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ORIGINAL PAPER

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Rural–urban differences in the prevalence of major depression and associated impairment

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Abstract *Background* The possibility of a rural and urban difference in the prevalence of major depression has been of interest to researchers and mental health service providers. The objectives of this analysis were to determine the rural and urban difference in the 12-month prevalence of major depressive episode(s) (MDE) in Canada and whether participants in rural and urban areas differed in the impairment levels due to depressive symptoms and in mental health service utilization. *Methods* Data from the 1998–1999 Canadian National Population Health Survey (NPHS) were used in this study. In the NPHS, MDE was measured by the Composite International Diagnostic Interview – Short Form for Major Depression. Two-week disability and daily life interference due to depressive symptoms were used as indicators of impairment in this analysis. The prevalence of MDE in rural and urban areas, at national and regional levels, was calculated. The association between urbanicity and MDE was evaluated by Odds Ratios, controlling for potential confounders. Impairment levels and mental health service utilization were also compared between the rural and urban groups. *Results* NPHS participants in rural areas had a lower prevalence of MDE than those in urban areas, controlling for the effects of race, immigration status, working status and marital status. Non-immigrants and those who are white in rural areas had a lower prevalence of MDE than did those in urban areas, and such differences depended on age and geographic regions. Rural and urban participants did not differ in 2-week disability and daily life interference due to depressive symptoms. However, rural participants were less likely to have contacted health professionals for mental health problems. *Conclusions* The reasons for the rural and urban differences in the prevalence of MDE are complex. This may depend on individuals' age, immigration status, race, working status, marital status and the provinces where they live. These differences should be considered in future mental health service planning, particularly at provincial levels. There may be gaps between rural and urban areas in terms of availability of mental health services. This should be addressed in future studies and in mental health service planning.

Key words rural-urban difference – major depression – impairment – disability – general population – mental health service utilization

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Introduction

The possibility of rural and urban differences in mental disorders has been of interest to researchers and mental health service planners. Individuals living in urban settings may have a higher risk of depression than those residing in rural areas because of the decline in community relationships and social isolation in the city (Wirth 1938; Dohrenwend and Dohrenwend 1974; Mueller 1981). Studies investigating rural and urban difference in depression are very important because disparity in services between rural and urban areas is often of concern. The results of such studies are essential to mental health and educational service planning and to our understanding of the etiology of depression.

Higher rates of mental disorders in large urban areas may be due to the faster pace and greater stresses of urban life (Toffler 1970) and the concentration of poverty in city centers (Harpham 1994). Wirth (1938) suggests that

urbanization leads to extensive differentiation and separation among occupational, familial, recreational and institutional aspects of life, which result in poor social integration and social withdrawal. Leighton's sociocultural disintegration hypothesis posits that family and marital disintegration, limited social networks and high levels of hostility affect psychological homeostasis in large urban areas and, therefore, increase the risk of mental disorders (Leighton 1959). Marsella (1992) further hypothesized that a conceptual framework involving the stress associated with housing, work, marriage, child-rearing and with security, in interaction with the resources available to cope with the stress, might explain the psychopathology among urban populations. Additionally, rural and urban migration, which encompasses stressors and coping resources and the cultural adaptation (integration, assimilation or rejection) after the migration, may have an impact on mental health (Neff 1983; Gaviria et al. 1986). However, findings regarding rural and urban differences in depression from previous studies conducted in different regions have been inconsistent.

By comparing studies from different regions in the U. S., Mueller (1981) suggested greater prevalence of depressive symptoms in urban than in rural areas. Such a difference was also reported by Eaton and Kessler (1981), when the estimates of depressive symptom prevalence were adjusted by socio-demographic variables. However, Neff (1983) failed to find a significant rural and urban difference in the prevalence of depressive symptoms when socio-demographic variables were controlled.

