Social Determinants of Health for Older Women in Canada: Does Rural–Urban Residency Matter?

Deanna Wanless,[1] Barbara A. Mitchell,[2] and Andrew V. Wister[3]

RÉSUMÉ

Cette étude a fourni une analyse exploratoire des principaux déterminants sociaux de la santé des femmes âgées canadiennes, en se concentrant sur les différences entre la résidence dans régions rurals et urbaines, étant donné que le statut socio-économique (SES) et le capital social ont été démontrés diffèrent selon la résidence rurale-urbaine. Une analyse secondaire a été effectuée en utilisant l'Enquête de la santé communautaire canadienne, 2000/2001. Une analyse comparative de régression logistique a inopinément révélé que les variables de statut socio-économique et capital social étaient plus fortement associés à la santé des femmes plus âgées urbaines qu'avec leurs homologues rurales. Les associations entre les mesures de revenu de ménage et l'état de santé, de l'insécurité alimentaire et d'appartenance au communauté n'ont pas été pris en charge, pour la plupart, parmi les femmes rurales, mais ont été pris en charge pour leurs homologues urbains. Les conclusions concernant les applications du modèle social-déterminants-de-santé sont discutées pour expliquer les motifs de santé parmi les femmes âgées urbaines et rurales.

ABSTRACT

This study provided an exploratory analysis of key social determinants of health for older Canadian women, with a focus on differences between rural and urban residency, given that socio-economic status (SES) and social capital have been shown to differ by rural–urban residence. Secondary analysis was conducted using the 2000/2001 Canadian Community Health Survey. A comparative logistic regression analysis revealed, unexpectedly, that SES and social capital variables were more strongly associated with the health status of urban older women than for the health status of their rural counterparts. Associations between health status measures and household income, food insecurity, and community belonging were largely not supported among rural women, but were for their urban counterparts. Findings are discussed concerning applications of the social-determinants-of-health model for explaining health patterns among older urban and rural women. Cost of living, access to health services, and dimensions of rural culture are discussed as potential explanations.

[1] Alberta Centre on Aging, University of Alberta

[2] Departments of Sociology/Anthropology & Gerontology, Simon Fraser University

[3] Department of Gerontology, Simon Fraser University

Manuscript received: / manuscrit reçu : 21/10/08

Manuscript accepted: / manuscrit accepté : 11/01/10

Mots clés : vieillissement, principaux déterminants sociaux de la santé, rural-e, urbain-e, femmes, capital social

Keywords: aging, social determinants of health, rural, urban, women, social capital

Correspondence concerning this article should be addressed to / La correspondance concernant cet article doit être adressées à:
Deanna Wanless, M.A.
Research Coordinator
Alberta Centre on Aging
University of Alberta
305 Campus Tower
Edmonton, AB T6K 1K8
(dwanless@ualberta.ca)

Introduction

In 2001, 19.2 per cent of seniors in Canada (727,480 individuals) were living in rural areas (Statistics Canada, 2004b), defined as those places with a population of fewer than 1,000 persons and a population density of fewer than 400 persons per square kilometre (Statistics Canada, 2001). However, controversy exists in the literature concerning the effect that rural residency has on the health of older Canadians, because researchers have identified both positive and negative aspects (Gerritsen, Wolffensperger, & Van Den Heuvel, 1990; Mitura & Bollman, 2003). On the one hand, lower individual

doi:10.1017/S0714980810000140

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

and household incomes and lower education status are more prevalent in rural areas, and both are associated with poorer health status (Kawachi, 2000). On the other hand, research suggests that rural residents receive more social and community support (indicating a higher level of social capital), which are associated with better health status (McCulloch, 1998; Pearson Scott & Roberto, 1985, 1987).

It is also well documented that older women are more likely than men to live in poverty and have differential access to support systems, factors that may shape health in later life (Pederson & Raphael, 2006). Older women also face unique challenges with respect to their aging-related experiences and health conditions than their male counterparts (partly due to differential life expectancy), suggesting the need for a gender-specific analysis. Further, it is recognized by researchers (see especially Rosenberg & Wilson, 2000) that the spatial or geographic component to variations in poverty and health may be magnified by being female, and especially among older women. For example, older women living in rural areas may have more limited formal health knowledge and more challenges in accessing health care professionals and services than urban women, despite having greater stocks of social capital (Rabiner, Konrad, DeFriese, Kincade, Berbard, Woomert et al., 1997). However, research has yet to focus on the relative importance of specific social determinants of health for Canadian older women living in diverse geographical settings. In light of these important trends and issues, the purpose of this study was to conduct a quantitative comparison of differences in key social determinants of health between older women living in rural and urban environments.

Social Determinants of Health: Location, Gender, and Social Capital

Research by Raphael and colleagues has been at the forefront of social determinants of health (SDH) research in Canada. Eleven key social determinants of health have been identified: (a) Aboriginal status; (b) early life; (c) education; (d) employment and working conditions; (e) food insecurity; (f) health care services; (g) housing; (h) income and its distribution; (i) social safety net; (j) social exclusion; and (k) unemployment and employment security (Raphael, 2004). A primary focus of SDH research has been on the association between social inequality and health outcomes. To a large degree, socio-economic status (especially income) has been used as a central SDH indicator of material advantage or disadvantage that accumulates over the lifespan. Marmot (2004) referred to this social gradient as the "status syndrome," which exposes individuals to different social and economic conditions that affect life chances and life choices, and ultimately shapes health. At the structural or policy level, cuts to spending in public infrastructure sectors (such as health services), may also place individuals at a disadvantage, and may be connected to geographic location. Further, material and social advantages/disadvantages are often intertwined. For instance, low income may affect food insecurity, housing, access to health care, and ultimately quality of life.

Pederson and Raphael (2006) further contended that women's health needs to be a distinct area of analysis within SDH research. Indeed, Denton, Prus, and Walters (2004) found unique gender inequities in health, and that social structural and psychosocial determinants are more important for women, while behavioural determinants are more important for men. The Public Health Agency of Canada (2006) identified similar determinants of health, but emphasized the importance of geographical location or residency. Yet, geography and whether people live in remote, rural communities or urban centres is a health determinant not specifically listed in Raphael's SDH model. This is surprising, since a number of studies have shown health and health care inequities linked to rural or urban residence (Allan & Cloutier-Fisher, 2006; Forbes, Morgan, & Janzen, 2006; Keating, 2008). Thus, an examination of rural-urban residence should reveal variation in a number of the SDH domains among older women (e.g., income, education, and social networks), suggesting the possibility that they may exert a differential impact on health across geographic or residency status.

We have extended the SDH model by incorporating the concept of social capital. Although conceptualizations vary, *social capital* refers to the resources that inhere in the nature and quality of social networks at the family and community level. As a productive resource, these networks of relations can provide certain benefits, such as emotional assistance (Bowen, Richman, & Bowen, 2000). Indeed, Coleman (1988), a pioneer of the conceptualization of social capital, described it as being a potentially beneficial "non-tangible" force in people's lives that generates advantages and creates opportunities for improved quality of life. Overall, we have expanded the SDH model to include the concept of social capital and applied it to a comparative examination of older women living in urban and rural environments. In particular, it allows us to conceptualize how the health of older Canadian women is differentially affected by their region of residence coupled with their access to key social and economic resources.

Literature Review

Rural-Urban Status and SDH Differentials

Few studies have focused specifically on health inequalities among older women, especially across

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

rural-urban status. We therefore drew on the broader literature on geographic location and health, as well as differentials in SDH factors across rural-urban status. A study using the Canadian Community Health Survey (CCHS) revealed that the self-rated health of all Canadians worsened from the most urban areas to the most rural and remote regions (Mitura & Bollman, 2003). Goins, Hays, Landerman, and Hobbs (2001) found a similar pattern in the U.S. Research focusing on Manitoban older adults has uncovered inconsistent findings. Havens, Hall, Sylvestre, and Jivan (2004) replicated the finding of Strain and Chappell (1983) showing that rural Manitoban seniors reported their health as being poorer than that of urban seniors. However, St. John, Havens, van Ineveld, and Finlayson (2002) showed no rural-urban differences in self-rated health among older Manitobans.

