ORIGINAL RESEARCH

Voluntary and involuntary psychiatric admissions in a suburban area: comparison with national rates, diagnosis and other correlates of involuntary admission status

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Objectives. To establish if the relatively low rate of involuntary psychiatric admission in a suburban area between 2007 and 2011 was maintained in 2014/2015, and explore key correlates of involuntary status.

Methods. We used existing hospital records and data sources to extract rates and selected potential correlates of voluntary and involuntary admission in south west Dublin (catchment area: 273 419 people) over 18 months in 2014/2015 and compared these with published national data from the census and Health Research Board.

Results. The rate of involuntary admission in the suburban area studied between 2007 and 2011 was 33.8 involuntary admissions per 100 000 population annually, which was lower than the national rate (48.6). By 2014/2015, the rate of involuntary admission in this area had risen to 46.8 involuntary admissions per 100 000 population annually, similar to the national rate (44.9). Nevertheless, the overall (voluntary and involuntary) admission rate in the suburban area (346.7 admissions per 100 000 population annually) was still lower the national rate (387.9), owing to a lower rate of voluntary admission in the suburban area (299.9) compared to Ireland as a whole (342.9). Multi-variable testing demonstrated that diagnosis was the strongest driver of involuntary admission in the suburban area: this area had 28.5 involuntary admissions per 100 000 population annually with schizophrenia or related disorders, compared to 18.9 nationally. Schizophrenia and related disorders accounted for 60.9% of involuntary admissions in the suburban area compared to 42.1% nationally.

Conclusions. Schizophrenia is the strongest driver of involuntary admission in the suburban area in this study.

Introduction

Involuntary inpatient psychiatric care has been a long-standing feature of mental health services in all countries for which there is recorded history (Kelly, 2016). The process of involuntary admission generally involves a combination of clinical assessments and specific legal procedures to ensure care is provided and rights are respected (Gostin *et al*. 2010).

Rates of involuntary admission vary significantly between and within countries (Zinkler & Priebe, 2002; Salize & Dressing, 2004). Overall, involuntary status is commonly associated with a diagnosis of psychosis and police involvement in admission (Ng & Kelly, 2012; Van der Post *et al*. 2012). In Ireland, involuntary admission is also associated with male gender, a

diagnosis of schizophrenia or related disorders (Cunningham, 2012; Ng & Kelly, 2012), and reduced insight (Kelly *et al*. 2004).

Involuntary admission in Ireland is governed by the Mental Health Act 2001, which has had a significant impact on some but not all aspects of mental health services since full implementation in 2006 (Kelly, 2007; Murray *et al*. 2009; Nwachukwu *et al*. 2010; Ng & Kelly, 2012; Ramsay *et al*. 2013; Kelly *et al*. 2015; Georgieva *et al*. 2016; Smyth *et al*. 2016). In 2014, there were 17 797 admissions to Irish psychiatry inpatient facilities, which yields a rate of 387.9 admissions per 100 000 population (Daly & Walsh, 2015). Of these, 2066 (11.6%) were involuntary, reflecting an involuntary admission rate of 45.0 per 100 000 population in that year.

Even within Ireland, however, involuntary admission rates vary between areas and over time. Between 2007 and 2011, the rate of involuntary admission in south west Dublin (a suburban area) was 33.8 per 100 000 population

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per year, which was notably lower than the national rate (48.6 per 100 000 population per year) (McManus *et al.* 2015). In sharp contrast, the involuntary admission rate in Dublin's north inner-city was 71.2 per 100 000 population per year between 2008 and 2014, which was higher than both the national rate and the rate in the suburban area (Curley *et al.* 2016).

These differences may relate to a number of factors. The service in Dublin's north inner-city, for example, covers a catchment area of 33 000 people with levels of deprivation that are three times higher than the national average, with 51% of residents in the lowest possible social class (class 10) (Ng & Kelly, 2012). Service factors could also be relevant to differences between these areas, including greater homecare and assertive outreach in the south west Dublin suburban area, and possibly greater use of private inpatient beds. More data are needed to explore these possibilities.

The purposes of the present study were to examine rates of voluntary and involuntary admission in south west Dublin suburban area in 2014/2015; to see if the relatively low rate of involuntary admission in 2007–2011 was maintained in this area; and to explore key correlates of involuntary status in this service to try to explain why rates in this area might differ over time or differ from national rates.

