NETHERLANDS INTERDISCIPLINARY DEMOGRAPHIC INSTITUTE

Theme group Ageing & Longevity

- MAIN RESULTS
- PLANS FOR THE FUTURE

Joop de Beer, Govert Bijwaard, Michaël Boissonneault, Nicole van der Gaag, Fanny Janssen, Ilya Kashnitsky

Brown Bag Seminar
15 October 2015

THEME GROUP AGEING & LONGEVITY

Theme group Ageing & Longevity

examines and projects
changes and differences
in mortality and health
and its consequences for ageing

THEME GROUP AGEING & LONGEVITY

	Ageing	Longevity
Joop de Beer		
Govert Bijwaard		
Michaël Boissonneault		
Arun Chandran		
Nicole van der Gaag		
Fanny Janssen		
Ilya Kashnitsky		

AGEING & LONGEVITY: WHAT DO WE KNOW?

- Longer and healthier life
  - Delay of mortality to old age
  - Delay of severe limitations to old age
- Longer active
  - Ability to work > labour force participation
- Later old
  - Ageing starts at higher age
- But not for everyone
  - Differences by education
  - Differences across countries and regions

AGEING & LONGEVITY: PLANS FOR RESEARCH

- Longer and healthier life
  - Limit to increase in life expectancy?
  - Will smoking and obesity have a downward effect?
- Longer active
  - How long can we work?
- Later old
  - How can we measure ageing better?
- But not for everyone
  - What causes educational differences?
  - Do differences across countries become smaller?

LONGEVITY

- Joop:
  - shape and shift of distribution of age at death
- Govert:
  - educational differences caused by education?
  - conditions in early life
- Fanny:
  - impact of smoking, obesity and alcohol on mortality

AGEING

- Michaël:
  - does ability to work allow a rise in age at retirement?
- Ilya:
  - convergence in ageing across EU regions?
- Nicole:
  - ageing and sustainability: beyond GDP
- Arun:
  - new ageing indicators: not only age

LONGEVITY

Joop de Beer:

Longevity: delay or compression?

LONGEVITY

Increase in life expectancy: is there a limit?

Two views:

1. **Limit to improvement at oldest ages: compression of mortality**
2. **Continuation of (linear) trend**

LONGEVITY

Japanese women:

high life expectancy: 86.8 years

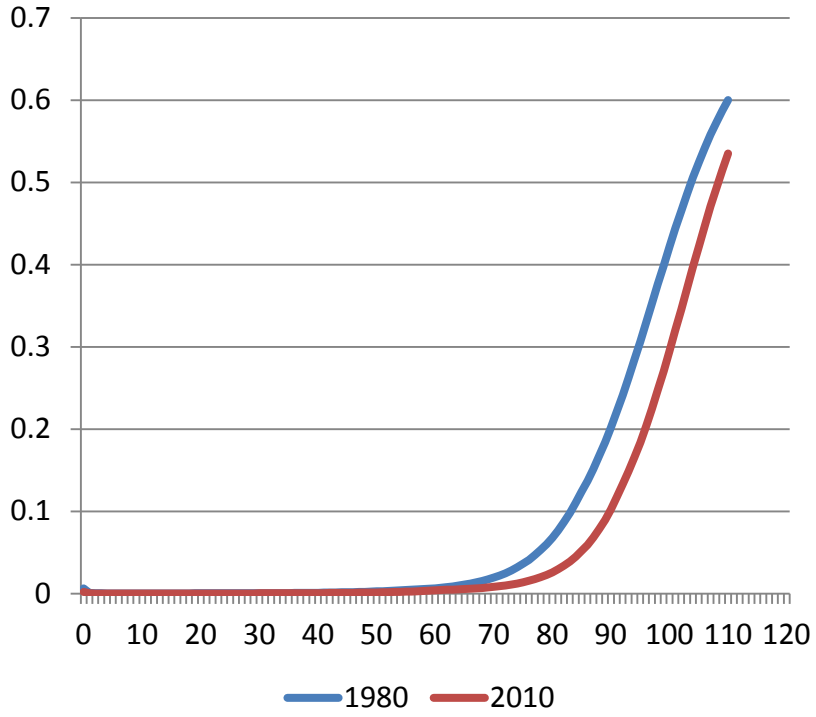
increase 2.5 years per decade

If increase continues:

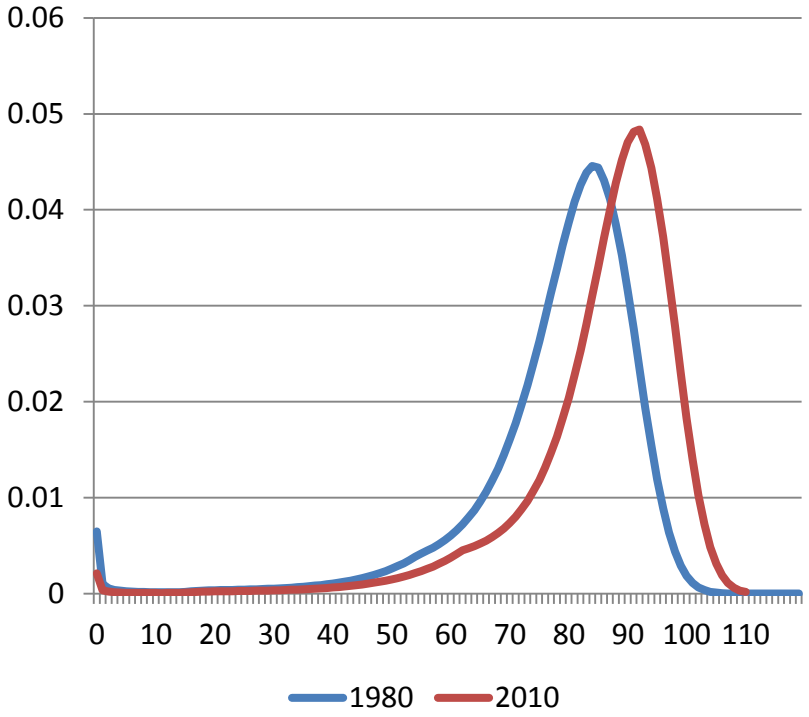
in 2060 life expectancy will be 100 years

LIFE TABLE: JAPANESE WOMEN

Death probability

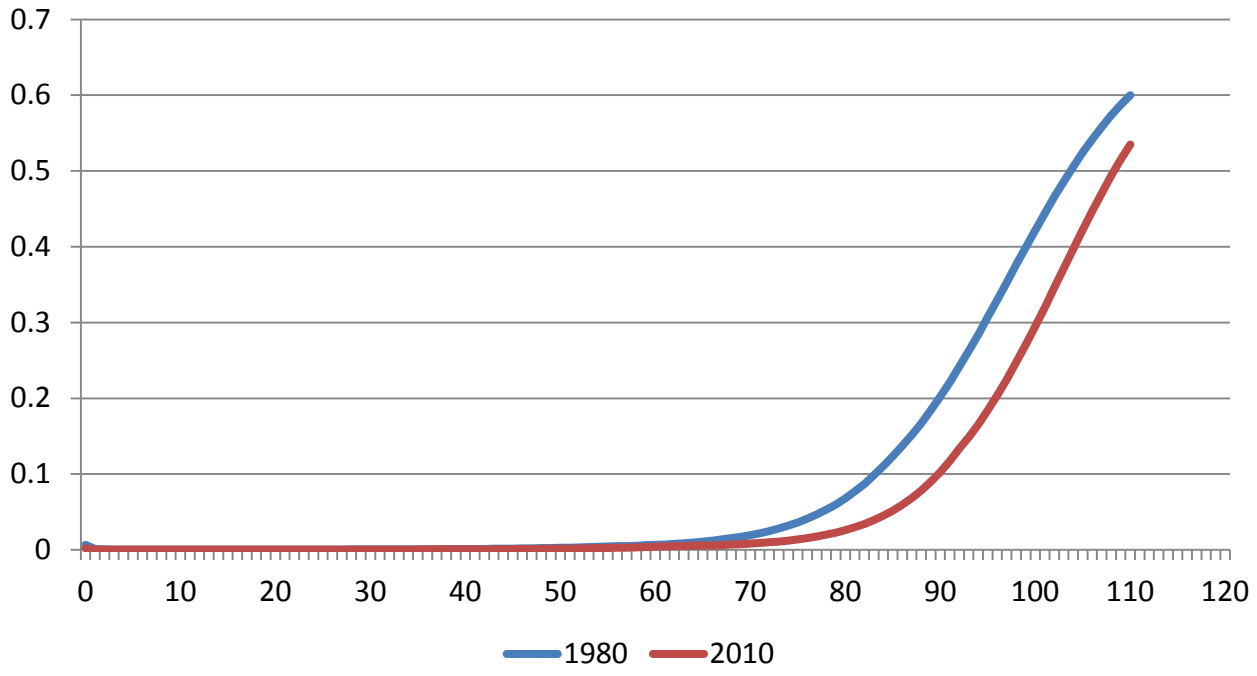


Distribution of age at death



PROJECTION OF DEATH PROBABILITY

Japanese women 1980 and 2010



PROJECTION OF DEATH PROBABILITY

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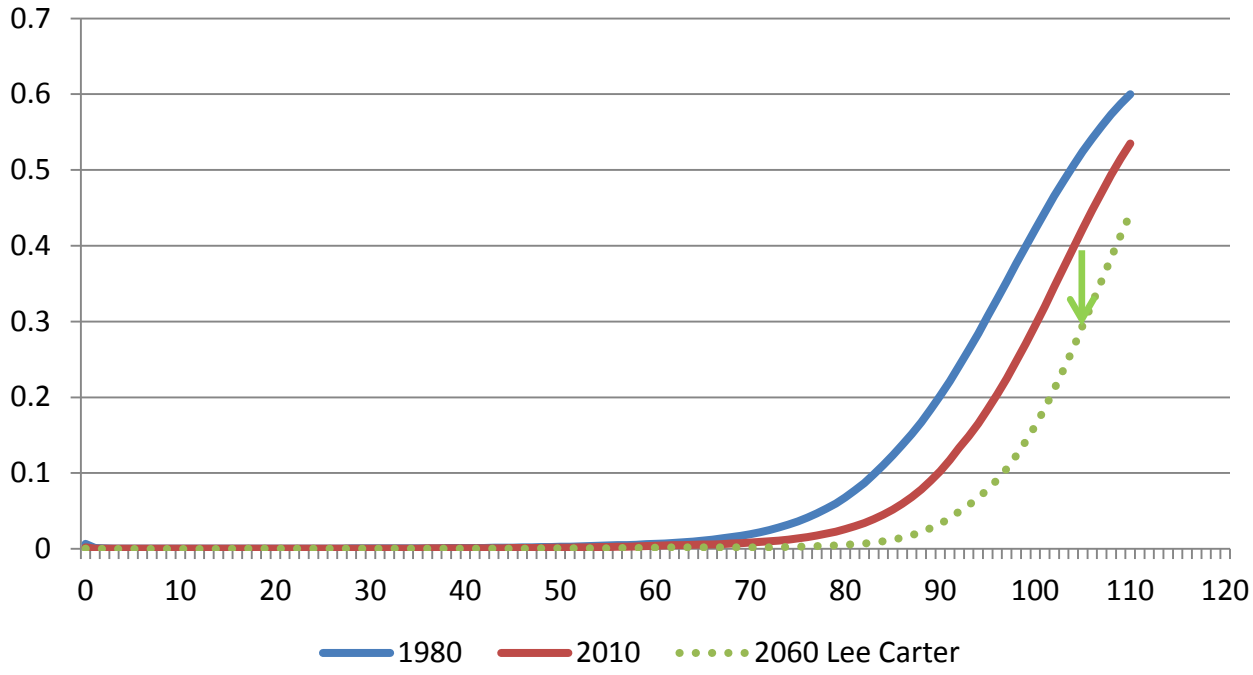
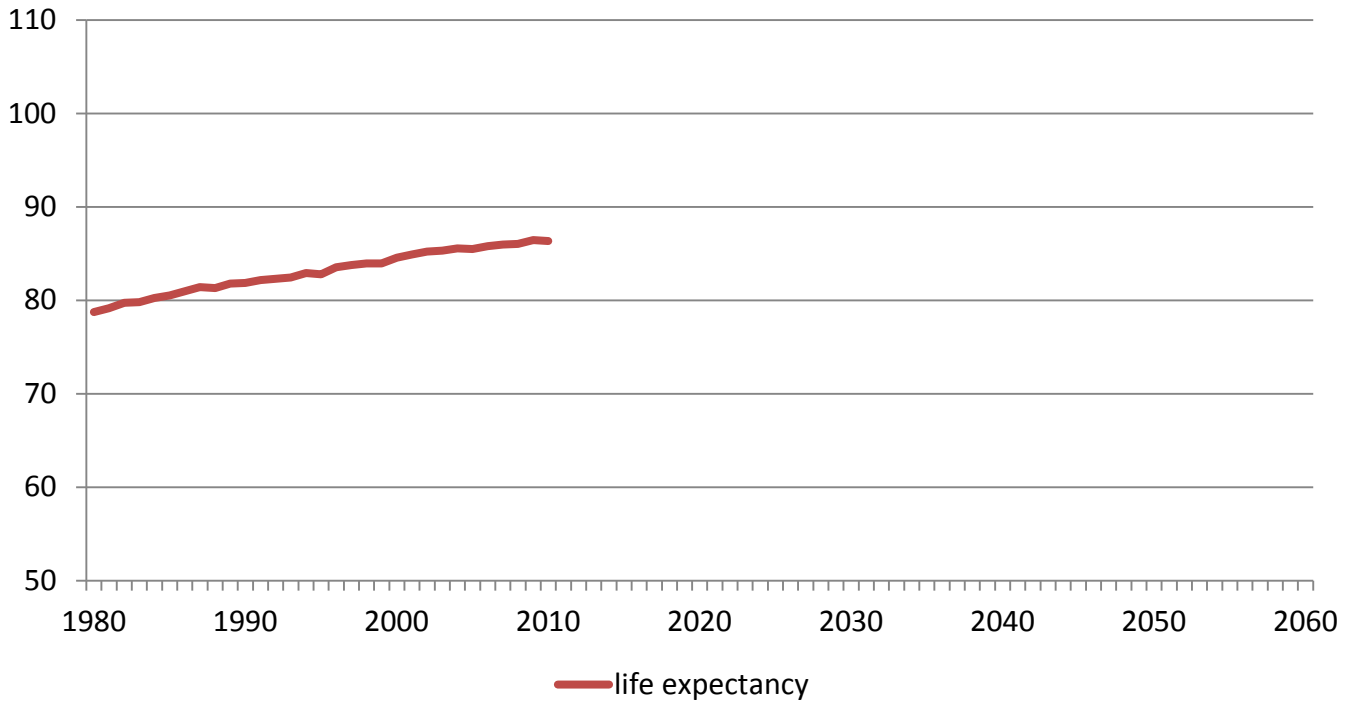
2060: Lee- Carter projection