It is important to distinguish between depressive symptoms and depressive disorders. Urbanicity may be relevant to depressive symptomatology, but this may not necessarily be related to depressive disorders (Weissman and Klerman 1978). Large mental health surveys in adult populations in North America indicated that the prevalence of major depression in urban areas was higher than that in rural areas. In the U. S. Epidemiologic Catchment Area (ECA) study, Blazer et al. (1985) reported that individuals living in urban settings had a significantly higher risk of major depression (2.4 %), measured by the Diagnostic Interview Schedule (DIS) (Robins et al. 1981), than those living in rural areas (1.1 %). In a study conducted in Quebec, Canada (Kovess et al. 1987), a significant rural and urban difference in point prevalence of major depression was found (metropolis area: 3.7 % vs. county center: 1.1 %), based on the DSM-III criteria. This study suggested that this difference was mainly concentrated among unemployed men and women without partners (Kovess et al. 1987). In a study using a sample of subjects aged 17–64 in Puerto Rico, the 6-month prevalence of major depressive episode in urban areas (3.3 %) appeared to be higher than that in rural areas (2 %) (Canino et al. 1987); however, the difference was not statistically significant. This could be due to the relatively small sample size based on which these estimates were calculated (rural n = 513; urban n = 100).

The results of the landmark Stirling County study, which was conducted in a rural county of Nova Scotia, Canada, showed that the current prevalence of major depression had been steady at 5 % (Murphy et al. 2000). The DIS was used to measure psychiatric disorders in the 1992 survey (Murphy et al. 2000). The Stirling County study supported the view that the proportion of psychiatric disorders is lower in rural and more "integrated" societies (Leighton et al. 1963). However, the mental health survey in the Edmonton metropolitan area, Canada, found a lower 6-month prevalence of major depression (3.2 %) than that found in the Stirling County Study, as measured using the DIS (Bland et al. 1988). The National Comorbidity Study (NCS) found no differences when the current (30 days) and 12-month prevalence of major depression was compared in metropolitan areas, smaller cities and rural areas (Blazer et al. 1994; Kessler et al. 1994). Similarly, a significant difference between rural and urban areas in the prevalence of major depression was not found in the studies conducted in Taipei, Taiwan (Hwu et al. 1989), in Seoul, Korea (Lee et al. 1990), and in the Ontario Health Supplement study, Canada (Parikh et al. 1996). These inconsistent findings present significant challenges for mental health service planning regarding how to efficiently allocate limited human and financial resources.

Large community surveys using child and adolescent samples did not find a rural and urban difference in the prevalence of major depression. The Ontario Child Health Study (Canada) (Offord et al. 1987) reported a rural and urban difference in the 6-month prevalence of one or more psychiatric disorders, with urban subjects having a higher prevalence of mental disorders. Rural and urban areas did not differ in the prevalence of major depression. Mental disorders were determined by items selected from the Child Behavior Checklist according to DSM-III criteria (Boyle et al. 1987). In the Quebec Child Mental Health Survey (Canada) (Breton et al. 1999), rural and urban differences in the 6-month prevalence of depressive disorders, measured by the Diagnostic Interview Schedule for Children, version 2.25 (Shaffer et al. 1991), were not found.

Most of the previous studies failed to consider the disability and/or impairment levels when the prevalence of major depression and depressive symptoms in rural and urban areas were compared. Thus, findings from such studies provide limited information for mental health service planning and the understanding of the etiology of depressive disorders (Goldner et al. 2001). However, there is no consensus as to how to define impairment. Broadhead et al. (1990) defined disability by whether, in the past 3 months, respondents missed work due to illness and spent all or part of the day in bed or were kept from usual activities due to feeling ill. Judd et al. (2000) focused on work/employment function, spouse/partner relationship and overall psychosocial functioning to determine impairment. In a recent study, Narrow et al. (2002) re-estimated the prevalence of various psychiatric disorders reported in the ECA and NCS,

considering clinical significant impairment. Impairment was determined upon daily life interference due to psychiatric symptoms, antidepressant use and whether participants had contacted health professionals for psychiatric symptoms (Narrow et al. 2002). Neff (1983) used a composite of total number of depressive symptoms to evaluate the persistence of depressive symptoms and a significant rural and urban difference in the prevalence of depressive symptoms was not found when the persistence factor was considered.

