Prevention for health: physical activity and nutrition interventions for people and places.

Willem van Mechelen

VU University Medical Centre Amsterdam

Body@Work - Microsoft Internet Explorer

Bestand Bewerken Beeld Favorieten Extra Help

Vorige Zoeken Favorieten

Adres http://www.bodyatwork.nl/ Ga naar Koppelingen SnagIt

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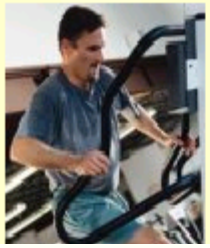
- Seminars
- Colophon

The research activities of Body@Work have been fitted into two research programs:



'Physical activity and Health'

- Developing knowledge about the efficacy of interventions aimed at stimulating physical activity and about the determinants of physical activity

Projects:

www.bodyatwork.nl

'Musculoskeletal disorders'

- Developing knowledge about the etiology of upper extremity musculoskeletal disorders and low-back pain and about the efficacy of measures on prevention and on the stimulation of reintegration.

Projects:

- Return-to-work following birth-giving: occupational health

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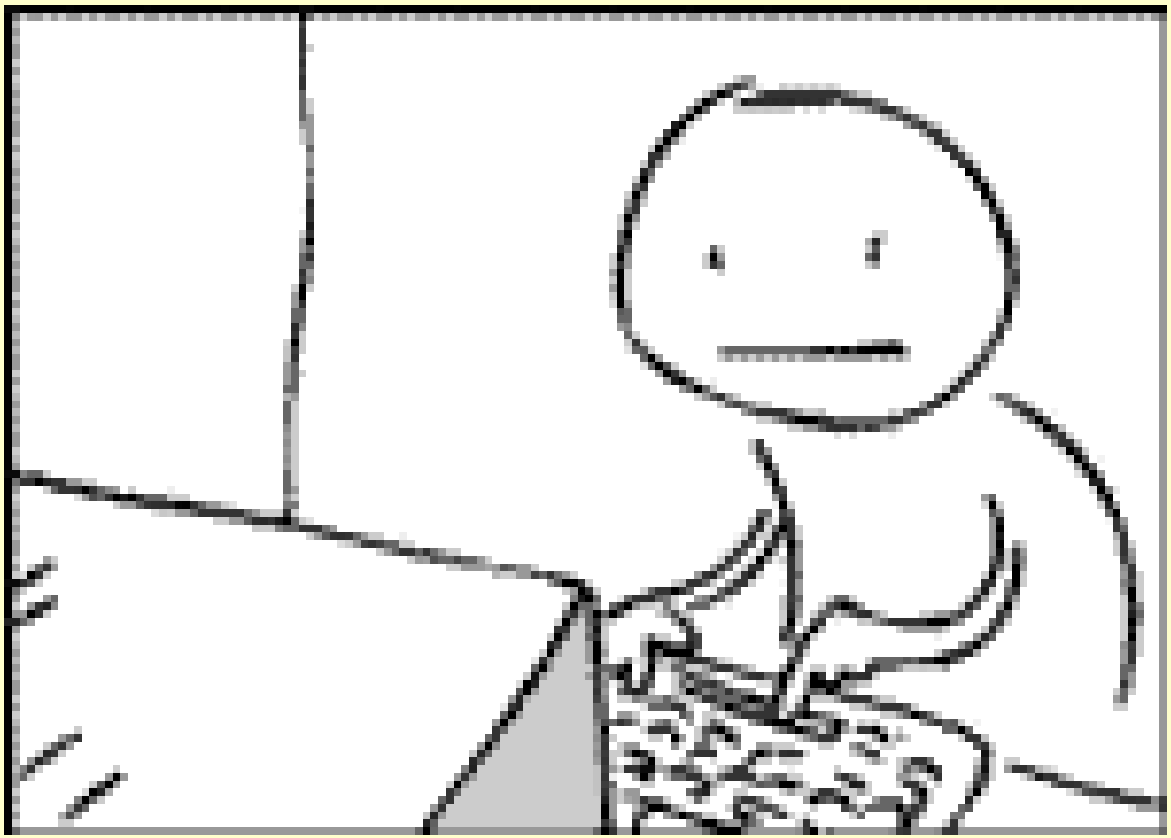
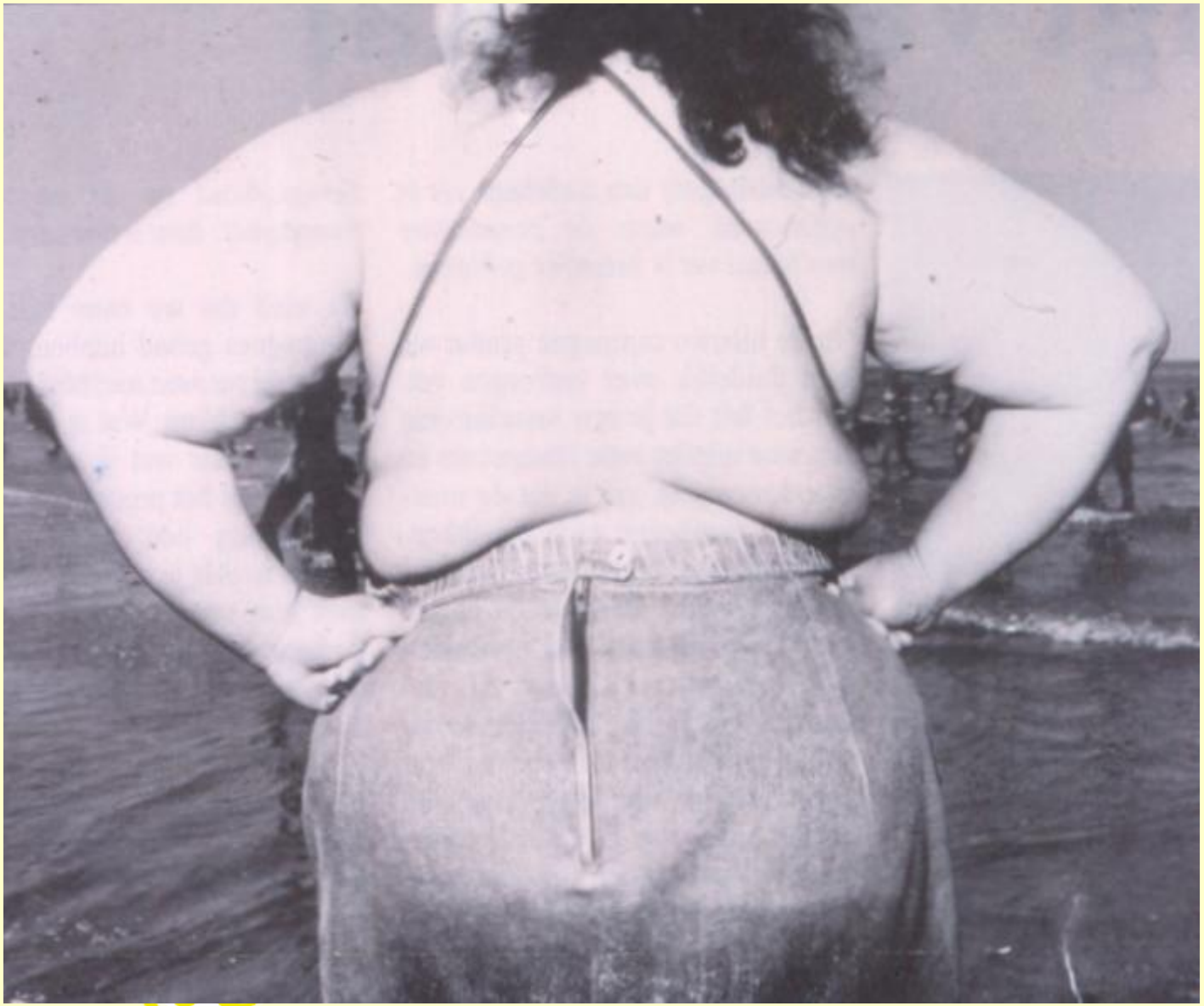


CONTENT

- *What is the problem?*
- *Interventions for people and places*
- *Public Health Research*



BMI

- weight/height^2

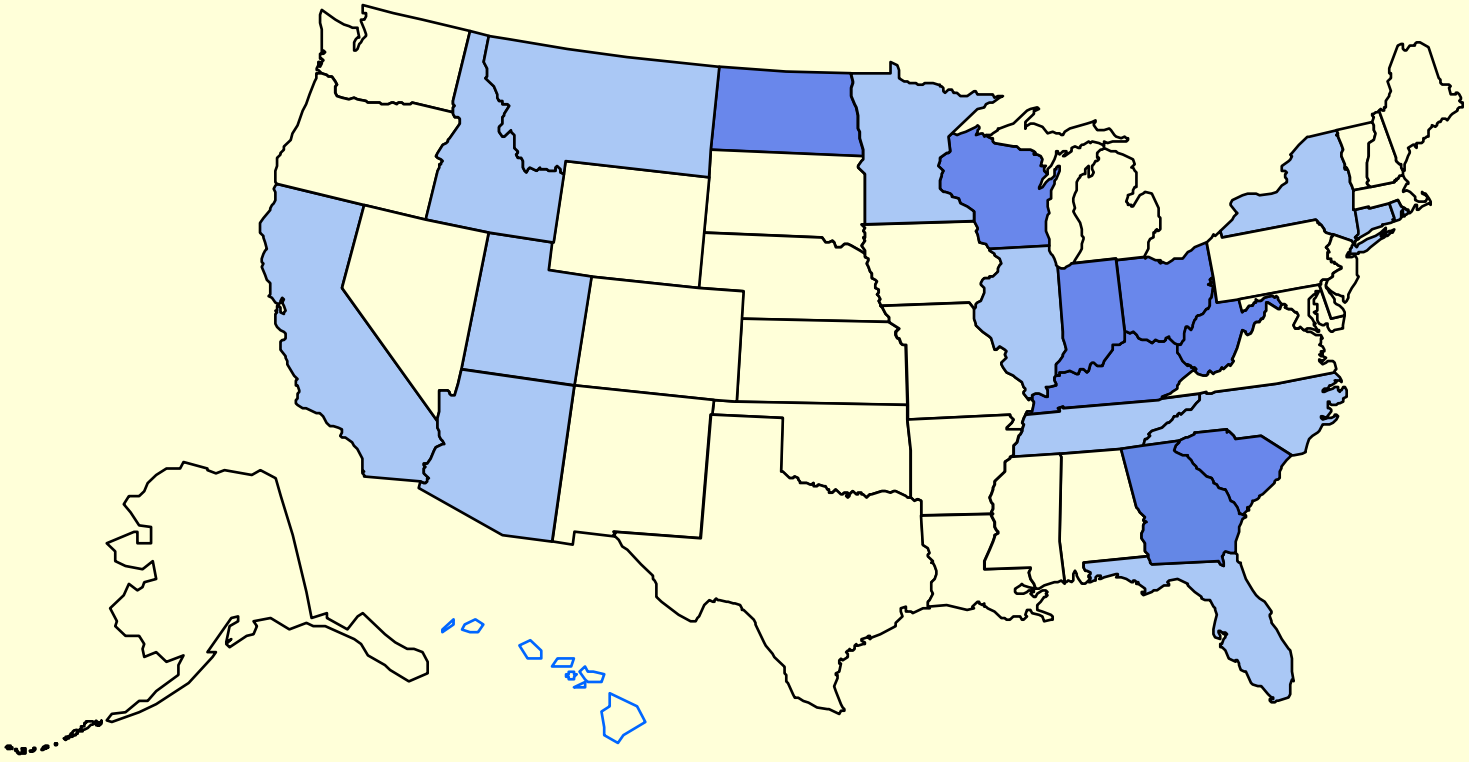
- overweight > 25
- obesity > 30

104 kg by 1,86 m

Obesity Trends* Among U.S. Adults

BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” woman)



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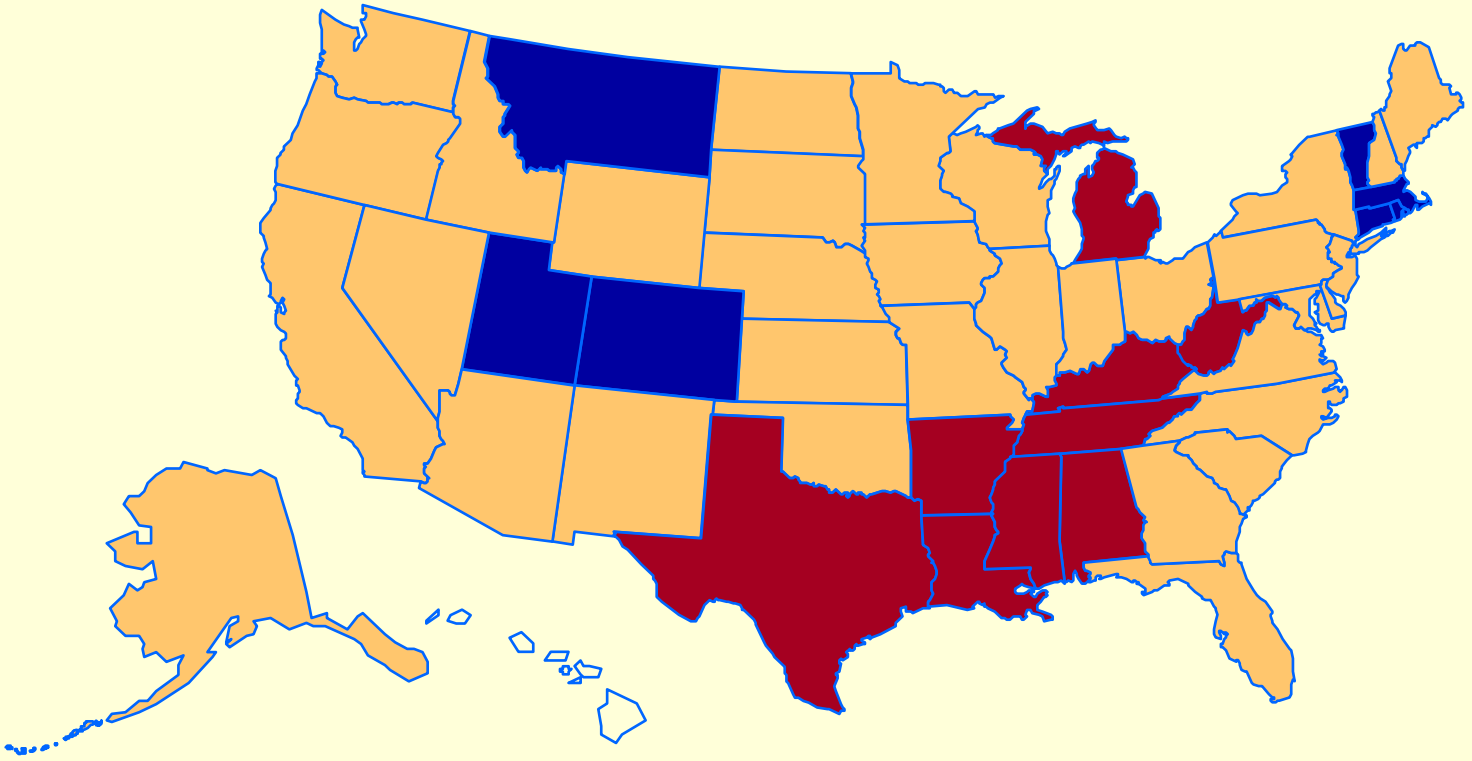
Obesity Trends* Among U.S. Adults

