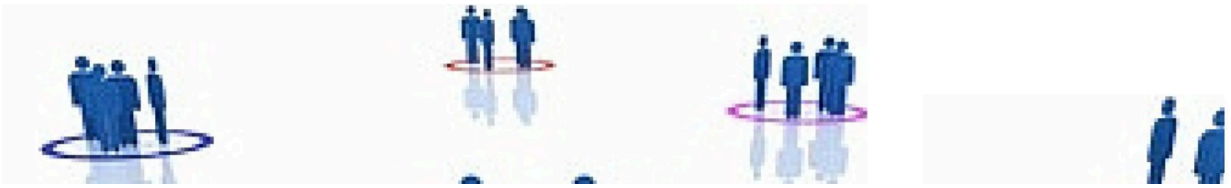
Fysieke fitheid op het werk,

om duurzaam inzetbaar te zijn en te blijven

Willem van Mechelen

VU University Medical Centre Amsterdam

CONGRES NKDI EN BA&O GEHOUDEN OP 20 MEI 2016
LOCATIE HAN ARNHEM VAN 9.45 UUR TOT 16.00 UUR



THEMA: CAPABILITY MANAGEMENT

Disclosure

- Research money (direct-indirect): UWV, TNO, NIVEL, ZonMw, Dutch Government, Dutch Heart Foundation, Delta Lloyd, UVIT, Monuta, KLM, RIVM, ArboNed, Heineken, Dutch Dairy Industry, KNMG, WCRF, KWF, AMD VU/VUmc, Astra Zeneca, Polar, Ergotron, Stichting Arbouw, …….

- Miscellaneous: TCCC, Masterfood, Donjoy, WHO, EC, CDC, GR, MRC, Finish Academy Sci., EHFA, Pfizer, Eli Lilly, Nike, …….

- Corporate board memberships: shareholder/director EVALUA Nederland B.V., non-executive board member ArboUnie B.V.


921
881
991
284

Inhoud

- What is the problem?
- What are the causes of the problem?
- Some examples
- Who is responsible?

What is the

problem?

Rapid increase

of NCD’s

lifestyle-related disease (NCD's)

BRAVO

- PA
- smoking
- alcohol
- nutrition
- relaxation

lifestyle (health behaviour)

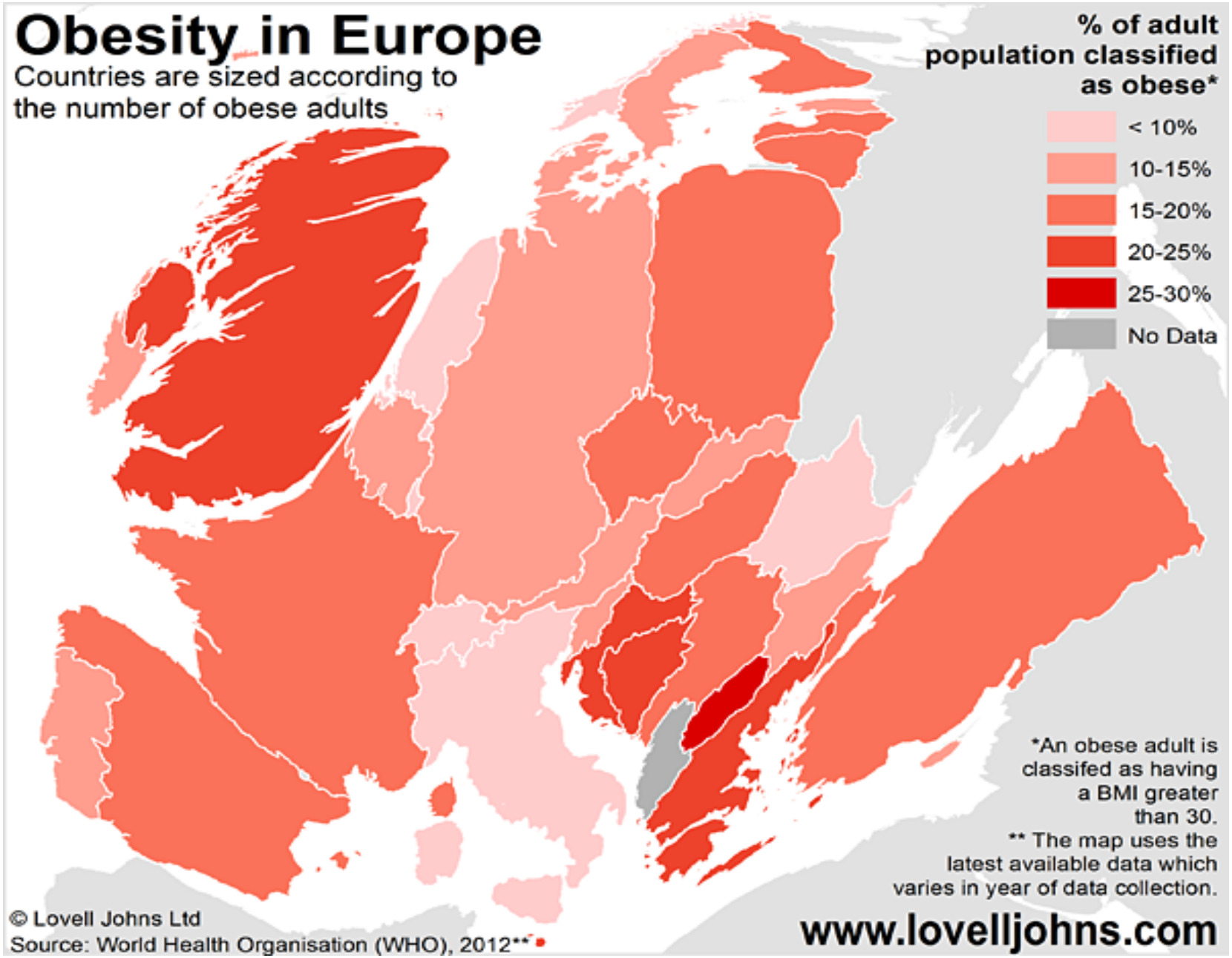
What is the problem?

BMI

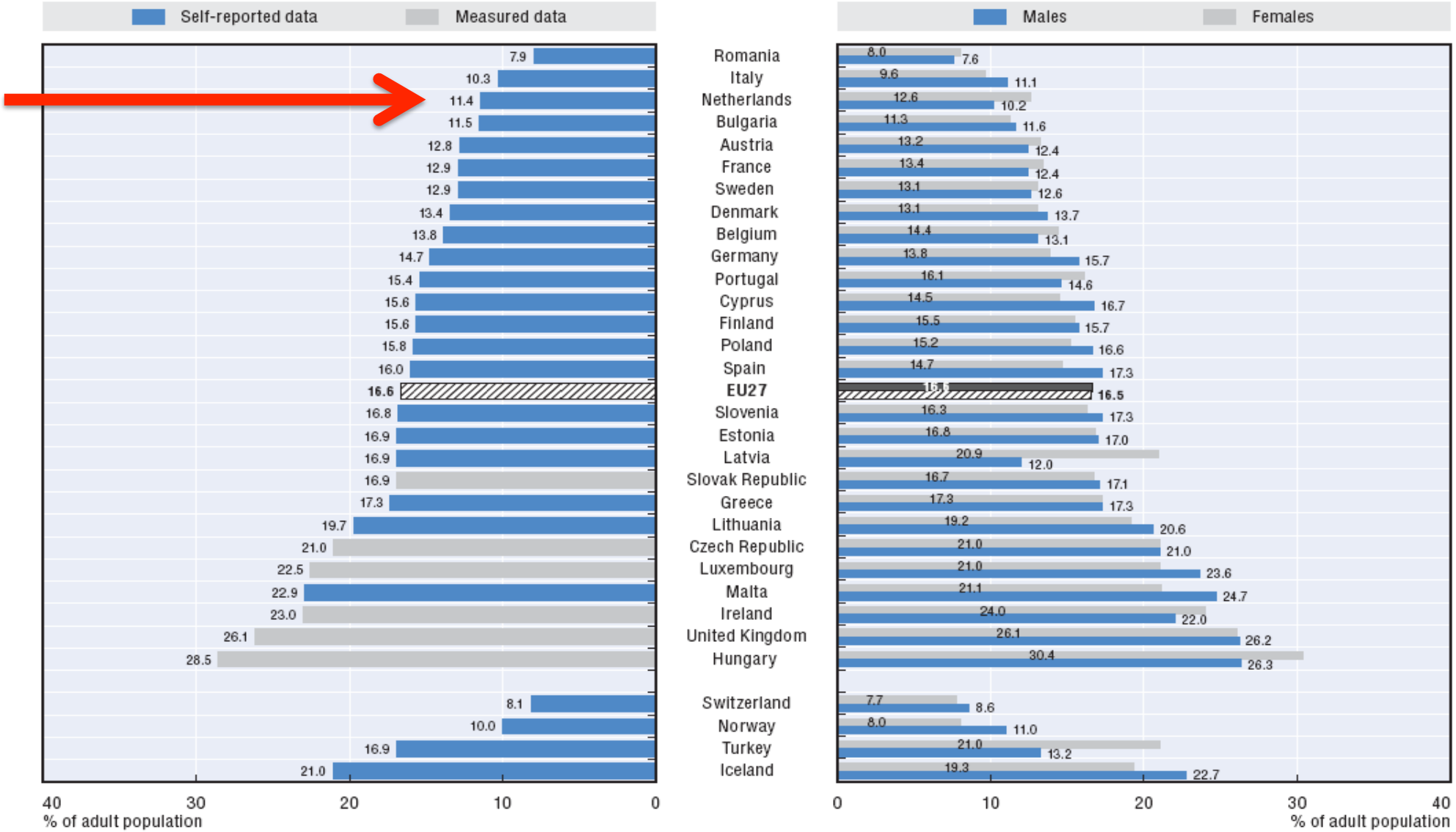
- weight/height^2

- overweight > 25
- obesity > 30

104 kg by 1,86 m


Obesity in Europe
Countries are sized according to the number of obese adults
% of adult population classified as obese*
< 10%
10-15%
15-20%
20-25%
25-30%
No Data
*An obese adult is classifed as having a BMI greater than 30.
** The map uses the latest available data which varies in year of data collection.
© Lovell Johns Ltd
Source: World Health Organisation (WHO), 2012**
www.lovelljohns.com

Obesity in Europe



Source: OECD Health Data 2012; *Eurostat Statistics Database*; WHO Global Infobase.

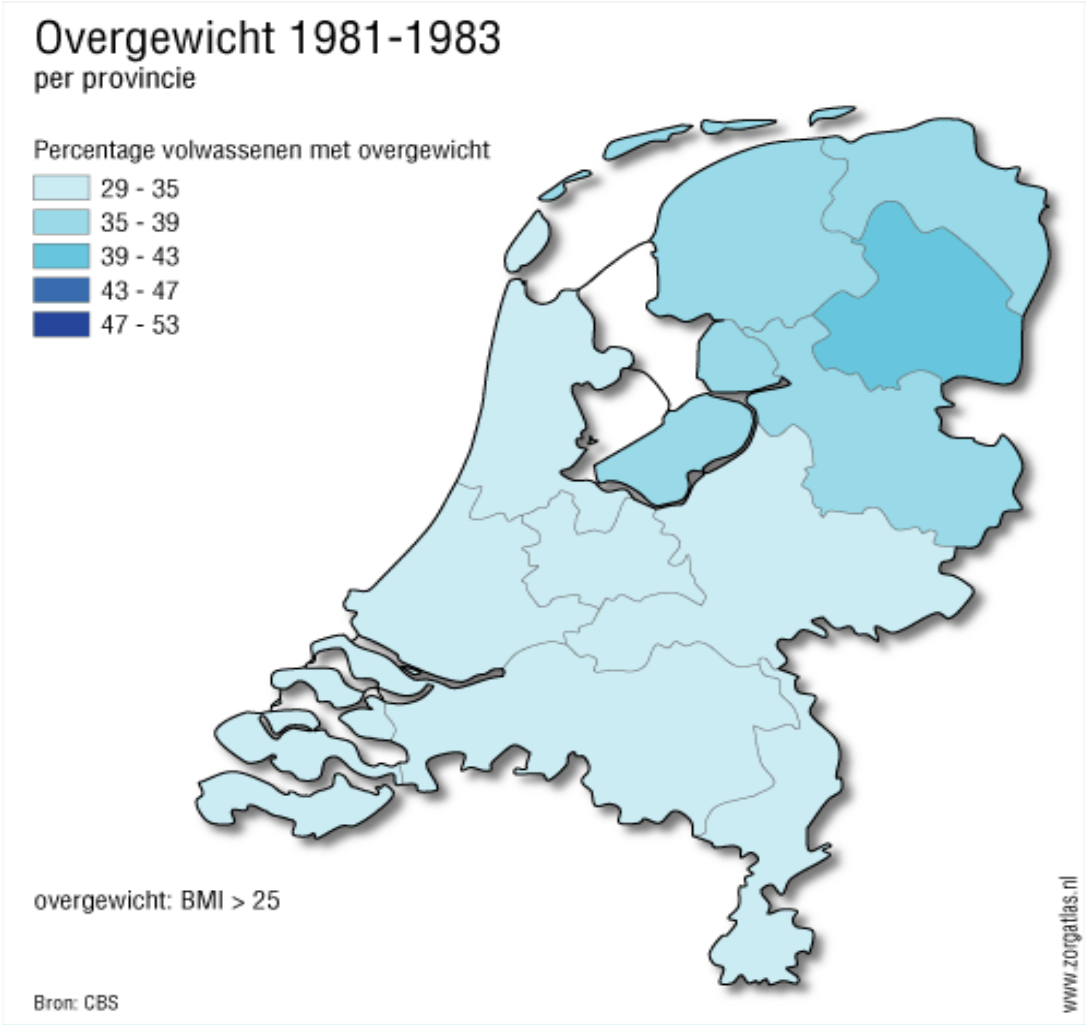
Facts and figures

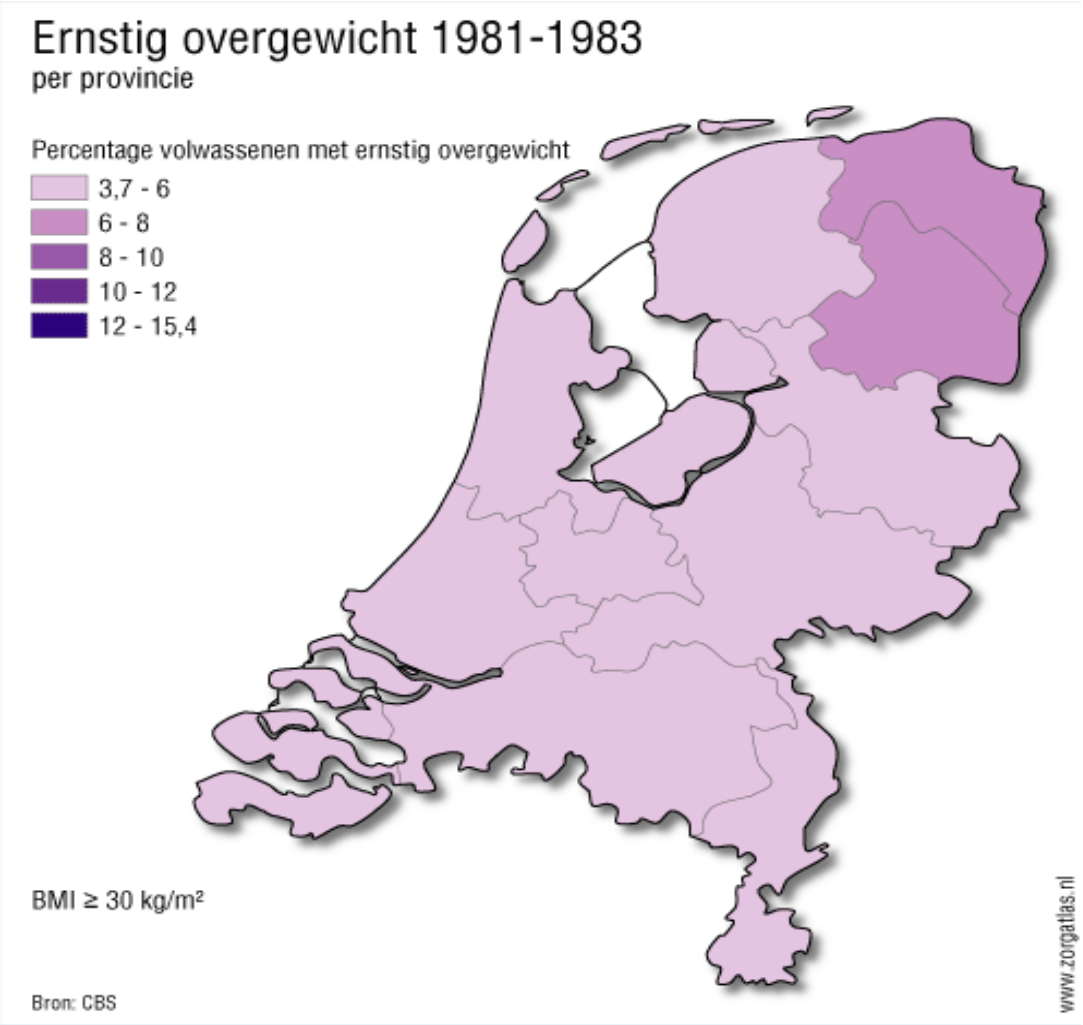
The challenge of obesity - quick statistics

- The worldwide prevalence of obesity nearly doubled between 1980 and 2008. According to country estimates for 2008, over 50% of both men and women in the WHO European Region were overweight, and roughly 23% of women and 20% of men were obese.