Turning to self-reported chronic illness, McCulloch (1998) discovered that older rural women reported a higher incidence of chronic conditions than urban women, although there was no difference in terms of mortality or acute diseases. When measuring health status in terms of the number of symptoms experienced, researchers found that rural residents had poorer health than urban-dwelling seniors (Clark & Dellasega, 1998; Gillanders, Buss, & Hofstetter, 1996; Pong, DesMeules, & Lagace, 2009). Mitura and Bollman (2003) also found that the prevalence rate of arthritis/rheumatism was higher in rural and small-metro areas. On the other hand, Shapiro and Roos (1984) revealed that rural Manitoban seniors were no more likely to have a serious illness diagnosed or to die within a one-year time period than urban seniors. In addition, research has shown that rural older adults tend to have higher rates of smoking, obesity, and sedentary levels of activity than their urban counterparts (for example, Wanless, 2005). Although these studies have occasionally reported conflicting results, the consensus has been that rural seniors generally have poorer health status than urban seniors, albeit most studies have not focused on older women. What is missing in this literature is a clear understanding of why these differences exist.

Indeed, differential SDH factors across rural and urban places of residence may contribute to health inequalities. There is a well-established and widely recognized relationship between income and health (Kawachi, 2000), which may affect rural-urban health differentials since incomes tend to be higher in urban areas. Low income has been found to have a consistent influence on one's health, particularly in later life (Buckley, Denton, Robb, & Spencer, 2003; Cairney, 2000; Hirdes & Forbes, 1993). In general, low-income seniors are twice as likely to report having poor health than those with mid to high incomes (Buckley et al.; Cairney). Moreover, adults living in poverty are more likely to have shorter life expectancies and shorter healthy life expectancies (remaining years free of disability) than those not living in poverty (Belanger, Martel, Berthelot, & Wilkins, 2002; Bolig, Borkowski, & Brandenberger, 1999). Thus, income differentials would be expected to affect the health of older women.

Low-income older women must also face the challenges of accessing high-quality nutritional foods, adequate and affordable housing, transportation, affordable prescription medication, and the ability to participate in social activities – all of which are financial issues (Chappell, 1998; McPherson & Wister, 2008). Income is considered to be an especially important SDH, given its impact on the experiences of other related SDH factors such as food insecurity (Raphael, 2006). Furthermore, given that income and education are correlated, education is an important determinant of health, particularly since it influences health behaviours (Marmot, 2004; McMunn, Breeze, Goodman, Nazroo, & Oldfield, 2006).

For instance, Grundy and Slogett (2003) had observed that among older women, having no formal education qualifications was associated with poor or very poor self-rated health. In addition, they found that lower education levels were associated with a higher likelihood of reporting poor health among community-dwelling older adults (Goins et al., 2001).

Food is considered one of the three basic needs of life (in addition to shelter and clothing); therefore, food insecurity is an additional measure of SES. A study by Nord (2000) revealed that as one's income increased, food insecurity decreased; however, even those in the most vulnerable income category were considered to be food secure. In terms of rural-urban residence, it is perhaps surprising that food security was shown to be higher in metro households, at almost every income level (Nord). Those in lower-income households tend to have a poorer diet than those in higher income households, and such dietary patterns can contribute to patterns of poor health (Robertson, Brunner, & Sheiham, 2006). Thus, although SES determinants of health may be an advantage to urban older women, it is unclear as to whether and to what degree these factors are stronger determinants of health across rural-urban environments.

Generally, rural seniors are thought to have larger and more supportive social networks and stronger ties to their communities (Keating, 2008; Pearson Scott & Roberto, 1985, 1987), while being worse off than urban seniors in terms of income and education (Newhouse, 1995). In addition, those in farming and remote areas tend to have fewer formal services available to them, and, therefore, may be more likely to have to rely on family and friends for assistance (Keating, 1991, 2008).

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

These stronger social support networks may help to buffer the impact of low income on the health of the rural aged.

Rogers (1999) documented that, among a sample of frail, low-income elders, those who had good social supports were less depressed and had higher life satisfaction than those elders who had few social supports. Conversely, a severe lack of social support was found to be associated with poorer health for older women (Grundy & Slogett, 2003) and higher risk of nursing home utilization (Kersting, 2001).

Even when no difference is shown in terms of the amount of contact with one's family and friends, rural residents perceive their social network as being more accessible than urban seniors (Keating, 1991). This suggests that there may be rural-urban differentials in community connectedness or social capital, possibly due to the size or population density of the communities, which can facilitate (or hinder) patterns of intimate or frequent interaction. Many rural seniors may also have lived in their communities for a long period of time, which can build up a "stock" of social capital in the form of stronger social connections. Overall, rural dwellers tend to report higher levels of community belonging, and it is understood that better connections to the community can promote better health (Shields, 2008).

In summary, SES and social capital are associated with health status among older women. Older rural women appear to be disadvantaged in terms of having lower incomes and education – key determinants of health – than urban older women have. However, rural older women are advantaged by having more ties to the community (Veninga, 2006) and social cohesion, which are often thought to have a buffering effect on the impact of those stressors on health status (McMunn et al., 2006; Stansfeld, 2006; Wilkinson & Marmot, 2003). Although it is understood that exhibiting different levels of SES, social support, or social capital does not necessarily result in different associations with health status among older women living in rural and urban environments, these social determinants of health may be more (or less) important as predictors of health status depending on residence location, since there may be a cumulative advantage (or disadvantage) effect. For instance, having a lower income and living in a rural environment may exert a weaker effect on health, since the cost of living is generally lower in these communities. Also, social support or social connectedness may be more important for the health status of rural older women, since opportunities for reducing social isolation could be more of a problem in rural communities. Notably, rural areas tend to offer fewer programs, services, senior centres, and other avenues for connecting to other seniors and the community.

On the basis of this literature review, we propose three exploratory hypotheses:

- Income will exert stronger effects on the health status of older women in urban environments than on their counterparts.
- No differences will be observed for education and food insecurity across the residence types.
- Social capital variables will be stronger predictors of health among rural than urban older women.

Methods

Sample and characteristics

This study used secondary data from Statistics Canada's CCHS, Cycle 1.1 (2000/2001). The total sample (n = 130,880) consisted of those living in private dwellings only (those persons living on Indian Reserves, on Canadian Forces Bases, in institutions, and in some remote areas were excluded).

The analysis was based on a sub-sample of females aged 65 years of age or older (n = 14,611), although the sub-sample was further reduced because not all survey questions were included in all health regions across Canada (because the CCHS survey allows for optional content chosen by each health region). Of the optional content, social support was included in the survey in only 86 out of 136 health regions across Canada. Therefore, a sub-sample was created to include those respondents who were female, over 65, and were asked the social support portion of the survey. This resulted in a final sample size of 8,684 respondents. The health regions excluded from this research were 37 of the 38 health regions of Ontario, all 10 health regions in Manitoba, and 3 of 11 health regions in Saskatchewan. Social support (as a measure of social capital) was determined to be more valuable to the analysis than having the entire CCHS sample size, but this is an important limitation of the research.

A sampling weight coefficient created by Statistics Canada (2004a) was used "in order for estimates produced from survey data to be representative of the covered population" (p. 7). The sample was subsequently rescaled back to the original sub-sample size of 8,684 by using a multiplier in order for us to conduct the analysis.

