

ESC Congress 3-7 Sept 2005- Stockholm



Changing patterns and
consequences of
obesity in children and
adults in Europe.

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Barcelona*

Obesity

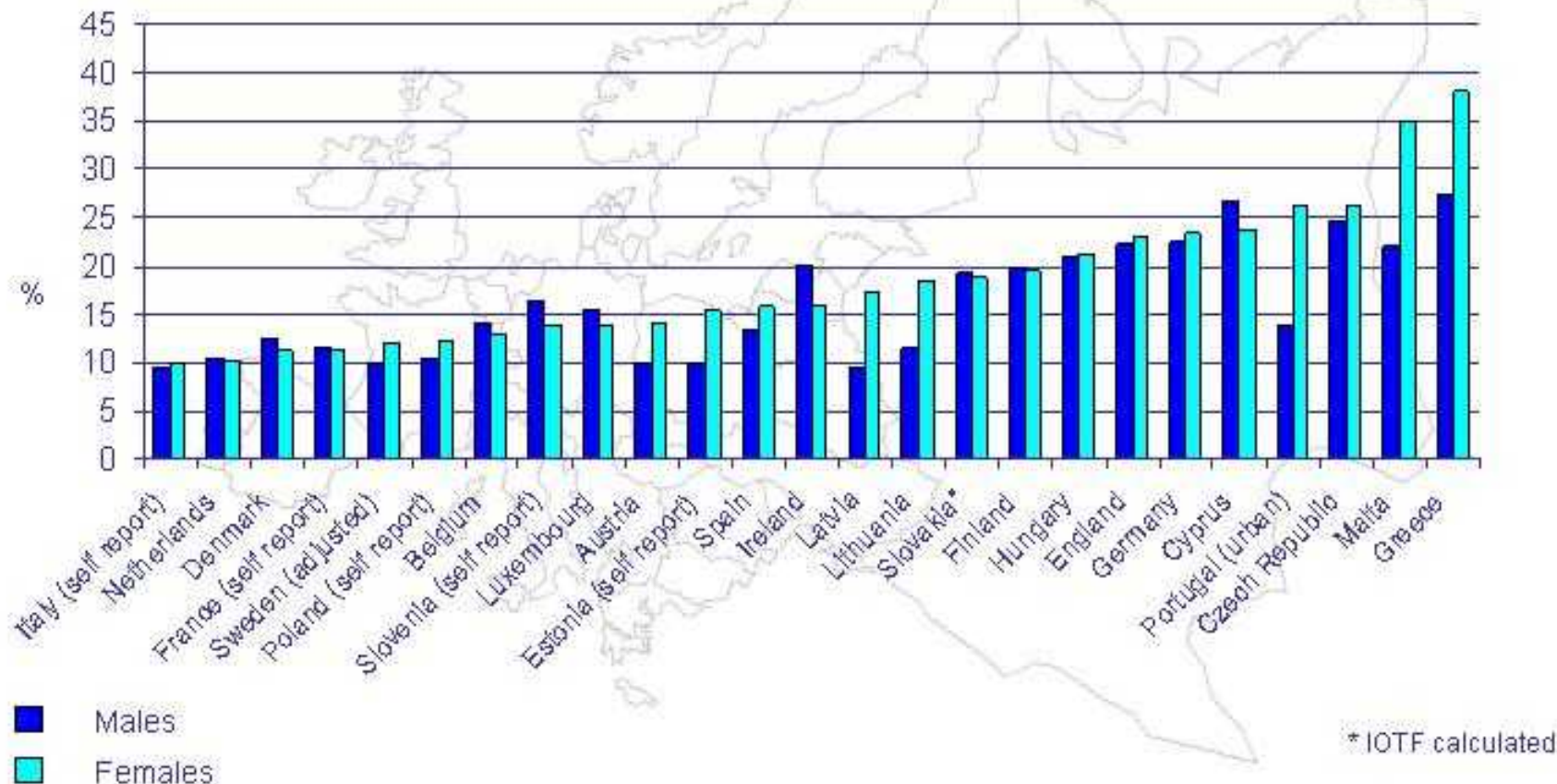
From the Latin *obesus*:

one who has

become plump through eating

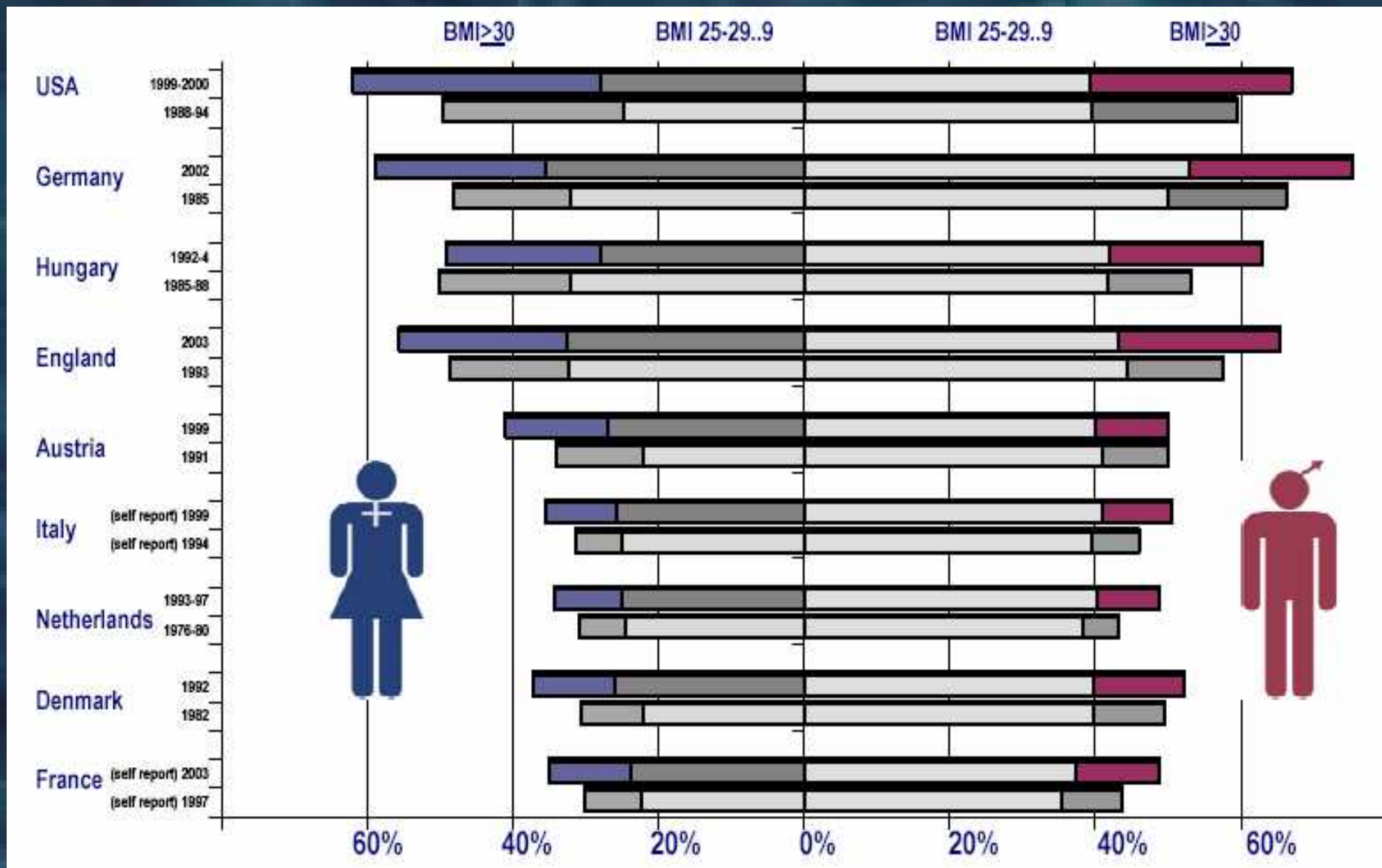
Barnett R. Lancet 2005; 366:204

Obesity in European Adults (BMI ≥ 30)



Age range and year of data in surveys may differ. With the limited data available, prevalences are not age standardised. Self reported surveys may underestimate true prevalence. © International Association for the Study of Obesity

Changes in prevalence of overweight and obesity in selected countries



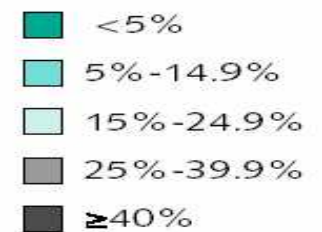
Estimated prevalence of obesity, ages 15 and above. 2002



