Challenges and Opportunities

Healthy Growth and Lifelong Health
Nutrition and Physical Activity

Hellenic Presidency Conference

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National Institutes of Health Research

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The NIHR Southampton Biomedical Research Centre in nutrition is funded by the National Institute for Health Research (NIHR) and is a partnership between University Hospital Southampton NHS Foundation Trust and the University of Southampton

Major Global Challenges

Nutrition:

malnutrition in all its forms,

chronic non-communicable disease

Global warming/ climate change

Water security

Food security

Population growth, 7 to 9 billion in 2050

Peace/ war, terrorism

Challenges:

- public engagement, several sectors

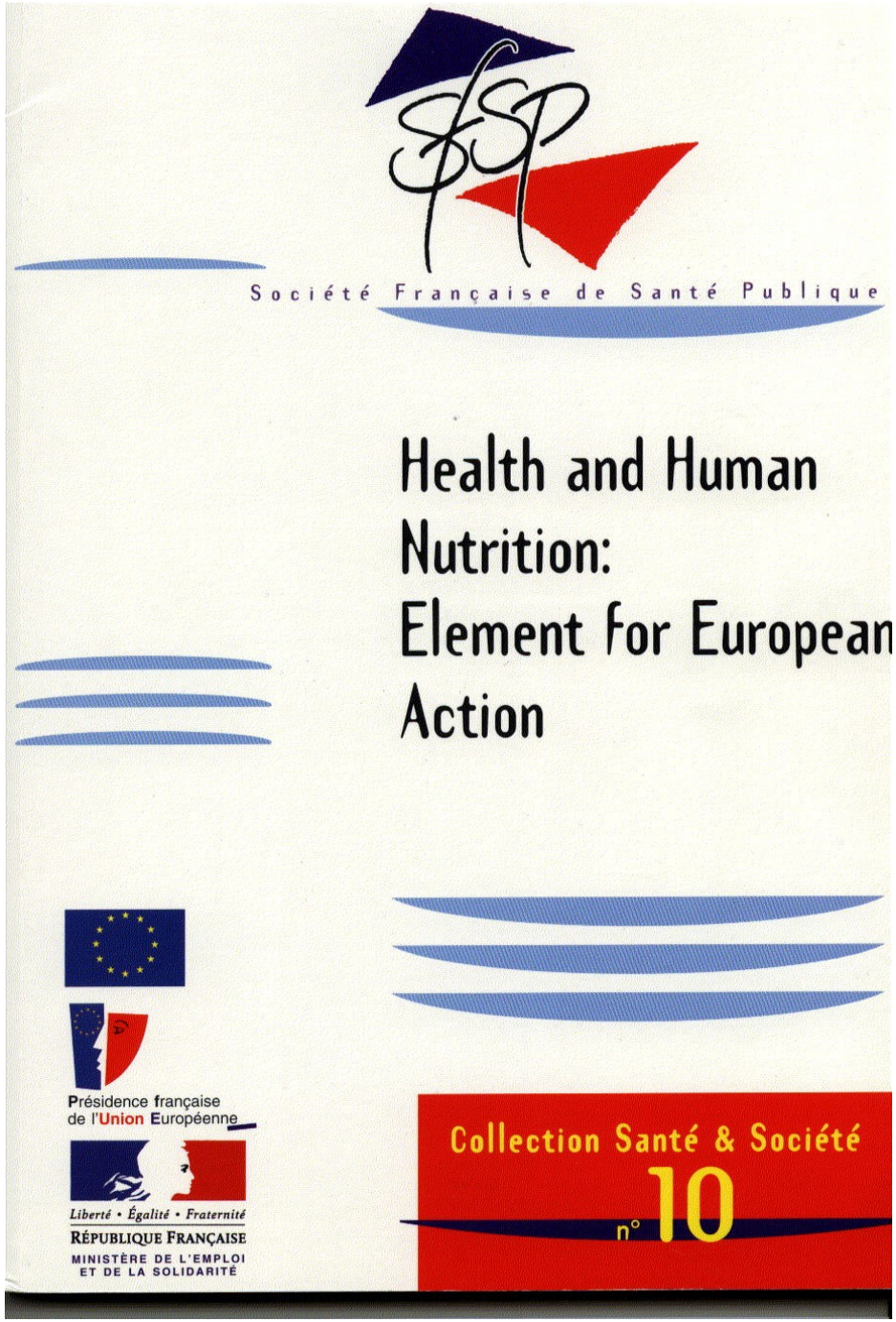
- evidence synthesis and action

- complexity

- multiple layers

- professional identity, capability

- big science: biomedical, sociological



Public Health Approach

Cross-sectoral

Integrated

Challenge- evidence

Food Standards Agency
Scientific Advisory Committee on Nutrition

Risk Assessment: Not risk management

Nutritional Wellbeing of the Population
– National Diet and Nutrition Surveys

Nutrient profiling

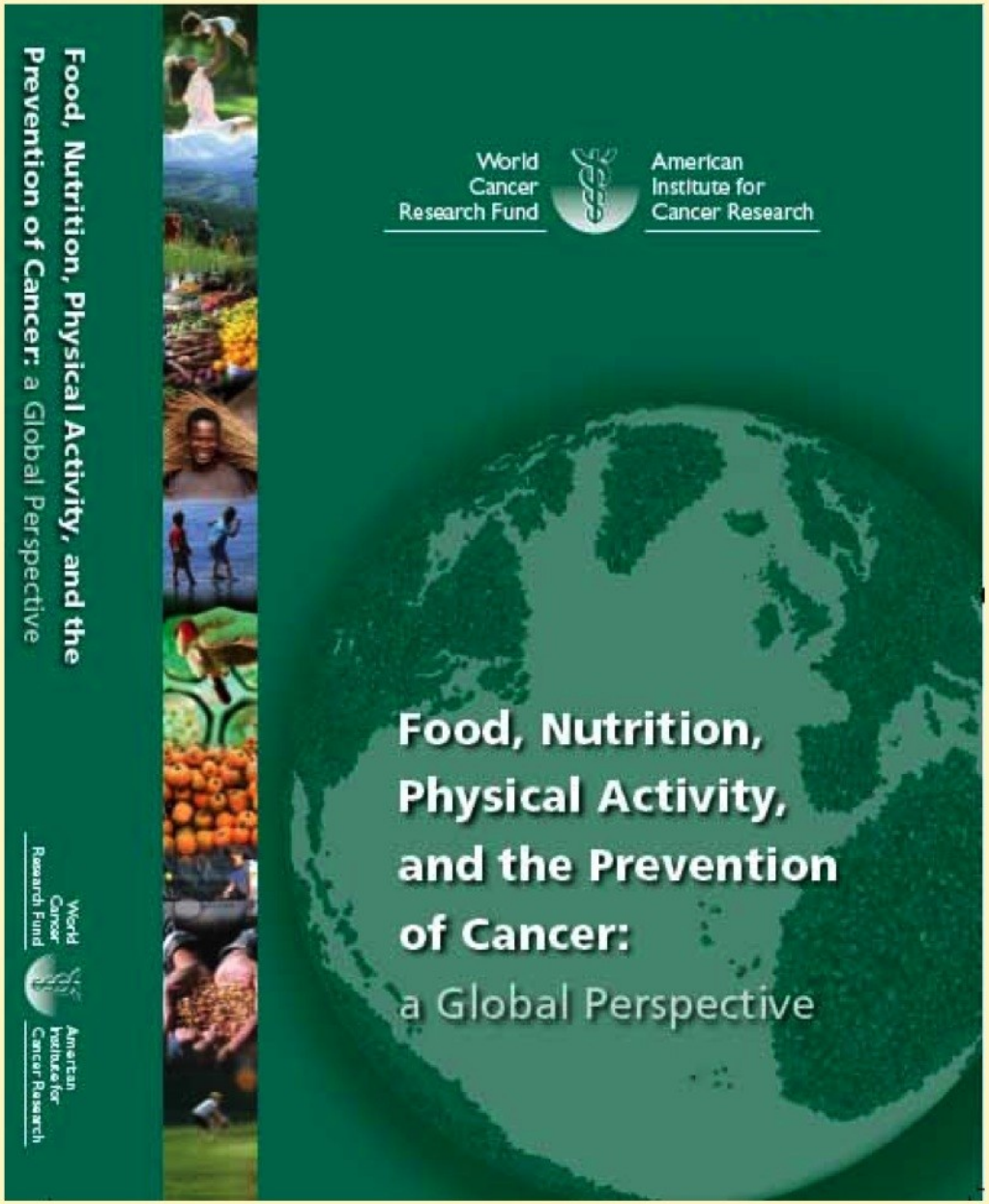
Advertising to children

Energy

Fatty acids, fish, n-3, carbohydrates, fibre, sugar