BRFSS, 2004

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)



No Data | <10% | 10%–14% | 15%–19% | 20%–24% | ≥25%

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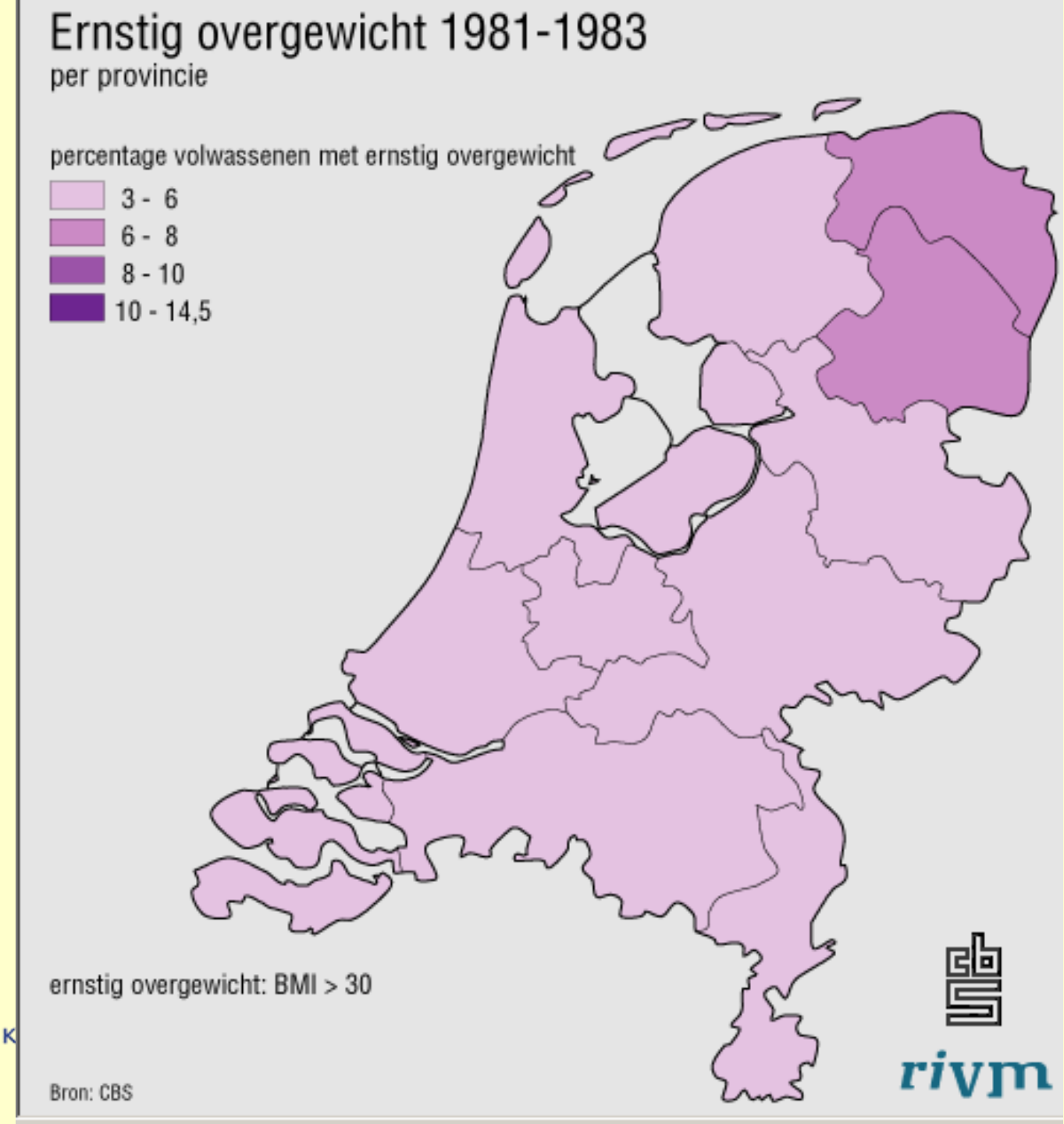
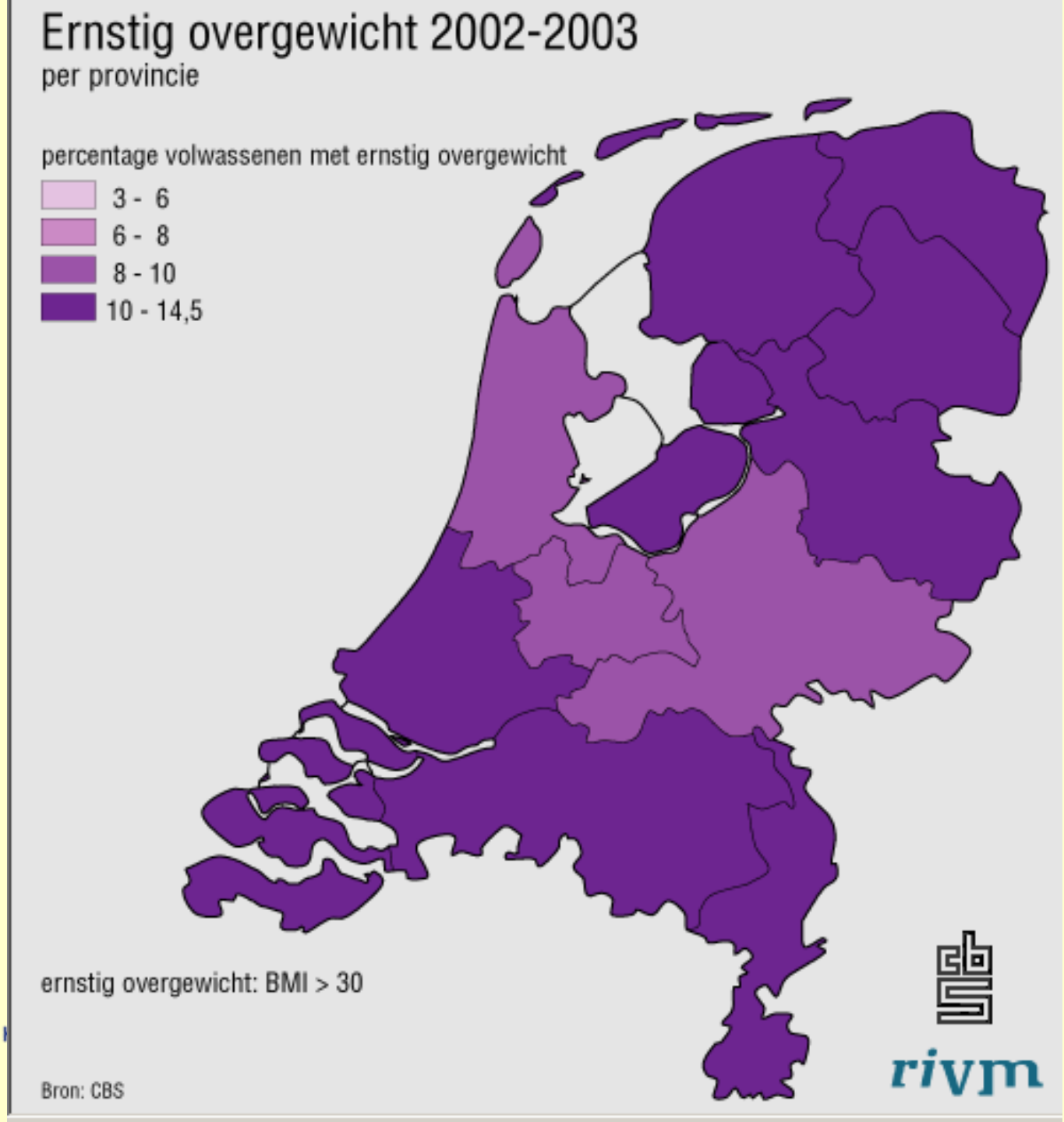
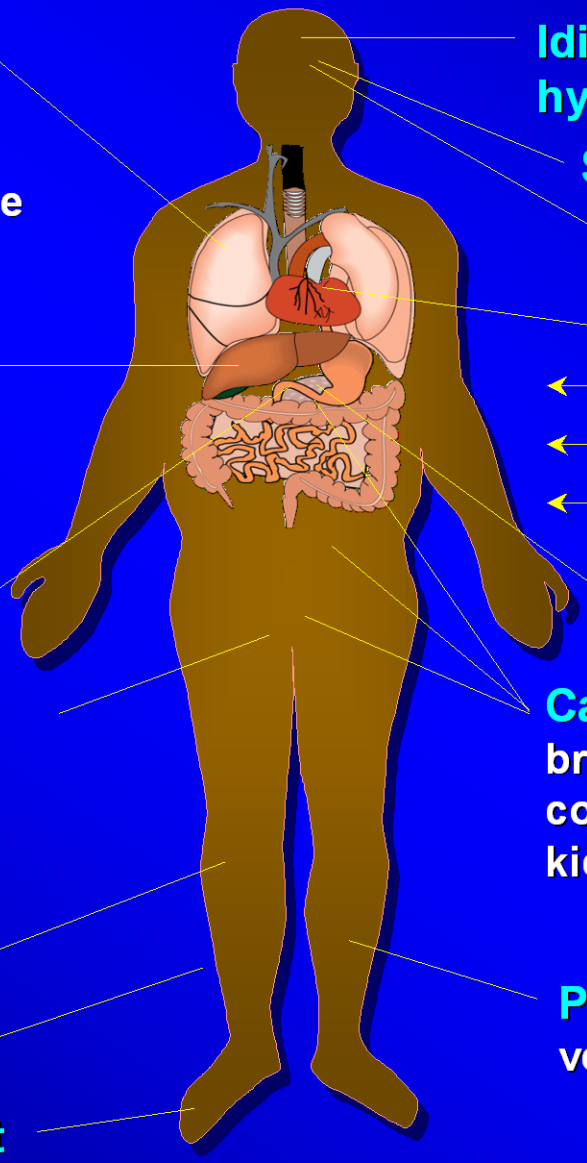

Ernstig overgewicht 1981-1983
per provincie
percentage volwassenen met ernstig overgewicht
3 - 6
6 - 8
8 - 10
10 - 14,5
ernstig overgewicht: BMI > 30
Bron: CBS
rivm


Ernstig overgewicht 2002-2003
per provincie
percentage volwassenen met ernstig overgewicht
3 - 6
6 - 8
8 - 10
10 - 14,5
ernstig overgewicht: BMI > 30
Bron: CBS
rivm

NL O&O trends 2024

- 6,6 million 36% & 12% = 48%
- 8,0 million 41% & 18% = 59%
- 8,7 million 35% & 30% = 65%

Medical Complications of Obesity



Pulmonary disease
abnormal function
obstructive sleep apnea
hypoventilation syndrome

Nonalcoholic fatty liver disease
steatosis
steatohepatitis
cirrhosis

Gall bladder disease

Gynecologic abnormalities
abnormal menses
infertility
polycystic ovarian syndrome

Osteoarthritis

Skin

Gout

Idiopathic intracranial hypertension

Stroke

Cataracts

Coronary heart disease

Diabetes

Dyslipidemia

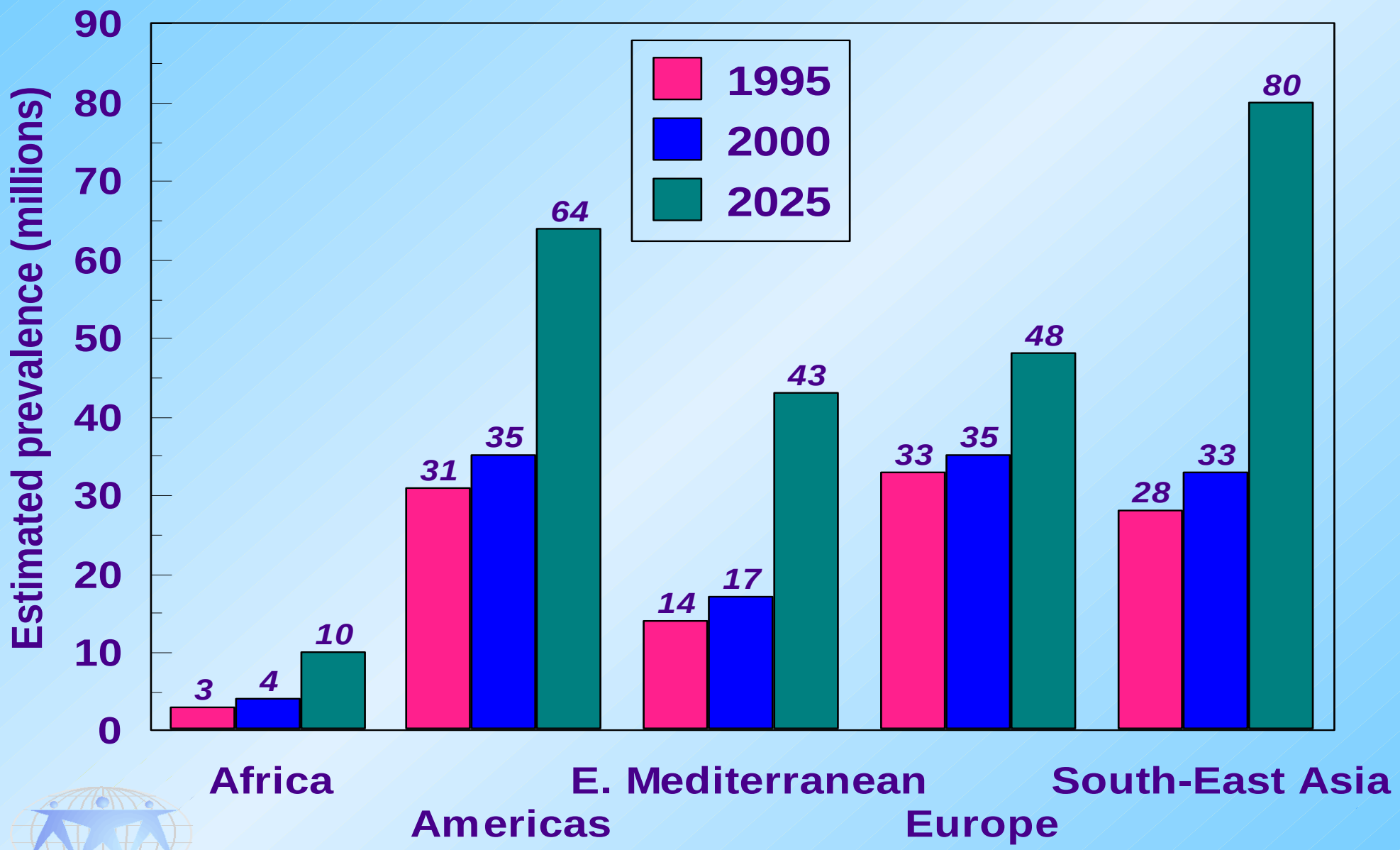
Hypertension

Severe pancreatitis

Cancer
breast, uterus, cervix
colon, esophagus, pancreas
kidney, prostate

Phlebitis
venous stasis

Diabetes Mellitus: WHO regional estimates 1995-2025



Overweight & obesity
have health consequences,

but also socio-economic consequences

The Netherlands:

