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Abstract

This paper uses the Canadian Community Health Survey of 2003 to examine health perceptions among elderly Canadians (age 60 and over). The results indicate that individual factors explain more of the variation in perceived health compared to community factors (employment rate, incidence of low income, percentage of visible minority, percentage of Canadians and percentage of non-family persons in private households). Among individual factors, age, sense of community belonging, education and income adequacy are particularly important in determining how individuals perceive their health. On the other hand, among community factors, the incidence of low income, percentage of visible minority and percentage of non-family persons had an independent effect on perceived health.

Key words: Health status, health perceptions, Aging population, Neighbourhood effects, Canada

Introduction

In recent decades there has been a great interest in the effect of contextual factors on diverse phenomena including a variety of measures of population health. Different contextual factors such as neighbourhood poverty levels or community characteristics such availability of social and health services and extent of income inequality have been found to be associated with such measures of health as nutrition and mortality (Filmer and Pritchett, 1999; Montgomery and Hewett, 2005). However, few studies have associated contextual effects to health status among the aged. Studies that have included contextual factors have shown that the effect of these factors is stronger than that of individual attributes such as sex, age and marital status (Sastry, 1996; 1997; Ross, 2002). For instance, Sastry (1997) in his Brazilian study of child mortality found that community variables such as infrastructure, education, healthcare services and environmental factors were largely responsible for the rural-urban child mortality differential compared to socioeconomic and behavioural characteristics at individual and household levels.

This paper examines the relationship between individual, household and community characteristics and health perceptions in old age. In particular, we pay attention to the effects of neighbourhood factors including poverty, sense of community belonging in mediating the effects of individual and household attributes on health perception. The proportion of Canadians who are aged over 60 has been increasing over the years as life expectancy increases. However, little or no research has been done to examine the determinants of self perceived health among Canadian old age population.

As in most household and clinical surveys, the CCHS asked respondents to assess their own health in the preceding twelve months. Respondents had to choose between

excellent, very good, good, fair or poor. Reservations have been expressed regarding the utility of such a subjective measure in capturing the totality of personal health. However, it has been shown to be an adequate measure of overall health, morbidity reported in surveys or diagnosed through clinical examination and a good predictor of mortality among other indicators of health status (See Pampalon et al., 1999). It is well known that old age comes with a myriad of health problems most of which are due to the aging process and a person's accumulation of ill health over life. Nonetheless, understanding health status from the aged point of view might help in designing appropriate response strategies.

Data and methods

The primary source of data for this study is the 2001 Canadian Community Health Survey. The CCHS interviewed 130,880 people aged 12 and above between September 2000 and November 2001. It covered 136 health regions, in the ten provinces and three territories of Canada. A full description of the survey is available in Statistics Canada (2003). The analysis is based on a sub-sample of those aged 60 and above totalling 30, 865 persons. The 2000-2001 Canadian Community Health Survey includes a broad range of factors relating to family structure, economic activities and other individual characteristics and it is therefore appropriate for an analysis of the determinants of health. The survey also includes various measures of such as self-rated health, self-rated stress, specified chronic conditions and long-term activity restriction.

In order to account for the effect of community effects, the 2001 Census Profile, developed for use in Statistics Canada Research Data Centres, was linked to the CCHS

data based on the Postal Code Conversion file. The linked data set therefore includes both individual characteristics of the respondents and characteristics of their area of residence. The initial analysis involves separate models with individual and community variables, while the final model includes both sets of variables. The overall objective of the analysis is to examine whether community-level characteristics contributes to the explanation of difference in self-perceived health. Table 1 presents a distribution of the factors analysed in this study. The measure of the 'community' used is the dissemination area.

The outcome variable, self-perceived health is multinomial. Consequently, we used multinomial logistic regression which takes into account the ordering of the outcome variable. There were five response categories corresponding to self-rated health perception: excellent, very good, good, fair or poor. However, for this analysis the first two and last two categories were combined to improve statistical modelling. A distinction is therefore made between three categories of self-perceived health status: Excellent, good and poor. For ease of interpretation, the results reported here are in form of probabilities. The procedure for deriving the probabilities is provided in the appendix.

Results

Three models were estimated in this analysis examining the relationship between health perception and individual and community characteristics. The first model included only individual variables, the second included only community variables, while the full model combined both sets of variables. The results of the analyses are presented in Tables 2, 3 and 4 consecutively.

