



Forecasting Disability

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Three causes of dynamics in disability

- “Ageing societies”: Progression of large birth cohorts, followed by smaller birth cohorts (fertility decline)
- “Ageing individuals”: Life extension of elderly, at the high end of the life course.
- Changes in risk factors
 - Smoking kills, obesity disables

Aim of WP 2

- To forecast the change in numbers of disabled elderly in a restricted set of scenario's.
 - Demographic change
 - Effects of life extension
 - Effects of risk factors smoking and obesity

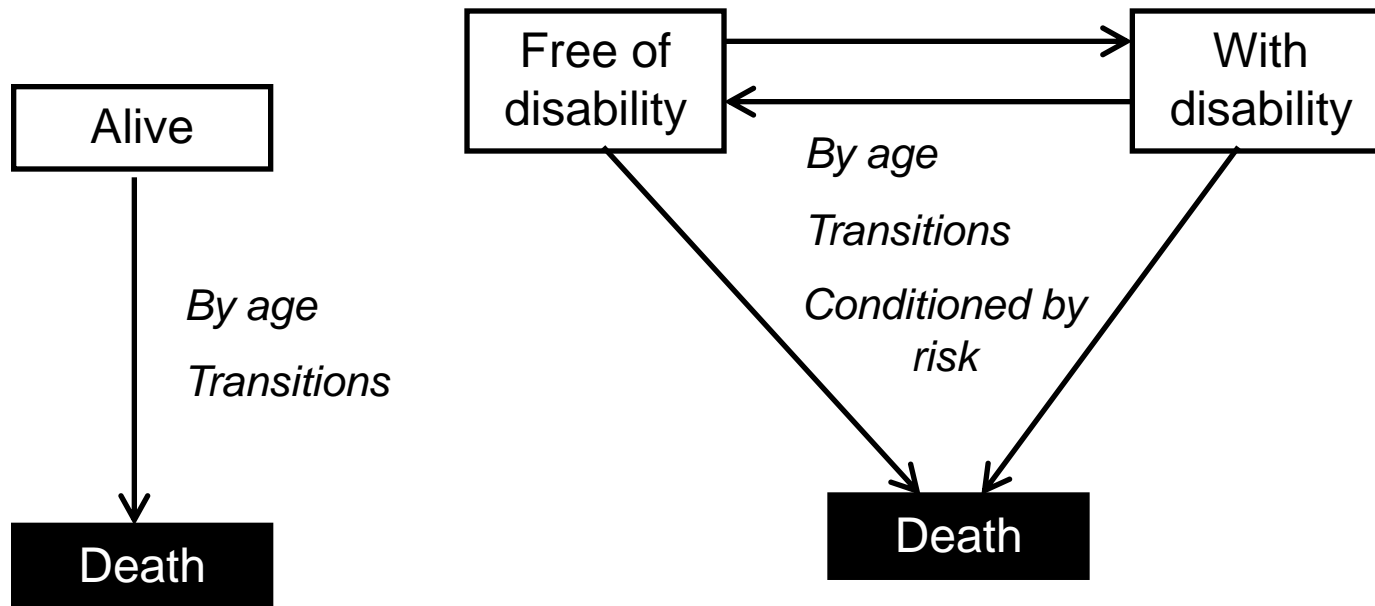
Operationalisation: Katz ADL

Dressing
Eating
Ambulating
Toileting
Hygiene

Katz Index of Independence in Activities of Daily Living

Activities Points (1 or 0)	Independence (1 Point) NO supervision, direction or personal assistance	Dependence (0 Points) WITH supervision, direction, personal assistance or total care
BATHING Points: _____	(1 POINT) Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity	(0 POINTS) Need help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing
DRESSING Points: _____	(1 POINT) Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	(0 POINTS) Needs help with dressing self or needs to be completely dressed.
TOILETING Points: _____	(1 POINT) Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	(0 POINTS) Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING Points: _____	(1 POINT) Moves in and out of bed or chair unassisted. Mechanical transfer aids are acceptable	(0 POINTS) Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE Points: _____	(1 POINT) Exercises complete self control over urination and defecation.	(0 POINTS) Is partially or totally incontinent of bowel or bladder
FEEDING Points: _____	(1 POINT) Gets food from plate into mouth without help. Preparation of food may be done by another person.	(0 POINTS) Needs partial or total help with feeding or requires parenteral feeding.

Multi state life table

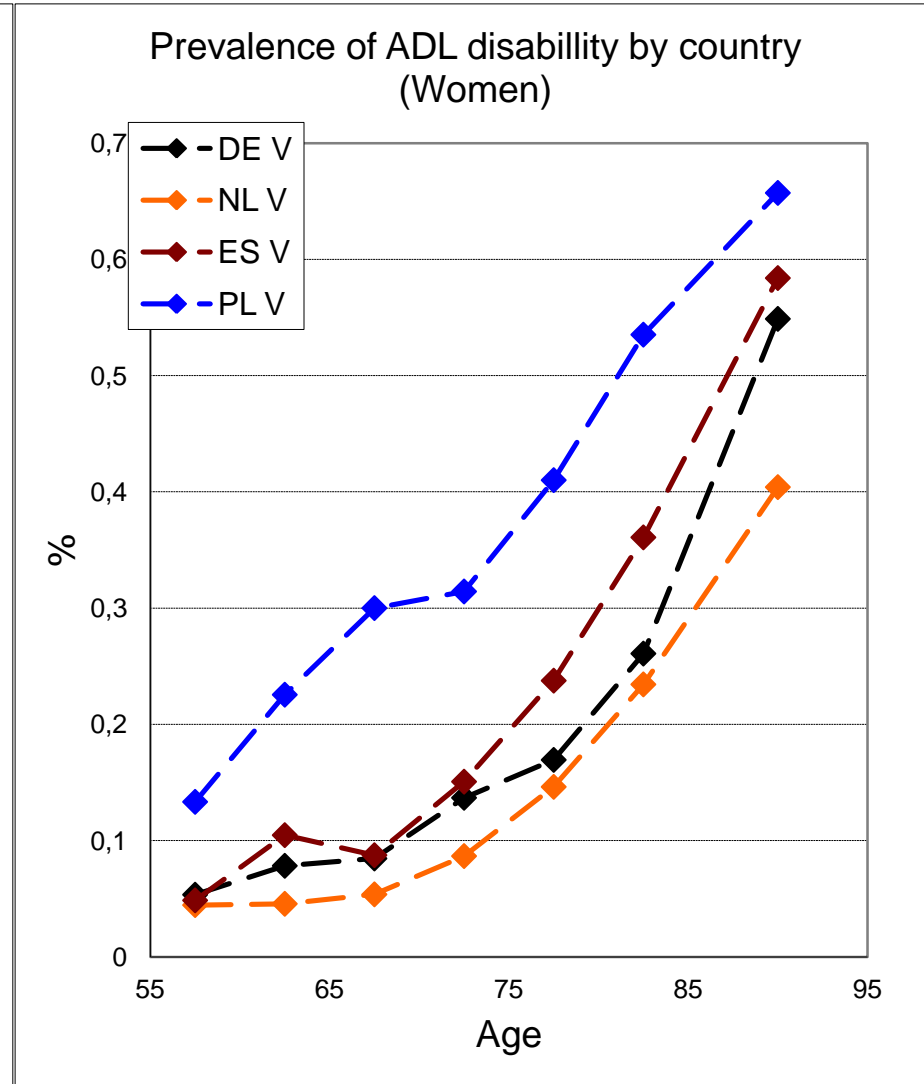
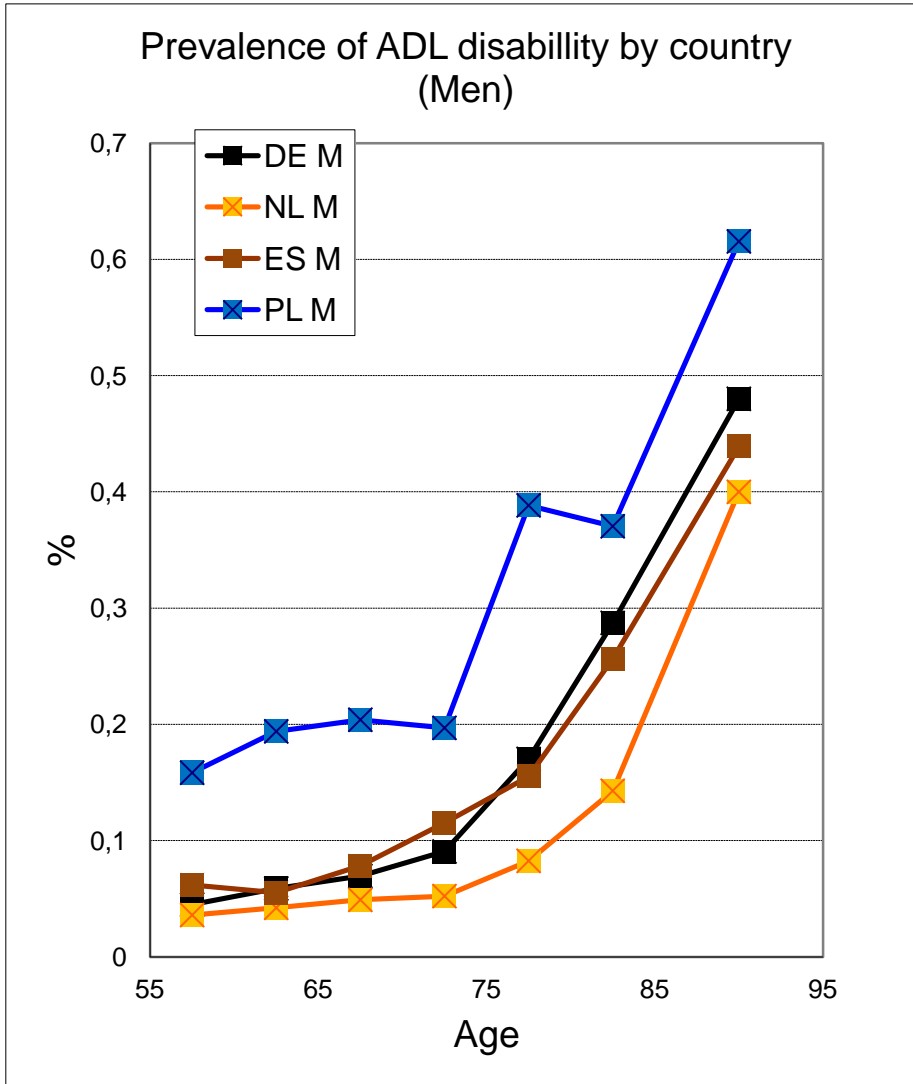