LIFE EXPECTANCY AT BIRTH

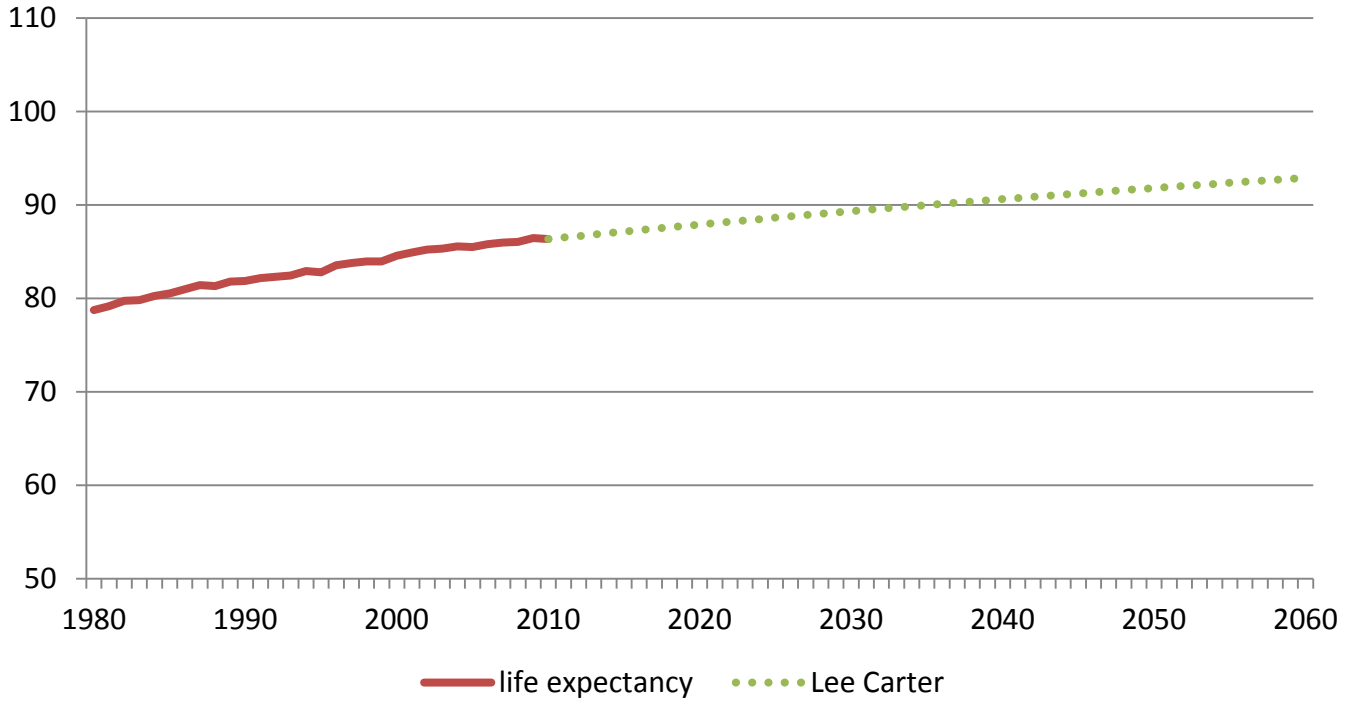
Japanese women, 1980- 2010



LIFE EXPECTANCY AT BIRTH

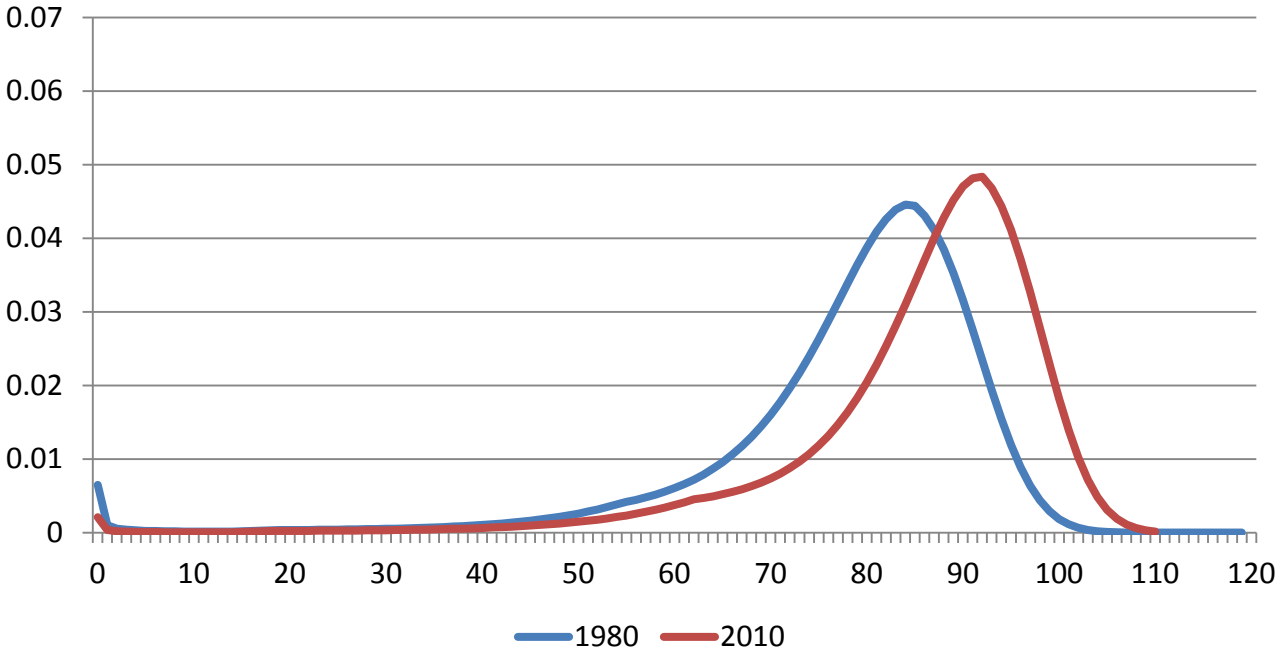
Japanese women, 1980- 2010 - 2060

Projection: Lee Carter



DISTRIBUTION OF AGE AT DEATH

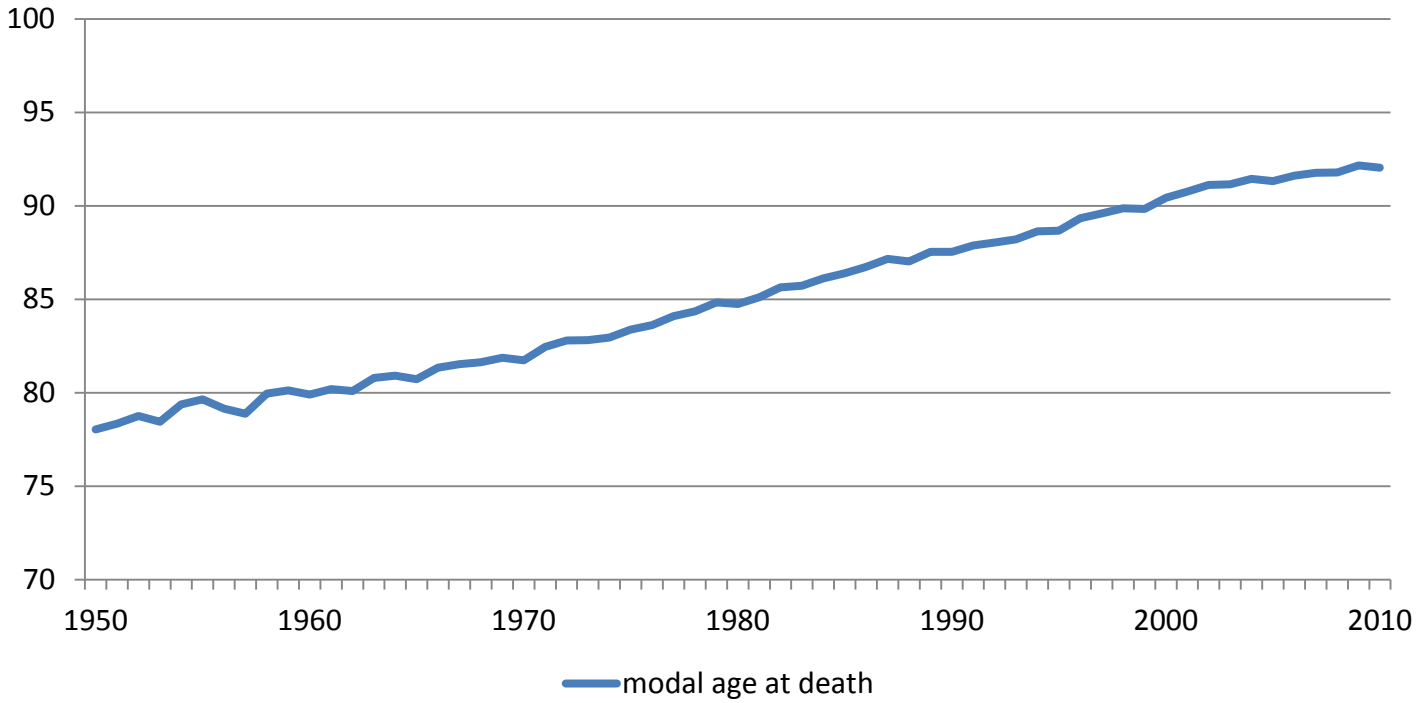
Japanese women 1980 and 2010



DISTRIBUTION OF AGE AT DEATH

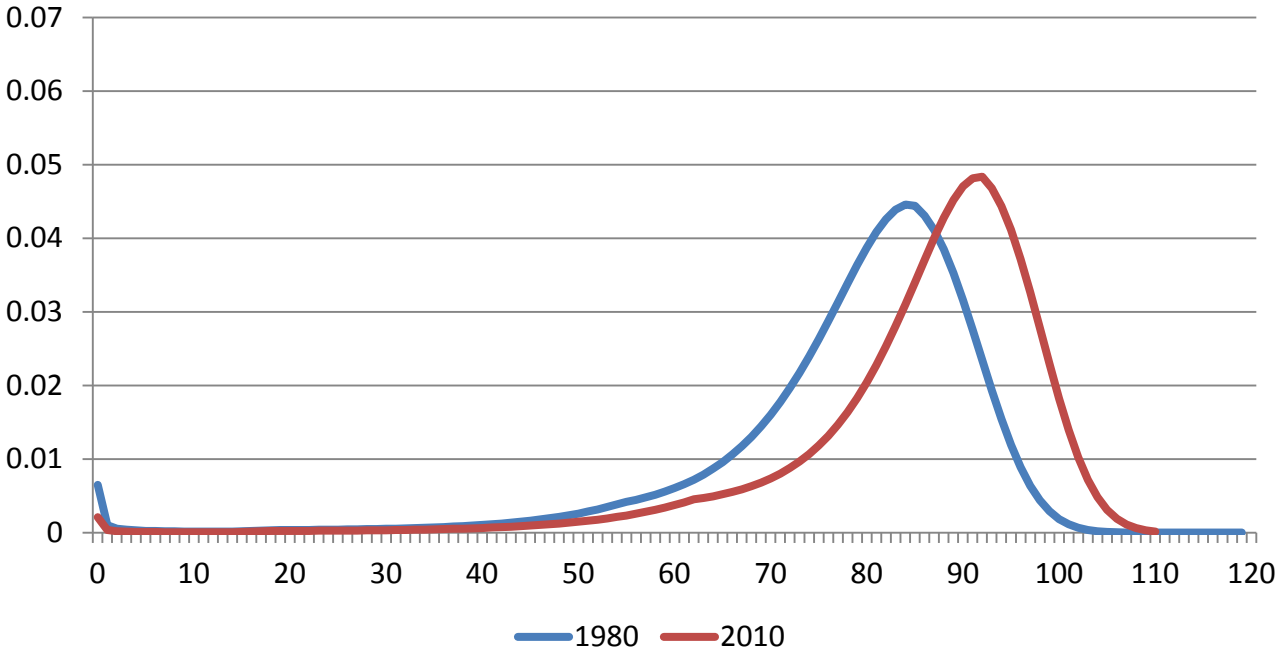
Japanese women 1950 and 2010

Linear increase in modal age at death



DISTRIBUTION OF AGE AT DEATH

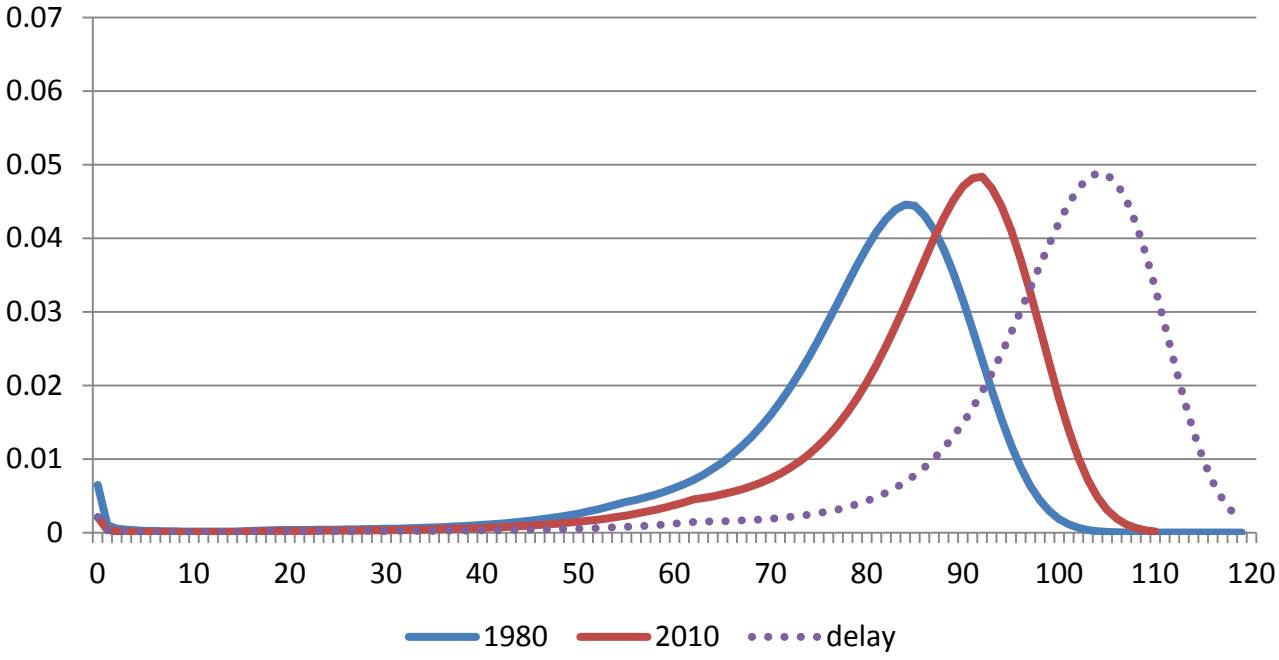
Japanese women 1980 and 2010



DISTRIBUTION OF AGE AT DEATH

Japanese women 1980 and 2010

2060: projection based on delay

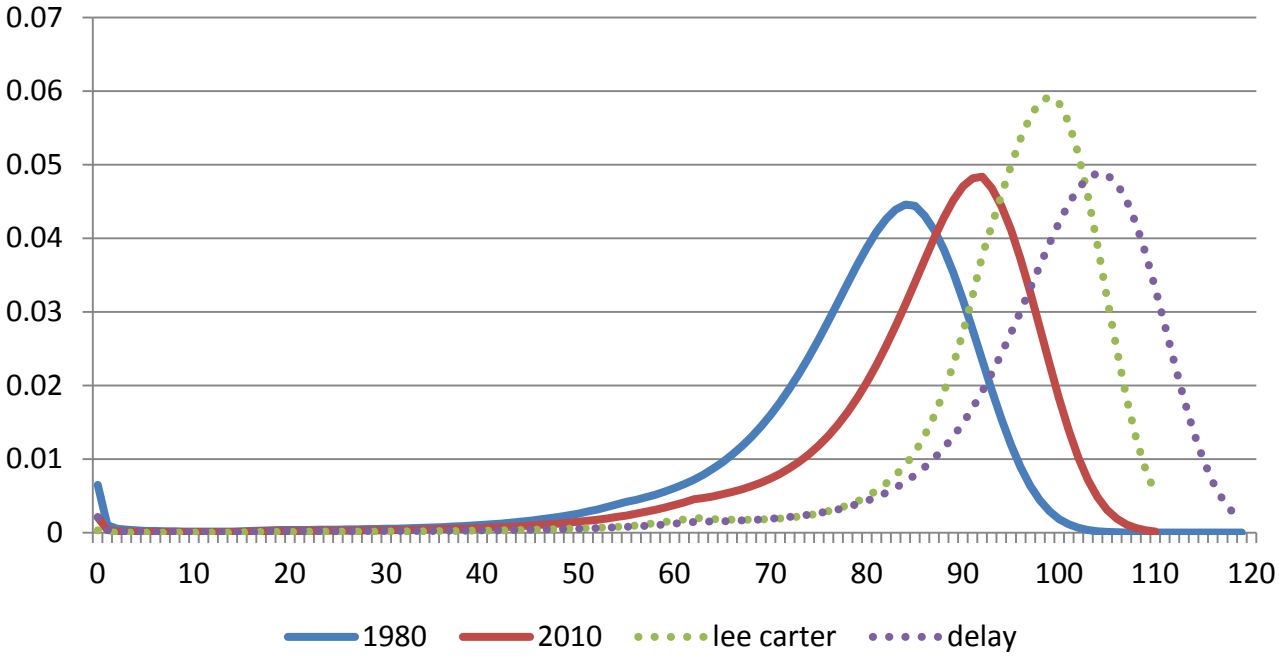


DISTRIBUTION OF AGE AT DEATH

Japanese women 1980 and 2010

2060: projection based on delay

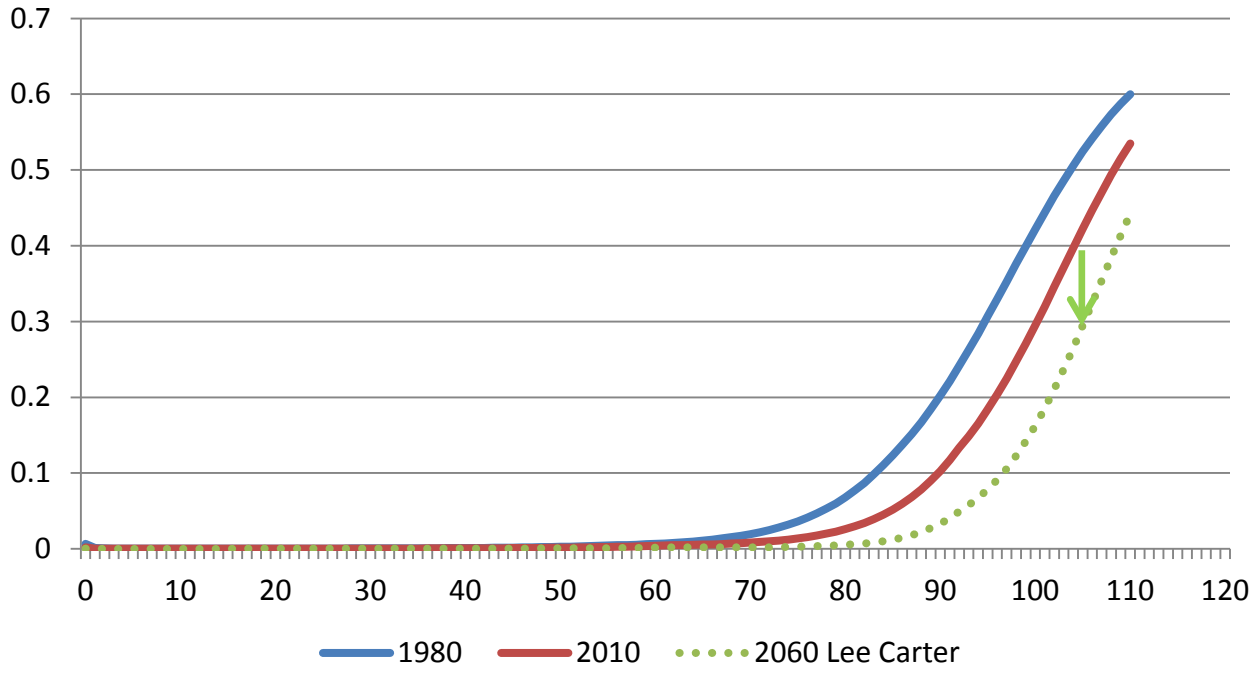
2060: projection based on Lee- Carter



PROJECTION OF DEATH PROBABILITY

Japanese women 1980 and 2010

2060: Lee- Carter projection



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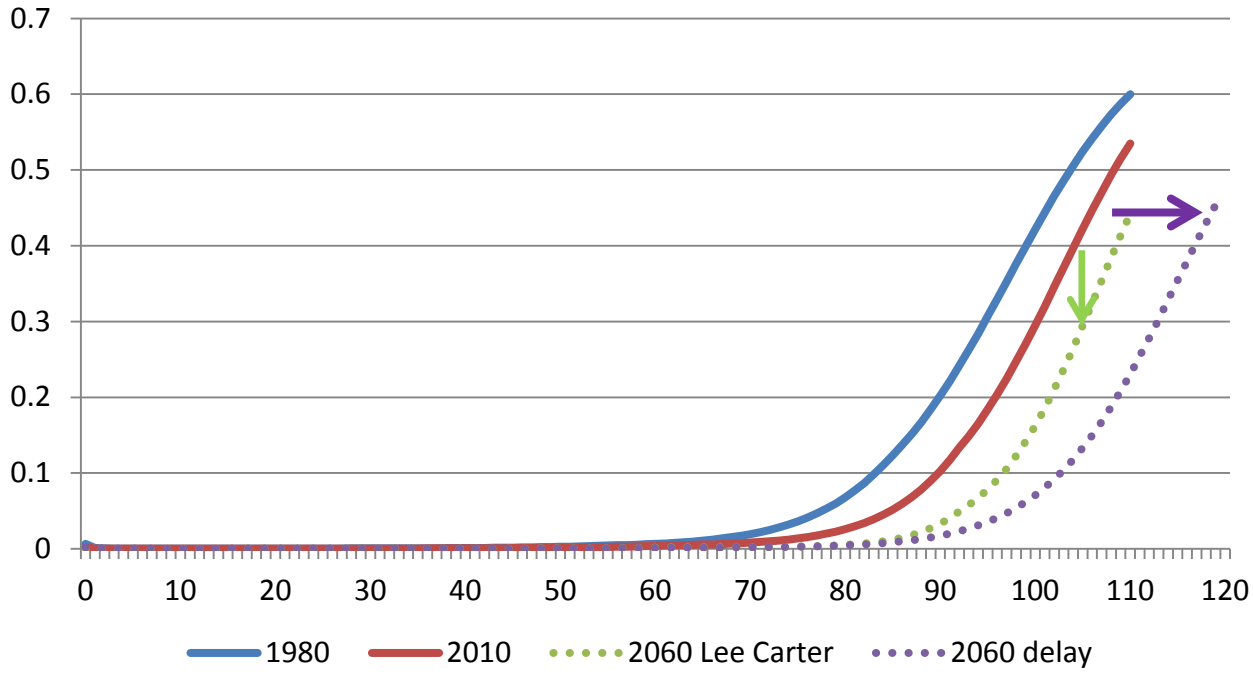
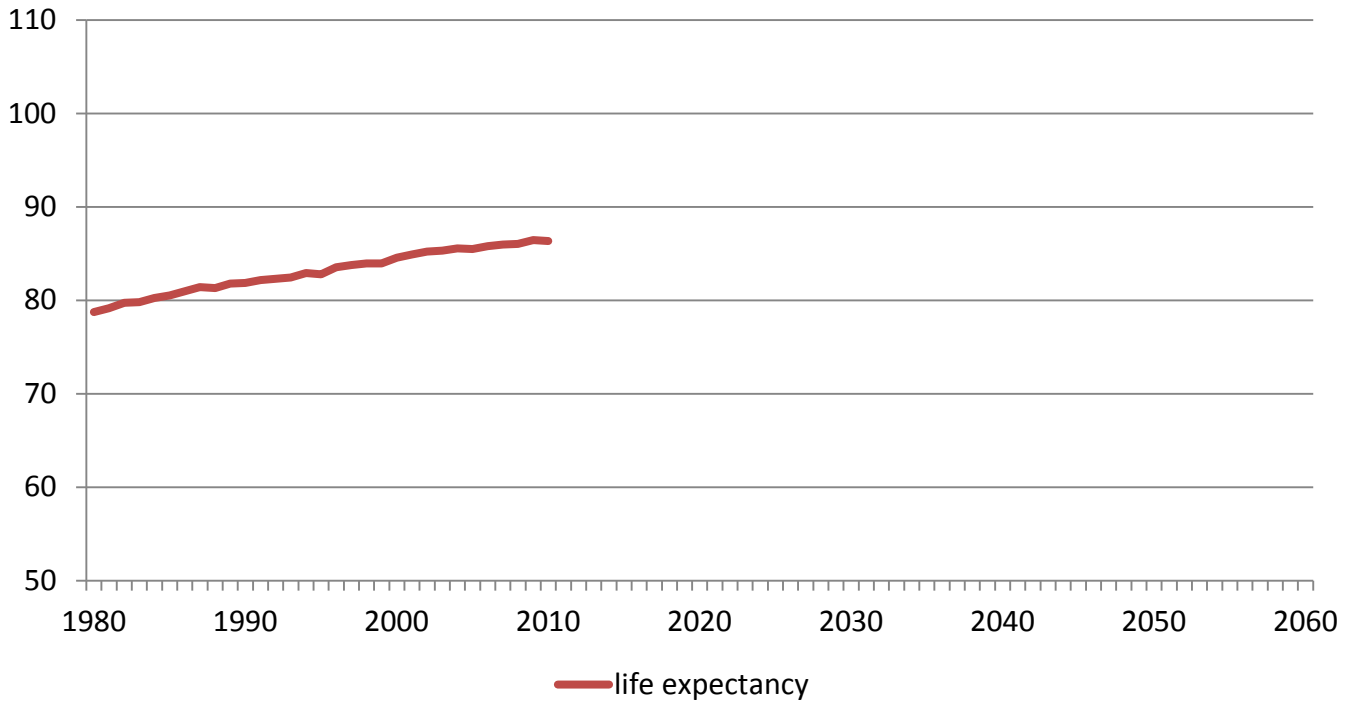


