



The University of
Nottingham

UNITED KINGDOM • CHINA • MALAYSIA



Session 1

Global Nutrition Needs: Setting the Scene

Chair: Prof Jerry Roberts

GLOBAL FOOD SECURITY FORUM
'Meeting Nutritional Needs'

7 - 8 July, 2014
Putrajaya Marriott Hotel, Malaysia

CONTENTS

Global Food Security Forum 2014: Meeting Nutritional Needs – Prof. Jerry Roberts

Session 1 - Global Nutrition Needs: Setting the Scene

Global overview picture - *Dr. Katrin Engelhardt*

Case study: Asia - *Prof. Khor Geok Lin*

Case study: Europe - *Prof. Ian Macdonald*



Overview of Food and Nutrition Security

Global Food Security Forum 2014
Dr Katrin Engelhardt
Technical Lead, Nutrition (WHO/WPRO)

Presentation outline

- What do we need? What are we getting?
- Snapshot: malnutrition; the double burden
- *Objective of the Forum (www):*
 - “*Possible solutions to issues related to food and nutrition security threat in the ASEAN region*”:
 - NCD Global and Regional Action Plans
 - (Draft) Action Plan to Reduce the Double Burden of Malnutrition in the Western Pacific Region 2015-2020

Nutrition need

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WHO Technical Report Series
916

DIET, NUTRITION AND THE PREVENTION OF CHRONIC DISEASES

Report of a
Joint WHO/IADB Expert Consultation




World Health Organization
Geneva 2003

Table 6
Ranges of population nutrient intake goals

| Dietary factor | Goal (% of total energy, unless otherwise stated) |
|---|---|
| Total fat | 15–30% |
| Saturated fatty acids | <10% |
| Polyunsaturated fatty acids (PUFAs) | 6–10% |
| n-6 Polyunsaturated fatty acids (PUFAs) | 5–8% |
| n-3 Polyunsaturated fatty acids (PUFAs) | 1–2% |
| Trans fatty acids | <1% |
| Monounsaturated fatty acids (MUFAs) | By difference ^a |
| Total carbohydrate | 55–75% ^b |
| Free sugars ^c | <10% |
| Protein | 10–15% ^d |
| Cholesterol | <300 mg per day |
| Sodium chloride (sodium) ^e | <5 g per day (<2 g per day) |
| Fruits and vegetables | ≥ 400 g per day |
| Total dietary fibre | From foods ^f |
| Non-starch polysaccharides (NSP) | From foods ^f |

And of course: Vitamins and Minerals
A, B, D, C, E, K, etc.

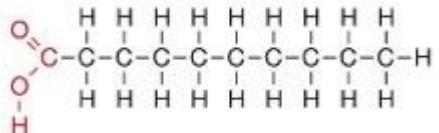
Iodine, Iron, Folate, Selenium, etc.