Dwelling time in the state "alive" = life expectancy

Disability free life expectancy
Duration of disability
Risk factor dependent

State in 2008

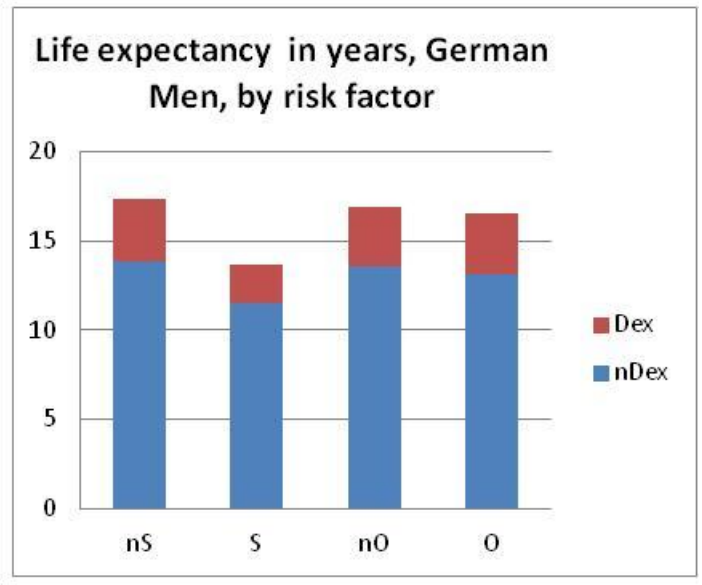
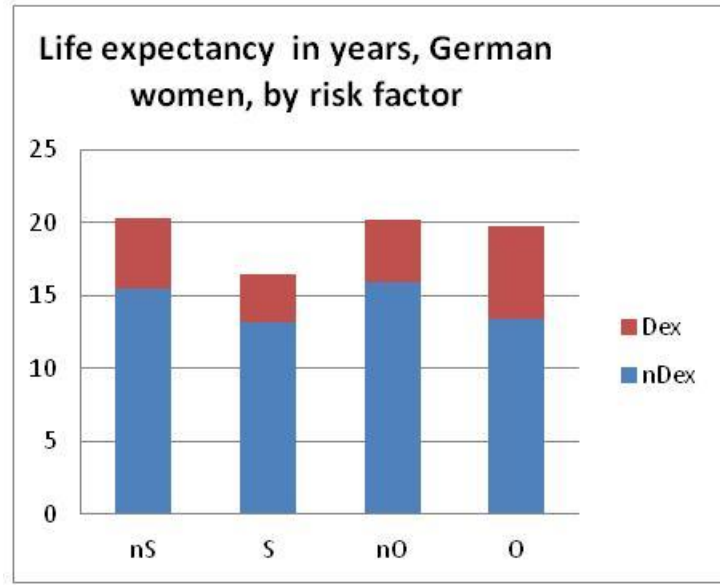
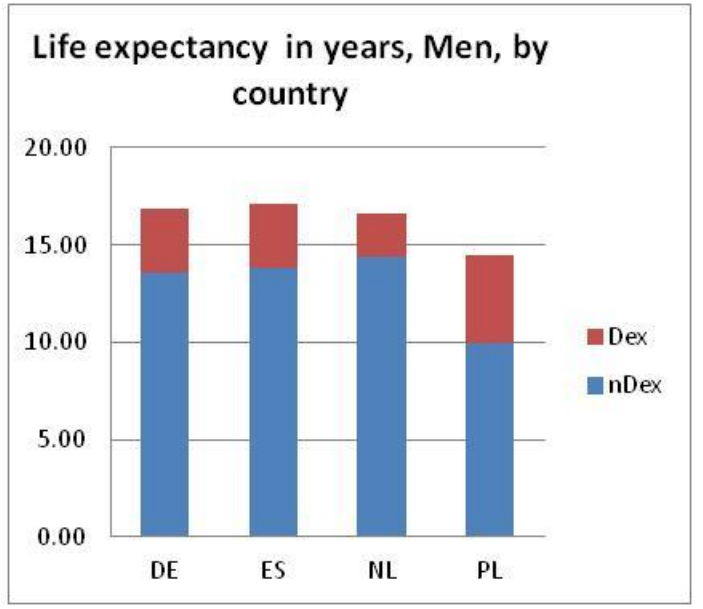
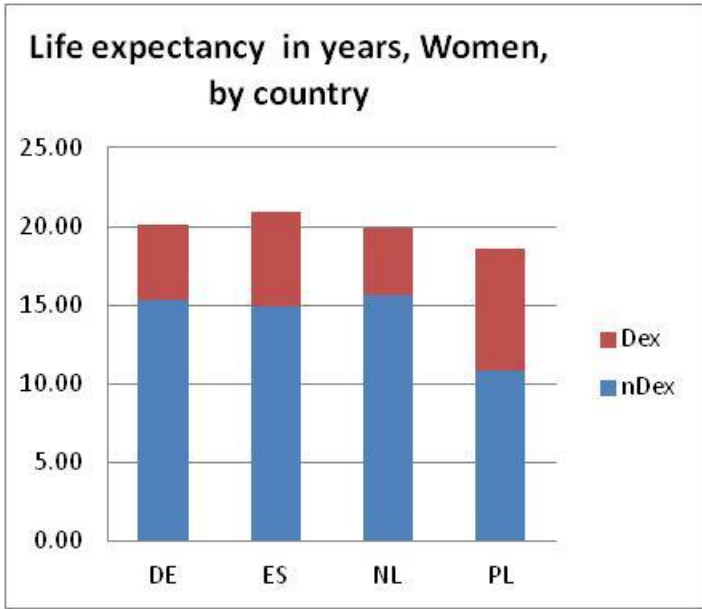
Prevalence of ADL disability in SHARE (waves 1 and 2 – 2004 and 2006)



