Brief Communication

Use of Administrative Data for the Surveillance of Mental Disorders in 5 Provinces

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Objective: To evaluate the usefulness of administrative data for the surveillance of mental illness in Canada using databases in the following 5 provinces: British Columbia, Ontario, Quebec, Nova Scotia, and Alberta.

Method: We used a population-based record-linkage analysis with data from physician billings, hospital discharge abstracts, and community-based clinics. The following diagnostic codes from the International Classification of Diseases, Ninth Edition, were used to define cases: 290 to 319, inclusive.

Results: The prevalence of treated psychiatric disorder was similar in Nova Scotia, British Columbia, Alberta, and Ontario at about 15%. The prevalence for Quebec was slightly lower at 12%. Findings from the provinces showed remarkable consistency across age and sex, despite variations in data coding. Women tended to show a higher prevalence overall of treated mental disorders than men. Prevalence increased steadily to middle age, declining in the 50s and 60s, and then increasing again after age 70 years.

Conclusions: Provincial and territorial administrative data can provide a useful, reliable, and economical source of information for the surveillance of treated mental disorders. Such a surveillance system can provide longitudinal data at little cost to support health service provision and planning.

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Clinical Implications

- The prevalence of treated mental disorders across Canada is fairly consistent (15%), although Quebec has a slightly lower rate of 12%. Women have a higher prevalence.
- Provincial and territorial administrative data from hospital morbidity and physician billings are useful for the surveillance of treated mental disorders. These data complement clinical records and community surveys.
- Such a surveillance system can provide longitudinal data at little cost for health service provision and planning. Using postal codes and census data, it is possible to study differences within jurisdictions based on location (for example, rurality) or socioeconomic status.

Limitations

- Administrative data are subject to reporting bias and lack indicators of disease severity other than hospital admission.
- The outpatient data are limited to contacts with physicians in 3 out of 5 provinces, although the availability of data for other disciplines in the other 2 provinces made little difference to the prevalence rate.
- Administrative data do not contain information on sociodemographic characteristics other than age and sex, although additional information could be obtained through linkage with census data.

Key Words: *surveillance, administrative data, psychiatric disorder*

Information sources on the prevalence of mental illness include medical charts, electronic medical records, administrative records, and self-report surveys.[1,2]

Medical charts and electronic medical records contain detailed information but are both time-consuming and expensive to retrieve and review.[1] Data quality may also vary.[2] Self-report community surveys, such as the CCHS 1.2, include all cases, not just those in treatment.[3] However, they are subject to recall bias, diminishing response rates, and, because they are expensive, are often conducted just once or repeated on an irregular, cross-sectional basis. Further, if lifetime symptoms are not assessed, surveys may miss people in remission at interview, such as those taking antidepressants.[4]

Administrative data have advantages over community surveys or data from clinical settings. They provide accessible and timely longitudinal data for an entire jurisdiction at little cost, and therefore can be useful for chronic disease surveillance.[5,6] However, as they were designed for billing, rather than surveillance, data accuracy may be compromised. Further, most data on accuracy concern inpatient morbidity,[7,8] rather than physician billings, where most encounters occur.

We evaluated the usefulness of administrative data for the surveillance of mental illness using databases from British Columbia, Alberta, Ontario, Quebec, and Nova Scotia. By surveillance, we mean the ongoing, systematic use of routinely collected population-based data to identify associations and predictors of health outcomes.[9,10] Surveillance can also help decision makers assess need, as well as implement and evaluate interventions.

Methods

Case Definition

A person was defined as a case if he or she had at least one physician visit, or discharge from any hospital, with a diagnosis in the most-responsible diagnosis field of the following codes: ICD-9 from 290 through 319, inclusive, or their ICD-10 or the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition equivalents. Rates were calculated annually.

