



# Hospital Mental Health Services

in Canada, 2003–2004

Hospital Mental Health Database



Canadian Institute  
for Health Information

Institut canadien  
d'information sur la santé

All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage and retrieval system now known or to be invented, without the prior permission in writing from the owner of the copyright, except by a reviewer who wishes to quote brief passages in connection with a review written for inclusion in a magazine, newspaper or broadcast.

Requests for permission should be addressed to:

Canadian Institute for Health Information  
495 Richmond Road, Suite 600  
Ottawa, Ontario  
K2A 4H6

Phone: 613-241-7860

Fax: 613-241-8120

[www.cihi.ca](http://www.cihi.ca)

ISBN 13: 978-1-55392-943-7 (PDF)

ISBN 10: 1-55392-944-6 (PDF)

© 2006 Canadian Institute for Health Information

How to cite this document:

Canadian Institute for Health Information, *Hospital Mental Health Services in Canada, 2003–2004* (Ottawa: CIHI, 2006).

Cette publication est disponible en français sous le titre :

*Services de santé mentale en milieu hospitalier au Canada, 2003-2004*

ISBN 13 : 978-1-55392-945-1 (PDF)

ISBN 10 : 1-55392-945-4 (PDF)

# Hospital Mental Health Services in Canada 2003–2004

## Table of Contents

Acknowledgements .....	i
Executive Summary .....	iii
Foreword.....	vii
Introduction .....	1
Chapter One—Pan-Canadian Perspective .....	3
Hospital Type.....	4
Age .....	11
Gender.....	13
Co-Occurring Disorders.....	16
Summary.....	19
References.....	20
Chapter Two—Provincial/Territorial/ Regional Perspective .....	21
Secondary Diagnoses .....	26
Regional Data.....	26
Summary.....	28
Chapter Three—General Hospital Readmissions .....	29
Introduction .....	29
Comparisons of General Hospital Incidence Rates of Readmission .....	30
Age .....	31
Length of Hospital Stay .....	32
Confirmatory Analysis .....	32
Probabilities of Readmission by Diagnoses .....	33
Co-Occurring Mental Illness.....	35
Dual Diagnosis and Readmission.....	36
Summary.....	38
References.....	39
Appendix A—Mental Illness Diagnosis Categories and Sub-Categories .....	A-1
Appendix B—Methodological Notes.....	B-1
Appendix C—Glossary.....	C-1
Appendix D.....	D-1

# Hospital Mental Health Services in Canada 2003–2004

## List of Figures

Figure i	Hospital Separation Rate for Mental Illness by Type of Hospital 1994–1995 to 2003–2004 .....	iv
Figure ii	Average Length of Stay for Mental Illness by Type of Hospital 1994–1995 to 2003–2004 .....	v
Figure 1.1	Percentages of Mental Illness Separations by Diagnosis Category for General Hospitals, 2003–2004 .....	8
Figure 1.2	Percentage of Mental Illness Separations by Diagnosis Category for Psychiatric Hospitals, 2003–2004 .....	9
Figure 1.3	Percentage of Length of Stay by Diagnosis Category for General Hospitals, 2003–2004 .....	10
Figure 1.4	Percentage of Length of Stay by Diagnosis Category for Psychiatric Hospitals, 2003–2004 .....	10
Figure 1.5	Percentage of Mental Illness Separations by Diagnosis Category for Males, 2003–2004 (All Hospitals) .....	13
Figure 1.6	Percentage of Mental Illness Separations by Diagnosis Category for Females, 2003–2004 (General and Psychiatric Hospitals) .....	14
Figure 1.7	Percentage of Length of Stay by Diagnosis Category for Males, 2003–2004 (General and Psychiatric Hospitals) .....	15
Figure 1.8	Percentage of Length of Stay by Diagnosis Category for Females, 2003–2004 (General and Psychiatric Hospitals) .....	15
Figure 1.9	Total General Hospital Separations Involving Primary or Secondary Diagnosis of Mental Illness, 2003–2004 .....	16
Figure 2.1	Proportion of Separations by Province/Territory, 2003–2004 .....	23
Figure 2.2	Age-Standardized Separation Rates per 100,000 Population by Select Diagnosis Categories for Provinces and Territories (General and Psychiatric Hospitals), 2003–2004 .....	24
Figure 2.3	Proportion of General Hospital Separations With a Psychiatric Diagnosis by Provinces and Territories, 2003–2004 .....	26
Figure 3.1	Percentage of Readmission by Patients Admitted for MRDx of Mental Illness (General Hospitals), 2003–2004 .....	36

# Hospital Mental Health Services in Canada 2003–2004

## List of Tables

Table 1.1	Separations, Percentage of Separations, Median Length of Stay, Average Length of Stay, 1% Trimmed Mean Length of Stay, Total Length of Stay by Diagnosis Category (General and Psychiatric Hospitals), 2003–2004 .....	4
Table 1.2	Characteristics of the Populations by Hospital Type, 2003–2004 .....	6
Table 1.3	Percentage of Separations by Diagnosis Category for General and Psychiatric Hospitals, 2003–2004 .....	7
Table 1.4	Percentages of Separations by Diagnosis Category and Age Group, 2003–2004 (General and Psychiatric Hospitals) .....	11
Table 1.5	Percentages of Total Length of Stay and Median Length of Stay by Diagnosis Category and Age Group, 2003–2004 (General and Psychiatric Hospitals) .....	12
Table 1.6	Comparisons of Mental Illness Separations With and Without Co-Occurring Substance Related Disorders, 2003–2004 (General Hospitals).....	17
Table 1.7	Separations, Total Length of Stay, Total Acute Length of Stay, ALC Stay and Their Averages by Diagnosis Category (General Hospitals), 2003–2004 .....	18
Table 2.1	Separations Frequencies and Rates by Hospital Type and Province/Territory, 2003–2004 .....	22
Table 2.2	Total Patient Days, Average Length of Stay, and Median Length of Stay Related to Mental Illness Separations, 2003–2004 .....	25
Table 2.3	Separations with ALC, ALC Days, Percentage of Days Stayed in ALC, and ALC per Separation for Provinces and Territories (General Hospitals), 2003–2004 .....	27
Table 3.1	Probability of 1-Year Readmission/100 persons (General Hospitals), 2003–2004.....	31
Table 3.2	Adjusted Hazard of Readmission for Patients Admitted for a Most Responsible Diagnosis of Mental Illness in the First Admission (General Hospitals), 2003–2004 .....	33
Table 3.3	Risk (/100 persons) of 1-Year Readmission Among Patients With and Without Co-Occurring Mental Illness, 2003–2004 .....	34
Table D-1	Regional Hospital Mental Health Service Indicators (General Hospitals), 2003–2004.....	D–1
Table D-2	Person-time Incidence Rates of Readmission by Patients’ Characteristics (General Hospitals), 2003–2004 .....	D–4

## Hospital Mental Health Services in Canada 2003–2004

### List of Tables (cont'd)

Table D-3	Crude and Adjusted Hazard Ratios of Readmission for Patients Admitted for a Most Responsible Diagnosis of Mental Illness in the First Admission (General Hospitals), 2003–2004 .....	D-4
Table D-4	Person-Time Incidence Rates of Readmission Among Patients Admitted for a MRDx of Mental Illness (General Hospitals), 2003–2004.....	D-5

## **Acknowledgements**

The Canadian Institute for Health Information (CIHI) wishes to acknowledge and thank the following individuals for their contribution to *Hospital Mental Health Services in Canada 2003–2004* report.

The report was produced by Nawaf Madi, Helen Zhao, and Jerry Fang Li of the Mental Health and Addictions program area. Publications, translation, and communications support relating to the report was carried out by the respective departments at CIHI.

The report is based primarily on data from the 2003–2004 Hospital Mental Health Database, which was produced with the generous assistance of CIHI's IT Operations group, Statistics Canada, and provincial and territorial ministries of health. CIHI would also like to thank the Expert Advisory Group and Reviewers for their valuable advice and insightful feedback.

Please note that the analyses and conclusions in the present document do not necessarily reflect those of the individuals or organizations mentioned above.





## Executive Summary

*Hospital Mental Health Services in Canada 2003–2004* uses data from the Hospital Mental Health Database and the Hospital Morbidity Database to examine inpatient hospital service use among individuals diagnosed with a mental illness. The information provided in this report from the Canadian Institute for Health Information (CIHI) will be of relevance for individuals interested in the policy, clinical, and service management sectors of the health and mental health fields. As well, it will be of relevance for individuals generally interested in health and mental health services in Canada. The information and analyses in the report are focused on inpatient hospital separations (discharges or deaths), which are one part of a broader spectrum of mental health services.

The level of use of hospital mental health services, defined in terms of separations, was very similar in 2003–2004 to the preceding fiscal year. However a longer-term perspective indicates a decline. Canadian hospitals reported 192,562 separations for mental illness in 2003–2004. This represents an age-standardized rate of separation (586 per 100,000 population), which is very similar to the age-standardized rate for 2002–2003 (592 per 100,000 population). Over the course of 10 years, dating back to 1994–1995, a trend towards fewer hospitalizations is apparent (see Figure i). A similar decline is apparent in the 10-year trend for average length of stay (ALOS) as illustrated in Figure ii. For 2003–2004, the ALOS was 35 days. This represents a 47.0% decrease from 66 days in 1994–1995.

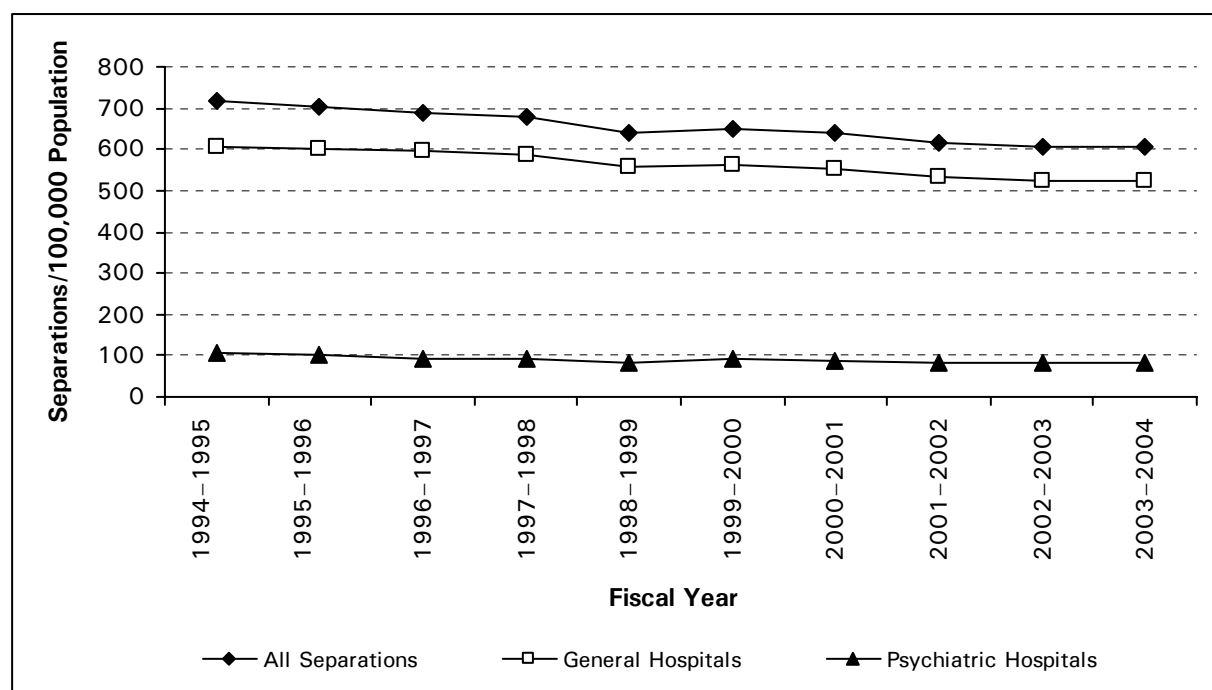
Although hospital services for mental illness may most commonly be considered the domain of specialized psychiatric hospitals, in reality, the majority of hospitalizations for mental illness occurred in acute care facilities. In 2003–2004, general hospitals accounted for 86.5% of separations and psychiatric hospitals accounted for the remaining 13.5% of separations for mental illness. These proportions are very similar to those of the previous year, but indicate a more prominent role for general hospitals than previously in the last two decades (82.5% of separations in 1983–1984, and 84.7% of separations in 1993–1994).

In comparison with separations that emerged from general hospitals, those from psychiatric hospitals more often included severe illnesses (schizophrenia) that required specialized care. Differences in the type of services provided by general and psychiatric hospitals are evident in the discrepancy in average lengths of stay for the two types of institutions, which were 16.9 and 148.5 days respectively. Both figures however were greater than the average of 7.2 days for hospital separations with non-psychiatric diagnoses.

The most common category of psychiatric diagnosis responsible for hospital separations was mood disorders (depression and bipolar disorder). This was consistent across age groups and across provinces and territories. However, the largest proportion of hospital days stayed was attributable to schizophrenic and psychotic disorders. For many who were separated from hospital for a mental illness, their conditions were impacted by alcohol and drugs. Almost 20% of separations with a psychiatric diagnosis in 2003–2004 had a co-occurring substance related disorder.

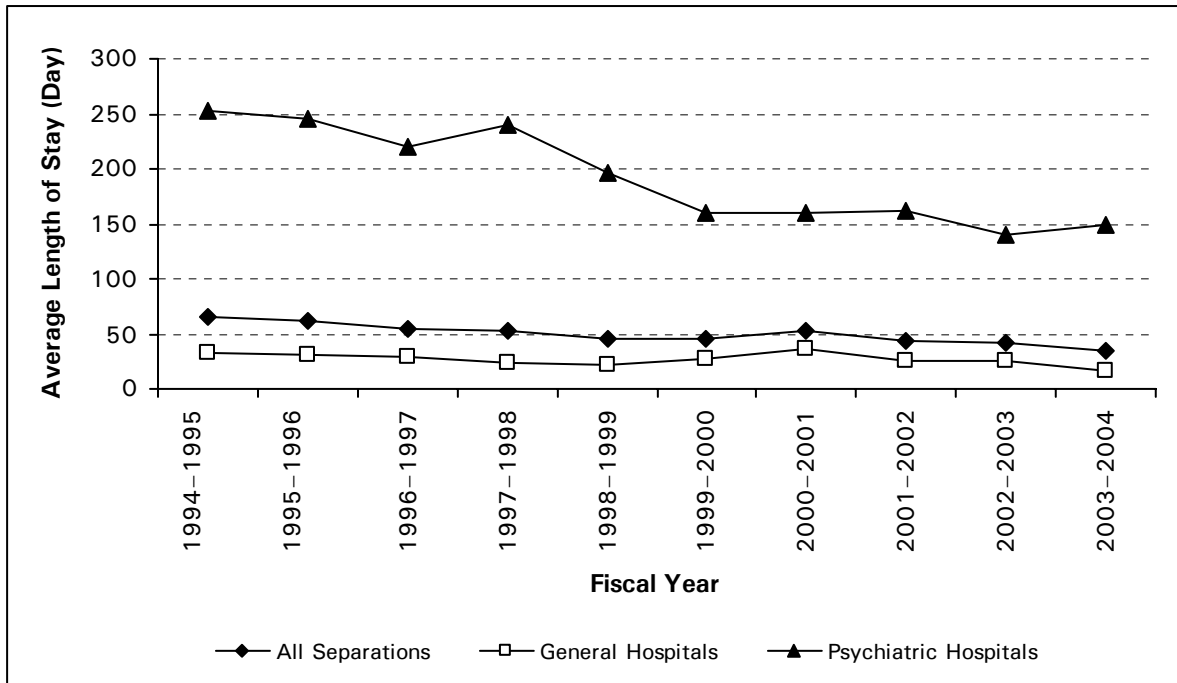
Differences in the provincial and territorial rates of separation and lengths of stay hint at the systemic differences that exist for the provision of hospital mental health services from a pan-Canadian perspective. The regional level data for these same indices give an idea of the intra-jurisdictional variations that exist for hospital mental health services.

Unplanned readmissions to hospital are generally regarded as undesirable events. Among individuals with a most responsible diagnosis of mental illness, readmissions to a general hospital within one year of an initial episode of hospitalization were 35.5% higher than they were for individuals whose most responsible diagnosis was a non-psychiatric illness. General hospital readmissions were highest among individuals diagnosed with personality disorders, and schizophrenic and psychotic disorders. Also, among those whose most responsible diagnosis was a mental illness, individuals who had a co-occurring substance related disorder were more often readmitted.



**Figure i Hospital Separation Rate for Mental Illness by Type of Hospital 1994–1995 to 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.



**Figure ii Average Length of Stay for Mental Illness by Type of Hospital 1994–1995 to 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health information.



## Foreword

Although inpatient hospital mental health services represent only a fraction of a continuum of health care that includes primary, outpatient, and community based care, their role is an important one. The significance of hospital mental health service is particularly evident for individuals with the most severe and persistent conditions (although they are certainly not limited to this population (Dewa, Rochefort, Rogers, & Goering, 2003)). For instance, whereas schizophrenia is estimated to affect about 1% of the Canadian population as compared to about 12% for anxiety disorders, the former—which is generally a more severe and debilitating disease—accounts for more than four times the proportion of hospital separations (discharges from hospital or deaths), and more than twenty times the number of hospital days stayed.

The *Hospital Mental Health Services in Canada 2002–2003* (Canadian Institute for Health Information, 2005) report examined the changes that had occurred in the provision of hospital services for mental illness, and noted a general decline in both number and duration. The data for 2003–2004 suggest that the portrait of hospital separations and duration of inpatient episodes remains largely as it was for the previous year, and that over a 10-year period it shows a decline. The reasons for the decline require further study, but may include reduced capacity in terms of the number of hospital beds allocated for psychiatric care, and the increasing usage of community mental health services such as Assertive Community Treatment teams.

Hospitalization for mental illness is often associated with serious social and economic costs. Episodes of hospitalization resulting from degradation in mental health status are often the basis of major disruption to the normal course of private and professional life of individuals living with mental illness. Also, despite a decline in the use of hospital mental health services, they tend to be significantly more expensive than other forms of direct mental health care (McCrone, Chisholm, & Bould, 1999), and therefore continue to account for the largest proportion of direct mental health care costs in Canada (Stephens & Joubert, 2001).



