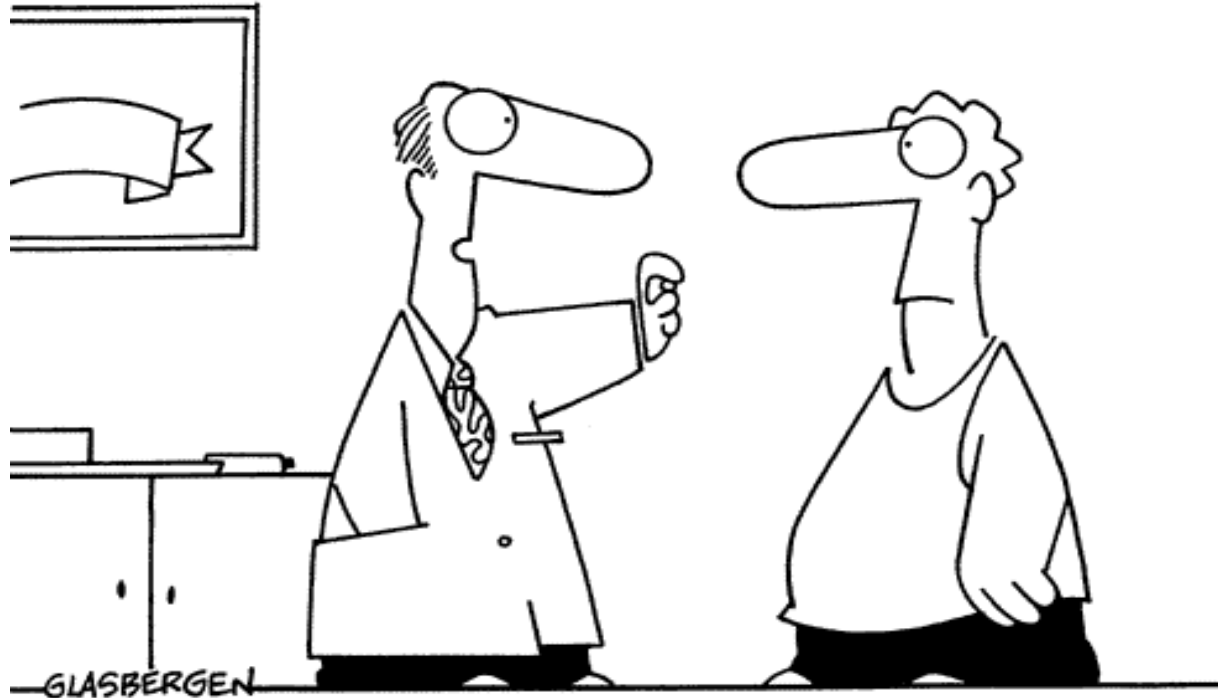


Lifestyle interventions

© 1998 Randy Glasbergen. E-mail: randy@glasbergen.com



**“To prevent a heart attack, take one aspirin every day.
Take it out for a jog, then take it to the gym,
then take it for a bike ride....”**

Lifestyle over the life course

Dr. Ir. Eva Corpeleijn

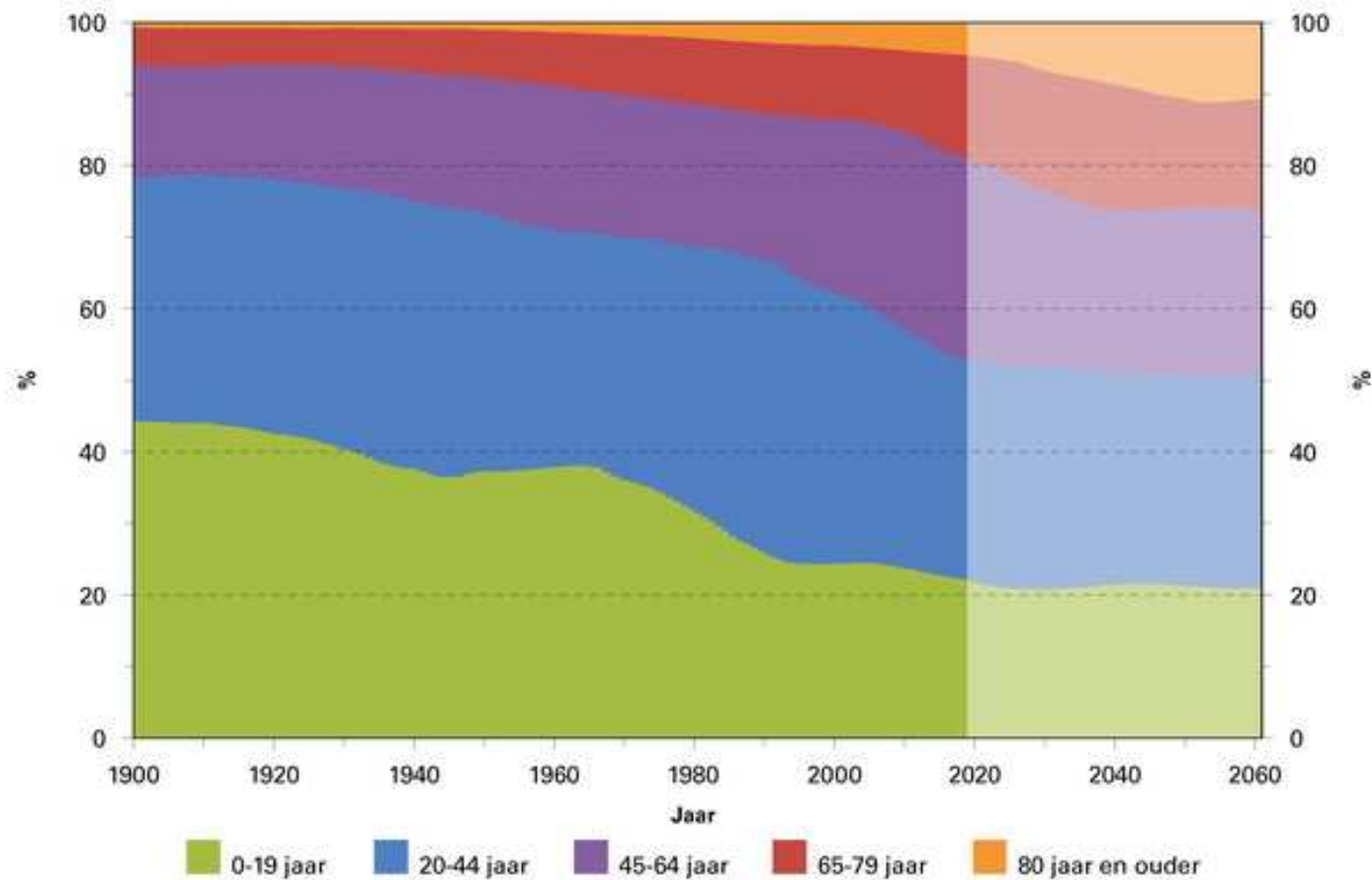
Unit 'Lifestyle medicine in obesity and diabetes'
Associate Professor Lifestyle epidemiology