Salt, Iron, Selenium, Iodine

Vitamin A, Vitamin D, folic acid



Comprehensive

Rigorous

Detailed

Sound Method

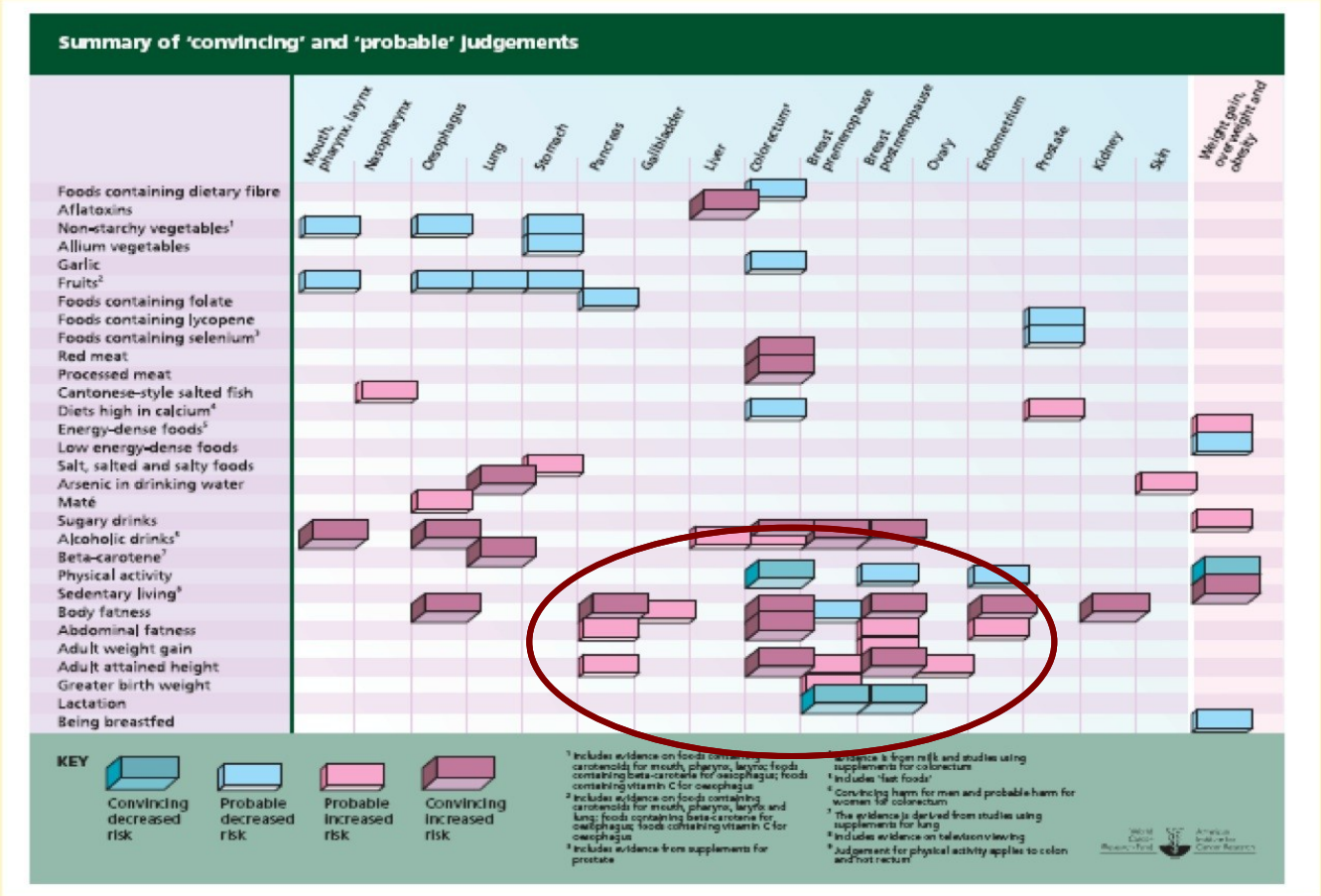
Authoritative

2007

World Cancer Research Fund
American Institute for Cancer Research

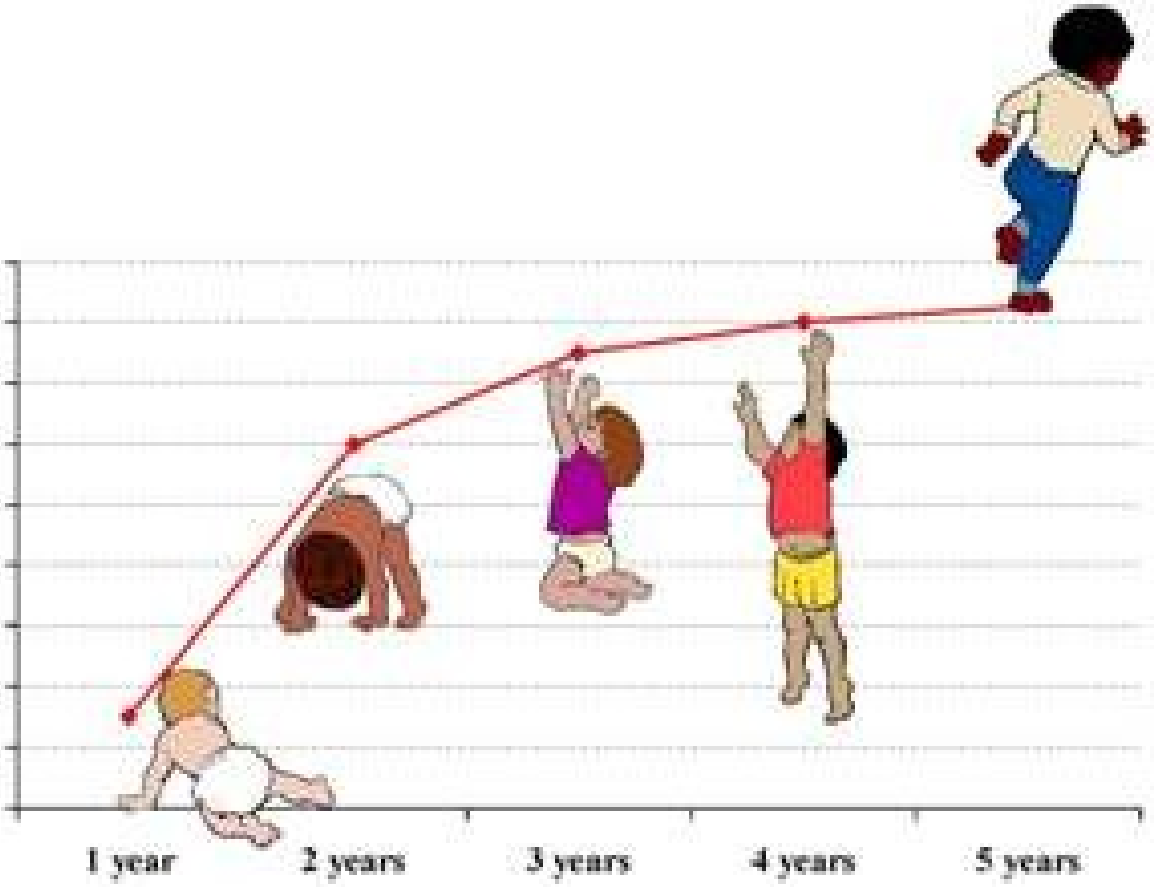
Causes of cancer: OBESITY, PHYSICAL INACTIVITY, POOR QUALITY DIET

Food, nutrition, physical activity, and the prevention of cancer : overview of the panel's key judgments



World Health Organization: Growth Standards

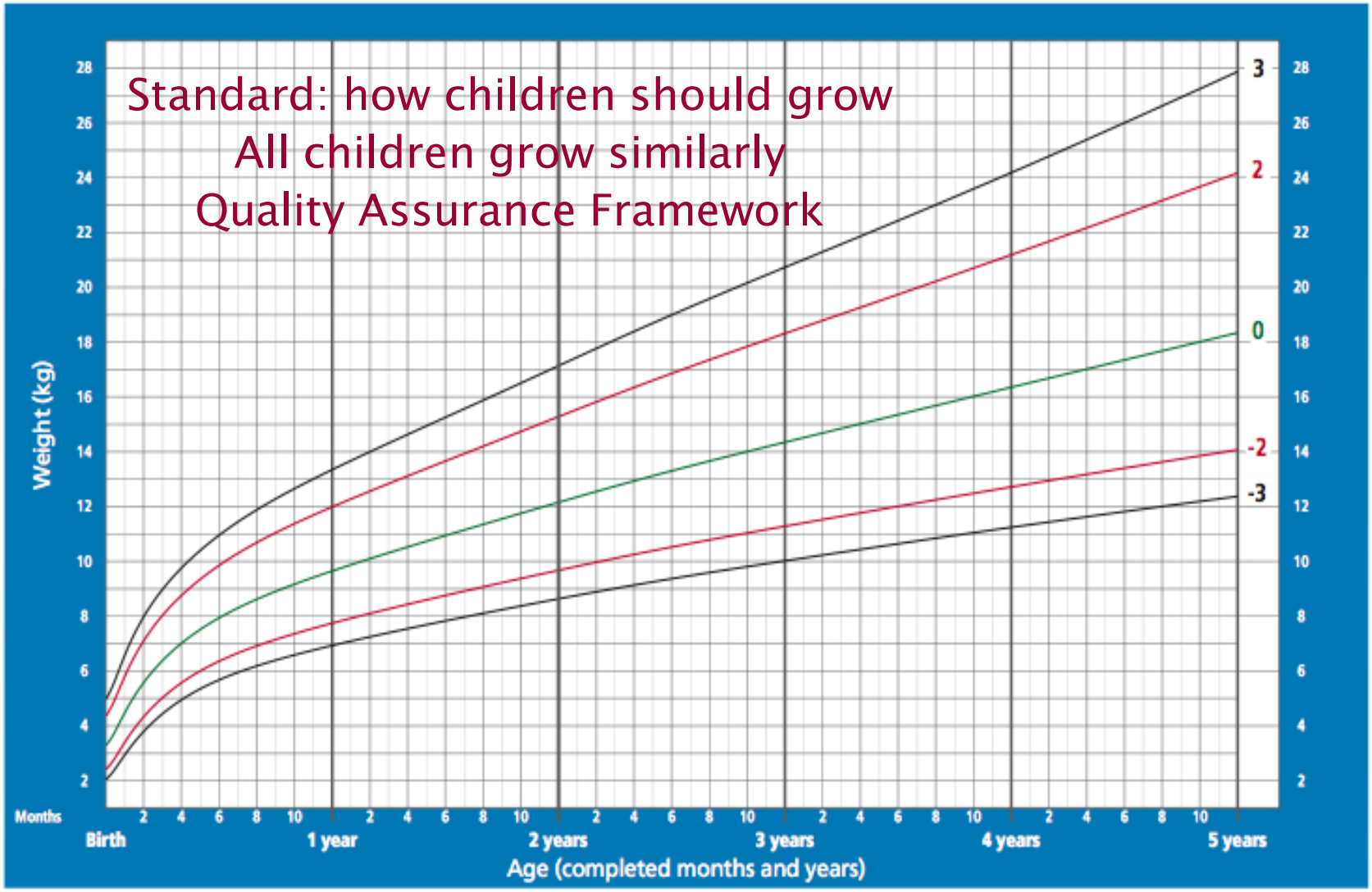
Growth of infants and children from 6 countries
USA, S America, Africa, Europe, Asia, Middle East



Weight-for-age BOYS

Birth to 5 years (z-scores)