## Introduction

The information presented in this, the *Hospital Mental Health Services in Canada 2003–2004* report, offers an update to the facts and figures provided in previous iterations of the report. Like preceding reports, this one provides pan-Canadian and provincial/territorial perspectives on some basic indicators of hospital services for individuals diagnosed with mental illness. In addition, the report undertakes the examination of a number of topics not previously explored in this series, including analyses of readmission to a general hospital, alternate level of care, data on co-occurring and dual diagnosis cases, and the provision of regional level data on a number of key indicators.

The first chapter presents a pan-Canadian perspective on hospital separations for mental illness, including lengths of stay, and key descriptors of the population that received hospital services for mental illness. The chapter explores and compares data from general and psychiatric hospitals.

The second chapter provides a provincial/territorial breakdown of the hospitalization data, including age-standardized rates of separation and an assessment of diagnosis categories. New for this report is the inclusion of regional level data for a number of key indicators of hospital mental health services. Included are separation rates, average lengths of hospital stay, and most common categories of diagnosis for health regions with a population of greater than 75,000.

Chapter 3 addresses the issue of hospital readmissions within the 2003–2004 fiscal year for those separated from acute care hospitals with a mental health diagnosis. Using data from CIHI's Hospital Morbidity Database, the analyses focus on differences in rates of readmission by age and diagnosis, among a number of other variables.

## Methods

The analyses in this report were based on data from the Canadian Institute for Health Information's (CIHI) Hospital Mental Health Database (HMHDB) and Hospital Morbidity Database (HMDB). The HMHDB includes data for separations from general hospitals with a most responsible diagnosis of mental illness, combined with separations from provincial psychiatric hospitals. See Appendix A for a table describing the make-up of the diagnosis categories included. The report's focus is on hospital mental health separations and does not attempt to offer a comprehensive overview of mental health services, or even hospital mental health services in Canada. A more detailed account of the methods used in the report is offered in Appendix B.

## References

Canadian Institute for Health Information (2005). *Hospital Mental Health Services in Canada 2002–2003*. Ottawa: Canadian Institute for Health Information.

Dewa, C. S., Rochefort, D. A., Rogers, J., & Goering, P. (2003). Left behind by reform: the case for improving primary care and mental health system services for people with moderate mental illness. *Applied Health Economics and Health Policy*, 2, 43–54

McCrone, P., Chisholm, D., & Bould, M. (1999). Costing different models of mental health service provision. *Mental Health Research Review*, 6, 14–17.

Stephens, T. & Joubert, N. (2001). *The economic burden of mental health problems in Canada*. (Public Health Agency of Canada), [online], <[http://www.phac-aspc.gc.ca/publicat/cdic-mcc/22-1/d\\_e.html](http://www.phac-aspc.gc.ca/publicat/cdic-mcc/22-1/d_e.html)> .



## Chapter One—Pan-Canadian Perspective

In this opening chapter, hospital mental health services across Canada are examined along a number of dimensions. The information is intended to offer a pan-Canadian perspective on hospital service usage by individuals diagnosed with mental illness, and on the scope of these services for different age groups, diagnosis groups, and hospital types. These data were aggregated across regions and provinces, and thus necessarily omit details and inherent variations due to differences in policies, service delivery models, demographics and other characteristics that exist across jurisdictions.

Overall, individuals separated from hospital in 2003–2004 with a mental illness as the most responsible diagnosis had stayed over 6.6 million days. The majority (57.8%) of these were days stayed in psychiatric hospitals.

Table 1.1 presents aggregated (general and psychiatric hospitals) data for hospital separations and lengths of stay by category of most responsible diagnosis. The largest proportion of hospital separations for mental illness had a primary diagnosis of mood disorders. Over 32% of those separated were diagnosed with one of two diagnoses in this category, either depression or bipolar disorder. In terms of hospital days stayed, the largest proportion (36.6%) was for separations based on schizophrenic and psychotic disorders.

The average length of stay was highly influenced by those separations of relatively long duration. This is highlighted by large differences between the ALOS and both the 1% trimmed mean and the median lengths of stays. Overall, the ALOS was 34.7 days, but if the 1% with the longest stays are excluded, this figure is reduced to 20.0 days. The overall median length of stay is shorter still. That is, half of all separations had a LOS of 9 days or less. Based on the median and trimmed mean, the longest hospital stays were for separations based on organic disorders, and schizophrenic and psychotic disorders.

**Table 1.1 Separations, Percentage of Separations, Median Length of Stay, Average Length of Stay, 1% Trimmed Mean Length of Stay, Total Length of Stay by Diagnosis Category (General and Psychiatric Hospitals), 2003–2004**

Diagnosis Category	Separations	Percentage of Separations	Median LOS (Days)	ALOS (Days)	1% Trimmed Mean LOS (Days)	Total LOS (Days)
Organic Disorders	18,463	9.6	20.0	51.2	39.3	945,801
Substance Related Disorders	27,868	14.5	4.0	10.0	8.2	279,324
Schizophrenic and Psychotic Disorders	40,611	21.1	15.0	60.2	36.1	2,443,818
Mood Disorders	62,319	32.4	11.0	20.8	17.8	1,296,433
Anxiety Disorders	8,711	4.5	4.0	11.6	10.2	101,100
Personality Disorders	7,684	4.0	4.0	13.6	9.9	104,279
Other Disorders	26,906	14.0	5.0	56.0	16.4	1,507,537
<b>Total</b>	<b>192,562</b>	<b>100.0</b>	<b>9.0</b>	<b>34.7</b>	<b>20.0</b>	<b>6,678,292</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

## Hospital Type

Differences in the nature of services provided by the general hospitals and the more specialized psychiatric hospitals are manifested in the duration of stays, and in the types of diseases treated. It should be noted that, among general hospital separations with a primary diagnosis of mental illness, 97% of separations and 91% of days stayed by individuals with a psychiatric primary diagnosis were in acute care facilities. The remaining numbers were from chronic or other types of facilities.

Table 1.2 presents differences between separations from general hospitals with a psychiatric primary diagnosis, separations from psychiatric hospitals and separations from general hospitals with a non-psychiatric primary diagnosis. Psychiatric hospital separations, on average, were slightly younger, more often males, and more often had a co-occurring psychiatric diagnosis. The hospital types had similar proportions of separations by age category. For both types of hospital, the largest proportion of separations were for those between the ages of 25 and 44 years, whereas the smallest proportion of separations were for those between 0 and 14 years of age. Also, 13.8% of separations from general hospitals had a LOS of one day, almost half had a LOS of one week or less, 86.0% had a LOS of one month or less and almost all had a LOS of 1 year or less. Among separations from psychiatric hospitals, the majority had a LOS of between one month and one year.

The comparison of psychiatric and non-psychiatric separations revealed differences in demographic characteristics and service usage. In comparison to those separations with a psychiatric primary diagnosis, those with a non-psychiatric primary diagnosis were more often females and were older on average. The distribution by age categories demonstrates

that the largest proportion of non-psychiatric separations was above the age of 65 years, whereas among psychiatric separations, the largest proportion was between the ages of 25 and 44 years.

Non-psychiatric general hospital separations also had shorter hospital stays than separations from either of the two types of hospitals that had a psychiatric primary diagnosis. Compared to general hospital separations with a psychiatric primary diagnosis, those with a non-psychiatric primary diagnosis had an ALOS that was less than half as long. This difference is manifested in the smaller median LOS and the smaller proportion of separations that had stays of greater than 1 week among those with a non-psychiatric primary diagnosis.

In the context of all general hospital separations for 2003–2004, the 166,553 separations with a primary or most responsible diagnosis of mental illness made up 5.9%. A larger number of separations, 238,309 or 8.4% of the total, had a non-psychiatric primary diagnosis and a secondary<sup>i</sup> condition that was a mental illness. Separations, as referred to in this report, are discharges from hospital or deaths.

Taken in consideration with the proportion of days stayed, it is apparent that hospital stays for mental illness were on average longer than those for non-mental illness. Separations with a primary diagnosis of mental illness constituted 12.9% of the total number of days stayed in general hospitals. Separations with a secondary diagnosis of mental illness made up a further 17.2% of days stayed. In both cases, the proportion of days stayed is more than twice the proportion of separations.

Also, among general hospital separations, there existed little difference in the type of hospital used. Most separations (over 95%), both with and without a mental illness diagnoses, were from acute care facilities. The ALOS for acute care facilities was 15.9 days for those with a primary psychiatric diagnosis, 14.4 days for those with a secondary psychiatric diagnosis, and 6.1 days for those with a non-psychiatric diagnosis in 2003–2004. Thus, irrespective of facility type, general hospital stays for psychiatric diagnoses were longer than those for non-psychiatric diagnoses.

---

i. A separation was deemed to have a secondary diagnosis of mental illness if one or more of the 2nd through 25th diagnoses were mental illnesses.

**Table 1.2 Characteristics of the Populations by Hospital Type, 2003–2004**

	Psychiatric MRX			Non-Psychiatric MRX
	General Hospitals	Psychiatric Hospitals	Total	
<b>Male (%)</b>	47.1	56.9	48.4	41.7
<b>Mean Age (years)</b>	44.4	42.7	44.2	51.9
<b>Age Group (%)</b>				
0–14	3.4	1.4	3.2	8.2
15–24	16.0	15.6	16.0	7.4
25–44	36.2	41.7	37.0	23.5
45–64	25.6	28.2	26.0	22.5
65+	18.7	13.2	17.9	38.4
<b>Death in Hospital (%)</b>	0.8	1.1	0.8	4.1
<b>With at Least One Co-occurring Psychiatric Condition (%)</b>	52.2	57.8	52.9	9.0
<b>Length of Stay (%)</b>				
1 Day	13.8	6.3	12.8	23.9
1 Week	35.6	16.2	33.0	53.9
1 Month	36.5	35.8	36.4	19.4
1 Year	13.9	37.0	17.0	3.6
More than 1 year	0.1	4.5	0.7	0.0
<b>ALOS (Days)</b>	16.9	148.5	34.7	7.2
<b>Median LOS (Days)</b>	8.0	25.0	9.0	3.0

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

MRX: Most Responsible Diagnosis.

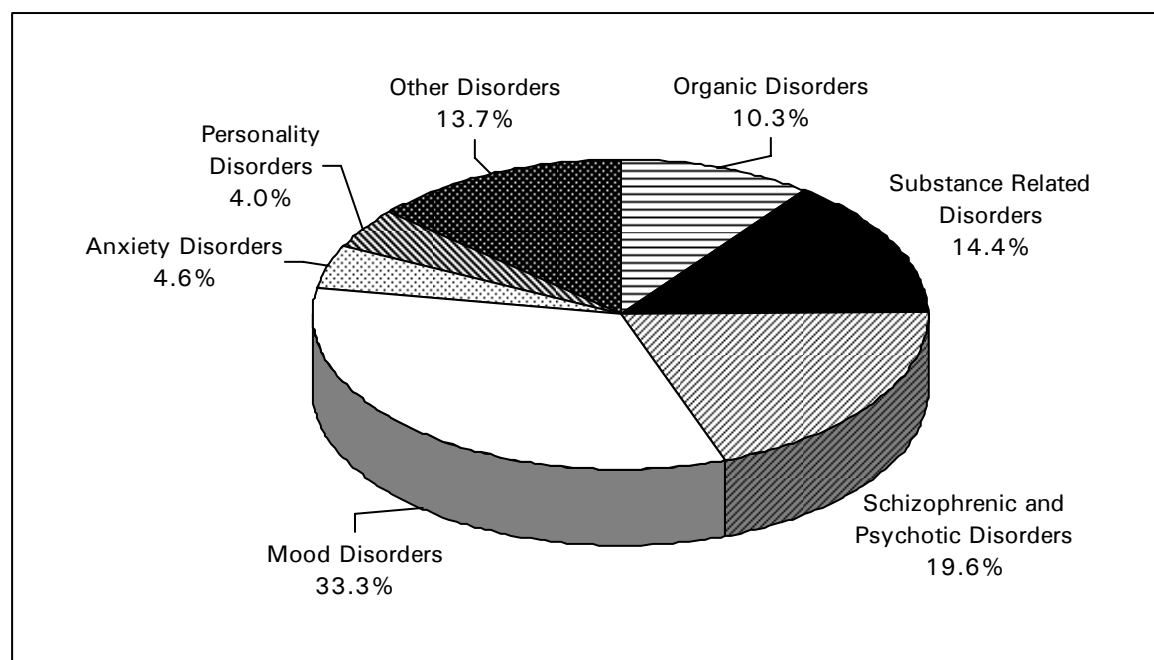
Table 1.3 presents the proportions of separations by diagnosis category and by hospital type. Essentially, this illustrates variations in the types of hospitals that provided services for each of the respective diagnosis categories. Almost 20% of separations with schizophrenic and psychotic disorders were from psychiatric hospitals. This represents a relatively large proportion when compared to the proportion (13.5%) of all separations, but is not unexpected given the complex and lengthy treatment needs for the disease, and the specialized service that can be offered in psychiatric hospitals. When compared to general hospital separations for other diagnosis categories, a relatively large fraction of Organic Disorder separations were from general hospitals.

**Table 1.3 Percentage of Separations by Diagnosis Category for General and Psychiatric Hospitals, 2003–2004**

<b>Diagnosis Category</b>	<b>General Hospitals (%)</b>	<b>Psychiatric Hospitals (%)</b>
Organic Disorders	93.0	7.0
Substance Related Disorders	86.2	13.8
Schizophrenic and Psychotic Disorders	80.4	19.6
Mood Disorders	89.1	10.9
Anxiety Disorders	88.6	11.4
Personality Disorders	87.5	12.5
Other Disorders	84.5	15.5
<b>Total</b>	<b>86.5</b>	<b>13.5</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

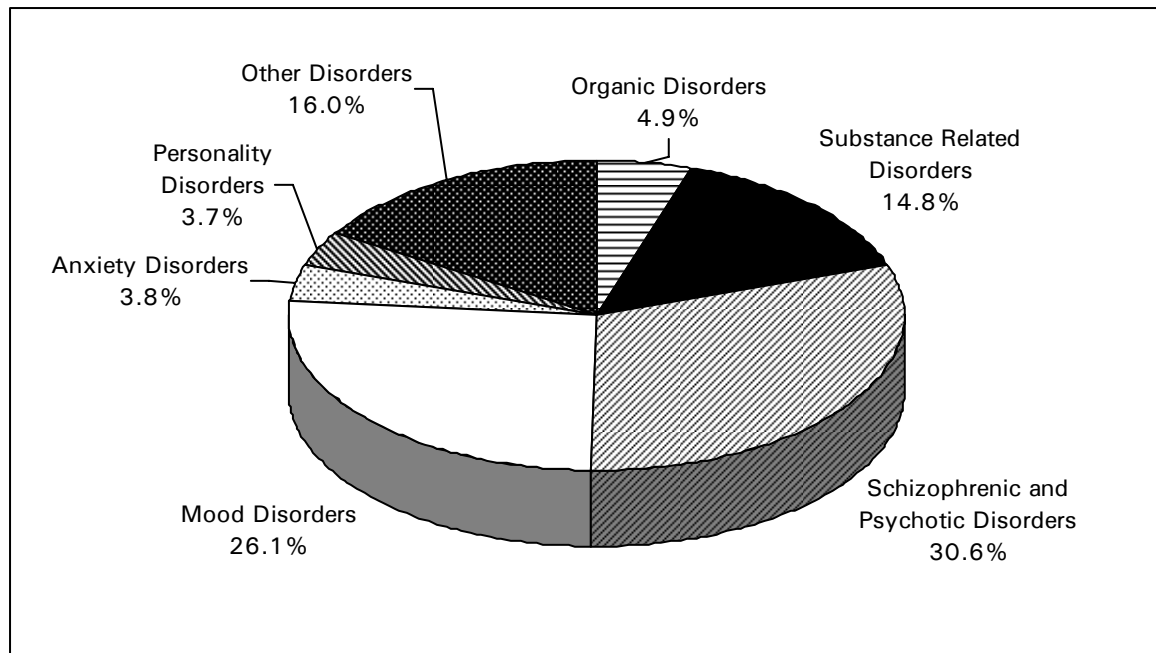
Figures 1.1 and 1.2 present the proportion of separations by diagnosis category, for each of the two hospital types. The largest group of separations from general hospitals was those diagnosed with mood disorders, which constituted one third of all mental health separations from this hospital type. Schizophrenic and psychotic disorder diagnoses were also prominent among general hospital mental health separations. Combined separations for mood disorders and schizophrenic and psychotic disorders made up over half of all general hospital separations.