Epidemiology Department
University Medical Center Groningen
E.Corpeleijn@umcg.nl

Healthy lifestyle ... Who? And why?



Figuur 1. De leeftijdsverdeling van de bevolking, Nederland, 1900-2018 en prognose 2019-2060



Bron: CBS.

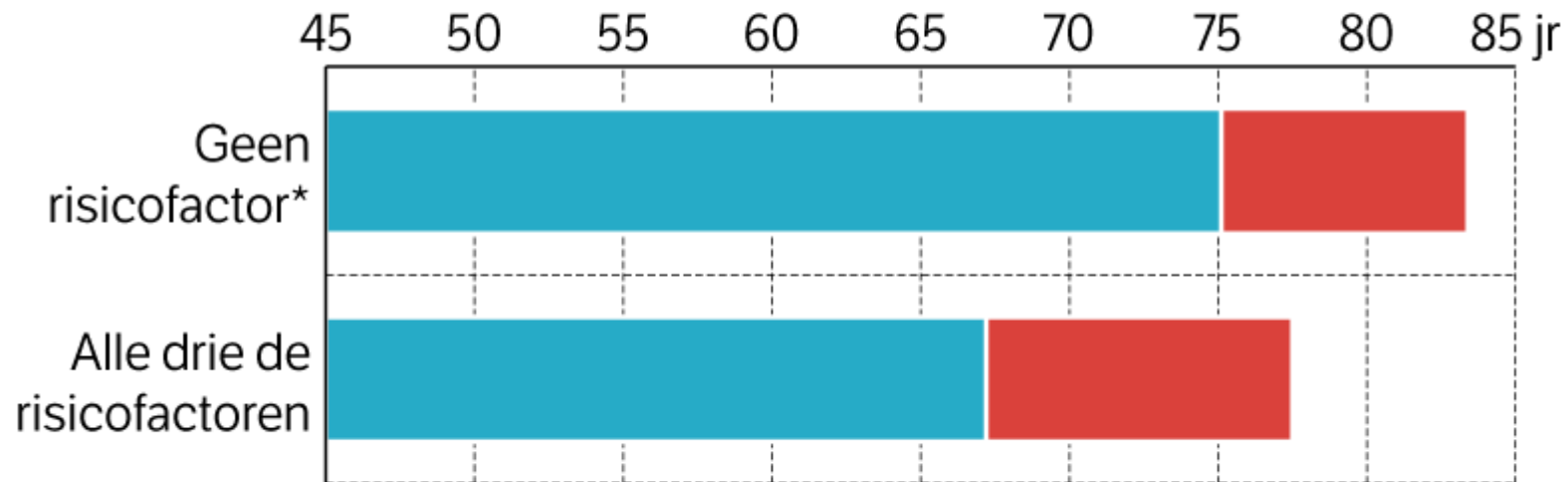
- Working age 1980: 65%
- 2018: 59%
- 2060: 55%

What can be gained?

Levensverwachting

Mensen die gezond leven worden gemiddeld pas ziek als rokers met overgewicht en hoge bloeddruk al op het punt van overlijden staan.

