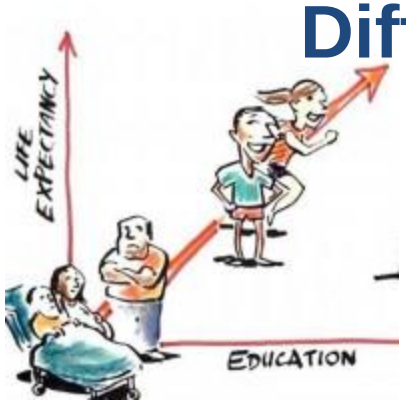
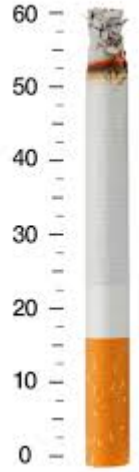
Subjective Life Expectancy:
Differences by Smoking, Education





Source: Google Images

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Subjective Survival Probability (SSP)

- ***What are the chances that you will live to be age T or more?***

- The target age T depends on the age of the respondent:
  - it is equal to 75 for those aged 50-65
  - to 80 for those aged 66–69
  - 85 for those aged 70–74
  - 90 for those aged 75–79
  - 95 for those aged is 80–84
  - 100 for those aged 85–89

SSP

- SSP survey question is a **good predictor of mortality**
  - controlling for mortality-related risk factors (Elder 2012; Hurd & McGarry 1995; 2002; Manski 2004; Siegel et al. 2003)

- **People know** the effects of their characteristics & behaviours on their survival probabilities
  - SSPs are consistent with the observed survival patterns (Hurd 2009; Hurd & McGarry 2002; Novak & Palloni 2013)

- SSPs incorporate **private and subtle information** on mortality (Perozek 2008)
  - often used to predict individuals' economic and health behaviours

Sub-group differences

- **Sub-groups behave differently** (also because of individual perceptions of ageing)
- Thus, understanding the **variability of SSPs** within a population is important because they may affect life-cycle decisions
- Yet, sub-groups may be **more or less able to predict** the own survival probability

Aims

1. To **compare sub-groups SSPs** obtained from a population survey
2. To study sub-group differences in objective survival probability (**OSP**) calculated from survey data
3. To **compare subjective and objective survival probabilities**

Particular attention to **sub-group differences**

(i.e., by **education** and **smoking behaviour**)

Hypotheses

- Current **smoking** is **negatively correlated with SSPs** (see also Aktas & Sanderson (2015) on a negative association between smoking and SSP)
- Reporting **heterogeneity in SSP**
  - focusing on the differences between smokers and non-smokers, with a further distinction between more and less educated individuals

www.grandparents.com

Data

Health and Retirement Study (HRS)

Age-cohort–based longitudinal panel survey of persons aged 50 years and older in the United States

- we consider respondents interviewed **for the first time in 2000, 2002, 2004, 2006, 2008, 2010, and 2012 waves**
- N = **23,895** older adults aged 50–89 years, excluding nursing home residents

Outcome variables

SSP

- What are the chances that you will live to be age T or more?
  - The target age T depends on the age of the respondent

OBJECTIVE SURVIVAL PROBABILITY (OSP)

- We know whether respondents died between first interview and 2013
  - Information on vital status obtained by HRS through tracking of respondents & matches to the National Death Index (year and month of death, match score, and an alive/deceased flag)

GAP

- From these two variables, we calculate a measure of how close the SSPs are to the OSPs, as the difference between SSP and OSP

Explanatory & control variables

1) *Education*

- higher (master degree, professional degree; 21%)
- lower (no degree, GED, two year college degree, four year college degree)

