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by Helen Johansen and Philippe Finès

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...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p}	preliminary
^{r}	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E}	use with caution
F	too unreliable to be published
*	significantly different from reference category ($p < 0.05$)

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Released online December 19, 2012

Abstract

Background

Data from the Discharge Abstract Database of the Canadian Institute for Health Information were used to examine acute care hospital days for patients with a mental condition coded as the most responsible diagnosis or a comorbid diagnosis. In 2009/2010, patients with a mental diagnosis represented 11.8% of people who had been hospitalized and 25.5% of acute care hospital days. Those for whom the mental condition was the most responsible diagnosis accounted for 9.0% of hospital days (1.2 million), and those with a comorbid mental diagnosis accounted for 16.5% of hospital days (2.3 million). Mental diagnoses were often associated with physical conditions. The average hospitalization with a mental diagnosis was two and a half times as long as the average for hospitalizations without a mental diagnosis. About one-quarter of hospital days with a mental diagnosis were designated as alternate level of care days.

Keywords

Alternate level of care, comorbidity, hospital records, length of hospital stay, mental disorders, mental health, mental patients

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Despite an increase in population-based studies of mental health at the national and provincial levels,[1-6] substantial gaps remain in understanding the impact of mental illness on the use of health care services. Reports tend to focus on mental conditions as a most responsible diagnosis and provide limited information about mental illness as a co-morbidity. However, psychiatric disorders can accompany physical conditions, and many physical conditions increase the risk of poor mental health.[7-10] The combination of physical and mental conditions may result in higher rates of health care use, because mental illness often complicates help-seeking, diagnosis and treatment, and may influence prognosis.[11-14]

Based on administrative data for acute care hospitals, this study examines hospitalizations with a most responsible or comorbid mental diagnosis (see *The data*). Rather than the number of hospitalizations, the analysis is based on the number of days and the average length of stay. The total number of days provides a proxy measure of resource use in the acute care hospital system, and the average length of stay is an indication of the intensity of hospital service use. This study updates an earlier working paper,[15] but unlike that report, does not include Quebec because of data limitations.

Less than 1% of population use a quarter of hospital days

In 2009/2010, approximately 182,000 people with a mental diagnosis were separated at least once from an acute care hospital (data not shown). They made up 0.7% of the population, but 11.8% of all patients separated from hospital

The data

The data are from the Canadian Institute of Health Information's Discharge Abstract Database and are compiled from discharge records for inpatients in acute care hospitals.[16] This analysis excludes newborns, stillbirths, Quebec residents, patients not resident in Canada, and those without a usable patient identification number. Records with missing admission or separation dates and those missing gender were also excluded. A total of 2,069,690 records for patients who were separated from hospital during fiscal year 2009/2010 (April through March) were retained for this study.

A hospital record is generated for each hospital separation when the patient leaves the facility because of discharge, transfer, sign-out against medical advice, or death. The hospital records in this analysis pertain to inpatient care; they do not include out-patient visits.

A "most responsible" diagnosis is assigned to each hospital record. Reported diagnoses of mental conditions that were not designated "most responsible" were considered to be "comorbid." To identify mental diagnoses, the International Classification of Diseases tenth revision (ICD-10-CA) codes were used.[1,17-19]

Length of stay is the number of days indicated in a hospital record; specifically, the number of days from the date of admission to the date of discharge. If admission and discharge occurred the same day, the length of stay was set to 0.5. Only days within fiscal year 2009/2010 were included (April 1, 2009 to March 31, 2010).

Descriptive statistics (percentages and averages) were calculated using SAS version 9.1.3.

that year. For one-third of these patients (61,900), a mental condition was the most responsible diagnosis, and for the remaining two-thirds (120,500), a mental condition was listed as a comorbidity. These patients accounted for 25.5% of all hospital days: 9.0% (about 1.3 million days) were attributable to a most responsible mental diagnosis, and 16.5% (2.3 million days) involved a comorbid mental diagnosis (Table 1).

Among male and female patients, similar percentages of acute care hospital days were attributable to mental diagnoses. A most responsible mental diagnosis was recorded for 9.2% and 8.9% of the days used by male and female patients, respectively (data not shown). The corresponding figures for comorbid mental diagnoses were 17.3% and 15.9%.

Patterns vary by age

The percentage of acute care hospital days involving mental diagnoses varied by the patients' age and by whether the mental condition was the most responsible or a comorbid diagnosis.

The percentage of hospital days attributable to a most responsible mental diagnosis was highest among patients aged 10 to 19 (Table 1). Almost 30% of all days that 10- to 19-year-olds spent in hospital in 2009/2010 had a most responsible mental diagnosis. Among patients at progressively older ages, the percentage of days with a most responsible mental diagnosis generally declined, and by age 50 or older, was less than 10%.

