Determinants of self rated health for Canadians with chronic disease and disability

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Abstract

Objective—**To identify the factors associated with self rated health of people with and without chronic health conditions or long term disability.**

Setting—**Canadian household population.**

Design—**Analysis of 1994/95 National Population Health Survey interview data with 13 995 respondents aged 20 years and older. Determinants of poor and good compared with excellent health were examined using multivariate nominal logistic regression. Factors included in the analyses were illness related (chronic disease, long and short-term disability, and pain) demographic, lifestyle (smoking, physical activity, drinking), and social psychological resources (mastery, chronic stress, distress, self esteem, and social support).**

Results—**Illness related variables were associated with poor health, with smaller but significant contributions from demographic and lifestyle factors. Psychological resources, especially high mastery and self esteem, are associated with better health in those with chronic conditions or disability.**

Conclusion—**The determinants of self rated health for people with chronic illness and disability make the greatest contribution to the findings for the overall population.**

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Self rated health has been identified as an important indicator of the multi-dimensional construct, health. Self evaluations of health have been found to be related to a wide range of outcomes from well being to service use, and are a significant predictor of mortality[1–6] and morbidity.[7–9] Although functional disability and the absence of chronic diseases are important to the formation of subjective health perceptions, people with chronic diseases can also report good health. Data from the 1990 Ontario Health Survey showed that 79% of those with chronic disorders reported that their health was good to excellent, as did over 50% of those with long term disability, including 40% of those with mobility disabilities.[10] These data suggest that despite the presence of chronic illness and disability, most people perceive their health in favourable terms. This raises questions about the distinction between people's self rated perceptions of their health status and a diagnosed medical condition or disability. When asked to rate their overall health, people may use additional information that goes beyond a simple summing of their medical conditions or the level of disability that those conditions engender.

Very little work has been directed to the predictors of self rated health in the presence of chronic disorders. Given the literature on the positive health outcomes associated with self rated good health, the promotion of "good" health and the prevention of illness in people with chronic disease and disability would seem to be a priority. A better understanding of the link between self reported health and chronic and disabling conditions will have implications for the development of strategies to improve the health of the population and may reduce the need for formal health care. The primary objective of this research is to identify the determinants of self rated health in the overall Canadian population and in people with and without disability and chronic illness.

The high prevalence of chronic conditions and disability in Canada make understanding the predictors of self rated health in this group an important issue. In the 1991 General Social Survey (GSS), almost two thirds of Canadians reported at least one chronic health problem, of which skin and other allergies, arthritis and rheumatism and hypertension were the most common.[11] Long term disability is reported by 10–15% of the Canadian adult population[12 13] with the major reported causes of long term disability including arthritis and rheumatism, back disorders, heart disease and respiratory disorders.[10]

Perceptions of good health among Canadians have been linked to better socioeconomic status,[6 14] being younger and being male.[10 14] Other factors associated with better self reported health include personal health practices such as being physically active, a non-smoker and having moderate alcohol intake[15–17] and the presence of social psychological resources such as social support[17–19] and self esteem.[20] Our review of the literature suggests that much less is known about self rated health for those with chronic disease and disability. In studies of persons with spinal cord injury, better self reported health was associated with greater life satisfaction, which, in turn, was associated with higher perceived social support, more satisfaction with the quality and quantity of social contacts and greater perceived control of one's life.[21–23] Other studies suggest that health perceptions influence the course of disability in elderly people.[5–9] However, information about the predictors of self rated health associated with other disabilities or chronic conditions is lacking.

Based on the literature, we hypothesise that factors influencing self rated health will

Table 1   Dichotomised predictive variables by block

Block 1: Illness related factors		*(Comparison group)*
Chronic condition or disability	any chronic health problems and/or long term disability that restricted activity lasting or expected to last 6 months or more	no chronic health problem or disability
Pain severity	moderate or severe	mild or none
Two week disability	presence of any disability in last 14 days	no disability in last 14 days
Block 2: Individual demographic variables		
Age	55 years old and over	less than 55 years old
Marital status	married (married/common law/partner)	not married (single, widowed, divorced, separated)
Gender	female	male
Education	less than post-secondary education	any post-secondary education
Employment status	not currently employed	currently employed
Income	low, lower-middle or middle	upper-middle or upper
Block 3: Personal health practices		
Physical activity	active (active or moderate)	inactive
Type of smoker	ever smoked	never smoked
Type of drinker	regular drinker	not a regular drinker
Block 4: Social psychological resources		
Perceived social support (4 questions re: presence of social support)	low (1, 2 or 3 yes responses)	high (4 yes responses)
Mastery (Pearlin and Schooler's Mastery Scale[25])	low to moderate (score of 2–20)	high (score of 21–28)
Self esteem (Rosenberg Self esteem Scale[26])	low to moderate (score of 1–20)	high (score of 21–24)
Chronic stressors	2 or more	0 or 1
Distress (Kessler and Mroczek's index of distress[27])	intermediate or high (score of 4 or more)	no or low (score of 1 to 3)

