

# **Subjective probabilities of survival: An international comparison**

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## **Why are we interested in subjective probabilities of survival?**

- Survival expectations influence important life-cycle decision, in particular for older people.
- Structural models of live-cycle behavior require reliable measures of subjective expectations.
- Measurement of health status using direct survey questions (“self-rated health status”) is problematic.
- Subjective survival probabilities could serve as an additional or alternative survey-based measure of health status.

## **How to ask for expectations?**

Here's an example of an important random event about which people may have formed subjective expectations:

*When is this session going to be over?*

## **How to ask for expectations? – (1) Qualitative response alternatives**

How likely is it that this session will be over by 3.30 p.m.?

Very likely

Likely

Somewhat likely

Somewhat unlikely

Unlikely

Very unlikely

## **How to ask for expectations? – (2) Point expectations**

When do you think this session will be over?

[       ] hours

## **How to ask for expectations? – (3) Probabilistic expectations**

Finally, I have some questions about how likely you think various events might be. When I ask a question I'd like for you to give me a number from 0 to 100.

Let's try an example together and start with the very important issue of when this session will be over. What do you think the chances are that this session will be over by 3.30 p.m.?

For example, '90' would mean a 90 percent chance that the session will be over by 12.30 hours. You can say any number from 0 to 100.

[     ]

## Probabilistic expectations

- Probabilistic question formats for eliciting subjective expectations have many advantages (Manski, 2004, *Econometrica*).
- Original idea by Juster (1966, *JASA*): “What is the percent chance that you will buy a car within the next 12 months?”
- Dominitz and Manski (1997, *JASA*) extended this design so that the complete subjective distribution of a variable in the future can be estimated.
- Applications: survival, unemployment, income, stock market returns, ...

## **Surveys on older populations in industrialized countries**

HRS: Health and Retirement Study, USA (since 1993)

ELSA: English Longitudinal Study of Ageing, UK (since 2002)

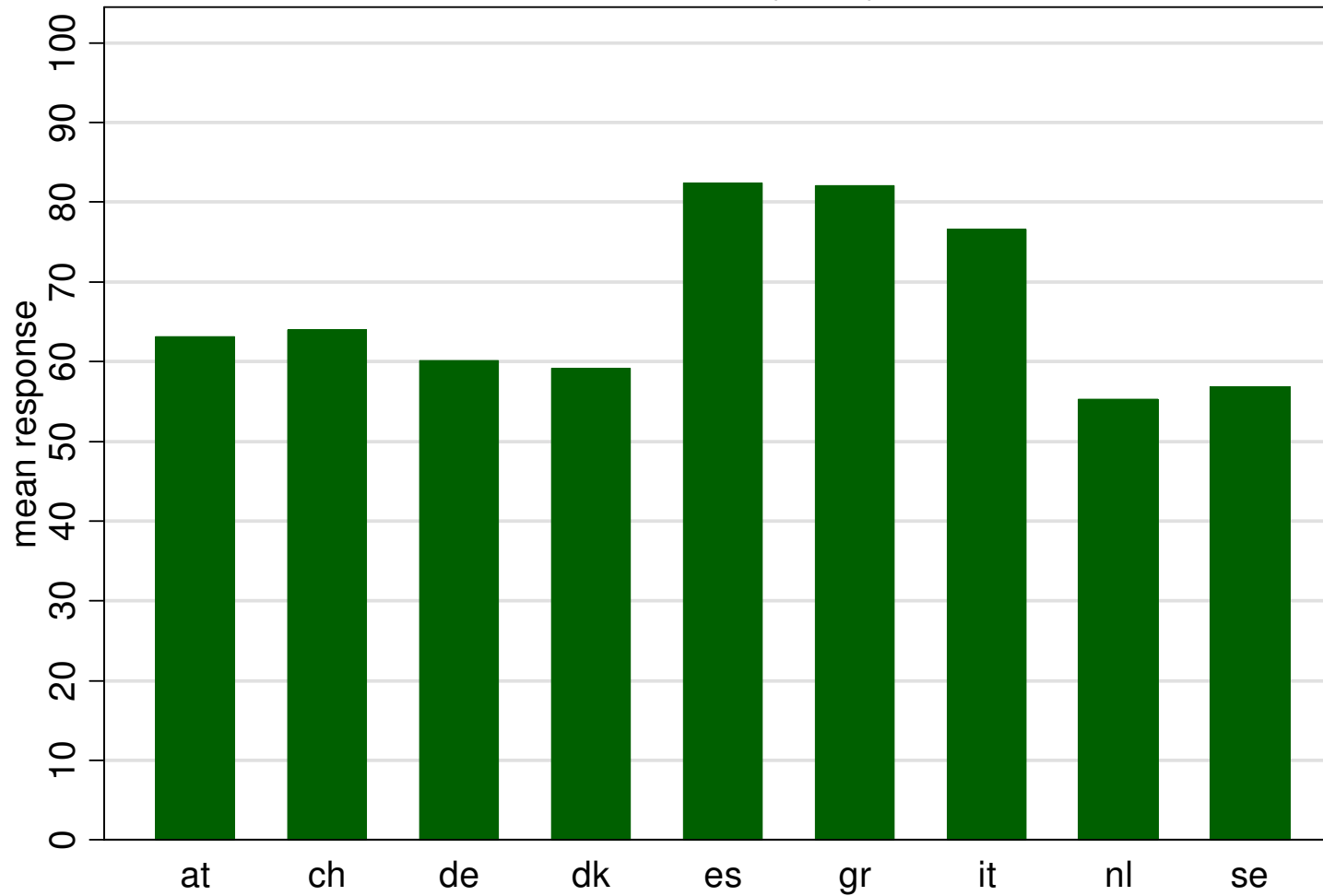
SHARE: Survey of Health, Aging, and Retirement in Europe (since 2004)