Measurement

Dependent Variables

Six dependent variables (see Table 1) were used to measure older women's health status and were coded to reflect poorer health. Self-perceived health was obtained from the question, "In general, would you say your health is (excellent, very good, good, fair, or poor)?" These five possible responses were dichotomized,

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

Table 1: Dependent variable frequencies

Dependent Variable	Excellent/ Very Good/Good		Fair/Poor	
	n	%	*n*	%
Self-perceived Health	6,200	71.4	2,484	28.6
	No		**Yes**	
	n	%	*n*	%
Chronic Condition	1,032	11.9	7,653	88.1
Arthritis/Rheumatism	4,571	52.6	4,114	47.4
High Blood Pressure	5,056	58.2	3,628	41.8
Diabetes	7,711	88.8	974	11.2
Heart Disease	7,157	82.4	1,527	17.6

resulting in a category of those who rated their health more favourably (excellent, very good, and good) and those who rated their health as fair or poor. The missing cases for self-perceived health (n = 2, .02%) were recoded into the excellent/very good/good category. The ordering of this dichotomy (0 = excellent/very good/good, 1 = fair/poor) was to ensure the prediction of fair or poor health, which complemented the prediction of having a number of chronic conditions.

Five additional health measures were derived from the chronic conditions section of the questionnaire. Respondents were asked to identify "long-term conditions that have lasted or are expected to last 6 months or more and that have been diagnosed by a health professional", and they responded with a yes/no to each item on a list of 25 health conditions. A derived variable was created in the data set to indicate whether the respondent reported having any chronic condition. The majority of respondents (n = 7,653, 88.1%) reported having at least one chronic condition. Missing cases (n = 128, 1.5%) were recoded as "yes". Limitations with this variable were recognized, given the high number of respondents in this sample reporting at least one chronic condition and the wide variety of conditions included in this variable.

To further examine the impact of chronic conditions, four common conditions considered to greatly impact older women's overall health status were also included in the analysis. These conditions were (a) arthritis/rheumatism, (b) high blood pressure, (c) diabetes, and (d) heart disease. Nearly half of respondents reported having arthritis/rheumatism (n = 4,114, 47.4%) and high blood pressure (n = 3,628, 41.8%). In addition, a small minority reported being diagnosed with diabetes (n = 974, 11.2%) and heart disease (n = 1,527, 17.6%). To deal with the small number of missing cases for each of these variables – arthritis/rheumatism (n = 14, .2%), high blood pressure (n = 20, .2%), diabetes (n = 18, .2%) and heart disease (n = 14, .2%) – all were recoded into the modal category of "no", as the majority of respondents reported not having these specific conditions.

For the dependent variables, missing data ranged between 2 and 128 cases (1.5%). For independent variables, most of the missing cases were also small (under 5%), except for four variables. Variables with less than 5 per cent missing data were recoded into the mean average for interval variables and the modal category for nominal and ordinal variables. Variables with 5 per cent or more missing data (income, social support, sense of belonging, and physical activity) were imputed into the appropriate category based on valid data for age and education. We selected these imputation variables because of the strength of their associations with the target variables. This method had the advantage of maximizing our sub-sample sizes.

Independent Variables

Ten independent variables were chosen for analysis and organized into four categories, or blocks, for comparison purposes: (a) socio-demographic characteristics, (b) SES, (c) social/community support, and (d) lifestyle factors. Given the focus here on SES and social capital, only those two categories are discussed in detail.

Socio-Demographic Characteristics. Age, marital status, and visible minority status were used to measure older women's socio-demographic characteristics. Age was used in interval form while marital status was recoded into a five-category variable comparing those who were married/common-law to those who were single, separated, divorced, and widowed. Visible minority status was obtained by asking respondents to self-identify as belonging to different cultural or racial backgrounds. Owing to the small number of cases in categories other than "White", these categories were recoded into "White or non-visible minority" persons and "visible minority" persons.

Socio-Economic Status. Three variables were used to measure SES: (a) total household income, (b) education level, and (c) food insecurity. To measure financial status, a series of questions were asked to obtain the "best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months." For analysis purposes, the ordinal variable was recoded with the following five groupings: (a) less than $15,000; (b) $15,000–$29,999; (c) $30,000–$49,999; (d) $50,000–$79,999; and (e) $80,000 or more. These groups facilitated comparisons to other studies and were similar to the household income adequacy variable in the CCHS. The missing cases (n = 1,419, 16.3%) were imputed into the mean income level according to age group (65–74, 75–84, and 85 and

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

over) and education level (grade 8 or lower, some secondary or secondary graduate, and some post-secondary or higher).

Educational attainment of the respondent was measured by an ordinal variable, recoded into six categories: (a) grade 8 or lower, (b) some secondary, (c) secondary graduate, (d) some post-secondary, (e) trade or college certificate/diploma, and (f) university certificate/degree. A small number of missing cases ($n = 112$, 1.3%) were recoded into the modal category, "grade 8 or lower".

The final measure of SES was "some food insecurity in the past 12 months", which reflected the possible impact income may have had on nutrition, and consequently, on one's health. This was derived from three questions asking: "In the past 12 months how often did you or anyone in your household: worry there would not be enough to eat; not have enough to eat because of a lack of money; and not eat the quality or variety of foods that you wanted to eat because of a lack of money?" The derived variable was a dichotomy of no/yes for food insecurity in the past 12 months. Missing cases ($n = 126$, 1.4%) were recoded into the modal category, which was "no".

Social Capital. Two variables – social support and sense of community belonging –were selected to measure social capital. We recognized that although measures of social support have been used as measures of social capital, there has been controversy as to whether the concepts are separate or interrelated (Baum & Ziersch, 2003). We chose to use social support as an indicator of social capital, consistent with considerable previous research in the area (e.g., Coleman, 1988). Unfortunately, other measures of social capital at the community or ecological level (e.g., civic engagement, volunteerism, etc.) were lacking in the data set.

Three of the four subscales in the social support section of the questionnaire, derived from the Medical Outcomes Social Support Survey (MOS scales), were chosen because of their relevance to this study: (a) affection, (b) emotional/informational support, and (c) positive social interaction. Missing cases for each subscale (affection: $n = 575$, 6.6%; emotional/informational: $n = 692$, 8.0%; positive social interaction: $n = 572$, 6.6%) were imputed into the mean category according to age group (65–74, 75–84, 85 and over). Before conducting multivariate analyses, a correlation matrix was examined to detect any correlations over a level of .70, which would indicate potential for multicollinearity. This revealed that the positive social interaction subscale was collinear with both the affection ($r = .76$) and emotional/informational scales ($r = .77$), and the affection and emotional/informational scales approached collinearity with each other ($r = .68$). Therefore, an additive scale was created by combining the three subscales into one scale to measure "social support". The fourth subscale, tangible social support, was not included in the analysis, owing to overlap with positive social interaction and because it was not collinear with the other three scales.

Combined, these scales assessed the affection and positive appraisal concepts of social support, resulting in an appropriate measure of social capital. The combined scale had a range of 60 with a mean score of 48.2, and higher scores indicated higher levels of social support. A reliability analysis for the total additive scale produced a Cronbach's alpha of .91, indicating that the scales had good inter-reliability.

Sense of belonging to local community was derived from the general health section of the questionnaire, which asked, "How would you describe your sense of belonging to your local community?" Respondents rated their sense of belonging as "very weak", "somewhat weak", "somewhat strong" and "very strong". The missing cases ($n = 612$, 7.0%) were recoded into the mean category by age group.