**Figure 1.1 Percentages of Mental Illness Separations by Diagnosis Category for General Hospitals, 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

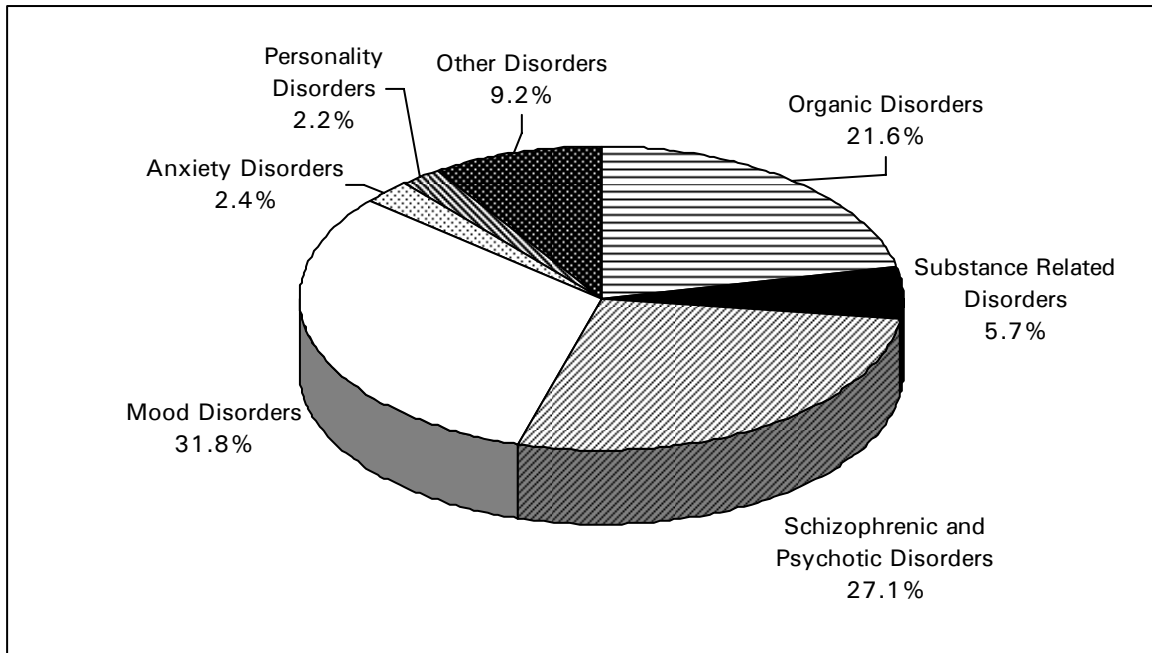
Mood disorders and schizophrenic and psychotic disorders also made up over half of separations from psychiatric hospitals, although in this case it was the latter category that had the single largest number of separations. By contrast, anxiety disorders—which are among the most common mental disorders in terms of prevalence (Offord et al. 1996; Kessler et al. 2005)—made up less than five percent of separations in each of the two types of hospitals. This, perhaps, reflects the fact that anxiety disorders can often be treated in community-based settings, and although hospitalization is also an option for the treatment of moderate mental illnesses (Dewa et al., 2005), it is most often the most severe conditions that result in hospitalization.



**Figure 1.2 Percentage of Mental Illness Separations by Diagnosis Category for Psychiatric Hospitals, 2003–2004**

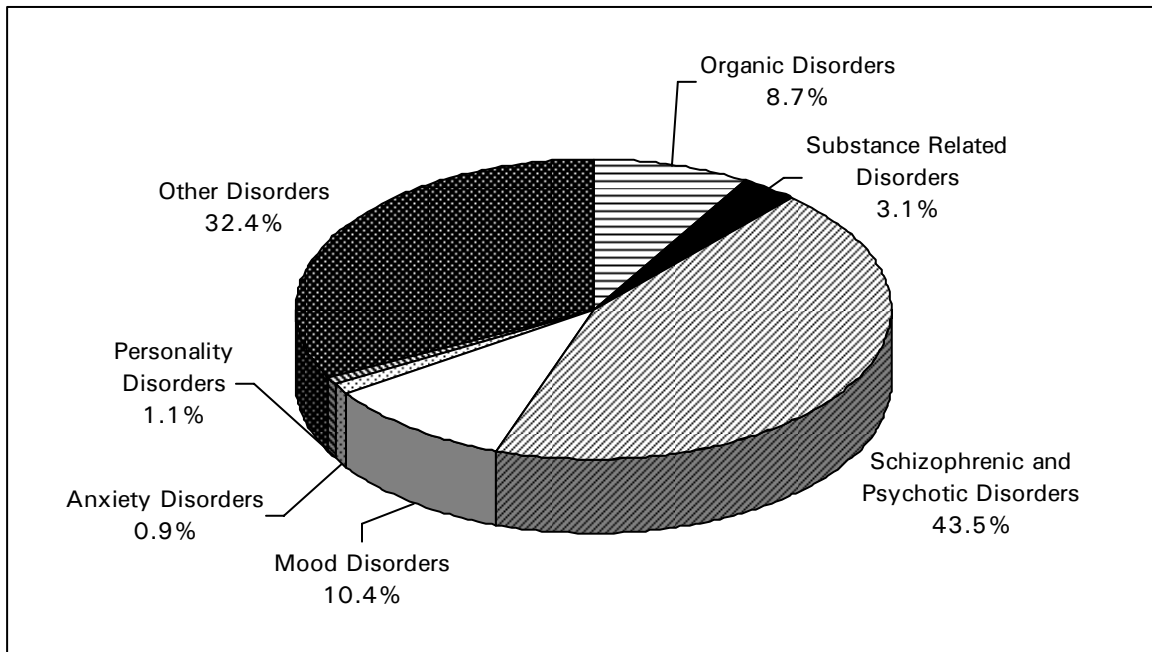
Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

The pattern for general and psychiatric hospitals, in terms of days stayed, was very similar to that of separations. The majority of general hospital days stayed were attributable to three categories of primary diagnosis (see Figure 1.3). Mood disorders and schizophrenic and psychotic disorders accounted for almost 60% of hospital days stayed in general hospitals. When organic disorders are included, over 80% of the total is accounted for. For separations from psychiatric hospitals, over 75% of the total days stayed were due to diagnoses of schizophrenia and psychotic disorders, and “other” disorders. Disaggregation of the latter category revealed that over 70% of the days stayed in the “other” category were for various diagnoses of mental retardation and developmental disabilities.



**Figure 1.3 Percentage of Length of Stay by Diagnosis Category for General Hospitals, 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.



**Figure 1.4 Percentage of Length of Stay by Diagnosis Category for Psychiatric Hospitals, 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.



The variations by diagnosis category for separations and days stayed suggests a different focus of clinical attention as a function of hospital type. In both general and psychiatric hospitals a significant proportion of the separations were for schizophrenic and mood disorders. However it would appear that the more severe conditions, which require more specialized care and longer stabilization and recovery times, were attended to in psychiatric hospitals.

## Age

The age of onset and the age at which the conditions of different disorders attain a severity that requires hospital attention varies. Some disorders affect individuals across the age spectrum, whereas others are associated with specific periods for onset and attenuation of symptoms. Table 1.4 presents the proportion of hospital separations associated with each of the diagnosis categories by age group. It is notable that mood disorders made up a significant proportion of separations across all age groups consistently. Specifically, depression is known to affect individuals of all ages, although its symptoms and intensity might vary (Bland, 1997). Separations based on mood disorders were the most common category by diagnosis in the 15–64 year age range. The “other” category is most prominent between the ages of 0 and 24, reflecting the fact that it consists primarily of developmental disorders as well as disorders of childhood.

**Table 1.4 Percentages of Separations by Diagnosis Category and Age Group, 2003–2004 (General and Psychiatric Hospitals)**

Diagnosis category/Age (Years)	0–14	15–24	25–44	45–64	65+
	% N = 6,092	% N = 30,733	% N = 71,203	% N = 50,039	% N = 34,495
Organic Disorders	0.3	0.5	0.8	2.7	47.5
Substance Related Disorders	4.7	13.9	16.8	17.3	7.7
Schizophrenic and Psychotic Disorders	2.8	22.3	26.3	22.8	9.9
Mood Disorders	22.9	30.5	33.2	39.4	23.8
Anxiety Disorders	8.4	5.0	4.3	4.2	4.4
Personality Disorders	1.5	6.0	5.6	3.1	0.6
Other	59.3	21.8	13.0	10.4	6.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

In terms of lengths of stay, separations diagnosed with schizophrenic and psychotic disorders had the longest median lengths of stay across all age groups (Table 1.5). This invariance across age groups suggests, again, the severity of schizophrenia and psychotic disorders and the duration of care required to stabilize and treat them. Substance related disorders, on the other hand, tended to require relative short stays in hospital, although the stays tended to get longer with age. Overall, the longer median lengths of stay were observed as the age at separation increased. The median length of stay ranged from 6.0 days in the 0–14 age category, to 18.0 days in the 65 and over category.

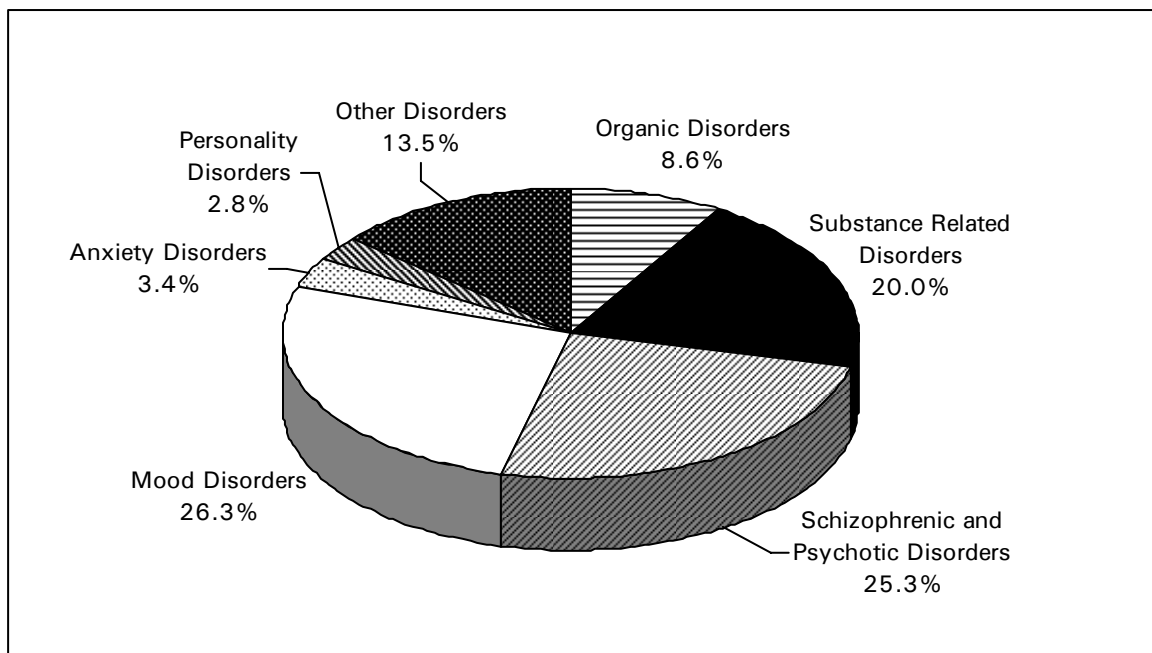
**Table 1.5 Percentages of Total Length of Stay and Median Length of Stay by Diagnosis Category and Age Group, 2003–2004 (General and Psychiatric Hospitals)**

Diagnosis Category/Age (Years)	0–14		15–24		25–44		45–64		65 +	
	Percentage(%)	Median (Days)	Percentage(%)	Median (Days)	Percentage(%)	Median (Days)	Percentage(%)	Median (Days)	Percentage(%)	Median (Days)
Organic Disorders	2.9	1.0	1.9	6.0	3.4	10.0	6.5	13.0	53.5	21.0
Substance Related Disorders	0.1	1.0	3.6	3.0	4.5	3.0	5.8	4.0	4.3	7.0
Schizophrenic and Psychotic Disorders	7.3	11.0	37.6	15.0	50.6	14.0	48.3	16.0	14.9	20.0
Mood Disorders	3.7	6.0	13.5	7.0	19.7	9.0	28.9	12.0	20.3	20.0
Anxiety Disorders	1.1	6.0	1.7	4.0	1.5	4.0	1.6	5.0	1.4	5.0
Personality Disorders	0.2	4.0	1.8	3.0	2.5	4.0	1.7	5.0	0.4	13.0
Other	84.7	7.0	40.0	4.0	17.8	4.0	7.2	5.0	5.2	12.0
<b>Total</b>	<b>100.0</b>	<b>6.0</b>	<b>100.0</b>	<b>6.0</b>	<b>100.0</b>	<b>7.0</b>	<b>100.0</b>	<b>9.0</b>	<b>100.0</b>	<b>18.0</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

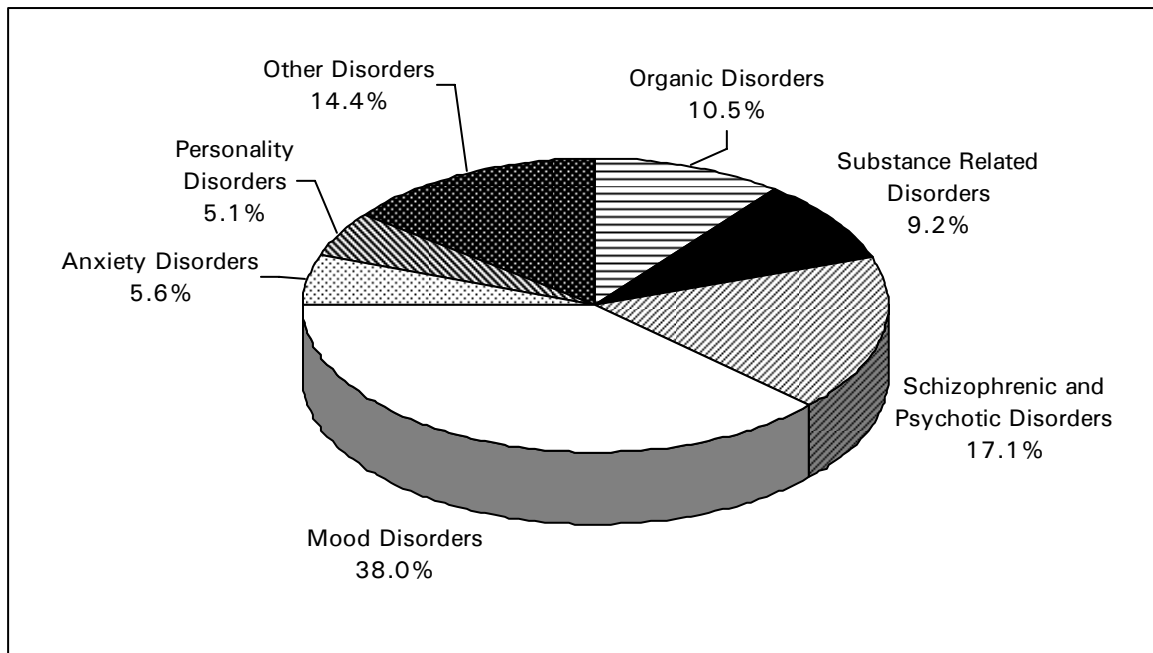
## Gender

A number of gender differences are apparent in the prevalence of certain mental illnesses (Government of Canada, 2006). Some of the diagnosis categories used in this report for hospital separations reflect these differences. Figures 1.5 and 1.6 provide a comparison of the proportions of separations from all hospitals for the different diagnosis categories by gender. Among males, for instance, separations for mood disorders and schizophrenic and psychotic disorders made up just over a quarter of the total each. Also among male separations, substance related disorders made up 20% of separations. For females, however, mood disorders were much more prominent, as they constituted well over a third of all separations, and more than double the proportion accounted for by schizophrenic and psychotic disorders. Also, separations for substance related disorders were less than half the proportion among female separations as compared to male separations.



**Figure 1.5 Percentage of Mental Illness Separations by Diagnosis Category for Males, 2003–2004 (All Hospitals)**

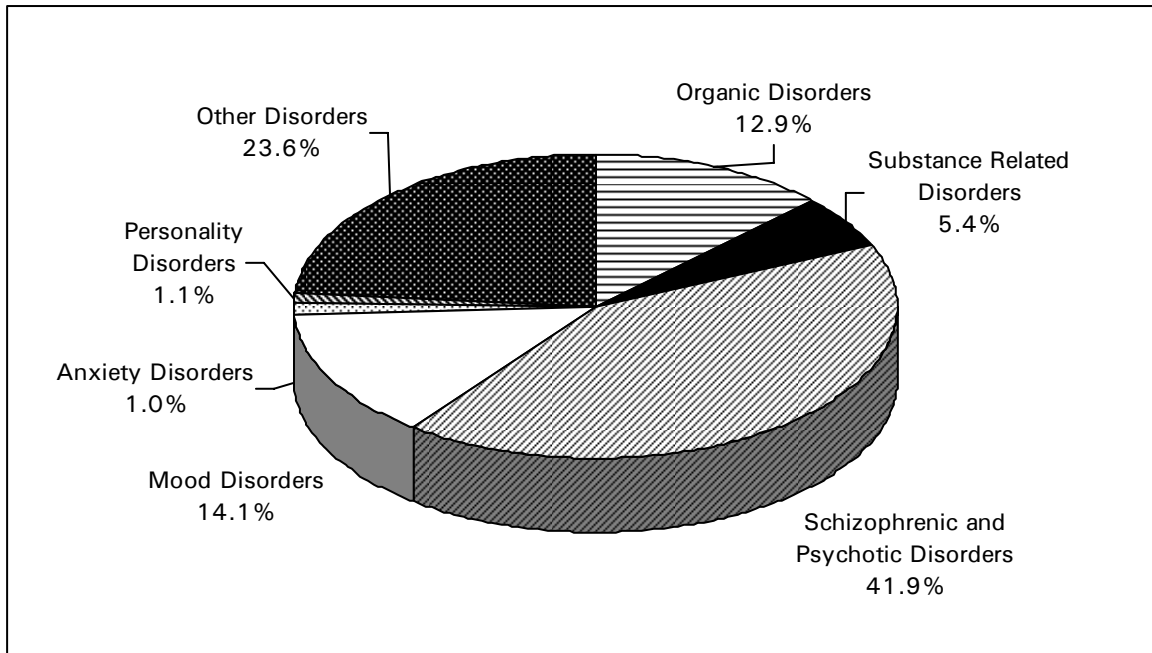
Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.



