



*Saving lives and resources by preventing osteoporotic fractures with dairy products*

CERIN-EMF-GDP LUNCH SYMPOSIUM

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WCO-IOF-ESCEO Florence, 25 March 2017

# Background - implementation of a nutrition program?

Clinical evidence

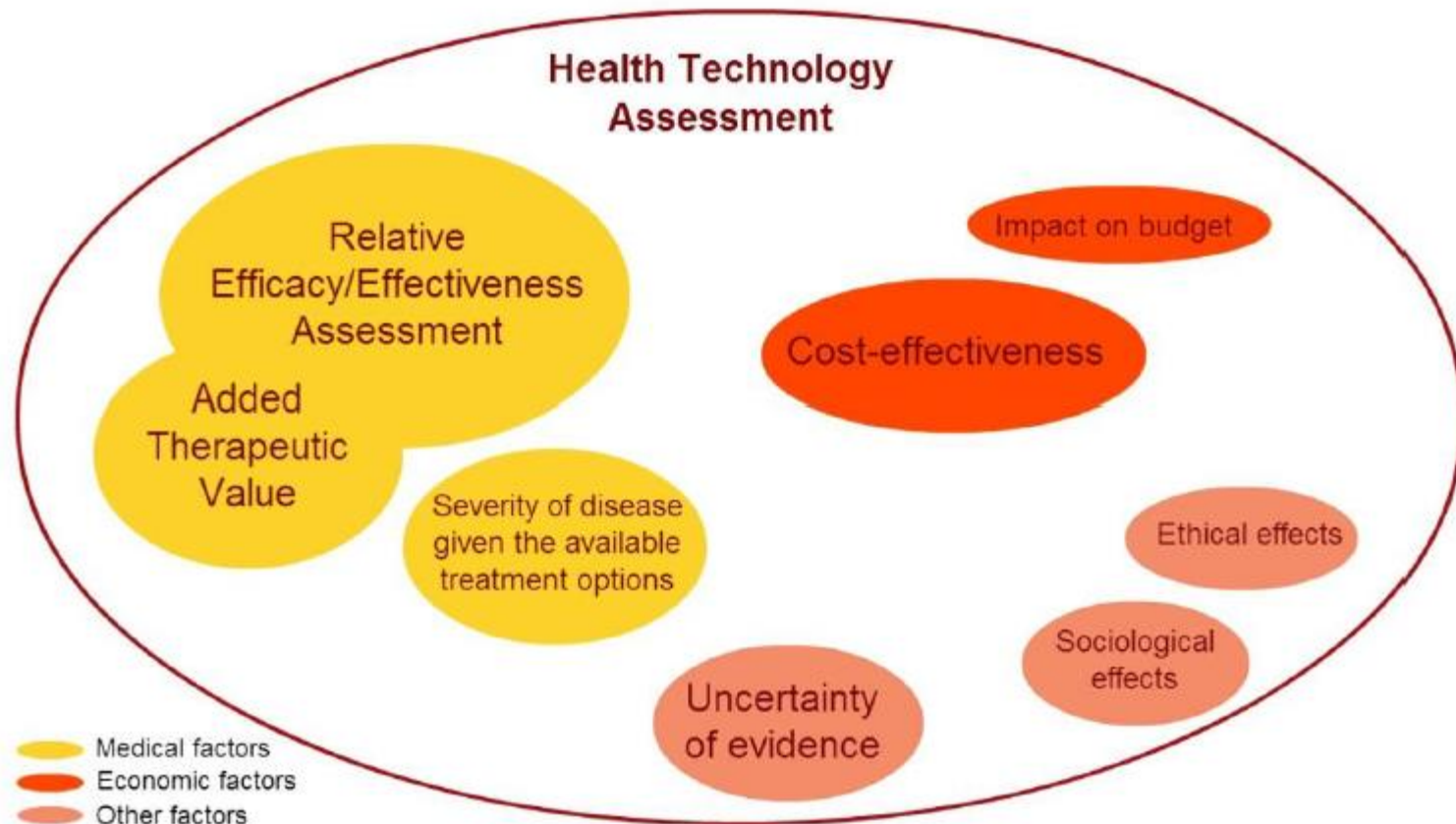
Societal impact



Economic impact



## Criteria used to assess health products

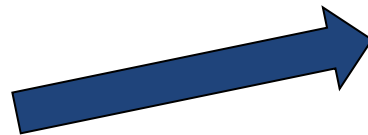


Health Technology Assessment, European Parliament, 2015

## Aim of this presentation

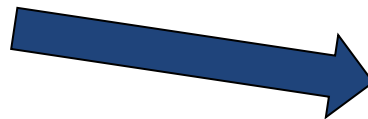


*Dairy products*



Public health impact

⇒ **Saving lives?**



Economic impact

⇒ **Saving resources?**

## Measuring public health impact

- Clinical outcome: *number of (hip) fractures prevented*
- Life years: *number of years saved*
- Quality adjusted life years: *number of QALY gained*