2) *Smoking behaviour*

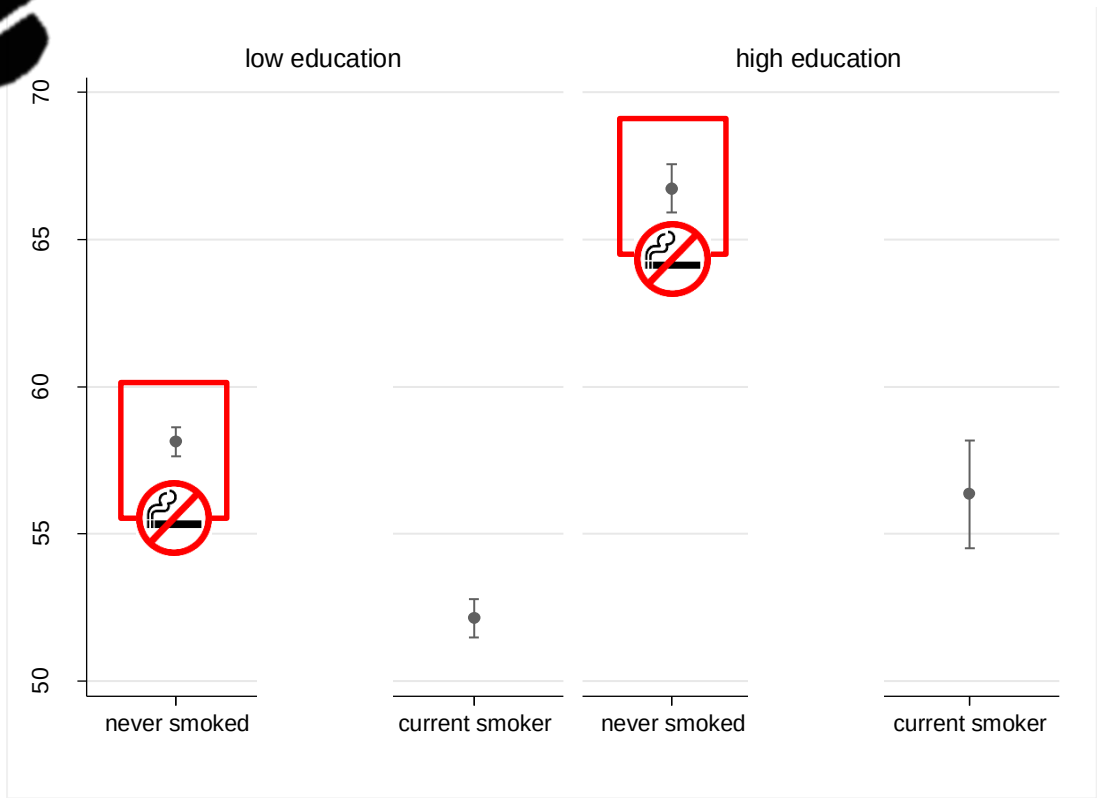
- the respondent has *never smoked* (41.2%);
- *smoked* in the past, but currently does not smoke (40.1%);
- *currently smokes* cigarettes (18.7%)

- ***Ethnicity*** (White/Caucasian; Black/African American; other)
- ***Health*** (diagnosed with cancer, stroke, lung problems, and/or heart disease)
- ***Wave*** at which the interview was carried out