Incidence is reconstructed

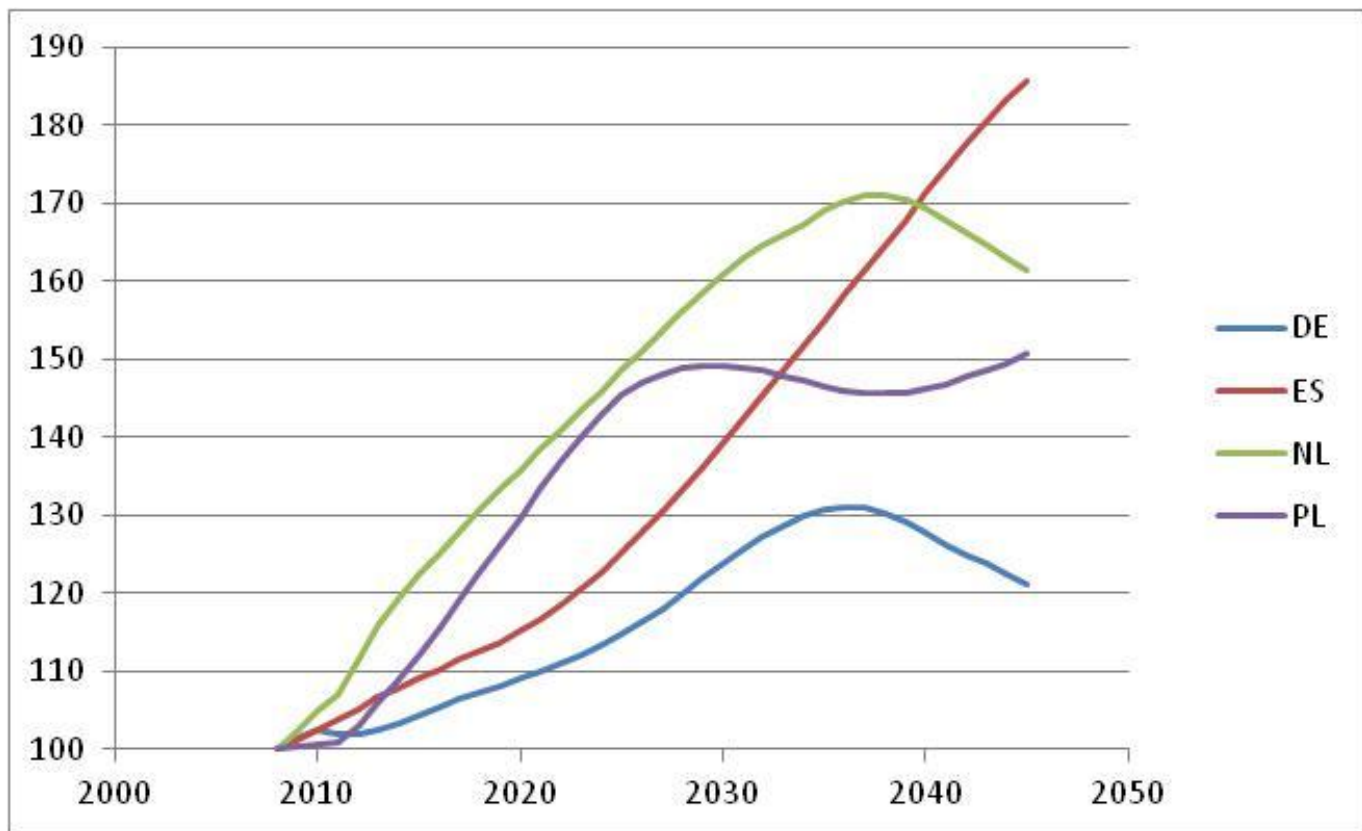
- We have prevalence by age, gender, disability and risk factor status
- We calculated mortality by age, gender, disability and risk factor status from the Rotterdam Study
 - (interaction by age was not significant, and dropped)
- Incidence by age, gender, disability and riskfactor status can now be calculated, assuming a steady state

LE at age 65 in 2008, divided by disability state.



Demography: Ageing populations

Population growth 65+ (2008=100)

