



# Royal Netherlands Academy of Arts and Sciences (KNAW) KONINKLIJKE NEDERLANDSE AKADEMIE VAN WETENSCHAPPEN

## Forecasting disability in the European Union. Paper presentation

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# Forecasting disability in the European Union

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Assessing Needs of Care In European Nations

# ANCIEN, general information

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- Assessing Needs of Care in European Nations
- 7th Framework Programme, European Council
- January 2009 – August 2012
- 21 EU-countries included

# Summary

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- Basic ADL disability
- Deriving incidence from prevalence
- Forecasts of long term care needs
- Conclusions

# Katz ADL

**D**ressing

**E**ating

**A**mbulating

**T**oilet

**H**ygiene

**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.

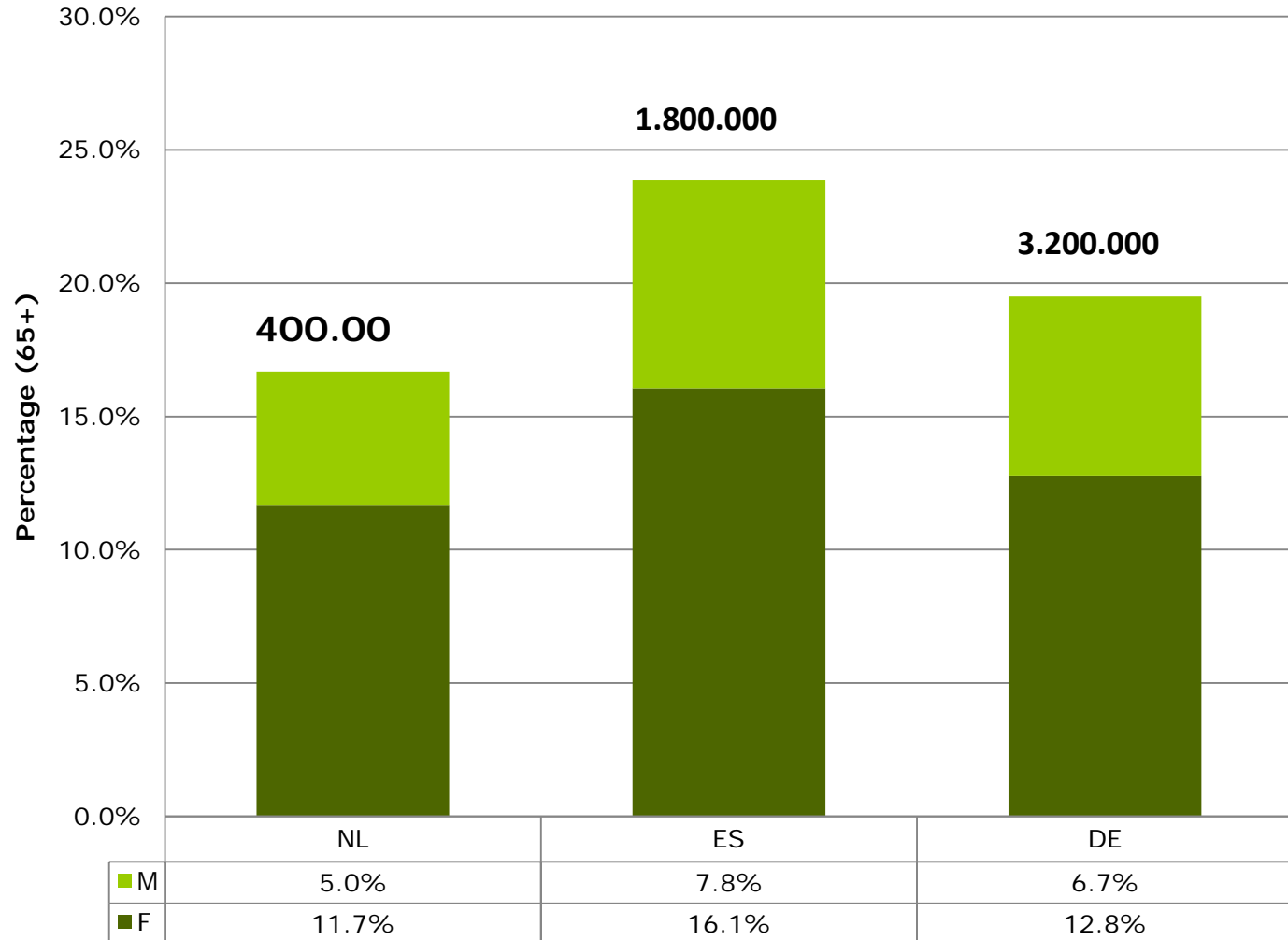