Lifestyle Factors. The physical activity index was based on the daily energy expenditure (kcal/kg/day) in the past three months, calculated by the duration and frequency of engaging in a number of leisure activities. The reference category, "active" individuals, had an energy expenditure value of 3.0 or greater, while "moderate" individuals had an expenditure value greater than or equal to 1.5, but less than 3.0, and "inactive" individuals' value was less than 1. Although it is possible that there may have been a reciprocal relationship between physical activity and the health measures, a large literature has supported the association used in this study (see McPherson & Wister, 2008). To determine smoking status, a series of questions were asked about current and former smoking behaviour creating a variable to indicate smoking status, with the following categories: (a) daily; (b) occasional, which combined those who are an occasional smoker but former daily smoker and those who were always an occasional smoker; (c) former daily; (d) former occasional; and e) never smoked.

Analytical Strategy

To examine the ways in which the selected social determinants of health differ among rural and urban older women, a comparative analysis using separate logistic regressions for each sub-sample was conducted. Each of the six health status dependent variables was modelled by running separate regression equations for those residing in rural areas (rural fringe and rural outside a central metropolitan area/census agglomeration

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

(CMA/CA), $n = 1,613$) and urban areas (urban core, urban fringe, and urban outside a CMA/CA, $n = 7,071$).

We based rural-urban residence on the 1996 census data and Statistics Canada's definition of rural. Statistics Canada (2001) defined rural areas as those not classified as urban, categorized as those places with a "minimum population concentration of 1,000 persons and a population density of at least 400 persons per square kilometre" (p. 1). Our sample was representative of the actual population because 19.2 per cent of seniors in Canada were living in rural areas in 2001 (Statistics Canada, 2004b).

A preliminary analysis using multiplicative interaction terms between rural-urban residency status and the other SDH variables on the health outcomes produced non-statistically significant results. The separate analyses of rural and urban sub-samples were more sensitive in identifying interaction effects. Although the sub-sample sizes were unequal (1,613 and 7,071 respectively), the relatively large size of the sub-samples lessened the problem of comparing statistically significant associations, since both maintained high levels of statistical power with relatively small differences in sensitivity.

Results

As shown in Table 2, more independent variables were associated with each of the six dependent variables for the urban sub-sample compared to the rural one. In addition, the model chi-squares for the urban analyses were consistently larger than for the rural sample, although were statistically significant. This suggests that the model, which reflects many components of the SDH framework, was better specified for the urban sample.

Socioeconomic Status and Food Insecurity

After controlling for all other variables in the extended SDH model, household income was not associated with any of the six health measures for rural women 65 years of age or older. However, for their urban counterparts, associations were supported for income and perceived health, and for having a chronic condition, high blood pressure, diabetes, and heart disease in the expected direction. Specifically, the odds of having negative self-perceived health increased ($OR = 1.54$) for those with a household income of less than $15,000 compared to $80,000 and over, and was also associated with reporting a chronic condition ($OR = 1.46$) by those who had an income of $30,000 to $49,999 compared to the reference category ($80,000 and over).

Furthermore, we found that urban older women were more likely to report a diagnosis of hypertension with household incomes less than $15,000 ($OR = 1.69$); $15,000 to $29,999 ($OR = 1.66$); and $30,000 to $49,999 ($OR = 1.58$), compared to the reference group ($80,000 and over). In addition, urban older women also were more likely to report diabetes if they had an income of less than $15,000 ($OR = 3.52$); $15,000 to $29,999 ($OR = 3.13$); and $30,000 to $49,999 ($OR = 2.40$), compared to the reference category ($80,000 and over). Finally, among urban women, the odds ratio for reporting heart disease was higher if their income was less than $15,000 ($OR = 1.63$) and $30,000 to $49,999 ($OR = 1.58$), compared to an income of $80,000 and over.

As observed in Table 2, there was a relatively consistent positive association between education and health status measures for both the rural and urban sub-samples. Among rural older women, the odds of reporting fair or poor perceived health increased for those with education at grade 8 or lower ($OR = 2.76$), and some secondary education ($OR = 2.25$), compared to those with a university degree (reference group). For their urban counterparts, associations with perceived health were found for all five educational contrasts (OR range 2.23 – 3.30). The odds ratio of reporting any chronic condition decreased ($OR = .37$) among those with grade 8 or lower education (compared to those with a university degree), but only for the rural group.

Turning to individual chronic illnesses, self-reporting arthritis increased ($OR = 1.31$) among persons with a trade or college diploma (compared to a university degree). The odds of reporting high blood pressure increased for those with some post-secondary education ($OR = 2.41$) compared to a university degree for the rural group; and among those with grade 8 or lower education ($OR = 1.36$) and some secondary education ($OR = 1.41$) for the urban group. The odds of reporting diabetes increased significantly for those with grade 8 or less ($OR = 3.42$) compared to a university degree (reference) for the rural group; and also among those with grade 8 or lower education ($OR = 2.10$) and a secondary school degree ($OR = 1.78$) compared to a university degree for the urban group. Finally, the odds ratio for reporting heart disease increased ($OR = 1.97$) among women with some secondary education compared to having a university degree, but only for the rural group.

Interestingly, similar to household income, food insecurity (as a social determinant of health) was not a significant predictor of health for older rural women, but did predict the health of their urban counterparts. After controlling for all other variables, there was an increased odds of reporting fair or poor health compared to good to excellent ($OR = 1.42$); having a chronic condition ($OR = 1.97$); arthritis/rheumatism ($OR = 1.38$); and heart disease ($OR = 1.80$) for older urban female

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

Table 2: Results from comparative logistic regression

Independent Variables	Fair/Poor Self-Perceived Health						Has Any Chronic Condition					
	Rural			Urban			Rural			Urban		
	Model χ^2 = 179.57***			Model χ^2 = 706.10***			Model χ^2 = 52.22**			Model χ^2 = 206.26***		
	β	SE	OR	β	SE	OR	β	SE	OR	β	SE	OR
Age	0.05***	0.01	1.05	0.03***	0.004	1.03	0.03	0.02	—	0.05***	0.01	1.05
Marital Status												
Single	–0.58	0.31	—	–0.27	0.14	—	0.29	0.45	—	0.55**	0.21	1.74
Divorced	0.50	0.40	—	–0.53***	0.15	0.59	0.27	0.73	—	0.18	0.18	—
Separated	0.36	0.57	—	–0.01	0.22	—	18.93	9.943	—	0.06	0.30	—
Widowed	–0.45**	0.15	0.64	–0.23***	0.07	0.79	–0.39*	0.54	.68	0.24**	0.09	1.27
Married/C.L. (ref)[a]												
Visible Minority Status	–0.26	0.38	—	0.35***	0.11	1.42	0.09	0.54	—	–0.21	0.14	—
Household Income												
< $15,000	0.22	0.46	—	0.43**	0.17	1.54	–0.07	0.78	—	0.20	0.20	—
$15,000–$29,999	–0.20	0.44	—	0.29	0.16	—	–0.49	0.76	—	0.16	0.18	—
$30,000–$49,999	–0.19	0.46	—	0.23	0.16	—	–0.69	0.77	—	0.38*	0.18	1.46
$50,000–$79,999	–0.38	0.50	—	0.29	0.18	—	–0.76	0.80	—	0.22	0.20	—
$80,000+ (ref)												
Education												
Grade 8 or lower	1.01**	0.34	2.76	1.19***	0.15	3.30	–1.00*	0.44	0.37	–0.23	0.16	—
Some Secondary	0.81*	0.35	2.25	0.97***	0.16	2.63	–0.69	0.45	—	0.05	0.17	—
Secondary Graduate	0.63	0.38	—	0.84***	0.16	2.31	–0.75	0.48	—	–0.09	0.17	—
Some Post-Secondary	0.42	0.45	—	0.96***	0.19	2.60	–0.89	0.56	—	–0.02	0.22	—
Trade/College Diploma	0.17	0.37	—	0.80***	0.16	2.23	–0.18	0.48	—	0.12	0.16	—
University Degree (ref)												
Food Insecurity	0.16	0.24	—	0.35***	0.10	1.42	0.11	0.35	—	0.68***	0.18	1.97
Social Support	–0.02***	0.01	.98	–0.02***	0.002	0.98	0.01	0.01	—	0.00	0.00	—
Community Belonging												
Very Weak	0.02	0.22	—	0.68***	0.95	1.97	0.53	0.35	—	0.27*	0.00	1.31
Somewhat Weak	0.23	0.16	—	0.32***	0.08	1.38	0.25	0.23	—	0.34***	0.00	1.40
Somewhat Strong	–0.10	0.15	—	0.08***	0.08	—	0.05	0.20	—	0.44***	0.00	1.55
Very Strong (ref)												
Physical Activity												
Inactive	1.07***	.24	2.90	1.10***	.12	2.99	0.94***	0.00	2.57	0.28*	0.00	1.33
Moderate	.21	.29	—	.42**	.13	1.53	0.67*	0.00	1.95	0.18	0.00	—
Active (ref)												
Smoking Status												
Daily	0.43*	0.21	1.54	0.17	0.10	—	0.20	0.30	—	–26*	0.12	0.77
Occasional	0.11	0.52	—	0.13	0.20	—	1.01	1.06	—	–0.19	0.25	—
Former Daily	0.41**	0.15	1.51	0.20**	0.07	1.22	0.47*	0.22	1.60	0.54	0.10	1.71
Former Occassional	0.07	0.19	—	–0.18*	0.09	0.84	0.20	0.26	—	0.12	0.12	—
Never (ref)												