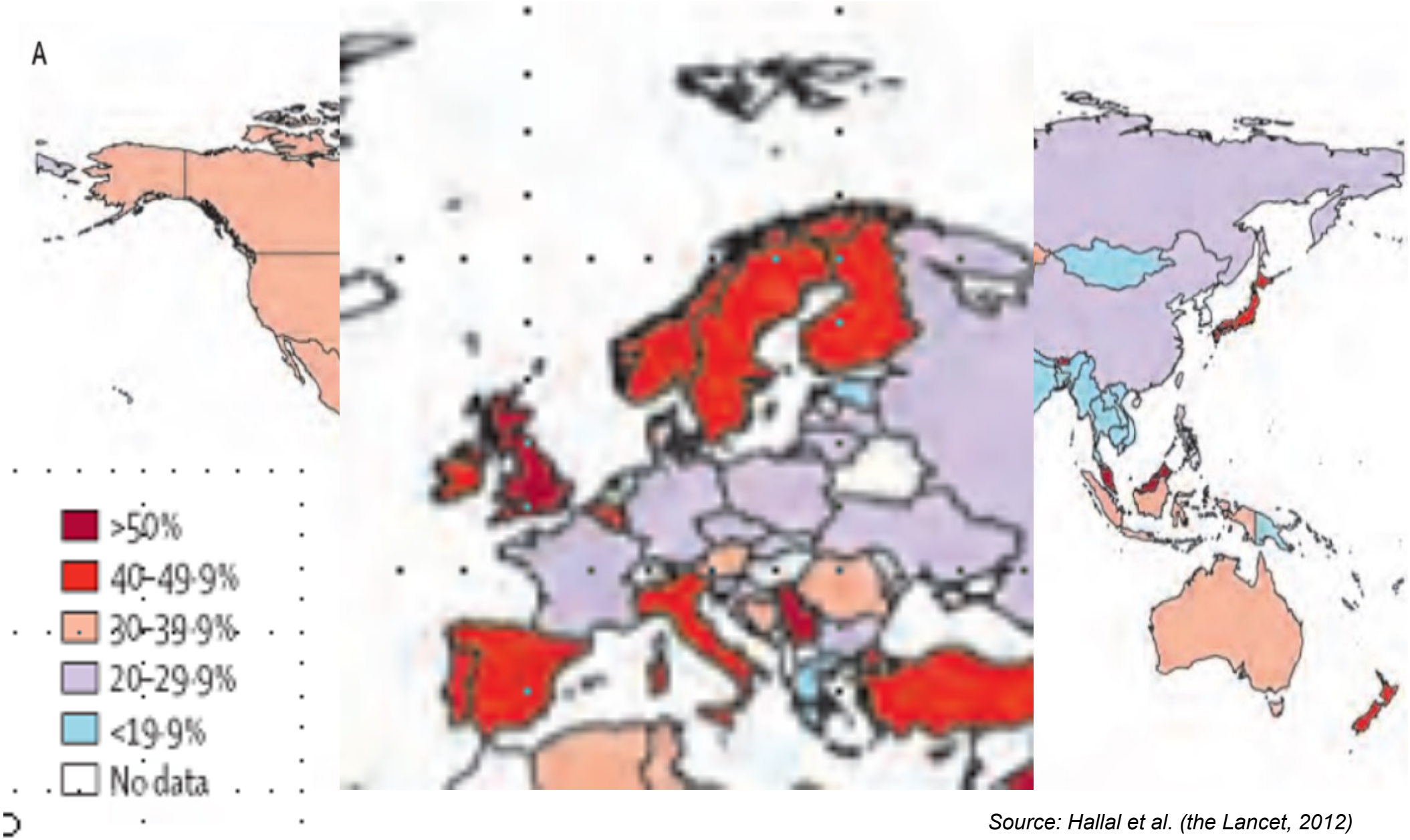
- Based on the latest estimates in European Union countries, overweight affects 30-70% and obesity affects 10-30% of adults.

overweight & obesity



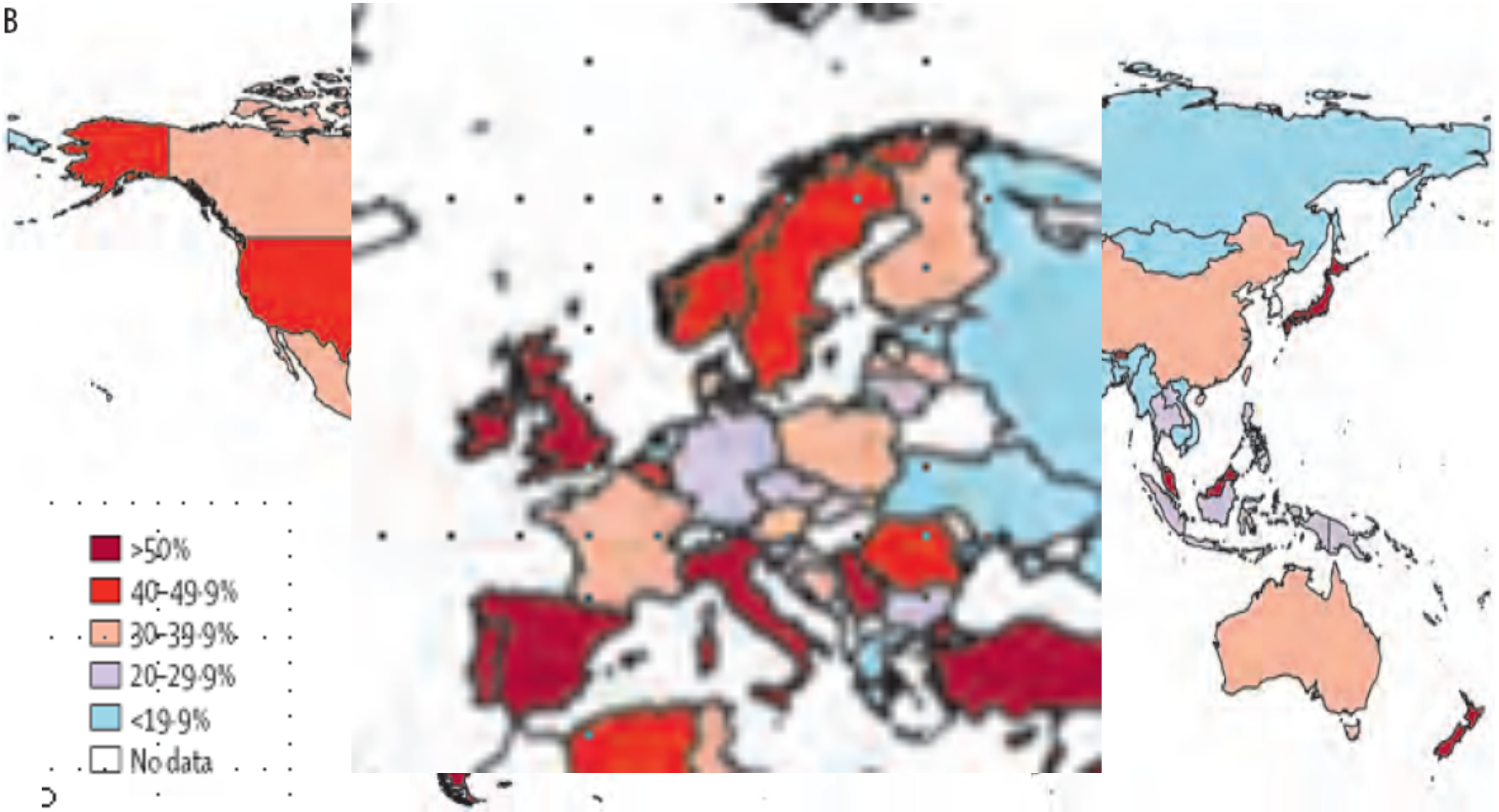


Physical inactivity in Men



Source: Hallal et al. (the Lancet, 2012)

Physical inactivity in Women



Source: Hallal et al. (the Lancet, 2012)

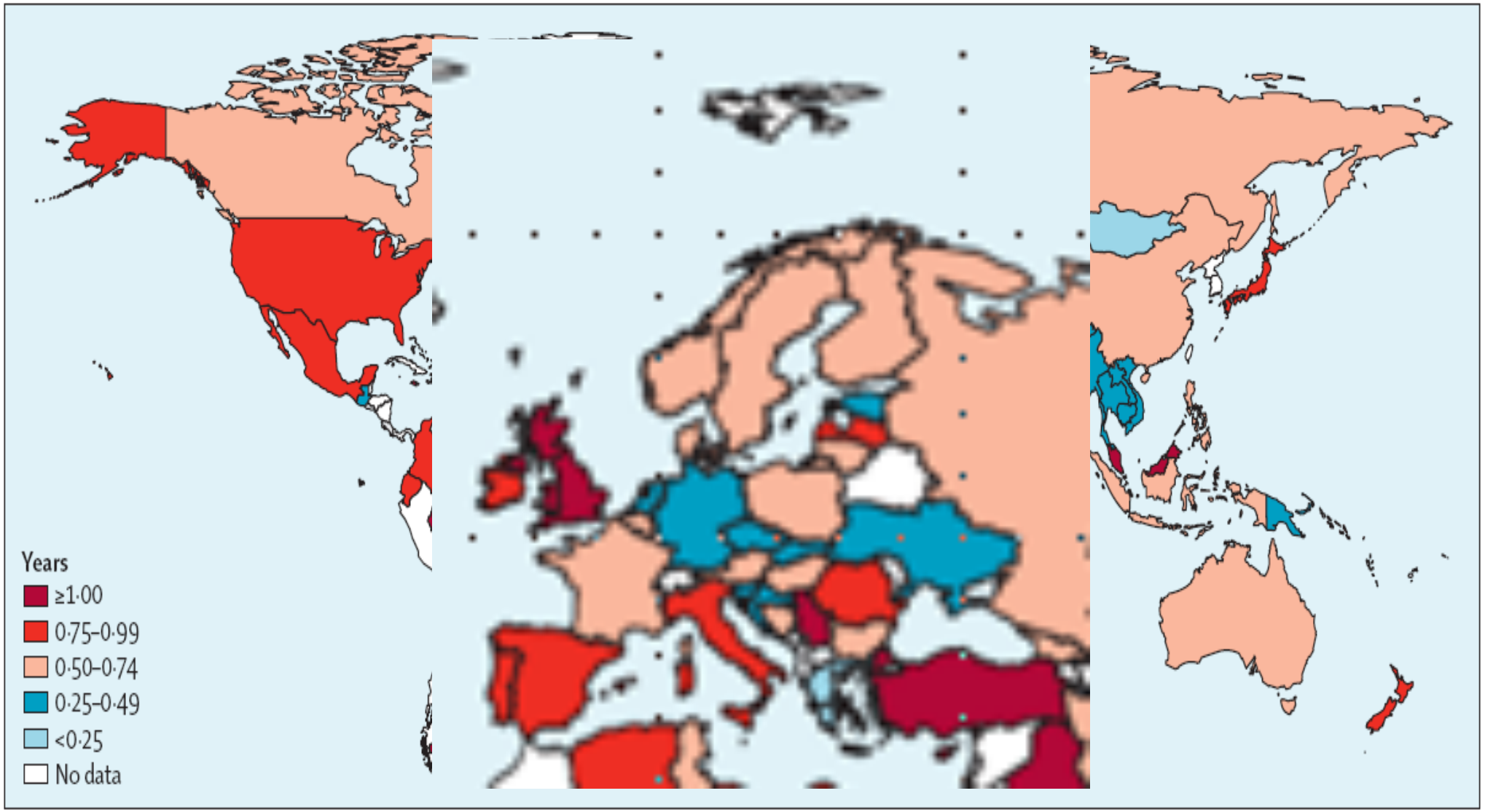


Figure: Estimated gains in life expectancy worldwide with elimination of physical inactivity

Source: Min Lee et al. (the Lancet, 2012)

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Kerncijfers voor beleid

- een introductie -

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Postbus 1 | 3720 BA Bilthoven
www.rivm.nl

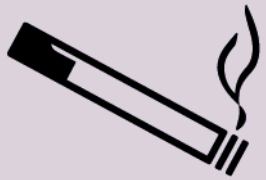
mei 2016

De zorg voor morgen begint vandaag

Leefstijl in 2015 en trends sinds 2001

(Bron: CBS Gezondheidsenquête (2001-2013); Gezondheidsenquête/Leefstijlmonitor, CBS i.s.m. Trimbos-instituut en RIVM (vanaf 2014)).