- Jaren zonder levensbedreigende ziekte
- Jaren met levensbedreigende ziekte



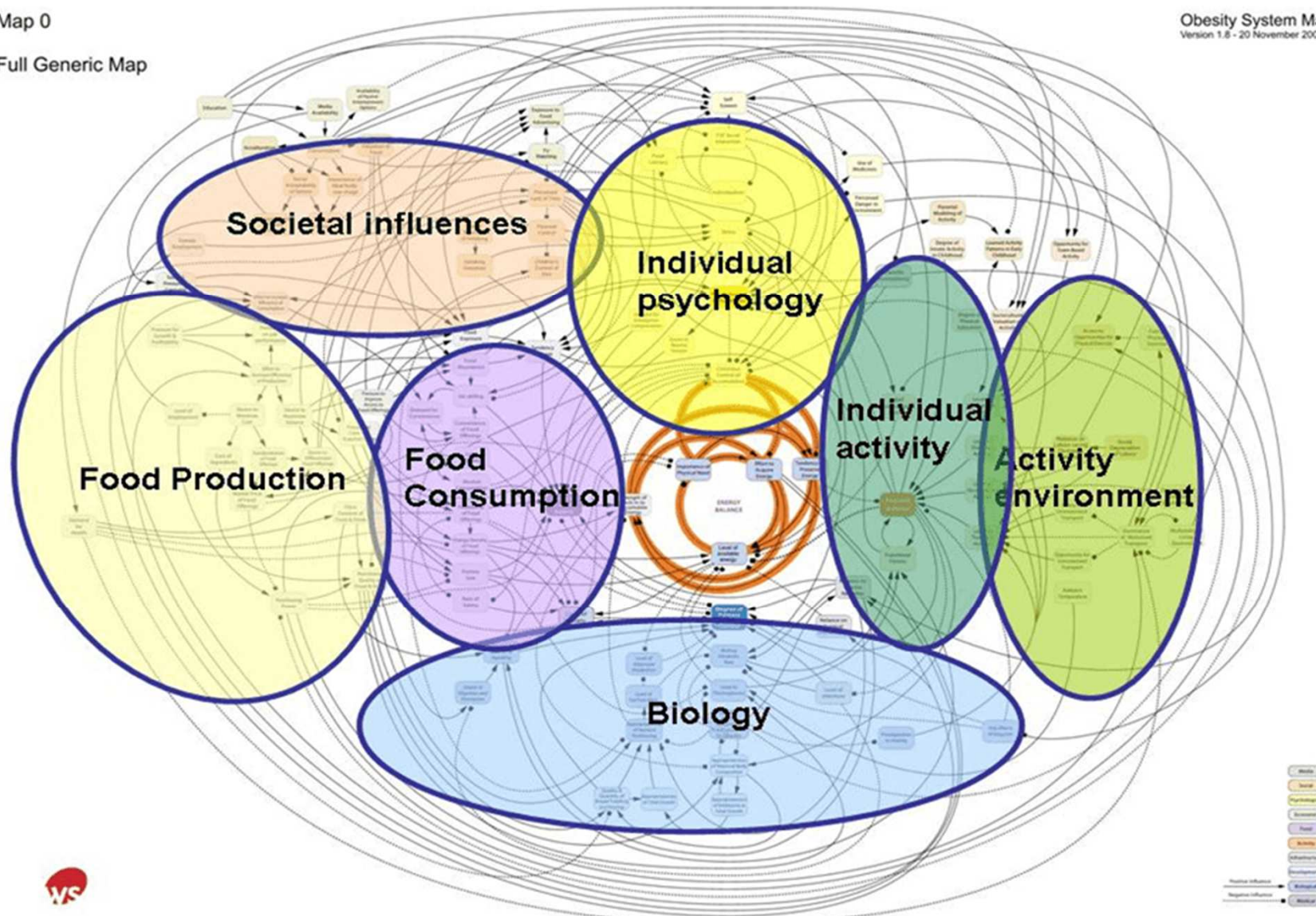
* *smoking, high blood pressure and overweight/obesity*

Societal approach

Map 0

Full Generic Map

Obesity System Map
Version 1.6 - 20 November 2006









LifeLines a prospective 3-generation cohort study and biobank on the causes of multimorbidity and chronic diseases in the general population

www.lifelines.net

How does diet relate to weight gain over the lifecourse?

- How to measure diet quality?

Shift in focus from nutrient to food product level
Stronger relation food products with chronic disease risk

How to measure diet quality?

- Food-based 2015 Dutch Dietary Guidelines



POSITIVE

1. Vegetables
2. Fruits
3. Wholegrain products
4. Legumes & Nuts
5. Fish
6. Oils & Soft margarines
7. Coffee
8. Tea
9. Unsweetened dairy

