

Health status over the life-cycle

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Netspar Pension Day

Introduction

- ▶ **What is health and how should we measure it?**
- ▶ Combine survey data on self-reported health and administrative medical records.
 - ▶ Prescription drugs; Hospital discharge register; Long-term care use
- ▶ How persistent is a change in health?
- ▶ Does the evolution of health differ by socioeconomic status and gender?
- ▶ Do education and economic variables reduce the risk of illness and increase the change to recover from illness?

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Measuring health in this paper

- ▶ **Self-reported health has proven to be a very useful measure of health**
 - ▶ Reporting bias (Crossley and Kennedy, 2002), differences in health perception (e.g. Lindeboom and Van Doorslaer, 2004), justification bias (Bound et al., 2001)
 - ▶ Only partially able to explain the persistence in underlying health problems (Lange and McKee, 2011)
 - ▶ Usually available for a relative small sample of the population
 - ▶ Health related attrition might be a problem
- ▶ Clinical measures about illness and chronic conditions from medical registers

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Contributions

- ▶ Health measurement model which combines panel data on SRH and rich data from medical registers
 - ▶ Much less prone to measurement error (Baker et al., 2004).
 - ▶ Allow and test for differences in health perception
 - ▶ Predict health status for the population at large
- ▶ Account for unobserved heterogeneity and the persistence in **unobserved health shocks**
- ▶ Account for inconsistent reporting over time in SRH
- ▶ Justify studies on the relationship between SES and health who use 'subjective health' (e.g. Case and Deaton, 2005; Contoyannis et. al., 2004; Ross et al., 2012).

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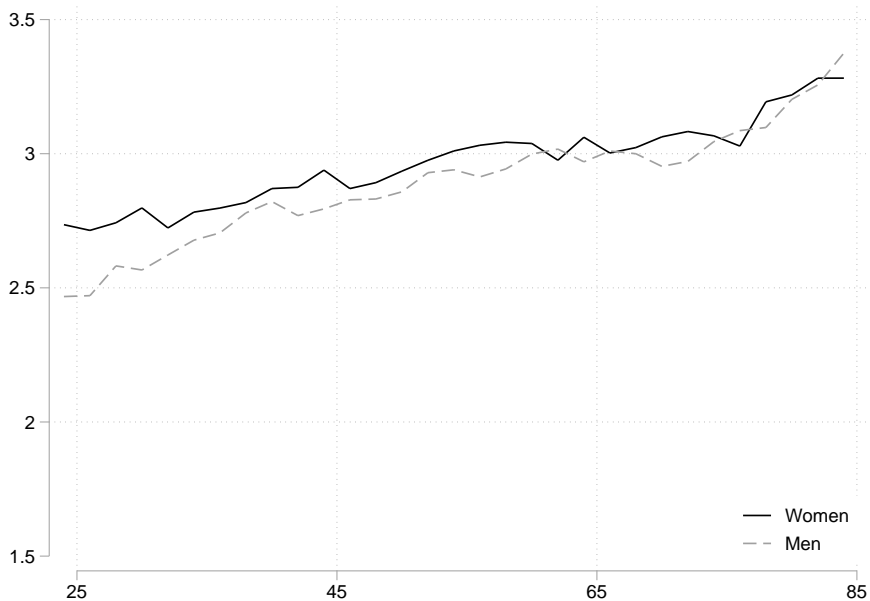
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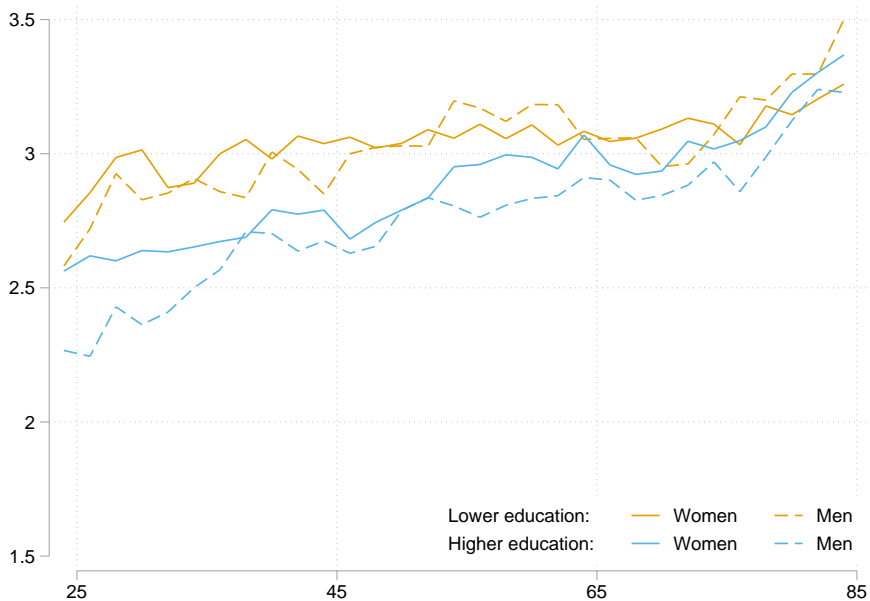
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Self reported health, 1 = Excellent — 5 = Poor