- **direct cost:** **Euro 0,5 billion/year**
- **indirect cost:** **Euro 2,0 billion/year**

RVZ, 2002

This is the problem

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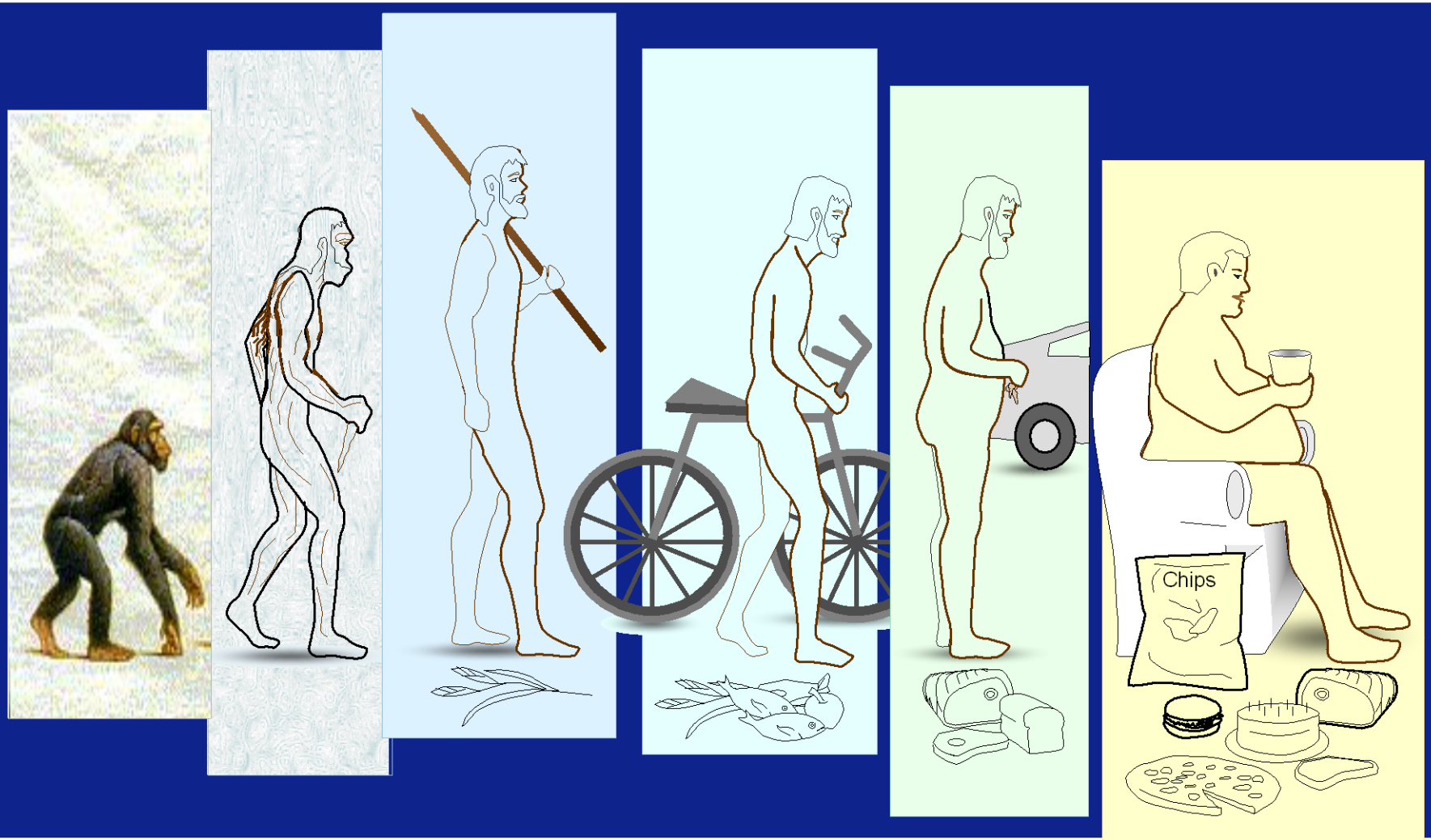
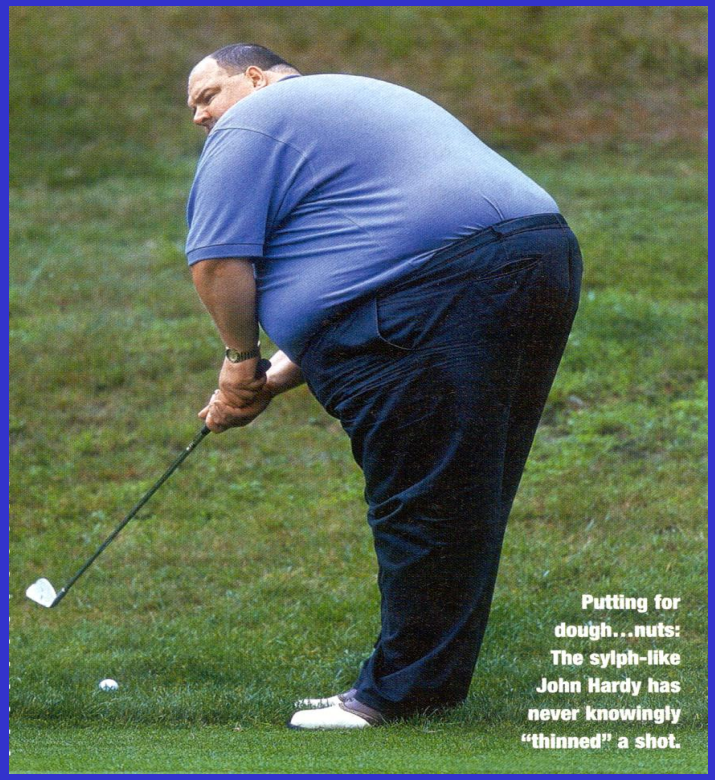
What causes the problem?

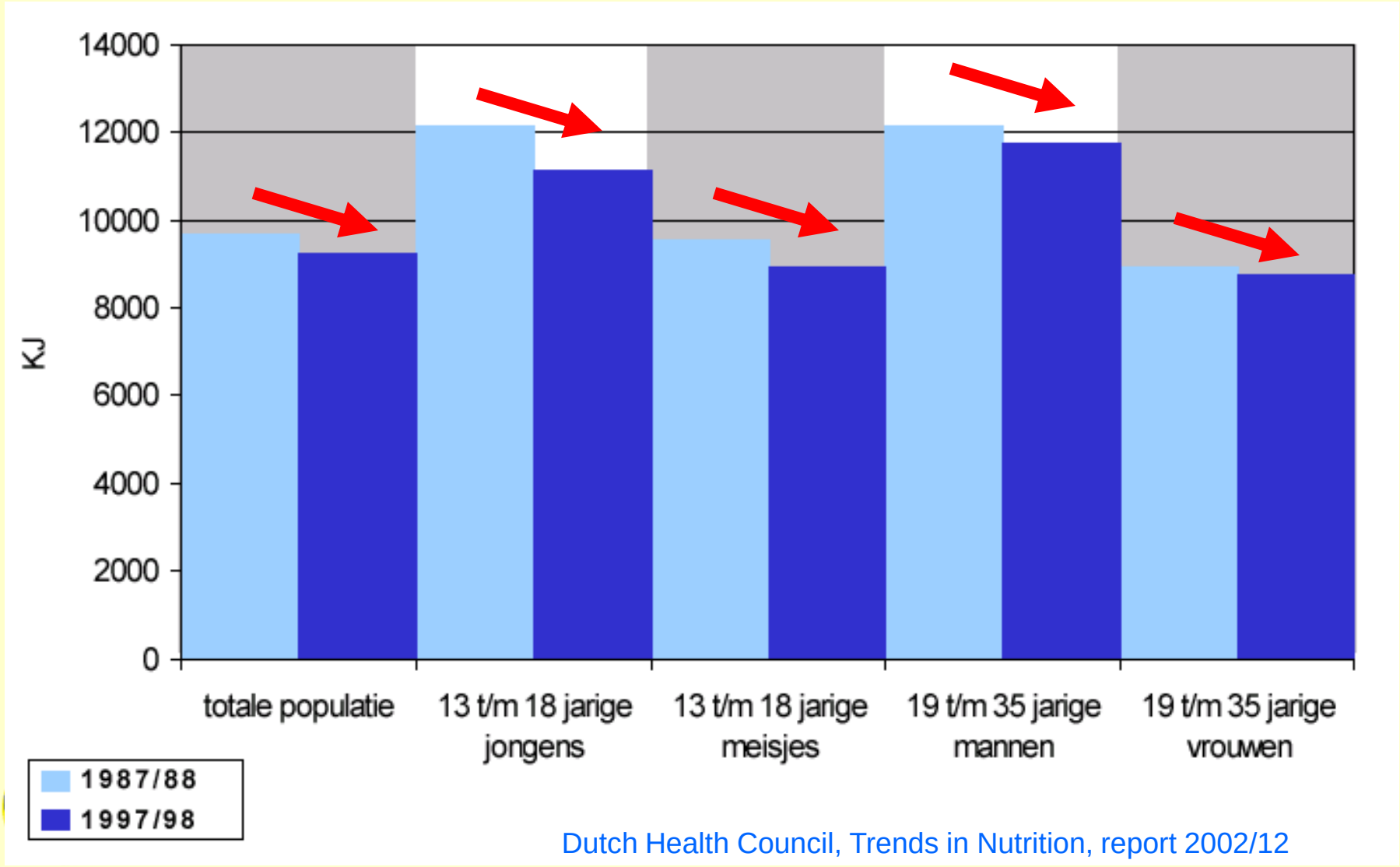


Something has gone wrong…….