World Health Organization



WHO Child Growth Standards

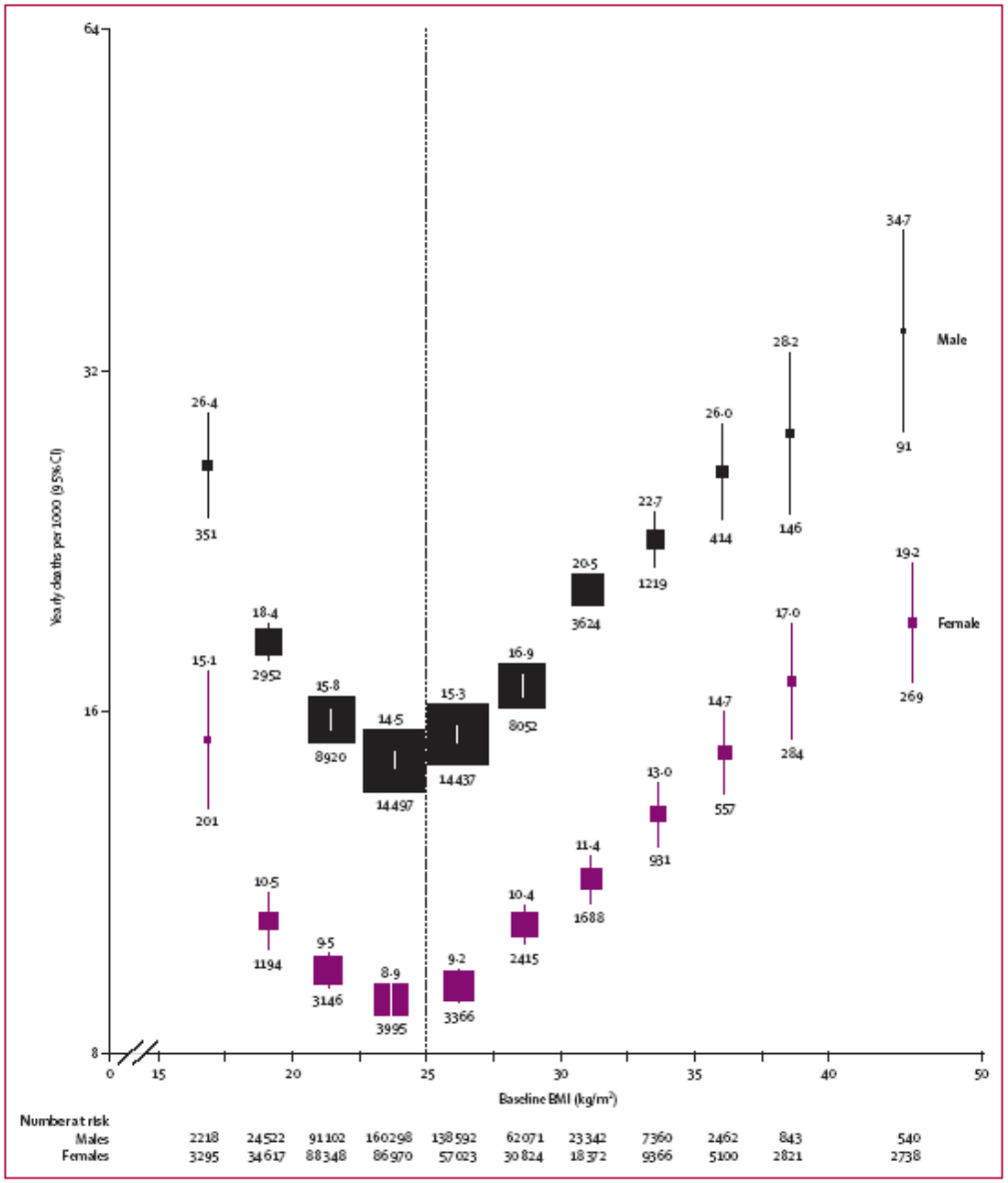


Figure 2: All-cause mortality versus BMI for each sex in the range 15–50 kg/m² (excluding the first 5 years of follow-up)
Relative risks at ages 35–89 years, adjusted for age at risk, smoking, and study, were multiplied by a common factor (ie, floated) to make the weighted average match the PSC mortality rate at ages 35–79 years. Floated mortality rates shown above each square and numbers of deaths below. Area of square is inversely proportional to the variance of the log risk. Boundaries of BMI groups are indicated by tick marks. 95% CIs for floated rates reflect uncertainty in the log risk for each single rate. Dotted vertical line indicates 25 kg/m² (boundary between upper and lower BMI ranges in this report).

Prospective studies collaboration. Lancet 2009, 373, 1083-1096

57 prospective studies
900,000 adults

Body Mass Index

U-shaped relationship
all cause mortality

Preferred range 22-25 kg/m²

Europe: Secular Increase in Height

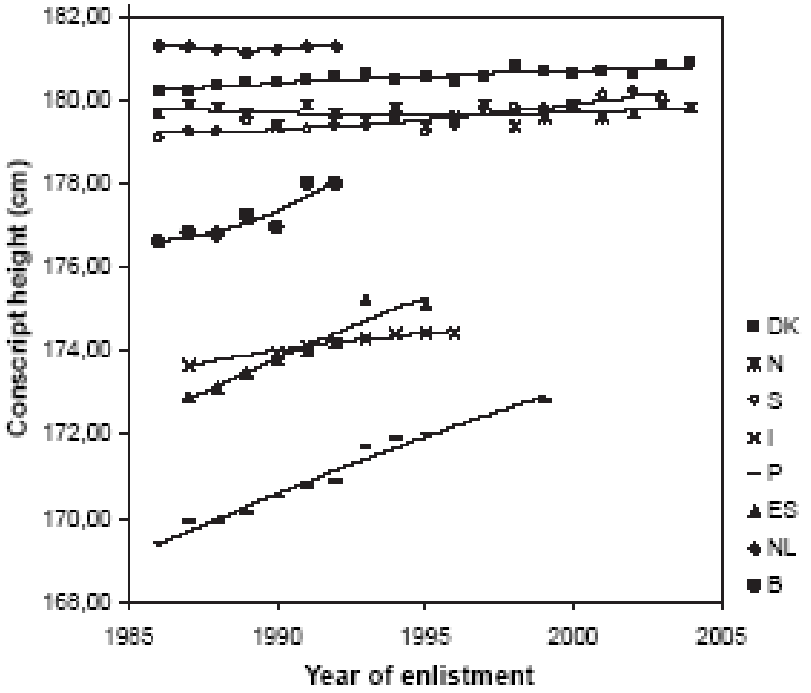


Figure 1. Mean conscript height in eight European countries according to year of enlistment. Previously published data from 1987 to 1990 have been included for comparison. B: Belgium; DK: Denmark; ES: Spain; I: Italy; N: Norway; NL: the Netherlands; P: Portugal; S: Sweden.

Larnkjaer et al Acta Paediatrica 2006

Plateau ~1.8 m:
- Denmark, Sweden, Norway, Netherlands
- ?genetic potential

Increasing:
- Belgium, Spain, Italy, Portugal

Europe: secular increase in height:

Stopped, 18 years following post-neonatal mortality around 4/1000 deliveries.

Improving socio-economic conditions

- better nutrition – healthier diet
- decrease in infectious diseases

Global trend towards increase weight and height:

generally desirable:

BUT

increase in weight achieved
- before increase in height

Increase in childhood overweight and adiposity

Increased risk of shortness/stunting and obesity

Quality of Growth as Well as Quantity of Growth

Is the ENERGY IN - ENERGY OUT Model Sufficient?

Pattern of nutrients retained

Nutrient requirements for net deposition:

- bone
- lean tissue
- adipose (by default)

Nutrient availability – altered pattern tissue deposition:

- energy
- macronutrients
  dietarily essential, conditionally essential
- micronutrients

Body mass index:

no (remove) relationship with height

high BMI is for weight relative to height

too heavy for that height

too short for that weight?