$C_n(H_2O)_n$

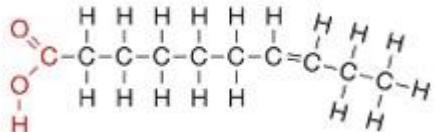
or $C_6H_{12}O_6$



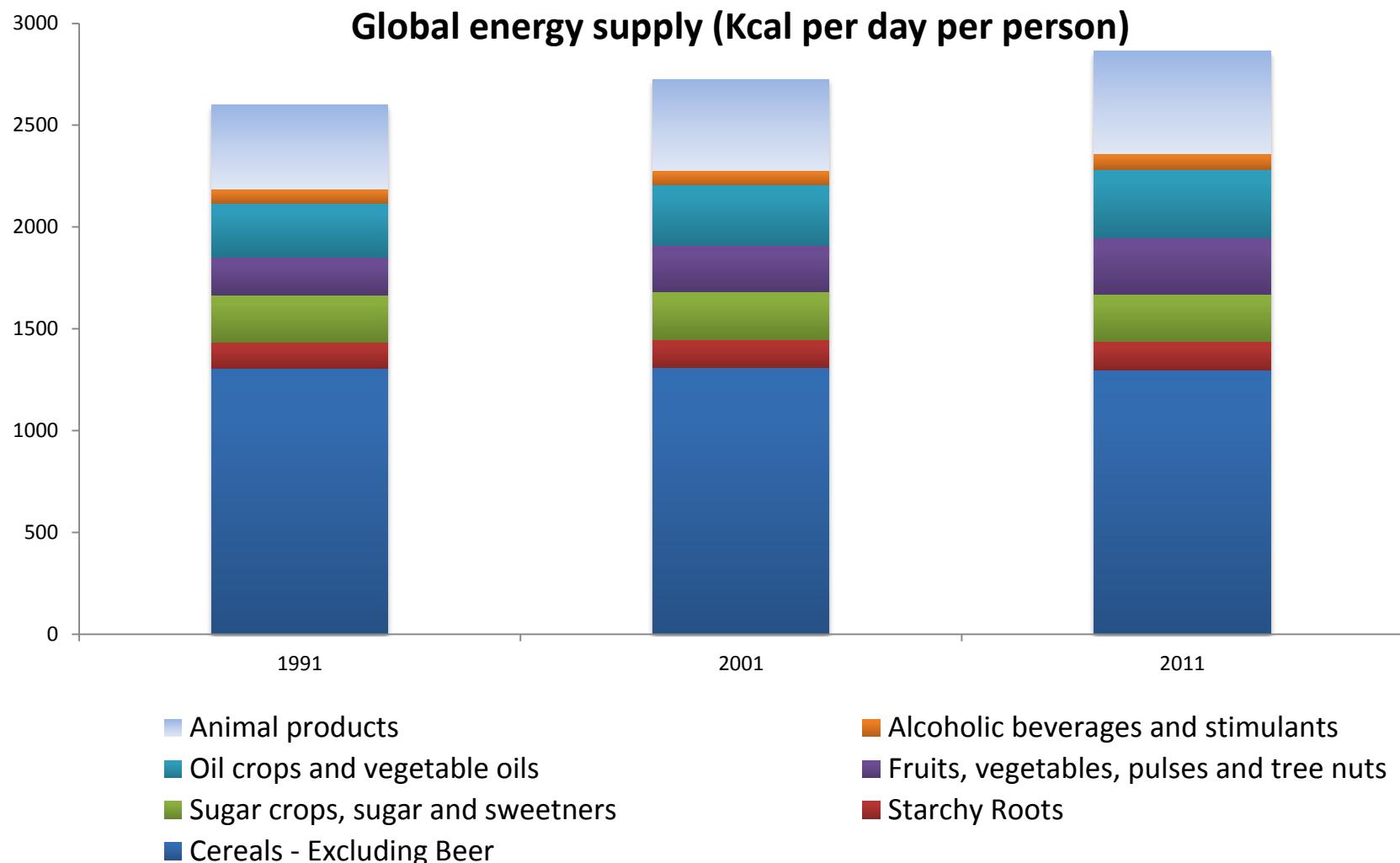
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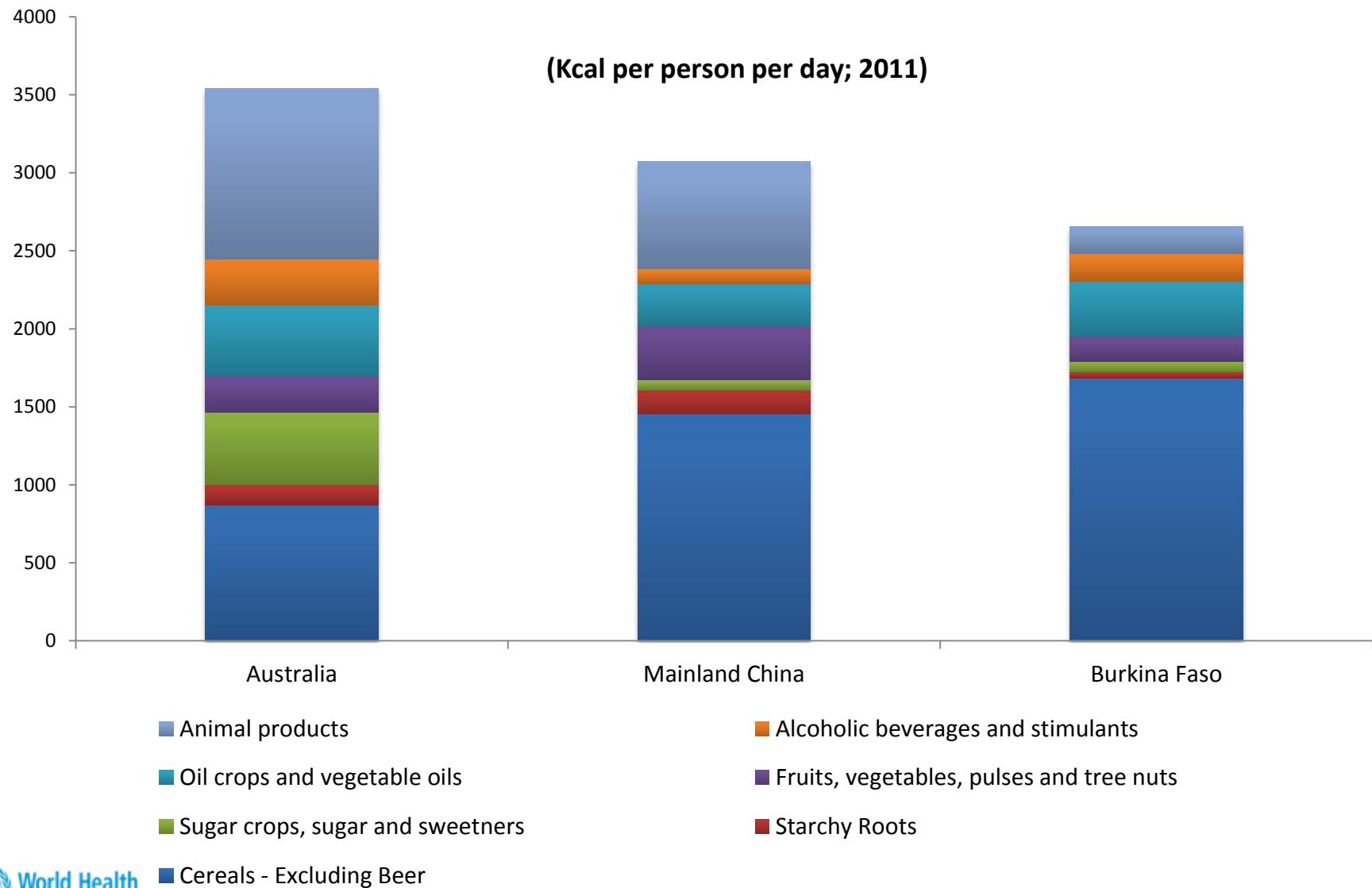
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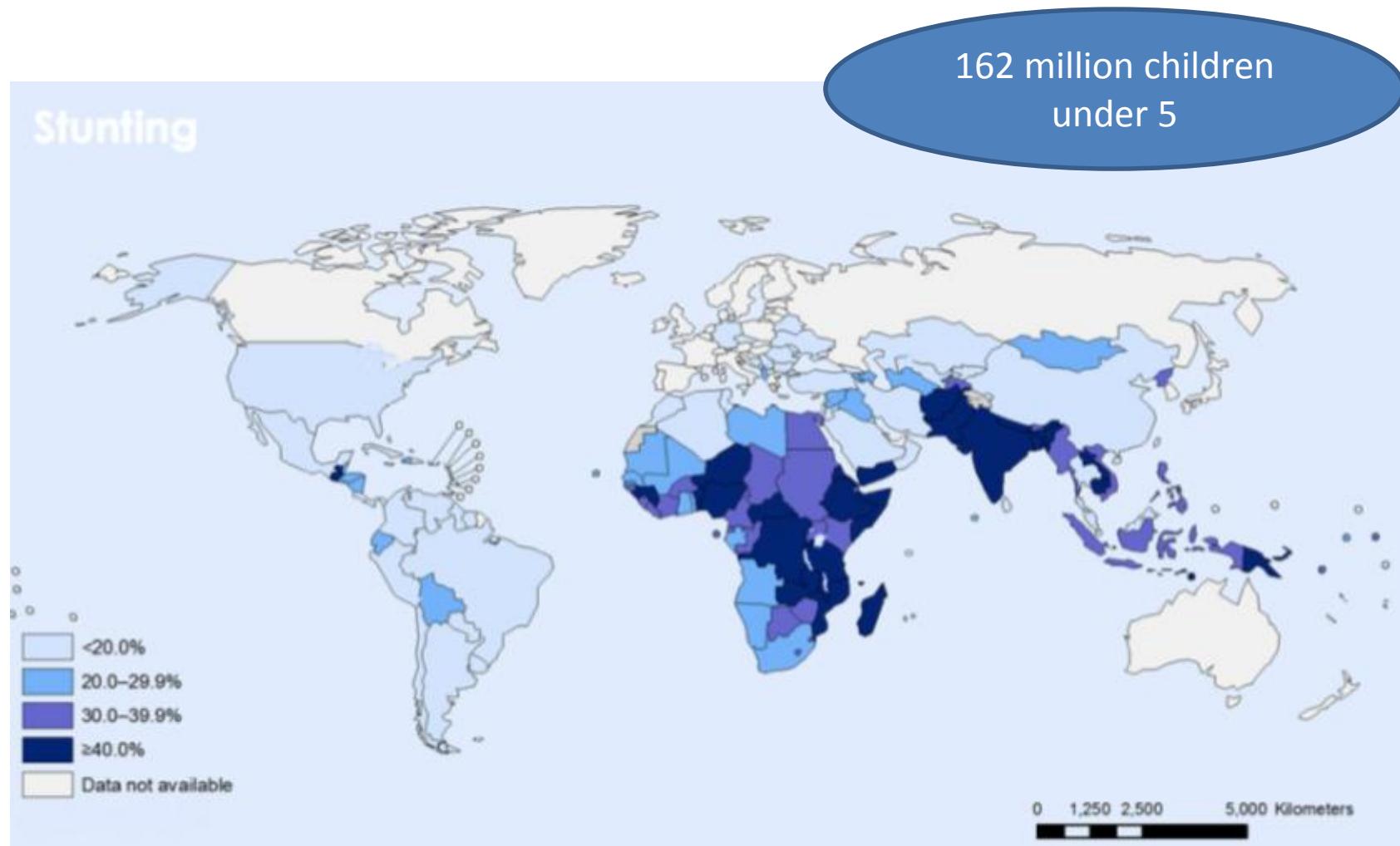
Global energy supply



