

Future trends in the area of

FOOD, NUTRITION & HUMAN HEALTH

An epidemiologists prediction

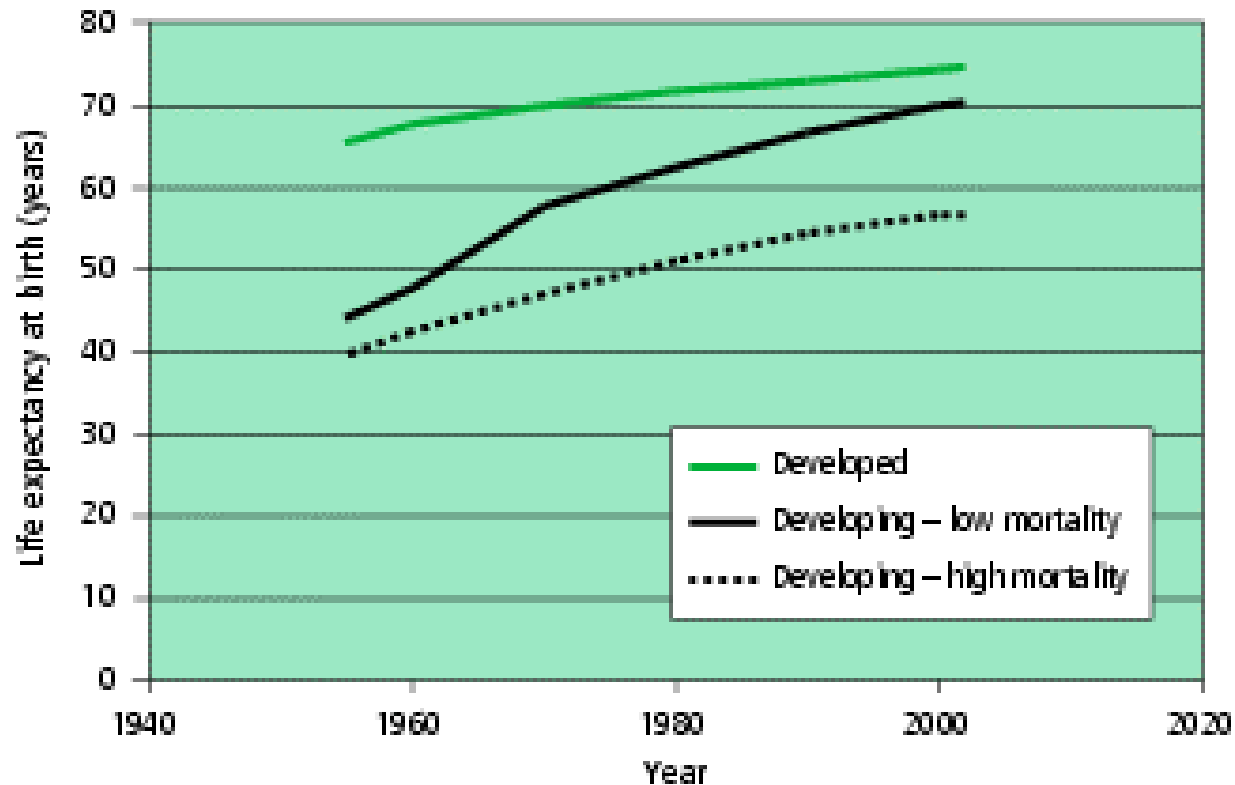
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Epidemiology

- Disease occurrence
 - Global, EU-15, EU-25
 - Global trends and cross sections
- Risk factors
- Prevention of disease

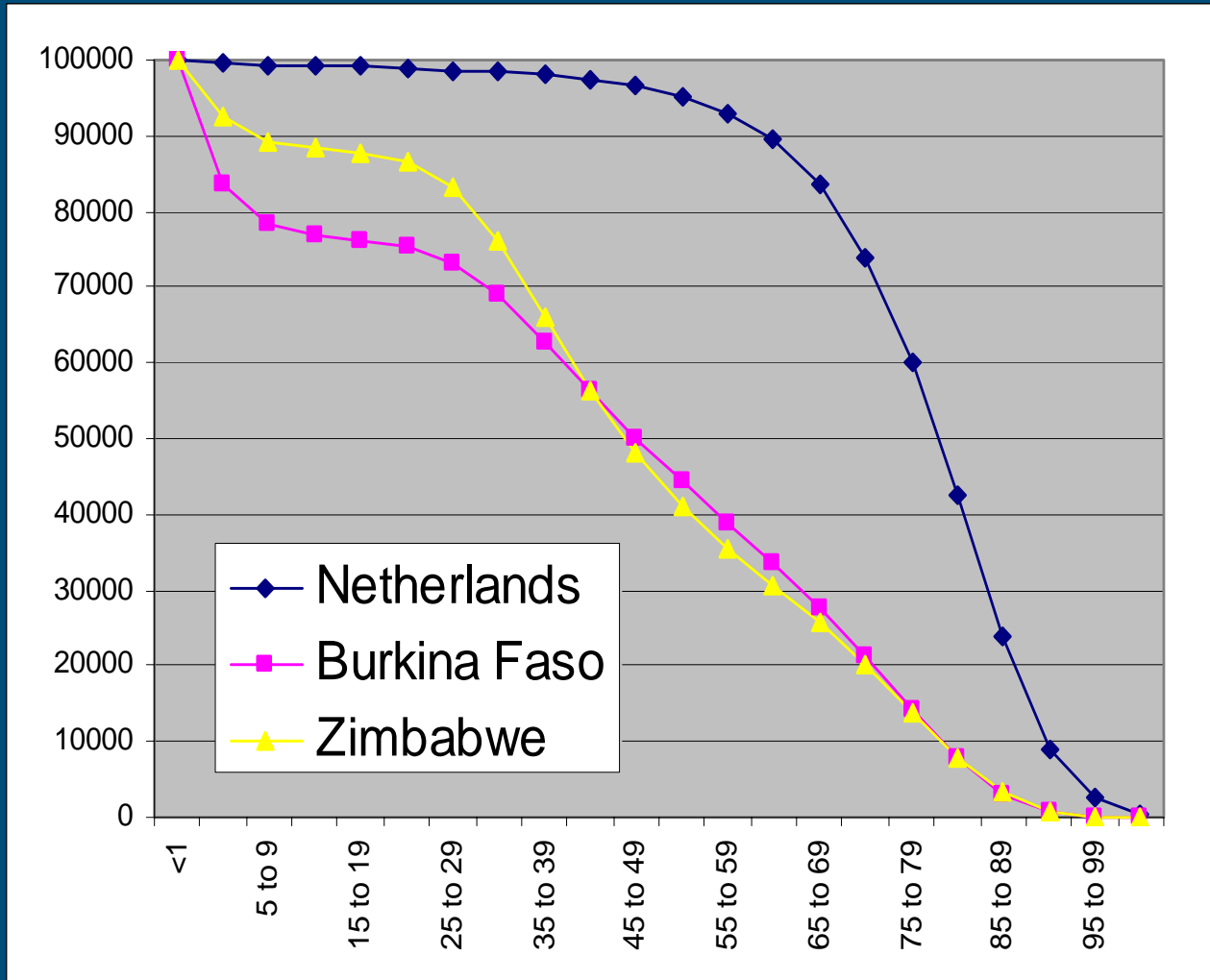
Life expectancy: developed and developing countries

Figure 1.1 Life expectancy at birth: developed and developing countries, 1955–2002



Note: The term developed countries includes Australia, Canada, European countries, former Soviet countries, Japan, New Zealand and the USA. High-mortality developing countries include those in sub-Saharan Africa, and countries with high child and adult mortality in Asia, Central and South America and the Eastern Mediterranean. Other developing countries are referred to as "developing - low mortality".

Survival curves in three countries

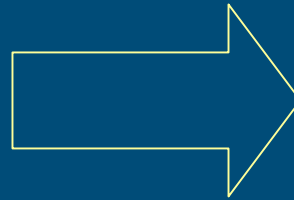
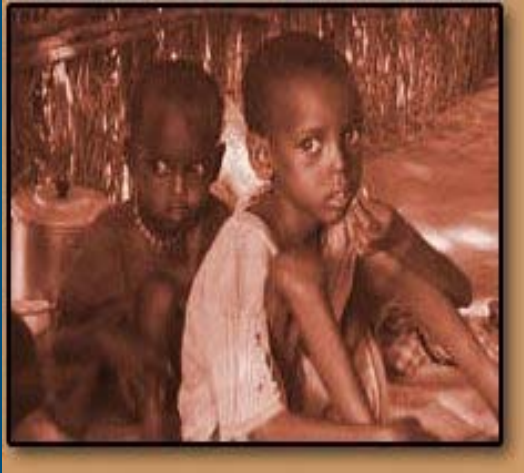


WHR (2002)

- safe water
- sanitation and
- education

are likely to have large benefits and should be increased, especially in poorer countries