NEUTRAL

1. Eggs

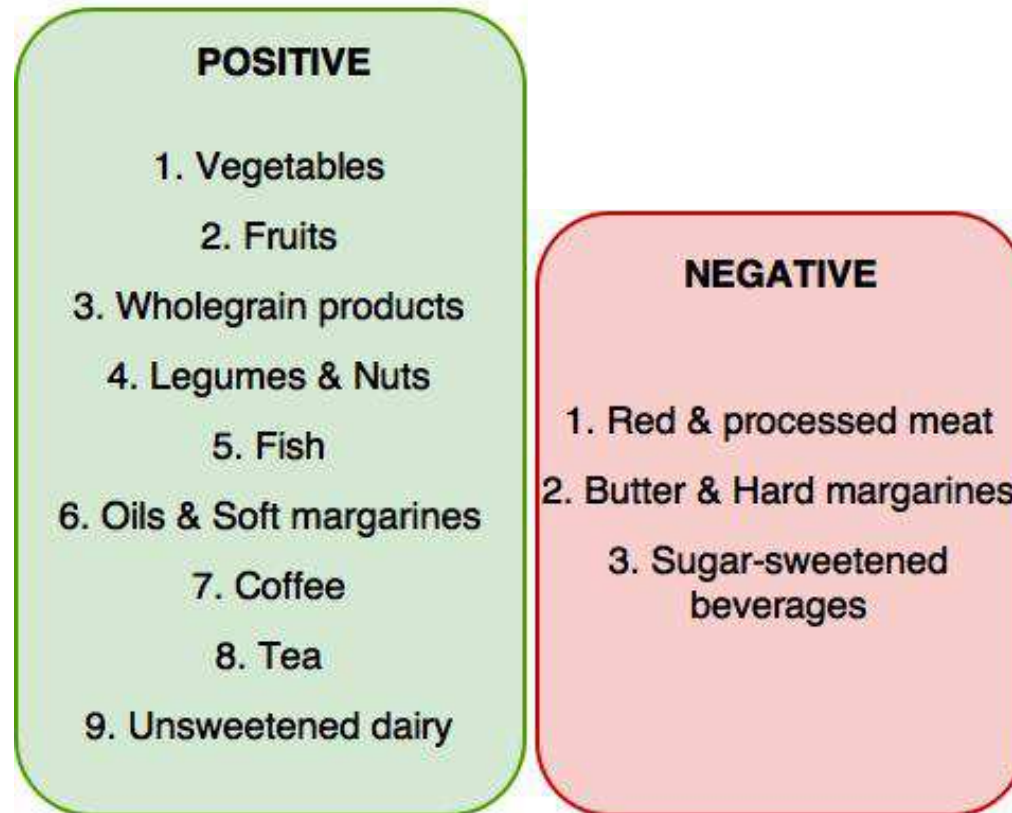
NEGATIVE

1. Red & processed meat
2. Butter & Hard margarines
3. Sugar-sweetened beverages

UNKNOWN

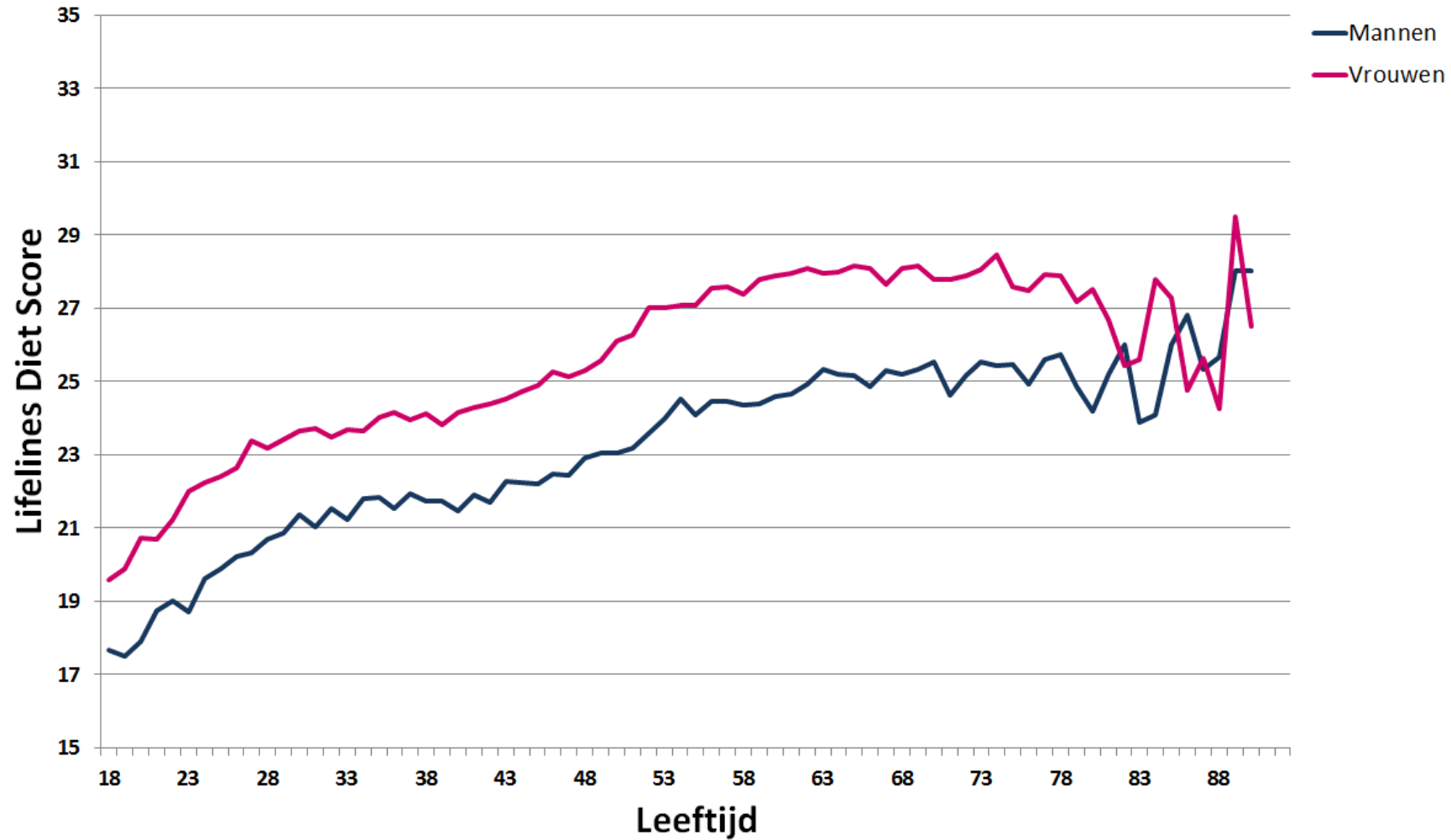
1. Potatoes
2. Cheese
3. White, unprocessed meat
4. Soups
5. Savory, ready products
6. Sugary, ready products
7. Artificially sweetened products
8. Sweetened dairy
9. Refined grain products

