



UCD GEARY INSTITUTE DISCUSSION PAPER SERIES

The Determinants of Self-Rated Health in the Republic of Ireland Further Evidence and Future Directions

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10th December 2007

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Geary WP/41/2007

Abstract

This paper examines the determinants of self-rated health in the Republic of Ireland using data from the 2001 Quarterly National Household Survey Health Module and the 2005 ESRI Time Usage Survey. Results indicate that self-rated health is a useful proxy for self-reported chronic illness indices. Higher education, having private medical insurance cover and being married is associated with better self-rated health. The strong inverse relationship between age and self-rated health is found to be robust to the inclusion of self-reported morbidity. Caregivers display lower self-rated health, even after controlling for age, marital status and education. We find only minor effects of gender. Understanding further the causal nature of the above associations is a key issue for future research.

Introduction

The extent to which income^{1, 2, 3}, education^{4, 5, 6, 7} and occupational status^{8, 9, 10, 11,12} determines health is a key issue in the public health literature globally and has important ramifications for health policy¹³. Several previous papers have examined demographic variation in self-rated health in Ireland.^{14 15} Delaney et al (2007) verify the income, age and educational gradient in self-rated health in Ireland and show statistically significant though modest effects of social capital variables such as associational membership and social trust.¹⁶ In general, however, far more work is needed to isolate the determinants of health in Ireland including the reanalysis of existing data-sets that have not yet been exploited and the creation of new data, particularly panel data. The existence of the Irish Social Science Data Archive is a useful resource with regard to the former. The aim of this paper is to further exploit the data available in this resource to examine: firstly the extent to which self-rated health correlates with measures of morbidity; and secondly the extent to which self-rated health is related to the following key demographic characteristics: age, gender, education, occupational status, marital status, caregiver status and medical insurance cover.

Data and Methods

Data were derived from the Irish Social Science Data Archive and were cleaned, coded and analysed using STATA 9. Subjective health state was assessed by a single-item measure of general health status. This was measured in the Time-Use Survey, by a four point scale ranging from “*excellent*”, “*very good*”, “*good*”, “*fair*”. The Time-Use Survey also contained a single-item measure of self-rated morbidity which assessed the

presence of a “*chronic physical or mental health problem, illness or disability*”. Age, gender, education, employment, marital status and caregiver status were selected as independent variables in the analysis of Time-Use Survey data. Subjective health state was assessed in the QNHS by a five-point scale ranging from “*very good*”, “*good*”, “*fair*”, “*bad*”, “*very bad*”. Measures of self-reported morbidity included the following *chronic* illnesses: angina; heart attack; stroke; hypertension; rheumatoid arthritis, osteoarthritis; asthma; chronic bronchitis; diabetes; gastric ulcer; stroke; gallstones; kidney stones; osteoporosis; underactive thyroid, leg ulcer; skin cancer; and all other cancers. Age, gender, medical insurance cover, and marital status were included as independent variables in the analysis of QNHS self-reported health data. The data sets used are described below.

The Irish National Time-Use Survey (2005)

The Irish National Time-Use Survey (2005) is a pilot survey conducted by the Economic and Social Research Institute for the NDP Gender Equality Unit of the Department of Justice, Equality, and Law Reform. The 2005 survey collected detailed time-use statistics of a nationally representative Irish sample of over 1,000 men and women. Detailed background information including; marital status; own occupation; partner’s occupation; occupational responsibility; education level; self-reported health; disability; and caregiver status is available for each participant in the survey.

Quarterly National Household Survey (QNHS) (2001)

The Quarterly National Household Survey is a large-scale, nationwide survey of households in Ireland, the main purpose of which is the provision of timely estimates of short-term labour market trends. The core survey collects information on the following variables: gender; age; nationality; employment status; occupation; industry; hours worked; education level. The survey began in September 1997, replacing the annual April Labour Force Survey (LFS). Through the inclusion of quarterly special survey modules, the QNHS provides a rich source of data on a range of social topics including health, and disability. The QNHS contains an index of eighteen common chronic illnesses, for which individual level self-report data is available.

