Unplanned admissions to inpatient psychiatric treatment and services received prior to admission

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ABSTRACT

Background: Inpatient bed numbers are continually being reduced but are not being replaced with adequate alternatives in primary health care. There is a considerable risk that eventually all inpatient treatment will be unplanned, because planned or elective treatments are superseded by urgent needs when capacity is reduced.

Aims of the study: To estimate the rate of unplanned admissions to inpatient psychiatric treatment facilities in Norway and analyse the difference between patients with unplanned and planned admissions regarding services received during the three months prior to admission as well as clinical, demographical and socioeconomic characteristics of patients.

Method: Unplanned admissions were defined as all urgent and involuntary admissions including unplanned readmissions. National mapping of inpatients was conducted in all inpatient treatment psychiatric wards in Norway on a specific date in 2012. Binary logit regressions were performed to compare patients who had unplanned admissions with patients who had planned admissions (i.e., the analyses were conditioned on admission to inpatient psychiatric treatment).

Results: Patients with high risk of unplanned admission are suffering from severe mental illness, have low functional level indicated by the need for housing services, high risk for suicide attempt and of being violent, low education and born outside Norway.

Conclusion: Specialist mental health services should support the local services in their efforts to prevent unplanned admissions by providing counselling, short inpatient stays, outpatient treatment and ambulatory outpatient psychiatry services.

Implications for health policies: This paper suggests the rate of unplanned admissions as a quality indicator and considers the introduction of economic incentives in the income models at both service levels.

1. Introduction

Modern mental health services try to ensure that people with severe mental illness spend the minimum amount of time in hospital because unnecessary hospital care is wasteful, stigmatizing and disliked by patients [1]. The main arguments for shifting care from institutions to community care are improved access to services, enabling people with mental illness to maintain family relationships, friendships and employment while receiving treatment, and reduced segregation and stigma [2]. However, the broad picture over the past two decades shows a progressive reduction in hospital beds, along with imbalanced, inadequate and slow investment in community services [3]. As in most industrialized countries, in recent decades, mental health services for adults in Norway have been characterized by deinstitutionalization and redistribution of patients from long-term care to short-duration active treatment [4].

The locus of care is changing from psychiatric hospitals to the community, and this is a contentious component of mental health care policy in many countries [5]. Although both community and hospital services are necessary, the relative mixture of the service components needed depends on specific local circumstances, and most care should be provided at or near people's homes [6]. In line with this, the World Health Organization (WHO) recommends that countries should limit the number of mental hospitals, build community mental health services, develop mental health services

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in general hospitals, integrate mental health services into primary health care, build informal community mental health services and promote self-care [7].

Reducing the number of beds in inpatient treatment without providing adequate local alternatives may result in much unplanned or acute treatment because planned or elective treatments are superseded by urgent needs. Unplanned admissions are much studied in somatic patients but receive less research attention where patients suffer from mental illnesses. One study found that people with multiple illnesses are much more likely to be admitted to hospital unexpectedly, and mental health issues and economic hardship further increase the likelihood [8].

Readmission rates are increasingly used as a performance indicator [9], even though the validity of using the rate of readmission as an outcome measure has been questioned [10–13]. In somatic services, it has been suggested that readmission rates provide an incomplete picture of unplanned care and it has been suggested that payers and policy makers should broaden their focus from readmission measures to unplanned care composite measures [14]. They suggest that a composite measure of unplanned care should include readmissions, observation stays and emergency department visits [14].

The first objective of this study is to estimate the prevalence of unplanned admissions and analyse the difference between patients with unplanned and planned admissions regarding services received during the three months prior to admission. The second objective is to identify the clinical, demographical and socioeconomic characteristics of patients with unplanned treatment compared to patients with planned treatment. We assume that elective or planned treatment is more effective than treatment provided without a treatment plan and that both patients and clinicians prefer that the treatment follows a plan.

Unplanned admissions were defined as the sum of all urgent or involuntary admissions. This also includes unplanned readmissions because these are assumed to be urgent admissions.