Probabilistic expectations questions in SHARE wave 1 (2004) and 2 (2007):

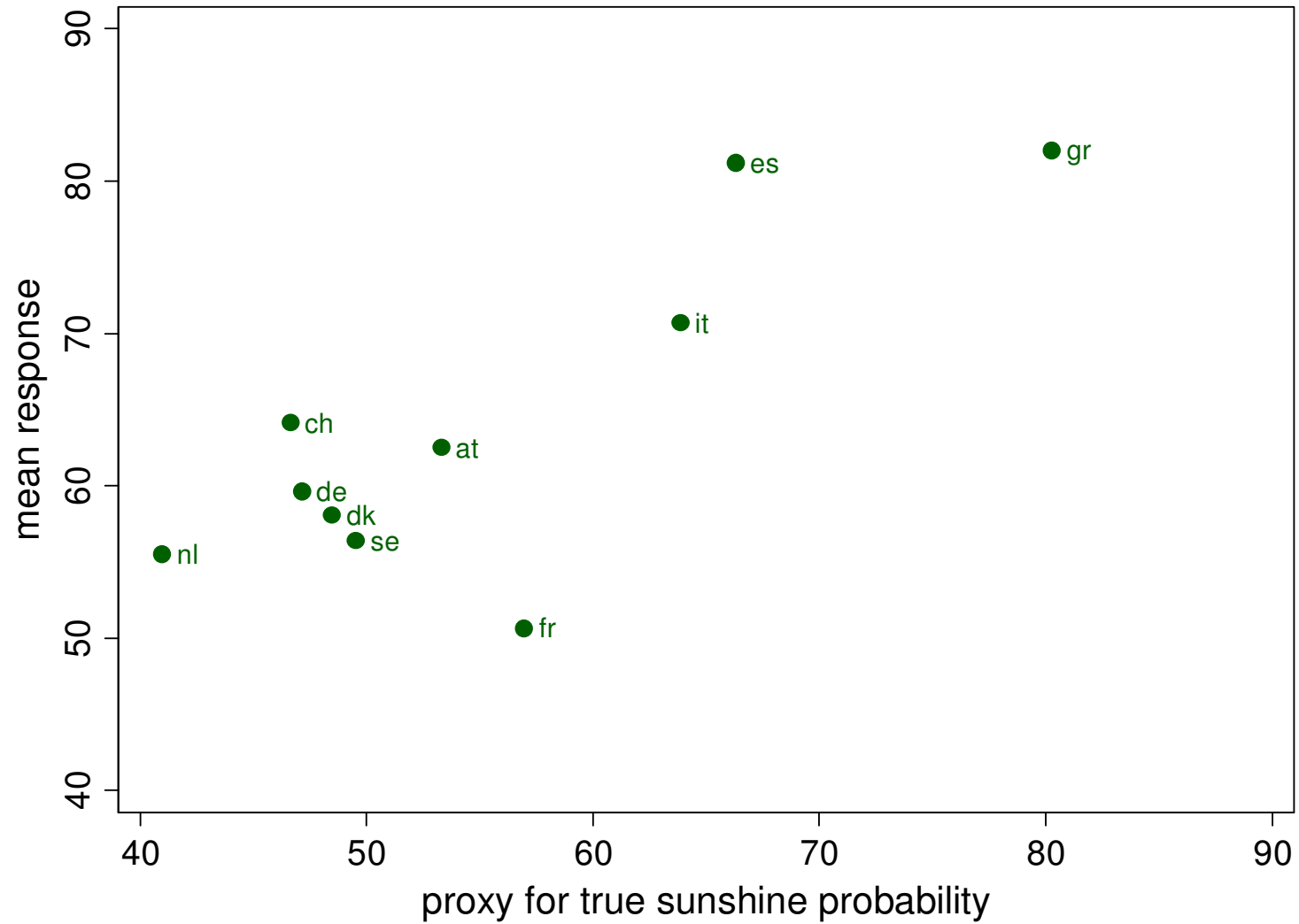
- “Sunny day”
- Survival (to an age-dependent target age)
- Bequests, standard of living, pension reform measures
- Hypothetical behaviors

