

# SUBJECTIVE HEALTH EXPECTATIONS OF OLDER AUSTRALIANS

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# Introduction

- In modern dynamic economic models individuals are making expected utility-maximizing choices that affect their future under uncertainty about future events
  - ▣ Eg. Deciding how much to consume/save taking into account risk of deterioration of health in the future
- So the decision maker will evaluate utility in each possible realization of future health and choose  $c/s$  that will maximize the weighted average of utility in the various health states, with weights being estimated probabilities of these states
- Standard practice is to assume that the individual has rational expectations-i.e. their subjective probability distribution coincides with the actual distribution
  - ▣ E.g. in the example above the decision maker uses the actual population probability of transitioning between health states which in practice would be estimated from population data on health transitions
- But in reality individual may have persistently incorrect expectations about future events, or have private information that makes their own expectations different from the population average
- Measuring subjective probabilities may uncover departures from rationality in individual decision-making and improve predictive accuracy of economic models

# Introduction

- Research of subjective probabilities has been growing since early 1990s after household survey began to include subjective expectations questions
  - ▣ E.g. 1992 HRS baseline wave had 0-100 prob. questions about
    - stock market expectations;
    - expectations to live to 75 and more;
    - expectations of working full-time after reaching age 62;
    - expectations of health limiting work during the next 10 years;
    - expectations of leaving a bequest of \$10,000 or more;
    - expectations of receiving an inheritance
  - ▣ There is a wealth of studies which address characteristics of these expectations data, including reporting properties, predictive accuracy and effects of actual economic decisions

# Subjective mortality expectations

- Subjective probability to live to 65/75 and more, 0-100% chance – many surveys (HRS, SHARE, BHPS, etc) has been studied extensively
- Hurd and McGarry (1995 JHR) - subjective survival probabilities are close to actual population probabilities and reasonably co-vary with known risk factors
- Hurd and McGary (2002 EJ) - subjective probabilities change with onset of health conditions and they predict survival, conditional of extensive measures of health
- Hurd et al. (2004 JAE)- survival probabilities predict retirement and social security claiming behaviour, i.e. those with very low subjective probabilities of survival retire earlier and claim earlier
- Elder (2013), Bissonnette et al. (2014), Bago d’Uva et al. (2017) –subjective survival probabilities are not very accurate, especially for low education and cognition groups. Smokers are over-optimistic about their survival prospects, compared to non-smokers
- Wang (2014 AEJ: AE) – Adult smokers’ survival expectations formation process is different from rational expectations (e.g. smokers attach less weight to health and smoking and more to age, race and parent's’ longevity). Adjusting expectation formation would decrease smoking to 8 percentage points.

# Subjective Health Expectations

- In contrast to survival, expectations about future health have not been studied, despite the growing literature incorporates health risks into dynamic lifecycle models (e.g. French and Jones (2011), Capatina 2015, Yogo 2016)
- Perhaps data limitation is a reason for the lack of such research
- Huynh and Jung (Economic Modelling, 2015):
  - Subjective probability of health problem limiting work during the next 10 years; 0-100% in HRS
  - Analysed in subjective health expectations contain information beyond subjective mortality;
  - individuals younger than 70 yo more pessimistic than older respondents
- Winter and Wupperman (JHE, 2014):
  - Subjective risks (0-100%) of developing 15 various diseases in 5 years in the RAND American Life Panel (2010 survey)
  - Risks of a heart attack, a stroke, and chronic lung disease are correctly assessed by a large fraction of individuals, but some individuals in all BMI groups overestimate these risks.
  - A large fraction of normal weight individuals correctly assess their risk of diabetes, but a large fraction of obese individuals underestimates this risk.
  - The risks of hypertension and arthritis are significantly underestimated by a large fraction of individuals in all BMI groups, particularly so among the obese.