'Stone-age' (Palaeolithic) genes
in 'space-age' (devitalised) circumstances

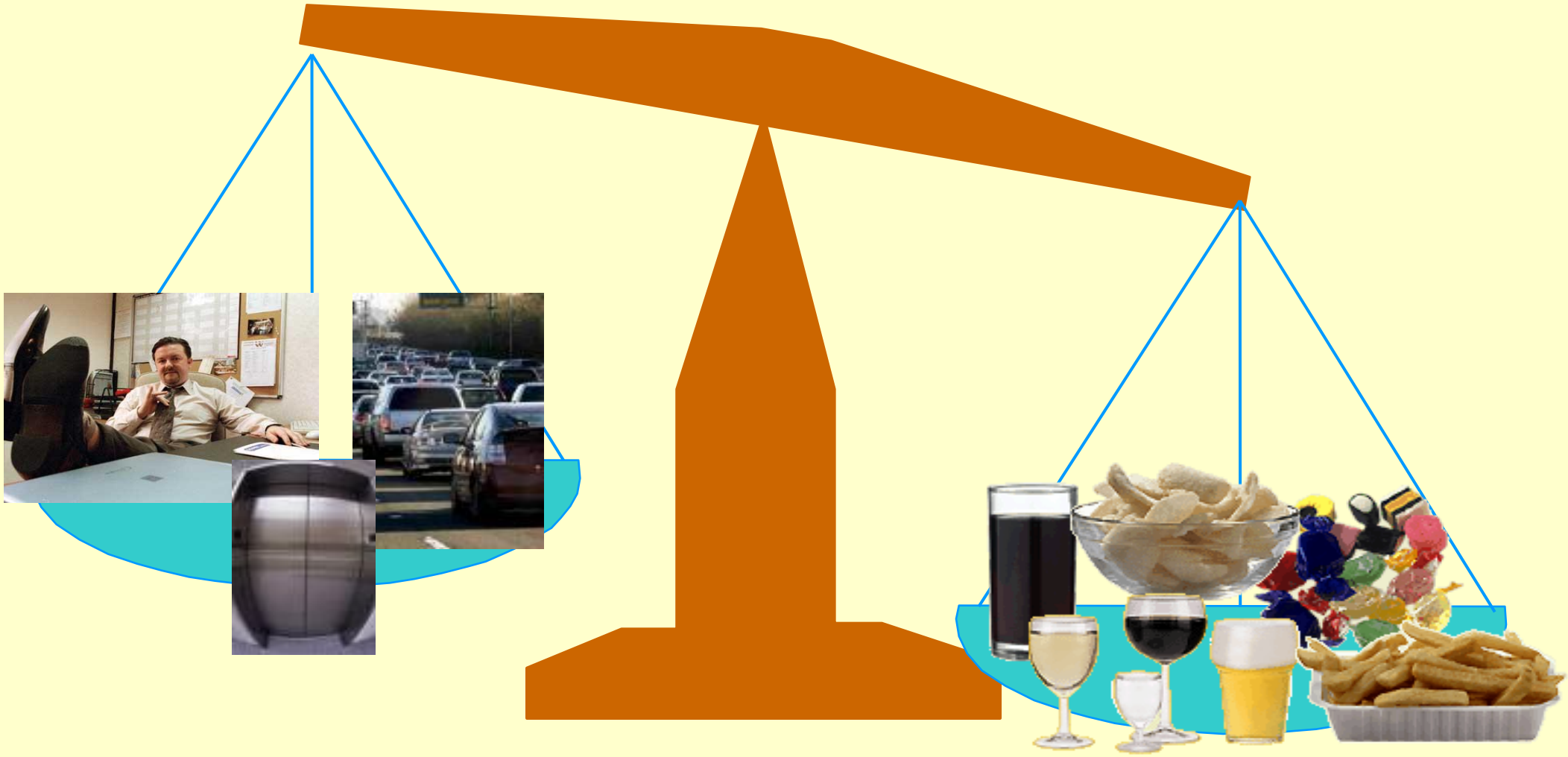


Trends in Energy-intake (Kilojoules) in the Netherlands

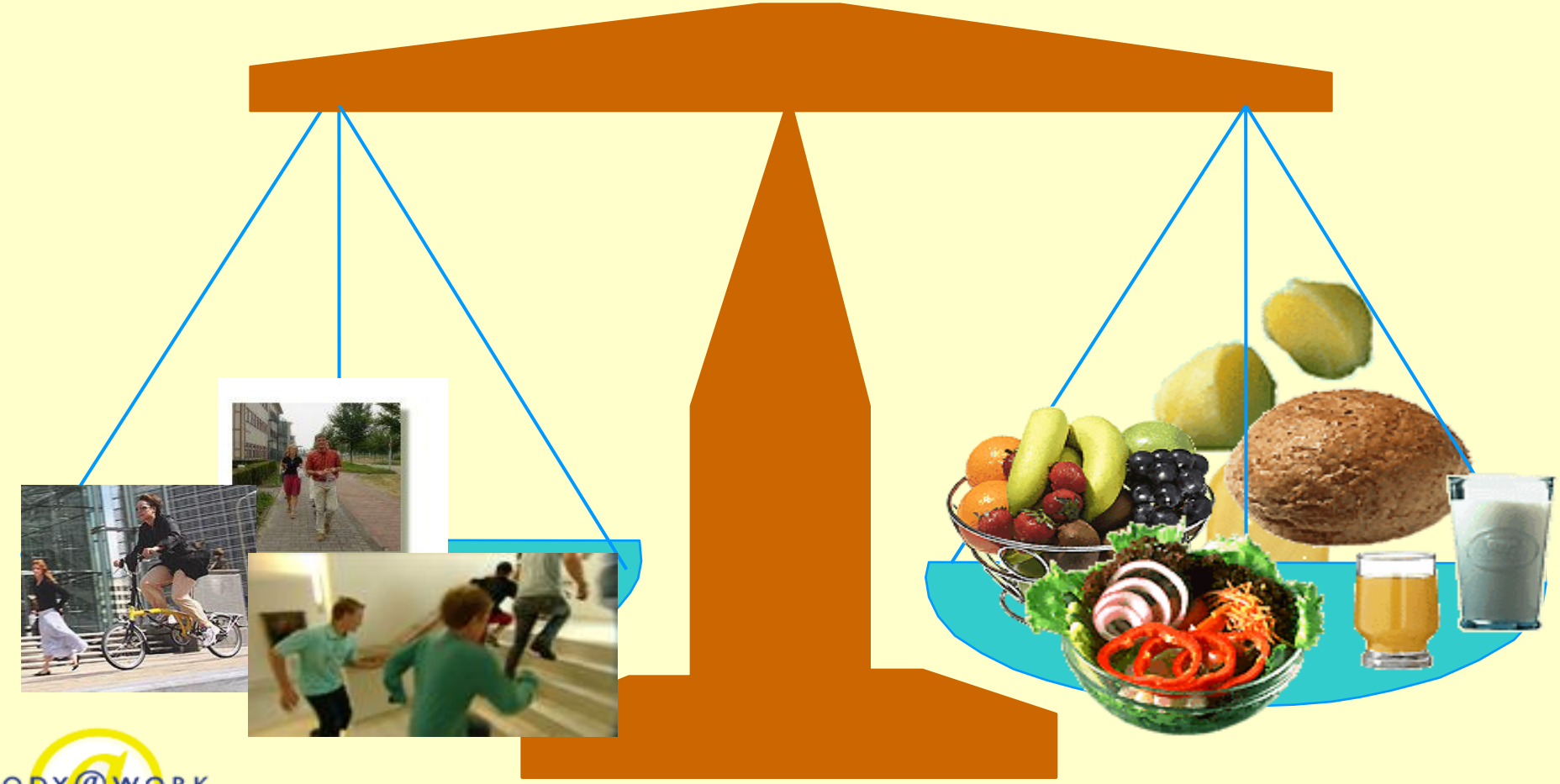


Dutch Health Council, Trends in Nutrition, report 2002/12

Positive energy balance



Equilibrium



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24 HOUR
FITNESS

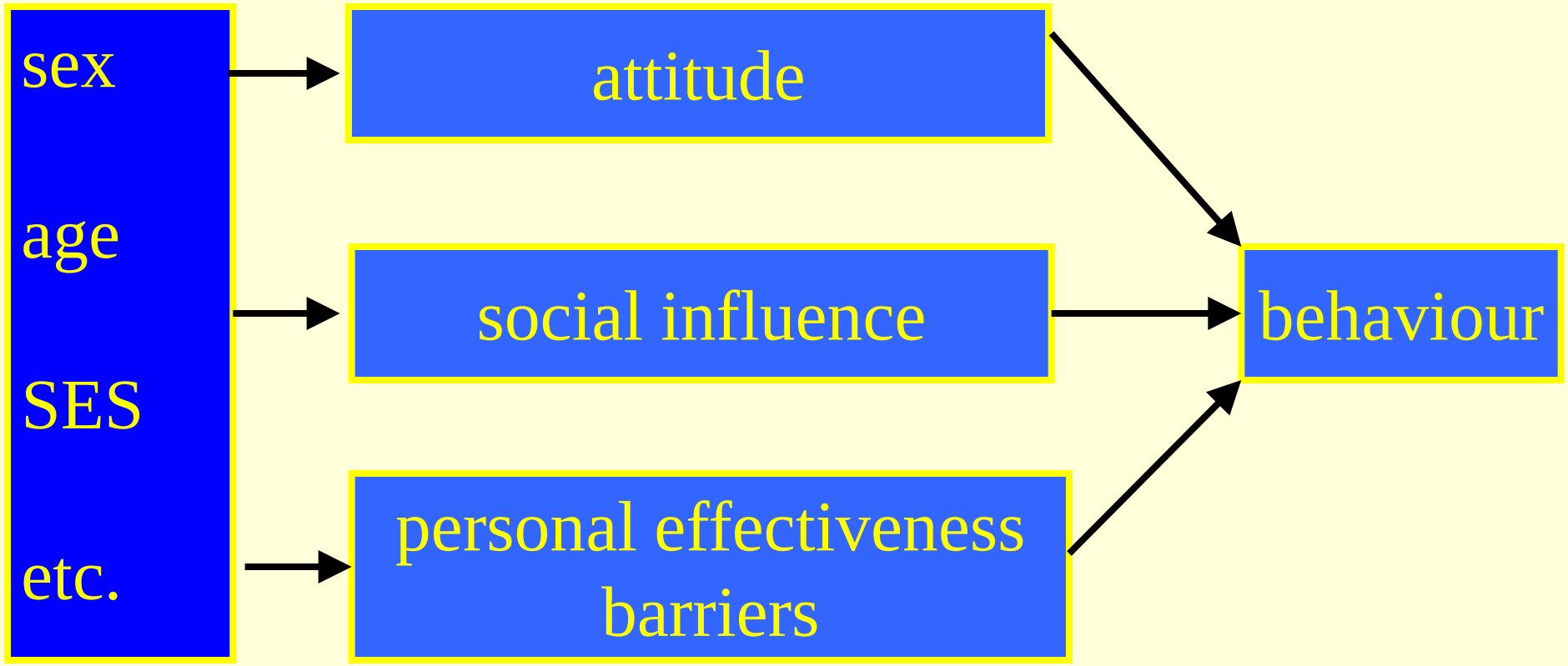
Physical inactivity
Abnormal reaction to a normal environment?
Normal reaction to an abnormal environment?

SCREEN INVASION

XN-63-NT

We need to change behaviour

Determinants of health behaviour



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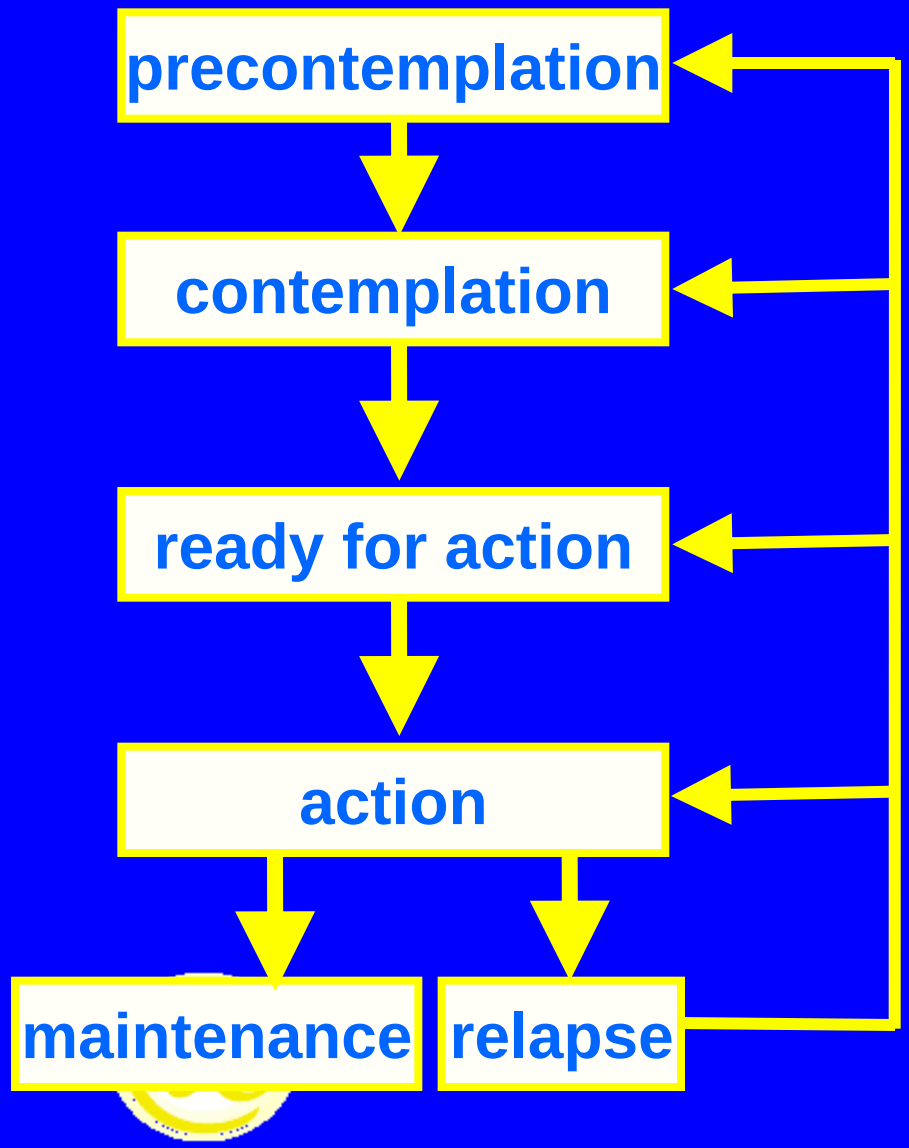
De Vries, OU, 1993

‘stages-of change’



Get off your chair!

