

# Tackling chronic diseases: an international perspective

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IUNS



IDF



IOTF



IPA



WHF

# Deaths from chronic disease 2005

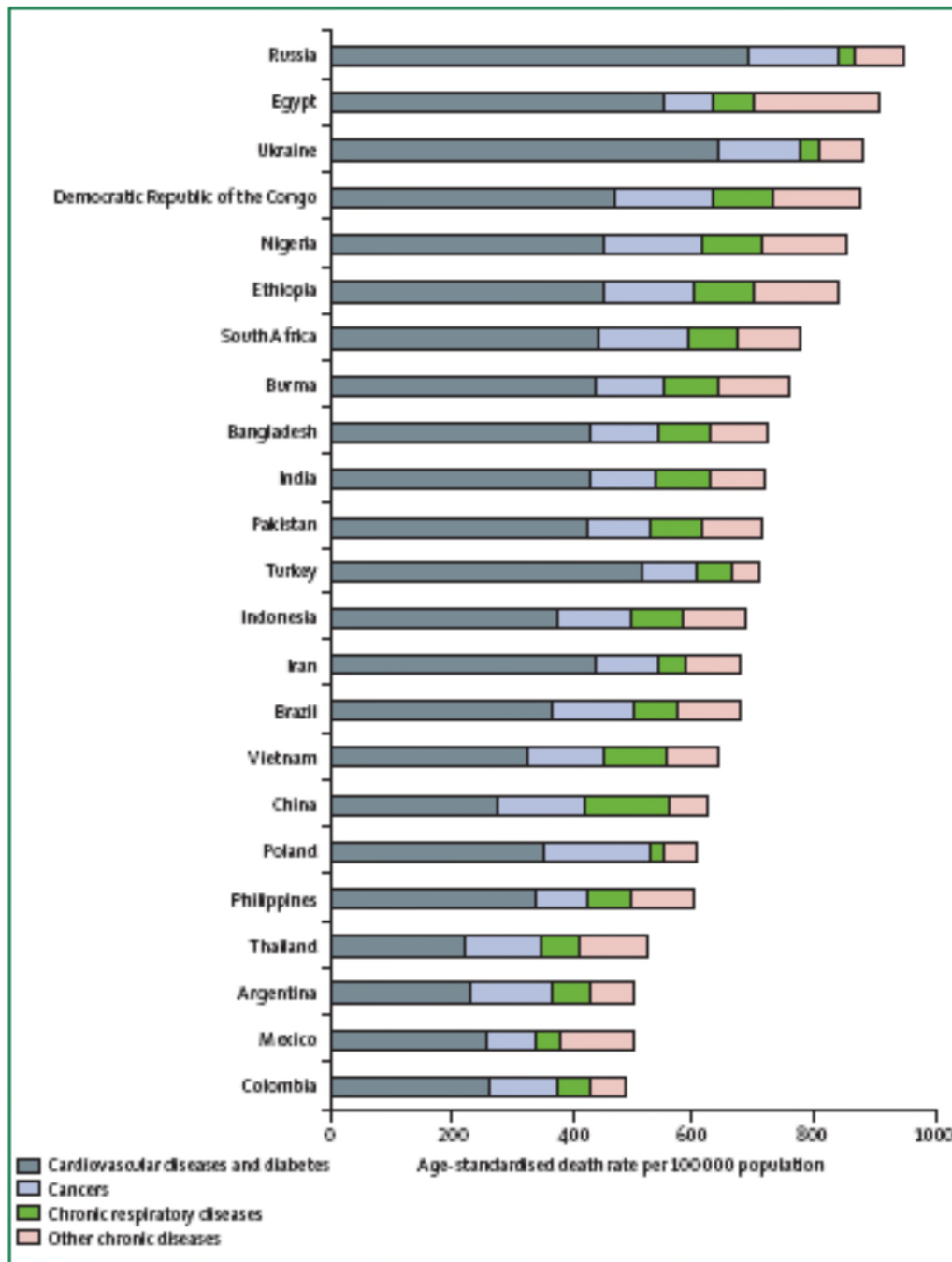
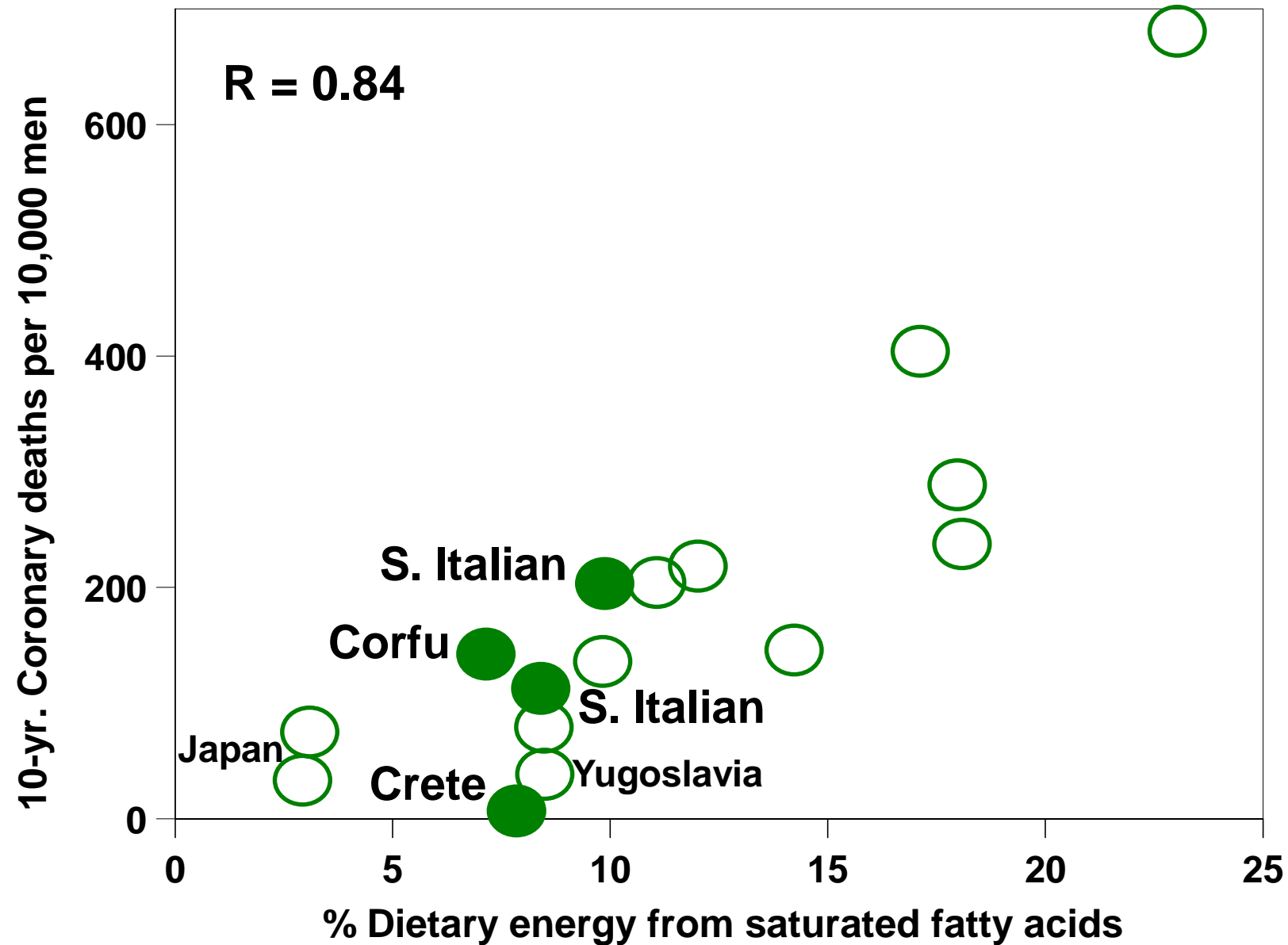


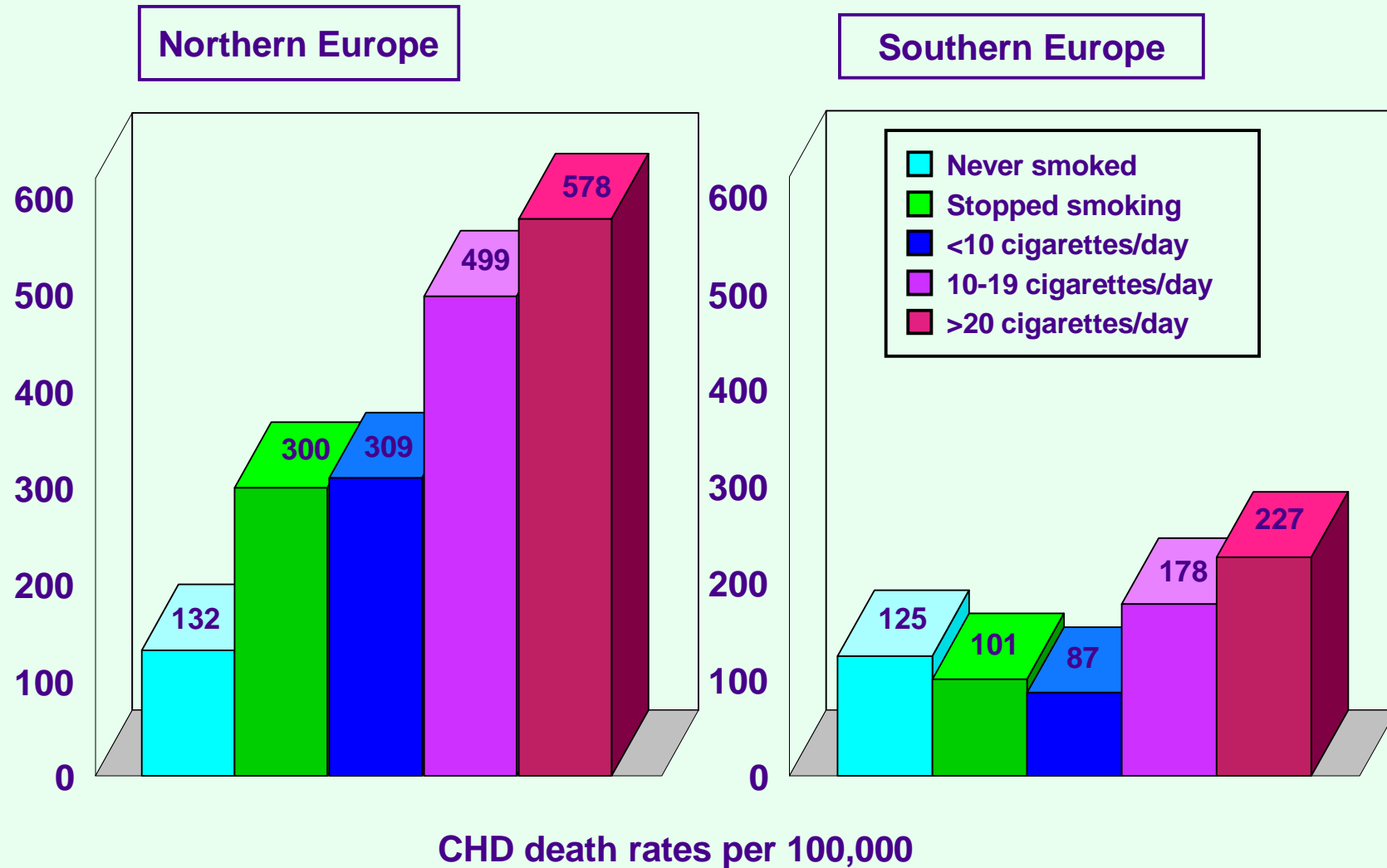
Figure 1: Projected age-standardised death rates for 2005 from chronic diseases (per 100 000), for all ages and both sexes in 23 selected countries

Abegunde et al, Burden & costs of chronic diseases in low income and middle income countries Lancet, Dec.2007.

## 10-year coronary mortality in men



## The importance of diet (saturated fat intakes) in amplifying smoking's cardiovascular effects



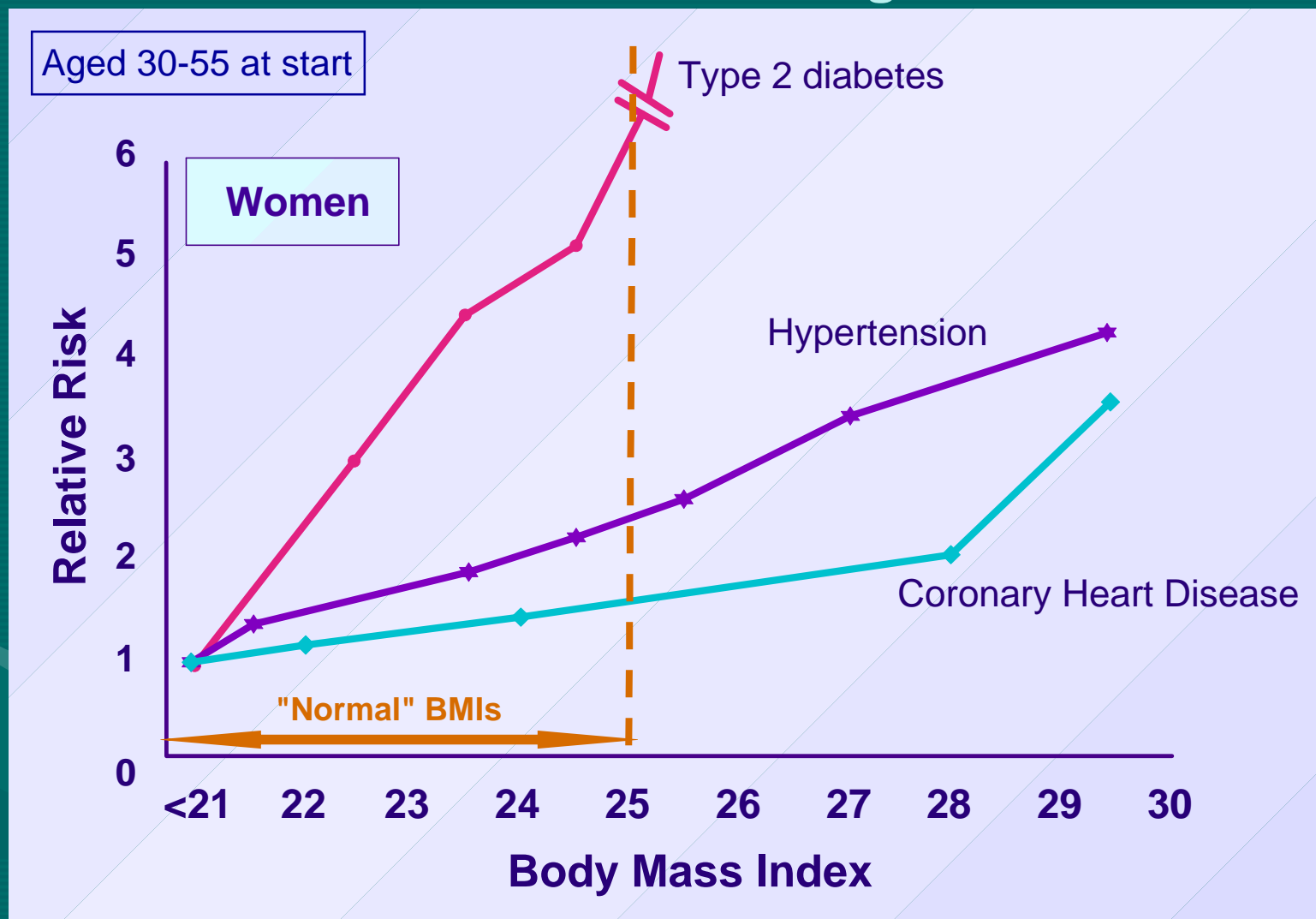
From: Keys A. (Ed). Seven countries. A multivariate analysis of death and coronary heart disease. Cambridge, MA, US: Harvard University Press, 1980.

**Risk factors in global cardiovascular disease; identifiable criteria usable in cancer studies but other risk factors demand special tests**

**Modifiable risk factors for myocardial infarction: PAR%**

● ApoB/ApoA1 ratio( top vs lowest quintile):	49.2
● Smoking (current & former vs never):	35.7
● Psychosocial factors:	32.5
● Abdominal obesity(top vs bottom tertile):	20.1
● Hypertensive history:	17.9
● No daily fruit and vegetable intake:	13.7
● Regular physical activity:	12.2
● Diabetes:	9.9
● Regular alcohol intake:	6.7
● Total impact of all 9 factors:	men 90%
	women 94%

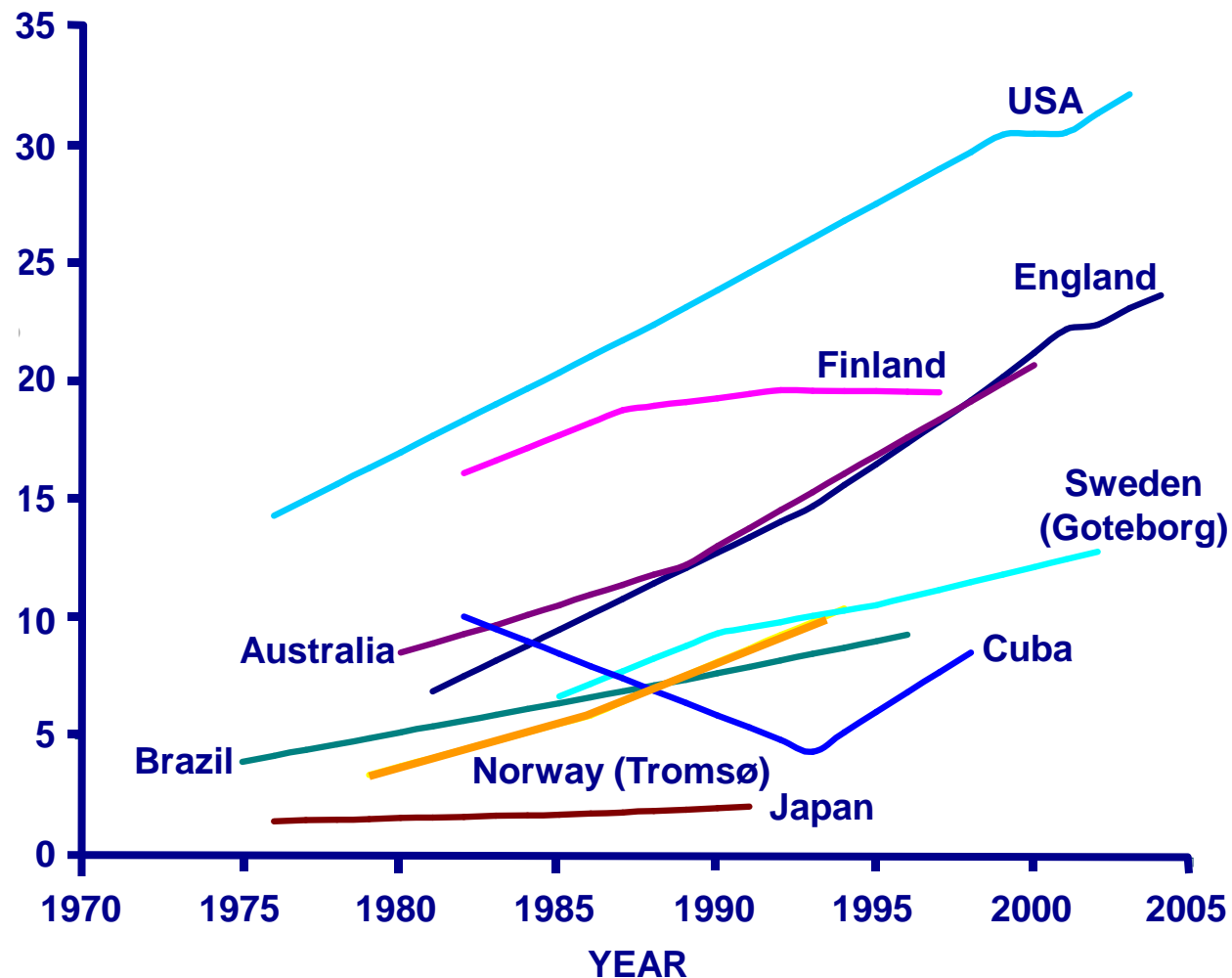
# The importance of modest weight gain in precipitating chronic disease: risks markedly increase within "normal" BMI range



Adapted from Willett, Dietz & Colditz, NEJM, 1999; 341, 426-434

# Escalating obesity rates in adults

% Obese  
(BMI  $\geq 30$  kg/m<sup>2</sup>)