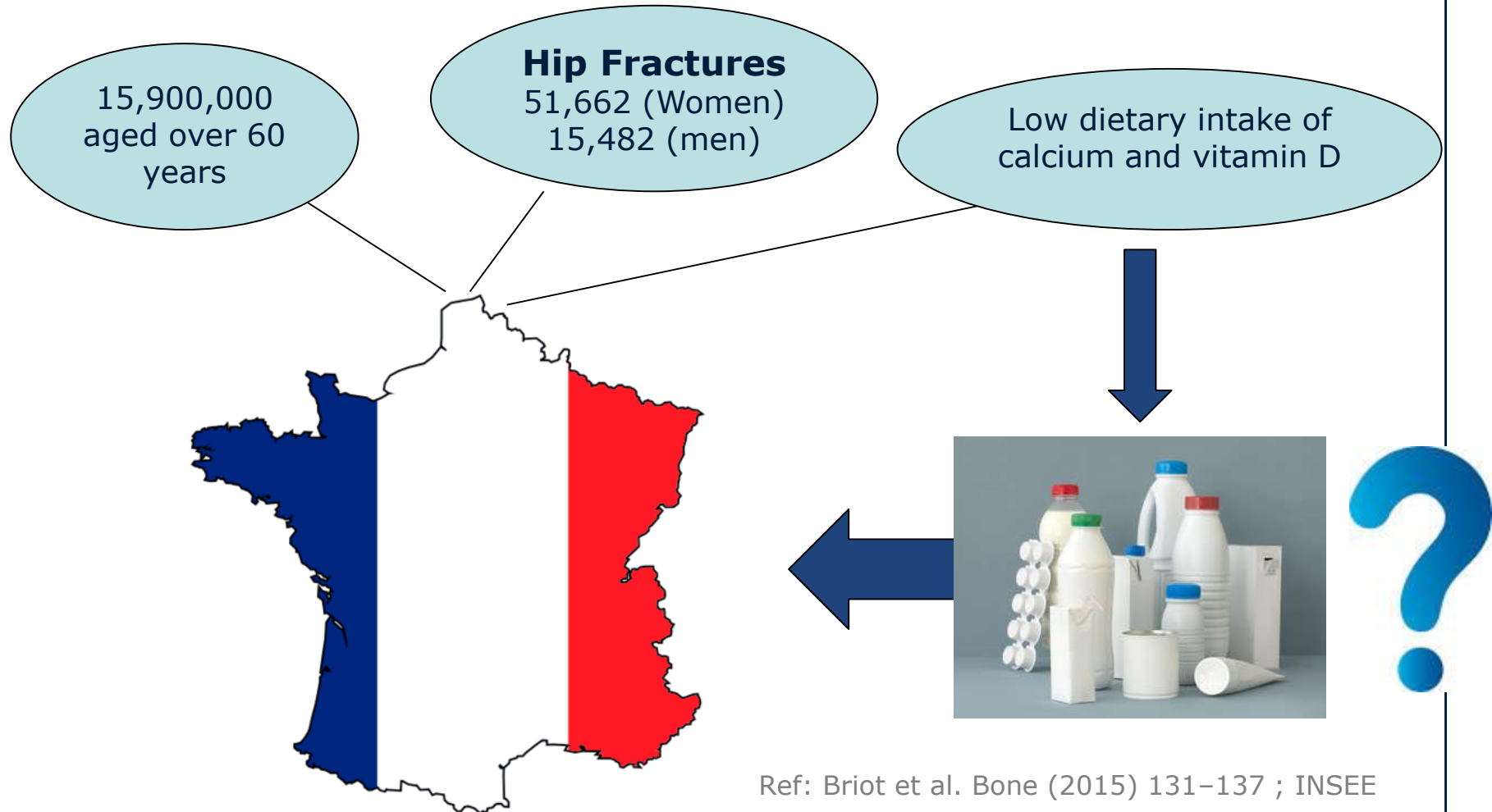
$$QALY = \text{years} \times \text{utility}$$



$$1 \text{ QALY} = \underline{1 \text{ year in perfect health}}$$

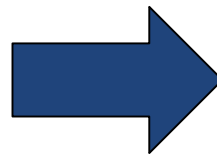


# Example



Ref: Briot et al. Bone (2015) 131–137 ; INSEE

Recommended  
intake of dairy  
products



Lifetime impact

- Fractures prevented
- Life years gained
- QALY gained

1 year  
(2015)

