



Surveillance of Mental Disorders in Québec: Prevalence, Mortality and Service Utilization Profile

Introduction

According to the most recent survey data, close to one in five people have mental disorders, both in Québec and in Canada. Anxiety disorders, depression and schizophrenia affect 10%, 5% and 1% of the population, respectively (ISQ, 2010).

Studies have shown that all mental disorders are associated with excess mortality (Lawrence et al., 2010; Roest et al., 2010; Murphy et al., 2010). Mental disorders are particularly associated with suicide, and represent 50% to 60% of the population-attributable fraction of suicide risk (Arsenault-Lapierre et al., 2004; Cavanagh et al., 2003). Yet, suicide is not the only explanation for excess mortality associated with mental disorders.

An analysis of a 2002 population survey demonstrated that in Québec, like elsewhere in Canada, most people who have mental disorders do not consult health professionals (Gravel and Béland, 2005; ISQ, 2010). Family physicians are the professionals most consulted for mental disorders; overall, 5% of the population reported having seen family physicians for mental health reasons (ISQ, 2010). The survey also showed that only 2% of the population reported having consulted a psychiatrist in the past year, and 3% stated they had seen a psychologist (ISQ, 2010).

Although population surveys based on standardized questionnaires on mental disorders convey information on prevalence, they cannot provide timely monitoring data on changes in prevalence of mental disorders or their complications. Moreover, they cannot deliver information on links between services offered and utilization that could be used provincially, regionally and locally for mental health prevention planning and service organization.

To overcome this problem, the Unité de surveillance des maladies chroniques et de leurs déterminants (USMCD; Chronic Diseases and determinants Surveillance Unit) at Institut national de santé publique du Québec (INSPQ) was given the mandate to develop and implement a mental disorder surveillance system in Québec.

To shed light on the nature and magnitude of mental disorders in Québec, the USMCD has published this first report on surveillance of mental disorders, for the years 1999–2000 to 2009–2010. The report provides information about the diagnosed prevalence of mental disorders, anxio-depressive disorders and schizophrenic disorders in Québec. It also contains information on mortality associated with mental disorders and utilization of mental health services by people who have these disorders.

Methodology

1. Data Sources

Estimates were produced using data from linked administrative databases of Régie de l'assurance maladie du Québec (RAMQ) and Ministère de la Santé et des Services sociaux du Québec (MSSS), which together make up the *Système intégré de surveillance des maladies chroniques du Québec* (SISMACQ; Québec Integrated Chronic Disease Surveillance System). Data sources include: the *Fichier d'inscription des personnes assurées* (FIPA; Health Insurance Registry), the physician billing database, *MED-ÉCHO* (hospitalization database), and the *Fichier des décès du Registre des événements démographiques* (Vital Statistics Death Database). The health insurance registry provides information on demographic data and health insurance eligibility period; the physician billing database compiles all medical acts billed to the RAMQ; and *MED-ÉCHO* identifies primary and secondary diagnoses associated with hospital admissions. The Ninth Revision of the International Classification of Diseases (ICD-9) codes are used for coding diagnoses in the physician billing database for the entire observation period, and in *MED-ÉCHO* for the period up to March 31, 2006; since April 1, 2006, Tenth Revision (ICD-10) codes have been used in *MED-ÉCHO*. Causes of death for the mortality study are extracted from the death database.

2. Case Identification and Measure of Prevalence

To be considered as having a mental disorder, an individual aged 1 year or over must have received, during the year (April 1 to March 31), a diagnosis of mental disorder in the physician billing database or a primary diagnosis of mental disorder in *MED-ÉCHO*. The diagnostic codes associated with mental disorders are as follows:

- a) All mental disorders: 290-319 in ICD-9 and F00-F99 in CIM-10;
- b) Anxio-depressive disorders: 296, 300, 311 in ICD-9 and F30-F48, F68 in CIM-10;
- c) Schizophrenic disorders: 295 in ICD-9 and F20, F21, F23.2, F25 in ICD-10;
- d) Hyperkinetic disorders: 314 in ICD-9 and F90 in ICD-10.

Annual prevalence was the indicator selected to evaluate the magnitude of mental disorders in the population. Therefore, an individual must meet inclusion criteria for each year to be considered a prevalent case of diagnosed mental disorder.

The choice of using annual prevalence for mental disorders differs from that for other chronic diseases such as diabetes, for which prevalence is calculated concurrently over the years. Therefore, cumulative prevalence includes recent and long-standing cases, whereas annual prevalence is comprised only of individuals who have met the case definition during the year. The choice of annual prevalence can better represent the burden on health services, but understates the chronic, more widespread character of mental disorders.

3. Periods Covered, and Temporal and Regional Comparisons

Estimates were obtained through longitudinal follow-up. The analysis period began April 1, 1999 and ended on March 31, 2010.

Comparisons over time and between regions were made using age-adjusted measures, obtained with direct standardization using the age structure of the population of Québec in 2001.

The dearth of information in administrative data on services rendered outside the province can be a limitation for interregional comparisons. Indeed, in the areas bordering Ontario or New Brunswick (e.g. Ouataouais, Gaspésie–Îles-de-la-Madeleine and Abitibi-Témiscamingue), where part of the population obtain medical care in the adjoining province, prevalence measures could be underestimated.

4. Definition of Excess Mortality and Measure of Life Expectancy

Abridged life tables using Chiang's method were used to calculate life expectancies of people with mental disorders by five-year age groups, that is, 1-4 years, 5-9 years, and so on up to 80-84 years and 85 years and over (Chiang, 1984). Life expectancy calculations were based on mortality data observed over a five-year period.

An analysis examining causes of death takes into account deaths in a year among people meeting the case definition during that year.

Overall excess mortality and excess mortality stratified by leading causes of death in persons with mental disorders were calculated using reports on age-standardized mortality rates; they are presented according to a person's status, whether or not the individual has a mental disorder.

5. Definition of Services

Service utilization profiles were constructed based on place where services were rendered and by speciality of the physician involved: family physician (general practitioner), psychiatrist and other specialist. Information about the site was collected in the physician billing database, which classifies institutions. Consequently, a distinction was made between physicians' offices and hospital based care; within hospitals, outpatient visits, emergency and psychiatry were distinguished from each other. Information on a hospital's vocation and hospital department in which the person stayed are from derived from *MED-ÉCHO*.

