

Overfeeding and malnutrition – a Janus challenge for the ageing Europe

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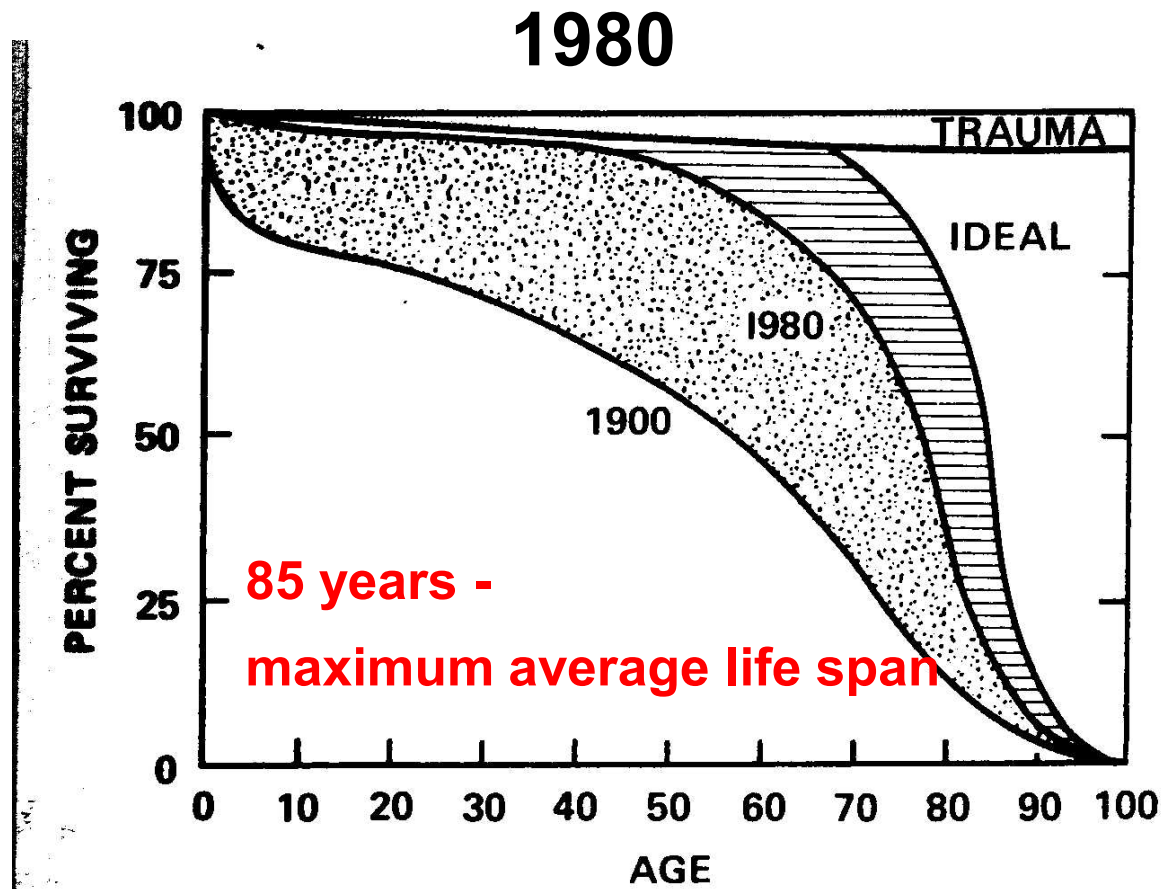
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Compression of morbidity





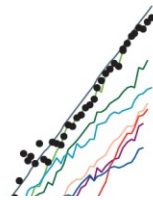
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Changing demography

Increasing life expectancy

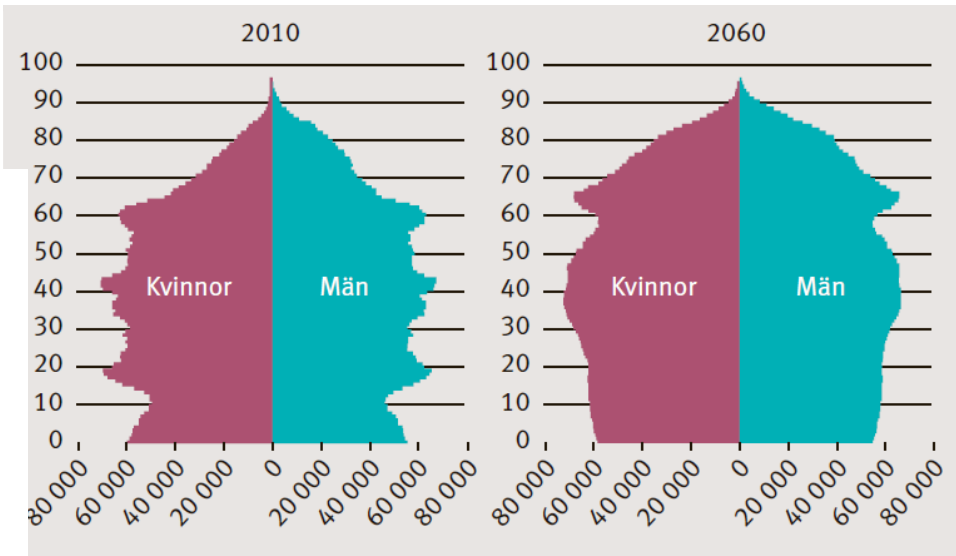
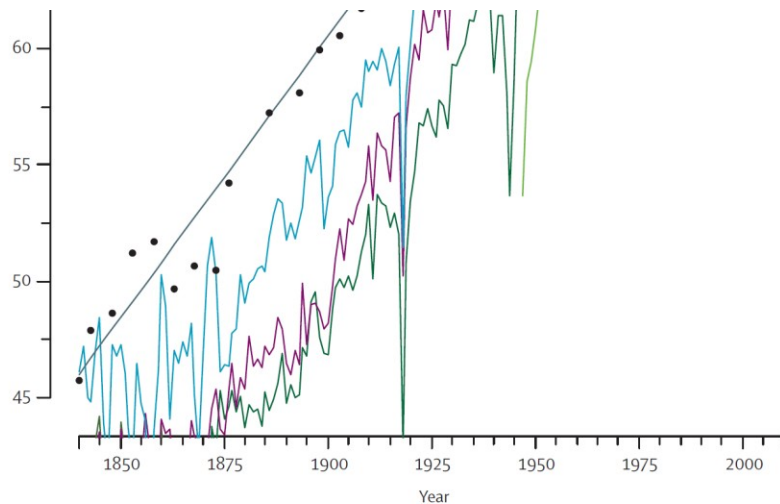
• Best-practice
— England & Wales
— France
— Germany (East)
— Germany (West)
— Japan
— Sweden
— USA