Methods

Setting

We studied all voluntary and involuntary admissions to the Acute Psychiatric Unit in Tallaght Hospital, Dublin (south west Dublin) between 1 January 2014 and 30 June 2015 (inclusive). This is a 52-bed admission unit for the Dublin South West and West Mental Health Service, a public sector general adult psychiatry service serving a catchment area of 273 419 people. This mental health service includes four multidisciplinary general adult psychiatry teams, one old age psychiatry service and one rehabilitation/assertive outreach service.

The inpatient unit is part of a large general hospital (i.e. with medical and surgical patients) and provides care for acute mental illness in adults (aged 18 years or over), including both voluntary and involuntary patients under the Mental Health Act 2001. Children (i.e. people aged under 18 years) are occasionally admitted when there are no appropriate child and adolescent inpatient facilities available.

Data collection

For all admissions from 1 January 2014 to 30 June 2015, we recorded gender, date of birth, occupation, marital status, date of admission and date of discharge. We recorded clinical discharge diagnosis using the International Classification of Diseases, Volume 10 (World Health Organisation, 1992). We selected these variables owing to both their possible relevance to admission status and the fact that they were available from existing hospital data sources.

For patients whose status was involuntary for part or all of their admission, we recorded the date their status became involuntary and the criteria upon which this was based, as outlined in Section 3(1) of the Mental Health Act 2001, as follows: (a) 'because of the illness, disability or dementia, there is a serious likelihood of the person concerned causing immediate and serious harm to himself or herself or to other persons' (the 'risk criterion'); (b) 'because of the severity of the illness, disability or dementia, the judgement of the person concerned is so impaired that failure to admit the person to an approved centre would be likely to lead to a serious deterioration in his or her condition or would prevent the administration of appropriate treatment that could be given only by such admission, and the reception, detention and treatment of the person concerned in an approved centre would be likely to benefit or alleviate the condition of that person to a material extent' (the 'treatment criterion'); or (c) both (a) and (b).

We also recorded the date involuntary status was terminated and method by which it was terminated, categorised as follows: (a) detention order revoked by responsible consultant psychiatrist, (b) detention order revoked by mental health tribunal, (c) detention order expired and not renewed, or (d) patient transferred to another hospital while still detained.

We obtained population figures from the Irish national census (www.cso.ie/en/census) and national psychiatric admission figures from the Health Research Board's published report on *Activities of Irish Psychiatric Units and Hospitals 2014* (Daly & Walsh, 2015). For all rates, the denominator is the total population in the area (regardless of age).

Ethics

This study was approved by the Joint Research Ethics Committee of St James's Hospital and Tallaght Hospital. The study was performed in accordance with the Declaration of Helsinki (World Medical Association, 2008) and Data Protection Guidelines on Research in the Health Sector (Data Protection Commissioner, 2007). Data were stored on a password-protected research computer in a locked research office. Data were anonymised and encrypted. Data protection legislation was adhered to and patient confidentiality protected at all times.

Statistics

We stored and analysed data using IBM Statistical Package for the Social Sciences Statistics (Version 24). Data were normally distributed except where specified otherwise. For bi-variable analyses, we used Student's *t*-test and analysis of variance for continuous variables and Pearson's χ^2 tests for categorical variables. For multi-variable analysis, we generated a multi-variable, logistic regression model with admission status as the dependent variable (voluntary *v.* involuntary for all or part of the admission). Independent variables entered in the model were gender, age, occupation, marital status and diagnosis. We tested the model for multi-collinearity, which is when one or more variables are so closely related to each other that the model cannot reliably distinguish the independent effects of each. To test for this, we calculated a 'tolerance value' for each independent variable; tolerance values below 0.25 indicate possible multicollinearity, and tolerance values below 0.10 indicate significant problems with multi-collinearity (Katz, 1999).

Results

Over the 18-month-period studied (1 January 2014 to 30 June 2015), there were 948 admissions of which 820 (86.5%) were voluntary and 128 (13.5%) were involuntary (i.e. all or part of the admission was on an involuntary basis). This yields an annual admission rate of 346.7 admissions per 100 000 population per year (Table 1). The voluntary admission rate was 299.9 per 100 000 population per year and the involuntary admission rate was 46.8 per 100 000 population per year.

Women accounted for 48.5% (*n* = 460) of all admissions and 32.8% (*n* = 42) of involuntary admissions. Almost 18% of male admissions were involuntary (17.6%) compared to 9.1% of female admissions (Pearson's χ^2 14.623, $p < 0.001$). Mean age at admission was 41.4 years (range 16–91; S.D. 15.3); this did not differ between voluntary and involuntary patients ($t = 1.379$, $p = 0.168$).

