Private health insurance and health inequalities in a national health system

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Abstract

Background

The Canada Health Act (1984) guarantees universal public coverage of all "services provided by hospitals, medical practitioners or dentists". Yet, gaps exist notably in the coverage of prescription drugs, dental and eye care, and a supplementary private insurance market has developed to bridge them. We assess the contribution of supplementary private health insurance to social inequalities in health through a proxy of health care utilization, namely unmet health care needs because of cost.

Methods

Data come from the National Population Health Survey (NPHS) conducted by Statistics Canada. We examine these associations among three groups of working age (25-34; 35-44; 45-54 year olds) over a ten-year period, or from 1994/95 to 2004/05. Path analyses were estimated using Mplus® v4.0.

Results

Results concerning the impact of supplementary private health insurance coverage on social inequalities in health vary by age group. First, no significant impact was found among the 25-34 year olds. Second, health insurance coverage among the 35-44 year olds appeared to mitigate health inequalities and to have a positive impact only when barriers to health care utilization occur. Third, among the 45-54 year olds, health insurance tended to exacerbate health inequalities and shows a positive impact on later health status both directly and indirectly through unmet needs because of cost.

Conclusions

We show here that health inequalities exist and persist even within a national health system. In the context of the growing reliance on private health insurance coverage to the expense of public coverage, the surveillance of theses trajectories is necessary for the development of evidence-based health policies.

Background

Decades of research have led to a better understanding of health inequalities. While these inequalities reflect lifestyle and health behaviours, they are also strongly related to social determinants [2-4]. More especially, these social inequalities in health are generated by the accumulation of vulnerabilities and risks that begin at conception and that may be compounded or mitigated by the intervening life experiences [5]. These inequalities are also thought to be the product of multigenerational processes that combine genetic and social risks [6-8].

This situation has been deemed of such concern to researchers and policymakers alike that limiting these inequalities has been put at the forefront of the agenda of many governing bodies. Since the 80's for instance, universal health insurance coverage policies have been implemented in many developed countries to overcome health inequalities. Some studies indeed highlighted that universal insurance decreases social health inequalities (mostly in terms of mortality rates) [9-14] while others find that it improves a population's mean health without reducing the gap [15, 16]. Contradictory results have also been found regarding, for instance, relative and absolute reduction of inequalities [17, 18]. At the same time, private insurance increases the gap in the sense that lack of insurance results in less access to health care, preventive and diagnostic services [19-21] and poorer health [6, 20-22], though we should note also some inconclusive or negative results [23, 24]. And thus, despite these universal coverage policies and after many health system reforms, a recent report of the WHO's Commission on Social Determinants of Health highlighted that most developed and developing countries are still faced with glaring health inequalities [25].

Even in the presence of universal health insurance systems, the type of coverage (basic or extended) and the number of services included may widely vary between countries. The

coverage is often based on means- or needs-tested characteristics for instance. Typically, only some vulnerable populations are covered totally free of charge, such as the elderly, the poor (people with income under a certain threshold of income or that already benefit from social assistance), or those with chronic conditions. In this context of partial universal coverage, many studies highlighted that the likelihood of experiencing unmet health care needs is higher among people without health insurance [26-31]. Lack of insurance also increases the probability of stating that these needs were unmet because of cost [19, 27, 32-34].

Where does Canada stand in this context? The Canada Health Act guarantees universal public coverage of all "services provided by hospitals, medical practitioners or dentists" [1]. Yet, this equitable coverage does not automatically lead to equitable access. Indeed, a recent study found that while universal health coverage in Ontario leads to income equity in physician visits (both primary and specialist care), a gradient persist in specialist visits with regards to education [35]. Moreover, this public coverage is limited to hospital services and general practitioners visits: gaps therefore exist in the coverage of prescription drugs, dental and eye care, and a supplementary private insurance industry has developed to bridge those gaps.

Thus, even if universal coverage in Canada appears to reduce disparities in access to care compared to USA, and especially among immigrants [28, 36], some Canadians nevertheless experience unmet needs [37, 38]. Social inequalities in health may therefore persist, even in a universal healthcare system such as Canada. At greatest risk of inadequate coverage are those whose incomes or health put them over the threshold limits for comprehensive public insurance but who do not hold privileged enough positions in the labor market to obtain supplementary private insurance [39]. Supplementary private health insurance for services that are not covered

by the public system may therefore lead to social inequalities in health among the working age population.

