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Original Research

The clinical and demographic profile of inpatient psychosis admissions in Ireland

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Abstract

Objectives: To examine the clinical and demographic profile of inpatient psychosis admissions in Ireland.

Methods: Anonymised data was extracted from the Health Research Board (HRB) National Psychiatric Inpatient Reporting System (NPIRS) from 2013–2022. The NPIRS database is maintained by the HRB and records all admissions to inpatient units and hospitals on the register of approved centres under the Mental Health Act 2001. Data was reviewed and analysed using SPSS V26.

Results: There were 43,963 psychosis admissions over the 10-year period corresponding to 26% of all psychiatric admissions. Males accounted for 58% of psychosis admissions. The median age at first admission was 36 years of age for males and 42 years of age for females. Median length of stay in days was longer for psychosis admissions (median = 20 days IQR = 8–43) than for other mental health disorders (median = 13 days IQR = 4.0–33).

Conclusions: Understanding the clinical and demographic profile of psychosis related inpatient psychiatric admissions in Ireland provides insights that can inform effective service planning and care delivery. The findings of this study have particular relevance for the implementation and evolution of the Health Service Executive Early Intervention in Psychosis Clinical Programme.

Keywords: Psychotic disorders; early intervention in psychosis; schizophrenia; drug-induced psychosis

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Introduction

Psychosis is a constellation of symptoms that is associated with several mental health disorders, including schizophrenia spectrum disorders, delusional disorders, mood disorders and substance-use disorders (Kempf *et al.*, 2005; Bhati 2013). It is characterised by delusions, hallucinations and formal thought disorders (Archiniegas 2015), often described as a 'loss of contact with reality' (National Institute of Mental Health, 2022). Most recent diagnostic criteria separate psychotic disorders into two classifications, affective disorders (bipolar disorder and major depressive disorder) and non-affective disorders (schizophrenia and schizophrenia-related disorders) (Cerqueira *et al.*, 2022). Symptoms of psychosis can be categorised into 'positive symptoms' (hallucinations and delusions) and 'negative symptoms' (social withdrawal, anhedonia, disordered thinking and impaired cognition) (Iyer *et al.*, 2015). A 2023 systematic review of psychotic disorders in the Republic of Ireland concluded that the incidence of all psychotic disorders varied from 22.0 in Dublin to 34.2 in Cavan-Monaghan per 100,000 person-years (Jacinto *et al.*, 2023). Psychotic disorders are a major source of suffering and disability in society (GBD 2019 Mental Disorders Collaborators, 2022). Psychosis is, therefore, a significant mental health issue which in some cases may require admission to a psychiatric inpatient unit.

Sex differences in the prodrome, course of illness, symptom severity and treatment type of psychosis are discussed within the literature. Of those diagnosed with First Episode Psychosis, males are more likely to suffer from non-affective psychosis, have a lower level of education, more likely to be single, have a longer duration of untreated psychosis, and were more likely to attempt suicide (Schothorst, *et al.*, 2006; Conus *et al.*, 2007; Kapila *et al.*, 2019). Earlier research found a higher proportion of females in the subgroup of individuals diagnosed with an affective psychotic disorder and reported an older age at onset among females compared to males, 25–35 years *versus* 18–24 years respectively (Ochoa *et al.*, 2012). Onset distribution curves also show two distinct peaks of disease onset within a woman's life-course, after menarche and menopause (Castle, *et al.*, 1993; Ochoa *et al.*, 2006).

The association between the development of psychosis and several social, environmental, and economic risk factors, including socio-economic status, urbanicity, employment, and marital status have been discussed in the literature. Mechanisms of causality are not well understood; however, it is generally accepted that the interaction of a number of these factors increase the incidence, prevalence and progression of psychotic disorders (Fett, *et al.*, 2019).

Early recognition and access to evidence-based interventions are key to improving outcomes in people presenting with a first episode of psychosis (Perkins *et al.*, 2005).There is also evidence that treatment provided by early intervention in psychosis (EIP) teams can reduce the need for hospital admissions, crisis interventions and improve quality of life (McCrone *et al.*, 2010). A 2016 Public Health England report stated that 65% of adult inpatient bed days were occupied by people with psychotic disorders (Public Health England 2016), and yet historical models of care do not prioritise the early phase of disease progression (Garety and Rigg 2001). In 2019, the Health Service Executive (HSE), the national health service of Ireland, committed to an Early Intervention in Psychosis (EIP) model of care to improve service user access and outcomes.

In this study we aim to examine the demographic and clinical data of those admitted with psychosis to inpatient mental health units and hospitals in Ireland. Understanding the clinical and demographic profile of psychosis related inpatient psychiatric admissions in Ireland can inform effective service planning and care delivery. The findings of this study have particular relevance for the implementation and evolution of the Health Service Executive Early Intervention in Psychosis Clinical Programme.