Results

Mean self-rated health in the QNHS was 3.70, with 25.8% of respondents stating that they had “excellent” health, 34.8% of respondents claiming that their health was “very good”, 26.2% stating that their health was “good”, 10.5% stating that their health was “fair” and 2.6% stating that their health was “poor”. The total percentage reporting “poor” or “fair” health at 13.1% is lower than the 16% recorded in the 2002 and 2005 European Social Survey for “bad”, “very bad” and “fair” self-ratings of health combined. The mean self-rated health in the ESRI time-usage study was 4.20 with 39.06% stating that they had “very good” health, 44.82% stating that they had “good” health, 14.06% stating that they had “fair” health, 1.66% stating that they had “bad” health and 0.39% stating that they had “very bad” health. In sum, there is a high degree of consistency across data-sets but scale placement at the higher end is sensitive to the use of options

such as “very good” as opposed to “excellent” with respondents being more reluctant to use “excellent”.

Table 1 examines several models of the relationship between self-rated health and demographic factors utilising the QNHS 2001 data. The results show a marked effect of age, private health insurance marital status and caregiver status on self-rated health. Previous findings showing a negligible gender effect are confirmed and the effect is insignificant in most models. There are strong relationships between measures of morbidity and self-rated health. The results show, in particular, that stroke and cancer are substantially negatively associated with self-rated health. Treating self-rated health as a continuous as opposed to categorical variable does not yield substantive differences in the results. Interestingly, the negative coefficients on age are only slightly altered by including morbidity in the regressions indicating that morbidity (at least along the dimensions analysed) is not the main factor driving age differences in self-rated health.

Table 2 replicates these models utilising the ESRI Time-Usage data. The results confirm age, educational and occupational gradients in self-rated health as well as confirming that there are no gender and only minor marital status effects. In particular, we find that self-rated health declines with age and that those with higher levels of education have substantially higher self-rated health. Once again, including morbidity in to the regressions does not impact substantially on the age-coefficient. Furthermore, modelling the self-rated health variable as continuous as opposed to categorical does not effect results substantially.

Discussion

The results confirm the high degree of correlation between self-rated health and measures of reported morbidity.^{6, 17, 18, 19} This is positive in terms of the validity of several studies that include rich socio-economic and social capital information but relatively sparse health information such as the European Social Survey. Although our results confirm that self-rated health is a valuable proxy for more detailed morbidity questions, further work is necessary to outline the conditions under which self-rated health is a particularly poor measure. For example, comparison of the distribution of self-ratings of health in the QNHS and Time-Usage Survey highlights scaling effects due to variation in wording of Likert response options as a potential source of bias in self-report data requiring further investigation.

Those with higher levels of education have substantially higher self-rated health. There are also occupational gradients in self-rated health, however the magnitude of the coefficients is small in comparison, with significant effects shown only for a negative relationship between the occupational categories of 'sick/disabled' and 'retired', and self-rated health.

The results from several different Irish data-sets confirm a number of results with respect to the determinants of health in Ireland. There are almost certainly educational and occupational gradients with respect to health in Ireland and the establishment of the direction of causality and mutuality of these relationships must be seen as a key priority for health research and policy in Ireland. The current data does not allow us to conclude that increasing education or changing occupational structures will have an effect on

health. Rather, it suggests an important marker for health outcomes that needs to be investigated.