The association between income and health has been extensively described in the literature. However, accounts of the time dynamics of this relationship are scant, as are studies examining the mediating effect of public policies on this relationship, measured here through supplementary private health insurance. One specific way to better characterize the impact of health insurance on health status is to see how it is mediated by health services use or health care utilization. The objective of this paper is therefore to assess the contribution of health insurance to social inequalities in health, analyzing its cumulative and pathway effects through a proxy of health care utilization, namely unmet health care needs because of cost.

Methods

Sample

We used the Canadian National Population Health Survey (NPHS) conducted by Statistics Canada since 1994/1995 [40]. This longitudinal household study is based on a representative sample selected by a multistage stratified design. A longitudinal panel of 17 276 individuals was initially recruited and is still interviewed biennially. The response rate was 86.0% at inclusion (17 276 of the 20 095 respondents initially selected). The overall response rates for the following waves used in the present analysis were respectively 93.6% (cycle 2), 88.9% (cycle 3), 84.9% (cycle 4), 80.8% (cycle 5) and 77.6% (cycle 6).

Some restrictions were made on this sample (Figure 1). We initially considered individuals aged between 25 and 54 in 1994 (ie of working age) who were not at school or university and that did

not change province of residence between cycle 1 and cycle 6 (n=6446)[1]. This is to avoid a potential period of fluctuation or instability with regards to health insurance status among younger people and those who are still studying. We chose the maximum likelihood estimation with robust standard errors (MLR) to estimate parameters and handle missing data. Some cases were nevertheless deleted to avoid non-informative cases (15 had missing information on all outcomes) and for the purpose of the software used (1970 individuals showing missing information on at least one covariate). This lead to the deletion of 31% of individuals, while a complete case analysis would have lead to the deletion of more than 50% of them. As part of the sensitivity analysis, the estimation of a complete case model did not change the results, but resulted in a loss of power. We stratified our analysis by age groups of 10 years (25-34, 35-44 and 45-54 year olds). In the first age group, while the usual pathway from SES to health status was found, the impact of health insurance on health was never significant. These results could be explained by the unstable situation that individual may experience in their very first years spent in the workforce, or because they feel unconcerned by health insurance as they do not have health needs. In general, younger individuals are indeed known to have less insurance coverage [41]. We will not further describe these results and present results of only two groups of age (the 35-44 and the 45-54 year olds).

Measurement of the main outcomes.

Health status. The main outcome of our model was self-rated health, as reported in 2004/05. We dichotomized the question ("in general, would you say your health is excellent, very good, good, fair or poor?") to distinguish people in poor health (fair or poor) from those who are not

[1] There is enough variation between provincial health systems that an inter-province move could lead to a gap in coverage, particularly as some provinces impose a 3-month waiting period for provincial coverage eligibility.

(excellent, very good, or good). We considered the report of a chronic condition at inclusion to control for initial health status as well as from 1996 to 2002 to assess its impact over time.

Supplementary health insurance 1996-2002. The number of years insured for services not typically covered under the public system (supplementary health insurance coverage) from cycle 2 to cycle 5 was created thanks to the following question: "Do you have insurance that covers all or part of (Please include any private, government or employer-paid plans): 1/ the cost of your prescription medications? 2/ your dental expenses? 3/ the costs of eye glasses or contact lenses? and 4/ hospital charges for a private or semi-private room?". Reporting at least one of these insurance counted for 1 year insured. Health insurance status was unfortunately not measured during other cycles. These questions did not allow us to distinguish between public and supplementary private health insurance (which includes here employer-paid health insurance), but sensitivity analyses suggest that most of this supplementary coverage came from private sources. First, we created an indicator to take into account potential public coverage (based on the source of income such as social assistance or old age security recipients). The associations of supplementary coverage with this indicator were not significant and did not change other estimations. Second, our analyses are based on a sub-sample of non-student 35-54 year olds in 1994 during all six cycles used. The proportion of social assistance recipients is likely to be low in this sample, as it declined from 10% of Canadians in 1996 to 5.5% in 2003 [42]. Results reported here can therefore be primarily representative of supplementary private health insurance.