Roken
18 jaar en ouder



26% ↘

Overmatig drinken
18 jaar en ouder

10%

Drugsgebruik
18 t/m 64 jaar

Cannabis 9%
Andere drugs 5%

Overgewicht
18 jaar en ouder

49% ↗

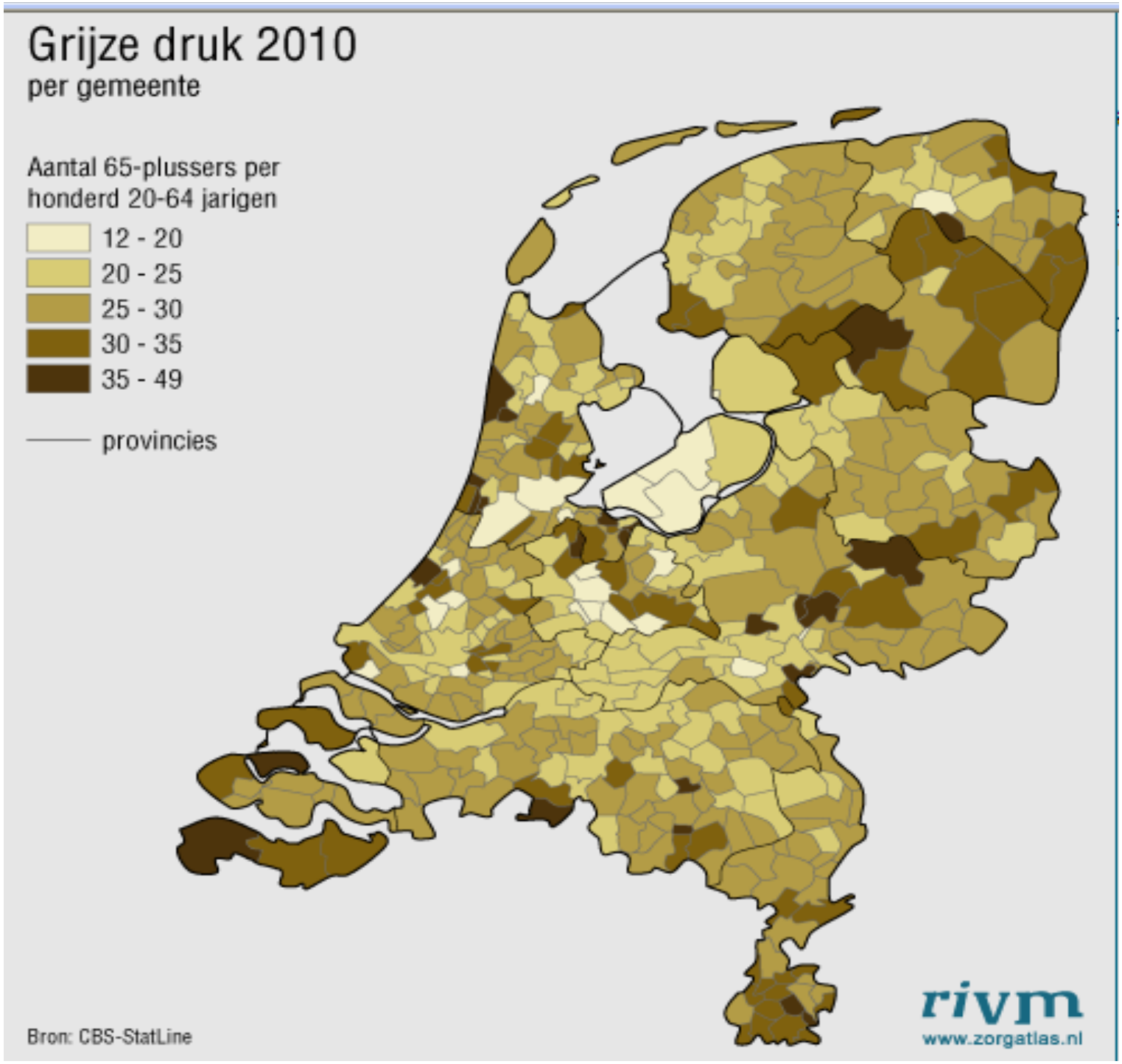
Voldoende beweging
12 jaar en ouder

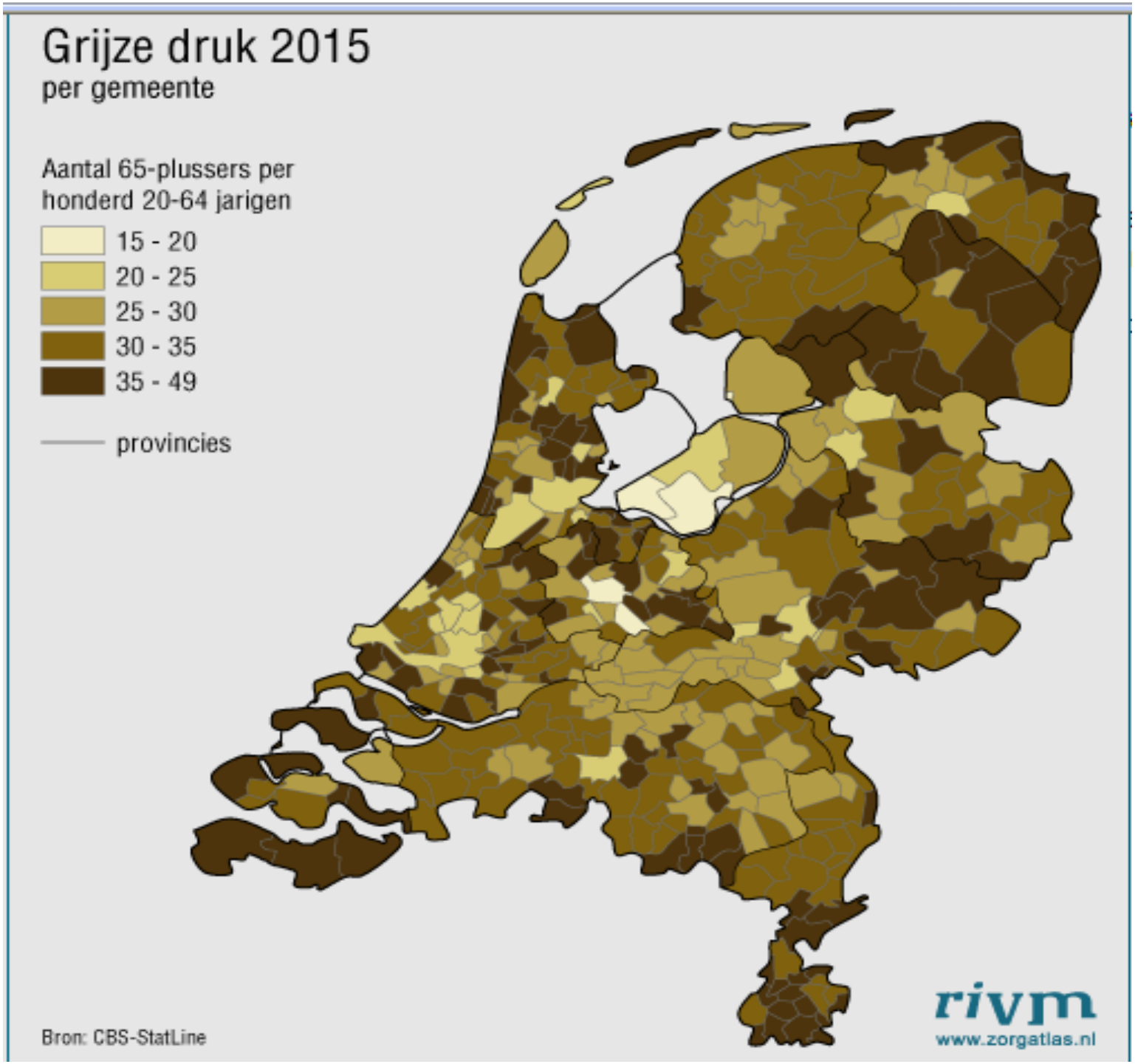
57%

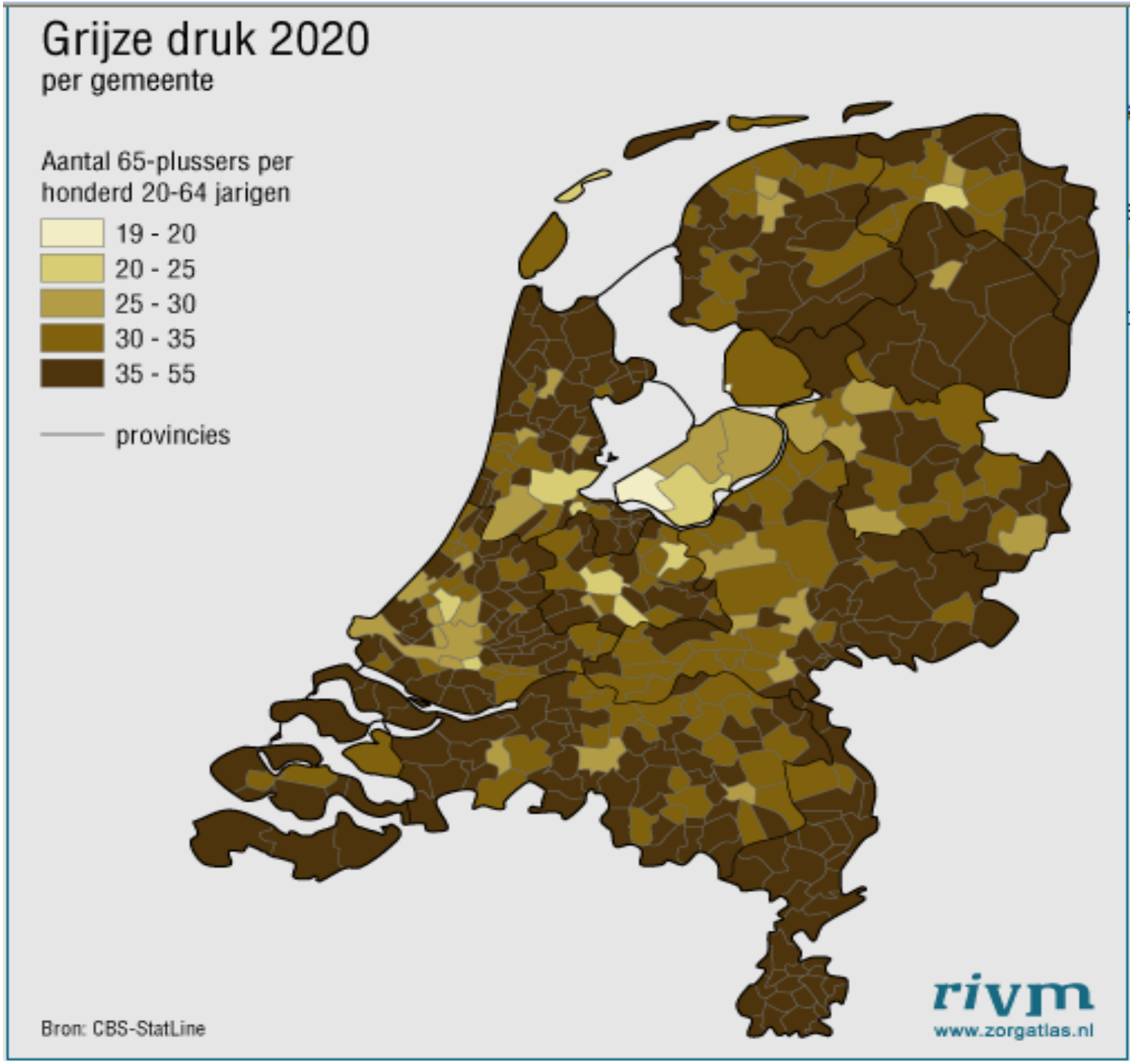
Wekelijks sporten
12 jaar en ouder

53% →

↘ *Daling sinds 2001* ↗ *Stijging sinds 2001* → *Stabiel sinds 2001*


Grijze druk 2010
per gemeente
Aantal 65-plussers per
honderd 20-64 jarigen
12 - 20
20 - 25
25 - 30
30 - 35
35 - 49
provincies
Bron: CBS-StatLine
rivm
www.zorgatlas.nl

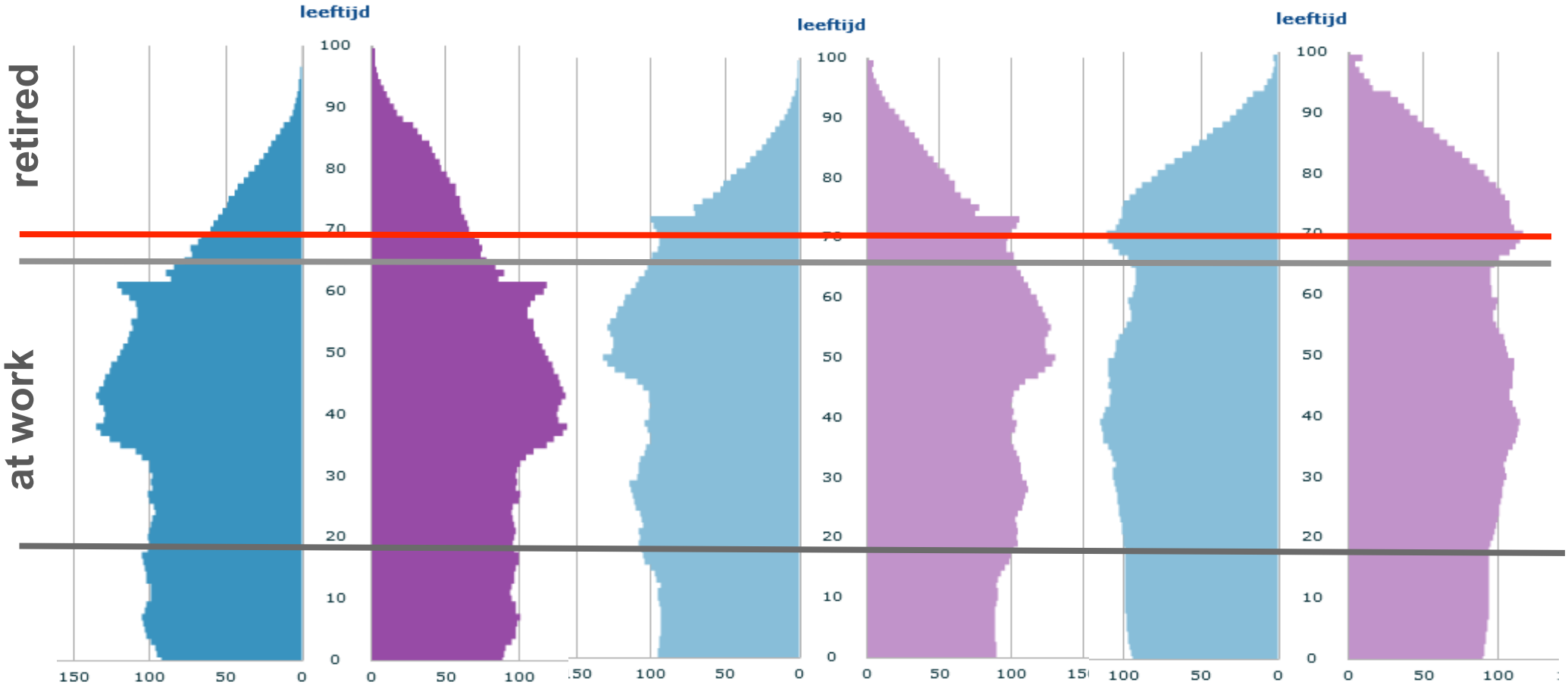

Grijze druk 2015
per gemeente
Aantal 65-plussers per honderd 20-64 jarigen
15 - 20
20 - 25
25 - 30
30 - 35
35 - 49
provincies
Bron: CBS-StatLine
rivm
www.zorgatlas.nl


Grijze druk 2020
per gemeente
Aantal 65-plussers per honderd 20-64 jarigen
19 - 20
20 - 25
25 - 30
30 - 35
35 - 55
provincies
Bron: CBS-StatLine
rivm
www.zorgatlas.nl


Grijze druk 2025
per gemeente
Aantal 65-plussers per
honderd 20-64 jarigen
20 - 25
25 - 30
30 - 35
35 - 57
provincies
Bron: CBS-StatLine
rivm
www.zorgatlas.nl

Aging in NL

2008: 15% **2020: 20%** **2040: 26%**



How to manage the ageing workforce?