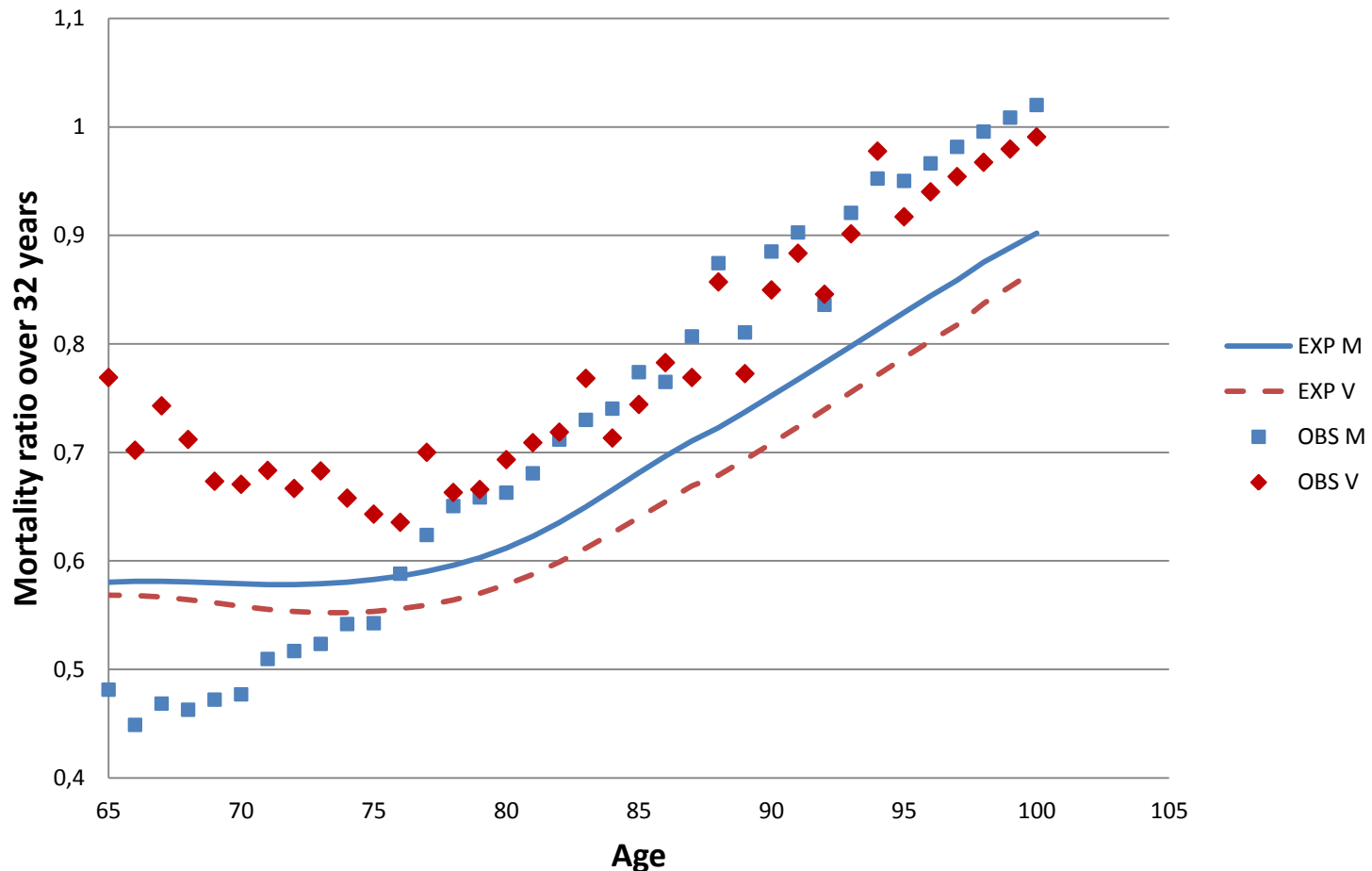


Life extension:
Ageing populations, living longer

One set of mortality forecasts

- Choice: Europop 2008 forecasts
- Reasons:
 - Consistency
 - Face validity
 - Adds disability to existing mortality and population forecasts

Mortality trends, by age and sex, as observed (NL, 1976-2008) and as expected (EUROPOP, 2008-2040)



Ageing

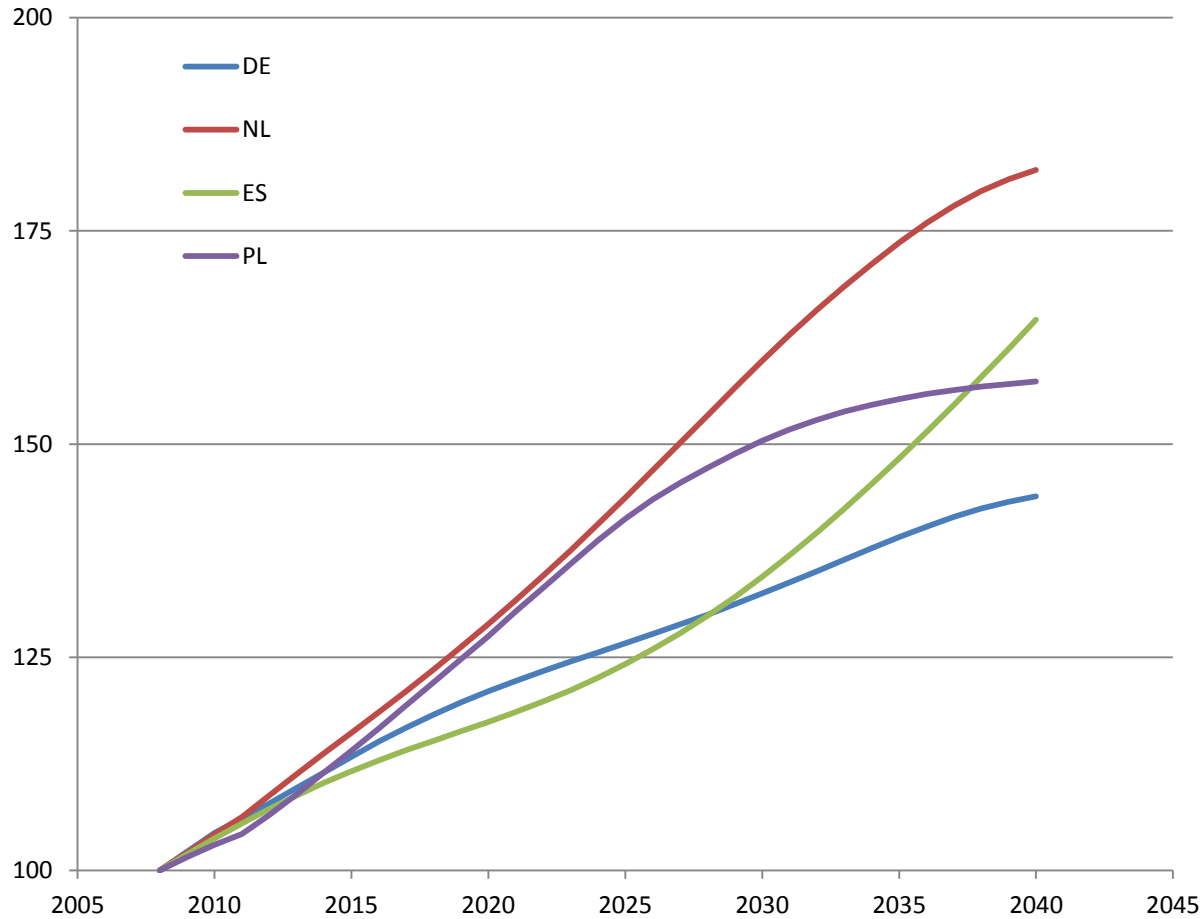
- Chronological
 - Time since birth
 - “retrospective”
 - Predicts epidemic of disability
- Biological
 - Time before death
 - “Prospective”
 - Predicts little change in disability, healthy elderly

Scenarios

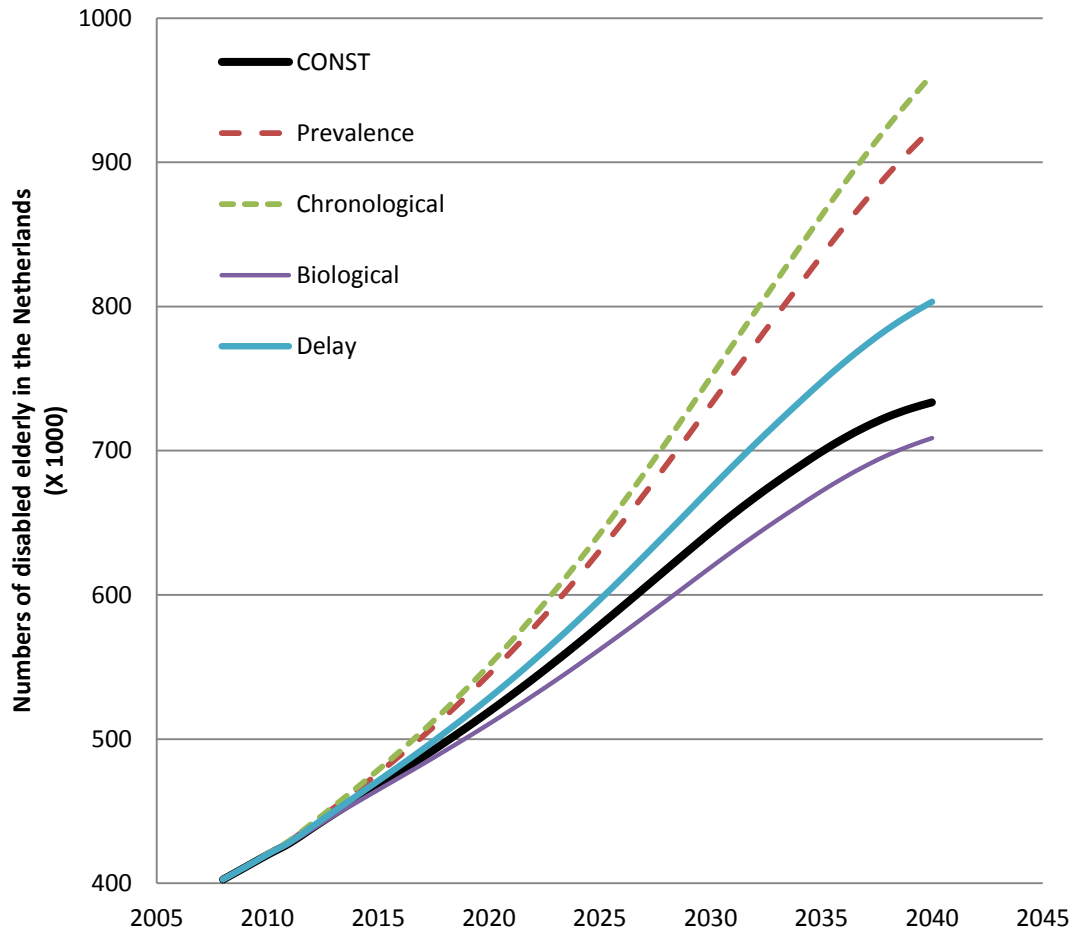
- Ageing of baby boom, no life extension (CONSTANT)
- Ageing of baby boom, life extension, constant age specific disability prevalence (PREVALENCE)
- Ageing of baby boom, life extension, constant age specific disability incidence (CHRONOLOGY)
- Ageing of baby boom, life extension, age specific decline of disability incidence equals age specific decline of mortality (BIOLOGY)
- Ageing of baby boom, life extension, disability incidence postponement equals mortality postponement (DELAY)