include: (1) illness related factors including any reported chronic health condition or long term disability, severity of pain and short-term disability; (2) individual demographic factors including age, marital status, gender, education, employment status and income; (3) personal health practices including level of physical activity, smoking and alcohol use; and, (4) social psychological resources such as perceived social support, mastery, self esteem, chronic stress and distress. Furthermore, we hypothesise that factors associated with self rated health will differ for those with and without chronic illness and disability.

Method
This project used data from the Health File of the 1994 National Population Health Survey (NPHS). The sample design of this survey has been described elsewhere.[24] The target population included all household residents in each of the Canadian provinces, excluding populations on Indian reserves, Canadian Forces Bases, and some remote areas of Quebec and Ontario. The survey used a stratified two stage design for data collection. At the first stage, information about all household members was obtained from one knowledgeable household member in all dwellings. In the second stage, a person, 12 years of age or over, was selected randomly from each household for a more in depth interview including additional components on self rated health, health status, health behaviours and risk factors, life events, stress, and psychological variables (n=17 626).

We restricted our analyses to respondents from the second stage who were 20 years of age or older (n=15 779), as questions relating to the psychological variables were not asked of the younger respondents. As we were also interested in conducting each step of the multivariate analysis on the same group of respondents, respondents who had a missing value for any of the variables being examined were excluded from the analysis (n=1784). These exclusion criteria resulted in a sample size of 13 995.

STATISTICAL ANALYSIS
In determining the predictors of self rated health, three multivariate analyses were performed for: (1) the overall sample; (2) those with reported chronic conditions or long term disability; and, (3) those with no reported chronic conditions or long term disability. The protocol for this analysis was approved by the Research Institute Ethics Committee. All analyses were conducted using SAS (Statistical Analysis Systems) package.

A polytomous model (for a multi-level categorical outcome variable) was used to determine the predictors of poor health compared with good or excellent health. We categorised the outcome variable, self rated health, into three groups: "excellent", which included ratings of excellent or very good self reported health (baseline), "good", and "poor", which included fair or poor self reported health. Thus, the likelihood of reporting good or poor health was predicted as compared with reporting excellent health. To facilitate the interpretation of the results and the modelling technique, all of the explanatory variables were dichotomised based on extensive preliminary analyses (see table 1). The chronic illness and disability variable was used as an explanatory variable only in the overall model and was used to stratify respondents in the other two models.

Using a nominal logistic regression technique, the likelihood of membership in one category of self reported health versus another category was predicted by a series of variables classified into the following conceptual blocks: (1) illness related factors; (2) individual demographic factors; (3) personal health practices; and, (4) social/psychological resources. All statistical tests were two tailed. Ninety five per cent confidence intervals were calculated for all odds ratios.

WEIGHTING
All data were weighted to be representative at the national level. For statistical testing, weights were rescaled so that the average weight equals one and further adjusted by the design effect

Table 2 Bivariate relations between potential predictive variables and three levels of self reported health