MEN

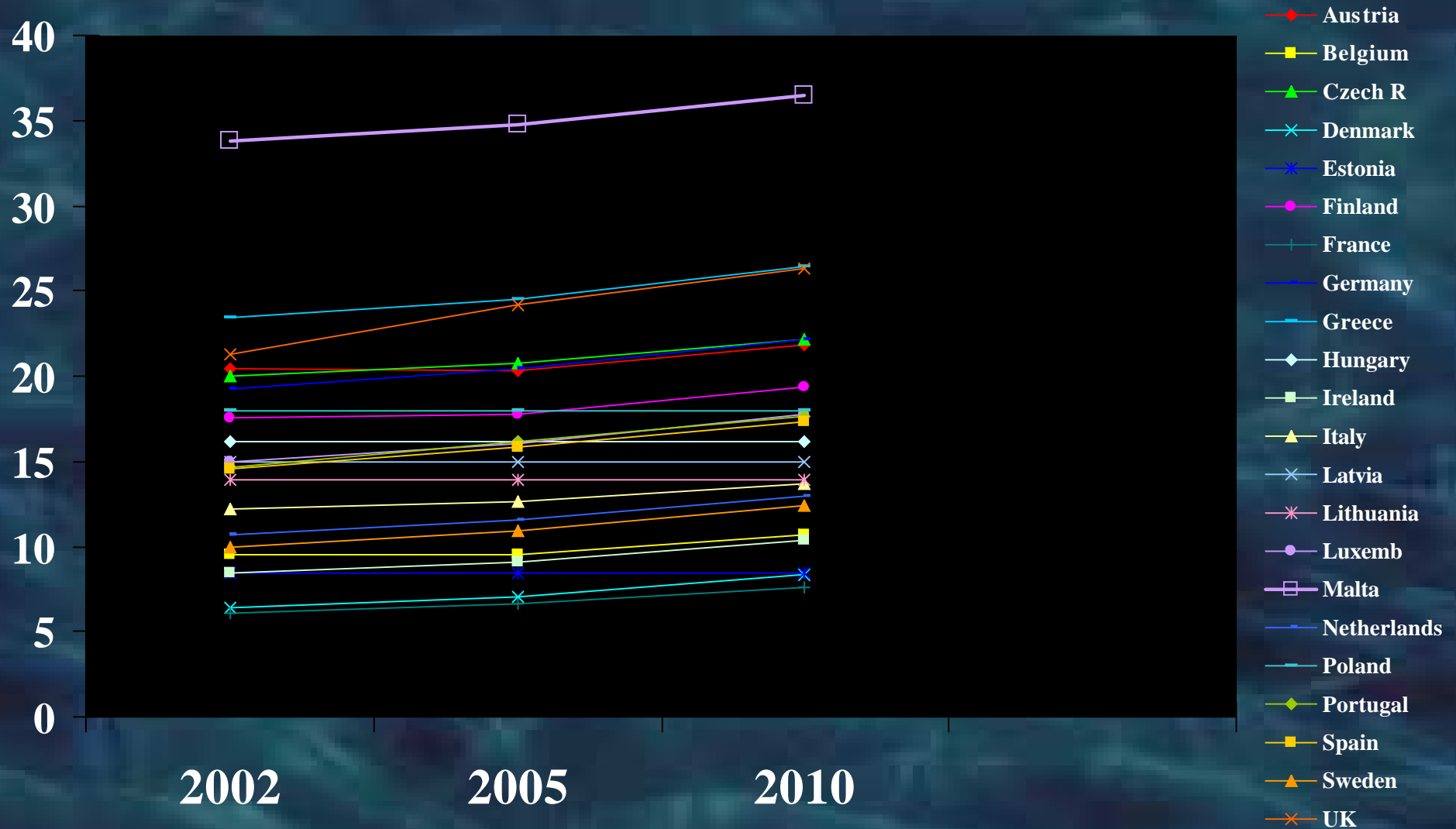


WOMEN

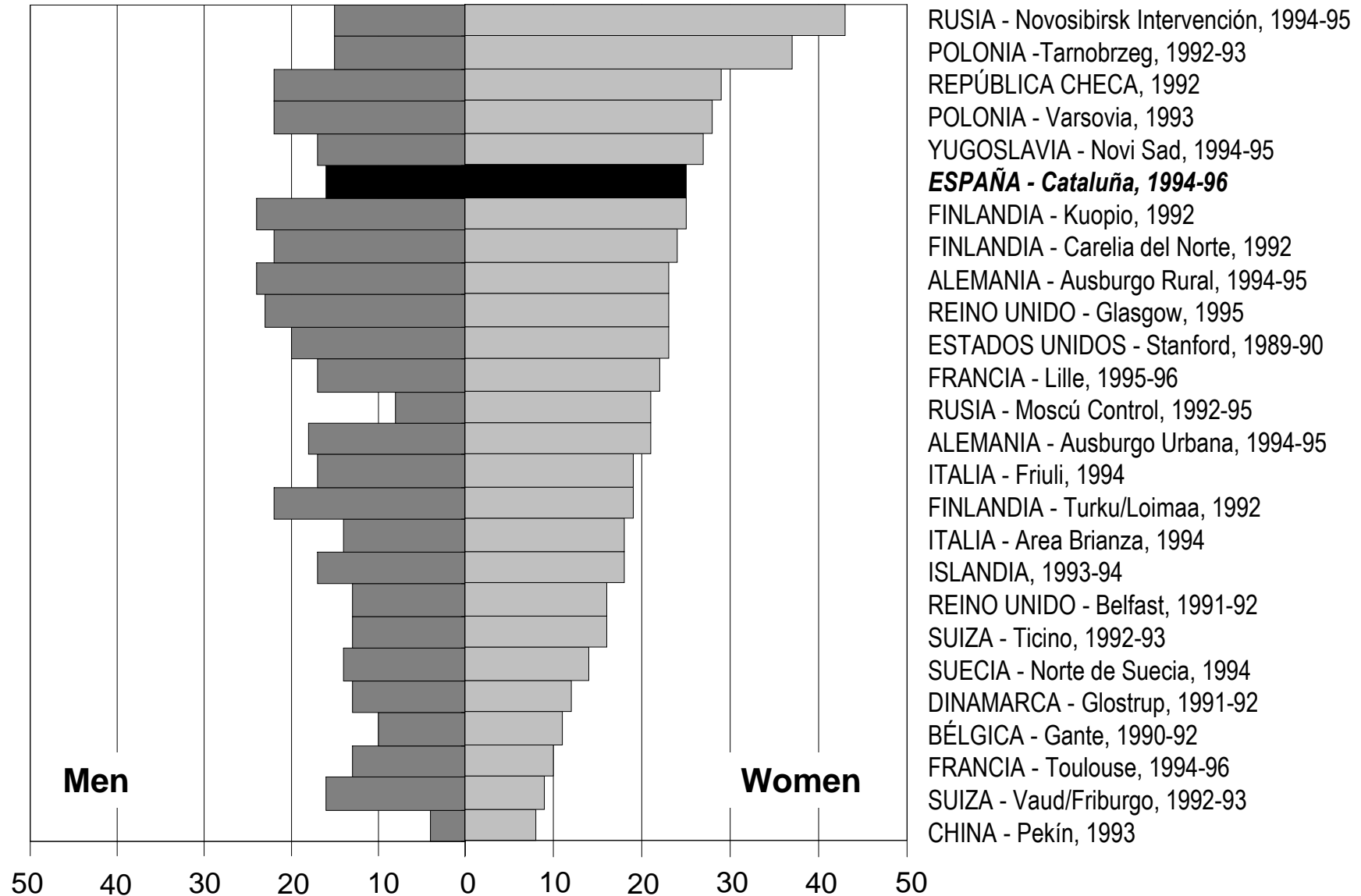


WHO infobase

Prevalence of obesity estimates and projections. Women aged 15 and above



Prevalence of obesity (BMI ≥ 30 kg/m²) in the third MONICA surveys. 35-64 years. Mid nineties.



Men

Women

50 40 30 20 10 0 10 20 30 40 50

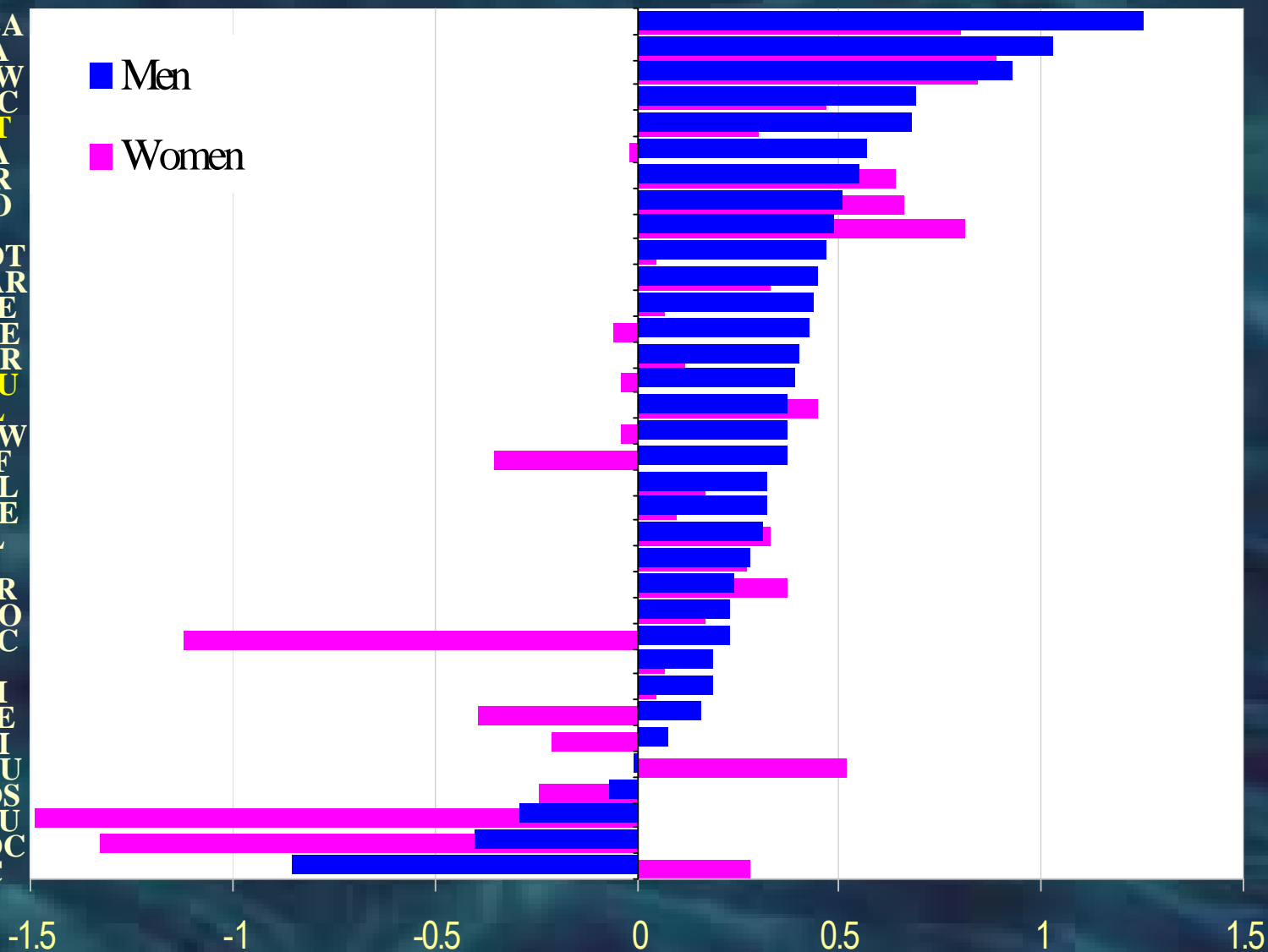
Molarius A et al.

Am J Public Health 2001; 91: 1261

Average annual trends in prevalence of obesity (BMI \geq 30 Kg/m²)

UNK-GLA
 USA-STA
 AUS-NEW
 NEZ-AUC
 SPA-CAT
 FIN-NKA
 AUS-PER
 FIN-KUO
 ICE-ICE
 SWE-GOT
 POL-WAR
 BEL-CHE
 GER-EGE
 GER-AUR
 FRA-TOU
 FRA-LIL
 SWE-NSW
 SWI-VAF
 UNK-BEL
 GER-BRE
 FIN-TUL
 ITA-BRI
 POL-TAR
 DEN-GLO
 RUS-NOC
 ITA-FRI
 RUS-NOI
 CZE-CZE
 CHN-BEI
 GER-AUU
 YUG-NOS
 LTU-KAU
 RUS-MOC
 SWI-TIC

■ Men
 ■ Women



Prevalence of obesity in the SENECA Study

% BMI \geq 30. Ages 70-75 yrs.

	Males	Females
Mainland Greece	29	48
Crete	8	22
FMP/Italy	43	56
V/Portugal	21	27
B/Spain	24	41

Obesity

- From the Latin *obesus*: one who has become plump through eating
- First appears in a medical context in Thomas Venner's *Via Recta* (1620). For Venner obesity was an occupational hazard of the *enteel* classes.