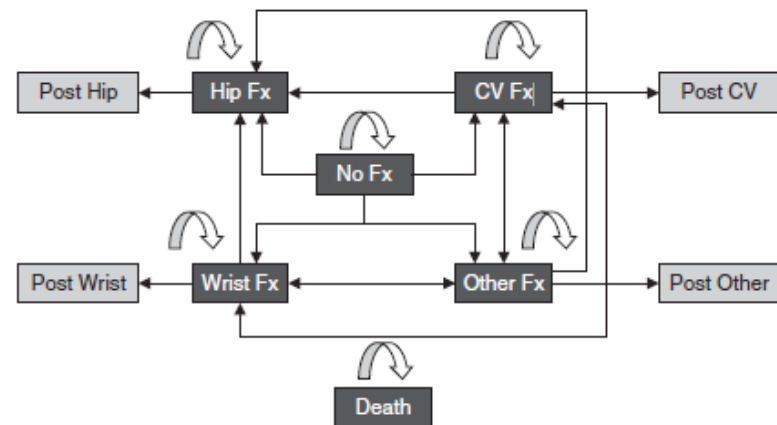


Hiligsmann et al. Osteoporos Int. 2017;28(3):833-840

## Methods

### Markov microsimulation model

- Fracture incidence, mortality, fracture cost, fracture disutility



### Dairy products

- Effects on fracture from Cochrane review
- ↓16% (Hip), ↓ 14% (Vertebral) ↓11% (other)

Avenell et al 2014 Cochrane Database Syst Rev 4:CD000227.



## CAPHRI School for Public Health and Primary Care

Health impacts of the recommended intake of dairy products in the general French population over 60 years for 1 year

### Hip fractures

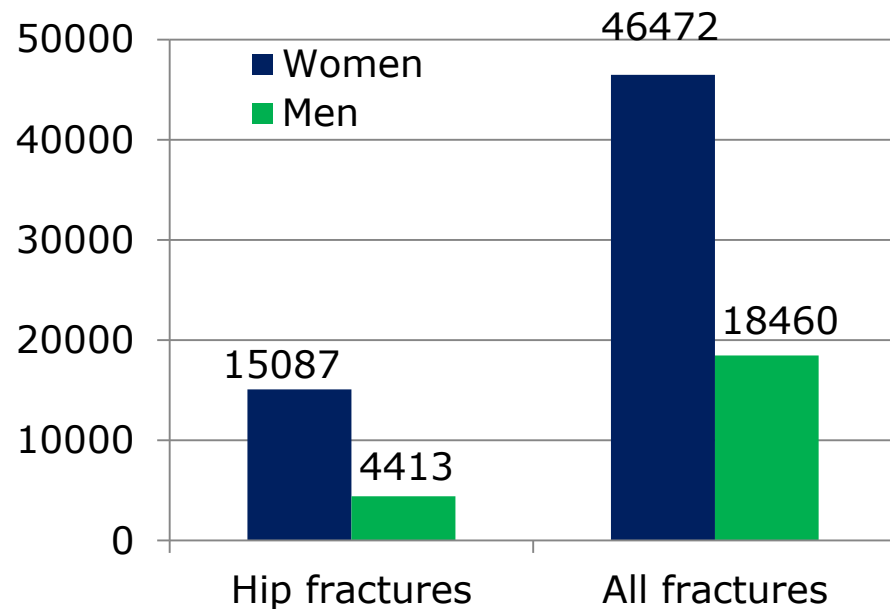
#### First year:

- 8,000 women
- 2,500 men
- ⇒ 126 millions € saved (hospitalization)