The negative relationship between self-rated health and age is confirmed by separate analyses of data from both surveys. Further work is certainly needed to examine the precise nature of this relationship. Firstly, it is necessary to understand whether the age-health relationship represents a life-cycle effect or a cohort effect. To partly address this question, a research stream examining age-health distributions in data going back to the early Eurobarometers taken in the 1970s is underway. Further, given the substantial migration from Ireland throughout the 20th century, it is vitally important that we begin to compare the age-health relationship in Ireland to that of people who were born in Ireland but who emigrated. The current Irish data only examines people who were living in Ireland at the time of the interviews, however research which is currently matching data from international studies such as the British General Household Survey that contains information on (albeit relatively small) samples of Irish-born individuals will partly achieve this task. Ultimately, a survey of Irish emigrants taken across the world would be necessary to fully unravel the complex relationship between age, health and life-events. Interestingly, the negative age-health association is robust to the inclusion of self-reported morbidity data in both surveys. Explaining the relationship between age and self-rated health in an Irish context may require further investigation of the part played by the psychosocial contexts of ageing in an Irish society and changes in labour market variables across different life stages.

Gender does not seem to have an effect across several different models and datasets and the effect of marital status is low when compared to other effects. The absence of a gender effect in Irish self-rated health is confirmed now in several papers.¹⁴ This is in contrast to the international literature, which generally demonstrates that women have lower self-reported health.^{20, 21, 22} Further research is needed to understand this discrepancy. Indeed, there is only one paper to-date that reports a gender difference in self-rated health and this finds the opposite effect, with men reporting worse health.²

The independent negative effect of caregiver status on self-rated health emerging from our QNHS survey data is consistent with nationally^{23, 24} and internationally^{25, 26, 27,}²⁸ documented effects of caring on health and mental health. In the context of Ireland's ageing population, assessing the economic cost of caregiving at the national level and the personal, social and health impact at the individual level will be important foci for future policy and research initiatives.²⁹

The relationship between marital status and health is replicated in several papers now and is consistent with international findings. Previous research has demonstrated a substantial marital status differential in mental well-being and self-reported health status.^{30, 31, 32, 33} A body of work examining the interaction between economic change, marriage patterns, health and mental health needs to emerge in Ireland to further unravel these complex patterns.

The results also demonstrate that those with private health insurance have substantially better health. It would be insufficient to use this result to argue that private health insurance has positive effects on people's health. In this case, the lack of good income data makes it possible that private health insurance is acting as a proxy for

income. It is very important, in the context of debates surrounding public policy regarding health insurance, to understand the nature of the relationship between health and health insurance. More detailed statistical modelling is one route, though ultimately some degree of experimentation offers the most effective method to unravelling these complex associations. The RAND Health Insurance Experiment is the most comprehensive attempt globally to do this so far.³⁴ An effort like this in Ireland would get to the heart of debates surrounding health, inequality and public policy.

Some key questions for future research include: to what extent does measurement of socio-economic status influence conclusions related to socio-economic gradients?; have socio-economic gradients increased or decreased over time?; at what stage of the life-cycle are socio-economic gradients in health formed?; to what extent are socio-economic gradients determined by early-life and ante-natal events?; to what extent are socio-economic gradients in self-reported and self-rated measures determined by different response styles and interpretations across social groups?; what role does differential access to health care and health insurance play in determining socio-economic health gradients and related to this how does this link to regional variations in health?; what role do health behaviours and self-care play in socio-economic gradients?; what role is played by education and primary health-care services throughout the life-cycle?; What role is played by environmental factors both inside the home (e.g. heating) and outside (e.g. air pollution) in explaining socio-economic gradients?; What role was played by historical events, improvements in public health systems and medical technologies, drug advances and changes in legislation throughout the 20th century in generating current socio-economic status/health distributions? Future research will

continue to uncover and make use of existing data that is available in Ireland as well as collecting new data. This research effort offers very exciting prospects but must be tempered with a degree of realism. Ireland was a relatively poor country for most of the 20th century and data-collection was not a priority. Thus, many of the above questions may never be answered to a high degree of certainty.