LIFE EXPECTANCY AT BIRTH

Japanese women, 1980- 2010



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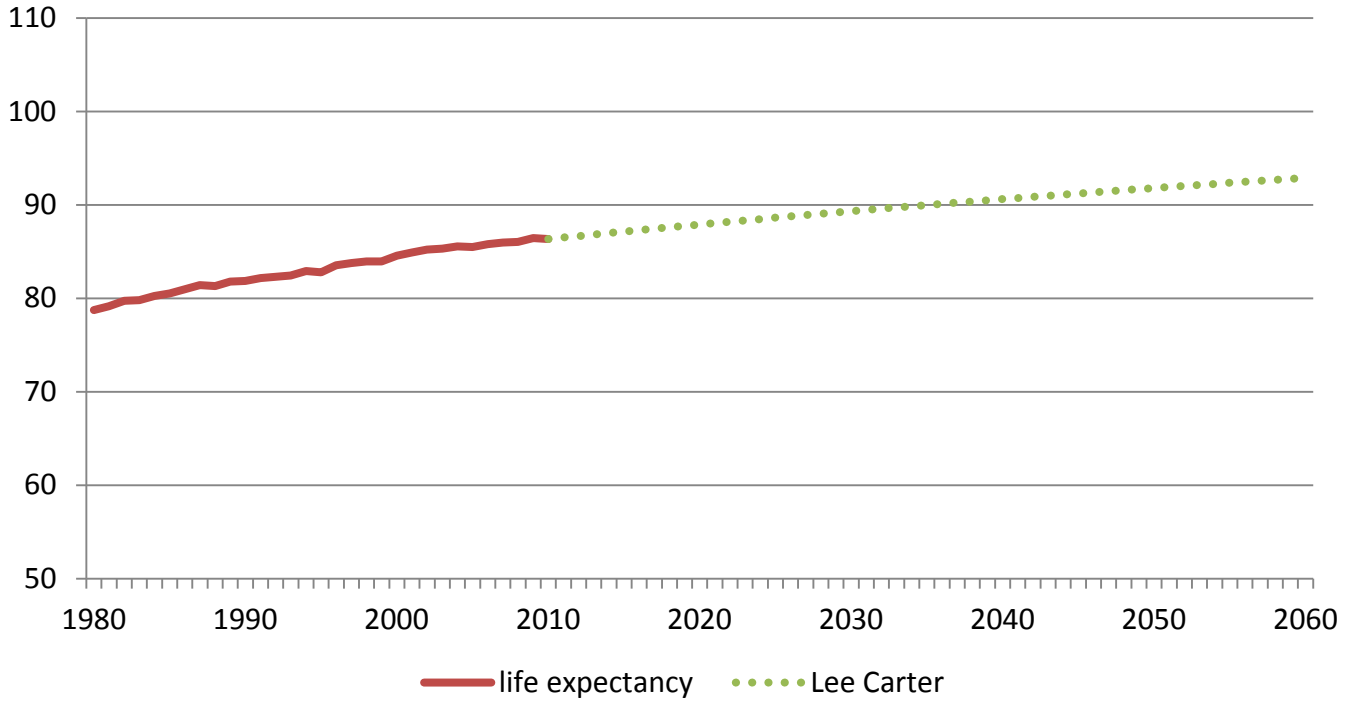
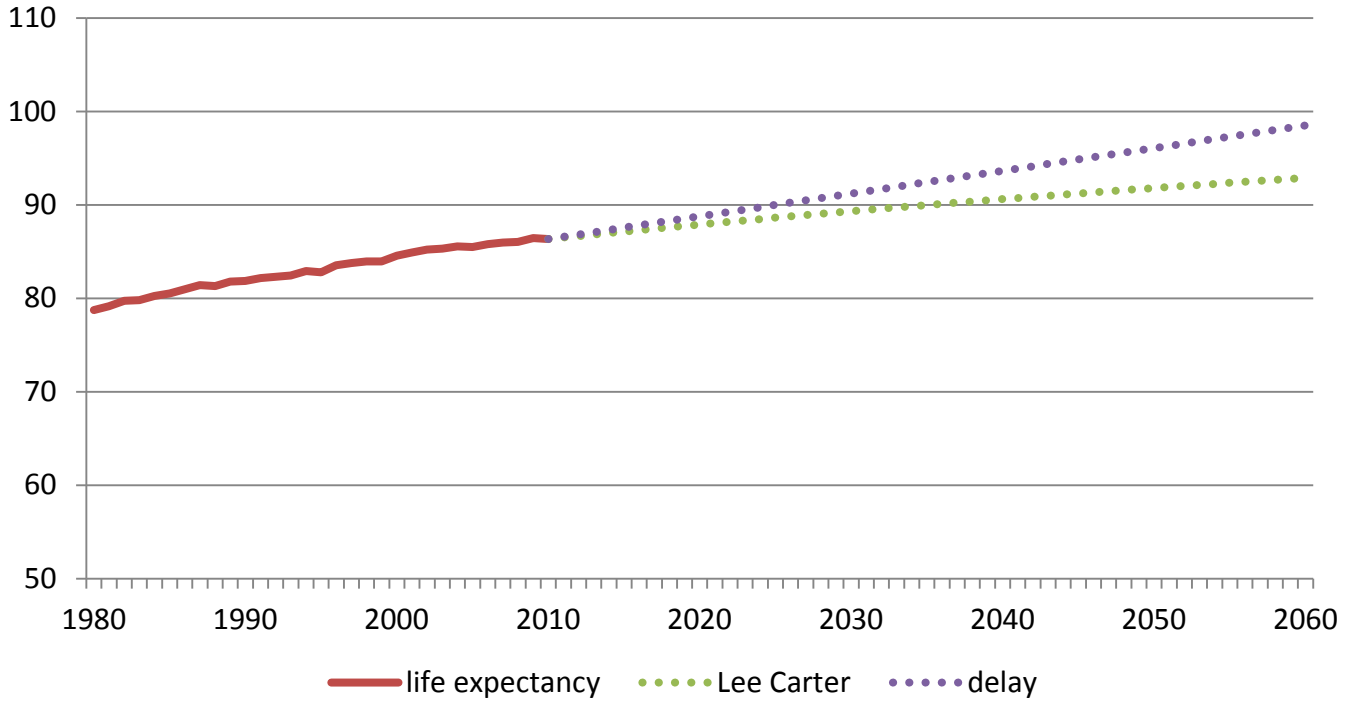


LIFE EXPECTANCY AT BIRTH

Japanese women, 1980- 2010 - 2060

Projection: Lee Carter vs delay scenario

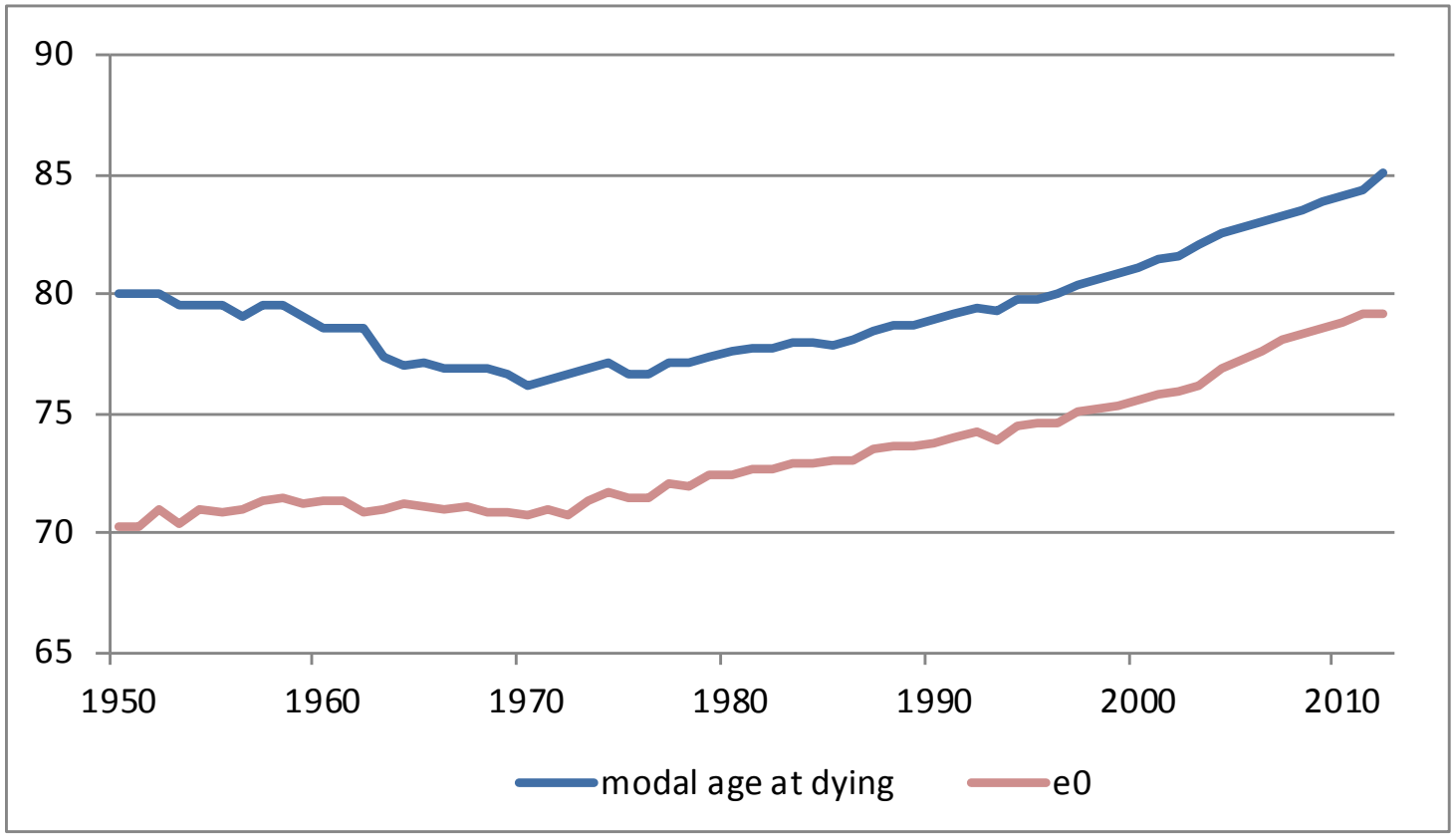


LONGEVITY

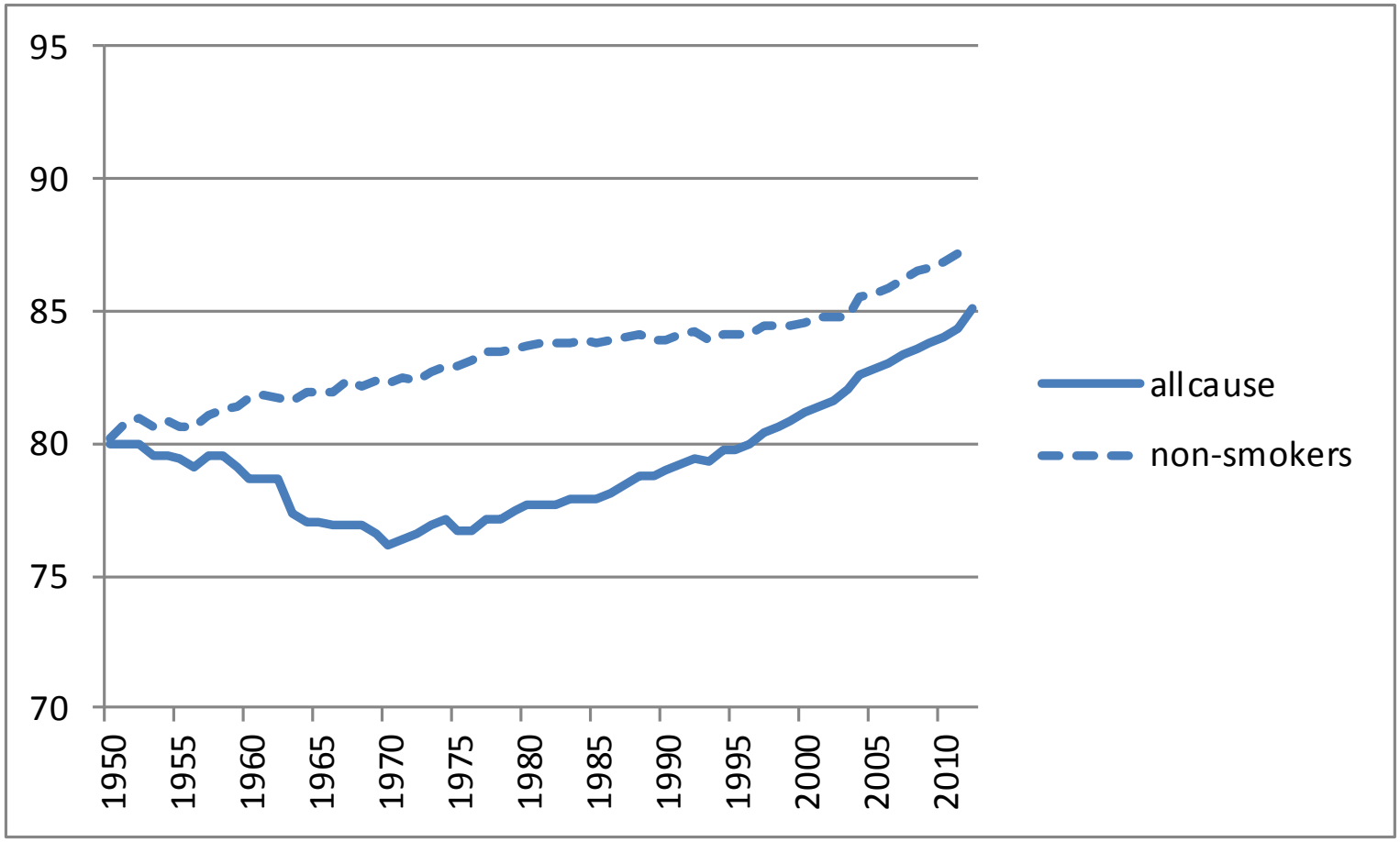
Fanny Janssen:

Impact of smoking on life expectancy

LONGEVITY DUTCH MEN



DUTCH MEN – MODAL AGE AT DYING



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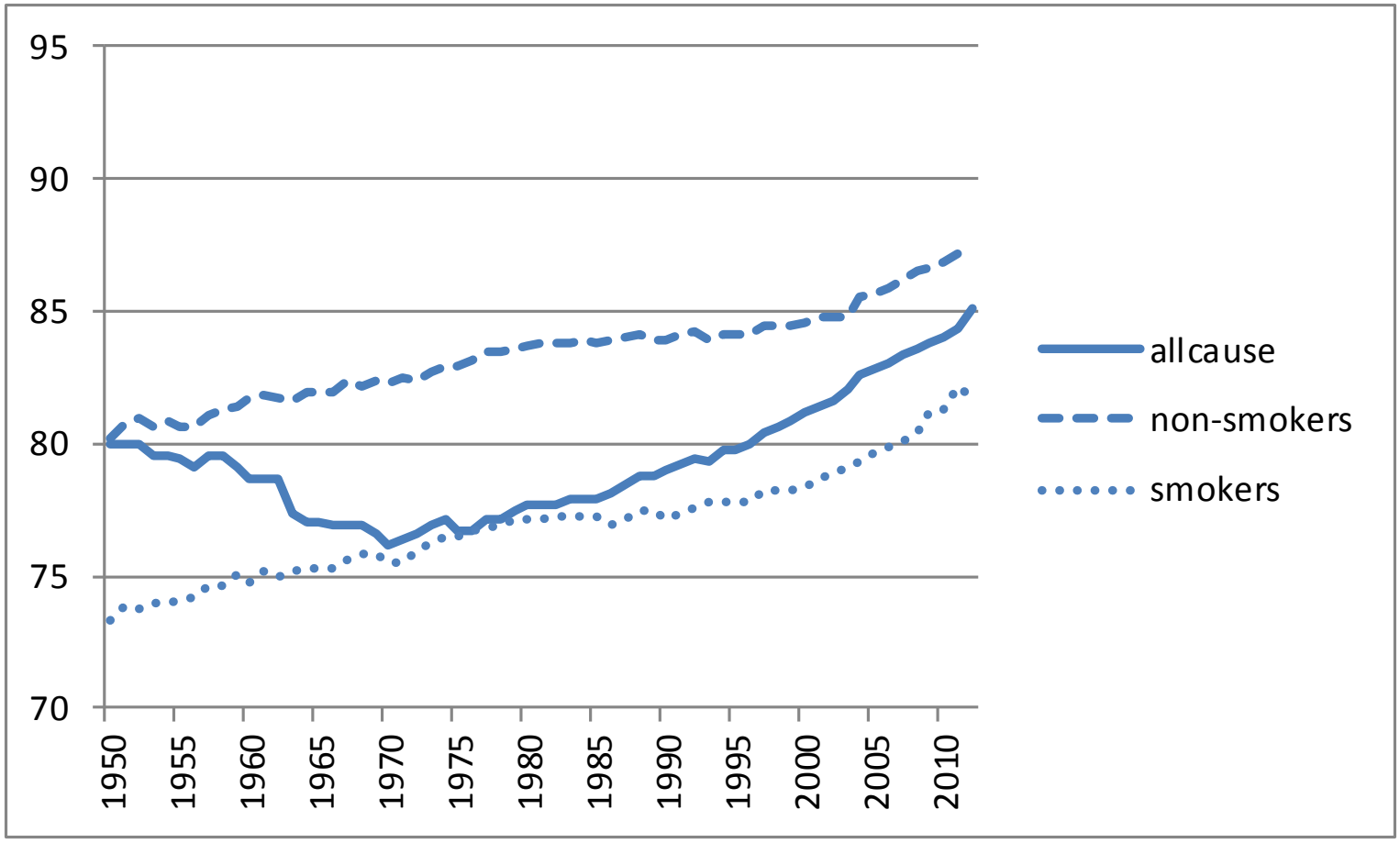
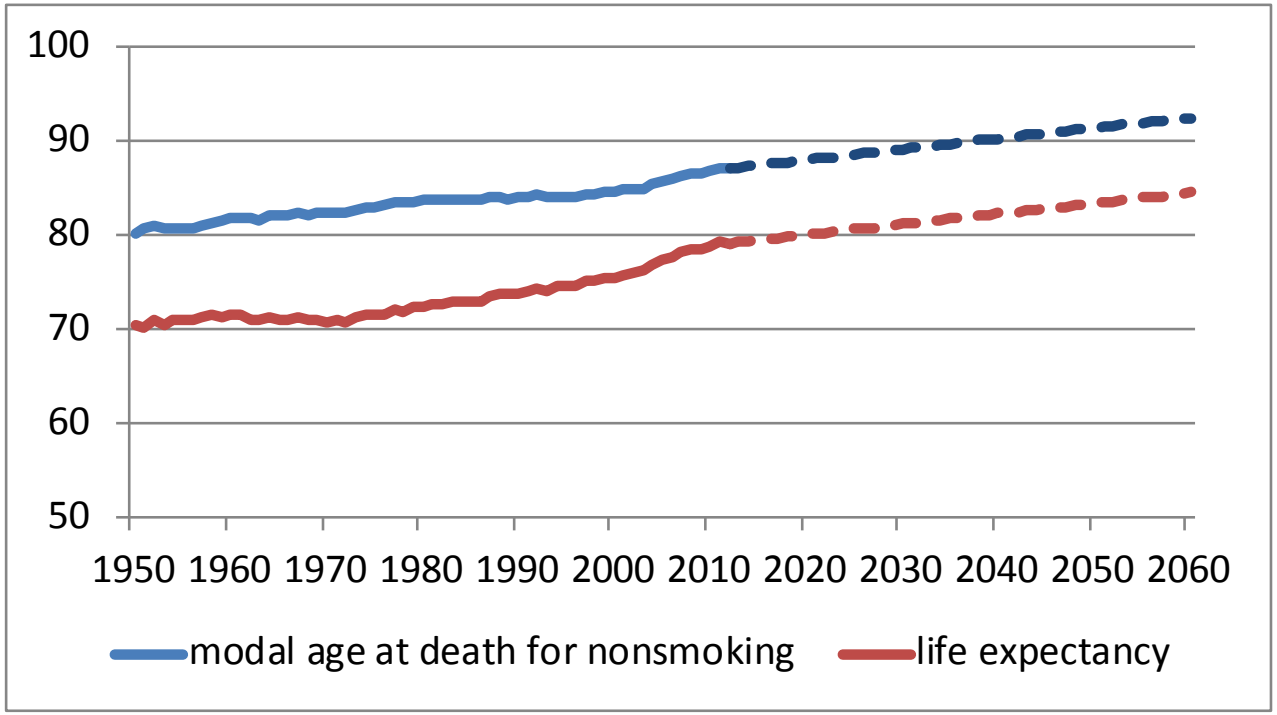