Results



Prevalence of mental disorders

Charts 1, 2 and 3 respectively illustrate annual prevalence in Québec of all diagnosed mental disorders, of anxio-depressive disorders, and of schizophrenic disorders, by age and sex for the period from 1999-2000 to 2009-2010.¹ On average, mental disorders affect 12% of the population annually, which represents 903,000 people in 2009-2010. Anxio-

depressive disorders account for almost 65% of all mental disorders, affecting about 7.5% of the population or 581,000 individuals. Schizophrenic disorders affect 0.4% of the population, or 34,000 Quebecers. Diagnosed mental disorders, especially anxio-depressive disorders, are more prevalent in women than in men. Generally, schizophrenia appears in early adulthood in men, and slightly later in women. By comparison, anxio-depressive disorders begin during childhood and adolescence in both sexes. Prevalence of anxio-depressive and schizophrenic disorders varied little from 1999-2000 to 2009-2010.

In people under age 20, the prevalence of mental disorders has doubled. Analyses have shown that this significant increase in the prevalence of mental disorders over the past decade can essentially be explained by more frequent diagnosis of hyperkinetic disorder (Brault et al., 2012). Chart 4 confirms the increase in annual prevalence of hyperkinetic disorder in Québec boys and girls under age 20 over the past several years.

Table 1 presents the number and the proportion of people affected by different types of mental disorders diagnosed in Québec in 2009-2010, by health region. These numbers help define the burden of care for people affected with mental disorders, by region of Québec. For instance, in the Gaspésie-Îles-de-la-Madeleine region, schizophrenic disorders affect about 300 people; in Montérégie, these serious mental disorders affect about 5,000 people, even though these regions present the same percentage of cases. Anxio-depressive disorders affect almost 6,000 people in Gaspésie and Îles-de-la-Madeleine, but over 100,000 residents of Montérégie.

¹ Note: Readers should note that the y-axis scales in Charts 1 to 4 are different.

Chronic Disease
SURVEILLANCE

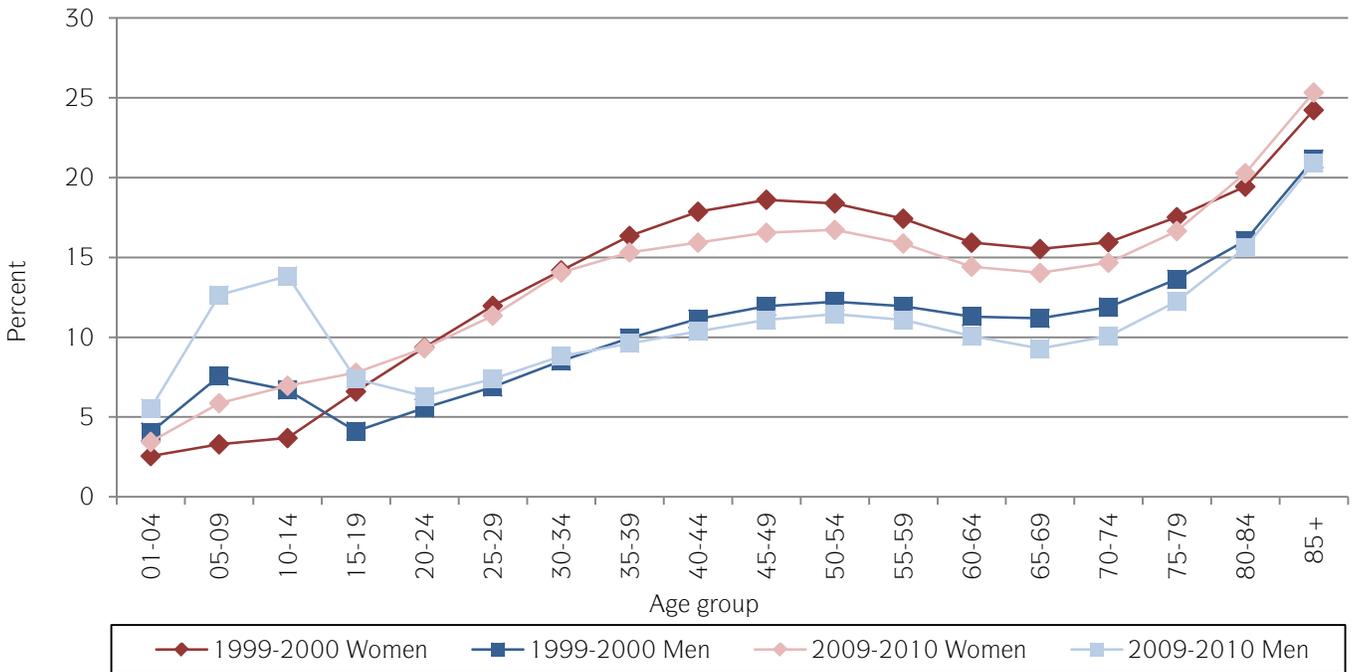


Chart 1 Annual prevalence of all diagnosed mental disorders by age and sex, Québec, 1999-2000 and 2009-2010