# Basic ADL

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## □ Data:

- SHARE (survey) for community dwelling elderly
  - Low response
  - “Having difficulties with” basic ADL
- Administrative data institutionalised persons
  - (In NL: corrected for 30% non disabled but institutionalised)

## Prevalence disability 3 countries in 2008



# Methodology (1)

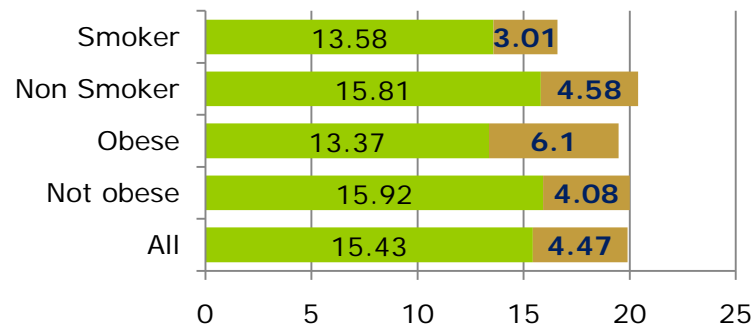
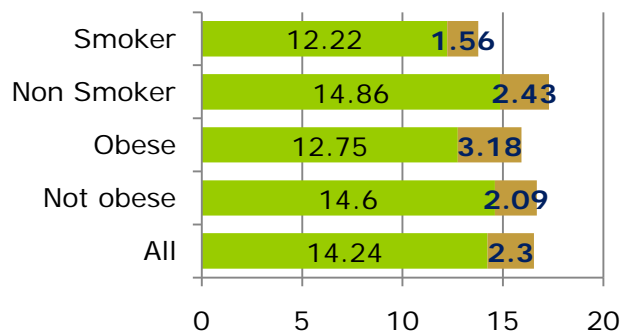
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- Prevalence of disability decomposed in incidence and duration by incidence/prevalence model
- All cause mortality from Eurostat, state specific mortality is determined by proportional hazard ratios derived from Rotterdam Study
- Recovery is ignored: “net incidence” (sum of transitions from able to disabled and from disabled to able in a single year of age)

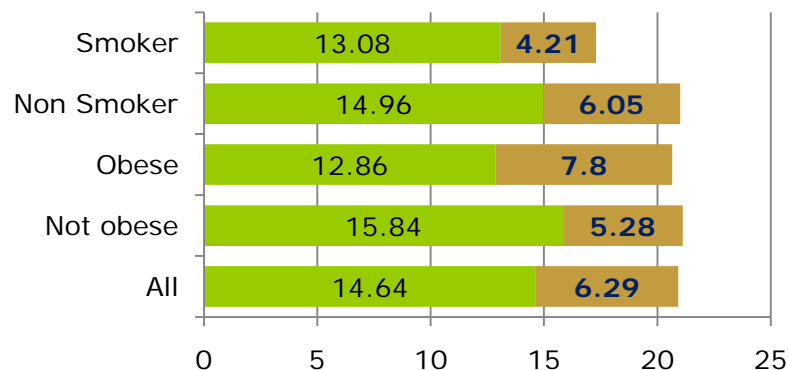
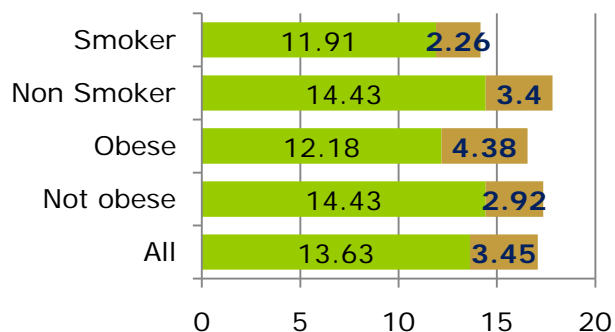