The objectives of this analysis were to investigate: (1) the rural and urban difference in the 12-month prevalence of major depressive episode(s) (MDE) at the national and regional levels, and (2) the rural and urban difference in impairment and disability levels and in mental health service utilization. For this analysis, data from the 1998–1999 Canadian National Population Health Survey (NPHS) were used.

Subjects and methods

The NPHS is a national survey using multiple stage, stratified random sampling procedures. It was initiated by Statistics Canada during the period 1994–1995 and has been conducted every 2 years. The target population comprised the household residents in all Canadian provinces, excluding those living in long-term institutions, in the Yukon and North West Territories, on Indian reserves and military bases and in some remote areas in Ontario and Quebec (Statistics Canada 1995). The 1994–1995 NPHS was conducted by face-to-face interviews. Telephone interviews were performed in the subsequent NPHS. Personal visits were made if the respondents did not have a telephone. The NPHS data were collected by experienced interviewers who were hired and trained by Statistics Canada. To date, data are available for the first three surveys. There were 17626 subjects in the first NPHS (1994–1995), 81434 subjects in the second NPHS (1996–1997), and 17244 subjects in the third NPHS (1998–1999).

In the NPHS, rural and urban areas were defined by population concentration and population density methods (Statistics Canada 1995). Urban areas had minimum population concentrations of 1000 with a population density of at least 400 per square kilometer, based on the previous census (Statistics Canada 1999a). All territory outside urban areas was considered to be rural areas. In the NPHS, Census Metropolitan Area (CMA) was defined for Vancouver and Montreal in the three surveys, and for Toronto in the 1998–1999 NPHS. In the present analysis, CMAs were considered to be urban areas. In the 1994–1995 and 1996–1997 NPHS, participants in Ontario were grouped into health regions. An indicator for rural and urban was not generated for this province. Similarly, health regions instead of rural/urban were defined in Manitoba and Alberta in the 1996–1997 NPHS. This significantly reduced the number of participants with the indicator for rural and urban to 11601 in the 1994–1995 NPHS and to 9227 in the 1996–1997 NPHS. The reduction in NPHS sample size due to the unavailability of the rural/urban indicator represented a tremendous loss of information. Therefore, only the data from the 1998–1999 NPHS were used in this analysis.

In the NPHS, MDE was measured using the Composite International Diagnostic Interview – Short Form for Major Depression (CIDI-SFMD) according to the DSM-III-R criteria. This instrument was developed and validated by Kessler et al. (1998). In the NPHS, major depression refers to MDE that occurred in the previous 12 months. The NPHS participants who were aged 12 or over at the time of interviews were eligible for the CIDI-SFMD. The sensitivity and specificity of the CIDI-SF ranged between 90 % and 94 % in studies conducted by Kessler and colleagues (1998). However, the CIDI-SFMD does not contain probe questions to determine whether depressive symptoms are due to substance use, physical illness or bereavement. The CIDI-SFMD development and validation documents showed that organic exclusions were used in the empirical work to select the scale items and were taken into consideration in generating the possibilities of caseness. A recent validation study using a community sample (Patten et al. 2000) suggested the CIDI-SFMD might pick up a broader spectrum of depressive morbidity than major depression as strictly defined using the full version of CIDI.

The NPHS also collected information about disability in the 2 weeks prior to the interviews, daily life interference due to depressive symptoms and mental health service utilization in the past 12 months. Specifically, the NPHS participants were asked: "During the past 14 days, did you stay in bed at all because of illness or injuries, including any nights spent as a patient in a hospital?" and "During those 14 days, were there any days that you cut down on things because of illness or injuries?". In the analysis, an answer of "yes" to either question was considered to indicate the presence of disability. The participants were also asked: "How much do these experiences (depressive symptoms) usually interfere with your life or activities?". This question was identical to that used in the NCS conducted in the U. S. (Kessler et al. 1994). A participant might provide one of four answers, i. e., a lot, some, a little, not at all. In the current analysis, an answer of "a lot" to this question was defined as having impairment due to depressive symptoms. This classification schema was consistent with that used in Narrow et al.'s study (2002). With respect to mental health service utilization, the NPHS participants were asked: "In the past 12 months, have you seen or talked on the telephone to a health professional about your emotional or mental health?".