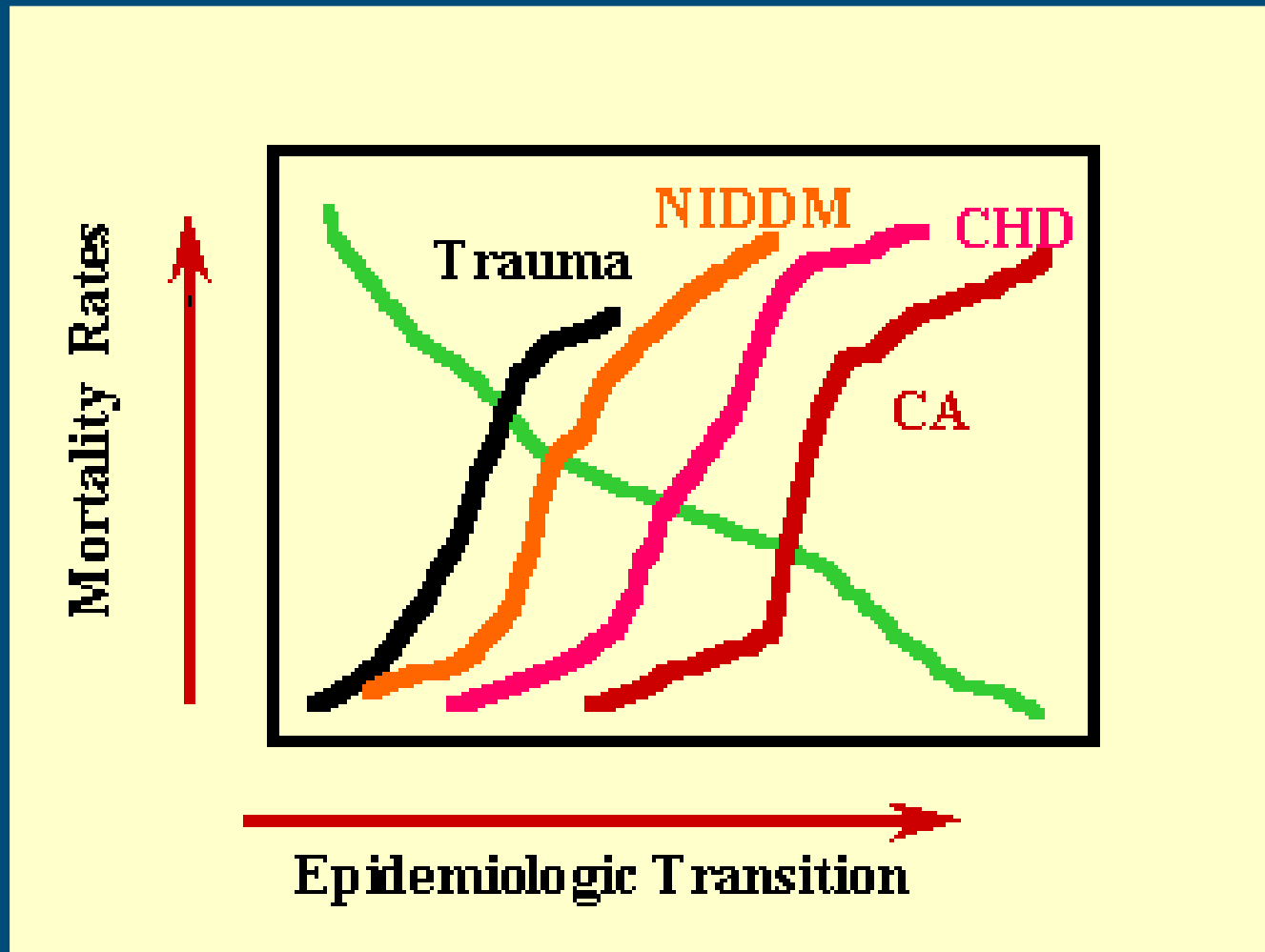
The epidemiologic transition



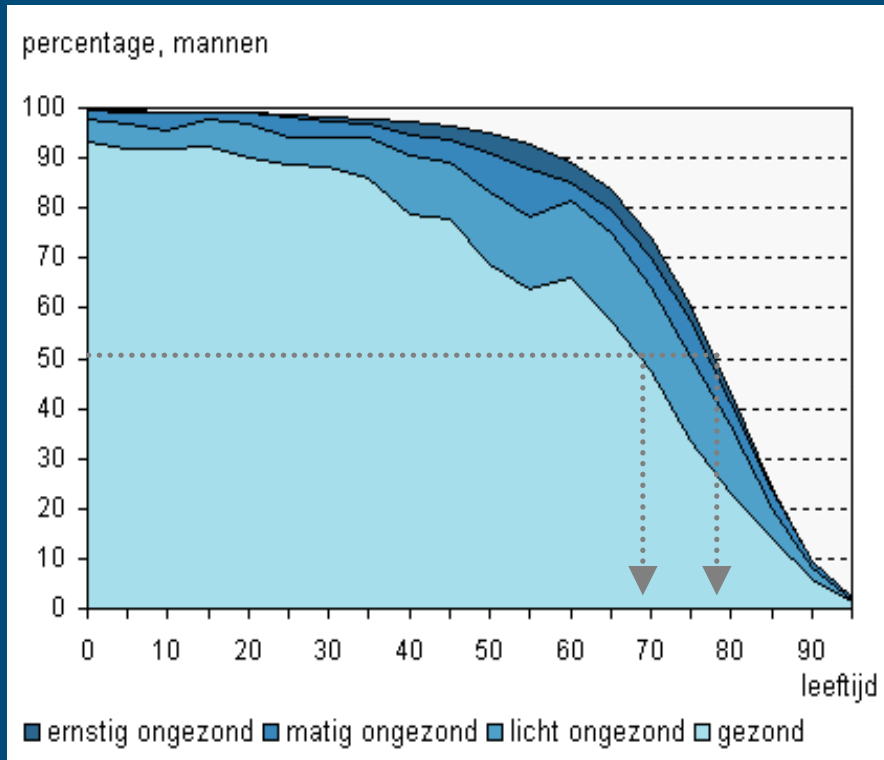
Infections & sanitation
Micronut def's (A, I, Fe)
Energy deficit
Food security

Safe water
Energy excess
Physical inactivity
Food abundance

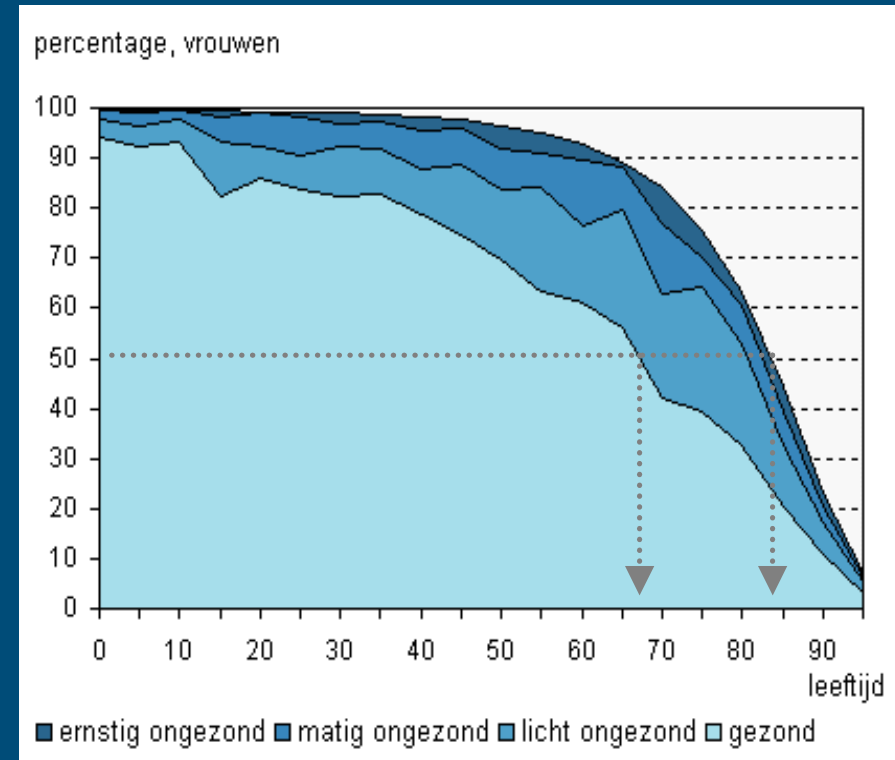
The epidemiologic transition



Healthy life expectancy (Netherlands)

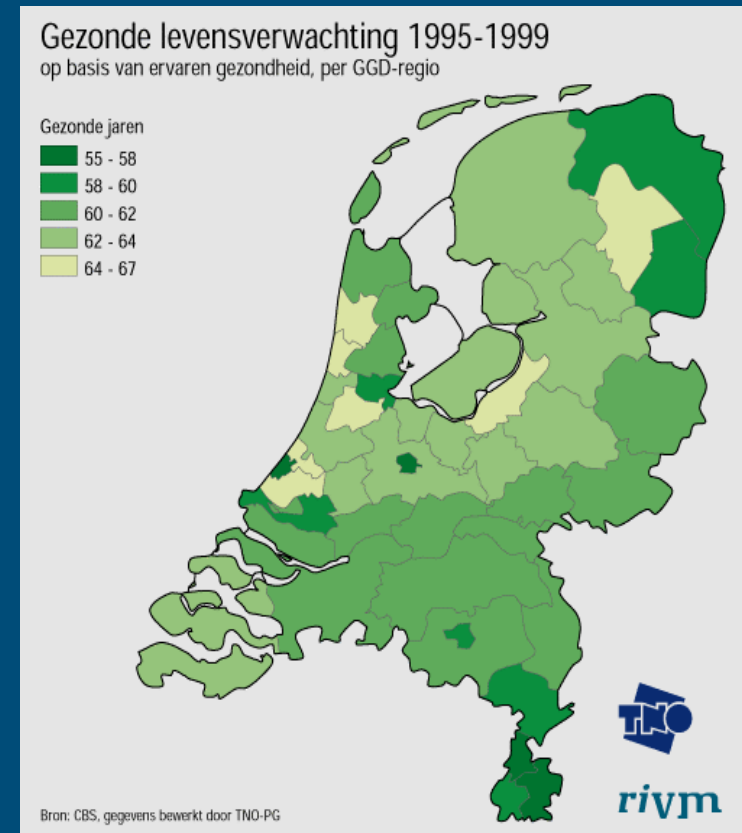
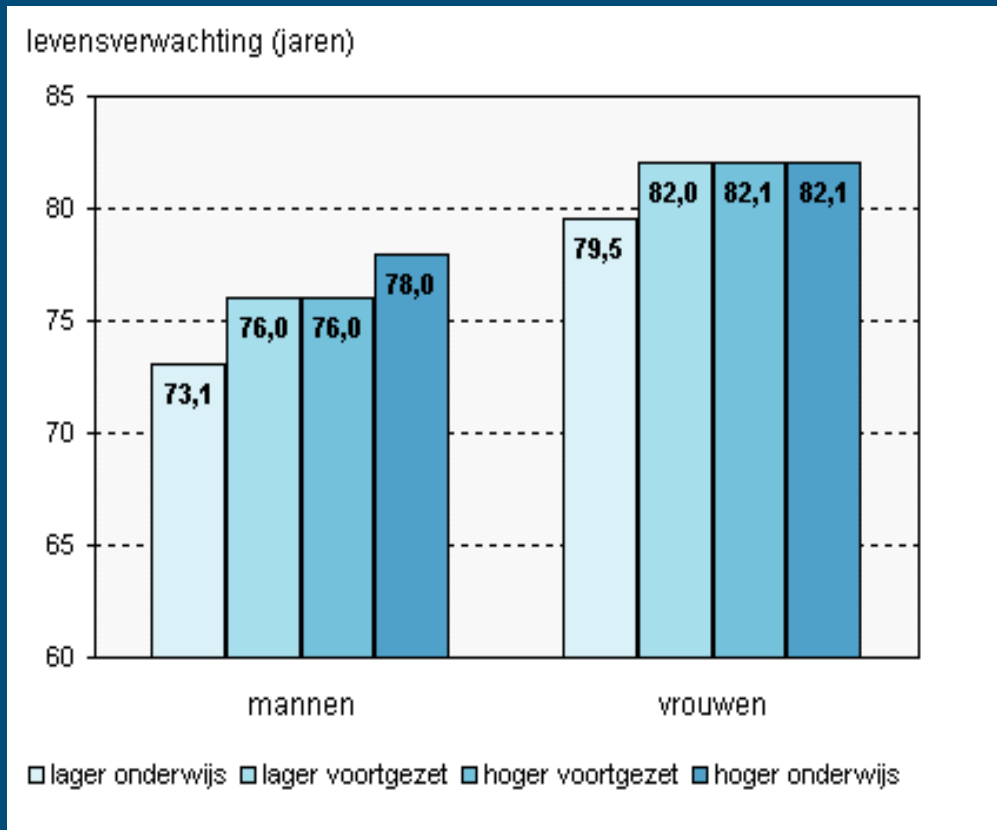


