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Factors Associated with Timely Physician Follow-up after a First Diagnosis of Psychotic Disorder

Facteurs associés au suivi ponctuel d'un médecin après un premier diagnostic de trouble psychotique

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Abstract

Objective: Physician follow-up after a first diagnosis of psychotic disorder is crucial for improving treatment engagement. We examined the factors associated with physician follow-up within 30 days of a first diagnosis of schizophrenia.

Method: We conducted a retrospective cohort study using linked health administrative data to identify incident cases of schizophrenia between 1999 and 2008 among people aged 14 to 35 years in Ontario. We estimated the proportion of patients who had physician follow-up within 30 days of the index diagnosis. We used multilevel logistic regression models to examine the factors associated with any physician follow-up and follow-up by a psychiatrist.

Results: We identified 20,096 people with a first diagnosis of schizophrenia. Approximately 40% of people did not receive any physician follow-up within 30 days, and nearly 60% did not receive follow-up by a psychiatrist. Males had lower odds of receiving any physician follow-up, and the odds of psychiatrist follow-up decreased with increasing age and were lower for those living in rural areas. Both prior contact with a general practitioner for a mental health reason and prior contact with a psychiatrist were strongly associated with higher odds of receiving both types of follow-up.

Conclusions: Many people do not have any physician contact within 30 days of the first diagnosis of schizophrenia, and patients without prior engagement with mental health services are at highest risk. We need information on the reasons behind this lack of physician follow-up to inform strategies aimed at improving engagement with services during the early stages of psychosis.

Abrégé

Objectif : Le suivi d'un médecin après un premier diagnostic de trouble psychotique est essentiel pour améliorer l'engagement au traitement. Nous avons examiné les facteurs associés au suivi du médecin dans les 30 jours suivant un premier diagnostic de schizophrénie.

Méthode : Nous avons mené une étude de cohorte rétrospective à l'aide de données de santé administratives couplées pour identifier les cas incidents de schizophrénie entre 1999 et 2008 chez les personnes de 14 à 35 ans, en Ontario. Nous avons estimé la proportion des patients qui ont eu un suivi du médecin dans les 30 jours suivant le premier diagnostic. Nous avons

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utilisé des modèles de régression logistique multiniveaux pour examiner les facteurs associés à un suivi par n'importe quel médecin et à un suivi par un psychiatre.

Résultats : Nous avons identifié 20 096 personnes ayant reçu un premier diagnostic de schizophrénie. Environ 40% de ces personnes n'ont reçu aucun suivi d'un médecin dans les 30 jours, et près de 60% n'ont pas reçu de suivi d'un psychiatre. Les hommes avaient de plus faibles probabilités de recevoir un suivi par n'importe quel médecin, et les probabilités d'un suivi par un psychiatre diminuaient plus l'âge augmentait, et étaient plus faibles pour ceux habitant en région rurale. Tant le contact précédent avec un omnipraticien pour une raison de santé mentale que le contact précédent avec un psychiatre étaient fortement associés avec des probabilités plus élevées de recevoir les deux types de suivi.

Conclusions : De nombreuses personnes n'ont aucun contact avec un médecin dans les 30 jours suivant le premier diagnostic de schizophrénie, et les patients sans engagement précédent avec les services de santé mentale sont à risque plus élevé. Il nous faut de l'information sur les raisons de ce manque de suivi d'un médecin pour éclairer les stratégies visant à améliorer l'engagement aux services durant les premières phases de la psychose.

Keywords

schizophrenia, mental health services, physician follow-up

Timely and adequate management of the early stages of psychosis is critical to the well-being of young people with psychotic disorders. There is strong evidence to suggest that long delays between the onset of psychotic symptoms and the initiation of treatment result in poor clinical and functional outcomes.^{1,2} These outcome trajectories are defined in the 2-year period following the first psychotic episode,³ making the early stages of psychotic disorder a critical period for detection and intervention.

Recognition of the importance of rapid access to care following the onset of psychosis has not prevented persistent access difficulties and lengthy delays.⁴⁻⁶ Many patients in the early stages of psychosis make multiple help-seeking attempts and cycle within and between different services, with poorly integrated care across providers.^{7,8} Physician follow-up, in particular, is critical for facilitating linkages with specialized services, reinforcing treatment plans, and providing continuity of care. Prior literature has focused on physician follow-up after hospitalisation or emergency department (ED) visits.^{9,10} To our knowledge, there are no prior studies investigating the follow-up care received after the first diagnosis of psychosis, despite evidence of the need for early and continuous physician involvement in this population.