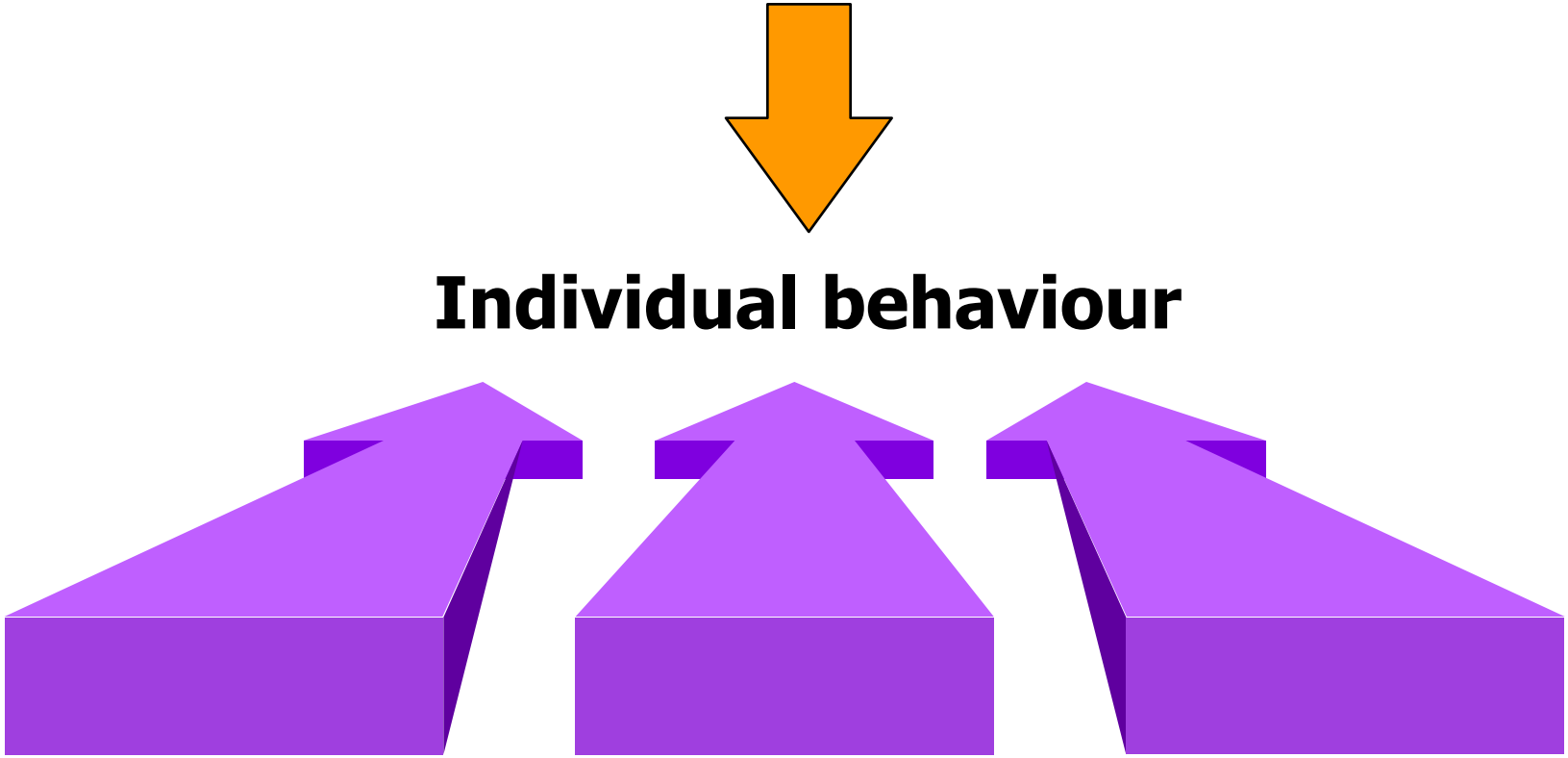
How to plan the first step

I will get started next week

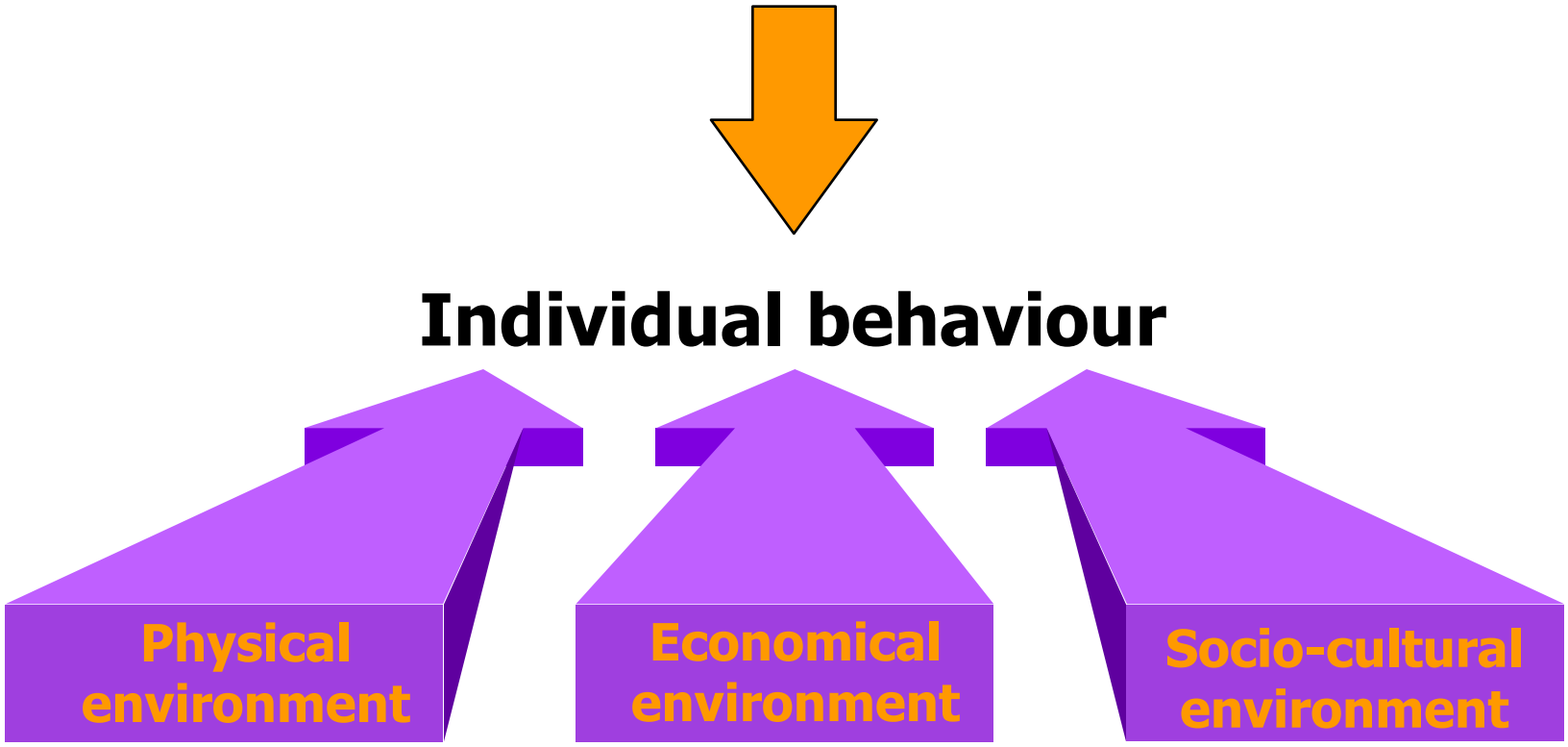
I use the stairs every dayy

Prochaska en Marcus, HKP, 1994

The environment



.....various influences

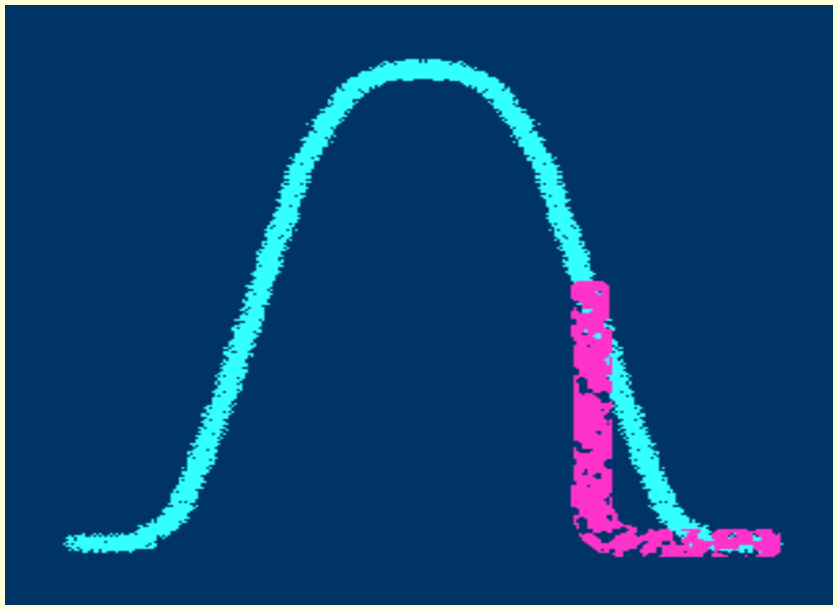


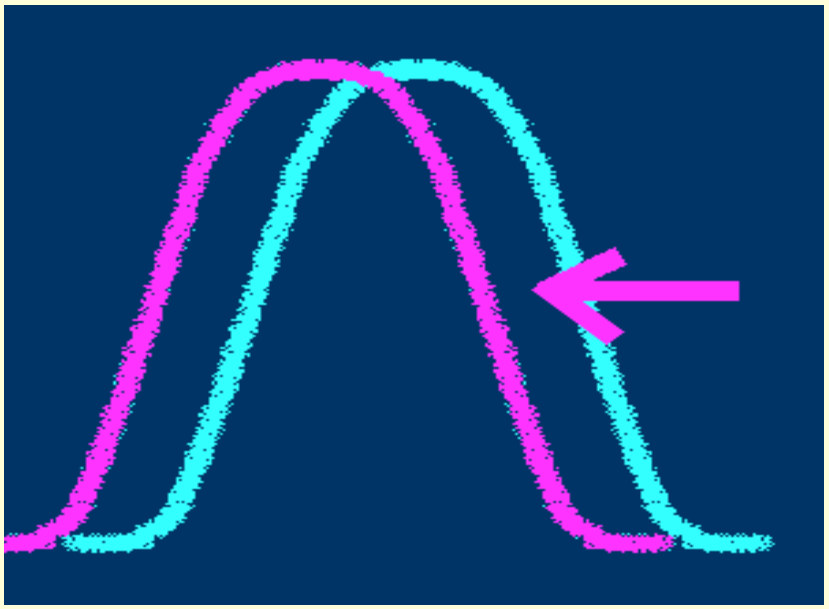
Macro environment
Micro environment

BMJ, Egger& Swinburn, 1997

Prevention Strategies

High Risk vs. Population





Truncate high risk end of exposure distribution (e.g. organise an obesity clinic).
Clinical approach to tertiary prevention.

Reduce risk a little risk in most people: Primary and promiordial prevention : Lifestyle change combined with an environmental approach.

CONTENT

- *What is the problem?*
- ***Interventions for people and places***
- *Public Health Research*

Individual → individual-environment → environment

- Alife@Work
- Dutch Obesity Intervention in Teenagers (DOiT)
- Foodsteps

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ALIFE@Work

Amsterdam Lifestyle Intervention on Food and Exercise at Work

Marieke van Wier[1], ***Caroline Dekkers***[1], ***Geertje Ariëns***[1], ***Tjabe Smid***[1], ***Ingrid Hendriksen***[2], ***Nico Pronk***[3] ***& Willem van Mechelen***[1]

Body@Work, Research Center Physical Activity, Work and Health, TNO-VUmc

1) Department of Public and Occupational Health/EMGO Institute, VU medical center, Amsterdam 2) TNO Work and Employment, Hoofddorp en 3) Health Partners, Minneapolis, USA

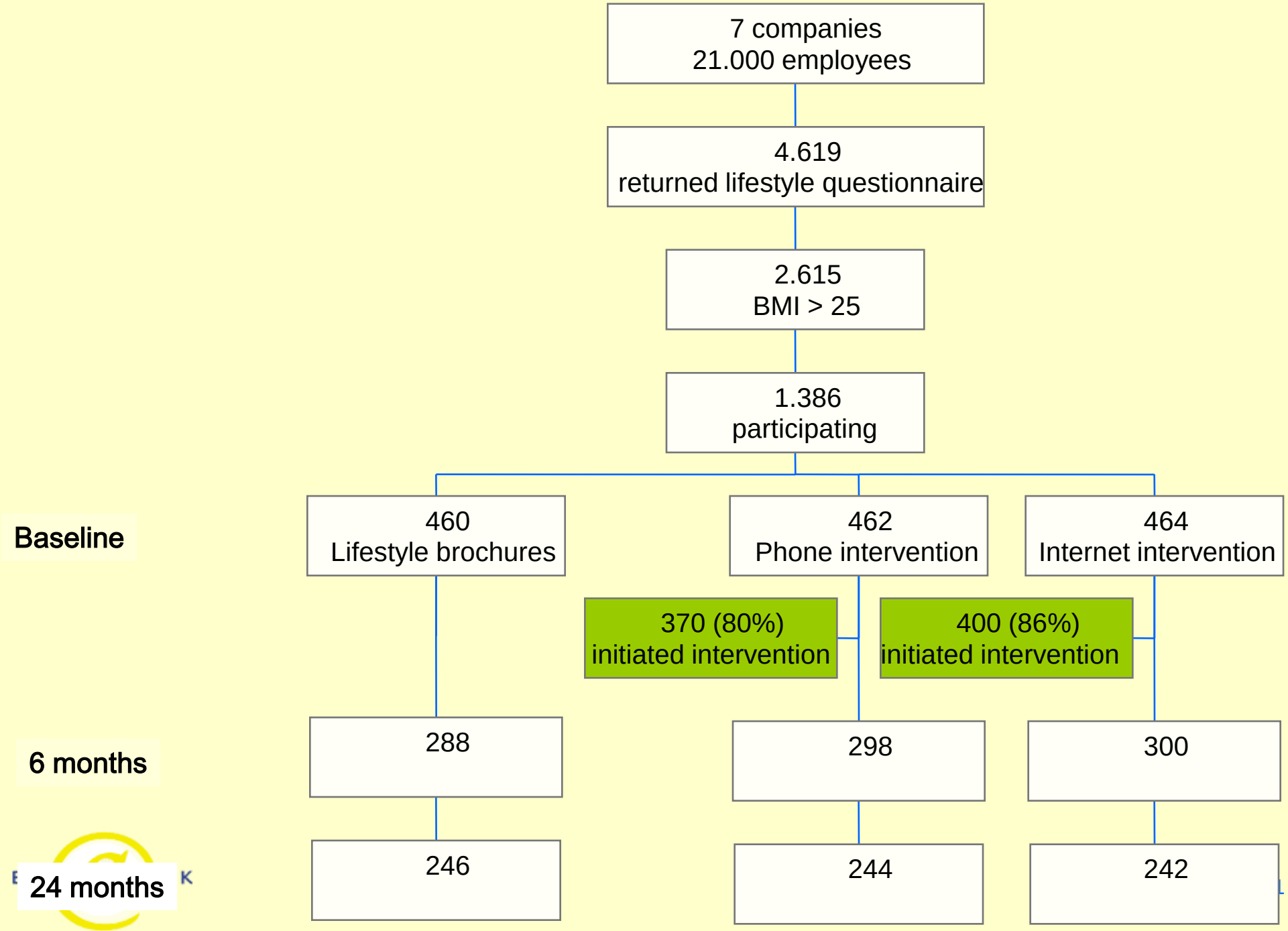
Objectives

- To evaluate, among in an overweight working population, the effectiveness of a lifestyle intervention program on body weight
- To compare the efficacy of two different communication strategies, i.e. phone and internet

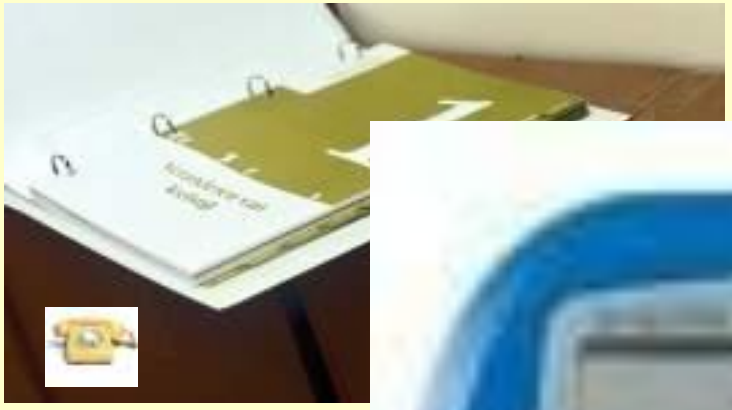
Study population

- **inclusion**: employee, between 18 – 65 yrs, BMI ≥ 25 kg/m^2, adequate in Dutch, access to internet
- **exclusion**: pregnancy, diagnosis- or treatment of cancer, any disorder that makes physical activity impossible
- **1386 employees** were eligible and randomised to three groups:

1. **reference**: brochures Dutch Heart Foundation (460)
2. **phone**: binder and counselling by phone (462)
3. **internet**: access to website and counselling by e-mail (464)


7 companies
21.000 employees
4.619
returned lifestyle questionnaire
2.615
BMI > 25
1.386
participating
Baseline
460
Lifestyle brochures
462
Phone intervention
464
Internet intervention
370 (80%)
initiated intervention
400 (86%)
initiated intervention
6 months
288
298
300
24 months
246
244
242

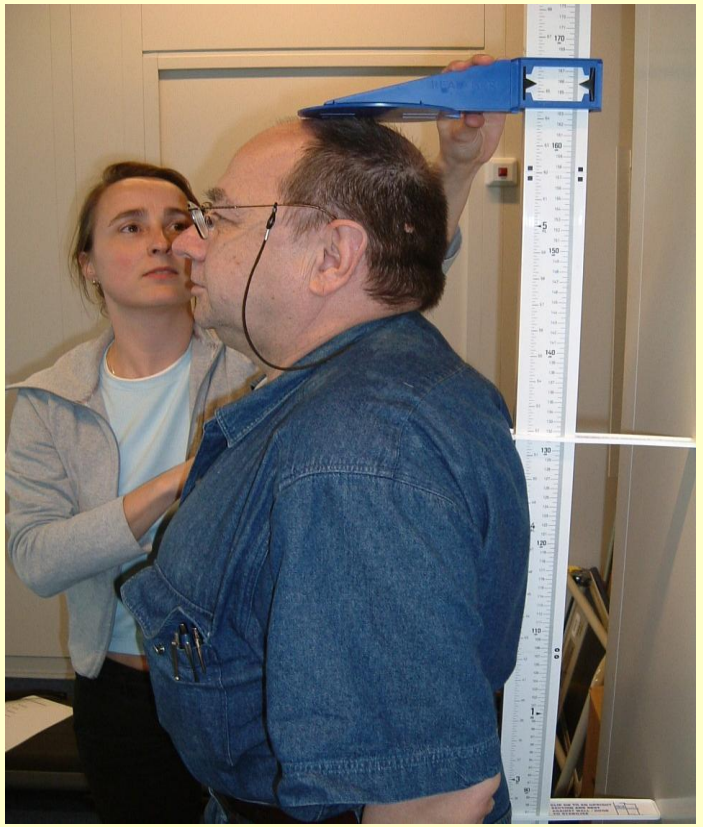
Intervention



- The 'Leef je … **months** and comprises 1… **s**.
- In each mo… …s (in a binder, respective, …n in changing their behaviour.
- **Trained counsellors provide feedback** on the assignments by either phone or e-mail.