Men



Women

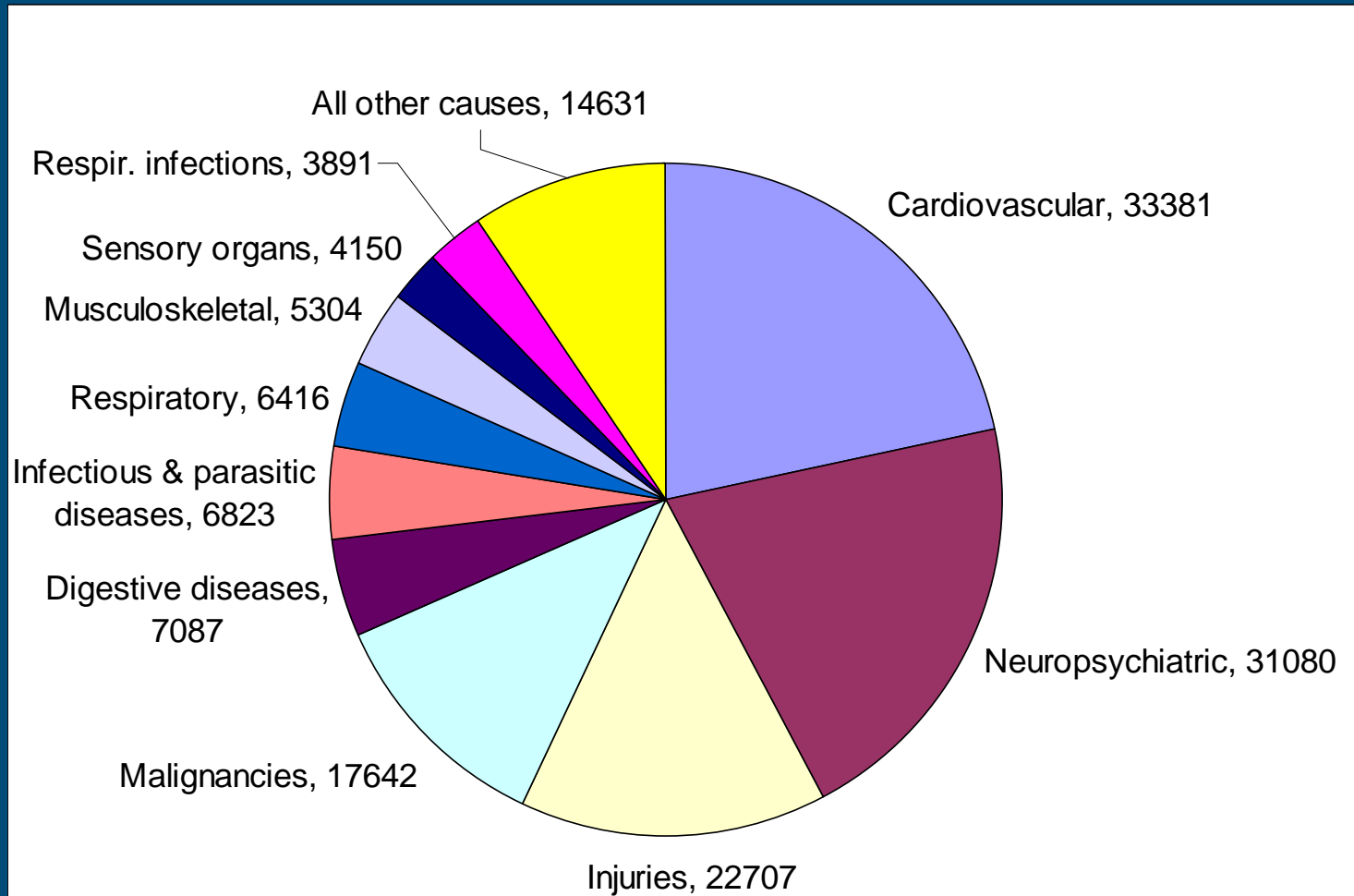
Life expectancy by education level and region