**Figure 1.6 Percentage of Mental Illness Separations by Diagnosis Category for Females, 2003–2004 (General and Psychiatric Hospitals)**

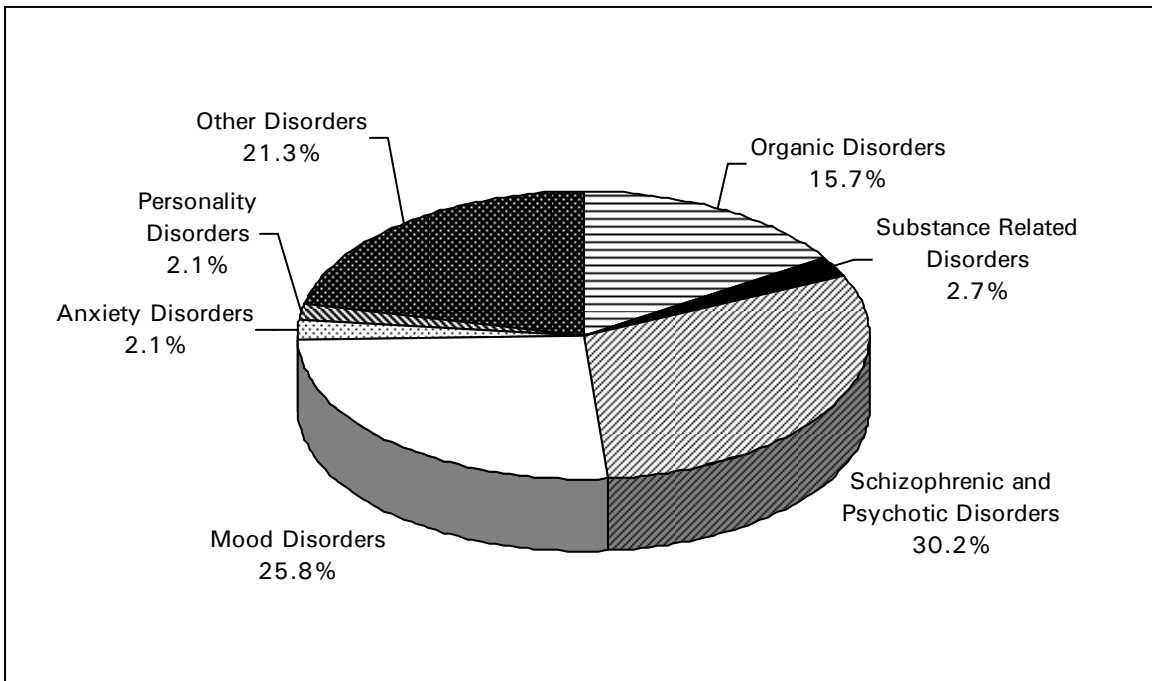
Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

The gender differences between mood and schizophrenic and psychotic disorders are obscured somewhat when length of stay is considered. Schizophrenic and psychotic disorders made up the largest category by length of stay for both males and females, because of the relatively long lengths of stay associated with separations in this category.



**Figure 1.7 Percentage of Length of Stay by Diagnosis Category for Males, 2003–2004 (General and Psychiatric Hospitals)**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

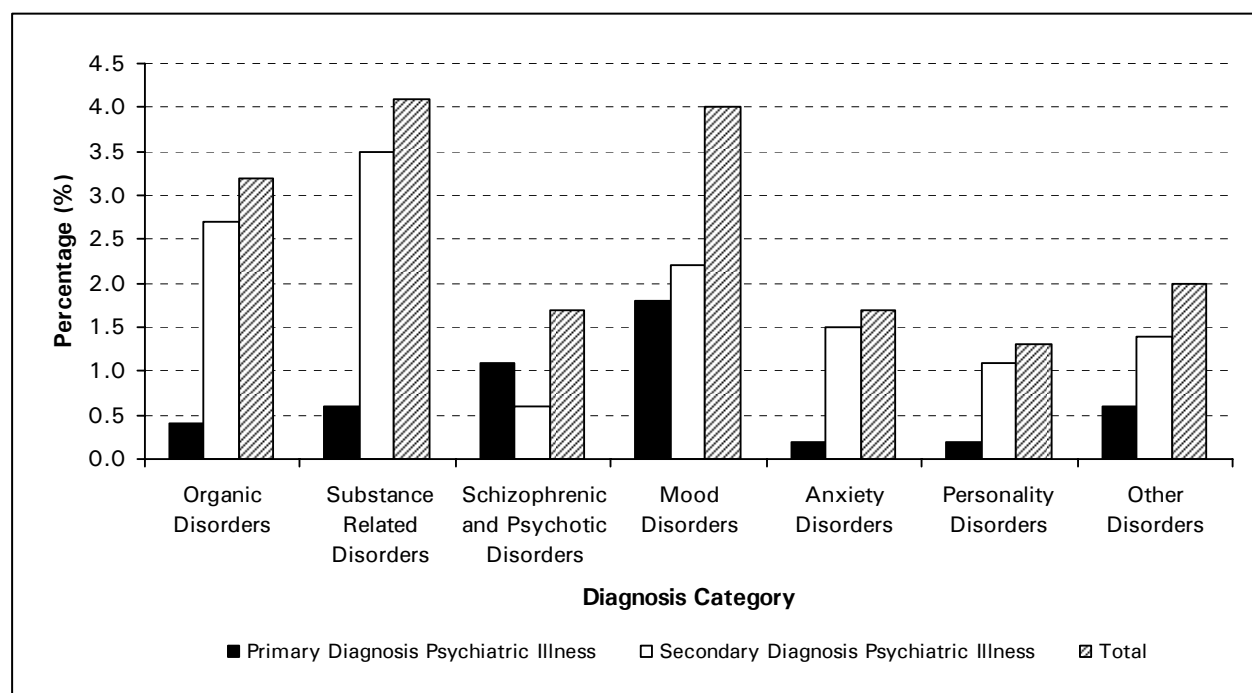


**Figure 1.8 Percentage of Length of Stay by Diagnosis Category for Females, 2003–2004 (General and Psychiatric Hospitals)**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

## Co-Occurring Disorders

To provide a more comprehensive perspective on the role of psychiatric diagnoses among those separated from general hospitals, secondary or co-occurring mental illnesses were explored. The findings presented in Figure 1.9 are derived from a scan of general hospital data from the HMDB, and includes a compilation of up to 24 secondary diagnoses. Among many hospital separations in which the most responsible diagnosis was non-psychiatric, mental illness was involved as a secondary or co-occurring diagnosis. Separations with a primary diagnosis of mental illness made up 5.9% of all general hospital separations, whereas those with a secondary diagnosis of mental illness made up 8.5%. In terms of days stayed, separations with a primary diagnosis of mental illness accounted for 12.9% of all general hospital days stayed, and those with a secondary diagnosis of mental illness accounted for 17.9% of hospital days stayed.



**Figure 1.9 Total General Hospital Separations Involving Primary or Secondary Diagnosis of Mental Illness, 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

The most common category of secondary diagnosis among the mental illnesses was substance related disorders. As a most responsible diagnosis, substance related disorders were less than one percent of all general hospital separation, however as a secondary diagnosis, they were involved in 3.5 percent of separations. To investigate further, patients with and without substance related disorders as a secondary diagnosis were compared. Table 1.7 illustrates this comparison. Patients with a co-occurring substance related disorder constituted 19.6% of separations with a primary diagnosis of mental illness. They were on average younger than those without substance related disorders, and they were

more likely to be males. Also, patients with a co-occurring substance use disorder had shorter lengths of stay than those without. Although this may appear counterintuitive, it is probably due in part to the high proportion of separations that were associated with a primary diagnosis of substance disorder, and is consistent with certain evidence (Ries et al. 2000) that suggests shorter stays for this population. On average, separations with a primary diagnosis of substance related disorders tended to have the shortest lengths of stay of all the diagnosis categories.

**Table 1.6 Comparisons of Mental Illness Separations With and Without Co-Occurring Substance Related Disorders, 2003–2004 (General Hospitals)**

	Without Co-Occurring Substance Related Disorders (%)	With Co-Occurring Substance Related Disorders (%)
<b>Age Group (Year)</b>		
0–14	3.7	0.9
15–24	14.8	20.9
25–44	34.6	46.7
45–64	26.2	24.9
65 +	20.6	6.7
<b>Average Age (Years)</b>	<b>45.6</b>	<b>38.5</b>
<b>Gender</b>		
Female	55.3	36.3
Male	44.7	63.7
<b>LOS (Days)</b>		
1 Day	12.9	12.6
1 Week	32.0	37.1
1 Month	36.5	36.1
1 Year	17.9	13.7
More than 1 year	0.8	0.5
<b>ALOS (Days)</b>	<b>37.9</b>	<b>21.5</b>
<b>Diagnosis Category (Primary)</b>		
Organic Disorders	11.2	3.1
Substance Related Disorders	12.0	24.6
Schizophrenic and Psychotic Disorder	21.3	20.4
Mood Disorders	32.9	30.2
Anxiety Disorders	4.9	3.2
Personality Disorders	3.6	5.6
Other Disorders	14.1	13.0
<b>Total</b>	<b>80.4</b>	<b>19.6</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

## Alternate Level of Care (ALC) in General Hospitals

To explore hospital stays in greater detail, alternate level of care (ALC) days were examined for general hospital separations with a primary diagnosis of mental illness. The data for psychiatric hospitals did not include an index of ALC days, and so these were not included in the analysis. ALC days are the number of days spent in acute care after it has been determined that acute care is no longer necessary. It has been suggested that ALC days may represent inefficiencies in the use of hospital resources, as well as the broader mental health care system, as they indicate an inability to transfer an individual to a more appropriate level of care (Ontario Hospital Report, Mental Illness, 2004). This may be due to the lack of available facilities beyond acute care or inadequate transfer procedures.

Of almost 1.8 million general hospital days stayed for mental illness (excluding Quebec, Nunavut, and the Yukon, which did not report ALC days) 11.9% were ALC days. In terms of average days stayed, this equated to 1.7 out of every 14.3 days stayed when all separations were considered.

The duration of general hospital stays for those with ALC days were significantly longer than stays for those without. When only those separations with ALC were considered, the ALOS was over 54 days, and the average length of ALC stays were 32.5 days. Table 1.2 presents data on ALC days by diagnosis category. A breakdown of ALC days across jurisdictions is provided in chapter 2.

Although there is evidence of relatively longer hospital stays among separations that involved ALC days, the issue seemed to pertain largely to those separations with a primary diagnosis of organic disorders. The majority of separations with ALC days (71.3%) had a primary diagnosis of organic disorder. However, within the remaining diagnosis categories, ALC days were only evident for about 1% of separations.

**Table 1.7 Separations, Total Length of Stay, Total Acute Length of Stay, ALC Stay and Their Averages by Diagnosis Category (General Hospitals), 2003–2004**

Diagnosis Category	Separations	Total LOS (Days)	Acute LOS (Days)	ALC (Days)	ALOS (Days)	ALOS in Acute Care (Days)	ALOS in ALC (Days)
Organic Disorders	4,566	237,760	86,075	151,685	52.1	18.9	33.2
Substance Related Disorders	371	16,995	6,779	10,216	45.8	18.3	27.5
Schizophrenic and Psychotic Disorders	549	41,927	21,198	20,729	76.4	38.6	37.8
Mood Disorders	681	38,499	20,880	17,619	56.5	30.7	25.9
Anxiety Disorders	56	2,904	1,365	1,539	51.9	24.4	27.5
Personality Disorders	31	1,424	531	893	45.9	17.1	28.8
Other Disorders	148	8,148	2,637	5,511	55.1	17.8	37.2
<b>Total</b>	<b>6,402</b>	<b>347,657</b>	<b>139,465</b>	<b>208,192</b>	<b>54.3</b>	<b>21.8</b>	<b>32.5</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

Excludes Quebec, Nunavut, and the Yukon Territory



## **Summary**

The chapter provided an overview of hospital mental health services by reporting on separations and lengths of hospital stays for seven categories of primary diagnosis. The descriptive analyses in this chapter highlight differences in the numbers and rates of separations, and hospital days stayed as a function of hospital type, age and gender. Over half of all hospital days stayed for a mental illness were spent in psychiatric hospitals, although less than 15% of separations came from psychiatric hospitals. This can be understood in light of the fact that the largest category of separations from psychiatric hospitals, by primary diagnosis, was schizophrenic and psychotic disorders. These are among the most severe types of illnesses, and their treatment often involves prolonged hospitalizations. Among general hospital separations, ALC days constituted almost 12% of days stayed for a mental illness, however the situation was really only relevant for separations based on organic disorders. For general hospitals, the largest category of separations was mood disorders. In terms of their impact mood disorders were consistent across both age and gender. Mood disorders made up a significant proportion of separations across all of the age categories, from childhood to old age, and—although more prominent among hospital mental health services for females—constituted the largest proportion of separations for both genders. These analyses invite more detailed investigations of the relationships outlined here.

## References

- Bland R. C. (1997). Epidemiology of affective disorders: a review. *Canadian Journal of Psychiatry, 42*, 367–77.
- Canadian Institute for Health Information. (2004). *DAD Abstracting Manual*. Ottawa: Canadian Institute for Health Information.
- Dewa C. S., Rochefort D. A., Rogers J., Goering P. (2003). Left behind by reform: the case for improving primary care and mental health system services for people with moderate mental illness. *Applied Health Economics and Health Policy, 2*, 43–54.
- Government of Canada (2006). *The Human Face of Mental Illness*. Ottawa: Government of Canada.
- Kessler R. C., Chiu W. T., Demler O., Walters E. E. (2005). Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry, 62*, 617–27.
- Offord D. R., Boyle M.H., Campbell D., Goering P., Lin E., Wong M., & Racine, Y. A. (1996). One-year prevalence of psychiatric disorder in Ontarians 15 to 64 years of age. *Canadian Journal of Psychiatry, 41*, 559–563.
- Ontario Hospital Report. (2004). *Hospital Report 2004: Mental Health*. Toronto: Ontario Hospital Report Research Collaborative.
- Ries, R. K., Russo, J., Wingerson, D., Snowden, M., Comtois, K. A., Srebnik, D., Roy-Byrne, P. (2000). Shorter hospital stays and more rapid improvement among patients with schizophrenia and substance disorders. *Psychiatric Services, 51*, 210–215.

## Chapter Two—Provincial/Territorial/ Regional Perspective

The main challenge of presenting an overview of provincial/territorial/regional analyses is to provide descriptive insight into the characteristics of mental health services in a province/territory/region, without inviting unwarranted comparative inferences. Differences among jurisdictions may arise from numerous structural, political, economic and other factors, interacting with each other in complex and largely unknown ways. They should thus be interpreted with caution.

New to the present report is the inclusion of regional level data for a number of key indicators of hospital mental health service usage. Regional boundaries were defined according to health region codes<sup>ii</sup>, and included areas with a population of 75,000 or greater. Examining the data at a regional level, it becomes apparent that much variation in the main indicators exists within provinces.

Table 2.1 also includes crude and age-standardized separation rates. Since these were, ordinarily, very similar only the latter will be discussed here. The age-standardize separation rate for both hospital types combined ranged from a high of 1477.6 per 100,000 population in the Northwest Territories to 258.4 separations per 100,000 population in Nunavut. These two jurisdictions also had the highest and lowest age adjusted separation rates respectively for general hospitals.

The rates for psychiatric hospitals appeared to be more varied. For the territories, there were no psychiatric hospital separations reported, as no such facilities existed there. The age-standardized rate ranged from a low of 17.0 separations per 100,000 population in British Columbia, to a high of 264.4 separations per 100,000 population in Newfoundland and Labrador. Among those jurisdictions in which there were psychiatric hospitals, the variation in rates likely reflect the availability and capacities of such facilities, as well as the jurisdictions' policies for assigning individuals with mental illness to hospital service. To illustrate this variation, in Newfoundland and Labrador 59.5% of mental health separations were from general hospitals. In all other jurisdictions where psychiatric hospitals existed, the figure was greater than 80%.

It should be noted that the data presented in Table 2.1 are based on the jurisdictional location of the facilities that submitted data, rather than on the location of patients' residence. Thus the absence of psychiatric hospital data for the three territories is a result of the fact that no psychiatric hospitals existed in the territories. Provincial/territorial data based on the jurisdiction of patients' residence are available in Table 1 of Appendix D, for general hospital separations.

---

ii. Health regions were defined in accordance with the methodologies used in the 2006 Health Indicators report (CIHI and Statistics Canada, 2006), and were based on patients' region of residence. This is different from the determination based on the province in which the facility is located, that is used for Table 2.1 and elsewhere in this chapter.

**Table 2.1 Separations Frequencies and Rates by Hospital Type and Province/Territory, 2003–2004**

	Psychiatric Hospitals			General Hospitals			All Hospitals		
	Number of Separations	Crude Rate/100,000 population	Age Standardized Rate*/100,000	Number of Separations	Crude Rate/100,000 population	Age Standardized Rate*/100,000	Number of Separations	Crude Rate/100,000 population	Age Standardized Rate*/100,000
N.L.	1,403	269.7	264.4	2,057	395.4	377.9	3,460	665.2	642.3
P.E.I.	266	192.8	191.0	1,441	1,044.6	1,020.4	1,707	1,237.5	1,211.3
N.S.	560	59.8	59.2	3,949	421.5	399.7	4,509	481.3	458.9
N.B.	203	27.1	28.7	5,779	770.1	704.8	5,982	797.1	733.5
Que.	5,969	79.5	76.7	40,515	539.9	508.4	46,484	619.5	585.1
Ont.	13,242	107.8	105.3	54,889	447.0	435.0	68,131	554.8	540.3
Man.	542	46.6	48.3	7,479	642.5	620.0	8,021	689.0	668.3
Sask.	213	21.4	24.3	6,392	642.4	634.8	6,605	663.8	659.1
Alta.	2,882	91.1	90.1	17,332	547.7	540.4	20,214	638.8	630.5
B.C.	729	17.5	17.0	25,828	621.1	602.6	26,557	638.6	619.6
Y.T.				205	653.5	686.2	205	653.5	686.2
N.W.T.				608	1,446.2	1,477.6	608	1,446.2	1,477.6
Nun.				79	269.1	258.4	79	269.1	258.4
<b>Canada</b>	<b>26,009</b>	<b>82.0</b>	<b>80.3</b>	<b>166,553</b>	<b>525.2</b>	<b>506.1</b>	<b>192,562</b>	<b>607.2</b>	<b>586.4</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

\*Based on Statistics Canada's Canadian Population Estimates for 2003–2004.

Standard Population for Age-standardize Rate: 1991 Canadian Population.

Data are based on the location of the facility.

Figure 2.1 illustrates the proportions of separations by diagnosis category for each jurisdiction. The consistent prominence of mood disorders across age and gender that was discussed in Chapter 1 is demonstrated across jurisdictions. In twelve of the thirteen jurisdictions, mood disorders made up the largest proportion of hospital mental health separations. The exception, as in the previous fiscal year, was the Northwest Territories, where almost half of separations had a diagnosis of substance related disorders. Beyond mood disorders, there appeared to be some variation in the proportional ranking of separations by diagnoses categories. In most jurisdictions, schizophrenic and psychotic disorders, and substance related disorders also represented a significant proportion of the separations.