	Excellent/very good		Good		Fair/poor	
	number (thousands)	%	number (thousands)	%	number (thousands)	%
1 Illness related factors						
Chronic condition:						
yes	4 989	49.9	3257	32.6	1756	17.6
no	6 025	77.1	1586	20.3	200	2.6
Pain:						
moderate to severe	965	29.9	1096	33.9	1170	36.2
none	10 050	68.9	3747	25.7	787	5.4
Two week disability:						
yes	869	40.6	597	27.9	675	31.6
no	10 150	64.7	4246	27.1	1281	8.2
2 Individual demographic variables						
Age groups:						
55+	2 161	44.4	1652	33.9	1057	21.7
<55	8 853	68.4	3191	24.7	900	7.0
Marital status:						
married	7 559	62.6	3343	27.7	1184	9.8
not married	3 455	60.3	1500	26.2	773	13.5
Gender:						
female	5 668	60.2	2605	27.7	1135	12.1
male	5 347	63.6	2238	26.6	822	9.8
Education:						
secondary or less	3 794	51.3	2365	32.0	1232	16.7
post-secondary	7 220	69.3	2478	23.8	725	7.0
Employment:						
unemployed	3 288	47.7	2198	31.9	1409	20.4
employed	7 726	70.8	2645	24.2	548	5.0
Income:						
low-middle	4 475	53.0	2613	30.9	1362	16.1
upper	6 539	69.8	2230	23.8	595	6.4
3 Personal health practices						
Physical activity:						
active	4 777	69.6	1566	22.8	518	7.6
inactive	6 238	57.0	3278	29.9	1438	13.1
Type of smoker:						
ever	6 595	58.6	3235	28.7	1424	12.7
never	4 419	67.4	1608	24.5	533	8.1
Type of drinker:						
regular	7 060	66.5	2766	26.1	785	7.4
not regular	3 954	54.9	2077	28.8	1172	16.3
4 Social/psychological resources						
Perceived social support:						
high	10 159	63.6	4233	26.5	1578	9.9
low	1 697	52.6	1010	31.3	520	16.1
Mastery:						
low	5 057	52.8	3018	31.5	1511	15.8
high	5 957	72.4	1826	22.2	446	5.4
Self esteem:						
low	5 207	55.1	2889	30.6	1361	14.4
high	5 807	69.5	1954	23.4	596	7.1
Chronic stressors:						
1 or less	5 305	66.9	1900	23.9	731	9.2
2 or more	5 709	57.8	2943	29.8	1226	12.4
Distress:						
no or low	7 720	69.0	2731	24.4	746	6.7
intermediate or high	3 294	49.8	2112	31.9	1211	18.3

correction factors provided in the NPHS Public Use Microdata documentation.[27] These adjustments do not affect parameter estimates such as means and odds ratios but allow for variance estimates to be more conservative while retaining the unequal probability of case selection.

Results

BIVARIATE ANALYSIS

Table 2 contains the bivariate relations between the independent variables and the three levels of health for the total population. As might be expected, excellent or very good health were reported by a higher proportion of those without chronic conditions or disability, whereas fair or poor health were reported more frequently by those with chronic conditions or disability. However, almost 50% of those reporting a chronic illness or long term disability did rate their health as excellent or very good. A similar pattern was found in relation to two week disability, where a higher proportion of those with no short-term disability reported excellent or very good health. More striking were the differences in severity of pain, with almost 70% of those with no pain reporting excellent or very good health as compared with only 30% of those with pain.

Almost 70% of those under age 55 reported excellent or very good health as compared with less than 41% of those over age 55. A slightly higher proportion of men than women reported excellent or very good health and even less difference in levels of health were reported by those who were married (or common law) compared with those who were not.

Self rated level of health varied by education and income, with those with lower education or income being less likely to report excellent or very good health. Overall, over 70% of those who were employed reported excellent or very good health compared with less than half of those who were not employed.

A healthy lifestyle was also related to the reporting of excellent health, with lower proportions of those who were inactive or who were ever smokers reporting excellent or very good health. In contrast, regular drinkers were more likely to report excellent or very good health than non-regular drinkers.

Social psychological resources were also related to good health. Those with two or more chronic stressors or high levels of distress were less likely to report excellent or very good health. In contrast, those with higher levels of mastery and self esteem were more likely to report excellent or very good health. There was little difference in self reported health for those with high or low social support.

MULTIVARIATE ANALYSES

Tables 3–5 contain the results of the multivariate analyses. As hypothesised, all of the independent variables were significantly related to self rated health in at least one of the models, except for social support. Social support is therefore not included in these results.

Total population

Table 3 gives the results of the logistic regression model for the total population. Respondents with a chronic condition or long term disability were more likely to report good as compared with excellent health (OR 2.33) and much more likely to report poor as compared with excellent health (OR 4.73). A similar pattern was found for pain severity and two week disability although the odds ratios were somewhat lower for the latter.

Being over 55 years of age, female, less highly educated, and unemployed were all associated with poor health as compared with excellent, and of good health as compared with excellent health. Lower income was associated with poor health as compared with excellent health, but not of good health as compared with excellent health. Being married decreased the odds slightly of reporting good as compared with excellent health.

