Canadian Institute for Health Information
Institut canadien d'information sur la santé

Analysis in Brief
Taking health information further

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The Association Between Socio-Economic Status and Inpatient Hospital Service Use for Depression

Summary

Although lower socio-economic status (SES) has been linked consistently with higher rates of mental illness, it has not always been associated with higher rates of mental health service use. In this Analysis in Brief the relationship between SES, as measured by neighbourhood income, and inpatient hospital mental health service use for depression was examined in persons age 15 to 64 in 13 cities across Canada. The results suggest an inverse relationship such that individuals from lower-SES neighbourhoods were more likely to be hospitalized for depression than those in higher-SES neighbourhoods. However, no relationship was observed between SES and hospital length of stay or hospital readmission rates, suggesting that differences in SES were not linked with differences in severity of illness or persistence of treatment.

Introduction

Examinations of the relationship between socio-economic status and mental illness have demonstrated more psychiatric health issues in poorer and more deprived areas.[1–6] The association between various mental health conditions and unemployment, homelessness, poverty, lower levels of education and lack of social supports has been identified in the Canadian population, as well as in those of other countries.[7–11]

Depression, in particular, has been the focus of numerous inquiries into the relationship between SES and mental health,[3, 12, 13] with individuals from lower-SES backgrounds generally exhibiting higher rates of morbidity. Depression is a mental illness that affects individuals of all ages, and across Canada rates of acute hospitalization for depression are consistently higher than for any other mental illness.[14] Questions remain regarding the extent to which depression contributes to individuals' drift toward lower socio-economic circumstances, and the extent to which the socio-economic circumstances themselves contribute to the development of depression or the exacerbation of its symptoms.[5, 15]

The greater concentration of individuals living with depression in materially and socially deprived areas is consistent with the inverse relationship between SES and the prevalence of mental illness more generally. However, evidence for a similar relationship between SES and the use of mental health services has been less clear. Canadian studies have found that in certain community-based and fee-for-service settings, more advantaged groups have been as or more likely to use services as those in lower-SES groups.[8, 16–19]

Hospitalization is often the form of treatment sought when symptoms of a disease become most severe, when other forms of treatment are not available or when individuals are unaware of possible alternatives. Although those in the lowest-SES groups do not necessarily use community, primary care or psychiatrist services at the level that would be expected based on their higher prevalence rates,[8] there has been evidence of greater use of hospital services for individuals from lower-SES groups.[20] This may reflect differences in awareness of or access to non-hospital services.[9] It may also reflect a propensity to seek care only when the conditions of an illness become very severe and require hospitalization.

This Analysis in Brief considered the relationship between SES, as measured by neighbourhood income, and hospital service use for depression in the population age 15 to 64 in 13 Canadian cities. The analysis assessed rates of hospitalization for depression across neighbourhoods of different SES. Also, hospital lengths of stay were compared across levels of neighbourhood SES to examine possible differences in severity of illness during the period of hospitalization. An association between hospital length of stay and severity of mental illness has been demonstrated in a number of studies.[21–25] Finally, it has been demonstrated that, after onset, lower SES is associated with greater persistence of depression,[12, 26] which suggests a poorer prognosis and poorer outcomes. The analysis attempted to investigate this issue by examining differences by SES in rates of hospital readmission for depression.

What Distinguishes Individuals Hospitalized for Depression?

The characteristics of individuals hospitalized for depression and those in the general population are presented in Table 1. The data show that individuals from low-income neighbourhoods and women were overrepresented among those hospitalized and that hospitalized individuals were also slightly older. These variations do not account for the potential confounding effects of age, sex, city and neighbourhood income quintile on each other variable; however, these potential confounding effects are taken into account in the regression analyses that follow.

Hospital stays for depression lasted an average of 16 days, with half of individuals staying less than 11 days. The data in Table 1 also show that some of those hospitalized for depression had other health issues as well. One in five individuals (19.7%) had one or more comorbid substance-related disorders, and nearly one-third (30.5%) reported three or more comorbidities other than substance-related disorders. In some cases, issues were severe enough to require rehospitalization. About 7.5% of those hospitalized were readmitted within 30 days, and slightly more than one-quarter (25.2%) were readmitted within one year.