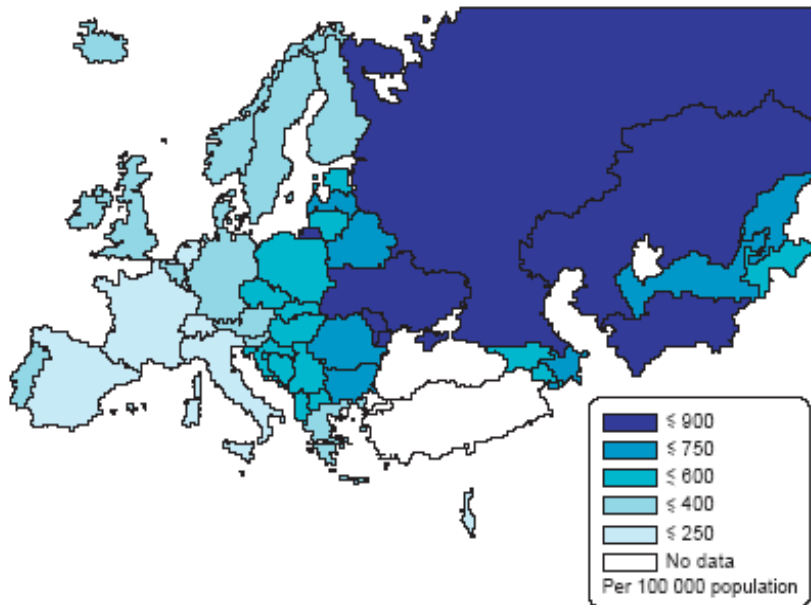
European Union

- Disease pattern
- Enlargement & health

Major diseases: DALYs for top-10 diseases in Europe

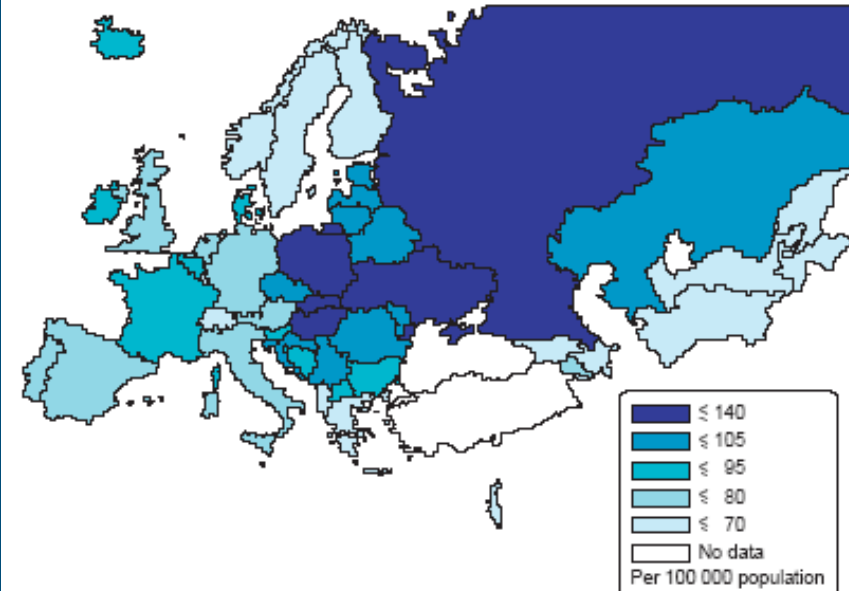


Death rates for circulatory and malignant diseases



Circulatory system

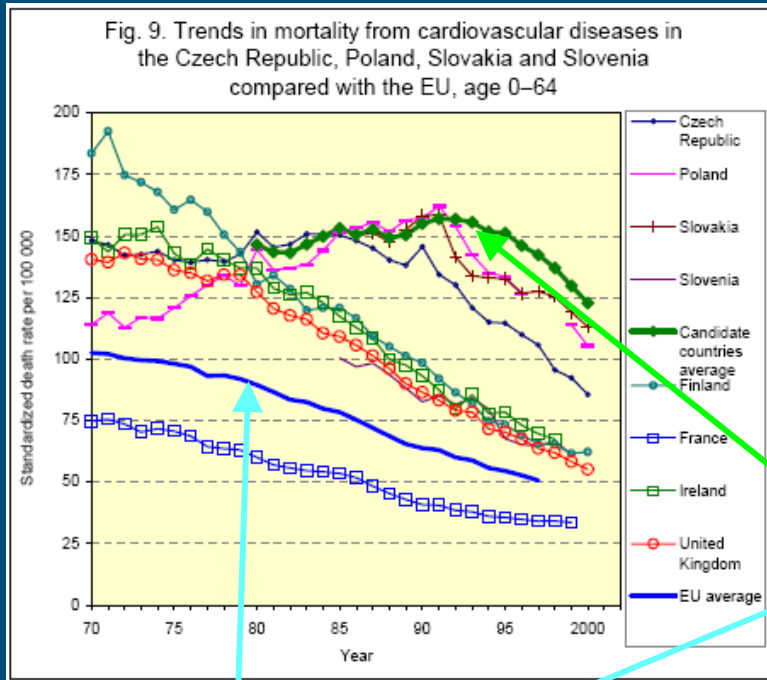
Deaths from cancer, 0–64 years



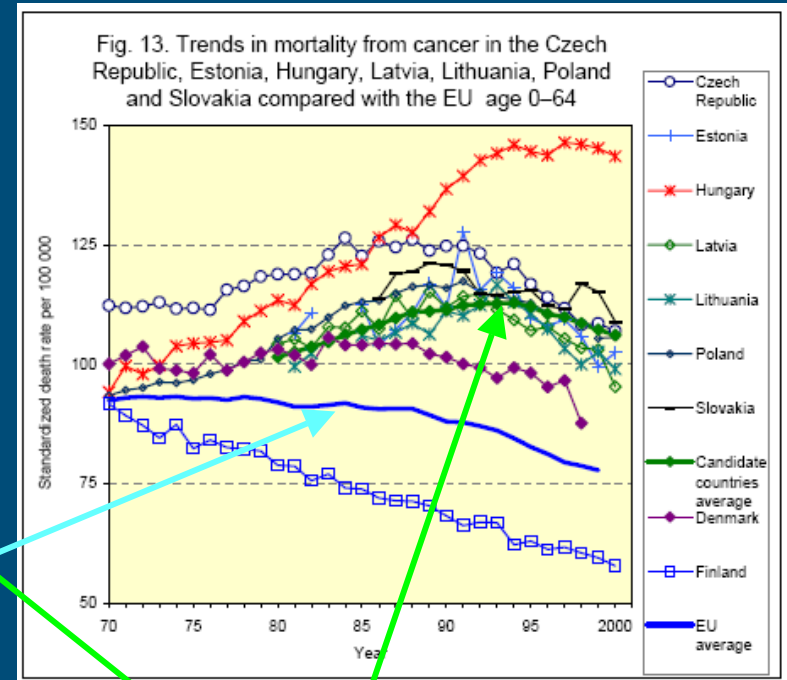
Total cancer, 0 – 64 yrs

Health Status Overview for former EC and new member states

Cardiovascular Disease



Cancer

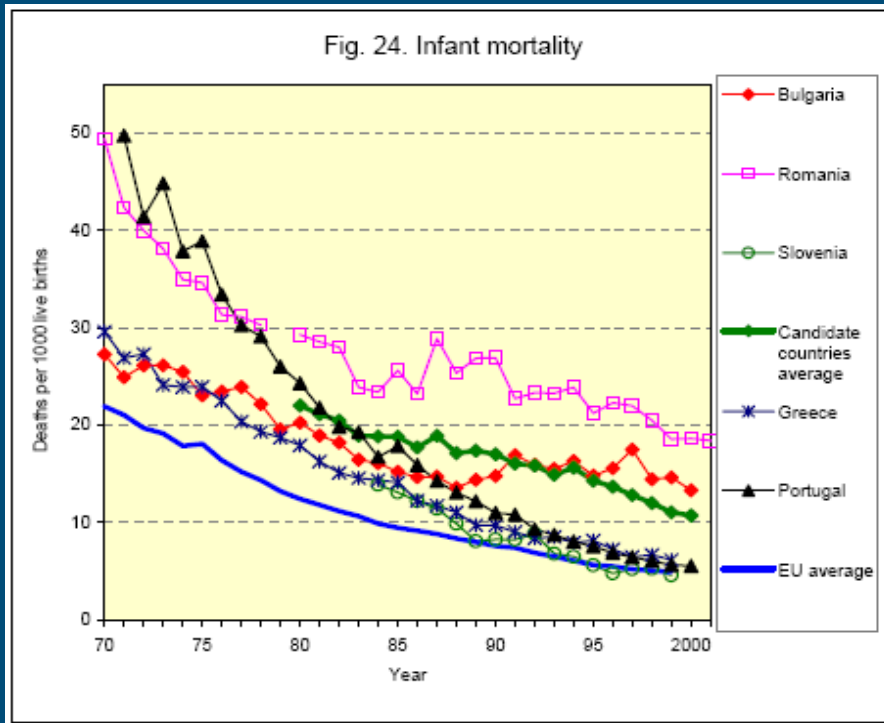


EU-15 (blue)

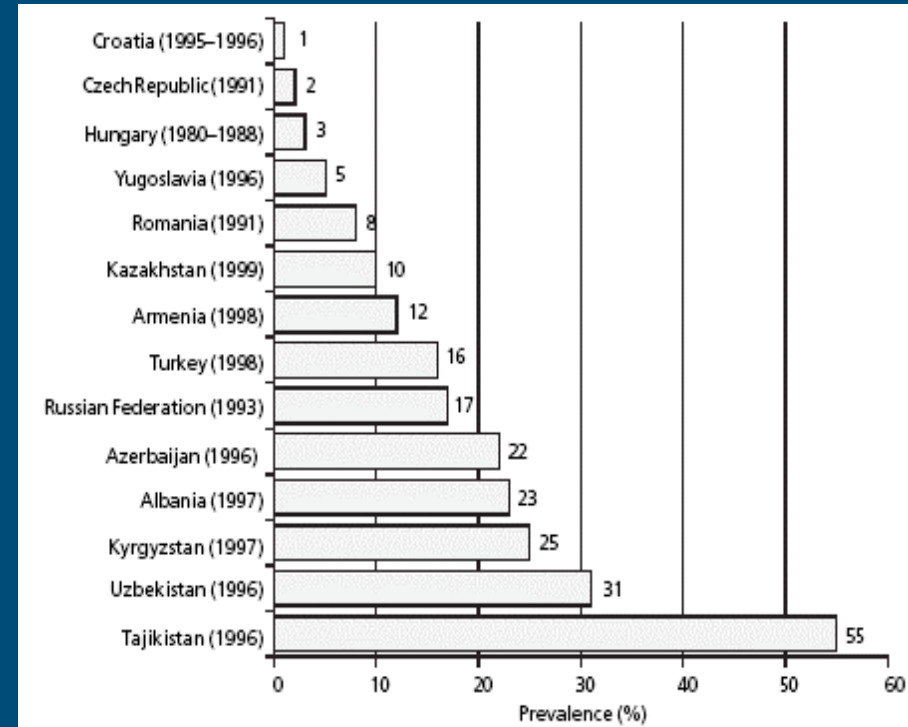
new members (10)

Health and nutrition in early life

Infant mortality in former (15) and new member states (10) of the EU



Prevalence of stunted growth in preschool children (selected CCEE and NIS, 1990s)



Left: Health Status Overview for countries of central and eastern Europe that are candidates for accession to the EU; EC & WHO, 2002; website accessed on 2 May 2004:

http://europa.eu.int/comm/health/ph_projects/1999/monitoring/health_status_overview_en.pdf,
 Right: <http://www.euro.who.int/document/e78578.pdf>

Prediction / summary so far.....

EU-15 and 10 new members states

- Life expectancy less favorable
- Child health lags behind, develops favorably
- Higher rates of CVD & cervical cancer
- Lower breast cancer rates

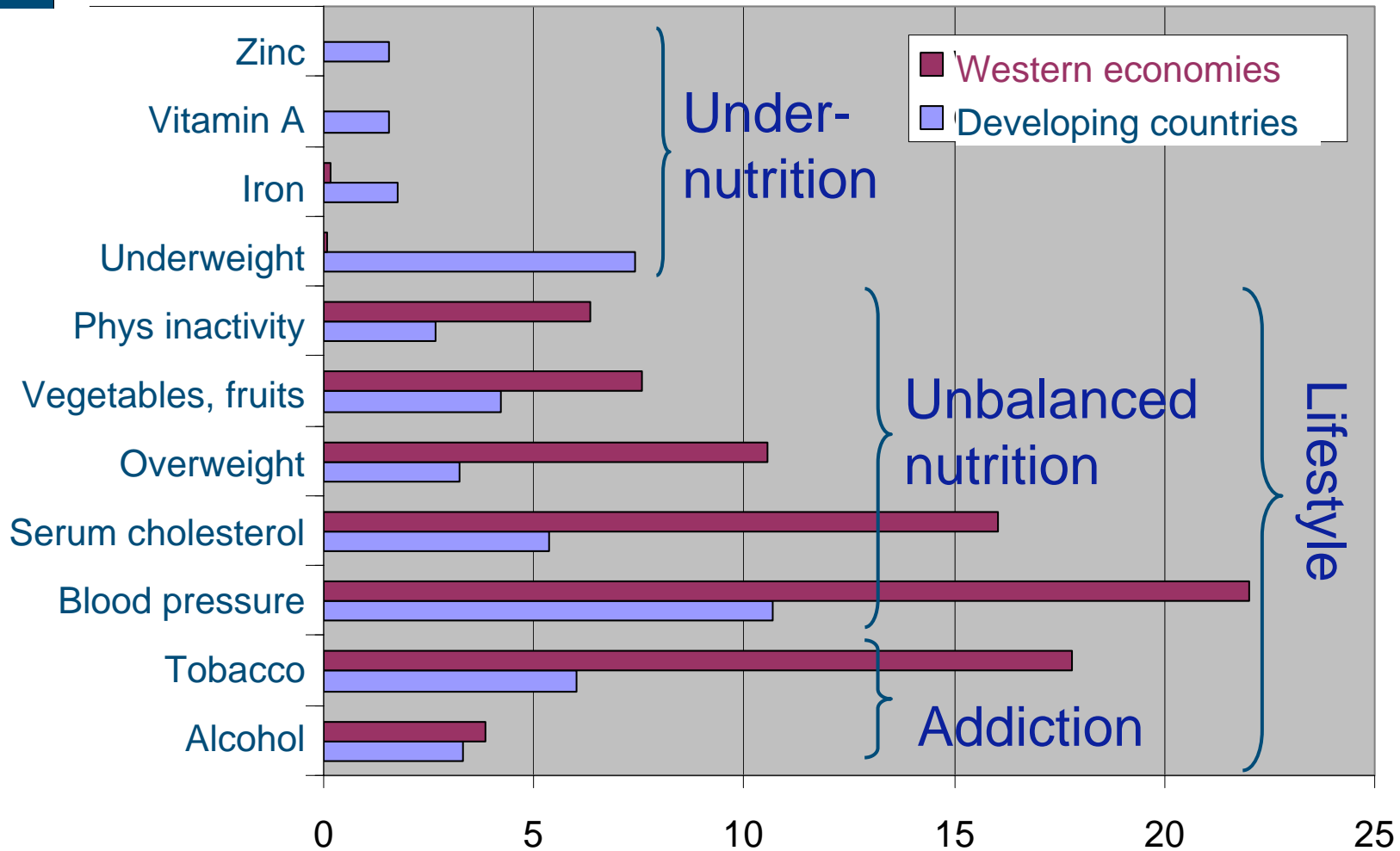
Future

- EU+ will develop pattern of diseases like EU-15
- Can they prevent safety and health problems?