The controlling variables in this analysis included gender, age, marital status, immigration status, employment status, educational levels, family income adequacy levels and race. Immigrants were those who are permanent residents or Canadian citizens, not by birth (Federal Government of Canada 1999). Therefore, this term included individuals who had left their country-of-origin either by choice (landed immigrants) or due to unavoidable circumstances (refugees). Family income adequacy was determined by total family income and number of persons living in the household at the time of the interviews.

In this analysis, the relationships between demographic, socioeconomic characteristics and urbanicity and depression status were first examined. The prevalence of MDE and associated standard error (SE) was calculated for rural and urban groups. The association between rural/urban and MDE was, then, evaluated by Odds Ratio (OR) and 95 % C. I., controlling for potential confounders. If a variable was associated with both urbanicity and depression status, this variable was considered to be a potential confounder.

The prevalence of MDE in rural and urban areas was also estimated at the regional level. For this purpose, provinces were classified into three groups, i. e., Atlantic Region (Prince Edward Island, Nova Scotia, New Brunswick, Newfoundland), Central Region (Quebec, Ontario), and Prairie and Pacific Region (Manitoba, Saskatchewan, Alberta, British Columbia). Finally, the NPHS participants from rural and urban areas were compared in disability, impairment due to depressive symptoms and mental health service utilization.

The data were weighted to account for the effect of the complex survey design. Therefore, the proportions reported are weighted proportions. These sampling weights and design effects were calculated by Statistics Canada (1999b). The Pearson Chi square statistic converted into a F statistic was used to determine if the proportions were significantly different and the p values are reported. This analysis was conducted using STATA 6.0 (StataCorp 1999).

Results

The demographic and socioeconomic characteristics of participants from rural and urban areas and those with and without MDE are presented in Tables 1 and 2. As seen from Table 1, participants in urban areas were more likely than those in rural areas to be single, divorced, separated or widowed; non-white; immigrants; not

Table 1 Demographic and socioeconomic characteristics of the 1998–1999 NPHS participants in rural and urban areas

	Urban N (%)	Rural N (%)	P value
Gender			
Men	6 081 (49.1)	1 943 (51.5)	NS
Women	7 233 (50.9)	1 987 (48.5)	
Age			
12–19	2 616 (26.4)	872 (28.2)	NS
20–54	7 200 (52.8)	1 979 (50.2)	
55+	3 498 (20.8)	1 079 (21.6)	
Marital status			
M/C/P	6 092 (46.5)	2 126 (54.8)	< 0.005
Single	4 860 (41.5)	1 310 (37.5)	
D/S/W	2 362 (12.0)	494 (7.7)	
Income adequacy			
Middle/high	10 324 (86.0)	3 030 (85.1)	NS
Low	2 112 (14.0)	673 (14.9)	
Educational levels			
12 years or less	3 302 (27.8)	1 367 (37.4)	< 0.005
> 12 years	8 527 (72.2)	2 041 (62.6)	
Working status			
Working	6 725 (66.1)	1 814 (63.1)	0.03
Not working	3 792 (33.9)	1 182 (36.9)	
Race			
White	11 853 (85.3)	3 830 (98.1)	< 0.005
Non-white	1 408 (14.7)	96 (1.8)	
Immigration status			
Non-immigrants	11 060 (79.2)	3 729 (94.5)	< 0.005
Immigrants	2 244 (20.8)	200 (5.5)	

Table 2 Demographic and socioeconomic characteristics of the 1998–1999 NPHS participants with and without major depressive episode(s)