Healthcare use 1998-2004. The impact of health insurance coverage should be different depending on health care needs. The later will be assessed through years with a chronic condition and with unmet health care needs from 1998-99 to 2004-05. To assess the health care needs, we

used the following questions: “During the past 12 months, was there ever a time when you felt that you needed health care but you didn’t receive it?” and if so, “Thinking of the most recent time, why didn’t you get care?”. We only considered the ‘because of cost’ modality of response to create our third main outcome: Unmet needs because of cost, Yes/No. Because of the small number of events, we dichotomized years stated with unmet needs because of cost as such: to have declared or not an UNC at least once between cycle 3 and cycle 6 (Yes/No).

Socioeconomic status (SES) 1996-2002. Years unemployed and out of the labor force (years employed being the reference) as well as income adequacy (created by Statistics Canada taking into account household income threshold and the number of person living in the household) were assessed from 1996 to 2002.

For all repeated measures considered in our models, every biennial measure counted for only one year of exposure; sensitivity analyses where these measures contributed two years rather that one cycle changed neither the magnitude nor the significance of the results (not shown).

Measurement of covariates. We finally controlled for usual social and demographic covariates: sex, age, marital status (living in couple trajectory: always, unstable, never), race/ethnicity (white or not), and province of residence. As mentioned earlier, we also adjusted for the presence of a diagnosed chronic condition at inclusion.

Statistical analyses

We based our research on structural equation modeling (SEM) to estimate a path analysis. Linear regressions were computed for continuous outcomes (number of years exposed) and logistic regressions for dichotomous outcomes (poor self-rated health and unmet needs because of cost). We estimated alternative specifications modeling years exposed as count rather than continuous

variables through Poisson regressions (rather than linear regression). These models resulted in much greater computation time but did not affect the substantive interpretation of findings. We therefore decided to consider years of exposure as continuous variables, with the added confidence that the MLR method of estimation has been demonstrated to be robust to non-normality. Sampling weights were used and the Montecarlo algorithm of integration was specified.

We performed our analyses in three steps. We first estimated a model 1, which contains only SES characteristics. We then successively added health insurance status (model 2) and health care needs proxies (model 3). We used SAS® 9.2 for weighted descriptive statistics and Mplus® v4.0 for the SEM.

Results

Table 1 contains the descriptive statistics for the two age groups considered. The 35-44 year olds presented a greater average number of years employed (3.523), a lower rate of respondents with less than a high school degree (0.147) and fewer years spent with a chronic condition (2.465) than the 45-54 year olds (respectively 2.872, 0.248 and 2.809). Years spent insured and the proportion of people experiencing unmet needs were comparable between the two groups.

Health inequalities over time

The pathway assessing the direct impact of SES on health is shown in model 1. Table 2 presents results for the 35-44 year olds and table 3 those for the 45-54. First and not surprisingly, we found the usual social stratification association linking education, employment and income adequacy in both groups of age. The number of years spent with an adequate level of income increased with the level of education but decreased with the number of years spent unemployed

or out of labor force in both groups. Years out of labor force significantly decreased with increasing education in both groups, while the same association was only observed with years unemployed among the 35-44 year olds. Finally, the number of years spent out of the labor force increased significantly with the number of years spent with a chronic condition.

Regarding the self-rated health outcome, results were more contrasted between the two age groups: education and employment status had a greater impact on health among the 35-44 year olds while it is income adequacy that bore the largest impact among the 45-54 year olds. While an increasing number of years spent out of labor force significantly increased the probability of being in poor health in both groups (0.479, $p<.001$ versus 0,263, $p<.01$), other associations were either non-significant or in the opposite direction. For instance, increasing years spent with an adequate income tended to significantly reduce the probability of being in poor health but only for the 45-54 group (-0.375 (0.091), $p<0.001$). An increasing educational level seemed to protect against poor health among the 35-44 year olds while it tended to put the 45-54 at risk of poorer health. However, these associations reached at best marginal significance.

Impact of health insurance on social inequalities in health

The addition of health insurance in the pathway (model 2), did not affect the impact of SES on self-rated health observed in model 1 (no more than 15% of variation in estimations, and if so, only on non significant variables). Among the 35-44 year olds, direct and indirect effects went in opposite directions. The direct effect indeed indicated that greater income adequacy marginally reduces the likelihood of being in poor health (-0.158, $p<.10$), while the indirect effect of income through insurance tended to increase the probability of being in poor health (0.329*0.153=0.050). In sum, the total effect of greater years with income adequacy on self-rated

health tended to be slightly reduced through years insured for the age group 35-44 year olds (-0.158 direct + 0.050 indirect effects = -0.108).