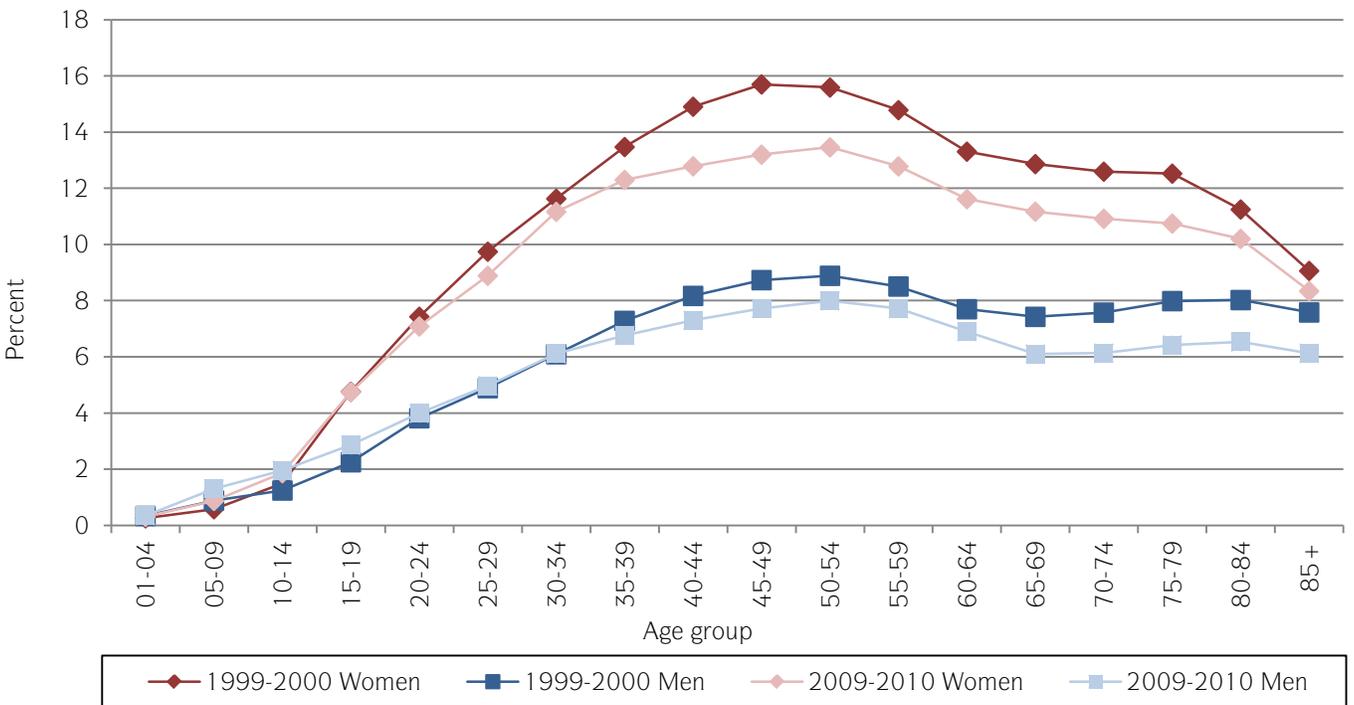


Chart 2 Annual prevalence of diagnosed anxio-depressive disorders by age and sex, Québec, 1999-2000 and 2009-2010

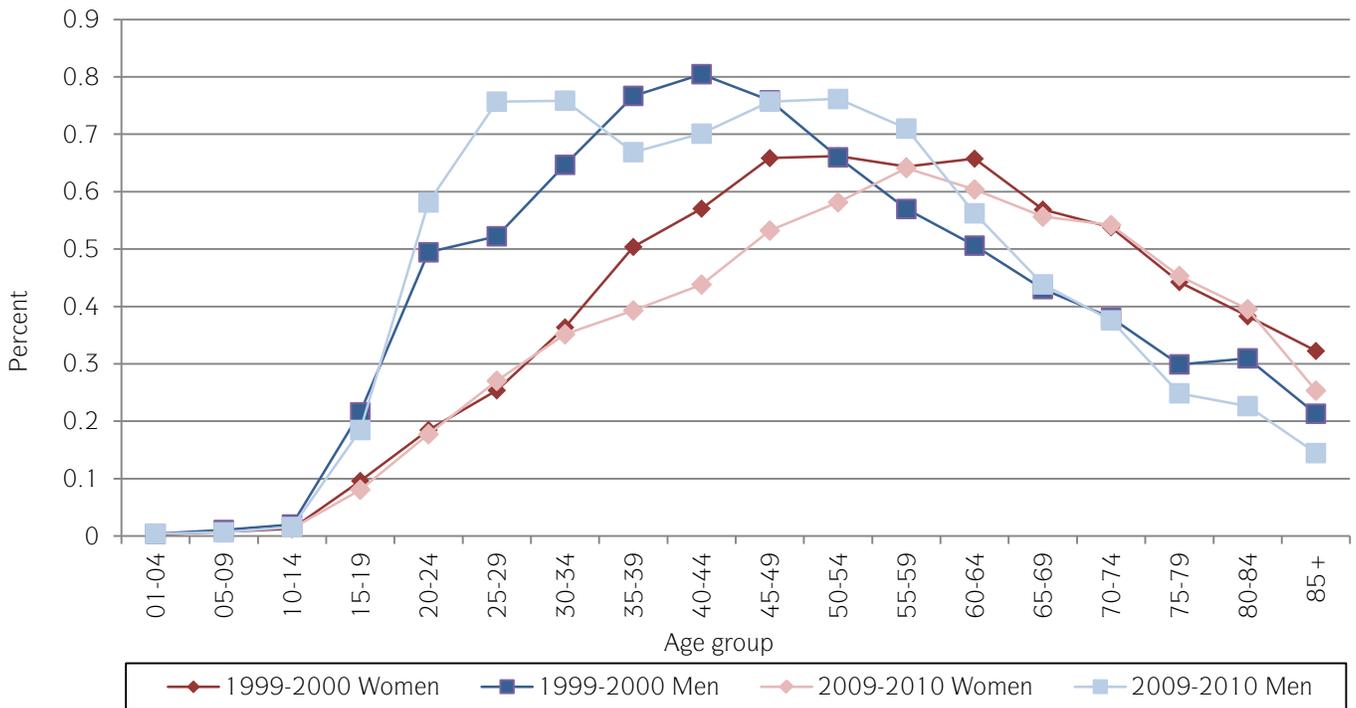


Chart 3 Annual prevalence of diagnosed schizophrenic disorders by age and sex, Québec, 1999-2000 and 2009-2010