	With MD N (%)	Without MD N (%)	P value
Gender			
Men	206 (33.1)	6 514 (49.5)	< 0.005
Women	462 (66.9)	7 599 (50.5)	
Age			
12–19	56 (8.4)	1 317 (12.7)	< 0.005
20–54	500 (74.9)	8 528 (62.5)	
55+	112 (16.7)	4 268 (24.8)	
Marital status			
M/C/P	289 (42.9)	7 698 (57.6)	< 0.005
Single	202 (34.0)	3 796 (29.4)	
D/S/W	177 (23.1)	2 619 (13.0)	
Income levels			
Middle/high	457 (76.2)	10 999 (87.0)	< 0.005
Low	169 (23.8)	2 183 (13.0)	
Educational levels			
12 years or less	169 (24.4)	4 234 (28.8)	NS
> 12 years	498 (75.6)	9 873 (71.2)	
Working status			
Working	340 (53.5)	8 075 (66.7)	< 0.005
Not working	295 (46.5)	4 513 (33.3)	
Race			
White	628 (93.3)	12 885 (87.7)	0.001
Non-white	37 (6.7)	1 186 (12.3)	
Immigration status			
Non-immigrants	590 (84.1)	11 910 (79.4)	0.04
Immigrants	78 (15.9)	2 192 (20.6)	

working; having a higher educational level; less likely to be married, in a common law relationship or in a partnership. Rural and urban participants did not differ in gender, age and family income adequacy levels. The depressed participants were more likely to be women, aged 20 to 54, single, divorced, separated or widowed, currently not working, at the low family income level, white and non-immigrants (see Table 2).

There were 668 participants (4.5 %) who had MDE in the 1998–1999 NPHS according to the CIDI-SFMD. The prevalence of MDE in rural and urban areas at national and regional levels is presented in Table 3. Although urban areas appeared to have a higher prevalence of MDE than rural areas at the national level and in the Central and in the Prairie and Pacific Regions, the differences were not statistically significant. In the Atlantic Region, the prevalence of MDE in urban areas resembled that in rural areas.

Since working status, marital status, race and immigration status were associated with both urbanicity and depression status, as reflected in Tables 1 and 2, they were potential confounders in the relationship between rural/urban and MDE. Logistic regression models controlling for the effect of each of four factors respectively did not reveal a rural and urban difference in the prevalence of MDE. However, in the model incorporating working status, race, immigration status and marital status, it was found that participants in rural areas were less likely to have MDE than those in urban areas (OR = 0.80, 95 % C. I.: 0.62, 0.97).

Table 3 The prevalence of major depressive episode(s) in rural and urban areas at the national and regional levels

	Rural areas weighted % (SE)	Urban areas weighted % (SE)
Canada	3.8 (0.57)	4.6 (0.35)
Atlantic Region	5.6 (0.78)	5.1 (0.50)
Central Region	3.4 (0.63)	4.6 (0.36)
Prairie and Western Region	3.2 (0.55)	4.7 (0.39)

Stratified analyses did not find a rural and urban difference in the prevalence of MDE by gender, age, marital status, family income levels, working status, educational levels and having long-term medical conditions. However, the data indicated that, among participants who are white and those who are non-immigrants, urban participants had a higher prevalence of MDE than did those in rural areas. Table 4 contains the prevalence of MDE in rural and urban areas by age and regions among those who are white and those who are non-immigrants. Among participants who are white, a significant rural and urban difference in the prevalence of MDE was

Table 4 The prevalence of major depressive episode(s) in rural and urban areas among participants who are white and those who are non-immigrants, by age and geographic regions (%s were weighted)