Table 1 Description of Individuals Hospitalized for Depression Treatment and Corresponding Population

	Individuals Hospitalized for Depression*	Population†
N	10,858	8,523,520
Neighbourhood Income Quintile‡ (Percent)		
1 (lowest)	25.5	19.2
2	22.1	20.0
3	19.3	20.2
4	17.6	20.4
5 (highest)	15.5	20.2
Men (Percent)	40.1	49.2
Age Group (Percent)		
45–64	36.5	33.8
25–44	44.8	46.6
15–24	18.6	19.7
City (Percent)		
St. John's	1.0	1.4
Halifax	1.0	2.9
Ottawa–Gatineau	6.0	8.6
Toronto	36.3	36.1
Hamilton	6.2	5.1
London	4.7	3.4
Winnipeg	6.6	5.2
Regina	2.1	1.5
Saskatoon	2.5	1.8
Edmonton	6.9	7.5
Calgary	6.3	7.8
Vancouver	16.8	16.3
Victoria	3.5	2.4
Comorbid Substance Disorder (Percent)	19.7	—

	Individuals Hospitalized for Depression*	Population†
No. of Other Comorbidities (Percent)		
3+	30.5	—
1–2	41.8	—
0	27.7	—
Readmitted Within 30 Days (Percent)	7.5	—
Readmitted Within 1 Year (Percent)	25.2	—
Length of Stay (Days)		
Average	16.1	—
Median	11	—

Notes

* The patients hospitalized for depression treatment were extracted from the Canadian Institute for Health Information's Discharge Abstract Database (DAD); extraction was restricted to those receiving treatment for a primary diagnosis of depression, age 15 to 64, residing in 1 of 13 selected cities, admitted to an acute care facility and discharged home; the extraction was further restricted to those with a valid postal code, health card number (HCN) and neighbourhood income quintile; only the first eligible discharge observed for each patient in the 2004–2005 fiscal year was extracted.

† The population was estimated using the 2001 Canadian census data; population counts were extracted for each age-, sex-, city- and income quintile–specific group, and were restricted to those age 15 to 64 and residing in 1 of 13 selected cities and census dissemination areas with valid neighbourhood income quintiles.

‡ See Appendix A for a full description of income quintiles and number of comorbidities.

Source

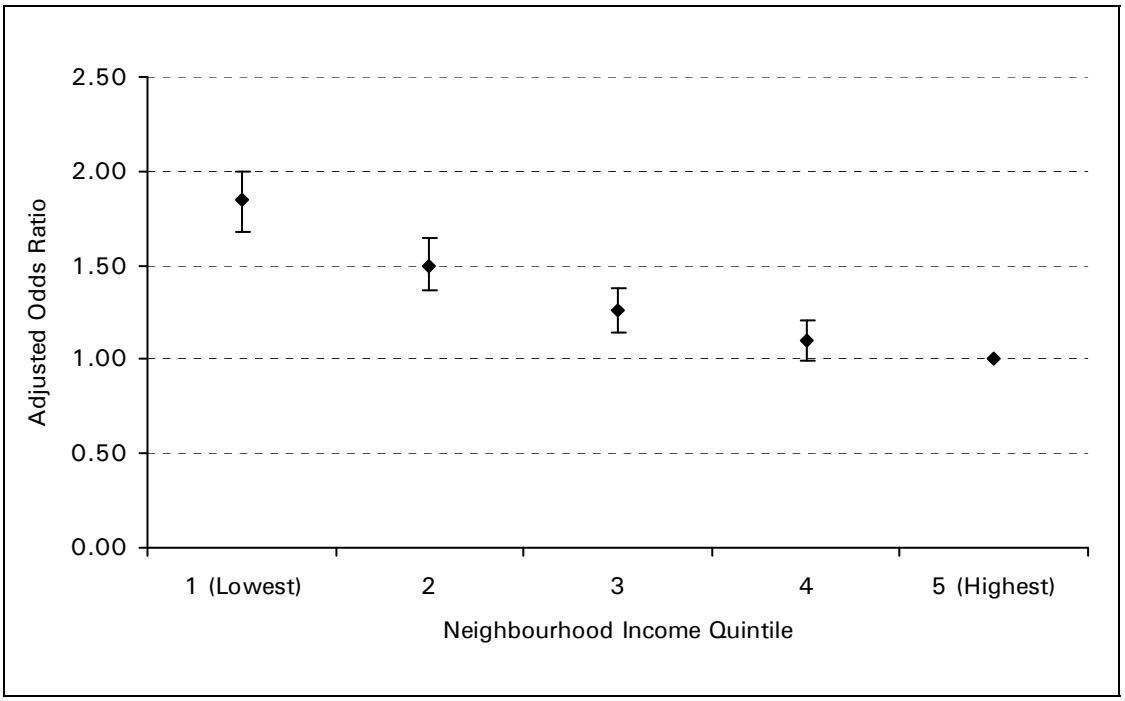
Discharge Abstract Database, 2004–2005, Canadian Institute for Health Information.

Is SES Associated With Depression-Related Hospital Discharge?