# Country variation makes sense: The “sunny day” question

Chances for a sunny day tomorrow



## Country variation makes sense: The “sunny day” question



## **Purpose of this paper**

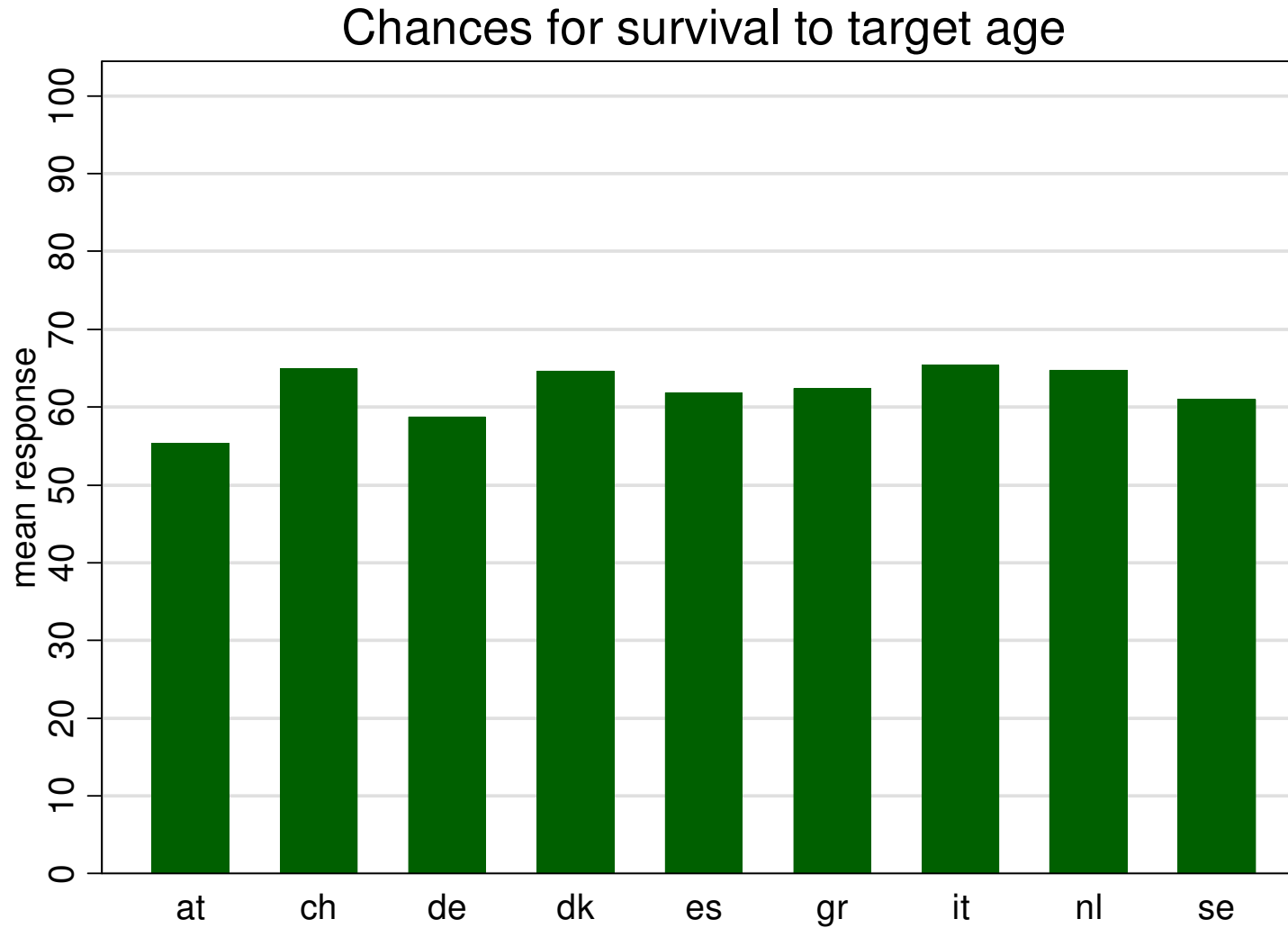
- Compare response patterns to questions on subjective probabilities of survival across countries.
- Identify response problems and develop models of the response process:
  - Rounding, focal values
  - Item nonresponse
  - Optimism/pessimism
- Investigate the use of subjective probabilities of survival as a measure of health status.

## Target ages in the subjective survival question in SHARE wave 1

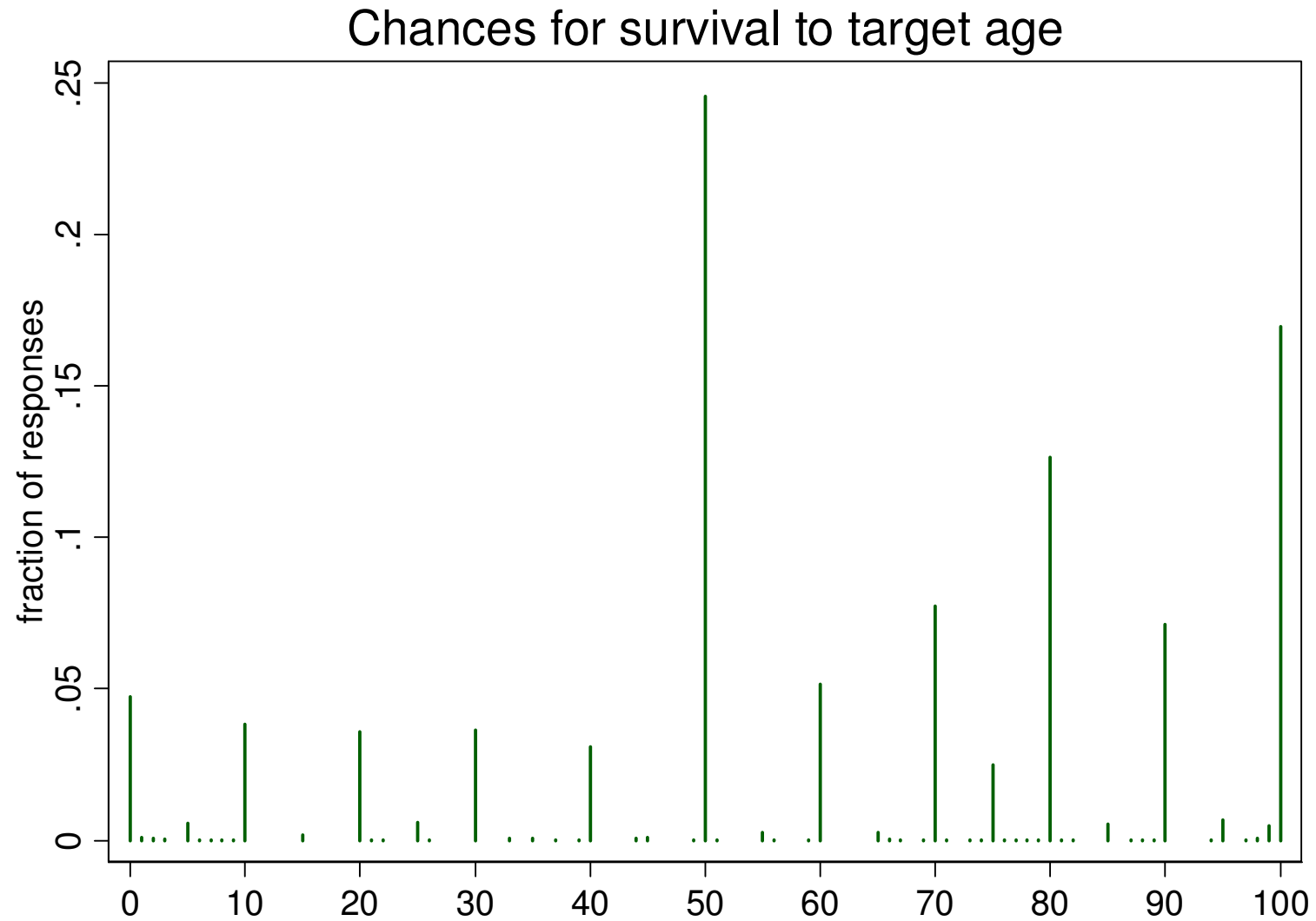
“On a scale from 0 to 100, where 0 is no chance and 100 is absolutely certain, what are the chances that you will live to age [XX] or older?”