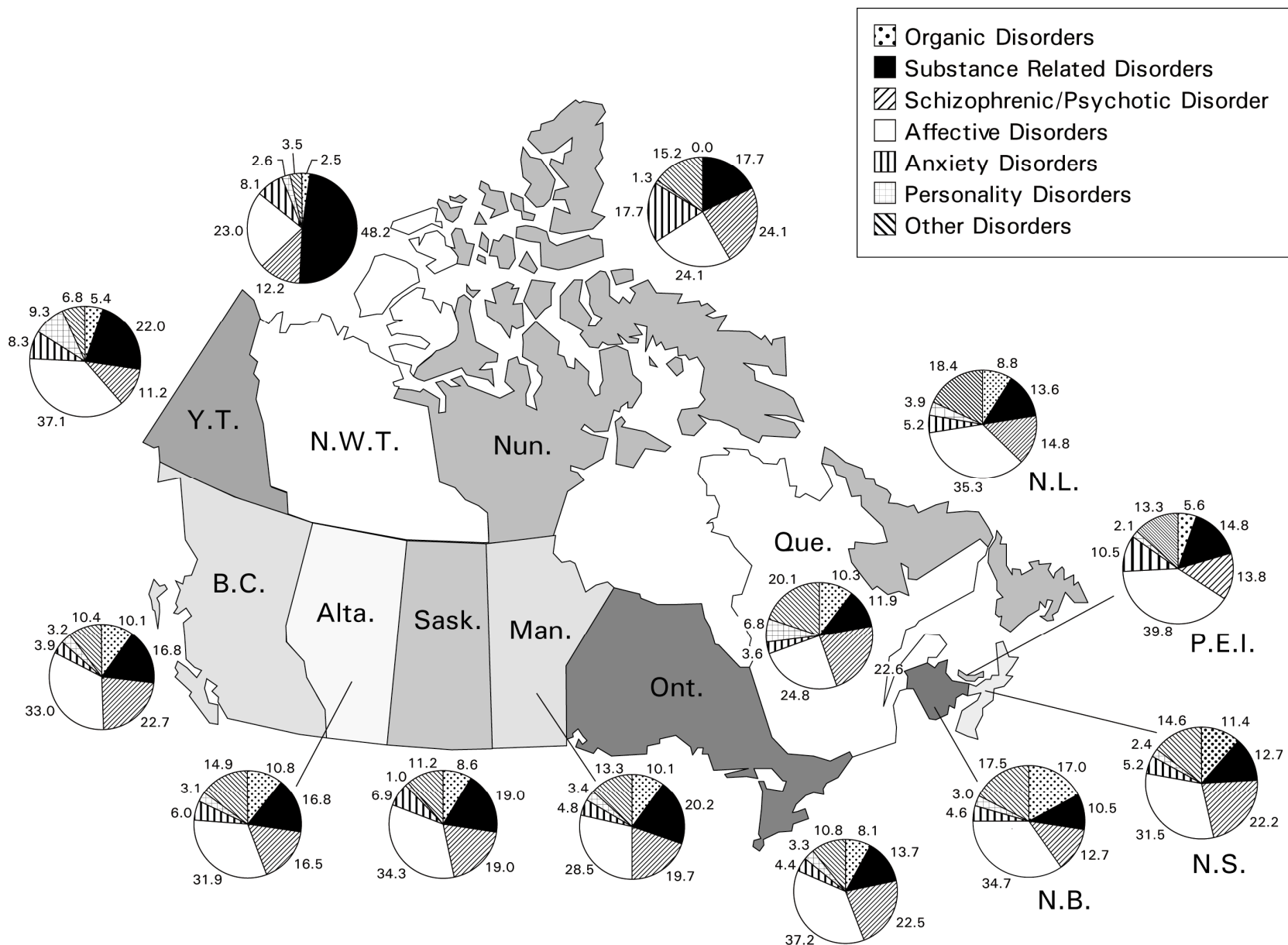
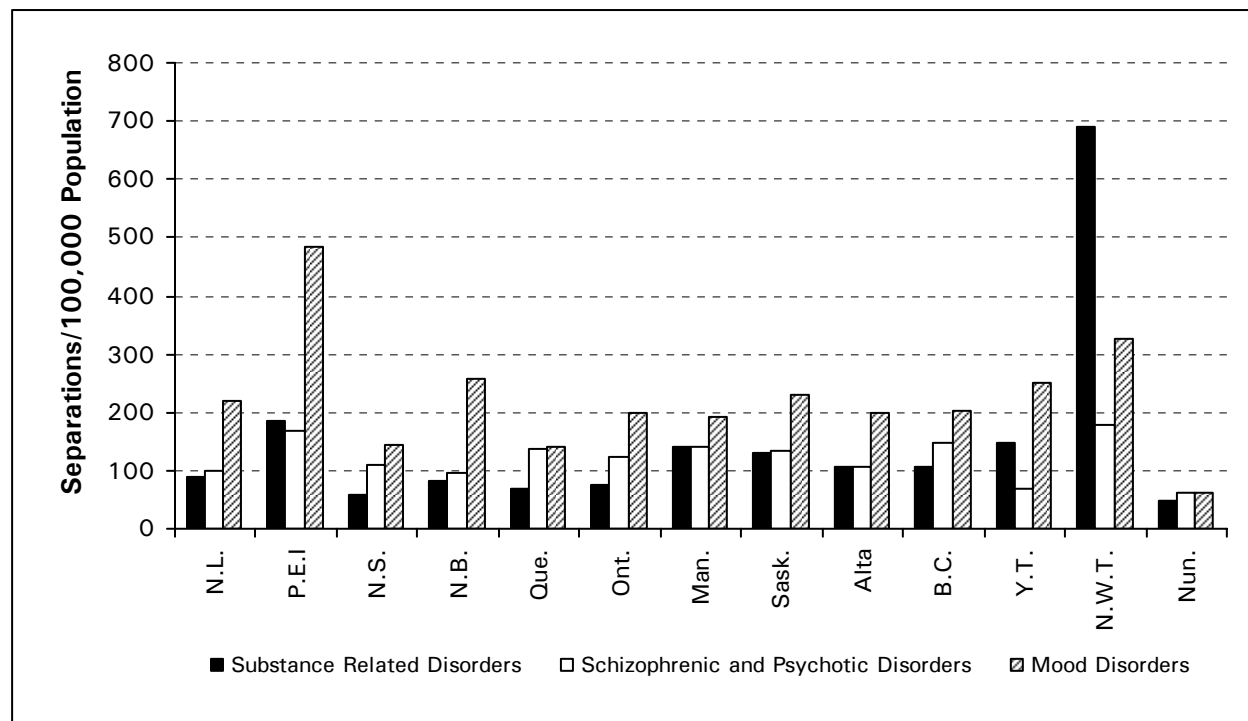


Figure 2.1 Proportion of Separations by Province/Territory, 2003–2004

The jurisdictional age-standardize rates for substance related disorders, schizophrenic and psychotic disorders, and mood disorders are charted in figure 2.2. The rates reflect the pattern observed in figure 2.1 for the three most common diagnosis categories.



**Figure 2.2 Age-Standardized Separation Rates per 100,000 Population by Select Diagnosis Categories for Provinces and Territories (General and Psychiatric Hospitals), 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

Data on lengths of stay offer some perspective on the amount of hospital services used within a given fiscal year. However, longer or shorter lengths of stay do not necessarily imply a difference in service quality, nor do they imply what are appropriate or best health care practices for the treatment of a mental illness.

The differences observed between the ALOS (average or mean length of stay) and the median LOS, suggest that the former was influenced by separations with relatively long stays. This appears to be particularly significant for the ALOS in psychiatric hospitals, as the number of separations was small and therefore susceptible to the influence of extreme scores. The variation between jurisdictions in the median length of stay, which is not influenced by extreme scores, was greatly reduced in comparison with variation in the mean.

Overall, Quebec had the largest number of hospital days stayed at over 2.3 million, followed by Ontario at over 1.9 million. Quebec and Ontario also had the largest numbers of days stayed for both psychiatric and general hospitals. Among the provinces, only

P.E.I., Nova Scotia, New Brunswick, and Saskatchewan had a larger number of hospital days stayed in general hospitals than in psychiatric hospitals. The longest and shortest lengths of stay for both hospital types combined appeared to be in Quebec and Nunavut, respectively. The median length of stay ranged from 12 days in Newfoundland and Labrador and Quebec, to 2 days in the Northwest Territories and Nunavut. The ALOS ranged from 51 days in Quebec to 3 days in Nunavut.

For separations from psychiatric hospitals, the range of the median was from 85 to 10 days, and the ALOS was from 622 and to 19 days for British Columbia and P.E.I., respectively. For separations from general hospitals the ranges were smaller, and for most jurisdictions were about one week. The range for the median length of stay was from 11 days (Quebec) to 2 days (Nunavut and Northwest Territories). The range for the ALOS was from 23 days in Quebec and New Brunswick, to 3 days in Nunavut.

**Table 2.2 Total Patient Days, Average Length of Stay, and Median Length of Stay Related to Mental Illness Separations, 2003–2004**

	Psychiatric Hospitals			General Hospitals			All Hospitals		
	Total Days	ALOS*	Median LOS <sup>†</sup>	Total Days	ALOS*	Median LOS <sup>†</sup>	Total Days	ALOS*	Median LOS <sup>†</sup>
N.L.	86,048	61	18	37,826	18	9	123,874	36	12
P.E.I.	4,995	19	10	14,121	10	5	19,116	11	6
N.S.	30,199	54	12	75,012	19	7	105,211	23	7
N.B.	27,266	134	27	132,446	23	9	159,712	27	9
Que.	1,444,326	242	24	939,532	23	11	2,383,858	51	12
Ont.	1,238,095	94	26	684,125	13	7	1,922,220	28	8
Man.	217,345	401	21	164,673	22	8	382,018	48	9
Sask.	39,177	184	22	84,900	13	7	124,077	19	7
Alta.	319,999	111	27	285,084	16	8	605,083	30	9
B.C.	453,635	622	85	386,201	15	6	839,836	32	7
Y.T.				1,431	7	4	1,431	7	4
N.W.T.				11,606	19	2	11,606	19	2
Nun.				250	3	2	250	3	2
<b>Canada</b>	<b>3,861,085</b>	<b>149</b>	<b>25</b>	<b>2,817,207</b>	<b>17</b>	<b>8</b>	<b>6,678,292</b>	<b>35</b>	<b>9</b>

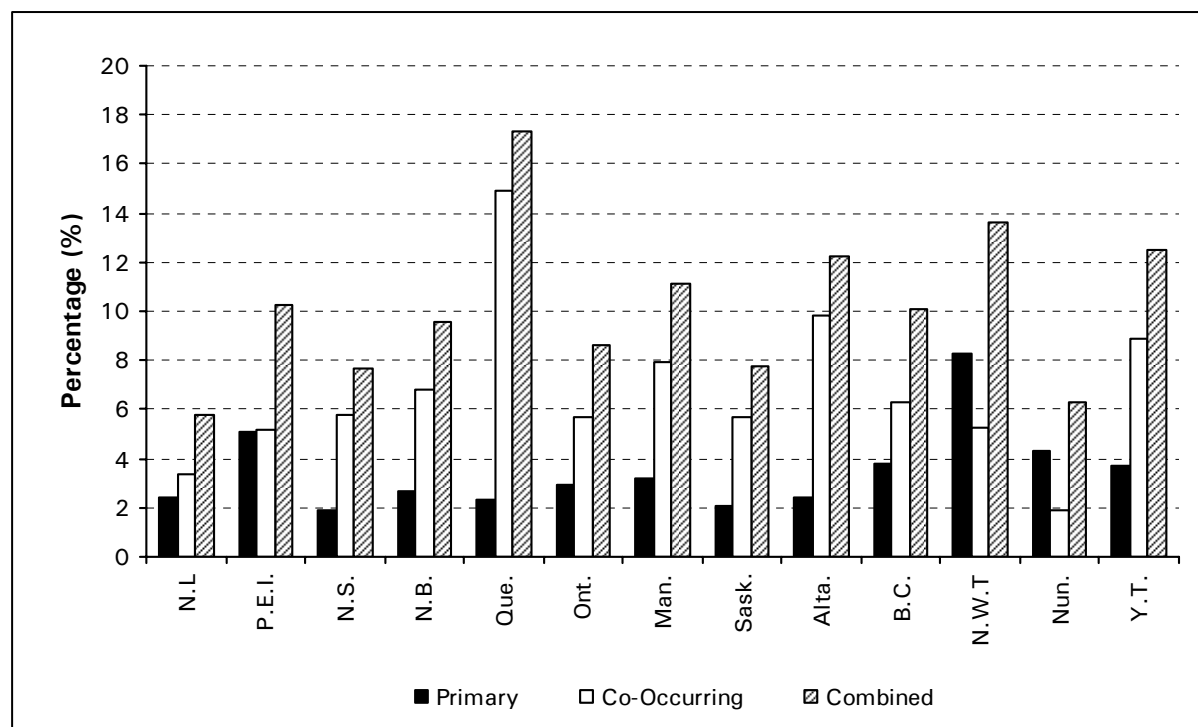
Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

\* ALOS—Average Length of Stay.

† LOS—Length of Stay.

## Secondary Diagnoses

The proportion of all general hospital separations with either a primary or a secondary diagnosis of mental illness ranged from 5.8% in Newfoundland and Labrador, to 17.3% in Quebec. With the exception of Nunavut and the Northwest Territories, mental illnesses were more often diagnosed as a secondary rather than a primary condition. Mental illness as a secondary diagnosis associated with a non-mental illness may have developed as a result of the primary illness, or may have existed independently of the primary illness.



**Figure 2.3 Proportion of General Hospital Separations With a Psychiatric Diagnosis by Provinces and Territories, 2003–2004**

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

## Regional Data

Regional<sup>iii</sup> level data for general hospitals are presented in Table 1 of Appendix D. The table contains counts of separations and hospital days stayed, as well as ALOS, separation rates, and percentage of days spent in ALC for separations with a primary diagnosis of mental illness. These basic indicators of hospital mental health services are presented for all health regions in Canada with a population greater than 75,000. As such, they offer an account of the variation in services that exist across regions and within provinces.

iii. Regional data is based on individuals' region of residence, and not region of hospitalization.



## Alternate Level of Care

As discussed in Chapter 1, alternate level of care (ALC) days are an indicator of general hospital days stayed after acute care has been deemed to be no longer necessary. The proportion of hospital days in ALC varied across jurisdictions. Among the jurisdictions that reported ALC, the highest percentage of hospital days stayed attributable to ALC was in Nova Scotia (18.4%), and the lowest percentage was in Saskatchewan (5.4%).

**Table 2.3 Separations with ALC, ALC Days, Percentage of Days Stayed in ALC, and ALC per Separation for Provinces and Territories (General Hospitals), 2003–2004**

	Separations with ALC	ALC Days	% of Days Stayed in ALC	ALC per Separation (Days)
N.L.	2,043	4,557	12.9	2.2
P.E.I.	1,440	924	6.7	0.6
N.S.	3,943	13,768	18.4	3.5
N.B.	5,481	10,339	11.9	1.9
Ont.	54,889	74,743	10.9	1.4
Man.	7,214	17,454	11.5	2.4
Sask.	4,834	2,991	5.4	0.6
Alta.	17,058	26,671	9.9	1.6
B.C.	25,812	56,489	15.1	2.2
N.W.T.	600	256	6.8	0.4
<b>Canada</b>	<b>123,314</b>	<b>208,192</b>	<b>11.9</b>	<b>1.7</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

Note: Que., Nun. and Y.T. did not submit ALC days.

In addition to having a role as a primary or most responsible hospital separation diagnosis, mental illnesses are more often involved as a secondary diagnosis. Therefore, to gain an appreciation for the scope of mental illness in hospitalization more broadly, the separation rate for mental illness as either a primary or a secondary diagnosis was examined. Figure 2.3 presents the percentage of all general hospital separations that were associated with mental illness for each jurisdiction. The categories represent separations with a most responsible or primary diagnosis of mental illness, those with a secondary or co-occurring diagnosis of mental illness—but no primary diagnosis of mental illness, and the total of the first two categories.

## **Summary**

The chapter provided provincial and regional analyses of some indicators of hospital service use for separations with a primary diagnosis of mental illness. The variations in hospital separation rates and lengths of stay that were observed between provinces were also evident between regions within provinces. Consistent, however, was the prominence of mood disorders as the most frequently observed hospital separation diagnosis for mental illness.

# Chapter Three—General Hospital Readmissions

## Introduction

For the first time in CIHI's *Hospital Mental Health Services in Canada* series, this year's report presents information on hospital readmissions and their relationship to mental illness. In this chapter, readmissions are examined for patients who were discharged from general hospitals and whose primary diagnosis in the index episode<sup>iv</sup> was a mental illness. Data required for this analysis were obtained from the Discharge Abstract Database (DAD) and Hospital Morbidity Database (HMDB). Both data holdings are maintained by CIHI.

Readmissions represent a potentially important indicator for the assessment of mental health services for a number of reasons (Hermann et al., 2004). An unplanned readmission to hospital inpatient mental health services is generally considered an undesirable event (Nelson, Maruish, & Axler, 2000; Cougnard et al., 2005). Readmissions often coincide with a disruption of treatment and rehabilitation regimes, and may signal instability and a recurrence of severe symptoms of a disease. In addition to its disruptive effect, a return to inpatient hospitalization generally represents a much greater expense than the continuation of outpatient or community treatment services (Jacobs et al., 2006).

As a measure of system level quality of care, hospital readmission has been examined in the context of availability of outpatient services and discharge planning (Nelson et al., 2000), community treatment orders (Burgess et al, 2006; Kisely et al. 2005) and the adequacy of index hospital stay (Lyons et al 1997). In terms of patient and clinical characteristics, readmissions have been linked with a lack of compliance with prescribed medications, concurrent alcohol and drug use (Haywood et al., 1995), comorbid personality disorders (Bobo et al. 2004) and inadequacy of social supports (Dyck et al, 2002).