Study objective

This is an observational study to determine the clinical and demographic profile of inpatient psychosis admissions in Ireland.

Ethical considerations

This study used retrospective, anonymised data for secondary analysis with no potential harm or risk to individuals. Trends and characteristics are reported at a group level.

The National Psychiatric Inpatient Reporting System data processing is justified by the Health Research Board's statutory authority per SI no. 279/1986 and Section 2(b) of SI No.305/2007 for public interest or in the exercise of official authority vested in the Health Research Board.

Methods

Study design

This retrospective observational study used the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist in reporting the study (von Elm *et al.*, 2008).

Data source and population

Anonymised data on admissions to adult inpatient units was extracted from the National Psychiatric Inpatient Reporting System (NPIRS). NPIRS is a national epidemiological database which records data on patient admissions to, and discharges from, psychiatric hospitals and units on the Register of Approved Centres under the Mental Health Act 2001 throughout Ireland. Admissions represent events or episodes rather than persons and thus reflect the activity of inpatient services.

All received data is submitted under pre-defined specifications and verified by the individual units. Data, including diagnosis, is recorded at source in the units and hospitals by clinical staff. This study includes secondary use of anonymised data on admission and discharges recorded by the NPIRS system over a 10-year period (2013–2022) with aggregated trends and characteristics reported at the group level.

Study variables

The NPIRS database records up to four admission and discharge diagnoses. In this study a psychosis admission was defined as having a diagnosis of psychosis within any of the four admission diagnoses.

A diagnosis of psychosis was defined as having a diagnosis of any of the following ICD-10 codes:

- Psychosis due to psychoactive substance use (including alcohol, drugs, and tobacco): F10.5, F11.5, F12.5, F13.5, F14.5, F15.5, F16.5, F17.5, F18.5, F19.5
- Schizophrenia: F20.0, F20.1, F20.2, F20.3, F20.5, F20.6, F20.8, F20.9
- Persistent delusional disorder: F22.0– F22.9
- Brief Psychotic Disorder F23.0–F23.9.
- Induced delusional disorder: F24.
- Schizoaffective disorders: F25.0– F25.9
- Other nonorganic psychotic disorders: F28
- Unspecified nonorganic psychosis: F29
- Mania with psychotic symptoms: F30.2
- Bipolar affective disorder, current episode manic with psychotic symptoms: F31.2
- Bipolar affective disorder, current episode severe depression with psychotic symptoms: F31.5
- Severe depressive episode with psychotic symptoms: F32.3
- Recurrent depressive disorder, current episode severe with psychotic symptoms: F33.3

Where an admission had more than one diagnosis of psychosis, the first occurrence of the psychosis diagnosis and its ICD-10 code was used in the analysis.

The comparison group was all other admission diagnoses to approved psychiatric units, referred to as 'other mental health disorder'. Other mental health disorder was defined as having an admission diagnosis (from first to fourth) other than the ICD-10 codes listed above.

Several variables were recoded for analysis. Age was recoded to include the following groups: Under 18, 18–24, 25–44, 45–64 and 65 years of age and for additional length of stay (LOS) analysis, LOS in days was recoded into a dichotomous variable ($0 = 0$–365 days, $1 = >365$ days).

Variables included for association analysis, are based on scientific evidence on psychosis including marital status (Yang *et al.*, 2015), employment (Ajnakina *et al.*, 2021), having no fixed abode (NFA) (Ayano *et al.*, 2019) and living in an urban environment (Van Os *et al.*, 2001; Sundquist *et al.*, 2004; Newbury *et al.*, 2016). For association analysis the following variables were recoded into dichotomous variables, ethnicity ($0 = $ ethnic minority, $1 = $ White Irish), marital status ($0 = $ single, $1 = $ not single), employability status ($0 = $ employed, $1 = $ not employed). For analysis of urbanicity, inpatient units were coded based on their location, with units situated in one of Ireland's six cities defined as urban and all remaining sites defined as rural ($0 = $ urban, $1 = $ rural). Private or inpatient units with wide catchment areas were excluded from this analysis as admissions can be located nationwide. The occupation variable was excluded from analysis due to a low return rate on the NPIRS system. Other data such as LOS, legal status (voluntary or involuntary) and order of admission

(first admission of psychosis or readmission) were also included in analysis.

Statistical analysis

The primary outcome of interest was any admission with a diagnosis of psychosis in the primary to the fourth admission diagnosis. Descriptive, frequency and non-parametric univariate analysis was conducted due to non-normality of data. A one-way between-subjects ANOVA analysis was used to analyse differences in LOS between subtype of psychosis, as ANOVA is robust to non-normality of data especially with large databases. To examine association, chi-square tests of independence and odds ratio were utilised. Data was analysed using SPSS version 26 (IBM SPSS Statistics for Windows, v.26.0. Armonk, NY: IBM Corp.). A P-value of less than or equal to 0.05 was used in analysis to consider the results to be statistically significant.