The relationship between neighbourhood income quintile and depression-related hospital discharge was examined by fitting a logistic regression model (see Appendix A for additional methodological detail). The logistic model included terms to adjust for the city, age and gender of the patient.

Results show that neighbourhood income quintile was statistically significantly associated with depression-related hospital discharge (see Table 2 in Appendix B for regression output). As shown in Figure 1, the data show that relative to individuals from the highest-income areas, those from the lowest-income areas had 85% higher odds of being discharged from hospital for the treatment of depression. Moreover, a gradient effect is observed, whereby the odds of discharge for each neighbourhood income quintile are slightly lower than the immediately preceding quintile. What this seems to suggest is that people access general hospital services for depression in different ways, based in part on SES.

Figure 1 Adjusted Odds Ratios* for Hospital Discharge for Depression Treatment by Neighbourhood Income Quintile, 2004–2005



Note

* Adjusted odds ratios were generated by a logistic regression model that controlled for age group, gender and city. Age group-, gender- and city-specific population counts used in estimating the model were derived from the 2001 Canadian census data published by Statistics Canada.

Source

Discharge Abstract Database, 2004–2005, Canadian Institute for Health Information.

Is SES Associated With the Length of Depression-Related Hospital Stay?

The relationship between neighbourhood income quintiles and length of depression-related hospital stay was examined by fitting a multiple linear regression model (see Appendix A for additional methodological detail). The model included terms to adjust for city, age, gender, comorbid substance-related disorder and number of other comorbidities (excluding substance-related disorders) of the patient. Results indicate that neighbourhood income quintile was not associated with length of stay (see Table 3 for results of the regression model), suggesting that once they access inpatient services for depression at a general hospital, SES does not influence how long people stay in hospital.

Is SES Associated With Hospital Readmission Following Depression-Related Hospital Discharge?

The relationship between neighbourhood income quintile and readmission following depression-related hospital discharge was examined by fitting two logistic regression models: one for 30-day readmission and one for one-year readmission (see Appendix A for additional methodological details). The logistic models included terms to adjust for city, age, gender, comorbid substance-related disorder, number of other comorbidities (excluding substance-related disorders) of the patient and length of stay of the patient's index episode. The results of the logistic regression models indicate that neighbourhood income quintile was not associated with either 30-day or one-year readmission (see Table 4 for results of the regression model). This finding suggests that people from poorer neighbourhoods do not, on average, return to a general hospital for depression treatment more often than those from other neighbourhoods.

Conclusion

The analyses presented here indicate that SES was inversely related to hospitalization for depression among persons age 15 to 64. Rates of hospitalization based on data from 13 Canadian cities were higher among individuals from lower-SES neighbourhoods than individuals from higher-SES neighbourhoods. Individuals living in the lowest-SES neighbourhoods were almost twice as likely to have been hospitalized for depression as those living in the highest-SES neighbourhoods. This finding aligns with what are known to be higher prevalence rates for mental illnesses in general and for depression in particular among the poorest members of society.[3, 12, 15]

The finding also suggests a more explicit relationship between SES and mental health care in the acute inpatient setting, in comparison with what has been found in the community and fee-for-service settings, where either no differences have been found between levels of SES, or where higher-SES individuals have been shown to make greater use of services.[8, 16, 18]

Although individuals from lower-SES neighbourhoods were hospitalized for depression more often, once hospitalized, they had similar durations of inpatient stay as individuals from higher-SES neighbourhoods. This may suggest similarity in the severity of illness that elicited hospitalization. It may also suggest parity in the provision of services to individuals hospitalized for depression in contrast with differences in hospital lengths of stay for mental illness observed in multi-tiered health systems.[27, 28]

The absence of any differences in readmission rates across SES goes against other findings suggesting that the persistence of depression is greatest among the poor and deprived. However, readmission to hospital more likely represents persistence of care, as opposed to persistence of the illness and its symptoms. This distinction is pertinent in this instance as it implies that despite higher rates of hospitalization among those from lower-SES groups, there were no differences, on average, in the likelihood of future episodes of hospitalization as a function of SES. Regardless, a broader analysis that includes both treated and untreated individuals should be undertaken to more comprehensively examine the question of SES and its impact on persistence of depression and other mental illnesses.

The findings from this Analysis in Brief point to the continued role of hospital mental health care for many individuals with depression, particularly among those from lower-SES neighbourhoods in larger cities. Findings also show that, once admitted for depression, neighbourhood SES is not a factor in the length of stay or readmission of a patient for a given disease severity. Given the relatively higher cost of hospitalization and the fact that depression is often amenable to treatment in non-hospital settings, results suggest that there may be an opportunity for policy-makers and system planners to further explore the role of community-based services among those in need from lower-income neighbourhoods.