2010



Life span has
increased 7-10
years in 3 decades

Life expectancy (years)



**"The majority of children
born after year 2000 will
be >100 y"**

Christensen et al. Lancet 2009

Cardiovascular mortality down by half in Sweden 1986-2002

Similar trend all over Europe

Explanation?

- **55%** - reduced blood lipids, hypertension and non-smoking
 - **Dietary changes and lower cholesterol**
- **36%** - improved medical treatment





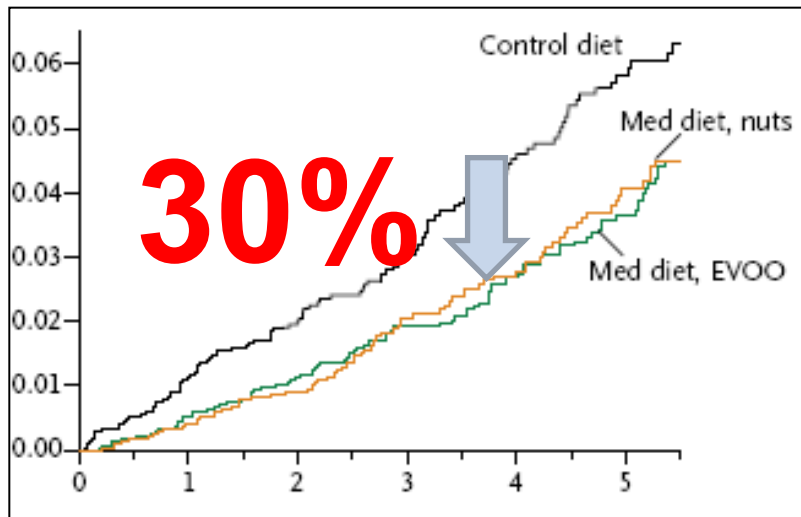
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Mediterranean food - extra **olive oil** or **nuts** reduces risk for cardiovasc. disease - PREDIMED

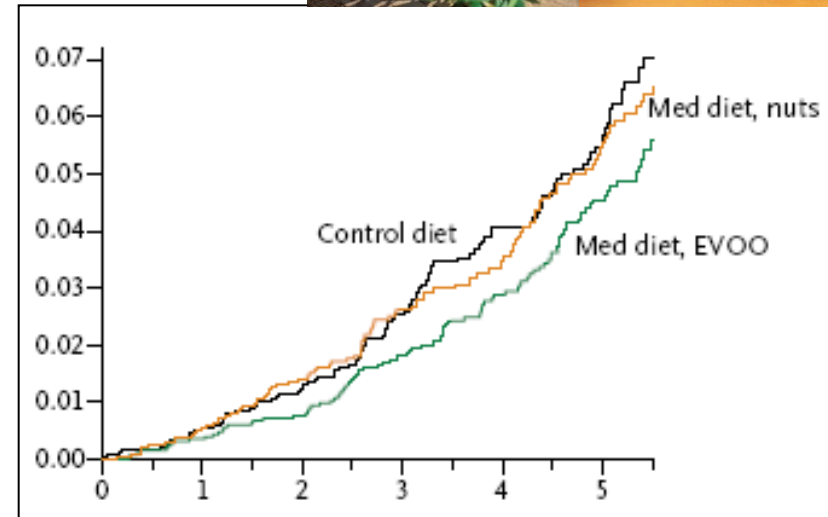
7447 Spanish (55-80 y, 57% female), healthy w. risk factors

3 groups - ~5 years

- ✓ Med. food + extra virgin olive oil – 1/2 dl/day
- ✓ Med. food + nuts – 30 g/day
- ✓ Control diet - Low fat med. diet



Cardiovascular disease



Mortality



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Food pattern and 12-y mortality in Swedish older men