LONGEVITY

Projection life expectancy, Dutch men

Assume: delay, no compression



FUTURE PLANS

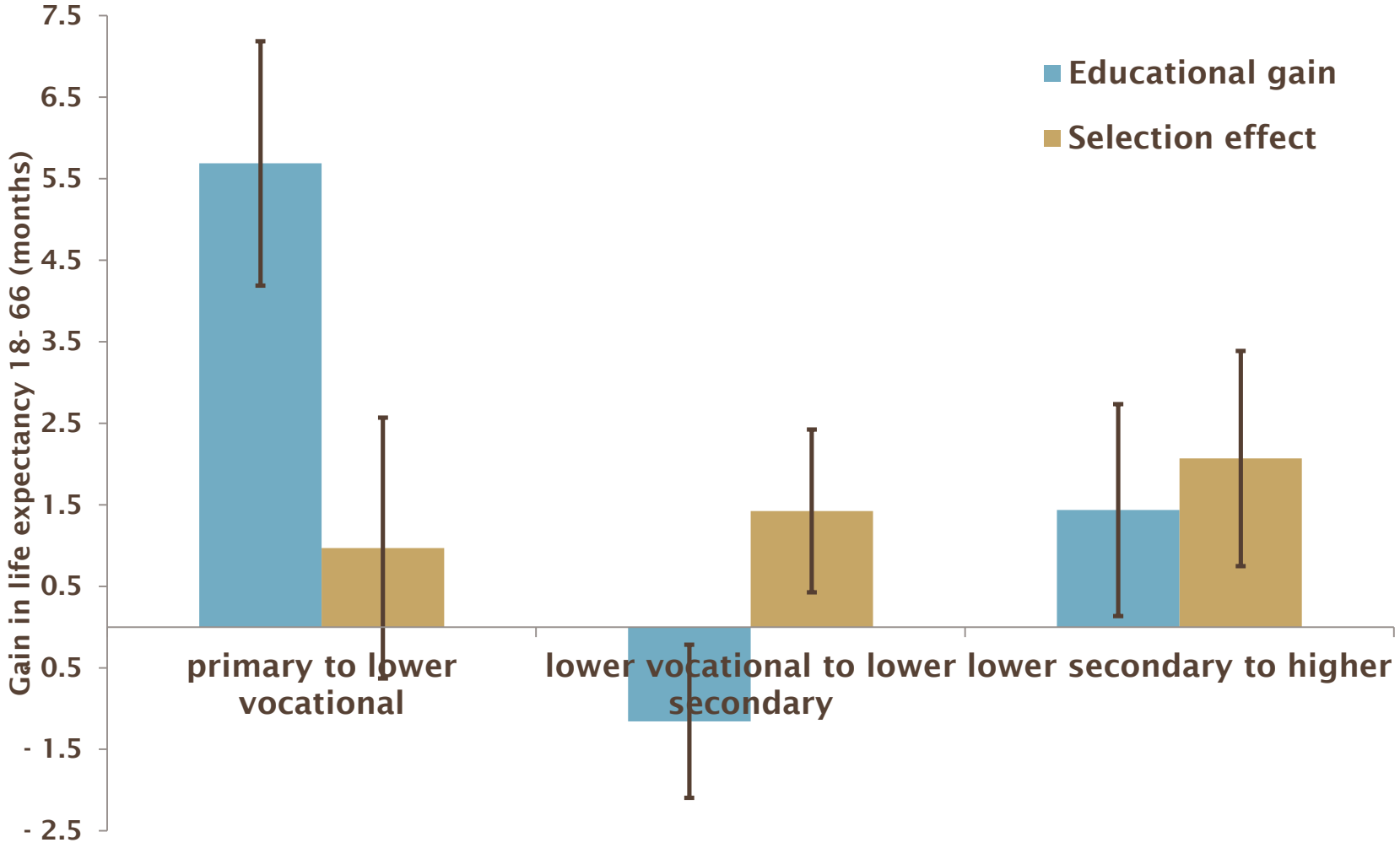
1) Assess impact of smoking, alcohol and obesity on mortality (VIDI)
2) Improve mortality projections by including lifestyle-related mortality (VIDI)
3) To examine socio- economic differences in the impact of lifestyle on mortality
4) To extend to developing countries

LONGEVITY

Govert Bijwaard:

Impact of education on life expectancy

EDUCATIONAL GAINS IN LIFE-EXPECTANCY

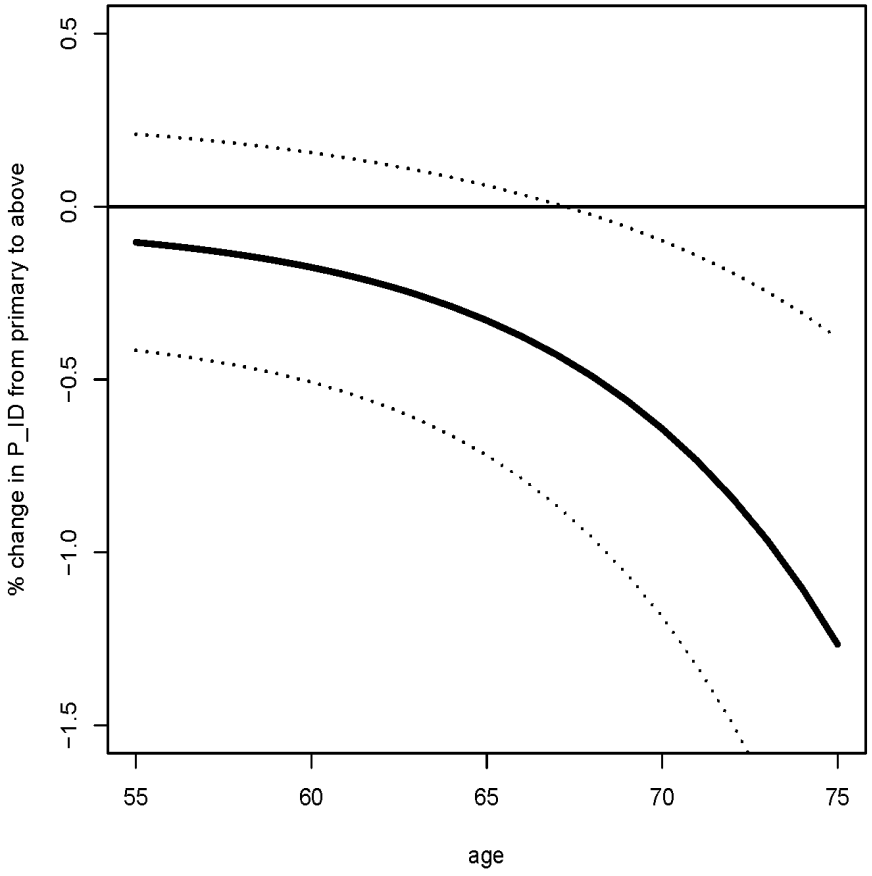


Source: Dutch military conscription data (born 1944-1947)

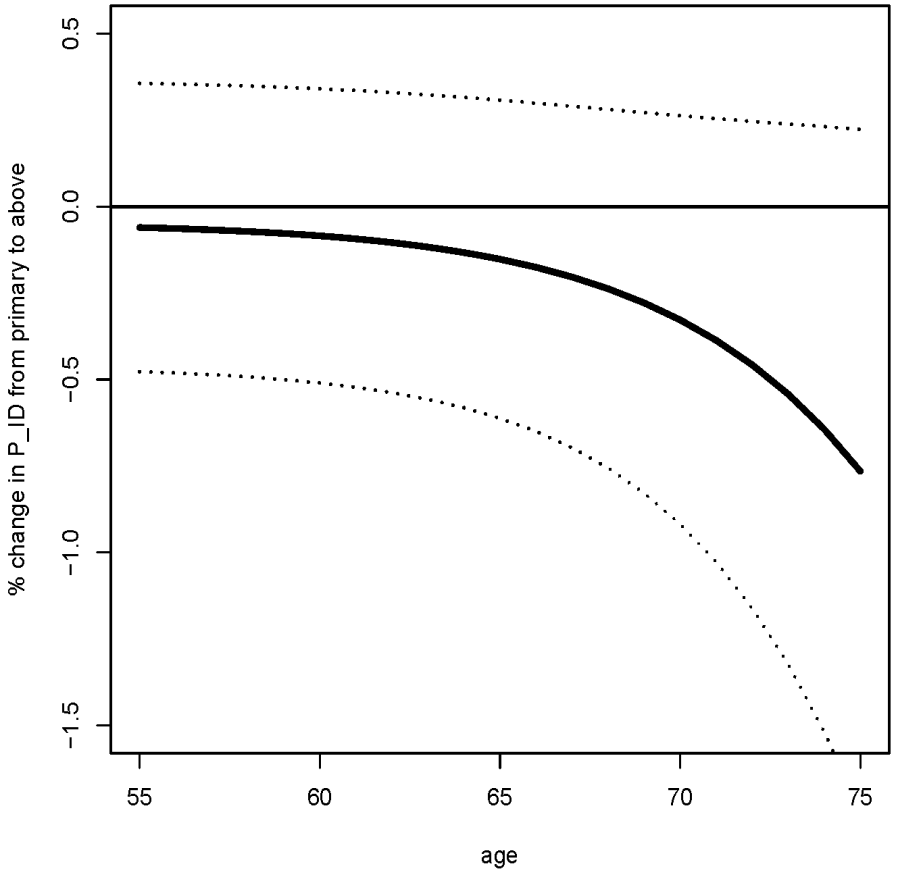
DECREASE OF PROBABILITY TO DIE WITHIN ONE YEAR AFTER HOSPITALIZATION

DOES INTELLIGENCE EXPLAIN EFFECT OF INCREASING EDUCATION?

Without intelligence

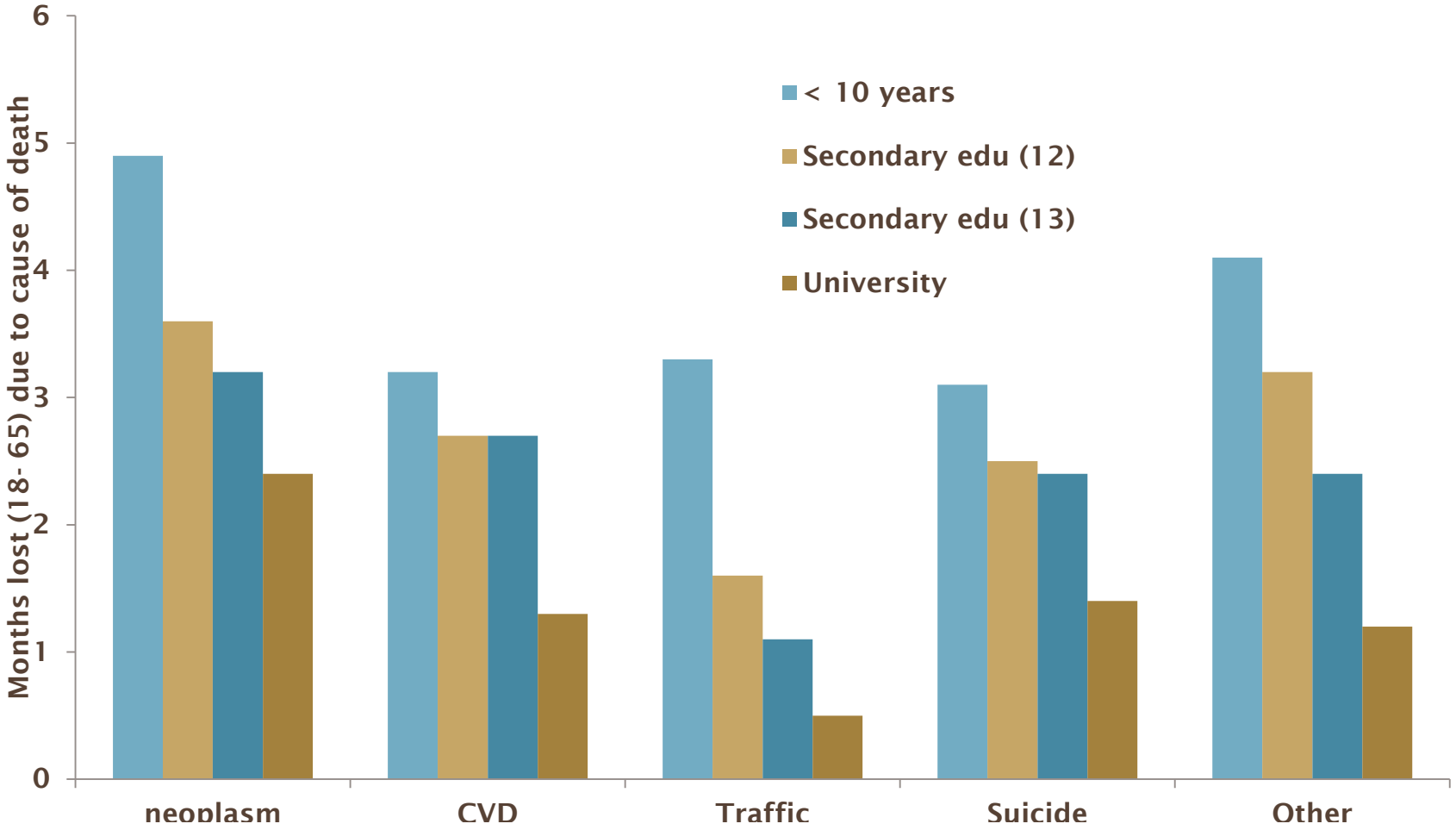


With intelligence



Source: Brabant data

EDUCATIONAL GAINS AND CAUSE OF DEATH

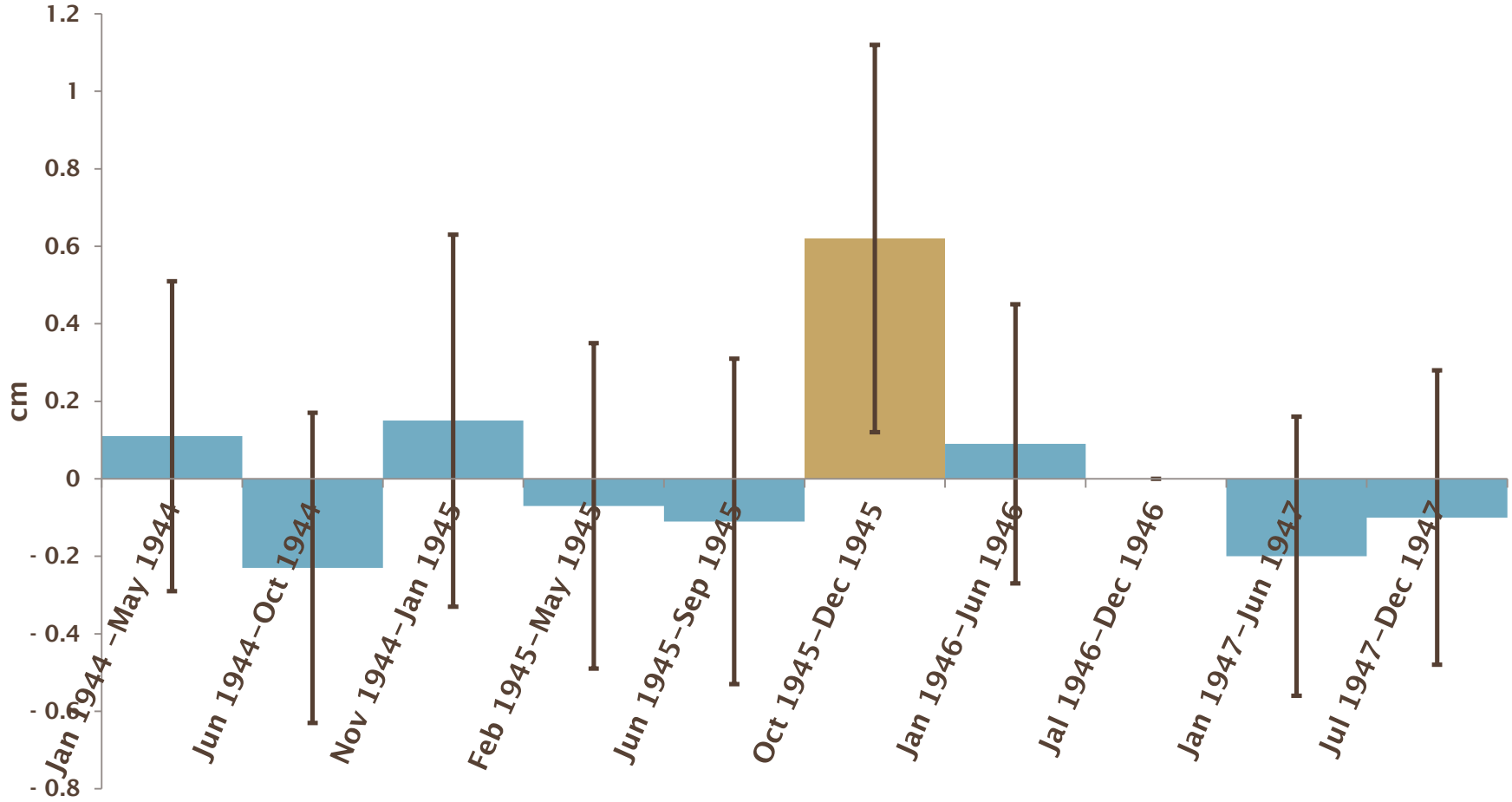


Source: Swedish conscription data (born 1951)