Energy supply Australia, Mainland China and Burkina Faso

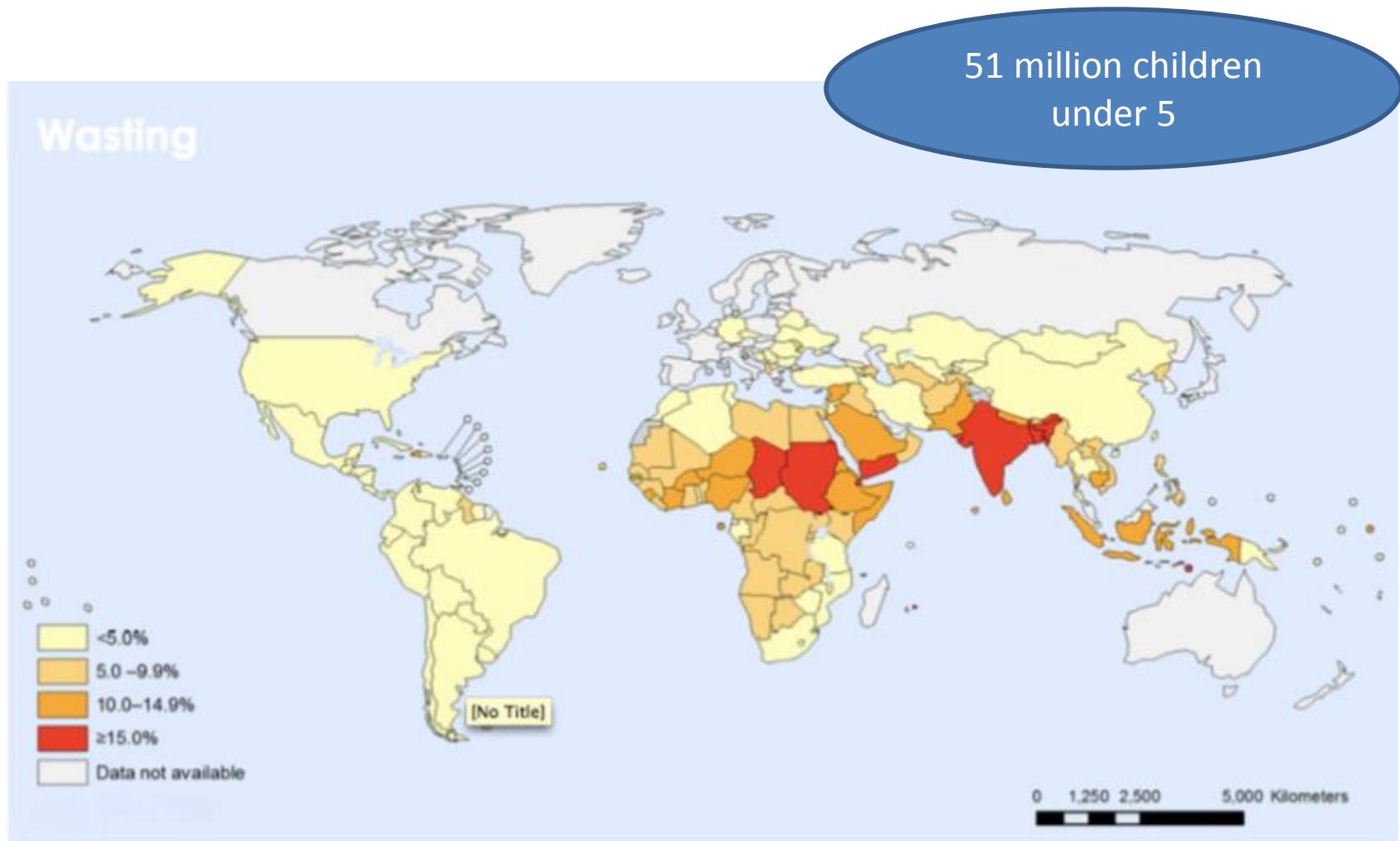


Global stunting (children under five years)



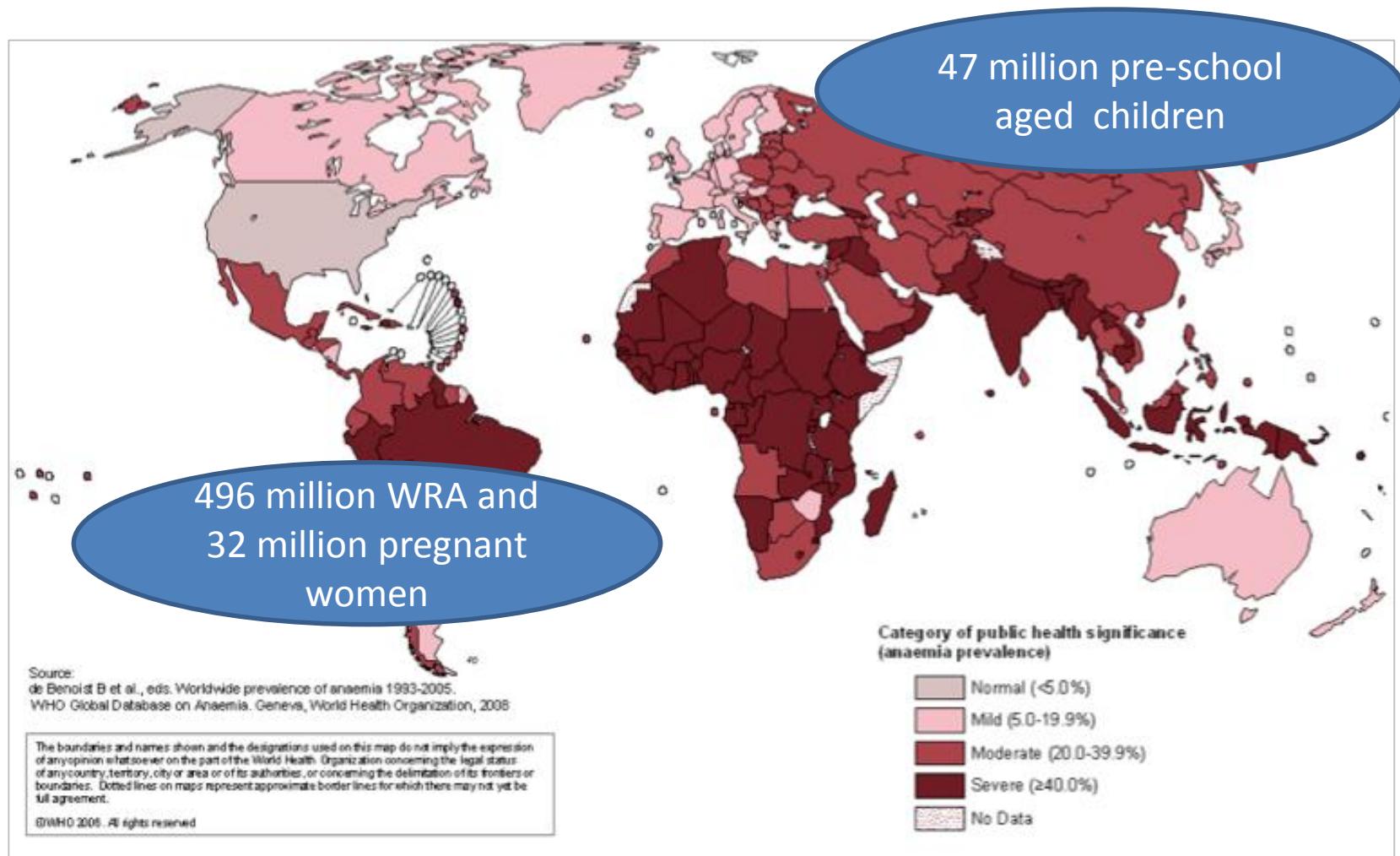
Source: Levels & Trends in Child Malnutrition, UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates

Global wasting (children under five years)



Source: Levels & Trends in Child Malnutrition, UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates

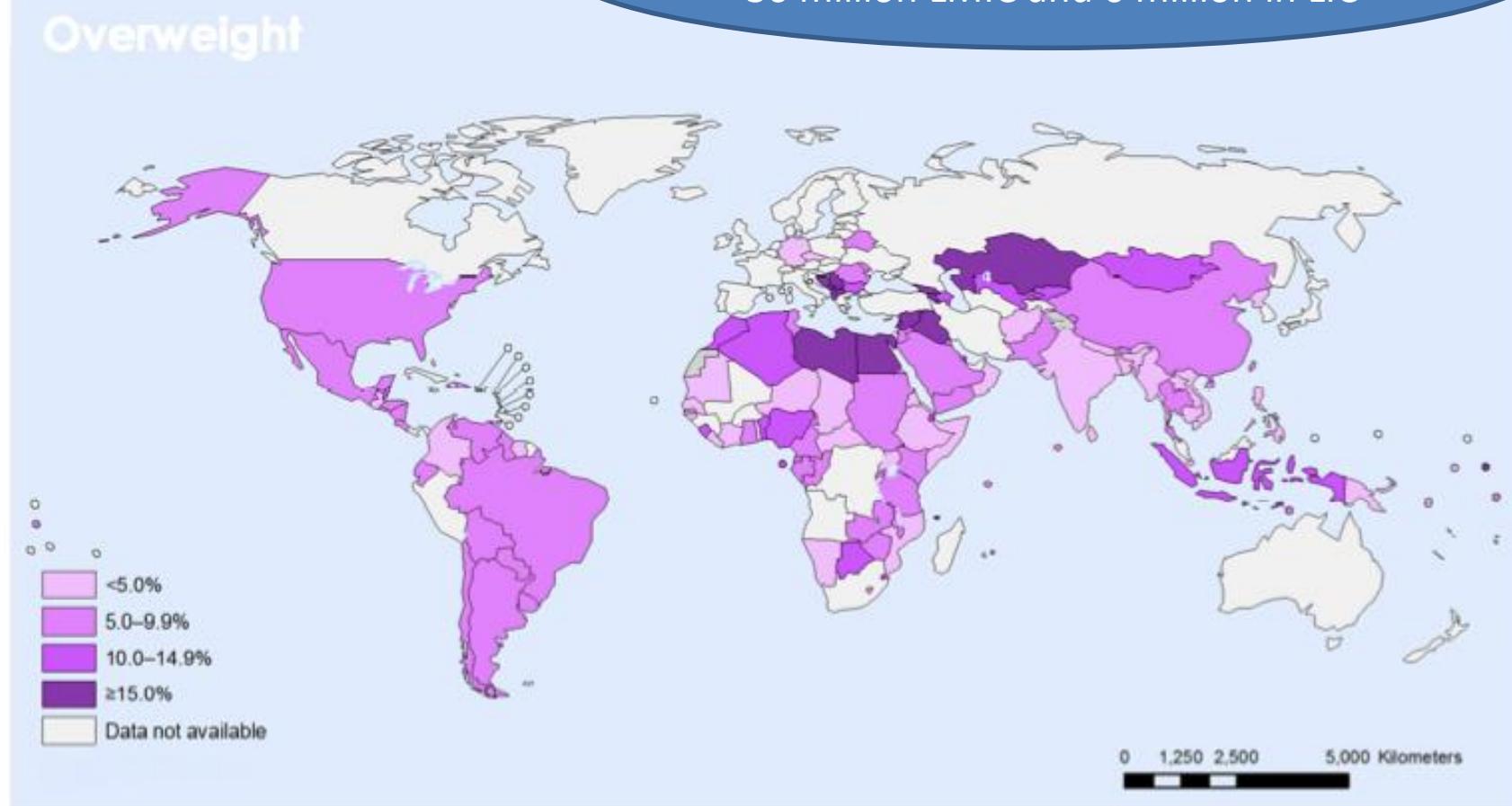
Global anaemia (pre-school aged children)



Source: WHO VMNIS, http://www.who.int/vmnis/anaemia/prevalence/summary/Pre-SAC_anaemia.pdf?ua=1

Global overweight (children under 5 years)