Epidemiology

- Disease occurrence
- Risk factors
 - Population attributable risks
 - Diet and lifestyle factors
- Prevention of disease

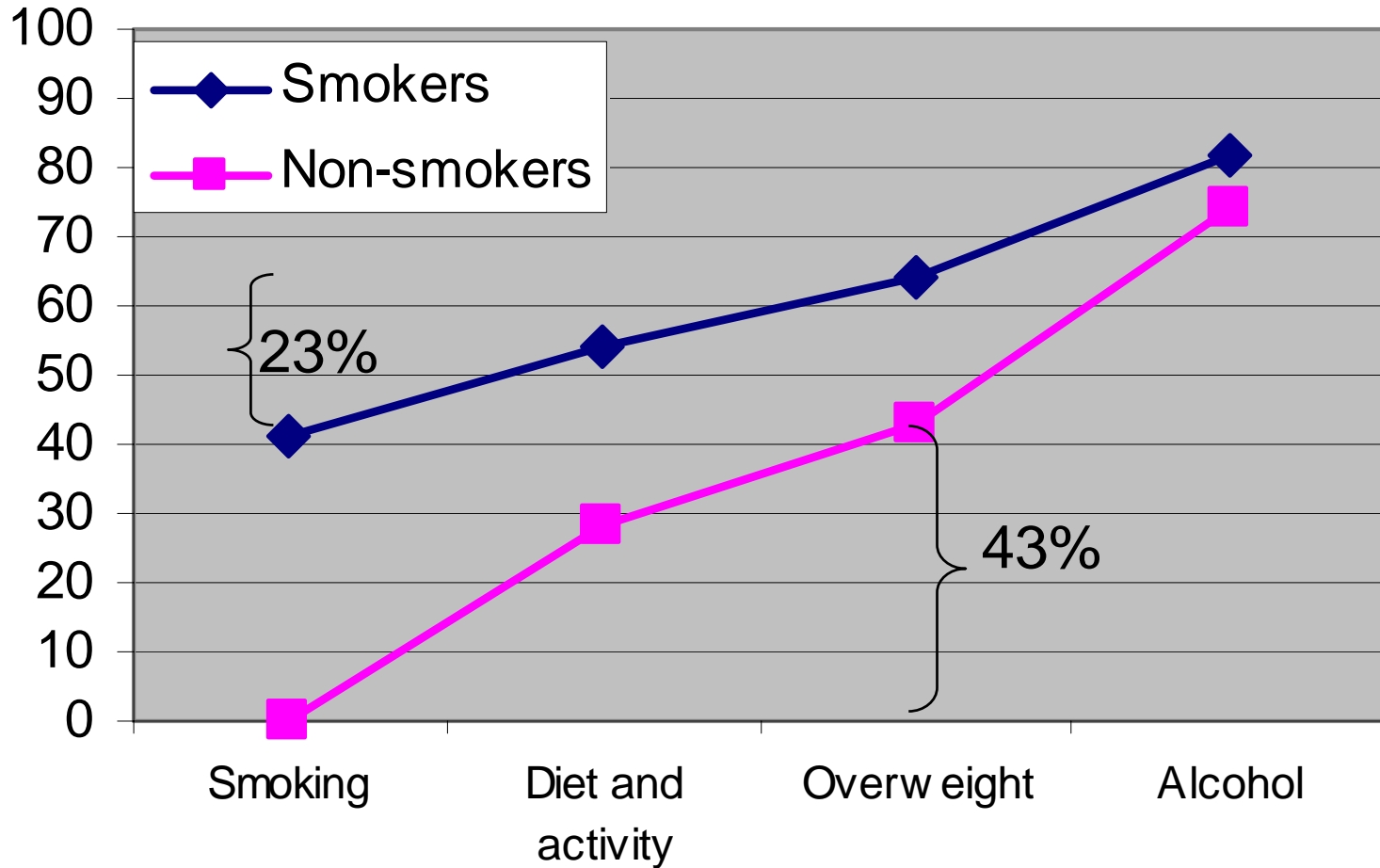
Attributable risks of death for 11 most important exposures (WHO)



Lifestyle and prevention of CVD

- Example: US Nurses -

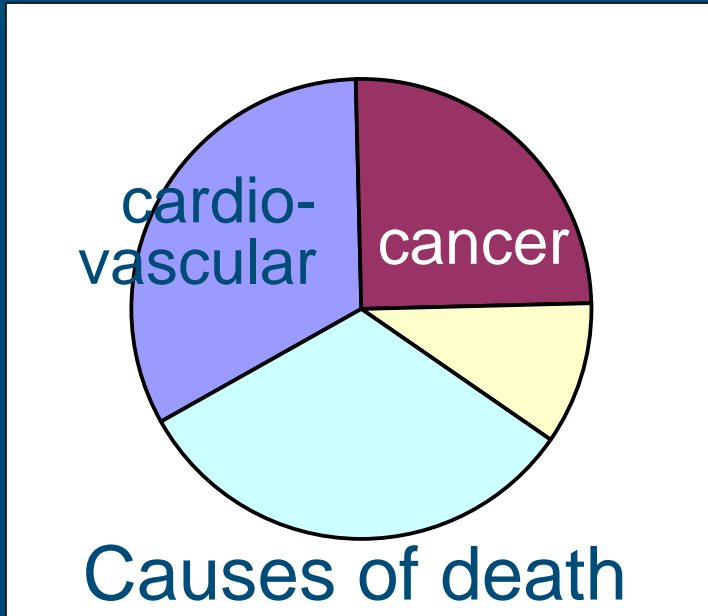
Avoidable proportion (%)



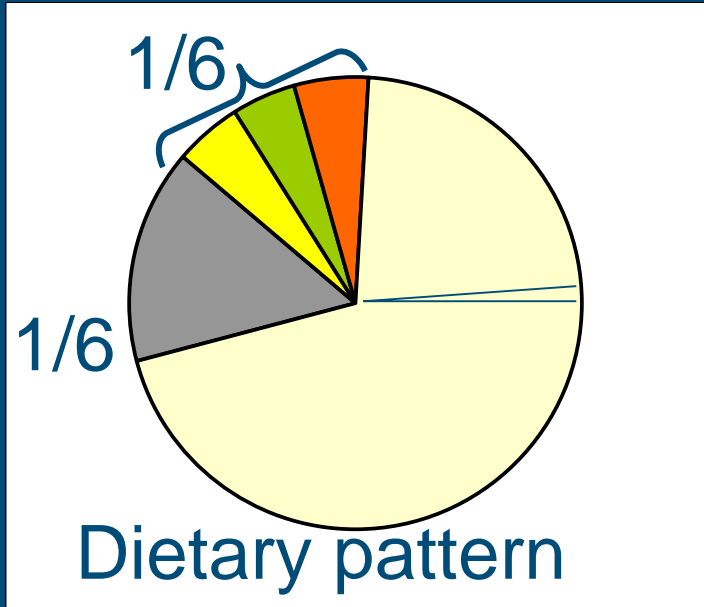
American Nurses, 1980-1994

Diet and prevention of chronic disease

- Example: The Netherlands -



Saturated fat
Vegetables and fruits
Overweight



Smoking

Disease burden attributable to nutrition

Example: Europe

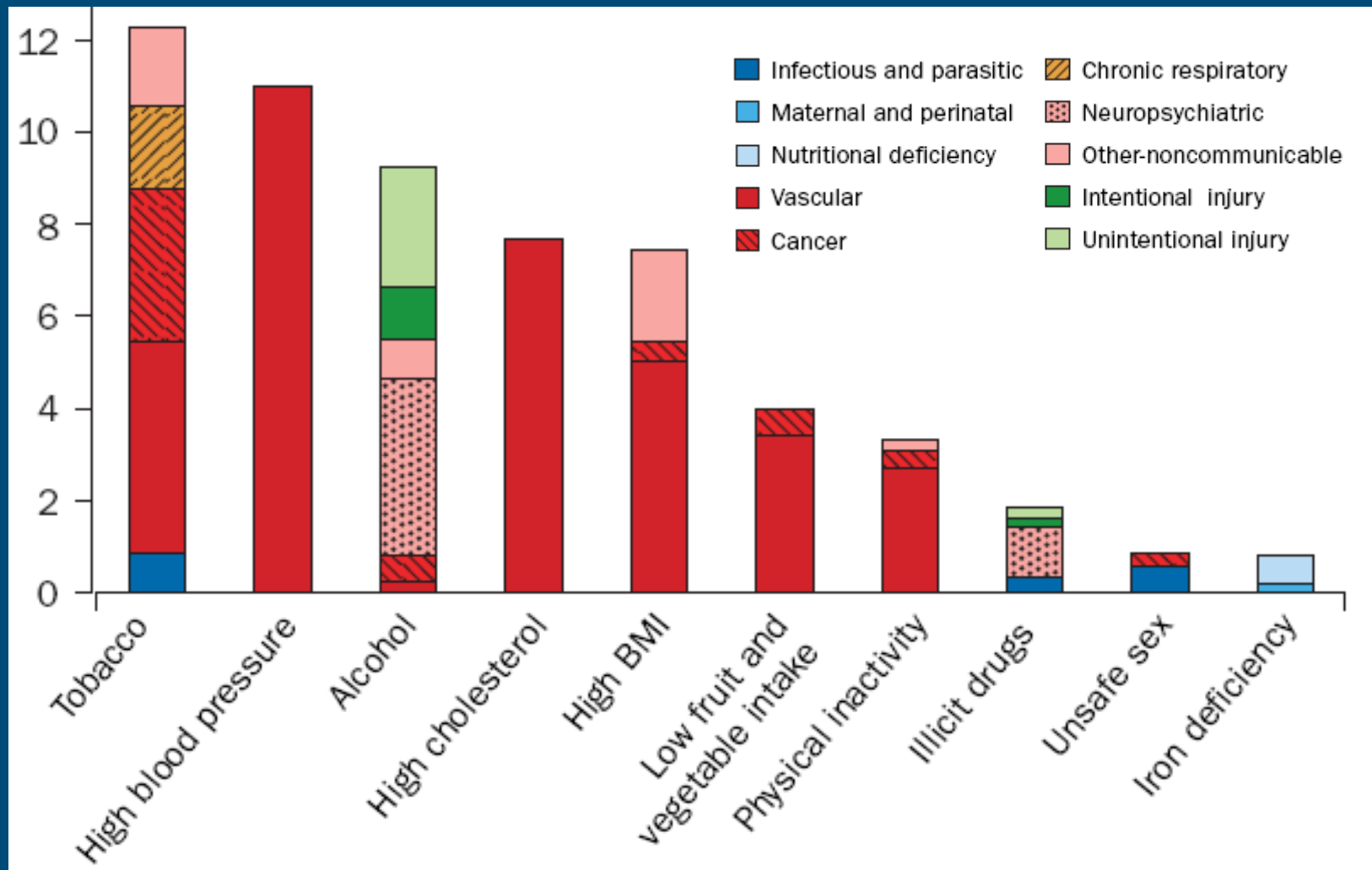
Table 2 Contribution of different factors to the burden of disease in the European Union

Causal factor	Contribution to overall burden of disease (%)
Tobacco smoking	9.0
Alcohol consumption	8.4
Overweight*	3.7
Occupational risks	3.6
Low fruit and vegetable consumption*	3.5
Relative poverty	3.1
Unemployment	2.9
Illicit drugs	2.4
Physical inactivity	1.4
Diet high in saturated fat*	1.1
Outdoor air pollution	0.2

Source: National Institute of Public Health⁴².