Continued

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

Table 2: Continued

Independent Variables	Has Arthritis/Rheumatism						Has High Blood Pressure					
	Rural			Urban			Rural			Urban		
	Model χ^2 = 54.03***			Model χ^2 = 202.66***			Model χ^2 = 68.60***			Model χ^2 = 170.11***		
	β	SE	OR	β	SE	OR	β	SE	OR	β	SE	OR
Age	0.03***	0.01	1.03	0.03***	0.004	1.03	0.02	0.01	—	0.002	0.004	—
Marital Status												
Single	–0.16	0.26	—	0.28*	0.12	0.75	0.001	0.26	—	–0.31**	0.12	0.73
Divorced	0.76*	0.38	2.15	–0.04	0.12	—	0.45	0.37	—	–0.30*	0.12	0.74
Separated	–0.001	0.53	—	0.11	0.20	—	0.26	0.54	—	–0.23	0.21	—
Widowed	–0.15	0.13	—	0.08	0.06	—	0.17	0.13	—	–0.02	0.06	—
Married/C.L. (ref)												
Visible Minority Status	–0.20	0.33	—	–0.13	0.10	—	–1.36***	0.41	0.26	0.02	0.10	—
Household Income												
< $15,000	0.08	0.37	—	0.02	0.14	—	–0.06	0.38	—	0.62***	0.15	1.69
$15,000–$29,999	–0.09	0.36	—	–0.07	0.13	—	–0.11	0.36	—	0.51***	0.15	1.66
$30,000–$49,999	–0.04	0.36	—	–0.12	0.13	—	–0.10	0.37	—	0.46***	0.14	1.58
$50,000–$79,999	–0.33	0.40	—	–0.08	0.15	—	0.06	0.40	—	0.27	0.15	—
$80,000+ (ref)												
Education												
Grade 8 or lower	–0.29	0.24	—	–0.03	0.10	—	0.34	0.25	—	0.31**	0.11	1.36
Some Secondary	0.06	0.25	—	–0.01	0.11	—	0.34	0.26	—	0.25**	0.11	1.41
Secondary Graduate	–0.46	0.27	—	0.04	0.11	—	0.39	0.28	—	0.22	0.11	—
Some Post-Secondary	–0.12	0.34	—	0.24	0.14	—	0.88*	0.22	2.41	0.09	0.15	—
Trade/College Diploma	–0.35	0.25	—	0.27**	0.11	1.31	0.07	0.26	—	0.16	0.11	—
University Degree (ref)												
Food Insecurity	0.38	0.21	—	0.32***	0.00	1.38	–0.03	0.22	—	–0.10	0.10	—
Social Support	0.00	0.01	—	–0.002	0.002	—	0.003	0.01	—	–0.01*	0.002	.99
Community Belonging												
Very Weak	–0.02	0.19	—	–0.02	0.09	—	0.11	0.19	—	0.16	0.09	—
Somewhat Weak	–0.08	0.14	—	–0.01	0.84	—	–0.11	0.14	—	0.10	0.07	—
Somewhat Strong	–0.11	0.13	—	–0.07	0.07	—	0.05	0.13	—	0.09	0.07	—
Very Strong (ref)												
Physical Activity												
Inactive	0.19	0.17	—	0.31***	0.08	1.36	0.86***	0.18	2.36	0.42***	0.08	1.52
Moderate	–0.01	0.20	—	0.04	0.09	—	0.77***	0.21	2.16	0.24*	0.10	1.27
Active (ref)												
Smoking Status												
Daily	0.22	0.19	—	–0.17	0.09	—	–0.22	0.19	—	–0.36***	0.09	0.70
Occasional	–0.03	0.45	—	0.41*	0.18	1.51	0.04	0.45	—	–0.73**	0.20	0.48
Former Daily	0.28*	0.13	1.33	0.28***	0.06	1.32	0.01	0.13	—	0.06	0.06	—
Former Occassional	0.48**	0.16	1.61	0.05	0.08	—	–0.05	0.16	—	0.15*	0.08	1.17
Never (ref)												

Continued

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

Table 2: Continued

Independent Variable	Has Diabetes						Has Heart Disease					
	Rural			Urban			Rural			Urban		
	Model χ^2 = 82.77***			Model χ^2 = 229.18***			Model χ^2 = 82.99***			Model χ^2 = 243.90***		
	β	SE	OR	β	SE	OR	β	SE	OR	β	SE	OR
Age	0.001	0.01	—	–0.04***	0.01	0.96	0.06***	0.01	1.06	0.04***	0.01	1.04
Marital Status												
Single	0.52	0.33	—	–0.25	0.22	—	0.44	0.30	—	–0.44*	0.18	0.64
Divorced	–0.67	0.80	—	–0.09	0.20	—	0.21	0.47	—	0.04	0.16	—
Separated	1.11	0.62	—	–0.44	0.37	—	0.08	0.70	—	0.38	0.25	—
Widowed	0.03	0.18	—	0.22*	0.10	1.25	–0.15	0.16	—	0.15	0.08	—
Married/C.L. (ref)												
Visible Minority Status	1.28***	0.35	3.60	0.30*	0.15	1.35	–0.03	0.41	—	0.50***	0.15	0.61
Household Income												
< $15,000	0.22		—	1.26***	0.31	3.52	–0.26	0.48	—	0.49*	0.21	1.63
$15,000-$29,999	0.36	0.64	—	1.14***	0.30	3.13	–0.39	0.46	—	0.34	0.20	—
$30,000-$49,999	0.12	0.64	—	0.87**	0.31	2.40	–0.27	0.47	—	0.46*	0.21	1.58
$50,000-$79,999	0.91	0.66	—	–27	0.38	—	0.31	0.50	—	0.41	0.23	—
$80,000+ (ref)												
Education												
Grade 8 or lower	1.23**	0.47	3.42	0.74***	0.22	2.10	.54	.33	—	.12	.14	—
Some Secondary	0.87	0.48	—	0.31	0.23	—	0.68*	0.34	1.97	–0.003	0.15	—
Secondary Graduate	0.50	0.53	—	0.58*	0.23	1.78	0.46	0.38	—	0.03	0.16	—
Some Post-Secondary	0.27	0.69	—	0.24	0.30	—	0.39	0.47	—	–0.01	0.20	—
Trade/College Diploma	0.56	0.50	—	0.38	0.23	—	–0.03	0.36	—	0.14	0.15	—
University Degree (ref)												
Food Insecurity	–0.03	0.31	—	–0.06	0.15	—	0.20	0.27	—	0.59***	0.11	1.80
Social Support	0.002	0.01	—	0.004	0.003	—	0.004	0.01	—	–0.004	0.003	—
Community Belonging												
Very Weak	0.11	0.26	—	0.37**	0.13	1.44	0.47*	0.23	1.61	0.02	0.11	—
Somewhat Weak	–0.29	0.21	—	0.14	0.12	—	0.22	0.18	—	–0.14	0.09	—
Somewhat Strong	–0.01	0.18	—	0.05	0.11	—	0.11	0.17	—	–0.18*	0.09	0.83
Very Strong (ref)												
Physical Activity												
Inactive	0.89**	0.32	2.43	0.66***	0.16	1.93	0.65*	0.25	1.91	0.54***	0.12	1.72
Moderate	0.63	0.36	—	0.16	0.18	—	0.24	0.30	—	0.17	0.14	—
Active (ref)												
Smoking Status												
Daily	–0.42	0.31	—	–0.41**	0.15	0.66	–0.48	0.28	—	–0.06	0.12	—
Occasional	1.20*	0.51	3.32	–0.62	0.35	—	0.23	0.58	—	–0.17	0.25	—
Former Daily	0.26	0.18	—	0.05	0.10	—	0.41**	0.16	1.50	0.20*	0.08	1.22
Former Occassional	–0.38	0.26	—	0.29*	0.12	1.33	–0.01	0.21	—	0.15	0.10	—
Never (ref)												