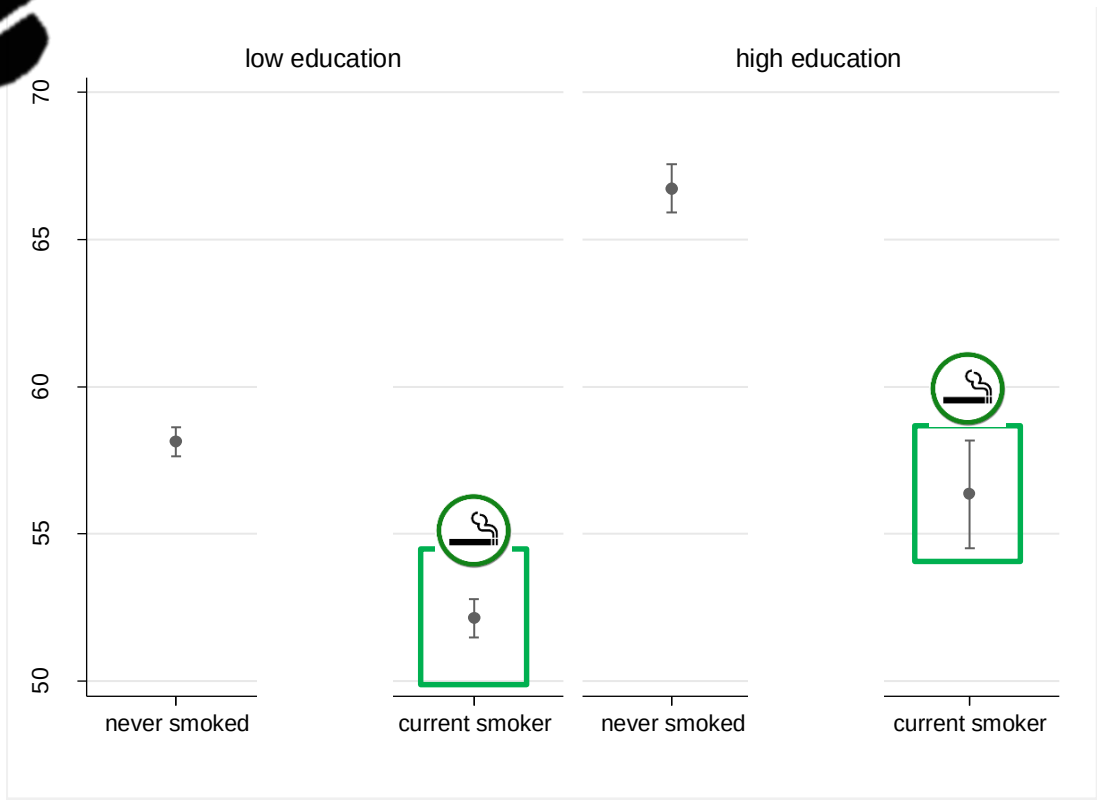
Methods

- **Linear models** on the association between smoking & education and SSPs (outcome bounded at 0 and 100)
  - we obtain **predicted survival probabilities for different sub-groups**
- We apply a **Gompertz survival model** to real mortality data to assess the association between smoking & education and OSP
  - we obtain **estimates of OSPs by smoking behaviour and education**
- We **compare** respondents' SSPs and their predicted OSPs

Predicted SSP by education and smoking behaviour



Predicted SSP by education and smoking behaviour



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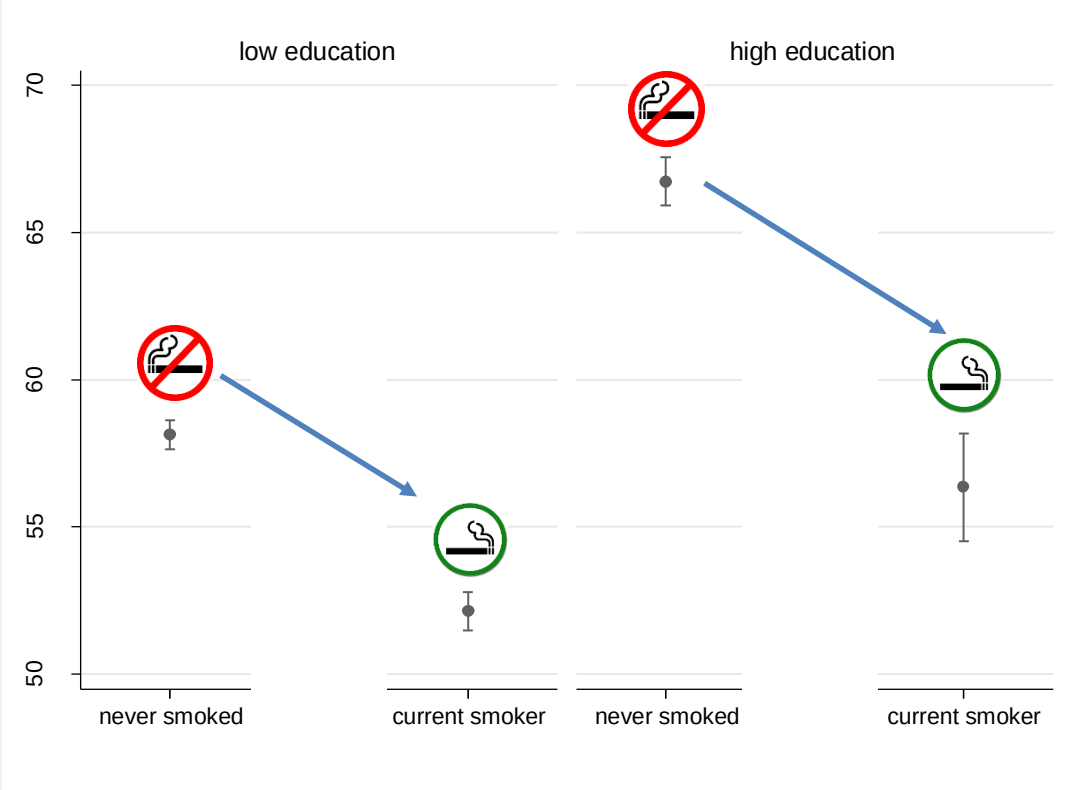