# Life expectancy with or without disability at age 65 in 2008

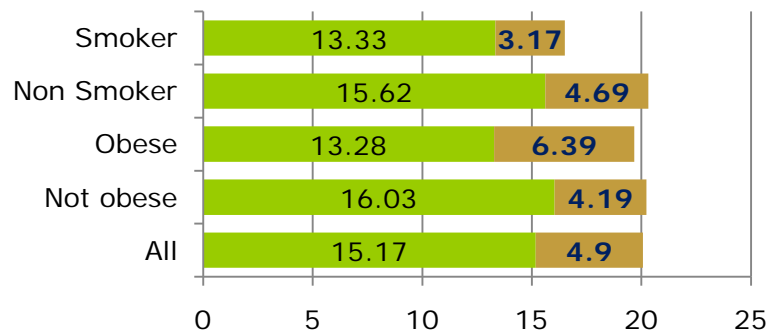
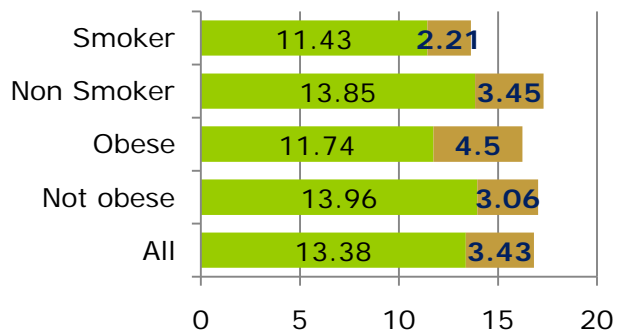
NL