1140 70 y old men in Uppsala

7-day food registration

Three dietary patterns

Healthy Diet Index

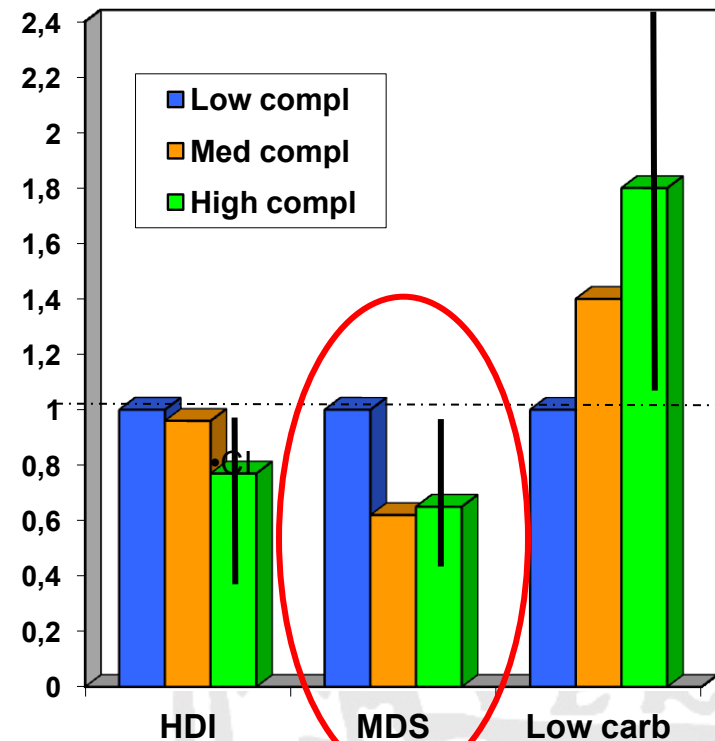
Mediterranean Diet Score

Carbohydrate restricted

Mortality after 12 years

Adjusted for smoking, BMI,
cholesterol, blood pressure and
PA

Risk to die



Sjögren et al. Am J Clin Nutr 2010;92:967-74



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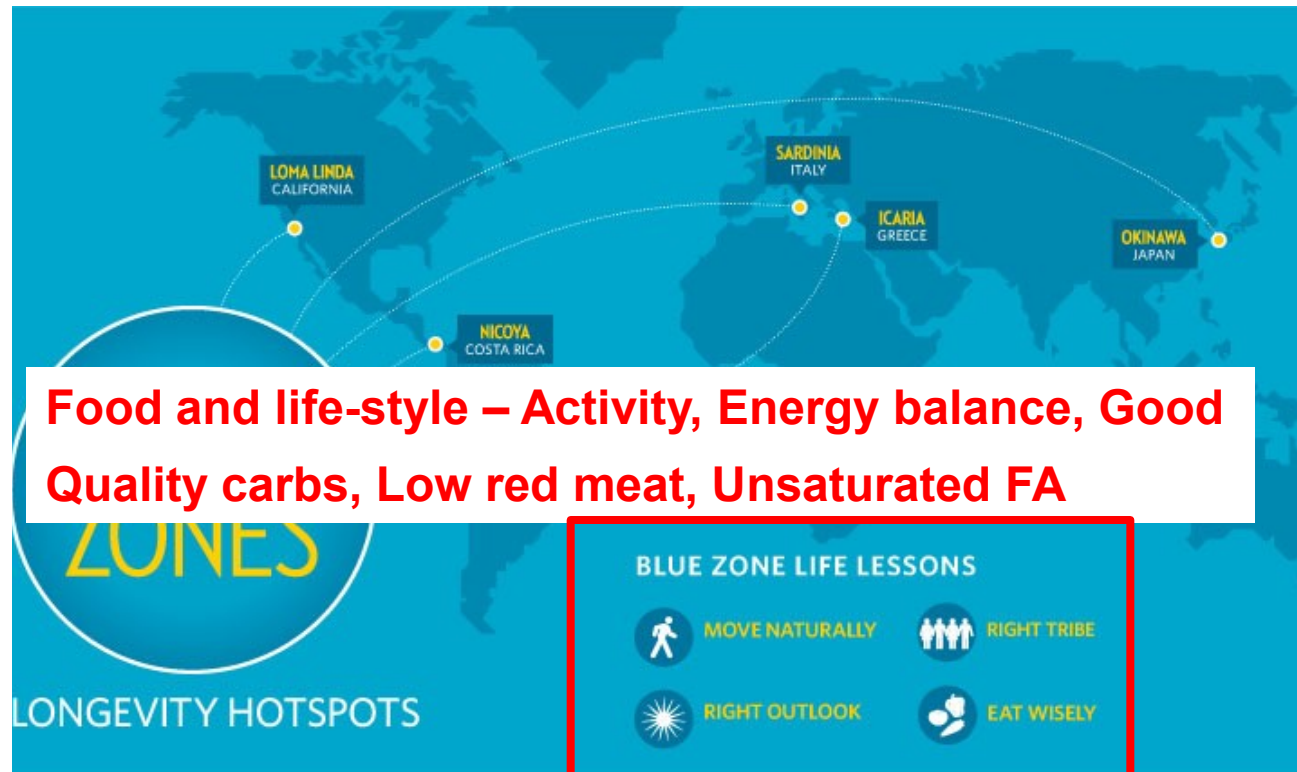
Blue zones – longevity hotspots

Okinawa (♀)

- **Food – amount/choices**
- **Active life-style**
- **Co-herence (religion)**
- **Social participation**

Sardinia (♂)

- **Active life-style**
- **Low red meat intake**
- **High-quality carbs**
- **Medium dose wine**