Self reported health by education 1 = Excellent — 5 =Poor



Outline

- ▶ Different approaches to model health
- ▶ A longitudinal health measurement model
- ▶ Data
- ▶ Results: health index
- ▶ Evolution of health status over the life-cycle
- ▶ Conclusion

Different approaches to model health

- ▶ Literature overview by Kapteyn and Meijer (2013)
- ▶ Three different methods:
 - ▶ Jurges (2007), Lindeboom and van Doorslaer (2004); Cutler et al. (1997)
 - ▶ Poterba, Venti and Wise (2010)
 - ▶ Meijer et al. (2011)
- ▶ Lange and McKee (2012) and Heise, Venti and Wise (2014) explicitly model the persistence in health

Health measurement model

$$y_{it}^* = \mathbf{x}'_{it}\boldsymbol{\beta} + \varepsilon_{it}, \quad t = 1, \dots, T$$

\mathbf{x} , is a vector of chronic health conditions,

$$\varepsilon_{it} | \mathbf{x}_{it} \sim N(0, 1)$$

$$\varepsilon_{it} = c_i + u_{it}$$

$$c_i \sim NID(0, \sigma_c^2)$$

$$u_{it} = \gamma u_{it-1} + \zeta_{it}$$

$$\zeta_{it} \sim NID(0, \sigma_\zeta^2)$$

$$\sigma_\zeta^2 = (1 - \sigma_c^2) \cdot (1 - \gamma^2)$$

$$\text{cov}(c_i, u_{it}) = 0, \quad t = 1, \dots, T$$

Health measurement model (2)

- ▶ *SRH* reflects latent health status.

$$SRH_{it} = L \text{ if } \lambda_{L-1}^g < y_{it}^* \leq \lambda_L^g, \quad L = 1, \dots, 5; \quad g = 1, \dots, G$$

- ▶ $\lambda^g = (\lambda_1^g, \lambda_2^g, \lambda_3^g, \lambda_4^g)'$ are the threshold parameters for demographic group g ($\lambda_0^g = -\infty$ and $\lambda_5^g = \infty$).
 - ▶ Males born before 1945
 - ▶ Males born between 1945 and 1965
 - ▶ Individuals born after 1965
 - ▶ Females born before 1945
 - ▶ Females born between 1945 and 1965
- ▶ Account for 'cut-point' shifting

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Health measurement model (3)

- ▶ Estimate the 'structural' parameter vector $\theta = (\beta', \sigma_c^2, \gamma, \lambda^g)'$ by MD.

$$y_{i1}^* = \mathbf{x}'_{i1} \beta_1^g + \varepsilon_{i1}$$

$$y_{i2}^* = \mathbf{x}'_{i2} \beta_2^g + \varepsilon_{i2}$$

$$y_{i3}^* = \mathbf{x}'_{i3} \beta_3^g + \varepsilon_{i3}$$

$$y_{i4}^* = \mathbf{x}'_{i4} \beta_4^g + \varepsilon_{i4}$$

$$\varepsilon_i | \mathbf{x}_i \sim NID \left(\begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_{21}^g & \rho_{31}^g & \rho_{41}^g \\ \rho_{21}^g & 1 & \rho_{32}^g & \rho_{42}^g \\ \rho_{31}^g & \rho_{32}^g & 1 & \rho_{43}^g \\ \rho_{41}^g & \rho_{42}^g & \rho_{43}^g & 1 \end{pmatrix} \right)$$

$$\rho_{21} = \rho_{32} = \rho_{43} = (1 - \gamma)\sigma_c^2 + \gamma$$

$$\rho_{31} = \rho_{42} = (1 - \gamma^2)\sigma_c^2 + \gamma^2$$

$$\rho_{41} = (1 - \gamma^3)\sigma_c^2 + \gamma^3$$

- ▶ No 'index shifting': $\beta^g = \beta$ and $\rho^g = \rho$

Prediction of the health index in large administrative data

- ▶ Use the estimated parameters γ , σ_c^2 and β to construct a health index for a large random sample of the Dutch population
- ▶ Health index: $\hat{y}_{it}^* = \mathbf{x}'_{it}\hat{\beta} + \tilde{c}_i + \tilde{u}_{it}$
 - ▶ Continuous health measure
 - ▶ Ordinal health measure — anchor to one threshold

