance treatment (34). However, research has found few differences between buprenorphine and methadone groups in controlling crime (35).

In the present study, there were considerable regional differences in the proportions of patients engaged in continuous treatment; in the Northern region more than 80% were retained in continuous compared to almost 62% in the Eastern region. Retention in treatment has been consistently found to be associated with treatment outcome (2,3,9,36), and studies have documented that patients who drop out of maintenance treatment have more criminal activity during treatment compared to patients retained in continuous treatment (3,17). The present study is in accordance to prior findings; by stratifying all analysis according to whether patients were retained in continuous treatment or not, we found that the overall crime levels during treatment were significantly higher for patients in non-continuous treatment than for patients in continues. Among patients who were in non-continuous treatment, there were however not differences in criminal convictions between the

regions.

In interpreting these findings certain limitations should be considered. Firstly, official crime records are known to underestimate the actual rates of criminal activity. Also, we did not have information on the reasons why patients failed to remain in treatment. Some patients might have dropped out or have been discharged for some violation of programme rules, others may have left for other reasons (moving home, transfer to other forms of treatment, hospitalisation after accidental injury). It is also possible that the casemix of patients in the different treatment regions might have differed in important psychological, psychiatric, or behavioural characteristics that were not measured during this study. We would also note that this study has certain strengths. It is a longitudinal study that follows a complete national cohort of 3221 patients over a prolonged period of time including time before, during, and after treatment. The study sample includes complete patients records from each OMT-centre, allowing for comparisons between treatment regions. Further, nationwide registers were ensuring that no patients were lost to follow-up, giving us the opportunity to address the consequence of patients' tendencies of interrupting and dropping out of treatment.

Awareness and understanding of the process by which the programmes are delivered when examining the differences in outcomes across treatment regions within a national programme, is essential for improving treatment effectiveness. The substantial variations in criminal convictions during treatment across regions

could point toward that national standards may have been implemented differently. Our study suggests that reaching the goals of less criminal activity and more social rehabilitation may be more feasible at the smaller OMT centres. The Central-Northern region stood out by having the highest retention rate and the least criminal convictions among patients in continuous treatment: a small number of patients per staff and being able to give more attention to each individual patient may have contributed to the high levels of patients in work, education and in long-term living arrangements. However, similar and elevated rates of convictions during treatment across regions for non-continuous patients illustrate the need to emphasise retention in treatment on a national level.

Rapid expansion of treatment services, most prominent in the Eastern region, might have been a challenge in terms of optimal treatment delivery. Policy makers need to be aware that a higher burden on the treatment systems may be accompanied with a reduced quality of the treatment services and less favourable treatment outcomes if sufficient resources are not provided.

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