Based on the findings, we discuss whether the rate of unplanned admissions is a suitable indicator of the quality of the collaboration between primary and secondary services, rather than a performance indicator for specialist services only. This study also contributes to the literature on deinstitutionalisation and community mental health care by studying the link between use of community services and type of hospital admission.

2. Methods

2.1. Setting

Norway is a country with 5.2 million inhabitants, a stable economy and universal health care. In the Norwegian democratic welfare state, public authorities are responsible for providing and financing health services. The health service in Norway is funded through general income tax and through the mandatory National Insurance Scheme, and the quality of the services is high [15].

The responsibility for specialist care lies with the state (administered by four Regional Health Authorities), and the municipalities are responsible for primary care. Mental health services in Norway are provided at two levels: the municipality level (primary health care) and the specialist level. Municipal responsibility includes prevention, diagnosis and assessment of functional ability, early intervention and rehabilitation, follow-up, psychosocial support and counselling, and referral to specialist services. Norway is currently divided into 428 municipalities; over half of these have fewer than 5000 inhabitants, and nearly 40% have fewer than 3000 inhabitants. There is an ongoing political debate about mergers of

municipalities into larger units to strengthen their economic potential and to improve the provision of services.

At the specialist level, there are district psychiatric centres (DPCs) and hospitals. The 75 DPCs around the country are responsible for providing specialized mental health services in the form of outpatient, ambulatory or inpatient treatment. The DPCs assist the municipal mental health services with counselling and ensure continuity in specialist services. On average, each DPC covers more than five municipalities. The hospitals are responsible for specialist health services that can only be performed at hospital level, such as secure wards, closed emergency departments and some other limited functions.

In total, specialist mental health services in Norway employ about 21,000 full-time equivalents, while mental health services in the municipalities employ about 14,000 (i.e., about 7 person-years per thousand inhabitants in 2015).

The long-term policy has been to shift activity from hospitals to DPCs, and from inpatient treatment to outpatient and ambulatory activity [16]. In 1998, the Norwegian parliament adopted a 10-year National Programme for Mental Health, calling for major investment, expansion and reorganization of the services. There was a 39% reduction in the number of inpatient psychiatric beds in Norway between 1998 and 2015. Of the 3664 beds in adult mental health services in 2015, 54% were in hospitals, 42% were in DPCs, and 4% were in nursing homes and other institutions. The number of outpatient consultations per inhabitant has increased by 167% from 1998 to 2015, and in 2015, 86% of consultations occurred at DPCs with the rest at hospitals [17].

2.2. Design

A comprehensive national mapping of patients was conducted in all psychiatric wards and departments providing inpatient treatment on a specific date in 2012. Each patient's clinician was responsible for completing the form. This study comprised full mapping conducted on behalf of the national health authorities. Written consent was obtained from the patients, but the clinician completed the forms for all patients, including those who did not give their consent. In the latter case, no personal identification number was collected. The data were not combined with any data from registers in the current study, so all mapping forms were included. The study was approved by the Regional Committee for Medical and Health Research Ethics (2012/848/REK midt).

2.3. Data collection

The targeted participant group comprised all inpatients on a given day (20 November 2012). All mental health services in public and private sectors were invited to participate. Several months prior to the mapping, the service managers and clinicians received information that described the project and the data collection procedures. Because of information technology firewall restrictions at the institutions and clinics, it was not possible to collect the data electronically, so all of the units received printed forms according to the number of patients registered at the same time in the previous year plus 20% in case the number of patients had increased. The clinicians completed one form per patient. Excluding those who were expected to react negatively, patients were invited to participate in the completion of the form, but the clinician rather than the patient answered the questions during the mapping. Over half of the patients (55%) participated in the completion of their forms. The completed forms were returned by registered mail to a company that scanned all of the forms and performed coarse quality control. Further quality control of the data files was performed by the project team.

2.4. Variables

The registration form was six pages long and consisted of a wide range of topics, such as previous use of services, main and secondary diagnoses (International Classification of Diseases, ICD-10), voluntary/involuntary commitment, demographics characteristics (including gender, age), socioeconomic characteristics (including main source of income, education) and family information, place of residence and country of birth.