## Global Totals

2002

Obese: 356 million

O/wt  $\geq 25$ : 1.4 billion

2007

Obese: 523 million

O/wt  $\geq 25$ : 1.539 billion

2015

Obese: 704 million

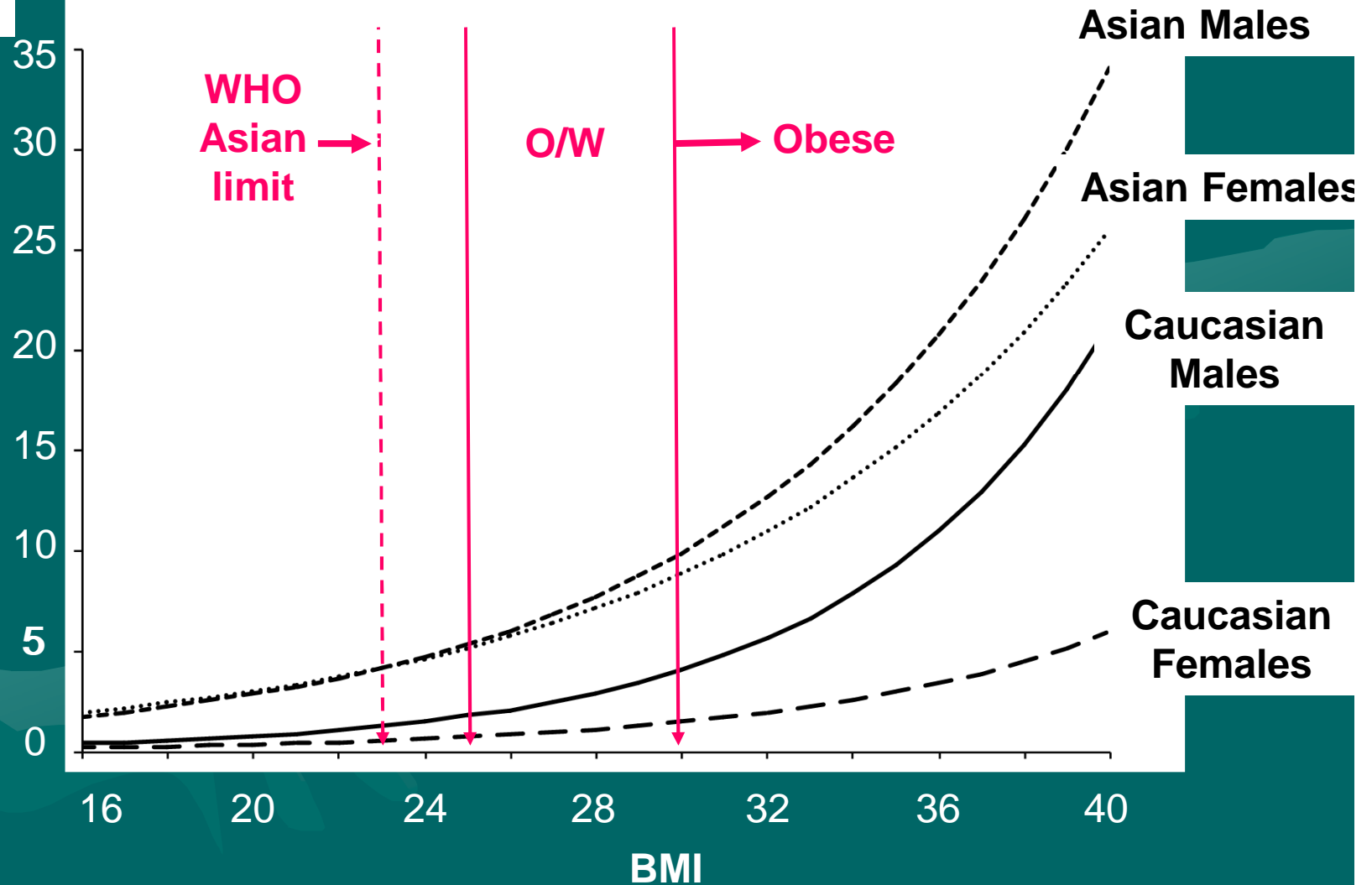
O/wt  $\geq 25$ : 2.3 billion

IOTF 2007

# A comparison of the impact of BMI on Diabetes in Asians and Caucasians

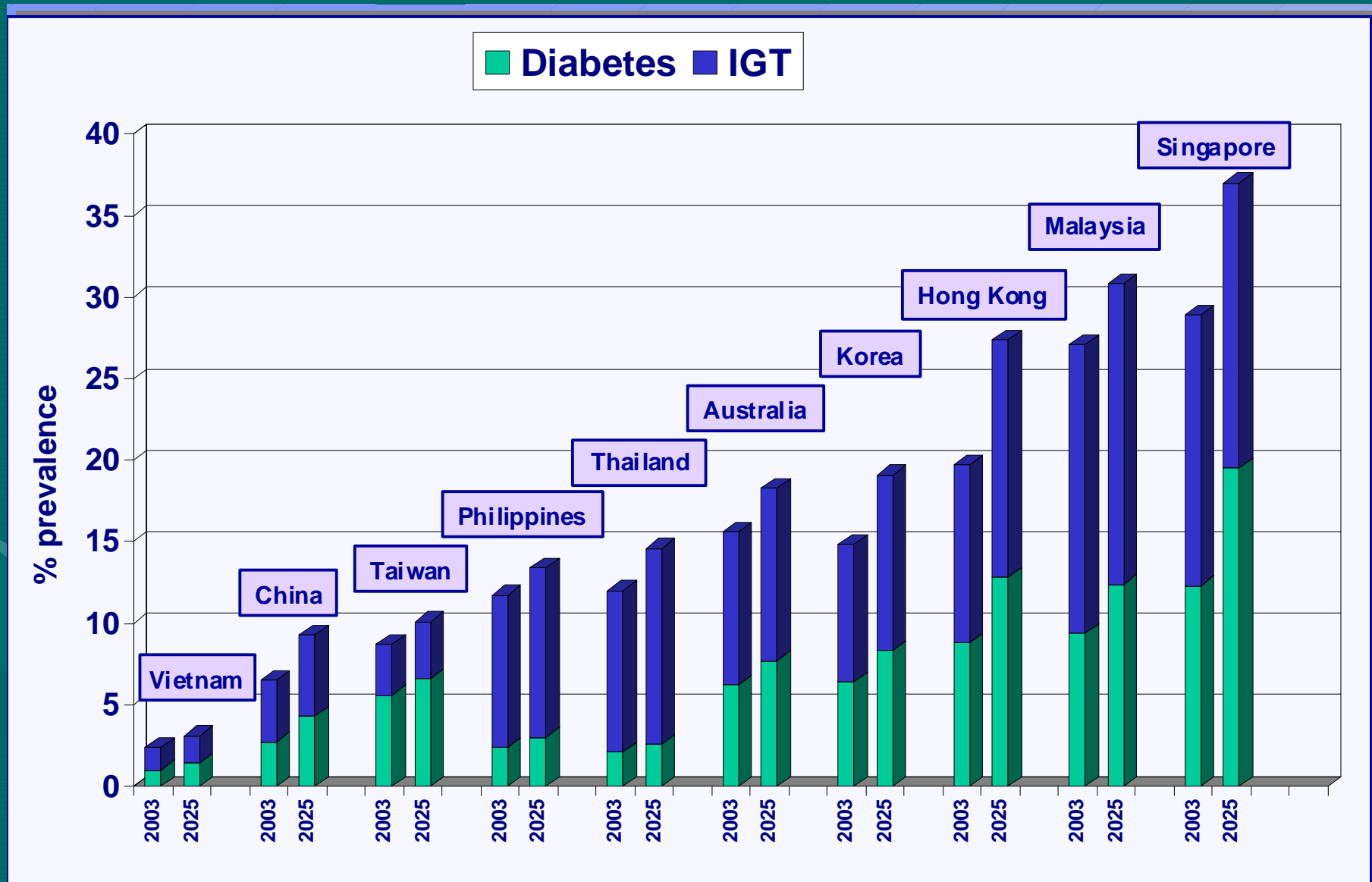
Diabetes

%



Huxley R, James WPT et al. Obesity in Asia Collaboration. Ob. Rev. (in press 2007)

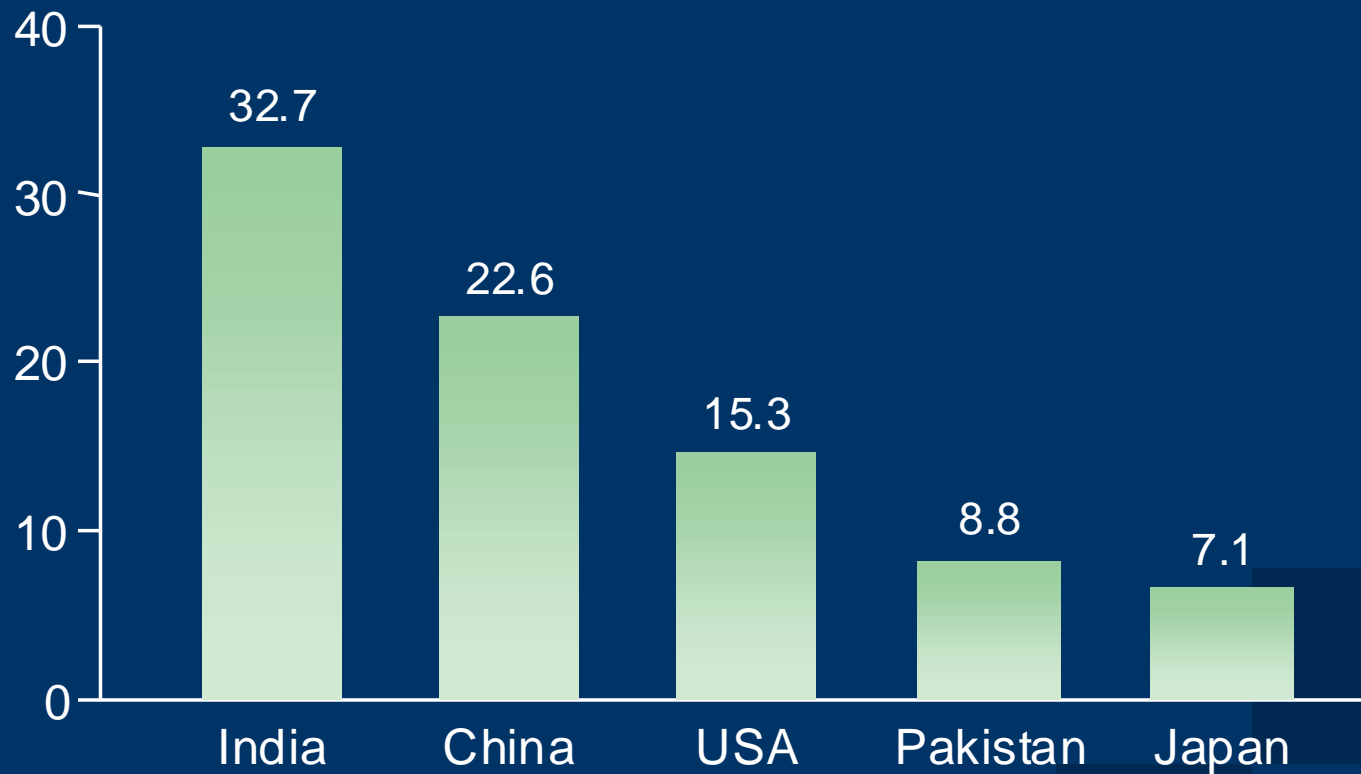
# The environmental impact in Asia on the population's health burden from diabetes and IGT



Source: Diabetes Atlas, 2<sup>nd</sup> edition. IDF, 2003.

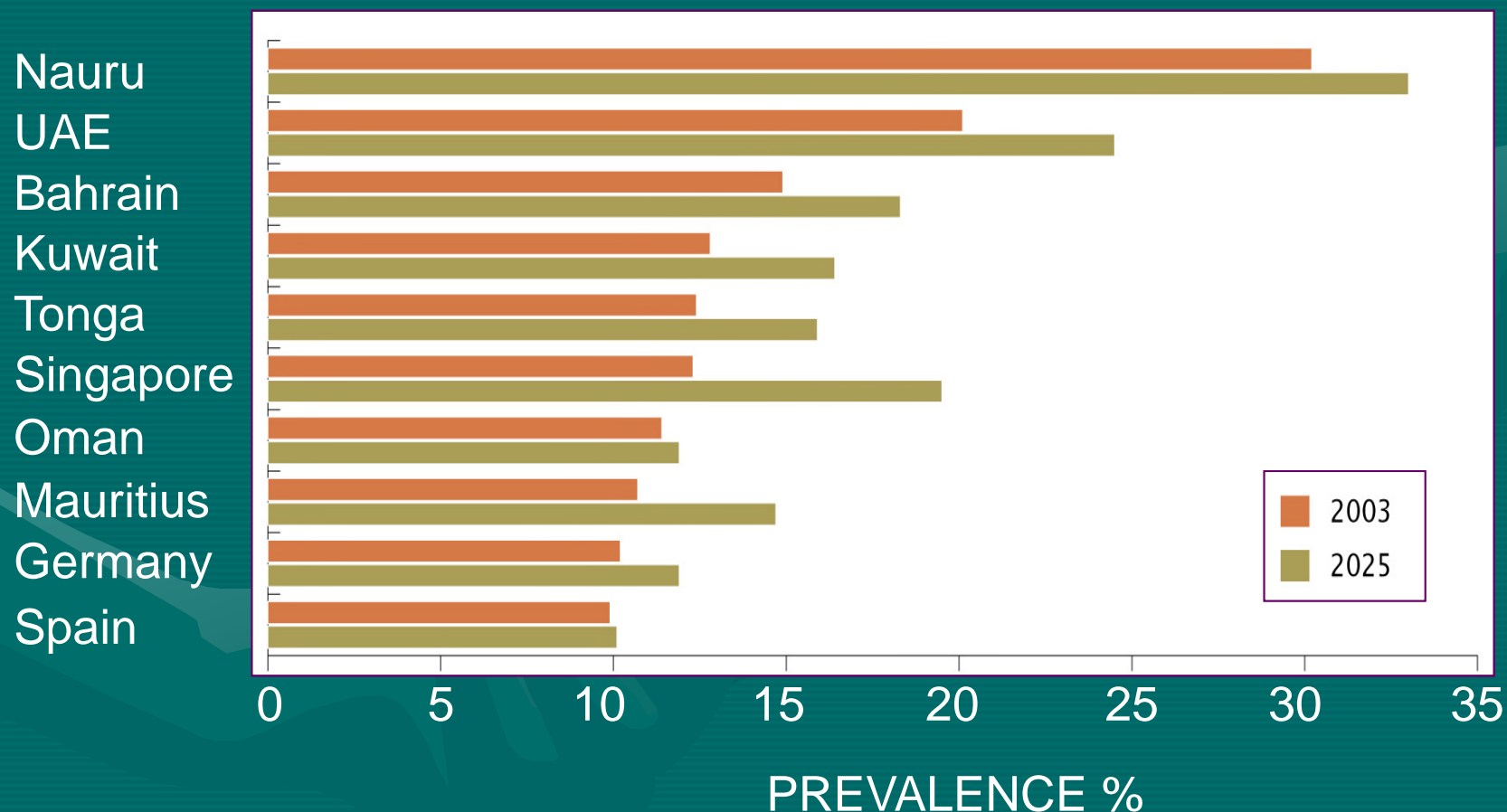
## Diabetes is prevalent in developing and developed countries

Population affected (millions) - Year 2000



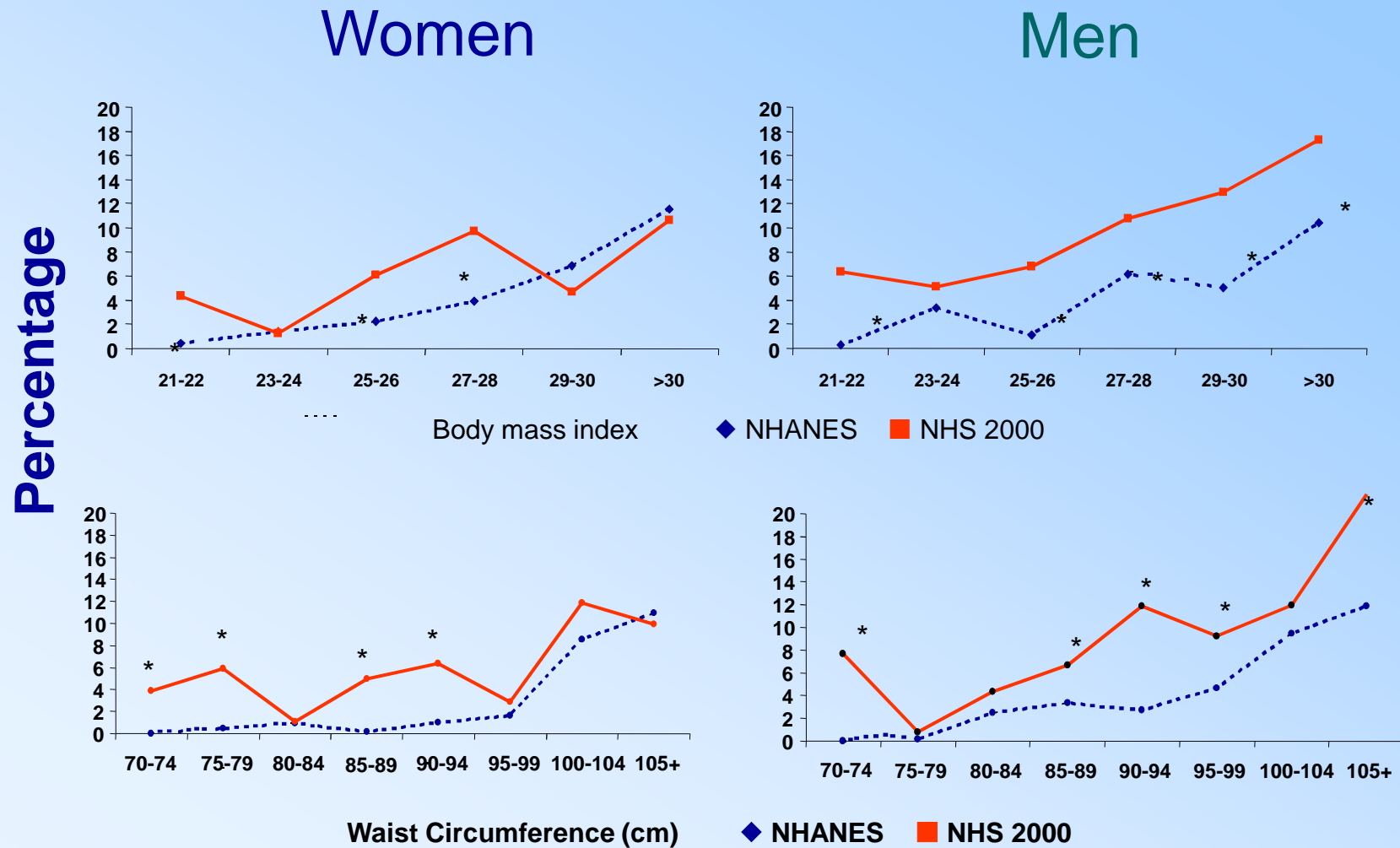
<http://www.idf.org> (Accessed February 2003)

# The top global prevalences for adult type II diabetes 20-79 year age group 2003



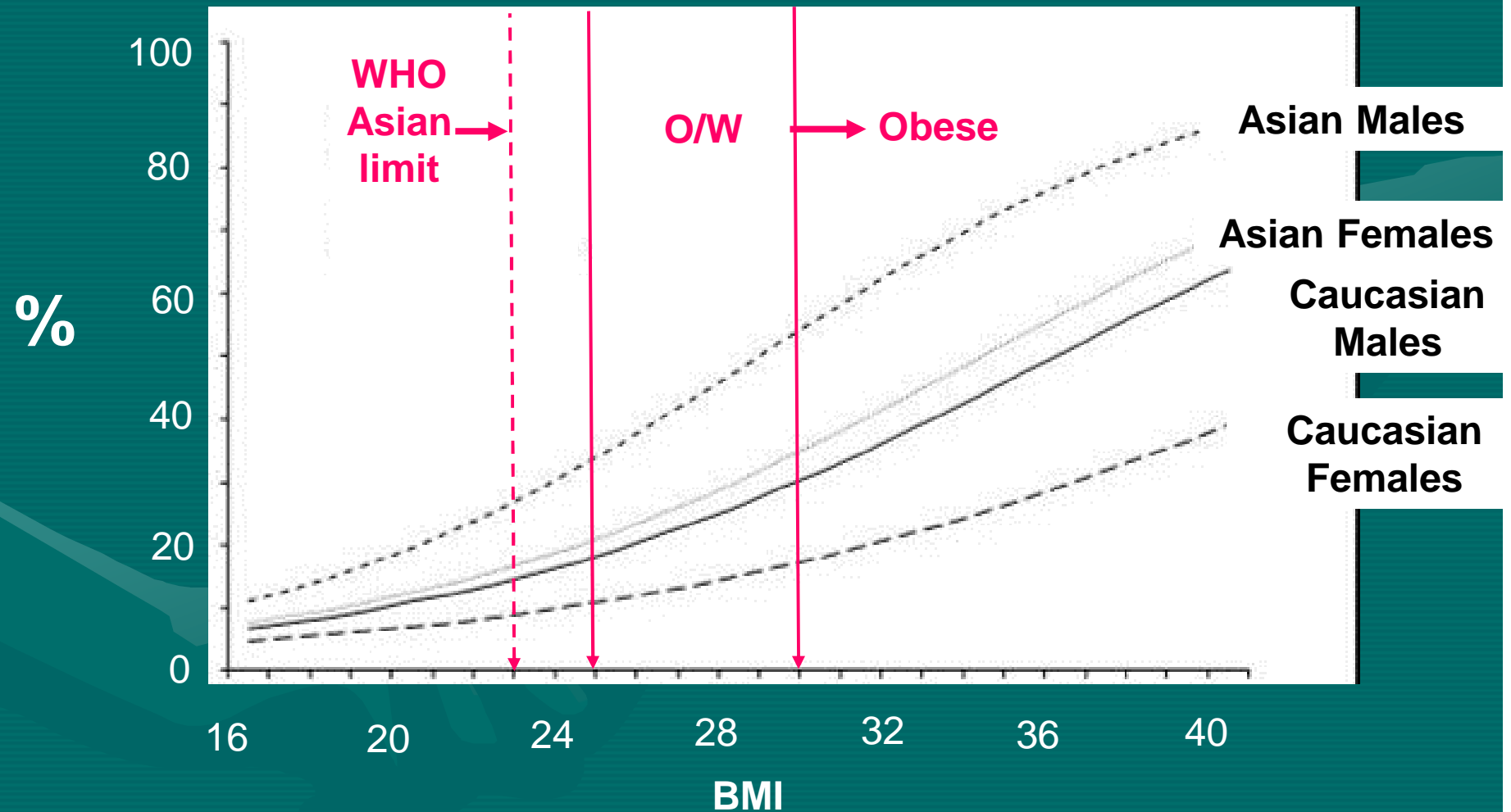
Source: Diabetes Atlas, 2<sup>nd</sup> edition. IDF, 2003.

# Prevalence of type 2 diabetes in Mexican and US population (Non-Hispanic whites) standardized by age



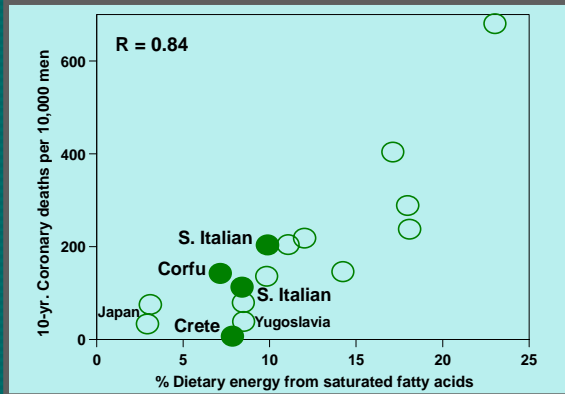
# A Comparison of the impact of BMI on Hypertension in Asians and Caucasians

Hypertension



Huxley R, James WPT et al. Obesity in Asia Collaboration. Ob. Rev. (in press 2007)

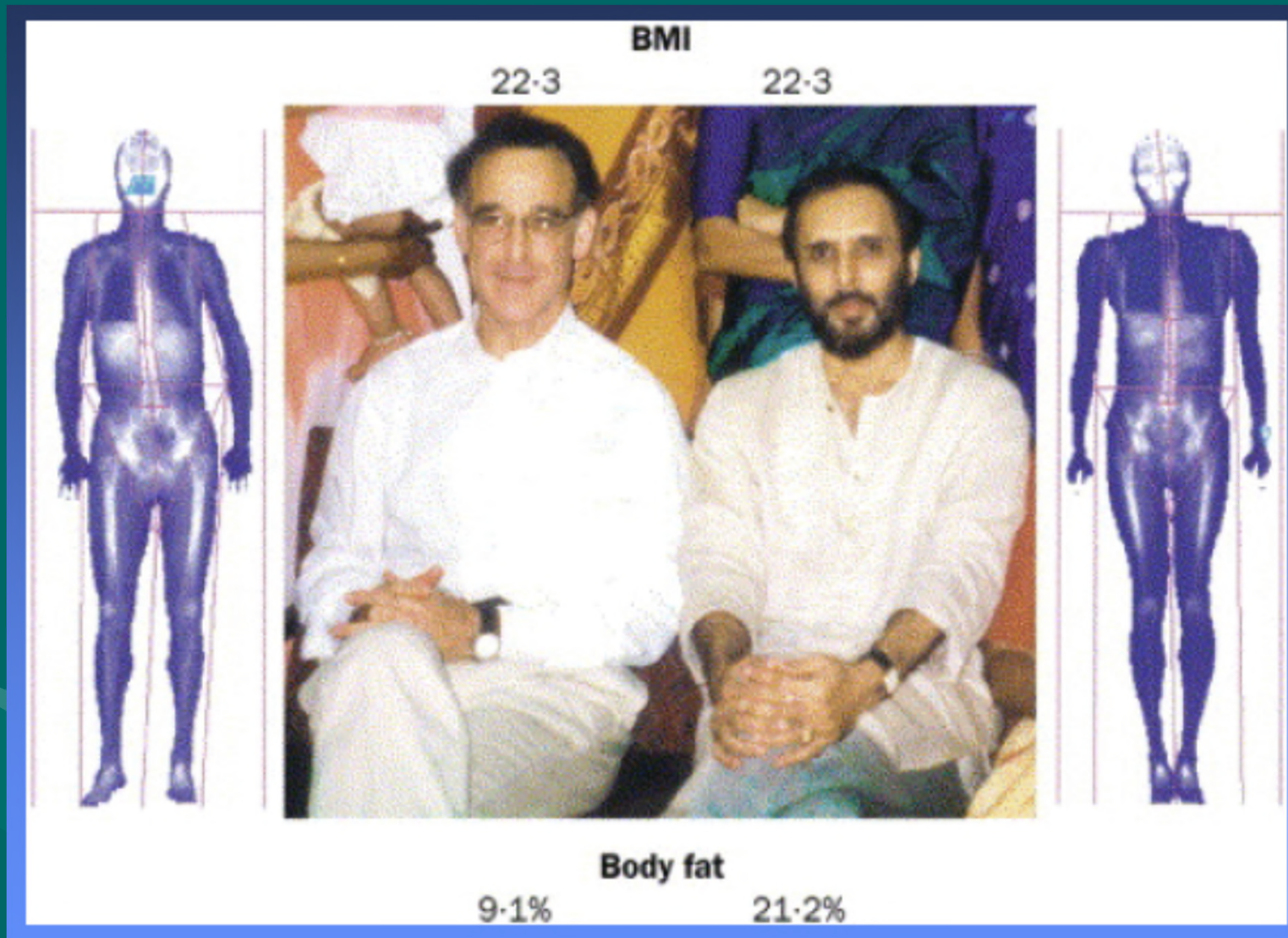
10-year coronary mortality in men - Seven Country Study