Results

Study demographics

Between 2013–2022, there were 168,760 inpatient admissions to adult units, of which 43,963 had a psychosis diagnosis, accounting for 26% of all inpatient admissions into adult units over the 10-year period. Males accounted for a higher proportion amongst psychosis admissions than other mental health disorders, at 58 to 47% respectively (Table 1). Admissions due to psychosis had a younger median age at admission (median 42, IQR 31–55) compared to that for other mental health disorders (median 44, IQR 31–59; $Z = -12.4$ $p \leq 0.001$). The majority of all inpatient admissions were White Irish, at 77%, and all other ethnicities accounted for a small proportion of the total sample (<8% each) (Table 1). In relation to child and adolescent admissions into adult inpatient units, there was a total of 80 psychosis admissions amongst under 18s (male $n = 51$ and female $n = 29$), equating to 12% of all under-18 psychiatric admissions to adult inpatient units.

Regarding the presenting ICD-10 diagnosis for the psychosis admissions, 81% of the study population had a diagnosis of schizophrenia, schizotypal and delusional disorders, 15% were diagnosed with a mood disorder, and 4% were admitted due to substance-induced psychosis (Table 2). Of the 35,487 admitted with Schizophrenia, Schizotypal and Delusional Disorders, the majority of admissions were associated with schizophrenia ($n = 19,515$, 55%) followed by admissions due to schizoaffective disorder ($n = 7,459$, 21%). Of the 6,510 people diagnosed with a mood disorder with psychosis, just over half ($n = 3,386$, 52%) were associated with severe depression and 48% ($n = 3,122$) were associated with bipolar disorder. Furthermore, of the 1,612 people diagnosed with drug-induced psychosis (excluding alcohol-induced psychosis), almost two thirds ($n = 1,045$, 65%) were related to polydrug induced psychosis with no breakdown of specific drugs detailed in the data. Where a specific drug group was identified ($n = 567$), a psychotic disorder due to cannabis use accounted for three in every four admissions ($n = 426$, 75%).

Association analysis concluded several significant differences between admissions due to psychosis and admissions due to other mental health disorders (Table 1). These differences included sex ($X^2 = 1729.5$, $p \leq 0.001$), marital status ($X^2 = 4711.5$, $p \leq 0.001$), employment status ($X^2 = 3660.7$, $p \leq 0.001$), ethnicity ($X^2 = 1732.7$, $p \leq 0.001$), urbanicity ($X^2 = 216.2$, $p \leq 0.001$) and homelessness (NFA) ($X^2 = 443.7$, $p \leq 0.001$). Odds ratio analysis

concluded that compared to other mental health disorders, psychosis admissions were more likely to be male (OR = 1.25, [95% CI: 1.23–1.26]), single (OR = 1.33, [95% CI: 1.32–1.34]), from an ethnic minority background (OR = 1.68, [95% CI: 1.64–1.73]), and of NFA (OR = 2.18, [95% CI 2.02–2.35]). Furthermore, psychosis admissions were less likely to be employed (OR = 0.68, [95% CI: 0.67–0.70]) and living in an urban environment (OR = 0.90, [95% CI: 0.89–0.92]) compared to other mental health disorders (Table 1).

Sex differences

When data was analysed by sex, differences in age at admission and presenting psychosis diagnosis were observed. A younger age at admission was observed among males compared to females; this was true for all psychosis admissions (median age for males: 39 years, females: 47 years) and first-time admissions (median age for males: 36 years, females: 42 years) (Table 2).

A Chi-Square test of independence was conducted to examine the relationship between sex and presenting psychosis diagnosis. The results indicated a significant association between the variables ($X^2 [2,43,963] = 762.4$, $p \leq 0.001$). Males accounted for a higher proportion of admissions with a diagnosis of schizophrenia (82.7% v. 77.9%) and substance-induced psychosis (5.8% v. 2.5%) than females, whilst females accounted for a higher proportion of admissions due to mood disorders (19.5% v. 11.4%), (Table 2).

Analysis concluded several significant differences between male and female psychosis admissions, in relation to marital status ($X^2 = 2758.0$, $p \leq 0.001$), employment status ($X^2 = 2617.8$, $p \leq 0.001$), ethnicity ($X^2 = 38.7$, $p \leq 0.001$, urbanicity ($X^2 = 4.2$, $p = 0.04$, and homelessness (NFA) ($X^2 = 115.8$, $p \leq 0.001$). Male psychosis admissions were more likely to be single (OR = 1.58, 95% CI:1.55–1.62) and of NFA (OR = 1.27, 95% CI = 1.22–1.31) compared to female psychosis admissions. However, male psychosis admissions were less likely to be employed (OR = 0.94, 95% CI:0.92–0.96) or living in an urban environment (OR = 0.98, 95% CI:0.95–0.99) than female psychosis admissions (Table 3).