The ICD-10 two-digit codes were grouped in the following diagnoses: Substance use disorders (F10-F19), Schizophrenia (F20), Schizoaffective disorder (F25), Other psychotic disorders (F29, F23), Bipolar disorder (F31), Major depression (F32-F34), Anxiety disorders (F40-F42), Reaction to severe stress and adjustment disorders (F43), Hyperkinetic disorder (F90), Eating disorders (F50), Personality disorders (F60-F61+ F21) and Other (all other diagnoses).

Type of admission was defined by two questions: "Was the patient admitted for emergency/urgent help?", and "At the time of admission, had fewer than 30 days passed since the patient was last discharged?" The answers to both questions were simply "yes" or "no". Legal referral information was used to identify patients who were involuntary admitted.

2.5. Sample

Ninety-four of the 104 inpatient departments participated. Most of the units that did not participate were small and cited a lack of time as their reason for not participating. Non-participating institutions comprised 4% of all inpatient days during 2012.

Data were returned for 2358 patients. Based on data from the National Patient Register for the number of inpatients the specific date (N = 3618), we estimated that at least 65% of all inpatients on the given day were included in the mapping. This indicates that many of the participating department did not map all their patients and the inclusion rate varied from 35% to 87% between the hospital trusts.

2.6. Data analyses

Proportional Venn diagrams and simple set theory was used to study the proportion of different types of admissions and their combinations. Binomial logit regressions were used to compare characteristics of patients including services received during the three months prior to admission.

3. Results

The proportional Venn diagram of the sample is shown in Fig. 1, and the sizes of the different elements are shown in Table 1. Readmissions are included because this is a potential quality indicator. Because readmissions are often not urgent (planned readmissions), this is probably a weak quality indicator. The shaded areas of Fig. 1 represent the unplanned admissions, and the white areas represent planned readmissions (area B) and other planned admissions (area outside the circles). All unplanned readmissions are also urgent admissions.

Using the basic set theory symbols, the following is true:

1) *Emergency admissions* $(49\%) = A \cup D \cup E \cup G$
2) *Readmissions* $(21\%) = B \cup E \cup F \cup G$
3) *Involuntary admissions* $(34\%) = C \cup D \cup F \cup G$
4) *Unplanned admissions = Emergency admissions, involuntary admissions and unplanned readmissions* $(58\%) = A \cup C \cup D \cup E \cup F \cup G = Emergency$ *admissions and/or involuntary admissions*
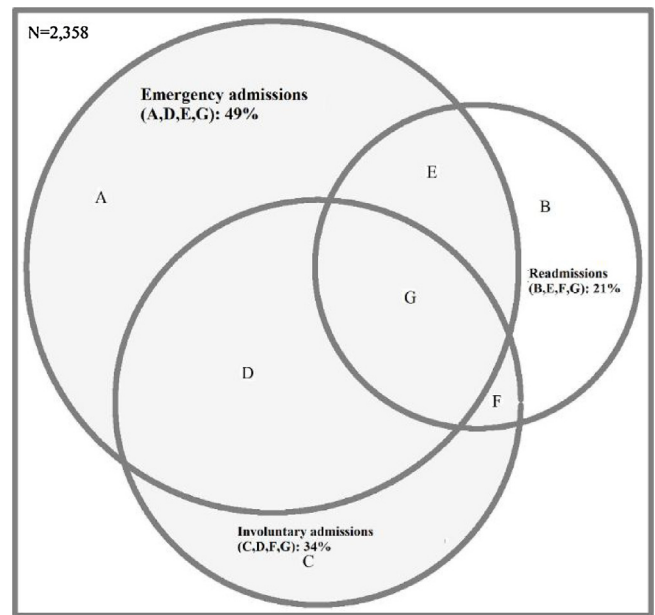

Fig. 1. Proportional Venn Diagram of Emergency Admissions, Readmissions within 30 days and Involuntary Admissions. Shaded area = unplanned admissions.

There were some differences in the composition of type of admissions between hospitals and DPCs. While 52% of all admissions at hospital wards were urgent, only 39% were urgent in the DPCs. Involuntary admissions were much more common at hospitals wards (41%) than DPCs (15%). This mean that there were considerable more planned admissions to DPCs (57%) than to hospital wards (36%). The main reason for this is that emergency departments and security wards are located at the hospitals. However, there was a considerable rate of unplanned admissions to both hospital wards and the DPCs.