LifeLines Diet Score (LLDS)



1. quintiles POSITIVE or NEGATIVE food groups (g/1000 kcal)
2. Negative groups scored inversely
3. Total score = sum of scores (0-4) of the food groups, ranging from 0 to 44
4. Relative consumption of food groups that are associated with chronic disease risk

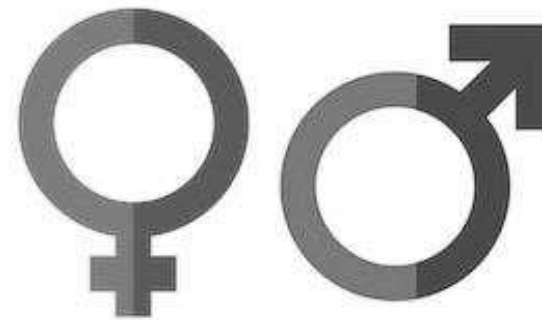
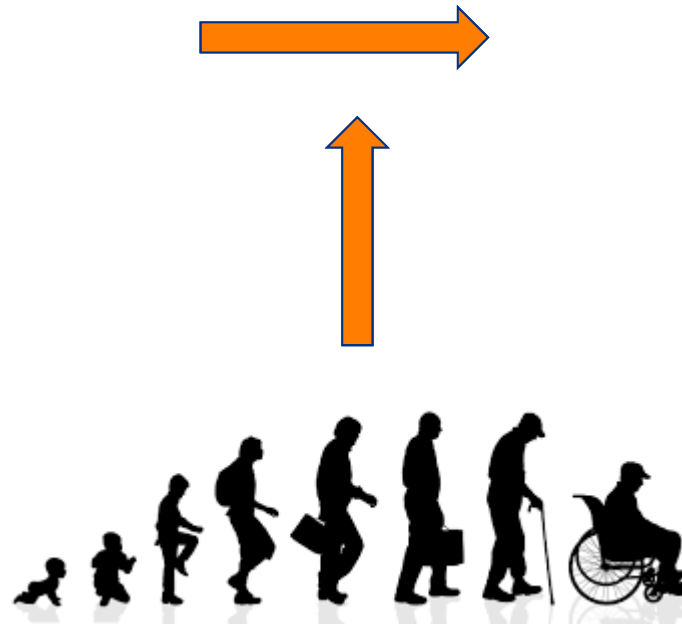
Diet quality over the life course