#### Subsequent years:

- 7,000 women
- 1,900 men

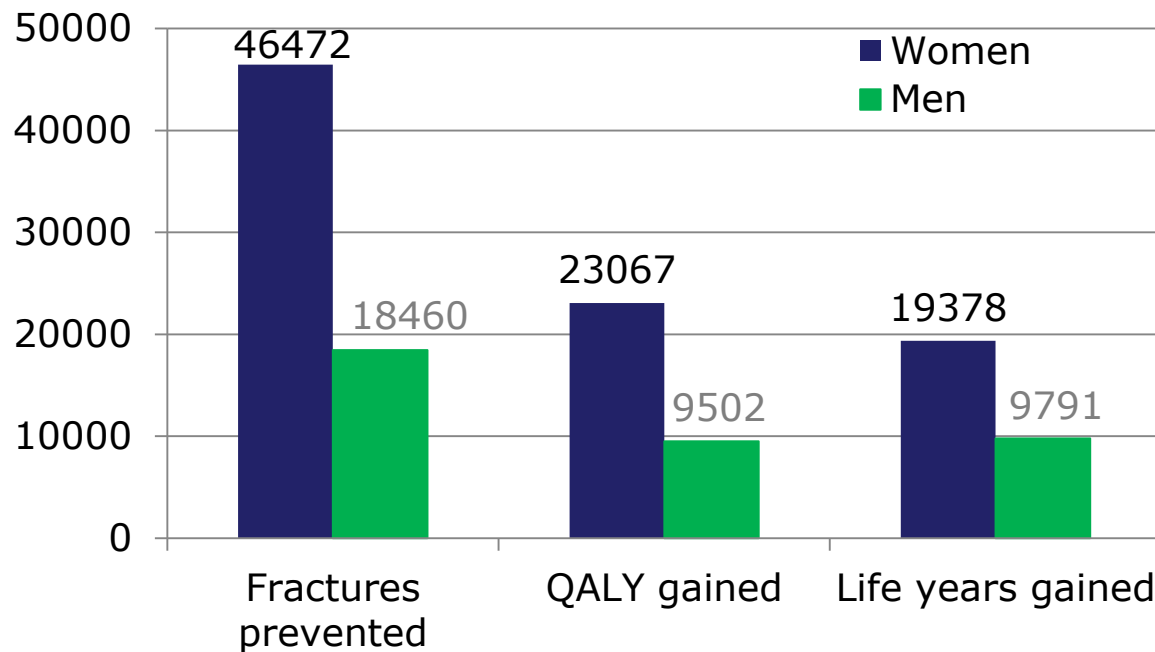
### Lifetime



Hiligsmann et al. Osteoporos Int. 2017;28(3):833-840

## CAPHRI School for Public Health and Primary Care

Health impacts of the recommended intake of dairy products in the general French population over 60 years for 1 year