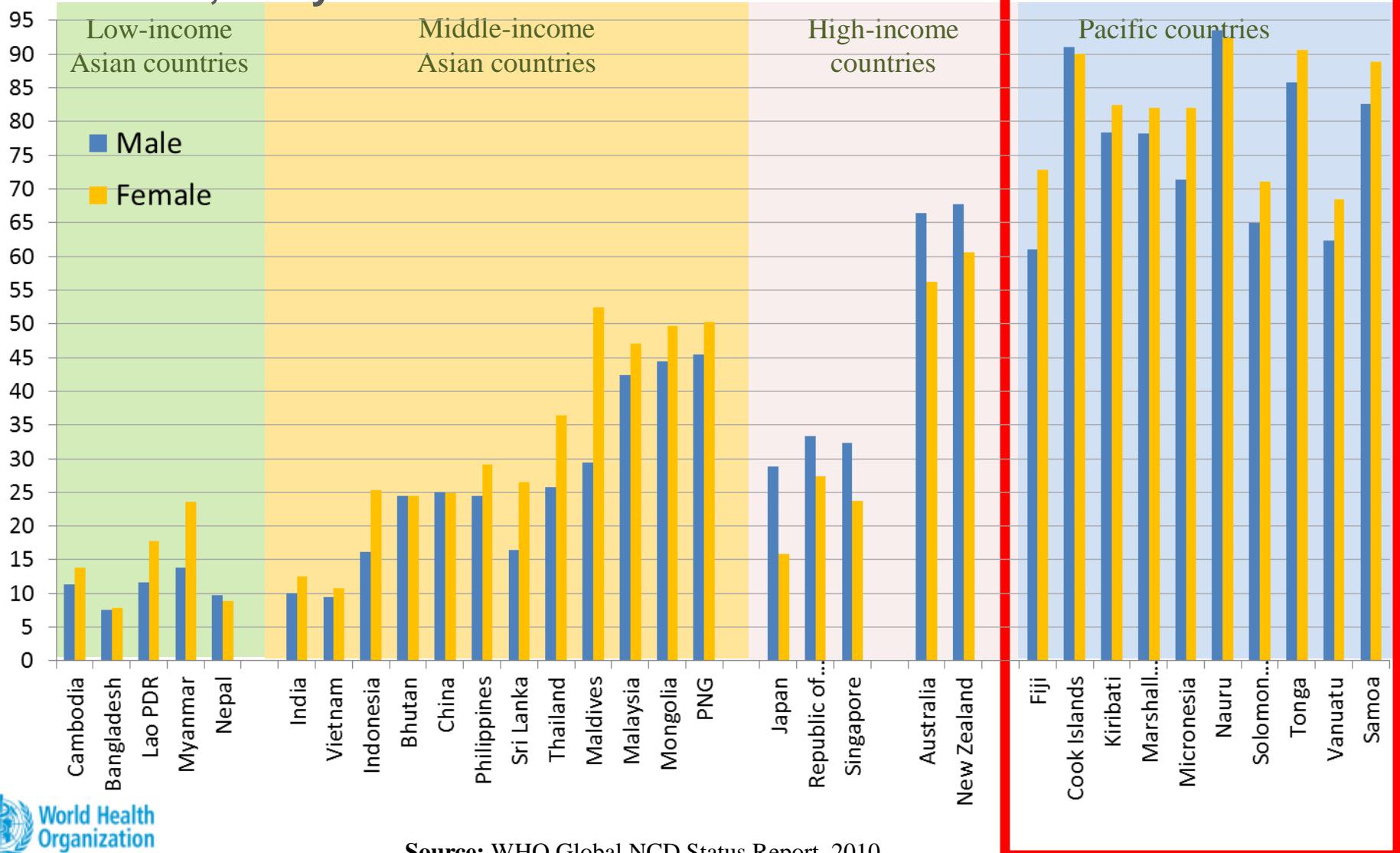
44 million children under 5
30 million LMIC and 6 million in LIC



Source: Levels & Trends in Child Malnutrition, UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates

Prevalence of overweight among adults

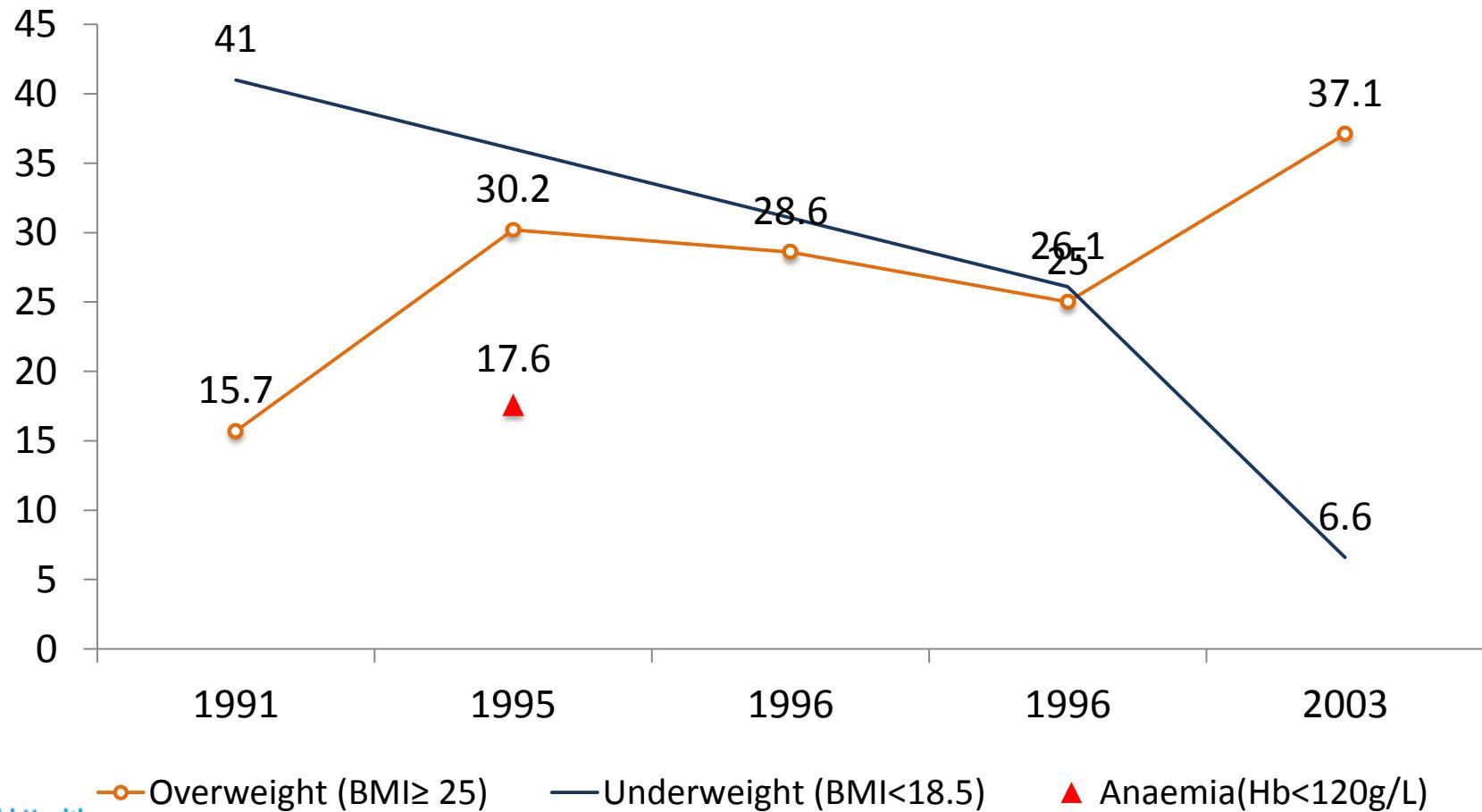
BMI >25, 25+ years



Source: WHO Global NCD Status Report, 2010

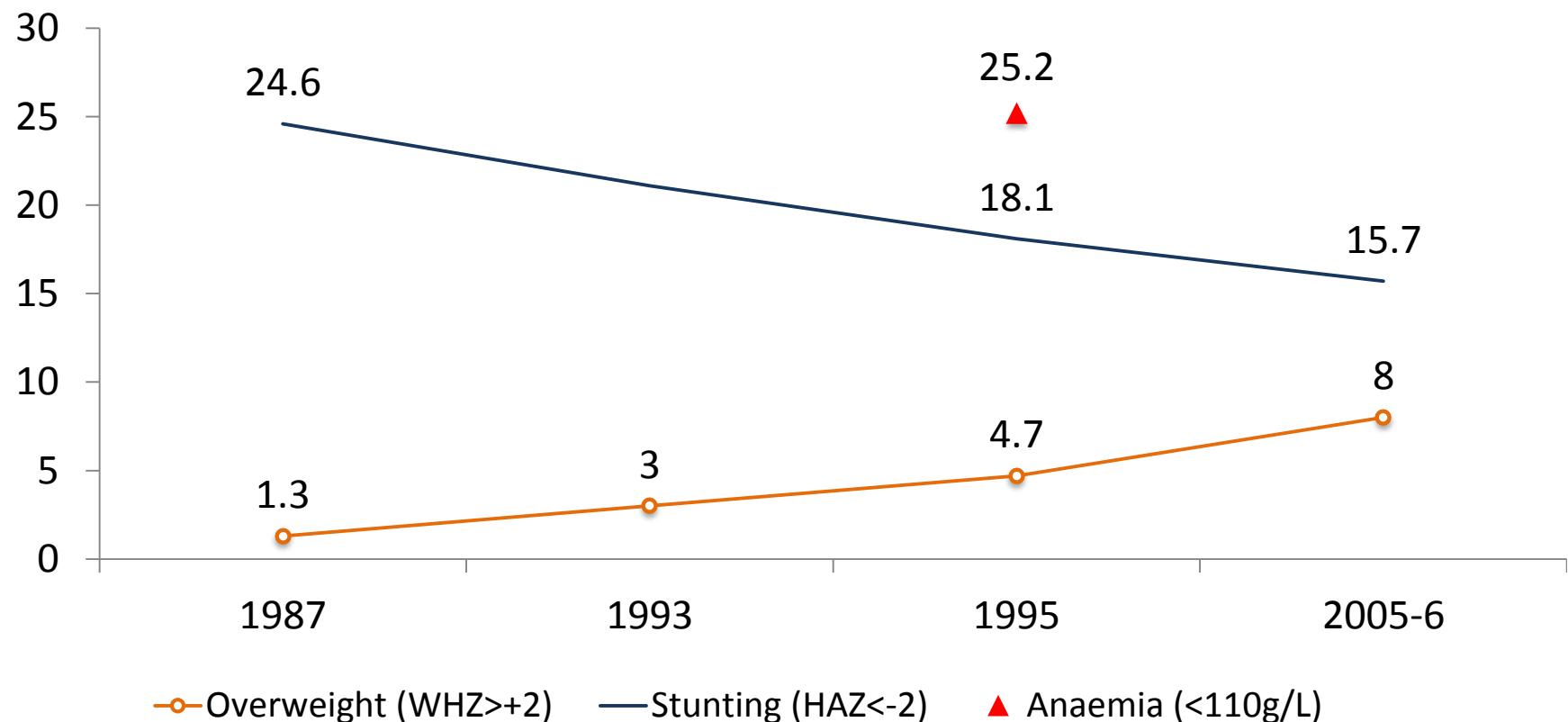
Thailand

Changes in the prevalence of malnutrition in women

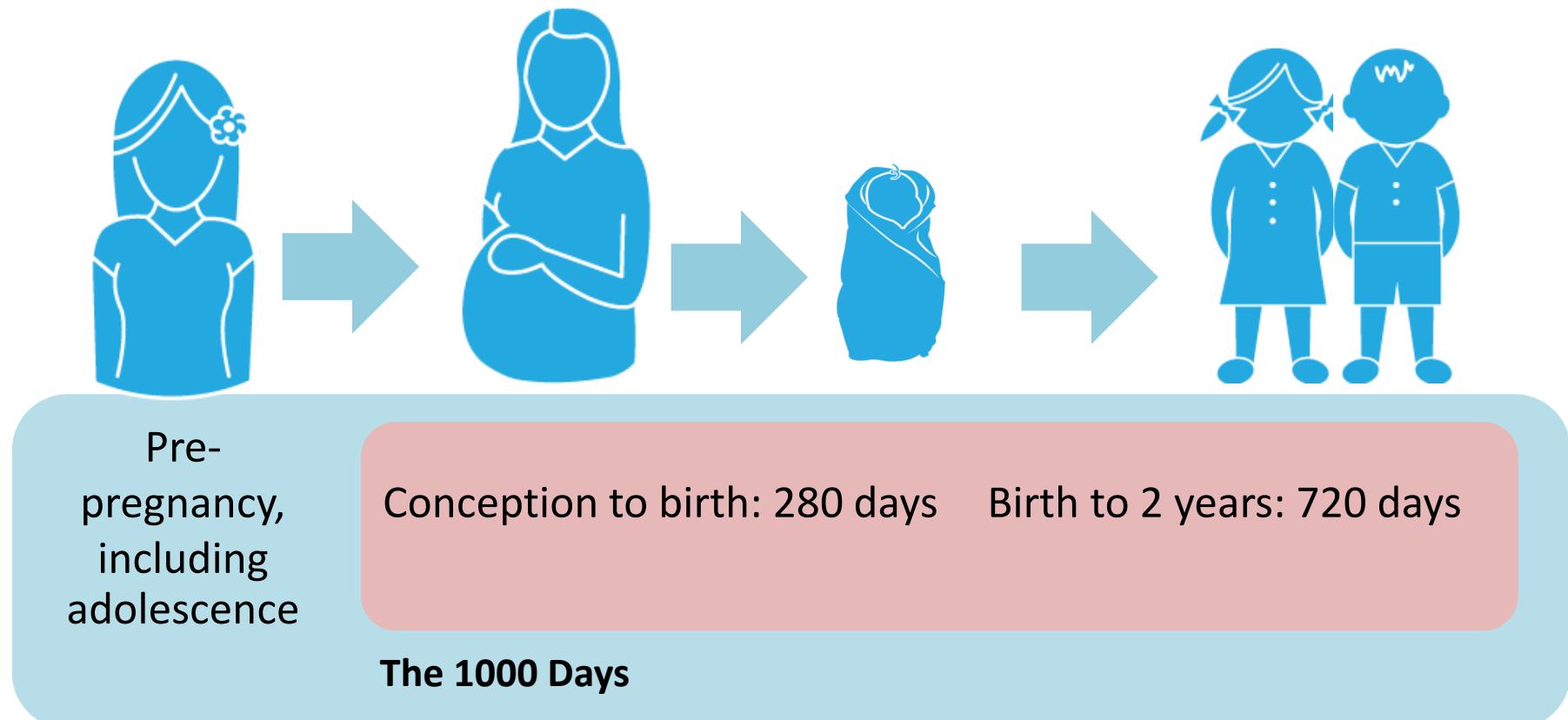


Thailand

Changes in the prevalence of malnutrition in children (<5 years)