Diet Quality

Body weight

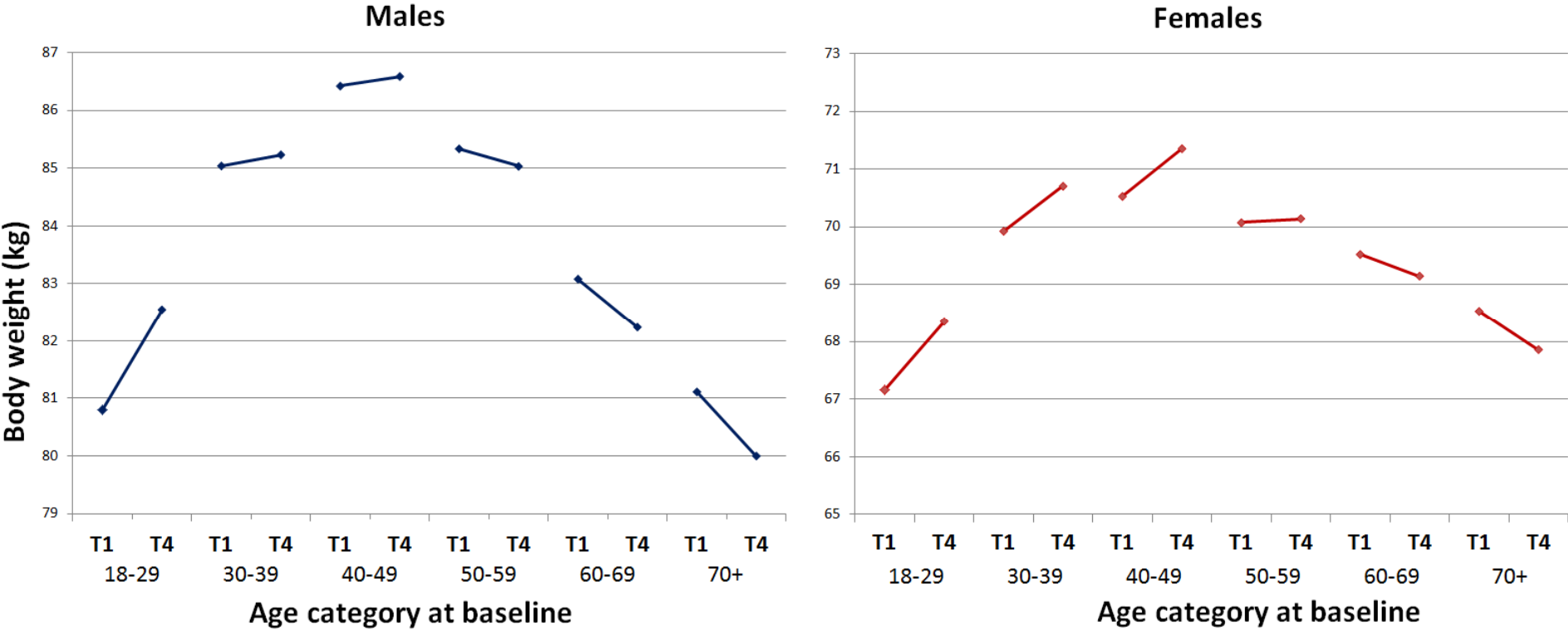
Lifelines Diet Score



Methods

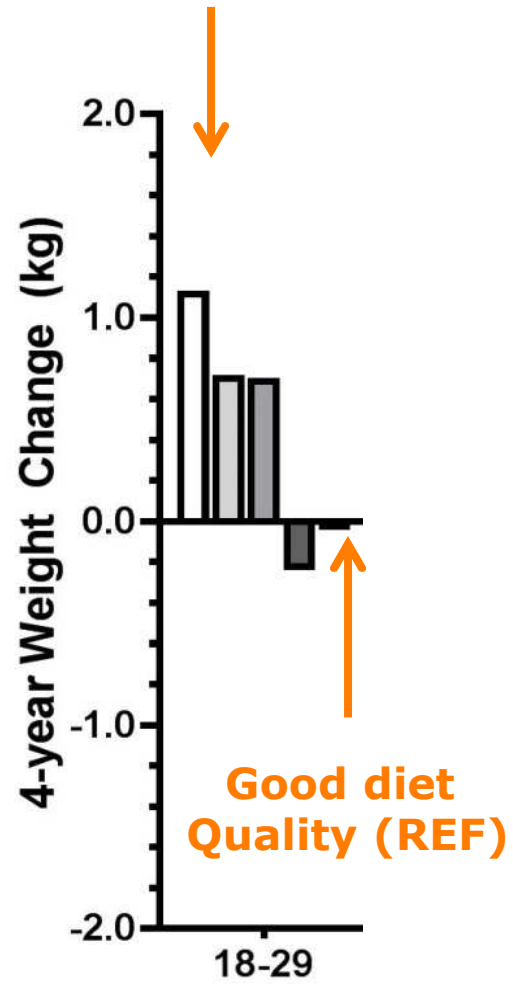
- Subject-specific Linear Mixed Model analyses (N=85.618)
- Investigate, in **gender-stratified** models, effect of:
 0. Does time influence body weight? (Time)
 1. Is this influenced by diet quality? (Diet quality \times Time)
 2. Does this influence of diet quality depend on age? (Age category \times Diet quality \times Time)
- Adjust intercept and slope for:
 - education level, smoking status, total leisure and commuting time MVPA, energy intake, alcohol intake, baseline BMI