Anthropometrics

- T0, T6, T24:
  - body weight
  - body height (T0)

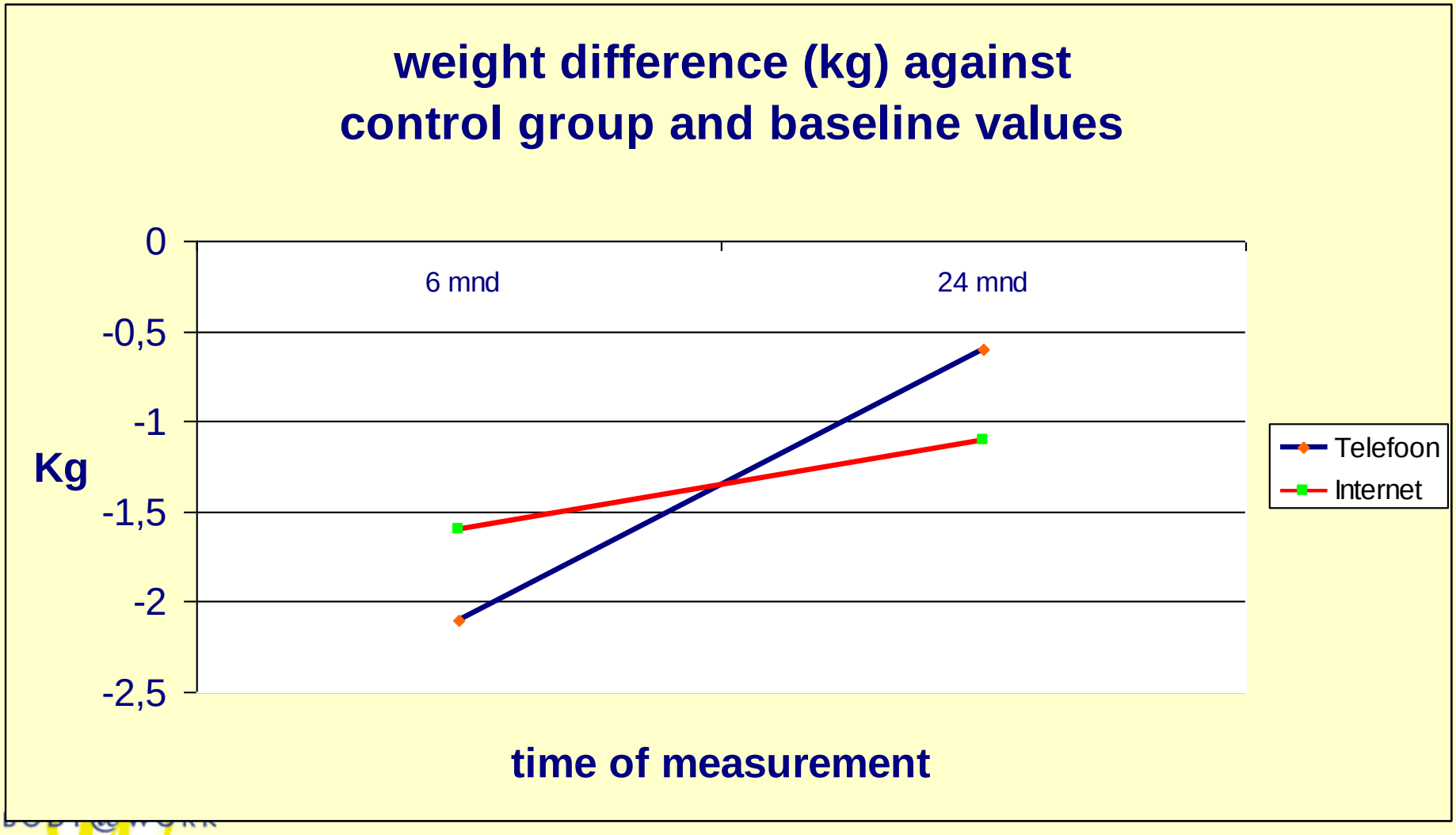


Baseline characteristics

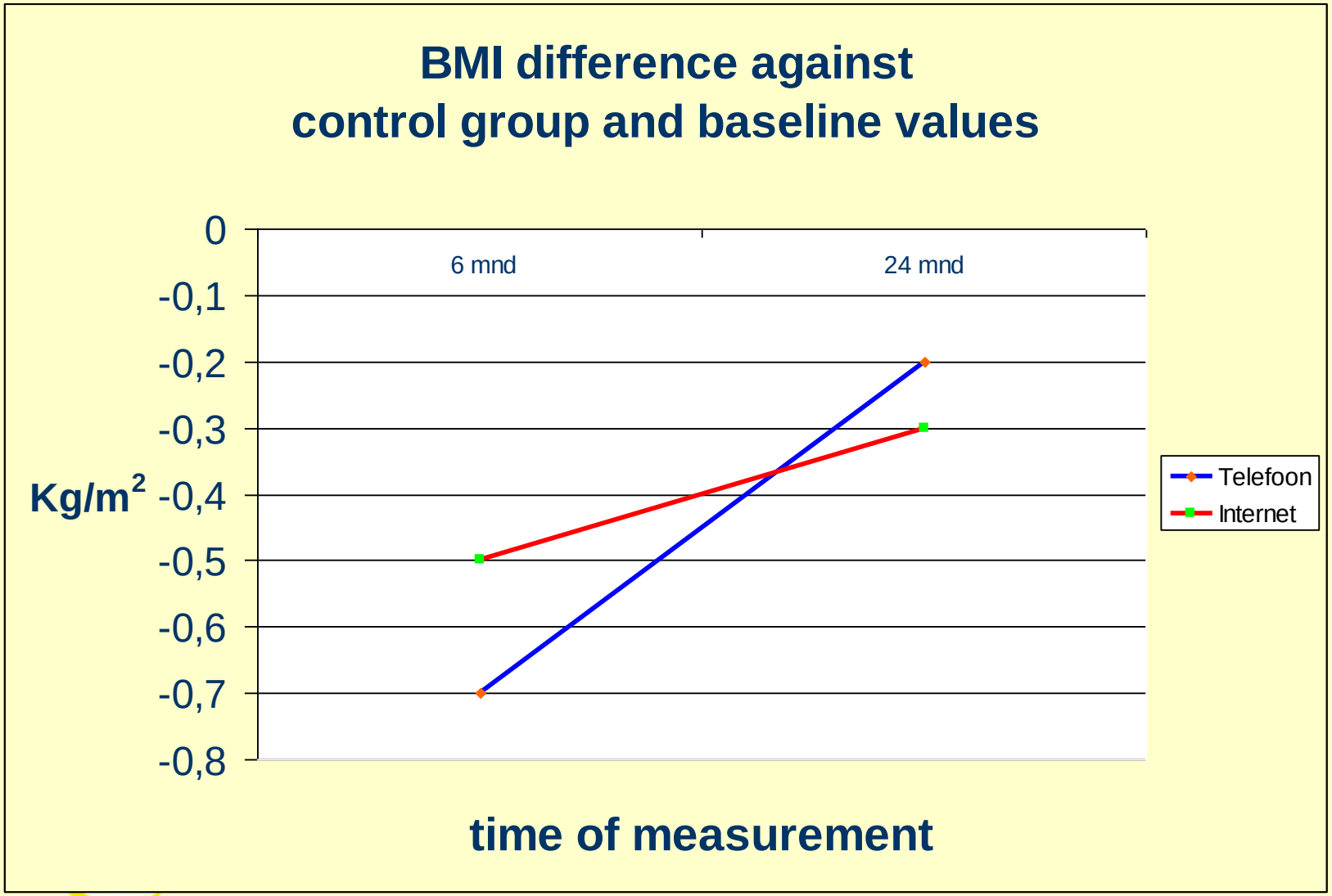
732 participants with objective weight measures T0, T6 en T24

	Control N=246	Telephone N=244	Internet N=242
male (%)	69.5	72.5	64.5
age (year)	45.1 (7.9)	44.7 (8.1)	44.0 (8.3)
education (% high)	62.2	62.6	64.4
Marital status (% married, living together)	82.5	83.5	83.7

Weight, corrected for baseline values



BMI, corrected for baseline values



What can we do about it?

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Dutch Obesity Intervention in Teenagers

Nederlandse Hartstichting
www.hartstichting.nl
Redt levens

What is DOiT?

- school-based multi-disciplinary program
- developed according to the Intervention Mapping (IM) Protocol (Bartholomew et al., 2001)
- target group: 12-13 year old adolescents, secondary prevocational education, low SES
- aim intervention: primary prevention
- central theme: energy balance

Identified risk behaviours

- **energy output**
  - sedentary behaviour
  - physical activity
    - active transport
    - sports participation
- **energy intake**
  - sugar-containing beverages
  - high-fat/high-sugar content snacks

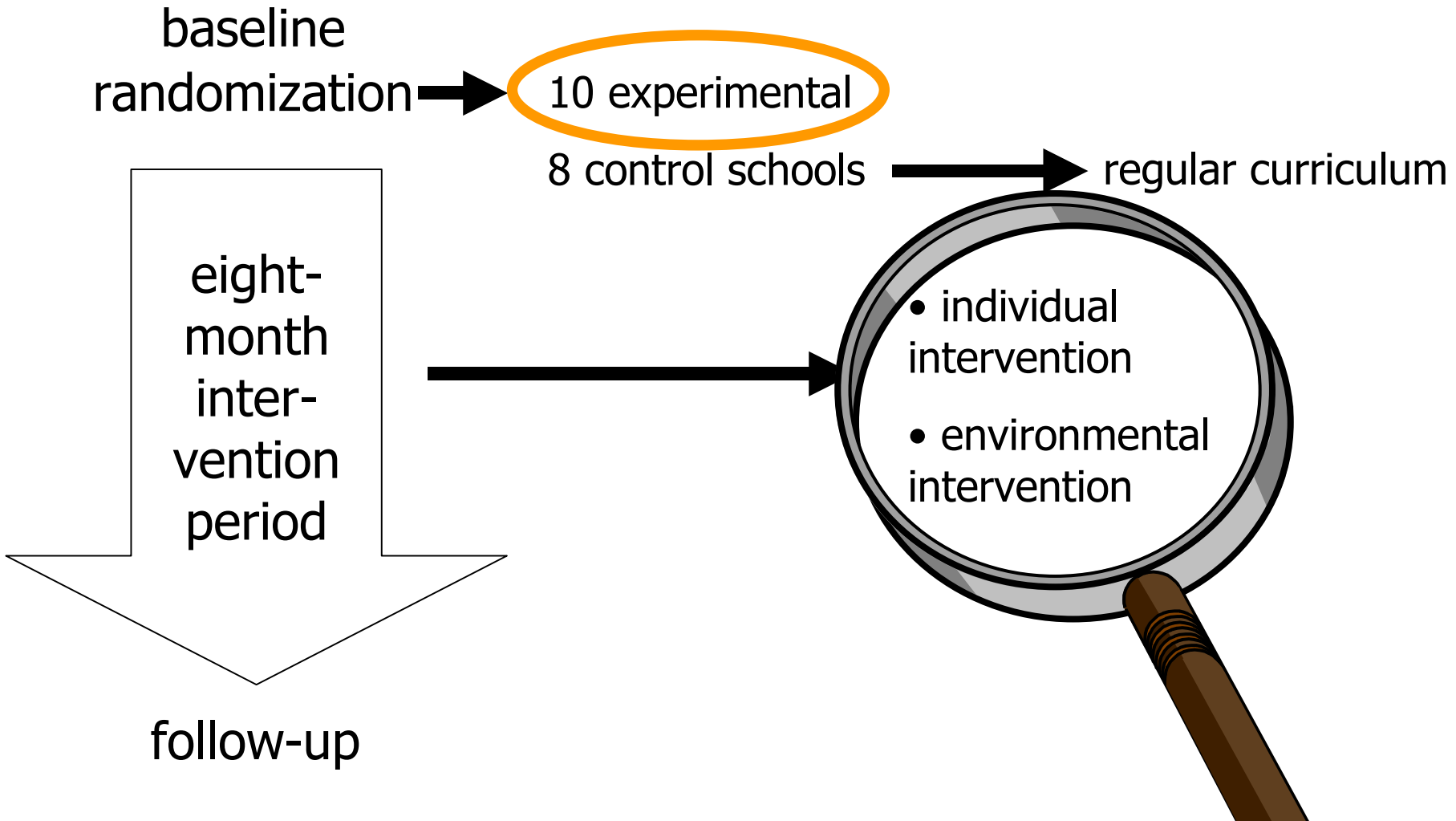
Research question

Is the DOiT-intervention effective in preventing excessive weight gain among Dutch adolescents?

Study population

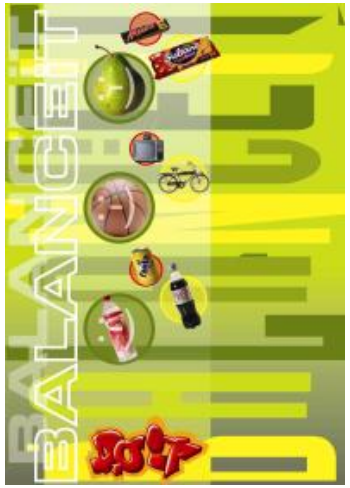
- participants
  - 18 participating schools, 3 classes each school
  - 1020 adolescents for both measurements, T0 and T1
- mean age 12.7 years
- ethnicity
  - Western: 87%
  - Non-Western: 13%
- no inclusion criteria set

Study design (RCT)



Individual intervention

- educational program, covering 11 biology and physical education lessons
- aimed at increasing awareness and behavioural changes
- including computer-tailored advice (www.doitproject.com)



Environmental intervention

- funding to support additional physical activity options
- school-specific advice on assortment of school canteen
- posters for school canteen and class rooms

Effect evaluation

Baseline (boys)

variable	experimental	control	p-value
	n = 279	n = 239	
weight (kg)	45.9 (9.2)	48.9 (10.0)	0.00
height (m)	158.6 (8.2)	159.6 (8.2)	0.26
SR test (lap)	8.9 (2.1)	8.6 (2.1)	0.30
overweight (%)	9.4	16.7	0.08
obesity (%)	1.1	1.3	

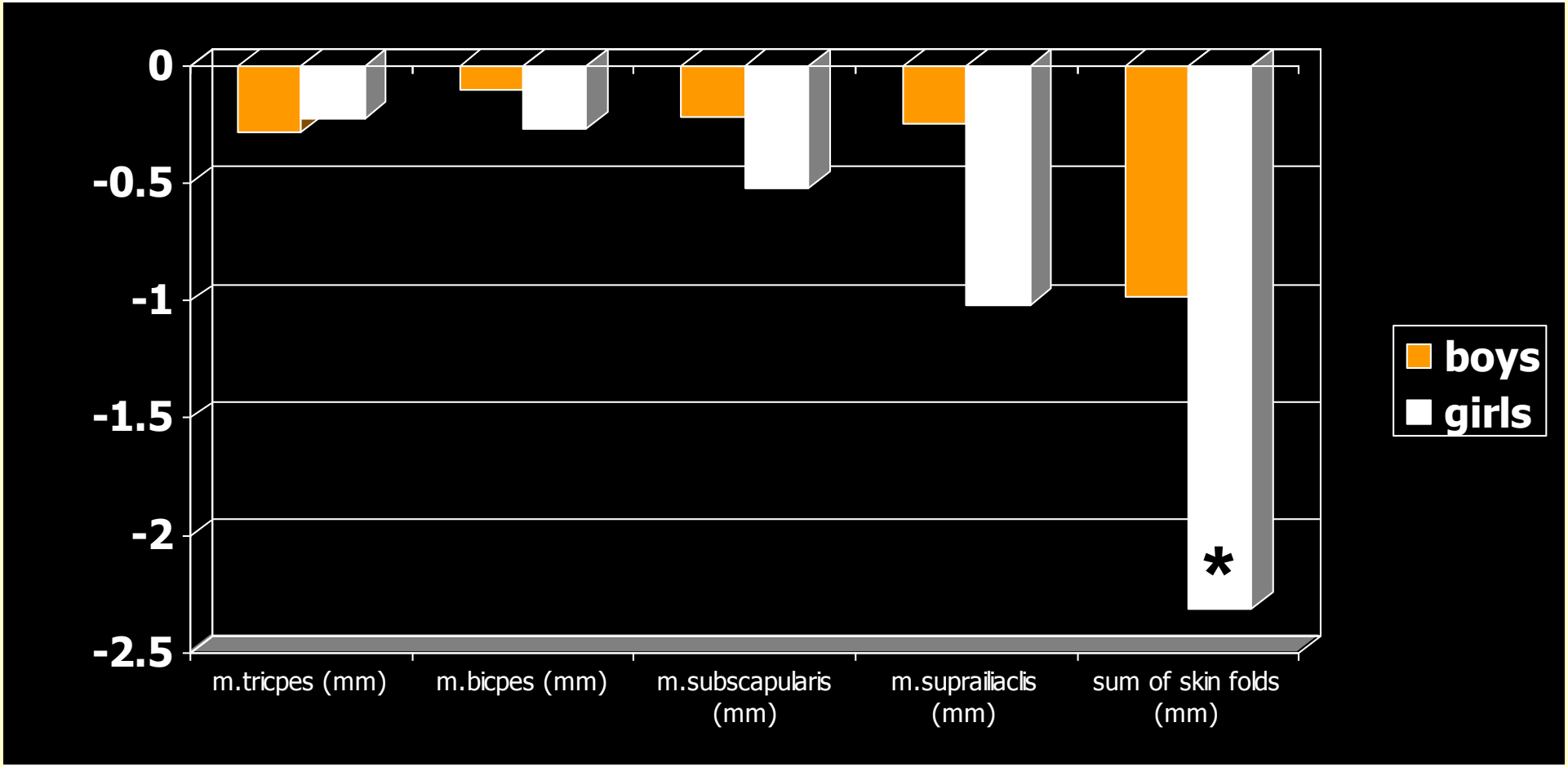
using Kolmogorov-Zmirnov Z Test, and Pearson Chi Square