Abbreviations used in this article

CCHS 1.2	Canadian Community Health Survey: Mental Health and Well-Being
ICD	International Classification of Diseases

Data Sources

This was a convenience sample of 5 provinces that had ready access to the following administrative databases: physician billings data covering all fee-for-service claims; service date, physician specialty (for example, family physician and private psychiatrist), and associated diagnosis(ses); and hospital discharge data (Med-Echo in Quebec, and the Discharge Abstract Database in other provinces) including separation and admission dates and diagnoses.

Coverage was province-wide, except for Quebec, where it was limited to Montreal because of cost and time constraints. In 2 jurisdictions, there was a third data source: the Mental Health Outpatient Information System in Nova Scotia and community-based clinic data in British Columbia. These cover encounters in the publicly provided system with all mental health clinicians, not just physicians.

Records were included back to 1995 where possible. Data were depersonalized or aggregated for privacy and confidentiality, and linked within each province through an encrypted unique identifier to further ensure anonymity. We obtained ethics approval in each jurisdiction.

Analysis

We tested the case definition by determining the prevalence of treated mental disorders in each jurisdiction and comparing rates across age, sex, time, and geography.

We also undertook sensitivity analyses of case definition variations and the use of additional databases. We examined the effect of adding psychiatric diagnoses in secondary or additional fields. We also determined the effect of excluding 2 ICD-9 categories, dementias (290) and developmental delays (315 to 319). Finally, we examined the effect of adding data from other health care sources, namely, community-based clinics in British Columbia and Nova Scotia.

All findings were standardized by age and sex to the 2001 Canadian population. Age was reported in 5-year groups based on the patient's age at each year's midpoint.

Results

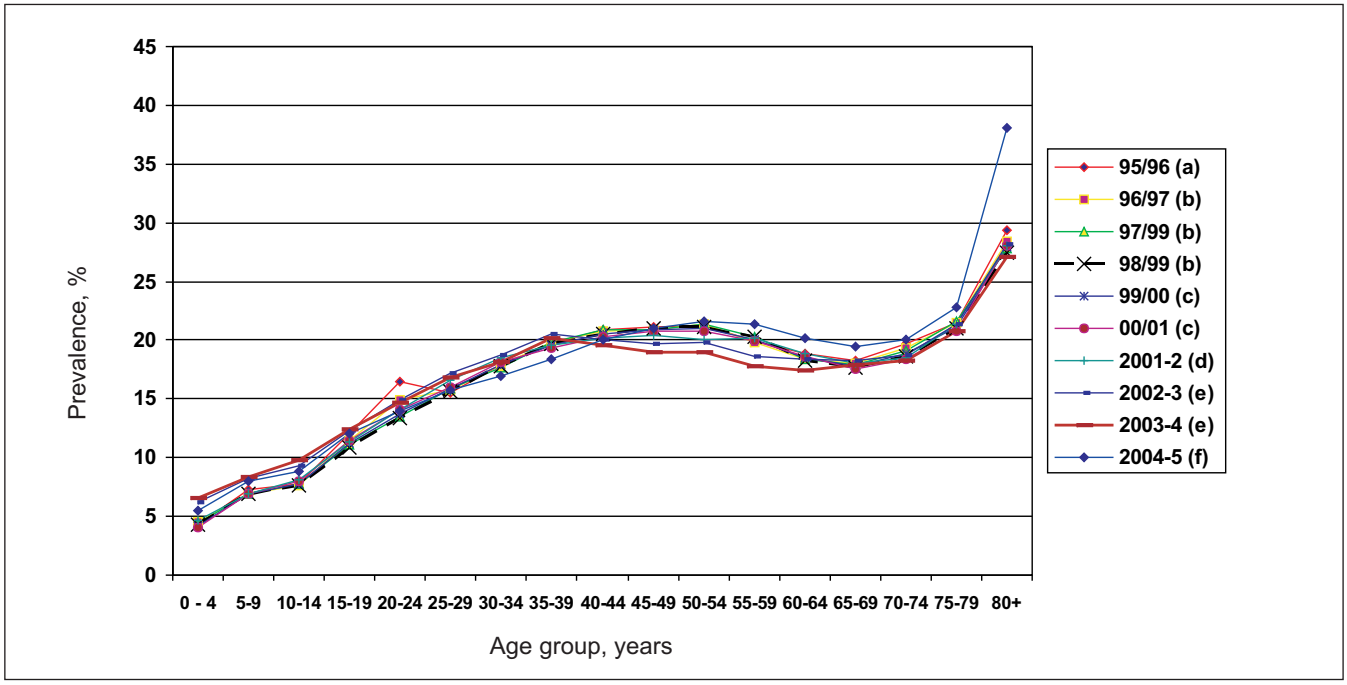
The data covered 2 to 10 years depending on jurisdiction (Table 1). The prevalence of treated psychiatric disorder was similar in Nova Scotia, British Columbia, Alberta, and Ontario at about 15% (Table 1). The prevalence for Quebec was slightly lower at 12% (Table 1). Women showed a higher prevalence of treated mental disorders than men.