3.1. Descriptive statistics

The descriptive statistics are given in Table 2. Asterisks indicate that the univariate analysis shows statistically differences between planned or unplanned treatment for this characteristic of the patient. Only these variables were included in the regression analyses shown below.

3.1.1. Services received three months prior to admission

Here, we focus only on whether the patient received treatment or services during the three months prior to their current admission and do not include information about the length or content of the treatment. Outpatient treatment from mental health services was received during the three months prior to the admissions for 24% of the patients, while somatic hospital services were received by 8% of patients. During the same period, 13% received unplanned treatment, defined as urgent or involuntary treatment, while 4% received ambulatory services.

About a quarter of patients had one or several consultations with their GP during the three months prior to their admission, and 5% of all patients had a housing service (with or without staff) from their municipality. Home services, including both home nursing and home care services, were received by 8% of the patients, while 9% had consultations or treatment from their local mental health service. Welfare services were provided for 9% of the sample, while 3% had support from a support person paid by the municipality or attended support services given to a group of people with similar needs. Six per cent of the inpatients attended an employment or activity service provided by the municipality during the three

Table 1
Elements in the Proportional Venn Diagram, Number of Patients and Percentage of All Patients.

Area	Number of Patients	% of All Patients
A (Emergency admissions)	440	19
B (Readmissions)	159	7
C (Involuntary admissions)	167	7
D (Involuntary emergency admissions)	424	18
E (Emergency readmissions)	147	6
F (Involuntary readmissions)	46	2
G (Involuntary emergency readmissions)	153	6
Involuntary and/or emergency and/or readmission	1536	65
Involuntary, emergency and/or unplanned readmission	1377	58
Planned admissions or planned readmissions	822	42
Total number of patients	2358	100

months prior to their admission, and 3% had meetings with their co-ordinator or a responsibility group (a personal team of appointed professionals) in the pre-admission period.

3.1.2. Clinical characteristics

The most common main diagnosis among the inpatients was schizophrenia (25%), followed by major depression (16%). Bipolar disorders were the main diagnosis for 9% of the patients. Thirty-seven per cent of patients were treated at DPCs, while the rest were treated at hospital wards (63%). Suicide attempts in relation to the current stay were made by 5% of the patients; while a high or very high risk of being violent was observed for another 5% of the sample. Very few individuals had both suicide attempt and high risk of violent behaviour (n < 5).

3.1.3. Demographic and socioeconomic characteristics

The sample had marginally more female (52%) than male (48%) patients. The largest age group was 30–39 years old.

Almost half of the sample had low levels of education (49%), and 64% had health-related benefits as their main source of income. Thirteen per cent of the patients were responsible for children under the age of 18 years, and 11% of the patients had been born outside Norway. Twenty-four per cent of the sample lived in the largest city in the region.

3.2. Regression results

Table 3 shows the regression results from the binomial logistic regression. Five models were estimated: 1) Probability of unplanned admission in association with services received during the three months prior to admission; 2) Model 1 controlled for clinical variables; 3) Model 1 controlled for clinical variables and demographic variables; 4) Model 1 controlled for clinical variables, demographic variables and socioeconomic variables; and 5) Model 1 controlled for clinical variables, demographic variables and socioeconomic variables, reduced model (excluding non-significant variables with p > 0.05).

The results are generally stable across the estimated models. The results show that having received outpatient treatment during the three months prior to admission reduces the probability of having unplanned admissions compared with planned admissions in all models. Patients with one or more unplanned admission (urgent and/or involuntary) during the three months prior to admission had a strong increase in the risk of unplanned admission, a finding that held throughout the model specifications. Patients who received housing services from the municipality had a much higher risk of unplanned admission than patients who did not receive housing services. Having a need for housing services is probably a proxy for having a low functional level; the estimate was reduced when diagnosis was controlled for, but the association prevailed throughout the model specifications. Patients who received home services (home nurse or home care) prior to admission, had a lower prob-

ability of unplanned admission than those without such services. Having contact with a support person or a support group prior to admission, and receiving services within employment and activity, reduced the probability of unplanned admission.

