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Does elapsed time between first diagnosis of schizophrenia and migration between health territories vary by place of residence? A survival analysis approach

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ABSTRACT

Migration of patients with schizophrenia might influence health care access and utilization. However, the time between diagnosis and migration of these patients has not yet been explored. We studied the first migration between health territories of 6873 patients newly diagnosed with schizophrenia in Quebec in 2001, aiming to describe the pattern of migration and assess the influence of the place of residence on migration. Between 2001 and 2007, 34.5% of patients migrated between health territories; those living in metropolitan areas were more likely to migrate than others but tended to remain in metropolitan areas. Migrant patients were also more likely to stay in or migrate to the most socially or materially deprived territories.

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1. Introduction

There has been a growing interest in understanding the influence of residential mobility or migration on health outcomes (Oishi and Schimmack, 2010). Studying the association between migration and the health of children, researchers have shown that children who moved frequently are more likely to report more behavioral problems (Adam, 2004; Jelleyman and Spencer, 2008), to attempt suicide, to smoke, and to drink alcohol when they become adolescents (Dong et al., 2005). Other researchers have examined migration among specific populations such as injecting drugs users (German et al., 2007; Roy et al., 2011) or people with Parkinson's disease and multiple sclerosis (Yiannakoulias et al., 2007). During the last three decades, a growing body of research has focused on migration among people with mental health

disorders (Lesage and Tansella, 1989; Drake et al., 1991; Lamont et al., 2000; Aro et al., 1995; Breslow et al., 1998; Chafetz and Goldfinger, 1984; McCarthy et al., 2007, McNaught et al., 1997). Three Canadian studies consistently suggested greater migration among patients with schizophrenia in comparison with the general population (De Verteuil et al., 2007; Lix et al., 2006, 2007), in contrast with American and European studies (Tulloch et al., 2010, 2011; Lystad, 1957; Caton and Goldstein, 1984; McCarthy et al., 2007; Lesage and Tansella, 1989).

Migration of patients with schizophrenia may negatively affect treatment and disrupt continuity of care. Broad studies in medical sociology have linked social networks to health care utilization (Earp et al., 2002; Horwitz, 1977, Levy-Storms and Steven, 2003). When individuals move to a new neighborhood from a place they have lived for a long period of time, they are disconnected from their long-term social relationships, their physicians and their social networks. Sociologists and social epidemiologists have shown that social ties and social networks are important determinants of access to and use of health care services (Kang et al., 2007; Albert et al., 1998; Lasebikan et al., 2012; Berkman et al., 2000, 2007; Bentham and Haynes, 1985; Berkanovic et al., 1981). Whyte (1956) indicated that to be well integrated in their new environment, migrants must possess or develop highly sophisticated social skills. From Whyte's perspective, if the migrant is extroverted, residential change will

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have little impact on his/her social networks since he or she can build new relationships in the new location quickly. In contrast, if the person is introverted and has difficulty creating new social networks in the new location, then social integration in the new environment will be probably more difficult. Because patients with schizophrenia are more introverted and have more difficulty making new friends (Kohn and Clausen, 1955; Cohen and Sokolovsky, 1978), we predict that migration should be associated with poor health service utilization. Knowing this in advance is important to orient health planners and policy makers in their decisions concerning the allocation of health resources. Such findings would also be helpful to health professionals, who would thus be prepared by knowing the particular needs and difficulties of the patients they will receive.

Knowing how long after the diagnosis of their illness patients will migrate and where they will go is also useful in health planning and for the allocation of health resources. Studies on socio-demographic characteristics of patients with schizophrenia and migration consistently suggest that younger age (especially 16–25 years), homeless, men, not being married, being poor, and living in metropolitan areas were associated with migration (Tulloch et al., 2011; Chafetz and Goldfinger, 1984; Jelleyman and Spencer, 2008; Lix et al., 2006, 2007; Dauncey et al., 1993).