Current age	Target age
51–65	75
66–70	80
71–75	85
76–80	90
81–85	95
86–95	100
96–100	105
101–105	110
106+	120

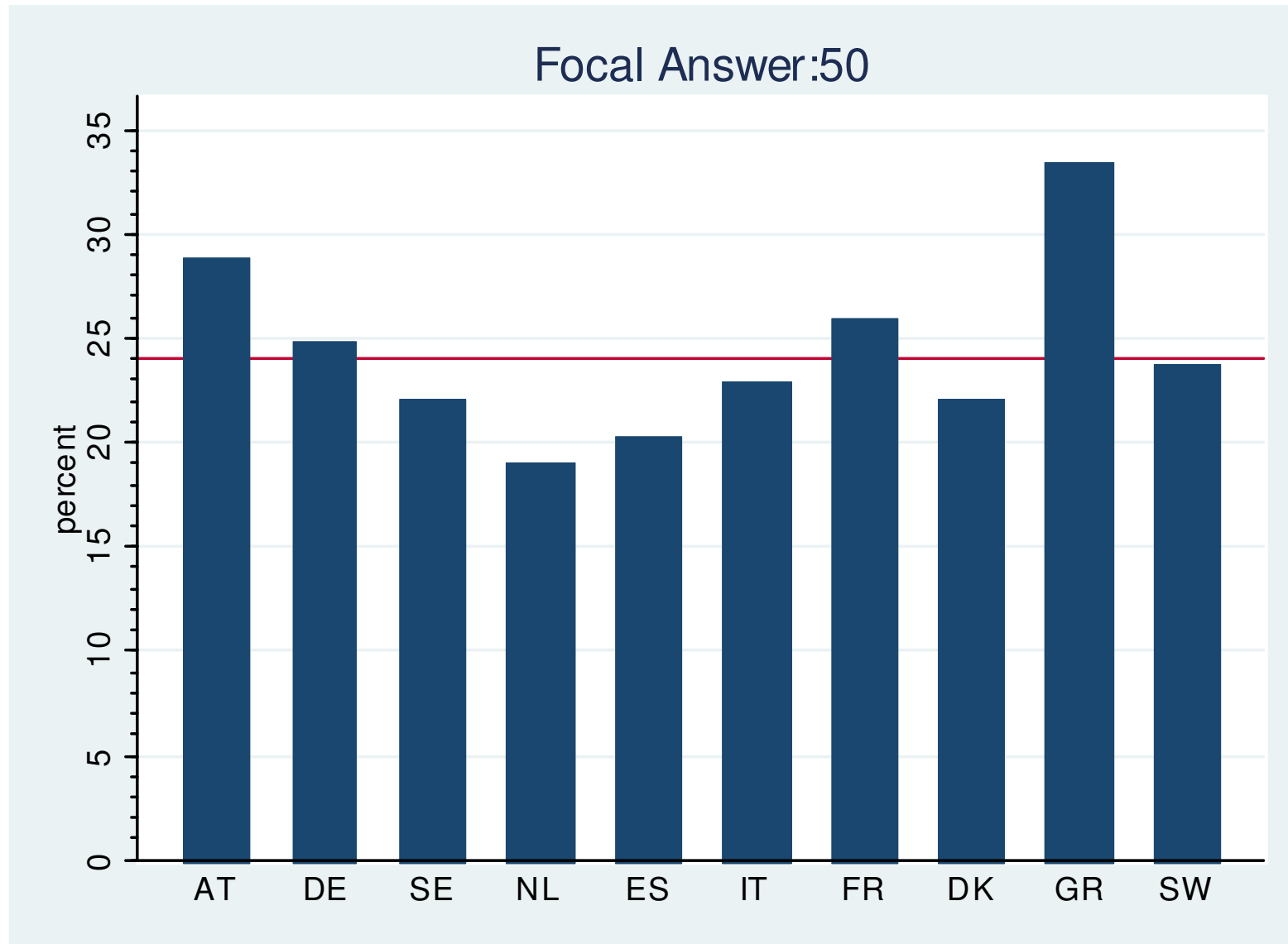
# Mean responses to the survival question in SHARE wave 1