Baseline (girls)

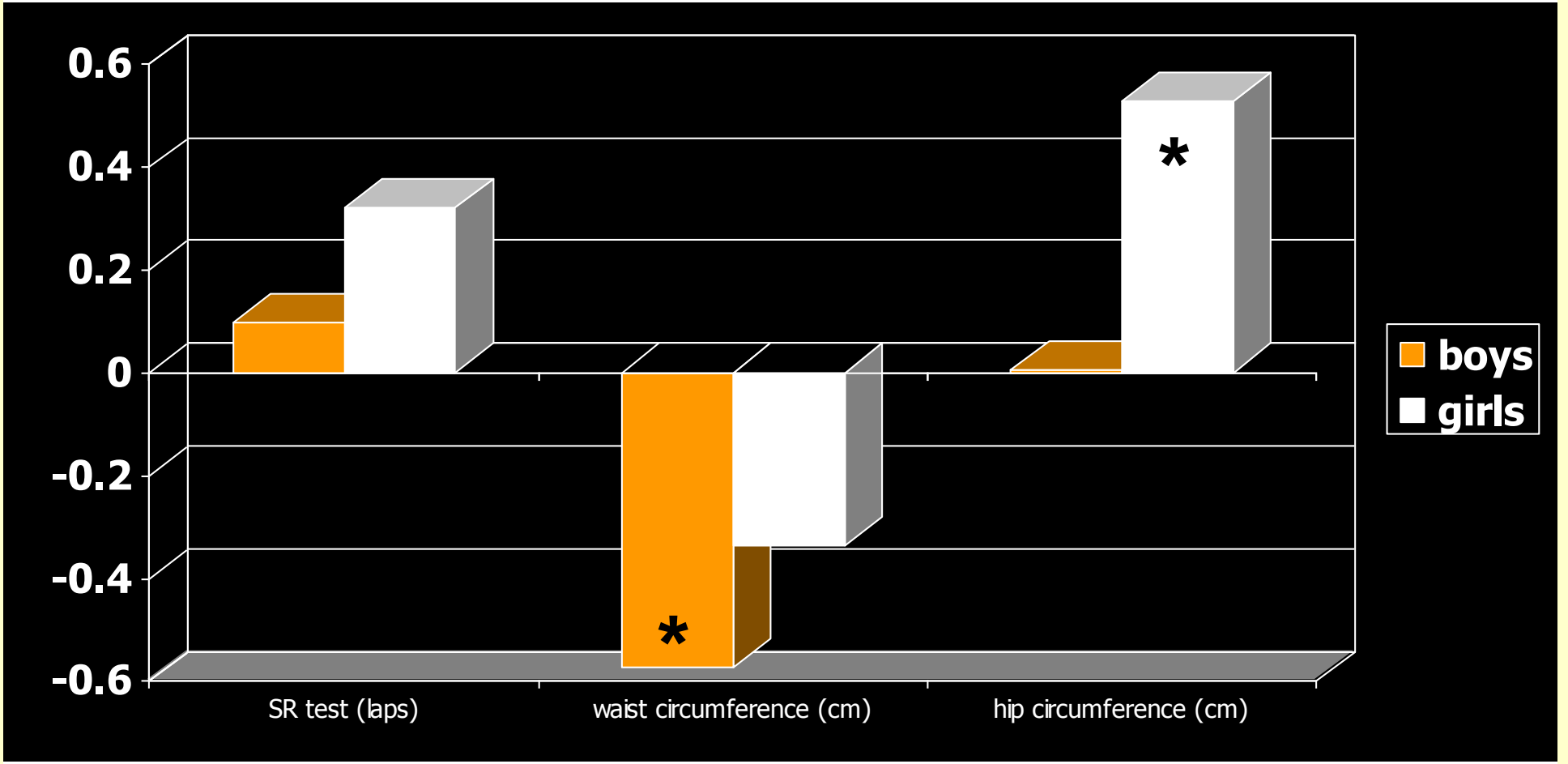
variable	experimental	control	p-value
	n = 322	n = 214	
weight (kg)	47.3 (9.3)	49.4 (10.6)	0.10
height (m)	157.4 (7.6)	158.8 (6.8)	0.01
SR test (lap)	7.2 (1.8)	7.2 (1.8)	0.35
overweight (%)	13.4	14.5	0.56
obesity (%)	1.9	3.3	

using Kolmogorov-Zmirnov Z Test, and Pearson Chi Square

Results after 8 months (skin folds)



Results after 8 months (other)



Re-shaping the office environment?

Reshaping an office environment. Does it make sense?

Mireille van Poppel, Luuk Engbers, Willem van Mechelen

VU University Medical Center, Amsterdam
Department of Public and Occupational Health
Body@Work TNO-VUmc

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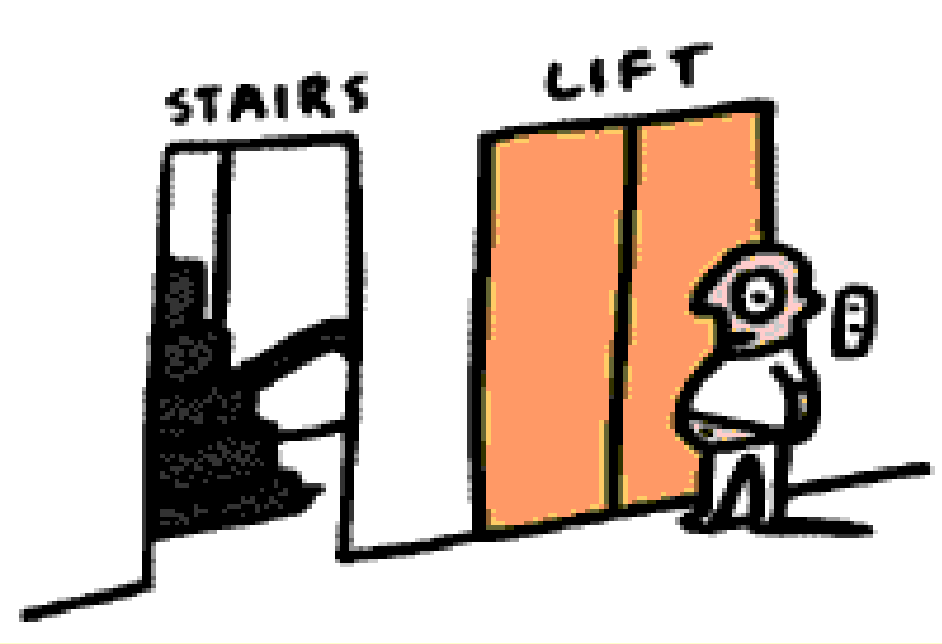
Aim of FoodSteps

To assess the effects of **environmental modifications** on

- physical activity; i.e. stair use
- Body Mass Index
- Biological CVD risk indicators of office workers



Design

- controlled trial (1 intervention & 1 control site)
- duration of the intervention 12 months
- baseline and follow-up measurements at 3 & 12 months
- population of office workers:
  - Body Mass Index >23
  - able to take stairs
  - contract until the last follow-up measurement

Intervention

Intervention *physical activity*

- ‘point-of-decision’-signs on elevator doors
- motivational texts in staircases
- slim making mirrors in staircases
- routing of people to the stairs

Intervention *physical activity*

Routing

Motivational texts

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Intervention *diet*

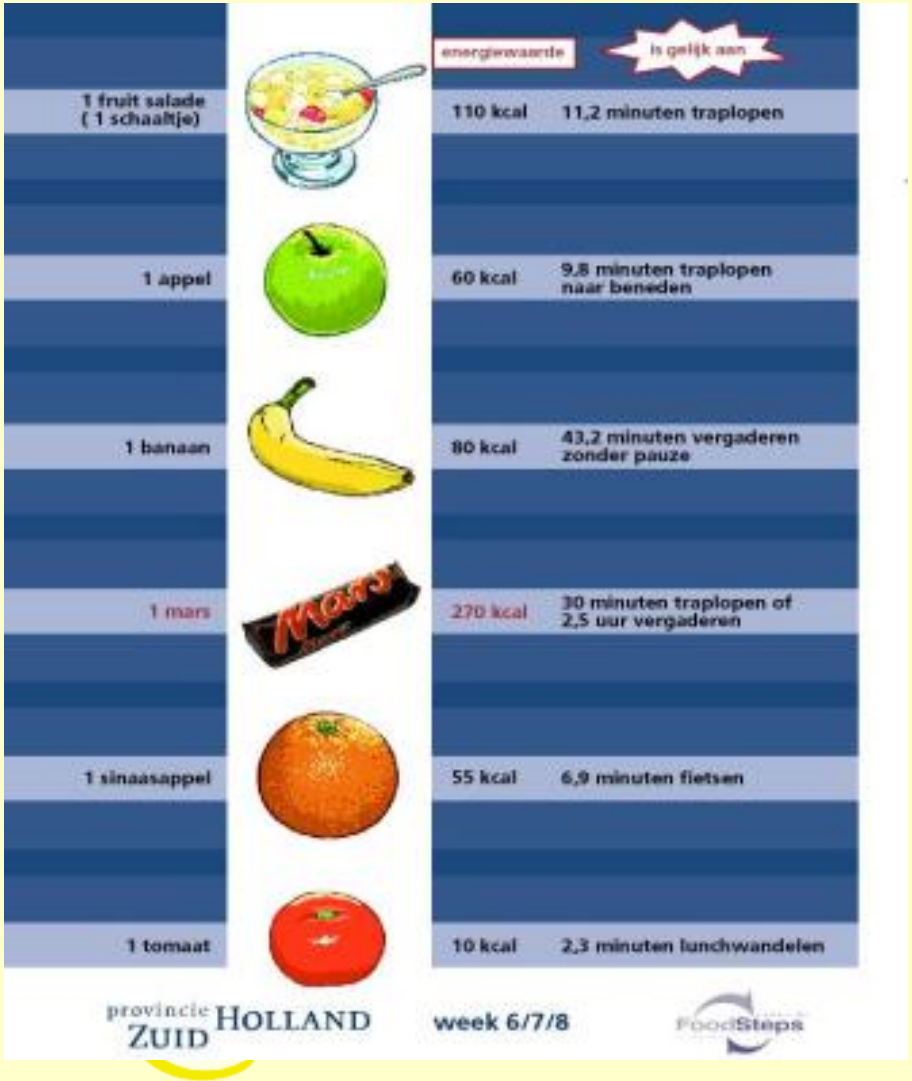
- food labelling in canteen & vending machines

  (every 4 weeks a different product group)
- information corner

  (computers & brochures)
- FoodSteps buffet

  (healthy product offerings, every 2 months)

Intervention *diet*



Food labelling:
caloric values of products
translated into number of minutes
of a certain activity

1 orange = 55 Kcal

≈ 6.9 minutes cycling

1 mars = 270 Kcal

≈ 30 minutes stair walking

≈ 2.5 hours sitting in a meeting

Outcomes: *physical activity*

Total population:

- self-reported physical activity

  (total PA, PA at work, stair use at work)

Subgroups:

- objectively measured stair use at work

  (hands free detection system & chip cards)

Outcomes: *Blood lipids*

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Groups at baseline

	intervention	control
number of subjects	316	325
% female	37.4	41.7
age (mean)	45.3	45.5
hrs at work/week (mean)	35.3	36.6
% higher educated	69.9	63.9
BMI (mean)	26.4	26.6

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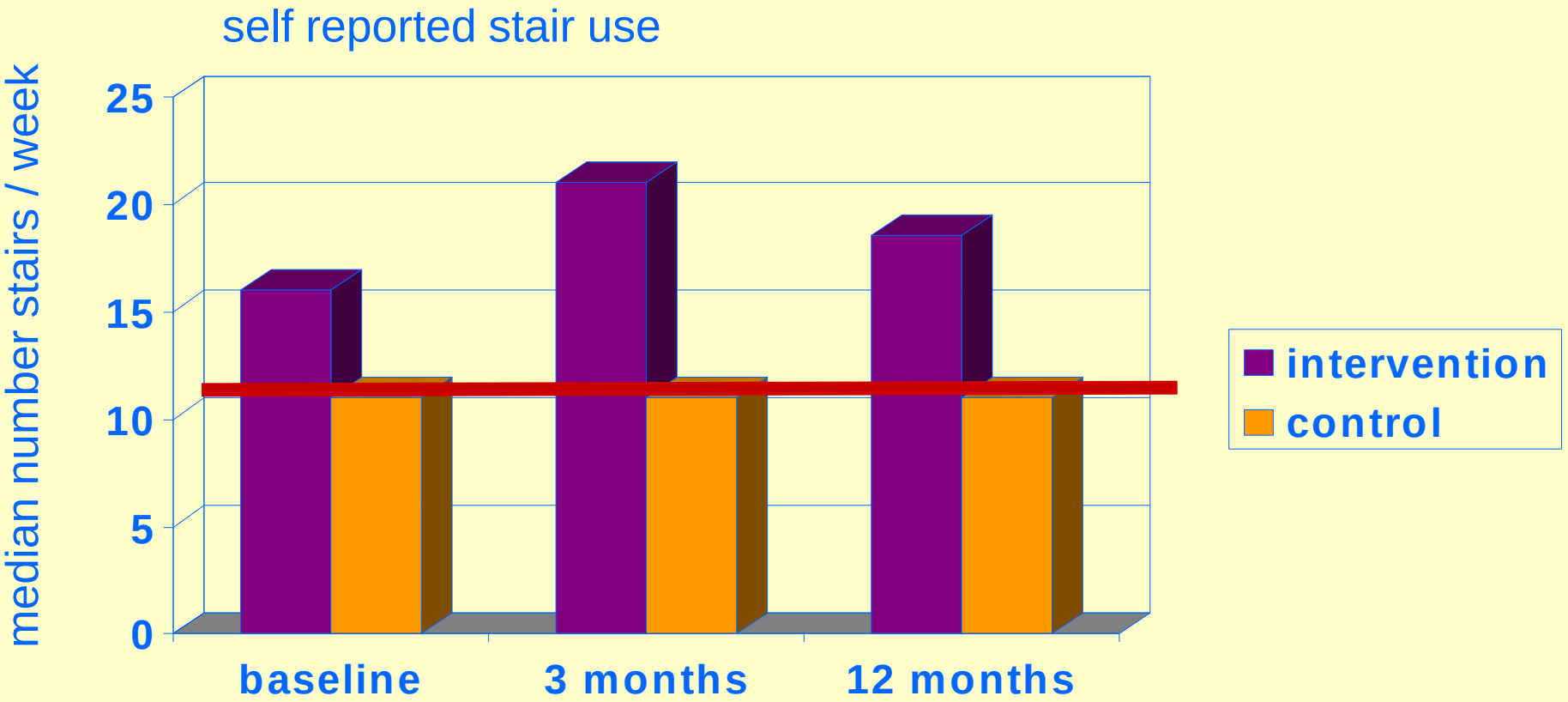
Results stair use



