

# Life expectancy with and without disability by Body Mass Index categories in Belgium 1997-2011

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## Background

- Prevalence of obesity is increasing globally (Walter, 2009).
- In the EU Member States, estimates suggest that more than half of the EU's population was overweight or obese in 2008 (Eurostat, 2016).
- Underweight and severe obesity are associated with an increased risk of mortality (Steensma, 2013).
- Those in overweight categories have a decreased risk of mortality compared to in the normal weight category (Steensma, 2013).

# Background

But, little is known about the effect of body weight on health expectancy (Steensma, 2013).

→ Objective: Assess duration of life with disability and without disability by body weight categories in the Belgian adult population (age $\geq$ 18).

# Methods

Two types of data needed:

1. Mortality follow-up of the Belgian Health Interview Survey (HIS)
  - HIS is organised every 4-5 years.
  - Around 10 000 individuals (N=16.364).
  - Face-to-face setting.
  - 60% participation rate.
  - 1997 and 2001 with 10 year follow-up.
  - Linkage between HIS and National Register with National Identification Number.

## 2. Prevalence of disability from HIS 1997 and HIS 2001

- 4 BMI categories: underweight  $<20$  kg/m<sup>2</sup>, normal weight 20-24.9 kg/m<sup>2</sup>, overweight 25-29.9 kg/m<sup>2</sup> and obesity  $\geq 30$  kg/m<sup>2</sup>.
- 3 disability categories: no disability, mild disability and severe disability.
- Disability= difficulty with activities of daily living in mobility and incontinence (Case, 2005).

# Methods

Table 1  
Definition of disability by severity

		Mild disability	Severe disability
Activity of Daily Living (ADL)	Transfer in and out bed	Ability to do the task on his/her own with difficulties	Only able to do the task with personal assistance
	Transfer in and out chair		
	Dressing		
	Washing of hands and face		
	Feeding		
	Going to the toilet		
Mobility		Ability to walk less than 200 metres without stopping	Ability to walk only a few steps or less without stopping
Continence		Loss of bladder control less than once a month	Loss of bladder control at least once a month

- Mortality
  - For each subject: person-years at risk for mortality.
  - Lexis expansions to account for age changes by 5 years age-bands.
  - Mortality rate from number of failures by person-time.
- Disability
  - Prevalence of disability by BMI were calculated stratified by age and gender, and weighted.
- Life table analysis
  - Age specific mortality rates to estimate LE by gender and BMI.
  - Sullivan method for DFLE and DLE by severity level at age 30 and 50.

# Results

Mortality rate per 100 000 person years by BMI for those aged 18+

BMI	Observed deaths	Observed person years	Crude mortality rate
<b>Males</b>			
underweight	60	3800.11	1570.25 (1059.95 - 2417.38)*
normal weight	393	36410.69	1085.07 (955.21 - 1237.05)
overweight	377	30663.01	1228.53 (1072.65 – 1413.10)
obesity	132	9095.46	1447.77 (1139.95 – 1866.27)
<b>Females</b>			
underweight	118	12409.48	958.34 (726.35 - 1290.28 )
normal weight	336	40407.19	831.11 (704.85 – 986.83)
overweight	241	20279.58	1186.14 (977.07 – 1453.43)
obesity	120	9602.65	1247.07 (980.70 – 1607.91)

\*: 95% Confidence Interval.



# Results

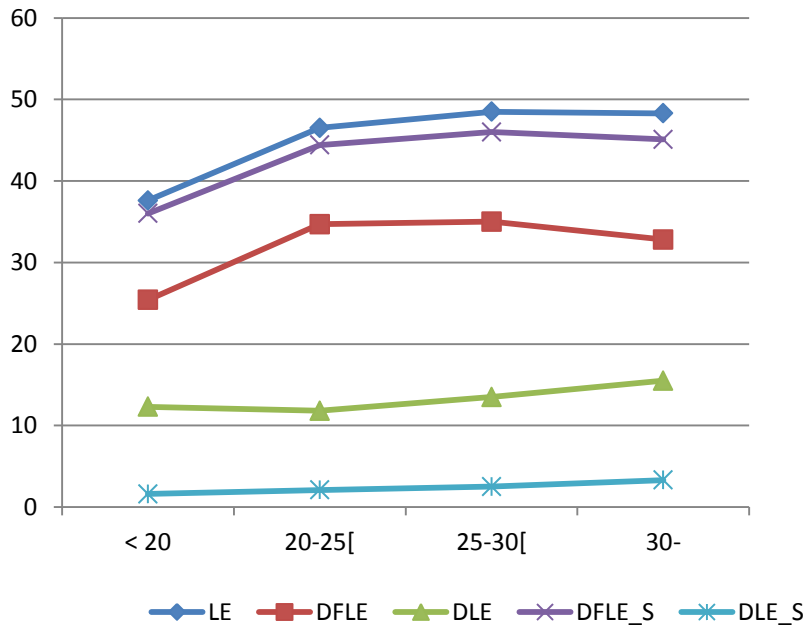
Disability prevalence (in %) by BMI for those aged 18+.