* Diet-related factors.

Burden of disease in developed regions



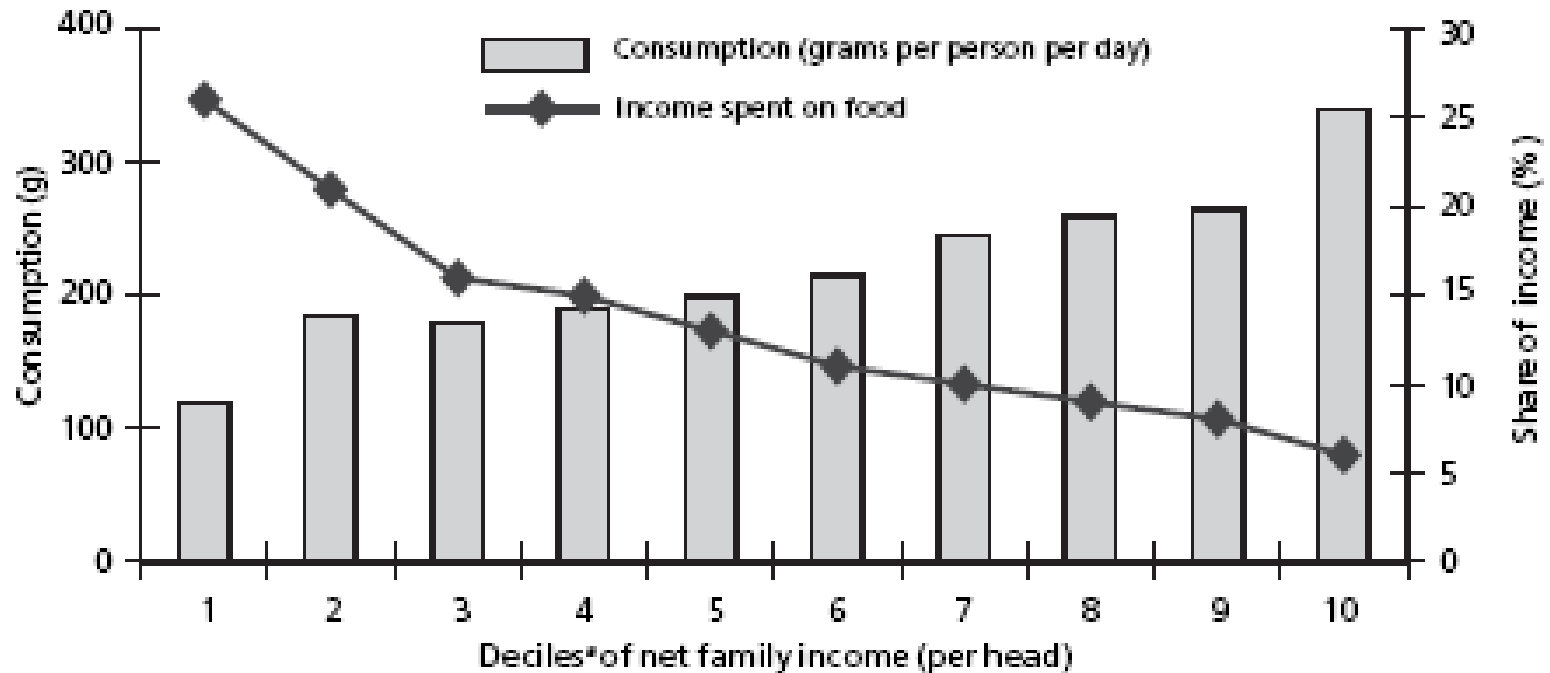
Ezzatti M et al. Lancet Oct 30, 2002;
<http://image.thelancet.com/extras/02art9066web.pdf>
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Dietary and lifestyle factors

- Socio-economic
- Smoking & drinking
- Energy balance
- Diet and nutrition

Socio-economic determinants

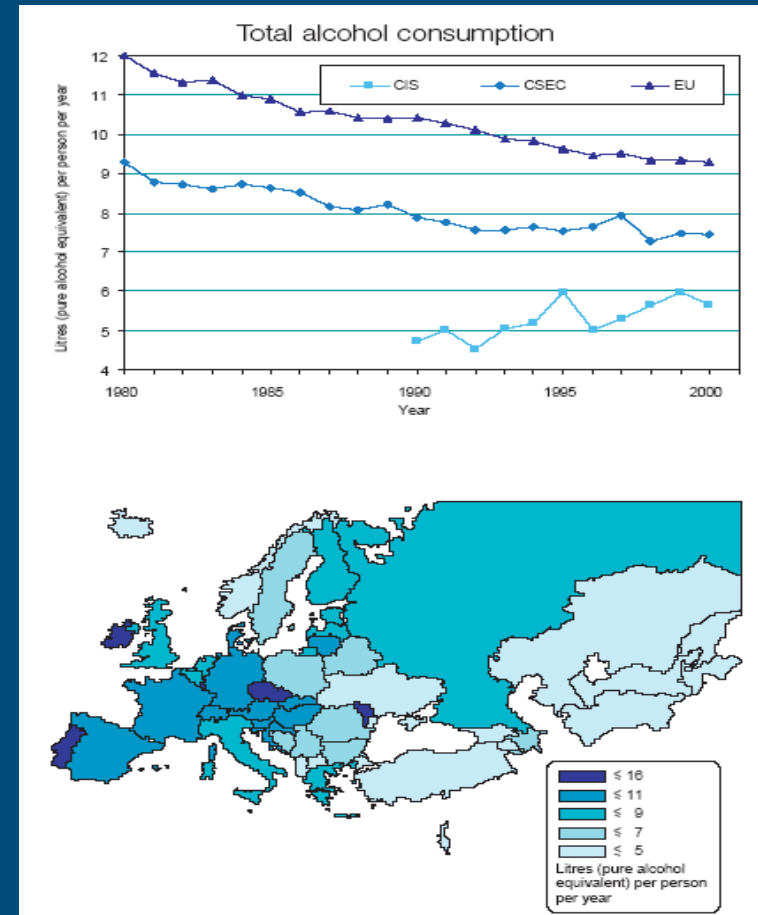
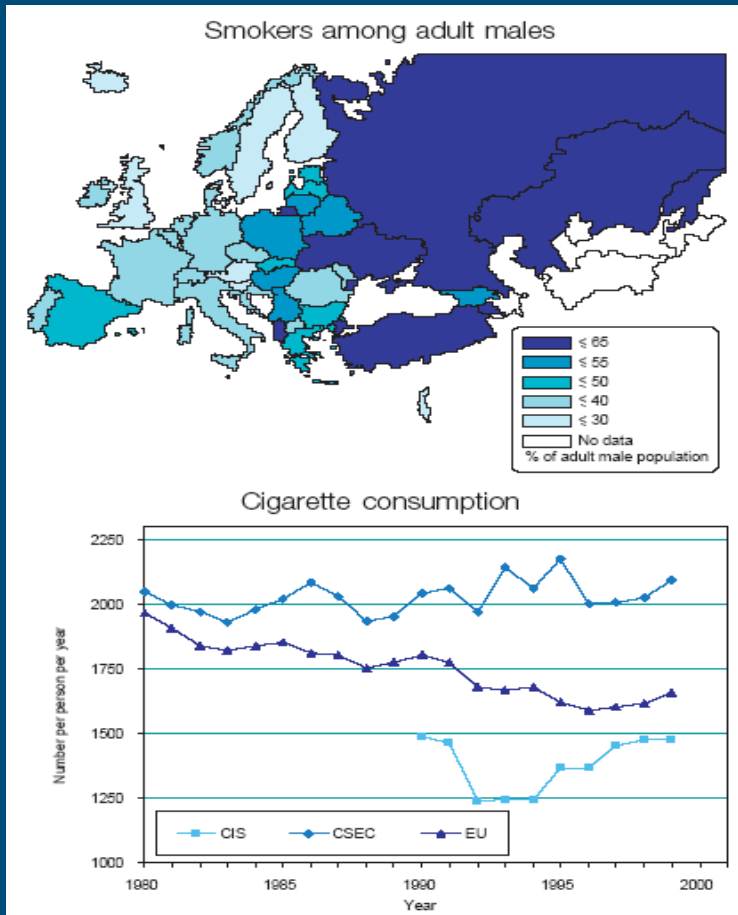
Fig. 3. Relationship of income to consumption of fresh fruit and vegetables and the share of income spent on food