# The striking contrast in global nutritional problems

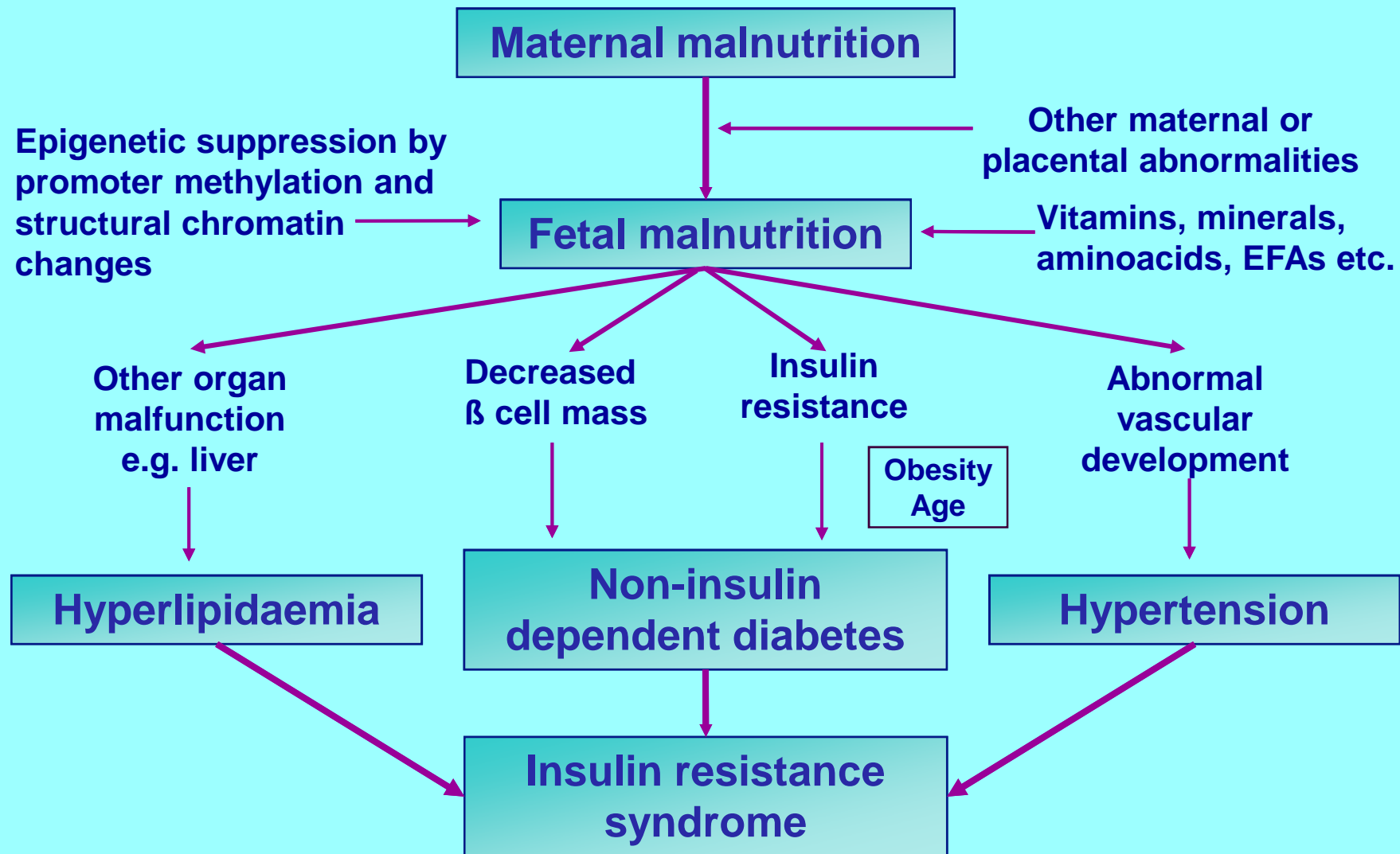


# The Y-Y Paradox



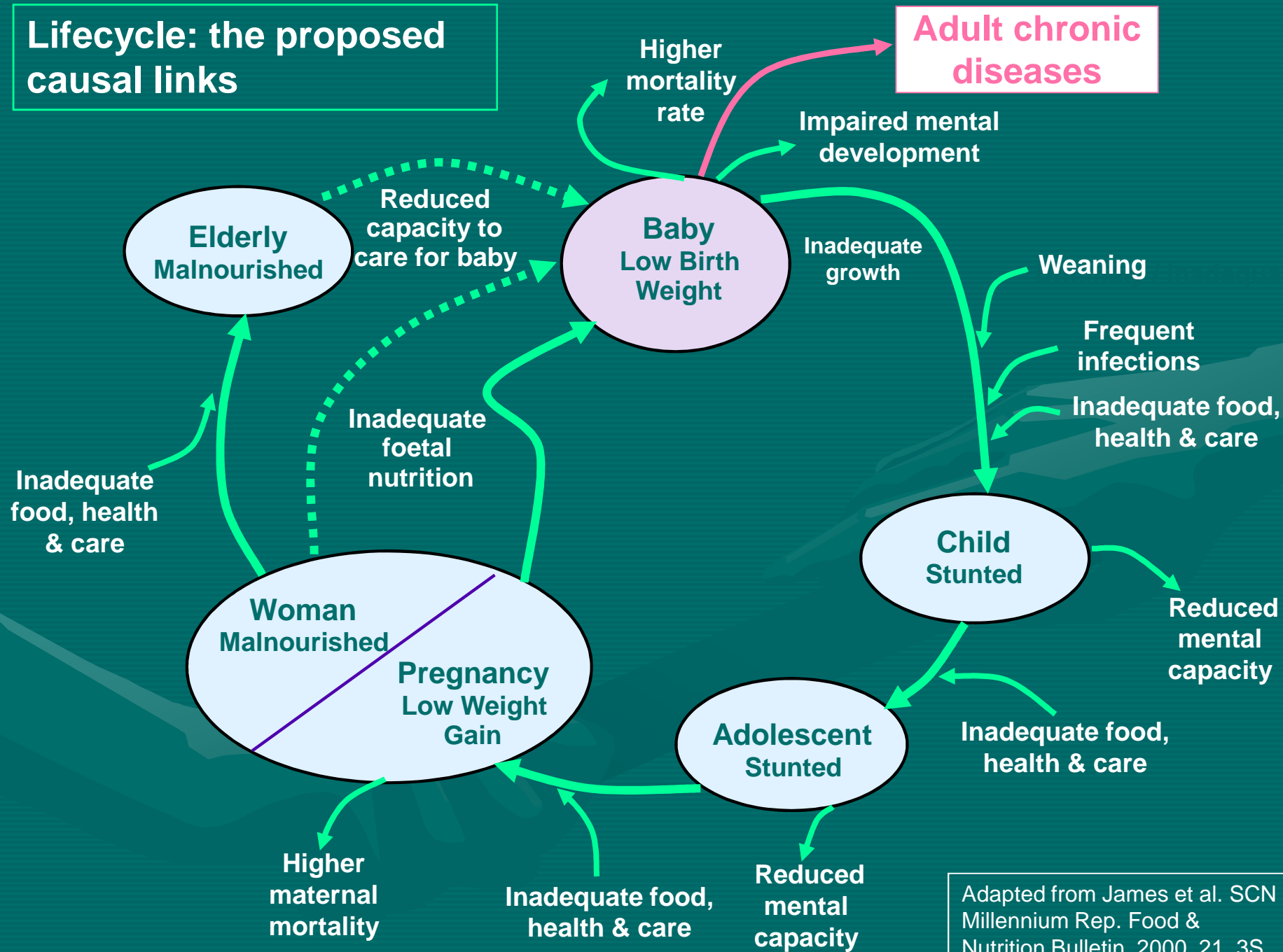
Yajnik and Yudkin, Lancet, 2004, **363:163**.

# Fetal origins of non-insulin-dependent diabetes and insulin resistance syndrome: the 'thrifty phenotype' hypothesis.



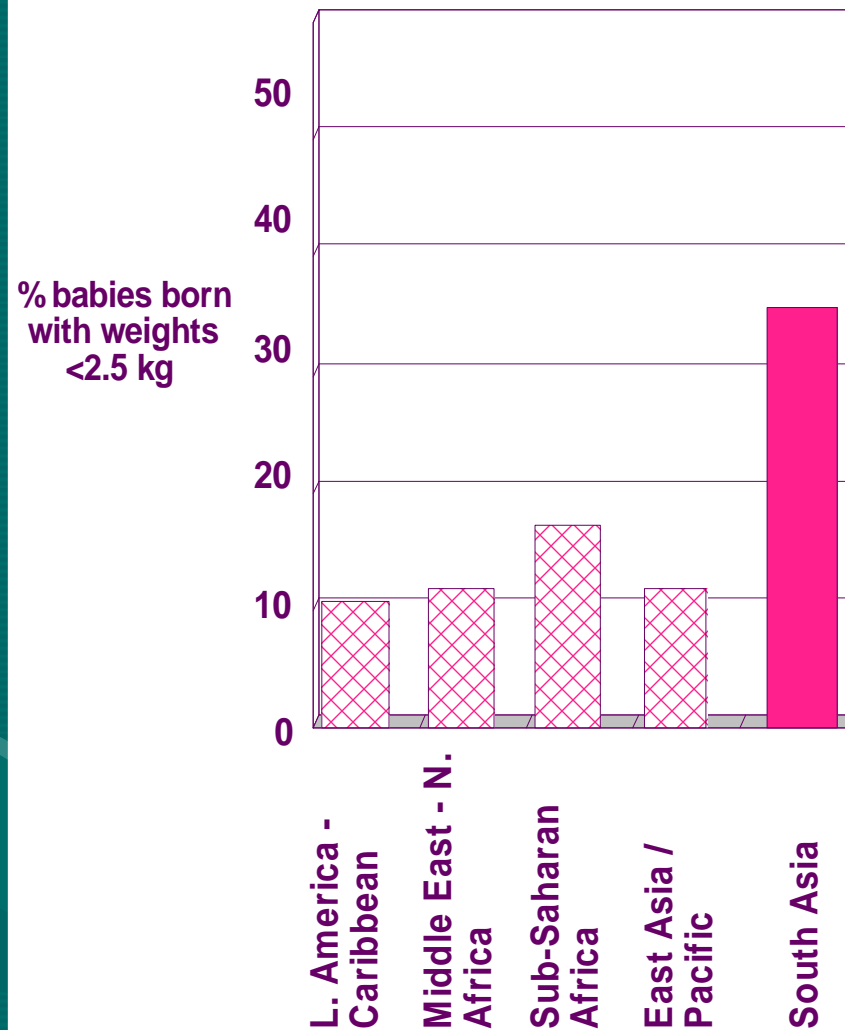
Adapted from Barker, D. Mothers, Babies & Health

## Lifecycle: the proposed causal links

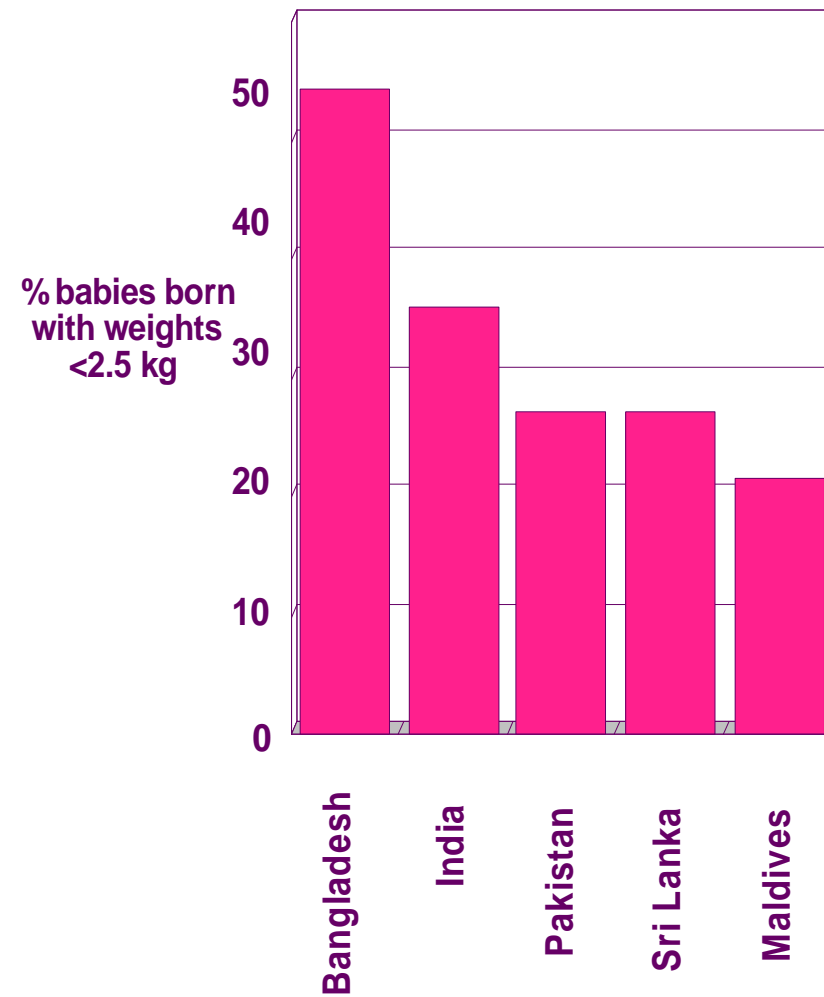


Adapted from James et al. SCN Millennium Rep. Food & Nutrition Bulletin, 2000, 21, 3S.

## The Developing World



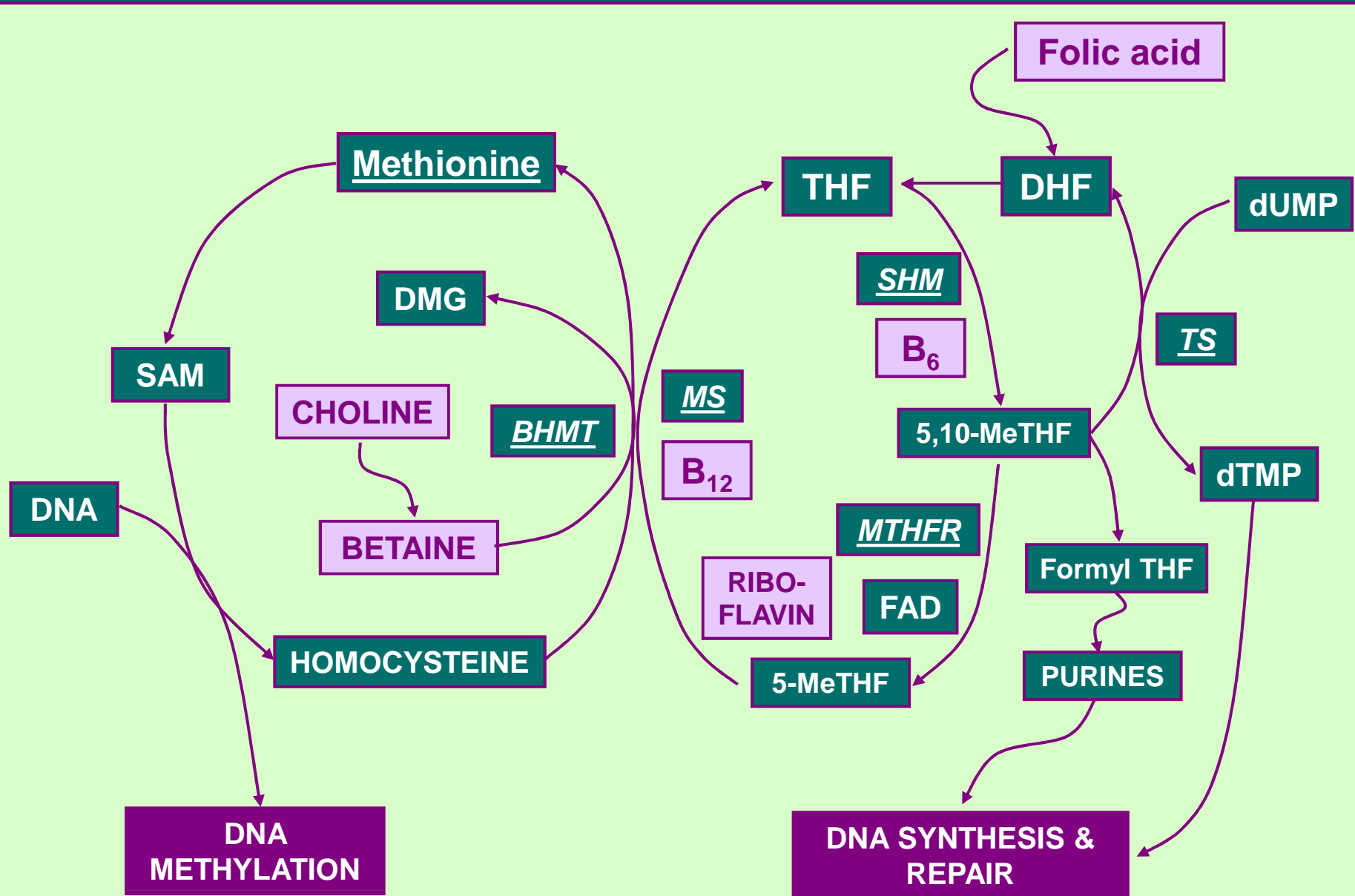
## South Asia



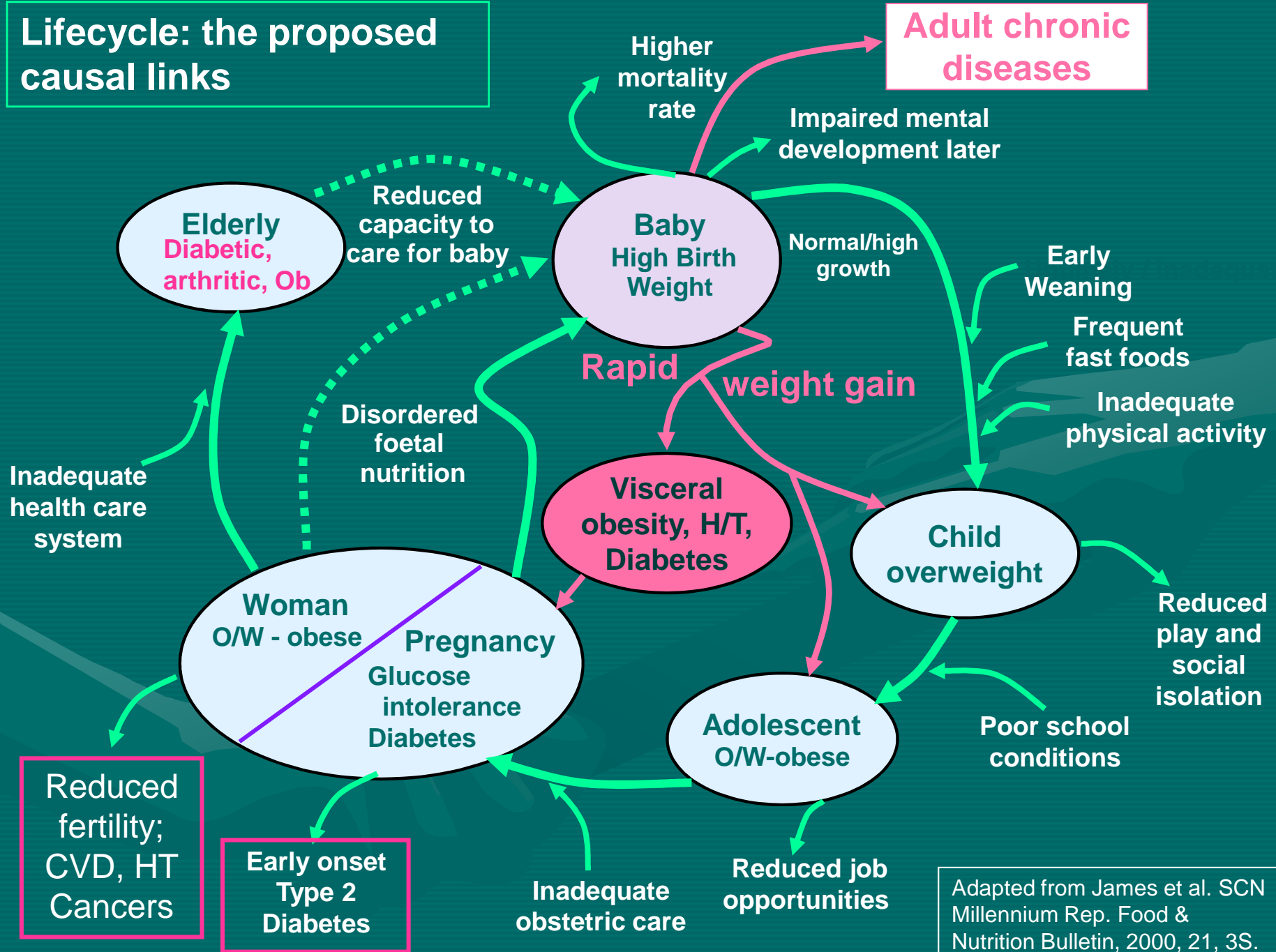
NOTE: On average 18% of babies born in the developing world are of low birth weight.

Source: UNICEF, 1997.