Province of residence

The descriptive results in Table 1 show that more than one-third of people in all provinces except the Northern territories reported being in excellent or very good health. Regarding the estimated probabilities, more people in the Atlantic provinces(37.8 percent) report being in poor health, those in Quebec report highest probability of good health, while a similar number of people in Western provinces and Quebec report being in excellent health. Fewer people in Yukon, North West Territories and Nunavut, about one-fifth report that they are in excellent health.

Type of place of residence

The type of place one lives has been associated with different health measures. From Table 1, it is evident that except for individuals living in the rural fringe, there is little variation in the percentage of people reporting excellent health by place of residence. Although the results of the model with only individual variables (Table 2) and that including community characteristics (Table 4) confirm this pattern, it shows that residents of the urban fringe are more likely to report poor health.

Age group

Comparing five groups of old age, the descriptive results show that as people age, their perception of their health status as being poor also increases. This pattern of perceived health is maintained in the regression models. For instance, in the model including community variables, 40.2, 46.7 and 47.6 percent of people aged 70-74, 75-79 and 80 and above report being in poor health.

Sex

The descriptive results in Table 1 show that there is little difference between the men and women in the numbers reporting being in excellent health. These results are further confirmed in the regression analysis, although men are more likely to report poor health and women excellent health.

Marital status

Generally, the married are more likely to report that they are in excellent health (Table 1). However, the results of the regression analysis did not establish any statistically significant relationship between marital status and perceived health.

Sense of community belonging

The results of this analysis clearly confirm that individuals' sense of belonging to their community is an important predictor of health status. The results show that the probability of reporting excellent health increases, with the level of sense of belonging. For example, in the models with both individual and community characteristics, people who perceive themselves as having 'somewhat weak' sense of community belonging are 40.7 percent, while those whose sense of community belonging is 'weak' are over 5o percent more likely to report poor health.

Country of birth

The results from both the descriptive and regression analysis show that people born in Canadian report excellent or good health, while foreign born individuals report poor health. However, the differences are not substantial. For instance, in the final model with both sets of variables, 32 percent of Canadian-born individuals report excellent health compared to 28.3 percent of foreign-born individuals.

Education

There are significant differences in the probability of reporting excellent, good or poor health by educational attainment. The results show that higher levels of educational attainment are associated with excellent health. For instance, the results in Table 4 show that 40.4 percent of people with post-secondary education, but less than university degree, while 50.2 percent those with university education report excellent health.

Income adequacy

In addition to education, income adequacy also emerges as a strong socioeconomic determinant of health status. The results show that as the levels of income adequacy increases, individuals are more likely to report being in excellent health. For instance, in the full model, 44 percent, 53.6 percent and 63.2 percent of individuals in middle, upper middle and highest income adequacy categories respectively, report being in excellent health.

Economic factors at community level

Two variables, employment rate and incidence of low income were use as a measure of community economic status. Expectedly, as the level of employment rate in the community increases, more people (50 percent) are likely to report being in excellent health. The result further show that an equal number of people are likely to report being in excellent or poor health by level of incidence of low income. The results show that Overall, all the community factors explain a very small percentage of the variation in perceived health.

Social and family structure at community level

Three variables, percentage of visible minority, percentage of Canadians and percentage of non-family persons in private households were used as a measure of social and family structure at community level. The result in Table 2 show that percentage of visible minority, percentage of Canadians and percentage of non-family persons in private households are associated with higher likelihood of people reporting that they are in excellent health. However, only the relationship between perceived health and percentage of visible minority is statistically significant. However, when control is made for individual variables, only the percentage of Canadians is statistically insignificant.

Conclusion

This analysis has demonstrated that self-perceived health is more likely to depend on individual-level characteristics than community-characteristics. Among the individual-level characteristics, age, education, income adequacy, and sense of belonging to community were found to be particularly important. One might, however, argue that although the sense of community belonging reflects individual perception, it depends on community's characteristics. For instance, individuals living in a crime-infested community are likely to express that they do not feel a sense of community belonging even though their individual experiences contradict their perception. This suggests that delineating the sphere of influence of strictly individual- or community-level factors is not easy. Ultimately, there is a great level of interchange between the two groups of factors.

Of the five community factors considered in this analysis, the incidence of low income, percentage of visible minority and percentage of non-family persons had an independent effect on perceived health. The results showed that all of these variables are associated higher probabilities of people reporting poor health. A major limitation of the study was the inability to control for community-level correlation to capture the extent to which individuals in the same community are related. This was due to the small number of people in the dissemination area which was used as a measure of community. However, use of larger data sets can permit future studies to properly disentangle the community effect on health.