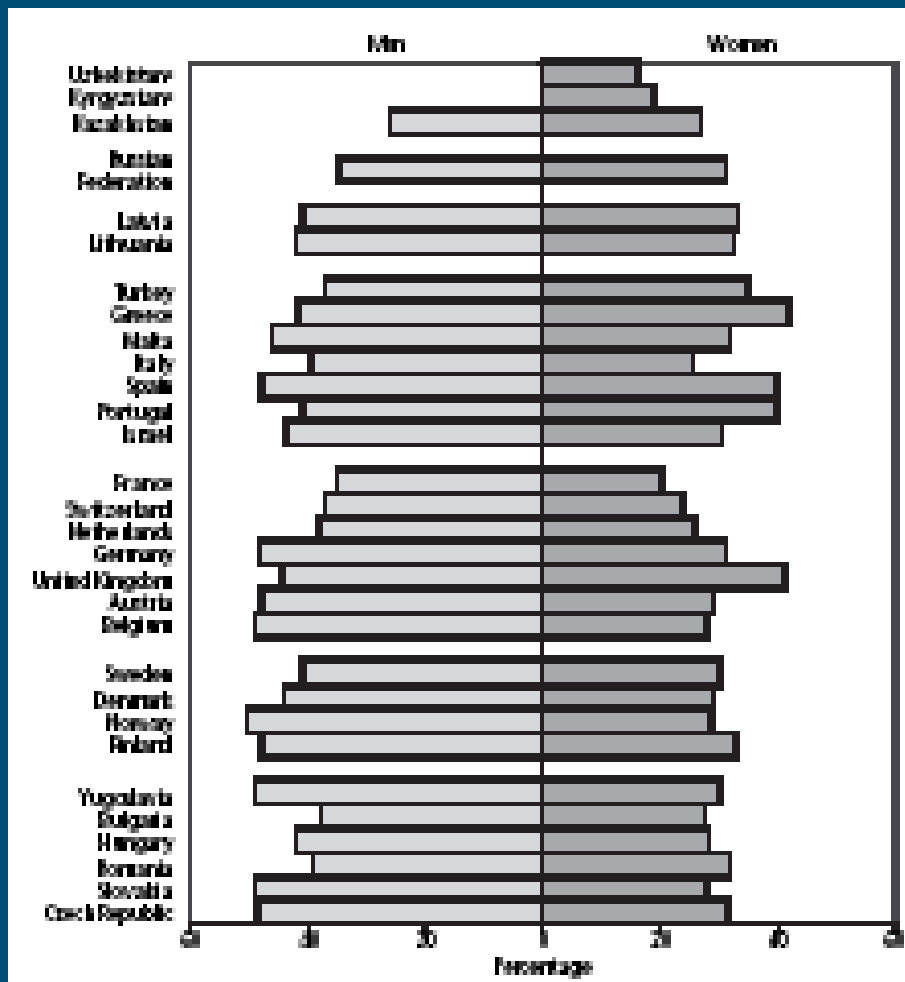
^a 1 = lowest incomes; 10 = highest incomes.

Source: Department for Food, Environment and Rural Affairs (18).

Lifestyle determinants: smoking and drinking



Energy balance: Overweight adults (BMI 25-29.9) in the European region (%)



- Relevance: CVD, diabetes, some malignancies
- Cause: Positive energy balance, mainly due to low physical activity

Physical activity

- 50% lower risk of dying from CVD
- Less hip fractures, HBP, NIDDM, obesity, functional limitations (aerobic capacity, independent living)

Healthy food supply: energy & nutrients



Energy balance

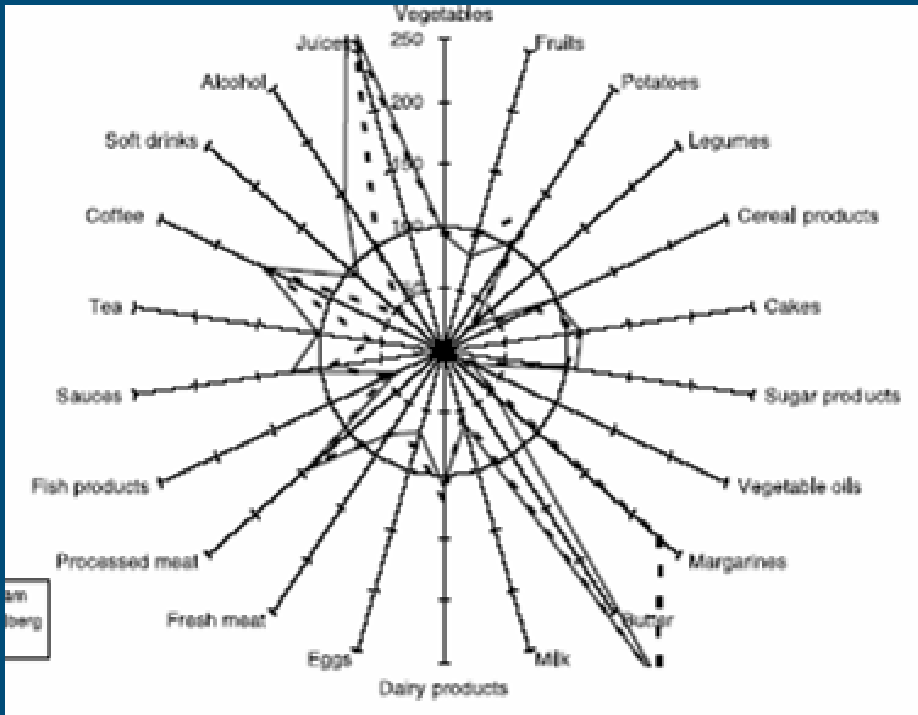


Composition
food pattern



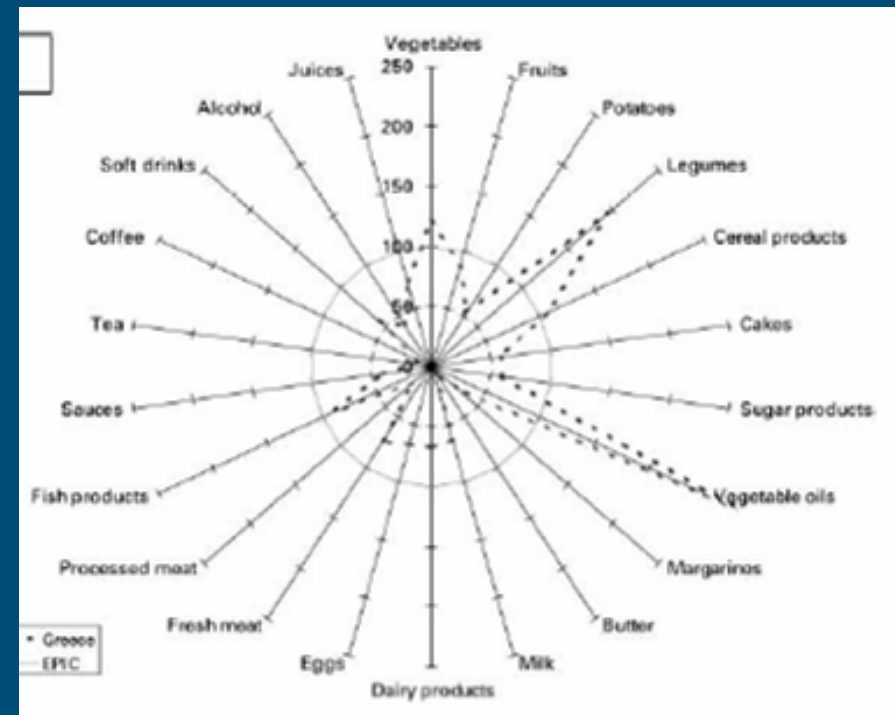
Dietary patterns in Europe

Women, Germany (EPIC)



Margarines, butter, processed meat, sauces, coffee, alcohol, juices

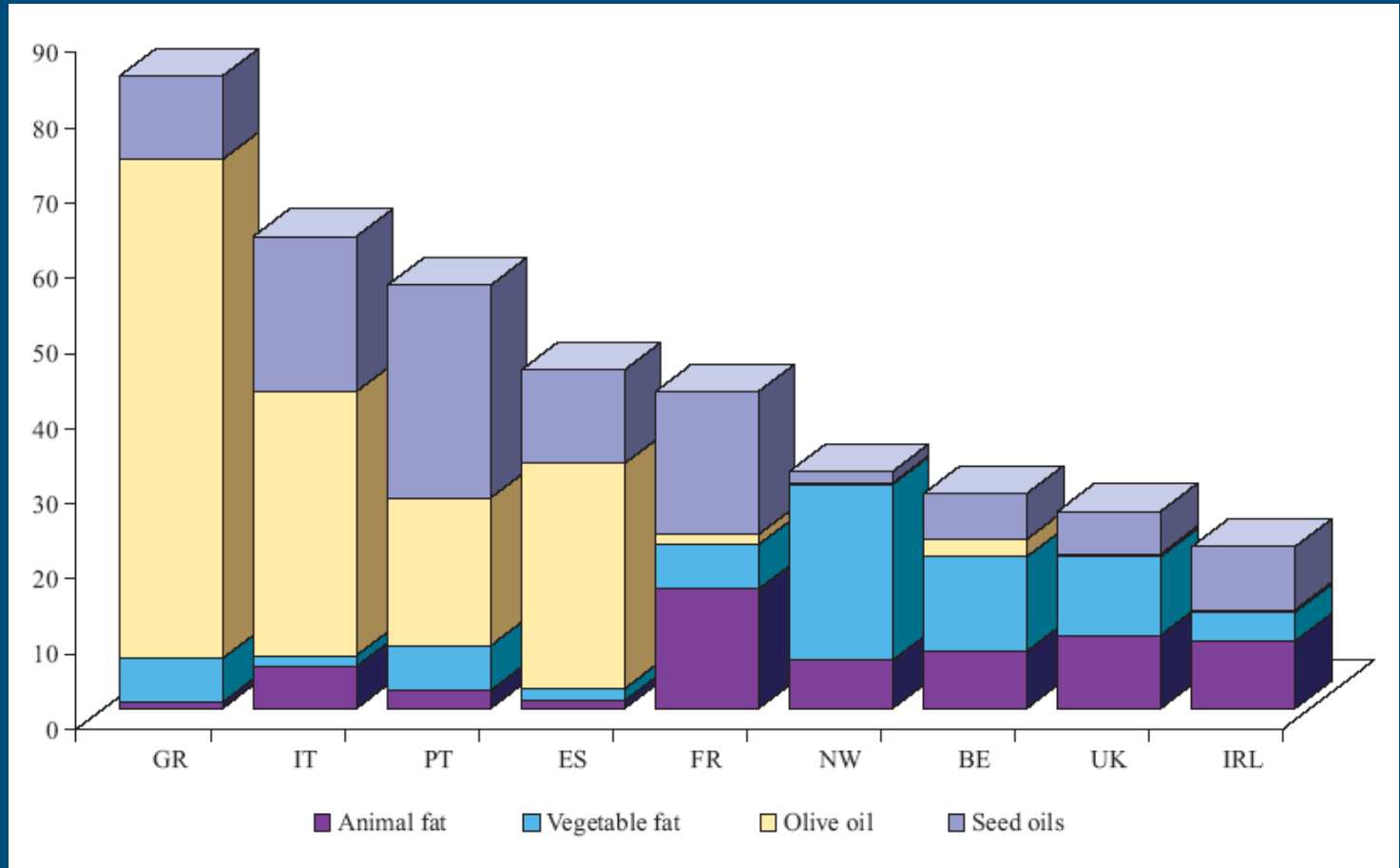
Women, Greece (EPIC)