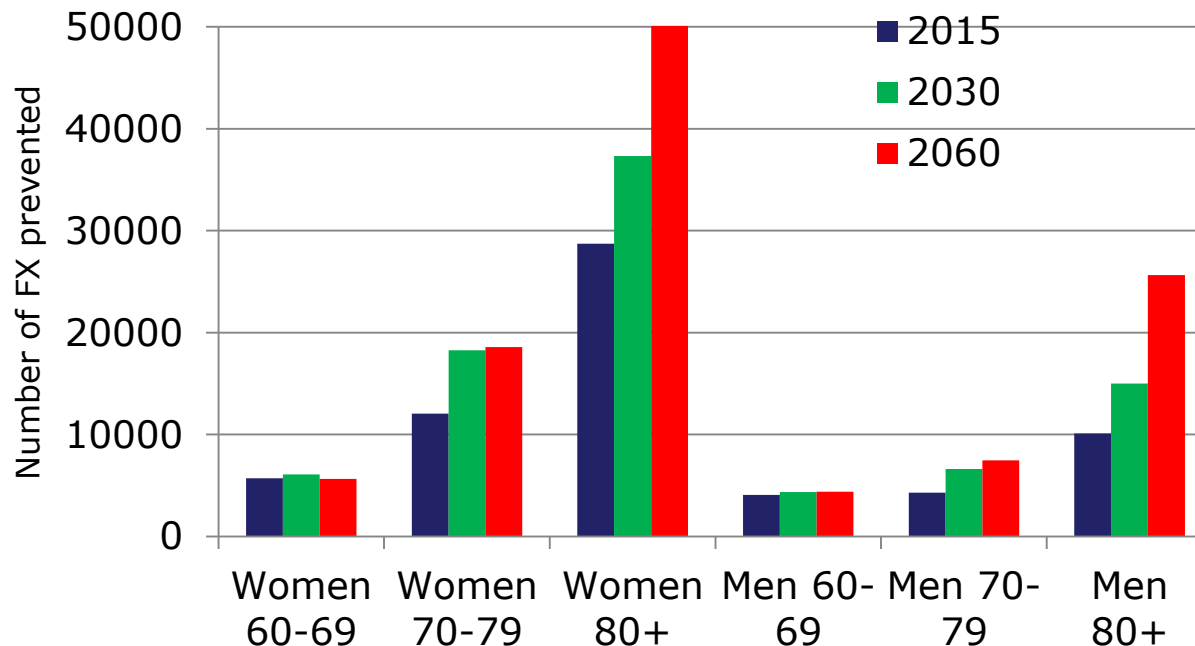


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## CAPHRI School for Public Health and Primary Care