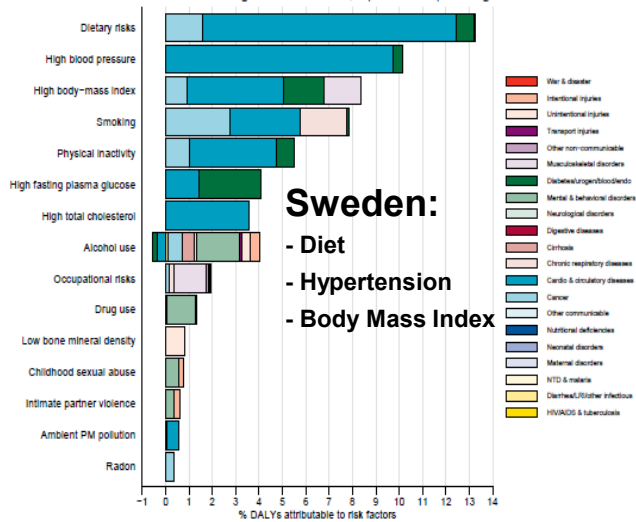


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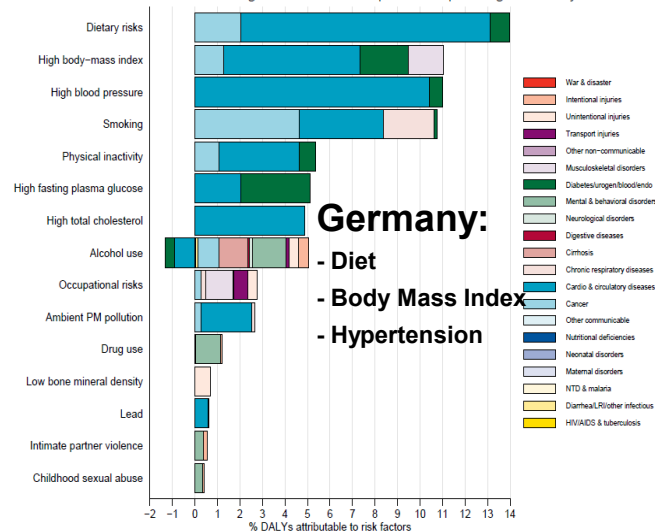
Global Burden of Disease – Risk factors for Europe's future health

- Dietary risks
- High blood pressure
- High body mass index
- Smoking
- Physical inactivity

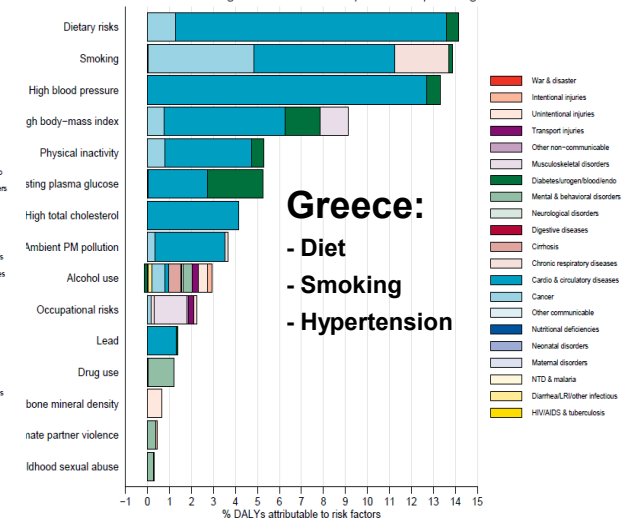
Burden of disease attributable to 15 leading risk factors in 2010, expressed as a percentage of Sweden DALYs



Burden of disease attributable to 15 leading risk factors in 2010, expressed as a percentage of Germany DALYs



Burden of disease attributable to 15 leading risk factors in 2010, expressed as a percentage of Greece DALYs





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BMI, function and survival in elderly