Being active decreased the odds of reporting of poor versus excellent health, and good

Table 3   Predictors of self reported health in the total population, nominal logistic regression model: odds ratio with 95% confidence intervals for levels of health, using excellent and good self reported health as baseline

	Good compared with excellent OR (95% CI)	Poor compared with excellent OR (95% CI)
1 Illness related factors		
Any chronic condition or disability	2.33 (1.82, 3.00)	4.73 (3.70, 6.05)
Pain severity (moderate/severe)	3.22 (2.69, 3.86)	6.84 (5.64, 8.29)
Any two week disability	2.59 (2.10, 3.18)	3.27 (2.63, 4.08)
2 Individual demographic variables		
Age 55 years or older	1.48 (1.19, 1.82)	2.53 (2.03, 3.14)
Married	0.79 (0.66, 0.96)	0.89 (0.74, 1.07)
Female	0.72 (0.60,0.87)	0.63 (0.52, 0.76)
Less than post-secondary education	1.38 (1.15, 1.66)	1.96 (1.63, 2.36)
Not in the labour force	1.68 (1.35, 2.09)	2.17 (1.74, 2.70)
Low income	1.18 (0.97, 1.44)	1.53 (1.25, 1.87)
3 Personal health practices		
Physically active	0.82 (0.68, 0.99)	0.52 (0.43, 0.63)
Ever smoked	1.41 (1.15, 1.71)	1.76 (1.44, 2.14)
Regular drinker	0.64 (0.53, 0.77)	0.59 (0.49, 0.71)
4 Social/psychological resources		
Mastery (low)	1.19 (0.97, 1.47)	1.52 (1.23, 1.86)
Self esteem (low)	1.32 (1.10, 1.60)	1.92 (1.59, 2.32)
Chronic stressors (2 or more)	1.07 (0.87, 1.30)	1.52 (1.24, 1.86)
Distress (high)	1.63 (1.35, 1.97)	2.47 (2.03, 2.99)

Table 4   Predictors of self reported health in those with chronic illness and disability, nominal logistic regression model: odds ratio with 95% confidence intervals for levels of health, using excellent and good self reported health as baseline

	Good compared with excellent OR (95% CI)	Poor compared with excellent OR (95% CI)
1 Illness related factors		
Pain severity (moderate/severe)	3.10 (2.55, 3.76)	7.15 (5.78, 8.85)
Any two week disability	2.66 (2.13, 3.32)	3.46 (2.72, 4.40)
2 Individual demographic variables		
Age 55 years or older	1.46 (1.16, 1.83)	2.46 (1.93, 3.13)
Married	0.78 (0.63, 0.95)	0.89 (0.72, 1.10)
Female	0.70 (0.57, 0.86)	0.60 (0.48, 0.74)
Less than post-secondary education	1.49 (1.22, 1.83)	2.00 (1.62, 2.47)
Not in labour force	1.77 (1.39, 2.26)	2.46 (1.91, 3.15)
Low income	1.23 (0.99, 1.53)	1.62 (1.30, 2.03)
3 Personal health practices		
Physically active	0.71 (0.57, 0.87)	0.48 (0.39, 0.60)
Ever smoked	1.40 (1.13, 1.74)	1.59 (1.28, 1.99)
Regular drinker	0.64 (0.52, 0.78)	0.63 (0.51, 0.77)
4 Social/psychological resources		
Mastery (low)	1.26 (1.00, 1.59)	1.68 (1.33, 2.12)
Self esteem (low)	1.34 (1.09, 1.64)	1.81 (1.46, 2.23)
Chronic stressors (2 or more)	1.06 (0.85, 1.32)	1.38 (1.10, 1.73)
Distress (high)	1.63 (1.33, 2.01)	2.22 (1.79, 2.76)

Table 5   Predictors of self reported health in those without chronic illness and disability, nominal logistic regression model: odds ratio with 95% confidence intervals for levels of health, using excellent and good self reported health as baseline