The objective of our study was to evaluate the sociodemographic and service-level factors associated with physician follow-up within 30 days of a first diagnosis of schizophrenia among young people aged 14 to 35 years in Ontario. As a secondary objective, we also examined the factors associated with follow-up by a psychiatrist. We chose to focus on psychotic disorder specifically, rather than all youth mental illness, given the evidence that untreated psychosis is associated with poor outcomes^{1,2} and the fact that people with psychotic disorders may have different follow-up needs than those with other psychiatric conditions.¹¹ We hypothesized that nonclinical factors, such as age, sex, and rural place of residence, as well as past patterns of health services utilisation, would affect the likelihood of receiving physician follow-up after a first diagnosis of psychosis. This

study will allow us to identify patients who may be disadvantaged with respect to follow-up care from physicians in the period following the first diagnosis of psychosis. Gaining an understanding of the predictors of timely physician follow-up could allow for the implementation of strategies aimed at improving physician follow-up rates and transitions of care in the crucial early stages of psychosis.

Methods

Study Setting: Early Psychosis Intervention in Ontario

The Ontario Ministry of Health and Long-Term Care (MoHLTC) first identified Early Psychosis Intervention (EPI) services as a priority in 1999, when the Implementation Plan for Mental Health Reform highlighted first-episode psychosis as an area in need of intensive services.¹² During the next 5 years, hospital-based EPI programs were established in academic centres in major cities, including London, Hamilton, Toronto, Kingston, and Ottawa. In December 2004, the MoHLTC announced funding for the expansion of early psychosis intervention services across the province and established a framework to aid the development of new programs.¹³ Since that time, over 50 hospital- and community-based EPI programs have been established across Ontario.

The time period considered in the current study (1999 to 2008) coincided with the rollout of these services across the province. For the first half of the study period, early psychosis intervention services would have been available only to a small proportion of cases located near tertiary-care academic centres. For the remaining half of the study period, the availability of these services would have been gradually increasing over time. Given the lag time required to implement these new programs, train the workforce, and increase awareness of these services among clinicians, we speculate that most people included in our cohort would not have had access to EPI services during the time period of our study.

Source of Data

We constructed a cohort of incident cases of psychotic disorder using the linked population-based health administrative databases held by the Institute for Clinical Evaluative Sciences (ICES). The databases contain information on all medically necessary hospital and physician services funded under the public health care system in Ontario, Canada. The linked data included the Registered Persons Database (RPDB) containing demographic and mortality information, the Ontario Health Insurance Plan (OHIP; 1991 to 2009) database containing data on physician services and outpatient visits, the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD; 1988 to 2009) containing information on acute hospitalisations, the Ontario Mental Health Reporting System (OMHRS; 2005 to 2009) containing data on inpatient mental health hospitalisations, and the National Ambulatory Care Reporting System (NACRS; 2000 to 2009), which includes information on ED visits. We also linked data from Immigration, Refugees, and Citizenship Canada (IRCC; 1985 to 2009) to ascertain the migrant status of cohort members. There were minimal missing data (<1%) for the variables of interest in the current analysis.

Approval to access the data was obtained from the Research Ethics Boards at the University of Western Ontario and Sunnybrook Health Sciences Centre, and the de-identified data sets were analyzed on site at ICES.

Study Population

The study cohort included all Ontario residents aged 14 to 35 years who received a first diagnosis of schizophrenia or schizoaffective disorder between 1999 and 2008, inclusive. This age group was selected as the focus for this study because it is considered a "priority population" by the Ontario MoHLTC.¹³ We identified cases using an algorithm validated against medical chart diagnoses for the identification of patients with schizophrenia and schizoaffective disorder.¹⁴ People were classified as an incident case if they met one of the following criteria:

- (i) a primary discharge diagnosis of schizophrenia, schizophreniform, or schizoaffective disorder from a general hospital bed (*International Classification of Diseases, Ninth Revision [ICD-9]* code 295.x; *International Classification of Diseases, Tenth Revision [ICD-10]* code F20 or F25);
- (ii) a *Diagnostic and Statistical Manual of Medical Disorders, Fourth Edition (DSM-IV)* Axis 1 diagnosis of schizophrenia, schizophreniform, or schizoaffective disorder from a psychiatric hospital bed (*DSM-IV* code 295.x); or
- (iii) at least 2 OHIP billing claims or ED visits with a diagnostic code for schizophrenia, schizophreniform, or schizoaffective disorder (*ICD-9* code 295.x; *ICD-10* code F20 or F25) in a 12-month period.