Weight change over age categories



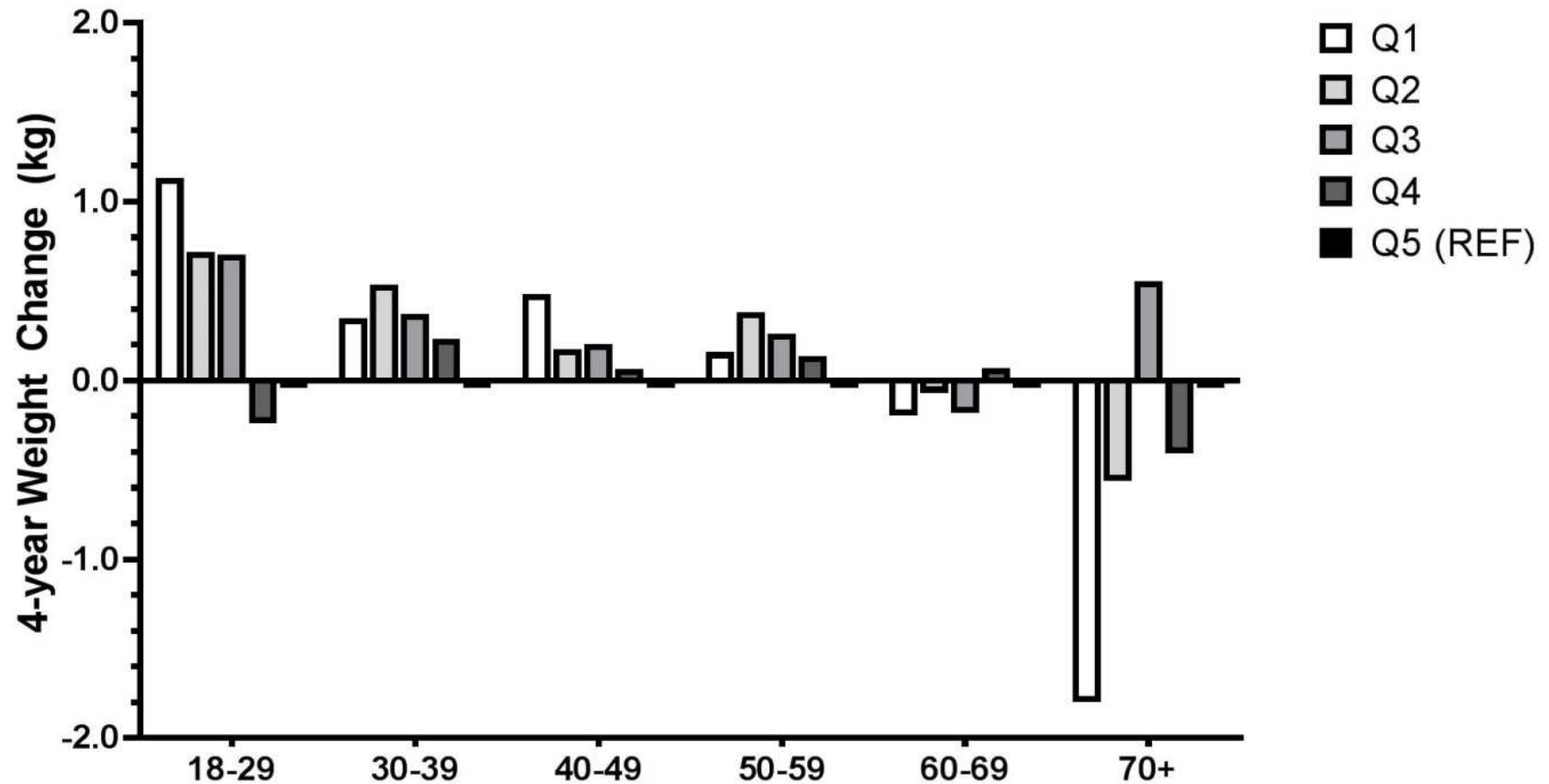
Females

Poor diet quality



- Q1
- ▤ Q2
- ▥ Q3
- ▦ Q4
- Q5 (REF)

Strength of inverse association diet quality and weight change **reverses** over age



Age category \times Diet quality \times Time: $p=0.001$

Diet and health over the life course

Methodological and statistical challenges

- Questionnaire data processing (FFQ), from 110 items to 1 evidence-based score
- 1 scoring system for all ages?
- How to estimate error for the estimates based on multiple estimates including interaction?
- Combine GLM with multiple imputation?

How does physical activity relate to health over the lifecourse?

- How to measure physical activity?

SQUASH questionnaire – adapted data processing

Physical activity and weight gain over the life course

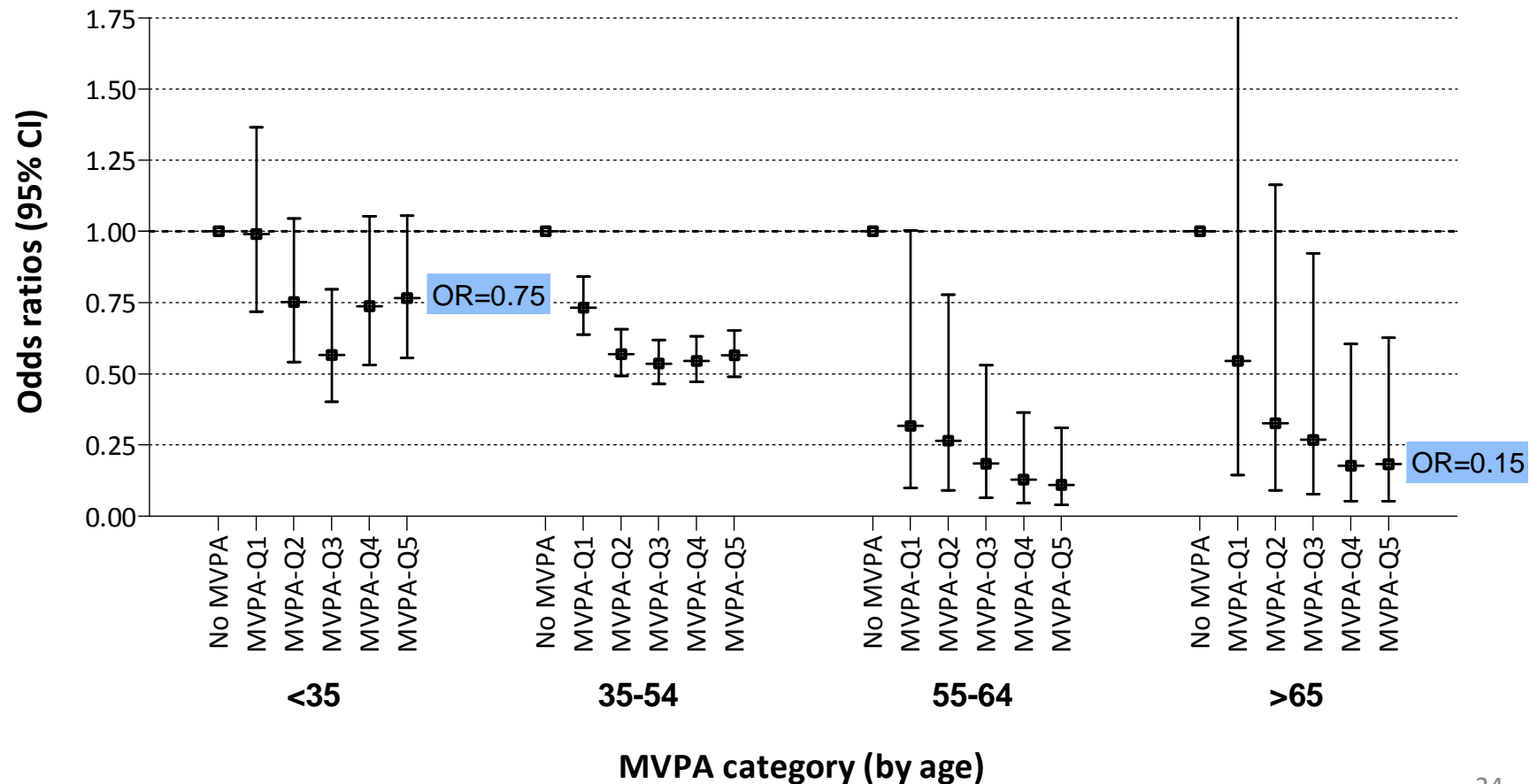
- PA related to weight gain in young men
< under embargo >