Length of stay

Discharge data for the years 2013–2022 was used to calculate length of stay (LOS) of admissions. LOS was calculated in number of days. Median LOS was significantly longer for psychosis admissions (median = 20.0 days) than other mental health disorders (median = 13.0 days, $p \leq 0.001$) (Table 4). Median LOS was shorter for male admissions (median = 19.0) compared to female admissions (median = 21.0, $p \leq 0.001$) (Table 4).

Regarding subtype of psychosis diagnosis, the mean LOS for Schizophrenia (mean = 104.7 SD = 794.9) was significantly longer ($F (2,45006) = 31.0$, $p \leq 0.001$) than LOS for substance-use disorders (mean = 17.9 SD = 47.5; $p \leq 0.001$) or mood disorders (mean = 44.2 SD = 262.7 $p \leq 0.001$) (Table 4). However, there was no significant difference in LOS between substance-use disorders and mood disorders ($p = 0.465$) (Table 4).

Additional analysis was conducted to examine LOS of psychosis and other mental health disorder admissions less than one year (0–365 days) relative to greater than one year (>365 days) in length. A higher proportion of psychosis admissions had a LOS longer than 1 year compared to other mental health conditions (Table 5).

Table 1. Demographic of admissions due to psychosis v other mental health disorders (N = 168,760)

	Psychosis		Other Mental Health Disorders		X^2	p	Adjusted Residual (ref: Psychosis)	OR	95% CI
	N	%	N	%					
Gender					1729.5	≤ 0.001		1.25	1.23–1.26
Male (Ref)	25,677	58.4	58,497	46.9			25.3		
Female	18,286	41.6	66,300	53.1					
Age					1382.9	≤ 0.001		–	–
U-18	80	0.2	570	0.5			−6.9		
18–24	4547	10.3	16,950	13.6			−14.1		
25–44	19,830	45.1	46,148	37.0			20.2		
45-64	14,095	32.1	39,574	31.7			1.0		
65+	5409	12.3	21.545	17.3			−19.2		
Ethnicity					1732.7	≤ 0.001		1.67	1.64–1.73
White Irish	34,541	78.6	106544	85.4			−33.1		
Irish Traveller	333	0.8	844	0.7			1.5		
White Roma	92	0.2	148	0.1			3.7		
Other White	3291	7.5	5765	4.6			19.2		
Black African	703	1.6	466	0.4			22.8		
Other Black	377	0.9	537	0.4			9.0		
Chinese	52	0.1	64	0.1			4.0		
Other Asian	206	0.5	287	0.2			6.8		
Other	1222	2.8	2592	2.1			7.2		
Unknown	3146	7.2	7550	6.0			6.8		
Marital Status					4711.5	≤ 0.001		1.33	1.32–1.34
Single (Ref)	31,354	71.3	66,907	53.6			64.7		
Married	6694	15.2	35,130	28.1			−54.0		
Widowed	1080	2.5	5714	4.6			−19.5		
Divorced	1126	2.6	4650	3.7			−11.6		
Other	3709	8.5	8379	6.7			−16.0		
Unknown	1693	3.9	4016	3.2			6.3		
Employment					3660.7	≤ 0.001		0.68	0.67–0.70
Employed (Ref)	7870	17.9	32,796	26.3			−35.3		
Unemployed	22,402	51.0	43,522	34.9			59.4		
Retired	3544	8.1	13,551	10.9			−16.7		
House Duties	1562	3.6	5875	4.7			−9.7		
Student	2064	4.7	7398	5.9			−10.1		
Unknown	6521	14.8	21,655	17.4			−12.2		
Urbanicity					216.2	≤ 0.001		0.90	0.89–0.92
Urban (Ref)	15,801	41.2	40,017	45.7			−14.7		
Rural	22,562	58.8	47,624	54.3			14.7		
NFA					443.7	≤ 0.001		2.18	2.02–2.35
Homeless (Ref)	1209	2.8	1575	1.3			21.1		
Other	42,754	97.2	123222	98.7			−21.1		

Note: For Ethnicity, White Irish through Other are grouped as "Ref".