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Results stair use

Intervention effect on self-reported stair use

- interaction with gender:

  only statistically significant effect for men

  self-reported: β = 1.41 (objectively measured: β = 1.34)

- interaction with BMI:

  only statistically significant effect for subjects with BMI < 25

  objective: β = 1.47

Results cholesterol

Intervention effects on cholesterol levels (interaction with gender)

Total cholesterol	12 months	men	β = - 0.41
LDL cholesterol	12 months	men	β = - 0.31
	12 months	women	β = - 0.41
HDL cholesterol	3 months	men	β = 0.05
	12 months	men	β = 0.11

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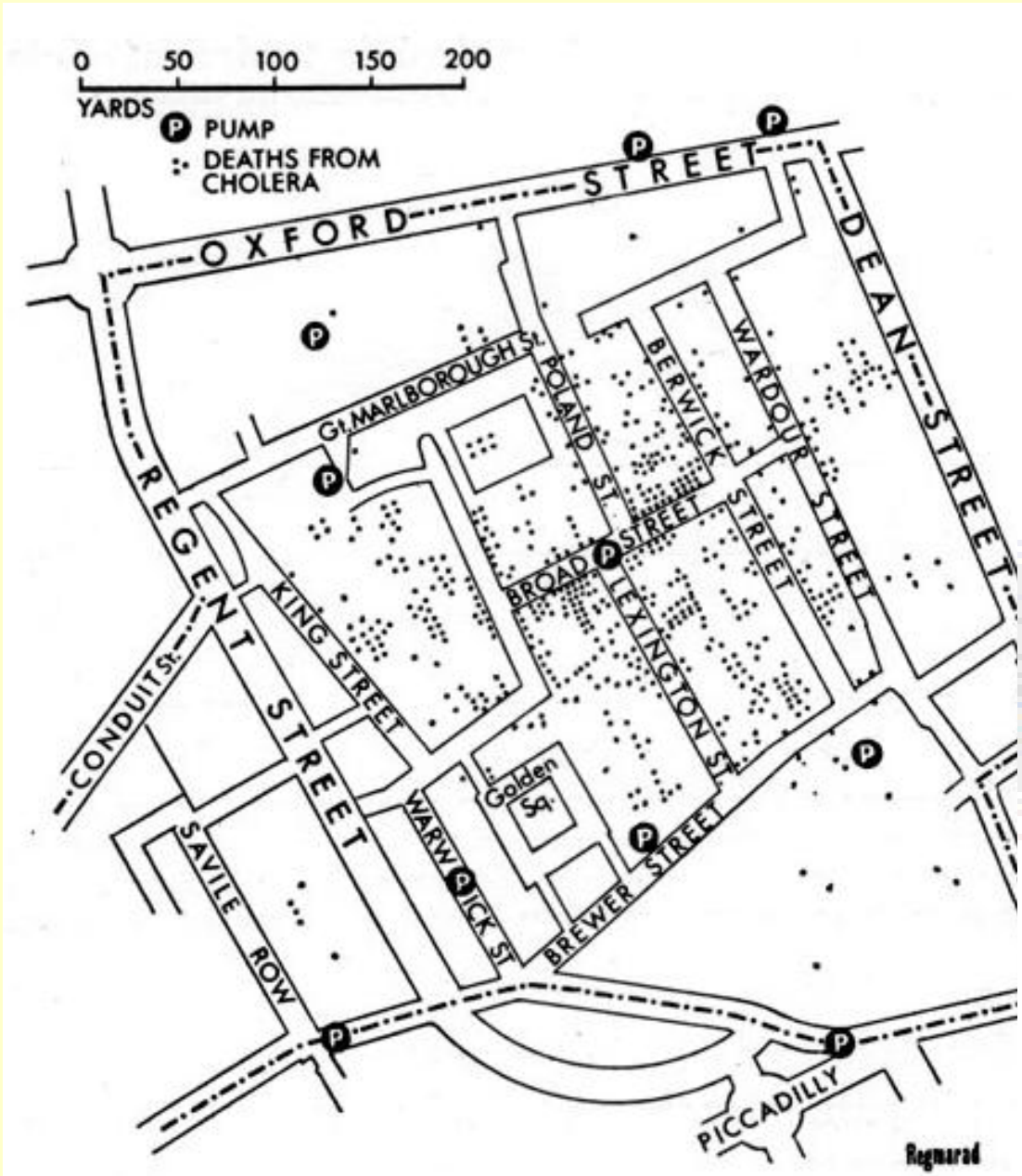
CONTENT

- *What is the problem?*
- *Interventions for people and places*
- **Public Health Research**

Do all these interventions aiming at ‘voluntary’ behavioral change make Public Health sense??

I don’t know, but perhaps more Draconic action is needed!!

Sanitation: pragmatism works



Johan P Mackenbach, BMJ 2006

Sanitation: pragmatism works

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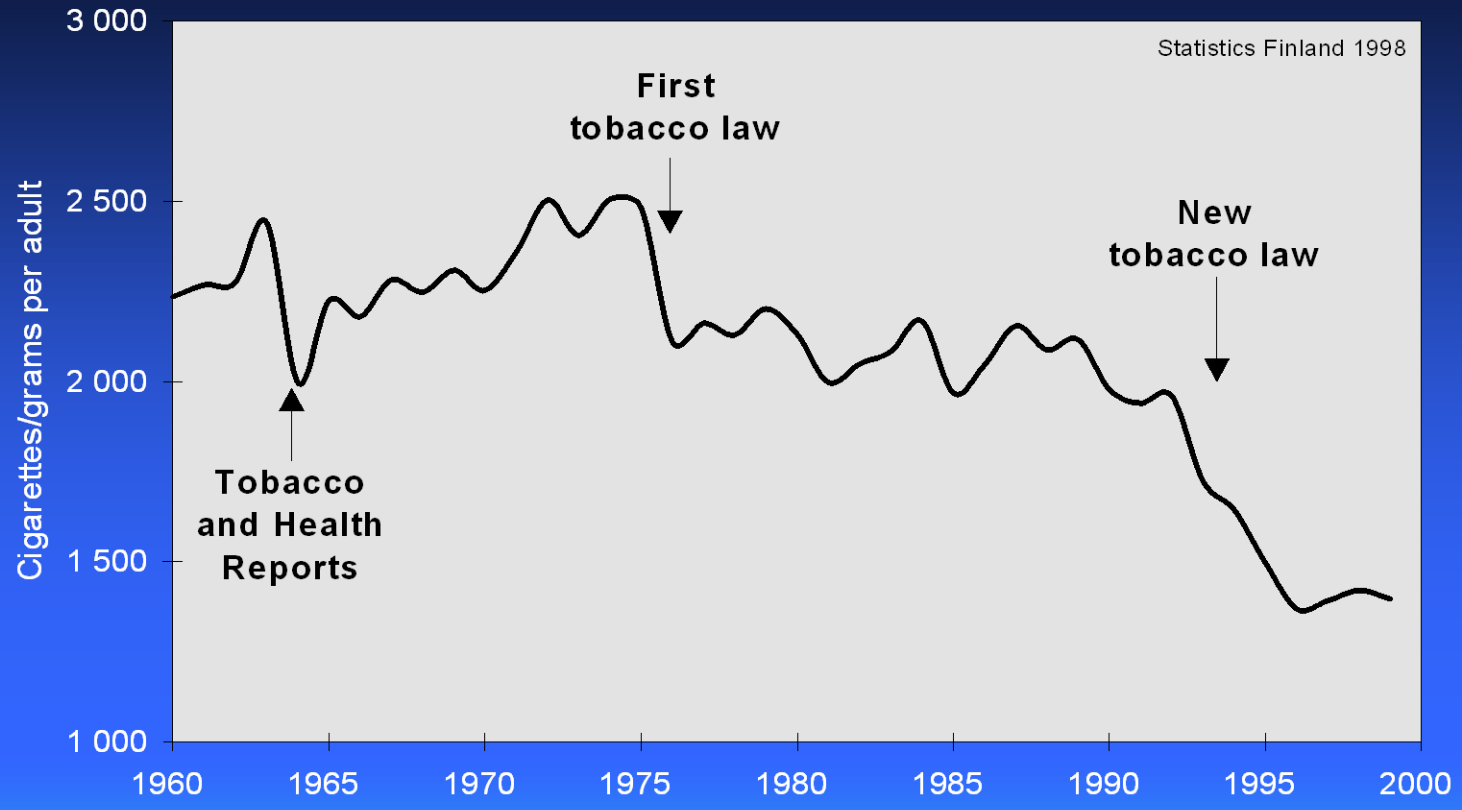
Obesity prevention:

pragmatism may work also

Consumption of tobacco products in Finland 1960-2000



pragmatism works

DRIVE

KFC-Drive
KFC-Drive

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KFC - Drive

The hidden costs of Cadbury's Get Active! campaign

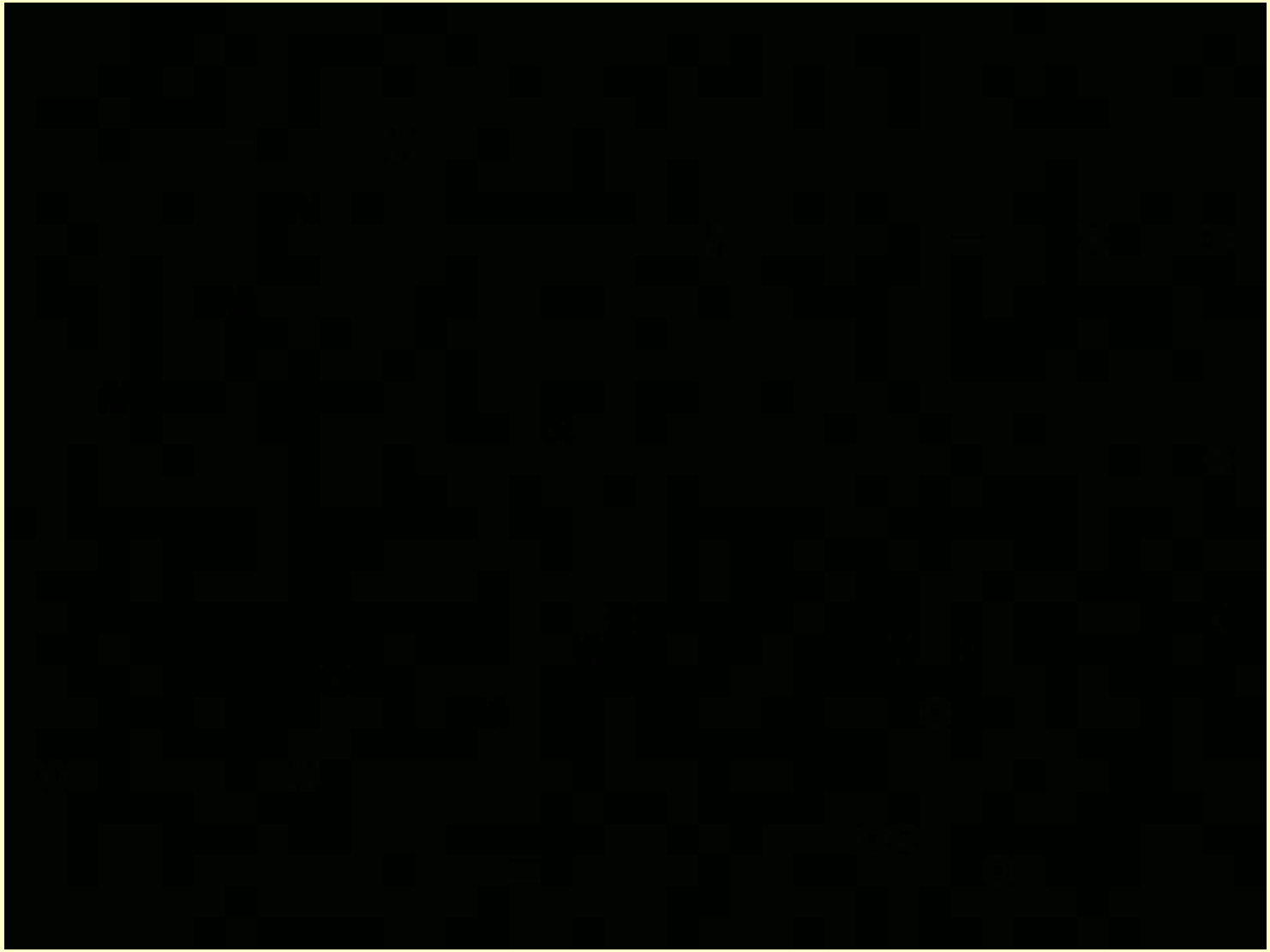
	Examples of equipment on offer	Number of tokens (chocolate bars consumed)	Total number of calories consumed (average 226.5 calories per bar)	Total amount of fat consumed+ (average fat 12.3g per bar)	Amount of money spent on chocolate (based on average of 42p per bar)	Value of equipment*
Primary schools	1 netball (brand: Firstouch)	90	20,363 kcal	1,107g (about 1kg)	£38	£5
	1 basketball (brand: Firstouch)	170	38,463 kcal	2,091g (about 2kg)	£71	£10
	1 volleyball (brand: Molten)	320	72,400 kcal	3,936g (nearly 4kg)	£134	£18
Secondary schools	1 cricket set (brand: Inter)	2,730	617,663kcal (over half a million)	33,579g (over 33kg)+	£1,147	£150
	1 set of posts for volleyball net (brand: Wheelaway)	5,440	1,230,800 kcal (over a million and a quarter)	66,912g (nearly 67 kg)	£2,285	£350
Total promotion		160 million	36,200,000,000 (over 36 billion)	1,968,000kg	£67,200,000	

+ Note: to help you visualise these amounts of fat, 33kg of fat weighs approximately the same as a healthy 10-year-old child.

* Prices are from the online sports equipment store www.newitts.com

To sum up

- Obesity is a fast growing Public Health problem, getting out of hand
- Effective interventions are available, at least providing short term effects
- Without Draconic, political, action the problem will not be solved



www.foodsteps.nl
www.alifeatwork.nl
www.doitproject.com