Patients with schizophrenia tend to reside in the most deprived areas, whether central or peripheral (Breslow et al., 1998; Lix et al., 2007). Over the last decade, there has been continuing research aimed at understanding the tendency of patients with schizophrenia to migrate into deprived areas (March et al., 2008; Nicholson, 2008). Among the theories suggested by the authors, the drift hypothesis is the most recurrent. Drift theory suggests that schizophrenia causes one to have a downward shift in social class (Fox, 1990) as opposed to the breeder hypothesis or the social causation thesis, which states that the inhabitants of more urban settings have more psychiatric disorders because of environmental stressors (Verheij Ra, 1998). The drift theory is based on the inverse relationship between socioeconomic status (SES) and symptoms of schizophrenia. The main hypotheses of the drift theory is that the inverse SES-mental illness correlation results from declining employment subsequent to the onset of the illness, which results in an important migration of patients with schizophrenia from higher to lower SES communities (Hudson, 2005).

However, to our knowledge, no study has assessed the time between initial diagnosis of schizophrenia and first migration. Moreover, the few studies that addressed migration among patients with schizophrenia were limited to a relatively short period, small samples, or urban areas and used only prevalent cases. Our research takes advantage of a population-based data resource that systematically captures longitudinal information on location of residence to examine the migration of persons with schizophrenia. Population-based data allow selection of several different comparison groups so that migration can be captured according to place of residence at the time of diagnosis or the destination of migrants. Accordingly, this study had two goals. The first goal was to compare the time between diagnosis of schizophrenia and first migration according to individual and socio-geographic variables associated with the place of residence at the onset of the disease. The second goal was to understand general patterns of migration among migrant patients, i.e. where migrants go after they have received a first diagnosis of schizophrenia.

2. Methods

2.1. Design and data sources

This cohort study used administrative data from the Régie de l'Assurance Maladie du Québec (RAMQ). The RAMQ operates

health administrative databases for all Quebec residents eligible to receive health services. Quebec has a universal health care system, which means that, in principle, almost all contacts of residents of the province with physicians and hospitals are captured in the registry of the RAMQ (Tamblyn et al., 1995). Data are routinely collected for the purpose of billing by physicians and hospitals. Even if they are not specifically designed to study health conditions, each claim contains a code indicating the main reason for the visit. The claim also includes a unique encrypted personal identification number, demographic characteristics (birth date and sex) and location of the patient's residence at the level of dissemination area (DA) and health territory by calendar year. Two databases were used to identify patients with schizophrenia: the Quebec's physician claim database and the hospital discharge register (Med-Écho). The former provides information on patient identification, date of service, diagnosis, and service code. The latter contains a summary of each hospital discharge, the main reason for admission and up to 19 diagnoses.

The health territory code at the onset of the illness was used to establish the baseline location of residence. In this study, health territory refers to the territory of the health and social services center (CSSS) and the province of Quebec is divided into 95 CSSSs. In Quebec, the CSSS provides a range of general and specialized services aimed at the territory's population as a whole: prevention, evaluation, diagnosis, treatment, rehabilitation, and residential care services including mental health services. Since health services and policies in Quebec are mainly organized at the CSSS level, using it as the baseline for our study will be helpful in the allocation of mental health resources.

2.2. Study cohort

All individuals aged 18 years and older with a "first" diagnosis of schizophrenia in 2001 and living in the province of Quebec were selected for this study. Schizophrenia patients were selected if they received a diagnosis of schizophrenia either in the hospital discharge register or in the physician claim database (international classification of diseases diagnosis codes ICD-9: 295, ICD-10: F20, F21, F25 and F232) (Warner and de Girolamo, 1995). To identify new cases only, individuals who received a diagnosis of schizophrenia in a period of five years before the diagnosis in 2001 were removed from this study. A previous study on the incidence of schizophrenia in Quebec using the same databases as ours showed that a clearance period of 5 years gives good values for both kappa (≥ 0.8) and the positive predictive value ($\geq 80\%$) in identifying incidence cases of schizophrenia (Vanasse et al., 2011). Individuals that died in 2001 and those without a valid territory code at the time of diagnosis (2001) were also removed (Fig. 1).

Patients were prospectively followed from the first diagnosis of schizophrenia in 2001 (baseline) until one of the following events occurs: changes in their health territory code (migration), death, loss to follow-up, or the end of 2007, whichever comes first.

2.3. Variables in the study

2.3.1. Migration between Heath territories

Migration refers here to any change in the CSSS's code of residence of the patient from baseline (2001) until the end of 2007. Since the RAMQ collects information on patient residence only once a year, the elapsed time between the first diagnosis and the first migration takes integer values (from 1 to 6 years).