Vegetables, legumes, vegetable oils, fish products

Dietary patterns in Europe

Average availability of total added lipids by type in the DAFNE countries (g/person /day)



Risk factors of disease -- Summary

- Higher smoking prevalence
- (Still) lower drinking in new member states
- Diversity in European dietary patterns

Consequently:

increased importance of suboptimal diet and NCD
in EU+

Epidemiology

- Disease occurrence
- Risk factors
- Prevention of disease
 - Science
 - Society

Science: exploring the unknown

- Time: Classic deficiencies to healthy ageing
- Individual: Nutrigenomics and personalized diets
- Vegetables/fruit – antioxidants, folate, bioactives
- Fats – safa & trans; n-6, monounsaturates & n-3
- Overweight and chronic diseases
- Neuropsychiatric diseases

Science: evidence base for policy

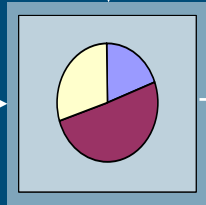
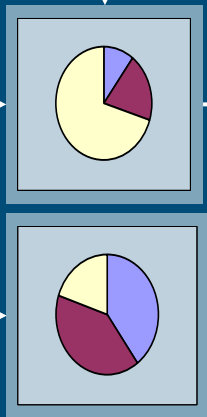
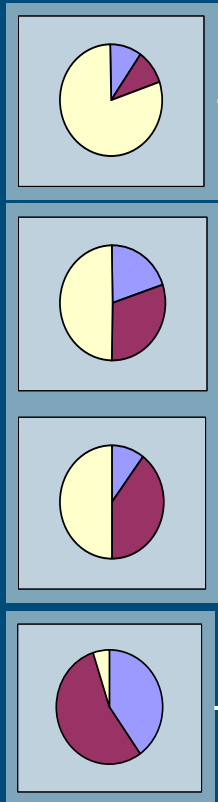
Agricultural production

Food chain and retail

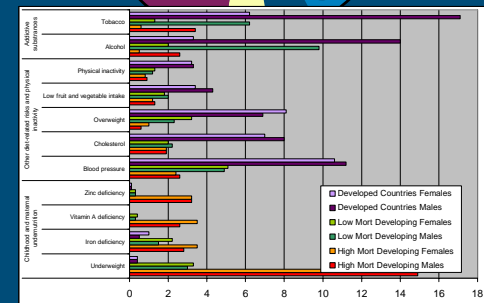
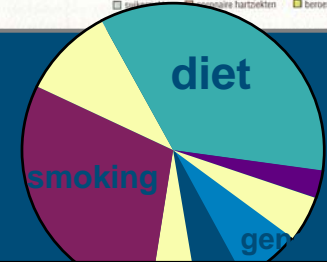
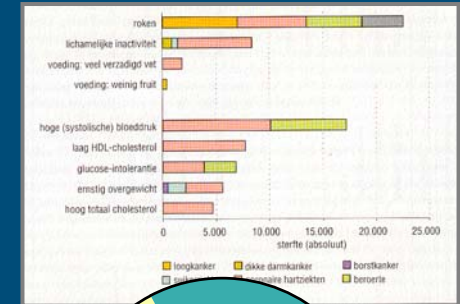
Food choice by consumer

Individual risk profile

Public health



- Smoking
- Serum cholesterol
- Blood pressure
- Overweight
- Physical activity
- Medical history
- Family history
- Susceptibility



Food chain: public health should be the driver

Science: evidence-base for policy

- **Occurrence: Monitoring and surveillance**
 - disease patterns, trends, modeling, forecasts
 - levels & trends in diet and lifestyle (FP6)
- **Risk factors: Etiological research**
 - epidemiological research and meta analysis
 - quantifying short/long term effects (risk, not hazard)
- **Prevention: Strategies**
 - quantifying adverse / beneficial effects
 - develop and communicate effective interventions

Science: evidence base for policy

Needed: strengthen evidence base for policy

- Valid and reproducible tools to assess dietary patterns in a valid and reproducible manner, comparable in the EU member states
- Comparable data and recommendations for nutrient status and requirements from different populations groups, throughout the life cycle

Diet indicators for monitoring in Europe (EFCOSUM)

Foods and nutrients

- Vegetables
- Fruit
- Bread
- Fish
- Saturated FAs (% of E)
- Total fat (% of E)
- Ethanol (g/day)

Biomarkers

- Folate
- Vitamin D
- Iron
- Iodine
- Sodium

Steingrimsdottir et al for the EFCOSUM group. EJC
56; 2002: S8-11

Society: stakeholders

Governmental agencies (ministries of health, agriculture), should play a stronger role in

- Formulating risk policies (effective, committed policies for the prevention of large risks to health)
- Appropriate balance between population-wide risk reduction and aiming to reduce risk in a smaller number of high-risk individuals.

A balance between government, community and individual action is necessary.

- e.g., great potential from community action by NGOs, local groups, the media
- others should be encouraged and expanded: stakeholders like food industry, insurance companies, municipal health agencies.

Society: consumers' choices

- Smoking and alcohol
- Safety and health
- Food choice and feedback

Society: consumers choices - lessons

■ Tobacco

- Risks identified 1950-60
- Filter-tips, low-tar
- Taxes, advertisement bans
- Smoke free environment, social pressure

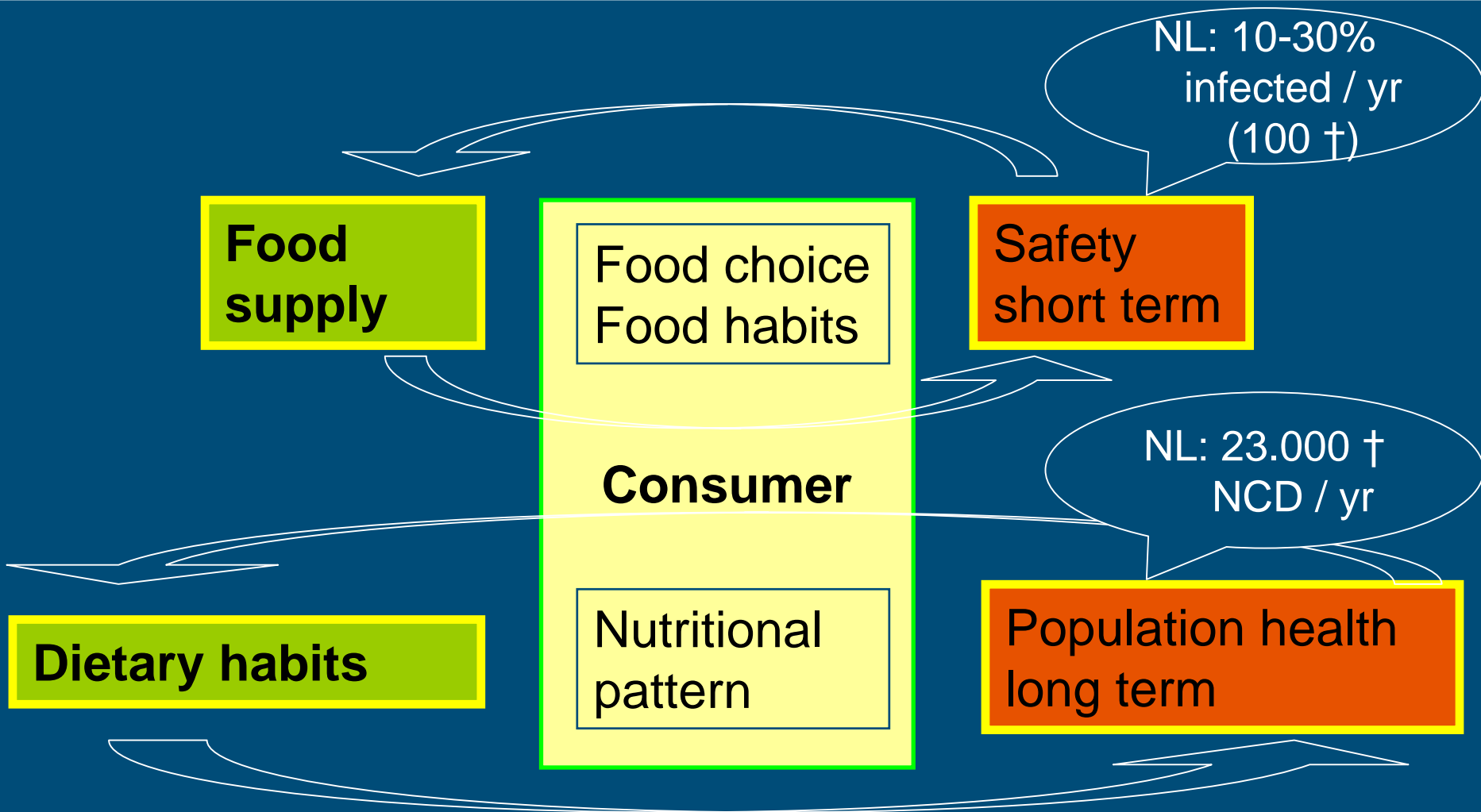
■ Alcohol

- More ambiguous (CVD), moderate drinking socially accepted
- Fines, drivers license, taxes
- Age-limit, restricted advertisement

■ Lessons

- Cognitive approaches < social environment
- Direct physiological feedback controls behavior

Consumers choices: safety and health



Consumers choices: feed back loops and time span

Feed back loops

- Short term: physiological (sufficient & safe food)
- Long term: cognitive (dietary pattern & health)

Time span

- Hours Hunger / Satiety (today)
- Days Safety (tomorrow)
- Years Health - NCD (beyond tomorrow)

Society: food choice and feedback

- Mass campaigns on dietary habits
 - Risk communication cognitive, food choice?
- Restructure the environment
 - Involve consumers, retail, industry,
- Development to tailor-made / personalized advice
 - Individual dietary habits (internet)
 - Personalized dietary advice (with feedback)
 - Metabolic markers of individual susceptibility

Society: consumers' choices

Needed

- Better understanding of consumer choices and dietary habits
 - Product side: physicochemical, sensory, product values, labelling
 - Consumer side: gender, age, lifestyle, SES
 - Research, training, communication: help consumer to make informed, healthy choices

Summary and conclusion

- Disease occurrence
 - NCDs more important in EU+
- Risk factors
 - Poor diet and alcohol as important as smoking
 - Monitor food habits & harmonize requirements (FP6)
- Prevention
 - Balance short and long term risks
 - Involve stakeholders (food chain, public health)
- Consumer is key player
 - Understand consumer choices (FP6)

Stages in development?