Involuntary patients were more likely to be single (i.e. never married) than voluntary patients (80.5% and 64.5%, respectively; Pearson's χ^2 13.135, $p = 0.011$). Over half of all patients were unemployed (58.9%) and this did not differ significantly between involuntary and voluntary patients (69.5% and 57.2%, respectively; Pearson's χ^2 7.432, $p = 0.059$).

Diagnosis and duration of admission

Similar to national data, affective disorders had the highest overall admission rate in our study (Table 1) and among voluntary patients, while schizophrenia and related disorders were the most common diagnoses among involuntary patients, accounting for 60.9% of involuntary admissions in our study (compared to 42.1% nationally).

More than one-third of patients in the suburban area (39.2%) were discharged within 1 week of admission and over three quarters (76.1%) were discharged within 1 month; these are slightly higher than comparable national figures (29.9% and 67.0%, respectively)

Table 1. *Clinical diagnoses among all psychiatric admissions (voluntary and involuntary) in Ireland (2014) and a suburban area (Dublin south west) (1 January 2014 to 30 June 2015)*

Diagnostic grouping	Rate of admission per 100 000 population					
	All patients		Voluntary patients		Involuntary patients	
	Ireland (national)[a]	Dublin south west suburban area	Ireland (national)[a]	Dublin south west suburban area	Ireland (national)[a]	Dublin south west suburban area
Affective disorders	150.6	118.1	137.4	105.7	13.2	12.4
Schizophrenia, schizotypal and delusional disorders	77.2	92.2	58.2	63.6	18.9	28.5
Other and unspecified	39.3	4.0	34.8	3.7	4.6	0.4
Neurosis	33.3	50.8	32.4	49.0	0.9	1.8
Alcoholic disorders	28.7	11.7	27.8	11.7	0.9	0
Personality and behavioural disorders	26.9	40.6	25.2	39.9	1.7	0.7
Other drug disorders	19.9	26.0	17.6	23.8	2.2	2.2
Organic disorders	12.0	3.3	9.5	2.6	2.5	0.7
Total	387.9	346.7	342.9	299.9	44.9	46.8

[a] Daly & Walsh (2015).

(Daly & Walsh, 2015). The mean duration of admission for involuntary patients in the suburban area (59.4 days, S.D. 98.0) was substantially longer than that for voluntary patients (18.9 days, S.D. 38.4; $t = -8.404$, $p < 0.001$), and involuntary patients spent a mean of 56.0 days with involuntary status (S.D. 111.7).

The 'treatment criterion' of the Mental Health Act 2001 was the sole basis for 61.9% of involuntary admissions in the suburban area; that is, 'because of the severity of the illness, disability or dementia, the judgement of the person concerned is so impaired that failure to admit the person to an approved centre would be likely to lead to a serious deterioration in his or her condition or would prevent the administration of appropriate treatment that could be given only by such admission, and the reception, detention and treatment of the person concerned in an approved centre would be likely to benefit or alleviate the condition of that person to a material extent'.

The 'risk criterion' was the sole basis for 11.9% of involuntary admissions; that is, 'because of the illness, disability or dementia, there is a serious likelihood of the person concerned causing immediate and serious harm to himself or herself or to other persons'. Both criteria were used as a basis for 26.3% of involuntary admissions.

Involuntary patients admitted under the 'treatment criterion' did not differ from those admitted under the 'risk criterion' in terms of age, occupation or marital status, but use of the 'treatment criterion' was associated with male gender and a diagnosis of schizophrenia or a related disorder (Table 2). Involuntary status was terminated following revocation of the order by the psychiatrist in 94.1% of cases, with 4.2% revoked by tribunals and 1.7% of patients transferred to another hospital while still detained.

Correlates of involuntary admission status

Table 3 outlines the results of multi-variable analysis of correlates of involuntary admission status. Involuntary admission was significantly associated with male gender (odds ratio: 1.55; 95% confidence interval: 1.02–2.35), single marital status (i.e. never married) and having a diagnosis of schizophrenia or related disorders; and was not associated with occupation or age (odds ratio: 1.00; 95% confidence interval: 0.99–1.01). This model accounted for 8.1% of variance in admission status between patients, meaning that 91.9% of the variability in admission status is not explained by factors included in the model. For each independent variable in the model we calculated a 'tolerance value' and all tolerance values were greater than 0.25 indicating no significant problems with multicollinearity (Katz, 1999).