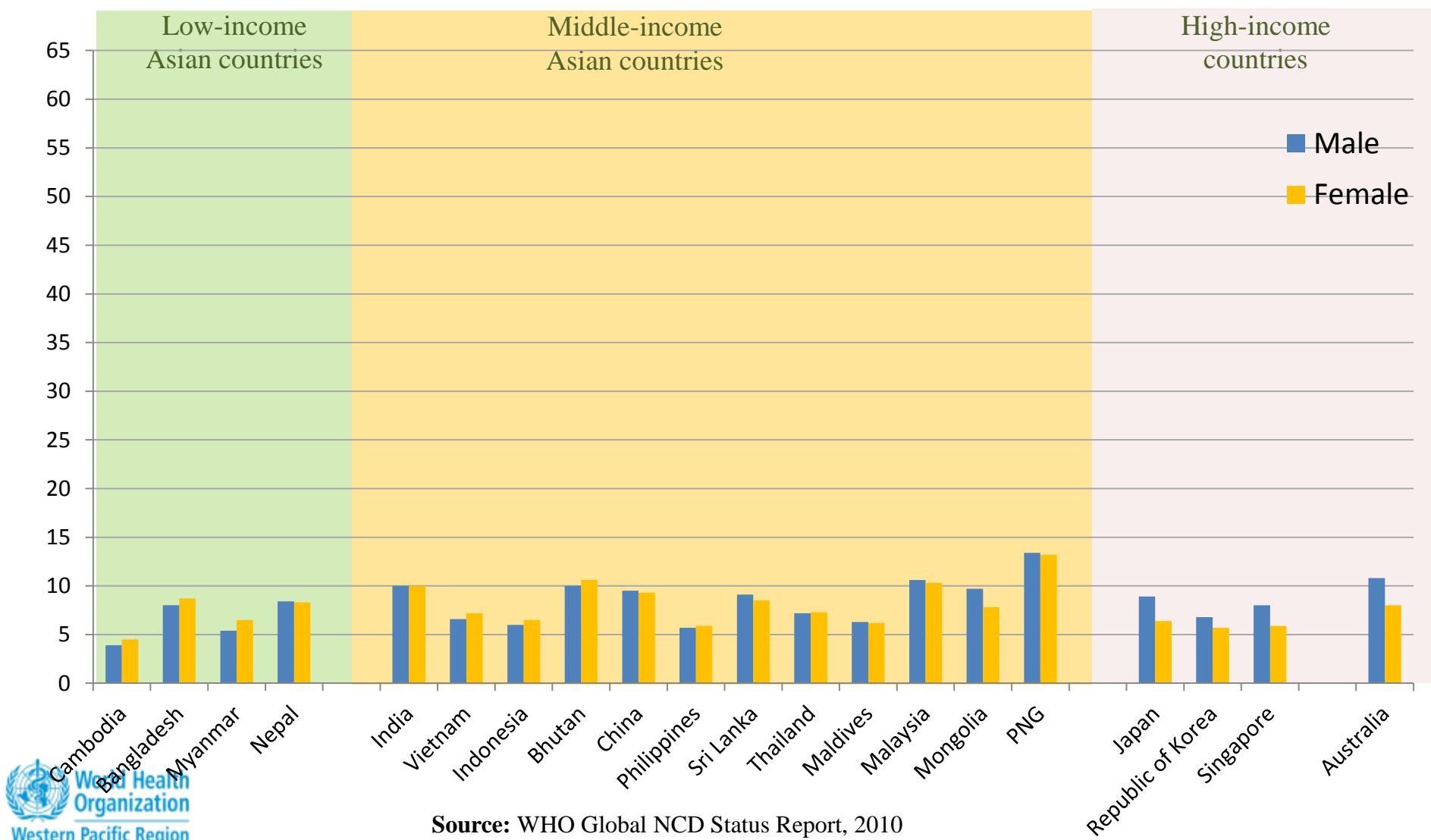


The 1000 Days “ window of opportunity “ for good nutrition



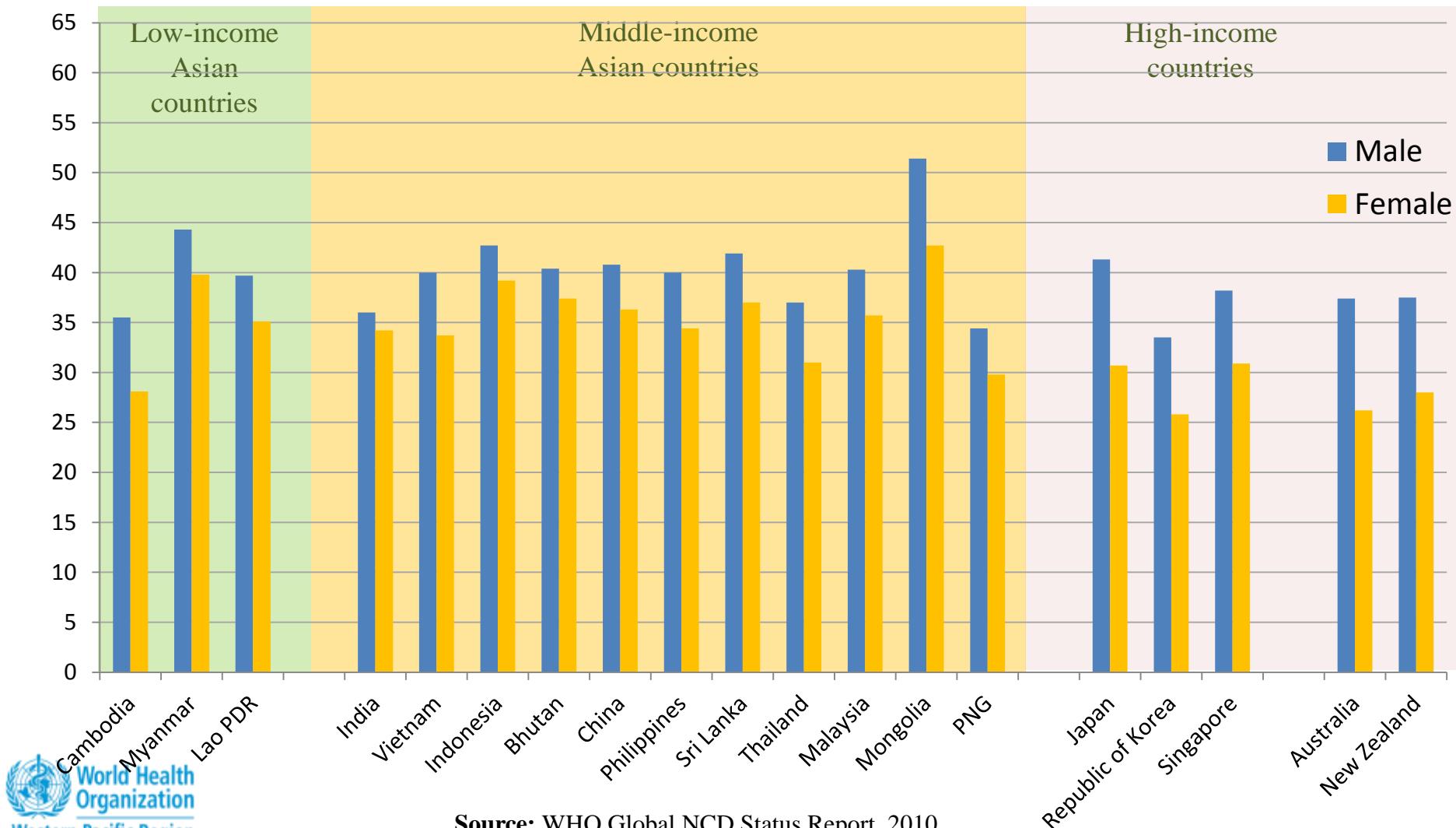
Burden of NCDs Prevalence of Diabetes

Fasting glucose ≥ 7.00 mmol/L or on medication, 25+ years

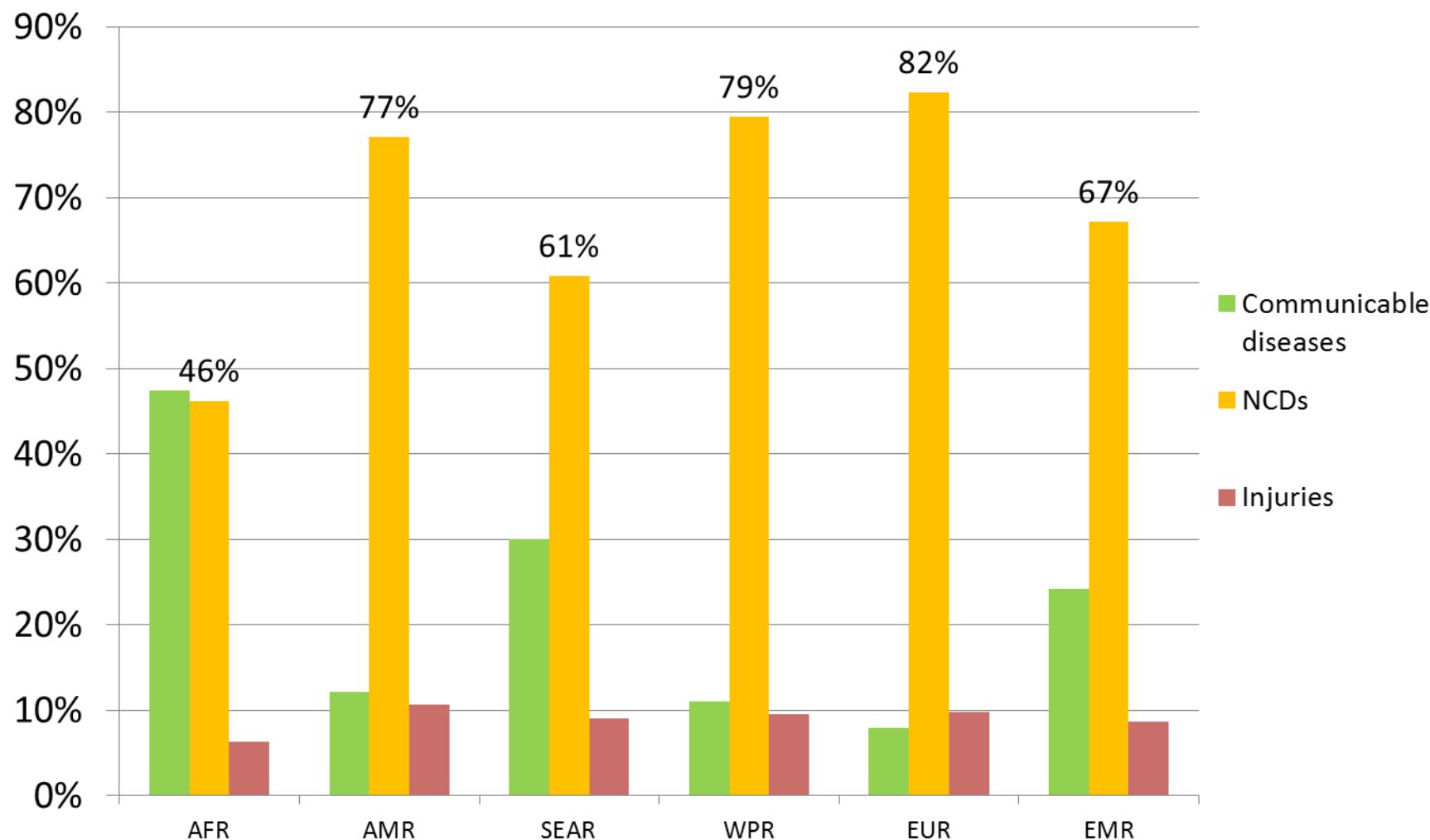