Patients suffering from comorbid substance use and mental disorders had a lower probability of unplanned admissions than patients suffering from schizophrenia, while patients suffering from schizoaffective disorder or other psychotic disorders did not differ from those suffering from schizophrenia. Patients with all other diagnoses had a higher probability of planned admissions than patients suffering from schizophrenia, with the highest rate of planned admissions and planned treatment found among patients suffering from eating disorders.

The regression results also show that there is a higher risk of unplanned treatment compared to planned treatment in hospital wards compared to DPCs. This is as expected as secure wards and closed emergency departments are placed at the hospitals.

Patients with a suicide attempt in relation to the current stay and patients with a high risk of being violent had a much higher risk of unplanned admission than patients with no such behavioural problems. Low education increased the risk of unplanned admission compared with planned admissions. In this sample, 11% of the patients are born outside Norway. The results show that patients born outside Norway has a higher risk of unplanned admission compared to planned admissions.

4. Discussion

Our assumption is that planned treatment is more effective than treatment provided without a plan, and that reducing the number of beds in inpatient treatment without providing adequate local alternatives may give a situation where elective treatment are superseded by urgent needs.

There was a 39% reduction in the number of inpatient psychiatric beds in Norway between 1998 and 2015. The local mental health services have not been strengthened enough to accommodate this reduced capacity in specialist mental health services according to the Norwegian Office of the Auditor General [18]. The same situation was observed in for instance England: a 39% reduction of inpatient psychiatric beds between 1998 and 2012 [19] with an inadequate and slow investment in community services [3].

Our results show that receiving outpatient treatment, consultations with a GP, home services and support from the primary services including employment and activity services prior to admission are associated with a higher probability of planned admissions, even when clinical, demographic and socioeconomic characteristics are controlled for. We also found that previous unplanned admission during the three months prior to the current admission increased the probability of unplanned admission. Previous service use for inpatient treatment has commonly been found to be a strong predictor for requiring inpatient treatment [20,21] and for

Table 2
Descriptive Statistics of Planned and Unplanned admissions to DPCs and Hospital Wards, as Percentage of all Patients.

	DPCs		Hospital Wards		
	Planned	Unplanned	Planned	Unplanned	All
Specialist health services received during the 3 months prior to admission:					
Outpatient treatment[a]	33	23	31	16	24
Somatic hospital services	8	8	10	8	8
Unplanned treatment (urgent or involuntary)[a]	9	18	5	17	13
Ambulatory Team from DPC/municipality	10	10	6	8	4
Municipality services/primary health-care services received during the 3 months prior to admission:					
GP[a]	41	34	38	20	24
Housing[a]	8	10	7	14	5
Home services (home nurse or home care)[a]	12	9	14	8	8
Consultation/treatment from local mental health services[a]	22	18	11	10	9
Welfare services	22	17	12	15	9
Support person or support group[a]	5	2	4	3	3
Work and/or activity[a]	15	10	7	5	6
Responsibility group	7	4	3	6	3
Main diagnosis[a]					
Comorbid substance use disorders and mental disorders	5	5	2	5	5
Schizophrenia	15	26	10	37	25
Schizoaffective disorder	3	6	1	5	4
Other psychotic disorders	3	5	5	8	6
Bipolar disorders	13	8	5	10	9
Major depression	16	19	21	8	14
Anxiety disorders	6	3	5	1	3
Reaction to severe stress and adjustment disorders	8	7	8	3	6
Hyperkinetic disorder	3	1	1	0	1
Eating disorders	2	0	11	1	3
Personality disorders	8	3	4	3	4
Other	19	17	27	19	20
Treatment unit[a]					
DPC	57	43			37
Hospital			36	64	63
Behaviour variables					
Suicide attempt[a]					
No	97	94	98	93	95
Yes	3	6	2	7	5
High/very high risk of being violent[a]					
No	99	98	98	89	95
Yes	1	2	2	11	5
Demographic variables					
Gender[a]					
Women	56	53	64	44	52
Men	44	47	36	56	48
Age group[a]					
18–23 years old	16	12	15	16	15
24–29 years old	16	13	13	16	15
30–39 years old	22	22	16	24	21
40–49 years old	18	24	13	17	18
50–59 years old	19	16	12	13	14
60–69 years old	8	8	9	8	8
70+ years old	2	4	22	7	8
Socioeconomic variables					
Education[a]					
High level of education	14	16	22	12	15
Medium level of education	44	38	35	32	36
Low level of education	42	47	43	56	49
Main source of income[a]					
Income from labour	10	11	13	8	10
Health-related benefits	74	69	46	66	64
Other economic support	16	20	41	26	26
Responsible for children under 18 years[a]					
No	83	86	86	90	87
Yes	17	14	14	10	13
Born outside Norway[a]					
No	92	89	92	86	89
Yes	8	11	8	14	11
Live in a large and central municipality in the region[a]					
No	79	77	79	73	76
Yes	21	23	21	27	24