Data: two samples

- ▶ Estimation sample (2007-2010)
 - ▶ LISS panel for self-assessed health enriched with administrative data
 - ▶ 16,720 individual-year observations (age 15+)
- ▶ Prediction sample (2006-2010)
 - ▶ Administrative data
 - ▶ Random sample of 163,695 observations in 2006 (age 15+)

LISS panel for self-assessed health (2007-2010)

- ▶ Longitudinal Internet Study in the Social Sciences, gathered by CentERdata, University of Tilburg
- ▶ Internet-based panel
- ▶ Representative for the non-institutionalized population
- ▶ 16,720 individual-year observations (age 15+)
- ▶ Consent to link to administrative data in 2011
 - ▶ On average 70 percent can be linked

SRH questions in the LISS

- ▶ *How would you describe your health in general?* With response options: Poor, Moderate, Good, Very Good and Excellent.
- ▶ *Can you indicate whether your health is poorer or better, compared to last year?* With response options: considerably poorer, somewhat poorer, the same, somewhat better and considerably better.

Uncorrected and corrected self-reported health, $N = 16,720$

Self-reported health	Uncorrected	Corrected
Poor	0.9	1.1
Moderate	14.2	14.7
Good	60.4	59.8
Very good	19.2	19.1
Excellent	5.2	5.3

Transition matrices uncorrected and corrected self-reported health

Panel A: Uncorrected health measure					
$t - 1 \setminus t$	Poor	Moderate	Good	Very good	Excellent
Poor	46.8	46.8	6.4	0.0	0.0
Moderate	3.3	59.5	36.3	0.9	0.1
Good	0.2	8.3	78.6	11.7	1.3
Very good	0.1	1.6	37.3	51.6	9.5
Excellent	0.2	0.7	17.6	37.1	44.5

Panel B: Corrected health measure					
$t - 1 \setminus t$	Poor	Moderate	Good	Very good	Excellent
Poor	70.6	25.7	3.7	0.0	0.0
Moderate	2.5	74.0	22.7	0.9	0.0
Good	0.2	5.7	88.4	5.3	0.5
Very good	0.1	1.3	16.6	78.4	3.6
Excellent	0.2	0.7	6.8	14.3	78.1

Administrative records (2006-2010) (Statistics Netherlands)

- ▶ Municipal Population Register: gender, age and marital status
 - ▶ Random sample of 200,000 Dutch residents alive in 2006
 - ▶ Age 15 and older who are not institutionalized (N=163.695)
- ▶ Administrative health data
 - ▶ Prescription drugs (no inpatient medications)
 - ▶ Hospital discharge register (88% of all inpatient stays)
 - ▶ Home care
- ▶ Administrative data on socio-economic characteristics
 - ▶ Tax records: Net Worth, Income, Employment status, Household members
 - ▶ Educational attainment (register data & labor force survey)

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Summary statistics, 2006, $N = 163,695$

	mean	sd	p25	p50	p75
Age	45.167	18.716			
Married	0.492	0.500			
Female	0.505	0.500			
Household members	2.709	1.400			
Primary education	0.032	0.176			
Secondary education, lower	0.185	0.389			
Secondary education, upper	0.338	0.473			
University bachelor	0.278	0.448			
University master	0.167	0.373			
Owner occupied house	0.642	0.480			
Dutch background	0.844	0.363			
Employment	0.579	0.494			
Unemployed	0.015	0.120			
Exempted from job seeking	0.020	0.139			
(Partial) disabled	0.031	0.172			
Retired	0.179	0.383			
Student	0.092	0.289			
No paid work	0.085	0.279			
Net household income	35,395	25,829	20,994	32,371	44,792
Total household wealth	202,004	673,287	9,724	90,494	244,892

Mapping prescription drugs → chronic conditions

Chronic disease	ATC-code	Matching variable Liss survey
Coronary disease	B01A, C04A	
Epilepsy	N03A	
Cardiac disease	C01, C03C	Heart or brain infarction, other heart diseases
Hypertension	C02, C03A, C07, C08, C09A,B	High blood pressure
Tuberculosis	J04A	
Rheumatologic conditions	H02, M01, M02	Joint pain or joint infection
High blood cholesterol	C10A	High blood cholesterol
Malignancies	L01	
Parkinsons disease	N04B, N04A	
Diabetes	A10A, A10B	Diabetes
Glaucoma	S01E	
Peptic/ Stomach Ulcers	A02A, A02B	Heartburn
Respiratory illness, asthma	R03	Chronic bronchitis, asthma
Thyroid disorders	H03A, H03B	
Chronic pain	N02A	
Anxiety and Depression	N05B, N06A	Anxiety or depression
Psychotic illness	N05A	
Migraine	N02C	Other pains (such as headache, backache)