“The Silver Tsunami”, The Economist, February 2010

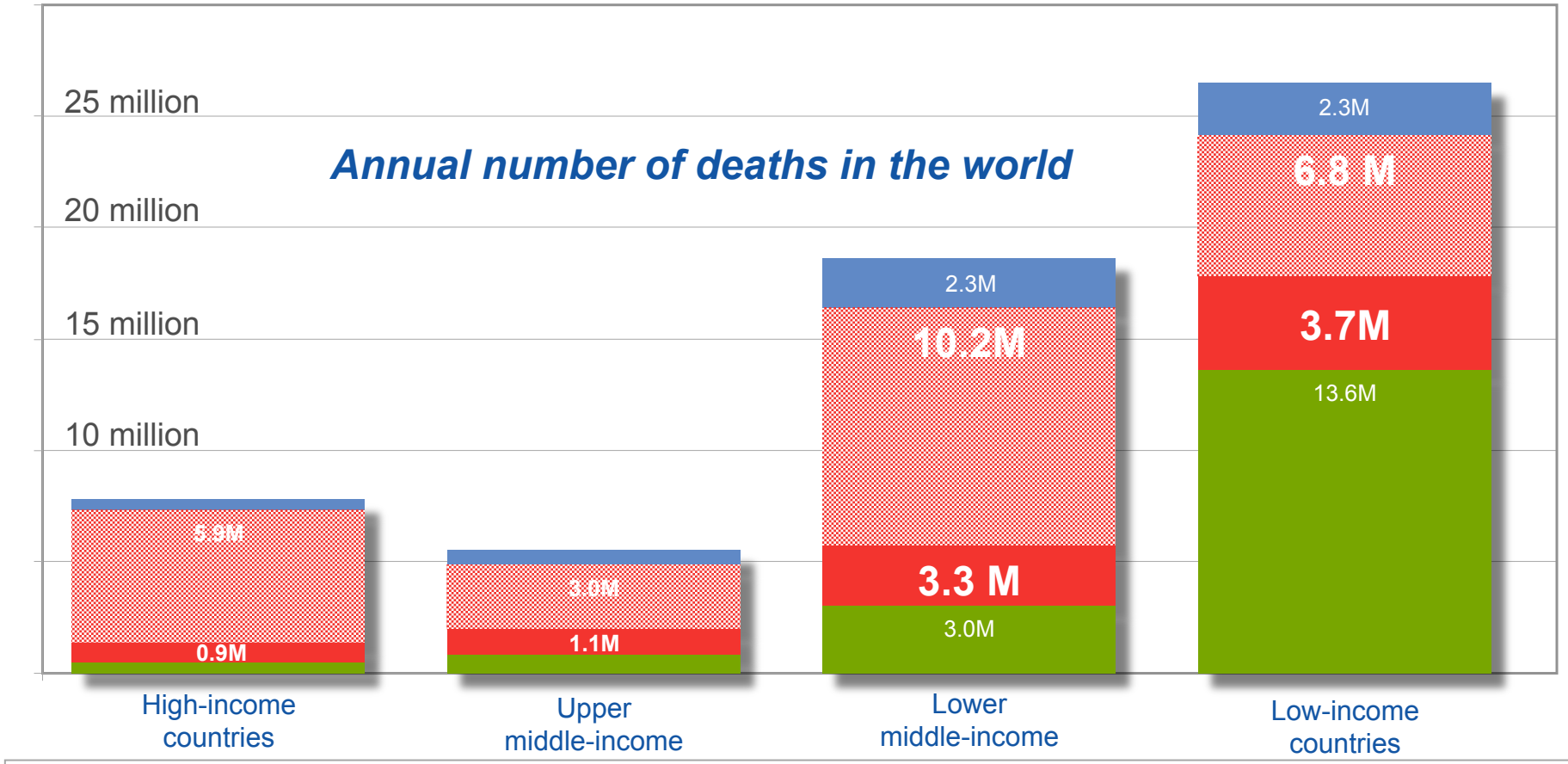
Increase labor participation >65 years

epidemiologic change

demographic change

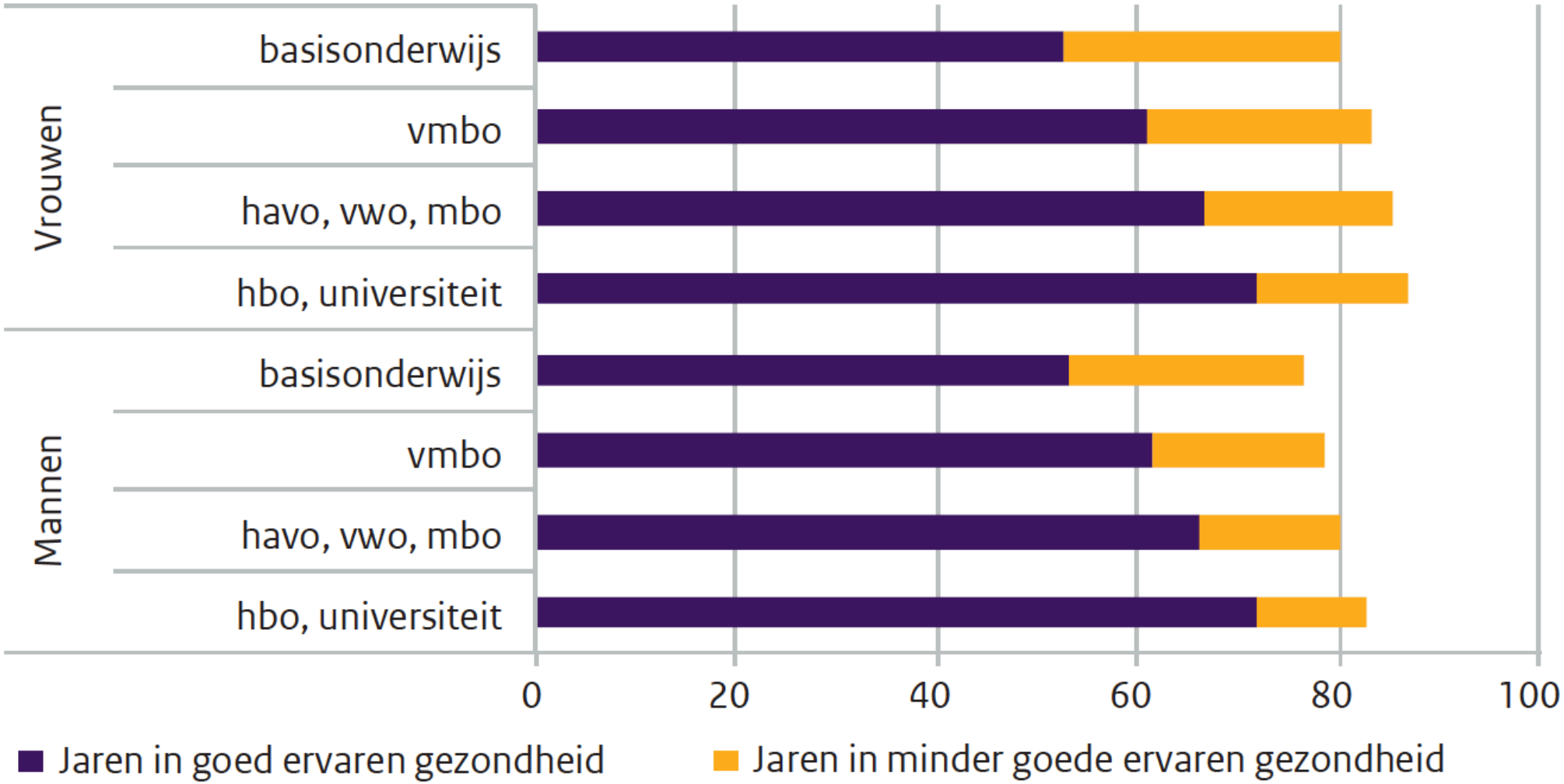
What are the consequences

90% of premature deaths from NCDs occur in developing countries



Source: THE GLOBAL BURDEN OF DISEASE 2004 UPDATE

Figuur 2.2 Levensverwachting bij geboorte naar opleiding, in jaren in goed ervaren gezondheid en in minder goed ervaren gezondheid, gemiddelde over 2011-2014 (Bron: CBS StatLine).



The relationship between overweight and obesity, and sick leave: a systematic review

International Journal of Obesity (2009) 1–10

0307-0565/09

DC van Duijvenbode[1], MJM Hoozemans[2], MNM van Poppel[1] and KI Proper[1]

[1]*Department of Public and Occupational Health and the EMGO Institute for Health and Care Research, VU University Medical Center Amsterdam, Amsterdam, The Netherlands and* [2]*Research Institute MOVE, Faculty of Human Movement Sciences, VU University Amsterdam, Amsterdam, The Netherlands*

13 studies overweight → longterm (>7 days) sickness absense:
- 4 out of 7: overweight predictor of long-term sick leave
- 3 out of 7: positive trend, but no significance

5 studies overweight → short-term sick leave: inconsistent results

8 studies obesity → longterm sickness absense:
- 7 out of 8: obesity significant predictor of long-term sick leave

5 studies obesity → short-term sick leave: inconclusive results

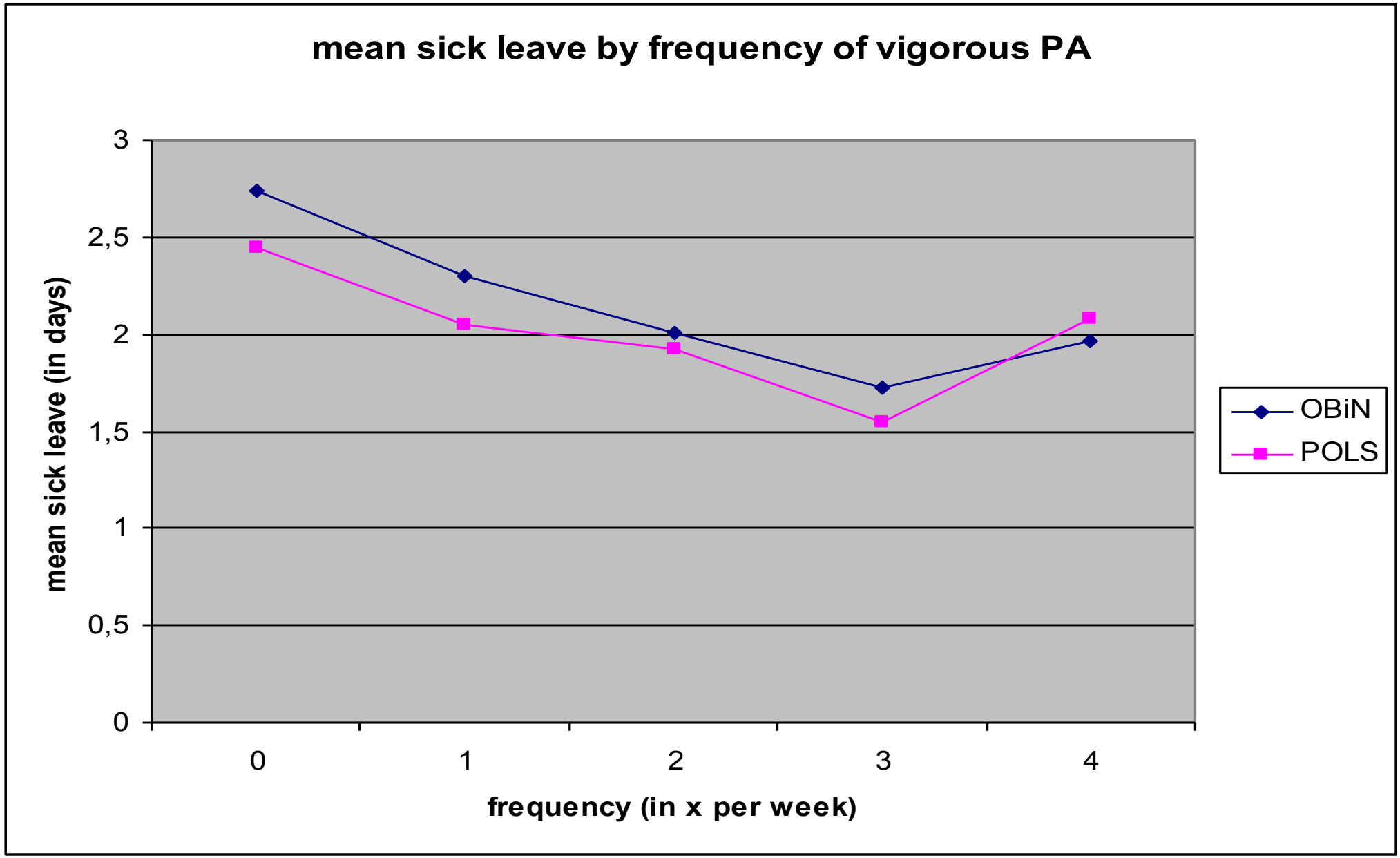
ORIGINAL ARTICLE

Br J Sports Med 2006;**40**:173–178. doi: 10.1136/bjsm.2005.022327

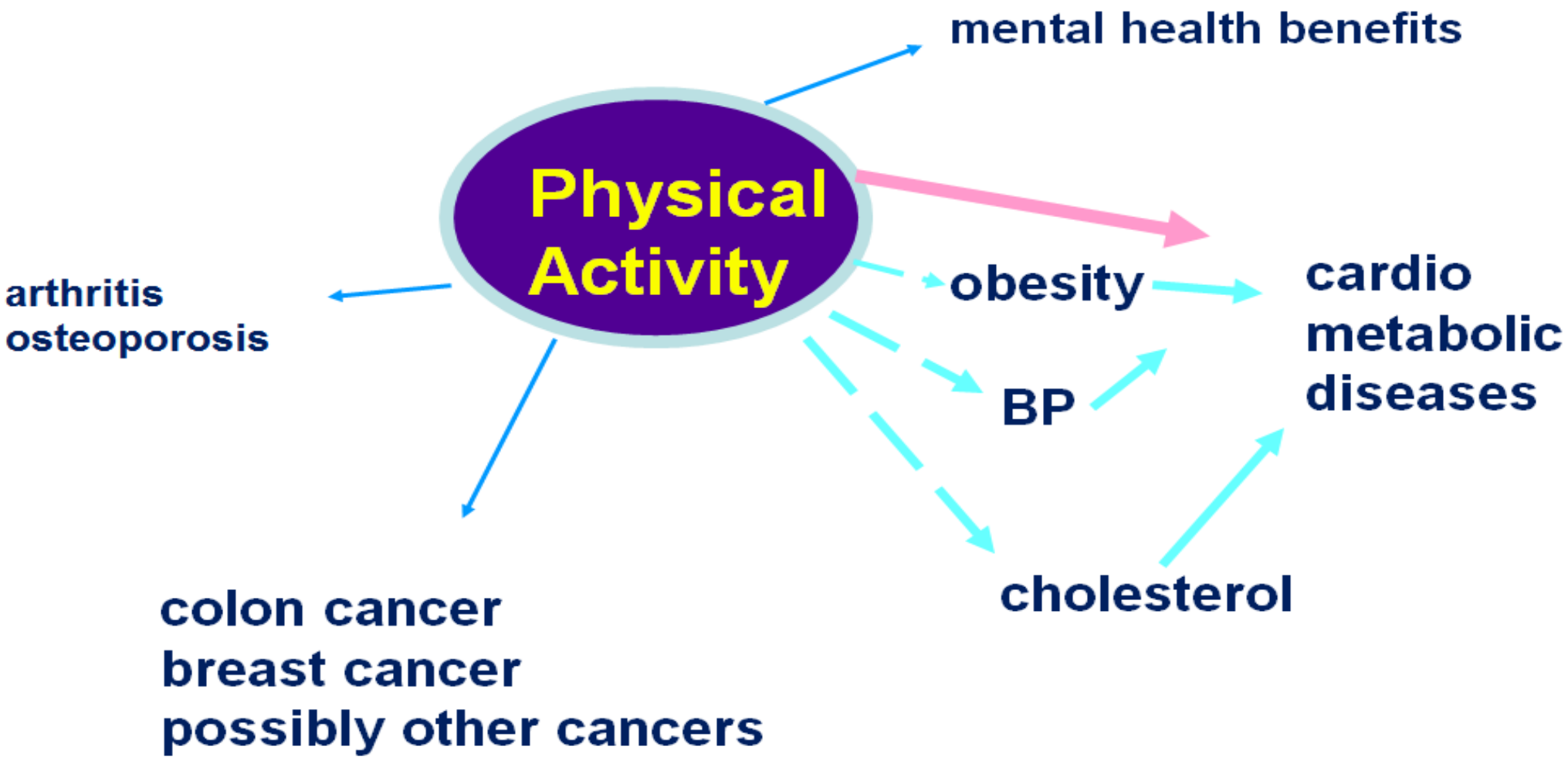
Dose–response relation between physical activity and sick leave