[a] Statistically associated with unplanned admissions at p < 0.005 in univariate models.

Table 3
Binomial Logistic Regression and Odds Ratios using Planned Admissions as the Base Outcome.

	Model 1	Model 2	Model 3	Model 4	Model 5
Services received during the 3 months prior to admission					
Outpatient treatment	0.468*** (0.380–0.576)	0.551*** (0.437–0.694)	0.521*** (0.411–0.661)	0.534*** (0.420–0.680)	0.538*** (0.426–0.678)
Unplanned admission (urgent and or involuntary)	3.481*** (2.573–4.709)	2.905*** (2.096–4.027)	2.728*** (1.956–3.805)	2.767*** (1.978–3.870)	2.837*** (2.044–3.939)
GP	0.526*** (0.432–0.640)	0.770* (0.619–0.958)	0.756* (0.604–0.947)	0.774* (0.617–0.972)	0.803* (0.645–0.999)
Housing	2.329*** (1.691–3.206)	1.760** (1.248–2.483)	1.792** (1.259–2.550)	1.740** (1.217–2.486)	1.695** (1.198–2.397)
Home services (home nurse or home care)	0.697* (0.511–0.950)	0.596* (0.429–0.828)	0.703* (0.496–0.998)	0.708 (0.498–1.005)	0.697* (0.497–0.978)
Consultation/treatment from local mental health services	0.905 (0.690–1.187)	0.966 (0.719–1.296)	0.898 (0.664–1.212)	0.878 (0.649–1.189)	
Support person or support group	0.682 (0.409–1.136)	0.623 (0.361–1.076)	0.621 (0.356–1.083)	0.608 (0.347–1.065)	0.570* (0.330–0.986)
Work and/or activity	0.620** (0.445–0.865)	0.695* (0.486–0.994)	0.698 (0.483–1.007)	0.692 (0.478–1.002)	0.680* (0.475–0.974)
Main diagnosis and unit of treatment (base: Schizophrenia)					
Comorbid substance use disorders and mental disorders		0.576* (0.359–0.927)	0.603* (0.371–0.979)	0.601* (0.369–0.980)	0.580* (0.360–0.933)
Schizoaffective disorder		1.316 (0.738–2.346)	1.485 (0.804–2.742)	1.496 (0.808–2.772)	1.402 (0.783–2.510)
Other psychotic disorders		0.821 (0.524–1.288)	0.855 (0.536–1.365)	0.854 (0.533–1.368)	0.846 (0.538–1.331)
Bipolar disorders		0.509*** (0.354–0.733)	0.536** (0.366–0.785)	0.561** (0.379–0.830)	0.561** (0.387–0.812)
Major depression		0.285*** (0.206–0.393)	0.332*** (0.235–0.469)	0.344*** (0.239–0.493)	0.341*** (0.245–0.476)
Anxiety disorders		0.157*** (0.0855–0.287)	0.179*** (0.0965–0.331)	0.180*** (0.0960–0.337)	0.174*** (0.0942–0.32)
Reaction to severe stress and adjustment disorders		0.247*** (0.160–0.383)	0.260*** (0.167–0.406)	0.263*** (0.165–0.418)	0.251*** (0.162–0.391)
Hyperkinetic disorder		0.160*** (0.0572–0.445)	0.138*** (0.0467–0.410)	0.143*** (0.0477–0.428)	0.168*** (0.0601–0.47)
Eating disorders		0.0329*** (0.0143–0.0755)	0.0363*** (0.0155–0.085)	0.0379*** (0.0161–0.089)	0.0339*** (0.015–0.078)
Personality disorders		0.182*** (0.110–0.299)	0.194*** (0.115–0.326)	0.194*** (0.115–0.328)	0.182*** (0.110–0.301)
Other diagnoses		0.294*** (0.221–0.392)	0.337*** (0.249–0.457)	0.345*** (0.251–0.473)	0.331*** (0.247–0.443)
Treated in hospital (base: DPCs)		2.548*** (2.094–3.101)	2.688*** (2.187–3.304)	2.684*** (2.181–3.304)	2.749*** (2.249–3.360)
Behavioural risk					
Suicide attempt		4.327*** (2.548–7.348)	4.253*** (2.495–7.250)	4.325*** (2.533–7.388)	4.313*** (2.536–7.337)
High/very high risk of being violent		3.853*** (2.004–7.411)	3.750*** (1.887–7.453)	3.481*** (1.746–6.939)	3.320*** (1.720–6.407)
Demographic and socioeconomic variables					
Male (vs female)				1.061 (0.865–1.302)	1.037 (0.844–1.275)
Age (base: 18–23 years old)					
24–29 years old				0.828 (0.575–1.191)	0.858 (0.590–1.247)
30–39 years old				0.980 (0.699–1.372)	1.039 (0.726–1.488)
40–49 years old				1.102 (0.773–1.569)	1.186 (0.812–1.733)
50–59 years old				0.808 (0.561–1.164)	0.874 (0.596–1.281)
60–69 years old				0.958 (0.626–1.467)	1.051 (0.681–1.621)
70+ years old (Model 1–4) Dummy for 70+ (Model 5)				0.472*** (0.304–0.731)	0.510** (0.320–0.811)	0.502*** (0.352–0.715)
Medium education (base: high level of education)				1.211 (0.897–1.634)	1.273 (0.955–1.696)
Low education (base: high level of education)				1.368* (1.007–1.858)	1.388* (1.044–1.845)
Health-related benefits (base: Income from labour)				0.898 (0.636–1.268)	
Other economic support (base: Income from labour)				0.874 (0.587–1.301)	