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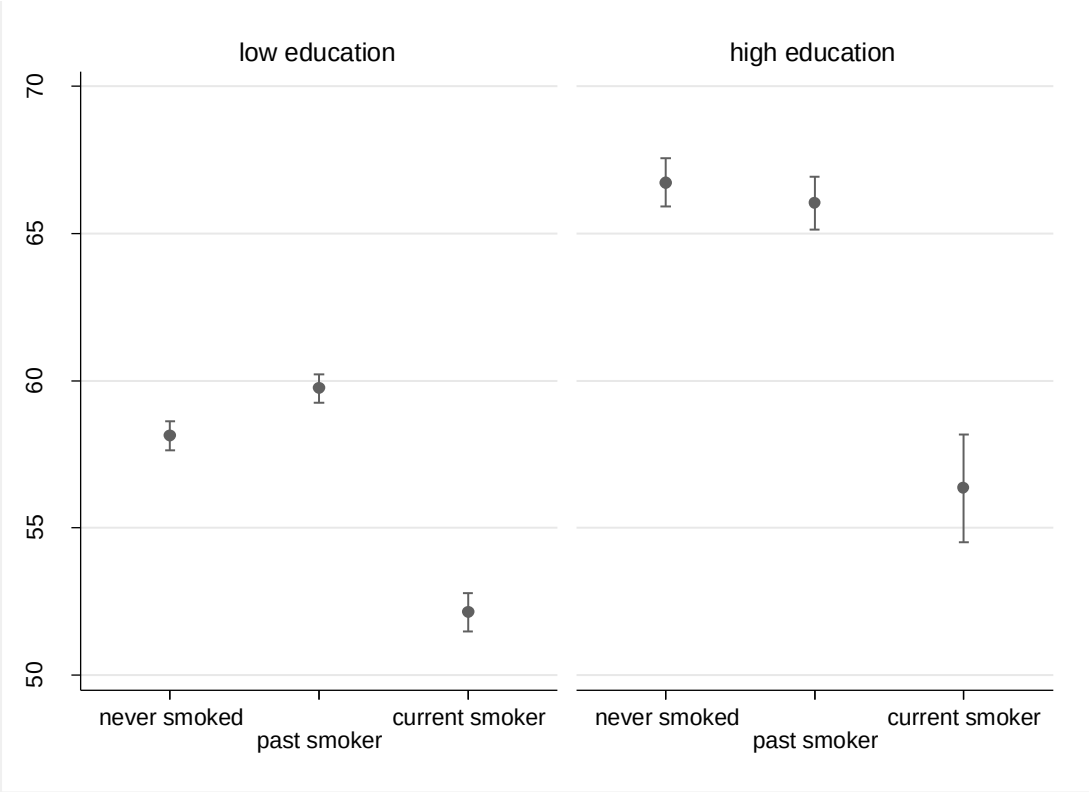
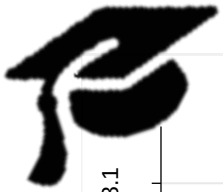
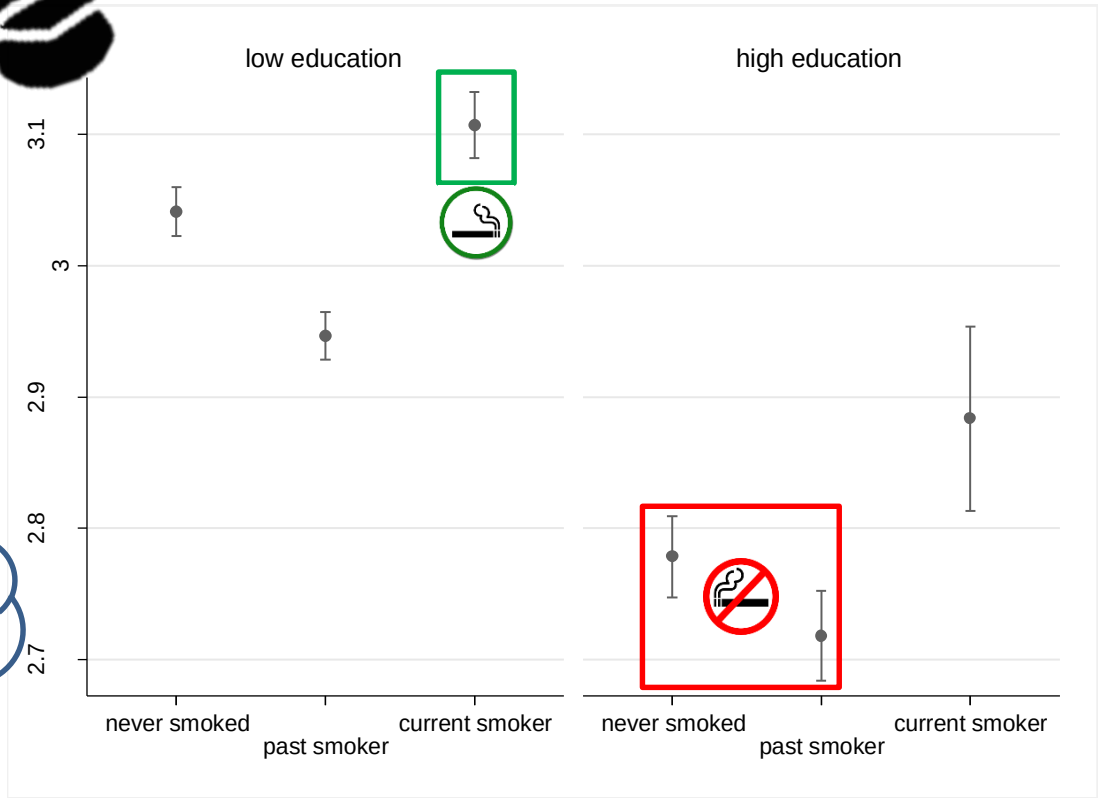