K I Proper, S G van den Heuvel, E M De Vroome, V H Hildebrandt, A J Van der Beek

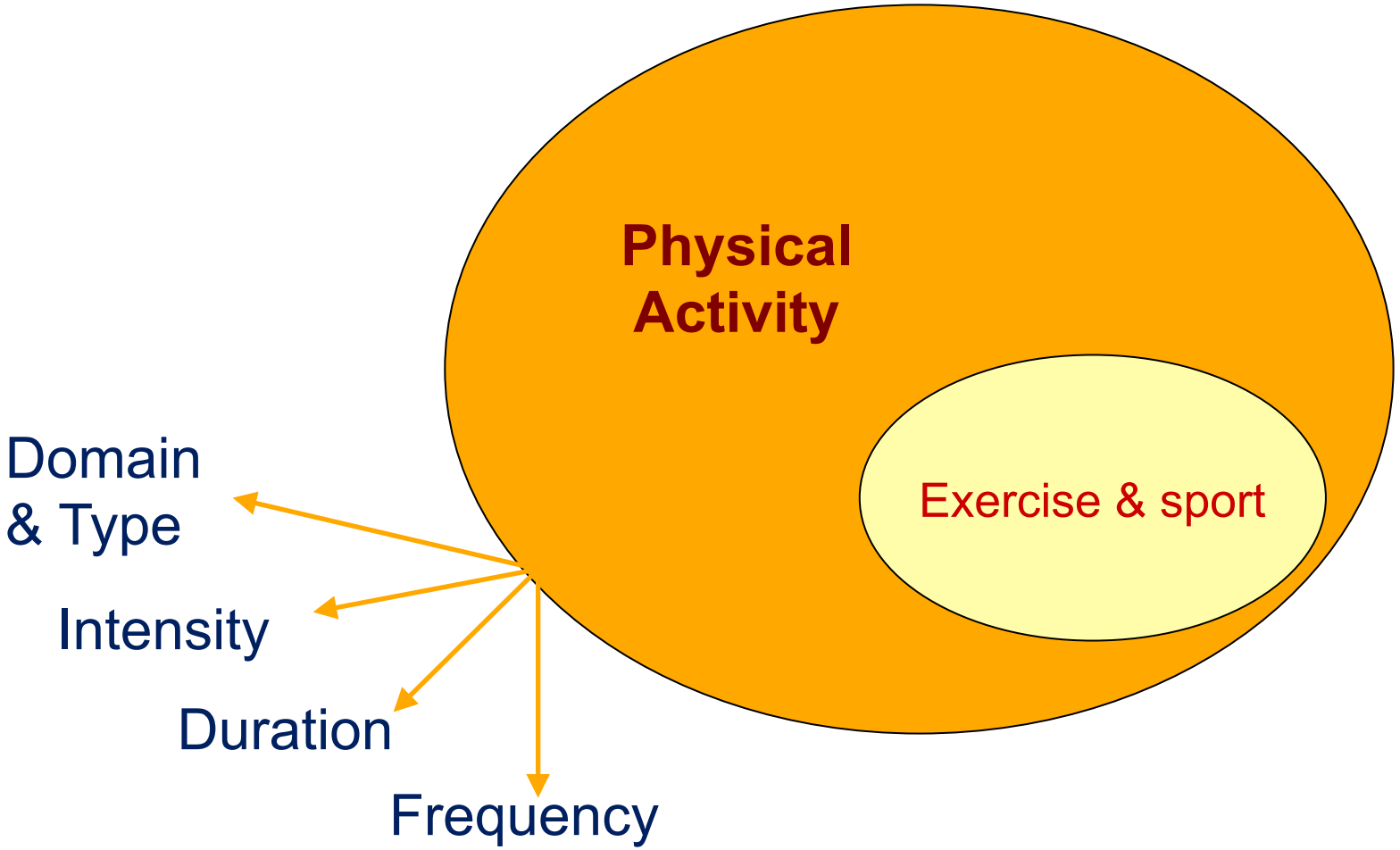
- 3 large Dutch databases:
  - 2 continuous + 1 cross-sectional
  - surveys
  - representative samples Dutch population
- Physical activity: duration, frequency and intensity
- Outcome measure: number of days of sick leave
- Results
  - No relation between moderate PA & sick leave
  - Workers meeting recommendation of vigorous PA (3 ≥ times/ week): significantly less sick leave
- Conclusion: vigorous PA for at least 3x/week has an inverse relationship with sick leave


mean sick leave by frequency of vigorous PA
mean sick leave (in days)
3
2,5
2
1,5
1
0,5
0
0
1
2
3
4
frequency (in x per week)
OBiN
POLS

Health benefits of physical activity



Dimensions of physical activity



Intensity

Everything we do when awake:

Sedentary (≤1.5 MET)

Light (>1.5 and <3 MET)

Moderate activities (≥ 3 and <6 MET)

Vigorous activities (≥ 6 MET)

} Total energy expenditure

Intensity

Sedentary (≤1.5 MET)

Light (>1.5 and <3 MET)

Moderate activities (≥ 3 and <6 MET)

Vigorous activities (≥ 6 MET)

} Health enhancing physical activity

US bureau of labour statistics

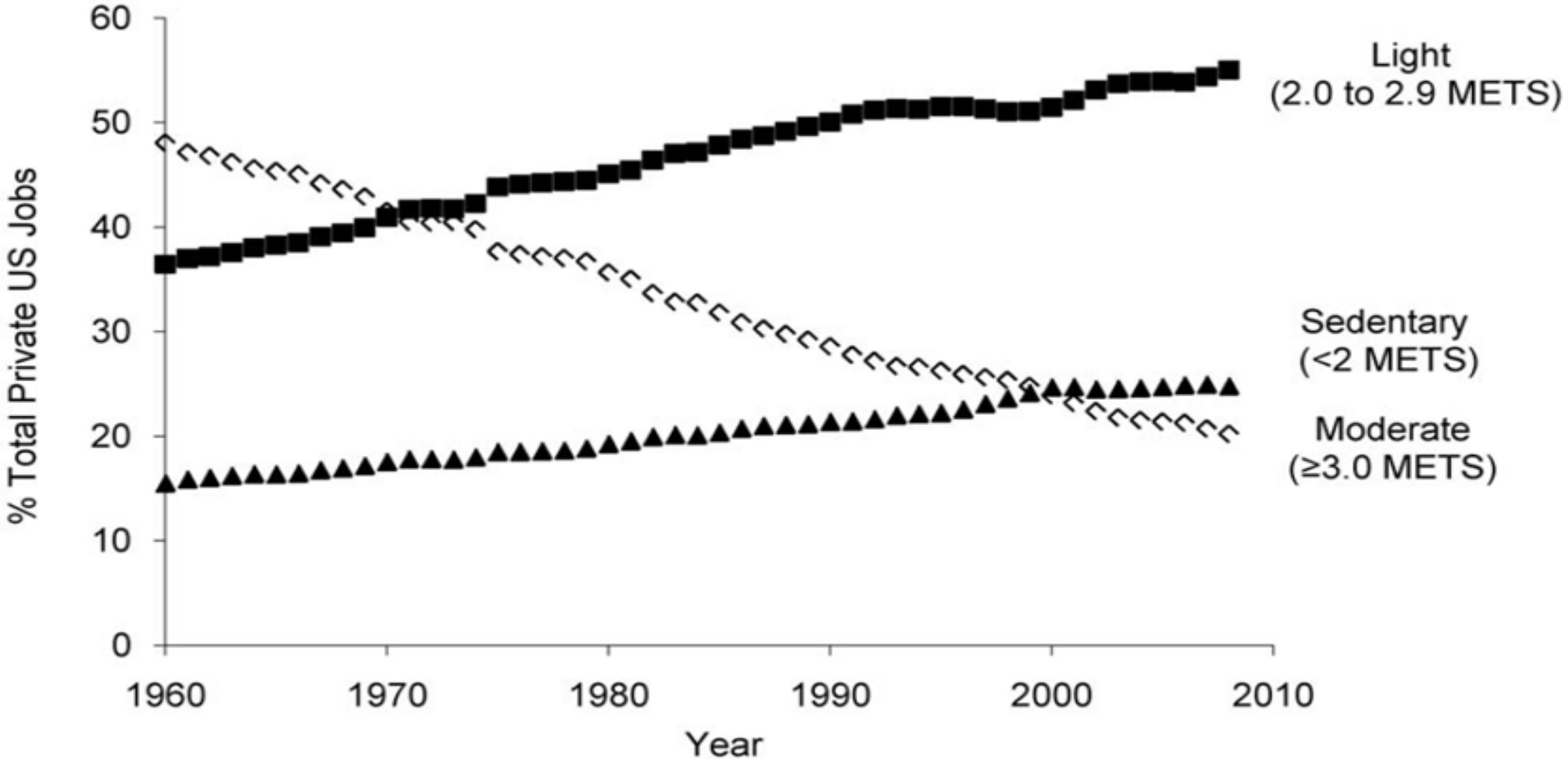
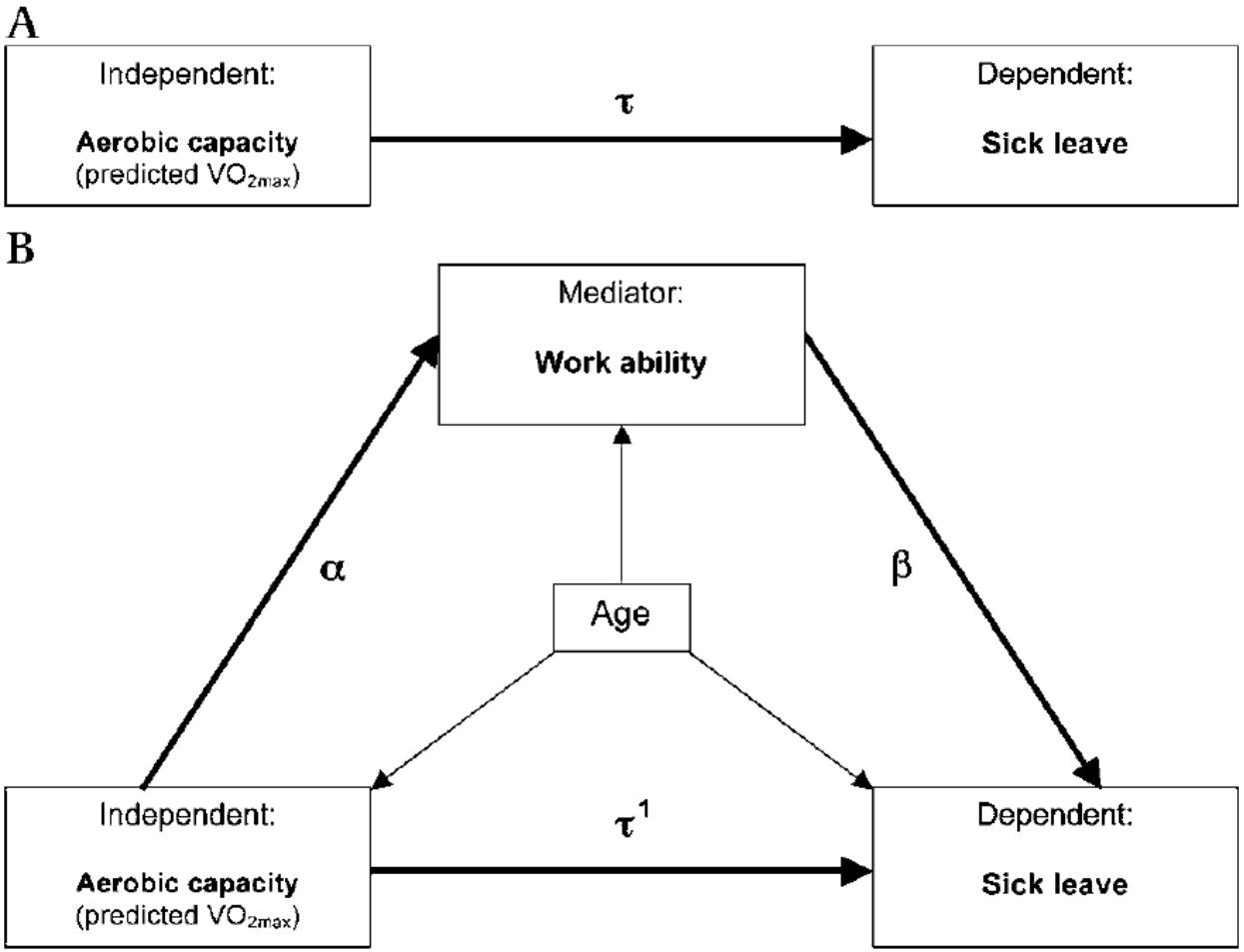


Figure 2. Trends in the prevalence of sedentary, light and moderate intensity occupations from 1960 to
doi:10.1371/journal.pone.0019657.g002

The role of work ability in the relationship between aerobic capacity and sick leave: a mediation analysis

Jorien E Strijk,[1] Karin I Proper,[1,2] Maartje M van Stralen,[1] Peter Wijngaard,[3] Willem van Mechelen,[1,2] Allard J van der Beek[1,2]