Prevalence of chronic conditions (conditional on prescription drugs use), 2006

	15- 24	25- 34	35- 44	45- 54	55- 64	65- 74	75- 84	85+
Coronary disease	0,4	0,9	1,9	6,6	17,3	33,1	48,5	55,8
Epilepsy	0,6	1,1	1,5	2,3	2,9	3,5	3,8	3,3
Cardiac disease	2,3	3,0	6,8	19,3	36,3	52,5	67,4	72,9
HIV/AIDS/Tuberculosis	0,6	0,8	0,8	0,8	0,7	0,8	1,0	0,9
Inflammation and rheumatism	19,8	21,8	27,4	33,8	33,2	33,4	33,2	31,1
Hyperlipidemia	0,3	0,7	2,8	10,1	23,7	33,9	32,0	14,3
Malignancies	0,1	0,3	0,3	0,4	0,7	1,0	1,2	0,9
Parkinson disease	0,0	0,2	0,3	0,4	0,6	1,2	1,7	1,7
Diabetes	0,5	0,9	1,4	3,7	8,6	13,2	16,0	14,5
Glaucoma	0,1	0,2	0,3	0,8	1,9	4,2	7,0	9,4
Peptic acid disease	3,4	6,0	9,2	15,3	21,0	26,7	32,5	33,9
Respiratory illness, asthma	8,5	8,4	9,3	10,7	11,7	14,7	17,8	16,9
Thyroid disorders	0,5	1,4	2,1	3,2	4,6	4,6	6,1	7,0
Gout	0,0	0,1	0,3	0,8	1,4	2,3	3,0	3,1
Crohn	0,3	0,8	0,8	0,9	0,8	0,8	0,9	0,7
Pain	1,4	2,2	3,3	5,2	6,3	7,8	10,5	15,0
Depression, anxiety and psychosis	4,9	10,6	14,9	20,2	19,2	19,8	24,1	28,3

Notes: (N=132,545).

Prevalence of chronic conditions and medical utilization

	Men			Women		
	Liss Obj	Admin Obj	Liss Subj	Liss Obj	Admin Obj	Liss Subj
Hospital care	15.72	14.24	9.37	19.59	19.3	11.61
Homecare	0.75	1.85	1.87	0.77	3.45	3.45
Prescription drug use	66.56	62.03	43.95	84.08	81.37	48.41
Coronary disease	12.45	11.43		7.26		
Epilepsy	1.54	1.41		1.88		
Cardiac disease	19.28	16.62	20.29	18.05	19.45	17.04
Inflammation and rheumatism	20.16	18.2	4.48	26.69	23.31	9.15
Hyperlipidemia	14.83	11.13	13.72	8.24	8.76	7.65
Malignancies	0.67	0.43		0.47		
Parkinson disease	0.64	0.45		0.56		
Diabetes	5.1	4.41	4.85	3.22	4.22	3.02
Glaucoma	1.53	1.41	1.53	1.11	1.35	1.11
Peptic acid disease	14.37	11.91	6.72	16.77	15.4	6.84
Respiratory illness, asthma	7.85	7.53	4.8	9.37	9.23	5.29
Thyroid disorders	1	0.86		4.66		
Crohn	0.49	0.51		0.68		
Pain	4.09	3.23		5.08		
Depression, anxiety	7.54	7.32	3.12	11.68	12.78	4.7

Main results (1)

- 1 Using the two different measures of SRH provides clear differences in persistence in health.
- 2 Medical conditions affect health status in a similar way.
- 3 Differences in health perception - (elderly) males are suppressing health problems.

Estimation results health SRH - Prescription drugs

	Uncorrected		Corrected	
	Coeff	SD	Coeff	SD
Parkinson's disease	-0.589	0.060	-0.645	0.052
Diabetes	-0.578	0.029	-0.534	0.028
Epilepsy	-0.436	0.034	-0.416	0.028
Anxiety and depression	-0.337	0.014	-0.288	0.012
Malignancies	-0.288	0.054	-0.181	0.045
Cardiac disease	-0.282	0.015	-0.244	0.013
Respiratory illness, asthma	-0.274	0.016	-0.198	0.014
Thyroid disorders	-0.269	0.031	-0.258	0.030
Chronic pain	-0.250	0.019	-0.239	0.016
Stomach Ulcers	-0.218	0.013	-0.154	0.011
Coronary disease	-0.163	0.020	-0.171	0.018
High blood cholesterol	-0.137	0.019	-0.127	0.018
Rheumatic conditions	-0.062	0.009	-0.051	0.008
Glaucoma	-0.027	0.043	-0.110	0.039
Tuberculosis	0.062	0.043	0.062	0.036
Hospital use	-0.121	0.011	-0.091	0.010
Home care	-0.150	0.046	-0.142	0.038
Prescription drugs use	-0.153	0.010	-0.090	0.008
γ	0.253	0.018	0.856	0.020
σ_c^2	0.602	0.009	0.161	0.112