EARLY LIFE AND IMPACT ON LATER LIFE OUTCOMES

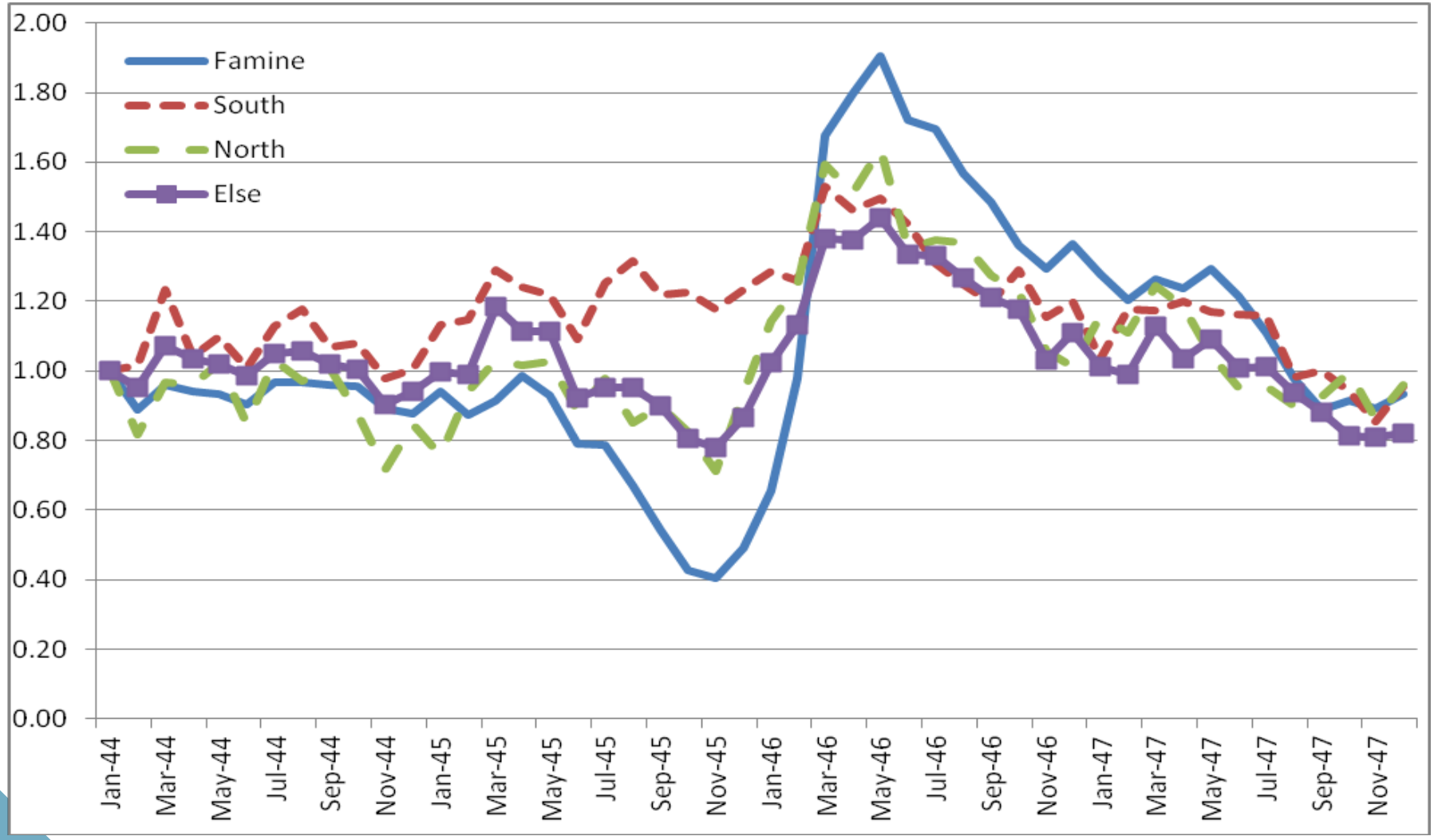
- **Impact of famine on height, weight (bmi), education and intelligence (FAMINE- 2)**
- **Impact of famine on socio- economic outcomes**
- **Home care use (together with RUG- FEB)**
- **Medication use**

COHORT EFFECT FAMINE ON HEIGHT



Source: Dutch military conscription data (born 1944-1947)

RELATIVE NUMBER OF BIRTHS



Michaël Boissonneault:
Impact of health on work

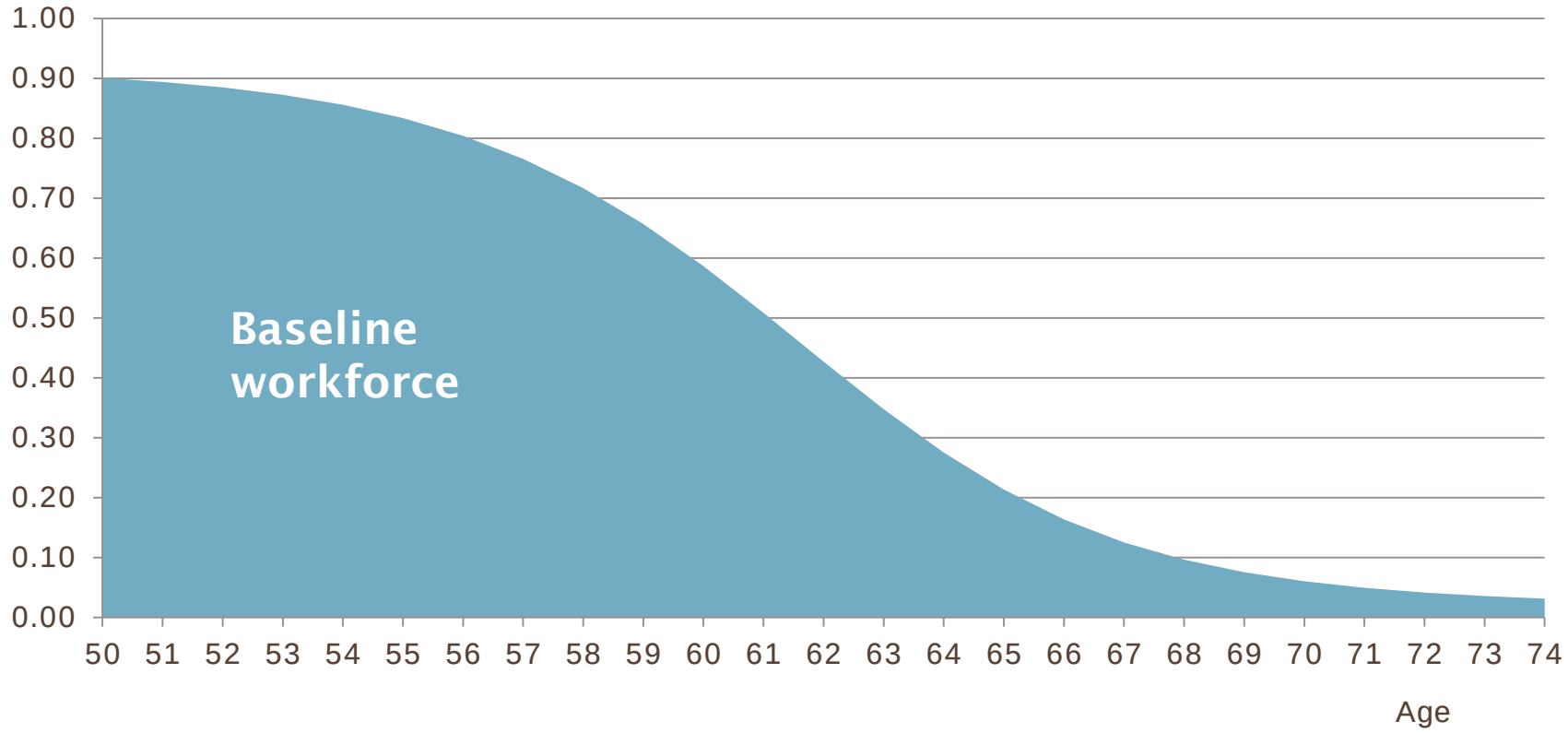
WILL OLDER PEOPLE BE HEALTHY ENOUGH TO HAVE LONGER ACTIVE LIVES?

We aim at modelling participation taking into account:

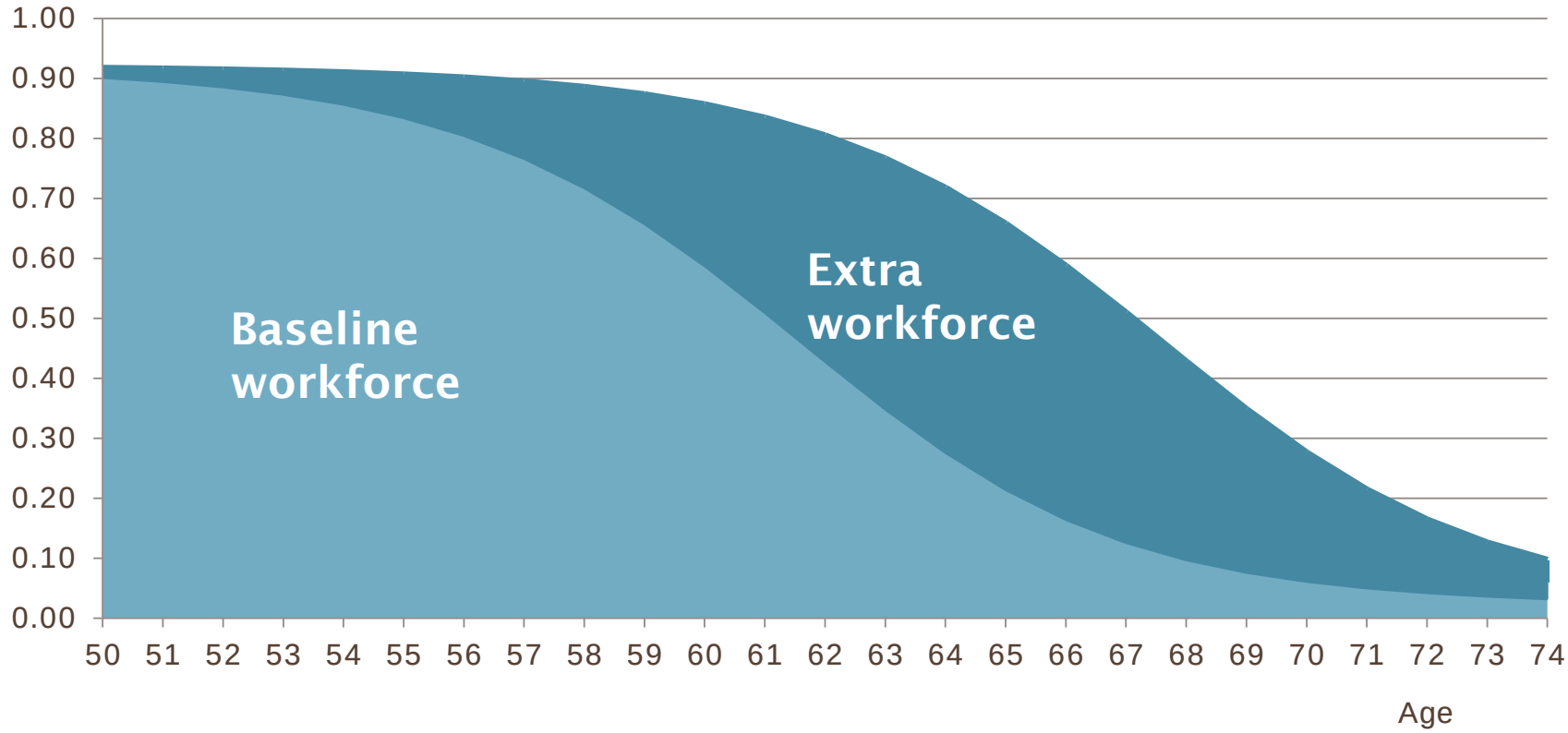
- **Changes in retirement behaviour (as induced by policy)**
- **The fact that older people more often have adverse health conditions that prevent them to work**

CHANGE IN LABOUR FORCE PARTICIPATION

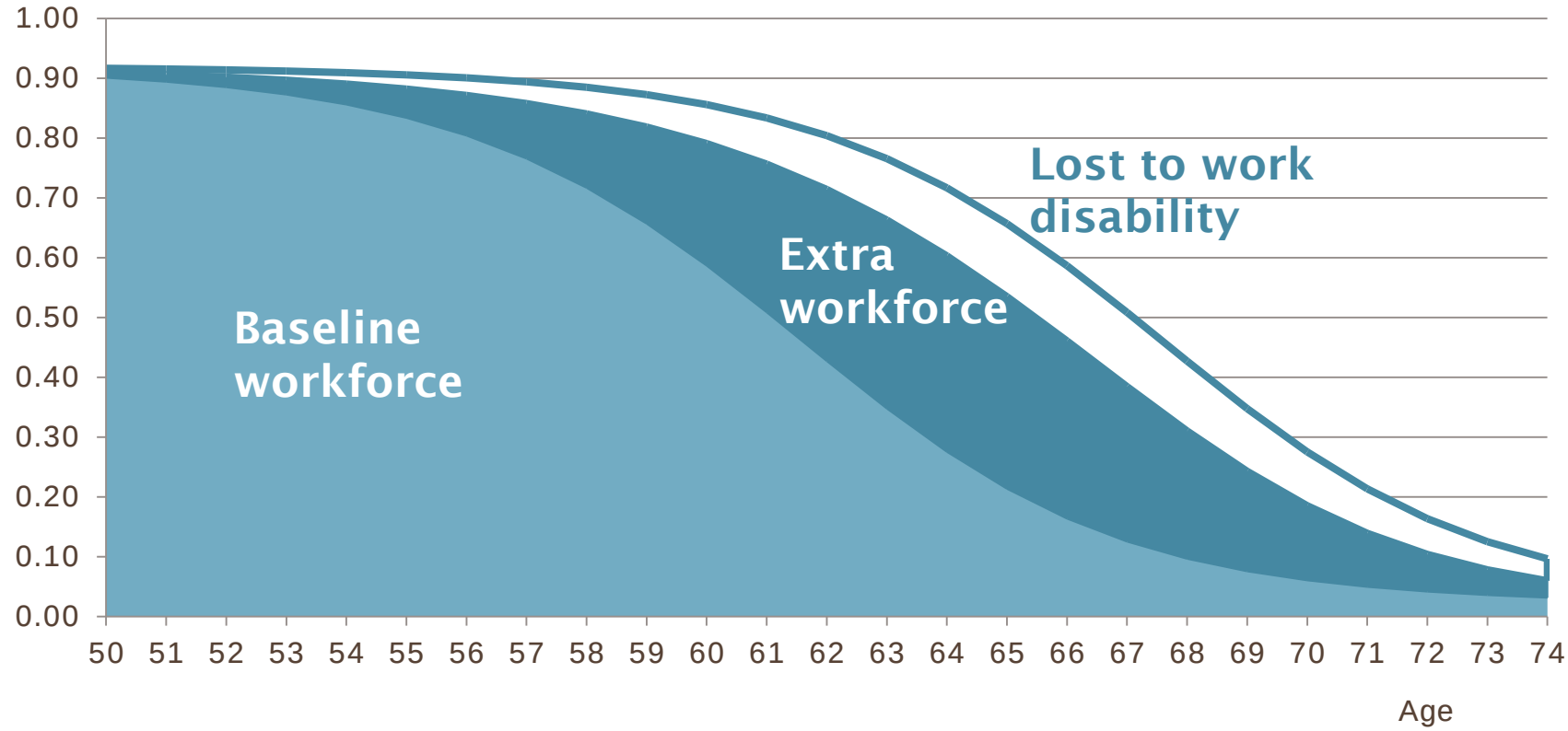
BASELINE



CHANGE IN LABOUR FORCE PARTICIPATION
EXTRA WORKFORCE

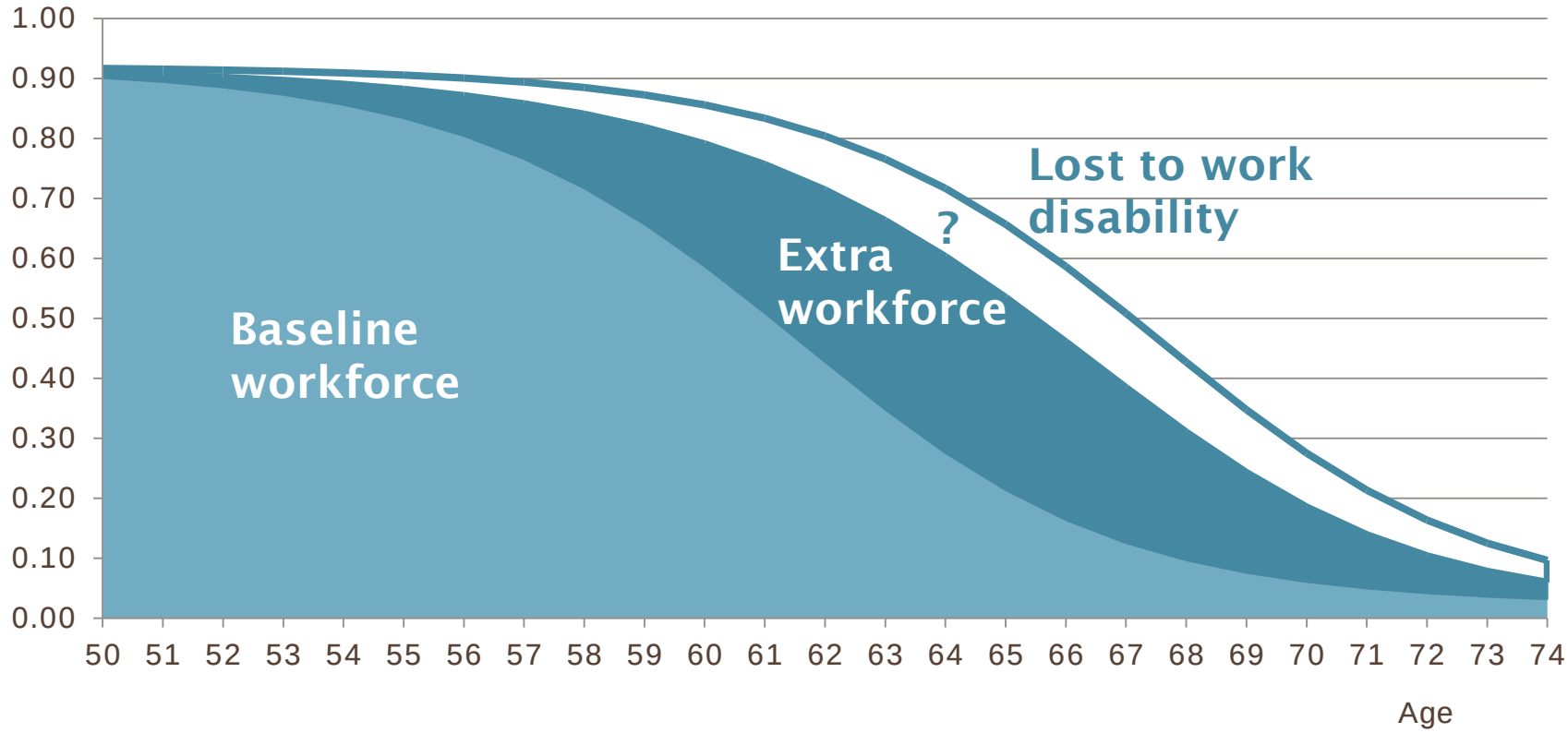


CHANGE IN LABOUR FORCE PARTICIPATION
LOST TO WORK DISABILITY



CHANGE IN LABOUR FORCE PARTICIPATION

LOST TO WORK DISABILITY: HOW MANY?