Constant scenario's, 4 countries

(Index 2008 = 100)

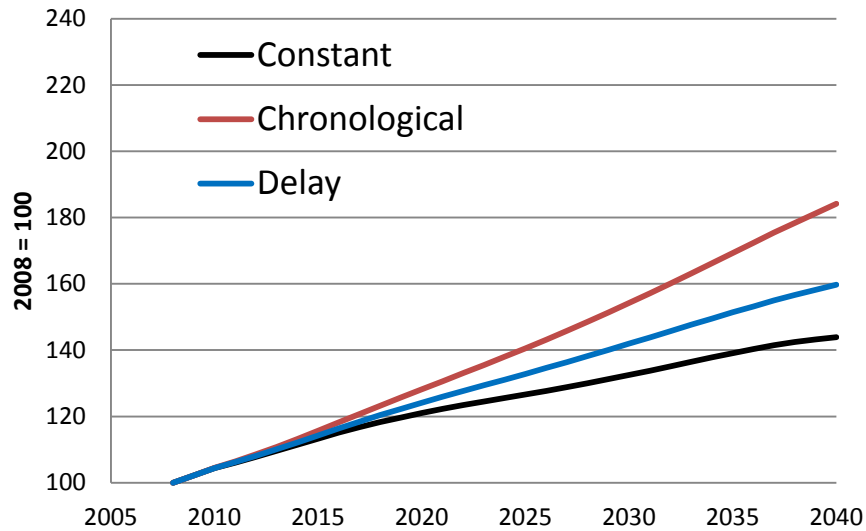


Life extension scenarios for the Netherlands

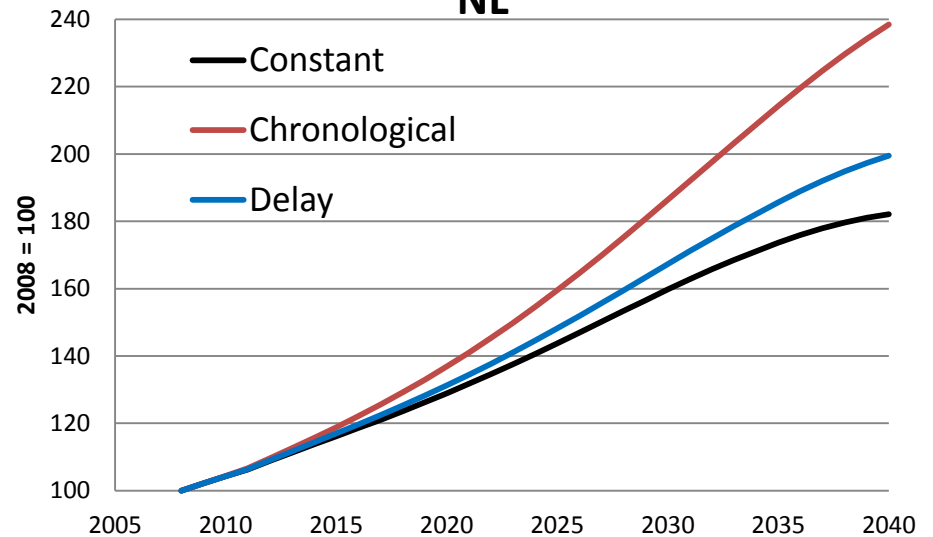


Life extension scenario's

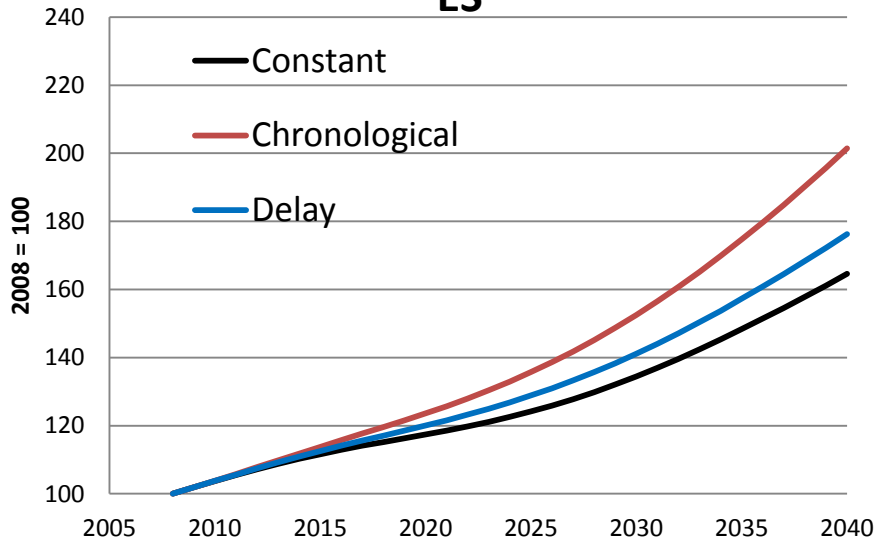
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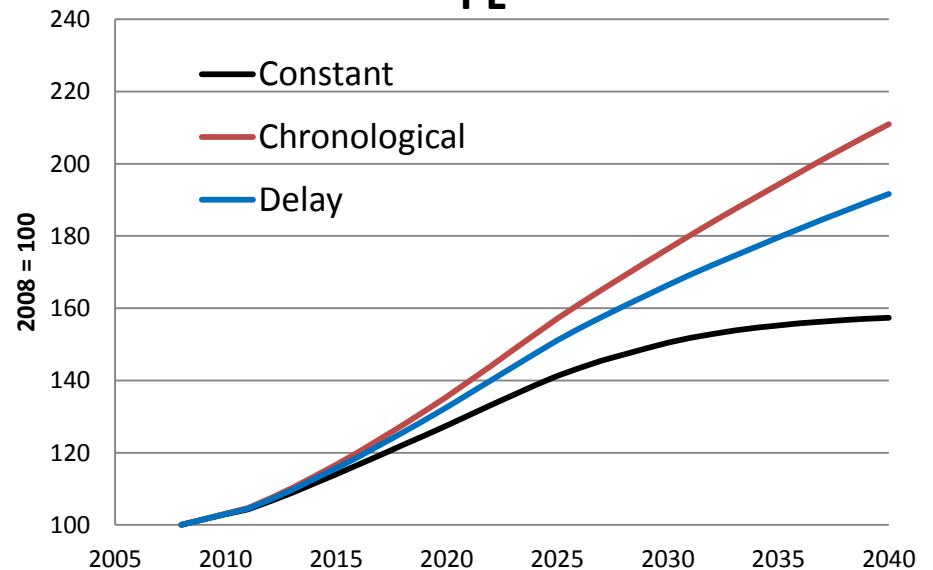
NL