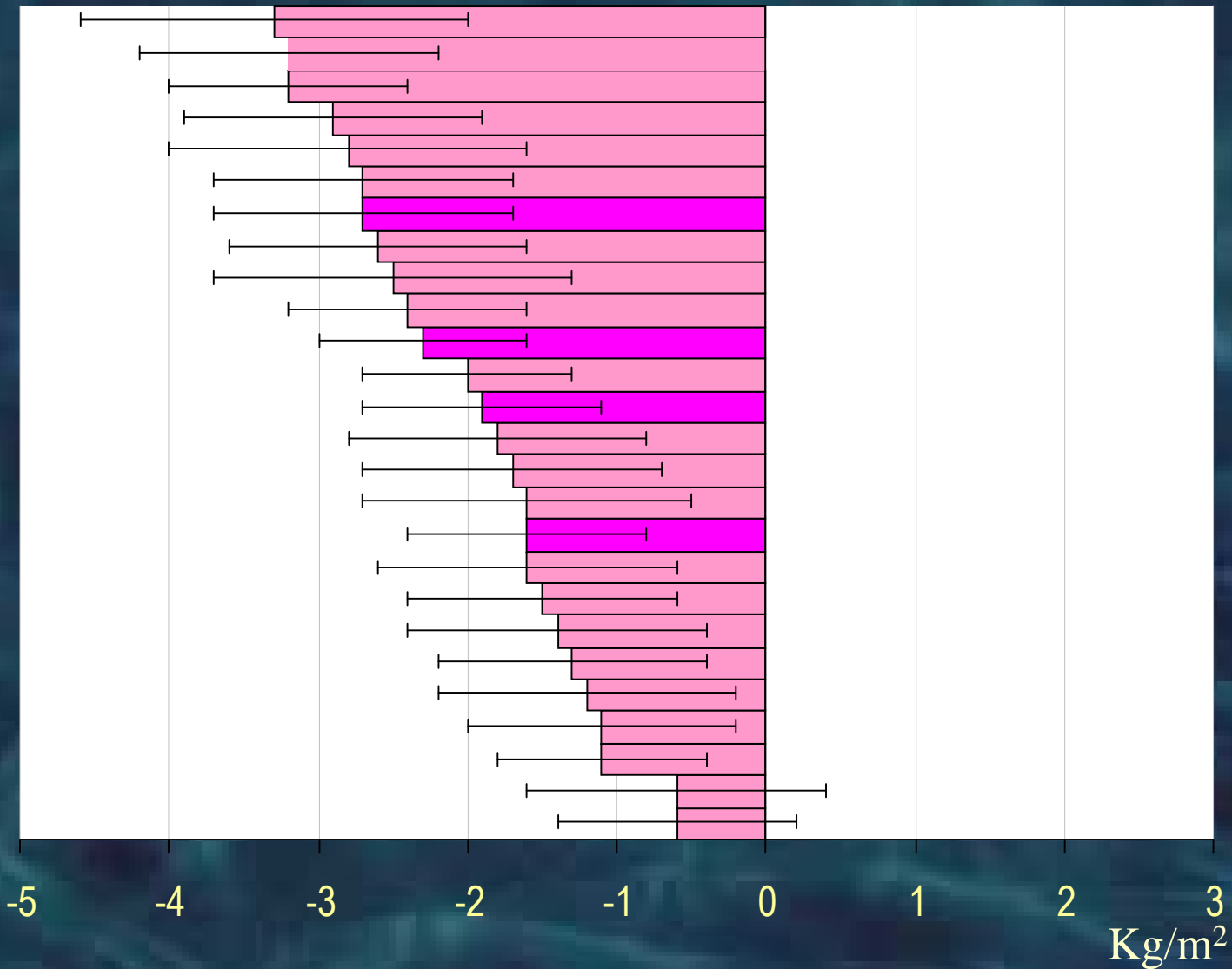
Barnett R. Lancet 2005; 366:204

Body weight is primarily regulated by a series of physiological processes but it is also influenced by societal and cognitive factors.



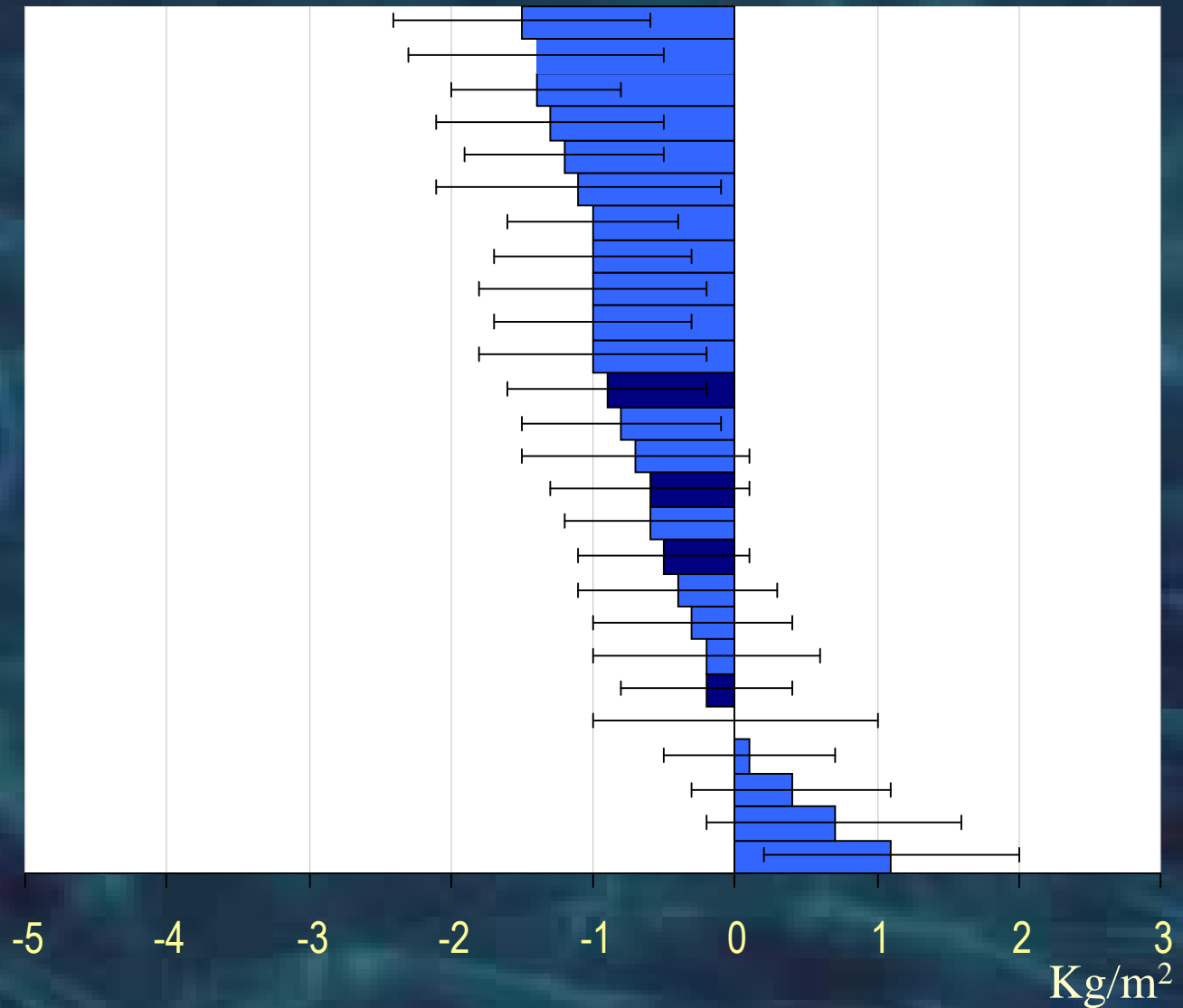
Differences in BMI between highest and lowest level of education. MONICA final surveys. Women

- USA-STA
- FRA-LIL
- SWI-TIC
- GER-AUU
- BEL-GHE
- FIN-NKA
- FRA-TOU**
- GER-AUR
- YUG-NOS
- CZE-CZE
- SPA-CAT**
- SWI-VAF
- ITA-BRI**
- RUS-NOI
- DEN-GLO
- RUS-MOC
- ITA-FRI**
- FIN-TUL
- ICE-ICE
- FIN-FUO
- UNK-BEL
- POL-TAR
- POL-WAR
- CHN-BEI
- UNK-GLA
- SWE-NSW



Differences in BMI between highest and lowest level of education. MONICA final surveys. Men

FIN-NKA
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 SWI-TIC
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 FIN-TUL
FRA-TOU
 ICE-ICE
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 POL-WAR
ITA-FRI
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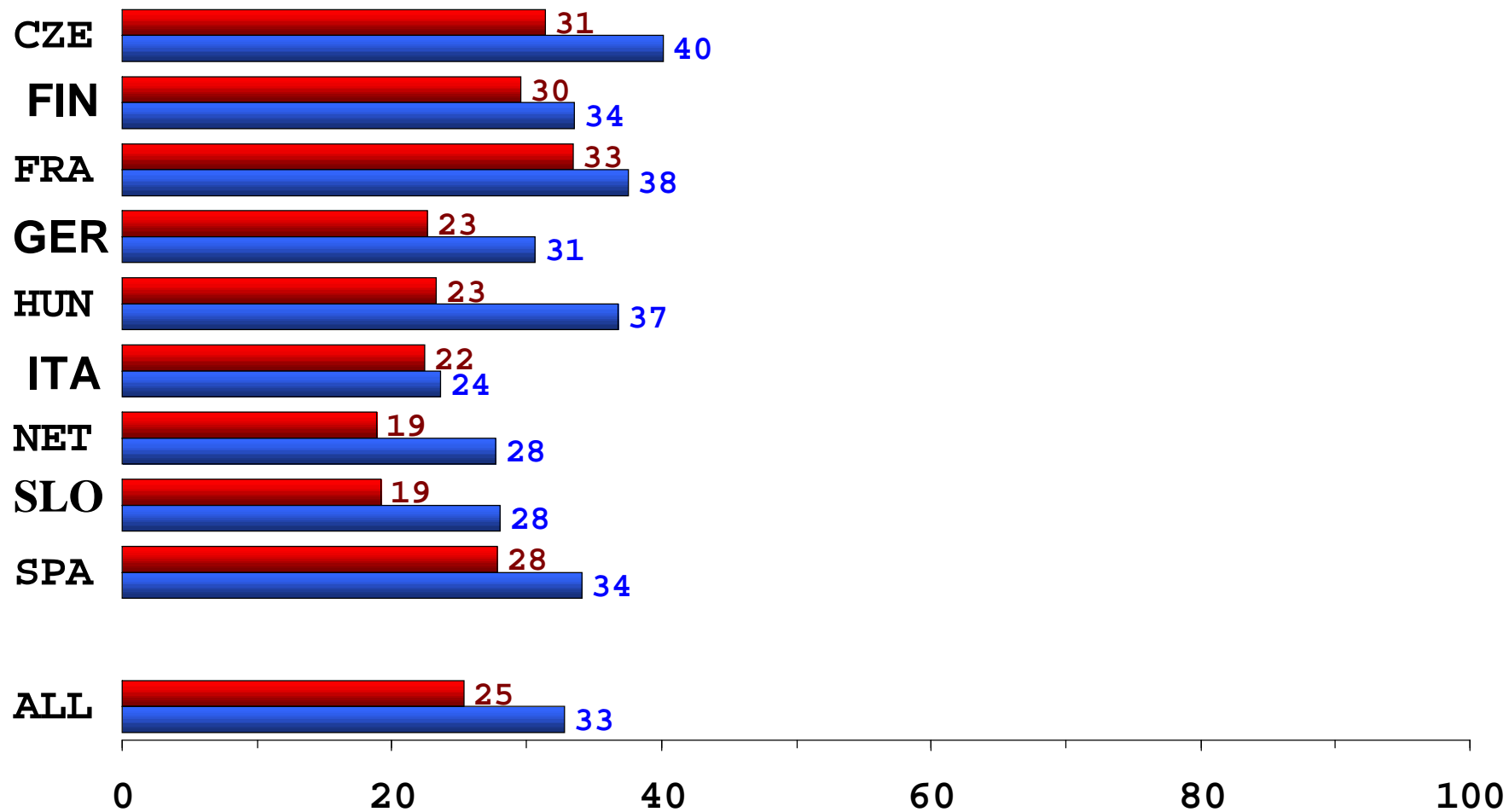