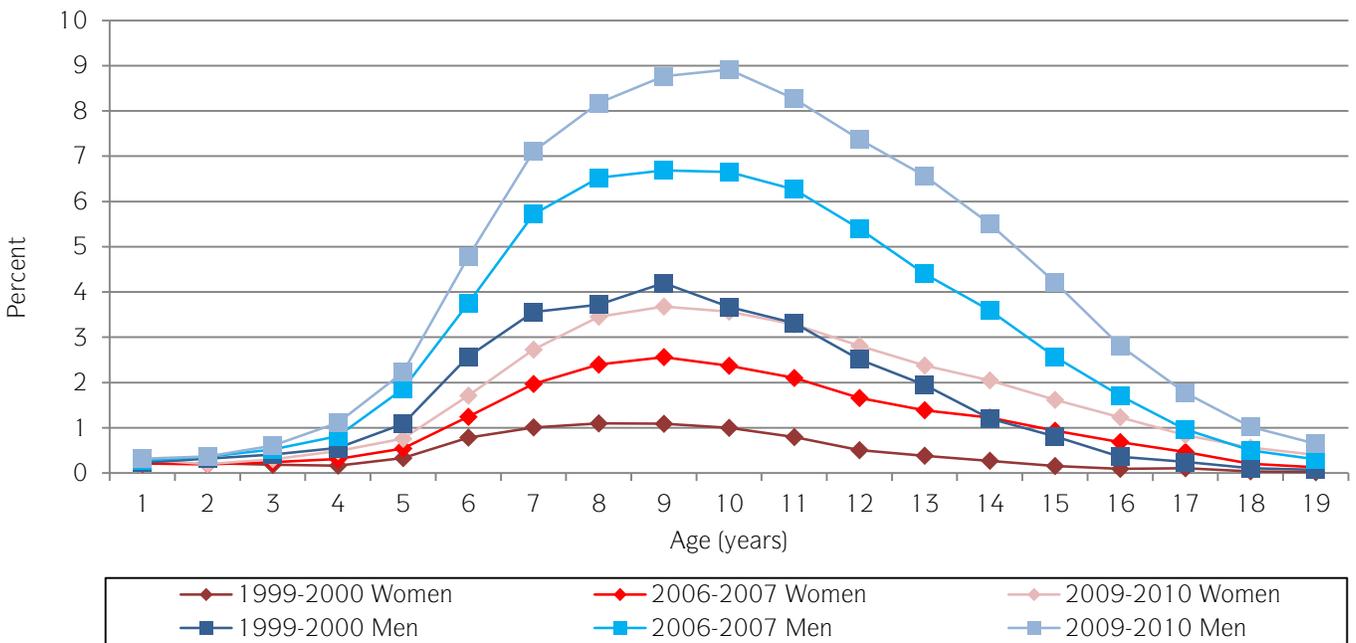


Chart 4 Annual prevalence of hyperkinetic disorders diagnosed in individuals under 20 years old by sex, Québec, 1999-2000 to 2009-2010

Table 1 Age-standardized prevalence and number of cases of diagnosed mental disorders, anxiety-depressive disorders, and schizophrenic disorders by health region, Québec, 2009-2010

	All mental disorders			Anxio-depressive disorders			Schizophrenic disorders		
	Number	Prevalence (%)	95% CI	Number	Prevalence (%)	95% CI	Number	Prevalence (%)	95% CI
Bas-Saint-Laurent	23,507	11.7	11.5-11.8	13,680	6.7	6.6-6.9	923	0.4	0.4-0.5
Saguenay–Lac-Saint-Jean	23,507	12.2	12.1-12.3	19,860	7.3	7.2-7.4	1,118	0.4	0.4-0.4
Capitale-Nationale	88,111	12.8	12.7-12.9	56,425	8.0	7.9-8.1	3,251	0.5	0.4-0.5
Mauricie et Centre-du-Québec	54,689	11.0	10.9-11.1	33,288	6.7	6.6-6.8	1,866	0.4	0.4-0.4
Estrie	39,243	12.8	12.7-12.9	23,559	7.7	7.6-7.8	2,573	0.8	0.8-0.9
Montréal	214,302	11.1	11.1-11.2	144,921	7.5	7.5-7.6	11,991	0.6	0.6-0.6
Outaouais	40,586	11.5	11.3-11.6	28,340	7.9	7.8-8.0	949	0.3	0.2-0.3
Abitibi-Témiscamingue	16,644	11.7	11.5-11.9	10,417	7.3	7.2-7.4	520	0.4	0.3-0.4
Côte-Nord	8,431	9.0	8.8-9.2	5,351	5.6	5.5-5.8	321	0.3	0.3-0.4
Gaspésie–Îles-de-la-Madeleine	9,743	10.3	10.1-10.5	5,864	6.1	6.0-6.3	314	0.3	0.3-0.4
Chaudière-Appalaches	45,364	11.3	11.2-11.4	28,415	7.0	6.9-7.1	1,409	0.3	0.3-0.4
Laval	43,058	11.0	10.9-11.1	28,480	7.3	7.2-7.4	1,229	0.3	0.3-0.3
Lanaudière	53,895	11.9	11.8-12.0	33,049	7.2	7.2-7.3	1,117	0.2	0.2-0.3
Laurentides	65,374	12.2	12.1-12.3	41,447	7.6	7.5-7.7	1,267	0.2	0.2-0.2
Montérégie	163,559	11.5	11.5-11.6	106,576	7.5	7.4-7.5	4,854	0.3	0.3-0.4
Québec	902,553	11.5	11.5-11.5	581,423	7.4	7.3-7.4	33,866	0.4	0.4-0.4



Mortality associated with mental disorders

Table 2 shows life expectancy at age 1 in the general population and in people with mental disorders, by sex. Data are presented by sex, for the period 2005-2010. For men with mental disorders, life expectancy is 8 years lower than for all male Quebecers. The difference is 4 years in men with anxiety-depressive disorders, and 12 years in those with schizophrenic disorders. The difference is less in women. The life

expectancy of women with mental health disorders is 5 years lower. Among women with schizophrenic disorders, life expectancy is 9 years less, while no significant difference has been observed in women with anxiety-depressive disorders.

A preliminary analysis of life expectancy measures of people with mental disorders for different regions of Québec indicates small interregional variations and is not presented in this document.

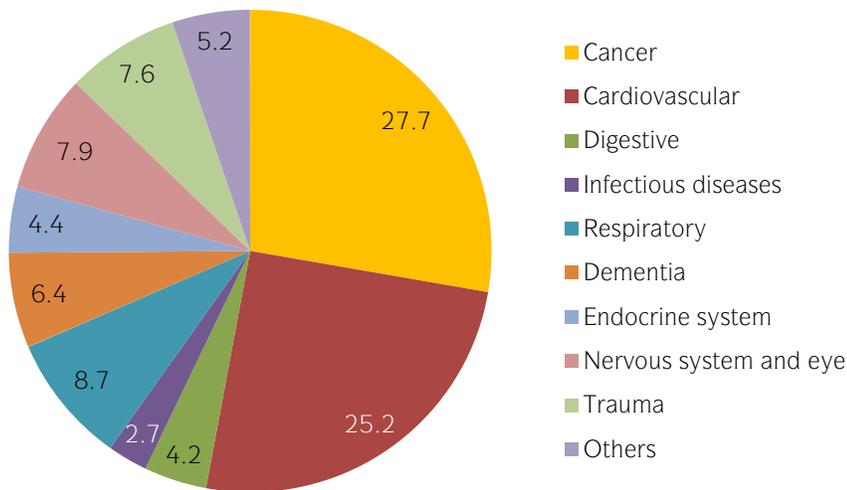
Table 2 Life expectancy at age 1 in the general population and in people with mental disorders by sex, Québec, 2005-2010

	Life expectancy at age 1 (years)	
	Men	Women
QUÉBEC (general population)	78	83
Mental disorders	70	78
Anxio-depressive disorders	74	84
Schizophrenic disorders	66	74

Chart 5 compares the leading causes of death of people with and without mental disorders. As in the general population, cardiovascular diseases and cancers are the main causes of death of people with

mental disorders. However, the distribution differs because other causes are relatively more important, such as dementia and trauma (including suicide).