Results are more consistent among the 45-54 year olds. This time, health inequalities tended to increase with supplementary coverage. Indeed, greater income adequacy decreases the likelihood of being in poor health both directly (-0.334, $p<0.001$) and indirectly (0.257*-0.139=-0.036). The total effect is thus reinforced (-0.334 - 0.036 = -0.670).

Impact of health insurance through unmet needs

Finally, adding perceived unmet needs because of cost (model 3) does not modify the pathway estimated in model 2 between SES, health insurance and self-rated health.

Regarding the pathway through years spent with chronic condition, among the 35-44 year olds, direct effects on self-rated health were significant for years spent with a chronic condition (0.487 (0.089), $p<0.001$) and experiencing unmet needs because of cost (1.435 (0.464), $p<0.01$). However, the direct link between chronic condition and unmet needs because of cost was not significant. The indirect effect of chronic conditions on self-rated health through unmet needs because of cost was therefore only marginal (0.044*1.435=0.063). Conversely, among the 45-54 year olds, chronic conditions had a significant impact on both unmet needs because of cost (0.448 (0.196), $p<0.05$) and health status (0.368 (0.115), $p<0.01$), while the effect of unmet needs on health was marginally significant (0.756 (0.436), $p<0.10$). The indirect impact of chronic condition on self-rated health was this time almost equal to the direct effect (0.448*0.756=0.339), and thus doubled the total effect.

Finally, we observed two different pathways regarding the direct and indirect effect of years with supplementary health insurance coverage on health. Regarding the 35-44 year olds, direct and

indirect effects went in opposite directions. While years spent with health insurance coverage marginally and directly increased the probability of reporting poor or very poor health (0.186 (0.098), $p<0.10$), this later probability decreased indirectly taking into account unmet health care needs (-0.226*1.435=-0.324). Globally, an increasing number of years spent insured has a positive effect on health status because the total effect of supplementary health insurance coverage decreases the likelihood of being in poor health (0.186 – 0.324 = -0.138). Regarding the 45-54 year olds, both direct (-0.126 (0.090), $p<0.25$) and indirect (through unmet needs: -0.385*0.756=-0.291) effects of supplementary health insurance coverage on health went on the same direction (even if sometimes only marginally significant). All direct, indirect and total effects lead to the same conclusion: increasing years of supplementary health insurance coverage seem to protect against poor perceived health.

Discussion

This research contributes to the debate on the impact of health insurance on health, which has been too seldom studied in its longitudinal dimension [6, 24]. Moreover, this is, to our knowledge, the first study that considered perceived unmet health care needs because of cost in this complex longitudinal pathway.

Results concerning the impact of supplementary health insurance coverage on social inequalities in health vary by age group. First, was no significant impact was found among the 25-34 year olds. Second, health insurance coverage among the 35-44 year olds appeared to mitigate health inequalities and to have a positive impact only when barriers to health care utilization occur. Third, among the 45-54 year olds, health insurance tended to exacerbate health inequalities and

show, this time, a positive impact on later health status both directly and indirectly through unmet needs because of cost.

This counterintuitive effect among the 35-44 year olds (a greater number of years insured leading to poorer health) may be the result of its sociodemographic composition. Indeed, we saw that this group differs from its older counterparts both in the descriptives and the multivariate relationships; regarding the simplest pathway assessing 'usual' social inequalities in health (model 1) for instance, we found a significant impact of income adequacy among the oldest, while employment status seemed to have a greater impact for the younger. However, it is also possible that these age-specific results reflect "real" relationships where health problems as well as health concerns obviously increase with age.

Some limits have to be mentioned with regards to these results. First of all, and regarding our main outcome of interest, a study found that in 1996 the NPHS may have underestimated the proportion of people insured for drug expenditures [43]. By extension, one can assume that the proportions regarding other types of insurance involved in our study (dentist, eye and hospital insurance) might have suffered from the same bias. More precisely, these authors have found that those eligible to public health insurance (seniors or social assistance recipients) do not always report prescription drug coverage. However, and as previously mentioned, we used a subsample that may circumvent this type of bias because there were no seniors and only very few social assistant recipients. As part of the sensitivity analysis, we nevertheless tested the effect of this potential measurement error adding specific factors in the model (reliability of 0.80 or measurement error of 20%). There were no major modifications in the estimations (not shown). Thus, rather than correcting for a hypothetical measurement error, we chose to rely on the individual statement, assuming that people who believe they are not covered by health insurance