ES



DE



Men

Women

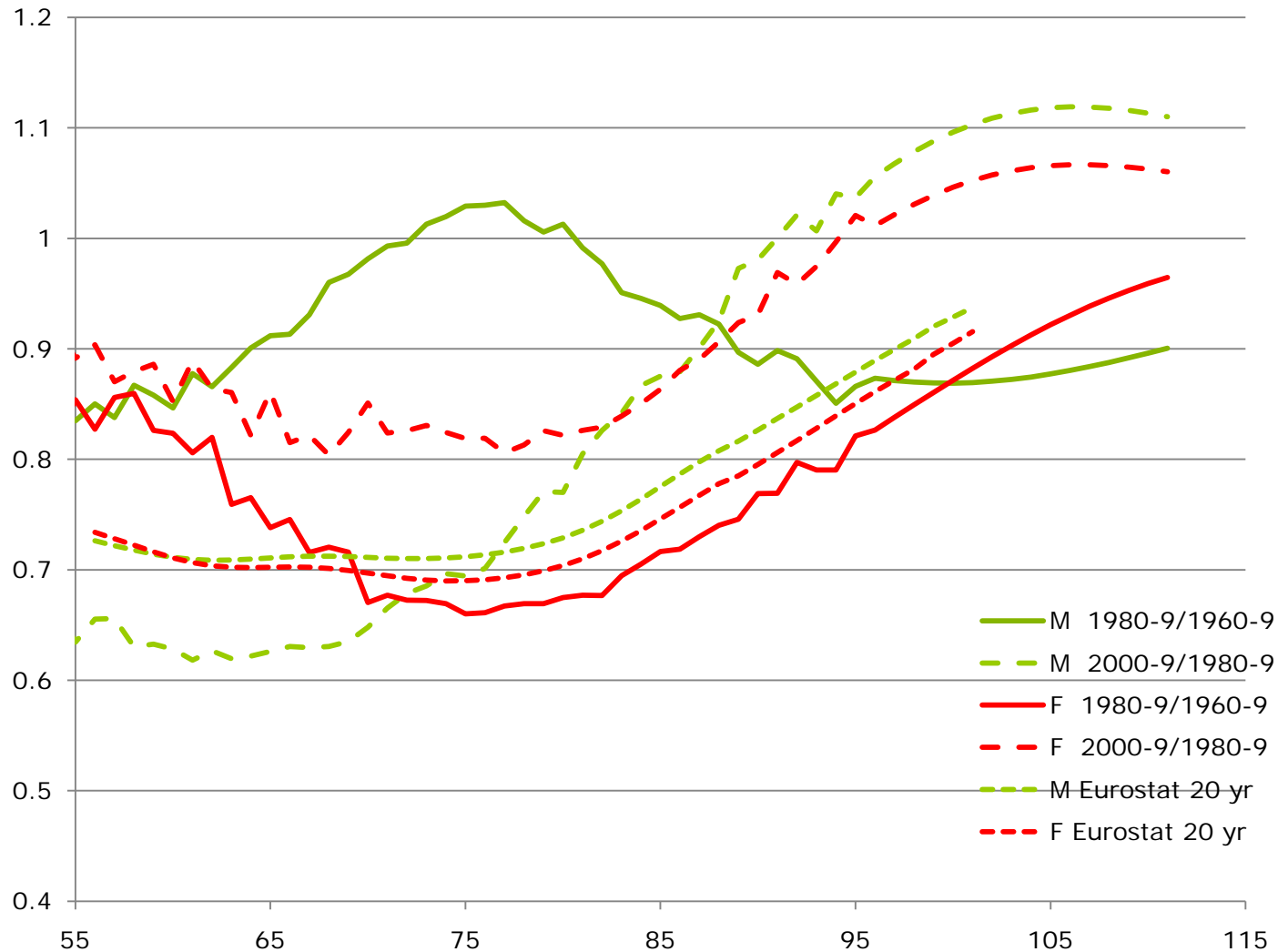
# Methodology (2)

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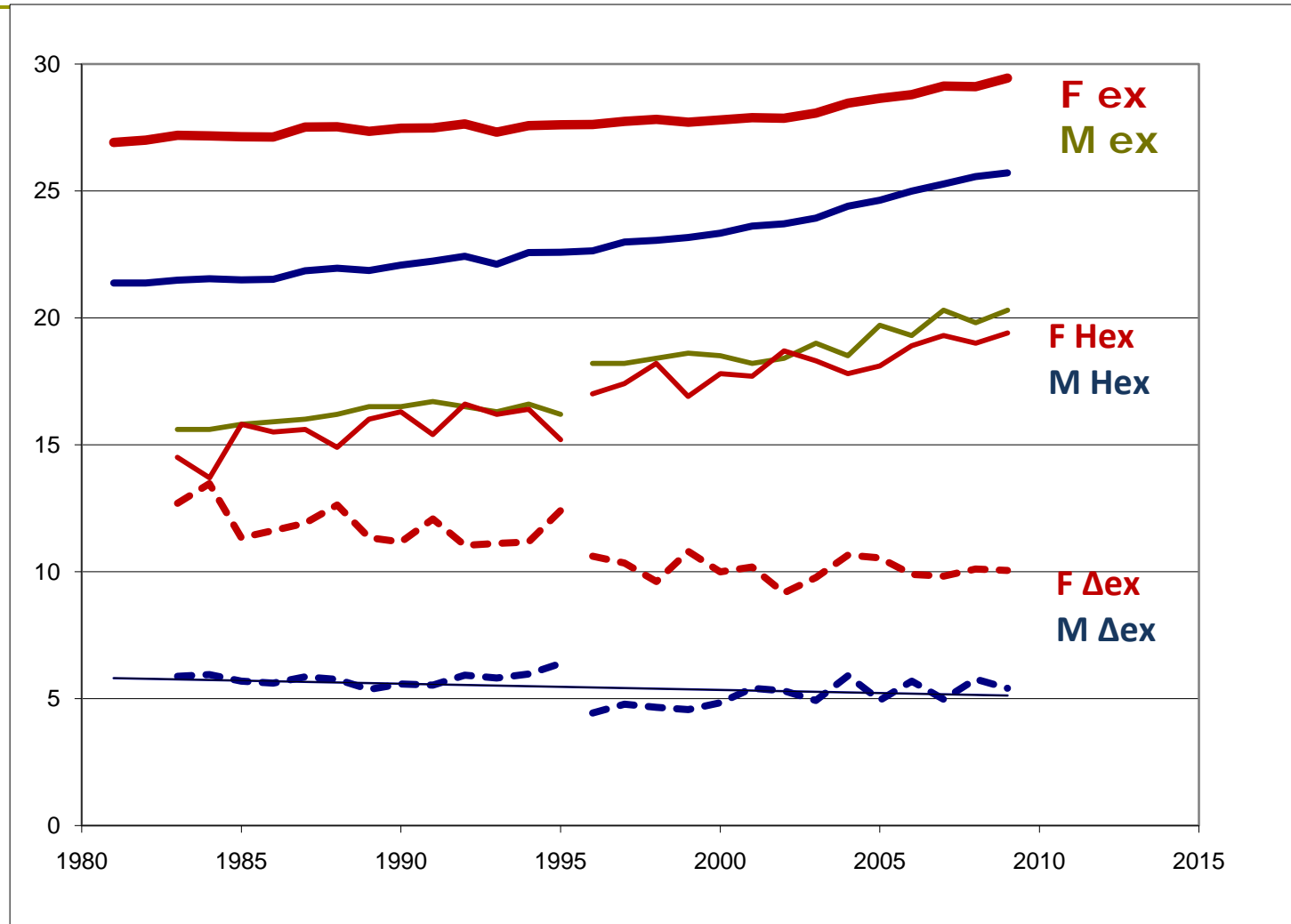
## □ Forecasts:

- Mortality forecast EUROPOP 2008
- Lee Carter model (age period model)
  - Assumes continuing progress
  - Ignores cohort (smoking!) trends
  - Historical good fit
- Estimated on EU-15 (“old” EU)
- Assumes convergence in the far future
  - (Hikes up new member states)

# Mortality changes by age and gender, NL, 20 yr



# NL active life expectancy at age 55



# Forecasts 1 (2040)

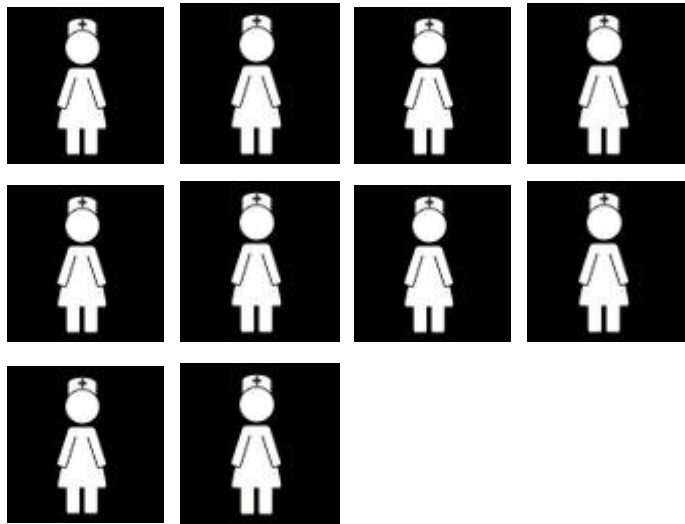
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- Ageing of baby boom, no life extension (CONSTANT)
- Ageing of baby boom, life extension, constant age specific prevalence (PREVALENCE)
- Ageing of baby boom, life extension, constant age specific incidence (CHRONOLOGY)