Cause of death among people with mental disorders



Cause of death among people without mental disorders

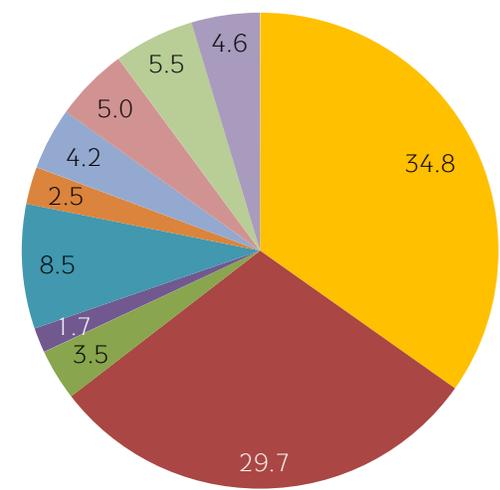


Chart 5 Causes of death of people with and without mental disorders, Québec, 2000-2007

The distribution of causes of death does not enable us to know if deaths occur prematurely in people with mental disorders. Thus, standardized mortality rate ratios for each leading cause of death are presented in Charts 6A, 6B and 6C. In these charts, suicide mortality rate ratios are also included because suicide is integrated into the trauma category.

Charts 6A and 6C show that death due to suicide, trauma, cardiovascular disease, infectious disease, but also for all other causes is clearly higher among people with mental or schizophrenic disorders than in the

general population, indicating premature mortality for all causes of death. Chart 6B illustrates that excess mortality linked to anxio-depressive disorders in men and women is due to trauma, including suicide.

It may be surprising to see higher suicide rate ratios in women than in men, given that surveillance data for Québec show that four times more men than women commit suicide (Gagné and St-Laurent, 2010). Rate ratios presented here are calculated for each sex, and indicate an increased risk of dying compared to women and men without diagnosed mental disorders.

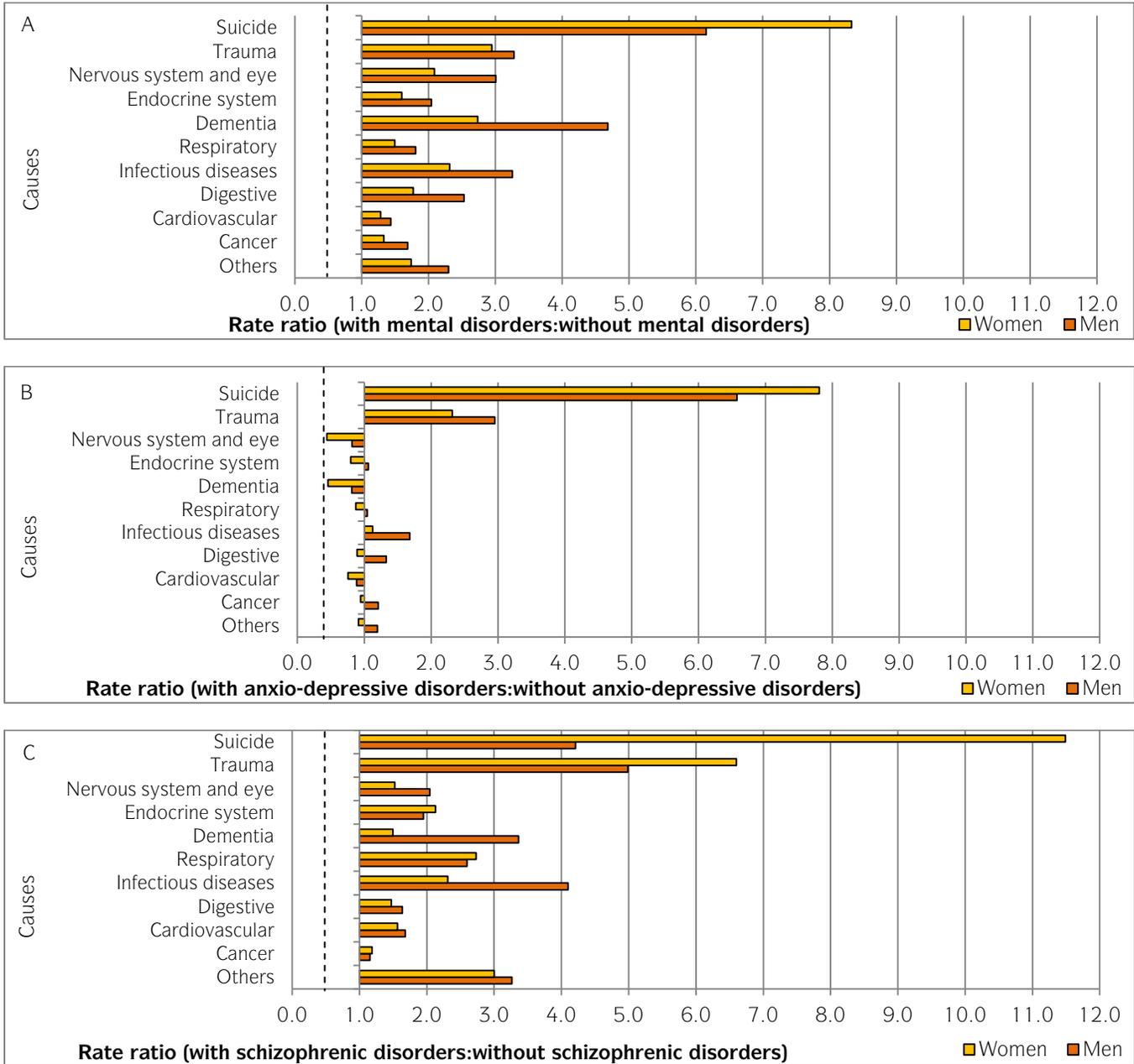


Chart 6 Standardized mortality rate ratios by age of persons with mental disorders (A), anxiety-depressive disorders (B) and schizophrenic disorders (C) by cause of death and sex, Québec, 2000-2007

 **Service Utilization Profile**

Service utilization profile was analyzed for people who had been diagnosed with mental disorders. More specifically, situations were identified where a patient:

- was seen by a family physician in his or her office;
- was seen by a psychiatrist as an outpatient;
- was seen in emergency;
- was hospitalized;
- was seen by a specialist other than a family physician or psychiatrist.

Chart 7 illustrates the mental health service utilization profile for the year 2009-2010 in Québec. Chart 7 shows that family physicians are the physicians most consulted by people with mental disorders, followed by psychiatrists and other specialists. The chart also indicates that fewer than 5% of people with mental disorders are hospitalized, and that 12% go to emergency during the year. A similar profile is

observed in this chart for people with anxio-depressive disorders; one difference is consultations with other specialists, which are lower. The mental health service utilization profile of people with schizophrenic disorders indicates that they consult mostly psychiatrists, and are more likely to be hospitalized or seen in emergency; nonetheless, they are also seen by general practitioners.