Estimation results health SRH - Prescription drugs and hospitalization

	Uncorrected Coeff	SD	Uncorrected Coeff	SD
Parkinson's disease *	-0.563	0.059	-0.361	0.055
Diabetes	-0.588	0.029	-0.562	0.061
Osteoporosis and Paget disease	-0.437	0.040	-0.288	0.019
Alzheimer, dementia and psychosis *	-0.429	0.048	-0.365	0.060
Epilepsy *	-0.350	0.029	-0.414	0.034
Anxiety and depression	-0.313	0.014	-0.187	0.032
Malignancies	-0.210	0.037	-0.076	0.019
Cardiac disease	-0.272	0.015	-0.214	0.016
Respiratory illness, asthma	-0.273	0.016	0.009	0.044
Thyroid disorders *	-0.244	0.031	-0.248	0.019
Chronic pain *	-0.256	0.019	-0.248	0.023
Stomach Ulcers	-0.216	0.012	-0.598	0.030
Coronary disease	-0.177	0.019	-0.169	0.020
High blood cholesterol	-0.127	0.019	-0.506	0.019
Migraine *	-0.121	0.033	-0.357	0.024
Rheumatic conditions	-0.044	0.010	0.027	0.044
Hospital use	-0.095	0.011	-0.194	0.012
Home care	-0.161	0.045	-0.124	0.024
Prescription drugs use	-0.158	0.010	-0.401	0.012
γ	0.248	0.018	0.256	0.018
σ_c^2	0.607	0.008	0.581	0.009

In-sample predictions: 'uncorrected' *SRH*

Panel A: In-sample prediction					
$t - 1 \setminus t$	Poor	Moderate	Good	Very good	Excellent
Poor	36.2	56.3	7.5	0.0	0.0
Moderate	4.4	52.5	42.5	0.5	0.0
Good	0.1	10.7	74.3	13.7	1.2
Very good	0.0	0.4	43.9	43.3	12.4
Excellent	0.0	0.0	14.4	43.6	41.9
Panel B: LISS data					
$t - 1 \setminus t$	Poor	Moderate	Good	Very good	Excellent
Poor	46.8	46.8	6.4	0.0	0.0
Moderate	3.3	59.5	36.3	0.9	0.1
Good	0.2	8.3	78.6	11.7	1.3
Very good	0.1	1.6	37.3	51.6	9.5
Excellent	0.2	0.7	17.6	37.1	44.5

In-sample predictions: 'corrected' *SRH*

Panel A: In-sample prediction					
$t - 1 \setminus t$	Poor	Moderate	Good	Very good	Excellent
Poor	58.3	41.0	0.7	0.0	0.0
Moderate	4.5	66.7	28.8	0.0	0.0
Good	0.0	8.0	81.9	9.9	0.2
Very good	0.0	0.0	30.1	60.1	9.8
Excellent	0.0	0.0	1.9	37.0	61.1
Panel B: LISS data					
$t - 1 \setminus t$	Poor	Moderate	Good	Very good	Excellent
Poor	70.6	25.7	3.7	0.0	0.0
Moderate	2.5	74.0	22.7	0.9	0.0
Good	0.2	5.7	88.4	5.3	0.5
Very good	0.1	1.3	16.6	78.4	3.6
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Main results

- 1 Using the two different measures of SRH provides clear differences in persistence in health.
- 2 Medical conditions affect health status in a similar way.
- 3 Differences in health perception - (elderly) males are suppressing health problems.
- 4 Lower educated and income people are more likely to stay in poor health than higher educated people —independent from the measure we use.**

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- 4 Lower educated and income people are more likely to stay in poor health than higher educated people —independent from the measure we use.