People had to be eligible for OHIP in the 5 years prior to cohort inception, and any person who had a

history of contact with services in Ontario for schizophrenia, schizophreniform, or schizoaffective disorder was removed as a prevalent case. The exclusion period for prevalent cases was up to 20 years, depending on the database used, the age of each person, and OHIP eligibility (minimum of 5 years).

When subjects entered the cohort via OHIP billings or ED visits, the date of the first physician or ED visit for psychotic disorder was assigned as the index date. When patients entered the cohort via a hospitalisation, the discharge date was used. If the person was rehospitalised within 30 days (<3% of cohort), the index date was reset to the discharge date of the second hospitalisation because there would have been an insufficient window for physician follow-up to be observed. If the person was again rehospitalised within 30 days of the second discharge, he or she was excluded from the cohort.

Classification of Physician Follow-up

Using physician billing records, we evaluated the short-term (30-day) outpatient physician follow-up subsequent to the index diagnosis of psychosis, categorized as 1) no follow-up by a general practitioner (GP) or psychiatrist, 2) GP follow-up, 3) psychiatrist follow-up, or 4) both GP and psychiatrist follow-up. Given that GPs will often provide mental health services in the context of a general health visit that may not be assigned a mental health diagnostic or procedure code,¹⁵ we opted to include any visit with a GP as part of our definition of physician follow-up.

Our primary outcome measure was dichotomized as any physician follow-up within 30 days versus no physician follow-up. Our secondary outcome was dichotomized as follow-up by a psychiatrist within 30 days of the index diagnosis versus no psychiatrist follow-up.

Sociodemographic and Service-Level Factors

The covariates chosen for inclusion in our multivariate models were based on factors shown to influence physician follow-up rates in prior literature that were available in the health administrative databases.^{11,16-20} Available sociodemographic data included age, sex, and migrant status. We also had an ecological indicator of material deprivation available from the Ontario Marginalization Index, which is described in detail elsewhere.²¹ Briefly, it was developed based on data from the 2006 Canadian census and comprises neighbourhood-level indicators of education level, unemployment, income, housing, and lone-parent families. The scores are assigned by census dissemination area and grouped into quintiles based on the provincial distribution.²¹ Urban versus rural place of residence was defined using the Rurality Index of Ontario, and areas with scores of 40 or above were considered rural.²²

We also constructed several binary indicators of health service use for mental health conditions other than

schizophrenia, schizophreniform, or schizoaffective disorder in the 6-month period preceding the index diagnosis, including contact with a GP for a mental health reason, contact with a psychiatrist, a visit to the ED for a mental health reason, and a hospitalisation with a discharge diagnosis of a mental disorder. These indicator variables were included to reflect level of engagement and prior utilisation patterns of mental health services. We also adjusted for year of index diagnosis as a continuous variable to account for changes in the availability of EPI services over time.

Data Analysis

We summarised the demographic data by calculating proportions for categorical data and means and standard deviations (SDs) for continuous data. After verifying model assumptions, we used multivariate hierarchical logistic regression models, clustered at the local health authority level (known as local health integration networks), to estimate the independent associations of the sociodemographic and service-level factors with the binary outcomes of any physician follow-up and follow-up by a psychiatrist. We stratified all analyses based on whether the patient was hospitalised at the index diagnosis in an effort to account for differences in acuity of illness. People with psychotic disorder who are hospitalised at the first episode tend to have more severe functional and behavioural disturbances, are more likely to be a risk to self or others,^{23,24} and have a higher likelihood of subsequent readmissions.²⁵

All analyses were conducted using PROC GENMOD in SAS version 9.3 (SAS Institute, Cary, NC). We compared unadjusted logistic regression models with the fully adjusted models for the presence of confounding, and the conclusions did not change substantially across models. Because the deviance information criterion (DIC) was lower for the multivariate models, indicating better model fit, we present the fully adjusted models here. All results are presented as adjusted odds ratios (ORs) with corresponding 95% confidence intervals (CIs), and CIs that do not overlap with unity are statistically significant.

Results

Over the 10-year period, we identified 20,096 incident cases of psychotic disorder among people aged 14 to 35 years in Ontario. This yields a crude annual incidence estimate of approximately 57 per 100,000, which is comparable to incidence estimates from other studies from within Canada²⁶ and elsewhere²⁷ for the age range considered in the current study. Sixty-two percent of the cohort was identified via physician and ED visits, and the remaining 38% were identified from a first hospitalisation for psychotic disorder. Among the former group who were identified via physician and ED visits, 54% received the index diagnosis from a

psychiatrist, with the remaining 46% of patients diagnosed by a GP or other physician.