Discussion

Summary of main findings

The overall rate of admission (including both voluntary and involuntary patients) in the suburban area over the 18-month-period studied (1 January 2014 to 30 June 2015) was 346.7 per 100 000 population per year, which was lower than the national rate (387.9) (Table 1). The rate of involuntary admission in this area (46.8 involuntary admissions per 100 000 population per year) was, however, comparable with the national rate (44.9). On multi-variable testing, male gender, being single (i.e. never married) and having a diagnosis of schizophrenia or related disorders were independent predictors of involuntary admission status, but most of the variance in admission status (91.9%) remained unexplained even after taking account of these factors.

Overall these findings indicate a rise in the involuntary admission rate in this suburban area since 2007–2011, when the rate was 33.8 involuntary admissions per 100 000 population per year, which was substantially lower than the national rate at that time (48.6) (McManus *et al.* 2015). By way of contrast, the involuntary admission rate in Dublin's north inner-city was 71.2 per 100 000 population per year between 2008 and 2014, which was higher than the national rate and the rate in in south west Dublin city (Curley *et al.* 2016). Despite the recent increase, however, the rate in south west Dublin in 2014/2015 (46.8) has not yet reached the rates in the inner-city.

Our results confirm the previously described association between male gender and involuntary status (Cunningham, 2012; Curley *et al.* 2016) but we found no link with age or occupation. There was, however, a relationship between involuntary admission and single marital status but the literature is notably inconsistent on this point, so further work is needed (Ng & Kelly, 2012; Van der Post *et al.* 2012; Kelly *et al.* 2015; Curley *et al.* 2016).

A diagnosis of schizophrenia or a related illness is commonly associated with involuntary status in Ireland and elsewhere (Cunningham, 2012; Ng & Kelly, 2012; Van der Post *et al.* 2012). In 2014, at national level, schizophrenia and related diagnoses had the highest rate of involuntary admission of any diagnosis in Ireland, at 18.9 per 100 000 population per year, followed by affective disorders, at 13.2 (Daly & Walsh, 2015, table 1). In our study, we also found that schizophrenia had the highest rate of involuntary admission with 28.5 involuntary admissions per 100 000 population per year in 2014/2015, compared to 12.4 for affective disorders.

Between 2007 and 2011, schizophrenia and related disorders accounted for 60% of involuntary admission in the suburban area studied (McManus *et al.* 2015). In our study, we found that schizophrenia and related

Table 2. *Comparison of involuntary patients admitted under the 'risk' and 'treatment criteria' of the Mental Health Act 2001 in a suburban area (Dublin south west) (1 January 2014 to 30 June 2015)*

Variables	Mental Health Act 2001 involuntary admission criteria			Statistical test	
	'Risk criterion'[a]	'Treatment criterion'[b]	Both the 'risk criterion' and the 'treatment criterion'	Test statistic	p
Gender					
Female	64.3%	26.0%	35.5%	Pearson's	0.019
Male	35.7%	74.0%	64.5%	$\chi^2 = 7.883$	
Mean age in years (S.D.)	41.07 (21.01)	39.75 (17.01)	40.03 (13.67)	ANOVA $F = 0.037$	0.964
Occupation					
Unemployed	57.1%	71.2%	74.2%	Pearson's	0.086
Employed	21.4%	26.0%	19.4%	$\chi^2 = 11.064$	
Student	7.1%	2.7%	0%		
Retired	14.3%	0%	6.5%		
Marital status					
Single	78.6%	83.6%	74.2%	Pearson's	0.736
Married	7.1%	12.3%	12.9%	$\chi^2 = 5.195$	
Separated	7.1%	1.4%	6.5%		
Divorced	0%	1.4%	3.2%		
Widowed	7.1%	1.4%	3.2%		
Diagnosis					
Affective disorders	21.4%	19.2%	41.9%	Pearson's	<0.001
Schizophrenia, schizotypal and delusional disorders	28.6%	72.6%	51.6%	$\chi^2 = 37.590$	
Other and unspecified	7.1%	0%	0%		
Neurosis	7.1%	2.7%	3.2%		
Personality and behavioural disorders	7.1%	1.4%	0%		
Other drug disorders	14.3%	4.1%	3.2%		
Organic disorders	14.3%	0%	0%		
Total	100%	100%	100.0%		

ANOVA, Analysis of variance.

[a] 'Risk criterion': The person has 'mental disorder' and 'because of the illness, disability or dementia, there is a serious likelihood of the person concerned causing immediate and serious harm to himself or herself or to other persons' [Mental Health Act 2001, Section 3(1)(a)].