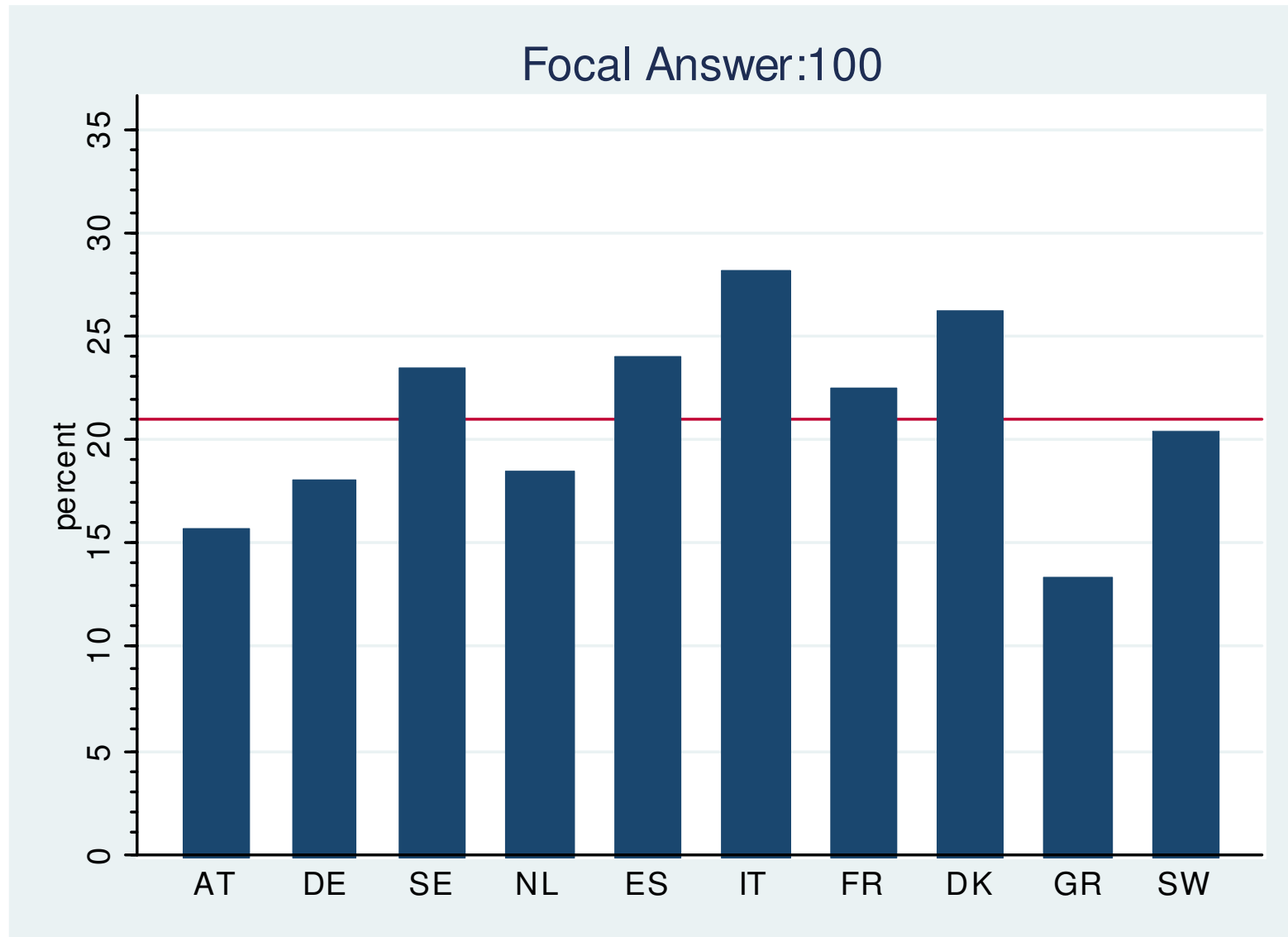
# Focal values in the survival question in SHARE wave 1 (all countries)