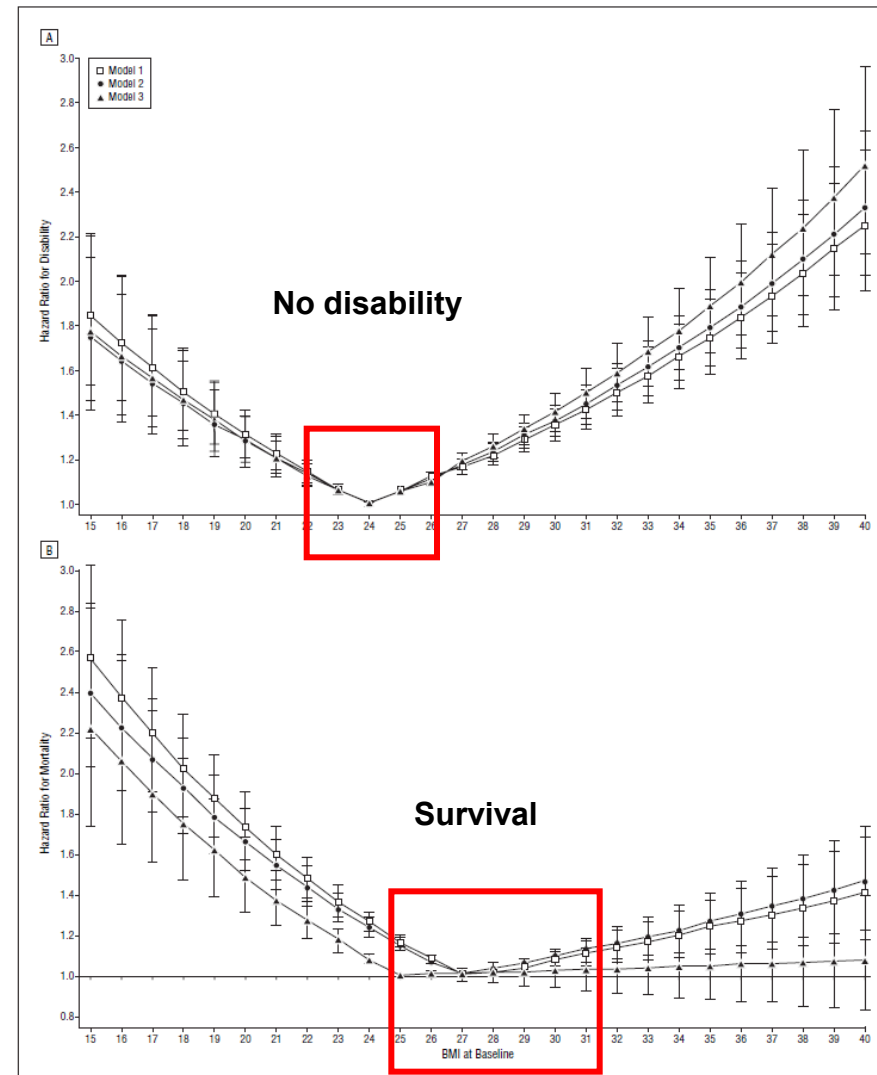
~13.000 >65 y

7 year follow-up

Optimal function by BMI ~25

Highest survival by BMI ~25-30

Al Snih S et al. Arch Intern Med 2007;167:774-80





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The Janus Face of nutrition

Old adults



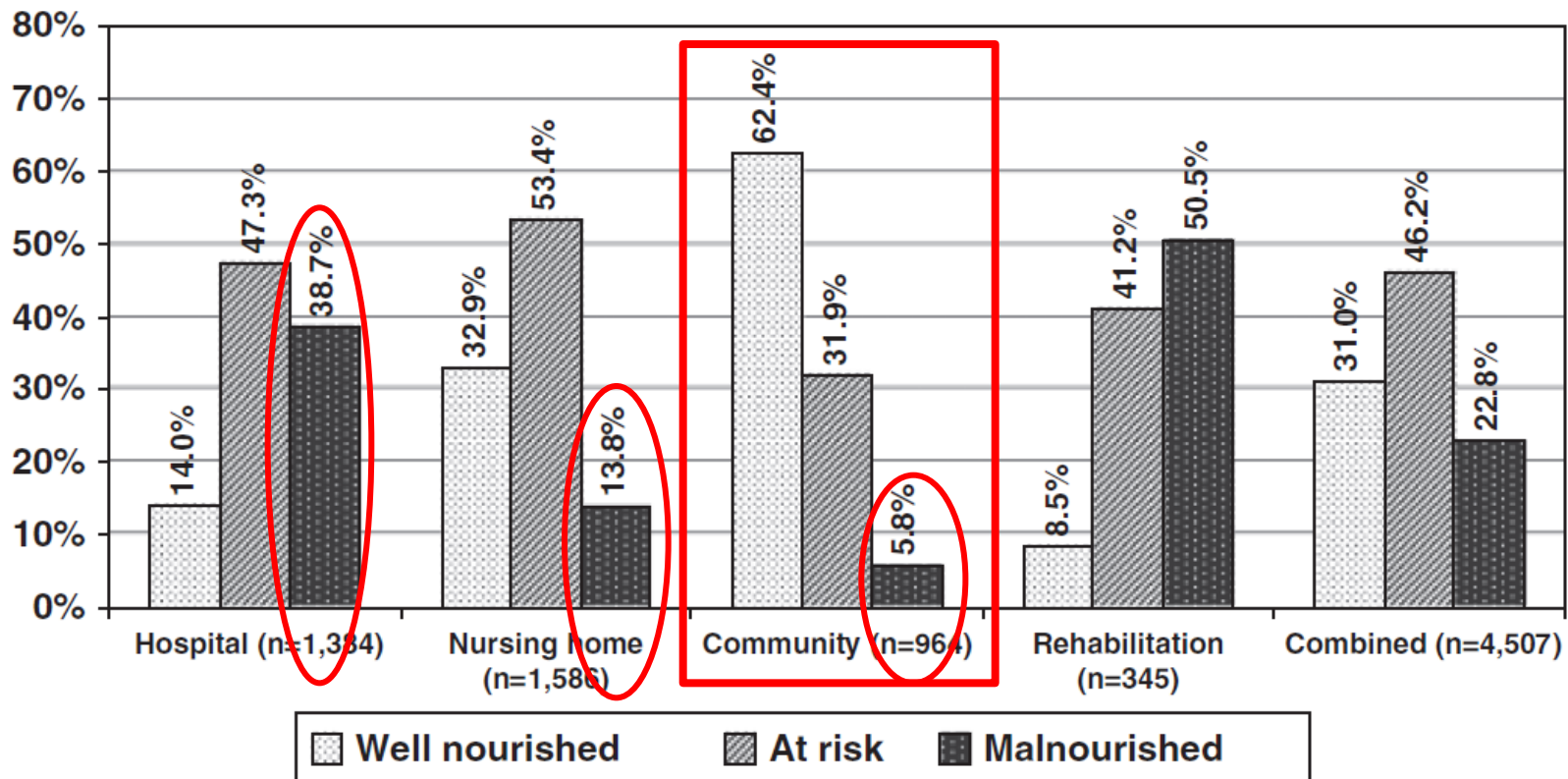
Undernutrition



Prevalence of undernutrition according to Mini Nutritional Assessment - an international perspective