	White		Non-immigrants	
	Rural % (SE)	Urban % (SE)	Rural % (SE)	Urban % (SE)
Overall	3.8 (0.58)	5.0 (0.40)[a]	3.9 (0.60)	5.0 (0.41)[b]
Age				
12–19	3.2 (1.29)	4.7 (1.24)	3.2 (1.27)	4.3 (1.14)
20–54	4.9 (1.00)	5.8 (0.61)	5.1 (1.01)	5.7 (0.62)
55+	1.7 (0.68)	3.3 (0.61)[a]	1.3 (0.57)	3.3 (0.68)[a]
Regions				
Atlantic	5.6 (0.79)	5.2 (0.51)	5.7 (0.80)	5.4 (0.52)
Central	3.5 (0.64)	5.0 (0.41)	3.3 (0.64)	5.0 (0.42)[b]
Prairie and Western	3.3 (0.57)	4.9 (0.43)	3.4 (0.60)	4.8 (0.44)

[a] rural-urban comparison $p < 0.05$; [b] rural–urban comparison $p = 0.05$

found among those aged 55 and over. At the regional level, white participants in urban areas appeared to have a higher prevalence of MDE than did those in rural areas in the Central and in the Prairie and Pacific Regions; however, these differences were not statistically significant. Among participants who are non-immigrants, a significant rural–urban difference in the prevalence of MDE was found among those aged 55 and over and in the Central Region.

The proportion of impairment due to depressive symptoms among rural participants (2.3 %, SE = 0.50) did not differ from that among urban participants (2.5 %, SE = 0.25). Similarly, the rate of participants with disability in the past 14 days prior to the interviews among rural participants (13.8 %, SE = 1.23) resembled that among urban participants (13.7 %, SE = 0.59). Such non-significant differences persisted when the prevalence of MDE in rural and urban areas was calculated at different levels of the variables in Table 1. However, the data showed that rural participants were less likely to have contacted health professionals for mental health problems (4.9 %, SE = 0.66) than those in urban areas (6.7 %, SE = 0.42) (p = 0.003).

Discussion

In the current analysis, the overall estimates of the prevalence of MDE did not significantly differ between rural and urban areas. Nevertheless, the data demonstrated that the NPHS participants in urban areas were more likely to have MDE than were those in rural areas when the effects of potential confounders were simultaneously controlled. This particular result is consistent with that reported by Blazer et al. (1985), in that a significant rural and urban difference was found when the effects of potential confounders such as gender, age, race, social status, education and whether the subjects had moved during the past 5 years were controlled. Although Parikh et al. (1996) reported a non-significant rural and urban difference in the prevalence of major depression using the Ontario Health Supplement survey data, they failed to examine the difference after controlling for the effects of potential confounders. The results of the current analysis indicated that the non-significant rural and urban difference in the prevalence of MDE was partially due to the joint confounding effect by immigration status, race, working status and marital status.

The non-significant overall rural and urban difference in the prevalence of MDE could also be due to the definition used for rural and urban areas in the NPHS. In the NPHS, urban areas were defined as having at least 1000 people with a population density of over 400 per square kilometer. By this definition, urban areas may include both large urban cities and semi-urban areas such as rural and urban towns. MDE prevalence could be lower in middle-sized cities than in large urban cities (Murphy 1974; National Center for Health Statistics 1980; Eaton and Kessler 1981). This might dilute the prevalence of MDE in urban areas and, therefore, underestimate the association between urbanicity and MDE. Unfortunately, NPHS did not collect information about the size of communities such as rural villages, towns, suburban, cities and metropolis. Future studies need to consider a more detailed breakdown according to population size.

As described in the Introduction, according to Wirth's (1938) and Leighton's (1959) theories with respect to rural and urban differences in mental disorders, marital and working status may act as mediators in the relationship between urbanicity and depression. This means that an observed association between rural/urban and MDE should disappear if the effects of marital and/or working status are controlled. However, the NPHS data indicated that marital status and working status worked as joint confounders with race and immigration status in the relationship between urbanicity and MDE. The NPHS data supported the hypothesis that urban participants were more likely to be divorced, separated or widowed than were those living in rural areas. Although urban participants were less likely to report currently not working than rural participants, this did not necessarily result in a rural and urban difference in family income as shown in Table 1. Perhaps, the nature of a person's job such as specific occupations and/or work stress, especially when it interacts with marital status, race, migration status and/or other social factors, is more important in determining the rural/urban difference in depression than whether or not an individual is employed. However, in-depth analyses regarding the interactions among these factors would go beyond the data available for the current analysis.