## Fraction of 50% responses to the survival question in SHARE wave 1



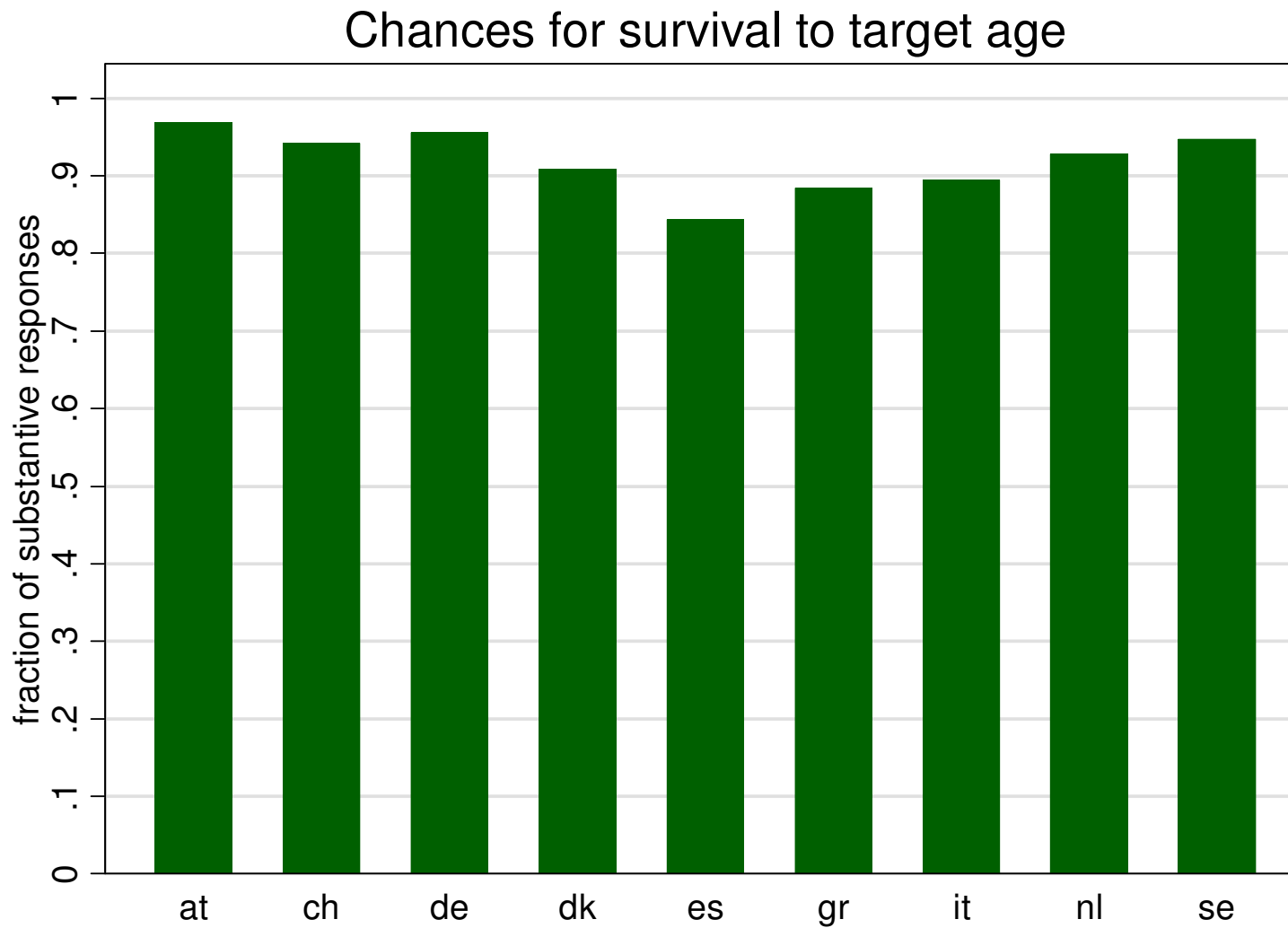
# Fraction of 100% responses to the survival question in SHARE wave 1



## Item nonresponse to two expectations questions in SHARE wave 1

Type of response	sunny day		survival	
Substantive response	15,972	96.8%	15,194	92.1%
Refusal	38	0.2%	85	0.5%
Don't know	372	2.3%	1,102	6.7%
Missing (other)	113	0.7%	114	0.7%
Total number of cases	16,495	100.0%	16,495	100.0%

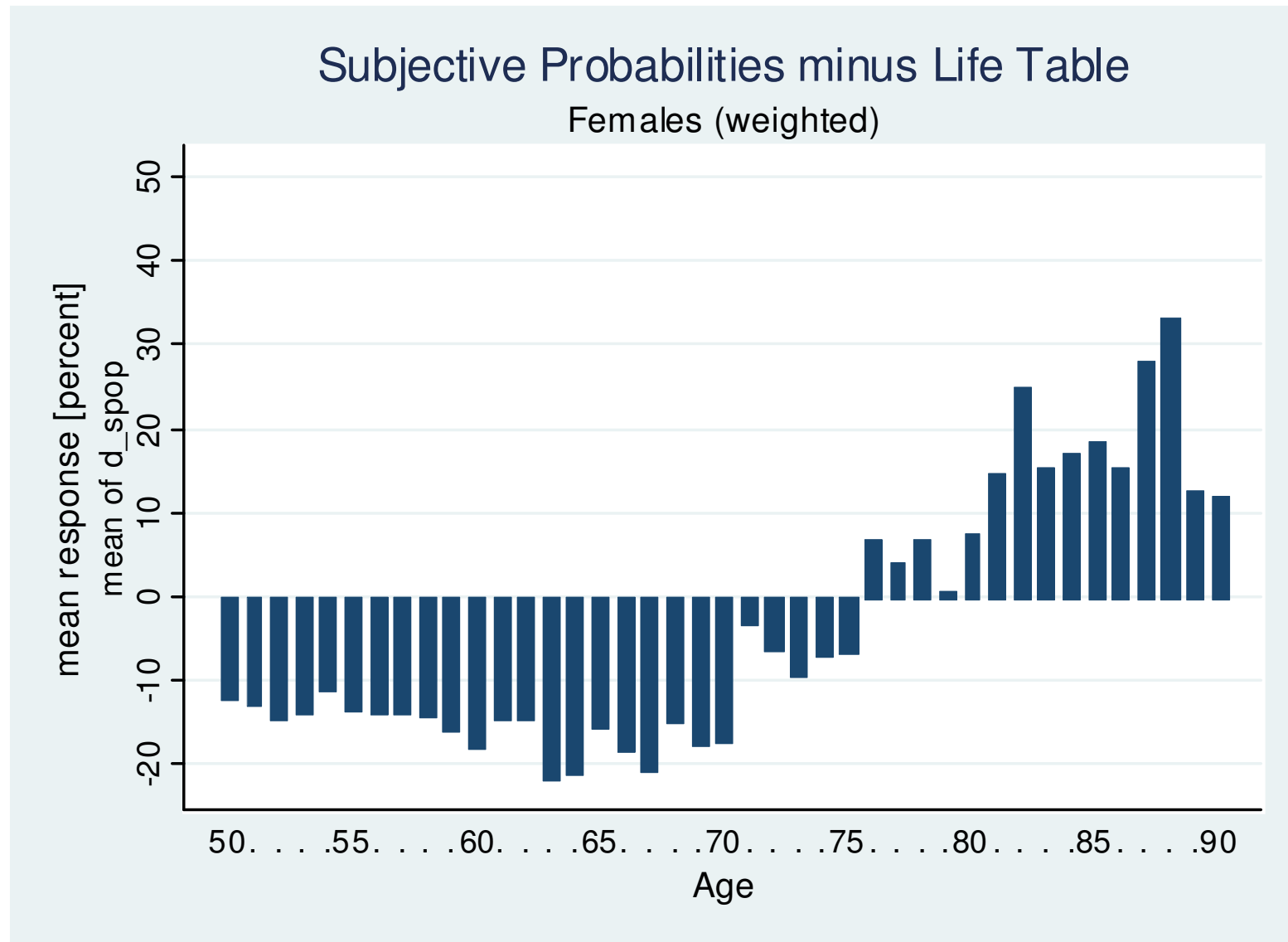
# Item nonresponse to the survival question in SHARE wave 1