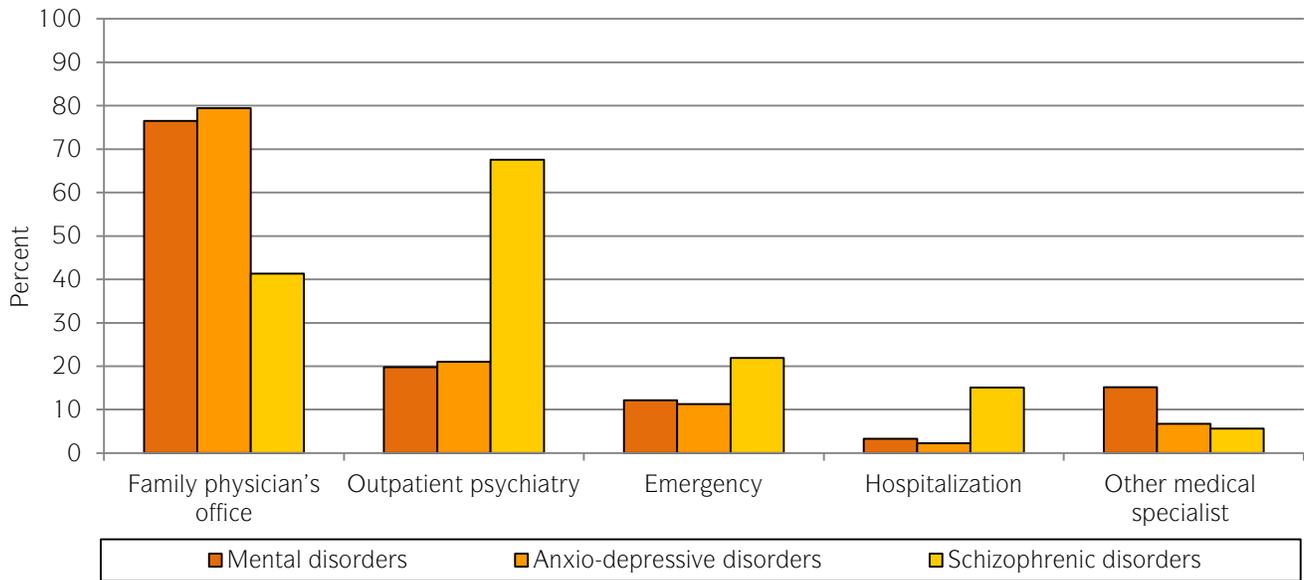


Chart 7 Mental health service utilization profile of people with mental disorders, anxio-depressive disorders and schizophrenic disorders, Québec, 2009-2010

A hierarchical mental health service utilization profile enables us to consider the fact that a single individual may consult various professionals or use various health services during a same period. With a hierarchical profile, the roles of various professionals or mental health services can be identified (primary care family physicians, psychiatrists, emergency department and hospitalization/specialized services). In this hierarchical profile, for instance, a person who has been hospitalized in the past year belongs only in the "hospitalization" category, even though this individual has been to emergency or was seen by a family physician in his or her office. In fact, mental health service utilization profile is organized according to the following categories, from the highest to the lowest hierarchical level:

- I. Hospitalization;
- II. Emergency department;

- III. Psychiatrist, as an outpatient;
- IV. Family physician's office;
- V. Other medical specialist.

Chart 8 shows that, in Québec in 2009-2010, people with mental disorders and common mental disorders such as anxio-depressive disorders consulted mostly family physicians in offices.

However, the hierarchical service utilization profile differs for people with severe mental disorders, such as schizophrenia. Indeed, Chart 8 reveals that these people are hospitalized more and see psychiatrists more than individuals with common mental disorders. Yet, this does not mean that people with schizophrenia do not see their family physicians, as can be seen in Chart 7. Rather, Chart 8 points out that psychiatry services are used systematically to treat severe mental disorders.

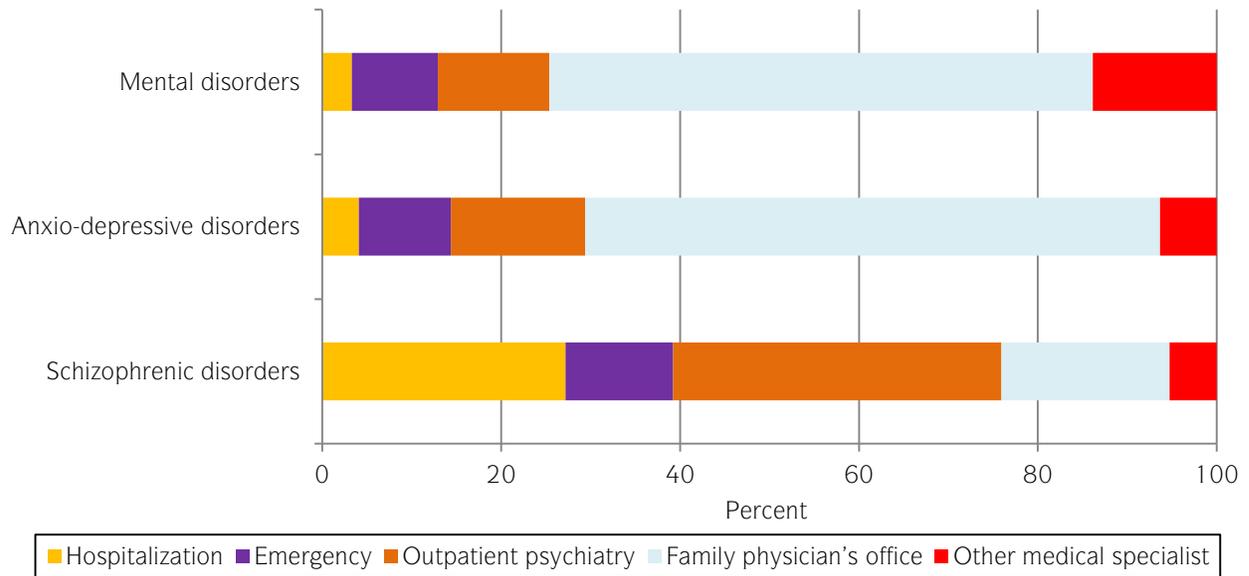


Chart 8 Hierarchical mental health service utilization profile of people with mental disorders, anxio-depressive disorders and schizophrenic disorders, Québec, 2009-2010

Charts 9 and 10 respectively present the hierarchical service utilization profile of people with anxio-depressive disorders and with schizophrenic disorders, by health region in 2009-2010. These charts show that primary (family physicians) and secondary (psychiatrist) care services sometimes differ by region. Emergency visits and hospitalizations also vary from one region to another. Like the profile for Québec as a whole, the regional hierarchical service utilization profile emphasizes that people with schizophrenia are

hospitalized and see psychiatrists more than people with anxio-depressive disorders. The latter use primary care services more, and there are fewer hospitalizations in this group than among people with severe mental disorders. If we consider hospitalization, emergency and outpatient psychiatry as secondary care services, people with anxio-depressive disorders use these services less than individuals with schizophrenic disorders.