	Good compared with excellent OR (95% CI)	Poor compared with excellent OR (95% CI)
1 Illness related factors		
Pain severity (moderate/severe)	3.80 (2.27, 6.36)	6.33 (3.84, 10.43)
Any two week disability	2.16 (1.11, 4.20)	2.63 (1.39, 4.99)
2 Individual demographic variables		
Age 55 years or older	1.44 (0.78, 2.64)	2.38 (1.31, 4.32)
Married	0.93 (0.57, 1.51)	1.00 (0.63, 1.61)
Female	0.90 (0.56, 1.42)	0.78 (0.50, 1.23)
Less than post-secondary education	0.92 (0.58, 1.47)	1.44 (0.91, 2.27)
Not in labour force	1.22 (0.73, 2.06)	1.41 (0.85, 2.34)
Low income	0.88 (0.54, 1.43)	1.14 (0.71, 1.84)
3 Personal health practices		
Physically active	1.72 (1.08, 2.73)	0.95 (0.60, 1.48)
Ever smoked	1.77 (1.03, 3.02)	2.52 (1.49, 4.27)
Regular drinker	0.63 (0.39, 1.01)	0.53 (0.33, 0.83)
4 Social/psychological resources		
Mastery (low)	0.89 (0.55, 1.47)	1.06 (0.65, 1.70)
Self esteem (low)	1.44 (0.87, 2.38)	2.33 (1.43, 3.81)
Chronic stressors (2 or more)	1.30 (0.76, 2.23)	2.12 (1.25, 3.58)
Distress (high)	1.83 (1.10, 3.02)	3.20 (1.96, 5.23)

health versus excellent health. Being a regular drinker was associated with reporting better health, while being a regular smoker increased the odds of reporting poor health.

Having low self esteem or high levels of distress increased the odds of reporting poor versus excellent health and good versus excellent

health. Having low mastery and more than one chronic stressor increased the likelihood of reporting poor health but not good health.

With chronic illness and disability
The model for persons with chronic illness and disability was very similar to that of the total population (table 4). As in the total population, pain severity and two week disability were associated with poor and good health as compared with excellent health, as were being older, female, less highly educated, and unemployed. Lower income was associated with poor health, whereas being married was associated with better health. The relations between physical activity, smoking and drinking were very similar to the total population. Finally, in terms of social psychological variables, low self esteem or high levels of distress were associated with poor versus excellent health and good versus excellent health. Having low mastery and more than one chronic stressor increased the odds of reporting poor, but not good, health.

Without chronic illness and disability
In terms of illness related factors (table 5), respondents with pain were more likely to report good health and much more likely to report poor health. However, two week disability was only predictive of poor versus excellent health. With respect to demographic factors, only age was associated with self reported health with those over 55 years of age being more likely to report poor health. Marital status, gender, education, income and employment status were not associated with self reported health for respondents without chronic illness or disability.

Being a smoker increased the odds of reporting poor versus excellent health, and good as compared with excellent health. The odds ratio is much higher (OR 2.52) for reporting poor versus excellent health for persons without chronic illness or disability who smoked as compared with the total population (OR 1.76) or persons with chronic illness and disability (OR 1.59).

Mastery was not a factor in self rated health for persons without chronic illness and disability. Respondents with higher levels of distress were more likely to report good as compared with excellent health and much more likely to report poor health. Having low self esteem and more chronic stressors were only associated with poor versus excellent health, but not good versus excellent health.

Discussion
Overall, our findings confirm the findings of other studies with respect to the predictors of self rated health. Most of these studies have considered the population as a whole, while we have considered self rated health in those with and without chronic illness and disability. Our findings suggest that the determinants of self rated health for persons with chronic illness and disability make the most important contribution to the findings for the overall population. That is, a major contribution to poor health in the population is the presence of

chronic disorders, long term disability and pain. It is the determinants of self rated health for those who do not have chronic illness and disability that remain less clear.

Illness related variables such as pain and current health impact, as indicated by two week disability, made a major contribution to self ratings of health. This was the case for the total population and for those with chronic illness or disability. Individual demographic factors made a contribution to reported poor health in the population, as a whole, as well as both for those with or without chronic illness and disability. These findings concur with other studies. Higher levels of income and education were consistently associated with a greater probability of maintaining good self rated health in the Ontario Longitudinal Survey of Aging[6] and, in the 1978–79 Canada Health Survey, unemployed Canadians reported significant differences in their self reported health in terms of greater global unhappiness, psychological distress, anxiety/depressive symptoms, short and long term disability and a number of health problems.[14] Similarly, in other studies, increasing age has been associated with a tendency to report one's health as poor, as is gender.[10]

The contribution of personal health practices was relatively modest for the total population and persons with chronic illness and disability. Although personal health practices have been associated with health, their relation to self reported health is not clear. Perceived health is an important predictor of physical activity and exercise levels with persons with poor self perceived health less likely to engage in physical activity or exercise programmes.[15] The negative consequences for smoking and alcohol misuse are generally well known in the population. However, the relation between these personal health practices, disability and self perceived health is not well understood.[7] Other studies of alcohol use and self reported health have suggested a J shaped relation with moderate drinkers more likely to report better health than lifelong abstainers and heavy drinkers, who were more likely to report poor or average health.[16] While we did not find a J shaped relation, our findings do support that regular drinkers report better health than those who do not report regular consumption of alcohol. There may be an association between alcohol intake, smoking and self rated health, although, in general, smoking was usually associated with poorer self rated health.[16] Interestingly, our results indicate that personal health practices, particularly smoking, are important predictors of self rated health for persons without chronic illness and disability.