will act and use the health care system as if they were uninsured. Secondly, the initial questionnaire of the NPHS does not allow us to clearly distinguish between those who received supplementary coverage through public or private sources. Thanks to the sub-sample used and as shown earlier, we are however confident that the effects shown here reflect mostly those of private health insurance. Thirdly, respondents were interviewed regarding their health insurance coverage only during four cycles (from 1996-7 to 2002-03) resulting in an underuse of the longitudinal dataset and in a shorter window of the individual lifecourse available for observation. In addition, we were not able to take into account the instability or the lack of continuity of health insurance coverage over time. It is known to have a negative impact on health status or healthcare utilization, at least in the US [21, 44] and the loss of private health coverage is often related to the loss of job or in income that can also potentially increase social health inequalities [44]. Fourth, because of statistical power issues, we had to dichotomize the experience of unmet needs because of cost over four cycles, while we used number of years for all other continuous outcomes. Only a few people were indeed concerned by unmet health care needs (around 20%) and even fewer because of cost (2%). This later proportion only consider the most recent time that the respondent experienced an unmet need care, and thus underestimates the real proportion of cost limitations ever experienced over 12 months.

Conclusion

While the impact of health insurance on existing social inequalities in health based on income is only moderate, it is globally positive for those with the greatest needs, and more especially those who experience unmet health care needs because of cost. In a national and public universal context where primary access to care is guaranteed, access to private health insurance still based on financial resources and social inequalities persist. Some vulnerable groups are left behind

such as those over the threshold of means-tested policies, the working poor and the unemployed. Finally, our work focused only on the working age population. As we highlighted, the importance of health insurance tends to increase with age. Further studies should focus on retirees, who are at risk of losing their employment insurance and may therefore suffer from unmet needs, particularly in provinces and countries where there is no supplementary coverage universally available to them.

The recent WHO Commission on Social Determinants of Health report highlighted the importance of extending universal coverage to developing countries [25], but we hope to have shown here that it is also important to pursue this goal in developed countries. According to this report, "health-care systems contribute most to improving health and health equity where the institutions and services are organized around the principle of universal coverage (extending the same scope of quality services to the whole population, according to needs and preferences, regardless of ability to pay)". In the international context of the growing proportion of private health insurance coverage to the expense of public insurance, the surveillance of theses trajectories could give evidence for future public health orientations and policies.

List of abbreviations used

NPHS: National Population Health Survey

SEM: Structural equation modeling

SES: Socioeconomic status

Competing interest

'The author(s) declare that they have no competing interests'.

Authors' contributions

ER and AQV performed the statistical analysis and drafted the manuscript. Both authors read and approved the final manuscript.

Acknowledgments

We acknowledge funding support from Canadian Institutes for Health Research grant MOP77800 (PI: Quesnel-Vallée) and a salary award from the Fonds de recherche en santé du Québec to Quesnel-Vallée.

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Figures

Figure 1: Sample selection, NPHS 1994-2007

Tables

Table 1: Descriptive statistics (mean (standard error) by age group, National Population Health Survey 1994-2004

	34-45, n=1628	45-55, n=1369
Demographic Characteristics		
Age in 1994	39.253 (2.943)	49.174 (2.801)
Male	0.498 (0.510)	0.519 (0.487)
White	0.905 (0.300)	0.910 (0.279)
Years married	3.199 (1.507)	3.226 (1.451)
Socioeconomic Position		
Years Insured	3.397 (1.141)	3.423 (1.061)
Years Income adequacy	2.985 (1.391)	3.101 (1.361)
Years employed	3.523 (1.064)	2.872 1.(471)
Years unemployed	0.130 (0.438)	0.112 (0.381)
Years OLF	0.346 (0.940)	1.016 (1.419)
Education less than HS	0.147 (0.361)	0.248 (0.421)
Education HS	0.462 (0.508)	0.381 (0.473)
Education higher than HS	0.392 (0.498)	0.372 (0.471)
Health Related Variables		
Poor SRH 2004	0.103 (0.309)	0.133 (0.330)
Chronic condition in 194	0.477 (0.509)	0.555 (0.484)
Years with chronic condition	2.465 (1.553)	2.809 (1.374)
At least one UN	0.219 (0.422)	0.215 (0.399)
At least one UNC	0.020 (0.141)	0.022 (0.143)

