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# **Which costs does childhood obesity cause? Implications for obesity prevention in Germany**

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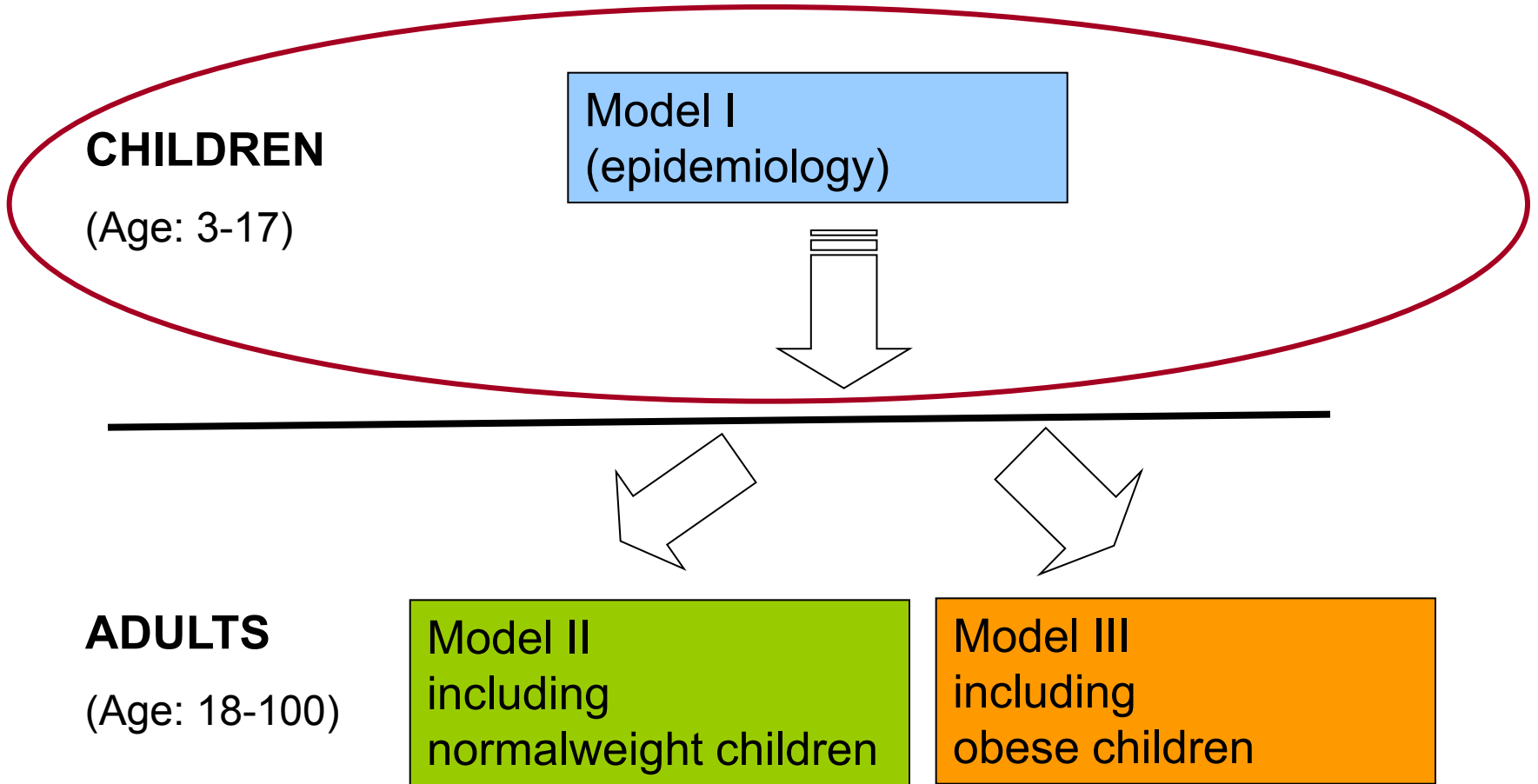
# Which costs are caused by obesity?