FOOD/NUTRIENT INSECURITY

Diet:

Quantity:

energy

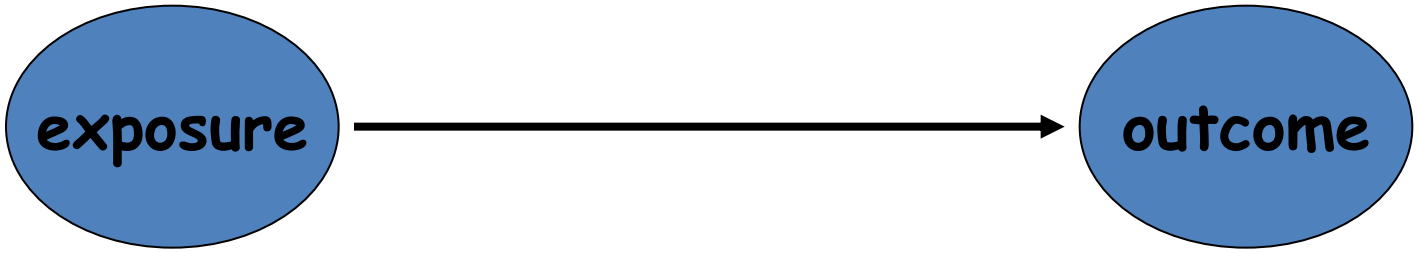
[macronutrients, carbohydrate, lipid (fat), protein]

Quality:

Nutrients

[CHO, lipid (essential fatty acids), amino acids, minerals, vitamins, trace elements, water, oxygen]

Activity and Stress (Inflammation/Infection)



diet

Ill-health
?
Health

Demands matched by diet ⟶ Health

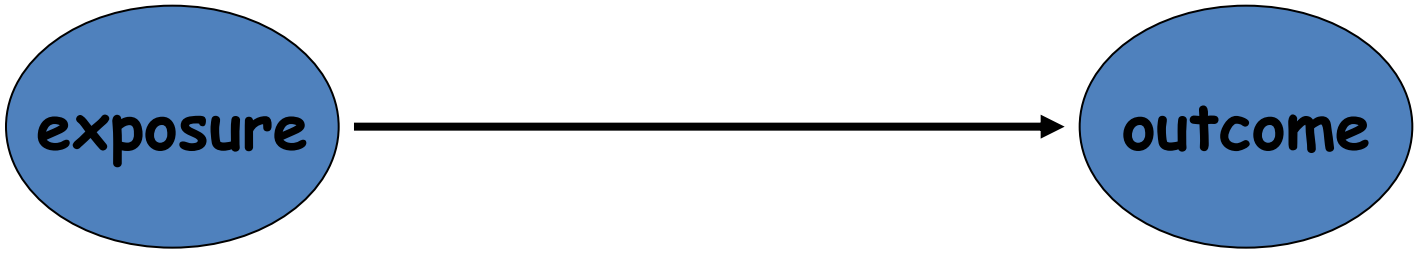
Demands not matched by diet ⟶ Ill-health

Demands

- age, gender, physiological state (activity)
- stressors (biological, behavioural, social)

BODY COMPOSITION

Mark the goodness of fit between demands and supply



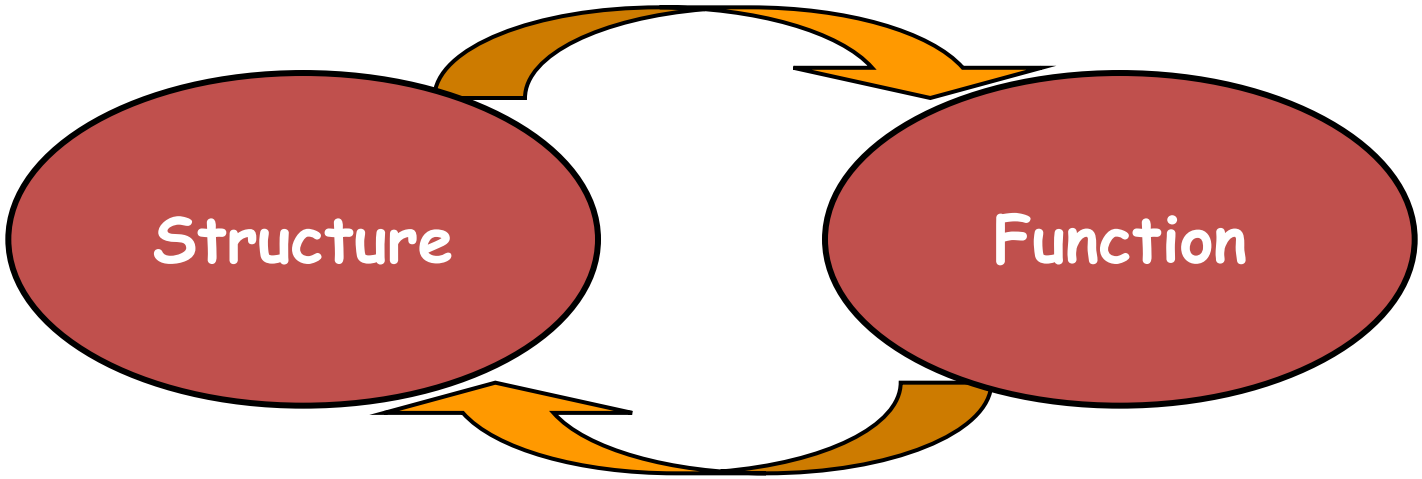
Body habitus (dimensions and composition)