# Vitamin / nutrient involvement in DNA imprinting and cellular synthesis



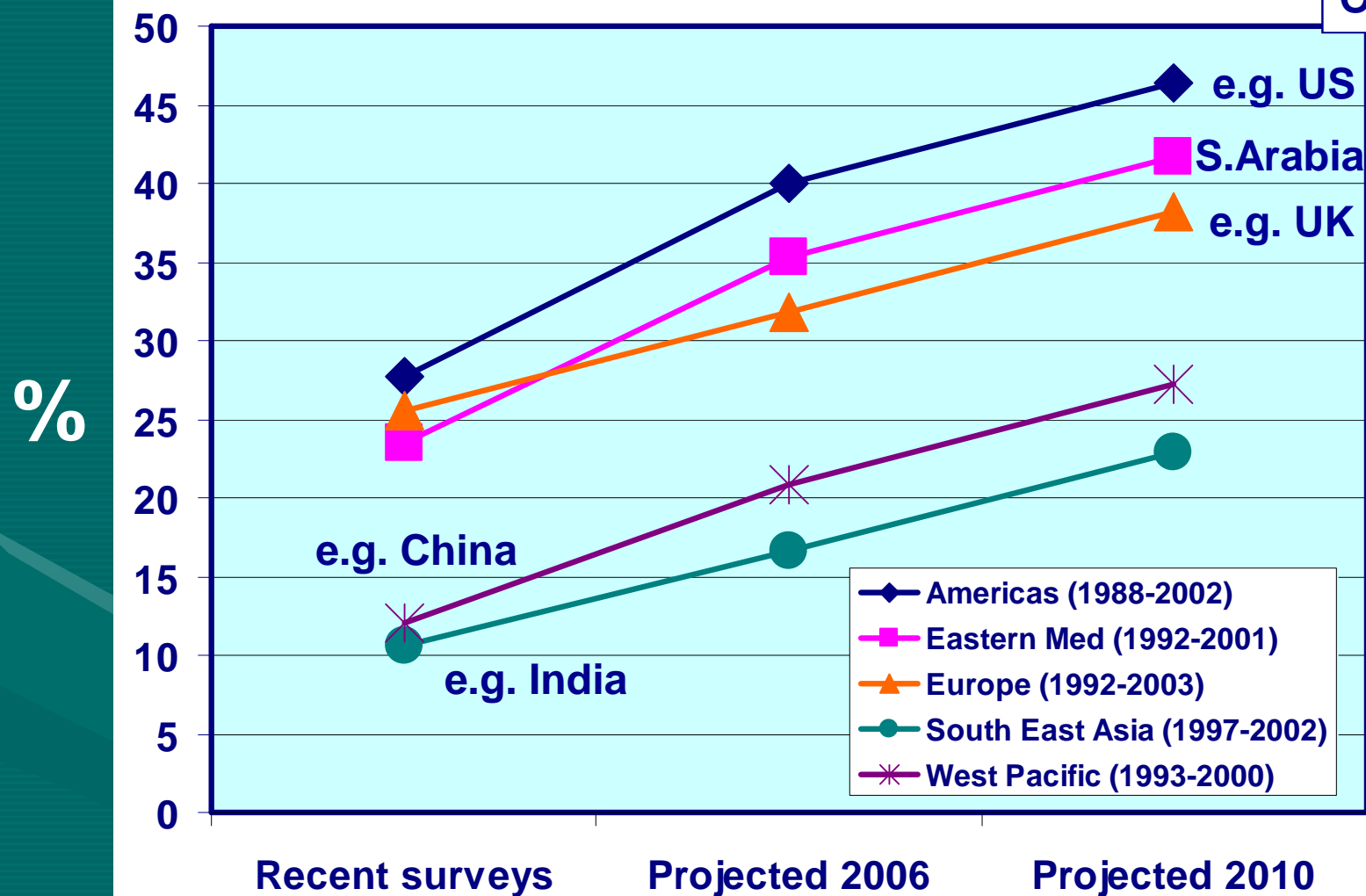
# Lifecycle: the proposed causal links



# Projected overweight (incl. obesity) rates for school age children

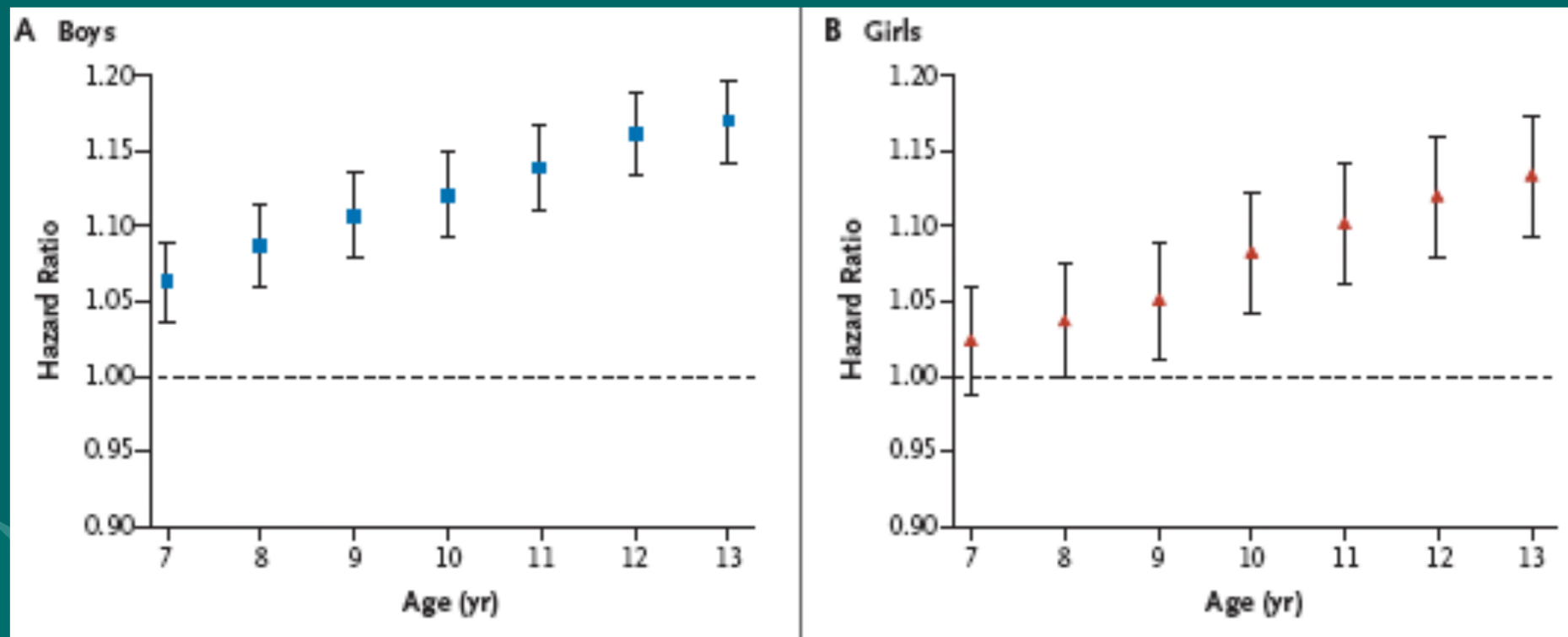
Prevalence

Global total  
Obese 74 mil.  
O/wt 287 mil.



Wang and Lobstein, IOTF, 2006.

# The increasing risk of adult coronary heart disease as childhood BMIs increase by one Z score from 7-13 yrs



Copenhagen school children's study on 276,835 children measured from 1955 - 1960 with National Death and Hospital Discharge Registries . BMI Z scores linearly related to events at all ages but hazard ratio progressively increased with age as shown.

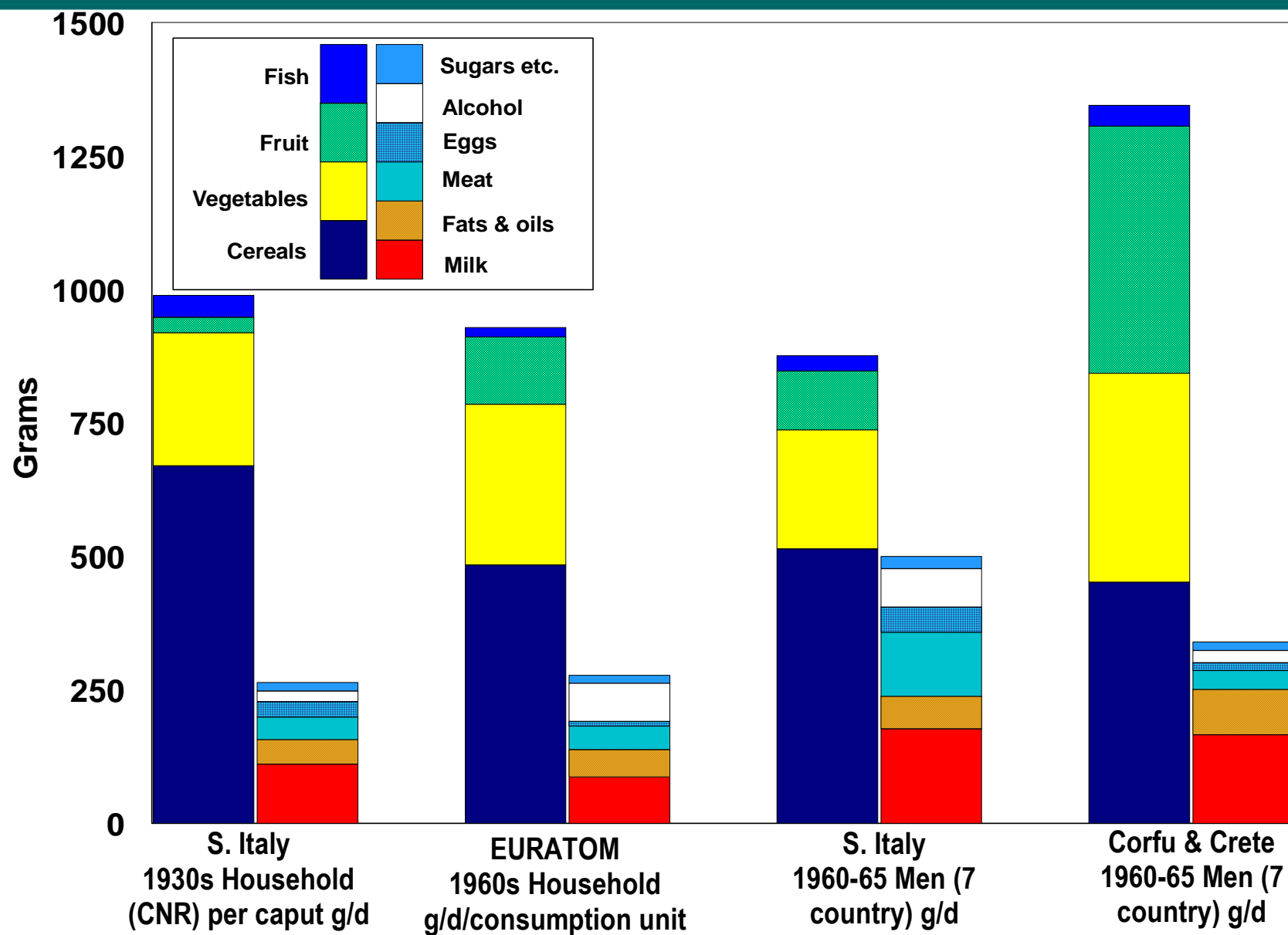
Baker, Olsen & Sorensen. NEJM 2007, 357: 2329-32

# WHO global strategy on diet, physical activity and health

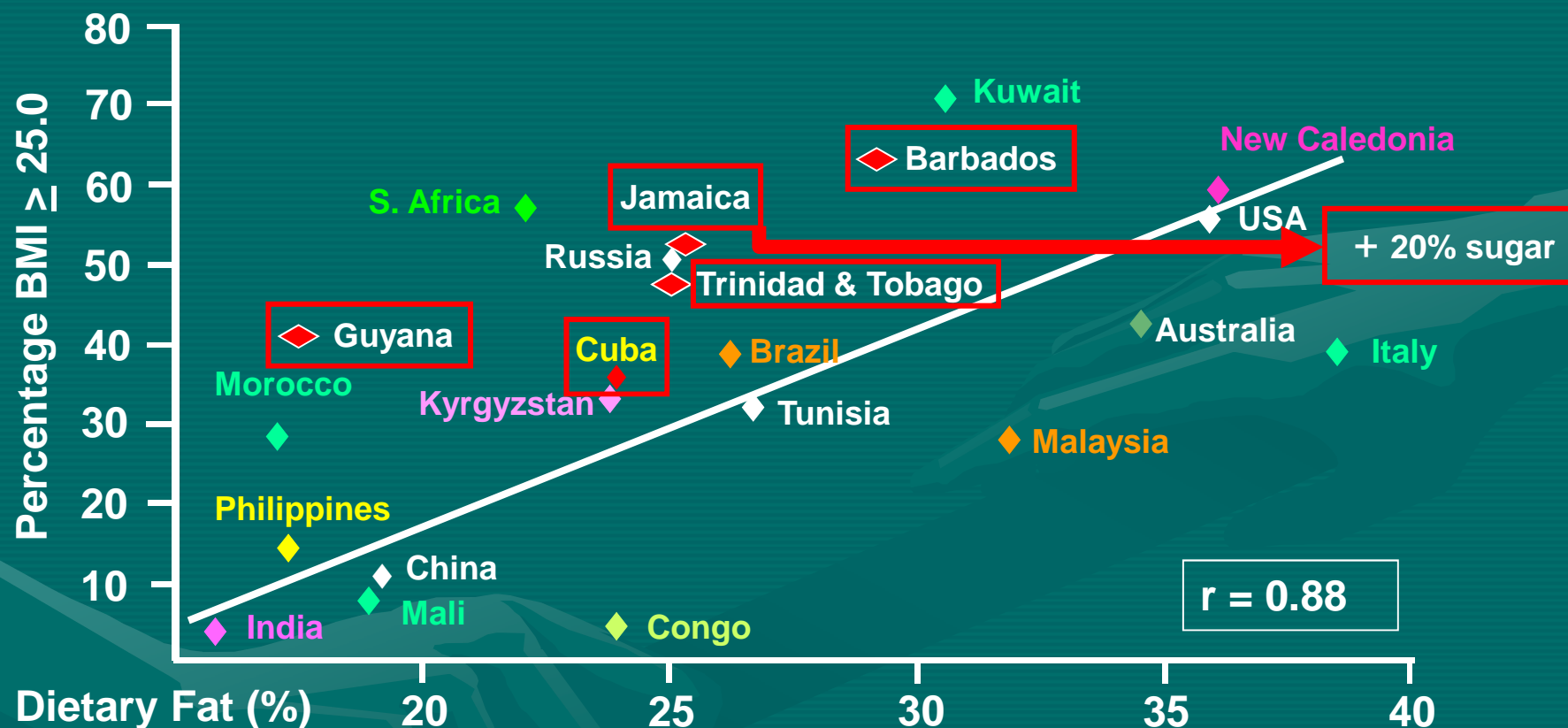
- Agreed by 191 governments
- Recommendations to curb consumption of fat, sugar and salt
- Action programme to engage regions and countries in implementing effective strategies



## The traditional Mediterranean diet



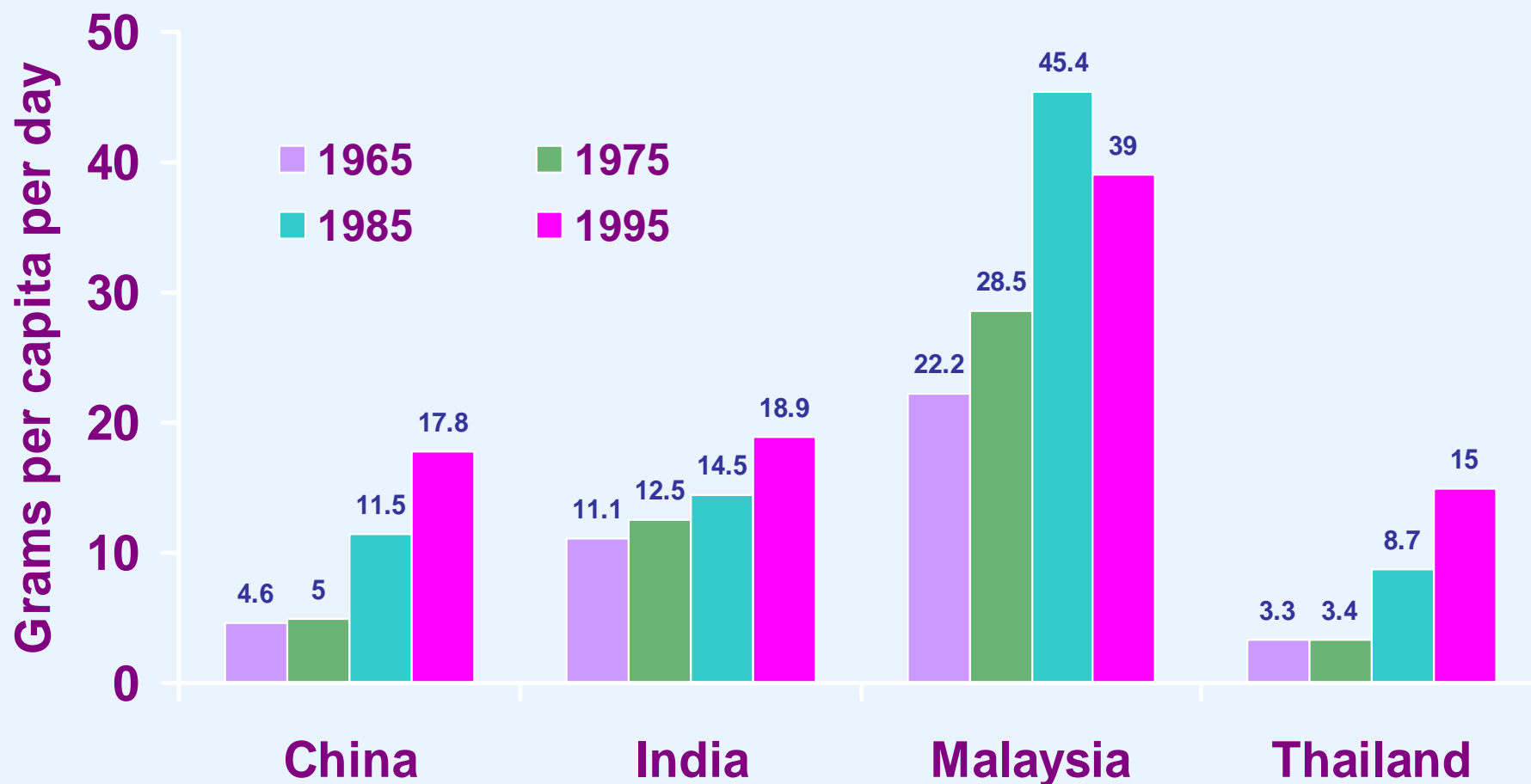
# Dietary fat and overweight : Latin American & Caribbean comparisons + sugar effect



Adapted from Bray & Popkin, Am. J. Clin. Nutr., 1998; 68: 1157-73 and data from FAO 2005, CFNI and national surveys

The epidemic is inevitable unless policies to substantially reduce fat and sugar intakes and increase activity are introduced now

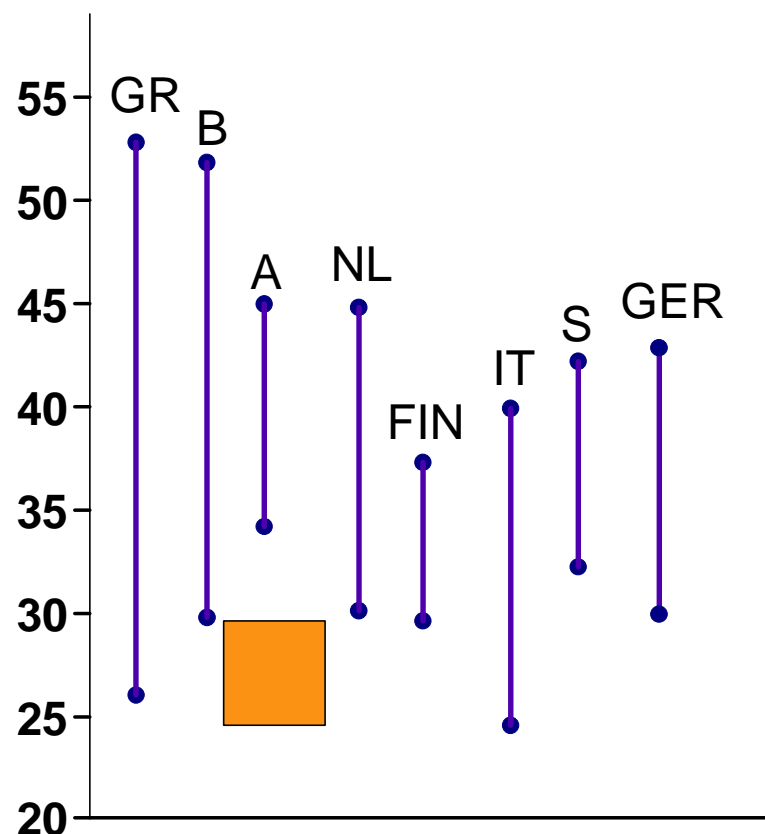
Increased vegetable oil consumption is a key component  
of the shift in the stages of the Nutrition Transition in Asia



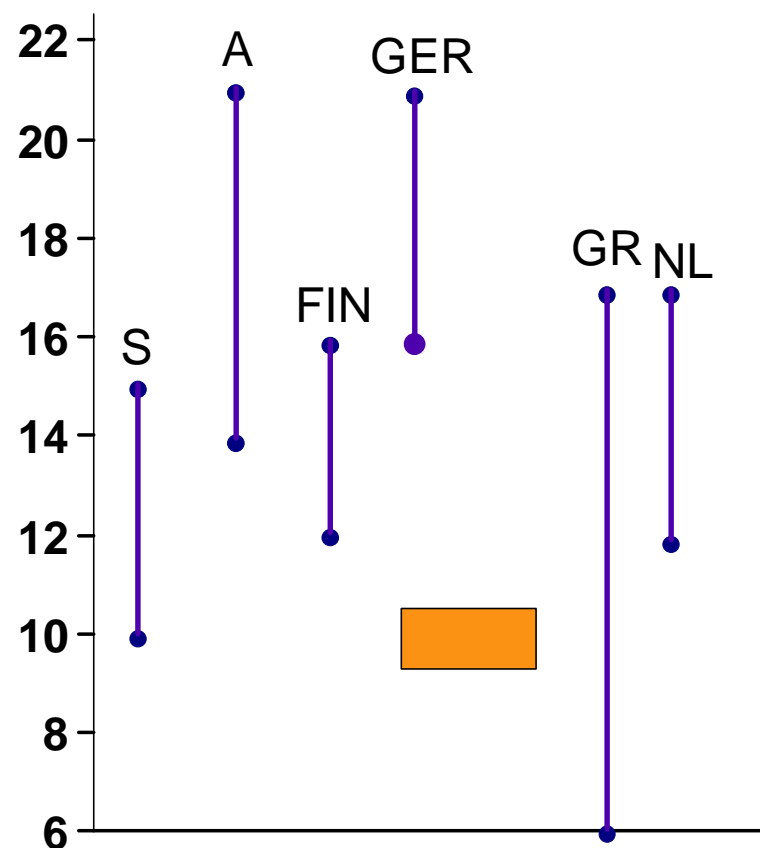
Source: Food Balance data, UNFAO

## Current intakes (inter-quartile ranges) in European National surveys in relation to nutrient goals

% fat energy



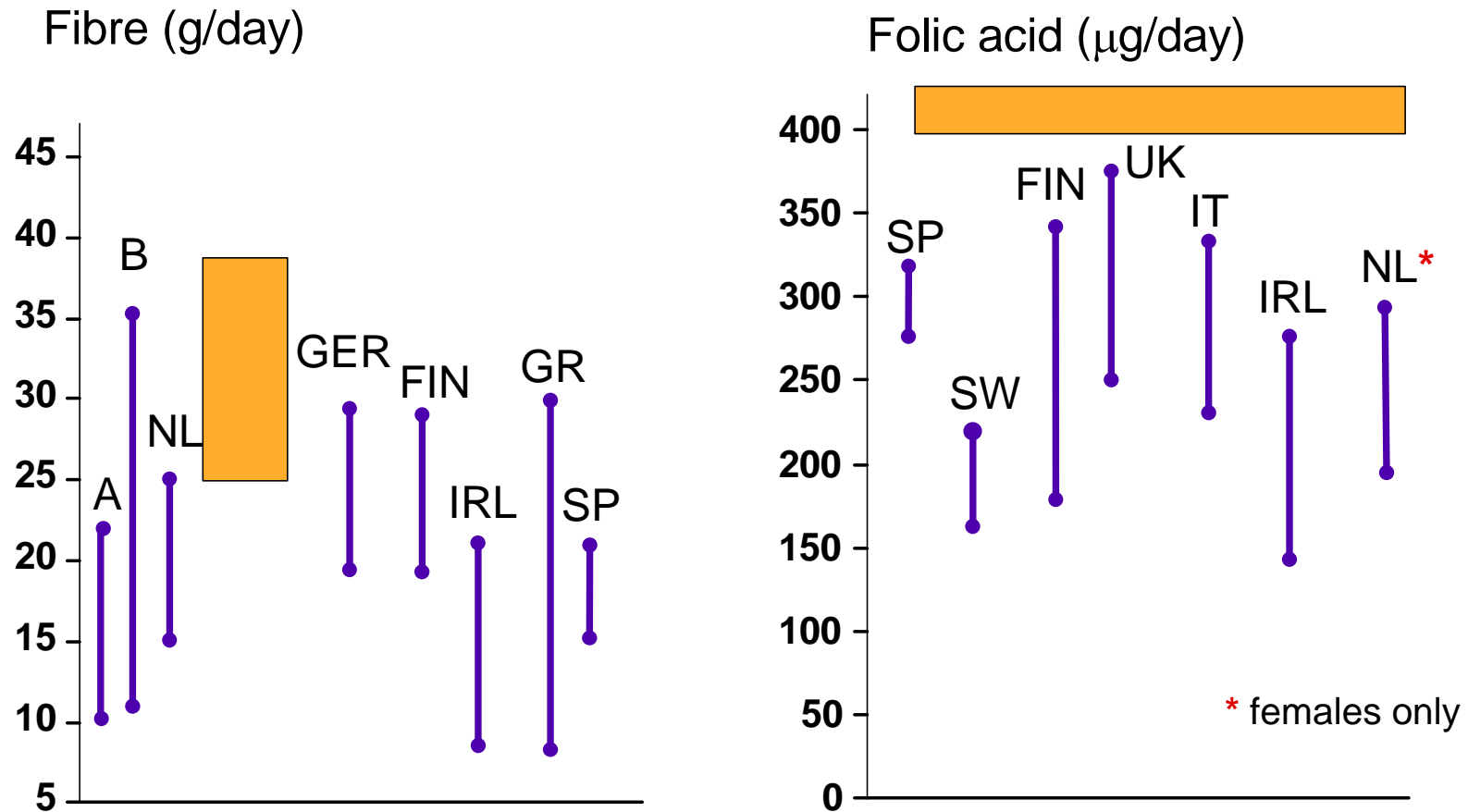
% SFA energy



A = Austria; B = Belgium; FIN = Finland; GER = Germany; GR = Greece; IRL = Ireland; IT = Italy; NL = Netherlands; SP = Spain; SW = Sweden; UK = United Kingdom