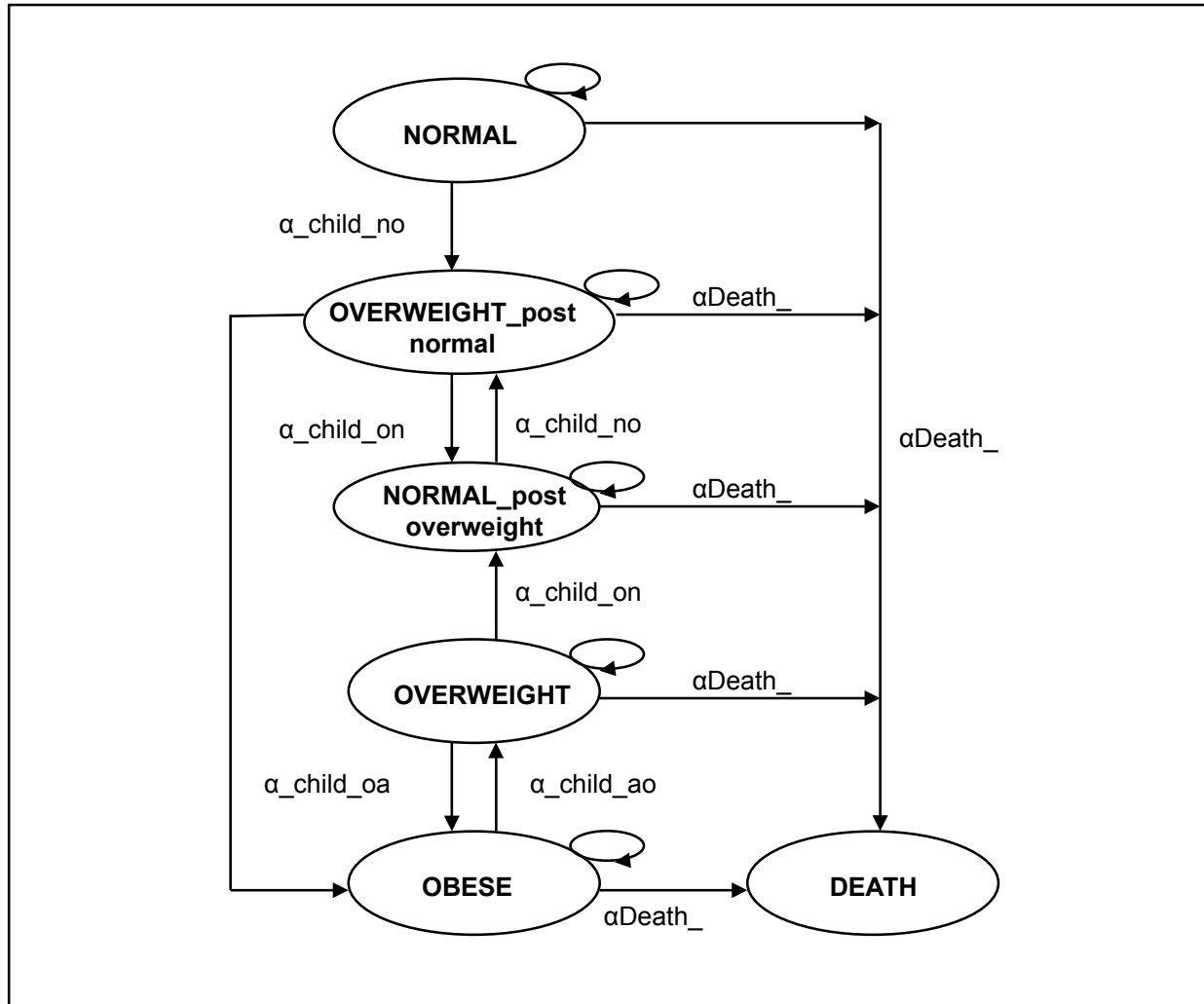
## Research question:

Do overweight and obese children ( $\text{BMI} > 25 \text{ kg/m}^2$ ) cause larger lifetime excess costs during adulthood than normalweight children?