THE MODEL

Simple two terms model:

$$L_x = A_x P_x$$

A_x : Ability to work

- The proportion of people who are able to work

P_x: Propensity to work

- The proportion of people who actually work inside the population that is able to work

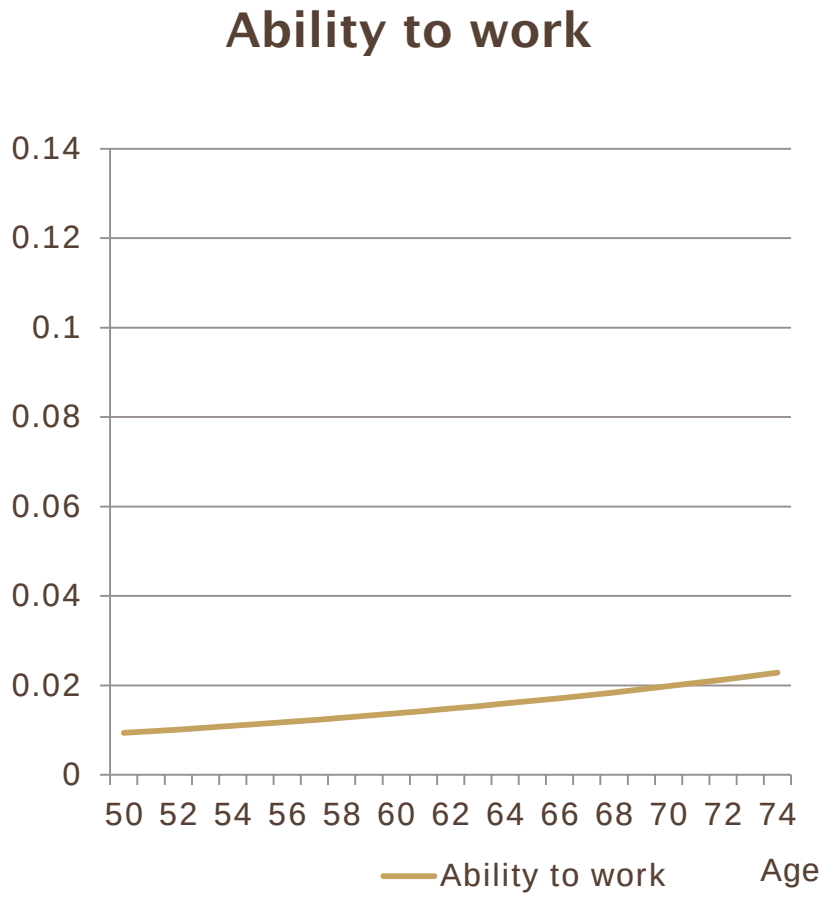
HOW TO ESTIMATE VALUES FOR THE FORMULA'S TERMS

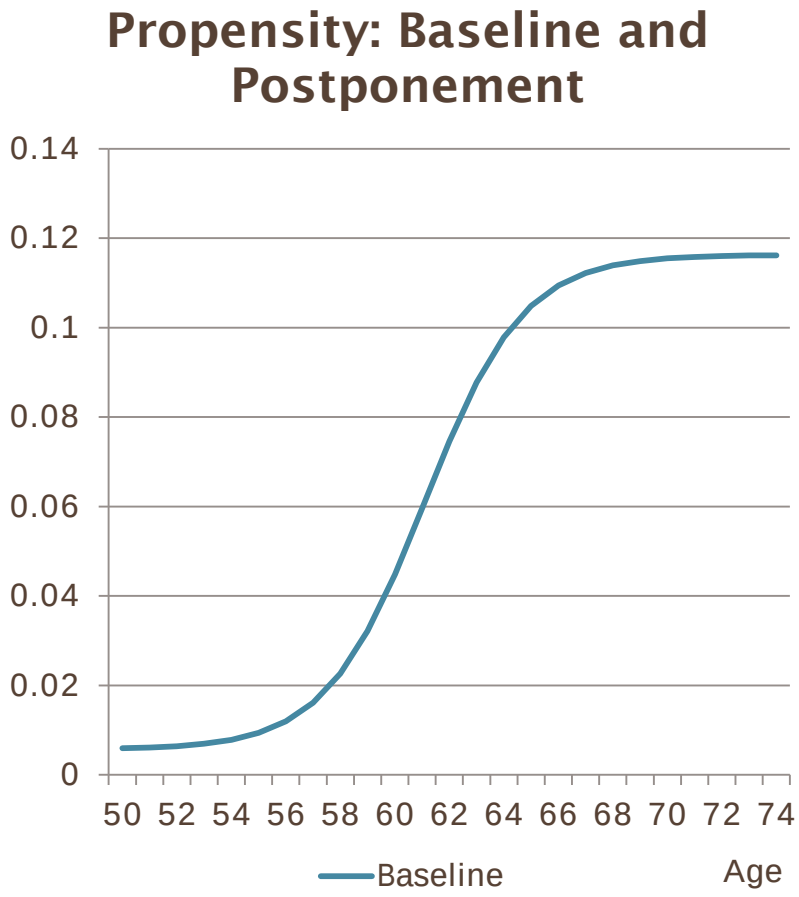
A_x: Ability to work is estimated based on retirement on grounds of poor health

P_x: Propensity to work is based on all non-health related retirements

Surveys contain information about why people retired (SHARE, HRS, different LFS's)

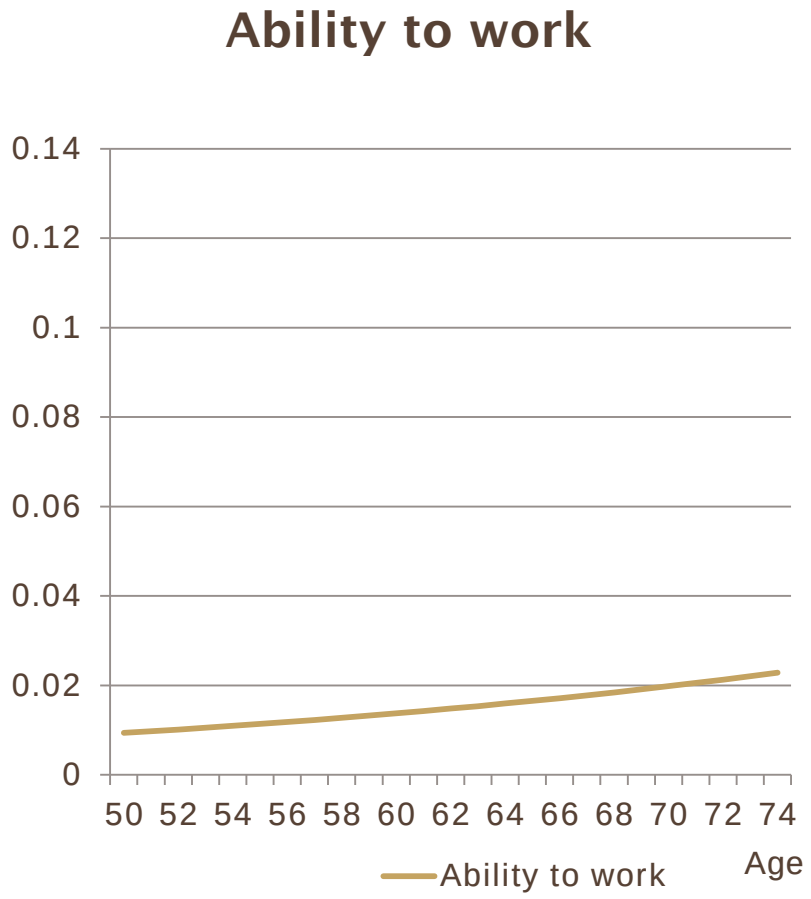
ESTIMATED VALUES

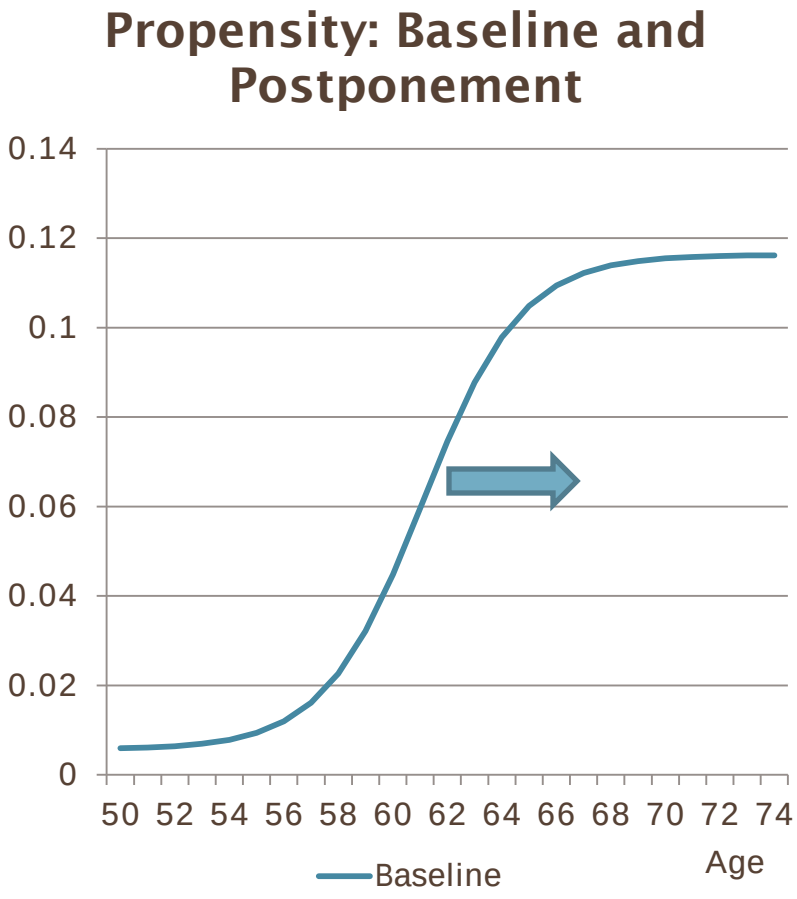




Source: HRS waves 2002-2012

ESTIMATED VALUES





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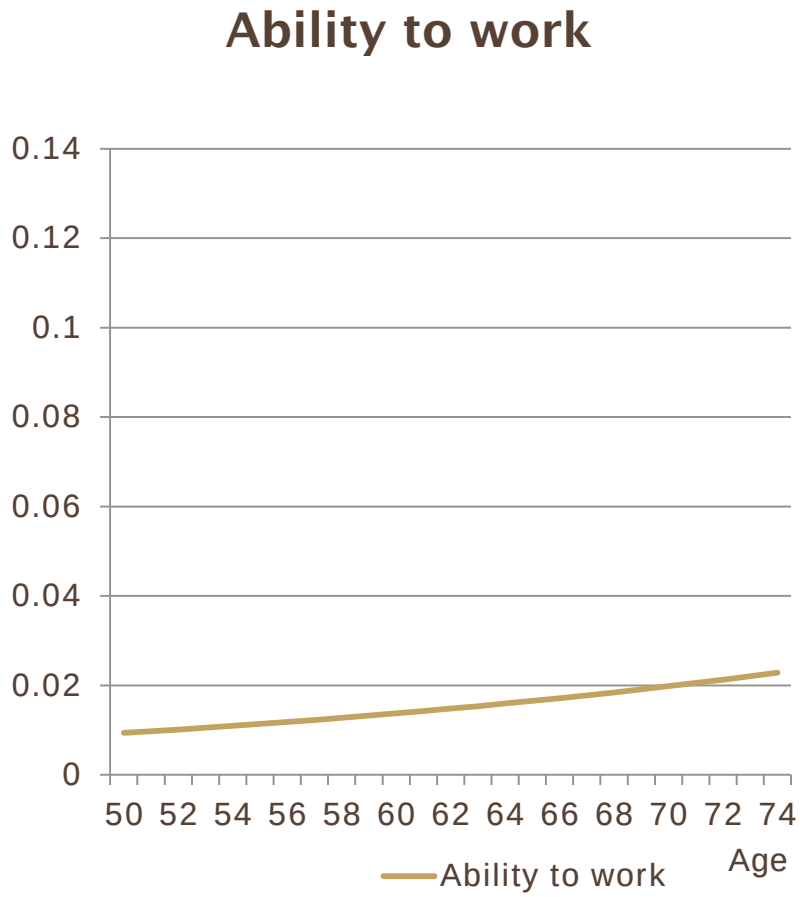
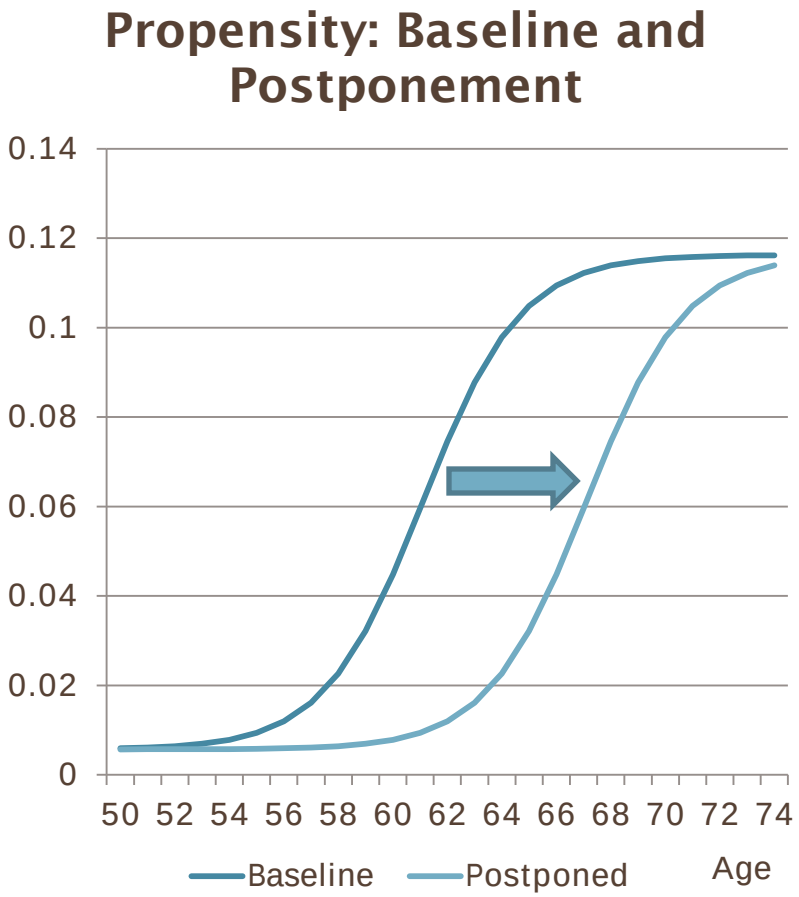
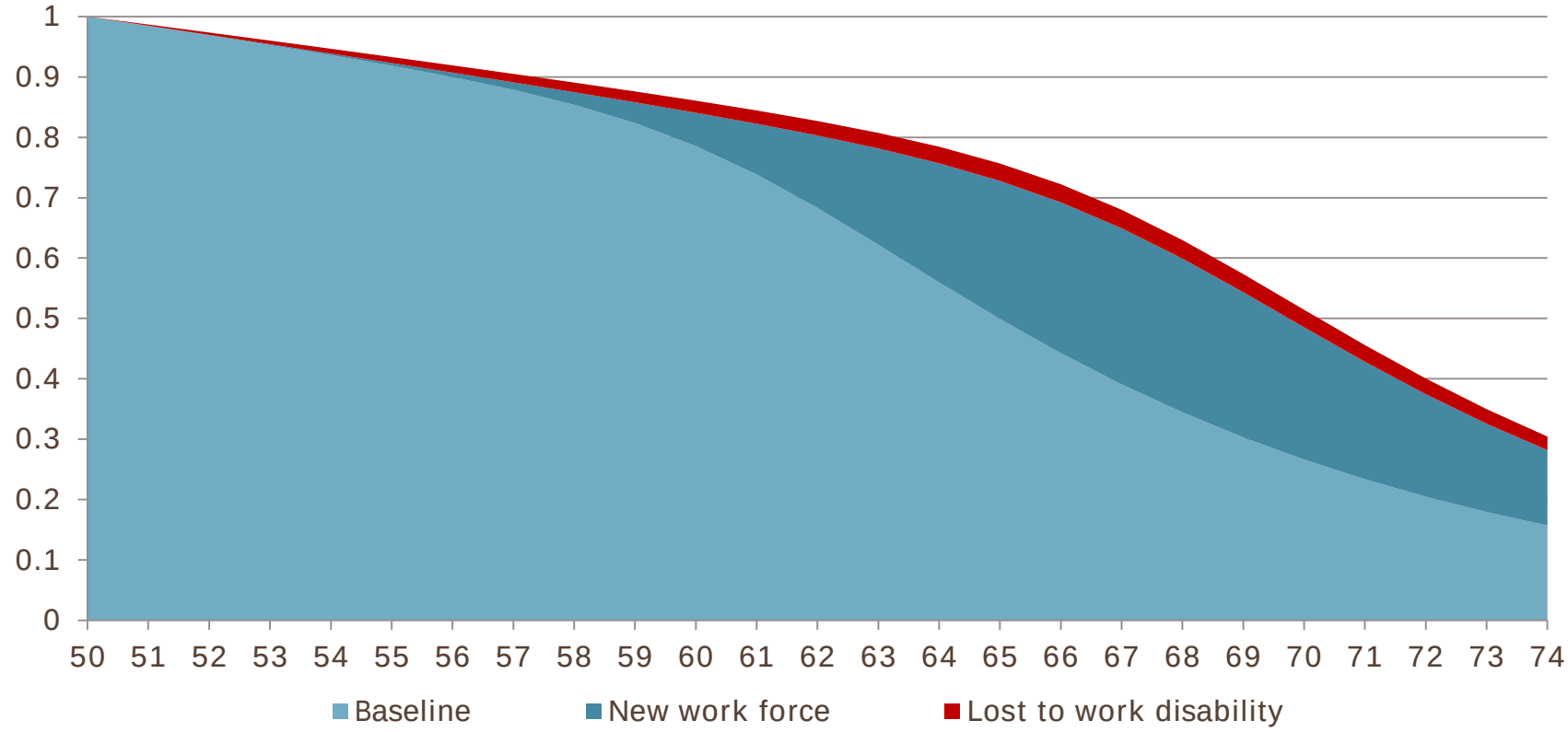