# Health/Survival Expectations Data in HILDA

## □ helths (Waves 9 and 13, PQ):

What do you think is the per cent chance that your health will [still be excellent (if currently excellent) / still be very good or better (if currently very good) / still be good or better (if currently good) / still be fair or better (if currently fair) / have improved significantly (if currently poor)] four years from now? Your answer should range between 0%, which means there is no chance, and 100%, which means it is absolutely certain

## □ gh11c: Health: Expect my health to get worse

- ▣ Definitely true, Mostly true, Don't know, Mostly false, Definitely false; All waves, SCQ

## □ helv10: DV: How likely that you will live to 75 or at least 10 more years

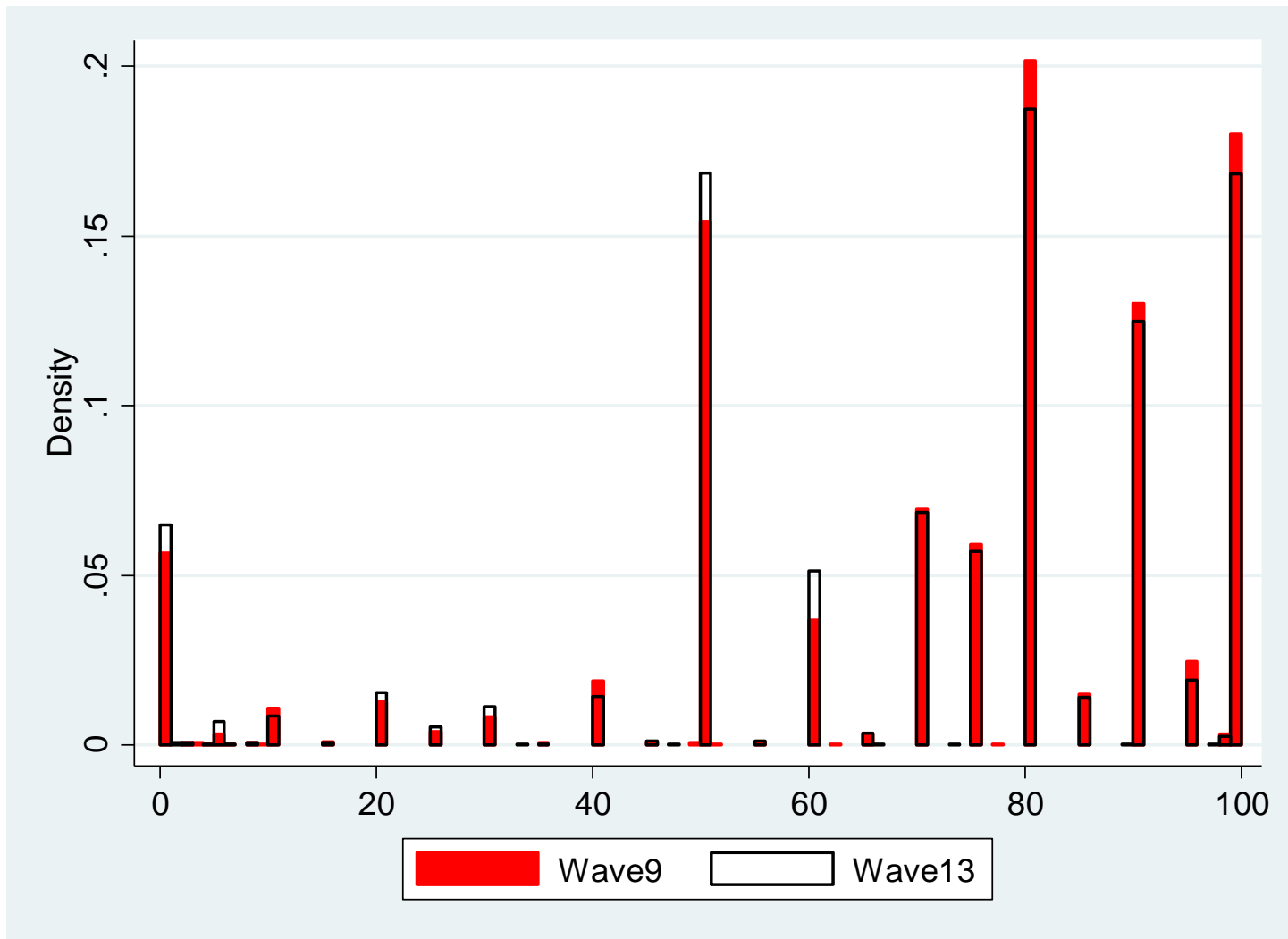
- ▣ Very unlikely, Likely, Unlikely, Very unlikely; Waves 9 and 13, PQ