Increasing life expectancy

⇒ increase in projected health impacts



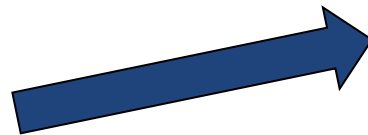
2030:  
+33%

2060:  
+77%

## CAPHRI School for Public Health and Primary Care

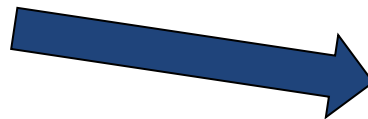


*Dairy products*



Public health impact

⇒ **Saving lives?**

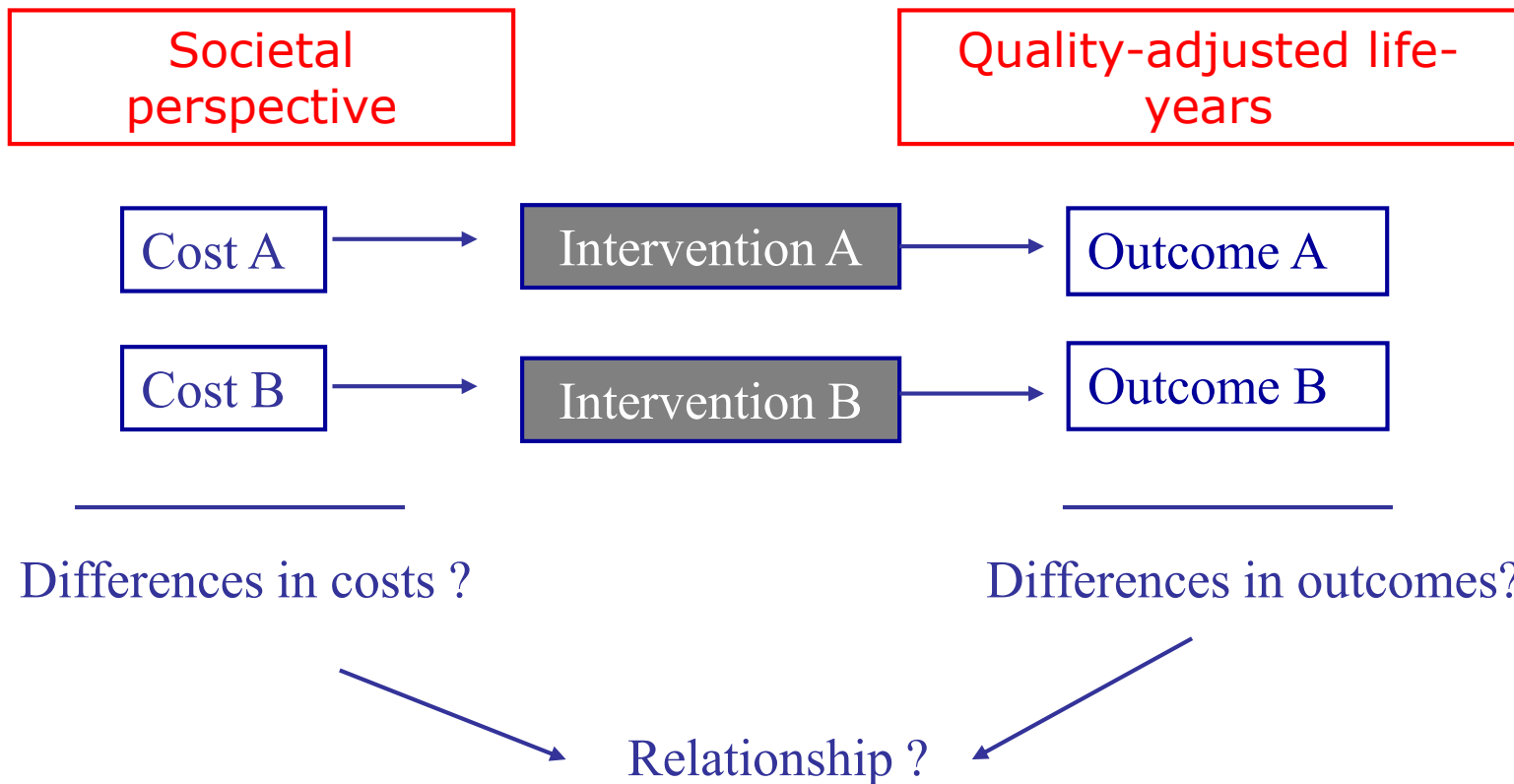


Economic impact

⇒ **Saving resources?**



# Measuring economic impact



## CAPHRI School for Public Health and Primary Care

COSTS



OUTCOME

↓ fracture costs

↑ dairy costs (€0.54/day for 2 products)



More COSTS



More QALYs



## Measuring economic impact

Incremental cost-effectiveness ratio

$$\text{ICER} = (C_A - C_B) / (E_A - E_B) = \Delta C / \Delta E$$

*= The additional cost per extra unit of effect from the comparator treatment*

Intervention adopted if **ICER** < **λ** (= willingness to pay per effectiveness unit)

ICER < 2 X GDP (68,000€)



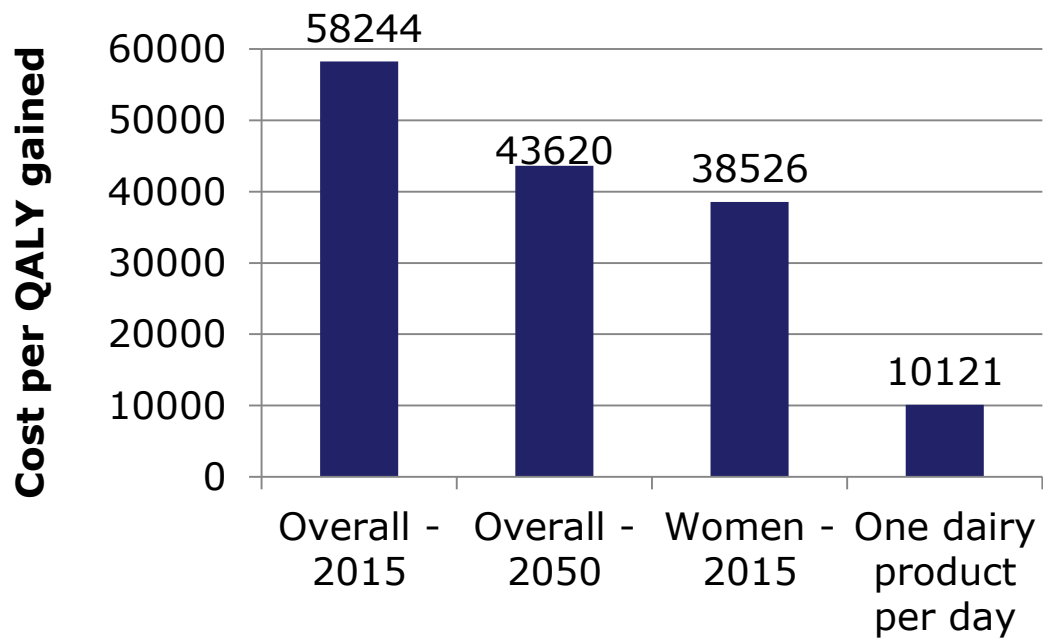
ICER < 30,000€)



ICER > 2 X GDP  
(68,000€)