Physical activity and weight gain over the life course

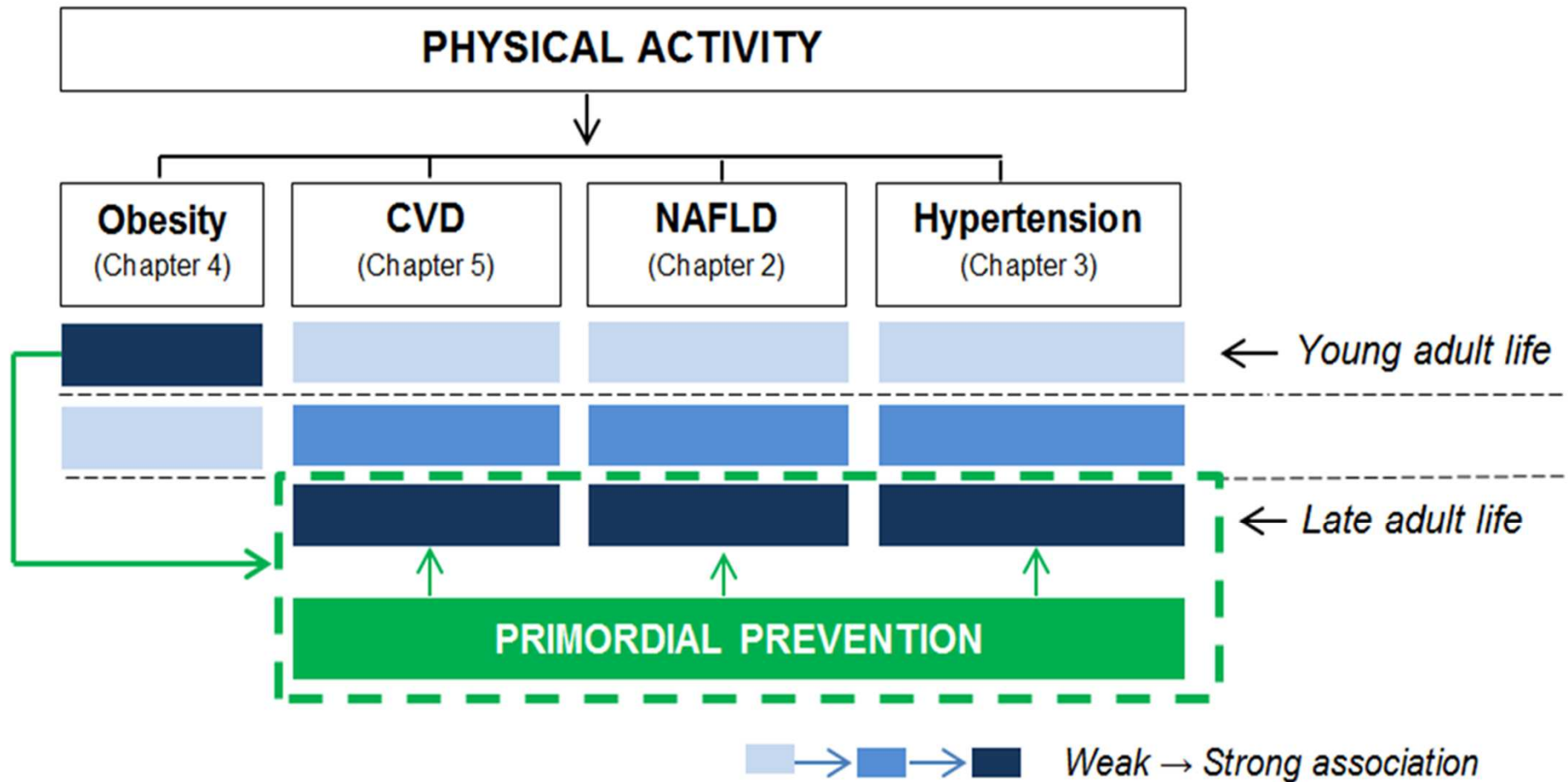
- ... and in young and middle aged women
< under embargo >

Physical activity and fatty liver over the life course

- Stronger association with older age



Physical activity and health over the life course



Physical activity and health over the life course

Methodological and statistical challenges

- Questionnaire data processing (SQUASH)
- Can we analyze the potential cumulative benefit of physical activity (multi-outcome)?

Lifestyle and health over the life course **wishlist**

- Investigate multiple predictors (exposome)
- Quantify multi-organ targeting (cumulative benefit)
- Combine statistical methods (GLM, imputation techniques, PCA, other kinds of trend modelling)
- Data processing and harmonisation over ages and between cohorts

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