simplest and most accessible approach to mark status

- function and risk

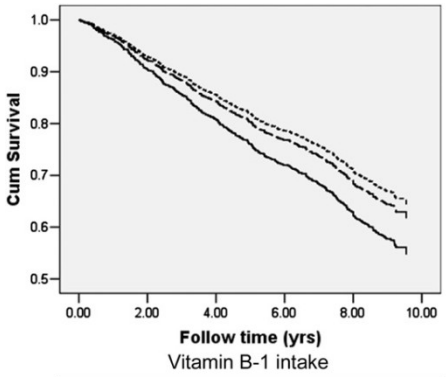
BODY COMPOSITION

More than simply energy balance

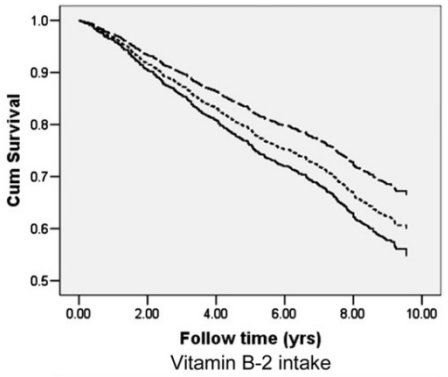


CUMULATIVE SURVIVAL in relation to B vitamin status: Older People

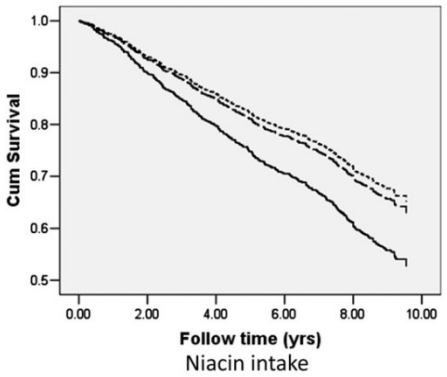
B1



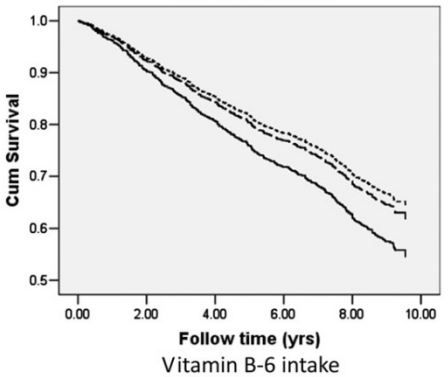
B2



Folate



B6



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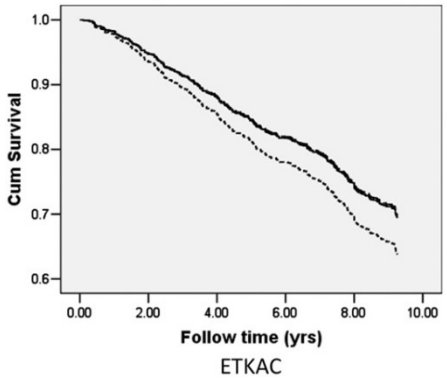
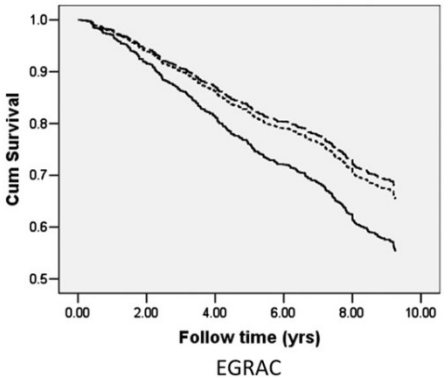


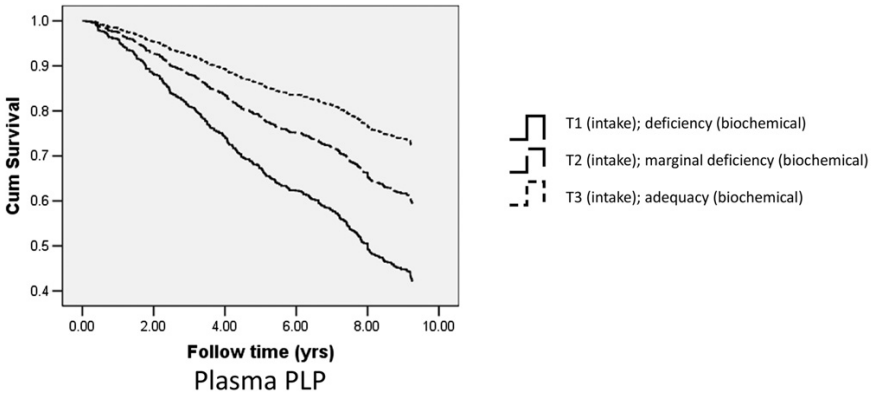
EGRAC



Huang et al Clin Nutr 2012, 31, 191

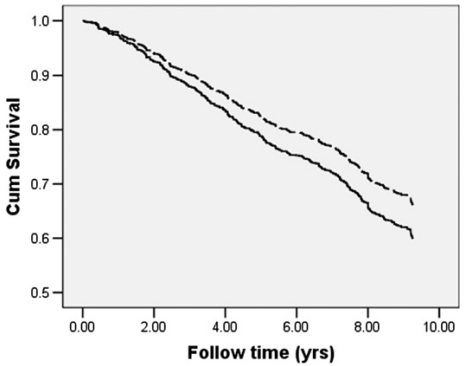
CUMULATIVE SURVIVAL in relation to B vitamin status: Older People

Plasma Pyridoxal Phosphate

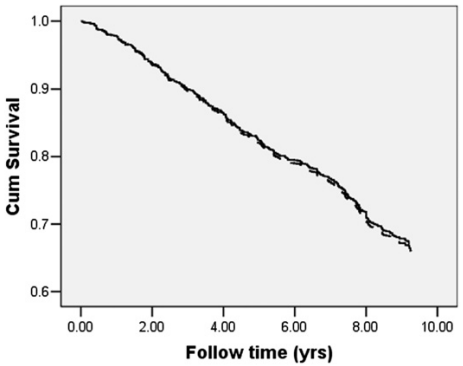


Plasma PLP

Plasma Folate

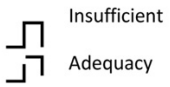


Plasma folate



Serum vitamin B-12

Serum B12



Food Quality: shortness, obesity, morbidity, mortality

Huang et al Clin Nutr 2012, 31, 191

What to do?

Growth: mothers and children first

impact of insult: timing, intensity, duration
sensitive periods: greater vulnerability, enduring effect
protect growth: investment for future

Barker:

variation within normal range
associated with risk of chronic non-communicable disease

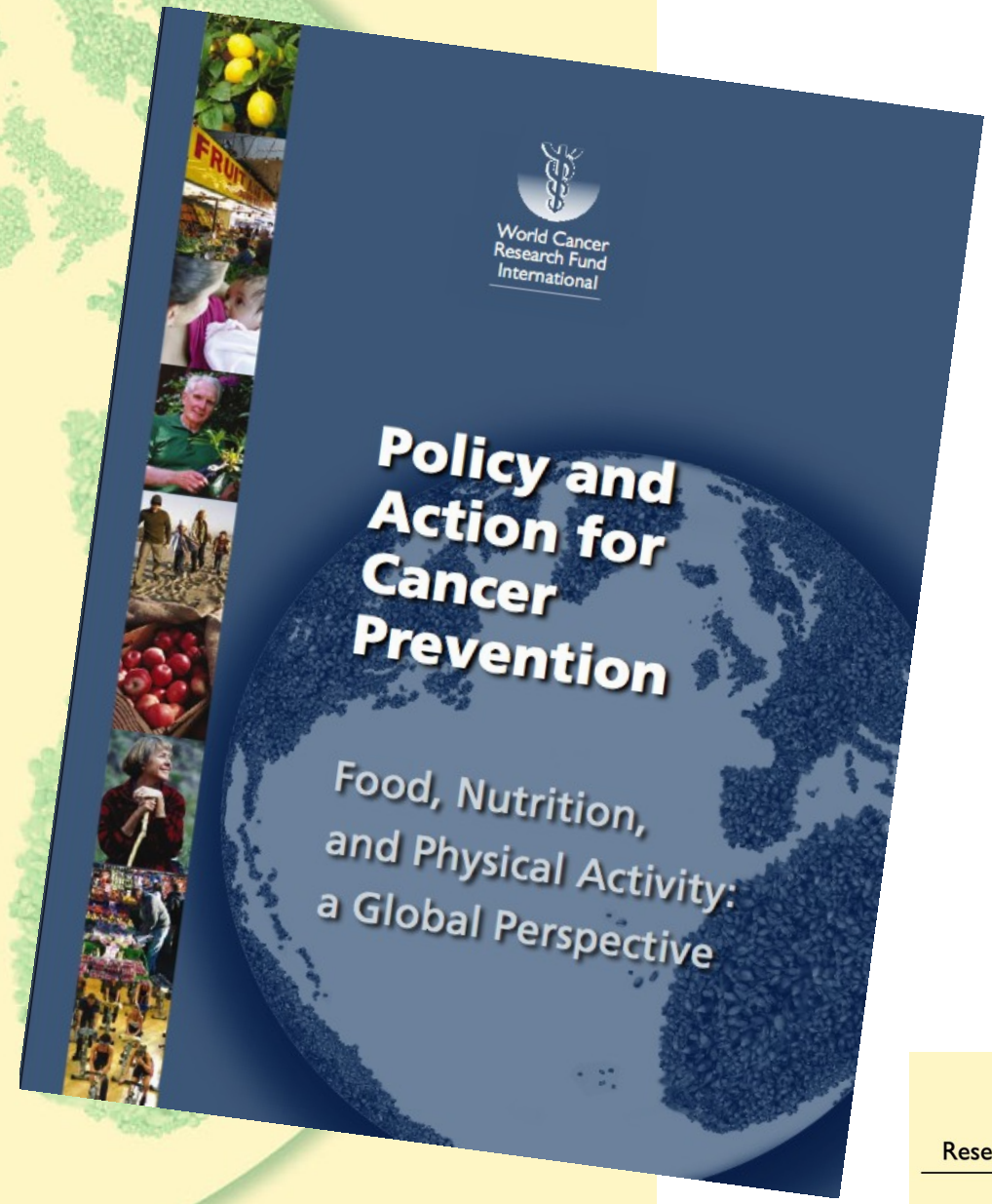
Uauy:

normal weight: stunting and adiposity
maturational processes and timing: maturational age