Table 1
Acute care hospital days, by age group and presence of mental diagnosis, Canada excluding Quebec, 2009/2010

	Total days		Number of days			Percentage of days			Average length of stay (days)				
			Mental most responsible	Mental comorbid	No mental diagnosis	Mental most responsible	Mental comorbid	No mental diagnosis	Mental most responsible	Mental comorbid	No mental diagnosis	Ratio†	Ratio‡
	'000	%	'000			%							
Total	**14,058**	**100.0**	**1,270**	**2,320**	**10,467**	**9.0**	**16.5**	**74.5**	**16.0**	**15.3**	**5.7**	**2.8**	**2.7**
Age group													
0 to 9	337	2.4	7	14	316	2.0	4.1	93.8	13.5	8.3	3.4	3.9	2.4
10 to 19	387	2.8	114	27	245	29.5	7.1	63.4	11.9	5.9	3.2	3.7	1.8
20 to 29	776	5.5	127	51	598	16.4	6.6	77.0	11.9	6.1	2.7	4.3	2.2
30 to 39	917	6.5	117	79	722	12.7	8.6	78.7	10.5	7.9	3.0	3.5	2.6
40 to 49	1,017	7.2	142	144	731	14.0	14.2	71.9	10.7	9.6	4.4	2.4	2.2
50 to 59	1,569	11.2	140	221	1,208	8.9	14.1	77.0	12.8	11.9	5.5	2.3	2.2
60 to 69	2,120	15.1	120	298	1,702	5.7	14.0	80.3	18.3	15.9	6.4	2.9	2.5
70 to 79	2,851	20.3	172	499	2,180	6.0	17.5	76.5	27.0	19.5	7.8	3.5	2.5
80 to 89	3,187	22.7	259	755	2,172	8.1	23.7	68.2	31.7	20.1	9.6	3.3	2.1
90 or older	898	6.4	73	231	594	8.1	25.7	66.1	32.6	19.8	11.6	2.8	1.7

† average days with most responsible mental diagnosis to average days with no mental diagnosis
‡ average days with mental comorbidity to average days with no mental diagnosis
Note: Because of rounding, detail may not add to total.
Source: 2009/2010 Discharge Abstract Database, Canadian Institute for Health Information.

By contrast, the percentage of hospital days with a comorbid mental diagnosis rose with age from fewer than 10% of days among patients younger than age 40 to about a quarter of days among those aged 80 or older.

Longer stays

Mental diagnoses, whether most responsible or comorbid, were associated with much longer hospital stays—overall, more than two and a half times as long—than stays not involving a mental diagnosis (Table 1). This pattern held among patients of all ages. For example, patients in their twenties who did not have a mental diagnosis averaged 2.7 days in hospital; their contemporaries with a most responsible mental diagnosis averaged 11.9 days, and those with a comorbid mental diagnosis, 6.1 days. For patients in their seventies, the averages were 7.8 days for stays without a mental diagnosis, 27.0 days for stays with a most responsible mental diagnosis, and 19.5 days for stays with a comorbid mental diagnosis.

Mental disorders

The three mental diagnoses accounting for the largest number of most responsible acute care hospital days were organic disorders (dementia, delirium) (461,000), mood disorders (313,000), and schizophrenic/psychotic disorders (266,000) (data not shown). The three comorbid mental diagnoses accounting for the largest numbers of days were organic disorders (1,404,000), mood disorders (600,000) and substance-related disorders (537,000).

As expected, the number of most responsible and comorbid days attributable to organic mental disorders were greatest for patients aged 70 or older (data not shown). Days attributable to substance-related disorders were prevalent over a wide range of ages, usually as a comorbidity. Days attributable to mood disorders appeared primarily as a most responsible diagnosis at young ages, but shifted to a comorbid diagnosis at older ages. Schizophrenic/Psychotic conditions were prevalent as a most responsible diagnosis from ages 20 to 60.

Diseases associated with mental comorbidity

The percentage of acute care hospital days involving mental comorbidity differed by major disease type (Table 2). The figure ranged from 2.4% of days for hospitalizations related to pregnancy to 24.8% of days for hospitalizations for diseases of the nervous system (for instance, Parkinson's Disease). Other disease types with a relatively high percentage of days with a comorbid mental diagnosis were metabolic (22.9%), injury/poisoning (23.6%), and infectious/parasitic (23.1%).

Regardless of disease type, a mental comorbidity was associated with a substantial increase in the average length of stay. For instance, patients with a most responsible diagnosis of neoplasm (cancer), but no mental comorbidity, averaged 7.6 days in hospital; for those with a mental comorbidity, the average length of stay was 21.0 days. Among patients hospitalized because of a circulatory disease, the corresponding averages were 7.1 days and 17.2 days.