References

1. Subramanian SV, Kawachi I. Whose health is affected by income inequality? A multilevel interaction analysis of contemporaneous and lagged effects of state income inequality on individual self-rated health in the United States. *Health Place* 2006; 12(2):141-156.
2. O' Reily D, Thompson KJ, Murphy AW, et al. Socio-economic gradients in self-reported health in Ireland and Northern Ireland. *Ir. J. Med Sci* 2006; 175:43-51.
3. Shibuya K, Hashimoto H, Yano E. Individual income, income distribution, and self-rated health in Japan: cross sectional analysis of nationally representative sample. *BMJ* 2002; 324(7328):16-21.
4. Nummela OP, Sulander, TT, Heinonen HS, Uutela AK. Self-rated health and indicators of SES among the ageing in three types of communities. *Scand. J. Publ. Health.* 2007; 35:39-47.
5. White, IR, Blane D, Morris JN, Mourouga P. Educational attainment, deprivation-affluence and self reported health in Britain: a cross sectional study. *J. Epidemiol. Community Health* 1999; 53:535-541.

6. Singh-Manoux A, Martikainen P, Ferrie J, Zins M, Marmot M, Goldberg M. What does self-rated health measure? Results from the British Whitehall II and French Gazel cohort studies. *J. Epidemiol. Community Health* 2006; 60:364-372.
7. von dem Knesebeck O, Verdeb PE, Draganoc N. Education and health in 22 European countries. *Soc Sci Med* 2006; 63:1344–1351.
8. Benavides FG, Benach J, Diez-Roux AV, Roman C. How do types of employment relate to health indicators? Findings from the second European survey on working conditions. *J. Epidemiol. Community Health* 2000; 54:494-501.
9. Ferrie JE, Shipley MJ, Newman K, Stansfeld SA, Marmot M. Self-reported job insecurity and health in the Whitehall II study: potential explanations of the relationship. *Soc. Sci. Med* 2005; 60(7):1593-1602.
10. Godin I, Kittel F, Coppieters Y, Siegrist J. A prospective study of cumulative job stress in relation to mental health. *BMC Public Health* 2005; 5.
11. Virtanen P, Vahtera J, Kivimaki M, Pentti J, Ferrie J. Employment security and health. *J. Epidemiol. Community Health* 2002; 56(8):569-574.
12. Chandola T, Ferrie J, Sacker A, Marmot M. Social inequalities in self-reported health in early old age: follow-up of prospective cohort study. *BMJ* 2007; 334:990-7.
13. Allison RA, Foster JE. Measuring health inequality using qualitative data. *J. Health Econ* 2004; 23(3):505-524.
14. Kelleher CC, Friel S, Gabhainn SN, Tay JB. Socio-demographic predictors of self-rated health in the Republic of Ireland: findings from the National Survey on Lifestyle, Attitudes and Nutrition, SLAN. *Soc. Sci. Med* 2003; 57(3):477-486.

15. Balanda K, Wilde J. Inequalities in Perceived Health. A report on the All-Ireland Social Capital and Health Survey. *Dublin. The Institute of Public Health in Ireland, 2003.*
16. Delaney L, Wall P, O' hAodha F. Social capital and self-rated health in the Republic of Ireland: Evidence from the European Social Survey. *Irish Medical Journal. In Press.*
17. Popham F, Walker JJ, Mitchel R. Could using general health and longstanding limiting illness as a joint health outcome add to understanding in social inequalities research? *J. Public Health Med* 2007; 29(2):208 – 210.
18. Manor O, Matthews S, Power C. Self-rated health and limiting longstanding illness: inter-relationships with morbidity in early adulthood. *Int J Epidemiol* 2001; 30:600–7.
19. Cohen G, Forbes J, Garraway M. Interpreting self reported limiting long-term illness. *BMJ* 1995; 311:722–4.
20. Rahman O, Strauss J, Gertler P, Ashley D, Fox K. Gender differences in adult health: an international comparison. *Gerontologist* 1994; 34(4):463-9.
21. McCullough ME, & Laurenceau J-P. Gender and the natural history of self-rated health: a 59-year longitudinal study. *Health Psychol* 2004; 23:651-655.
22. Franks P, Gold MR, Fiscella K. Sociodemographics, self-rated health, and mortality in the US. *Soc. Sci. Med* 2003; 56(12):2505-14.
23. O'Shea E. Costs and consequences for the carers of people with dementia in Ireland. *Dementia* 2003; 2: 201-219.
24. Lane P, McKenna H, Ryan A, Fleming P. The experience of the family caregivers' role: a qualitative study. *Research and Theory for Nursing Practice* 2003; 17(2):137-151.