 = range of member state recommendations for these nutrients

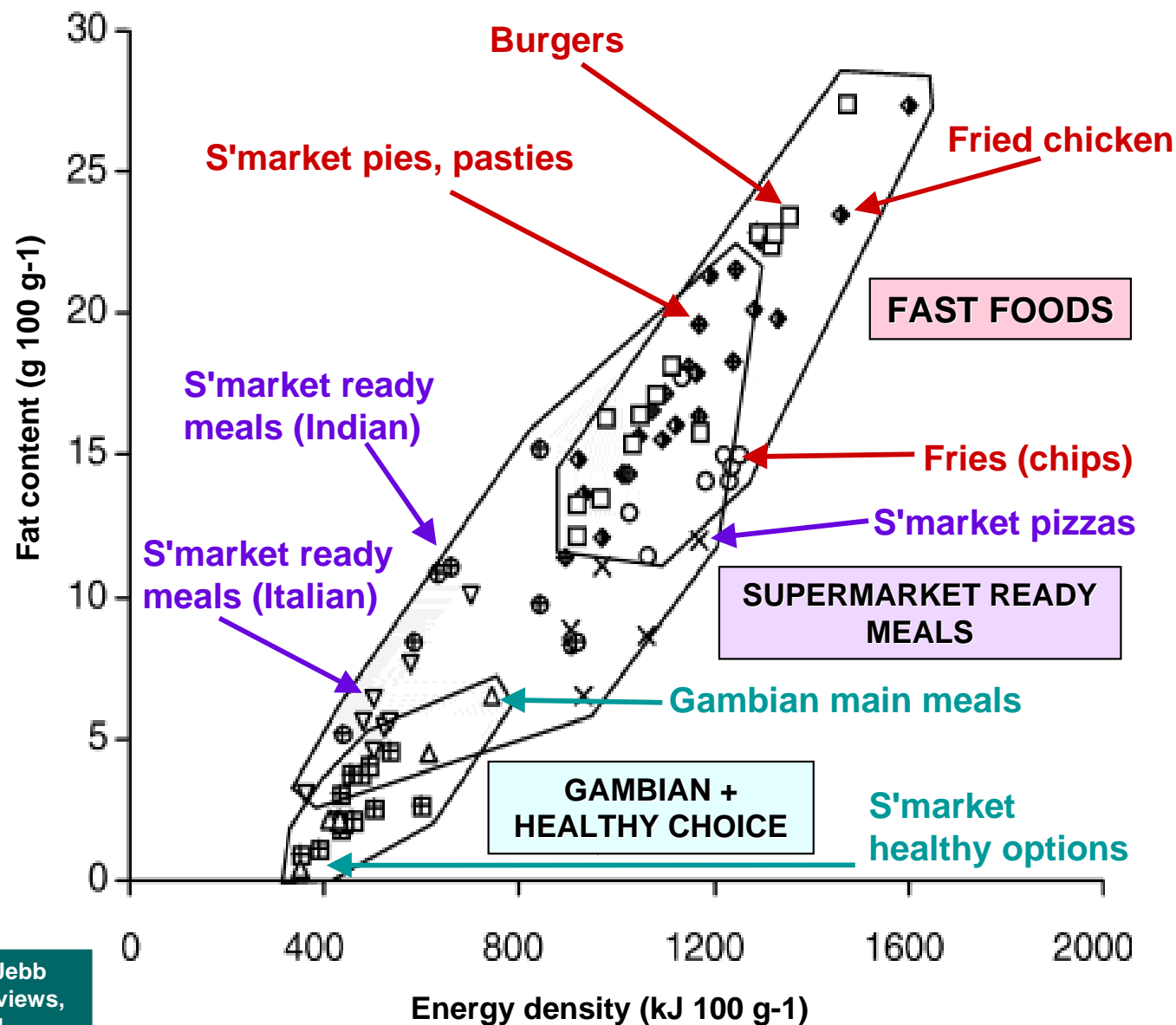
## Current intakes in relation to ideal international goals



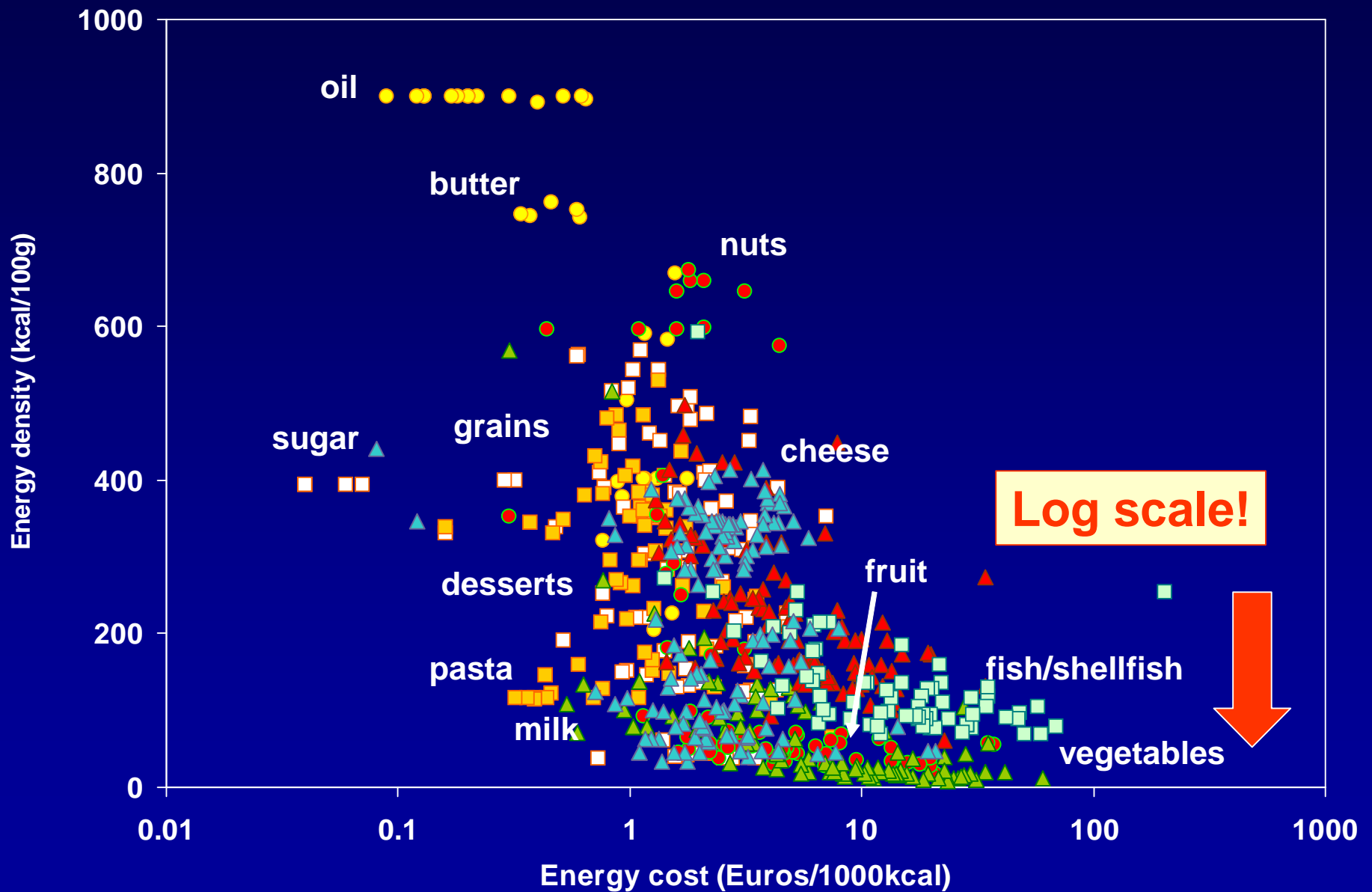
A = Austria; B = Belgium; FIN = Finland; GER = Germany; GR = Greece; IRL = Ireland; IT = Italy; NL = Netherlands; SP = Spain; SW = Sweden; UK = United Kingdom

 = range of member state recommendations for these nutrients

# The energy density of different foods is markedly influenced by their fat content



## High energy dense foods (kcal / 100g) cost less (€ / 1000 kcal)



Darmon, Darmon, Maillot and Drewnowski, JADA, 2005

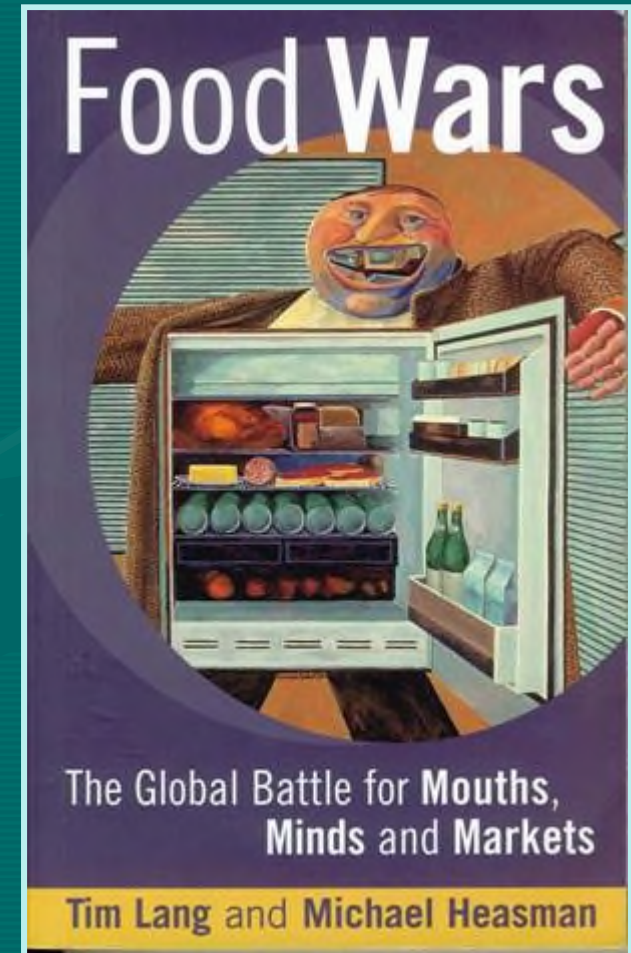


A quarter-pound cheeseburger, large fries and a 16 oz. soda provide:

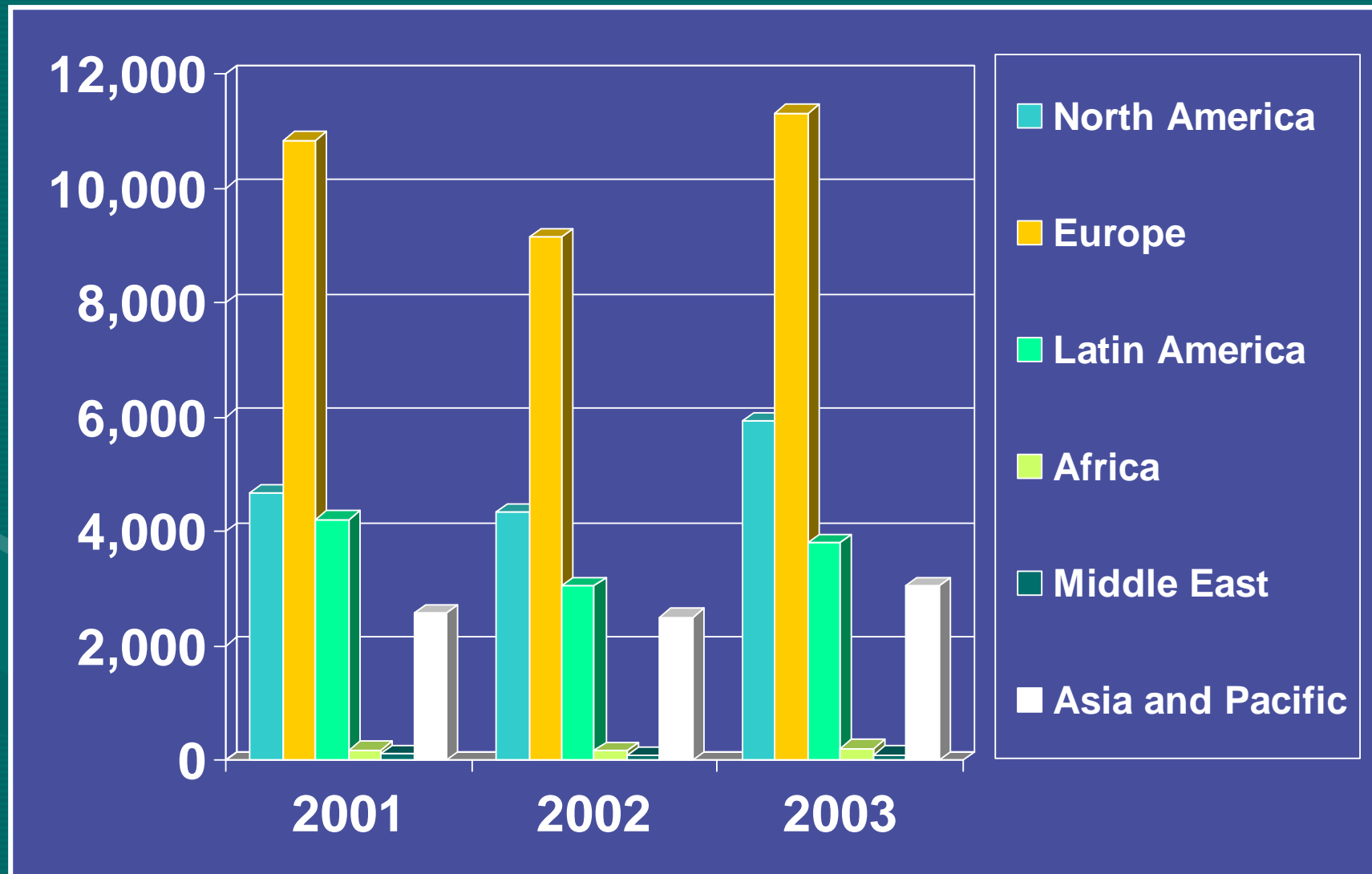
- ➔ 1,166 calories
- ➔ 51 g fat
- ➔ 95 mg cholesterol
- ➔ 1,450 mg sodium

# The keys to success in the food business and in obesity and chronic disease prevention

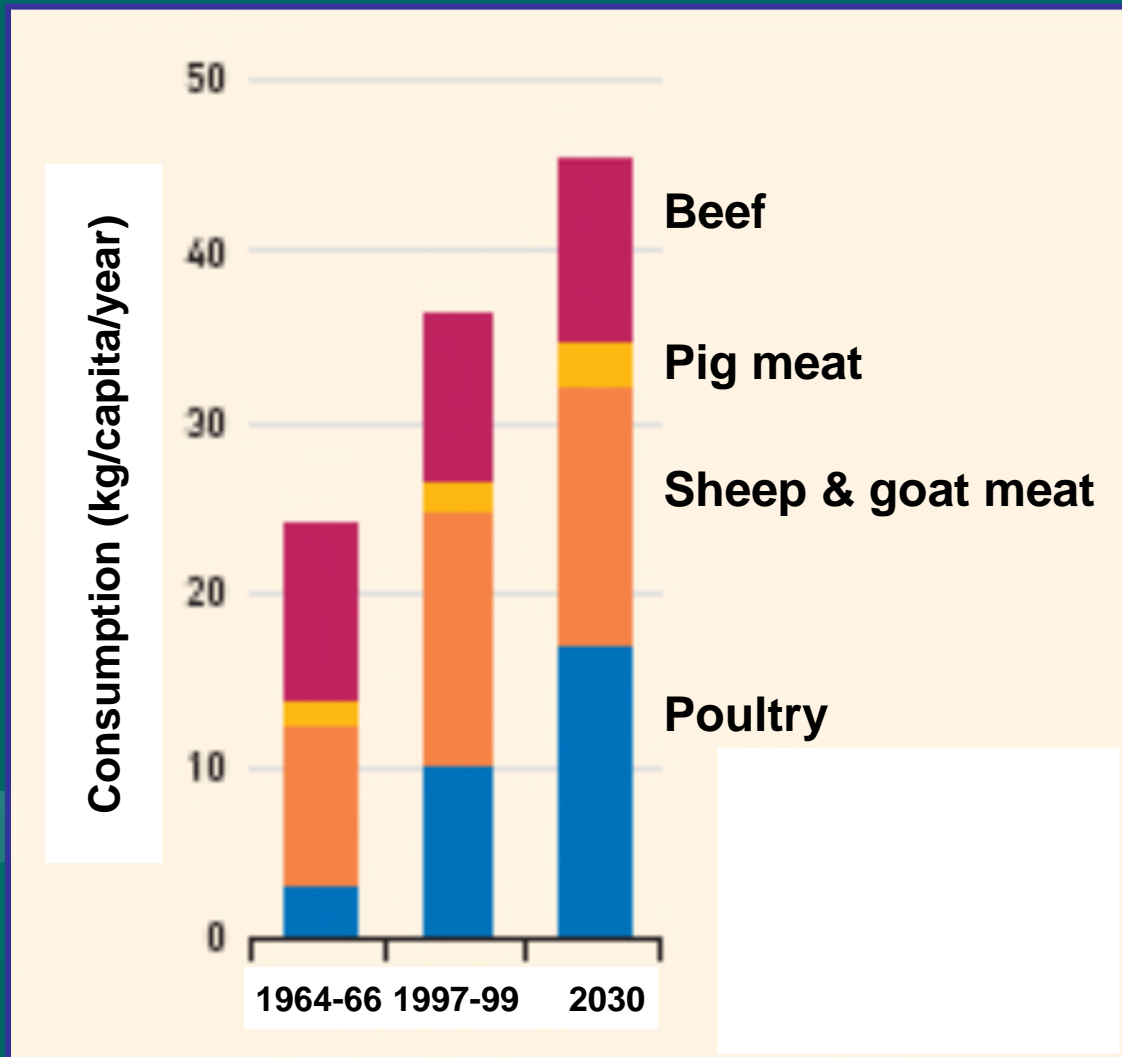
- **Price**
- **Availability**
- **Marketing**



# 'U.S. foreign direct investment in food manufacturing \$ million 2001-03

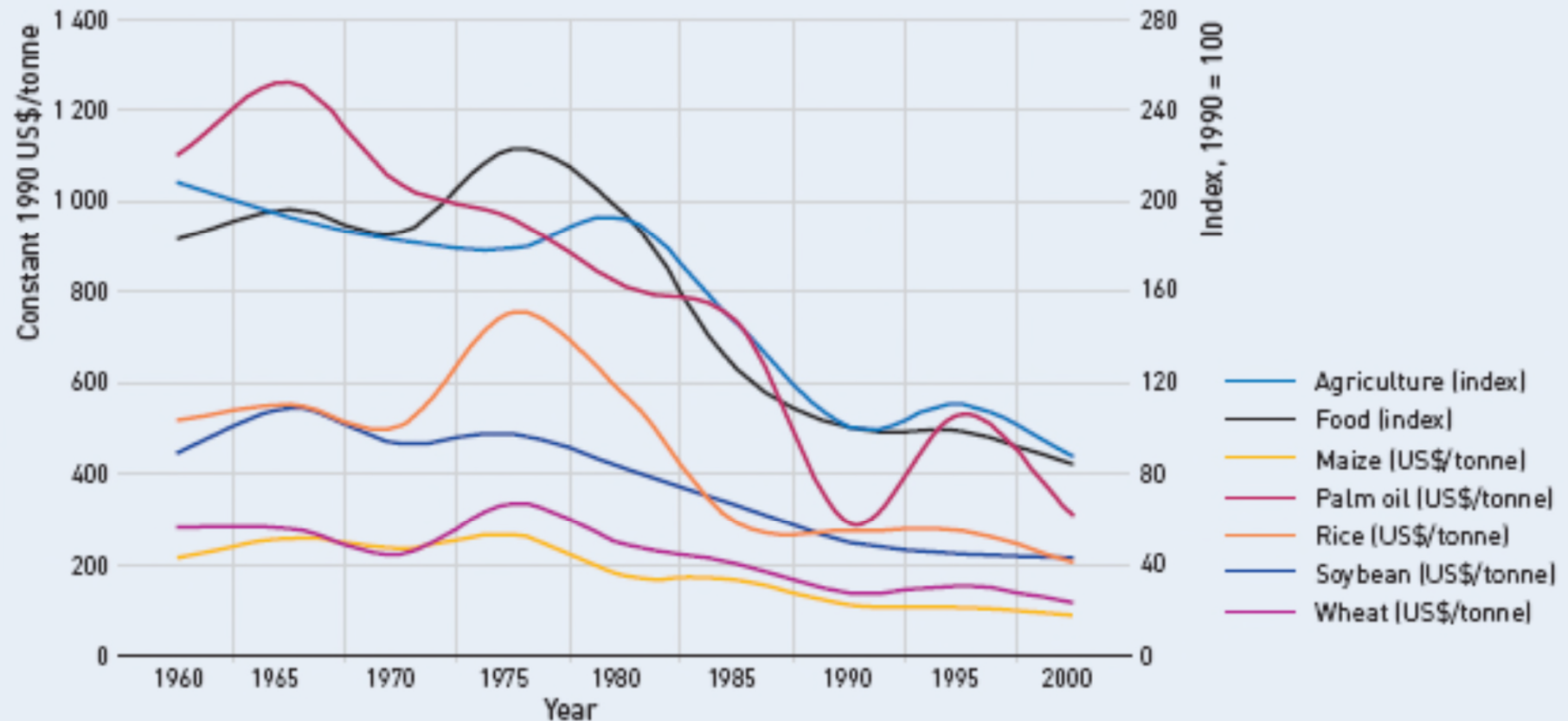


# World average meat consumption per person, 1964-66 to 2030



Source: FAO data and projections

# The fall in the cost of agricultural commodities 1960-2000



Source: World Bank [2001a]