BMI	No Disability		Mild disability		Severe disability	
	N	Prevalence (%)	N	Prevalence (%)	N	Prevalence (%)
<b>Males</b>						
underweight	335	79.3 (75.2-83.0)*	65	15.4 (12.3-19.2)	22	5.2 (3.5-7.8)
normal weight	2 999	82.6 (81.4-83.8)	508	14.0 (12.9-15.2)	122	3.4 (2.8-4.0)
overweight	2 319	77.4 (75.9-78.9)	563	18.8 (17.4-20.3)	111	3.7 (3.1-4.5)
obesity	691	72.2 (69.4-75.0)	223	23.3 (20.7-26.1)	42	4.4 (3.3-5.9)
<b>Females</b>						
underweight	1 007	79.3 (77.0-81.4)	189	14.9 (13.0-17.0)	74	5.8 (4.7-7.3)
normal weight	3 157	79.3 (78.0-80.5)	658	16.5 (15.4-17.7)	168	4.2 (3.6-4.9)
overweight	1 447	68.7 (66.7-70.7)	526	25.0 (23.2-26.9)	132	6.3 (5.3-7.4)
obesity	587	58.3 (55.3-61.4)	307	30.5 (27.7-33.4)	112	11.1 (9.3-13.2)

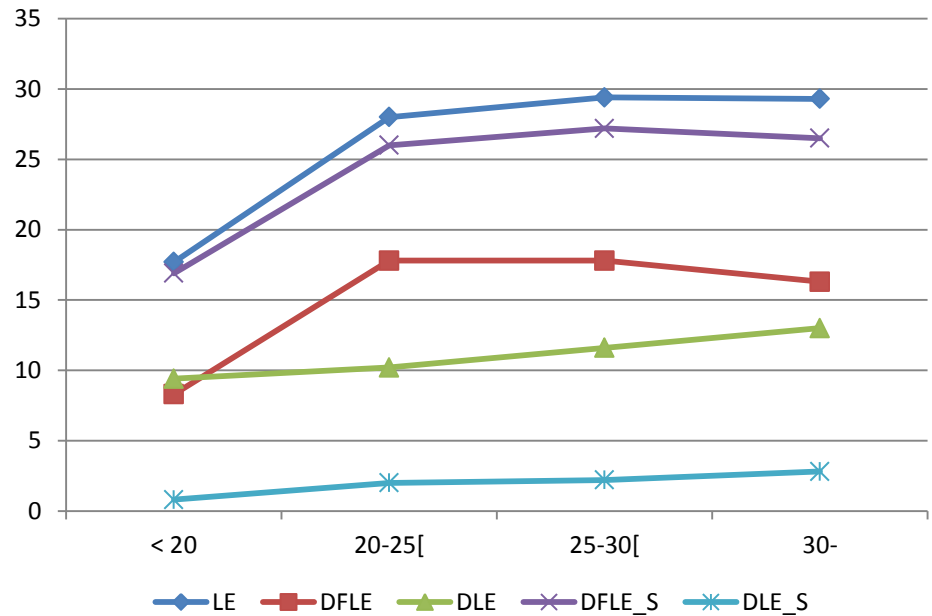
\*: 95% Confidence Interval.