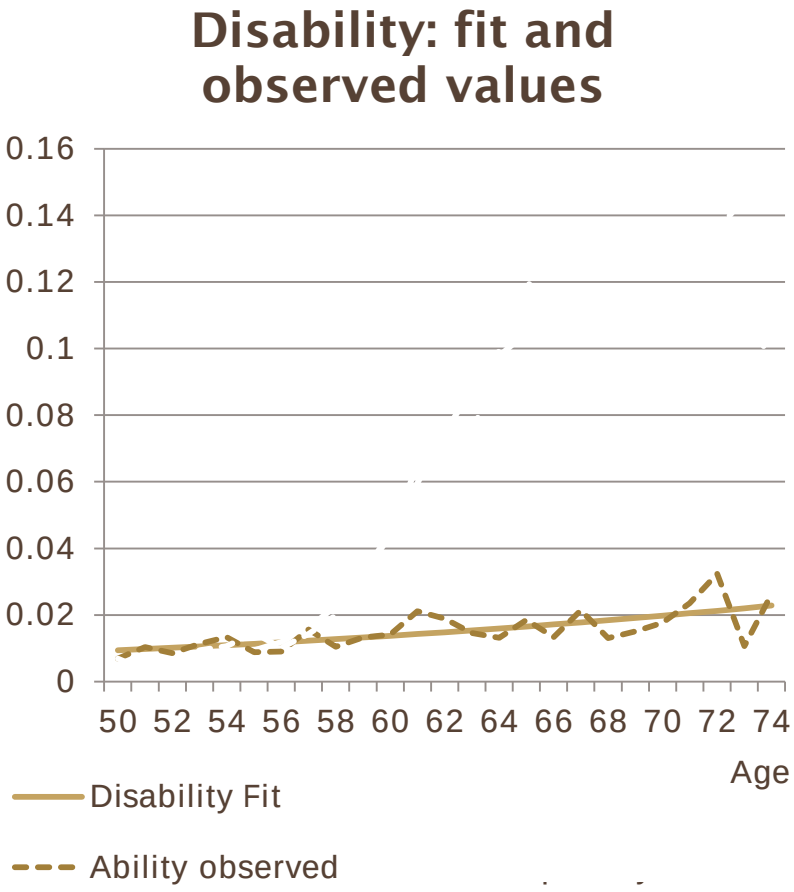
Source: HRS waves 2002-2012

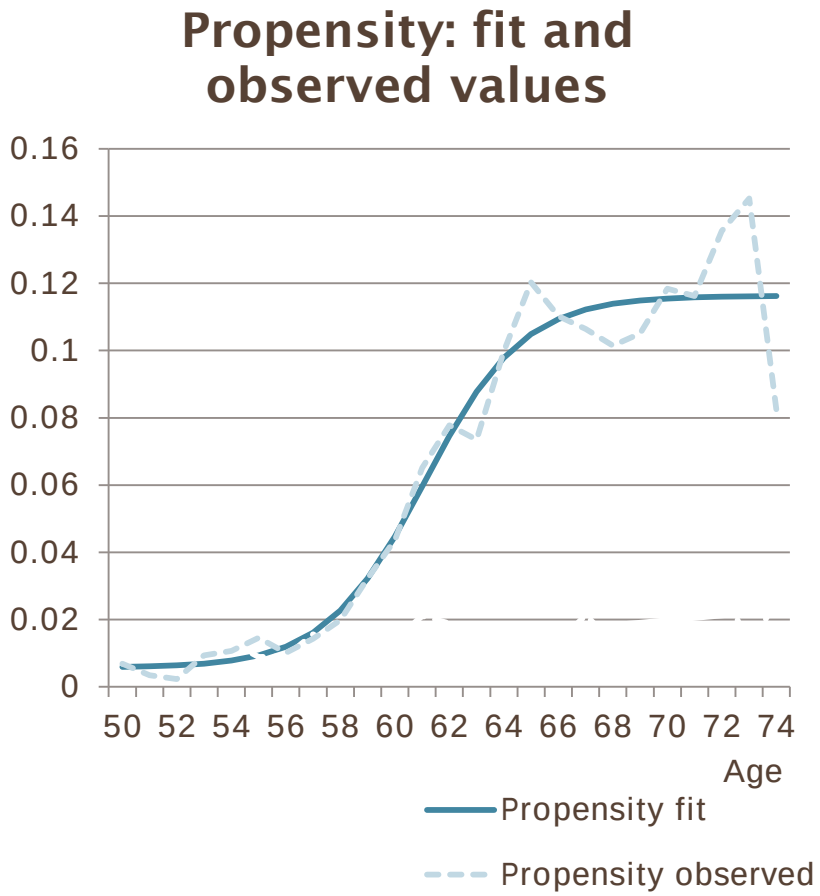
RESULTS: THE DECREASE WITH AGE IN ABILITY DOES NOT HAVE A BIG IMPACT ON POSTPONEMENT OF PARTICIPATION



Source: HRS waves 2002-2012

ABILITY AND PROPENSITY: FITTED AND OBSERVED VALUES





Source: HRS waves 2002-2012

AGEING

Ilya Kashnitsky:
Regional differences in ageing

WHY CONVERGENCE IN AGEING?

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Cohesion Policy (*success story* ?)

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Cohesion Policy (*success story ?*)

Ageing has a downwards effect on economic output

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Cohesion Policy (*success story* ?)

Ageing has a downwards effect on economic output

Measure variable is Working Ratio
(*working- to- non- working- age ratio*,
inverse of Dependency Ratio)

WHY CONVERGENCE IN AGEING?

Cohesion Policy (*success story ?*)

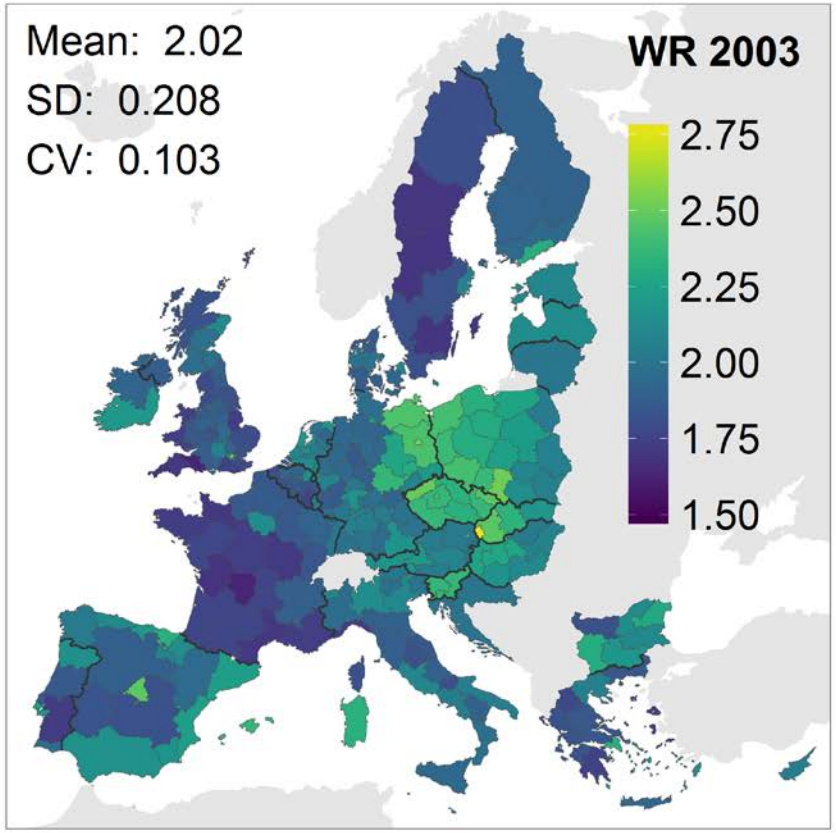
Ageing has a downwards effect on economic output

Measure variable is Working Ratio
(*working- to- non- working- age ratio*,
inverse of Dependency Ratio)