***p* ≤ .05, ****p* ≤ .01, *****p* ≤ .001**
[a] **(ref) means this was the reference category**

respondents with some food insecurity in the past 12 months, in comparison with food security (reference).

Social Capital

As a measure of one's perceived social capital or networks of social relations, the social support scale was also a strong predictor of the health status of older women. For both the rural and urban groups, the odds of having fair/poor health decreased (*OR* = .98), for each unit change in the social support scale. For the urban respondent, the odds of reporting a diagnosis of hypertension also decreased with each scale unit change in social support (*OR* = .99).

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

Sense of belonging to local community, another important SDH, better predicted the health of older urban women than of those residing in rural areas. For rural respondents, after controlling for all other variables in the model, a higher odds ratio (*OR* = 1.61) of heart disease was observed for those who rated their belonging as very weak, contrasted with very strong (reference). On the other hand, among urban-dwelling respondents, a sense of belonging to the local community was a good predictor of reporting fair or poor health, any chronic condition, diabetes, and heart disease. Indeed, the odds of having fair or poor health increased for those with very weak (*OR* = 1.97) and somewhat weak (*OR* = 1.38) ties to the local community, compared to those with very strong ties. Also, a greater odds of having a chronic condition was found for those with a very weak (*OR* = 1.31), somewhat weak (*OR* = 1.40), and somewhat strong (*OR* = 1.55) sense of belonging to the local community, compared to very strong. The odds of having diabetes among urban respondents was also higher for those with a very weak sense of belonging to the local community (*OR* = 1.44). The only unexpected association was for having heart disease, where the odds ratio was actually lower among those who rated their sense of belonging as somewhat strong, compared to very strong (*OR* = .83).

Supplementary Associations

A number of additional associations were uncovered for control variables (age, marital status, visible minority status, physical ability, and smoking status) that replicated other studies and were not substantially different across the sub-samples, except in two cases (see Table 2). With respect to these associations, the only anomalies found was with some of the smoking associations, where the likelihood of poorer health status decreased with daily smoking compared to those who never smoked. This may have been due to selection effects that occurred among older smokers who died, sometimes found in cross-sectional studies. In addition, there appeared to be a protective effect for hypertension among visible minorities, but only for rural older women, and for heart disease among visible minorities, but only for urban older women.

Discussion

The comparative analyses revealed that, overall, the SDH factors examined in this research were stronger predictors of health status for urban older women than for rural women. Indeed, associations between five of the six health measures and household income, food insecurity, and social support, and social capital indicators were not found among rural respondents. The only exception was an association between social support and perceived health. In addition, our findings supported one anomalous association between sense of community belonging (very weak/very strong contrast) and heart disease, which was in the opposite direction than hypothesized.

Support was found for hypothesis 1, in that associations between income and health status were supported for urban older women, but were not supported for rural women, even though their SES is usually lower. However, it was unexpected that the income effect was equivocal, given that we anticipated an income effect (albeit lower), on the basis of the importance of income for all populations, which the SDH emphasizes. Hypothesis 2 was partially supported. There were relatively small differences for the effects of education across rural and urban geographic locations. Yet, food insecurity was only supported among urban older women for some of the health measures. Hypothesis 3 was not supported. We found few associations for social capital and the health measures for the rural sub-sample. However, social capital was found to affect health status for urban older women considerably more than for their rural counterparts. Overall, we found considerably more and relatively consistent associations among the SDH variables for urban older women than rural ones; thus, there appear to be other factors not measured here that evidently influence rural health.

Taken together, these findings show that the health of older rural and urban women is considerably more complicated than previously thought, and this has implications for the applicability of the SDH model identified by Raphael (2004, 2006). It appears that the explanatory power of the SDH model varies according to key population characteristics, in particular geographic dimensions, or at least rural-urban residency of older women. In fact, the identical quantitative model produced a better fit with the data for urban older women than for their rural counterparts. It is likely that the SDH model as operationalized in the present study is mis-specified for rural populations of older women. That is, we may not have included all of the relevant social determinants discussed in the literature, or we may not have used a complete complement of valid and reliable measures.

There are likely other factors that shape the health of older women in rural regions. Ethnic variations, particularly aboriginal status, may be one key variable not included in this research, although visible minority status was included. Another factor is a full set of nutritional indicators and measures of diet, beyond food insecurity. For example, these data do not provide all indicators of healthy lifestyle behaviours, such as obesity, nor did we include factors that fully capture a socio-ecological explanation of rural aging and health

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

(Keating & Phillips, 2008). Nevertheless, we included many key variables identified in the health and aging literature.

It is particularly noteworthy that no association was found between income and any of the health indicators examined for older rural women, which contrasts sharply with a robust literature supporting such a relationship (e.g., see Berkman & Kawachi, 2000; Grundy & Slogett, 2003). This fact, coupled with the fact that many other social determinants were found to be unimportant predictors of health status among rural older women (social support, community belonging, and food insecurity), suggests that rural residence needs to be integrated into the SDH model as a unique dimension. Indeed, social determinants of health may affect older women quite differentially depending on their physical location, and SDH lends support to a social-ecological model of rural aging as elucidated by Keating and Phillips (2008). Rural and urban residence act as more than simple place-based descriptors – they reflect a host of contextual factors, such as access to care; availability to care options, amenities, and other services, such as transportation networks; and so on.

Several explanations have been identified as to why the SDH model may significantly differ for rural and urban older women. First, the cost of living in rural areas is lower, possibly making income (and other measures capturing economically based resources) a less important explanatory variable. Second, differences may be attributed to health care utilization and access to resources that enable use, factors that were not included in the analytic model. Also, driving status may have a larger impact on rural women's access to health care, given the lack of public transportation in rural areas and the distances that are often necessary to access health care services, such as general practitioners, specialists, clinics, and hospitals (Gerritsen et al., 1990).

Third, other distinct aspects of rural culture relating to self-sufficiency and self-reliance might exist that may result in both positive and negative health outcomes. On the negative side, rural women may be less likely to acknowledge health problems (due to a proclivity towards self-sufficiency and resilience), and thus to attempt to limit their dependence on medical and formal services (Davis & Magilvy, 2000; Keating, 2008; Rabiner et al., 1997; Shenk, 1998).