The mean (SD) age of the cohort members was 24.8 (5.7) years, and 68% of the cohort was male. Nearly 10% of patients were first-generation immigrants, and 3% were refugees. Most people (90%) were living in urban areas across the province. The other sociodemographic characteristics of the cohort are presented in Table 1.

Any Physician Follow-up

Approximately 40% of patients did not receive any physician follow-up within 30 days of the index diagnosis of psychotic disorder, and the proportion of patients receiving physician follow-up did not differ by hospitalisation status at the index diagnosis (Table 1). Of the remaining patients, 29% were seen by a psychiatrist, 18% by a GP, and 13% by both a psychiatrist and a GP. Among the patients who received follow-up by a GP, 66% of visits were identifiable as mental health related based on the diagnostic or procedure code assigned.

The results of the fully adjusted multilevel logistic regression models for physician follow-up are presented in Table 2. We found that males were less likely to receive any physician follow-up compared with females (hospitalised: OR, 0.88; 95% CI, 0.79 to 0.98; nonhospitalised: OR, 0.88; 95% CI, 0.83 to 0.94). Among people who were not hospitalised at the index diagnosis, those living in the least deprived areas of the province were 24% more likely to receive physician follow-up than those living in the most deprived areas of the province (OR, 1.24; 95% CI, 1.03 to 1.49). Material deprivation was not associated with the likelihood of physician follow-up among those who were hospitalised at the index episode. We also found that the likelihood of physician follow-up decreased with time, with a 3% to 4% decrease in the likelihood of physician follow-up per year (Figure 1; hospitalised: OR, 0.96; 95% CI, 0.95 to 0.98; nonhospitalised: OR, 0.97; 95% CI, 0.96 to 0.98).

Prior utilisation of outpatient mental health services was the strongest predictor of 30-day physician follow-up. Patients who had contact with a GP (hospitalised: OR, 1.54; 95% CI, 1.41 to 1.68; nonhospitalised: OR, 1.46; 95% CI, 1.35 to 1.57) or a psychiatrist (hospitalised: OR, 1.68; 95% CI, 1.52 to 1.85; nonhospitalised: OR, 1.73; 95% CI, 1.58 to 1.90) in the 6 months prior to the index diagnosis were more likely to receive physician follow-up by a physician. Among people who were not hospitalised at the index diagnosis, prior contacts with the ED for a mental health reason increased the likelihood of physician follow-up (OR, 1.13; 95% CI, 1.04 to 1.22) but not among those who were hospitalised at the index diagnosis. Unlike prior physician contact, prior hospitalisations for a mental health reason were not associated with the likelihood of physician follow-up in either group (Table 2).

Table 1. Sociodemographic Characteristics of the Cohort of Incident Cases of Schizophrenia Aged 14 to 35 Years in Ontario between 1999 and 2008 (*N* = 20,096).

Variable	Value	Hospitalised at Index Diagnosis (<i>n</i> = 7555), <i>n</i> (%) ^a	Not Hospitalised at Index Diagnosis (<i>n</i> = 12,541), <i>n</i> (%) ^a
Sociodemographic covariates			
Age at index date ^b	Age (years), mean ± SD	24.38 ± 5.55	25.07 ± 5.73
Sex ^b	Female	2258 (29.9)	4102 (32.7)
	Male	5297 (70.1)	8439 (67.3)
Rural residence	Urban	6805 (90.1)	11,300 (90.1)
	Rural	750 (9.9)	1241 (9.9)
Material deprivation ^b	Fifth quintile (high)	159 (2.1)	279 (2.2)
	Fourth quintile	3340 (44.2)	5869 (46.8)
	Third quintile	1016 (13.4)	1667 (13.3)
	Second quintile	2036 (26.9)	3103 (24.7)
	First quintile (low)	1004 (13.3)	1623 (12.9)
Migrant status	General population	6520 (86.3)	10,925 (87.1)
	Immigrant	760 (10.1)	1199 (9.6)
	Refugee	275 (3.6)	417 (3.3)
Source of index diagnosis	GP	NA	5550 (44.6)
	Psychiatrist		6557 (52.7)
	GP and Psychiatrist		214 (1.7)
	Other physician		220 (1.8)
Health services covariates			
Mental health GP contact in previous 6 months ^b	No	4458 (59.0)	5604 (44.7)
	Yes	3097 (41.0)	6937 (55.3)
Psychiatrist contact in previous 6 months ^b	No	3349 (44.3)	4826 (38.5)
	Yes	4206 (55.7)	7715 (61.5)
Mental health hospitalisation in previous 6 months ^b	No	5984 (79.2)	10,616 (84.7)
	Yes	1571 (20.8)	1925 (15.3)
Mental health ED visit in previous 6 months ^b	No	2689 (35.6)	7808 (62.3)
	Yes	4866 (64.4)	4733 (37.7)
Outcome measures			
Any physician follow-up within 30 days of diagnosis	No	3068 (40.6)	4998 (39.9)
	Yes	4487 (59.4)	7543 (60.1)
Psychiatrist follow-up within 30 days of diagnosis ^b	No	4170 (54.2)	7580 (60.4)
	Yes	3385 (44.8)	4961 (39.6)