## □ Focus on 50-70 y.o. in wave 9

# This study –descriptive stats of health expectations of older Australians

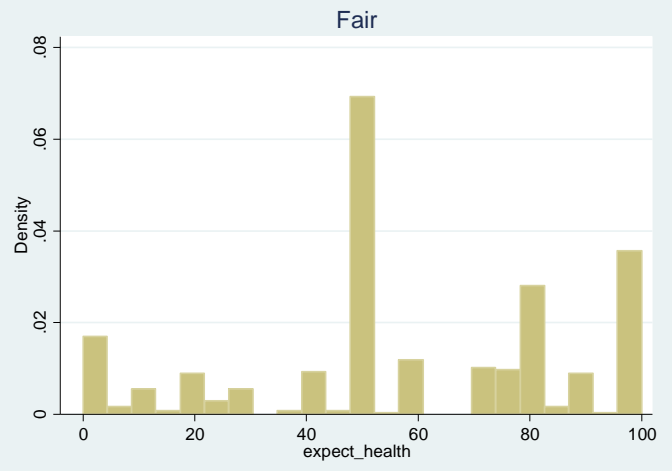
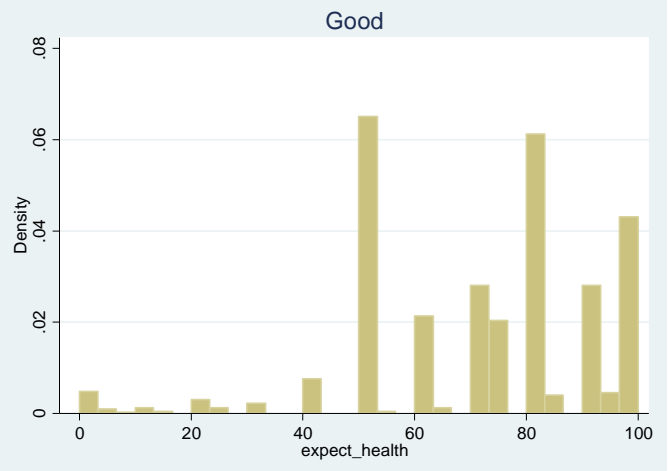
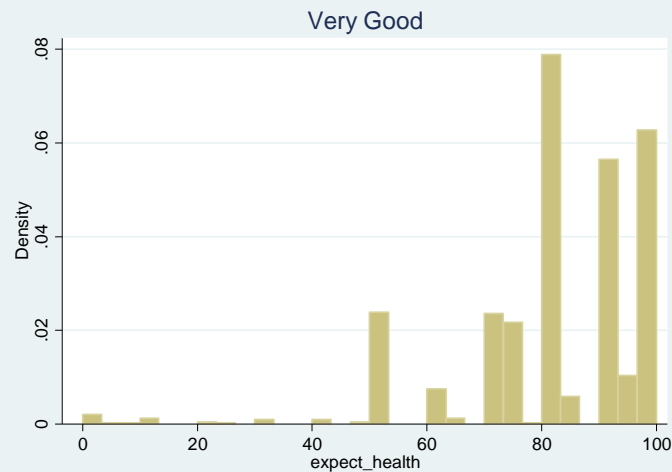
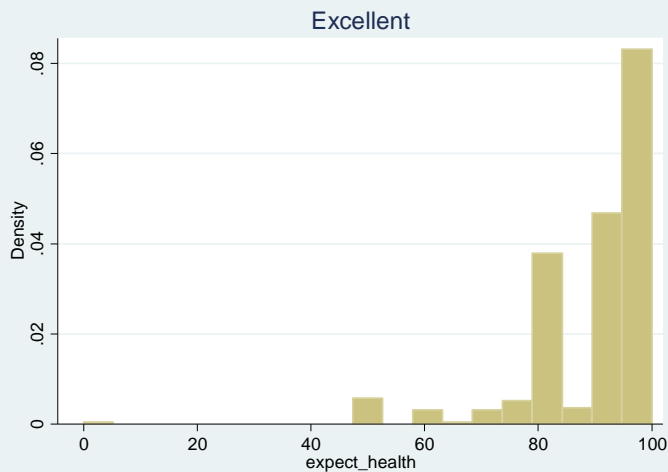
- Research questions:
  - ▣ Characteristics of the subjective health expectations of older Australians and the effects of key covariates
  - ▣ Informational content of subjective health expectations
  - ▣ Predictive accuracy of subjective health expectations
  - ▣ Heterogeneity in predictive accuracy of subjective health expectations