[b] 'Treatment criterion': The person has 'mental disorder' and '(i) because of the severity of the illness, disability or dementia, the judgment of the person concerned is so impaired that failure to admit the person to an approved centre would be likely to lead to a serious deterioration in his or her condition or would prevent the administration of appropriate treatment that could be given only by such admission, and (ii) the reception, detention and treatment of the person concerned in an approved centre would be likely to benefit or alleviate the condition of that person to a material extent' [Mental Health Act 2001, Section 3(1)(b)].

disorders still accounted for the same proportion of involuntary admissions in this area in 2014/2015 (60.9%). This was higher than the figure for Ireland as a whole (42.1%) (Daly & Walsh, 2015), suggesting that schizophrenia is an especially important driver of involuntary admission in this suburban area compared to Ireland as a whole.

Strengths and limitations of the present study

This study addresses an important issue, psychiatric admission status, which has considerable implications in terms of human rights, use of coercion (Ranieri *et al.* 2015) and various other matters, most notably therapeutic relationships. Other methodological strengths include the examination of a range of variables and co-variates commonly associated in different ways with admission status, including gender, age, occupation, marital status and clinical diagnosis, as well as duration of admission, criteria for involuntary admission, duration as an involuntary patient and reason for termination of involuntary status. We used clinical diagnoses coded using the International Classification of Diseases, Volume 10 (World Health Organisation, 1992) and

Table 3. *Multi-variable analysis of correlates of involuntary admission status in a suburban area (Dublin south west) (1 January 2014 to 30 June 2015)*

Variables	β	Wald	p
Gender	0.437	4.176	0.041
Age	0.000	0.002	0.961
Occupation	−0.139	0.838	0.360
Marital status	−0.341	6.177	0.013
Diagnosis	−0.322	16.776	<0.001
Constant	−0.333	0.232	0.630

The dependent variable in this multi-variable, logistic regression model was admission status (voluntary *v.* involuntary for all or part of the admission). $R^2 = 8.1\%$; $p < 0.001$.

compared our results with data from the same service between 2007 and 2011, and with national data.

Limitations include the fact that our research is based in a specific suburban area of south west Dublin, which reduces generalisability to other areas. Other limitations include the fact that we did not examine certain variables (e.g. country of origin, insight, deprivation), which might well relate to admission status (Kelly *et al.* 2004; Expert Group on Mental Health Policy, 2006). We also recorded only one diagnosis per patient (when some may have had two or more), and our final multi-variable model had low predictive power (8.1%), limiting the conclusions that can be drawn from it. This might be attributable, at least in part, to the fact that we selected the independent variables for inclusion in our model based on both their possible relevance to admission status and the fact that they were available from existing hospital data sources. Other variables (e.g. number of previous admissions, forensic history, etc.) merit study in this context in the future.

The diagnosis variable in this study also merits comment. National data on diagnoses were derived from the Health Research Board which collates diagnoses submitted by psychiatry inpatient units around Ireland (Daly & Walsh, 2015), while diagnostic data for south west Dublin were derived from a single inpatient unit (in Tallaght Hospital). As a result, there may be greater diagnostic variation in the national data compared to the south west Dublin data and that might account for some of the observed differences between the two. For example, 39.3 admissions per 100 000 population per year at national level were for 'other and unspecified' disorders, compared to just 4.0 in south west Dublin. While there is no particular reason to believe that this 'other and unspecified' category includes a disproportionate number of people with schizophrenia, further unpacking of that category would be useful for future studies.

Finally, we did not have access to national data at individual level, so it was not possible to perform a statistical comparison of local and national rates; we relied instead on summary national statistics published by the Health Research Board (Daly & Walsh, 2015). This limits the generalisability of our findings.

Conclusions

Research into patterns and correlates of involuntary admission is important in seeking to balance the individual's right to liberty with the right to treatment and various other concerns. In this study, we found that the rate of involuntary admission in the suburban area studied increased between 2007–2011 and 2014/2015, but that the overall admission rate in this area is still below the national rate and the involuntary admission rate is comparable with the national rate. Multi-variable testing demonstrated that diagnosis is the strongest driver of involuntary admission in this suburban area, as schizophrenia and related disorders account for 60.9% of involuntary admissions in south west Dublin, compared to 42.1% nationally.

We conclude that while much of the variance in involuntary admission remains unexplained, schizophrenia is an especially important driver of involuntary admission in this suburban area compared to the rest of Ireland.

Conflicts of Interest

None.

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation with the Helsinki Declaration of 1975, as revised in 2008. The study protocol was approved by the ethics committee of each participating institution.

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