Based on world market prices related to 1990

# Food without Thought

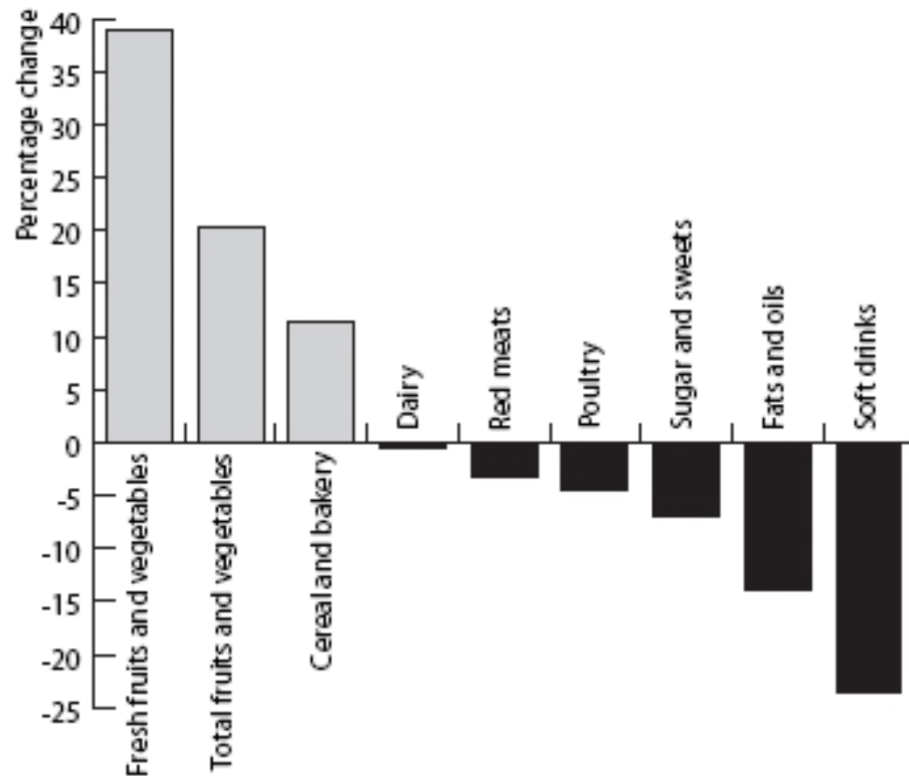
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## How U.S. Farm Policy Contributes to Obesity



Institute for Agriculture and Trade Policy  
Environment and Agriculture Program

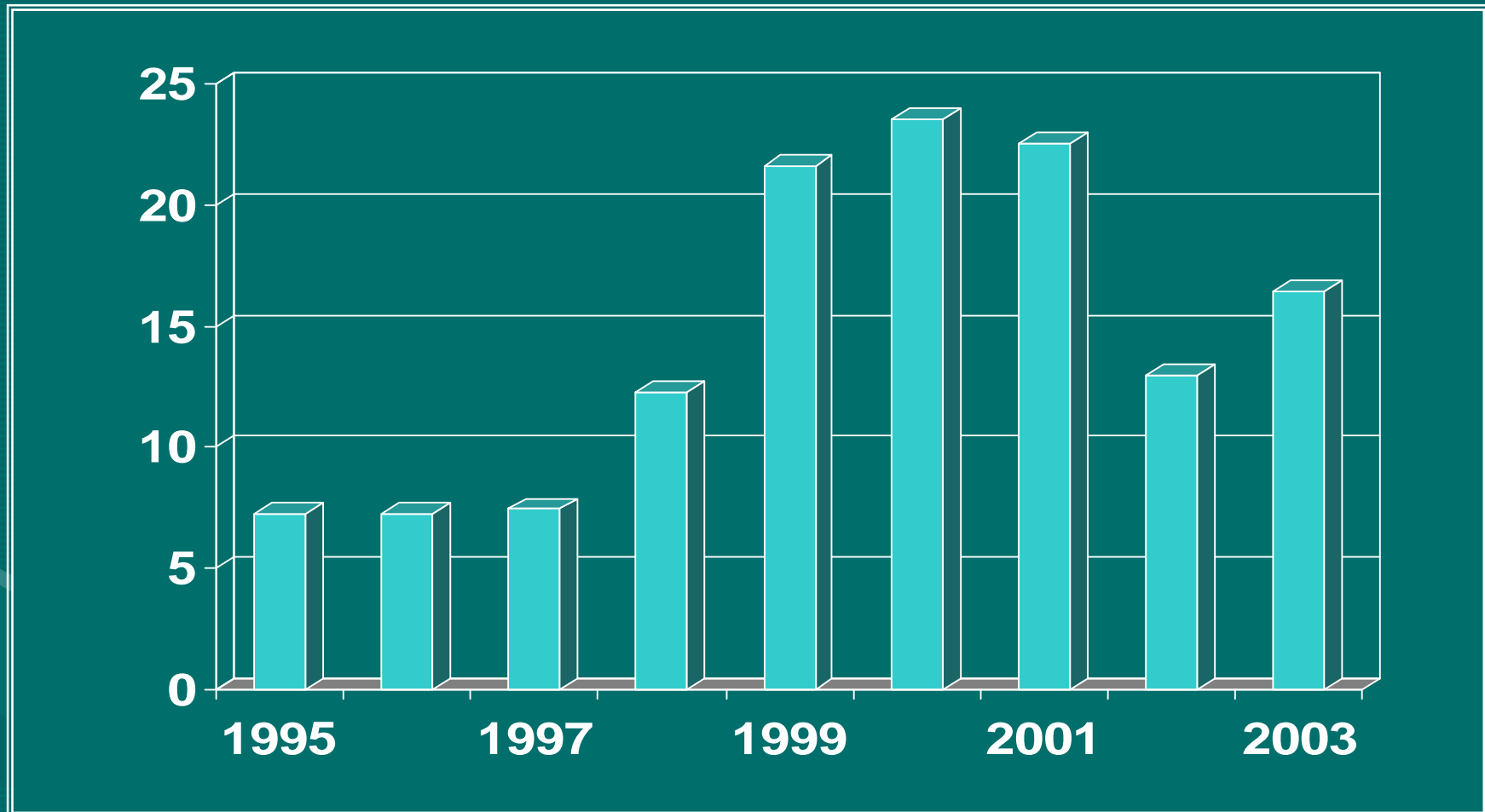
Change in food prices, 1985–2000  
(real dollars)



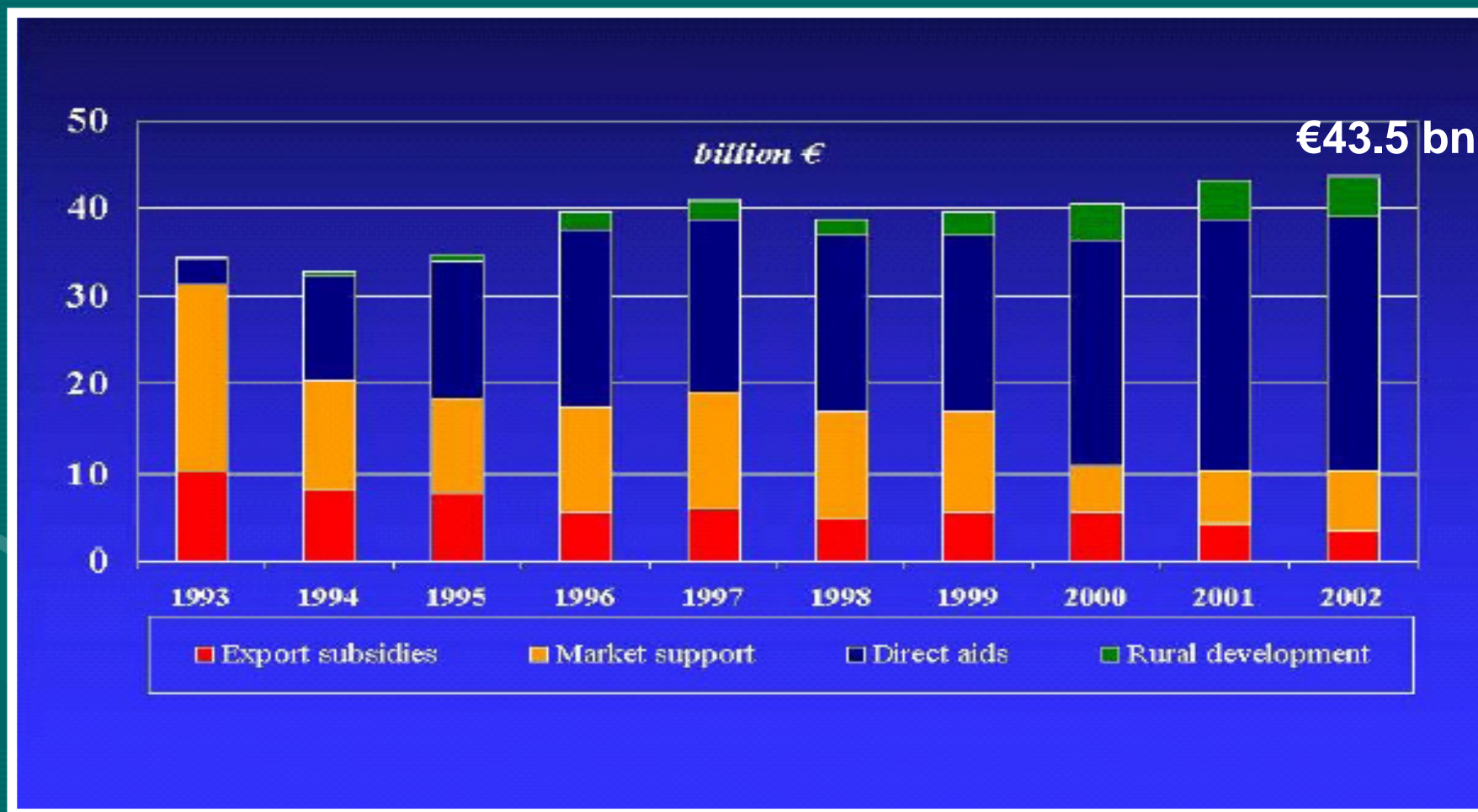
Source: USDA ERS FoodReview, Vol. 25, Issue 3. Converted to real dollars.

Government support for producing grain and oilseed crops comes in many forms, from money invested in public universities and government agencies to research such crops, to subsidy payments that make up for low prices, to continued promises of increased export markets for these crops.

# US farm subsidies \$ billion



# EU CAP Expenditures



Source: Schäfer Elinder L., Public Health Aspects of EU CAP, 2003

## Complementary approaches to obesity & chronic disease prevention

## Individual responsibility

e.g. Focus on Health Education - but need understandable food labelling; campaigns selectively help upper socio-economic groups



## Changes to the "toxic" environment

- Progressively adapt all towns/cities to favour pedestrian/cycling as norm with car restrictions
- Nutritional standards for food in all government facilities/schools; eliminate trans fats; catering on Finnish scale: fruit + veg. within meal costs
- Limit/abolish all marketing to children
- Selectively increase costs of high fat/sugary products; soft drinks
- Social/employment/medical policies for breast feeding as the norm

Adapted from Puska P, 2001

# Derek Wanless report to UK Prime Minister 2004 & Kings Fund Sept 2007!

- Major health problems and costs relate to:
  - Smoking,
  - Obesity (diet)
  - Physical inactivity
- Causes are socio-economic
- Solutions are socio-economic
- The Dept of Health copes - cannot solve the problems

## Wednesday 11<sup>th</sup> Sept:

- "However, without ....efforts to tackle key determinants of ill health, such as obesity, even higher levels of funding will be needed over the next two decades to deliver the high-quality services envisaged by the 2002 Wanless review."

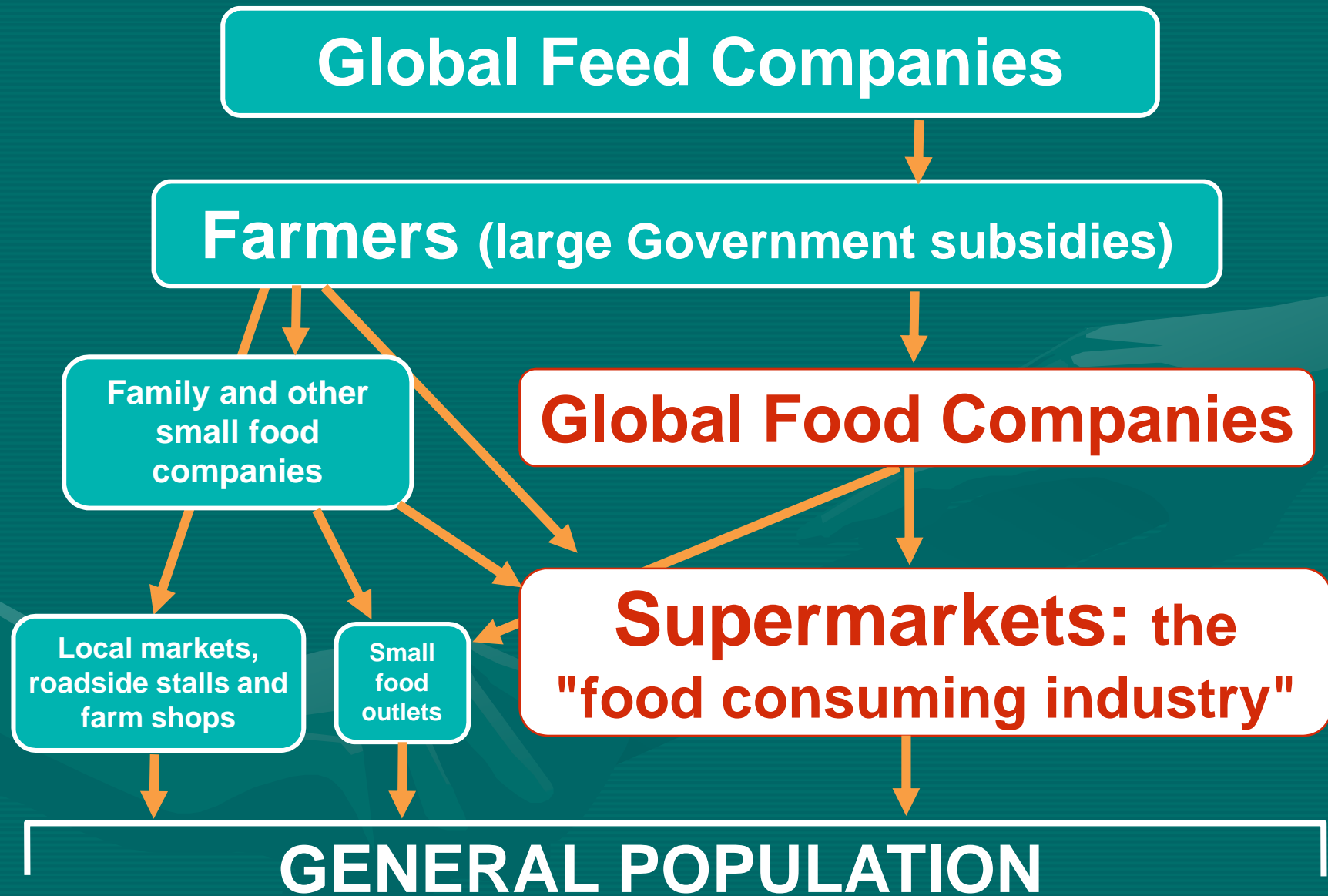
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Wanless D. Reports to the Treasury on  
Public Health: First Report, 2002;  
Second Report, 2004