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APPENDIX

The probabilities corresponding to the three categories of the response variables were computed using the following formulas:

1) Probability of reporting excellent health:

$$= \frac{EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)}{1 + EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)}$$

2) Probability of reporting good health:

$$= \left(\frac{EXP(\alpha_2 + \sum_{i=1,2...} \beta_i X_i)}{1 + EXP(\alpha_2 + \sum_{i=1,2...} \beta_i X_i)} \right) - \left(\frac{EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)}{1 + EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)} \right)$$

3) Probability of reporting poor health:

$$= 1 - \left[\left\{ \left(\frac{EXP(\alpha_2 + \sum_{i=1,2...} \beta_i X_i)}{1 + EXP(\alpha_2 + \sum_{i=1,2...} \beta_i X_i} \right) - \left(\frac{EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)}{1 + EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)} \right) \right\} + \left\{ \left(\frac{EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)}{1 + EXP(\alpha_1 + \sum_{i=1,2...} \beta_i X_i)} \right) \right\} \right]$$

where α_i and β_i are the intercepts and coefficients and X_i the independent variables included in the model.

Table 1: Percentage reporting excellent or very good health, population aged 60 and over, by selected characteristics, Canada 2000-2001

Variables	N	(%)excellent/very good
Total	30865	38.9
Region		
NFL/PEI/Nova Scotia/New Brunswick	2383	37.4
Quebec	7589	37.7
Ontario	11856	39.9
Manitoba/Saskatchewan	2286	35.5
Alberta/British Columbia	6713	40.2
Yukon/NWT/Nunavut	38	28.9
Rural/Urban Area		
Urban core	21443	38.6
Urban fringe	679	38.9
Rural fringe	1770	44.6
Urban O/S CMA	2935	38.3
Rural O/S CMA	4038	38.4
Age group		
60-64	7858	46.1
65-69	7275	44.1
70-74	6309	36.8
75-79	4673	32.6
80+	4750	28.1
Sex		
Male	13873	39.2
Female	16992	38.7
Marital status		
Married	19844	41.2
Widowed	7317	33.7
Separated/divorced/single	3670	37.2
Sense of community belonging		
Very strong	6966	46.3
Somewhat strong	11063	41.0
Somewhat weak	6495	35.7
Very weak	3472	30.7
Country of birth		
Canadian	22209	40.4
Foreign born	8418	35.4

Table 1 continued

Education		
Secondary	19221	33.2
Post-secondary<bachelor	8251	45.2
Bachelor's degree/University certificate	3043	58.1
Living arrangements		
Unattached	9253	36.2
Spouse or partner	15859	42.4
Parent and child/Child and parent	3612	35.2
Other	2058	32.0
Income adequacy		
Lowest	1077	22.7
Lower middle	3250	27.8
Middle	9064	32.3
Upper middle	8825	44.4
Highest	4349	55.4

Table 2: Individual characteristics and the probability of reporting excellent, good or poor health, population aged 60 and over, Canada 2000-2001

Individual characteristic	Excellent	Good	Poor
Region			
NFL/PEI/Nova Scotia/New Brunswick [a]	30.4	31.8	37.8
Quebec	31.7	39.3	29.0
Ontario*	31.1	32.8	36.1
Manitoba/Saskatchewan	27.9	35.1	37.0
Alberta/British Columbia*	31.9	35.7	32.4
Yukon/NWT/Nunavut*	25.7	37.8	36.5
Rural/Urban Area			
Urban core* [a]	30.4	31.8	37.8
Urban fringe	28.7	30.7	40.5
Rural fringe	34.0	32.0	34.0
Urban O/S CMA	32.2	32.8	35.1
Rural O/S CMA*	31.5	32.5	36.0
Age group			
60-64 [a]	30.4	31.8	37.8
65-69*	31.6	31.6	36.8
70-74	24.8	32.7	42.6
75-79	20.3	30.4	49.3
80+	19.7	29.8	50.5
Sex			
Male	30.4	31.8	37.8
Female*	34.5	33.2	32.3
Marital status			
Married [a]	30.4	31.8	37.8
Widowed*	29.4	30.7	39.8
Separated/divorced/single*	27.8	29.3	42.9
Sense of community belonging			
Very strong [a]	30.4	31.8	37.8
Somewhat strong	26.7	36.1	37.3
Somewhat weak	21.4	35.8	42.8
Very weak	19.2	27.9	52.8
Country of birth			
Canadian [a]	30.4	31.8	37.8
Foreign born	25.8	31.9	42.3