25. Cannuscio CC, Colditz GA, Rimm EB, Berkman LF, Jones CP, Kawachi I. Employment status, social ties, and caregivers' mental health. *Soc Sci Med* 2004; 58:1247-56.
26. Vitaliano PP, Zhang J, Scanlan JM. Is caregiving hazardous to one's physical health: a meta-analysis. *Psychol Bull* 2003; 129(6):946-72.
27. Graham N. Dementia and family care: the current international state of affairs [Editorial]. *Dementia* 2003; 2:147-149.
28. Cooper C, Balamurali T.B.S, Livingston G. A systematic review of the prevalence and covariates of anxiety in caregivers of people with dementia. *International Psychogeriatrics* 2007; 19:175-195.

29. O'Shea E. Developing a healthy ageing policy for Ireland: the view from below. *Health Policy* 2006; 76:93-105.
30. DeKlyen M, Brooks-Gunn J, McLanahan S, Knab J. The mental health of married, cohabiting, and non-coresident parents with infants. *Am J Pub Health* 2006; 96(10):1836-41.
31. Lucas RE, Clark AE, Georgellis Y, Diener E. Re-examining adaptation and the set point model of happiness. *J. Pers. Soc. Psycho.* 2002; 84:527-539.
32. Joutsenniemi KE, Martelin TP, Koskinen SV, et al. Official marital status, cohabiting, and self-rated health: time trends in Finland, 1978–2001. *Eur J Publ Health* 2006; 16(5):476-483.
33. Bennett KM. Does marital status and marital status change predict physical health in older adults? *Psychol Med* 2006; 36:1313-20.
34. Joseph P. Newhouse, Free for All?: Lessons from the RAND Health Insurance Experiment. *Harvard: Harvard University Press*, 1996.

Table 1: Modeling Self-Rated Health Using the QNHS Data

COEFFICIENT	(1) Health OLS	(2) Health Logit	(3) Health OLS	(4) Health Logit
25 to 34	-0.184*** (0.019)	-0.178*** (0.018)	-0.413*** (0.039)	-0.410*** (0.039)
35 to 44	-0.388*** (0.020)	-0.372*** (0.019)	-0.838*** (0.041)	-0.832*** (0.041)
45 to 54	-0.614*** (0.020)	-0.543*** (0.019)	-1.198*** (0.042)	-1.275*** (0.042)
55 to 64	-0.899*** (0.021)	-0.718*** (0.020)	-1.571*** (0.045)	-1.847*** (0.044)
65 plus	-1.081*** (0.022)	-0.771*** (0.021)	-1.672*** (0.046)	-2.183*** (0.045)
Female	-0.010 (0.009)	0.004 (0.009)	-0.009 (0.018)	-0.036** (0.018)
Private Insurance Only	0.644*** (0.011)	0.536*** (0.011)	1.107*** (0.024)	1.238*** (0.023)
Both Private and Card	0.236*** (0.029)	0.262*** (0.028)	0.569*** (0.060)	0.471*** (0.060)
Neither Private Nor Card	0.444*** (0.013)	0.342*** (0.013)	0.679*** (0.027)	0.825*** (0.027)
Married	0.075*** (0.012)	0.083*** (0.011)	0.161*** (0.024)	0.139*** (0.024)
Separated	-0.012 (0.022)	0.034 (0.021)	0.074 (0.045)	-0.020 (0.045)
Widowed	0.089*** (0.020)	0.126*** (0.018)	0.253*** (0.040)	0.165*** (0.039)
Angina		-0.497*** (0.026)	-1.080*** (0.058)	
Heart Attack		-0.532*** (0.032)	-1.166*** (0.072)	
Stroke		-0.686*** (0.047)	-1.527*** (0.110)	
Hypertension		-0.361*** (0.016)	-0.748*** (0.034)	
Rheumatoid Arthritis		-0.512*** (0.020)	-1.040*** (0.044)	
Osteo-Arthritis		-0.438*** (0.022)	-0.911*** (0.048)	
Asthma		-0.475*** (0.019)	-1.003*** (0.041)	
Chronic Bronchitis		-0.542*** (0.033)	-1.181*** (0.074)	
Diabetes		-0.489*** (0.031)	-1.051*** (0.069)	
Gastric Ulcer		-0.414*** (0.031)	-0.839*** (0.068)	
Gallstones		-0.118*** (0.033)	-0.247*** (0.071)	
Kidney Stones		-0.315*** (0.048)	-0.729*** (0.107)	
Osteoporosis		-0.357*** (0.039)	-0.746*** (0.084)	
Underactive Thyroid		-0.349*** (0.038)	-0.700*** (0.083)	