Occup Environ Med 2011;**68**:753–758. doi:10.1136/oem.2010.057646

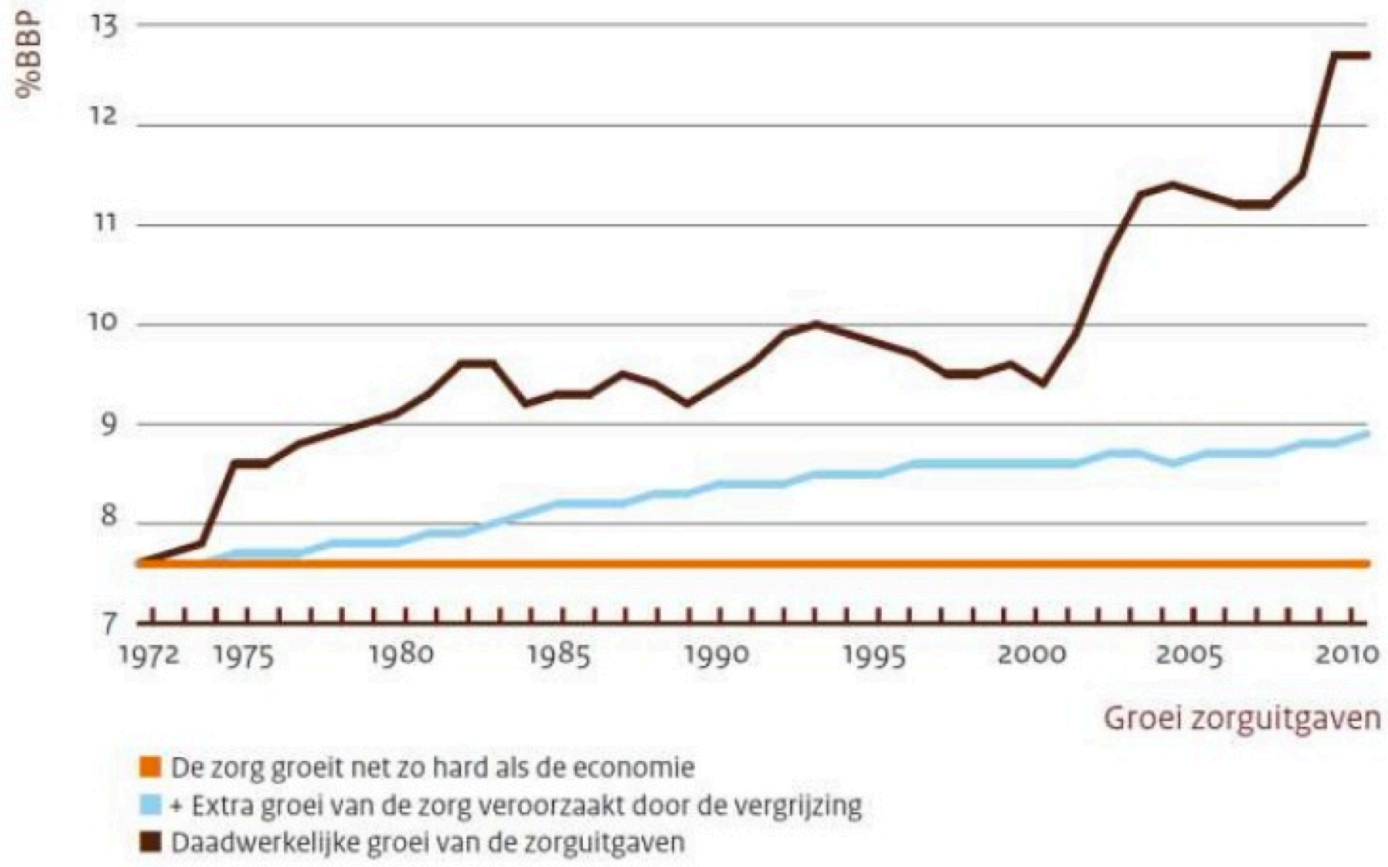
- fit workers have better work ability
- fit workers & workers with higher work ability are at lower risk sick leave
- work ability mediated 27.8% of the total effect of aerobic capacity on sick leave
- interventions (i. e. vigorous physical activity) to improve aerobic capacity could be effective for promoting work ability &reducing sick leave

directe & indirecte kosten

Growth Health Care Expenditure NL - 2010

- 87,6 Euro billion/year
- Growth 2007-2010: 5,3%/year
- 3 main reasons:
  - **Aging** **15%**
  - **Price increases (market)** **35%**
  - **Increase patient load/technology** **50%**

Groei zorguitgaven



Wat is de oorzaak

Energy intake of 140 kcal/ week

Glass of beer

Some peanuts

Croissant

Chocolate cookie

Energy expenditure

= 21 min

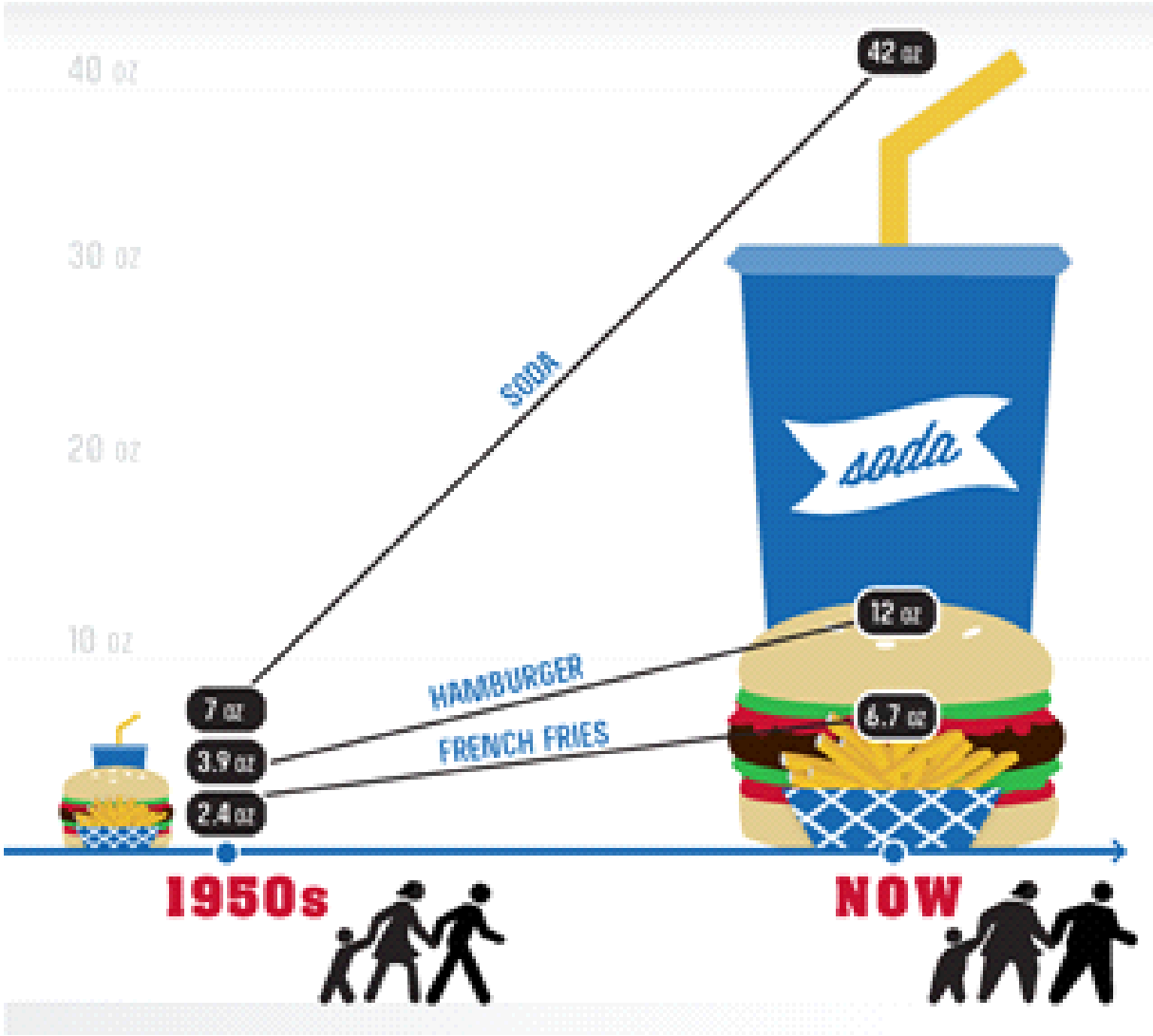
= 14 min

= 19 min

= 35 min

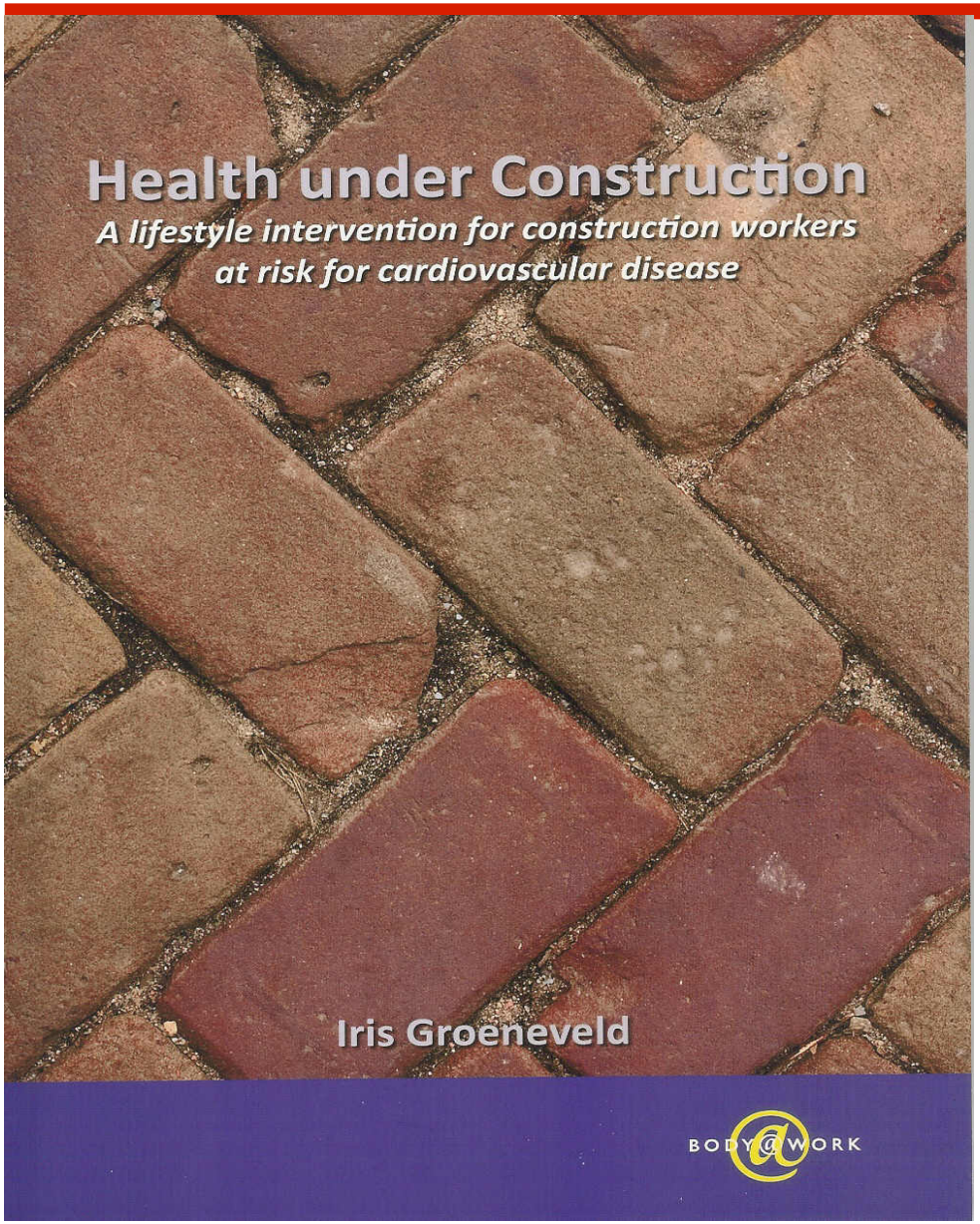
THE NEW (AB)NORMAL

Portion sizes have been growing. So have we. The average restaurant meal today is more than four times larger than in the 1950s. And adults are, on average, 26 pounds heavier. If we want to eat healthy, there are things we can do for ourselves and our community. Order the smaller meals on the menu, split a meal with a friend, or, eat half and take the rest home. We can also ask the managers at our favorite restaurants to offer smaller meals.



What to do

2 examples


Health under Construction
A lifestyle intervention for construction workers at risk for cardiovascular disease
Iris Groeneveld
BODY@WORK


Jorien Strijk
The (cost-) effectiveness of a lifestyle intervention in order to improve older workers' vitality
THE VITAL AT WORK STUDY

Jorien Strijk

The (cost-) effectiveness of a lifestyle intervention in order to improve older workers' vitality

THE VITAL AT WORK STUDY

Vital@Work study

Aim

a lifestyle intervention in order to improve older workers vitality

- RCT
- N=730 workers at baseline
- Older workers: aged 45 years and over

Strijk et al., BMC public health 2009 Nov 10;9:408

Vitality Exercise Programme (VEP)

Mental: Guided Yoga sessions (45 minutes, 1 x p.w.)




Physical: Guided Workout session (45 minutes, 2 x p.w.)

1x p.w. guided by fitness instructor, 1x p.w. without face-to-face instruction




Personal Vitality Coach

- First 12 weeks of intervention
- Goal setting, feedback, problem solving
- 3 visits

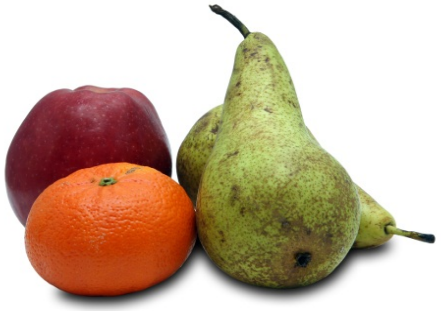
Fruit

- Free fruit was provided at the guided group sessions of the VEP
- To facilitate a healthy lifestyle!

lifestyle

Sports

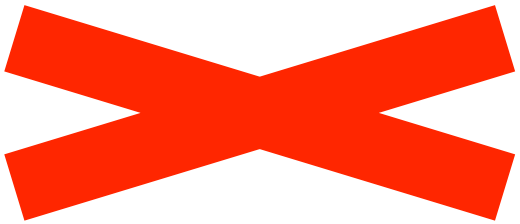
+ 40.4 min/week



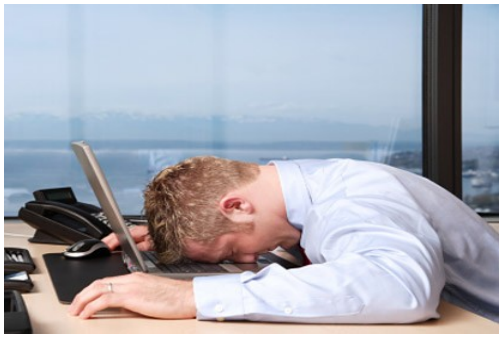
Fruit

+ 2.7 pieces/week

VPA



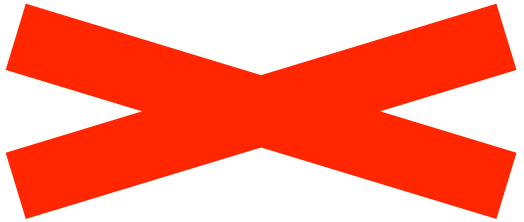
vitality



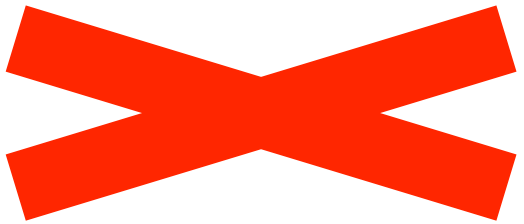
Need for recovery

-3.5 (-6.4 - -0.5)

Aerobic capacity



Mental health



Vital@Work: Economic evaluation

- **Intervention costs (2010 Euros)**

  € 149 / worker

- **Cost-benefit (2010 Euros)**

  € -478 per participant (Net loss)
  (The employer had a net loss of 478 euro as a result of the intervention)