Alternate level of care

The term alternate level of care (ALC) identifies hospital patients who have completed the acute care phase of their treatment, but who still occupy a bed because of ongoing post-acute care needs or the unavailability of supports in the community.[20,21] These patients may stay in acute care hospitals for a long period. Previous analyses indicate that dementia is the most common diagnosis for longer stay ALC patients,[22] and that a psychiatric diagnosis is common in ALC patients.[23]

Table 2
Acute care hospital days, by major disease type and presence of mental diagnosis, Canada excluding Quebec, 2009/2010

Disease type (ICD-10-CA Chapters)	Hospital days		Average length of stay (days)		
	Total	With comorbid mental diagnosis	No mental diagnosis	Comorbid mental diagnosis	Ratio†
	'000	%	Number		
All chapters	**14,058**	**2.3**	**6.7**	**13.5**	**2.0**
1 Infection	438	23.1	7.3	18.0	2.5
2 Cancer	1,170	10.7	7.6	21.0	2.8
3 Blood	132	12.0	6.1	11.8	1.9
4 Metabolic	450	22.9	7.3	14.6	2.0
5 Mental	1,195	1.9	...	...	...
6 Nervous	410	24.8	10.1	19.4	1.9
7 Eye	14	8.6	2.3	9.5	4.2
8 Ear	15	9.2	2.7	7.5	2.8
9 Circulatory	2,086	16.8	7.1	17.2	2.4
10 Respiratory	1,219	20.6	6.3	13.7	2.2
11 Digestive	1,236	13.9	5.3	11.7	2.2
12 Skin	193	20.1	8.4	16.7	2.0
13 Skeletal	693	12.9	5.3	16.7	3.2
14 Genito-urinary	578	18.8	4.2	13.6	3.3
15 Childbirth	737	2.4	2.4	4.5	1.9
16 Perinatal	23	x	17.7	x	x
17 Congenital	46	10.1	4.7	19.4	4.1
18 Symptoms, signs (not elsewhere classified)	719	26.4	4.7	12.8	2.7
19 Injury/Poisoning	1,365	23.6	6.7	13.5	2.0
20 External cause	1,339	22.6	8.2	28.4	3.5

† average days with mental comorbidity to average days without mental comorbidity
... not applicable
x suppressed to meet confidentiality requirements of Statistics Act
Note: This analysis uses only records coded in ICD-10-CA.
Source: 2009/2010 Discharge Abstract Database, Canadian Institute for Health Information.

Table 3
Percentage of acute care hospital days designated alternate level of care, by age group and presence of mental diagnosis, Canada excluding Quebec, 2009/2010

		Percentage of days designated alternate level of care		
	All hospital days	Mental most responsible	Mental comorbid	No mental diagnosis
		%		
Total	**13.0**	**23.2**	**26.6**	**8.7**
Age group				
0 to 9	0.5	0.2	1.1	0.5
10 to 19	0.9	0.7	2.5	0.8
20 to 29	1.7	3.4	4.2	1.2
30 to 39	2.3	3.1	9.0	1.4
40 to 49	4.5	4.8	11.5	3.1
50 to 59	6.3	9.6	14.4	4.4
60 to 69	8.6	20.9	19.7	5.8
70 to 79	15.2	41.4	29.2	9.9
80 to 89	23.3	50.4	34.9	16.1
90 or older	31.1	53.6	39.4	25.0

Source: 2009/2010 Discharge Abstract Database, Canadian Institute for Health Information.

In fiscal year 2009/2010, ALC patients accounted for 13% of hospital days (more than 1.8 million). About one-quarter of hospital days attributable to mental diagnoses were designated ALC versus 9% of days not associated with a mental diagnosis (Table 3).

This study has several limitations. The results refer to acute care hospitalizations; because psychiatric hospitals were not included, hospitalizations for some of the most severe mental conditions are missing from the analysis. In fact, psychiatric hospitals account for around 15% of all mental-related hospitalizations.[1] As well, emergency departments were not covered in this study. Finally, the validity of conclusions drawn from analyses of large administrative databases depends on the accuracy of case-defining diagnostic codes, which could not be determined.

Conclusion

In 2009/2010, people hospitalized with a mental diagnosis represented less than 1% of the population, but they used 25% of acute care hospital days. Two-thirds of these days involved a mental comorbidity. The average length of stay for patients with a comorbid mental diagnosis was more than two and a half times the average for patients who did not have a mental diagnosis, regardless of the patients' age and primary diagnosis. In addition, about one quarter of all mental health days were designated as ALC, indicating possible ongoing care needs or unavailability of support in the community. ■

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