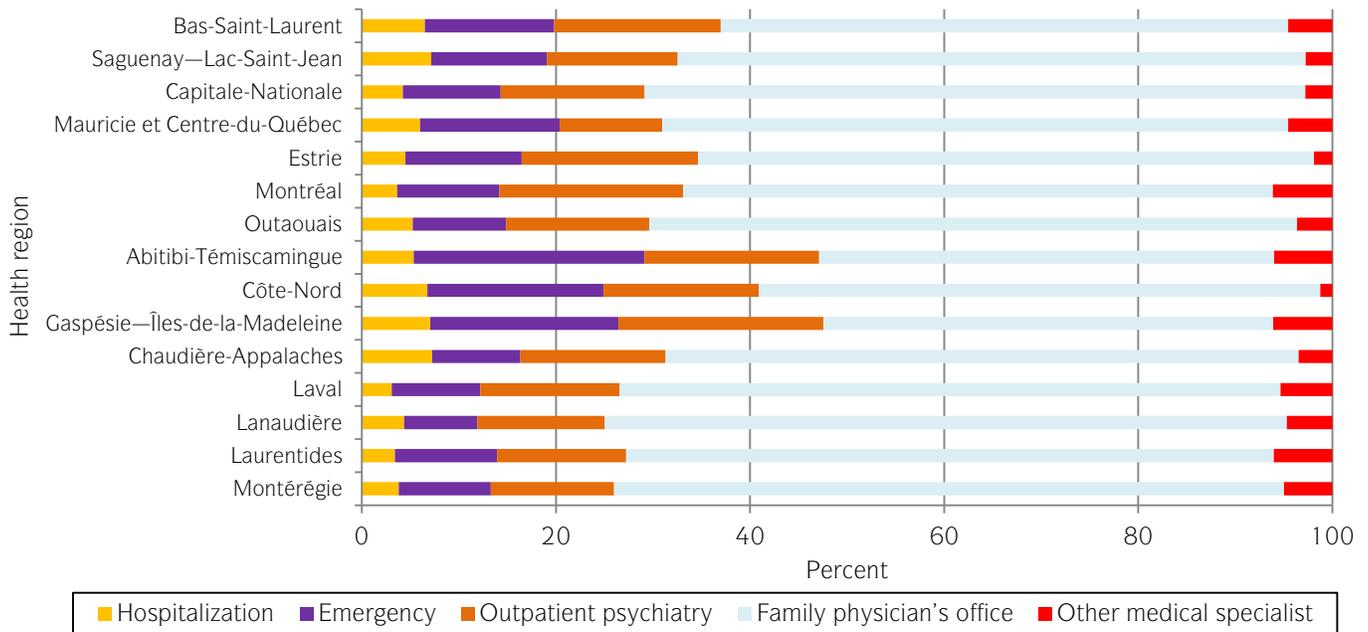


Chart 9 Hierarchical mental health service utilization profile of people with anxiety-depressive disorders by health region, Québec, 2009-2010

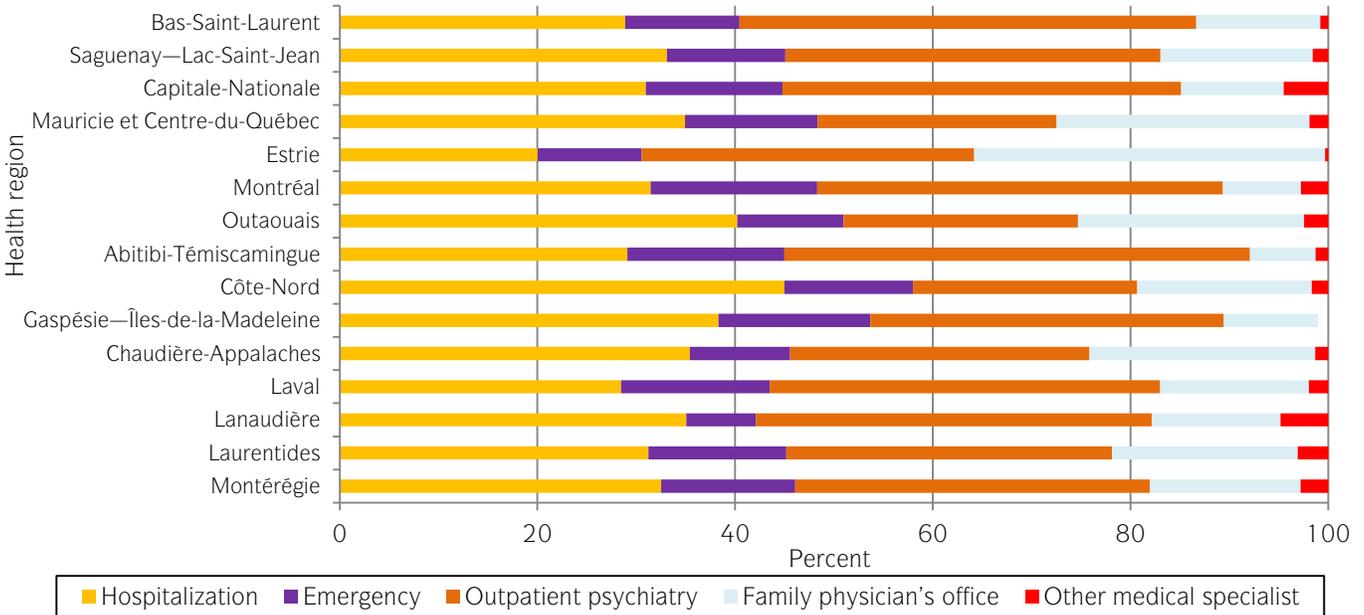


Chart 10 Hierarchical mental health service utilization profile of people with schizophrenic disorders by health region, Québec, 2009-2010

Discussion

Prevalence of Mental Disorders – A few comparisons

This report presents the first annual prevalence measures for mental disorders in Québec using administrative data. In 2009-2010, prevalence was estimated at 12% in people aged one year and over. In four other Canadian provinces using administrative data, prevalence was estimated at 15% (Kisely et al., 2009). This difference can be explained by under-documented administrative files or under-diagnosis in Québec, compared with other provinces. Taking into account both support therapy codes and diagnostic codes, the annual prevalence of mental disorders identified by family physicians in Québec was estimated to be 15% in 2006 (Ouahdi et al., 2009).