4507 subjects from 24 datasets - 12 countries, 83 y

Kaiser et al. J Am Geriatr Soc 2010;58:1734–1738





nutritionDay
IN EUROPE

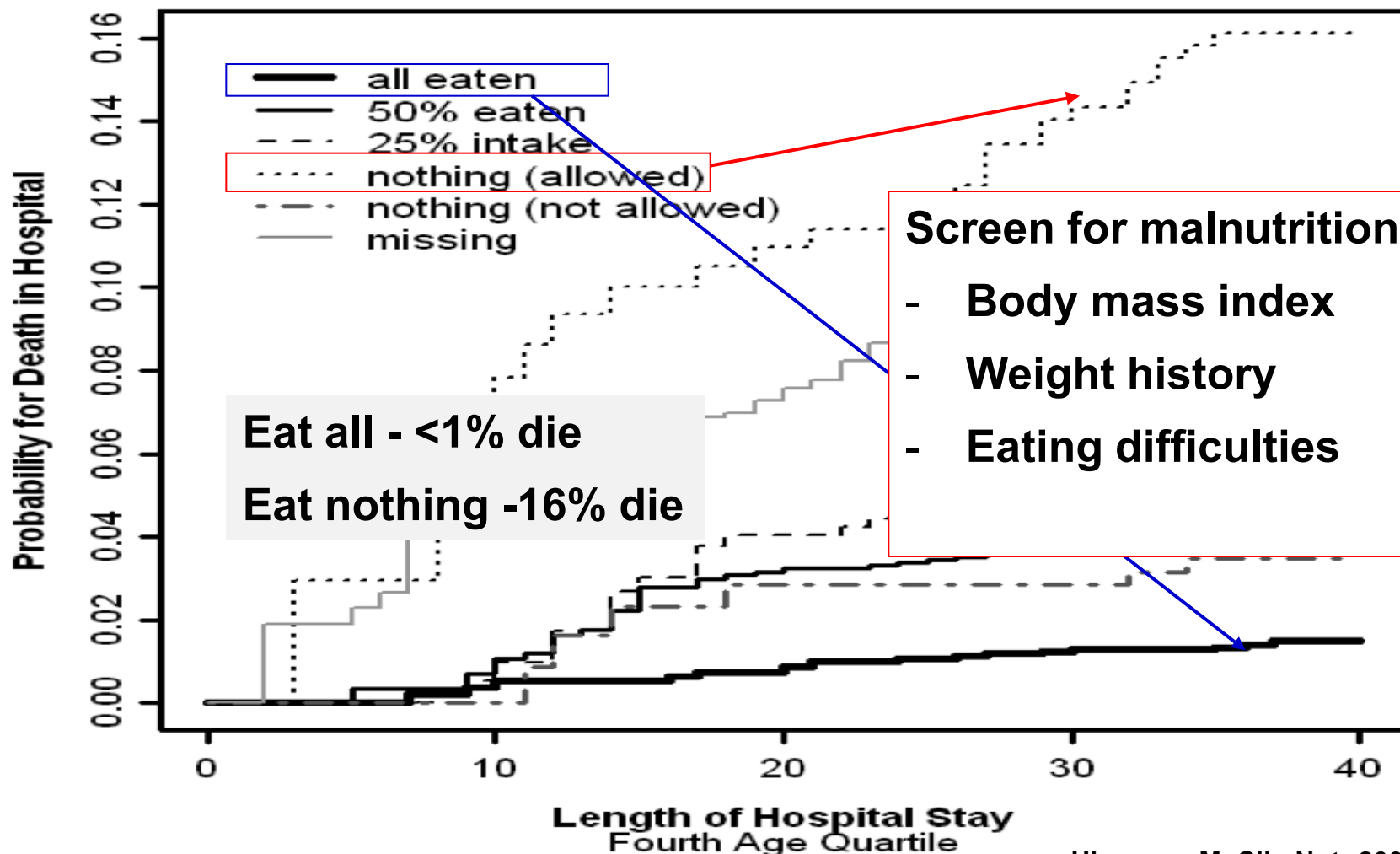
Poor eating in hospital \Rightarrow higher risk