# Methods (I)



# Methods (II)

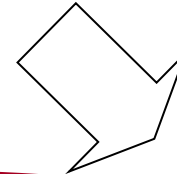
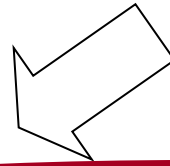
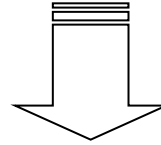


# Methods (IV)

**CHILDREN**

(Age: 3-17)

Model I  
(epidemiology)



**ADULTS**

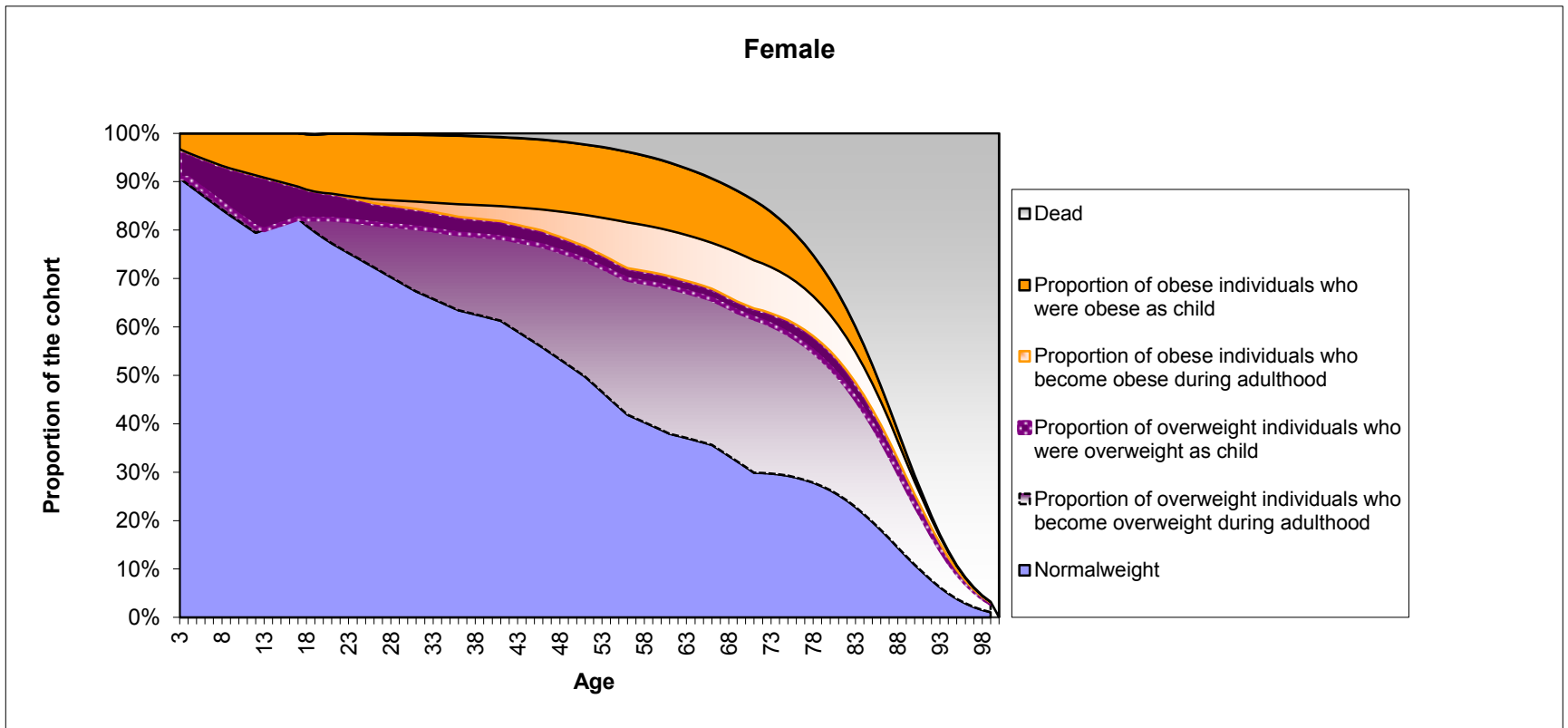
(Age: 18-100)