Wanless et al. Our future  
Health Secured? Sept 11<sup>th</sup>  
2007

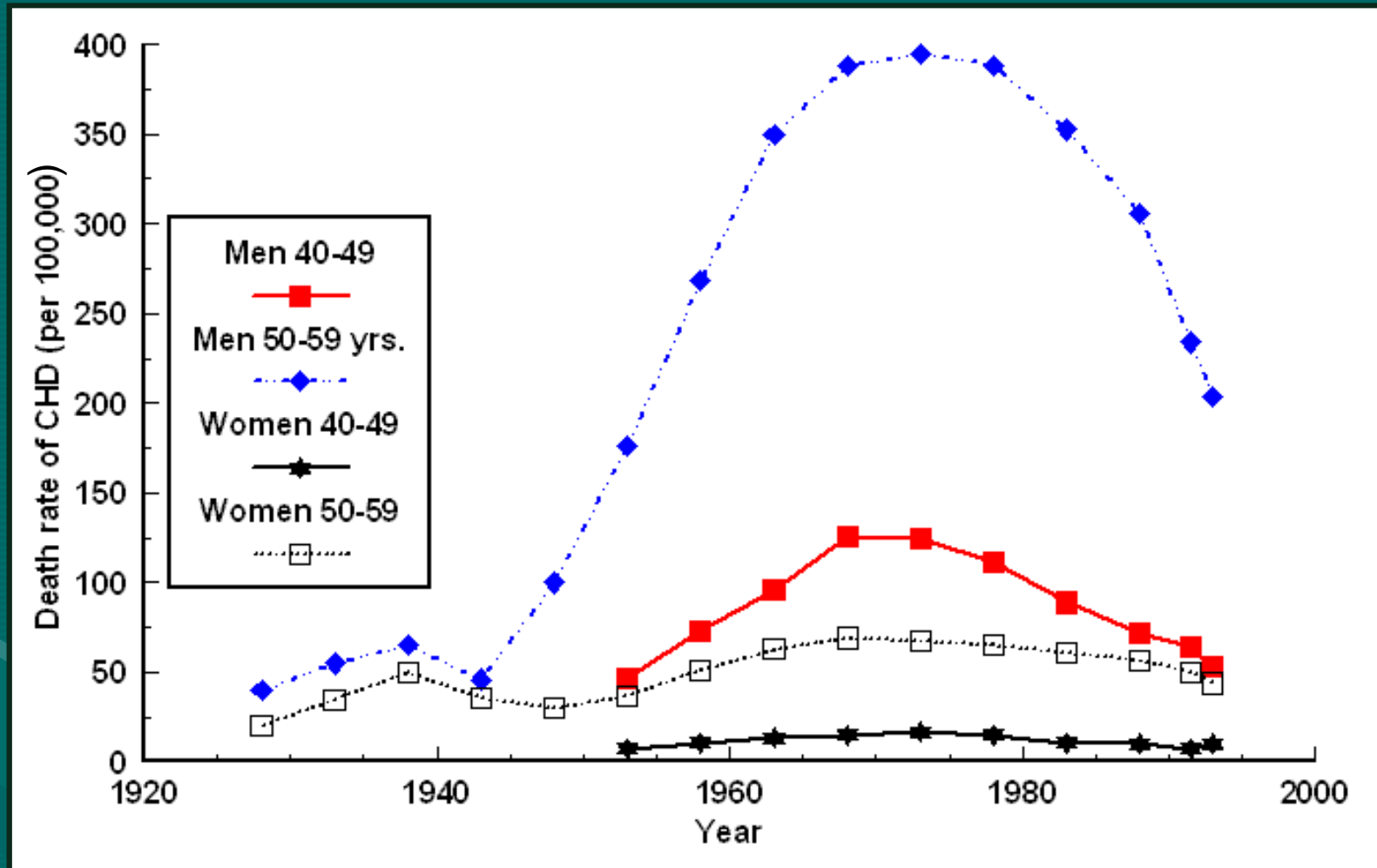


# Who controls the food chain ?



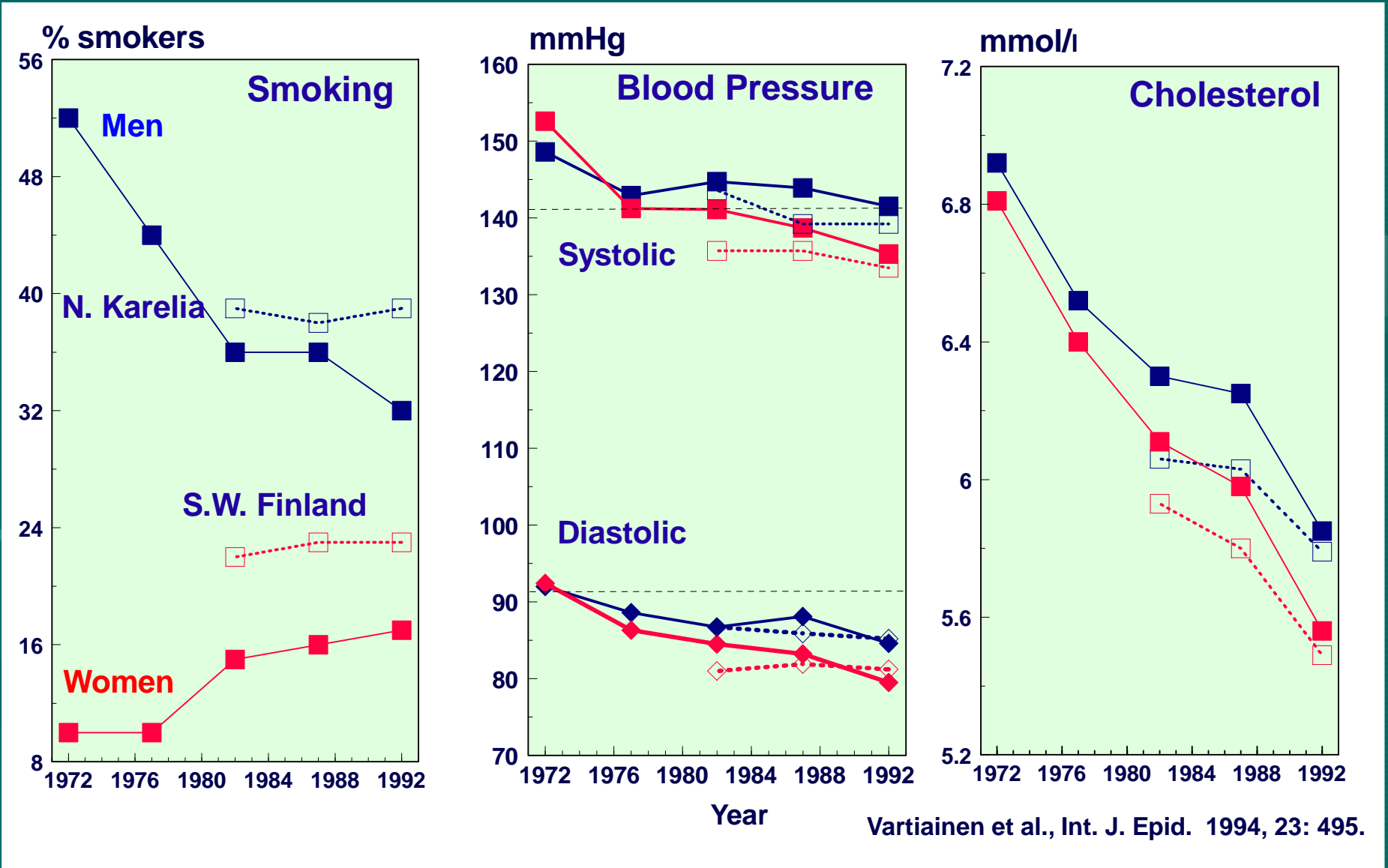
Adapted from Corinna Hawkes, 2006

## Nutritionists advocate a "balanced diet": the emergence of coronary heart disease in the Western world



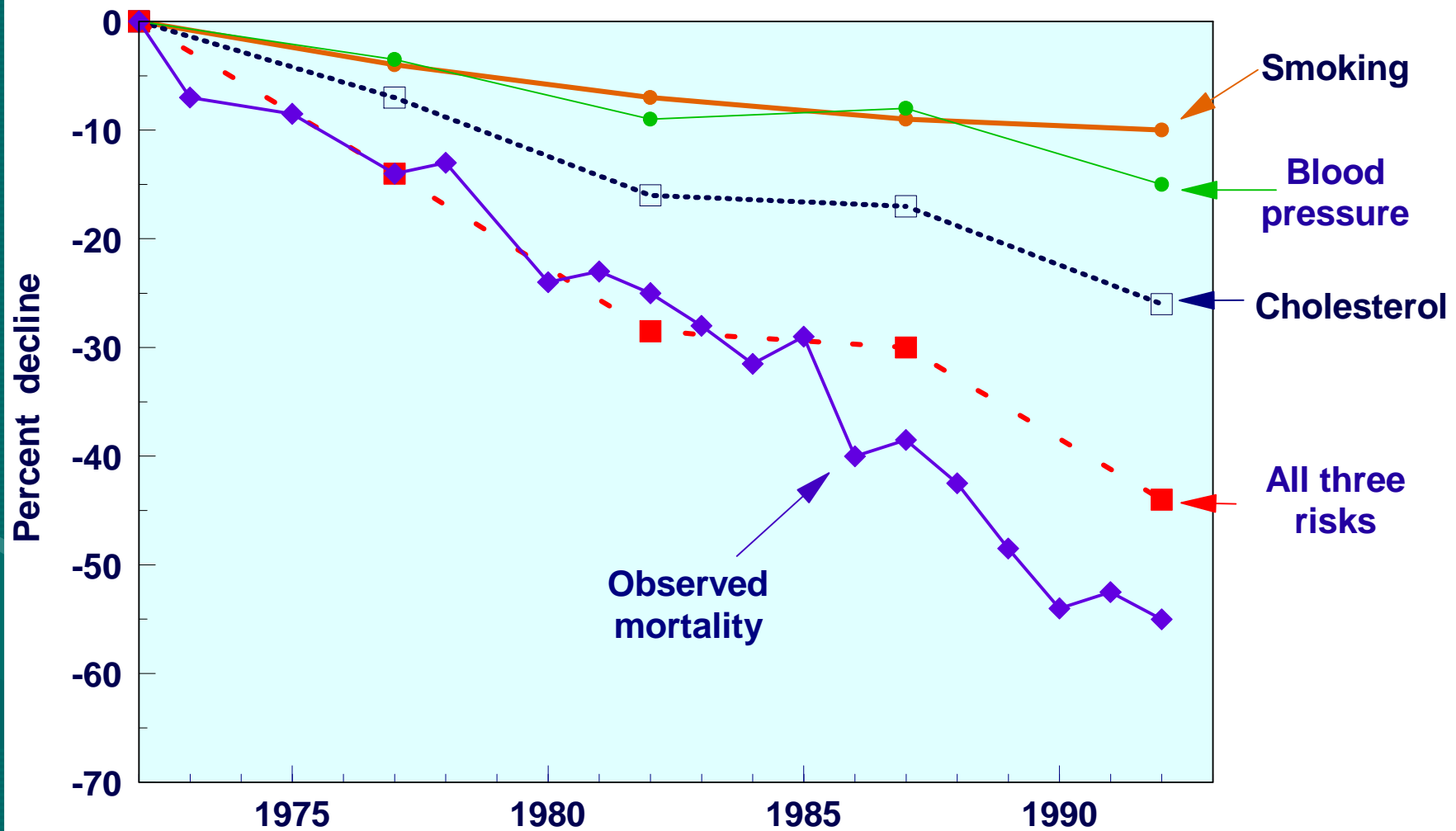
UN Commission Report: Food & Nutrition Bulletin, 2000.

# Changes in CHD Risk Factors in Finland Men & Women aged 30 - 59



Note remarkable 10mmHg fall in BP and 15% drop in cholesterol - not drug based

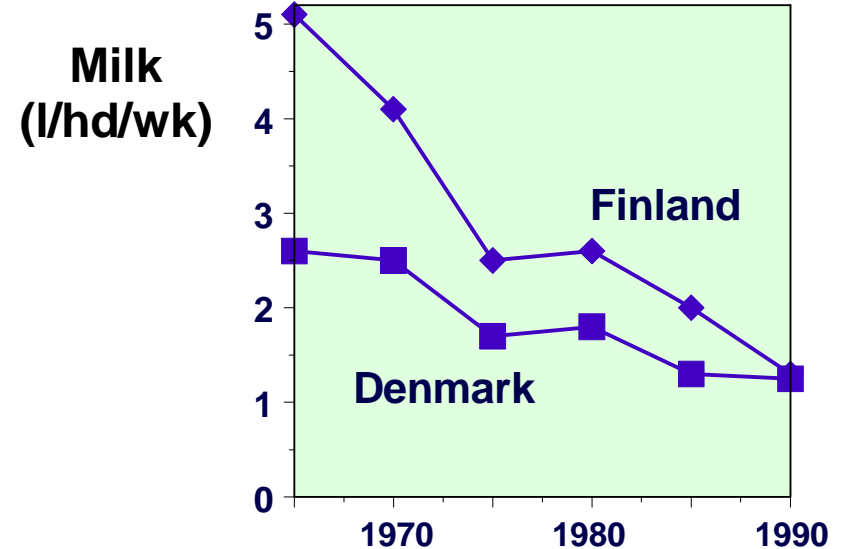
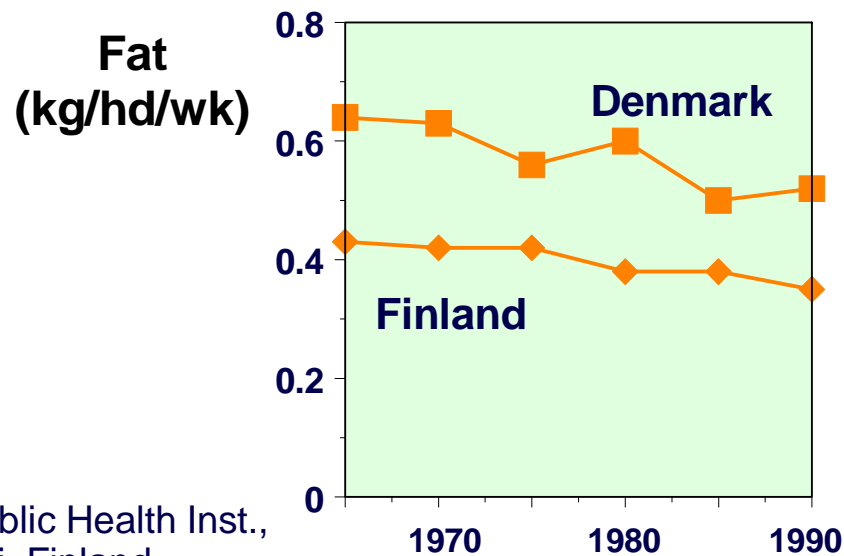
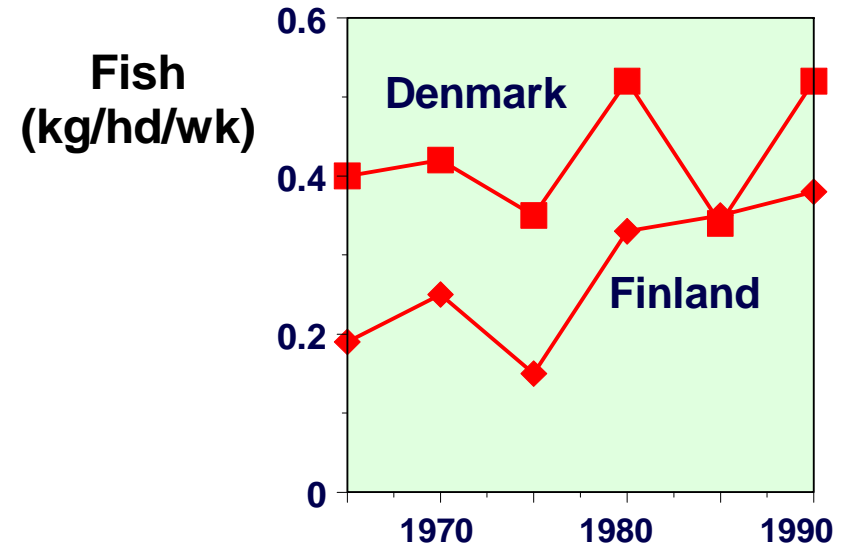
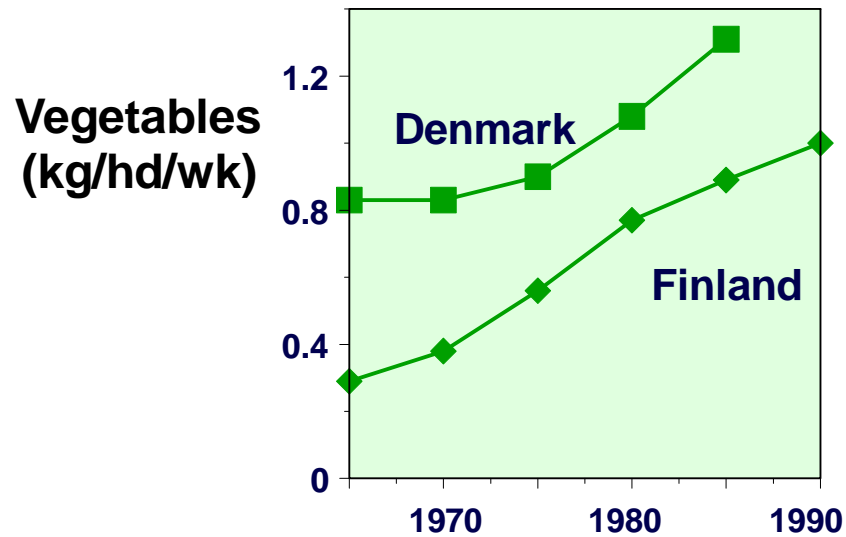
## Comparing the observed male mortality rates from CHD in N.E. Finland with those predicted from changes in the risk factors.



Vartiainen et al. 1994.

Mortality now down by 90%

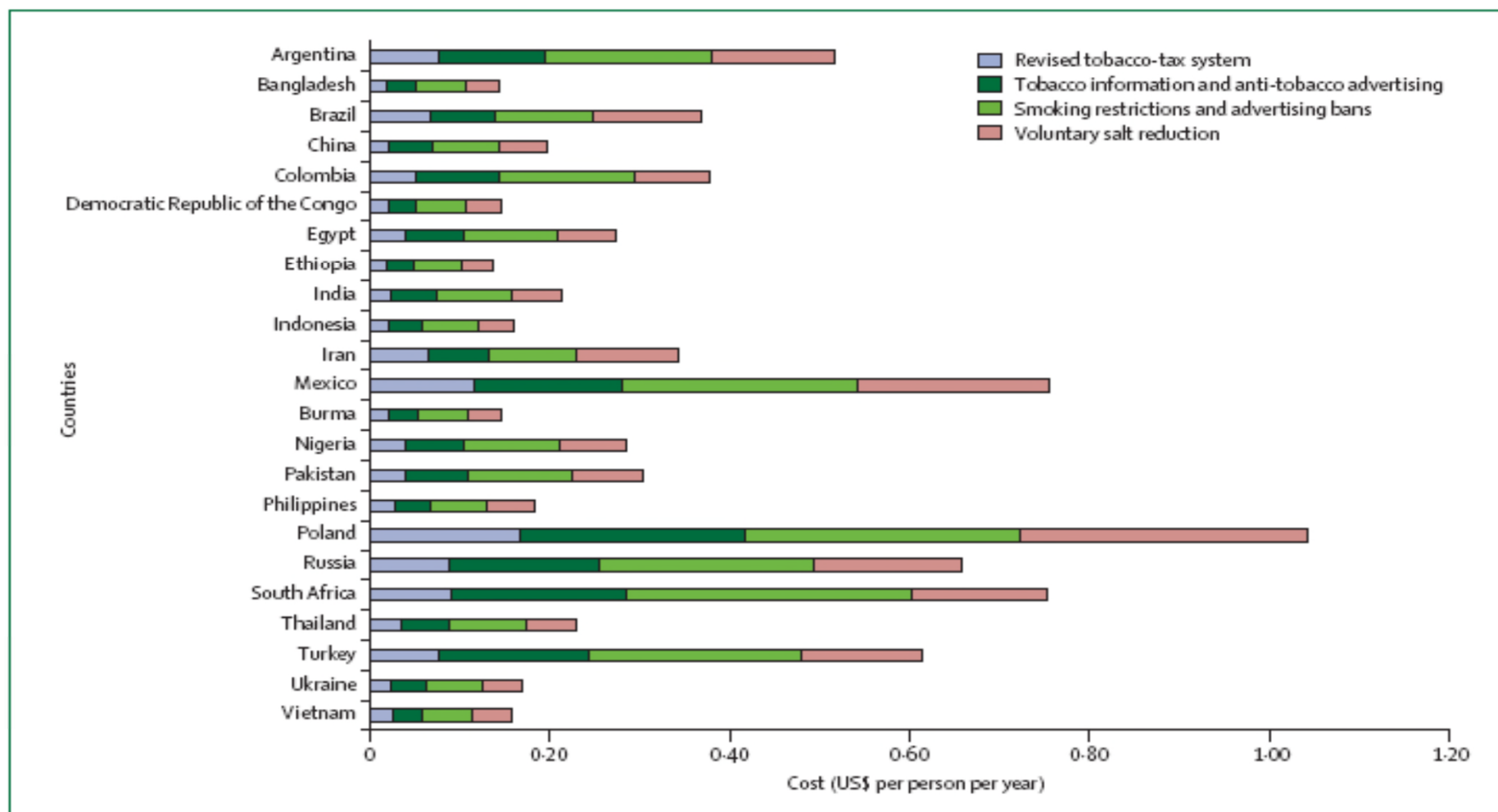
## CHANGING DIETARY PATTERNS IN SCANDINAVIA 1965 - 1990



Nat. Public Health Inst.,  
Helsinki, Finland.

The biggest change in diet ever seen other than in war and famine

# Cost to implement interventions US\$ per person per year 2005



Azaria et al Chronic disease prevention: health effects and financial costs of strategies to reduce salt intake and control tobacco use. Lancet chronic disease series Dec 2007

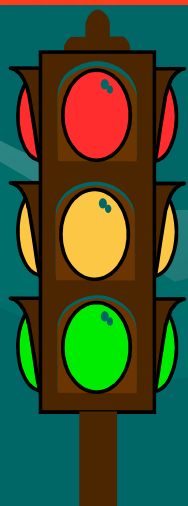
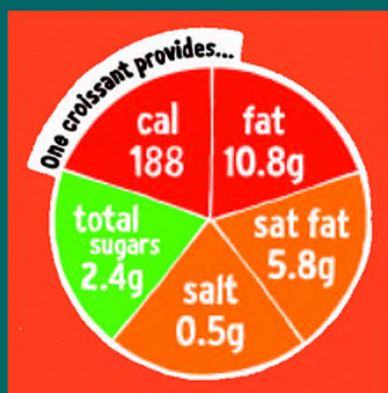
# Altering sales tax but preserving revenue in Denmark

- Reduce vegetable, fruit, wholegrain tax: 25% → 22%
- Increase tax on butter, cheese, beef, pork, fatty meats: 25% → 31%
- Add sugar tax

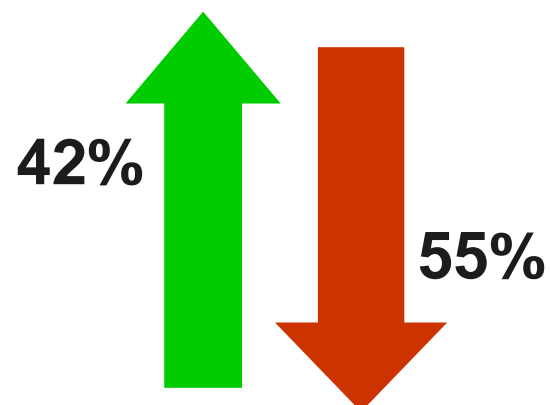
**NB:** income to government unchanged

# Consumer purchases with traffic light food labelling of nutrients as proposed by UK's Food Standards Agency. Healthy (green), reasonable (yellow), or unhealthy (red)

## Wheel of Health (WoH)



JS Ham and Pineapple Pizzeria 356  
all **5 GREEN** on WoH

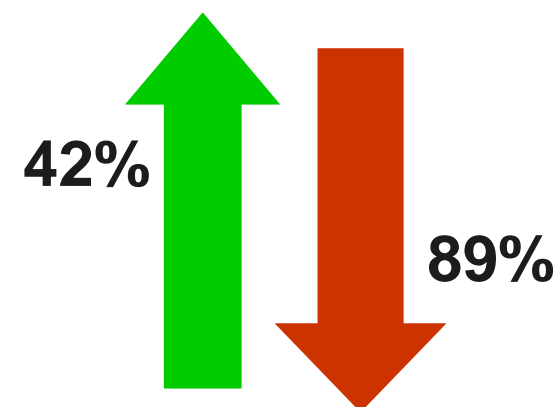


JS Ham & Pineapple Thin & Crispy Pizza 335g  
**1 red 2 amber 2 green**

Sainsbury's Supermarket presentation to The National Heart Forum, UK., 2006.

'Be Good to Yourself' Chocolate sponge puddings

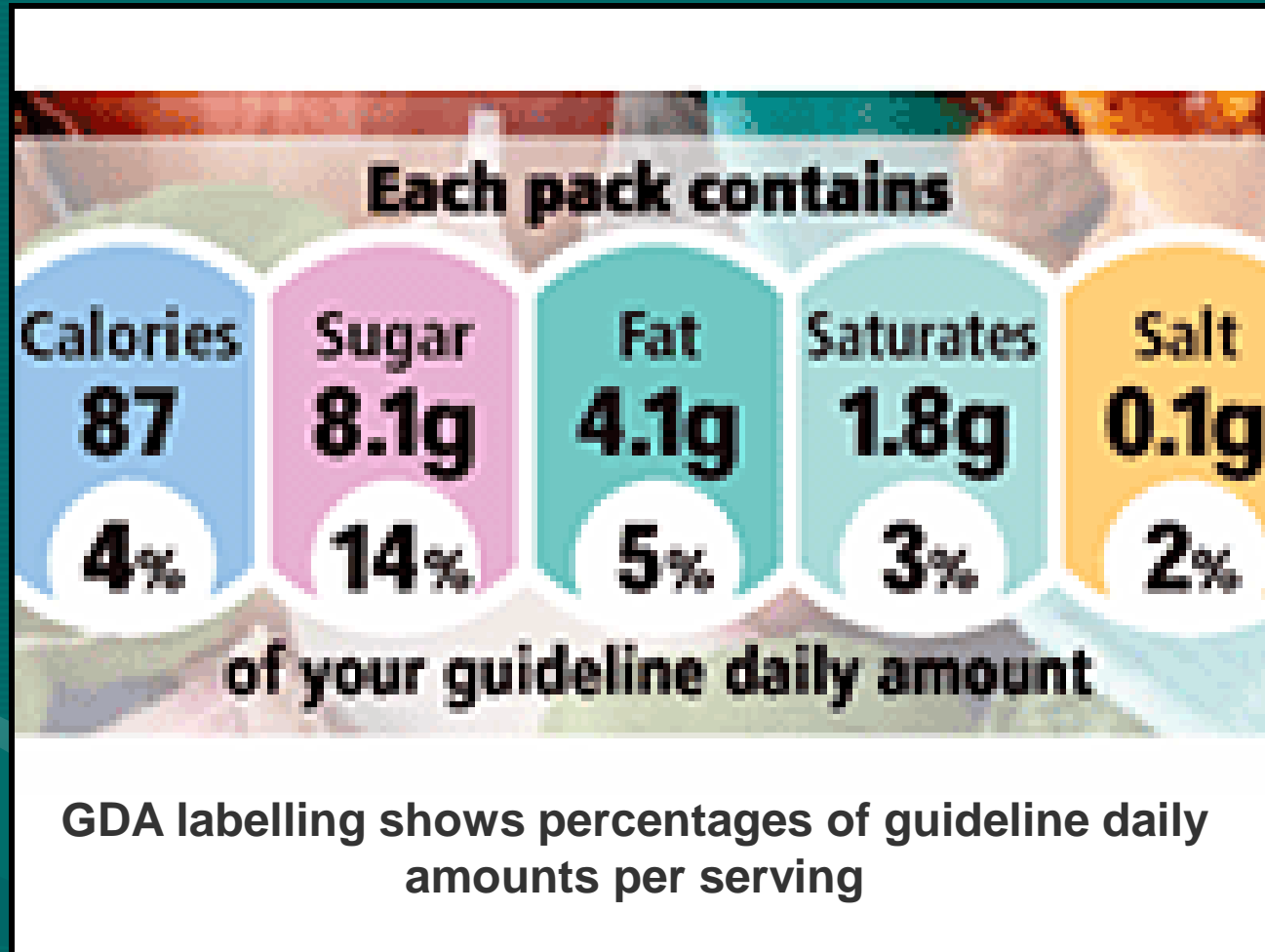
**4 Green 1 amber**



'Taste the Difference' Melting Middle Chocolate puddings

**4 red 1 amber**

# Illustration of the GDA system



Conceptually flawed - major differences between individuals' energy needs.  
Method failed in US - despite %RDA labelling diet terrible and obesity escalating