HS: High-school; OLF: Out of labor force; SRH: Self-Rated Health
UN: Unmet health care needs
UNC: Unmet health care needs because of cost

Table 2: Impact of health insurance on health, parameter estimates (standard errors), National Population Health Survey 1994-2004, 35-44 year olds subsample, n=1628

	MODEL 1			
	SRH	Years in income adequacy	Years unemployed	Years out of labor force
Unmet needs because of cost [a]				
Years insured [b]				
Years in income adequacy [b]	-0.097 (0.092)			
Years unemployed [b]	0.454 (0.174) **	-0.559 (0.080) ***		
Years out of labor force [b]	0.491(0.092) ***	-0.394 (0.055) ***		
High school degree in 1994	-0.453 (0.307) #	0.301(0.136) *	-0.087 (0.044) *	-0.258 (0.092) **
More than high school degree in 1994	-0.659 (0.326) *	0.600 (0.133) ***	-0.120 (0.044) **	-0.371(0.095) ***
Chronic condition in 1994	0.030 (0.270)	0.023 (0.093)	0.030 (0.025) #	0.115 (0.062) ***
Years with chronic condition [b]	0.501(0.090) ***	0.052 (0.037) #	-0.001(0.009)	0.054 (0.018) **
Rsquare	0.276	0.221	0.046	0.094
Adjusted BIC	16570.149			
# of free parameters	82			

	MODEL 2				
	SRH	Years insured	Years in income adequacy	Years unemployed	Years out of labor force
Unmet needs because of cost [a]					
Years insured [b]	0.153 (0.097) #				
Years in income adequacy [b]	-0.158 (0.094) +	0.329 (0.037) ***			
Years unemployed [b]	0.489 (0.175) **	-0.189 (0.078) *	-0.563 (0.079) ***		
Years out of labor force [b]	0.492 (0.091) ***	-0.010 (0.041)	-0.394 (0.054) ***		
High school degree in 1994	-0.436 (0.311) #	-0.026 (0.096)	0.322 (0.134) *	-0.084 (0.044) +	-0.257 (0.092) **
More than high school degree in 1994	-0.665 (0.333) *	0.111(0.093) #	0.629 (0.132) ***	-0.117 (0.044) **	-0.367 (0.094) ***
Chronic condition in 1994	0.011(0.273)	0.167 (0.070) *	0.037 (0.093)	0.028 (0.025)	0.112 (0.062) +
Years with chronic condition [b]	0.494 (0.089) ***	0.043 (0.027) #	0.048 (0.037) #	-0.001(0.009)	0.054 (0.018) **
Rsquare	0.281	0.223	0.227	0.046	0.093
Adjusted BIC	21117.284				
# of free parameters	103				

	MODEL 3					
	SRH	Unmet needs because of cost	Years insured	Years in income adequacy	Years unemployed	Years out of labor force
Unmet needs because of cost [a]	1.435 (0.464) **					
Years insured [b]	0.186 (0.098) +	-0.226 (0.177) #				
Years in income adequacy [b]	-0.147 (0.094) #	-0.508 (0.214) *	0.330 (0.036) ***			
Years unemployed [b]	0.477 (0.179) **		-0.185 (0.078) *	-0.572 (0.080) ***		
Years out of labor force [b]	0.479 (0.087) ***		-0.007 (0.041)	-0.397 (0.054) ***		
High school degree in 1994	-0.459 (0.311) #	0.397 (0.884)	-0.027 (0.096)	0.316 (0.135) *	-0.087 (0.044) *	-0.256 (0.091) ***
More than high school degree in 1994	-0.712 (0.329) *	1.314 (0.888) #	0.115 (0.092) #	0.621(0.132) ***	-0.120 (0.044) **	-0.367 (0.094) ***
Chronic condition in 1994	-0.030 (0.274)	0.639 (0.550) #	0.166 (0.070) *	0.034 (0.093)	0.030 (0.025) #	0.110 (0.062) +
Years with chronic condition [b]	0.487 (0.089) ***	0.044 (0.196)	0.043 (0.027) #	0.049 (0.037) #	-0.002 (0.009)	0.054 (0.018) **
Rsquare	0.781	0.363	0.225	0.227	0.047	0.093
Adjusted BIC	21419.147					
# of free parameters	122					