Vulnerable at all ages:

stunting most common nutritional problem
correction – improved social determinants of health
specific nutrient requirements.
enhance dietary quality: dietary diversity

Systematic Review Changing Behaviour, 2009



World Cancer Research Fund

American Institute for Cancer Research

Behaviour

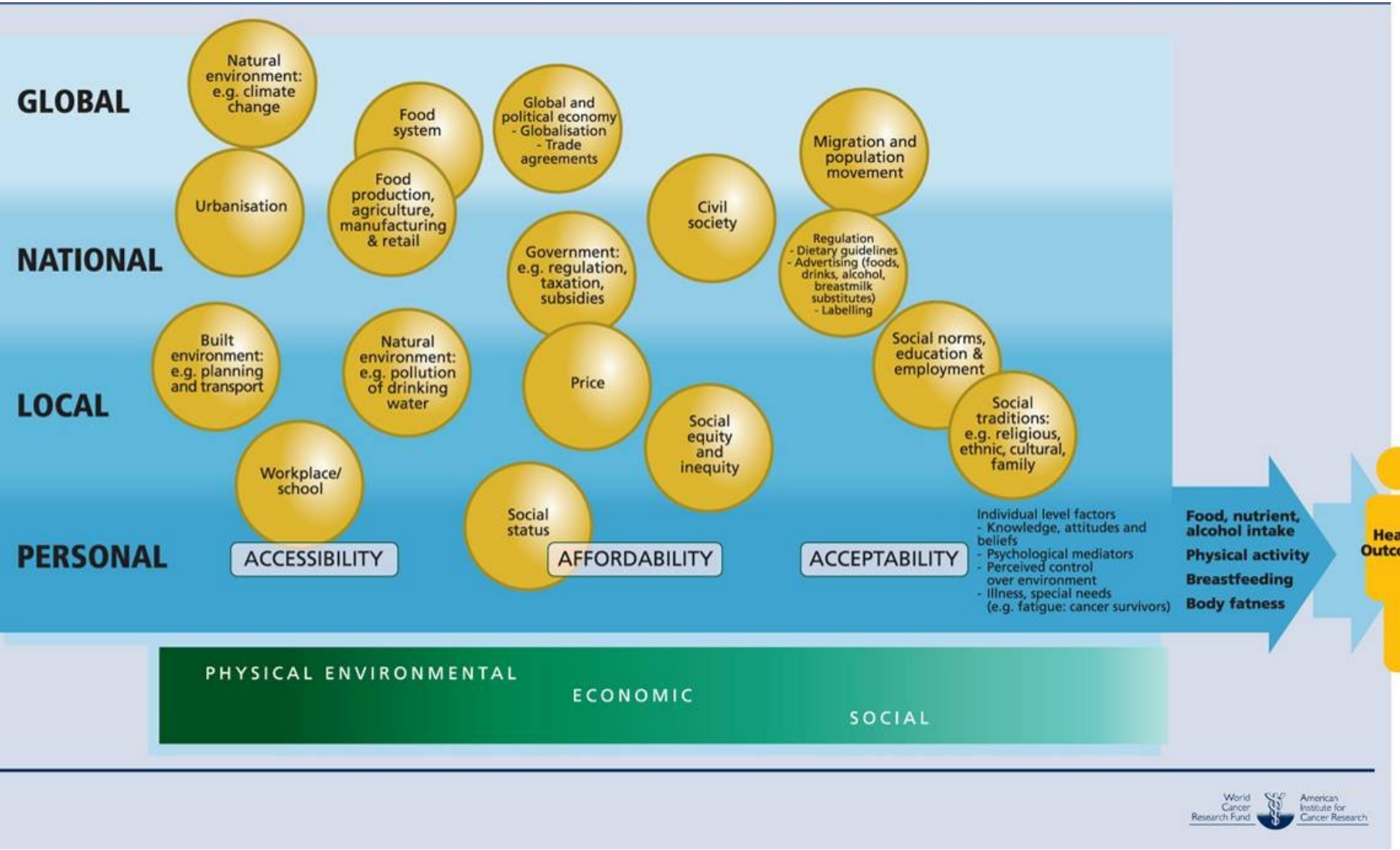
- People behave like those around them
  - social norms

- Asking people to behave very differently from their social norm only has limited or unsustained effect

- Personal choice determines individual variation around the social norm
  - small effect

- External factors determine social norms
  - big effect

What Constrains Personal Choice?



World Cancer Research Fund
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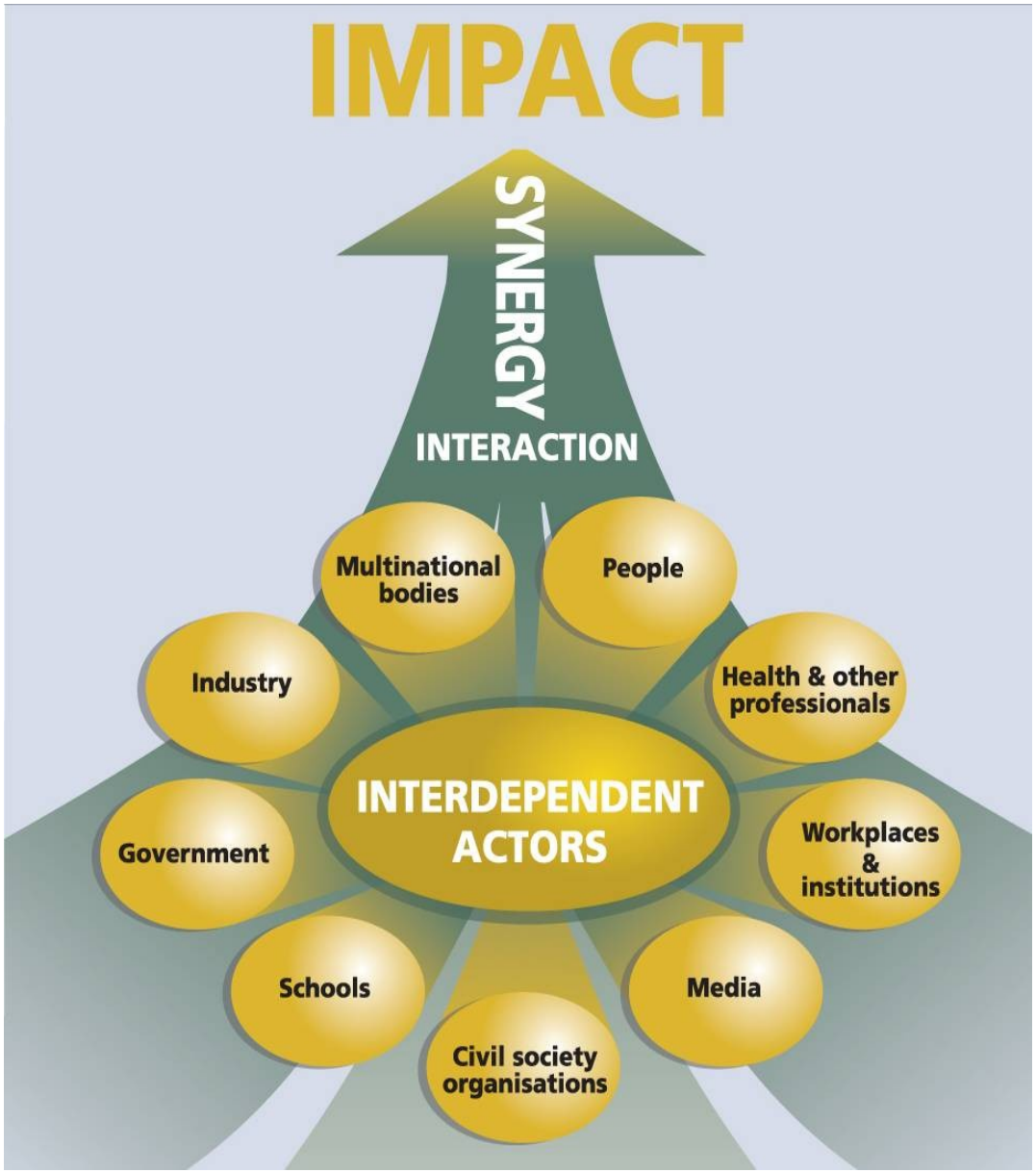
The Recommendations