ED, emergency department; GP, general practitioner; NA, not applicable.

^aUnless otherwise indicated.

^bDifference between groups statistically significant (*P* < .05).

Psychiatrist Follow-up

Nearly 60% of patients did not receive any follow-up by a psychiatrist in the 30-day period following the index diagnosis of psychotic disorder, and the proportion of patients who received psychiatrist follow-up was significantly higher among those who were hospitalised at the index episode (44.8%) compared to those who were not hospitalised (39.6%).

The results of the fully adjusted multilevel logistic regression models for psychiatrist follow-up are presented in Table 3. We found that sex was no longer associated with the likelihood of psychiatrist follow-up, whereas age was statistically significant, with a 1% to 2% reduction in the likelihood of receiving follow-up from a psychiatrist with each year increase in age (hospitalised: OR, 0.99; 95% CI, 0.98 to 0.99; nonhospitalised: OR, 0.98; 95% CI, 0.98 to 0.99). People living in rural areas were less likely to receive

follow-up from a psychiatrist (hospitalised: OR, 0.72; 95% CI, 0.59 to 0.87; nonhospitalised: OR, 0.82; 95% CI, 0.72 to 0.93). Material deprivation was again associated with the likelihood of receiving psychiatrist follow-up, but only among those not hospitalised at the index episode, with those living in the least deprived areas of the province being 32% more likely to receive follow-up than those living in the most deprived areas of the province (OR, 1.32; 95% CI, 1.07 to 1.63). We again found that the likelihood of psychiatrist follow-up decreased with time, with a 5% to 6% decrease in the likelihood of psychiatrist follow-up per year (Figure 2; hospitalised: OR, 0.95; 95% CI, 0.93 to 0.97; nonhospitalised: OR, 0.94; 95% CI, 0.93 to 0.96).

Prior utilisation of outpatient mental health services was also associated with 30-day psychiatrist follow-up. Patients who had contact with a psychiatrist in the 6 months prior to the index diagnosis were much more likely to receive

Table 2. Factors Associated with Follow-up by Any Physician within 30 Days of a First Diagnosis of Schizophrenia (N = 20,096).

Variable	Value	Hospitalised at Index Diagnosis (n = 7555)		Not Hospitalised at Index Diagnosis (n = 12,541)	
		Adjusted Odds Ratio	95% Confidence Interval	Adjusted Odds Ratio	95% Confidence Interval
Age at index date	Age (years), mean \pm SD	1.00	0.99 to 1.01	1.00	1.00 to 1.01
Sex	Female		Reference		Reference
	Male	0.88	0.79 to 0.98	0.88	0.83 to 0.94
Rural residence	Urban		Reference		Reference
	Rural	0.94	0.76 to 1.16	0.93	0.83 to 1.03
Material deprivation	Fifth quintile (high)		Reference		Reference
	Fourth quintile	0.74	0.56 to 0.97	1.18	0.99 to 1.40
	Third quintile	0.79	0.59 to 1.05	1.05	0.90 to 1.22
	Second quintile	0.88	0.64 to 1.21	1.20	1.02 to 1.42
	First quintile (low)	0.80	0.59 to 1.10	1.24	1.03 to 1.49
Migrant status	General population		Reference		Reference
	Immigrant	1.13	1.00 to 1.27	1.10	0.98 to 1.23
	Refugee	1.00	0.86 to 1.15	1.18	0.94 to 1.49
Mental health GP contact in previous 6 months	No		Reference		Reference
	Yes	1.54	1.41 to 1.68	1.46	1.35 to 1.57
Psychiatrist contact in previous 6 months	No		Reference		Reference
	Yes	1.68	1.52 to 1.85	1.73	1.58 to 1.90
Mental health hospitalisation in previous 6 months	No		Reference		Reference
	Yes	0.97	0.84 to 1.12	1.04	0.96 to 1.13
Mental health ED visit in previous 6 months	No		Reference		Reference
	Yes	1.09	0.97 to 1.22	1.13	1.04 to 1.22
Year	1999-2008	0.96	0.95 to 0.98	0.97	0.96 to 0.98

ED, emergency department; GP, general practitioner.