Table 3 (Continued)

	Model 1	Model 2	Model 3	Model 4	Model 5
Responsible for children under 18 years				0.946 (0.688–1.299)	
Born outside Norway				1.419* (1.014–1.985)	1.435* (1.035–1.989)
Live in a large and central municipality in the region				0.986 (0.775–1.254)	
Constant	1.822*** (1.624–2.043)	1.975*** (1.532–2.547)	1.967*** (1.333–2.902)	1.596 (0.899–2.834)	1.391 (0.972–1.990)
Observations	2358	2358	2251	2251	2358

Confidence intervals in parentheses*** p < 0.001, ** p < 0.01, * p < 0.05.

long-term use of services [22]. Treatment approaches that promote empowerment in individuals with a history of involuntary psychiatric hospitalizations as a preventive monitoring programme are suggested [23].

Fewer beds in psychiatric inpatient treatment indicate that the remaining capacity must be utilized efficiently. When more than half of the admissions are unplanned admissions, the elective (and presumably more efficient) treatments are at risk of being superseded. The political goal should probably be to reduce the number of unplanned admissions and to increase planned admissions to increase the treatment effect of the service, which is becoming increasingly scarce.

To prevent unplanned admissions, the local services must prioritize people at high risk of unplanned admissions; that is, patients suffering from severe mental illness, those with a low functional level as indicated by the need for housing services, those with previous unplanned admission (urgent and or involuntary), those at high risk for suicide attempts or being violent, those with low education levels and those born outside Norway.