Leg Ulcer		-0.396***	-0.829***	
		(0.053)	(0.115)	
Skin Cancer		0.029	0.020	
		(0.070)	(0.156)	
Other Cancer		-0.646***	-1.372***	
		(0.038)	(0.089)	
Constant	3.836***	3.941***		
	(0.023)	(0.022)		
Observations	44844	44844	44844	44844
R-squared	0.23	0.31	.	.

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: The Base Category for age is 18-24; The Base Category for Insurance Category is "Medical Card";
The Base Category for Marital Status is "Never Married";

Table 2: Modeling Self-Rated Health Using the Time-Usage Data

COEFFICIENT	(1) Health OLS	(2) Health OLS	(3) Health Logit	(4) Health Logit
Complete Prim	0.396*** (0.129)	0.334*** (0.120)	1.030*** (0.371)	0.974*** (0.375)
Junior Cert	0.525*** (0.127)	0.451*** (0.119)	1.348*** (0.365)	1.306*** (0.371)
Leaving Cert	0.649*** (0.127)	0.570*** (0.118)	1.681*** (0.366)	1.685*** (0.371)
PLC/Cert	0.570*** (0.133)	0.503*** (0.124)	1.485*** (0.382)	1.529*** (0.387)
College	0.749*** (0.131)	0.662*** (0.122)	1.968*** (0.379)	1.964*** (0.384)
Separated	0.189 (0.164)	0.179 (0.152)	0.577 (0.483)	0.575 (0.501)
Divorced	-0.349 (0.220)	-0.310 (0.205)	-0.740 (0.668)	-1.104 (0.675)
Widowed	-0.149 (0.113)	-0.057 (0.106)	-0.272 (0.320)	-0.211 (0.328)
Never Married	-0.066 (0.062)	-0.080 (0.058)	-0.197 (0.179)	-0.213 (0.183)
Self-Employed	-0.018 (0.071)	-0.014 (0.067)	-0.026 (0.204)	-0.037 (0.208)
Student	-0.007 (0.107)	-0.007 (0.100)	-0.084 (0.311)	-0.071 (0.314)
Training	-0.132 (0.282)	-0.073 (0.262)	-0.342 (0.753)	-0.231 (0.755)
Unemployed	-0.096 (0.148)	-0.079 (0.138)	-0.270 (0.424)	-0.197 (0.432)
Sick/Disabled	-1.358*** (0.139)	-0.824*** (0.138)	-3.571*** (0.438)	-2.519*** (0.473)
Caregiver	-0.184** (0.077)	-0.143** (0.072)	-0.505** (0.217)	-0.425* (0.221)
Retired	-0.253*** (0.086)	-0.142* (0.081)	-0.612** (0.248)	-0.399 (0.254)
Other	-0.172 (0.200)	-0.140 (0.186)	-0.492 (0.569)	-0.368 (0.590)
Female	0.052 (0.050)	0.023 (0.046)	0.174 (0.143)	0.100 (0.145)
age	-0.006*** (0.002)	-0.006*** (0.002)	-0.022*** (0.006)	-0.021*** (0.006)
endq18a		0.777*** (0.071)		2.387*** (0.242)
Constant	3.970*** (0.180)	2.576*** (0.214)		
Observations	962	956	962	956
R-squared	0.24	0.33	.	.