The chapter provides descriptive statistics on readmission rates during a 1-year period between fiscal 2002 and 2004 among individuals discharged from acute care facilities with a mental illness diagnosis. The assessment of readmissions was based exclusively on general hospital discharges, and therefore excludes those hospital separations that were from psychiatric hospitals. As well, a number of comparisons of patients readmitted within 1 year of an index episode are provided to further characterize these individuals. Included are comparisons of readmissions for individuals with and without a diagnosis of mental illness, comparisons of individuals with and without a co-occurring diagnosis of mental illness, and a more specific comparison of individuals with and without dual diagnosis (a mental illness and a co-occurring substance related disorder). The patient groups were compared in terms of their probability of readmission.

---

iv. The index episode refers to the first or initial episode in the observed series of hospitalization that is followed by a readmission.

A number of key findings are presented in this chapter. First, individuals with a primary diagnosis of mental illness were more likely to be readmitted to a hospital in the year after an index episode when compared to individuals with non-mental illness as a primary diagnosis. Second, the probability of readmission for those diagnosed with mental illness tended to be higher for older individuals. Third, readmission within one year was more likely for individuals who had longer lengths of hospital stay on their first or index admission. Fourth, differences in the probability of readmission as a function of diagnosis category were observed. Finally individuals with a combinations of diagnoses (such as co-occurring mental illness or substance-related disorders) had a higher probability of readmission.

## Comparisons of General Hospital Incidence Rates of Readmission

Central to the investigation of readmissions was the question of how individuals hospitalized with mental illness compared to those individuals hospitalized for a non-mental illness. Table 3.1 presents the 1-year incidence rates or probabilities of readmissions by age, gender, and index length of stay for individuals hospitalized with a primary diagnosis of mental illness (grouped by those with and without a co-occurring psychiatric disorder).<sup>v</sup> In these analyses, the incidence rate can be understood as the probability that an individual would be readmitted to hospital during the year after an index hospitalization.<sup>vi</sup>

The key comparison suggests that individuals with a primary diagnosis of mental illness were more likely to be readmitted to a general hospital than individuals with a primary diagnosis that was a non-mental illness. Among those individuals with a primary diagnosis of mental illness, over one-third (37.0 of every 100) were readmitted to hospital within one year of an index discharge. This compares to just over one quarter of individuals (27.3 of every 100) among those whose primary diagnosis was other than a mental illness.

---

v. Incidence densities are provided in Table 2 of Appendix D.

vi. The incidence rates or probabilities discussed here are also known as the cumulative incidence. For a fuller discussion of 1-year incidence rates of readmissions see Appendix C.

**Table 3.1 Probability of 1-Year Readmission/100 persons (General Hospitals), 2003–2004**

	MI MRX Only (/100 persons)	MRX + Co-Occurring MI (/100 persons)	All MI MRX (/100 persons)	Non-MI MRX (/100 persons)
<b>Age Group</b>				
0–14	25.4	27.3	26.5	18.0
15–24	31.5	34.9	33.5	18.1
25–44	36.2	38.6	37.5	16.5
45–64	37.7	39.9	38.8	28.5
65+	39.8	37.4	38.7	40.7
<b>Gender</b>				
Female	37.2	39.4	38.3	24.9
Male	35.3	35.8	35.5	31.0
<b>LOS (Days)</b>				
1 <= LOS <= 7	34.6	36.1	35.4	23.7
LOS > 8	38.0	39.0	38.5	42.5
<b>Total</b>	<b>36.3</b>	<b>37.6</b>	<b>37.0</b>	<b>27.3</b>

Source: DAD/HMDB, CIHI, 2002–2003 and 2003–2004. Discharge Abstract Database/Hospital Morbidity Database 2002–2003 and 2003–2004, Canadian Institute for Health Information.

MRX: Most Responsible Diagnosis.

MI: Mental Illness.

The higher probability of readmission for those with a mental illness diagnosis was consistent across gender (females had a higher rate of readmissions than males), and across most age categories when compared to individuals with a non-psychiatric primary diagnosis. Comparative analysis of individuals with and without a primary diagnosis of mental illness were conducted using incidence densities to assess the rate of readmissions as a function of the time individuals were at risk. The findings corroborate those presented in Table 3.1, and are detailed in Table 3 in Appendix D.

## Age

Comparisons across age groups suggest a higher risk of readmission to a general hospital with an increase in age. The incidence rates were lowest for those in the 0 to 14 year age group and highest in the 45 to 64 and the 65 and over age groups. Incidence rates for readmissions were higher among those with a primary diagnosis of mental illness in all but the 65 year and over age category.

## Length of Hospital Stay

The relationship between how long individuals stay in hospital for a mental illness and the likelihood that they will be readmitted is a complex one. The simple comparison provided in Table 3.1 suggests that longer hospital stays were related to a higher probability of readmission. The probability of readmission was lower among those whose index hospital length of stay (LOS) was 7 days or less, than among those whose index hospital LOS was 8 days or greater. Among those with a primary diagnosis of mental illness, the probability of readmission was about 8.8% higher for those whose index episode of hospitalization lasted 8 days or longer. However, this difference was far greater (79%) among those hospitalized for a non-mental illness.

The nature of the relationship between the duration of hospital stays for a mental illness and the likelihood of readmission has received some attention, as it has been proposed that it may reflect on the adequacy of the services provided to patients (Appleby et al., 1993; Lyons et al., 1996). It is unclear however, what the precise nature of this relationship is, and whether it reflects on adequacy of hospital service, the severity of the illness (Cognard et al, 2006), adequacy of follow-up services (Nelson, Maruish, & Axler, 2000; Dyck et al. 2002), level adherence to prescribed medication (Haywood et al, 1995), or substance use among other mechanisms (Callaghan, 2003).

## Confirmatory Analysis

Cox proportional hazard regression was conducted to further assess the differences observed in rates of readmission to a general hospital between individuals with and without a primary diagnosis of mental illness. Hazard ratios for this particular model represent the risk of hospital readmission for those with a most responsible diagnosis of mental illness compared to those with other diagnoses when age, gender, and hospital length of stay are controlled. Adjusted hazard ratios and 95% confidence intervals are presented in Table 3.2.<sup>vii</sup> The adjusted hazard ratios reflect the ratio of readmission for those hospital patients discharged with a primary diagnosis of mental illness, as compared to those discharged with a primary diagnosis of non-mental illness when age, gender, and hospital length of stay are controlled. A hazard ratio greater than 1.0 suggests a proportionately higher rate of readmission for those with a primary diagnosis of mental illness, whereas a hazard ratio less than 1.0 suggests a proportionately higher rate of readmission for individuals with a primary diagnosis of non-mental illness.

Overall, the adjusted hazard ratio was 1.35, and was statistically significant. This suggests that individuals with a primary diagnosis of mental illness had a probability of hospital readmission that was 35% greater than those individuals with non-psychiatric primary diagnoses. The results also indicate that individuals with a primary diagnosis of mental illness had a significantly higher rate of readmission among all age categories listed in Table 3.2, except the 65 years and older group. In the case of the latter, individuals with a primary diagnosis of mental illness had a significantly lower probability of hospital readmission than those without a mental illness.

---

vii. A more detailed version of this table is available as Table 3 in Appendix D.

**Table 3.2 Adjusted Hazard of Readmission for Patients Admitted for a Most Responsible Diagnosis of Mental Illness in the First Admission (General Hospitals), 2003–2004**

	Adjusted HR	95% CI
<b>Age Group (Year)</b>		
0–14	1.44	(1.35, 1.53)
15–24	1.59	(1.54, 1.64)
25–44	1.73	(1.70, 1.77)
45–64	1.24	(1.22, 1.27)
65 +	0.86	(0.85, 0.88)
<b>Total</b>	1.35	(1.34, 1.37)

Source: DAD/HMDB, CIHI, 2002–2003 and 2003–2004. Discharge Abstract Database/Hospital Morbidity Database 2002–2003 and 2003–2004, Canadian Institute for Health Information.

HR: Hazard Ratio.

CI: Confidence Interval.

## Probabilities of Readmission by Diagnoses

A breakdown of readmission probabilities by age and most responsible diagnosis in the index episode of hospitalization is presented in Table 3.3,<sup>viii</sup> Readmissions were more strongly associated with certain diagnosis categories than with others. Individuals with a personality disorder had the highest risk of 1-year readmission. Out of every 100 people hospitalized for a personality disorder almost 45 were readmitted to hospital within 1 year. Across diagnosis categories, older individuals tended to have a higher risk of readmission than younger individuals. The exception to this pattern was observed among those diagnosed with schizophrenia, who had higher risks of readmission for younger individuals and lower risks among older individuals. Also, individuals with a co-occurring mental illness had a higher risk of readmission than those without a co-occurring mental illness in all diagnosis categories except organic disorders.

viii. Incidence densities are provided for diagnosis categories in Table 4 of Appendix D.

**Table 3.3 Risk (/100 persons) of 1-Year Readmission Among Patients With and Without Co-Occurring Mental Illness, 2003–2004**

	<b>With Co-Occurring MI (/100 persons)</b>	<b>Without Co-Occurring MI (/100 persons)</b>	<b>All MI (/100 persons)</b>
<b>Organic Disorders</b>	<b>32.5</b>	<b>35.7</b>	<b>34.2</b>
0–14	–	–	–
15–24	37.8	27.3	32.6
25–44	32.8	35.7	34.2
45–64	35.3	38.3	36.6
65+	32.2	35.6	34.1
<b>Substance Related Disorders</b>	<b>38.0</b>	<b>35.2</b>	<b>36.8</b>
0–14	23.2	12.2	15.5
15–24	33.4	23.1	29.2
25–44	37.1	34.6	36.1
45–64	40.9	39.3	40.2
65+	42.7	43.6	43.2
<b>Schizophrenia and Psychotic Disorders</b>	<b>42.2</b>	<b>40.2</b>	<b>41.1</b>
0–14	35.7	58.0	46.2
15–24	42.7	42.9	42.8
25–44	43.3	40.1	41.5
45–64	40.3	39.7	40.0
65+	40.4	37.9	38.9
<b>Affective Disorders</b>	<b>39.2</b>	<b>37.2</b>	<b>38.2</b>
0–14	35.2	30.2	33.1
15–24	35.9	30.0	33.3
25–44	38.8	36.6	37.8
45–64	40.3	37.8	39.0
65+	43.9	45.7	44.9
<b>Anxiety Disorders</b>	<b>37.0</b>	<b>34.0</b>	<b>35.6</b>
0–14	29.5	18.4	24.8
15–24	29.8	32.6	30.9
25–44	35.6	31.8	34.0
45–64	43.4	29.2	36.5
65+	46.9	47.5	47.3
<b>Personality Disorders</b>	<b>44.6</b>	<b>44.2</b>	<b>44.5</b>
0–14	–	–	–
15–24	41.5	39.4	40.8
25–44	45.0	44.7	44.9
45–64	46.8	46.3	46.7
65+	46.3	58.1	50.4
<b>Other Disorders</b>	<b>31.3</b>	<b>27.0</b>	<b>29.7</b>
0–14	23.7	25.0	24.2
15–24	28.4	25.6	27.3
25–44	33.2	24.6	30.5
45–64	35.1	29.1	33.2
65+	37.3	38.8	38.0

Source: DAD/HMDB, CIHI, 2002–2003 and 2003–2004. Discharge Abstract Database/Hospital Morbidity Database 2002–2003 and 2003–2004, Canadian Institute for Health Information.

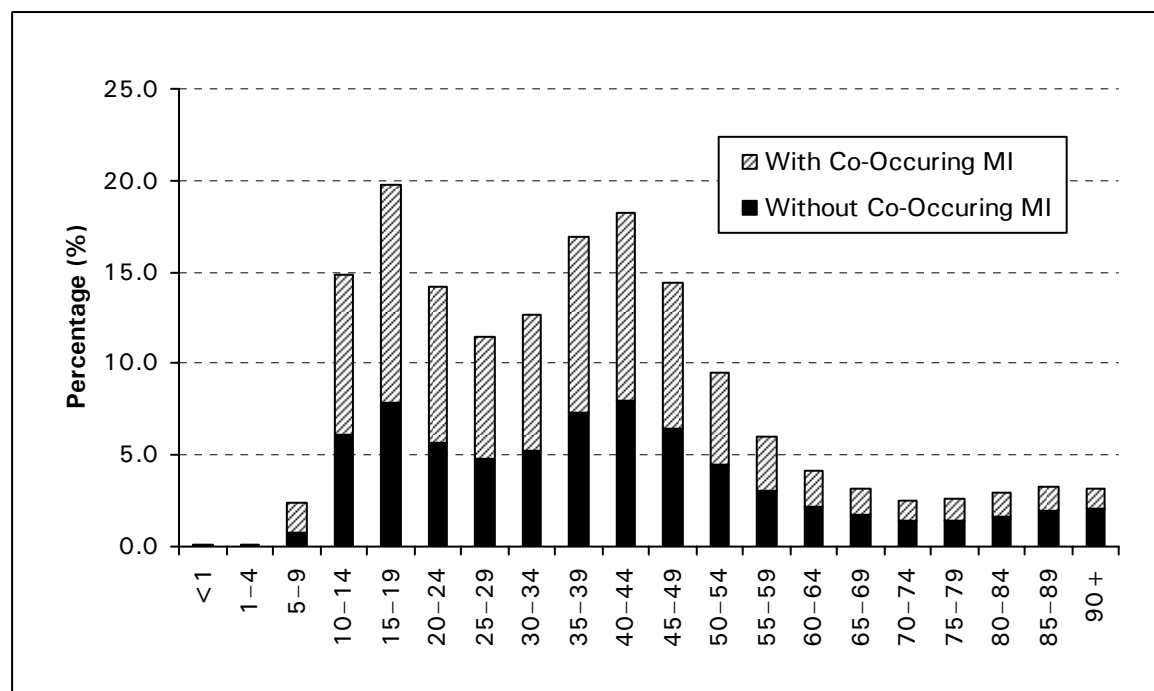
MI: Mental Illness.



## **Co-Occurring Mental Illness**

The presence of co-occurring mental illnesses has been linked to higher probabilities of hospital readmission (Hendryx et al., 2003), although not necessarily to a greater number of hospital days stayed (Blow et al., 1998). It is this picture that was in evidence for the data examined here. The group of individuals with a co-occurring mental illness (i.e. two or more mental illness diagnoses) had a higher probability of readmission to a general hospital than those without. Although this difference was smaller than that observed between those with and without a primary diagnosis of mental illness. Recall, also, that in Chapter 1, it was found that separations that had co-occurring mental illness had shorter stays on average than those without co-occurring mental illnesses.

Readmissions for mental illness made up a considerable proportion of all general hospital readmissions. Figure 3.1 presents the percentage of individuals readmitted to hospital for a mental illness within one year of an index hospitalization, as a proportion of all general hospital readmissions. Readmissions were particularly common in the ages between adolescence and middle adulthood. Between the ages of 10 and 49 years, individuals that had a primary diagnosis of mental illness made up over 10% of all general hospital readmissions consistently. The proportion was highest in the 15 to 19 year age category (19.8%). The split between those with and those without a co-occurring mental illness indicated that the former group made up a larger proportion of readmitted cases among those between the ages of 10 and 54. For those 55 and older, the opposite was the case, in that individuals without a co-occurring mental illness made up the majority of readmitted cases.



**Figure 3.1 Percentage of Readmission by Patients Admitted for MRDx of Mental Illness (General Hospitals), 2003–2004**

Source: DAD/HMDB, CIHI, 2002–2003 and 2003–2004. Discharge Abstract Database/Hospital Morbidity Database 2002–2003 and 2003–2004, Canadian Institute for Health Information.

## Dual Diagnosis and Readmission

What are commonly termed dual diagnoses refer to mental illnesses and co-occurring substance related disorders. The frequency and persistence of the relationship between the two has been shown to compromise the efficacy of treatments (Kessler et al. 1996; Minkoff, 2001), and generally to have reciprocal deleterious impacts on the severity and course of disorders (Kessler, 1995; Kessler, 2004). Estimates of the prevalence of substance related disorders among those with a mental illness vary, but lifetime prevalence may be over 50% (Kessler, 2004), and is higher among specific subgroups (Government of Canada, 2006). The implications for mental health service providers is that co-occurring substance disorders are to be expected and collaborative approaches to care, that involve alcohol and drug treatment services, may be required (Minkoff, 2001).

In Chapter 1, it was reported that among patients separated from general hospitals with a primary diagnosis of mental illness, 19.6% had a co-occurring substance use diagnosis. The proportion was also 19.6% when separations from psychiatric hospitals were considered. Furthermore, among the diagnosis categories, excepting substance related disorders as a primary diagnosis, personality disorders had the highest proportion of separations with a dual diagnosis (27.6%).

A comparison of probabilities of readmission for individuals from acute care facilities, with and without substance use disorders as secondary diagnosis, is provided in Table 4 of Appendix D. Overall, the probability of readmission was 6.8% higher among individuals

with a secondary diagnosis of substance related disorders. A higher rate of readmission for individuals diagnosed with a co-occurring substance related disorder was observed in all diagnosis categories except personality disorders.

The largest difference in probabilities of readmission based on the existence of a co-occurring substance related disorder was observed among individuals diagnosed with schizophrenia and psychotic disorders. In this diagnosis category, individuals with a co-occurring substance related disorders had a probability of readmission that was 16.8% higher than those without substance related disorders. This suggests that the impact of substances may have been particularly profound for those diagnosed with schizophrenia. In addition to diminishing adherence to prescribed medication and rehabilitation regimes (Drake et al, 1998), use and abuse of alcohol and illicit drugs can degrade the effectiveness of those anti-psychotic medications that are taken (Brunette et al., 2006; Brunette et al, 2003; Drake et al, 2000).

## Summary

The issue of hospital readmissions is particularly salient for individuals hospitalized for a mental illness. In this chapter, the rate of readmission among individuals discharged from a general hospital with a primary diagnosis of mental illness was assessed through a number of comparisons. Individuals discharged with a mental illness diagnosis had a rate of readmission within 1-year of discharge that was 35.5% higher than those with a non-mental illness. The rate of readmission for those diagnosed with mental illness tended to be higher for older individuals (excepting those over the age of 65), was higher for females than males, and was higher for individuals with longer lengths of hospital stay. Among the diagnosis categories, the risk of readmission was higher for individuals with a primary diagnosis of personality disorder.