# NL: no life extension, demographic aging only

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2008



2040



# 2040: prevalence and incidence

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## Prevalence



## Incidence



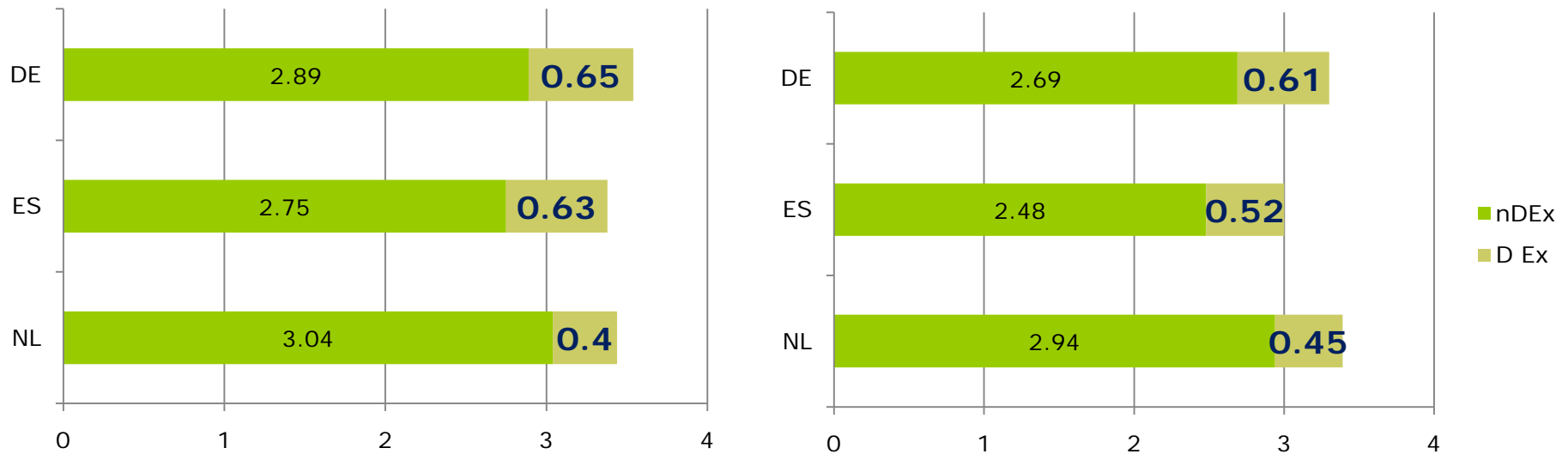
# Forecasts: biological

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- ❑ Decline in incidence of disability = decline of mortality (“moving down over the log y-axis”) (BIOLOGY)
- ❑ Decline in incidence of disability = postponing disability with mortality (“moving right over the x-axis”) (DELAY)



# Change in (D)Le 2008-2040 (NL, delay)



*Added life years with or without disability*

# 2040 (NL): delay or biological

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## biological



## delay





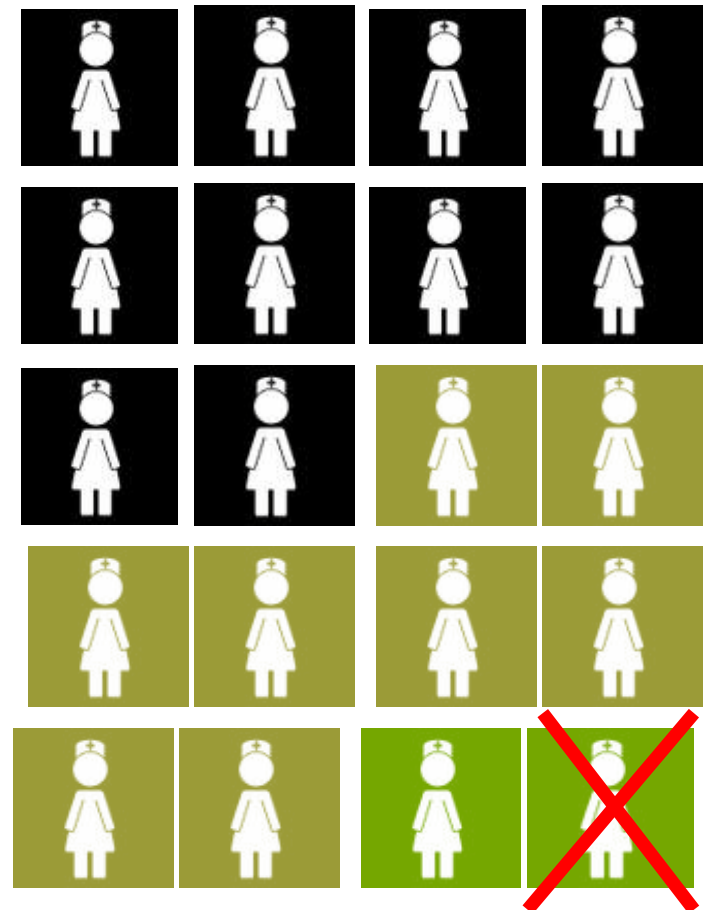
*For goodness's sake, Gerard, go back smoking*