# Results

### Male life expectancy with and without disability by BMI at age 30

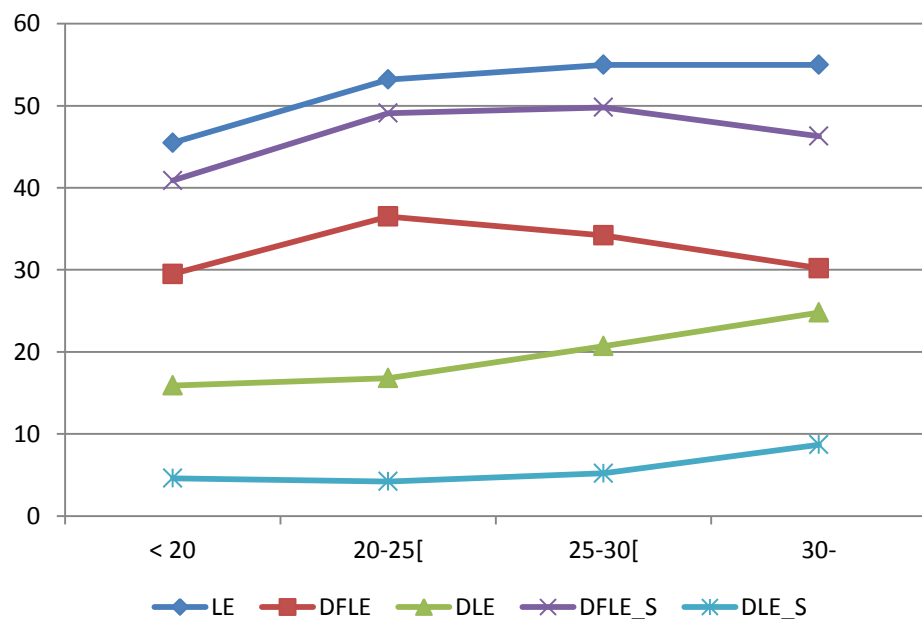


### Male life expectancy with and without disability by BMI at age 50

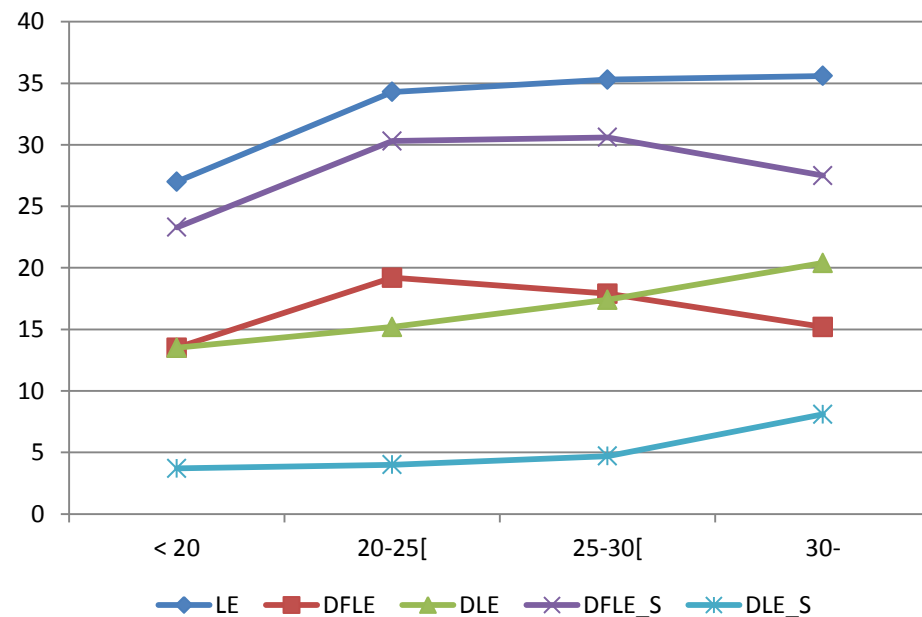


# Results

### Female life expectancy with and without disability by BMI at age 30



### Female life expectancy with and without disability by BMI at age 50



# Conclusions

- Although high BMI categories have been associated with a slight gain in LE as compared with the normal weight category, overweight and especially obese adults also experienced a higher proportion of years lived with disability.
- Especially in women, obesity contributed to excess years with severe disability.
  - The mortality advantage of women is most often balanced by a disability disadvantage → female-male health-survival paradox. (Van Oyen, 2013)

# Conclusions

## In literature:

- Compared with smoking and drinking alcohol, obesity is most strongly associated with an increased risk of spending many years of life with disability (Klijs, 2011).
  - Some lifestyle factors may especially influence mortality and reduce both the years lived with and without limitations; while obesity mainly expand the years lived with disability (Reuser, 2009).
- This study confirms that the negative health effect of overweight and in particular obesity is more important on disability than on mortality.

# References

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# Questions?

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