Also, general hospital readmission rates were slightly higher for individuals with a co-occurring psychiatric diagnosis, than those without. A comparison of incidence rates for those individuals discharged with and without dual diagnosis revealed that, overall, individuals with a co-occurring substance related disorder had a higher rate of readmission than those without. This difference was particularly evident for individuals discharged with a primary diagnosis of schizophrenic and psychotic disorders.

## References

- Appleby, L., Desai, P. N., Luchins, D. J., Gibbons, R. D., Hedeker, D. R. (1993). Length of stay and recidivism in schizophrenia: a study of public psychiatric hospital patients. *American Journal of Psychiatry*, 150, 72–76.
- Blow, F. C., Barry, K. L., BootsMiller, B. J., Copeland, L. A., McCormick, R., & Visnic, S. (1998). Longitudinal assessment of inpatient use and functioning of seriously mentally ill veterans with and without co-occurring substance use disorders. *Journal of Psychiatric Research*, 32, 311–319
- Bobo, W. V., Hoge, C. W., Messina, M. A., Pavlovic, F., Levandowski, D., & Grieger, T. (2004). Characteristics of repeat users of an inpatient psychiatry service at a large military tertiary care hospital. *Military Medicine*, 169, 648–653.
- Brunette M. F., Drake R. E., Xie H., McHugo G. J., Green A. I. Schizophrenia Bulletin 2006 [Epub ahead of print] Clozapine Use and relapses of substance use disorder among patients with co-occurring schizophrenia and substance use disorders. *Schizophrenia Bulletin*.
- Brunette, M. F., Noordsy, D. L., Xie, H., & Drake, R. E. (2003). Benzodiazepine use and abuse among patients with severe mental illness and co-occurring substance use disorders. *Psychiatric Services*, 54, 1395–1401.
- Burgess, P., Bindman, J., Leese, M., Szmukler, G. (2006). Do community treatment orders for mental illness reduce readmission to hospital?: An epidemiological study. *Social Psychiatry and Psychiatric Epidemiology*. 41, 574–579.
- Callaghan, R. C. (2003). Risk factors associated with dropout and readmission among First Nations individuals admitted to an inpatient alcohol and drug detoxification program. *Canadian Medical Association Journal*, 169, 23–27.
- Cougnard, A., Parrot, M., Grolleau, S., Kalmi, E., Desage, A., Misdrahi, D. et al. (2006). Pattern of health service utilization and predictors of readmission after a first admission for psychosis: a 2-year follow-up study. *Acta Psychiatrica Scandinavica*, 113, 340–349.
- Drake R. E., McHugo G. J., Clark R. E., (1998). Assertive community treatment for patients with co-occurring severe mental illness and substance use disorder: a clinical trial. *American Journal of Orthopsychiatry*, 68, 201–215.
- Drake R. E., Xie H., McHugo G. J., et al: (2000). The effects of clozapine on alcohol and drug use disorders among patients with schizophrenia. *Schizophrenia Bulletin*, 26, 441–449.
- Dyck, D. G., Hendryx, M. S., Short, R. A., Voss, W. D., & McFarlane, W. R. (2002). Service use among patients with schizophrenia in psychoeducational multiple-family group treatment. *Psychiatric Services*, 53, 749–754.

- Government of Canada. (2006). *The Human Face of Mental Health and Mental Illness in Canada 2006*. Ottawa: Government of Canada.
- Haywood, T. W., Kravitz, H. M., Grossman, L. S., Cavanaugh, J. L., Jr., Davis, J. M., & Lewis, D. A. (1995). Predicting the “revolving door” phenomenon among patients with schizophrenic, schizoaffective, and affective disorders. *American Journal of Psychiatry*, *152*, 856–861.
- Hendryx, M. S., Russo, J. E., Stegner, B., Dyck, D. G., Ries, R. K., Roy-Byrne, P. (2003). Predicting rehospitalization and outpatient services from administration and clinical databases. *Journal of Health Service Research*, *30*, 342–351.
- Hermann, R., Matke, S., and Members of the OECD Mental Health Care Panel. (2004). Selecting indicators for the quality of mental health care at the health systems level in OECD countries. *OECD Health Technical Papers No. 17*.
- Jacobs, P., Dewa, C., Bland, R., (2006) Expenditures on mental health for Canadian provinces, 2003/4. Edmonton, AB: Institute for Health Economics.
- Kessler, R. C. (1995). Epidemiology of psychiatric comorbidity. In: Tsuang, M. T., Tohen, M., Zahner, G. E. P., Eds. *Textbook in Psychiatric Epidemiology*. 179–197. New York: John Wiley & Sons.
- Kessler, R. C. (2004). The epidemiology of dual diagnosis. *Biological Psychiatry*, *56*, 730–737.
- Kessler, R. C., Nelson, C. B., McGonagle, K. A., Edlund, M. J., Frank, R. G., Leaf, P. J. (1996). The epidemiology of co-occurring addictive and mental disorders: implications for prevention and service utilization. *American Journal of Orthopsychiatry*. *66*, 17–31.
- Kisely, S., Smith, M., Preston, N. J., & Xiao, J. (2005). A comparison of health service use in two jurisdictions with and without compulsory community treatment. *Psychological Medicine*, *35*, 1357–1367.
- Minkoff, K. (2001). Developing standards of care for individuals with co-occurring psychiatric and substance use disorders. *Psychiatric Services*, *52*, 597–599.
- Nelson, E. A., Maruish, M. A., & Axler, J. L. (2000). Effects of discharge planning and compliance with outpatient appointments on readmission rates. *Psychiatric Services*, *51*, 885–889.
- Regier D. A., Farmer M. E., Rae D. S., Locke B. Z., Keith S. J., Judd L. L., Goodwin, F. K. (1990). Comorbidity of mental disorders with alcohol and other drug abuse. Results from the epidemiologic catchment area (ECA) study. *Journal of the American Medical Association*. *264*, 2511–2518.

## Appendix A—Mental Illness Diagnosis Categories and Sub-Categories

Diagnosis Category	Sub-Category	ICD-9-CM Code	ICD-10 Code
<b>Organic Disorders</b>	Senile and pre-senile psychotic conditions	290.0–290.9	F00–F09, G30
	Transient organic psychotic conditions	293.0, 293.1, 293.8, 293.9	
	Other organic psychotic conditions	294.0, 294.1, 294.8, 294.9	
<b>Substance Related Disorders</b>	Alcoholic psychoses	291.0–291.9	F10–F19, F55
	Drug psychoses	292.0–292.9	
	Alcohol dependence	303.0–303.9	
	Drug dependence	304.0–304.9	
	Nondependent abuse of drugs	305.0–305.9	
<b>Schizophrenic and Psychotic Disorders</b>	Schizophrenia	295.0–295.9	F20–F29
	Psychotic	298.8–298.9	
	Paranoia	297.1–297.3	
<b>Affective Disorders</b>	Bipolar	296.0–296.1, 296.4–296.8	F30, F31, F34.0
	Depression	296.2, 296.3, 300.4, 311	F32, F33, F34.1, F38.1
	Other	296.9	F34.8, F34.9, 38.0, F38.8, F39
<b>Anxiety Disorders</b>	Anxiety	300.0, 300.2, 300.3, 309.8	F40, F41, F42, F93.0–F93.2
	Acute stress	308.3	F43.0, 43.1, 43.8, 43.9
<b>Personality Disorders</b>	Personality disorders	301.0–301.9	F60, F61, F62
<b>Other</b>	Adjustment disorders	309.0–309.4, 309.8–309.9	F43.2, F99
	Physiological malfunction arising from mental factors	306.0–306.9	F59, F69
	Sexual disorders	302.0–302.9	F52, F64, F65, F66
	Delusional disorders	297.0–297.3, 297.8–297.9	
	Disturbance of conduct NOS	312.0–312.4, 312.8–312.9	F63, F91, F63, F91, F92, F95
	Non-organic psychoses	298.0–298.4	
	All other psychiatric disorders		F44, F45, F48, F50, F51, F53, F54, F68, F70–F73, F84, F98, F79, F78, F80–F82, F83, F88, F89, F90, F93.3–F93.9, F94

Source: International Classification of Diseases Volume 9. International Statistical Classification of Diseases and Related Health Problems Tenth Revision, Canada [ICD-10-CA] 2003.





## Appendix B—Methodological Notes

### Inclusion Criteria

The report focuses on cases hospitalized and separated for a mental illness. Some comparative analyses, as well as the analysis of co-occurring disorders, readmissions, regional level data, and a number of other indicators were predicated on data from the Hospital Morbidity Database (HMDB). The HMDB contains hospital inpatient separation data for a variety of diagnoses, including mental illness, as well as demographic data for acute care facilities across Canada. The analyses in this report focus on data for those separated in the 2003–2004 fiscal year, however data from previous fiscal years were used for comparative purposes. Psychiatric hospital data include inpatients whose residence is outside the province of hospitalization. For both hospital types, no limit was placed on length of stay. The data included separations with a diagnosis of Alzheimer's in the "Organic Disorders" category. These were determined by separation diagnoses of G30 in the ICD-10-CA classification system, or separation diagnoses of 294.1 in the ICD-9 classification system.

### Exclusion Criteria

The report is focused only on those cases of hospitalization for a mental illness that included a separation, and therefore does not include all hospitalized cases. For instance, since the report uses data based on hospital separations that follow a period of inpatient services, it does not include information on those individuals who were admitted to hospital but not separated within the 2003–2004 fiscal year. Also excluded from this report are those individuals treated for mental illness as outpatients, in community based facilities, in residential care facilities or group homes, in primary care facilities, in day and night centres, and those treated by private practitioners. It also excludes individuals treated in institutions for the mentally disabled and alcohol/drug treatment agencies. General hospital data in the HMHDB exclude newborns, inpatients whose residence is outside the province of hospitalization, and those individuals who present at emergency departments with a mental illness, but are not admitted as inpatients.

### Comparability

Caution must be exercised when comparing multiple years of HMHDB data, or data across jurisdictions, because of regular and ongoing changes in the HMHDB frame as well as the implementation of ICD-10-CA. Frame changes result from events such as hospital closures, restructuring of the way mental health services are delivered, hospital mergers, etc. In Canada, the last two decades have seen ongoing changes in mental health service delivery, and as a result, there has been significant change, year over year, in the HMHDB frame.

### Privacy and Confidentiality

The Privacy Secretariat at CIHI has developed a set of guidelines to safeguard the privacy and confidentiality of data received by CIHI. These guidelines govern the release of data in publications, media releases, the CIHI website and through ad hoc requests and special studies. In compliance with the guidelines, it is required that there be a minimum of five observations per cell. In situations where information may potentially identify an individual

or an institution, directly or through the combination or linking of data, data must be taken to higher levels of aggregation to avoid disclosure. For more information on CIHI's Privacy and Confidentiality policies, see [www.cihi.ca](http://www.cihi.ca).

## **Methods**

The HMDDB consists of two primary components: psychiatric hospital data that are compiled in the Hospital Mental Health Survey, and data on psychiatric separations from general hospitals that are derived as a subset of the Hospital Morbidity Database (HMDDB). The current database contains information on admission and separation dates, as well as diagnosis, and demographic information for hospital separations in 2003–2004.

Preliminary data quality checks were performed to verify hospital participation and completeness of data. A number of the indicators used in the report were based on derived variables. These variables include age and diagnosis groupings, and indicator of hospitals, and an indicator of the presence of a comorbid condition. The ICD10-CA or ICD-9 diagnosis codes were used to classify separations into one of seven major psychiatric/addictions categories (Appendix A). The coding system used was based on the system by which the data were originally coded. Therefore conversions were handled at the point of classification into the seven categories used in the report.

## **Analysis**

Descriptive analyses were conducted on age, gender and diagnosis-groups. Age-standardized hospital separation rates (/100,000) were calculated based on the standard population (1991 Canadian Population).

## Mental Health and Addiction Services Indicator Definitions

### 1. Crude hospital separation rate involving mental illness/addiction, 2003–2004.

Numerator: Number of psychiatric/general hospital separations in province/territory with primary diagnoses involving mental illness/addiction (ICD-9: 290–319 and ICD-10-CA: F codes and G30) within fiscal year.

Denominator: Province/territory population.

### 2. Age-standardized hospital separation rate involving mental illness/addiction, 2003–2004.

Crude hospital separation rates for provinces/territories are age-standardized for the 1991 Canadian population. Population estimates were provided by Statistics Canada.

### 3. Average length of stay for diagnoses involving mental illness/addiction, 2003–2004.

Numerator: Total number of days stayed for psychiatric/general hospital separations with primary diagnoses involving mental illness/addiction (ICD-9: 290–319 and ICD-10-CA: F codes and G30) within a fiscal year.

Denominator: Total number of psychiatric/general hospital separations for primary diagnoses involving mental illness/addiction (ICD-9: 290–319 and ICD-10-CA: F codes and G30) within a fiscal year.

### 4. Percentage of general hospital total separations involving mental illness/addiction, 2003–2004.

Numerator: Total number of general hospital separations with primary diagnoses involving mental illness/addiction (ICD-9: 290–319 and ICD-10-CA: F codes and G30) within fiscal year.

Denominator: Total number of all general hospital separations within fiscal year.

Notes: Calculated for general hospitals only. All psychiatric hospital separations were based on a primary diagnosis of mental illness/addiction.

### 5. Percentage of general hospital total days stayed involving mental illness/addiction, 2003–2004.

Numerator: Total days stayed for general hospital separations with primary diagnosis of mental illness/addiction (ICD-9: 290–319 and ICD-10-CA: F codes and G30) within a fiscal year.

Denominator: Total days stayed for all general hospital separations within a fiscal year.

**NB**: Calculated for general hospitals only. All psychiatric hospital separations were based on a primary diagnosis of mental illness/addiction.



## Appendix C—Glossary

### **1-Year Readmission**

Based on patients who had more than one episode of hospitalization with the second episode of hospitalization occurring within one year of the discharge date of the first episode of hospitalization.

### **1% Trimmed Mean**

A measure of central tendency that removes the highest and lowest 0.5% of values in a sample, and then computes the mean of that sample. The 1% trimmed mean is used to reduce the effect of extreme values or outliers in a mean.

### **Age-Standardize Separation Rate by Province, Territory or Health Region**

The age-standardize separation rate is adjusted for prevailing differences in age structures between populations of provinces, territories or health regions. The age-standardize rate allows for the comparison of separations statistics as if all populations had the same age distribution.

### **Anxiety Disorder**

A condition of excessive anxiety, fear or worry, causing either avoidance of situations that might precipitate the anxiety or development of compulsive rituals that lessen the anxiety. Examples of anxiety disorders include: Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Obsessive Compulsive Disorder, Panic Disorder, and Social Phobia.

### **Average Length of Stay (ALOS)**

The average length of stay is the mean number of days stayed in hospital at separation, and is calculated as the total number of inpatient days divided by the associated number of separations (departures from hospital through discharge or death). Separations captured in the HMHDB vary in their lengths of stay from a single day to several decades. The resulting ALOS may therefore be relatively high due to the separation of one or more patients with exceptionally long lengths of stay. As an additional reference of central tendency, the median length of stay is also provided.

### **Comorbid Diagnosis**

The presence of co-existing diseases with reference to an initial diagnosis or with reference to the index condition that is the subject of study. Comorbidity may influence the ability of affected individuals to function as well as survive; it may be used as a prognostic indicator for length of hospital stay.

### **Concurrent Disorder**

The co-occurrence of a substance related disorder and any other psychiatric disorder. Used interchangeably with Dual Diagnosis.

### **Co-Occurring**

Two diseases that exist simultaneously.

**Crude Separation Rate**

Calculated by dividing number of separations by population at risk.

**Cumulative Incidence Rate**

A measure of risk or probability. Specifically, it measures the risk that a person will develop a given disease (or other event) in a specific time period. For any given population, cumulative incidence rate represents a population member's average risk of developing a disease or having an event during the period of observation.

**Cumulative Incidence Rate (IR<sub>c</sub>) of 1-Year Readmission:**

Referred to as incidence rate of 1-year readmission in this report. Can be described as the number of people who acquire a disease during a specified period of time as a proportion of a specific population at risk of the disease. Calculated using the following formula:

$$IR_c = \frac{\text{Number of 1-year readmission}}{\text{Population at risk}} \times 10^2$$

**Days Stayed**

Length of hospitalization from date of admission to date of separation. See Average Length of Stay.

**Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)**

This manual, published by the American Psychiatric Association, classifies and defines mental disorders. In doing so, it presents their diagnostic feature of as well as information on their prevalence, course, and differential diagnosis.

**Fiscal Year**

The fiscal year of the Hospital Mental Health Database is designated as the period between April 1 2003, and .March 31, 2004.

**General Hospital**

A publicly-funded hospital that provides for the diagnosis and treatment of inpatients and clients with a wide range of diseases or injuries. The services of a general hospital are not restricted to a specific age group or sex. Within the HMHDB frame, facility types such as non-teaching general hospitals with or without long-term care units, pediatric hospitals, teaching general hospitals, and specialty institutions (i.e. cancer, cardiology, maternity, extended and chronic care, rehabilitation hospitals, neurological institutes, orthopedic hospitals, etc) are included. Contact CIHI for more information about the facilities included in the HMHDB frame.

**Hospital Separation**

A hospital separation is the departure of an inpatient from hospital, either due to a discharge or death. Hospital separation records are completed by hospitals for each patient who is discharged or who dies in hospital. Hospital separation records provide data on the relative frequency of a disease and the trends in morbidity from it.

**Incidence**

Incidence is the number of new events (e.g. new cases of a disease or other new event) occurring in a population.

**Incidence Density**

See Person-Time Incidence Rate

**Crude Hospital Separation Rate per 100,000 Population**

The hospital separation rate is a measure of hospital utilization. It is the total number of hospital separations for a particular subgroup (i.e. hospitalized for mental illness) that occur in an area over a specific time period divided by the population of the area during a time frame, multiplied by a factor of 100,000.

**Inpatient Psychiatric Services**

Psychiatric services provided to patients who have been admitted to a hospital.

**International Classification of Diseases, 9th revision (ICD-9)**

A set of internationally accepted codes for classification of medical diagnoses and conditions; medical records staff use these codes when transcribing from physician written medical charts to the hospital database that is submitted to CIHI.