# The most cost-effective community (not national) interventions in Australia

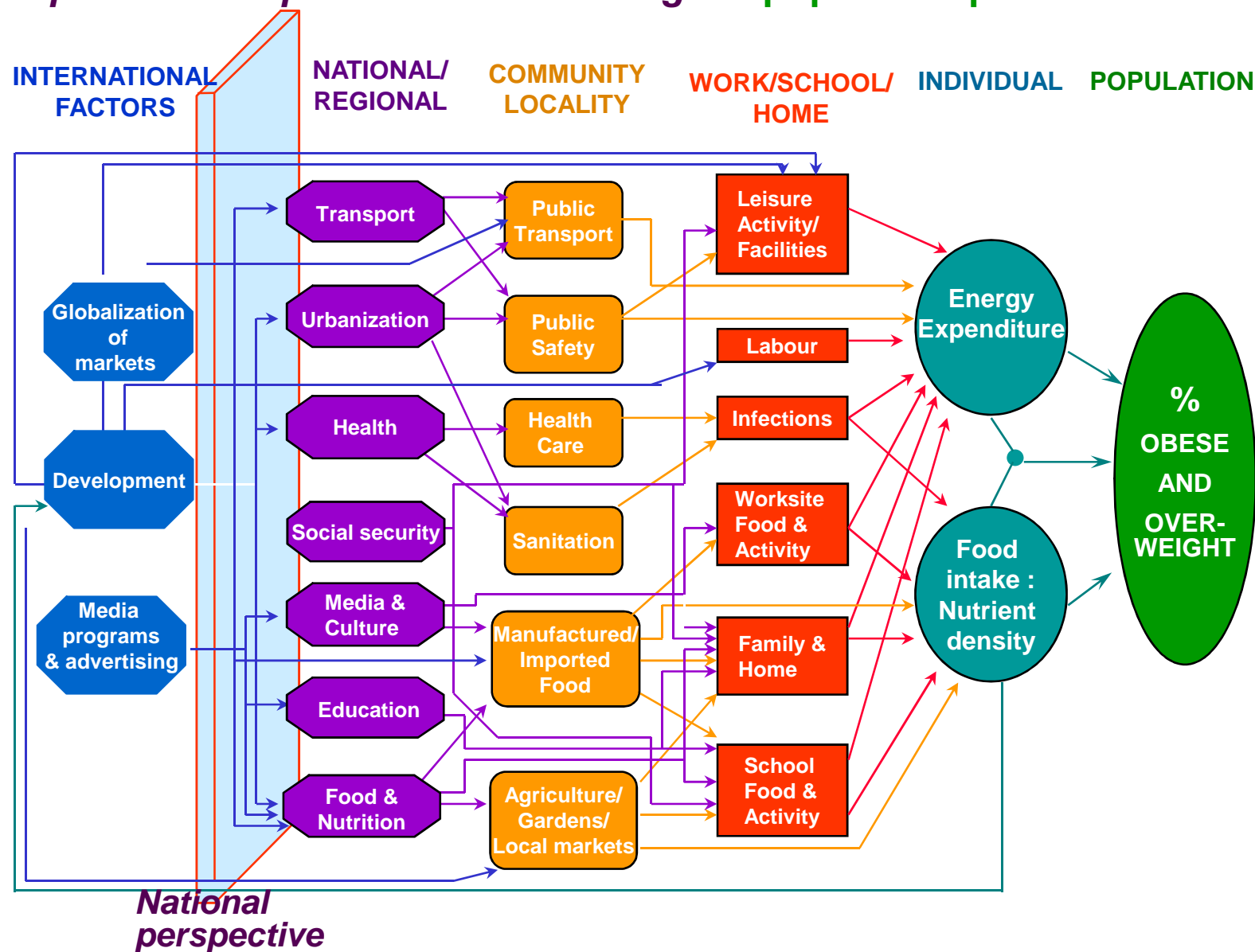
## Intervention

## Cost in Australian \$ for each DALY saved

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Restrict TV advertising	4
Soft drink intervention at school	3,000
Walking buses to school	770,000
Cycling (travel SMART schools)	260,000
After-school community programmes.	90,000
Doctors targeting the overweight children	32,000
School multiple interventions, but no physical education	14,000
<i>Add Physical Education</i>	7,000
School education to reduce TV viewing	3,000
Family-based program for obese child	4,000
School program targeting overweight & obese children	3,000
Medical treatment with drugs, e.g. Orlistat	14,000

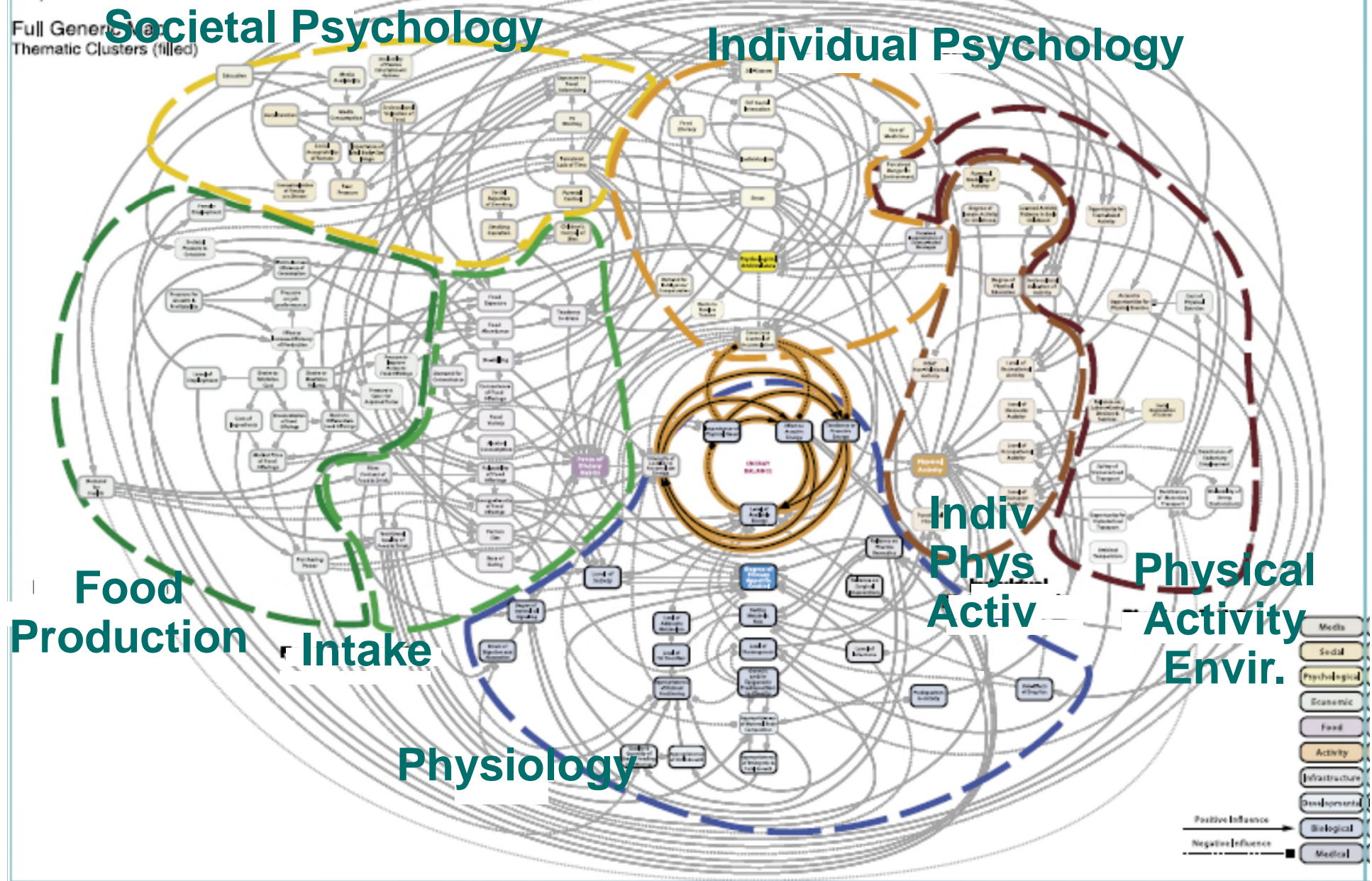
# Societal policies and processes influencing the population prevalence of obesity



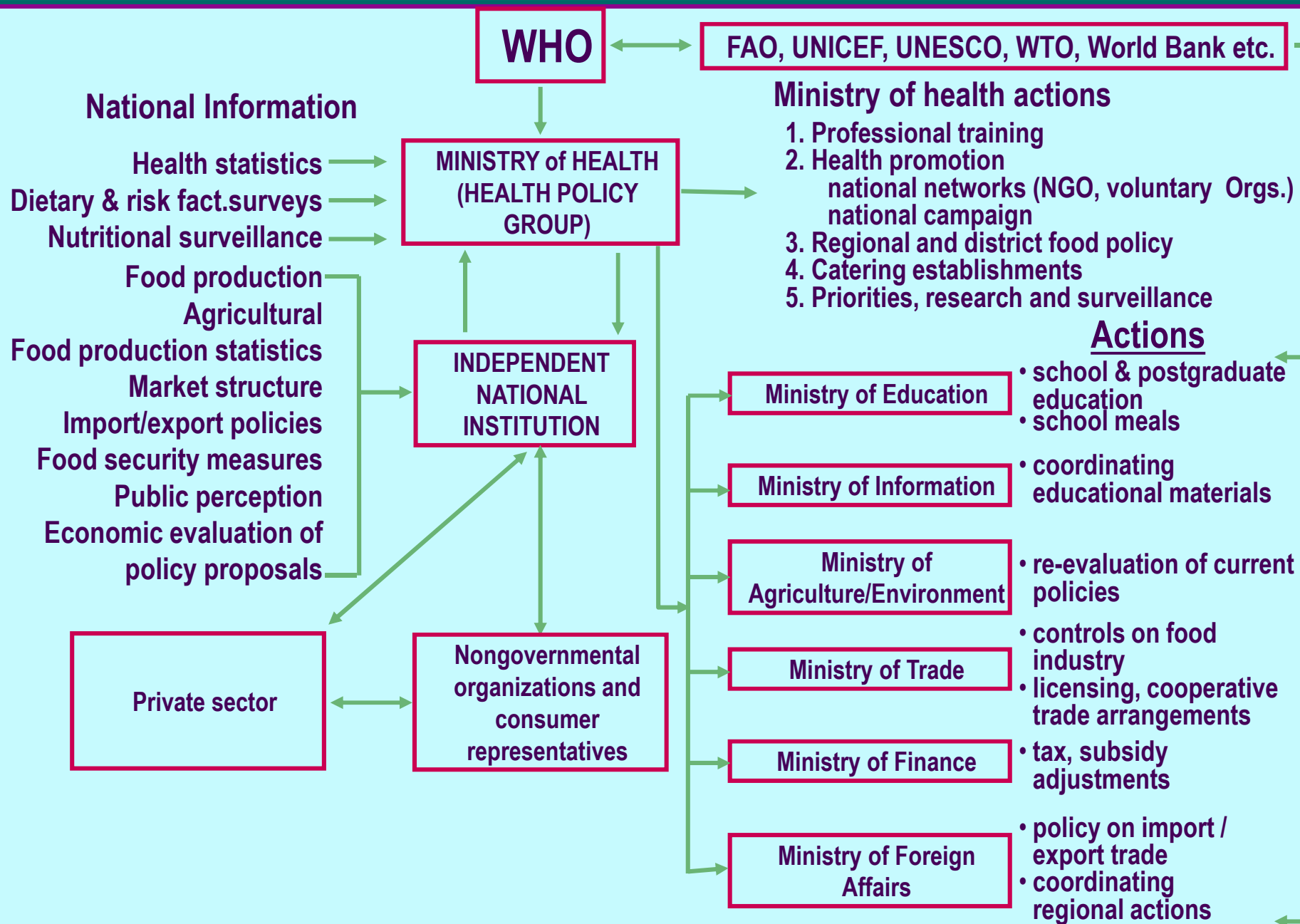
# The Foresight causal map of obesity

Map 5

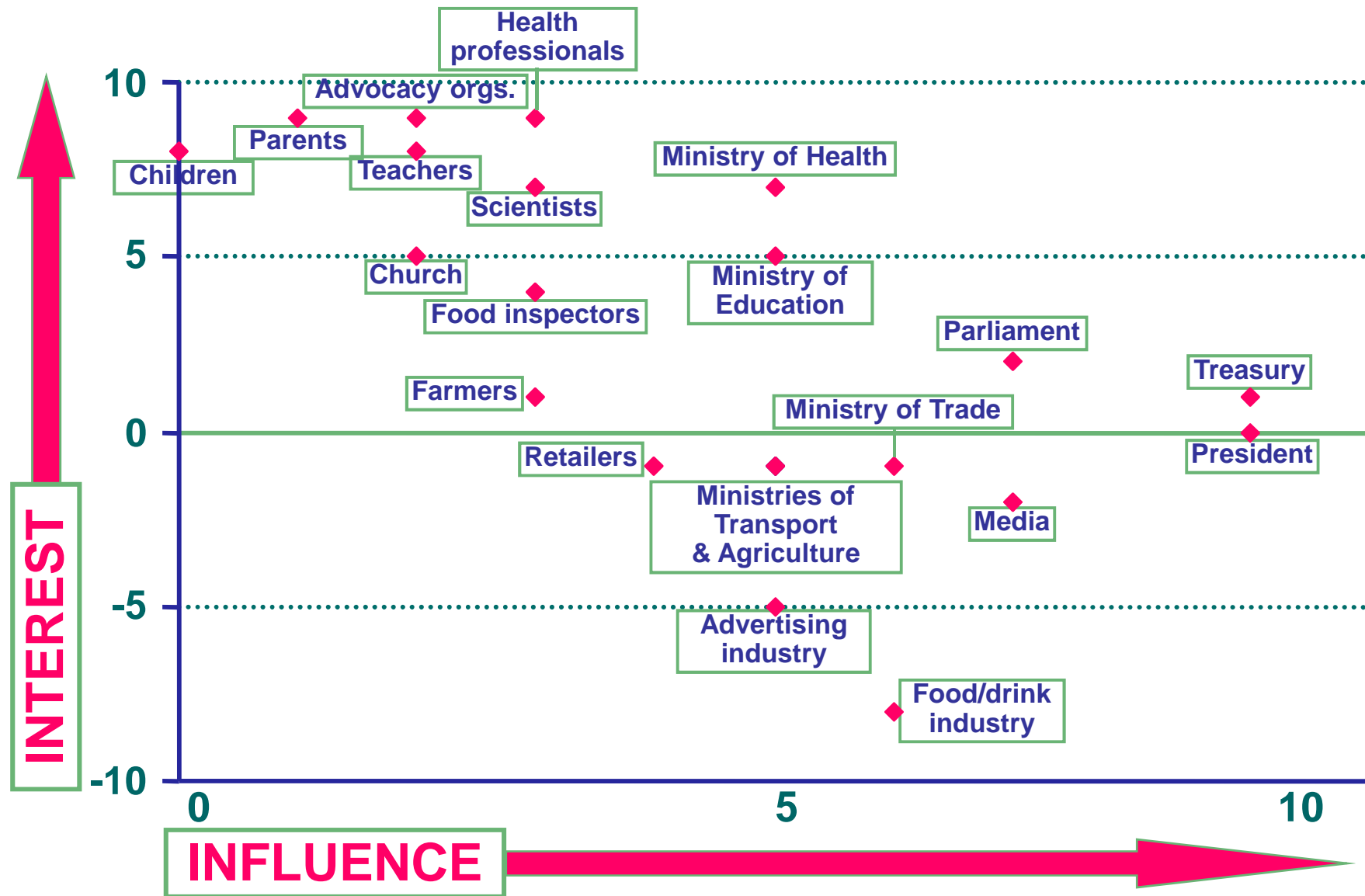
Full Generic Causal Map  
Thematic Clusters (filled)



# Formulating a nutrition policy for the prevention of obesity and chronic disease



# The interest and influences of different stakeholders



Lobstein T : Analyses based on The Food Commission's experience and new EU policy work.



# European Charter on Counteracting Obesity



# European Ministers' Istanbul Charter

## Nov 17, 2006

- **European Charter** on Counteracting Obesity signed by 48 Ministers of Health
- **Policy tools** range from legislation to public/private partnerships, with particular importance attached to regulatory measures.
- **International approaches** emphasised with e.g. the development of a Code of Marketing of HFSS products particularly to children – to go forward into the second Food and Nutrition Action Plan (FNAP) for Europe

## The STEFANI model: strategies for effective nutritional initiatives

	Ministry of Health – direct responsibilities		
	Dietary quality; physical activity	Food safety	Environment
<b>Physical</b>	Appropriately accessible health centres. Promoting access to appropriate self-monitoring, e.g. weight, BP	Catering in hospitals; monitoring facilities;	Fluoridation systems for water Facilities for iodising salt
<b>Economic</b>	Primary health payments for specific targets in management	Penalties for providing unsafe food	?? subsidise iodine for iodination purposes
<b>Policy</b>	Baby Friendly Hospitals Dietary guidelines establishing fortification policies Establish policies on health claims, e.g. functional foods	Health impact of multi-sectoral food safety policies	Establish specific guidelines for toxicants and contaminants in soil, water and primary food products HIA of agrochemical use
<b>Socio-cultural</b>	Health education	Promote concept of limited clinical antibiotic use	Promote new concept of health impact of new traffic policy;

**Source:** WHO Euro Nutrition Action Plan.

Inspired by the ANGELO model, Egger and Swinburn, BMJ 1997, 315, 477-480

## The STEFANI model: strategies for effective nutritional initiatives

	Other ministries: specified on a national basis		
	Dietary quality; physical activity	Food safety	Environment
<b>Physical</b>	Ensuring playgrounds in schools, suitable cycling and road systems; urban planning; sports facilities. Designated urban areas for local food production	Provision of appropriate local abattoirs. Proper public toilet and sanitary facilities. Proper catering facilities based on stringent hygiene requirements	Urban planning: green spaces, cycle paths, parks, playgrounds, lead free Establish facilities for farmers markets
<b>Economic</b>	Re-evaluate taxation and subsidy policies	Establish appropriate penalties for inappropriate hygiene	Reform CAP. Finance new public transport systems. Promote urban agriculture, new outlets for high quality, affordable foods in deprived areas
<b>Policy</b>	HIA of CAP Food labelling with appropriate, understandable health related information;	Establish criteria for ensuring pathogen and contaminant-free access to the food chain. Establish systematic HACCP for food chain, systematic surveillance and mechanisms for emergency response	Reform CAP Develop soil improvement, clean water, agricultural recycling, planting, fertilizer, pesticide, water use policies;
<b>Socio-cultural</b>	Promote physical activity in the workplace. Create breastfeeding time and space in the workplace with NGO help	Establish new criteria for excluding antibiotics as growth promoters and specifying veterinary use  Educational initiatives for safety of fast food outlets, and modifying nutrient composition, and limiting and ensuring appropriate food waste disposal	Change attitudes to cycle path use, pedestrian areas. Educational initiatives for caterers, communal use of school recreational facilities

**Source:** inspired by the ANGELO model, Egger and Swinburn, BMJ 1997, 315, 477-480

# Trinidad summit of Prime Ministers

## September 15<sup>th</sup> -17<sup>th</sup> 2007

1. **Collaboration** between CARICOM, PAHO, WHO &partners!
2. **Establish National Commissions**
3. **Legislation: immediate implementation tobacco framework:** ban sale marketing etc to children, tax, limit
4. **Money:** from tobacco, alcohol and other product taxes into NCD prevention
5. **Ministers of Health:** by mid 2008 develop action plan with other Ministries
6. **Physical education in schools :** immediate reintroduction
7. **Trans fats:** eliminate progressively
8. **Nutritional labelling:** get regional system organised
9. **Work site and other areas:** new plans for physical activity for the entire community
10. **Extensive public education**
11. **Surveillance**
12. **CARICOM:** continue development of action plans

# Peru summit with President Dec. 2007

1. **Collaboration** between PAHO, WHO & President's office
2. **Establish national mechanism: "Crecer" (to grow) :** selective help for poor
3. **Money: \$800million for Crecer**
4. **Legislation: proposed emphasis on tobacco:** ban sale marketing etc to children, tax, limit access
5. **Minister of Health:** proposed change in medical curriculum; altered role for nurses: rural medical school
6. **Teachers role:** need new strategies for formal education in the poor areas - 60% female illiteracy in very poor highland and jungle areas of Peru
7. **Trans fats:** eliminate progressively
8. **Nutritional labelling:** suggested new regional system organised
9. **Work site and other areas:** business involvement
10. **Water and sanitary improvements**
11. **Regional PAHO initiative?**

# Asia - Oceania Initiatives

- **China:** 10min play in schools!
- **India:** new Public Health Institutes!
- **Australia:** States vs Canberra. Marketing restrictions;\$10b diabetes prevention plan
- **New Zealand:** frustration with academics , NGOs; school & Maori initiatives: food industry consults; special task force: Jim Mann.
- **Pacific Islands:** action plan - nothing happening: proposals on junk food dumping sabotaged by Australia and New Zealand
- **Singapore:** Childhood programme just changed
- **Malaysia:** New Global Alliance - educational priority: Minister proposal on marketing junk food sabotaged by food industry and Nutrition Soc. reps
- **Pakistan:** focus on heart disease and diabetes

## Proposals for early UK Government action October 1997

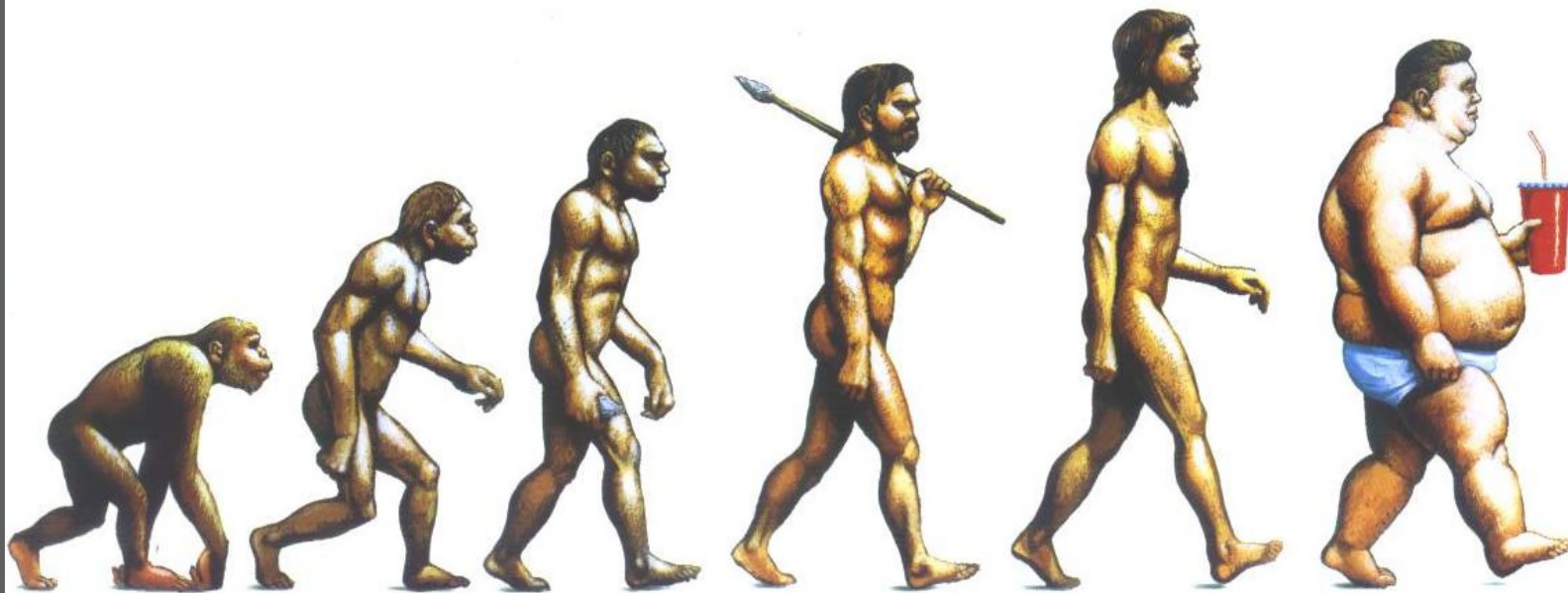
- **Stop:** a) selling school play areas & sports facilities  
b) eliminating catering facilities
- **Public/private** partnerships
- **Capital improvements** - link with new integrated community plans
- **Health Promoting Schools Unit:** establish in the DfEE.
- **Nutritional standards** for school meals needed
- **Change food culture** within schools.
- **Set meals in primary schools** rather than cash cafeterias
- **Tuck shops and vending machines:** improve
- **Food sold close to school:** how improve?
- **School Health Services:** new role; identified funding.
- **Village College** approach to schools
- **Free school meals** for families just above income support level?



# Conclusions

- **Greater societal challenge** with cancer & obesity than cardiovascular diseases which can be limited by "readily" manipulated changes in food composition
- **Toxic carcinogenic & obesogenic environment** needs major changes. To improve societal body fat levels need big external changes to overcome buffering by appetite control
- **Systematic multilevel changes:** need coherent 5-10 yr adaptable plan led by Governments
- **Industry can help** with specified regulations & 5 yr projected changes
- **External public health groups/body:** drive change, report to Congress/States not White House; publicly transparent
- **Medical leaders** should start working for the public Interest

# The shape of things to come



*The cover of "The Economist", Dec. 13-19, 2003.*