3200 patients age 78–103 y



THE EUROPEAN
SOCIETY FOR
CLINICAL
NUTRITION AND
METABOLISM

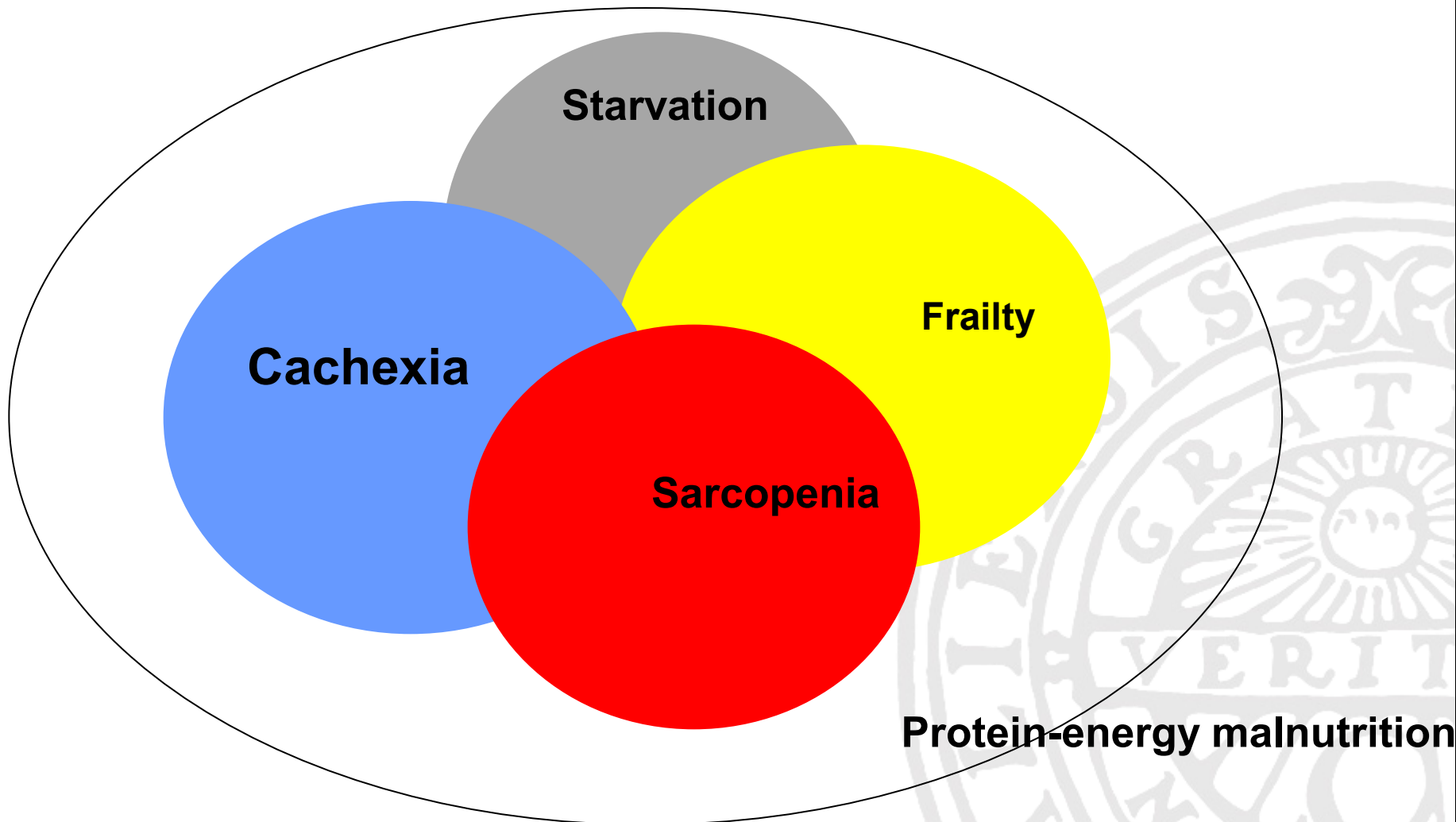
Adjusted Cumulative Incidence for Death in Hospital





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Catabolic conditions with negative effects on function and outcomes in old and ill adults





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Catabolism of aging → Frailty

Low food intake

- anorexia of aging
- oral/chewing dysfunction

Physical inactivity

Declining hormonal activity

- estrogen
- testosterone
- DHEA
- growth hormone

Inflammation

Oxidative stress

Social networks disintegrating

Sarcopenia

- ↓
- Weight loss
 - Weakness
 - Exhaustion
 - Slowness
 - Low physical activity

≥3 = **Frailty**



Fried L. Frailty in older adults: evidence for a phenotype.
J Gerontol 2001



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Clinical importance of sarcopenia and frailty – evidence!



- **Reduced QoL** Patel et al. Age Ageing 2013;42:378-84
- **Insulin resistance** Sanada et al. Eur J Clin Nutr 2012;66:1093-1098
- **Osteoporosis** Verschueren et al. Osteoporosis Int 2013;24:87-98
- **Falls** Landi F et al. Clin Nutr 2012;31:652-8
- **Hospital stay**↑ Gariballa&Alessa. Clin Nutr 2013;32:772-6
- **Early re-admissions** Gariballa&Alessa. Clin Nutr 2013;32:772-6
- **Mortality**↑ Landi F et al. Age Ageing 2013;42:203-9

Adjusted for relevant confounders



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The Japanese Centenarian Study

1907 100 y olds. 10% independent, i.e. preserved ADL functions, good cognition and good social networks

- Good vision
- ***Regular training***
- No falls
- No liqueur
- ***High protein intake***
- Chewing capacity
- Regular sleep
- Male