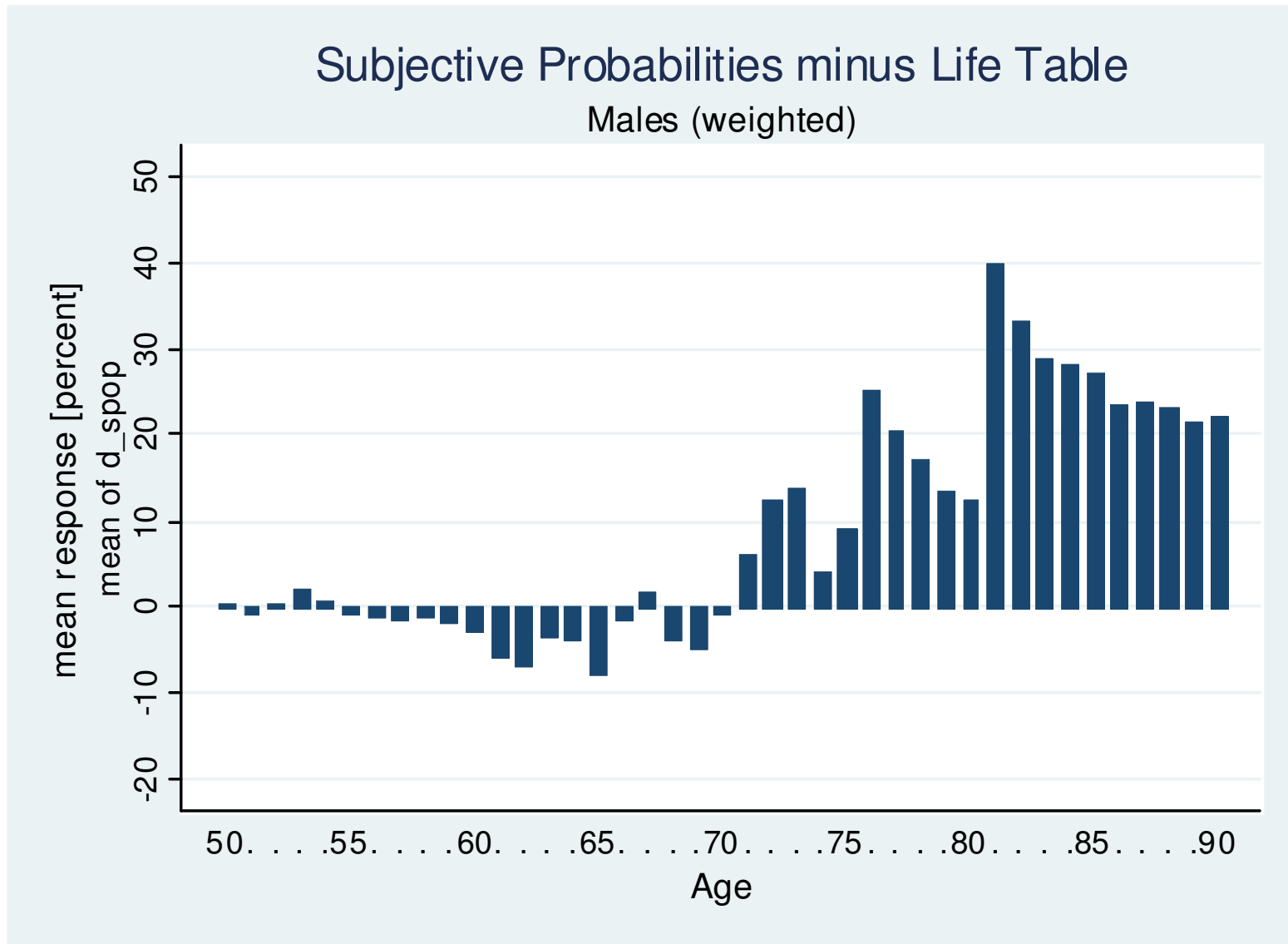
## Correlations with sunny day question in SHARE wave 1 (all countries)