Further investigation may benefit from an assessment of these relationships across the full spectrum of mental health care service settings in order to assess the level of service continuity and its relationship to SES. This might include individuals in specialty psychiatric hospitals, who are among the most severely ill and the most impoverished in terms of SES. Further investigation may also benefit from more explicit measures of depression severity, longitudinal measures of persistence and multi-dimensional measures of SES that capture differences in education and the social dimensions of deprivation.

Appendix A

Methods

Data Source and Inclusion Criteria

Hospital service use data were extracted from the Canadian Institute for Health Information's (CIHI) Discharge Abstract Database (DAD). The DAD contains information on individuals discharged from Canadian hospitals in nine provinces and the territories.

The extracted DAD data were restricted to individuals with a primary diagnosis of depression, age 15 to 64 (inclusive) and living in 1 of 13 selected Canadian metropolitan cities: St. John's, Halifax, Ottawa, Toronto, Hamilton, London, Winnipeg, Regina, Saskatoon, Edmonton, Calgary, Vancouver and Victoria. The data were further restricted to individuals discharged home from acute-care hospitals. Records were excluded if either the patient's health card number (HCN) or postal code were invalid, or if the patient's postal code could not be linked to a neighbourhood income quintile (described below).

Using HCN as a unique person identifier, the first depression-related hospital discharge observed in the 2004–2005 fiscal year (April 1 to March 31) was extracted for each hospitalized individual. A total of 10,858 abstracts were extracted, each representing a unique individual. The readmission analysis (described below) involved extracting the subsequent mental health–related hospital discharge for each individual (if applicable); some 2005–2006 fiscal year DAD data were used for this purpose.

Neighbourhood Income

Neighbourhood income quintile based on the average income per single-person equivalent within the dissemination area (DA) was used as a proxy for socio-economic status (SES) and was determined for each patient using his or her postal code. More specifically, each patient's postal code was mapped to his or her census DA using Statistics Canada's Postal Code Conversion File (PCCF). The income quintile associated with the patient's DA was then assigned to the patient. As noted above, some records (<3%) were excluded because postal codes could not be linked to a neighbourhood income quintile. In the sample used for this analysis, there were two reasons a patient's postal code could not be linked to his or her neighbourhood income quintile: (1) Statistics Canada did not have income data for the DA corresponding to the patient's postal code or (2) Statistics Canada was forced to suppress the income quintile of the patient's DA due to the small number of households represented in the DA.

Outcome Variables

Three indicators of hospital service use were employed to examine the relationship between SES and each of rate of hospital service use, severity of illness and persistence of use.

Discharge

All 10,858 individuals who met the inclusion criteria described above were compared to the relevant population. The population was estimated using age-, sex- and DA-specific population counts derived from the 2001 Canadian census data; the same age (15 to 64) and residential (1 of 13 selected cities and census DAs with a valid income quintile available) restrictions applied to the hospitalized population were applied to the census population counts. A total of 8,523,520 Canadians were represented in the extracted population counts.

Length of Stay

Length of stay was calculated for each hospitalized individual as the difference between admission and discharge date.

Readmission

Each hospitalized individual was classified as having been "readmitted" if a discharge record indicated that he or she had been admitted, via the emergency department, for the treatment of a primary mental health diagnosis, at least two days *after* his or her first eligible depression-related discharge. The time to this "readmission" was then used to create two binary variables, indicating whether the individual had been readmitted within 30 days and/or one year of the first eligible discharge. To ensure that each case was granted the same length of time to experience a readmission, regardless of the timing of his or her first discharge in the 2004–2005 fiscal year, hospital discharges that took place in the 2005–2006 fiscal year were also examined.

Number of Comorbidities

The count of comorbidities included all concurrent physical and mental illness, excluding concurrent mood and substance-abuse disorders.

Statistical Analyses

To test the relationship between discharge rates and neighbourhood income quintiles, a logistic regression model was fitted while adjusting for city, age and gender. In order to test the relationship between length of stay and neighbourhood income quintile, a linear regression model was used while adjusting for city, age, gender, existence of substance-related disorders and number of comorbid conditions (excluding substance-related disorders). In order to test the relationship between readmission and neighbourhood income quintiles, a logistic regression model was used for each of 30-day and one-year readmission, while adjusting for city, age, gender, existence of substance-related disorder, number of comorbidities (excluding substance-related disorders) and length of stay of the index episode.