# Health expectations in Wave 9 and Wave 13: 50-70 y.o. in wave 9

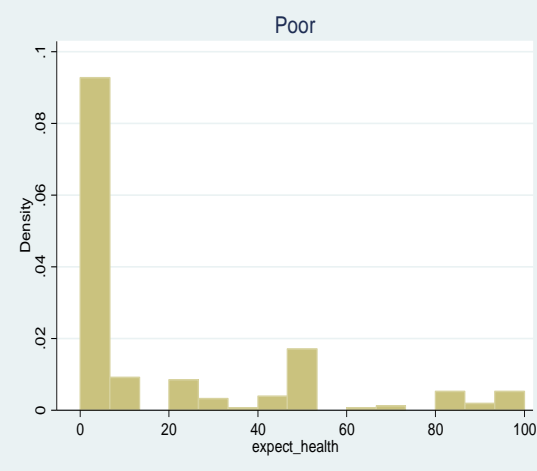




# HILDA Wave 9 – subjective health expectations: by SAH



- Wide variation in subjective probability
- Notable presence of rounding and focal points
- Prominence of 100%, 50% and 0 response



# Regression of Subjective Probability on health, by SAH

	(1) Excel	(2) VGood	(3) Good	(4) Fair	(5) Poor
ghpf	0.0391	0.110**	0.212***	0.210***	0.285***
pdk10s	0.651***	0.430***	0.0849	0.338*	0.0759
bmi_Underweight	3.183	4.146	-1.455	-34.04***	-6.239
bmi_Overweight	0.984	1.323	-0.929	-2.968	0.719
bmi_Obese	0.442	3.077*	1.123	-2.804	2.158
bmi_SevObese	3.462	-0.476	5.056*	-2.330	6.512
2.edu_coarse	-7.803***	0.884	-2.342	0.347	3.600
3.edu_coarse	-1.914	0.398	-0.367	-0.607	-4.473
4.edu_coarse	-1.637	0.631	-3.558	6.146	0.616
5.edu_coarse	-1.653	0.546	2.361	3.942	-6.732
hifditp	-0.00000202	-0.00000155	0.00000939	0.0000320	-0.0000596
female	0.760	2.321**	0.244	0.653	2.022
hgage	-0.167	-0.304***	-0.139	-0.141	-0.729*
smoker	-5.619**	-1.160	-3.148*	-5.108	-5.670
drinker_daily	-0.810	0.609	-0.653	0.718	0.0486
exer3w	4.251*	2.607*	0.369	0.400	2.026
_cons	101.3***	89.87***	63.29***	61.50***	54.49**
N	323	1044	1037	451	193
R2	0.098	0.036	0.05	0.07	0.12

# Does subjective health expectation predict actual change in SAH?

SAH	Mean of subj. prob of improvement	Mean of actual improvement	Freq.
[1] Excel	89.20	44.14	324
[2] Very	81.12	62.31	1,040
[3] Good	70.48	76.10	1,021
[4] Fair	59.28	86.02	465
[5] Poor	17.68	47.59	187
Total	71.16	67.73	3,037

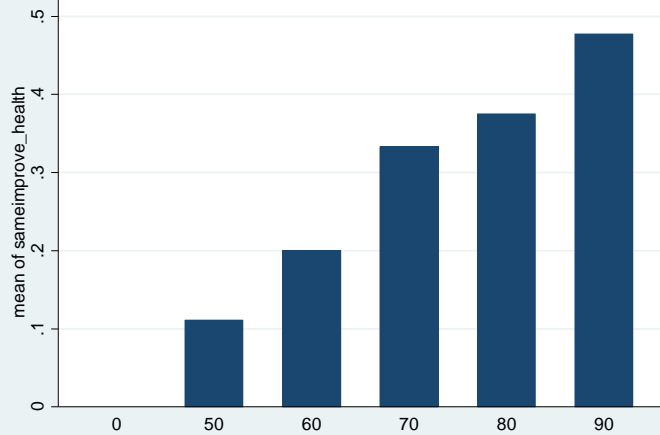
Unhealthy underestimate probability of health improvement