Health persistence by Educational Attainment, N=163,695

$t \setminus t + 1$		Very poor	Poor	Fair	Good	Very good
<i>Panel A: Uncorrected health measure</i>						
Lower	Very poor	36.7	55.6	7.6	0.0	0.0
	Poor	5.1	50.5	43.8	0.6	0.0
	Fair	0.2	12.0	74.2	12.5	1.2
	Good	0.0	0.7	48.3	39.9	11.1
	Very good	0.0	0.1	18.5	43.9	37.6
Higher	Very poor	31.2	60.4	8.5	0.0	0.0
	Poor	3.1	47.7	48.7	0.6	0.0
	Fair	0.1	10.0	74.9	13.7	1.3
	Good	0.0	0.5	46.8	40.8	11.9
	Very good	0.0	0.0	16.8	44.6	38.6
<i>Panel B: Corrected health measure</i>						
Lower	Very poor	50.1	47.7	2.2	0.0	0.0
	Poor	4.8	60.2	35.0	0.1	0.0
	Fair	0.1	10.2	78.9	10.6	0.3
	Good	0.0	0.1	38.6	51.6	9.7
	Very good	0.0	0.0	6.1	43.6	50.3
Higher	Very poor	39.9	58.1	2.0	0.0	0.0
	Poor	3.5	58.4	38.0	0.1	0.0
	Fair	0.1	8.6	79.5	11.5	0.4
	Good	0.0	0.1	37.1	52.8	10.0
	Very good	0.0	0.0	5.4	44.2	50.4

Health persistence by 2006 Income quintile

	$t \setminus t + 1$	Very poor	Poor	Fair	Good	Very good
Q1	Very poor	39.5	53.0	7.5	0.0	0.0
	Poor	6.1	51.8	41.6	0.5	0.0
	Fair	0.3	13.2	73.6	11.9	1.1
	Good	0.0	0.9	48.4	39.9	10.9
	Very good	0.0	0.1	18.2	44.1	37.6
Q2	Very poor	36.9	55.9	7.2	0.1	0.0
	Poor	5.1	50.8	43.5	0.6	0.0
	Fair	0.2	12.4	74.2	12.1	1.1
	Good	0.0	0.7	49.2	39.2	10.9
	Very good	0.0	0.1	18.9	43.9	37.2
Q3	Very poor	33.3	57.7	8.8	0.1	0.0
	Poor	3.9	49.1	46.4	0.6	0.0
	Fair	0.1	10.9	74.7	13.0	1.2
	Good	0.0	0.5	47.2	40.6	11.7
	Very good	0.0	0.0	17.4	45.1	37.5
Q4	Very poor	32.9	60.0	7.2	0.0	0.0
	Poor	3.6	47.5	48.3	0.6	0.0
	Fair	0.1	10.3	74.6	13.7	1.4
	Good	0.0	0.6	47.5	40.4	11.6
	Very good	0.0	0.1	17.8	44.0	38.1
Q5	Very poor	28.1	62.5	9.4	0.0	0.0
	Poor	3.1	48.2	48.1	0.6	0.0
	Fair	0.1	10.0	75.0	13.6	1.3
	Good	0.0	0.5	46.8	40.8	11.9
	Very good	0.0	0.0	17.1	43.7	39.1

Health persistence by 2006 Wealth quintile

	$t \setminus t + 1$	Very poor	Poor	Fair	Good	Very good
Q1	Very poor	36.5	54.7	8.8	0.0	0.0
	Poor	4.6	49.0	45.8	0.7	0.0
	Fair	0.2	11.0	74.5	13.1	1.2
	Good	0.0	0.6	47.3	40.7	11.4
	Very good	0.0	0.0	17.5	44.5	38.0
Q2	Very poor	39.3	54.0	6.7	0.1	0.0
	Poor	5.2	50.4	43.8	0.6	0.0
	Fair	0.2	11.9	74.2	12.5	1.3
	Good	0.0	0.7	47.2	40.4	11.7
	Very good	0.0	0.1	17.7	44.3	38.0
Q3	Very poor	29.9	61.1	8.9	0.1	0.0
	Poor	3.9	49.0	46.6	0.5	0.0
	Fair	0.1	10.7	74.4	13.5	1.3
	Good	0.0	0.6	47.7	40.2	11.5
	Very good	0.0	0.0	18.0	45.2	36.8
Q4	Very poor	35.5	55.7	8.8	0.0	0.0
	Poor	4.2	49.6	45.7	0.5	0.0
	Fair	0.2	11.4	74.6	12.6	1.3
	Good	0.0	0.6	48.1	39.9	11.4
	Very good	0.0	0.1	18.1	44.9	36.9
Q5	Very poor	34.4	59.2	6.4	0.0	0.0
	Poor	4.4	50.1	44.9	0.6	0.0
	Fair	0.2	11.5	74.5	12.7	1.2
	Good	0.0	0.6	48.5	40.0	11.0
	Very good	0.0	0.1	17.7	42.0	40.2