Model II  
including  
normalweight children

Model III  
including obese  
children

# Results (I)

## Development of BMI categories taking childhood obesity history into account



# Results (II)

## Comparison direct/ indirect lifetime excess costs

|                     | Cost differences                | Costs (€ 2010) without Discounting |               |
|---------------------|---------------------------------|------------------------------------|---------------|
|                     |                                 | Men                                | Women         |
| If obese as a child | <b>Direct</b><br>Excess costs   | <b>14,524</b>                      | <b>19,479</b> |
|                     | <b>Indirect</b><br>Excess costs | <b>11,547</b>                      | <b>6,428</b>  |



# Literature comparison– obese/non-obese childhood

|   |   | Sonntag/<br>De Bock 2013  |
|---|---|---------------------------|
|   |   | Germany                   |
|   |   | Proxy for incidence       |
|   |   | Markov Model with Kohorte |
| <b>Direct costs</b>                                     | m | <b>2.99</b>               |
|   | f | <b>3.37</b>               |
| <b>Indirect costs</b>                                   | m | <b>2.94</b>               |
|   | f | <b>3.85</b>               |
| <b>Additional direct lifetime-costs (3% discount)</b>   |   | <b>4,262-7,028 Euro</b>   |
| <b>Additional indirect lifetime-costs (3% discount)</b> |   | <b>2,442 – 4,206 Euro</b> |

**Thanks a lot for your attention!**

# **Additional Slides**

# Methods (VII)

## 1. Estimation of transition probabilities

- Kinder- und Jugendgesundheitssurvey (**KiGGS**):  
cross-sectional data
  - Adapting of health status „normalweight“, „overweight“ and „obese“ since two BMI states have been neglected.
  - Since data are not available for each year, data are adjusted by linear regressions
  - determination of genderspecific transition probabilities

# Methods (VIII)

- **Sample Census 2009:** cross-sectional data
  - Adapting of health status „normalweight“, „overweight and „obese“ since one BMI state has been neglected.
  - Since data are not available for each year, data are adjusted by linear regressions.
  - Determination of genderspecific transition probabilities; backward changes between stages have been considered e.g. tracking from obesity to overweight.

# Methods (IX)

## 2. Further data

- Mortality rates are used from Federal Statistical Office
- In order to determine relative risks (RRs) two literature reviews have been conducted:
  - Age-specific mortality RR associated with obesity or overweight are used from the **European Prospective Investigation into Cancer and Nutrition (EPIC-Study)**.
  - Adult mortality RR associated with obesity or overweight in childhood used from **Engeland et al. (2004)**.

# Methods (X)

## 3. Costs

Eur J Health Econ (2011) 12:345–352

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ORIGINAL PAPER

### Health burden and costs of obesity and overweight in Germany

A. Konnopka · M. Bödemann · H.-H. König

- Methodology: PAF

# Sensitivity Analysis

|                          | Cost   | % difference from base result |
|--------------------------|--------|-------------------------------|
| <b>Men</b>               |        |                               |
| <b>Univariate:</b>       |        |                               |
| Discount rate 5%         | 2.331  | -45%                          |
| Transition probabilities |        |                               |
| <i>factor 0.8</i>        | 3.948  | -6%                           |
| <i>factor 1.2</i>        | 4.399  | 5%                            |
| RR adult mortality       | 4.153  | -1%                           |
| Costs                    | 11.339 | 169%                          |
| <b>Women</b>             |        |                               |
| <b>Univariate:</b>       |        |                               |
| Discount rate 5%         | 1.423  | -42%                          |
| Transition probabilities |        |                               |
| <i>factor 0.8</i>        | 2.340  | -4%                           |
| <i>factor 1.2</i>        | 2.519  | 3%                            |
| RR adult mortality       | 2.372  | -3%                           |
| Costs                    | 5.571  | 129%                          |