# 2040: delay and doubling of obesity (NL 2040 = USA 1990)

## Double obesity



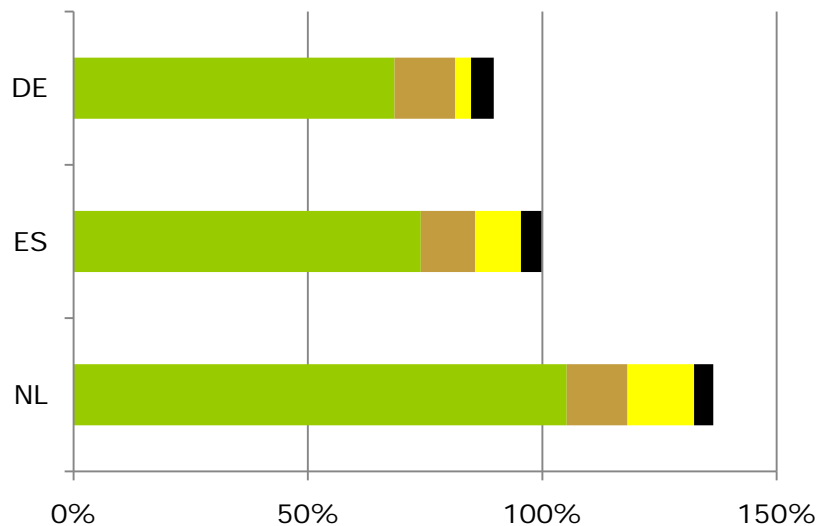
## No smoking



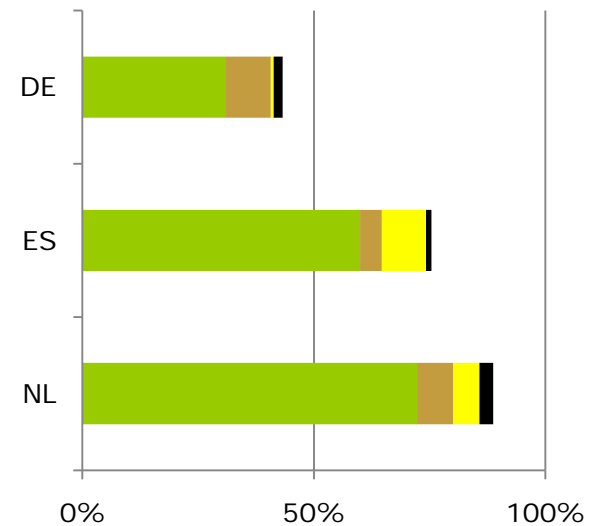
# Comparing countries and risk scenarios

## 2040/2008

### Men



### Women



## 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

# Data needs

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- SHARE will deliver – in due time - risk and country specific transition probabilities to all relevant states
- We know desperately little about 85 and over!
  - And this will not improve: low numbers in Share

# Conclusions

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Future disability can robustly be estimated

- Depends strongly on demography
- Even strong risk factor scenario's have limited effects
- Effect of life extension depends on common process of aging

HOWEVER: we will need sufficient AND sufficiently competent care giving personnel. ADL disabled in 2040:

**NL: +100% / ES: +75% / DE: +60%**