In each model, age was treated as a categorical variable (with three categories: 15–24, 25–44 and 45–64 years of age), as was number of comorbidities (with three categories: no comorbidities, one to two, and three or more). Categories instead of continuous values for these two variables were used because the linear relationship assumption did not hold between these variables and logarithm of length of stay in the length of stay model and logit (logarithm of odds) in the readmission model. The logarithm of length of stay was used in both the length of stay and readmission models to correct for the extremely positively skewed distribution of length of stay.

Appendix B

Regression Results

Table 2 Logistic Regression Results for the Depression-Related Hospital Discharge Analysis, 2004–2005

Variable	Unadjusted OR (95% CI)	P-value*	Adjusted OR (95% CI)	P-value*
Neighbourhood Income Quintile		<0.0001		<0.0001
1 (lowest)	1.83 (1.68, 2.00)		1.85 (1.69, 2.03)	
2	1.49 (1.36, 1.63)		1.50 (1.37, 1.65)	
3	1.25 (1.13, 1.38)		1.26 (1.14, 1.38)	
4	1.09 (0.99, 1.21)		1.10 (0.99, 1.21)	
5 (highest)†	1.00		1.00	
Gender		<0.0001		<0.0001
Men	0.68 (0.64, 0.72)		0.68 (0.64, 0.72)	
Women†	1.00		1.00	
Age Group		<0.0001		<0.0001
45–64	1.16 (1.08, 1.25)		1.18 (1.10, 1.27)	
25–44	1.03 (0.96, 1.11)		1.03 (0.96, 1.11)	
15–24†	1.00		1.00	
City		<0.0001		<0.0001
St. John's	0.56 (0.45, 0.70)		0.56 (0.45, 0.69)	
Halifax	0.26 (0.20, 0.33)		0.25 (0.20, 0.32)	
Ottawa–Gatineau	0.56 (0.49, 0.64)		0.56 (0.48, 0.64)	
Toronto	0.80 (0.72, 0.90)		0.80 (0.72, 0.90)	
Hamilton	0.95 (0.83, 1.08)		0.95 (0.83, 1.08)	
London	1.10 (0.96, 1.26)		1.09 (0.96, 1.25)	
Regina	1.11 (0.94, 1.31)		1.11 (0.94, 1.31)	
Saskatoon	1.12 (0.96, 1.31)		1.12 (0.96, 1.32)	
Edmonton	0.71 (0.63, 0.81)		0.71 (0.63, 0.81)	
Calgary	0.63 (0.55, 0.72)		0.63 (0.55, 0.73)	
Vancouver	0.81 (0.72, 0.91)		0.81 (0.72, 0.91)	
Victoria	1.14 (0.99, 1.32)		1.13 (0.98, 1.30)	
Winnipeg†	1.00		1.00	

Notes

* P-value calculated using likelihood ratio statistic; reflects global test of significance for class variables.

† Reference group.

Source

Discharge Abstract Database, 2004–2005, Canadian Institute for Health Information.

Table 3 Linear Regression Results for the Depression-Related Hospital Length of Stay Analysis*

Variable	Unadjusted Estimate (SE)	Median LOS Estimate†	P-value‡	Adjusted Estimate (SE)	Median LOS Estimate†	P-value‡
Neighbourhood Income Quintile			NS			NS
1 (lowest)	0.018 (0.034)	9.42		-0.030 (0.033)	10.31	
2	0.021 (0.035)	9.45		-0.006 (0.034)	10.57	
3	0.029 (0.036)	9.52		0.017 (0.035)	10.81	
4	0.049 (0.037)	9.71		0.056 (0.036)	11.25	
5 (highest)§	2.225 (0.027)	9.25		2.364 (0.054)	10.63	
Gender			NS			NS
Men	-0.034 (0.022)	9.28		-0.012 (0.021)	10.51	
Women§	2.262 (0.014)	9.60		2.364 (0.054)	10.63	
Age Group			<0.0001			<0.0001
45–64	0.398 (0.030)	11.65		0.318 (0.029)	15.56	
25–44	0.101 (0.029)	8.66		0.098 (0.028)	11.73	
15–24§	2.057 (0.024)	7.83		2.364 (0.054)	10.63	
City			<0.0001			<0.0001
St. John's	0.023 (0.058)	14.00		0.008 (0.057)	10.72	
Halifax	0.001 (0.056)	13.70		-0.039 (0.056)	10.22	
Ottawa–Gatineau	-0.122 (0.114)	12.12		-0.124 (0.113)	9.40	
Toronto	-0.124 (0.058)	12.09		-0.132 (0.057)	9.32	
Hamilton	-0.620 (0.063)	7.37		-0.594 (0.062)	5.87	
London	-0.310 (0.058)	10.04		-0.333 (0.058)	7.62	
Regina	-0.172 (0.082)	11.53		-0.174 (0.081)	8.94	
Saskatoon	-0.282 (0.077)	10.32		-0.250 (0.076)	8.29	
Edmonton	0.193 (0.110)	16.59		0.169 (0.109)	12.59	
Calgary	-0.616 (0.044)	7.39		-0.612 (0.043)	5.76	
Vancouver	-0.427 (0.048)	8.93		-0.413 (0.047)	7.04	
Victoria	-0.251 (0.069)	10.65		-0.230 (0.068)	8.45	
Winnipeg§	2.616 (0.040)	13.68		2.364 (0.054)	10.63	
Comorbid Substance Disorder			NS			<0.01
Yes	-0.048 (0.027)	9.11		-0.122 (0.028)	9.41	
No§	2.258 (0.012)	9.56		2.364 (0.054)	10.63	
No. of Other Comorbidities			<0.0001			<0.0001
3+	0.250 (0.028)	10.86		0.192 (0.029)	12.89	
1–2	0.087 (0.026)	9.23		0.083 (0.026)	11.56	
0§	2.135 (0.020)	8.46		2.364 (0.054)	10.63	