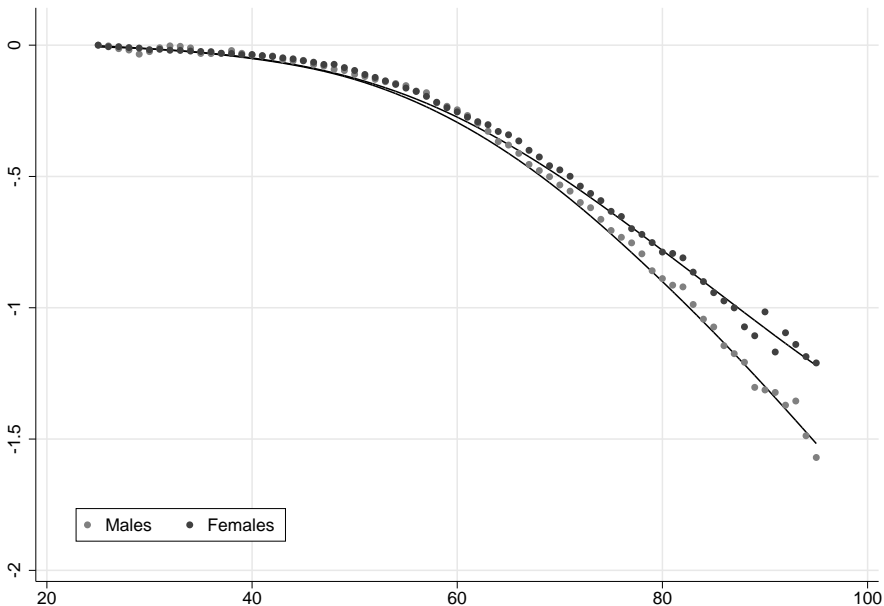
Main results

- 1 Using the two different measures of SRH provides clear differences in persistence in health.
- 2 Medical conditions affect health status in a similar way.
- 3 Differences in health perception - (elderly) males are suppressing health problems.
- 4 Lower educated and income people are more likely to stay in poor health than higher educated people —independent from the measure we use.
- 5 The age at which health starts to decline at a greater rate arrives earlier for males and persons with a lower level of education.

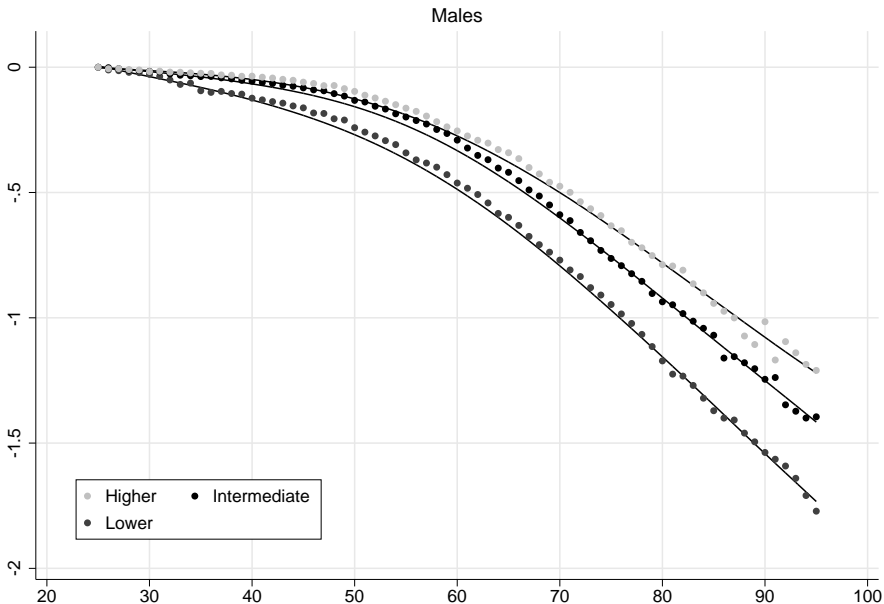
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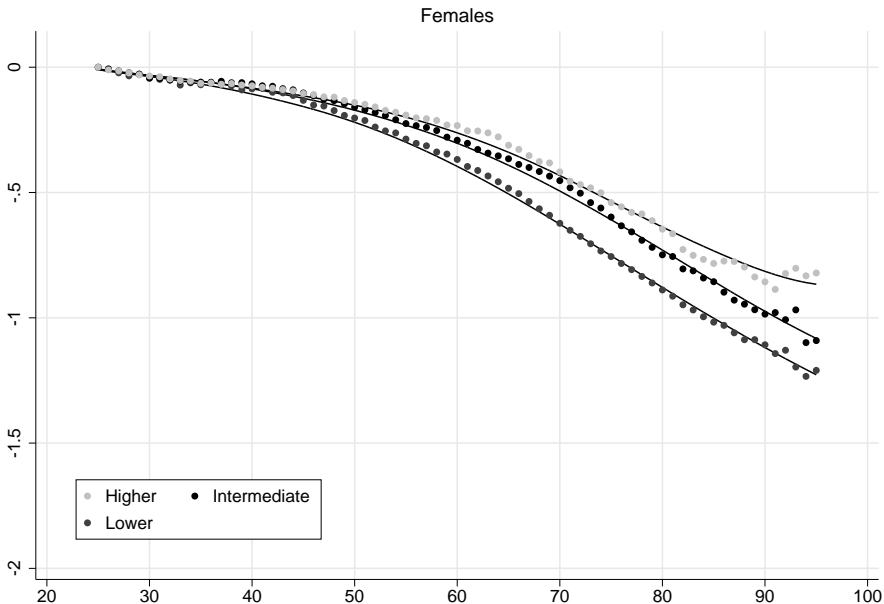
Predicted health by age and gender