Table 2. Age and diagnostic data of psychosis admissions by sex (N = 43,963)

Diagnosis		N	%	X^2	p
Substance - Induced Psychosis		**1968**	**4.5**		
Male		1501	5.8		
Female		467	2.6		
Schizophrenia, Schizotypal and Delusional Disorders		**35487**	**80.7**		
Male		21240	82.7	762.4	≤0.001
Female		14247	77.9		
Mood Disorders		**6508**	**14.8**		
Male		2936	11.4		
Female		3572	19.5		
Age analysis					
All Psychosis Admissions	Median	IQR		Z	p
Male	39.0	29.0-51.0		−42.4	≤ 0.001
Female	47.0	35.0-59.0			
First Admission of Psychosis					
Male	36.0	26.0-49.0		−19.5	≤ 0.001
Female	42.0	31.0-57.0			

Trend analysis of psychosis admissions

There was a downward trend in psychosis admissions from 2013–2022, falling from 4,702 in 2013 to 4,209 in 2022 (Fig. 1). A steeper decline in psychosis admissions was observed in 2020 and 2021 when Ireland was in a national lockdown due to the COVID-19 pandemic. Following the easing of national restrictions, admissions for psychosis began to rise again in 2022.

Analysis was conducted to examine the effect of national lockdown on the legal status of psychosis admissions (voluntary or involuntary) and order of admissions (first admission or readmission). For this analysis, data from 2019 was classified as pre-COVID-19 lockdown and 2022 was defined as post-COVID-19 lockdown. Regarding legal status, there was an increase in the proportion of involuntary admissions by 8%, from 28% pre-COVID-19 lockdown to 36% post-COVID-19 lockdown ($X^2 = 56.86$, $p ≤ 0.001$). A significant relationship was also observed between order of admission and admission year. Post-COVID-19 lockdown ($n = 1226$, 27%) there was a 3% increase in the proportion of first-time admissions compared to pre-COVID-19 lockdown figures ($n = 1256$, 30%, [$X^2 = 124.0$, $p ≤ 0.001$]) (Table 6). However, it is worth noting that order of admission was unknown for 127 admissions (2.8%) in 2019 so the true number of first admissions may have been underreported that year and this may have impacted the 3% rise increase in the proportion of first-time admissions observed over the time-period. This increase in the proportion of involuntary admissions and first-time admissions pre- and post-COVID-19 remains significant when the data is stratified by sex (Table 7).

Discussion

Summary of findings

The current study is the first to provide information on the demographic and clinical profile of inpatient psychosis admissions in Ireland. Study findings therefore provide key insights in the Irish context for mental health policy makers. A key study finding is that the median age of admission for men and women in this Irish dataset is older than the 75th percentile (35 years of age) for age of onset of psychosis symptoms reported in a 2022 meta-analysis (Solmi *et al.*, 2022). The NPIRS dataset only allows us to identify the first inpatient admission with psychosis rather than the first episode of psychosis. As such, it may be that with the move to community care, prompted by successive national mental health policy documents, a high proportion of young people are being treated for their first episodes of psychosis in the community setting. However, this finding could also be explained by a long duration of untreated psychosis associated with the delayed development and roll-out of nationwide early intervention in psychosis services in Ireland. The finding that women were significantly older than men on admission, including on first admission, requires further exploration in the Irish context. There is literature indicating that due to differences in symptomatology and perception of risk, women experiencing psychosis may not have their symptoms promptly identified and treated in the primary care setting (Carter *et al.*, 2023). It is also possible that greater carer responsibilities that more typically fall on women, may be discouraging or inhibiting women from attending secondary or tertiary care settings (Sambrook Smith *et al.*, 2019). There is also evidence that oestrogen may play a protective role against psychosis, and during low oestrogenic phases such as the menopause in midlife, the emergence of psychosis is more likely in women (Robinson 2001). Further research into sex differences in both the clinical presentation of psychosis as found in this study, and the role of oestrogen in the aetiology and treatment of psychosis, as found in other studies, is required.

In relation to ethnicity, in this study the odds of admission with psychosis from ethnic minority groups was almost twice that of White Irish. In particular, a high proportion of psychosis admissions was observed in the Black African ethnic group comparable to recent findings from other European studies (Selten *et al.*, 2005; Morgan *et al.*, 2006). Previous studies have attributed ethnic variation in inpatient admissions to reduced contact with primary care services during early mental illness (Bhui *et al.*, 2003; Morgan *et al.*, 2004). However, a more recent 2020 study concluded there was no evidence to support a relationship between ethnicity and untreated psychosis (Oduola *et al.*, 2021), instead, increased likelihood of police involvement and involuntary admission are discussed in literature in relation to increased likelihood of inpatient admission in Black African ethnic groups (Faber *et al.*, 2023). In this study psychosis admissions in the White Roma ethnic group were higher as demonstrated by the chi-square adjusted residual values. The White Roma together with the Irish Traveller populations are considered socially marginalised groups in Ireland with reduced access to healthcare, social supports, housing, education, employment and income (Priebe *et al.*, 2013). These factors could negatively contribute to poor mental health including vulnerability to psychosis.