We assessed age differences by combining the aggregate data from 4 provinces to compute unweighted means. We could not combine data from Quebec as the data were divided into different age intervals. Prevalence increased steadily to middle age, declining in the 50s and 60s, and then increasing

Table 1 Prevalence estimates for any mental disorder (ICD-9 codes 290 to 319) in 5 provinces, by sex

Province	Men, %	Women, %	Both, %
Quebec (2002–2003 to 2003–2004)	9.9–10.0	13.3–13.6	11.7–11.8
Ontario (1995–2004)	11.4–12.7	15.6–18.6	13.5–15.5
British Columbia (1996–1997 to 2001–2002)	11.2–12.1	18.7–19.4	14.9–15.7
Nova Scotia (1995–2000)	12.0–12.3	19.0–19.6	15.6–15.9
Alberta (1999–2000 to 2003–2004)	11.7–12.4	18.2–19.3	15.0–15.8

Figure 1 Treated prevalence of any mental disorder (ICD-9 codes 290 to 319) by age group and by year: 1995 to 2005 (provinces included in the values for each year)



(a) Nova Scotia, Ontario
(b) Nova Scotia, Ontario, British Columbia
(c) Nova Scotia, Ontario, British Columbia, Alberta
(d) Ontario, British Columbia, Alberta
(e) Ontario, Alberta
(f) Ontario

again after age 70 years (Figure 1). There was no variation in this pattern across provinces.

Excluding dementias (290) and developmental delays (315 to 319) made little difference to the overall prevalence in any province (less than 0.5%). Including data from additional databases available in Nova Scotia and British Columbia increased their prevalence rates by only 1%.

In 2 provinces (Ontario and Nova Scotia), it was possible to expand the case definition in hospital morbidity data to look for mental illness codes in fields other than the first, or most-responsible diagnosis field. This increased the prevalence by no more than 0.3%, even when extended to 16 fields. It was also possible to look for mental illness-related codes in up to 2 fields of physician billings in Alberta and Nova Scotia. This resulted in less than a 0.5% increase in prevalence.

Discussion

This study has shown the feasibility of using administrative data to measure the treated prevalence of mental health disorders. Despite suspected variations in data coding, the results show acceptable uniformity across the provinces in keeping with CCHS data.[3]

Quebec had a slightly lower prevalence, possibly due to differences in data coverage or because the sample only included Montreal. Treatment patterns may also contribute as Quebec psychologists, who were not covered by these data, play a greater role in treatment than in other provinces. The 3% difference may also reflect a true difference in treated prevalence in Montreal. In keeping with community survey data for most psychiatric disorders, women had a higher prevalence than men.[3,11,12] The dip in health service use among late working-age adults in this study has been reported elsewhere, the reasons for which are unclear.[13]

The treated prevalence in this study is higher than rates from population surveys.[3,11,12] The discrepancy can be partly explained by different information biases such as recall or recording bias. They also cover different, albeit overlapping, populations.[14] For example, surveys will identify people with unmet needs not included in administrative data. CCHS 1.2 reported that only 32% of those with mental disorders or substance use had talked to a health professional in the preceding 12 months.[3] Conversely, others may say they are not receiving care for a mental health problem when, in fact, they are.