Neff (1983) suggested that inter rural and urban migration and socioeconomic status might affect the relationship between urbanicity and depression. Unfortunately, the NPHS did not have information pertaining to inter rural and urban migration. Nevertheless, Neff's suggestion (1983) could also be applicable for immigrants from other countries to Canada because new im-

migrants might face the same problems. When the effect of immigration status was considered in this analysis, immigrants had a lower prevalence of MDE than did non-immigrants. A rural and urban difference in the prevalence of MDE was only found in non-immigrants and those who are white. It is possible that such results are due to the fact that few immigrants (5.5 %) and non-whites (1.9 %) were in the rural areas according to the NPHS. Family income adequacy levels did not affect the rural and urban difference in the prevalence of MDE. This could be due to the fact that rural and urban participants did not differ in family income levels. Inter rural and urban migration was not considered because of the unavailability of pertaining information in the NPHS. This is a limitation of the current analysis.

Among the participants who are white and non-immigrants, those who were aged 55 and over and resided in urban areas were more likely to have reported MDE than their counterparts in rural areas, despite the observation that elderly participants had a lower prevalence of MDE than younger participants. The reasons underlying the rural/urban difference by age are not clear. This should be a focus of future studies, given the importance of effective health service planning in an aging society.

Kovess et al. (1987) reported rural and urban differences in the prevalence of depressive episodes among unemployed men and unpartnered women. These were not found in the current analysis. The discrepancies might be due to the fact that Kovess et al.'s study (1987) measured point prevalence of major depression in a predominantly French-speaking sample. The NPHS targeted MDE in the past 12 months in participants with various ethnic backgrounds.

This analysis is one of few studies considering impairment levels when rural and urban areas were compared. Rural and urban participants were not different in terms of 2-week disability and daily life interference due to psychiatric symptoms. However, the data showed that rural participants were less likely to have contacted health professionals for mental health problems than those in urban areas. This highlights the importance of investigating the gap between rural and urban health services and addressing the barriers to accessing health services in rural areas. A possible explanation for these results was that the rural depressed managed better than their urban counterparts despite having fewer contacts with health professionals for emotional or mental health problems.

The results of this analysis suggested that the rural and urban difference in the prevalence of MDE might also depend on geographical regions. Some provinces in the Central and in the Prairie and Pacific Regions might have a higher prevalence of MDE in rural areas, despite the observation that a statistically significant difference was only found in the Central Region among the non-immigrants. It is possible that these regional variations could be due to different cultural and social contexts in each province, which may differentially affect the development of major depression (Blazer et al. 1985; Breton 1999). However, the mechanisms underlying the associations between social and cultural contexts and major depression are complex and cannot be clearly explained by the existing data. These results highlight that mental health service planners at the regional levels need to make evidence-based decisions according to their regional conditions.

The NPHS included only household subjects. Individuals who were in prisons and the homeless were not selected. Individuals who were institutionalized have been surveyed in a separate NPHS. However, the CIDI-SFMD was not administered in this population. Therefore, those who were institutionalized were not included in the present analysis. Since the prevalence of MDE may be higher in the populations of the homeless and the institutionalized than in the general population, the prevalence of MDE in urban areas observed in this analysis could have been underestimated. Another limitation of this analysis was that the NPHS relied on self-reported information, which might introduce reporting bias.

Conclusion

Rural and urban areas differ in the prevalence of MDE in those who are white, non-immigrants, and in specific provinces. The rural and urban difference in the prevalence of MDE is due to multiple factors. The NPHS data suggested that there might be existing barriers to accessing mental health services in rural areas, especially for those aged 55 and over. The findings of this analysis need to be replicated and the barriers to accessing mental health services in rural areas should be addressed in future studies. Such findings will have a significant impact on mental health service planning.

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