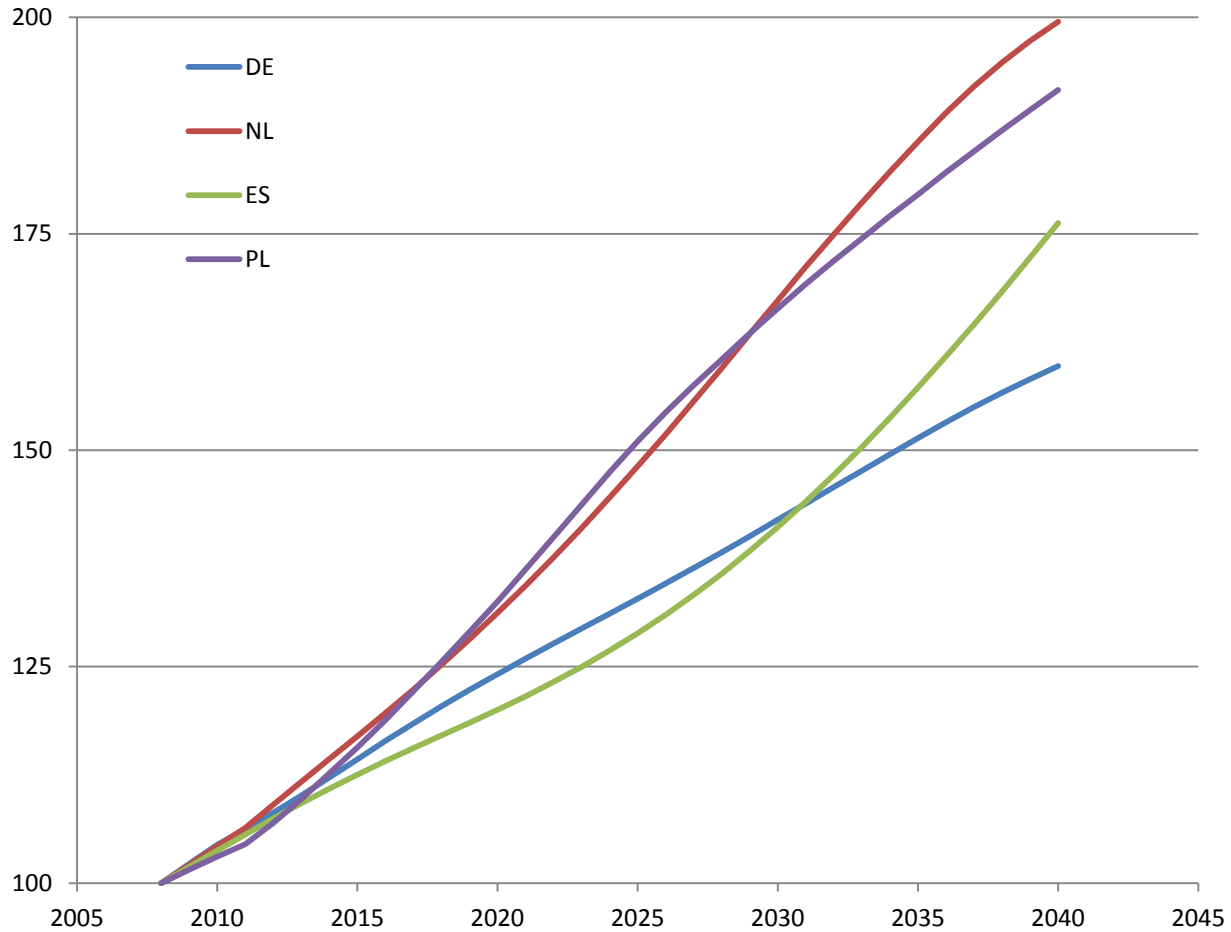
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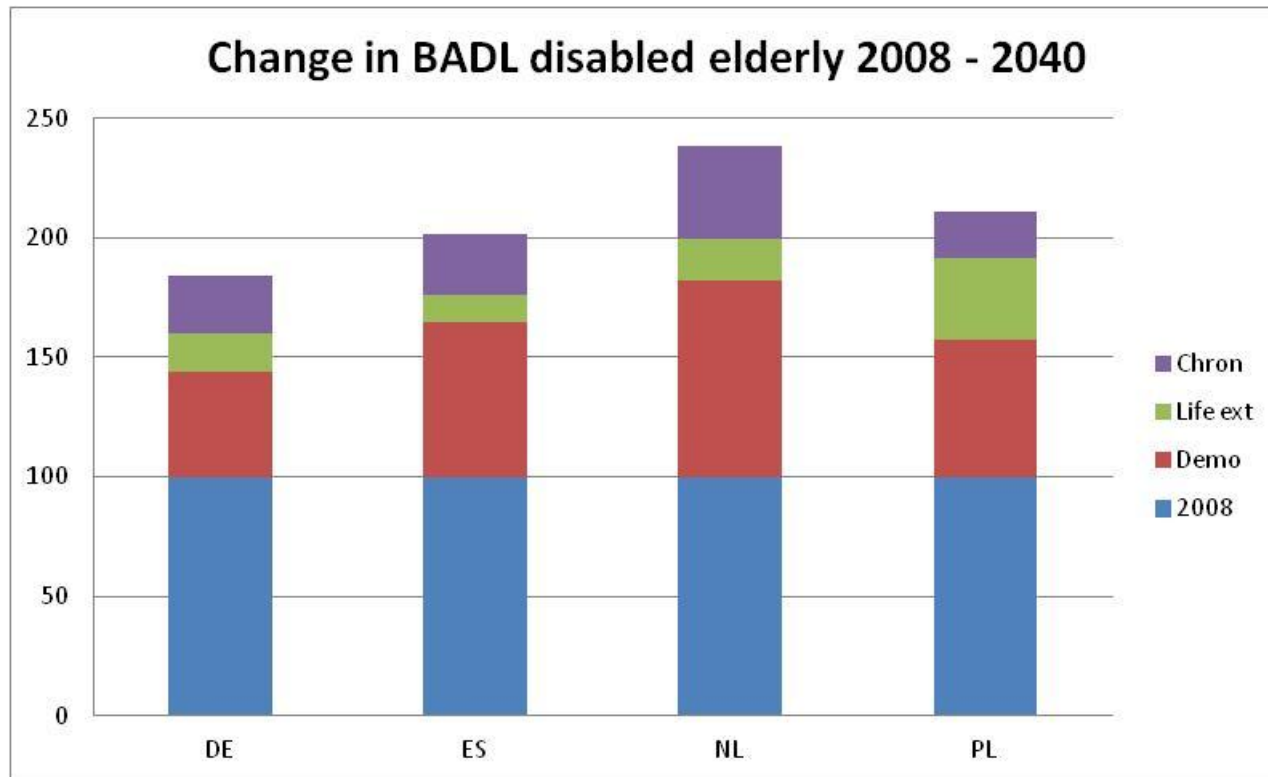
PL