^aUnless otherwise indicated; statistically significant results italicized ($P < 0.05$).

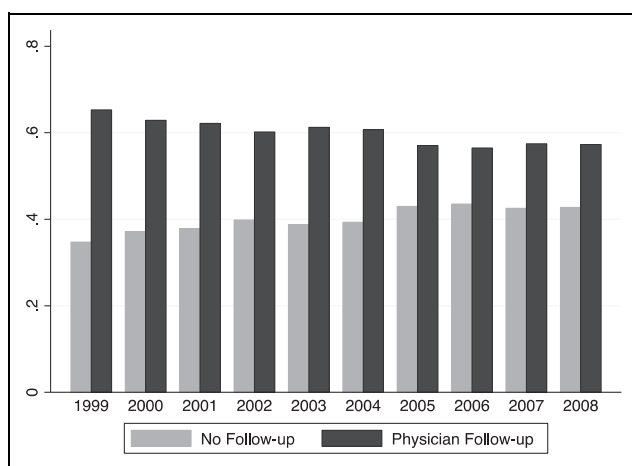


Figure 1. Proportion of the cohort receiving follow-up by any physician within 30 days of the index diagnosis of psychosis by year. Odds ratios (ORs) from multilevel logistic regression models suggest that the odds of receiving physician follow-up are decreasing over time (hospitalised: OR, 0.96; 95% confidence interval [CI], 0.95 to 0.98; nonhospitalised: OR, 0.97; 95% CI, 0.96 to 0.98).

follow-up by a psychiatrist (hospitalised: OR, 2.13; 95% CI, 1.90 to 2.37; nonhospitalised: OR, 3.56; 95% CI, 3.11 to 4.07). Among people who were not hospitalised at the index diagnosis, prior contacts with the ED for a mental health reason increased the likelihood of psychiatrist follow-up

(OR, 1.33; 95% CI, 1.17 to 1.52), but not among those who were hospitalised at the index diagnosis. Neither prior contacts with a GP nor prior hospitalisations for a mental health reason were associated with the likelihood of psychiatrist follow-up in either group (Table 3).

Discussion

Our findings suggest that approximately 2 of 5 people with first-episode psychosis in Ontario are not receiving follow-up from any physician within 30 days of the first diagnosis of schizophrenia, even among patients whose illness severity warranted inpatient treatment at the index diagnosis. Patients without prior engagement with services are at highest risk of not receiving physician follow-up, particularly from a psychiatrist. When the incident presentation is less acute, such that inpatient hospitalisation is not required, disadvantaged populations are at risk of not receiving follow-up care from a physician. We also observed a decrease in the odds of physician follow-up over time, which coincided with the implementation of EPI services across the province.

Patients who are in the active phases of early psychosis are known to be a difficult population to engage in treatment—the initial stages of illness are associated with poor insight,²⁸ a lack of knowledge or acceptance of the

Table 3. Factors Associated with Follow-up by a Psychiatrist within 30 Days of a First Diagnosis of Schizophrenia (N = 20,096).

Variable	Value	Hospitalised at Index Diagnosis (n = 7555)		Not Hospitalised at Index Diagnosis (n = 12,541)	
		Adjusted Odds Ratio	95% Confidence Interval	Adjusted Odds Ratio	95% Confidence Interval
Age at index date	Age (years), mean \pm SD	0.99	0.98 to 0.99	0.98	0.98 to 0.99
Sex	Female	Reference		Reference	
	Male	0.94	0.82 to 1.08	1.04	0.96 to 1.12
Rural residence	Urban	Reference		Reference	
	Rural	0.72	0.59 to 0.87	0.82	0.72 to 0.93
Material deprivation	Fifth quintile (high)	Reference		Reference	
	Fourth quintile	0.92	0.81 to 1.06	1.32	1.11 to 1.57
	Third quintile	0.91	0.68 to 1.22	1.09	0.89 to 1.33
	Second quintile	1.10	0.89 to 1.35	1.35	1.15 to 1.58
	First quintile (low)	1.08	0.86 to 1.36	1.32	1.07 to 1.63
Migrant status	General Population	Reference		Reference	
	Immigrant	1.12	1.01 to 1.25	1.13	0.99 to 1.30
	Refugee	0.92	0.80 to 1.06	1.14	0.89 to 1.45
Mental health GP contact in previous 6 months	No	Reference		Reference	
	Yes	1.10	1.00 to 1.21	1.01	0.95 to 1.07
Psychiatrist contact in previous 6 months	No	Reference		Reference	
	Yes	2.13	1.90 to 2.37	3.56	3.11 to 4.07
Mental health hospitalisation in previous 6 months	No	Reference		Reference	
	Yes	0.94	0.82 to 1.07	1.08	0.95 to 1.22
Mental health ED visit in previous 6 months	No	Reference		Reference	
	Yes	1.09	0.98 to 1.20	1.33	1.17 to 1.52
Year	1999-2008	0.95	0.93 to 0.97	0.94	0.93 to 0.96