Predicted logarithm of the gap

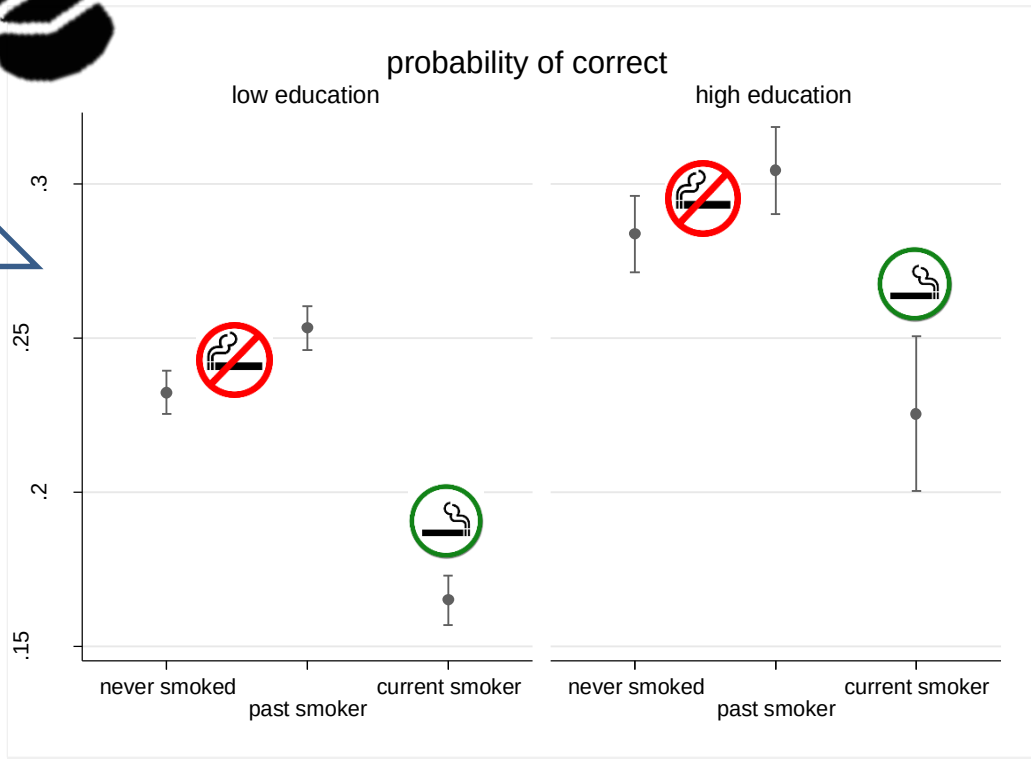




Smaller gap = smaller "mistake"