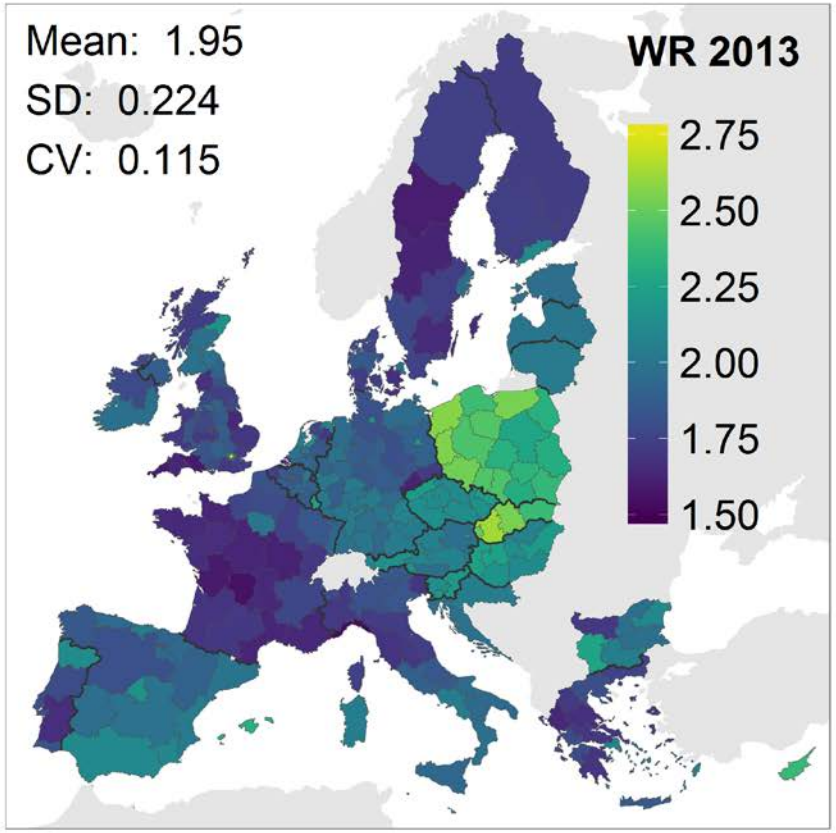
Sigma- convergence VS beta- convergence

NO SIGMA CONVERGENCE

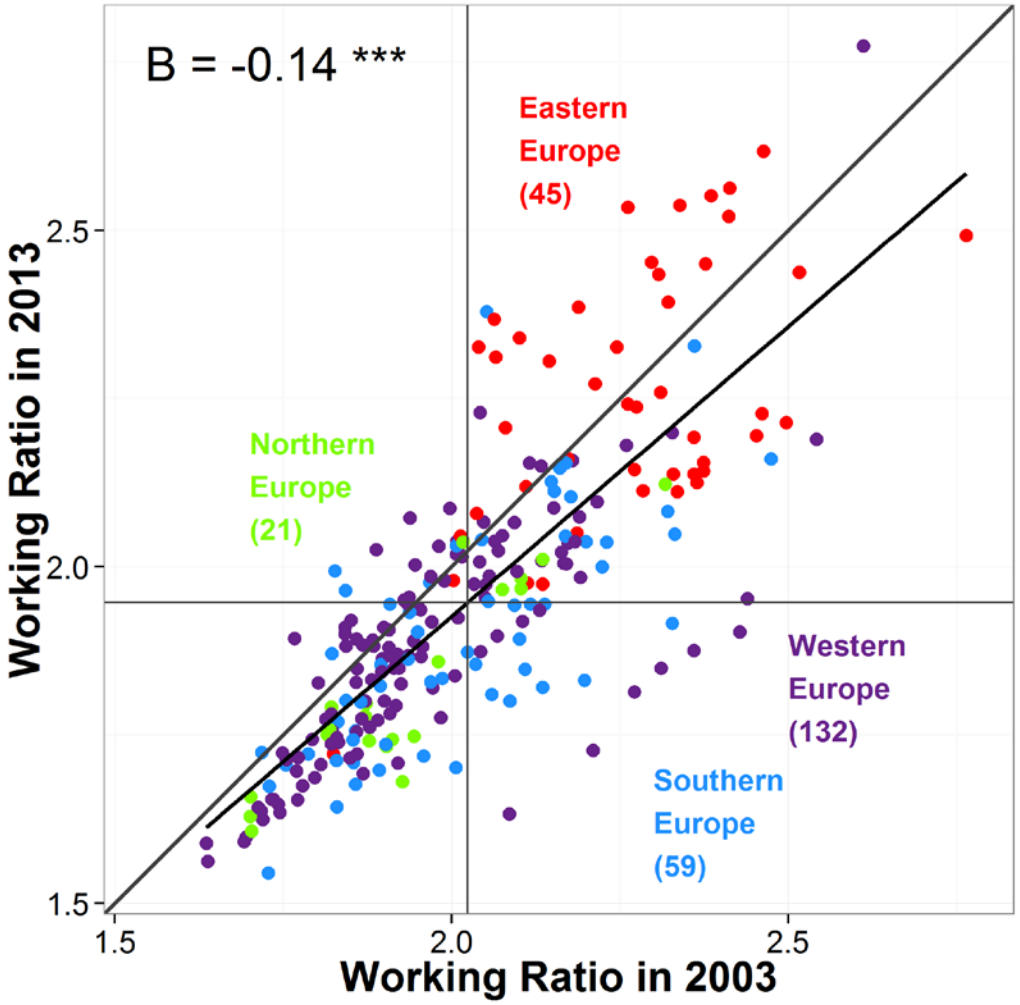
2003

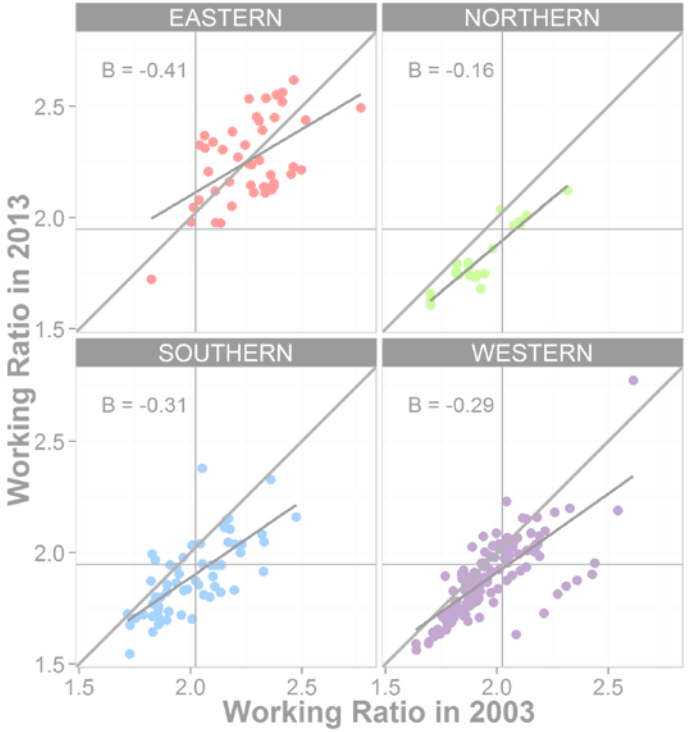


2013

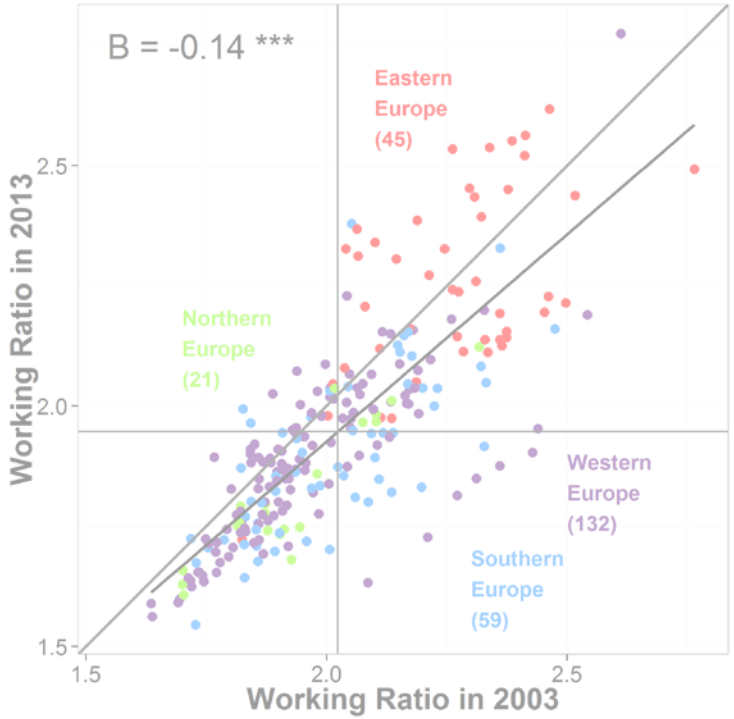


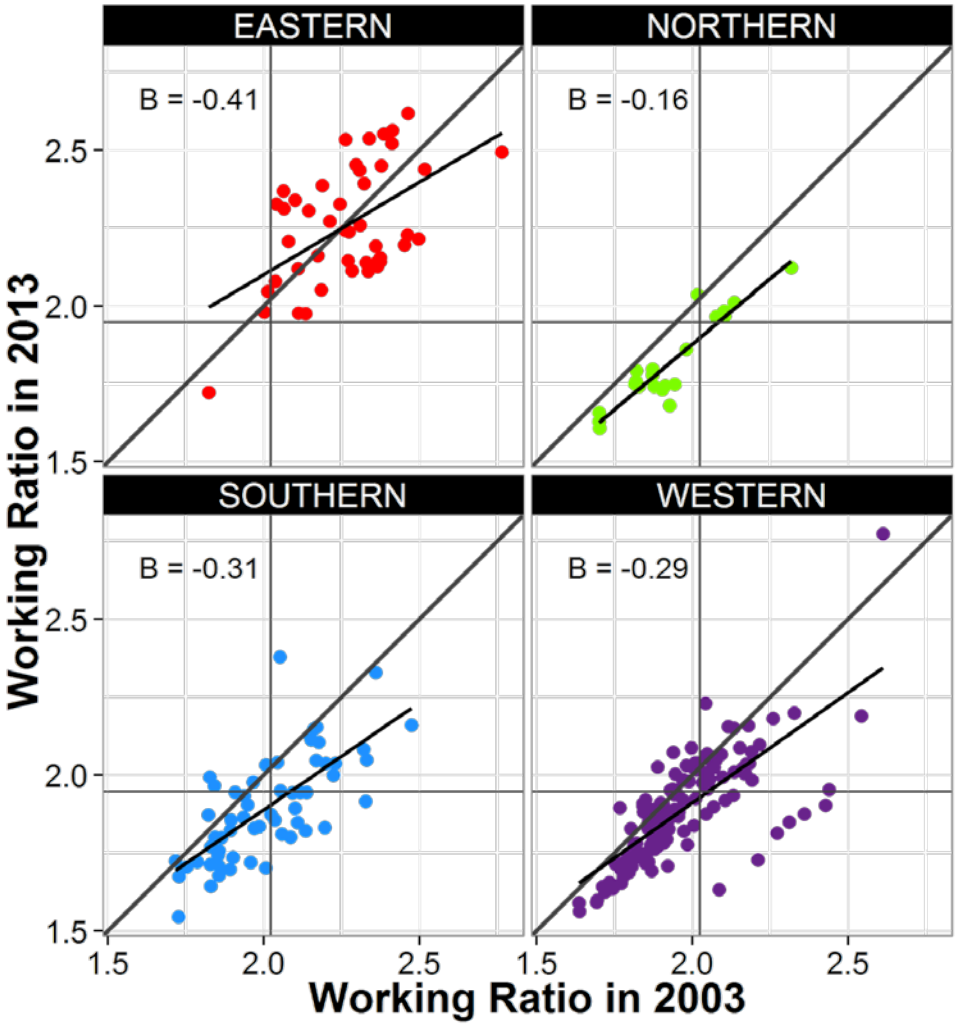
BETA CONVERGENCE





CLUB CONVERGENCE

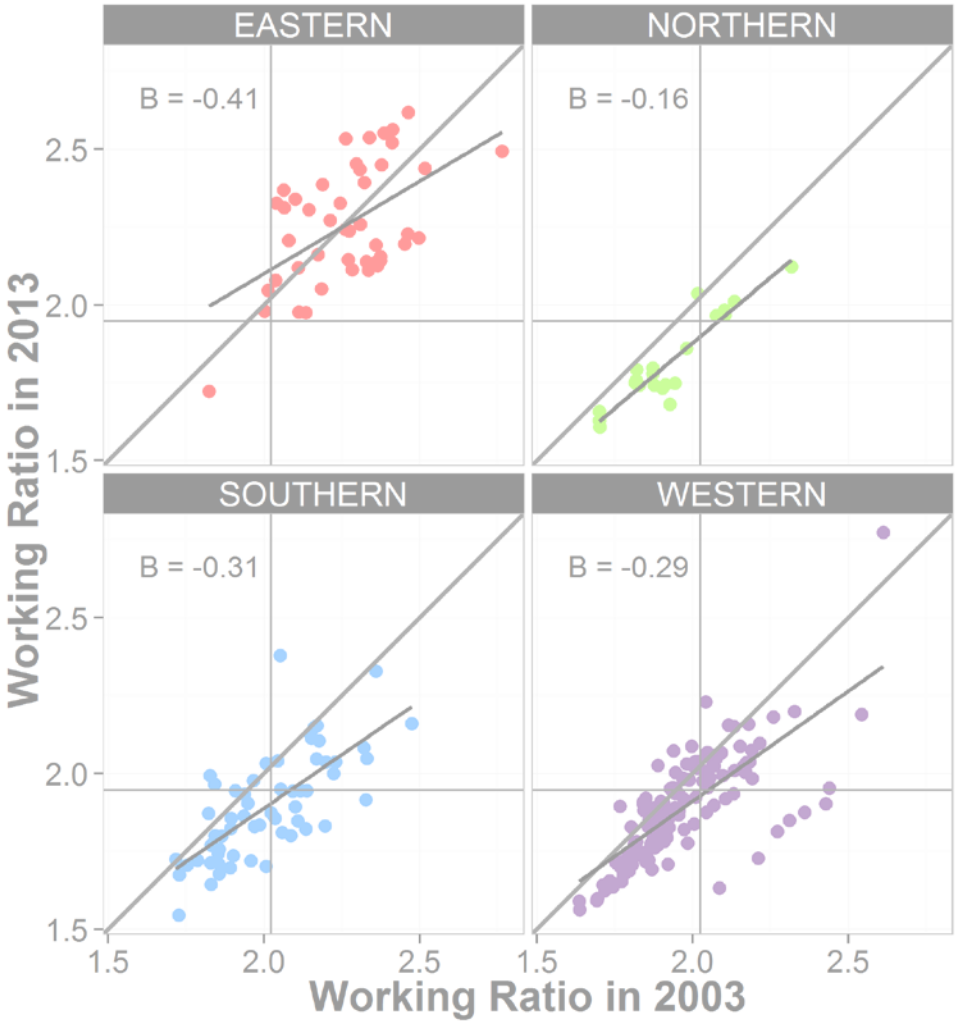




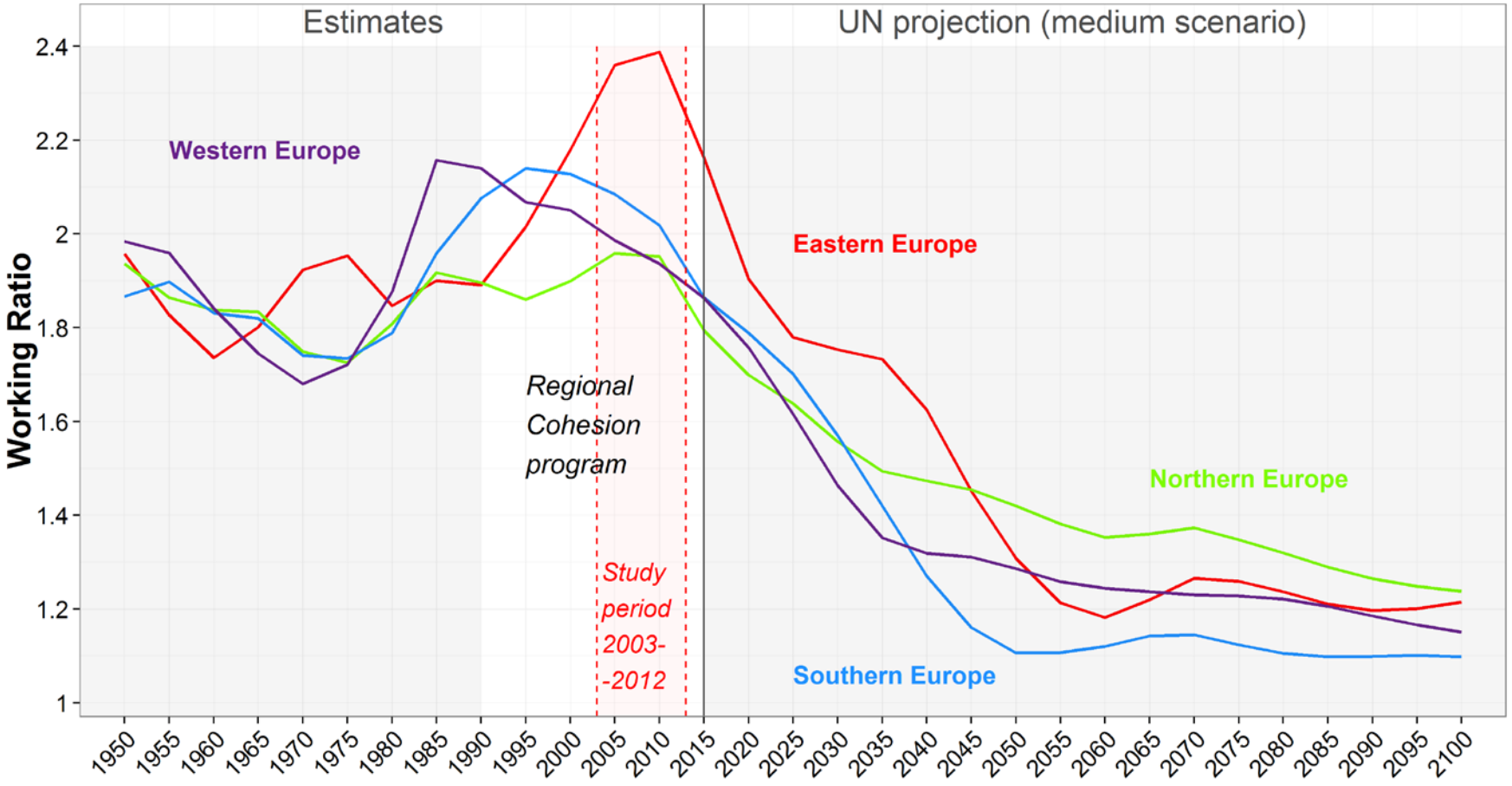
CLUB CONVERGENCE

	Europe, global	Europe, conditional
(Intercept)	0.20 (0.08)*	0.53 (0.09)***
Initial WR	-0.14 (0.04)***	-0.31 (0.04)***
Western (ref)		NA
Eastern		0.16 (0.02)***
Northern		-0.04 (0.03)
Southern		-0.02 (0.02)
R^2	0.04	0.22
Adj. R^2	0.04	0.21
Num. obs.	257	257
RMSE	0.13	0.12

***p < 0.001, **p < 0.01, *p < 0.05; standard errors in parenthesis



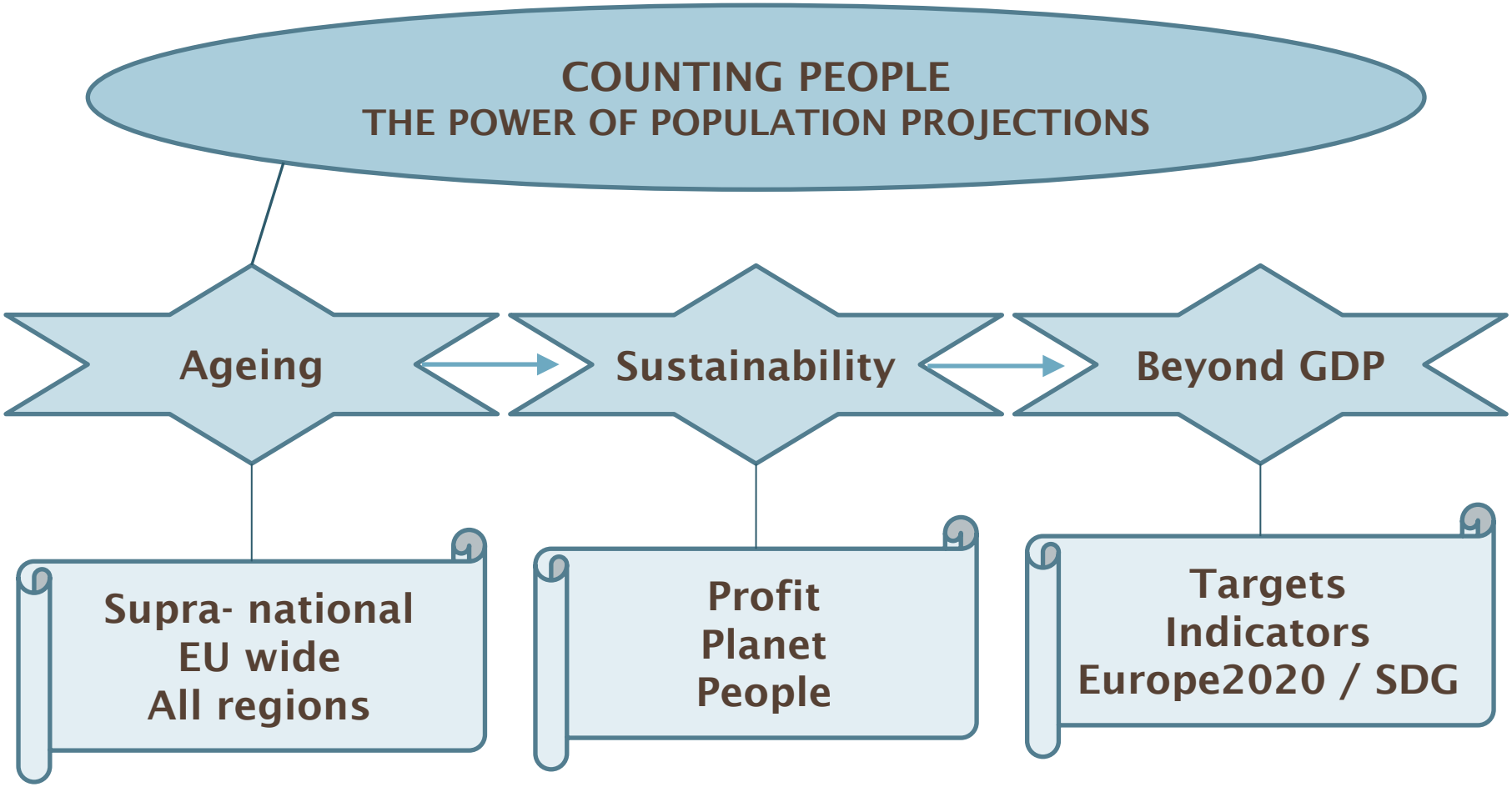
LONGER PERSPECTIVE



AGEING

Nicole van der Gaag:
Ageing and sustainability

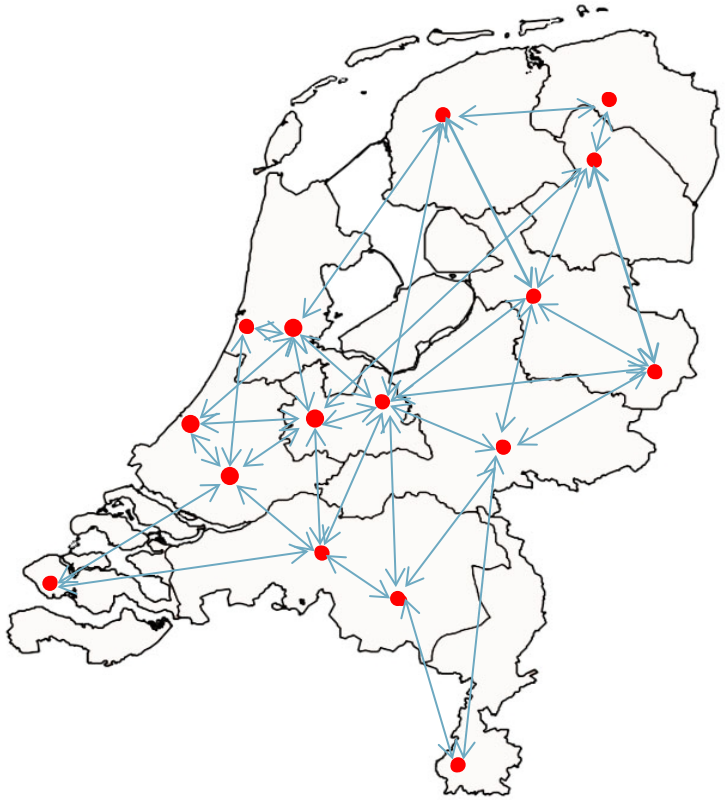
AGEING AND POPULATION PROJECTIONS



SUSTAINABLE POPULATION DISTRIBUTION ?

Minister Plasterk (Ministry of the Interior and Kingdom relations)

Netherlands:
One polycentric city



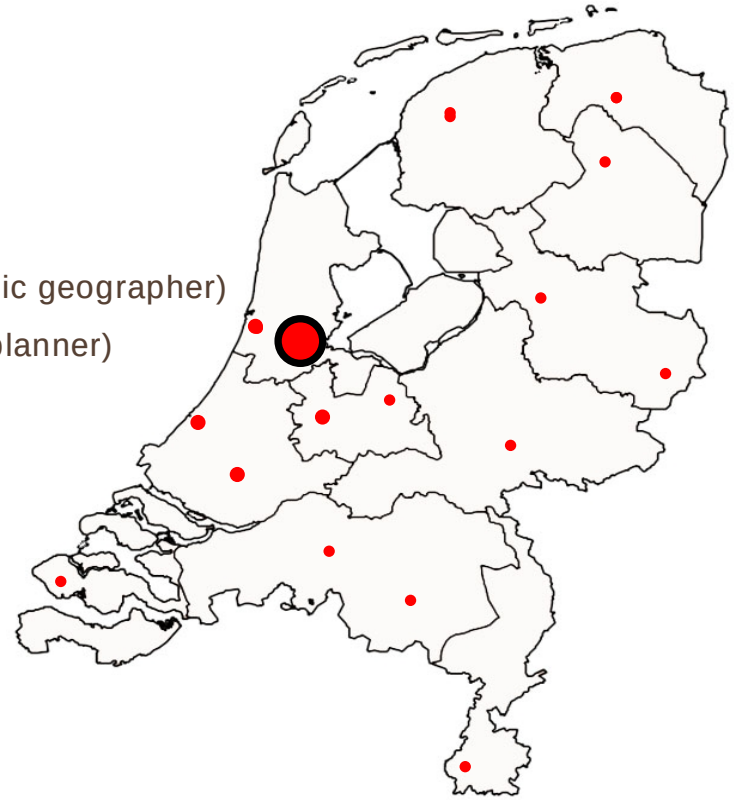
SUSTAINABLE POPULATION DISTRIBUTION ?

Minister Plasterk (Ministry of the Interior and Kingdom relations)

Netherlands:
One polycentric city

Frank van Oort (Economic geographer)
and Zef Hemel (Spatial planner)

Amsterdam:
2 million inhabitants



SUSTAINABLE POPULATION DISTRIBUTION ?

Minister Plasterk (Ministry of the Interior and Kingdom relations)

Netherlands:
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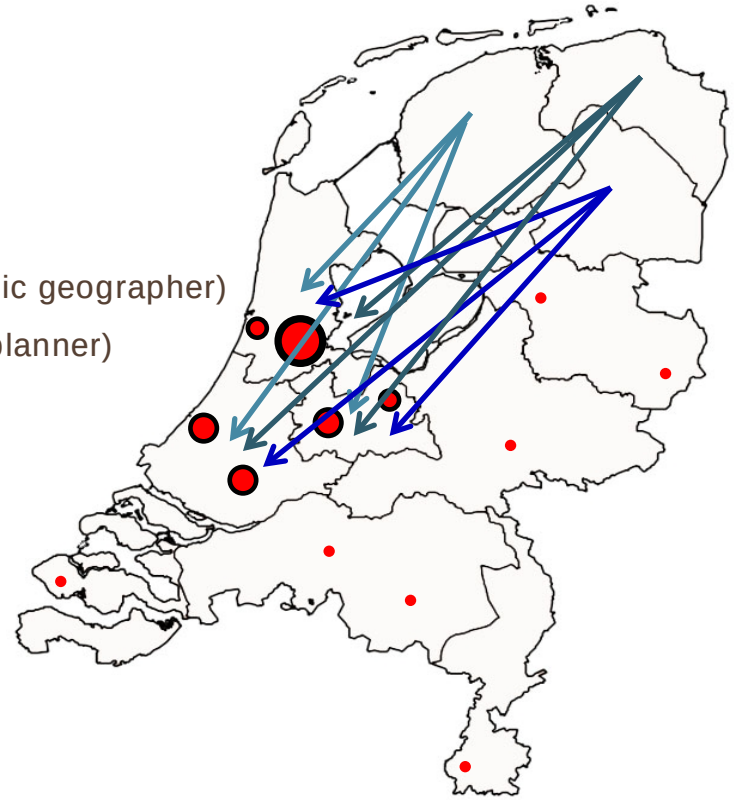
and Zef Hemel (Spatial planner)

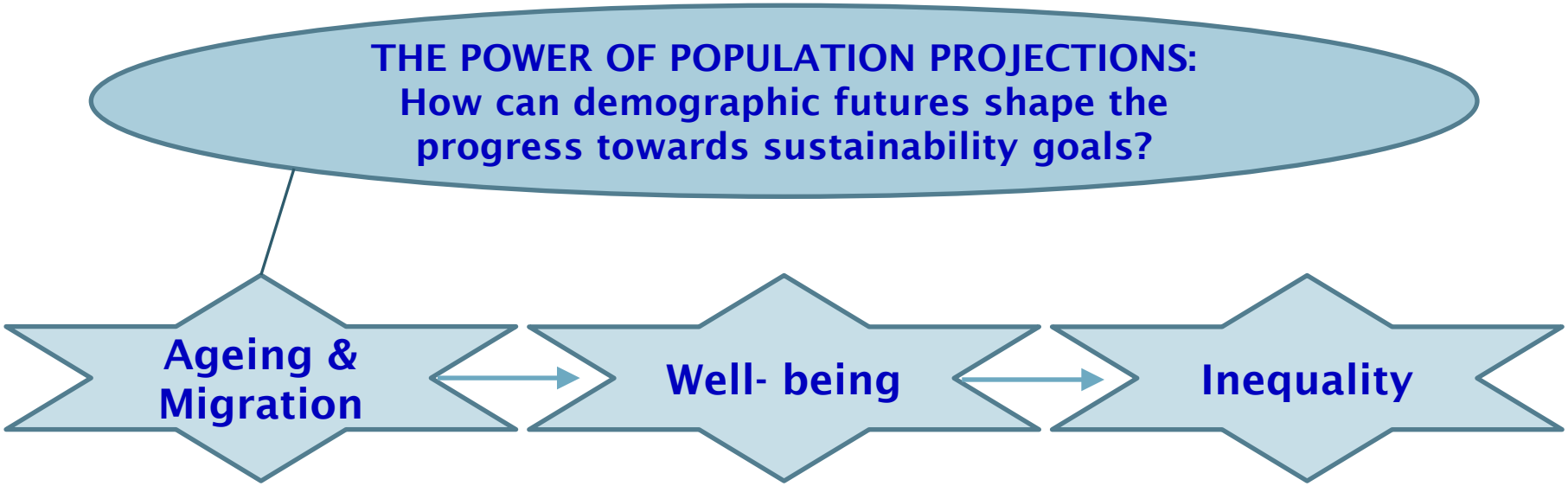
Amsterdam:
2 million inhabitants

Heleen Mees (Economist /Legal expert)

Northern provinces:
Move to the Randstad



AGEING, SUSTAINABILITY & PROJECTIONS



This research may fit into the RUG Research Priority Sustainable Society and may be linked to the tWIST Programme (Towards Wellbeing, Innovation and Spatial Transformation)

thank you

Joop de Beer
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Ilya Kashnitsky
Nicole van der Gaag

NIDI is an institute of the Royal Netherlands Academy of Arts and Sciences KNAW and is affliated to the University of Groningen
www.nidi.nl

KONINKLIJKE NEDERLANDSE AKADEMIE VAN WETENSCHAPPEN

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