In comparison, when using population surveys and valid diagnostic instruments, the annual prevalence of mental disorders is 20% (ISQ, 2010; Gravel and Béland, 2005). According to these authors, this difference can be explained by the fact that fewer than 50% of people with mental disorders diagnosed with valid survey instruments see a doctor for these problems (ISQ, 2010).

The annual prevalence of mental disorders in children and adolescents, also determined using Canadian and American population surveys conducted with valid diagnostic instruments, is 14% (see Table 4).

Table 4 shows that the prevalence in children of often comorbid anxiety and depressive disorders is between 6% and 10%, depending on the population survey. In comparison, administrative databases reveal a prevalence of anxio-depressive disorders of 2.4% in 5- to 19-year-olds, which suggests an underestimation. Similarly, the annual prevalence of anxiety and depressive disorders in adult population studies ranges from 10% to 14% (Somers et al., 2006; Waraich et al., 2004). By comparison, in administrative databases, the diagnosed prevalence in adults is around 9%, suggesting less of an underestimation than for children and adolescents.

For schizophrenic disorders, the annual prevalence of 0.4% estimated in this report exactly matches the average observed in a meta-analysis of 188 different international studies (Saha et al., 2005).

The prevalence of diagnosed mental disorders could increase over the next years, simply due to better diagnosis of and improved medical treatments for these disorders. The example of hyperkinetic disorders speaks volumes about this issue. Indeed, while the prevalence of diagnosed hyperkinetic disorders increased considerably in Québec during the years 1999-2000 to 2009-2010 (Chart 4), it only attained the estimated prevalence for these disorders. More specifically, in the 1991 *Enquête québécoise sur la santé mentale des jeunes* (a survey based on symptoms reported by youth, parents and teachers), the prevalence of hyperkinetic disorders was estimated to be 9% in boys aged 6 to 11 years old (Breton et al., 1993).

Excess Mortality of People with Mental Disorders – A few thoughts

In this report, excess mortality associated with schizophrenia corresponds to a decrease of about 10 years in the life expectancy of men and women, which is similar to the results obtained in recent literature reviews (Chwastiak and Tek, 2009). Some studies have shown that excess mortality is also linked to anxio-depressive disorders. However, while mortality risk appears to be higher among men, excess mortality has not been observed among women (Murphy et al., 2010). Excess mortality related to all mental disorders is due in part, but not exclusively, to suicide. Indeed, people with mental disorders are also at greater risk of dying of cancer, cardiovascular diseases and other diseases, compared with the rest of the population. A recent literature review suggests considering common public health risk factors to explain excess mortality among people with mental disorders, such as lifestyle factors (e.g. smoking, diet, lack of exercise), social deprivation, and the side effects of medications (Lawrence et al., 2010). Other studies also report that the discrimination these individuals face and long delays in obtaining vital medical or surgical interventions also explain the excess mortality associated with severe mental disorders such as schizophrenia (Kisely et al., 2007; Björkenstam et al., 2012).

Profile of Mental Health Service Utilization by People with Mental Disorders – Initial findings

Québec's 2005-2010 Mental Health Action Plan (MSSS, 2005) aims to offer quality services in the community while fostering the recovery of individuals with severe mental disorders. The Plan seeks to ensure management of common mental disorders by primary care services, with the support of specialized services. A review of the profiles of mental health service utilization helps determine links between the action plan and service utilization by individuals with mental disorders, as measured using administrative data, particularly regarding hierarchy of care. On one hand, most people with mental disorders obtain care from primary care family physicians. On the other hand, people with severe mental disorders like schizophrenia use specialized secondary care services. Moreover, psychiatrists also care for people with anxiety-depressive disorders.

The service utilization profiles of individuals with anxiety-depressive disorders vary little among the regions of Québec. Regional differences are greater for people with schizophrenic disorders. This could be explained by the varying availability of specialized services or by different orientations in therapeutic management. In addition, the data in this study show that mental health services are mostly delivered in the community. Only a minority of individuals with mental disorders go to emergency or are hospitalized. They are usually the most serious cases, which is consistent with the principles of a hierarchical management system for chronic diseases, such as mental disorders.

This report highlights the major role of family physicians in identifying and treating mental disorders in Québec. Population surveys underestimate visits to

family physicians because of how questions are formulated (Drapeau et al., 2011). These surveys assess that 5% of Quebecers and Canadians had seen family physicians for issues related to mental health (ISO, 2010). Yet, using administrative data, we have established that 10% of the population had consulted family physicians for mental health reasons in the past year in Québec. However, the role played by other health professionals, especially psychologists who work in private clinics or in CLSCs (local community health centers), cannot be evaluated using RAMQ's physician billing database or *MED-ÉCHO*. Nonetheless, it is clear that psychologists are major mental health care providers. They play a crucial role in alcohol and drug addiction treatment centres, and intervene to treat mental disorders through psychotherapy.

Conclusion

To conclude, this report takes a fresh look at people with mental disorders in Québec. It confirms that the prevalence of mental disorders among adults has remained stable in Québec. However, prevalence increased significantly among children and adolescents between 1999 and 2010, although this is probably due to more frequent diagnoses of hyperkinetic disorders. Moreover, this report sheds light on excess mortality among people with mental disorders, regardless of the severity of their mental health problem. Lastly, it emphasizes that family physicians are the health professionals most often consulted by people struggling with common mental health disorders. These findings call for interventions, not only by specialized services but by the health and social services system as a whole, to improve the health of Quebecers with mental disorders.

Table 4 Annual prevalence of child and youth mental disorders based on Canadian and American population surveys, using standardized diagnostic instruments (Boyle and Georgiades, 2010)

Disorder	Prevalence	95% confidence interval	Age
Anxiety disorders	6.4%	4.2-9.2%	5-17
Hyperkinetic disorders	4.8%	2.7-7.3%	4-17
Conduct disorders	4.2%	2.4-6.5%	4-17
Depressive disorders	3.5%	1.0-7.1%	5-17
Substance abuse	0.8%	0.5-1.3%	9-17
All mental disorders	14.3%	11.4-17.6%	4-17

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