Delay scenario's



Effect of demographic scenario's

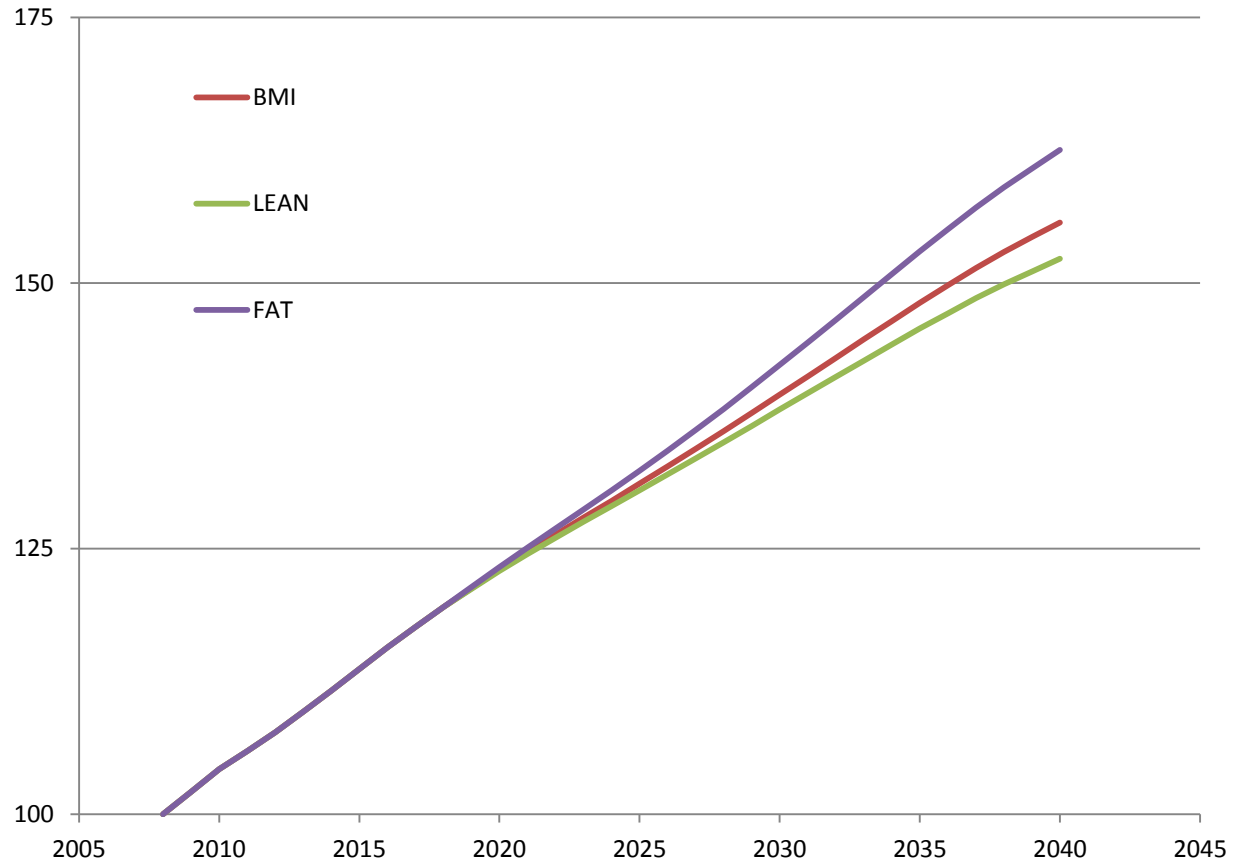


Epidemiology:
Ageing populations,
living longer at different risk of disability

3 simple, extreme BMI scenario's

- “BMI”: Prevalence of obesity (BMI 30+) of younger cohorts is projected over the future
- “FAT”: Prevalence of obesity (BMI 30+) of younger cohorts is doubled and projected over the future
- “LEAN”: Prevalence of obesity (BMI 30+) of younger cohorts is halved and projected over the future

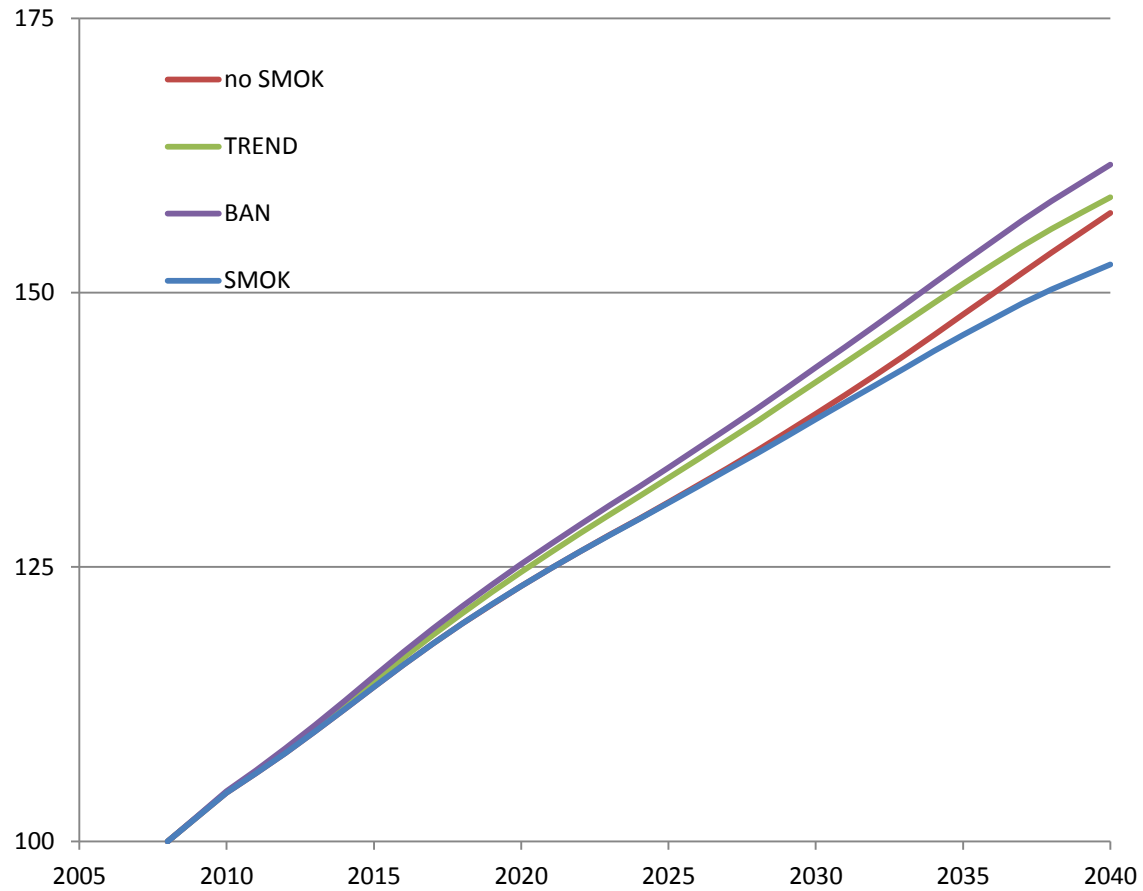
Obesity in Germany



4 simple smoking scenario's

- SMOK: cohorts continue smoking at actual rates, and do not quit, even when ill
- No-SMOK: cohorts continue smoking at actual rates, and do not quit, younger cohorts don't smoke
- TREND: actual trend: slow decline in smoking prevalence, constant quit rate among smokers
- BAN: younger cohorts don't smoke, accelerated quit rate among smokers