Notes

* The log length of stay (LOS) was modelled in place of the untransformed LOS because the latter was positively skewed.

† Median length of stay (LOS) estimates were calculated by exponentiating the sum of the specific group estimate and the reference group estimate (which represents the intercept).

‡ P-value was calculated using likelihood ratio statistic and, for class variables, reflects global test of significance.

§ Reference group.

NS = Not significant.

Source

Discharge Abstract Database, 2004–2005, Canadian Institute for Health Information.

Table 4 Logistic Regression Results for the Mental Health–Related Hospital Readmission Analysis, 2004–2005

Variable	30-Day Readmission				1-Year Readmission			
	Unadjusted OR (95% CI)	P-value*	Adjusted OR (95% CI)	P-value*	Unadjusted OR (95% CI)	P-value*	Adjusted OR (95% CI)	P-value*
Neighbourhood Income Quintile		NS		NS		<0.05		NS
1 (lowest)	1.24 (0.98, 1.57)		1.21 (0.95, 1.53)		1.25 (1.08, 1.44)		1.21 (1.05, 1.40)	
2	1.10 (0.86, 1.41)		1.09 (0.85, 1.39)		1.12 (0.97, 1.30)		1.10 (0.95, 1.28)	
3	1.20 (0.93, 1.54)		1.19 (0.93, 1.53)		1.17 (1.01, 1.36)		1.16 (0.99, 1.35)	
4	1.10 (0.85, 1.43)		1.08 (0.84, 1.40)		1.10 (0.95, 1.29)		1.07 (0.92, 1.25)	
5 (highest)†	1.00		1.00		1.00		1.00	
Gender		<0.05		NS		NS		NS
Men	1.17 (1.02, 1.36)		1.14 (0.99, 1.32)		0.96 (0.88, 1.05)		0.93 (0.85, 1.02)	
Women†	1.00		1.00		1.00		1.00	
Age Group		<0.05		NS		<0.001		<0.0001
45–64	0.91 (0.74, 1.12)		0.95 (0.77, 1.18)		0.97 (0.85, 1.10)		0.95 (0.83, 1.08)	
25–44	1.14 (0.94, 1.38)		1.14 (0.94, 1.39)		1.18 (1.04, 1.33)		1.17 (1.03, 1.32)	
15–24†	1.00		1.00		1.00		1.00	
City		<0.001		<0.01		<0.0001		<0.0001
St. John's	0.99 (0.46, 2.14)		1.05 (0.48, 2.27)		0.76 (0.45, 1.26)		0.76 (0.45, 1.27)	
Halifax	0.52 (0.18, 1.47)		0.53 (0.19, 1.49)		0.79 (0.46, 1.33)		0.79 (0.46, 1.33)	
Ottawa–Gatineau	0.84 (0.55, 1.28)		0.84 (0.55, 1.30)		1.01 (0.79, 1.31)		1.05 (0.81, 1.36)	
Toronto	1.08 (0.79, 1.46)		1.01 (0.74, 1.37)		1.14 (0.94, 1.38)		1.21 (0.99, 1.46)	
Hamilton	0.77 (0.50, 1.18)		0.76 (0.49, 1.18)		0.82 (0.63, 1.07)		0.82 (0.63, 1.07)	
London	1.66 (1.12, 2.45)		1.55 (1.04, 2.30)		1.72 (1.33, 2.21)		1.79 (1.38, 2.31)	
Regina	0.97 (0.54, 1.73)		0.97 (0.54, 1.74)		1.38 (0.98, 1.93)		1.39 (0.99, 1.95)	
Saskatoon	0.39 (0.18, 0.83)		0.36 (0.17, 0.78)		0.60 (0.41, 0.88)		0.60 (0.41, 0.87)	
Edmonton	0.80 (0.53, 1.21)		0.83 (0.55, 1.26)		0.85 (0.66, 1.10)		0.85 (0.66, 1.10)	
Calgary	0.84 (0.55, 1.28)		0.85 (0.56, 1.30)		1.03 (0.80, 1.32)		1.02 (0.80, 1.32)	
Vancouver	1.28 (0.92, 1.76)		1.18 (0.85, 1.64)		1.63 (1.33, 1.99)		1.66 (1.35, 2.03)	
Victoria	1.27 (0.81, 1.99)		1.22 (0.77, 1.91)		1.61 (1.22, 2.13)		1.63 (1.23, 2.15)	
Winnipeg†	1.00		1.00		1.00		1.00	
Comorbid Substance Disorder		<0.05		<0.05		<0.0001		<0.0001
Yes	1.22 (1.03, 1.44)		1.25 (1.03, 1.51)		1.28 (1.15, 1.42)		1.29 (1.15, 1.45)	
No†	1.00		1.00		1.00		1.00	
No. of Other Comorbidities				NS				NS
3+	0.78 (0.64, 0.94)	<0.05	0.79 (0.64, 0.98)		0.97 (0.86, 1.09)	NS	0.96 (0.84, 1.08)	
1–2	0.99 (0.83, 1.17)		0.97 (0.81, 1.16)		1.05 (0.95, 1.17)		1.03 (0.92, 1.15)	
0†	1.00		1.00		1.00		1.00	
Log (Length of Stay, Days)	0.86 (0.81, 0.92)	<0.0001	0.89 (0.83, 0.95)	<0.001	1.02 (0.98, 1.06)	NS	1.06 (1.02, 1.11)	<0.01