For instance, in their study of self-care practices among older adults, Rabiner et al. (1997) noted a stronger sense of independence and a value of self-reliance among rural residents than those living in metropolitan areas. Furthermore, lower levels of education, health literacy, and health knowledge can also affect the diagnosing and self-reporting of health status, such that rural women may be less aware of whether or not they have a professional diagnosis of health conditions and so may misreport these conditions (Davis & Magilvy, 2000).

Finally, we were unable to examine the lifelong accumulation of advantages or disadvantages of some variables (especially SES, food insecurity, and social capital in earlier years). Accordingly, it is probable that either longitudinal data or measures that capture SDH throughout life may better explain the rural-urban variation found here (Bolig et al., 1999). For instance, O'Rand and Hamil-Luker (2005) found that economic hardship during childhood development can influence the risk of developing cardiovascular disease in later life.

We should not overlook the fact that, for urban older women, the SDH model exhibited strong explanatory power for all six health measures, which is consistent with other research on older persons (e.g., Grundy & Slogett, 2003; Public Health Agency of Canada, 2002). With respect to the most prominent SDH measures, income exhibited associations with all health status measures except for self-reported arthritis, and was particularly important as a predictor of high blood pressure, cardiovascular disease, and diabetes among older urban women. Yet, the most salient educational effects were for self-perceived health and diabetes. In addition, weak social capital was strongly associated with fair or poor self-perceived health and reporting at least one chronic condition, lending support to the notion that social connectedness affects health in older age (Veninga, 2006), at least for this sub-group. The findings also suggest that social support and sense of belonging operate as fairly distinct social capital constructs. Finally, food insecurity was associated with poorer perceived health, with having at least one chronic condition, and with self-reports of arthritis and heart disease. Thus, the SDH model appears to be a better explanatory framework to account for health patterns among older women living in urban areas compared to rural areas.

Limitations

Because we conducted a secondary analysis of the 2001 CCHS, a number of limitations need to be recognized. The 2001 CCHS used a cross-sectional design, thereby limiting the opportunity to examine associations over time, such as length of rural residence. In addition, the CCHS excluded those residing in institutional settings, on Indian Reservations, and in some remote areas of the country. Given the topic of our study, the exclusion of these groups may have affected our findings. Another limitation of the 2001 CCHS is the common and optional content design of the survey. In order to include social support in the study, those respondents residing in 50 of the 136 health regions had to be excluded, causing the unweighted sample size to be reduced to

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

8,468 from 14,611. This included most of Ontario, all of Manitoba, and three health regions in Saskatchewan. However, it should be noted that analyses were repeated with the entire Canadian sample (excluding the social support measures), and the exclusion of the above health regions did not have a substantial impact on any of the remaining substantive findings (see Wanless, 2005).

Future Research, Implications, and Conclusion

In light of the findings and limitations, a number of future research directions can be delineated. First, there is a need to ascertain whether these findings are exclusive to older women or whether they extend to rural older men of various ages. It should also be investigated why income, as one major social determinant of health, has a stronger effect on the health of older urban women, compared to rural dwelling women. The findings uncovered in this study add substantively to the current knowledge base around rural-urban health differences and inequality (i.e., Rosenberg & Wilson, 2000), yet further exploration is required to fill in the gaps.

In addition, a distinction between small towns, small cities, and large cities may provide further insight into the influence of community size and related resources on the health of older women. Delineation of "rural farm" and "rural non-farm" or including communities with fewer than 5,000 persons as rural, as suggested by Joseph and Martin Matthews (1994), may also provide more useful information than the Statistics Canada definition of fewer than 1,000 persons. In addition, rurality is typically measured by current residence. Given the prevalence of geographic mobility in Canada, alternative methods to defining rurality should be explored, such as rural rearing (having spent the formative years of life in a rural setting) and rural self-identity (identifying as rural, regardless of current residence) (Joseph & Martin Matthews). Finally, the SDH model needs to add a rural-urban dimension, since it appears that it does not necessarily apply equally across geographic locations. As well, it is important to explore whether or not some of the other social determinants (e.g., access to health care services, housing) may better elucidate rural-urban health differentials.

References

Allan, D., & Cloutier-Fisher, D. (2006). Health service utilization among older adults in British Columbia: Making sense of geography. *Canadian Journal on Aging*, *25*(2), 219–232.

Baum, F.E., & Ziersch, A.M. (2003). Social capital. *Journal of Epidemiology and Community Health*, *57*, 320–323.

Belanger, A., Martel, L., Berthelot, J., & Wilkins, R. (2002). Gender differences in disability-free life expectancy for selected risk factors and chronic conditions. *Journal of Women and Aging*, *14*(1–2), 61–83.

Berkman, L.F., & Kawachi, I. (Eds.). (2000). *Social epidemiology*. New York: Oxford University Press.

Bolig, E.E., Borkowski, J., & Brandenberger, J. (1999). Poverty and health across the life span. In T.L. Whitman, T.V. Merluzzi, & R.D. White (Eds.), *Life span perspectives on health and illness* (pp. 67–84). Mahwah, NJ: Lawrence Erlbaum.

Bowen, G.L., Richman, J.M., & Bowen, N.K. (2000). Families in the context of communities across time. In S. Price, P. McKenry, & M.J. Murphy (Eds.), *Families across time: A life course perspective* (pp. 117–128). Los Angeles: Roxbury.

Buckley, N.J., Denton, F.T., Robb, A.L., & Spencer, B.G. (2003). *Socioeconomic influence on the health of older people: Estimates based on two longitudinal surveys*. Hamilton, Ontario, Canada: QSEP Research Institute.

Cairney, J. (2000). Socio-economic status and self-rated health among older Canadians. *Canadian Journal on Aging*, *19*, 456–478.

Chappell, N.L. (1998). Maintaining and enhancing independence and well-being in old age. In National Forum on Health (Ed.), *Determinants of health: Adults and seniors* (pp. 89–141). Saint-Foy, QC: Editiens MultiMondes.

Clark, D., & Dellasega, C. (1998). Unmet health care needs: Comparison of rural and urban senior center attendees. *Journal of Gerontological Nursing*, *21*(2), 24–33.

Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94*, S95–S120.

Davis, R., & Magilvy, J. (2000). Quiet pride: The experience of chronic illness by rural older adults. *Journal of Nursing Scholarship*, *32*(4), 385–390.

Denton, M., Prus, S., & Walters, V. (2004). Gender differences in health: A Canadian study of the psychosocial, structural and behavioural determinants of health. *Social Science & Medicine*, *58*, 2585–2600.

Forbes, D., Morgan, D., & Janzen, B. (2006). Rural and urban Canadians with dementia: Use of health care services. *Canadian Journal on Aging*, *25*(3), 321–330.

Gerritsen, J.C., Wolffensperger, E.W., & Van Den Heuvel, W.J.A. (1990). Rural-urban differences in the utilization of care by the elderly. *Journal of Cross Cultural Gerontology*, *5*, 131–147.

Gillanders, W.R., Buss, T.F., & Hofstetter, C.R. (1996). Urban/rural elderly health status differences: The dichotomy re-examined. *Journal of Aging and Social Policy*, *8*(4), 7–24.

Goins, R.T., Hays, J.C., Landerman, L.R., & Hobbs, G. (2001). Access to health care and self-rated health

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

among community-dwelling older adults. *Journal of Applied Gerontology*, *20*, 307–321.

Grundy, E., & Slogett, A. (2003). Health inequalities in the older population: The role of personal capital, social resources and socio-economic circumstances. *Social Science and Medicine*, *56*, 935–947.

Havens, B., Hall, M., Sylvestre, G., & Jivan, T. (2004). Social isolation and loneliness: Differences between older rural and urban Manitobans. *Canadian Journal on Aging*, *23*, 129–140.