EUROASPIRE

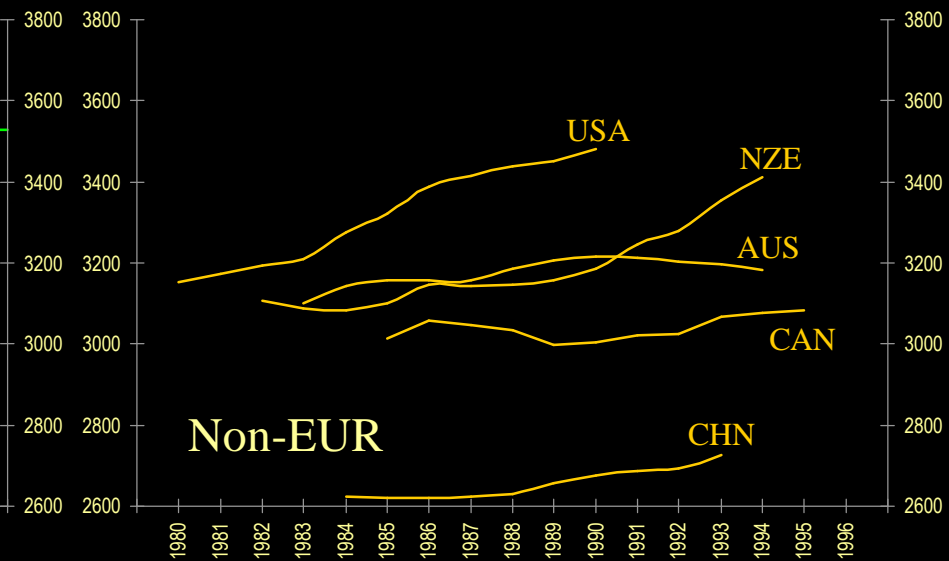
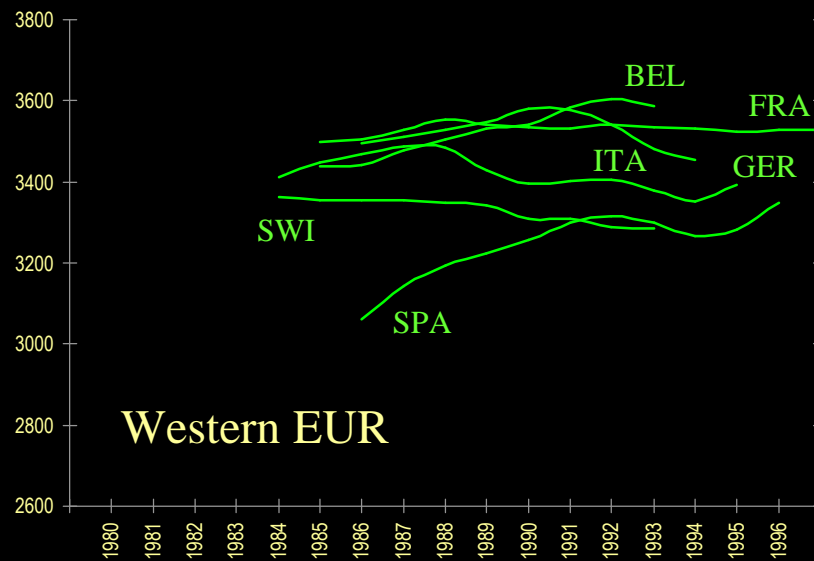
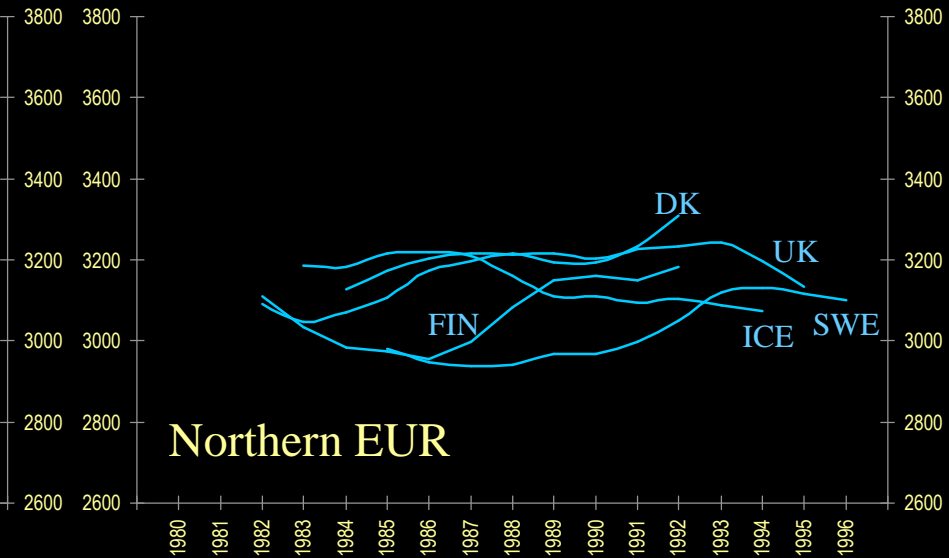
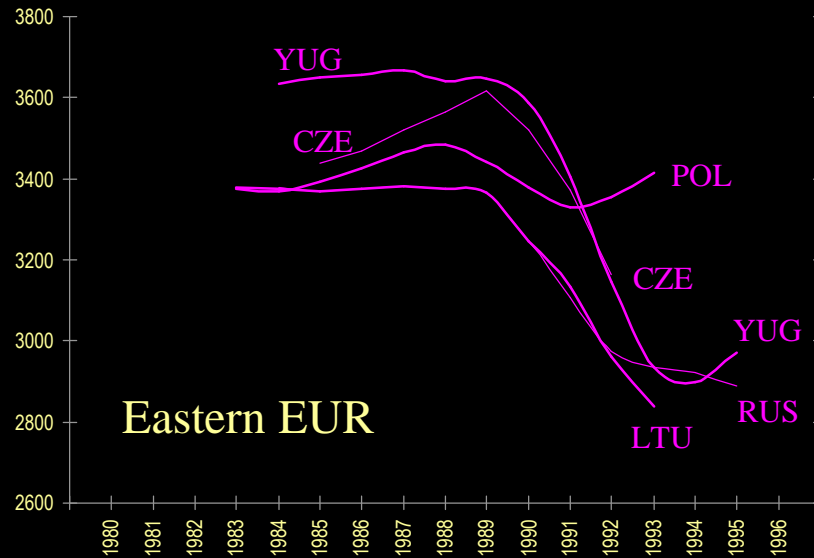
% obesity (BMI \geq 30 kg/m²) at interview

by center and survey

■ Survey 1 ■ Survey 2



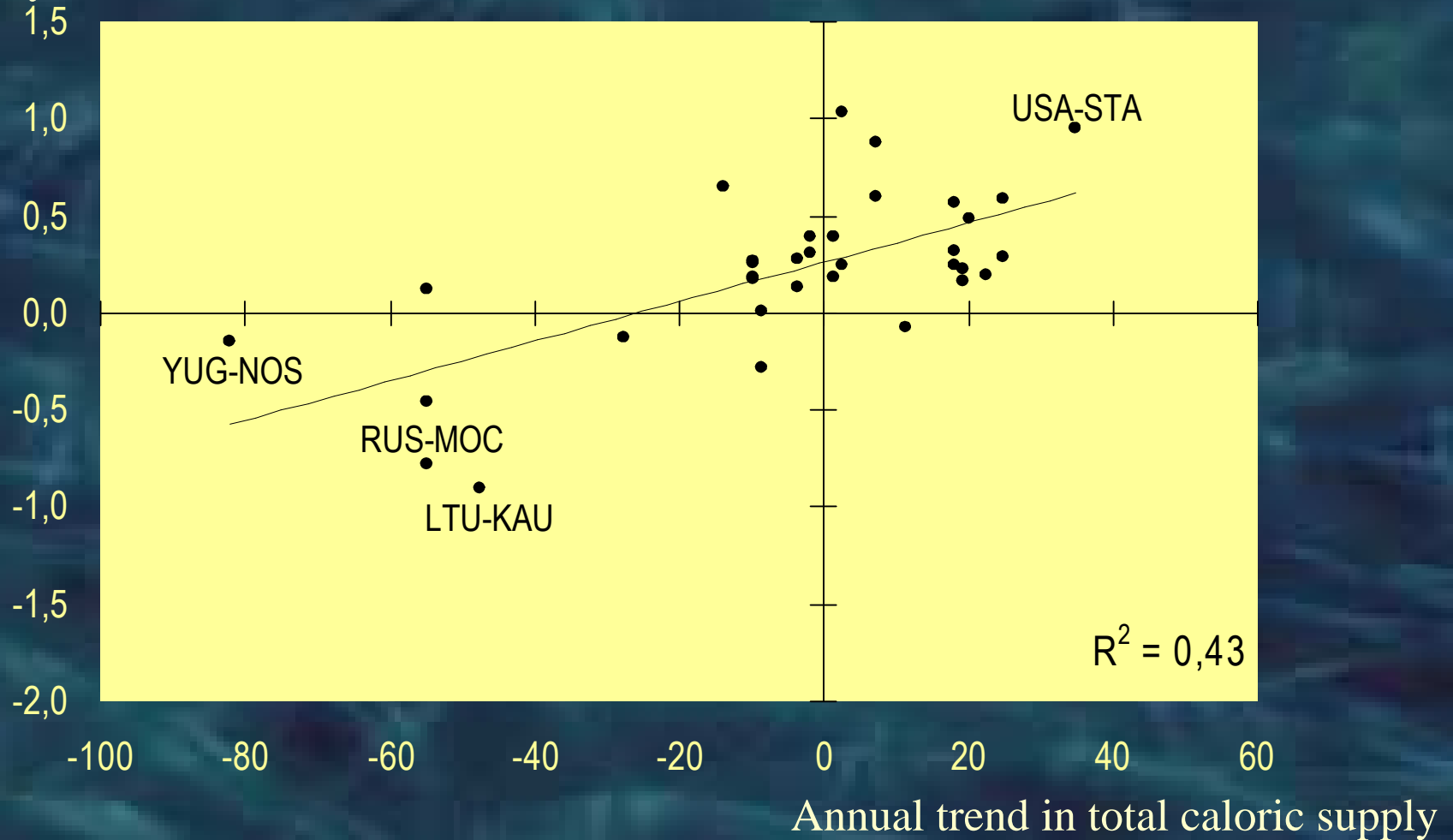
Trends in per capita supply of daily calories in MONICA countries