- **Key players within**
  - Multinational bodies
  - Civil society organisations
  - Government
  - Food, drink, allied and other industry
  - Media
  - Schools
  - Workplaces and institutions
  - Health and other professions
  - People

Conclusions

- Cancer is preventable
- The evidence is strong enough to justify action
- Concerted action needs leadership from government and health professionals
- Local implementation requires collection of locally relevant evidence

Impact of Concerted Action



- Everyone has a role
- Action to be coherent
- Leadership from
  - Government
  - Health professionals

Managing obesity: against the grain of progress

Dietary diversity CHOICE: Mediterannean diet/ nordic diet

Opportunities:

- public engagement, several sectors
- evidence synthesis and action
- complexity
- multiple layers
- professional identity, capability
- big science: biomedical, sociological

Risk Management: delivering a service

Young and Old

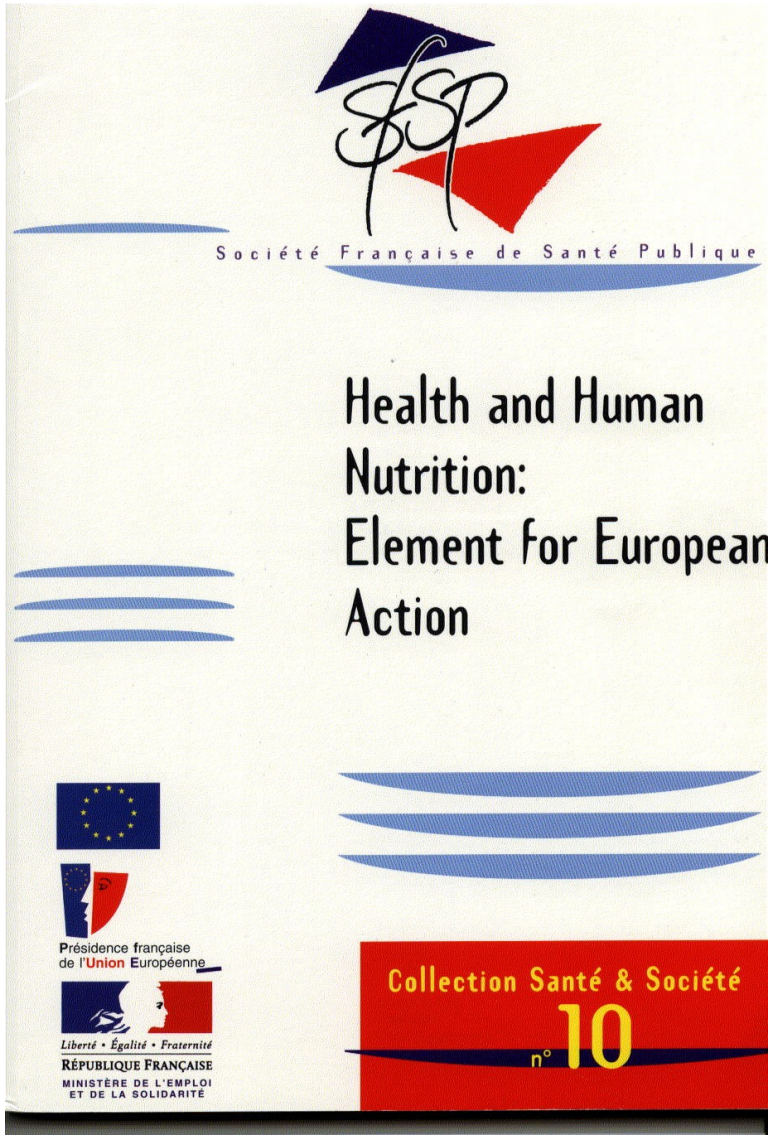
Characteristic: Vulnerability and Dependency

Potentially Better Practice: Operational Research

Learn by Doing

Examples:

EPODE or Healthy Aging over the Life Course



Public Health.

Working together

Difficulties:
political,
institutional

1.Informatics

2. Community based approach

3. Mind set and Capability

4. Professionalisation

1. Informatics

Gaps in evidence: data management systems

Synthetic and intersectoral (European systems biology)

Integration of biomedical, clinical, population level
- fit for purpose

Routine Monitoring and Evaluation

Develop and build skilled capability

2. Model: Community Based Approach

Create an Environment/People Centred Health Systems

Cannot do it TO people – pharma model

Have to do it for themselves: help, encourage, enable

Age-friendly communities that foster support for younger and older age groups

Community based care: fit for purpose, context specific

Develop skilled capability

3. New Mind-set and Build Capability

Owned by everybody

Health for all as the OBJECTIVE of the WHOLE of society

Health enabling for wealth creation

Focus on needs of Younger and Older age groups

Community based care

Develop skilled capability

4. Nutrition as a Profession (Public Protection)

Interventions that work: community based care

Competency training and defined skills
service delivery and quality assurance (M&E)

Leadership: manage complex intersectoral needs

Levels of responsibility: for for purpose

Working together to common purpose

Moral and ethical imperatives:
Professional responsibility: first do no harm
c/w legal instruments

Health is a Social Challenge NOT a Medical Problem

Quantity vs Quality

sugar, salt, fat – nutrient density

Individual vs Community

mutual support for better practice

Healthy opportunity for growth vs unhealthy options

insist on best environment for children

empower and enable women

Private vs Public sector

social responsibility for ethical market practices