ED, emergency department; GP, general practitioner.

^aUnless otherwise indicated; statistically significant results italicized ($P < 0.05$).

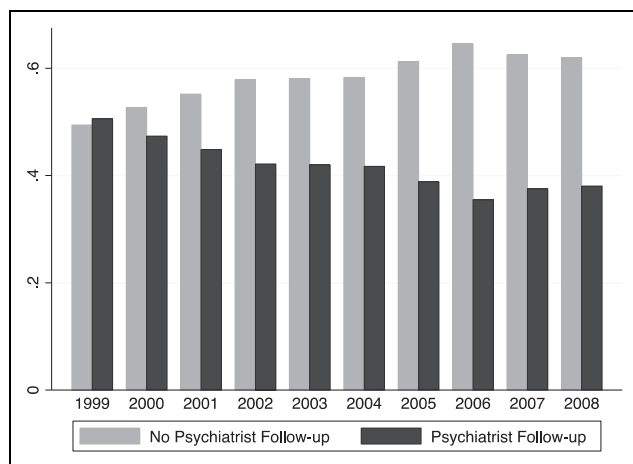


Figure 2. Proportion of the cohort receiving follow-up by a psychiatrist within 30 days of the index diagnosis of psychosis by year. Odds ratios (ORs) from multilevel logistic regression models suggest that the odds of receiving psychiatrist follow-up are decreasing over time (hospitalised: OR, 0.95; 95% confidence interval [CI], 0.93 to 0.97; nonhospitalised: OR, 0.94; 95% CI, 0.93 to 0.96).

diagnosis,²⁹ and high symptom levels and disorganized behaviour.³⁰ Our observation that 40% of patients are not receiving physician follow-up provides further evidence that many patients with recent-onset psychosis have difficulties

accessing timely care,⁴⁻⁶ despite widespread recognition of the need for comprehensive services during the early stages of psychotic illness. Prior research from Toronto, Canada, suggests that many patients with first-episode psychosis cycle within and between different services, with poorly integrated care across providers.⁷ This gap is occurring precisely when evidence-based guidelines suggest that intensive follow-up and phase-specific treatment are a necessity for high-quality care.³¹ Prior research on the impact of physician follow-up after psychiatric hospitalisation for psychotic disorder suggests that it is associated with increased adherence to antipsychotic medication, a higher utilisation of outpatient mental health services, and reduced use of assertive community treatment.¹¹ Ensuring timely physician follow-up at the first episode of psychosis is arguably even more crucial, as patients are still coming to terms with their diagnosis, may not have connections to an outpatient treatment provider or EPI program, and do not yet have an established treatment regimen. In the current context of early psychosis intervention, Ontario standards dictate that patients should ideally be followed up by a mental health professional within 72 hours of first identification of psychotic disorder.²² To meet these benchmarks, physicians of all specialties play a crucial role in facilitating linkages with these specialized programs.

Lack of psychiatric follow-up is not unique to psychotic disorder, as the likelihood of physician follow-up that we observed is comparable to other populations in Ontario—nearly 40% of adults hospitalised for depression do not receive physician follow-up within 30 days,³² and the proportion may be even higher among youth with a psychiatric hospitalisation.²⁰ Our findings also highlight geographic disparities in the likelihood of psychiatric follow-up across the province—people living in rural areas had similar odds of physician follow-up compared to those living in urban centres but had a 20% to 30% lower odds of receiving follow-up care from a psychiatrist. Indeed, access to psychiatric care in rural areas of the province has been an ongoing problem for more than 2 decades.³³ Psychiatrists tend to be concentrated in the large urban centres in Ontario, where there is a nearly 10-fold greater number of psychiatrists per capita compared to the least resourced areas of the province, and other physicians are more involved in outpatient psychiatric care in areas with a shortage of psychiatrists.³⁴