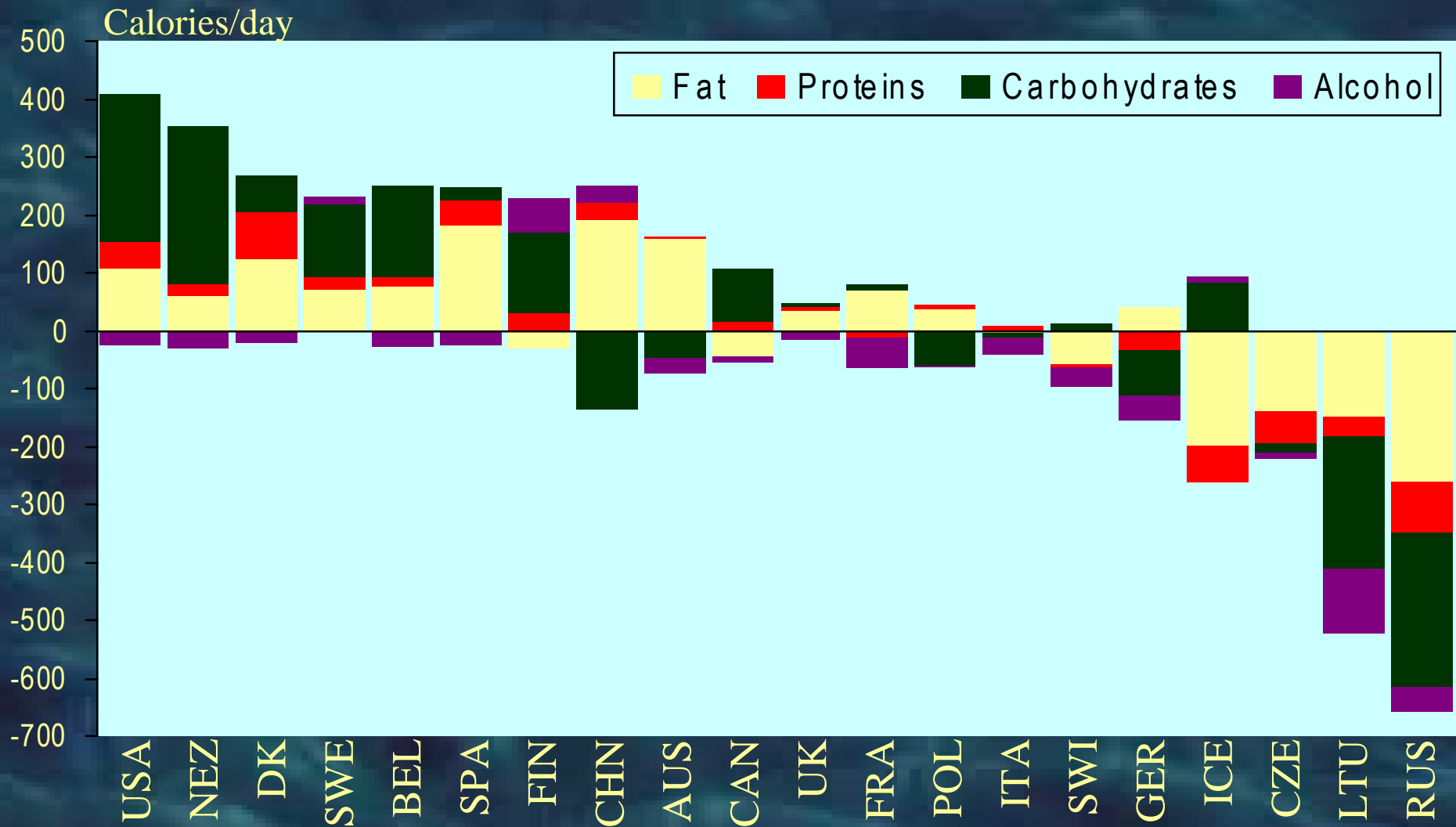
Correlation of trends in obesity and in country total caloric supply for MONICA specific periods.

Both sexes

Obesity annual trend



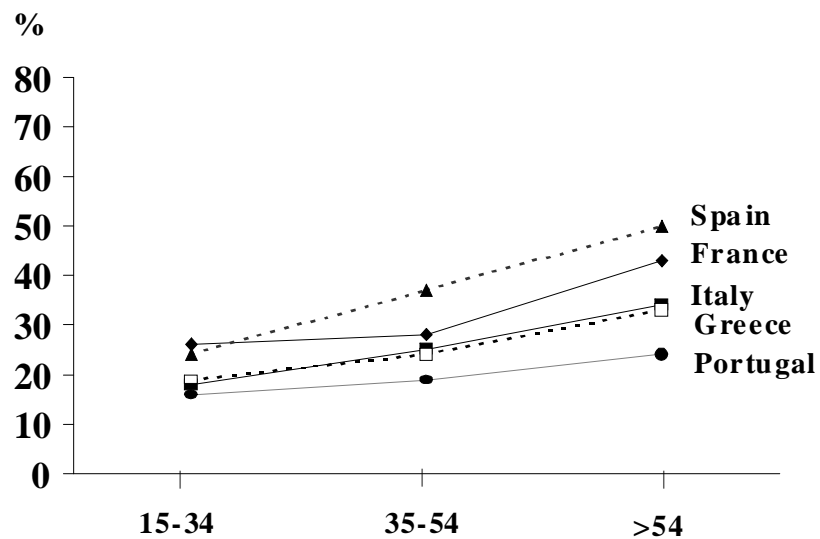
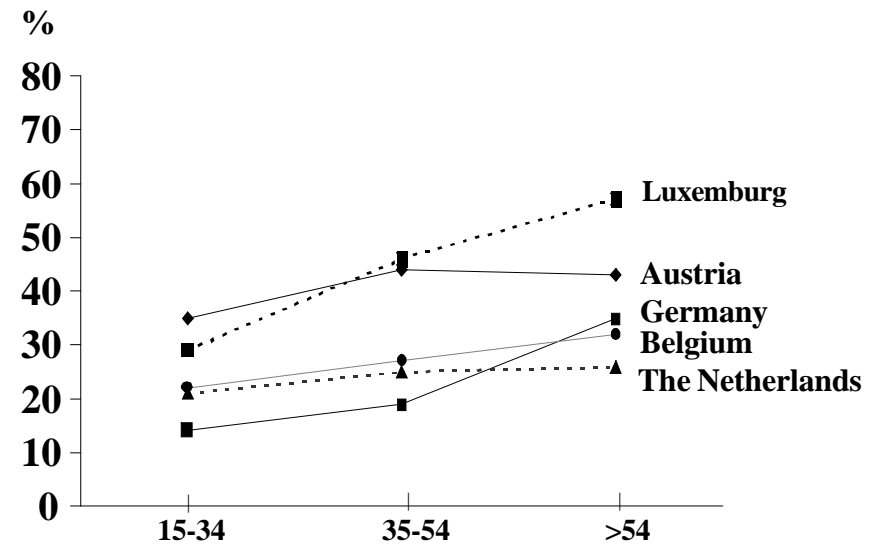
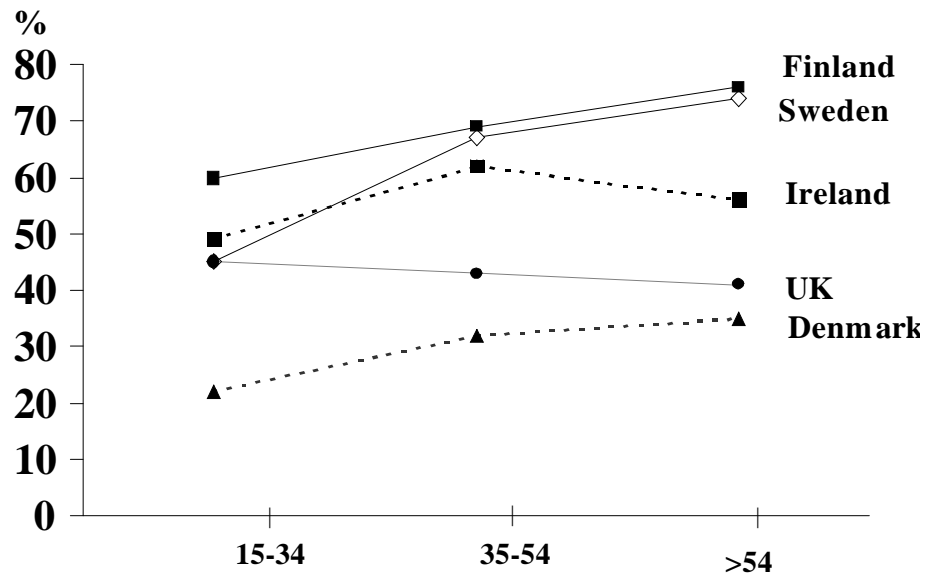
Macronutrient contribution to total energy supply change during ten year MONICA specific periods



Recomended Dietary Allowances (RDA)

- 2.900 Kcal men 25-50, height 176 weight 79 Kg.
- 2.200 Kcal women 25-50, height 163 weight 63 Kg.
- 3.413 Kcal average caloric supply in EU in 1997.