Regarding urbanicity, in previous studies living in an urban environment is associated with an increased risk of psychosis (Van Os *et al.*, 2001; Sundquist *et al.*, 2004; Newbury *et al.*, 2016) with some research reporting a dose-response relationship between factors (Pederson and Mortensen 2001; Kirkbride *et al.*, 2006). However, this study concluded that the risk of being admitted to hospital with psychosis was higher for people living in a rural environment compared to those living in an urban setting. As Ireland consists of only six cities/urban epicentres, urbanicity

Table 3. Demographic of admissions due to psychosis by sex ($N = 43{,}963$)

	Male		Female		X^2	p	Adjusted Residuals (ref: Male)	OR	CI
	N	%	N	%					
Age					1587.15	≤0.001		–	–
<18	51	0.2	29	0.2			1.0		
18–24	3299	12.8	1248	6.8			20.4		
25–44	12879	50.2	6951	38.0			25.2		
45–64	7072	27.5	7023	38.4			−24.1		
65+	2374	9.2	3035	16.6			−14.0		
Missing	2	0.0	–	–			–		
Ethnicity					38.69	≤0.001		1.00	0.97–1.03
Ethnic Minority (Ref)	5536	21.6	3886	21.3			0.0		
White Irish	20141	78.4	14400	78.7			0.0		
Marital Status					2758.00	≤0.001		1.58	1.55–1.62
Single (Ref)	20475	79.7	10879	59.5			16.0		
Married	2628	10.2	4066	22.2			−20.5		
Widowed	210	0.8	870	4.8			−16.8		
Divorced	400	1.6	726	4.0			−10.0		
Other	872	3.4	1144	6.3			−8.9		
Unknown	1092	4.3	601	3.3			3.3		
Employment					2617.77	≤0.001		0.94	0.92–0.96
Employed (Ref)	4347	16.9	3523	19.3			−6.3		
Unemployed	14477	56.4	7925	43.3			12.2		
Retired	1615	6.3	1929	10.5			−10.0		
Student	1240	4.8	824	4.5			1.0		
House Duties	47	0.2	1515	8.3			−45.2		
Unknown	3951	15.4	2570	14.1			3.9		
Urbanicity[a]					4.22	0.04		0.98	0.95–0.99
Urban (Ref)	9306	40.8	6495	41.8			−2.1		
Rural	13524	59.2	6495	58.2			2.1		
NFA					115.81	≤0.001		1.27	1.22–1.31
Homeless (Ref)	888	3.5	321	1.8			10.8		
Other	24789	96.5	17965	98.2			−10.8		

[a]Analysis of this data excludes data for private hospitals.

findings could be impacted by higher proportion of the population living in rural locations compared to other European countries. Furthermore, as this dataset looks at admissions with psychosis rather than episodes of psychosis it may be that these findings are explained by differences in the levels of acute and subacute supports available in community mental health services in urban and rural settings. For example, better access to crisis resolutions teams/ home treatment/acute day hospitals in urban settings compared to rural settings could reduce the need for acute hospital admissions (O'Keeffe and Russell 2019). There is known variation in service provision across Ireland (O'Keane *et al.*, 2004). This finding requires further exploration.

The higher rates of unemployment found amongst people admitted to hospital with psychosis is also noteworthy as supporting employment is a key target area for early intervention services (HSE 2019), justifying the need for targeted programmes to assist those experiencing psychosis to enter the workforce. Analysis by sex, also showed subtle differences in demographic factors previously associated with psychosis, pointing to the need for sex-specific therapeutic strategies and early intervention programmes (Barajas *et al.*, 2015).

Trend analysis also provides insight into the impact of the COVID-19 pandemic on psychosis admissions. Similar to other international studies, a decrease in admissions was observed as the country entered national lockdown. However, unlike some other nations, the threshold for psychiatric admission in Ireland was not modified during the COVID-19 pandemic (Davies and Hogarth 2021; Dionisie *et al.*, 2022; Ross *et al.*, 2023). This finding may indicate that there was a reduction in the number of people experiencing acute psychosis during the COVID-19 pandemic. However, it seems more likely that people who were experiencing psychosis, avoided presenting to psychiatric services due to a fear

Table 4. Length of stay (LOS) by sex and subcategory of psychosis

	Median	IQR	Z	p
Diagnosis				
Psychosis	20.0	8.0–43.0	56.6	≤0.001
Other Mental Health Disorder	13.0	4.0–33.0		
Admission Due to Psychosis				
Male	19.0	7.0–42.0	−5.7	≤0.001
Female	21.0	8.0–45.0		
Subcategories of Psychosis	Mean	SD	F	p
Substance- Induced Psychosis	17.9	47.5		≤0.001
Schizophrenia, Schizotypal and Delusional Disorders	104.7	794.9	30.9	
Mood Disorders	262.7	262.7		