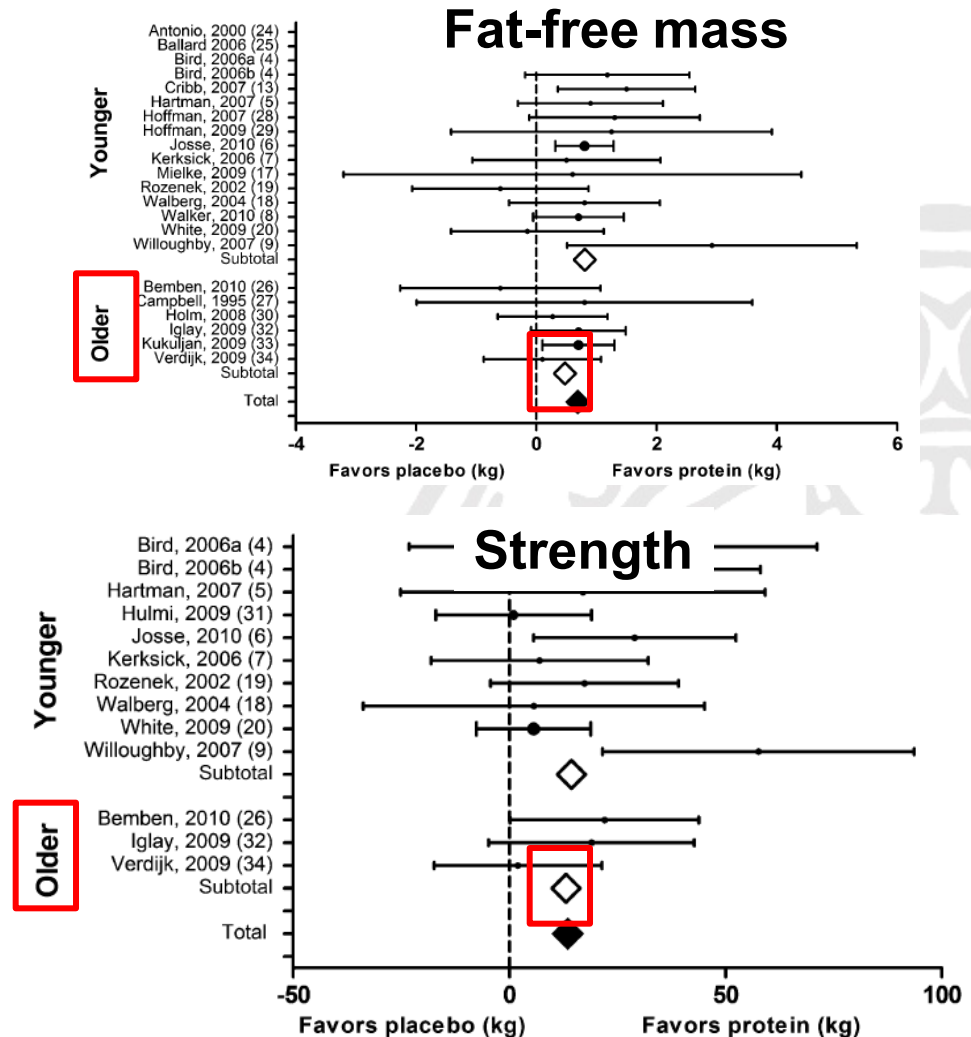


Combined exercise and protein supplementation – a meta-analysis

22 RCT, >6 weeks,
680 subjects - young and old

Protein supplementation
and **exercise** had additive
effects on

- **Muscle mass and**
- **Muscle strength**





Resistance training in old adults



Systematic review (15 RCTs) with consistent positive effects

- **Strength ~200%**, muscle mass↑ 10%.
- Improved stair walk, gait speed, chair rising...

- **Endurance exercise 150 min/week**
or 75 min of more vigorous exercise/w
- **Resistance training (PRT) 8-10 exercises,**
8 repetitions, 10 min, 3 times/week

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Cochrane meta-analysis update 2009 - 121 studies (RCT), 6700 subjects

- “modest improvement in gait speed”
- “moderate-large effect for getting out of chair”
- **“large effect on muscle strength”**

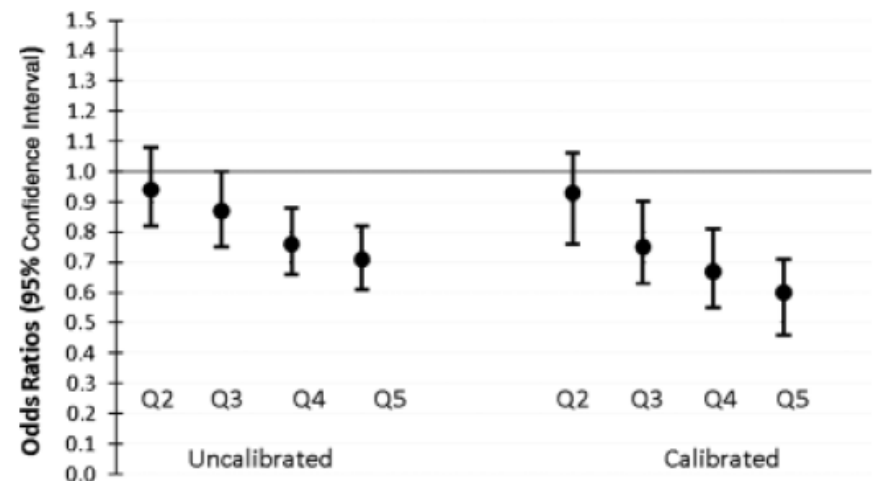


Protein intake and the risk of incident frailty in the WHI Obs St

- 24417 ♀ 65-79 y, non-frail
- Protein intake (quintiles) acc. to FFQ
- 3 year follow-up,
- Fried frailty criteria

Conclusion:

**The highest protein intake,
30% less risk for frailty**



Q1 – 1 g/kg bw, 35 g animal prot

Q5 – 1.2 g/kg bw, 58 g animal prot

Beasley et al. JAGS 2010

Nordic Nutrition Recommendations 2012

Protein recommendation in old adults

Systematic review 2000-2011 (Healthy, >65 y)

304 potential abstracts/154 full papers

... target for protein intake in elderly is 18 E%, corresponding to 1.2-1.4 g/kg BW/d...

Evidence grading

Conclusive, probable, suggestive and inconclusive



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Compression of morbidity - new challenges!

**Compress morbidity, prolong longevity,
prevent disease, promote activity**

- **Energy balance – avoid obesity and underweight**
- **Exercise regularly – endurance and resistance**

Traditional Mediterranean food

- **High protein intake from white meat/fish/veg**
- **High intake of antioxidants (fruit/veg/wine)**

THANKS