Hirdes, J.P., & Forbes, W.F. (1993). Factors associated with the maintenance of good self-rated health. *Journal of Aging and Health*, *5*, 101–122.

Joseph, A.E., & Martin Matthews, A. (1994). Growing old in aging communities. In V. Marshall & B. McPherson (Eds.), *Aging: Canadian perspectives* (pp. 20–35). Peterborough, Ontario, Canada: Broadview Press.

Kawachi, I. (2000). Income inequality and health. In L.F. Berkman & I. Kawachi (Eds.), *Social epidemiology* (pp. 76–94). New York: Oxford University Press.

Keating, N. (1991). *Aging in rural Canada*. Toronto, Ontario, Canada: Butterworths Canada.

Keating, N. (Ed.). (2008). *Rural ageing: A good place to grow old?* London: Policy Press.

Keating, N., & Phillips, J.E. (2008). A critical human ecology perspective on rural ageing. In N. Keating (Ed.), *Rural ageing: A good place to grow old?* (pp. 1–10). London: Policy Press.

Kersting, R.C. (2001). Impact of social support, diversity and poverty on nursing home utilization in a nationally representative sample of older Americans. *Social Work in Health Care*, *33*(2), 67–87.

McCulloch, B.J. (1998). Introduction. In B.J. McCulloch (Ed.), *Old, female and rural* (pp. 1–5). Binghamton, NY: Haworth Press.

Marmot, M. (2004). *The status syndrome: How social standing affects our health and longevity*. New York: Times Books.

McMunn, A., Breeze, E., Goodman, A., Nazroo, J., & Oldfield, Z. (2006). Social support and social cohesion. In M. Marmot & R.G. Wilkinson (Eds.), *Social determinants of health* (2nd ed., pp. 148–171). New York: Oxford University Press.

McPherson, B., & Wister, A. (2008). *Aging as a social process: Canadian perspectives*. Don Mills, Ontario, Canada: Oxford University Press.

Mitura, V., & Bollman, R.D. (2003). The health of rural Canadians: A rural-urban comparison of health indicators. *Rural and Small Town Canada Analysis Bulletin*, *4*(6), 1–23.

Newhouse, J.K. (1995). *Rural and urban patterns: An exploration of how older adults use in-home care.* New York: Garland Publishing.

Nord, M. (2000). Does it cost to live in rural areas? Evidence from new data on food security and hunger. *Rural Sociology*, *65*(1), 104–125.

O'Rand, A., & Hamil-Luker, J. (2005). Process of cumulative adversity: Childhood disadvantage and increased risk of heart attach across the life course. *Journals of Gerontology: Psychological Sciences and Social Sciences*, *60B*, 117–124.

Pearson Scott, J., & Roberto, K.A. (1985). Use of informal and formal support networks by rural elderly poor. *The Gerontologist*, *25*, 624–630.

Pearson Scott, J., & Roberto, K.A. (1987). Informal supports of older adults: A rural urban comparison. *Family Relations*, *36*, 444–449.

Pederson, A., & Raphael, D. (2006). Gender, race and health inequalities. In D. Raphael, T. Bryant, & M. Rioux (Eds.), *Staying alive: Critical perspectives on health, illness, and health care* (pp. 159–191). Toronto, Ontario, Canada: Canadian Scholars Press.

Pong, R., DesMeules, M., & Lagace, C. (2009). Rural-urban disparities in health: How does Canada fare and how does Canada compare with Australia. *Australian Journal of Rural Health*, *17*, 58–64.

Public Health Agency of Canada. (2002). *The social determinants of health: An overview of the implications for policy and the role of the health sector*. Ottawa, Ontario, Canada: Public Health Agency of Canada. Retrieved August 30, 2009, from http://www.phac-aspc.gc.ca/ph-sp/oi-ar/pdf/01_overview_e.pdf

Public Health Agency of Canada. (2006). *Determinants of health*. Ottawa, Ontario, Canada: Public Health Agency of Canada. Retrieved November 22, 2007, from http://www.phac-aspc.gc.ca/media/nr-rp/2006/2006_06bk2-eng.php

Rabiner, D., Konrad, T., DeFriese, G., Kincade, J., Berbard, S., Woomert, A., et al. (1997). Metropolitan versus nonmetropolitan differences in functional status and self-care practices: Findings from a national sample of community-dwelling older adults. *Journal of Rural Health*, *13*(1), 14–28.

Raphael, D. (2004). Introduction to the social determinants of health. In D. Raphael (Ed.), *Social determinants of health: Canadian perspectives* (pp. 1–18). Toronto, Ontario, Canada: Canadian Scholars Press.

Raphael, D. (2006). Social determinants of health: An overview of concepts and issues. In D. Raphael, T. Bryant, & M. Rioux (Eds.), *Staying alive: Critical perspectives on health, illness, and health care* (pp. 115–138). Toronto, Ontario, Canada: Canadian Scholars Press.

Robertson, A., Brunner, E., & Sheiham, A. (2006). Food is a political issue. In M. Marmot & R.G. Wilkinson (Eds.), *Social determinants of health* (2nd ed., pp. 172–195). New York: Oxford University Press.

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press

Rogers, A. (1999). Factors associated with depression and low life satisfaction in the low-income, frail elderly. *Journal of Gerontological Social Work*, *31*, 167–194.

Rosenberg, M.W., & Wilson, K. (2000). Gender, poverty and location: How much difference do they make in the geography of health inequalities? *Social Science & Medicine*, *51*, 275–287.

Shapiro, E., & Roos, L.L. (1984). Using health care: Rural/urban differences among the Manitoba elderly. *The Gerontologist*, *24*, 270–274.

Shields, M. (2008). Community belonging and self-perceived health. *Health Reports*, *19*(2), 1–10.

Shenk, D. (1998). Subjective realities of rural older women's lives: A case study. In B.J. McCulloch (Ed.), *Old, female and rural* (pp. 7–24). Binghamton, NY: Haworth Press.

St. John, P.D., Havens, B., van Ineveld, C.H.M., & Finlayson, M. (2002). Rural-urban differences in health status of elderly Manitobans. *Canadian Journal of Rural Medicine*, *7*(2), 89–93.

Stansfeld, S.A. (2006). Social support and social cohesion. In M. Marmot & R.G. Wilkinson (Eds.), *Social determinants of health* (2nd ed., pp. 148–171). New York: Oxford University Press.

Statistics Canada. (2001). Geographic units: Urban area (UA). *Data dictionary: 2001 census*. Ottawa, Ontario, Canada: Statistics Canada. Retrieved July 11, 2008, from http://www12.statcan.ca/english/census01/Products/Reference/dict/geo049.htm

Statistics Canada. (2004a). *Canadian community health survey*. Ottawa, Ontario, Canada: Statistics Canada. Retrieved July 11, 2008, from http://statcan.ca/english/sdds/3226.htm

Statistics Canada. (2004b). *Statistical area classification: Highlight tables, 2001 counts, for Canada, provinces and territories*. Ottawa, Ontario, Canada: Statistics Canada. Retrieved July 11, 2008, from http://www12.statcan.ca/english/census01/products/highlight/SAC

Strain, L.A., & Chappell, N.L. (1983). Rural-urban differences among adult day care participants in Manitoba. *Canadian Journal on Aging*, *2*, 197–209.

Veninga, J. (2006). Social capital and healthy aging. *Health Policy Research Bulletin*, *12*, 21–24.

Wanless, D. (2005). Health differentials among elderly women: A rural-urban analysis (Master's Thesis, Simon Fraser University, 2005). *Masters Abstracts International*, *44*, 5.

Wilkinson, R., & Marmot, M. (Eds.). (2003). *Social determinants of health: The solid facts* (2nd ed.). Copenhagen, Denmark: World Health Organization.

https://doi.org/10.1017/S0714980810000140 Published online by Cambridge University Press