Walking as physical activity in a typical week by age and country - 1997



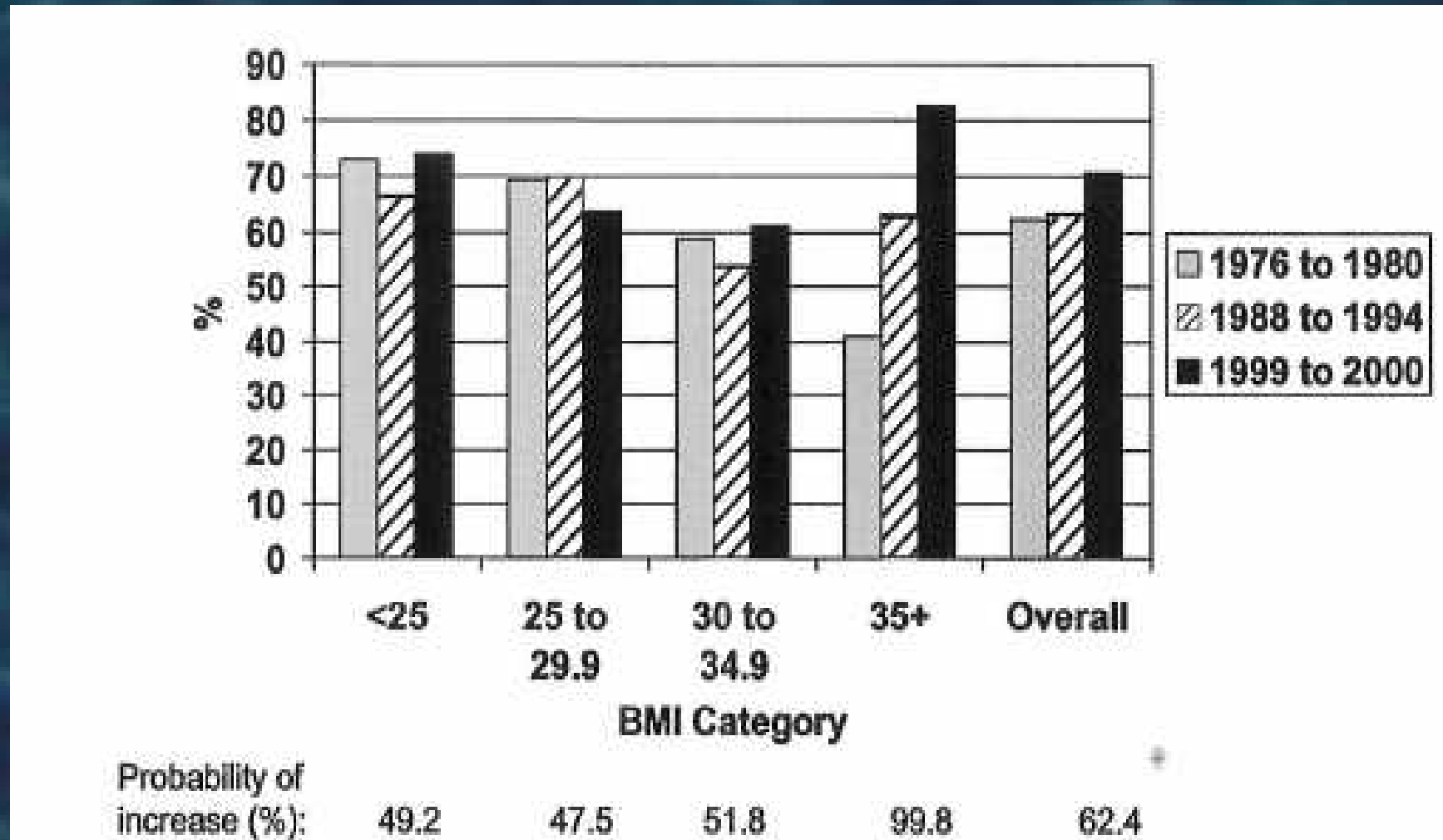


consequences

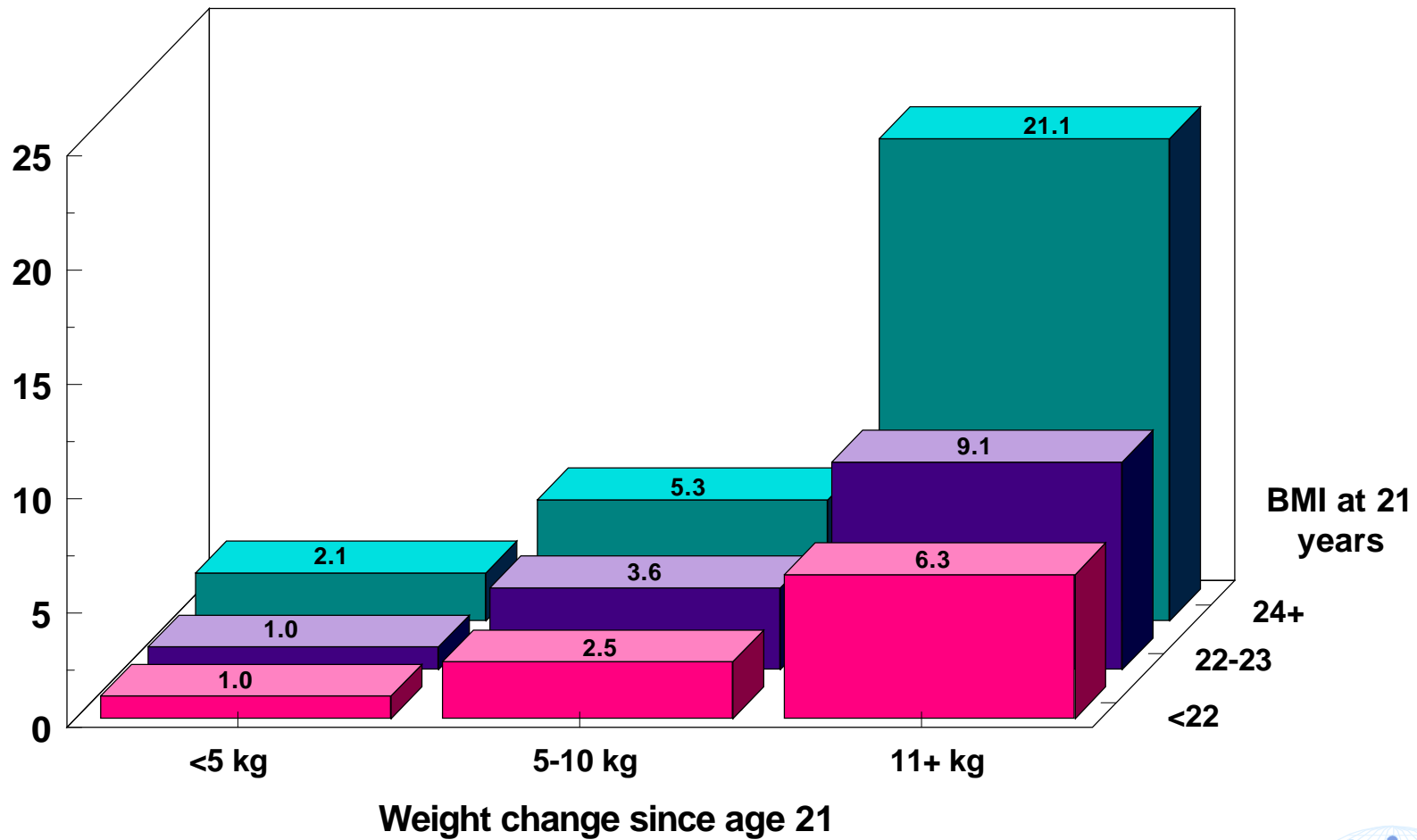
Common hormonal abnormalities associated with intra-abdominal fat accumulation

- Insulin resistance and increased insulin secretion
- Increased free testosterone and free androstendione levels associated with decreased sex hormone binding globulin (SHBG) in women
- Decreased progesterone levels in women
- Increased cortisol production
- Decreased growth hormone levels

Percentage of total diabetes cases that are diagnosed by NHANES survey year and BMI category



The risk of diabetes in relation to weight and weight change.



From: Chan et al. 1994, Diabetes Care, 17: 961.



IDF estimation of number of diabetics in Europe between 20 and 79 years of age

year	2003	2025
Men	22,337 M	27,842 M
Women	26,041 M	30,796 M
Total	48,378 M	58,638 M
Crude Prevalence	7.8 %	9.1 %

Relative risk of health problems associated with obesity in developed countries.

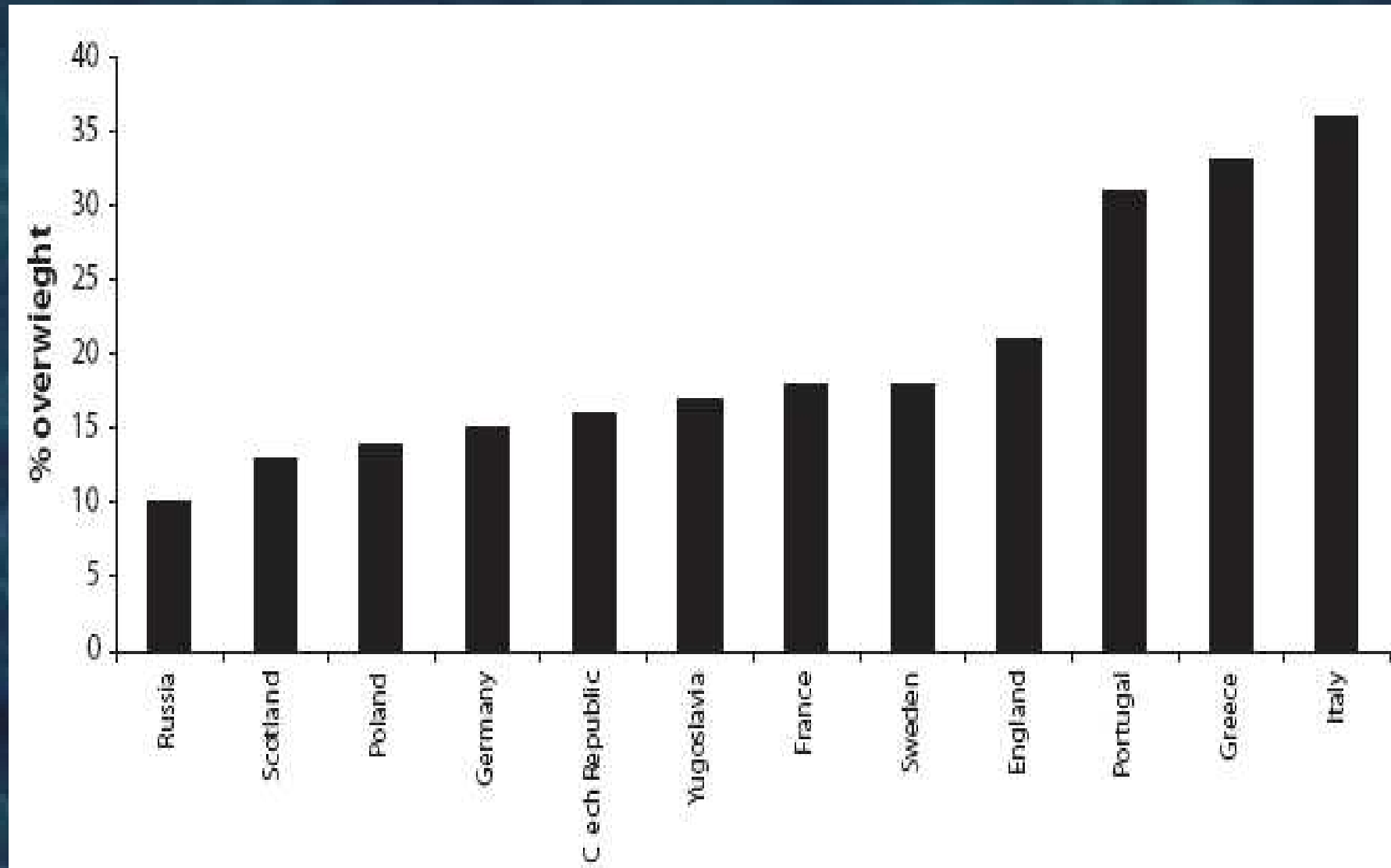
Greatly increased (relative risk >>3)	Moderately increased (relative risk ca 2-3)	Slightly increased (relative risk ca 1-2)
<ul style="list-style-type: none">▶ Diabetes▶ Gall bladder disease▶ Hypertension▶ Dyslipidaemia▶ Insulin resistance▶ Breathlessness▶ Sleep apnoea	<ul style="list-style-type: none">▶ Coronary heart disease▶ Osteoarthritis (knees)▶ Hyperuricaemia and gout	<ul style="list-style-type: none">▶ Cancer (breast cancer in postmenopausal women, endometrial cancer, colon cancer)▶ Reproductive hormone abnormalities▶ Polycystic ovary syndrome▶ Impaired fertility▶ Low back pain▶ Increased anaesthetic risk▶ Foetal defects arising from maternal obesity





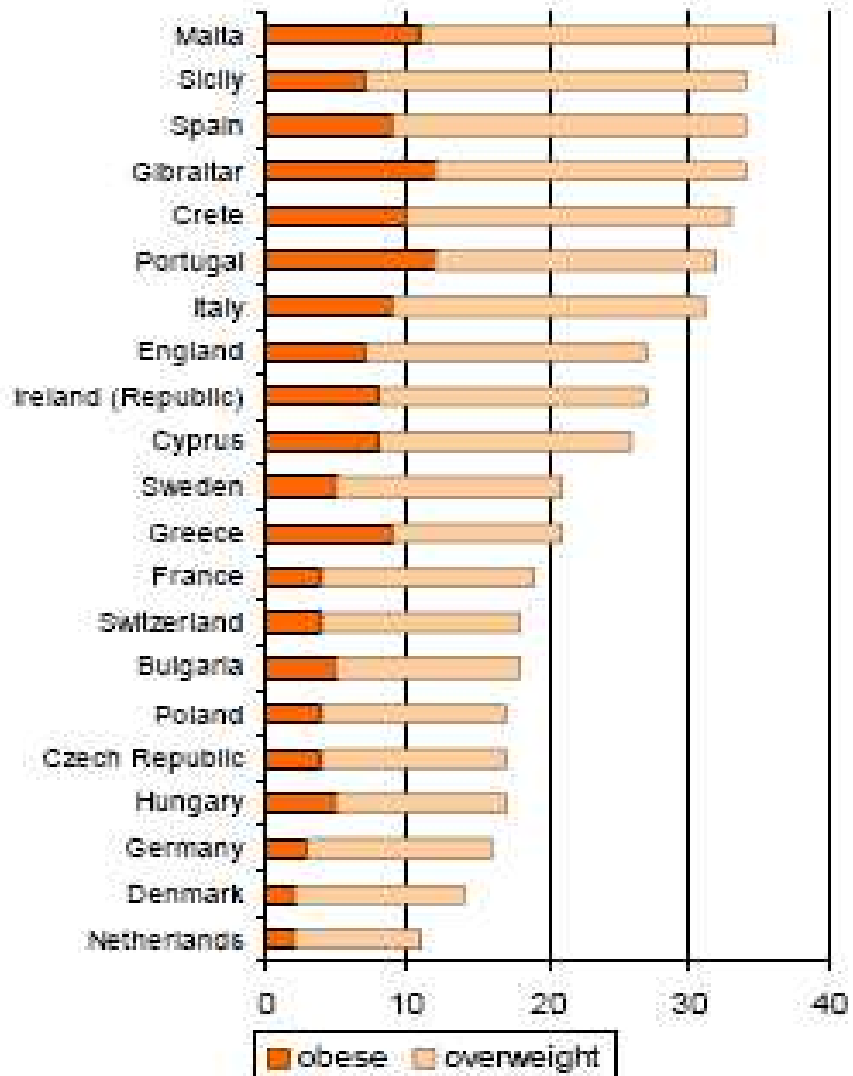
Children

*Prevalence of overweight in children aged between 4-11 years,
latest available year*