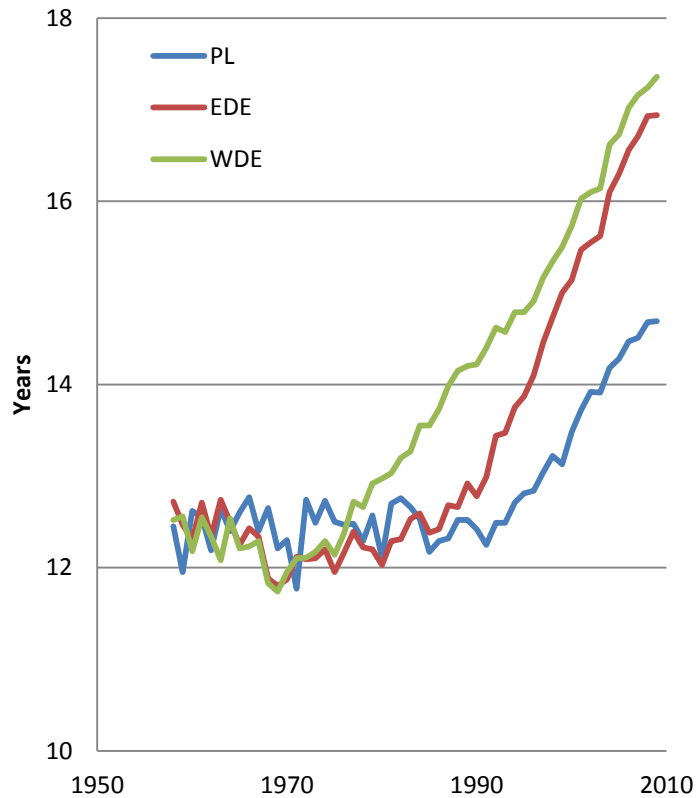
Smoking in Germany



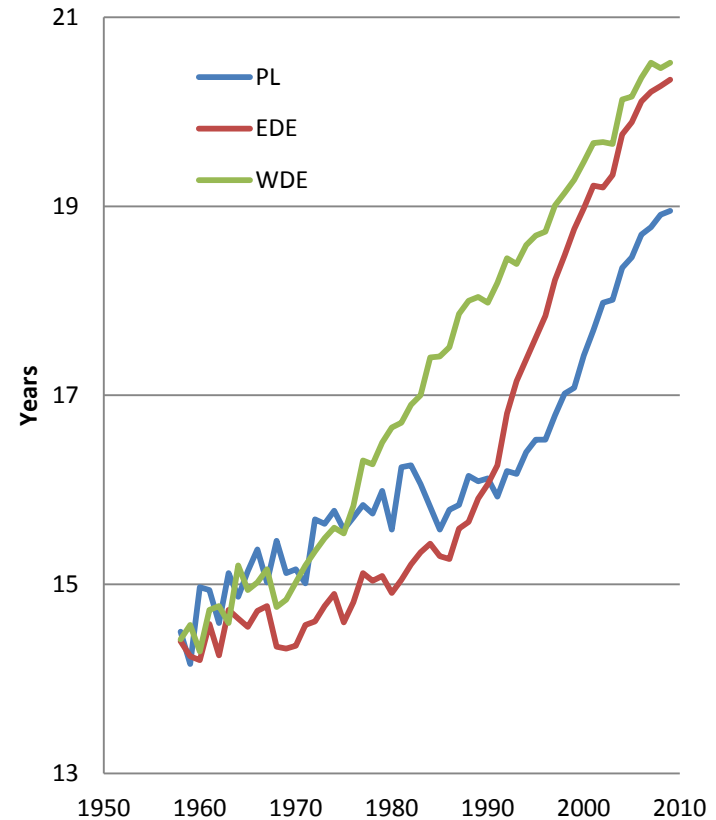
Poland:
a new member state in transition?

Life expectancy at age 65, Western, Eastern Germany and Poland

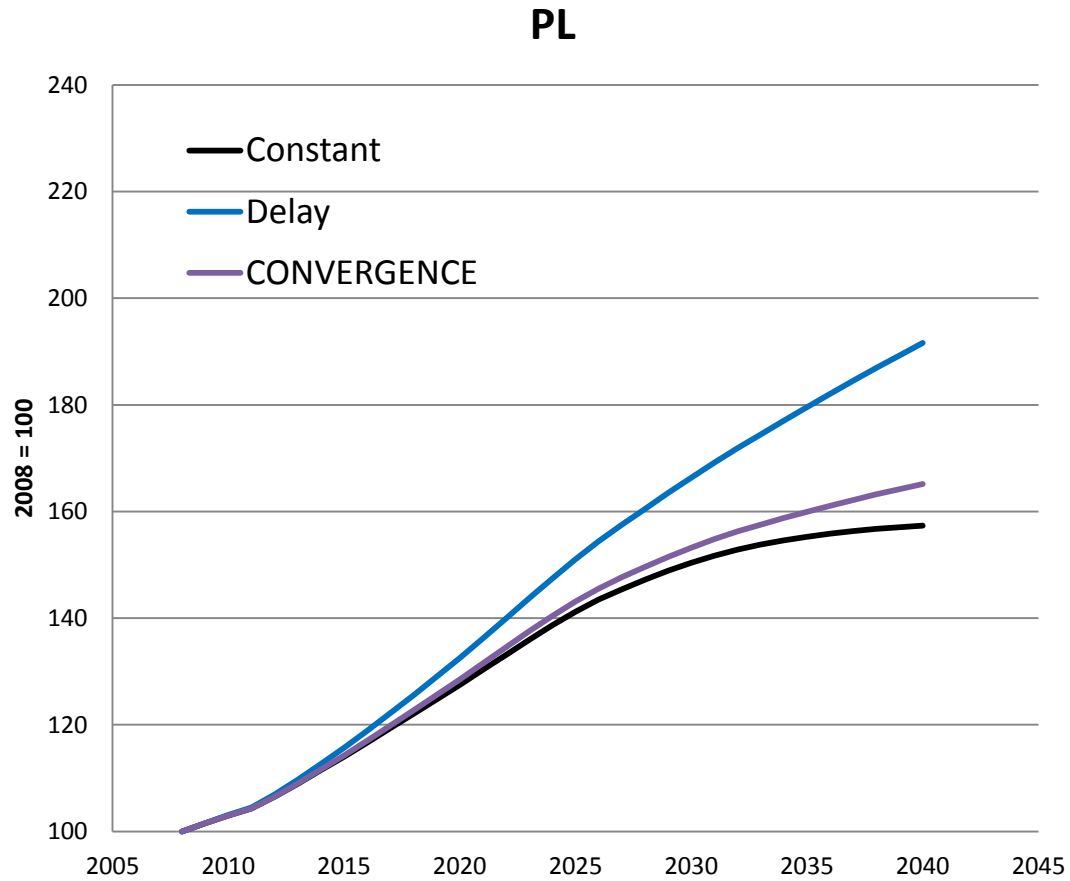
LE M 65



LE F 65



Poland: convergence scenario



Discussion and conclusion

Strength

Limited data needs, captures dynamics

Transparent assumptions

Adds disability to EUROPOP scenarios

Shows relative strength of demographic and epidemiologic processes

Weakness

No dynamics in 2008, recovery ignored

Transparent, but strong assumptions

The most important age group, 85+, is extrapolated from younger populations

EUROPOP scenarios questionable

Risk ratios not yet country dependent

True fork of uncertainty is smaller

- It is highly unlikely that disability and mortality at old age are independent processes
- It is highly unlikely that technology, promoting life extension, has no effect whatsoever on extension of life without disability
- Actual “delay” scenario does not take into account technology, directly directed at lowering disability among elderly

Conclusions

Future disability can robustly be estimated

- Depends strongly on highly predictable demographic aging
- Effect of life extension depends on common process of aging. The more disability and mortality at old age are correlated, the lower the effect
- Even strong risk factor scenario's have limited effects

Eshoeve
Nursing home in the Netherlands





- But chronic shortage of well trained personnel
- Open job offers are not filled
 - People leave due to heavy workload