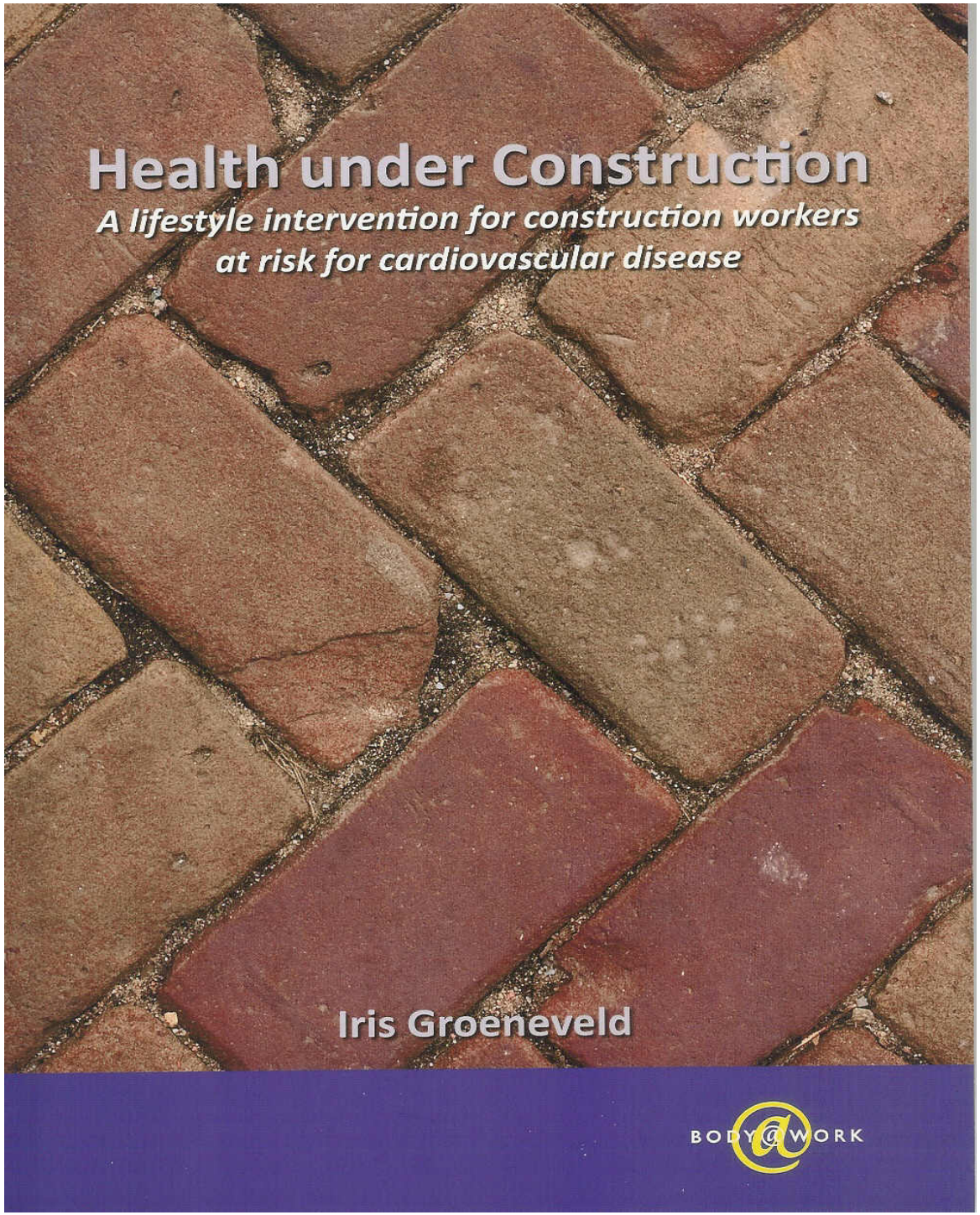
- **Cost-effectiveness (2010 Euros)**

  Vitality: €280 per 1-point increase in general vitality

Conclusion

- Sports
- Fruit
- Need for recovery

- VPA & aerobic capacity
- Mental Health
- Vitality & work engagement
- Productivity & sick leave
- Cost-effect


Health under Construction
A lifestyle intervention for construction workers at risk for cardiovascular disease
Iris Groeneveld
BODY@WORK

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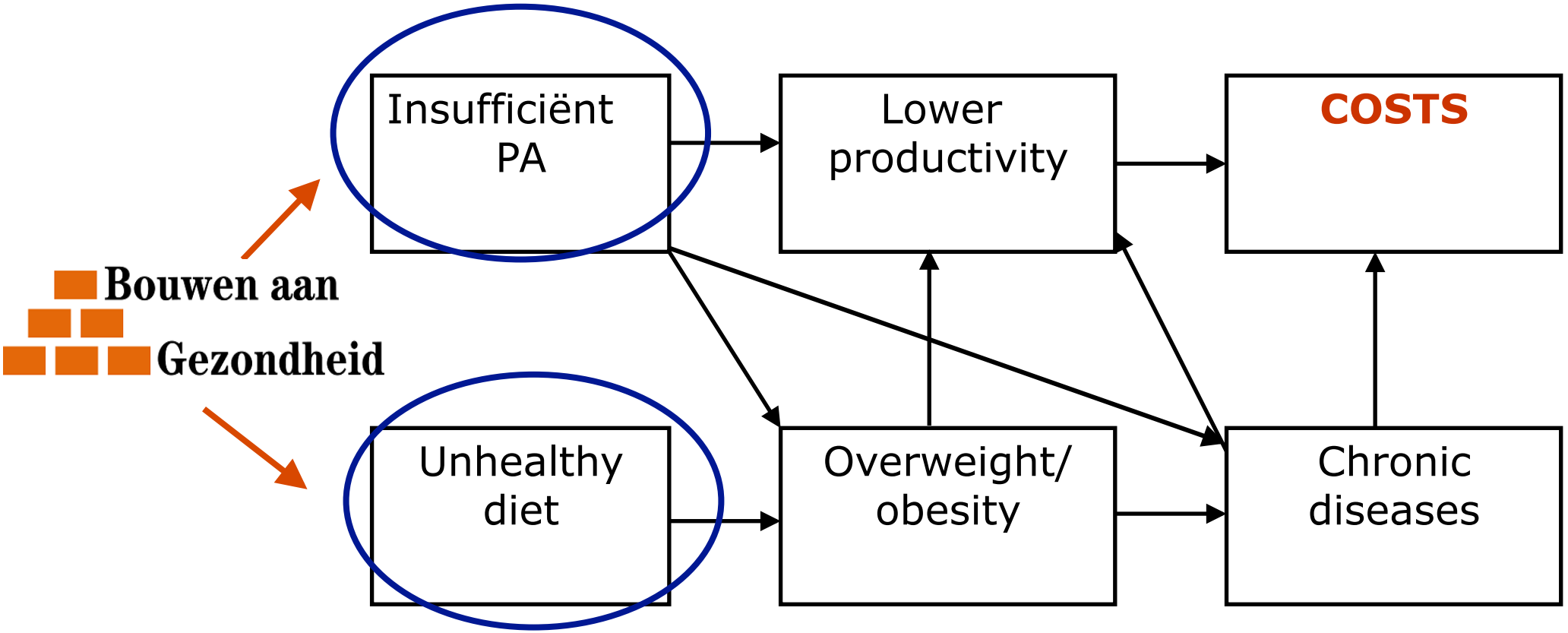
Lifestyle intervention

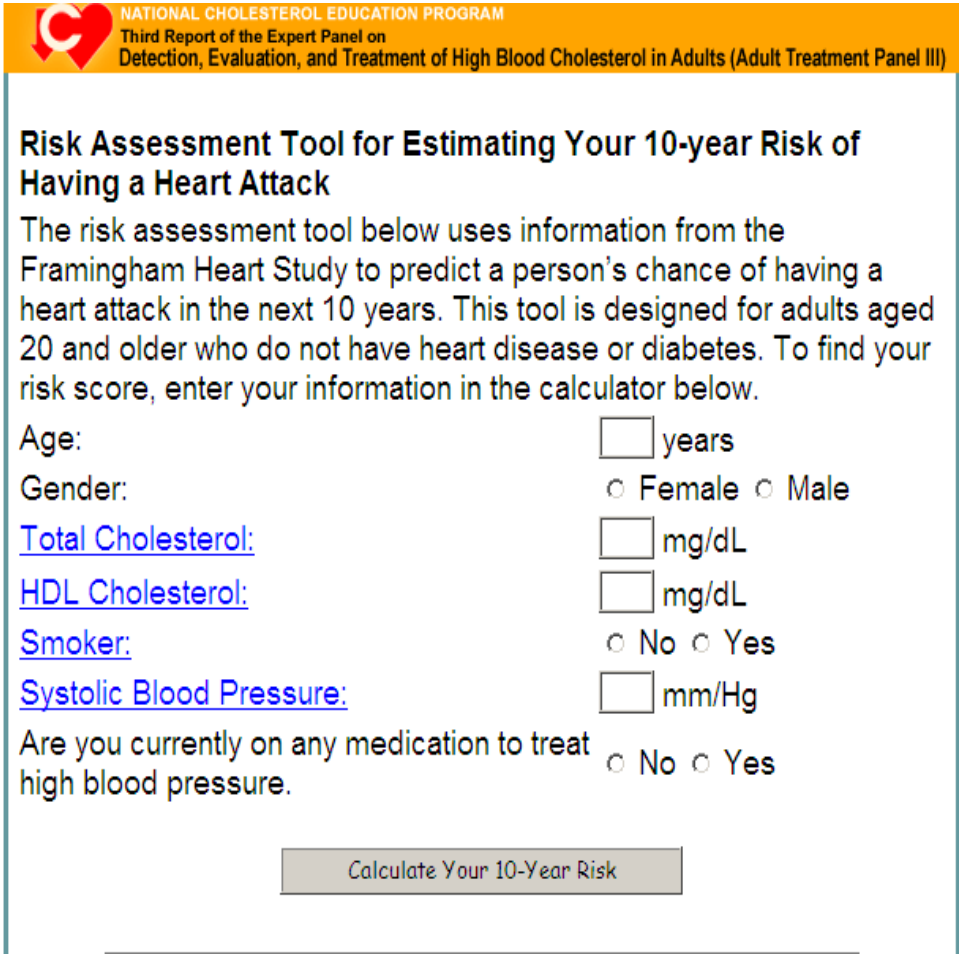


Health under Construction

- Design: Randomized controlled trial
- Participants: 573 male workers in the construction industry, aged 18-65, with an elevated risk of CVD
- Control: usual care
- Intervention:
  - Individual counseling, 7 sessions
  - in motivational interviewing style
  - by occupational physician or nurse
  - aimed at physical activity, diet and smoking
- Follow up: 6 and 12 months

Groeneveld IF et al., BMC Public Health 2008

Elevated CVD risk: 19,1 % population



NATIONAL CHOLESTEROL EDUCATION PROGRAM
Third Report of the Expert Panel on
Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)

Risk Assessment Tool for Estimating Your 10-year Risk of Having a Heart Attack

The risk assessment tool below uses information from the Framingham Heart Study to predict a person's chance of having a heart attack in the next 10 years. This tool is designed for adults aged 20 and older who do not have heart disease or diabetes. To find your risk score, enter your information in the calculator below.

Age: ☐ years

Gender: ○ Female ○ Male

Total Cholesterol: ☐ mg/dL

HDL Cholesterol: ☐ mg/dL

Smoker: ○ No ○ Yes

Systolic Blood Pressure: ☐ mm/Hg

Are you currently on any medication to treat high blood pressure. ○ No ○ Yes

Calculate Your 10-Year Risk

& one or more of the following:

- BMI>30
- HbA1c ≥ 6,5 %
- <150 min. Moderate PA/ week
- Heart complaints
- Psychological complaints
- Alcohol intake > 35 U/week

Results - Behavior

- **Significant effect on snack intake at 6 & 12 months**
- **Significant effect on fruit intake at 6 months**
- **Significant effect on smoking at 6 months**

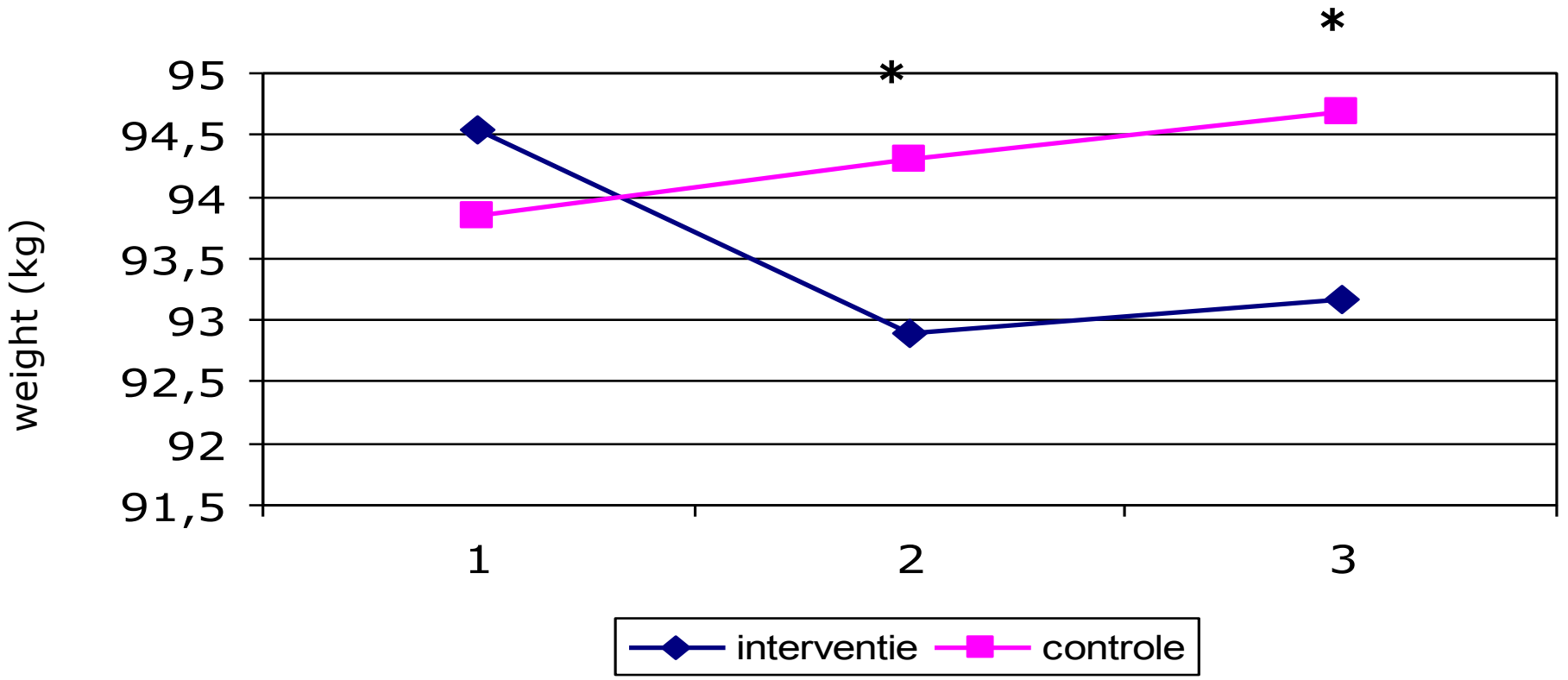
- **Positive trend, but no significant effects on physical activity**

Results

Variable	T0	T1-T0	T2-T0
Weight (kg)			
Intervention	94.5	-1.6*	-1.3*
Control	93.8	+0.5	+0.9
Systolic RR (mmHg)			
Intervention	143.7	-5.5	-5.3
Control	142.9	-3.8	-5.2
Diastolic RR (mmHg)			
Intervention	90.1	-4.1	-3.8
Control	89.9	-2.8	-3.7
HDL cholesterol (mmol/l)			
Intervention	1.11	+0.10	+0.09*
Control	1.11	+0.08	+0.04
Cholesterol ratio			
Intervention	5.86	-0.45	-0.35
Control	5.86	-0.35	-0.17