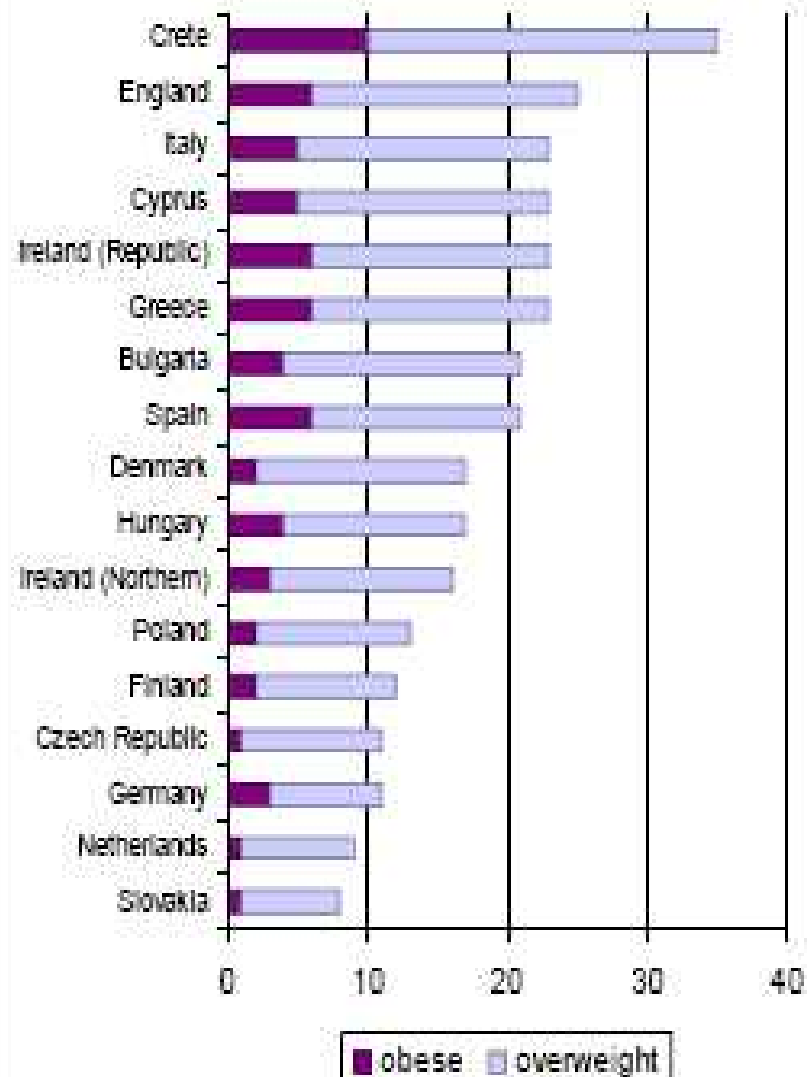


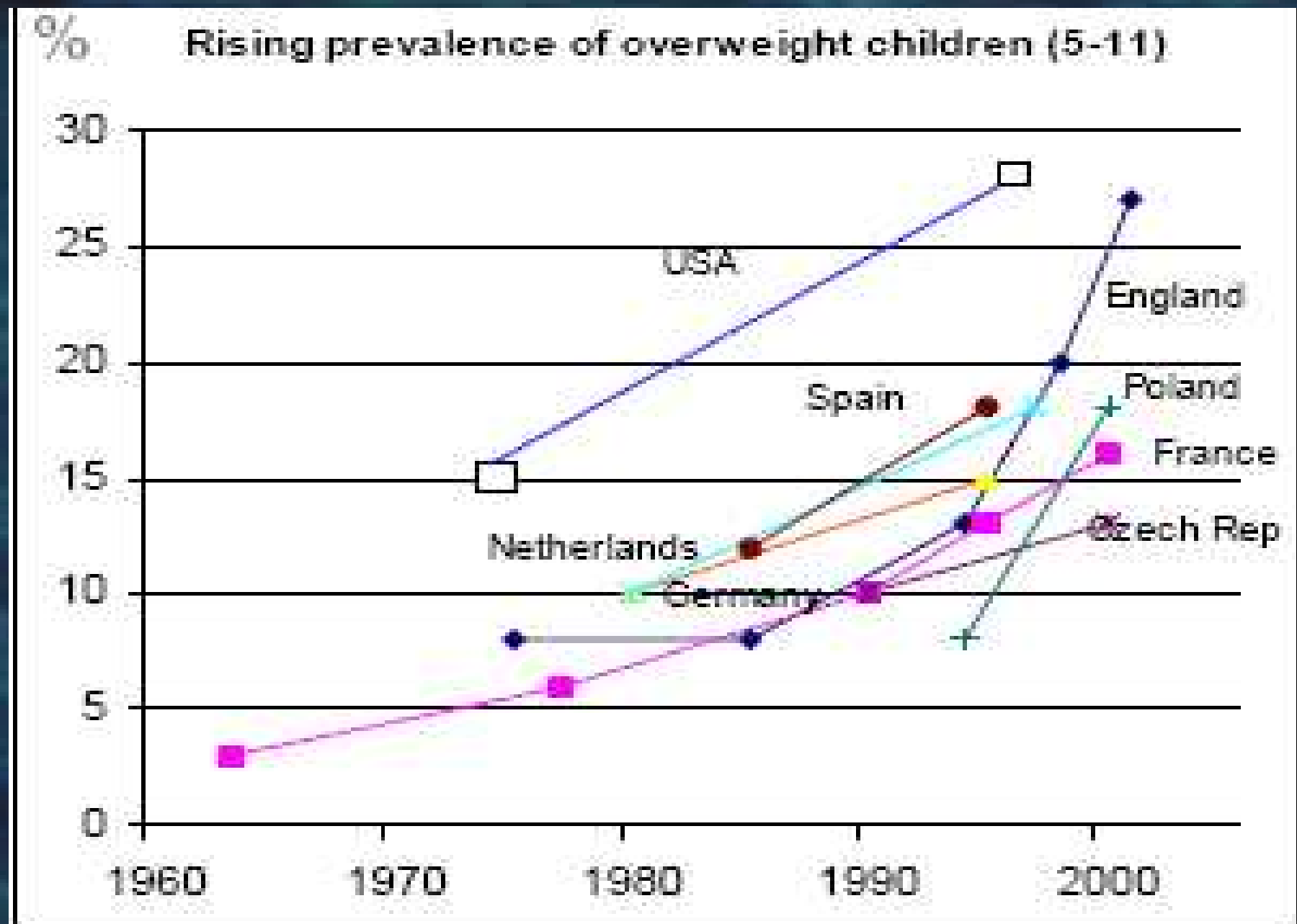
Prevalence of obesity in schoolchildren of different ages

Percentage of schoolchildren aged 7-11 obese or overweight



Percentage of schoolchildren aged 13-17 obese or overweight





Obesity definition in children and adolescents

- IOTF
- $>97^{\text{th}}$ local reference centiles
- $>90^{\text{th}}$ local reference centiles
- $>98^{\text{th}}$ centiles on an international BMI reference curve
- 95th and 85th NCHS BMI centiles
- $\text{WHZ} < 3$
- $\text{WHZ} > 2$

Defining obesity in children

- Use of growth charts
- BMI for age reference curves
- International childhood reference population

bmj.com

Establishing a standard definition for child overweight and obesity worldwide: international survey

Tim J Cole, Mary C Bellizzi, Katherine M Flegal and William H Dietz

BMJ 2000;320:1240-
doi:10.1136/bmj.320.7244.1240

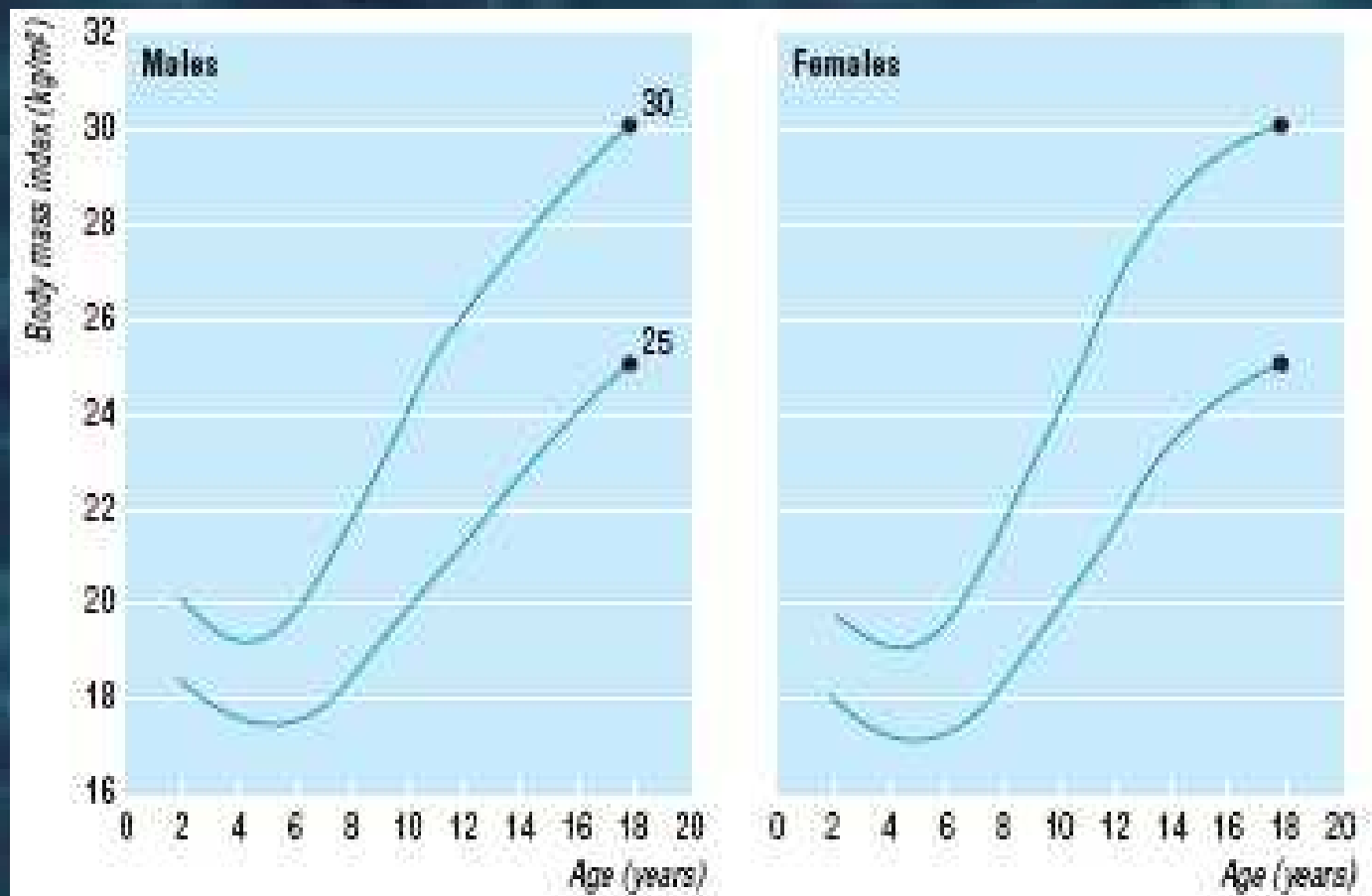


Fig 6 International cut off points for body mass index by sex for overweight and obesity, passing through body mass index 25 and 30 kg/m² at age 18 (data from Brazil, Britain, Hong Kong, Netherlands, Singapore, and United States)

What is already known on this topic

Child obesity is a serious public health problem that is surprisingly difficult to define

The 95th centile of the US body mass index reference has recently been proposed as a cut off point for child obesity, but like previous definitions it is far from universally accepted

What this study adds

A new definition of overweight and obesity in childhood, based on pooled international data for body mass index and linked to the widely used adult obesity cut off point of 30 kg/m^2 , has been proposed

The definition is less arbitrary and more international than others, and should encourage direct comparison of trends in child obesity worldwide

Adverse outcomes in childhood obesity

Metabolic

Type 2 diabetes mellitus

Metabolic syndrome

Orthopedic

Slipped capital femoral epiphysis

Blount's disease

Cardiovascular

Dyslipidemia

Hypertension

Left ventricular hypertrophy

Atherosclerosis

Psychological

Depression

Poor quality of life

Neurological

Pseudotumor cerebri

Hepatic

Nonalcoholic fatty liver disease

Nonalcoholic steatohepatitis

Pulmonary

Obstructive sleep apnea

Asthma (exacerbation)

Renal

Proteinuria

“In Southern Europe the remarkable shift away from healthier Mediterranean type diets over the years may be contributing to the trend”

Athyros V.G. et al. The MetSGreeceCollaborative Group. The prevalence of the metabolic syndrome in Greece: TheMetSGreeceMulticentre Study. Diabetes, Obesity and Metabolism: doi:10.1111

A study of “apparently healthy” families in Northern France had revealed a significant increase in metabolic syndrome over five years with the children of affected adults showing early signs of cardiovascular risks.