One of our most striking findings is the role of psychological factors in predicting self rated health. Previous population research on self reported health with persons with chronic conditions and disability has not included psychological factors. Instead, the focus has been largely limited to illness related and sociodemographic information. However, a variety of psychological factors have been associated with other health outcomes in other research. For example, high self esteem or self worth, as well as

a sense of mastery or control over life experiences have been associated with a variety of behavioural outcomes, as well as psychological measures of well being.[20] However, theories of how these variables promote health are not well developed. Zautra and Hempel[28] propose that positive psychological states may provide people with a breather from stress, restore their depleted energy, and help them sustain their coping efforts. Similarly, Antonovsky[29] proposes that psychological variables can help people avoid threat or danger and can help encourage people to engage in activities that are health promoting. (Antonovsky's sense of coherence scale[29] was included in preliminary analyses but was not included here as it contributed minimally to the models). High self esteem or self worth, as well as a sense of mastery or control over life experiences are hypothesised to protect people against environmental stressors and social strains.[20 25] Our results, for both persons with and without chronic illness and disability, suggest that the presence of low self esteem, chronic stress and high distress are significantly related to poor self rated health.

A particularly important finding in this study is that low mastery was an important predictor of poor health only for persons with chronic illness and disability. One possible explanation for this finding is that mastery acts as a kind of coping resource that protects people in times of stress. This explanation is similar to the stress buffering effect that some researchers hypothesise of social support.[30] As such, mastery would have less impact on self reported health at times when there is little health related stress, as in the case where there is an absence of chronic illness and disability. Our findings are consistent with studies that have demonstrated a buffering effect for perceived control and functional impairment in older adults[31 32] and perceived control and adjustment to chronic illness.[33]

Social support has been linked to a variety of health related measures in previous research. A lack of social support and social integration has been found to relate to physiological strain, and can be a good indicator of health problems, including mortality risk, among the elderly.[17–19] The lack of predictive value of social support in this study is probably attributable to measurement problems in the variable of interest, and represents a limitation of this study. There was little variability in the range of scores for this

variable, thereby limiting its explanatory value. Another limitation is the cross sectional nature of the data, which along with other considerations, can limit the ability to explore causal relations.

The results of this study suggest a number of directions for future research. Firstly, it is important that future studies on self reported health distinguish between people with and without chronic conditions and disability and include information on psychological resources. Longitudinal research is also needed to further clarify the relative contribution of illness related variables and psychological resources and how they relate to health care utilisation. The NPHS is a longitudinal survey, but unfortunately the psychological variables were only included in the first wave (1994) and were not repeated in the 1996 wave. The processes by which these factors influence health warrant further investigation. As well, the way that social support is measured needs to be reconsidered in order to sufficiently identify variations within the population. Longitudinal research would also allow for investigation of the stability of psychological resources and their ability to predict the onset and course of chronic conditions and disability associated health care utilisation.

The finding of non-overlapping confidence intervals for chronic illness, pain, age, physical activity and distress suggests that any decrement in self rated health is important for these key variables. Moreover, given the large numbers of people who rated their health as good to excellent in this study, differences in good versus excellent health may be important to differentiate in future research by using three levels of self rated health.

These findings also have implications for practice and policy. The contribution of individual factors is relatively greater for those with chronic illness and disability as compared with those without, suggesting the importance of resources such as income and employment in this population. Although the contribution of lifestyle factors is relatively small, it points to the potential role of improving health behaviours in the population by increased physical activity and smoking cessation. The importance of psychological resources has implications for health promotion and health education fields in that current efforts to increase people's mastery and control may ultimately be associated with improvements in self rated health. Furthermore, as poor self rated health has been associated with increased health care utilisation,[34] these efforts to improve people's self rated health could result in decreased health care utilisation.

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