Table 2 continued

Individual characteristic	Excellent	Good	Poor
Education			
Secondary	30.4	31.8	37.8
Post-secondary<bachelor	39.0	31.0	29.9
Bachelor's degree/University certificate	48.5	29.8	21.7
Living arrangements			
Unattached [a]	30.4	31.8	37.8
Spouse or partner*	26.0	29.6	44.4
Parent and child/Child and parent	23.0	32.4	44.6
Other	22.8	32.1	45.0
Income adequacy			
Lowest [a]	30.4	31.8	37.8
Lower middle	37.4	27.0	35.6
Middle	43.6	29.1	27.2
Upper middle	53.5	27.5	19.0
Highest	63.5	24.6	11.9
Pseudo R square	0.0514		
Log-likelihood ratio	-25166.7		
Wald Chi-square (DF/probability)	1090(58/0.000)		

Note: * Not significant at 95 percent significance level, weighted sample size: 24469, [a] Reference category

Table 3: Community characteristics and the probability of reporting excellent, good or poor health, population aged 60 and over, Canada 2000-2001

Community characteristic	Excellent	Good	Poor
Employment rate	50.4	21.2	28.4
Incidence of low income	39.8	20.5	39.7
Percentage of visible minority	43.4	20.4	36.2
Percentage of Canadians*	40.9	30.0	29.1
Percentage of non-family persons *	43.4	19.9	36.7
Pseudo R square	0.006		
Log-likelihood ratio	-33090		
Wald Chi-square (DF/probability)	173(10/0.000)		

Note: * not significant at 95 percent level, weighted sample size: 30574

Table 4: Individual and community characteristics and the probability of reporting excellent, good or poor health, population aged 60 and over, Canada 2000-2001

Individual characteristic	Excellent	Good	Poor
Region			
NFL/PEI/Nova Scotia/New Brunswick [a]	32.0	32.4	35.6
Quebec	33.0	39.7	27.3
Ontario*	31.5	32.1	36.4
Manitoba/Saskatchewan	29.0	35.4	35.5
Alberta/British Columbia*	29.8	43.4	26.8
Yukon/NWT/Nunavut	25.1	38.2	36.7
Rural/Urban Area			
Urban core [a]	32.0	32.4	35.6
Urban fringe	27.2	31.7	41.1
Rural fringe*	31.5	32.7	35.7
Urban O/S CMA*	30.9	33.7	35.4
Rural O/S CMA	29.9	33.5	36.6
Age group			
60-64 [a]	32.0	32.4	35.6
65-69	33.6	32.1	34.3
70-74	26.3	33.5	40.2
75-79	21.9	31.4	46.7
80+	21.4	30.9	47.6
Sex			
Male [a]	32.0	32.4	35.6
Female*	36.1	33.7	30.1
Marital status			
Married [a]	32.0	32.4	35.6
Widowed*	31.5	31.4	37.0
Separated/divorced/single*	31.1	29.8	39.1
Sense of community belonging			
Very strong	32.0	32.4	35.6
Somewhat strong	27.9	36.7	35.3
Somewhat weak	22.7	36.6	40.7
Very weak	20.6	28.8	50.6
Country of birth			
Canadian [a]	32.0	32.4	35.6
Foreign born	28.3	32.6	39.1

Table 4 continued

Individual/community characteristic	Excellent	Good	Poor
Education			
Secondary [a]	32.0	32.4	35.6
Post-secondary<bachelor	40.4	31.4	28.1
Bachelor's degree/University certificate	50.2	29.9	19.9
Living arrangements			
Unattached	32.0	32.4	35.6
Spouse or partner	27.1	30.4	42.5
Parent and child/Child and parent	23.9	33.0	43.1
Other	23.6	32.4	44.0
Income adequacy			
Lowest [a]	32.0	32.4	35.6
Lower middle	38.4	27.3	34.3
Middle	44.2	29.4	26.3
Upper middle	53.6	27.7	18.7
Highest	63.2	24.8	11.9
Community variables			
Employment rate*	28.0	23.2	48.8
Incidence of low income	24.4	20.8	54.8
Percentage of visible minority	24.7	21.4	54.0
Percentage of Canadians*	35.8	28.6	35.7
Percentage of non-family persons	23.3	20.8	55.9
Pseudo R square	0.0542		
Log-likelihood ratio	24888		
Wald Chi-square (DF/probability)	1155(68/0.000)		

Note: * Not significant at 95 percent significance level, weighted sample size: 24268 [a] Reference category