Predicted health by age and education - males



Predicted health by age and education - females

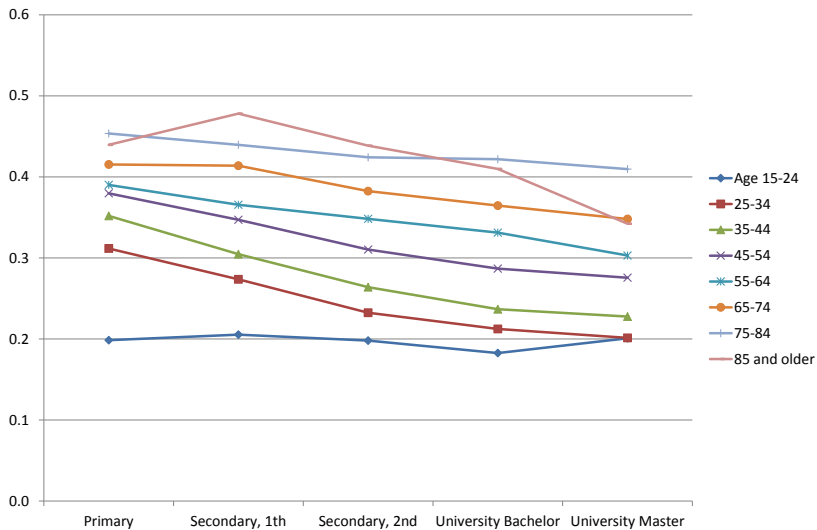


Estimation results, dependent variable: predicted health, N=163,695

	Men	Women	Men	Women	Men	Women
Sec. educ	0.083 ***	0.098 ***	0.064 ***	0.070 ***	0.056 ***	0.068 ***
Higher educ	0.124 ***	0.175 ***	0.093 ***	0.126 ***	0.084 ***	0.121 ***
Married	-0.002	0.013 *	-0.011	-0.015 **	-0.013 *	-0.017 *
HH size	0.003	0.012	-0.005	-0.002	-0.004	-0.001
Homeowner			0.026 ***	0.010	0.022 **	0.005
2nd income Q			0.018 *	0.048 ***	0.012	0.039 ***
3th income Q			0.019 *	0.037 ***	0.006	0.025 **
4th income Q			0.028 **	0.053 ***	0.011	0.038 ***
5th income Q			0.022 *	0.080 ***	0.000	0.060 ***
2nd wealth Q			0.032 ***	0.046 ***	0.026 ***	0.038 ***
3th wealth Q			0.045 ***	0.045 ***	0.040 ***	0.038 ***
4th wealth Q			0.069 ***	0.095 ***	0.064 ***	0.089 ***
5th wealth Q			0.094 ***	0.137 ***	0.088 ***	0.130 ***
Retired					-0.056 ***	-0.065 ***
Unemployed					-0.045 **	-0.085 ***
Disabled					-0.348 ***	-0.314 ***
Self-employed					0.010	0.018
Other					0.020	-0.011
Constant	-0.169 ***	-0.369 ***	-0.195 ***	-0.384 ***	-0.183 ***	-0.359 ***

Significant at the *** 1%; ** 5%; * 10% level.

SD of 5 year predicted health change – by age and education



Conclusion

- ▶ Evidence of reporting effects.
- ▶ Construct a health measurement model which takes this into account.
- ▶ Using the two different measures of SRH provides clear differences in persistence in health.
 - ▶ People of low SES are more likely to stay in poor health.
 - ▶ The age at which health starts to decline at a greater rate arrives earlier for males and persons with a lower level of education.
 - ▶ Women on average are in worse health than men.
 - ▶ Women's health seems to benefit more from higher education than men.
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