Notes

* P-value calculated using likelihood ratio statistic; reflects global test of significance for class variables.

† Reference group.

NS = Not significant.

Source

Discharge Abstract Database, 2004–2005, Canadian Institute for Health Information.

References

1. R. Pampalon and G. Raymond, "A Deprivation Index for Health and Welfare Planning in Quebec," *Chronic Diseases in Canada* 21, 3 (2000): pp. 104–113.
2. C. G. Hudson, "Socioeconomic Status and Mental Illness: Tests of the Social Causation and Selection Hypotheses," *American Journal of Orthopsychiatry* 75, 1 (2005): pp. 3–18.
3. C. Muntaner, W. W. Eaton, R. Miech and P. O'Campo, "Socioeconomic Position and Major Mental Disorders," *Epidemiological Reviews* 26 (2004): pp. 53–62.
4. D. A. Regier, M. E. Farmer, D. S. Rae, J. K. Myers, M. Kramer, L. N. Robins, L. K. George, M. Karno and B. Z. Locke, "One-Month Prevalence of Mental Disorders in the United States and Sociodemographic Characteristics: The Epidemiologic Catchment Area Study," *Acta Psychiatrica Scandinavica* 88, 1 (1993): pp. 35–47.
5. J. M. Murphy, D. C. Olivier, R. R. Monson, A. M. Sobol, E. B. Federman and A. H. Leighton, "Depression and Anxiety in Relation to Social Status. A Prospective Epidemiologic Study," *Archives of General Psychiatry* 48, 3 (1991): pp. 223–229.
6. E. M. Goldner, W. Jones and P. Waraich, "Using Administrative Data to Analyze the Prevalence and Distribution of Schizophrenic Disorders," *Psychiatric Services* 54, 7 (2003): pp. 1017–1021.
7. J. Dekker, J. Peen, A. Goris, H. Heijnen and H. Kwakman, "Social Deprivation and Psychiatric Admission Rates in Amsterdam," *Social Psychiatry and Psychiatric Epidemiology* 32, 8 (1997): pp. 485–492.
8. L. S. Steele, R. H. Glazier and E. Lin, "Inequity in Mental Health Care Under Canadian Universal Health Coverage," *Psychiatric Services* 57, 3 (2006): pp. 317–324.
9. S. J. Katz, R. C. Kessler, R. G. Frank, P. Leaf and E. Lin, "Mental Health Care Use, Morbidity, and Socioeconomic Status in the United States and Ontario," *Inquiry* 34, 1 (1997): pp. 38–49.
10. M. Beiser, F. Hou, I. Hyman and M. Tousignant, "Poverty, Family Process, and the Mental Health of Immigrant Children in Canada," *American Journal of Public Health* 92, 2 (2002): pp. 220–227.
11. T. Huurre, M. Eerola, O. Rahkonen and H. Aro, "Does Social Support Affect the Relationship Between Socioeconomic Status and Depression? A Longitudinal Study From Adolescence to Adulthood," *Journal of Affective Disorders* 100, 1–3 (2007): pp. 55–64.
12. V. Lorant, D. Deliege, W. Eaton, A. Robert, P. Philippot and M. Ansseau, "Socioeconomic Inequalities in Depression: A Meta-Analysis," *American Journal of Epidemiology* 157, 2 (2003): pp. 98–112.
13. D. Kim, "Blues From the Neighborhood? Neighborhood Characteristics and Depression," *Epidemiologic Reviews* 30 (2008): pp. 101–117.