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3: Description of Covariates

		Covariate	Description
QNHS (2001)	Dependent Variables	Self-rated Health	4-value categorical variable (“excellent to “fair”) indicating the respondent’s subjective general health.
		Self-rated Morbidity:	
		Angina	Binary variable 1 = Yes; 2 = No/Not Stated
		Heart Attack	Binary variable 1 = Yes; 2 = No/Not Stated
		Stroke	Binary variable 1 = Yes; 2 = No/Not Stated
		Hypertension	Binary variable 1 = Yes; 2 = No/Not Stated
		Rheumatoid Arthritis	Binary variable 1 = Yes; 2 = No/Not Stated
		Osteo-Arthritis	Binary variable 1 = Yes; 2 = No/Not Stated
		Asthma	Binary variable 1 = Yes; 2 = No/Not Stated
		Chronic Bronchitis	Binary variable 1 = Yes; 2 = No/Not Stated
		Diabetes	Binary variable 1 = Yes; 2 = No/Not Stated
		Gastric Ulcer	Binary variable 1 = Yes; 2 = No/Not Stated
		Gallstones	Binary variable 1 = Yes; 2 = No/Not Stated
		Kidney Stones	Binary variable 1 = Yes; 2 = No/Not Stated
		Osteoporosis	Binary variable 1 = Yes; 2 = No/Not Stated
		Underactive Thyroid	Binary variable 1 = Yes; 2 = No/Not Stated
		Leg ulcer	Binary variable 1 = Yes; 2 = No/Not Stated
		Skin cancer	Binary variable 1 = Yes; 2 = No/Not Stated
		Other cancer	Binary variable 1 = Yes; 2 = No/Not Stated
	Demographic Variables	Age	One to six categorical variable (“18-24”, “25-34”, “35-44”, “45-54”, “55-64”, “65 and over”) indicating respondent’s age group.
		Gender	Binary variable 0 = female; 1 = male
		Marital Status	4-value categorical variable indicating marital status (“single”, “married”, “separated”, “widowed”)
		Medical Insurance	4-value categorical variable indicating respondent’s medical cover (“medical card only”, “private insurance only”, “both”, “neither (including a small number of ‘not-stated’”)
Time-Use Survey (2005)	Dependent Variables	Self-rated Health	5-value categorical variable (“very good” to “very bad”) indicating the respondent’s subjective general health
		Self-rated Disability	Binary variable determining respondent’s self-report of <i>any</i> chronic physical or mental health problem, illness or disability.
	Demographic Variables	Age	Respondent’s age in integers
		Gender	Binary variable 0 = female; 1 = male
		Education	Highest level of Education completed
		Employment	4-value categorical variable or (“self-employed”, “unemployed”, “retired”, “other”) indicating respondent’s employment status.
		Marital Status	5-value categorical variable indicating marital status (“married”, “separated”, “divorced”, “widowed”, “never married”). Implemented using dummy variables with “married” ad the base class.
		Caregiver Status	Binary variable indicating whether the respondent has any current caregiver responsibilities inside or outside the home (excluding standard childcare activities).