Adjusted on age, gender, ethnicity, marital status, and province of residence

***<.001; **<.01; *<.05; +<.10; # <.25

a: 1998-2004

b: 1996-2002

Table 3: Impact of health insurance on health, parameter estimates (standard errors), National Population Health Survey 1994-2004, 45-54 year olds subsample, n=1369

	MODEL 1									
	SRH		Years in income adequacy		Years unemployed		Years out of labor force			
Unmet needs because of cost [a]										
Years insured [b]										
Years in income adequacy [b]	-0.375 (0.091)	***								
Years unemployed [b]	-0.210 (0.256)		-0.358 (0.128)	**						
Years out of labor force [b]	0.248 (0.090)	**	-0.252 (0.037)	***						
High school degree in 1994	0.113 (0.290)		0.577 (0.126)	***	-0.035 (0.031)		-0.458 (0.136)	***		
More than high school degree in 1994	0.314 (0.289)	#	0.777 (0.122)	***	-0.039 (0.030)	#	-0.595 (0.126)	***		
Chronic condition in 1994	-0.130 (0.249)		-0.019 (0.094)		-0.008 (0.028)		0.076 (0.107)			
Years with chronic condition [b]	0.375 (0.115)	**	-0.041(0.034)	#	-0.006 (0.011)		0.172 (0.036)	***		
Rsquare	0.206		0.301		0.021		0.210			
Adjusted BIC	14511.062									
# of free parameters	82									
	MODEL 2									
	SRH		Years insured		Years in income adequacy		Years unemployed		Years out of labor force	
Unmet needs because of cost [a]										
Years insured [b]	-0.139 (0.090)	#								
Years in income adequacy [b]	-0.334 (0.094)	***	0.257 (0.036)	***						
Years unemployed [b]	-0.243 (0.256)		-0.344 (0.083)	***	-0.363 (0.128)	**				
Years out of labor force [b]	0.258 (0.090)	**	0.018 (0.030)		-0.249 (0.037)	***				
High school degree in 1994	0.139 (0.290)		0.094 (0.095)		0.577 (0.125)	***	-0.032 (0.031)		-0.459 (0.136)	***
More than high school degree in 1994	0.339 (0.291)	#	0.123 (0.093)	#	0.793 (0.121)	***	-0.037 (0.030)	#	-0.598 (0.126)	***
Chronic condition in 1994	-0.098(0.247)		0.112 (0.081)	#	-0.034 (0.094)		-0.008 (0.028)		0.077 (0.107)	
Years with chronic condition [b]	0.377 (0.115)	**	0.021(0.030)		-0.031(0.034)		-0.006 (0.011)		0.172 (0.036)	***
Rsquare	0.209		0.163		0.302		0.021		0.210	
Adjusted BIC	18370.386									
# of free parameters	103									
	MODEL 3									
	SRH		Unmet needs because of cost		Years insured		Years in income adequacy		Years unemployed	Years out of labor force
Unmet needs because of cost [a]	0.756 (0.436)	+								
Years insured [b]	-0.126 (0.090)	#	-0.385 (0.113)	***						
Years in income adequacy [b]	-0.325 (0.094)	***	-0.328 (0.164)	*	0.257 (0.036)	***				
Years unemployed [b]	-0.262 (0.258)				-0.343 (0.083)	***	-0.363 (0.129)	**		
Years out of labor force [b]	0.263 (0.089)	**			0.016 (0.030)		-0.246 (0.037)	***		
High school degree in 1994	0.147 (0.291)		-0.015 (0.606)		0.090 (0.095)		0.579 (0.124)	***	-0.035 (0.031)	-0.461(0.136) ***
More than high school degree in 1994	0.333 (0.291)	#	0.361(0.659)		0.120 (0.093)	#	0.793 (0.119)	***	-0.039 (0.030) #	-0.597 (0.126) ***
Chronic condition in 1994	-0.106 (0.247)		0.103 (0.524)		0.113 (0.081)	#	-0.036 (0.094)		-0.007 (0.028)	0.076 (0.107)
Years with chronic condition [b]	0.368 (0.115)	**	0.448 (0.196)	*	0.022 (0.030)		-0.036 (0.034)		-0.006 (0.011)	0.173 (0.036) ***
Rsquare	0.625		0.475		0.163		0.303		0.021	0.210
Adjusted BIC	18660.609									
# of free parameters	122									

Adjusted on age, gender, ethnicity, marital status, and province of residence

***<.001; **<.01; *<.05; +<.10; # <.25

a: 1998-2004

b: 1996-2002