The observation window of our study coincided with the rollout of EPI programs across the province of Ontario. These services focus on symptom detection and comprehensive care during the initial stages of illness, as well as attempts to shorten the length of time that psychotic symptoms go untreated.³⁵ Our data suggest that the likelihood of receiving physician follow-up decreased over the 10-year period during which EPI programs were implemented. These decreasing follow-up rates over time could indicate psychiatric services were saturated due to the implementation of these specialized services, potentially resulting from more awareness of first-episode psychosis, higher rates of case identification, and consequently longer wait times to access care. Alternatively, these declining rates may also indicate that patients were being followed up by allied health care providers in the context of these programs. However, treatment with antipsychotic medication is an important component of early psychosis intervention,³¹ and a follow-up visit with a psychiatrist for diagnosis review and medication management would be needed, even in the context of these interdisciplinary EPI teams. If the lack of follow-up that we observed was due to people being seen within EPI programs, then we would expect to see a change in the slope of follow-up rates in 2005 when these programs began to be expanded across the province—this is not the case (Figures 1 and 2). Further research is needed to explain why physician follow-up is decreasing during a period of time when programs were implemented to increase access to care. In addition, an examination of data for the period after the scale-up of these programs would be worthwhile to examine whether physician follow-up improved once these programs were better established.

Limitations

A notable limitation to our findings is that we do not have information on the reasons behind the lack of physician

follow-up observed in our cohort—we do not know whether it arose at the level of the patient, the provider, or the health system. We are unable to examine this due to the limited information contained in health administrative data, and future studies using a qualitative or mixed-methods approach should focus on understanding the reasons behind this observed trend.

Contacts with nonphysician mental health services are also not captured in the data holdings that we used. This is especially relevant in the context of EPI services, where patients may be seen by an intake coordinator or case manager at the initial visit,³⁶ particularly in rural and remote areas that may use network or specialist outreach models for service delivery.³⁷ However, many cases in our cohort would not have had access to EPI services during the time period under investigation, and psychiatrist contact within an EPI program would be captured by our method.

The diagnostic information available in the database is assigned for billing purposes and has not been standardized across the province. Consequently, there may be variations in the coding practices of different physicians, specialties, and institutions. The diagnostic algorithm that we used was validated for chronic psychotic illness,¹⁵ and its performance may differ for first-onset or single acute episodes of psychotic disorder and may be more accurate when coded by psychiatrists versus primary care physicians. Regardless, the suspicion of the onset of psychotic illness requires follow-up even if it is to rule out the need for ongoing management. We opted to use a broad definition of follow-up visits with GPs that included codes for general health visits, given that mental health care may be provided in the context of a general health visit that may not be assigned a mental health diagnostic or procedure code.¹⁵ As a result, one-third of people in our sample who received GP follow-up did not have a record of a mental health diagnostic or procedure code in the administrative database, indicating that we may have underestimated the proportion of patients who do not receive any physician follow-up for a first diagnosis of psychosis.

We were limited by the availability of data in the administrative database and therefore were unable to account for other important factors known to be associated with the likelihood of physician follow-up for mental health issues, such as aboriginal status,¹⁷ ethnicity,^{16,19} substance use,^{16,19} comorbid physical health conditions,³⁸ and involvement of family members.²⁹ Our material deprivation variable was based on 2006 census data,²¹ and the stability of this neighbourhood-level indicator over our 10-year observation window is unknown. Finally, we limited the scope of our study to schizophrenia, schizophreniform disorder, and schizoaffective disorder and thus are unable to generalize our findings to affective psychoses, delusional disorders, or unspecified psychotic disorders. Our findings are also not generalizable to recent migrant groups, as well as people from outside the province who are attending university or college in Ontario, given that cohort members had to be eligible for OHIP for 5 years prior to the index diagnosis.

Conclusions

Our findings suggest that 2 of 5 patients with early psychosis do not have any physician contact within 30 days following the index diagnosis. The likelihood of receiving any physician follow-up was equivalent if the diagnosis was made in the hospital or in a community setting and was strongly related to past engagement with outpatient mental health services. However, if the first diagnosis of psychosis occurred in an ambulatory setting, the likelihood to receive physician follow-up was related to sex, income, and rurality. As early intervention efforts aim to divert patients from inpatient hospitalisation and treat people in outpatient settings, it becomes increasingly important to provide timely and adequate follow-up in the initial stages of illness to ensure continuity of care, connect patients with available resources, and prevent unnecessary hospitalisations. By understanding where gaps in service provision exist in Ontario, we can improve access to care for young people with first-episode psychosis, identify underserved populations, and target particular groups who may be at a high risk for poor outcomes.

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