healthy underestimate it

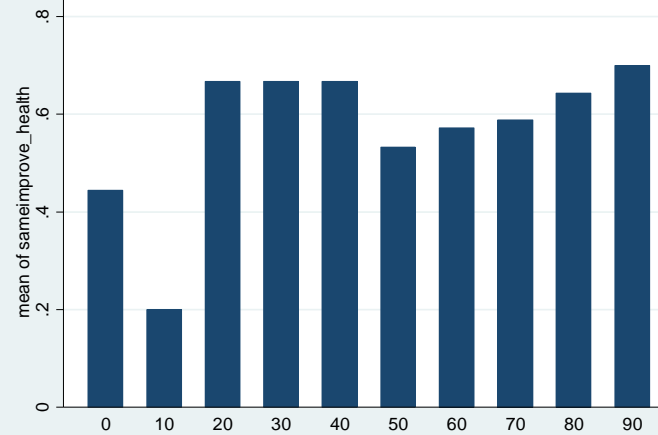
# Does subjective health expectation predict actual change in SAH?

- In absolute terms subjective expectation is not accurate predictor of actual health
- But this may be caused by reporting errors
- There is weakly positive relationship between expectations and realisations conditional in health

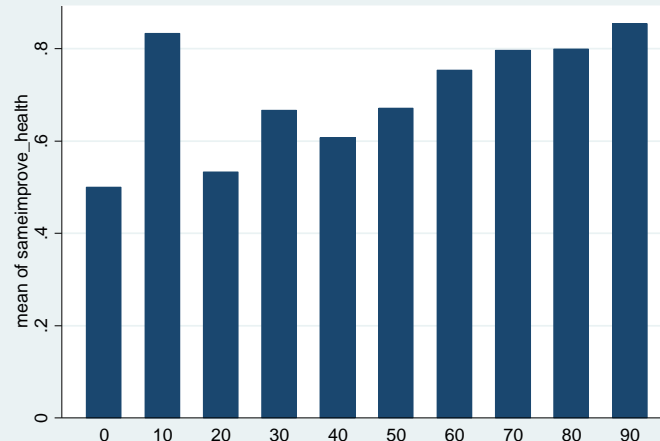
SAH: Excellent



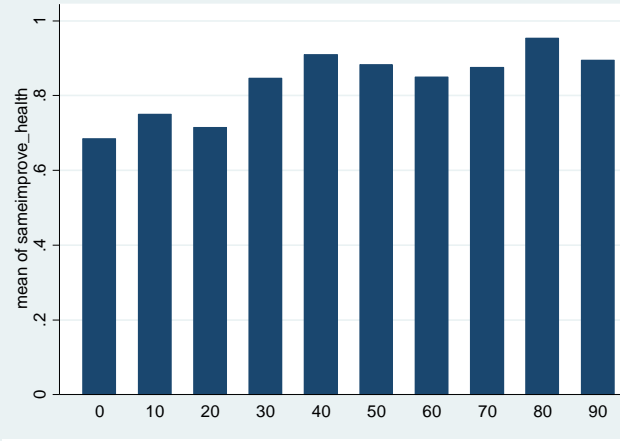
SAH: Very Good



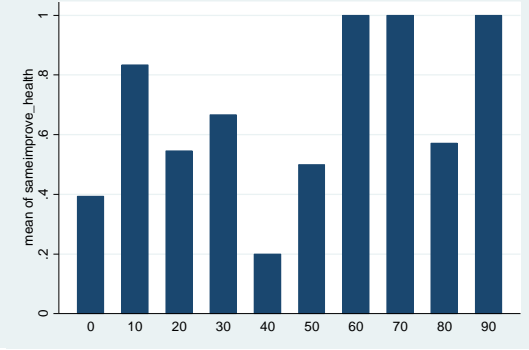
SAH: Good



SAH: Fair



SAH: Poor



# Regression: informational content of subjective health expectation

Dep Var	(1)	(2)	(3)	(4)	(5)
Actual same/ improvement in SAH	Excellent	VGood	Good	Fair	Poor
<b>expect_health</b>	0.00687***	0.00110	0.00268***	0.000765	0.00326**
ghpf	0.00128	0.00485***	0.00394***	0.00190**	0.00209
pdk10s	0.0107	0.00794*	0.00545**	0.00365	0.00523
bmi_Underweight	-0.579	0.194	-0.232	-0.0631	-0.585**
bmi_Overweight	-0.0588	-0.0562	-0.00236	0.0141	-0.0543
<b>bmi_Obese</b>	-0.153*	-0.112**	-0.0610	-0.0462	-0.146
<b>bmi_SevObese</b>	-0.0621	-0.293***	-0.00303	-0.106*	-0.349***
2.edu_coarse	-0.117	0.0340	0.00938	-0.0526	0.0700
3.edu_coarse	-0.0430	-0.00540	0.0325	0.0512	-0.0153
4.edu_coarse	-0.0529	-0.00635	0.0370	0.0316	0.230
5.edu_coarse	-0.0151	0.0448	0.0687	0.0908	0.245
hifditp	8.08e-08	8.86e-08	-4.50e-09	-1.79e-08	0.00000109
female	-0.113*	-0.00273	0.0400	-0.00197	-0.0552
hgage	-0.00554	-0.00160	0.00155	0.000472	0.000408
<b>smoker</b>	-0.110	-0.0906*	-0.0402	-0.0455	-0.163*
drinker_daily	-0.00414	0.00717	0.0171	0.0229	-0.103
exer3w	0.0794	0.00679	-0.0262	-0.0645*	-0.0638
_cons	0.228	0.353	0.253	0.791***	0.602
<i>N</i>	293	949	918	399	162
<i>R</i> <sup>2</sup>	0.078	0.066	0.081	0.071	0.215