Education and income are important characteristics of socioeconomic status (SES), and it has been found that low SES increase all-cause mortality mainly through unhealthy behaviours [24]. However, it has been argued that education, income and other commonly used SES characteristics, measure different underlying phenomena [25]. We find that education is more important than income in the study of unplanned mental health treatment compared to planned mental health treatment. This result may indicate that education is a more important SES characteristic than income among patients in mental health services in Norway. This is probably reasonable in a highly developed welfare state with generous medical benefits in case of sickness. Our study shows that patients born outside Norway have higher risk of unplanned compared to planned admission than patients born in Norway. Urgent and involuntary admissions imply more severe illness and this may be related to systematic differences in help seeking behaviour. Previous research found that immigrants have lower odds of a consultation about mental health issues in primary health care than their Norwegian counterparts [26].

The specialist mental health services must, for their part, support the efforts made by local services, give them the necessary support, including counselling and short inpatient stays when needed, and provide resources for ambulatory teams to support the preventive effort and to avoid unplanned admissions. This seems to be the only way to increase the capacity for elective treatment in the specialist mental health services, and neither of the service providers can achieve this alone. Given the higher share of unplanned admissions in hospitals compared to DPCs, also hospital wards should work closely with the local services to prevent unplanned admissions for their patients.

User involvement—for instance the opportunity to refer themselves for a short inpatient stay—should be made more available, as findings show that good patient experiences can result [27].

A recent study from Norway showed that Assertive Community Treatment teams reduce presumably avoidable hospitalization of high users and increase the presumably needed inpatient care of low users [28]. Similar results have been found in England [29].

The results indicate that unplanned admissions might be an adequate quality indicator for co-operation between the two service levels of municipalities and specialist mental health services. To substitute unplanned admissions with planned admissions, strong and systematic co-operation between the service levels is necessary. Including both service levels in a quality indicator might provide a measure of how well the service levels are operating collectively. Currently, most performance indicators try to measure the quality of only the specialist level. There is a large geographic variation in the rate of unplanned admissions, both urgent and involuntary [17]. The specialist mental health services and the municipality services in each geographic area should plan and act to reduce unplanned admissions, taking into account the needs in the population in each area.

One possible weakness of this indicator is that increasing the number of beds would probably reduce the rate of unplanned admissions, thus increasing the quality. However, this is an unlikely scenario because there is a lack of economic and political incentives. A more logical strategy would be to establish Assertive Community Treatment teams or other teams in co-operation with the municipalities to reduce unplanned admissions.

Another complicating factor is the system of financing, because the service levels do not share the same budget. This could be mitigated by making both budgets dependent on the joint quality indicator. Today, the incentives for strong co-operation between the services levels seem to be weak and insufficient, and this is supported by the findings of the Norwegian Office of the Auditor General published in 2015 [18].

4.1. Strength and weaknesses

The study compared unplanned admissions with planned admissions. We do not say anything about the probability of being admitted, as other data would be required for such analysis.

In this type of mapping or census, patients in long-term treatment were likely to be included because they were more likely to receive treatment at any given time. A major strength of this study was that it included the majority of inpatients receiving specialist mental health services in Norway and information about services they received from the municipality prior to the admission. Each patient's clinician was responsible for completing the registration form. The quality of the data is considered to be fairly good because many clinicians were familiar with the methodology from similar national mappings that have been conducted every five years since 1979. Nevertheless, our study clearly is not free of limitations. If the inclusion of patients by clinicians in the mapping was random, then our dataset is a representative sample. One limitation is that we do not have information about the patients who were not included in the mapping. It is possible that inpatients who were admitted

or discharged on the mapping day were less likely to be mapped. Because the data also serve as part of the baseline data for the evaluation of the Co-ordination Reform, the form to be filled out by clinicians was rather long, which may have contributed to a lower quality of answers.

5. Conclusion

A shift from unplanned to planned care will only be possible with better co-operation between service levels to prevent urgent and involuntary admissions. Having received outpatient treatment, consultations with a GP, home services and support from the primary services, including employment and activity services prior to admission, are associated with a higher probability of planned admissions after controlling for clinical and socioeconomic characteristics.

Primary and secondary health services should work to prevent unplanned care and to provide treatment at the site best suited to the patient's needs. Making effective use of both primary and secondary health-care skills and competence may reduce unplanned admissions for inpatient treatment and improve the overall quality of the services.

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