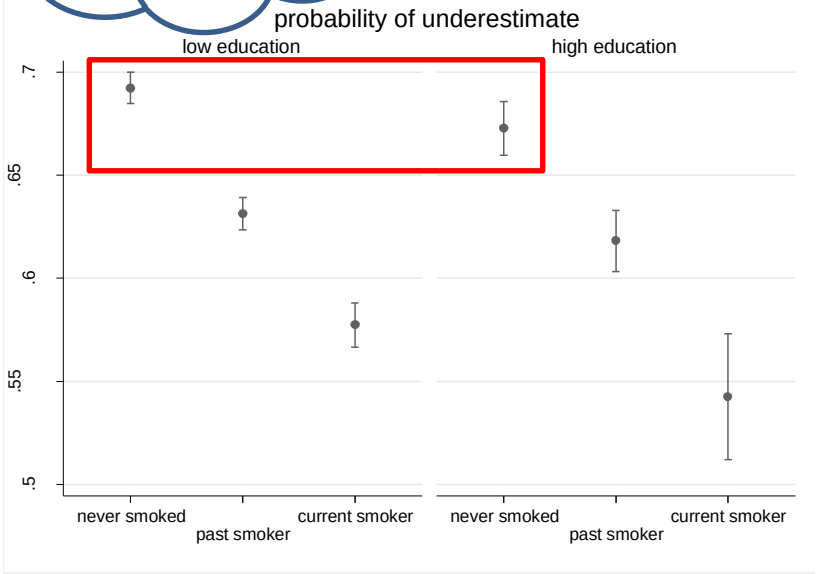
Probabilities of being correct in estimating survival probabilities

More likely to be "correct"

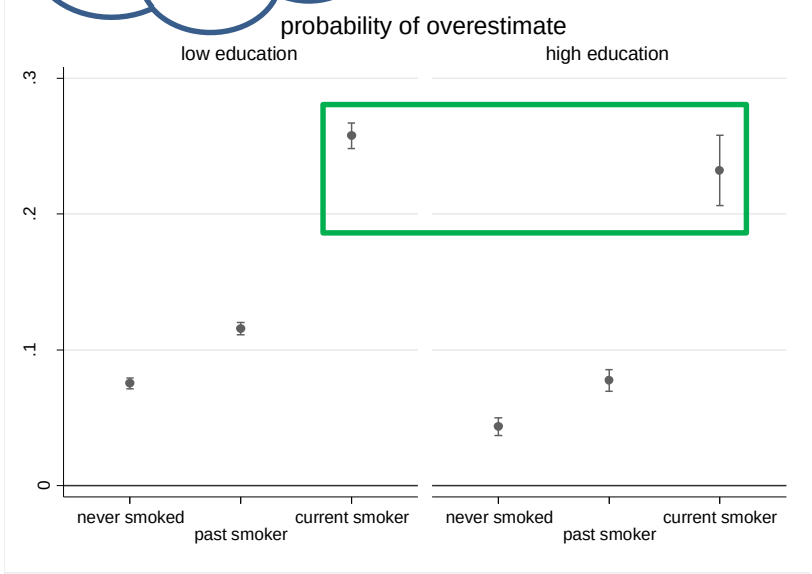


Probabilities of under/over-estimating survival probabilities

More likely to underestimate



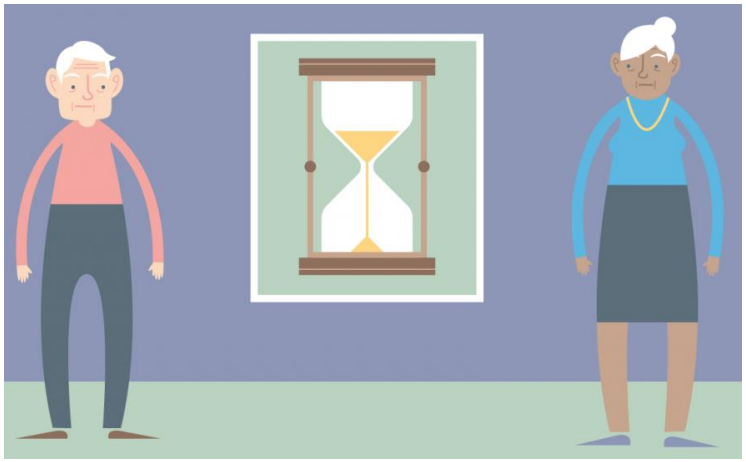
More likely to overestimate



Conclusions

- **Smokers** and **low educated** people are **less able to correctly predict** their survival probabilities (SSPs)
  - Low educated tend to either underestimate or overestimate SSPs
  - Smokers tend to overestimate SSPs
- **Interaction** between smoking and education
  - Among the smokers, the effect of education on the probabilities of incorrect estimation is not significant

Thank you!



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