Another difference is that prevalence in many surveys (for example, CCHS 1.2) declines significantly with increasing age,[3] while the prevalence of treated disorder in administrative data does not. This is possibly because older people may present more commonly with somatic symptoms of mental disorders, and be less likely to admit to psychiatric care in a survey.

This study has limitations. Administrative data are subject to recording bias, especially for diagnosis; we emphasised overall psychiatric morbidity rather than specific disorders to minimize this. Data only includes physician and hospital services. However, data on visits to other disciplines in publicly funded facilities made little difference to the treated prevalence rate. Some people will not be captured because they either seek services outside the observed system, such as private psychologists, or not at all. However, the data, although not representative of everyone with a mental disorder, probably reflects those who seek services, as most people consult family physicians or psychiatrists, rather than other professionals.[3,15–17] These are the encounters covered by provincial administrative data. The only exception is Quebec where psychologists are most commonly seen after family physicians. Further, we could only compute the unweighted mean for 4 provinces. However, given the rates in these provinces were almost identical, this is unlikely to have biased our results. In addition, this was a convenience sample of 5 provinces, and the Quebec sample was restricted to Montreal, therefore limiting generalizability. Lastly, by restricting the case definition to the most-responsible diagnosis, we might have missed people with disorders coded in subsidiary fields. However, this study showed that these fields added less than 0.5% to the prevalence.

These findings suggest the feasibility of surveillance for mental disorder similar to the National Diabetes Surveillance System where provinces and territories share aggregate data based on a common case definition.[5] The Public Health Agency plans to create a similar national picture of mental disorders using the methodology of this study. With postal codes, it is possible to study differences within jurisdictions such as rural residence. If linked to Census data, socioeconomic status could be studied using the average household income of subjects' residence area at the time of contact.

More research is also needed into the use of such a system for specific diagnoses. For instance, what is the prevalence of schizophrenia or of substance abuse across provinces, and does the sex distribution reflect the general finding that men are more affected than women?

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Résumé : L'utilisation des données administratives pour la surveillance des troubles mentaux dans cinq provinces

Objectif : Évaluer l'utilité des données administratives pour la surveillance des maladies mentales au Canada, au moyen des bases de données des 5 provinces suivantes : Colombie-Britannique, Ontario, Québec, Nouvelle-Écosse et Alberta.

Méthode : Nous utilisons analyse de couplage des dossiers de la population des données de facturation des médecins, des registres des sorties des hôpitaux, et des cliniques communautaires. Les codes diagnostiques suivants de la Classification internationale des maladies, 9e révision, ont été utilisés pour définir les cas : de 290 à 319 inclusivement.

Résultats : La prévalence des troubles psychiatriques traités était semblable en Nouvelle-Écosse, Colombie-Britannique, Alberta, et Ontario à environ 15 %. La prévalence au Québec était légèrement plus faible à 12 %. Les résultats des provinces présentaient une cohésion remarquable selon l'âge et le sexe, malgré des variations d'encodage de données. Les femmes tendaient à indiquer une prévalence générale plus élevée des troubles mentaux traités que les hommes. La prévalence augmentait de façon constante jusqu'à l'âge moyen, diminuait chez les 50 et 60 ans, puis augmentait de nouveau après 70 ans.

Conclusions : Les données administratives provinciales et territoriales peuvent constituer une source de renseignements utile, fiable et économique pour la surveillance des troubles mentaux traités. Ce système de surveillance peut fournir des données longitudinales à coût modique pour soutenir la prestation et la planification des services de santé.