14. Canadian Institute for Health Information, *Hospital Mental Health Services in Canada, 2005–2006* (Ottawa, Ont.: CIHI, 2008).

15. B. P. Dohrenwend, I. Levav, P. E. Shrout, S. Schwartz, G. Naveh, B. G. Link, A. E. Skodol and A. Stueve, "Socioeconomic Status and Psychiatric Disorders: The Causation-Selection Issue," *Science* 255, 5047 (1992): pp. 946–952.

16. A. Rhodes, J. R. Liisa, S. Bondy and K. Fung, "Depression and Mental Health Visits to Physicians—A Prospective Records-Based Study," *Social Science and Medicine* 62, 4 (2006): pp. 828–834.

17. L. Steele, C. Dewa and K. Lee, "Socioeconomic Status and Self-Reported Barriers to Mental Health Service Use," *Canadian Journal of Psychiatry* 52, 3 (2007): pp. 201–206.

18. J. M. Starkes, C. C. Poulin and S. R. Kisely, "Unmet Need for the Treatment of Depression in Atlantic Canada," *Canadian Journal of Psychiatry* 50, 10 (2005): pp. 580–590.

19. B. Diverty and M. P. Beaudet, "Depression: An Undertreated Disorder?" *Health Reports* 8, 4 (1997): pp. 9–18.

20. A. E. Rhodes, M. Agha, M. Creatore and R. Glazier, "Monitoring Mental Health Reform in a Canadian Inner City," *Health and Place* 10, 2 (2004): pp. 163–168.

21. J. Durbin, P. Goering, G. Pink and M. Murray, "Classifying Psychiatric Inpatients: Seeking Better Measures," *Medical Care* 37, 4 (1999): pp. 415–423.

22. I. Galynker, L. Cohen, C. Salvit, C. Miner, E. Phillips, M. Focseneanu and R. Rosenthal, "Psychiatric Symptom Severity and Length of Stay on an Intensive Rehabilitation Unit," *Psychosomatics* 41, 2 (2000): pp. 114–120.

23. S. D. Horn, A. F. Chambers, P. D. Sharkey and R. A. Horn, "Psychiatric Severity of Illness. A Case Mix Study," *Medical Care* 27, 1 (1989): pp. 69–84.

24. R. Ries, M. Mullen and G. Cox, "Symptom Severity and Utilization of Treatment Resources Among Dually Diagnosed Inpatients," *Hospital and Community Psychiatry* 45, 6 (1994): pp. 562–568.

25. A. Weinberg, J. Greaves, F. Creed and B. Tomenson, "Severity of Psychiatric Disorder in Day Hospital and In-Patient Admissions," *Acta Psychiatric Scandanavica* 98, 3 (1998): pp. 250–253.

26. P. Bracke, "The Three-Year Persistence of Depressive Symptoms in Men and Women," *Social Science and Medicine* 51, 1 (2000): pp. 51–64.

27. M. S. Hendryx and J. DeRyan, "Psychiatric Hospitalization Characteristics Associated With Insurance Type," *Administration and Policy in Mental Health* 25, 4 (1998): pp. 437–448.

28. D. Mechanic, D. D. McAlpine and M. Olfson, "Changing Patterns of Psychiatric Inpatient Care in the United States, 1988–1994," *Archives of General Psychiatry* 55, 9 (1998): pp. 785–791.

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The Canadian Institute for Health Information (CIHI) collects and analyzes information on health and health care in Canada and makes it publicly available. Canada's federal, provincial and territorial governments created CIHI as a not-for-profit, independent organization dedicated to forging a common approach to Canadian health information. CIHI's goal: to provide timely, accurate and comparable information. CIHI's data and reports inform health policies, support the effective delivery of health services and raise awareness among Canadians of the factors that contribute to good health.

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