Maumus S et al. Diabetes Care. 2005 Mar;28(3):

- Duncan GE, Li SM, Zhou XH.
Prevalence and trends of a metabolic syndrome phenotype among U.S. adolescents.
Diabetes Care 2004;27(10):243843.
- Ford ES, Giles WH, Mokdad AH.
Increasing prevalence of the metabolic syndrome among U.S. Adults. Diabetes Care.2004 27(10):24449.

Preliminary estimates of the numbers at risk for obesity-associated disease among EU children

Hypertension	520,000
High triglycendes	830,000
High cholesterol	900,000
High LDL cholesterol	900,000
Low HDL cholesterol	710,000
Impaired glucose tolerance	90,000
Type 2 Diabetes	2-10,000
Steatohepatitis	225,000

© International Obesity TaskForce 2005

Medical evaluation of an overweight child or adolescent

Evaluation of growth: Normal growth makes metabolic or genetic form of overweight less likely

History of sleep-disordered breathing (eg, snoring, nocturnal irregular breathing, diurnal somnolence)

History of irregular menstrual periods, acne, and hirsutism in adolescent girls (evidence of polycystic ovary syndrome)

Blood pressure measurement (with attention to proper cuff size)

Physical assessment for orthopedic abnormalities

Fasting lipoprotein profile

Fasting glucose, insulin

Liver enzymes

Consider if evaluation suggests an abnormality

Glucose tolerance test

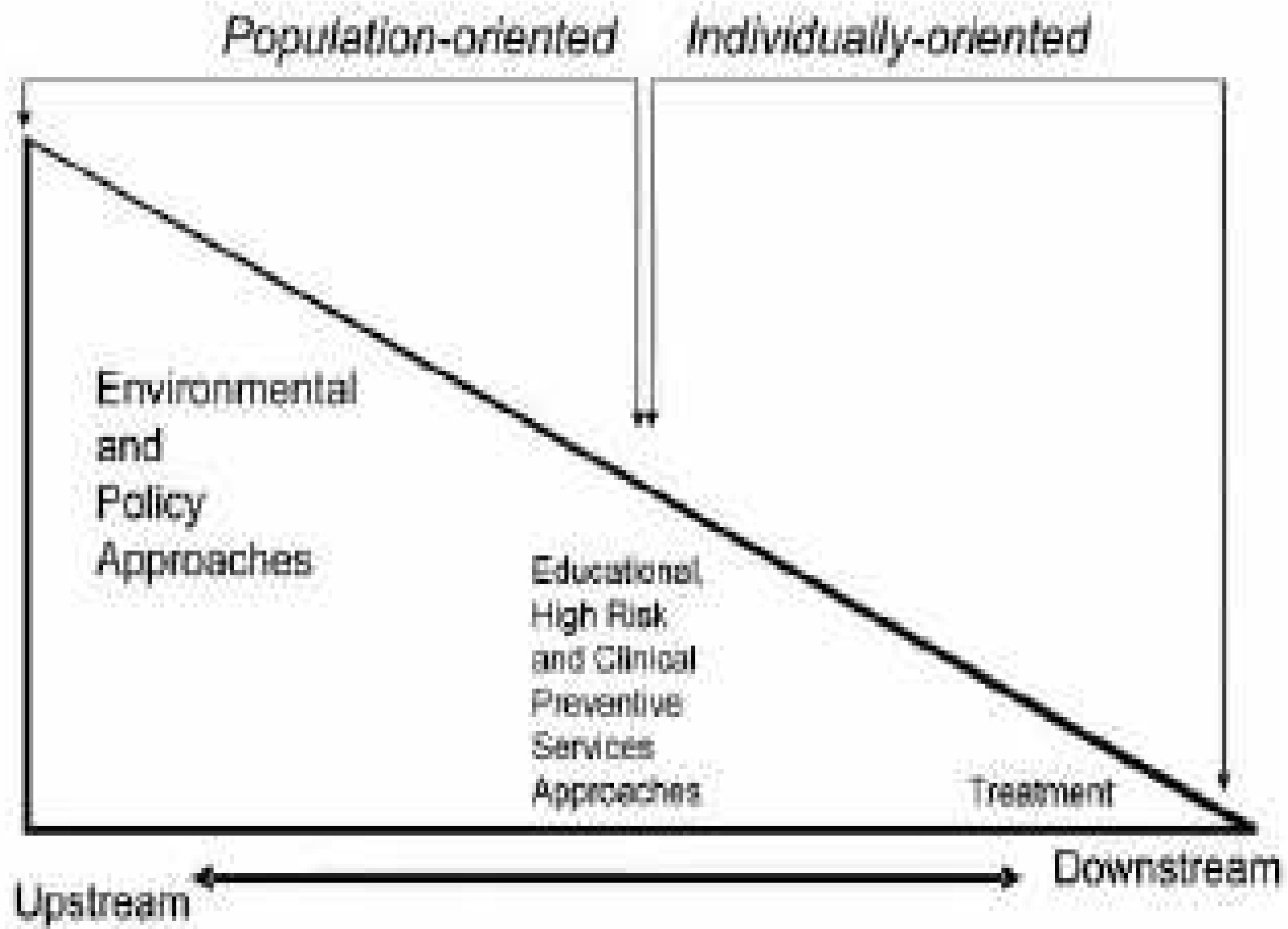
Sleep study

Echocardiographic evaluation of left ventricular mass, structure and function, and right-sided abnormalities related to increased pulmonary artery pressure

Hemoglobin A_{1c}

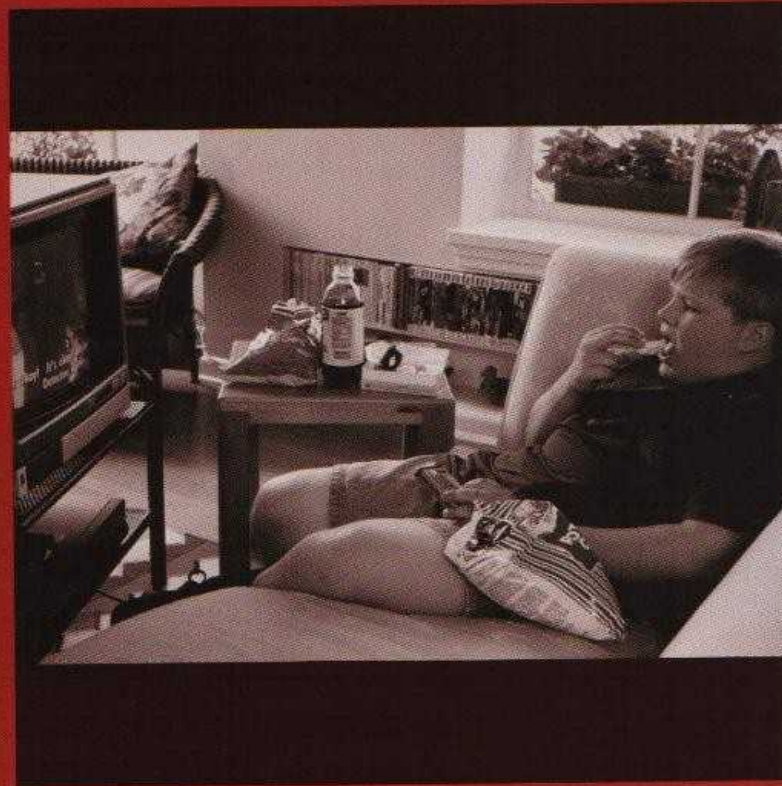
Obesity

- From the Latin *obesus*: one who has become plump through eating
- First appears in a medical context in Thomas Venner's *Via Recta* (1620). For Venner obesity was an occupational hazard of the *enteel* classes.
- In Latin *obesus* has another meaning: “coarse” or “vulgar”.
- Obesity still carries this sense of moral judgment: it implies a lack of self-control and self-respect .
- An afflicted individual could restore their physique by paying attention to the Hippocratic concept of *regimen*: balancing diet, sleep, and other factors to create and maintain health
- In the 18th and 19th centuries, writers favoured the term “corpulence” and the pressure remained on individuals to treat themselves.



The marketing of unhealthy food to children in Europe

A report of Phase 1 of the
'Children, obesity and associated avoidable chronic diseases' project



Foods high in fat, sugar or salt commonly consumed by children

- Potato crisps/ chips
- Chocolate/ confectionery
- Cakes, biscuits, croissants
- Fast foods (i.e. burgers, sausages, hot dogs)
- Sugary carbonated drinks
- Savoury snacks, i.e. nuts, pretzels, popcorn
- Sugar or chocolate coated breakfast cereals
- Full fat milk, favoured milk

European Heartnetwork survey in 17 countries

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- Cakes, biscuits, croissants
- Fast foods (i.e. burgers, sausages, hot dogs)
- Sugary carbonated drinks
- Savoury snacks, i.e. nuts, pretzels, popcorn
- Sugar or chocolate coated breakfast cereals
- Full fat milk, flavoured milk
- Ice cream
- Sugary, high fat yoghurt products
- Sweetened deserts
- Chocolate spread / jams
- Margarine, butter oils
- Meat , meat products
- Other (dressings, full fat cheese, pre-prepared meals)
- Canned fish, pizza, high salt , mineral water

European Heartnetwork survey in 17 countries

Role of food industry

- Active development of products with improved nutritional quality.
 - low saturated fat
 - low salt
 - light fibre
- Reliable and responsible marketing.
- Collaboration with governments in development of informative food labelling.
- Participation in disease prevention and health promote campaigns with governments, professional groups and other non-governmental organizations.

Conclusions

- Prevalence of obesity exceeds 10% of the adult and children population in the majority of countries and more than half of the population is overweight.
- Prevalence of obesity has increased during the last decade.
- Prevalence of obesity in coronary patients is even higher than among the general population.
- There is an increasing socio-economic gap in the prevalence of obesity.

Conclusions

- These trends are highly correlated with national trends in energy food supply and increased sedentarism.
- Sedentarism is commoner in Southern than Northern Europe.
- Prevention of the health consequences of obesity should be a priority in the years to come.
- Social responsibility of the food industry is essential to control this epidemic.