Question	Correlation	<i>p</i> -value	<i>N</i>
Decrease in pensions	-0.0755	0.000	6240
Increase in retirement age	-0.0563	0.000	6268
Survival to target age	0.0979	0.000	15108
Better standard of living	0.1154	0.000	15618

# Age variation and optimism/pessimism in the survival question (females)



# Age variation in optimism/pessimism in the survival question (males)



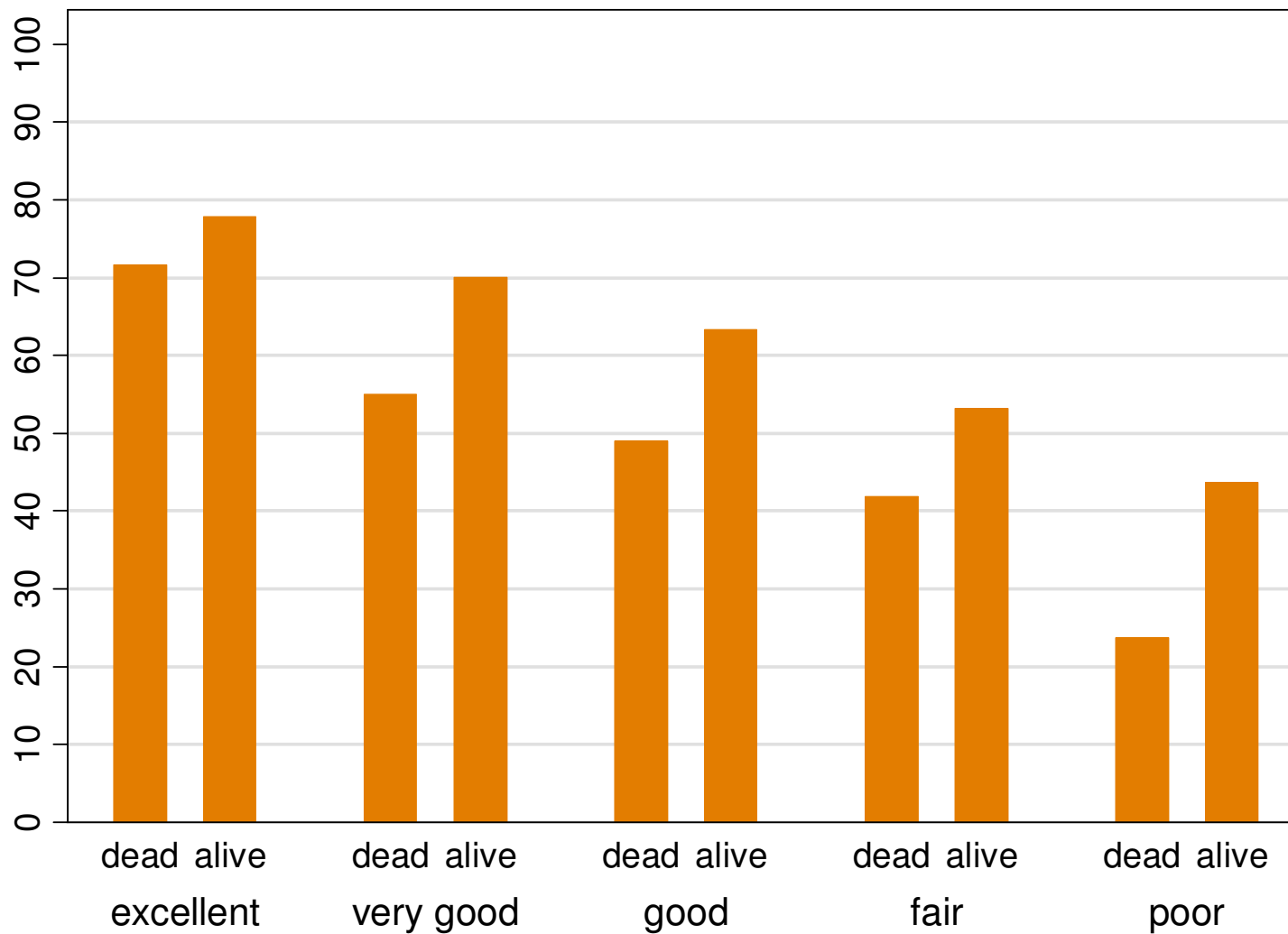
## Subjective survival probabilities and self-rated health status

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	Age- and sex-adjusted deviations of subjective survival probabilities from life-table survival probabilities	
Self-rated health	SHARE wave 1	HRS 2004
Excellent	11.1	15.4
Very good	5.3	7.8
Good	0.0	0.0
Fair	-8.9	-9.1
Poor	-19.8	-20.4

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# Subjective survival probabilities, self-rated health, and wave 1/2 survival



## Summary

Probabilistic survival questions seem to “work” (better than many predicted):

- Item nonresponse rates are low.
- Systematic variation with self-rated health and known risk factors.
- Predictive power for wave 1/2 survival – after controlling for self-rated health status and other covariates!

## Summary, cont'd

But some problems remain:

- Variation in response patterns across countries.
- Rounding and excess responses at 0%, 50%, and 100% should be modeled (and hopefully corrected).
- Intriguing age and gender-specific response patterns (optimism)?

Once these problems have been addressed, subjective probabilities of survival may provide measures of individual health that can be directly compared across countries.