Groeneveld IF et al. Preventive Medicine 2010; 51:240-246

Effects on BW: 6 & 12 months



Results: costs and effects

Effect body weight loss 2 kg (β-2.0 ,95% CI -3.0; -1.1)

Costs:	Intervention group (n=293)	Control group (n=280)	Mean difference
Intervention	605	0	605
Other health care	210	278	-68
Personal expenses	398	344	53
Absenteeism	4,038	4,825	-786

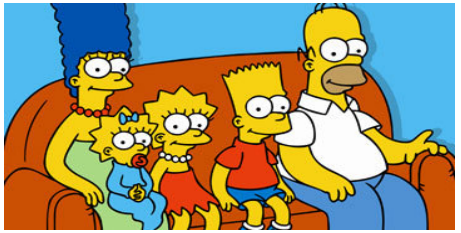
Cost-benefit: €254 (95%CI -1,070; 1,536)

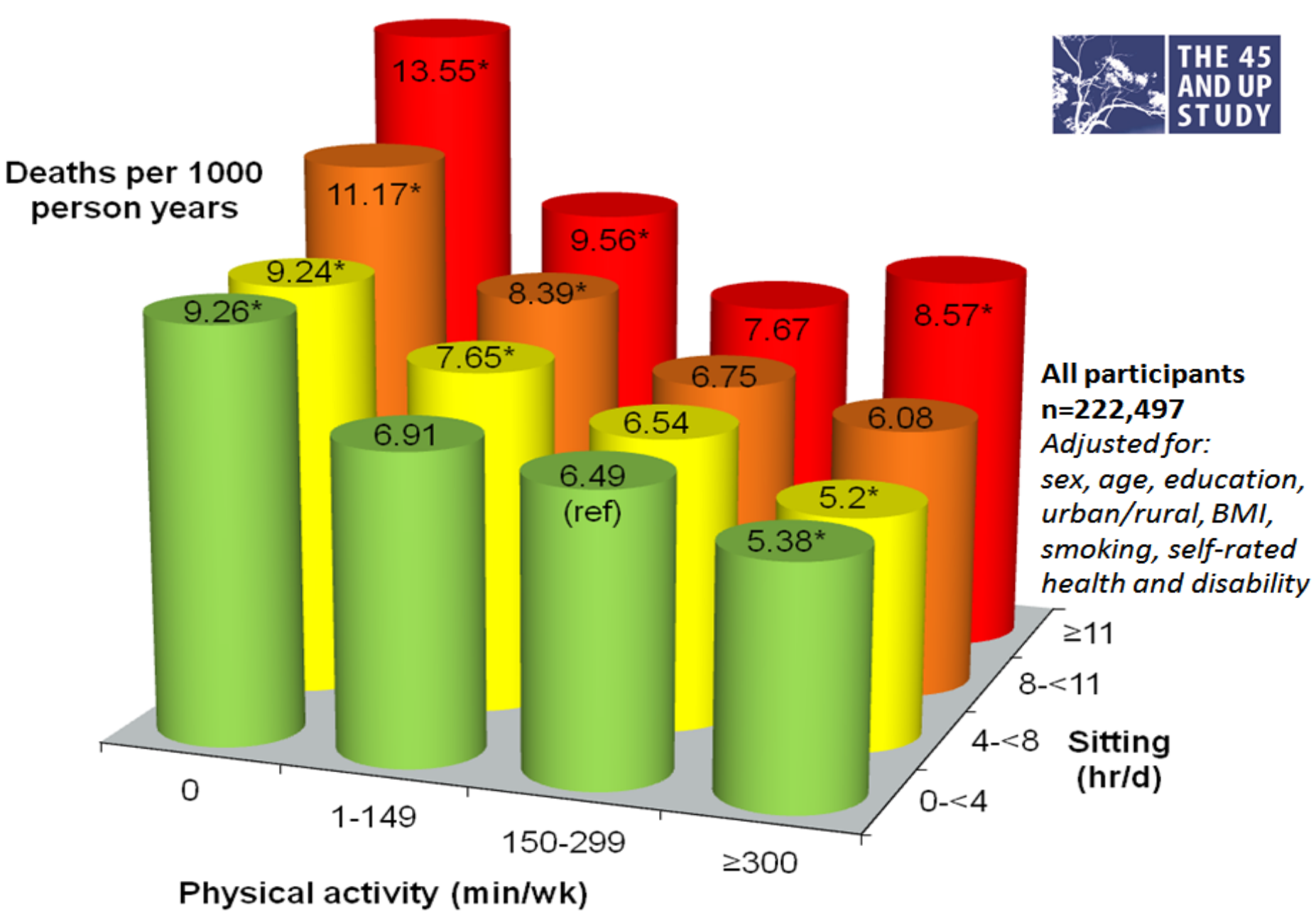
Employer paid €254 per employee

Food for thought

An Active Day? In the life of Homer Simpson

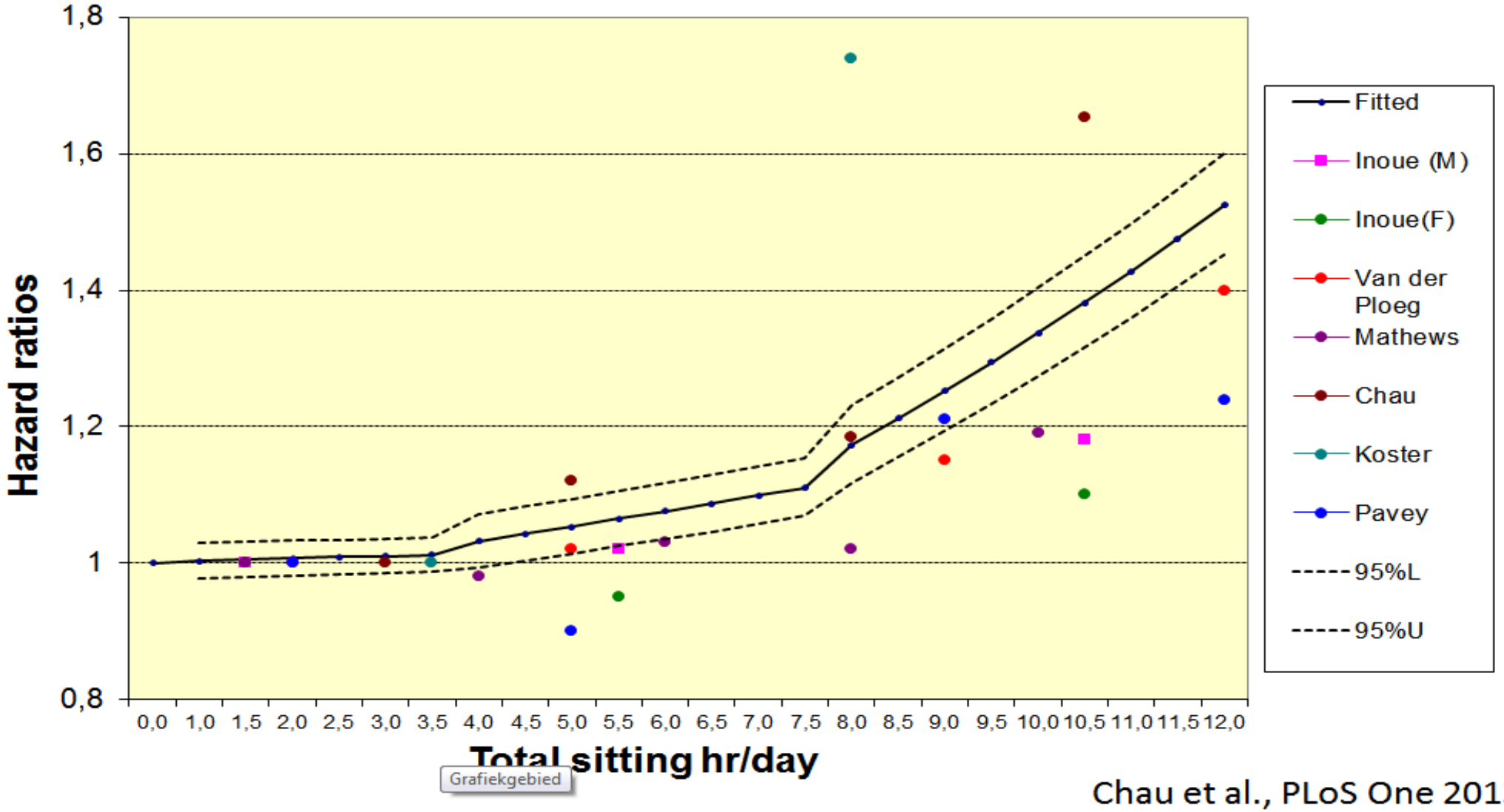
YES





van der Ploeg et al., Arch Intern Med 2012

Total sitting & mortality



Chau et al., PLoS One 2013

Do occupational physical activity (OPA) and leisure time physical activity (LTPA) have similar health effects?

The evidence from recent prospective cohort studies

Overview recent studies on OPA - mortality

1st author	journal	year	HR/RR	(95% CI)
Holtermann	*Scand J Work Env Hlth*	*2010*	**1.33**	(1.18-1.51)
Holtermann	*BMJ Open*	*2012*	**1.22***	(1.05-1.41)
Petersen	*BMC Publ Hlth*	*2012*	**1.02#**	(0.75-1.39)
Clays	*Eur J Epidemiol*	*2013*	**1.28**	(0.68-2.44)
Moe	*Occup Environ Med*	*2013*	**1.46***	(1.10-1.93)
Clays	*Am J Epidemiol*	*2014*	**1.21**	(0.74-1.97)
Hu	*A-P J Publ Hlth*	*2014*	**1.53**	(1.06-2.22)
Hariri	*Occup Environ Med*	*2015*	**1.42**	(1.16-1.74)
Richard	*J Phys Act Hlth*	*2015*	**1.25**	(0.85-1.84)

All fully adjusted models

(incl. many confounders)

** only from subgroup analysis*

 # adjusted for heavy lifting?!

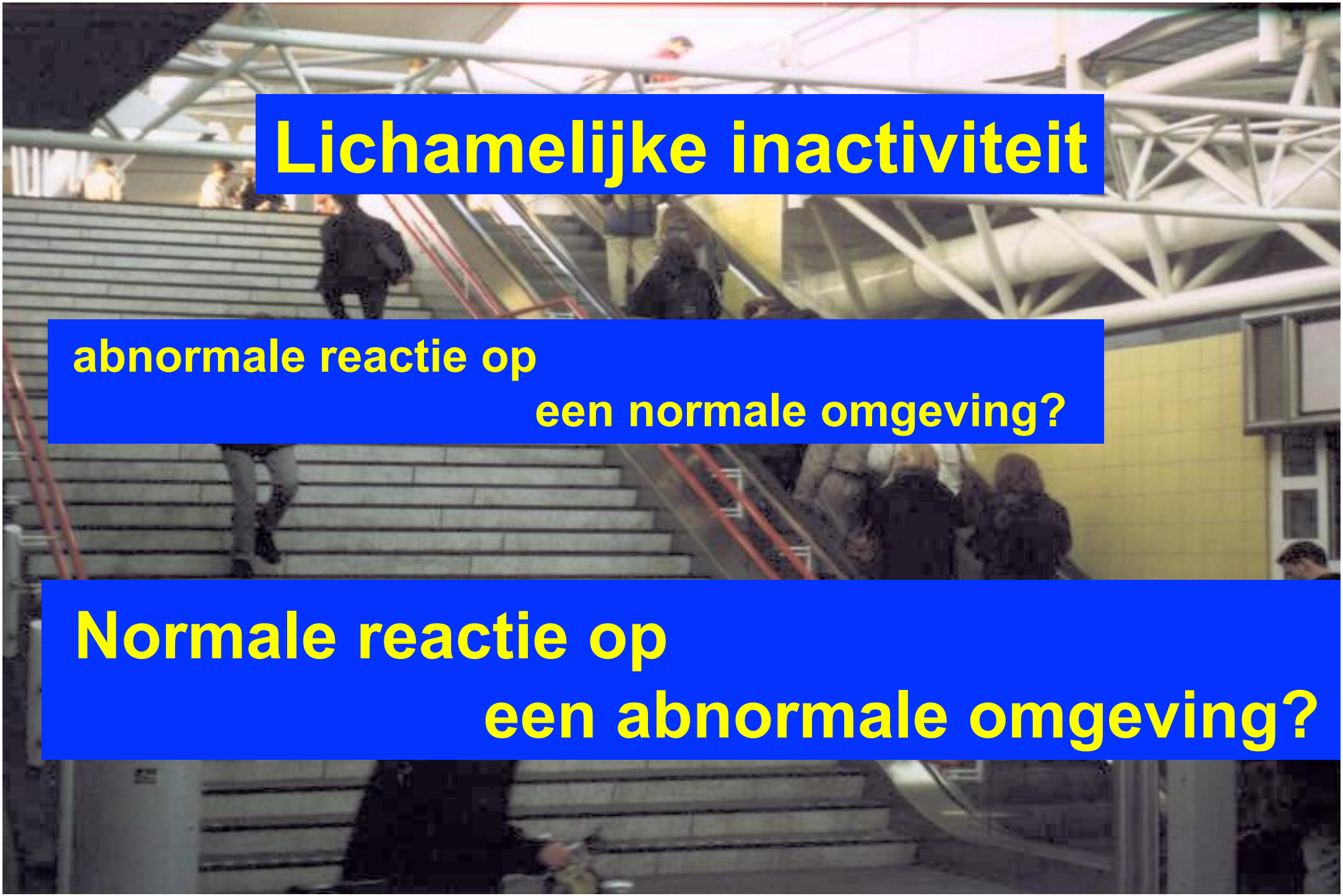
Physical activity at work and leisure

Work

- Low intensity
- Long duration (hours)
- 4/5 days per week
- Limited influence on periods of rest, intensity, duration, type, variation
- Often involving smaller muscle groups
- Often static and/or repetitive activities

Leisure

- Moderate / high intensity
- Shorter duration
- Mostly less days per week
- High influence on periods of rest, intensity, duration, type, variation
- Often involving larger muscle groups
- Often dynamic and varying activities


Lichamelijke inactiviteit
abnormale reactie op
een normale omgeving?
Normale reactie op
een abnormale omgeving?

Er is één en ander veranderd …….

‘Stone-age’ (Palaeolithic) genen
in ‘space-age’ (‘de-vitalised’) omstandigheden

society has changed also……..

The solution lies in self-regulation…….

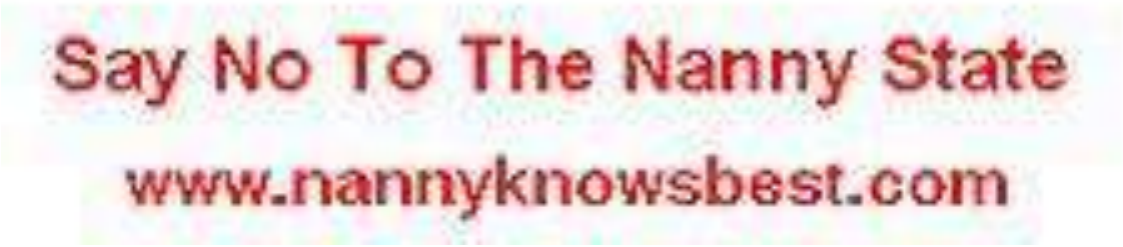
"My question is: Are we making an impact?"

Social Ecological Model of Physical Activity

Organizational PA
policies

(Adapted from Davison & Birch 2001)

Nanny State?



What if we do nothing?

Who is responsible?

Who is responsible?

- **driver/employee?**

- **manufacturer?**
- **traffic system?**
- **urban planner?**
- **alcohol retailer?**

- **employer?**
- **……..?**