**International Classification of Diseases, 10th revision (ICD-10-CA)**

ICD-10-CA classifies diseases, injuries and causes of death, as well as external causes of injury and poisoning. The classification has 23 chapters with alpha-numeric categories and subcategories. Unlike ICD-9, ICD-10-CA applies beyond acute hospital care. ICD-10-CA also includes conditions and situations that are not diseases but represent risk factors to health, such as occupational and environmental factors, lifestyle and psycho-social circumstances.

**Jurisdictions**

A term used to refer to provinces and territories.

**Median Length of Stay**

The median length of stay in hospital is the middle value in the distribution of all the individual lengths of stay. In the HMDDB, some separations have lengths of stay of years and, in some cases, decades. The median length of stay provides a measure of central tendency that is not affected by extreme values, unlike the average length of stay (see *Average Length of Stay*).

**Mood Disorder**

People with mood disorders experience either depression or mania or both. Those with depression may feel worthless, sad and empty to the point that these feelings impair functioning. Those with mania, are overly energetic and may do things that are out of character, these symptoms are severe and may interfere with day to day life. Examples of mood disorders include: major depressive disorder, bipolar disorder and dysthymic disorder.

**Organic Disorder**

People with organic disorders have a detectable physiological or structural change in an organ, usually the brain, causing impaired cognitive function. Examples of organic disorders include: Alzheimer's Disease.

**Person-Time Incidence Rate**

A measure of the rate at which new cases of a disease or other event occur in a population. The person-time incidence rate of readmission was calculated using the following formula:

$$IR_{P-T} = \frac{\text{Number of readmission}}{\text{Total person-time at risk}} \times 10^2$$

The denominator is the sum of time at risk for all individuals. The time of risk is the difference between admission date of a readmission and discharge date of the first admission for readmission cases, or the difference between the endpoint of the study (March 31, 2004) and discharge date of the admission for non-readmission cases. See also Cumulative Incidence Rate.

**Personality Disorder**

People with personality disorders have personality traits that are used inappropriately and become maladaptive. Some deviations may be quite mild and interfere very little with their life, others may cause great disturbance. Typical personality disorders include: Borderline Personality disorder, Narcissistic Personality disorder and dependent Personality disorder.

**Primary Separation Diagnosis**

The most responsible diagnosis.

**Percentage of Length of Stay**

The degree to which a group (hospital type, age, jurisdiction) makes up the total number of hospital days stayed. Used interchangeably with percentage of hospital days stayed.

**Psychiatric Hospital**

In Canada, there is no standard definition of a psychiatric hospital. For the purposes of this report and CIHI data collection, psychiatric hospitals are medical hospitals that provide psychiatric services on an inpatient and/or outpatient basis, and that have been identified by the provinces as those that should participate in the CIHI Hospital Mental Health Survey.

**Readmission**

Was identified if patients had more than one episode of hospitalization during the 2002–2003 and 2003–2004 fiscal years.



**Schizophrenic and Psychotic Disorder**

Schizophrenic and psychotic disorders are characterized by disturbances of thought, and the experience of delusions and hallucinations that might lead to atypical behaviour. These signs and symptoms are severe enough to cause mark dysfunction in their daily life.

**Secondary Psychiatric Disorder**

Any diagnosis that falls between 2nd and 25th.

**Separation Rate**

See Hospital Separation Rate per 100,000 population.

**Substance Related Disorder**

People with substance related disorder either abuse or are dependent on psychoactive substances. A substance can be anything that is ingested in order to produce a high, alter one's senses, or otherwise affect functioning. Examples of substances are: Alcohol, Marijuana, Cocaine and Heroine.

**Total Patient Days**

The sum of hospital days stayed.



# Appendix D

**Table D-1 Regional Hospital Mental Health Service Indicators (General Hospitals), 2003–2004**

Region Code	Health Region	Population (2003)	Number of Separations	Hospital Days Stayed	Separation Rate /100,000 population	Standardized Separation Rate /100,000 Population	Average Length of Stays (Days)	% of Days Stayed in ALC
<b>Newfoundland and Labrador</b>		<b>518,350</b>	<b>2,028</b>	<b>37,276</b>	<b>391.2</b>	<b>374.1</b>	<b>18.4</b>	<b>11.8</b>
1011	Eastern Health Authority	297,166	689	13,062	231.9	218.3	19.0	11.2
1012	Central Health Authority Region	100,144	488	11,488	487.3	459.0	23.5	8.0
1013	Western Health Authority	81,714	571	10,829	698.8	686.4	19.0	18.0
<b>Prince Edward Island</b>		<b>137,266</b>	<b>1,381</b>	<b>13,739</b>	<b>1,006.1</b>	<b>980.6</b>	<b>9.9</b>	<b>6.1</b>
<b>Nova Scotia</b>		<b>936,165</b>	<b>3,780</b>	<b>71,595</b>	<b>403.8</b>	<b>381.0</b>	<b>18.9</b>	<b>18.8</b>
1201	Zone 1	124,555	598	9,972	480.1	446.0	16.7	28.3
1202	Zone 2	82,675	199	3,650	240.7	218.4	18.3	35.8
1203	Zone 3	106,652	423	6,706	396.6	380.1	15.9	14.1
1204	Zone 4	95,038	602	7,191	633.4	611.0	11.9	4.8
1205	Zone 5	131,040	1,065	17,728	812.7	812.2	16.6	7.4
1206	Zone 6	396,205	893	26,348	225.4	216.9	29.5	25.5
<b>New Brunswick</b>		<b>750,896</b>	<b>5,520</b>	<b>127,990</b>	<b>735.1</b>	<b>673.4</b>	<b>23.2</b>	<b>7.9</b>
1301	Region 1	191,468	1,333	22,139	696.2	661.9	16.6	3.2
1302	Region 2	176,108	788	56,621	447.5	379.1	71.9	13.0
1303	Region 3	169,523	876	14,303	516.7	486.4	16.3	2.4
1306	Region 6	83,186	819	10,471	984.5	901.9	12.8	3.1
<b>Quebec</b>		<b>7,492,333</b>	<b>40,320</b>	<b>895,292</b>	<b>538.2</b>	<b>506.3</b>	<b>22.2</b>	<b>–</b>
2401	Région du Bas-Saint-Laurent	202,327	1,588	27,055	784.9	728.1	17.0	–
2402	Région du Saguenay–Lac-Saint-Jean	278,706	2,409	44,311	864.4	827.7	18.4	–
2403	Région de Québec	659,173	3,429	80,376	520.2	457.6	23.4	–
2404	Région de la Mauricie et du Centre-du-Québec	483,106	2,903	63,373	600.9	575.7	21.8	–
2405	Région de l'Estrie	295,981	1,727	44,598	583.5	553.4	25.8	–
2406	Région de Montréal-Centre	1,871,164	7,122	204,364	380.6	332.9	28.7	–
2407	Région de l'Outaouais	332,658	1,642	33,049	493.6	481.9	20.1	–
2408	Région de l'Abitibi-Témiscamingue	146,025	1,170	39,912	801.2	798.3	34.1	–
2409	Région de la Côte-Nord	97,326	866	16,517	889.8	867.7	19.1	–
2411	Région de la Gaspésie—Îles-de-la-Madeleine	96,821	954	16,061	985.3	975.6	16.8	–

Region Code	Health Region	Population (2003)	Number of Separations	Hospital Days Stayed	Separation Rate /100,000 population	Standardized Separation Rate /100,000 Population	Average Length of Stays (Days)	% of Days Stayed in ALC
2412	Région de la Chaudière-Appalaches	392,251	2,848	47,766	726.1	688.8	16.8	-
2413	Région de Laval	360,434	1,570	36,094	435.6	414.5	23.0	-
2414	Région de Lanaudière	406,885	2,338	42,766	574.6	580.6	18.3	-
2415	Région des Laurentides	490,586	2,609	51,579	531.8	531.0	19.8	-
2416	Région de la Montérégie	1,339,077	6,743	143,218	503.6	496.0	21.2	-
<b>Ontario (LHIN)</b>		<b>12,256,645</b>	<b>52,578</b>	<b>658,909</b>	<b>429.0</b>	<b>416.7</b>	<b>12.5</b>	<b>11.1</b>
3501	Erie St. Clair	643,205	3,880	45,834	603.2	593.0	11.8	5.0
3502	South West	919,962	4,851	56,950	527.3	508.0	11.7	10.2
3503	Waterloo Wellington	677,887	2,714	29,329	400.4	393.8	10.8	15.7
3504	Hamilton Niagara Haldimand Brant	1,343,403	5,746	78,130	427.7	416.2	13.6	11.3
3505	Central West	699,631	2,314	28,583	330.8	330.7	12.4	3.1
3506	Mississauga Halton	1,008,121	2,967	37,540	294.3	293.0	12.7	7.1
3507	Toronto Central	1,150,938	4,759	73,104	413.5	388.4	15.4	12.3
3508	Central	1,504,817	4,168	56,742	277.0	271.5	13.6	9.7
3509	Central East	1,446,826	5,587	66,658	386.2	374.4	11.9	8.3
3510	South East	468,835	2,095	26,973	446.9	441.2	12.9	13.0
3511	Champlain	1,170,172	4,984	71,579	425.9	410.8	14.4	10.7
3512	North Simcoe Muskoka	408,731	2,204	21,854	539.2	532.9	9.9	22.9
3513	North East	570,777	4,439	48,501	777.7	771.0	10.9	19.1
3514	North West	243,340	1,870	17,132	768.5	795.5	9.2	14.3
<b>Manitoba</b>		<b>1,161,552</b>	<b>7,135</b>	<b>159,357</b>	<b>614.3</b>	<b>589.8</b>	<b>22.3</b>	<b>10.7</b>
4610	Winnipeg Regional Health Authority	655,081	3,968	106,327	605.7	573.5	26.8	13.8
4630	Interlake Regional Health Authority	78,505	332	4,392	422.9	403.1	13.2	0.8
4640	Central Regional Health Authority	100,004	473	7,647	473.0	447.2	16.2	0.1
<b>Saskatchewan</b>		<b>994,428</b>	<b>6,247</b>	<b>83,544</b>	<b>628.2</b>	<b>620.1</b>	<b>13.4</b>	<b>3.6</b>
4704	Regina Qu'Appelle Regional Health Authority	240,534	1,360	19,402	565.4	553.7	14.3	3.6
4706	Saskatoon Regional Health Authority	283,301	1,344	18,632	474.4	459.6	13.9	7.8
4709	Prince Albert Parkland Regional Health Authority	75,063	606	6,903	807.3	823.2	11.4	0.0
<b>Alberta</b>		<b>3,158,641</b>	<b>16,768</b>	<b>275,945</b>	<b>530.9</b>	<b>524.0</b>	<b>16.5</b>	<b>9.5</b>
4820	Chinook Regional Health Authority	152,246	1,247	19,793	819.1	806.7	15.9	11.2
4821	Palliser Health Region	97,637	1,058	14,176	1,083.6	1,073.5	13.4	4.3
4822	Calgary Health Region	1,142,458	5,501	100,213	481.5	475.6	18.2	6.4

Region Code	Health Region	Population (2003)	Number of Separations	Hospital Days Stayed	Separation Rate /100,000 population	Standardized Separation Rate /100,000 Population	Average Length of Stays (Days)	% of Days Stayed in ALC
4823	David Thompson Regional Health Authority	284,612	1,498	26,806	526.3	516.2	17.9	23.7
4824	East Central Health	111,608	944	10,034	845.8	789.2	10.6	17.8
4825	Capital Health	996,038	3,744	75,019	375.9	368.2	20.0	10.3
4826	Aspen Regional Health Authority	175,747	1,245	14,140	708.4	722.1	11.4	7.5
4827	Peace Country Health	129,552	1,162	11,840	896.9	933.7	10.2	1.0
<b>British Columbia</b>		<b>4,152,289</b>	<b>24,792</b>	<b>375,250</b>	<b>597.1</b>	<b>576.9</b>	<b>15.1</b>	<b>14.8</b>
5911	East Kootenay	80,622	533	5,794	661.1	637.2	10.9	10.8
5912	Kootenay Boundary	80,510	635	5,827	788.7	785.3	9.2	13.5
5913	Okanagan	319,390	2,472	20,751	774.0	778.6	8.4	12.5
5914	Thompson Cariboo	216,257	1,367	14,288	632.1	643.9	10.5	13.8
5921	Fraser East	253,900	1,643	16,987	647.1	667.5	10.3	9.0
5922	Fraser North	549,520	2,671	41,450	486.1	471.9	15.5	13.4
5923	Fraser South	618,484	2,536	40,568	410.0	410.3	16.0	13.6
5931	Richmond	172,579	611	9,550	354.0	337.7	15.6	8.3
5932	Vancouver	587,784	3,983	67,194	677.6	614.5	16.9	10.6
5933	North Shore/Coast Garibaldi	269,184	1,264	16,629	469.6	460.6	13.2	6.0
5941	South Vancouver Island	344,299	2,434	66,192	706.9	659.8	27.2	27.9
5942	Central Vancouver Island	244,780	1,555	21,423	635.3	642.2	13.8	11.7
5943	North Vancouver Island	115,384	789	11,355	683.8	680.9	14.4	34.5
5951	Northwest	83,342	803	7,120	963.5	974.6	8.9	5.1
5952	Northern Interior	151,254	978	23,377	646.6	655.1	23.9	8.8
<b>Yukon Territory</b>		<b>30,554</b>	<b>220</b>	<b>1,809</b>	<b>720.0</b>	<b>750.5</b>	<b>8.2</b>	<b>-</b>
<b>Northwest Territories</b>		<b>42,206</b>	<b>580</b>	<b>11,290</b>	<b>1,374.2</b>	<b>1,404.8</b>	<b>19.5</b>	<b>2.3</b>
<b>Nunavut</b>		<b>29,141</b>	<b>145</b>	<b>1,282</b>	<b>497.6</b>	<b>473.3</b>	<b>8.8</b>	<b>-</b>
<b>Canada</b>		<b>31,660,466</b>	<b>161,494</b>	<b>2,713,278</b>	<b>510.1</b>	<b>490.7</b>	<b>16.8</b>	<b>7.9</b>

Source: Hospital Mental Health Database 2003–2004, Canadian Institute for Health Information.

Based on Statistics Canada's Canadian Population Estimates for 2003–2004.  
Standard Population for Age-standardize Rate: 1991 Canadian Population.

**Table D-2 Person-time Incidence Rates of Readmission by Patients' Characteristics (General Hospitals), 2003–2004**

	MRX of mental illness IR/100 person-years	MRX of non-mental illness IR/100 person-years	Difference (Percentage)
<b>Age (Year)</b>			
0–14	26.0	16.2	60.4%
15–24	35.5	18.3	93.7%
25–44	41.3	16.1	156.6%
45–64	42.9	28.7	49.3%
65+	43.6	47.2	-7.6%
<b>Gender</b>			
Female	42.6	25.3	68.5%
Male	38.3	32.0	19.7%
<b>LOS (Day)</b>			
1 <= LOS < = 7	38.1	23.6	61.5%
LOS > = 8	42.8	49.6	-13.7%
<b>Total</b>	40.5	27.8	45.7%

Source: DAD/HMDB, CIHI, 2002–2003 and 2003–2004. Discharge Abstract Database/Hospital Morbidity Database 2002–2003 and 2003–2004, Canadian Institute for Health Information.

MRX: Most Responsible Diagnosis.

IR: Incidence Rate.

**Table D-3 Crude and Adjusted Hazard Ratios of Readmission for Patients Admitted for a Most Responsible Diagnosis of Mental Illness in the First Admission (General Hospitals), 2003–2004**

	Crude HR	Adjusted HR
<b>Age Group (Year)</b>		
0–14	1.56 (1.47, 1.65)	1.44 (1.35, 1.53)
15–24	1.85 (1.80, 1.90)	1.59 (1.54, 1.64)
25–44	2.41 (2.37, 2.45)	1.73 (1.70, 1.77)
45–64	1.44 (1.42, 1.47)	1.24 (1.22, 1.27)
65+	0.93 (0.91, 0.95)	0.86 (0.85, 0.88)
<b>Total</b>	1.41 (1.40, 1.43)	1.35 (1.34, 1.37)

Source: DAD/HMDB, CIHI, 2002–2003 and 2003–2004. Discharge Abstract Database/Hospital Morbidity Database 2002–2003 and 2003–2004, Canadian Institute for Health Information.

Adjusted for age, gender, and hospital length of stay.

**Table D-4 Person-Time Incidence Rates of Readmission Among Patients Admitted for a MRDx of Mental Illness (General Hospitals), 2003–2004**

Diagnosis Category	Without Substance Related Disorder				With Substance Related Disorder				Difference (Percentage)
	N	Cases	Person-Years	IR/100 Person-Years	N	Cases	Person-Years	IR/100 Person-Years	
<b>Organic Disease</b>	9,186	3,704	10,072.2	36.8	590	244	652.2	37.4	1.7%
<b>Substance Abuse</b>	9,934	4,224	10,654.4	39.6	4,917	2,180	5,252.0	41.5	4.7%
<b>Schizophrenia</b>	16,537	7,701	16,901.5	45.6	3,176	1,627	3,057.7	53.2	16.8%
<b>Affective Disorder</b>	29,647	12,978	30,878.2	42.0	6,132	2,763	6,313.2	43.8	4.1%
<b>Anxiety Disorder</b>	4,363	1,794	4,693.3	38.2	713	298	775.6	38.4	0.5%
<b>Personality Disorder</b>	2,369	1,204	2,271.2	53.0	904	446	879.7	50.7	-4.4%
<b>Other</b>	12,262	4,217	14,104.1	29.9	2,843	1,052	3,229.1	32.6	9.0%
<b>Grand Total</b>	<b>84,298</b>	<b>35,822</b>	<b>89,574.9</b>	<b>40.0</b>	<b>19,275</b>	<b>8,610</b>	<b>20,159.5</b>	<b>42.7</b>	<b>6.8%</b>

Source: DAD/HMDB, CIHI, 2002–2003 and 2003–2004. Discharge Abstract Database/Hospital Morbidity Database 2002–2003 and 2003–2004, Canadian Institute for Health Information.