Table 5. Length of Stay (LOS) less than one year relative to greater than one year

	Psychosis admissions		Other mental health admissions				Adjusted Residuals (Ref: Psychosis)
	N	%	N	%	X^2	p	
LOS (Days)					342.7	≤0.001	
0-365	44064	97.9	122597	99.0			−18.5
>365	243	2.1	1186	1.0			18.5

of COVID-19 infection or a fear of burdening the health system. This pattern was seen in many other acute conditions including cardiac arrests and cerebrovascular disease during the COVID-19 pandemic (Schirmer *et al.*, 2020; Hammad *et al.*, 2021). In addition, there may have been an increase in the threshold and capacity of caregivers to manage psychosis symptoms at home to avoid inpatient admission. In this study we found that while the absolute numbers of people being admitted to hospital with psychosis post pandemic (2022) was lower than pre-pandemic (2019), the proportion of those being admitted post-pandemic that required an involuntary admission was significantly higher. This may indicate an increased capacity for community services to manage acute psychosis in the community setting (reducing the absolute need for an inpatient admission), but when an admission is required, these patients may be more unwell and more likely to require an involuntary admission. This finding could also indicate that COVID-19 has had a longer-term impact on help seeking behaviour for people experiencing psychosis such that presentations are now later and more likely to require an involuntary admission. This pattern is one that warrants longer-term follow up and examination.

The financial burden of psychosis on the Irish health service is high, accounting for a quarter of all psychiatric admissions, and occupying beds for 54% longer than other mental health disorders. The ESRI calculated that in 2018, expenditure for psychiatric inpatient services amounted to €180 million, with expenditure peaking at 25–39 years (€11.0m) for males and 50–54 year (€8.1m) for females (ESRI *et al.*, 2020). This study therefore, reinforces the importance and continued need for the development of Ireland's EIP National Clinical Programme to identify people with psychosis early, reduce the need for hospitalisation, improve clinical outcomes and recovery rates of patients and improve cost-effectiveness of treatment for the national health service (Darker *et al.*, 2023).

Policy and practice implications

The development of a nationwide early intervention in psychosis (EIP) service has been recommended in the National Mental Health Policy 'Sharing the Vision'. As it stands there are five EIP services in Ireland with approximately twenty more required to provide national coverage. EIP services seek to improve recovery rates in people experiencing psychosis by providing early access to assessments, access to a range of evidence-based interventions including psychological interventions, employment support, family interventions, medication and providing sustained community follow up. A significant focus of EIP services is to reduce the duration of untreated psychosis, provide care in the least restrictive environment (ideally community-based care) and provide a holistic and person-centered approach to care
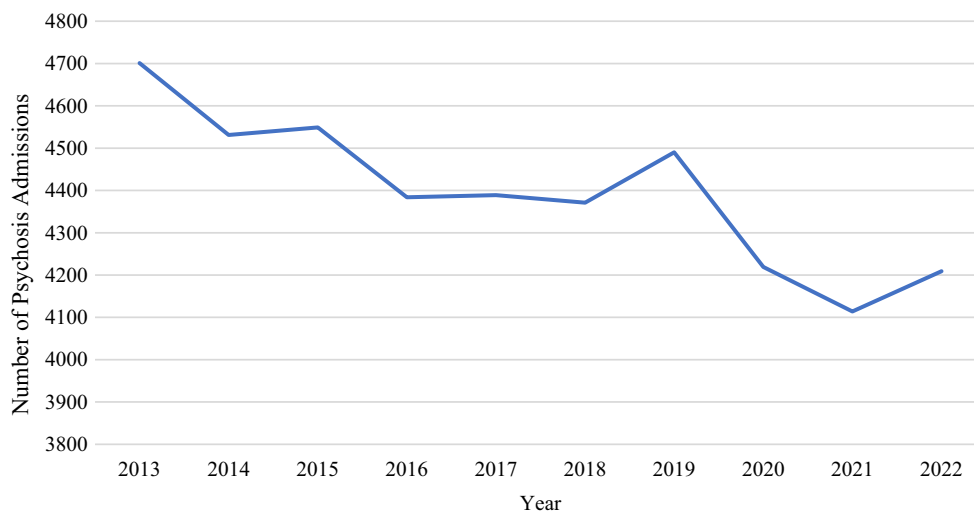

Figure 1. Number of psychosis admissions by year of admission, 2013–2022.