# What groups have systematically biased subjective health expectations?

Dep Var	(1)	(2)	(3)	(4)	(5)
Expect-Actual	Excel	VGood	Good	Fair	Poor
same/improv in SAH					
ghpf	-0.00119	-0.00376***	-0.00218**	0.000318	0.00330***
pdk10s	-0.00896	-0.00417	-0.00532*	-0.000741	0.000517
bmi_Underweight	0.604	-0.157	0.224	-0.270	-0.0969
bmi_Overweight	0.0593	0.0653*	0.00613	-0.0371	-0.0481
bmi_Obese	0.156*	0.133***	0.0755*	0.0117	0.0380
bmi_SevObese	0.0695	0.287***	0.0454	0.0806	0.0500
2.edu_coarse	0.0923	-0.0251	-0.0188	0.0397	-0.0944
3.edu_coarse	0.0378	0.0127	-0.0313	-0.0750	-0.0713
4.edu_coarse	0.0491	0.0101	-0.0509	0.00878	0.0254
5.edu_coarse	0.00885	-0.0371	-0.0482	-0.0711	-0.116
hifditp	-9.05e-08	-0.000000108	7.03e-08	0.000000274	-0.000000484
female	0.117*	0.0210	-0.0363	0.00984	-0.000241
hgage	0.00526	-0.000820	-0.00194	-0.000817	-0.00821*
smoker	0.106	0.0691	0.0192	0.0115	-0.0567
drinker_daily	0.00343	-0.00157	-0.0193	0.00130	0.0137
exer3w	-0.0683	0.0113	0.0272	0.0650	-0.0190
_cons	0.0749	0.429	0.139	-0.287	-0.372
<i>N</i>	293	949	918	399	162
<i>R</i> <sup>2</sup>	0.0425	0.0431	0.0268	0.027	0.1503

# Tentative conclusions:

## Characteristics of the subjective health expectations of older Australians and the effects of key covariates

- ▣ Exhibits high variability, focal points and rounding; reasonably covaries with health status and other characteristics
- Informational content of subjective health expectations
  - ▣ Is predictive of actual change in health, even conditional of large number of health and other characteristics
- Predictive accuracy of subjective health expectations
  - ▣ On average not very good, with important heterogeneity across groups. For example, conditional on SAH, unhealthy and obese **overestimate** probability of staying in good or better health