## CAPHRI School for Public Health and Primary Care



Hilgsmann et al. Osteoporos Int. 2017;28(3):833-840

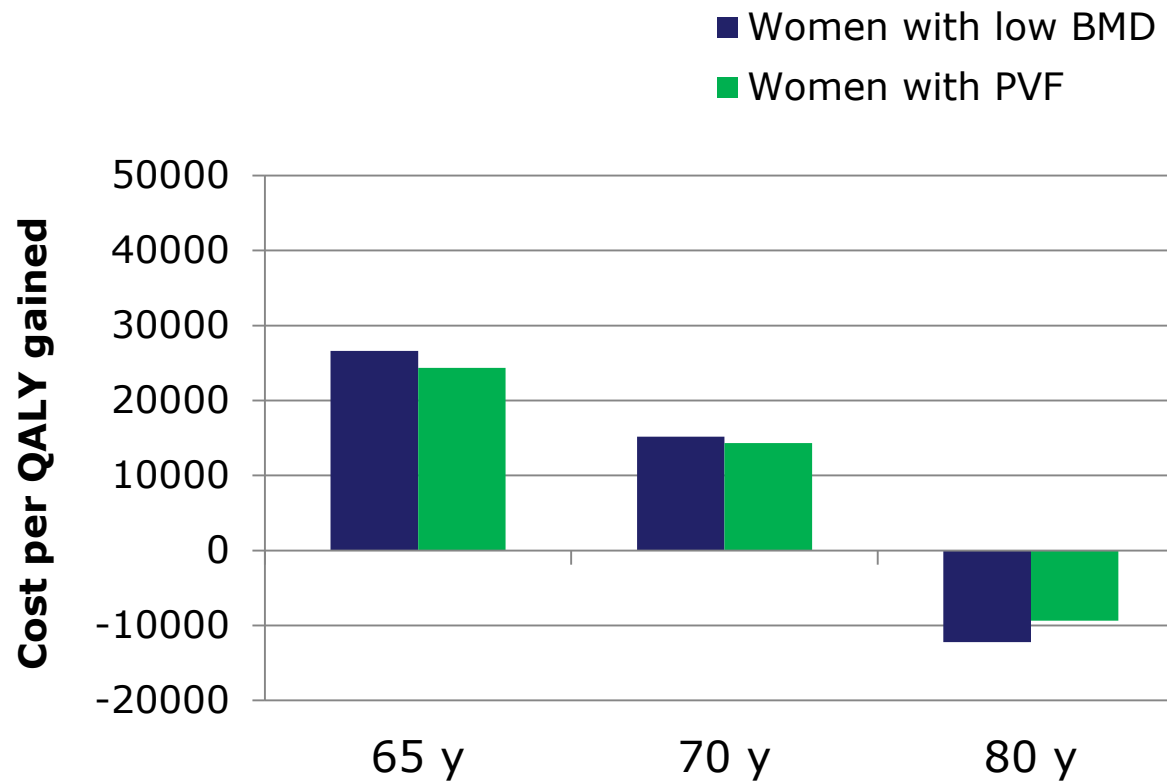
## Cost-effectiveness dairy products

- General population aged over 60 years
  - ⇒ Border of efficiency
- Highly cost-effective (ICER <30,000)
  - ⇒ Women aged over 70 years
  - ⇒ Men aged over 80 years



Hiligsmann et al. Osteoporos Int. 2017;28(3):833-840

## High-risk population



Ethgen et al. Osteoporos Int (2016) 27:301–308

## CAPHRI School for Public Health and Primary Care

Vitamin D and calcium food-fortification programme in the German female population aged 65 years and older



Annual net cost savings  
of €315 million

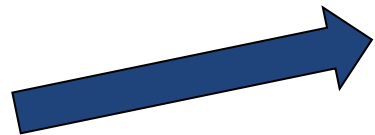
Annual total number of  
fractures prevented:  
36,705

Sandman et al. Public Health Nutr. 2015 Nov 16:1-10

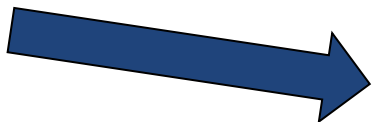
## CAPHRI School for Public Health and Primary Care



*Dairy products*



Public health impact  
⇒ **Saving lives?**



Economic impact  
⇒ **Saving resources?**



⇒ **Value for money**





## Discussion

- Effectiveness of dairy products (real-life studies)
- Willingness to consume fortified dairy products
  - ⇒ large majority of Germans would be willing to consume vitamin D-fortified dairy products (1)
  - ⇒ higher willingness to consume for nutritional products
- Adherence to dairy products
- Increase in expected benefits in population aged over 80 years
- Other effects of calcium and vitamin D

(1) Sandman et al. Food Qual Prefer. 2015 Jul;43:53-62

# Dairy products



- Substantial public health impact → **saving lives**
  - Efficient allocation of resources → **saving resources**
- => Need for dairy products programmes/support





**Thank you for your  
attention**



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