Table 6. Impact of Covid-19 lockdown on legal status and order of admission of psychosis admissions

	2019		2022		X^2	p	Adjusted Residuals (Ref: 2022)
	N	%	N	%			
Legal Status of Psychosis Admission					56.86	≤0.001	
Voluntary	3234	72.0	2715	64.5			−7.5
Involuntary	1256	28.0	1494	35.5			7.5
Order of Psychosis Admission					123.97	≤0.001	
First ever	1226	27.3	1256	29.8			2.6
Readmission	3137	69.9	2953	70.2			0.3
Unknown	127	2.8	0	0.0			−11.0

Table 7. Impact of Covid-19 lockdown on legal status and order of admission of psychosis admissions by sex

	Male Psychosis Admissions						Female Psychosis Admissions						
	2019		2022		X^2	p	Adjusted Residual (Ref: 2022)	2019		2022		X^2	p	Adjusted Residual (Ref: 2022)
	N	%	N	%				N	%	N	%			
Legal Status of Psychosis Admission					36.3	≤.001						20.4	≤0.001	
Voluntary	1884	71.5	1600	63.6			−6.0	1350	78.2	1115	65.8			−4.5
Involuntary	752	28.5	915	36.4			6.0	504	27.2	579	34.2			4.5
Order of Psychosis Admission					60.3	≤.001						64.4	≤0.001	
First ever	731	27.7	736	29.3			1.2	496	26.7	520	30.7			2.9
Readmission	1843	69.9	1779	70.7			0.6	1294	60.8	1174	69.3			−0.3
Unknown	62	2.4	0	0.0			−7.7	65	3.5	0	0.0			−7.8

(HSE 2019). The findings from this study indicate that people with psychosis require longer length of stays therefore occupying inpatient psychiatric beds in Ireland for extended periods. Data from other countries indicates that this demand could be significantly reduced by the nationwide expansion of EIP services in Ireland (Correll *et al.*, 2018).

The study findings also indicate that there are several areas that require further consideration as the Irish EIP model of care evolves. One area is the functional and occupational needs of women presenting in their middle years, who typically have additional caring responsibilities and parenting needs more so than their male counterparts. Employment support has provided a key focus for functional recovery and occupational support in EIP services in Ireland and internationally (National Institute for Health and Care Excellence, 2014). Given the high levels of unemployment among people with psychosis identified in this study, this needs to remain a key focus of EIP and other mental health teams. However, women in their middle years are more likely than their younger male counterparts to have had or continue to have responsibilities for children, parents and others. As such, employment support may not be as accessible or appropriate and an adaptation or alternative approach may need to be considered. Another area for exploration is support for people with psychosis who are parents and support for their children. EIP services have sought to involve family early and explicitly in care planning. However, this engagement and support has typically involved adult family members rather than children. Middle aged women presenting for a first admission with psychosis are more likely to be mothers. There is evidence that

having a parent with a psychotic disorder can impact on parenting and child development (Thorup *et al.*, 2022). EIP services in Ireland need to explore the role for family interventions that support parenting and children.

The high rates of substance-induced psychosis underlie the need to better integrate the EIP model with drug treatment services to avoid service fragmentation and/or duplication. The relatively higher rates of admission with psychosis amongst ethnic minority backgrounds underlies the need for staff in EIP services to be trained in trauma informed care approaches (particularly relevant to some migrant and minority groups) and to proactively engage with marginalised groups.

Study limitations

These study results should be interpreted considering possible limitations. The data was extracted from the NPIRS which has an overarching aim to monitor the activity of inpatient units. There are therefore a number of risk factors unique to, or, of greater relevance to, psychosis that were not included in the study, for example social economic status (Werner *et al.*, 2007; Kwok 2014) and family history of psychosis (Esterberg and Compton 2012). In addition, limitations within the dataset resulted in the crude analysis of some variables, for example urbanicity analysis was performed using location of admitting hospital. Due to the structure of Ireland's CHO areas, one hospital could serve several areas including towns of increased population density and service provision and rural locations of population and resource sparsity.

The relationship between urbanicity and psychosis could be masked in this study.

In relation to the database, NPIRS collects data on inpatient activity only and does not represent individuals, meaning incidence of mental illness or rates of readmission cannot be inferred. Furthermore, whilst data is submitted under pre-defined specifications and verification, the return rate for some variables is less than complete. Consequently, as the return rate for the variable 'patient occupation' was quite low, this variable was removed from analysis.

Conclusion

The study aimed to investigate the demographic and clinical data of inpatient admissions due to psychosis. As this study is the first of its kind, data and insights are important for policy in the Irish context providing foundations for psychosis prevention and intervention policies. Understanding the evidence around inpatient psychiatric admission is important for ensuring the availability of efficient and effective care. As such, study findings are important in supporting the expansion of the HSE EIP Model of care.

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