Burden of NCDs Prevalence of Raised BP

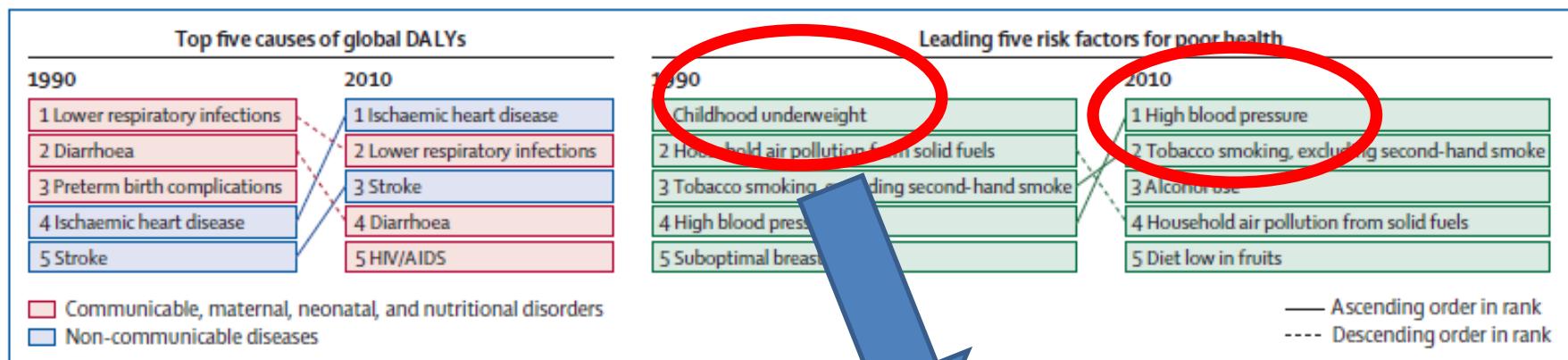
SBP≥140 DBP≥90 mmHg or on medication, 25+ years



Death by Broad Cause Group and WHO Region, 2011



Leading risk factors for global burden of disease 1990 and 2010



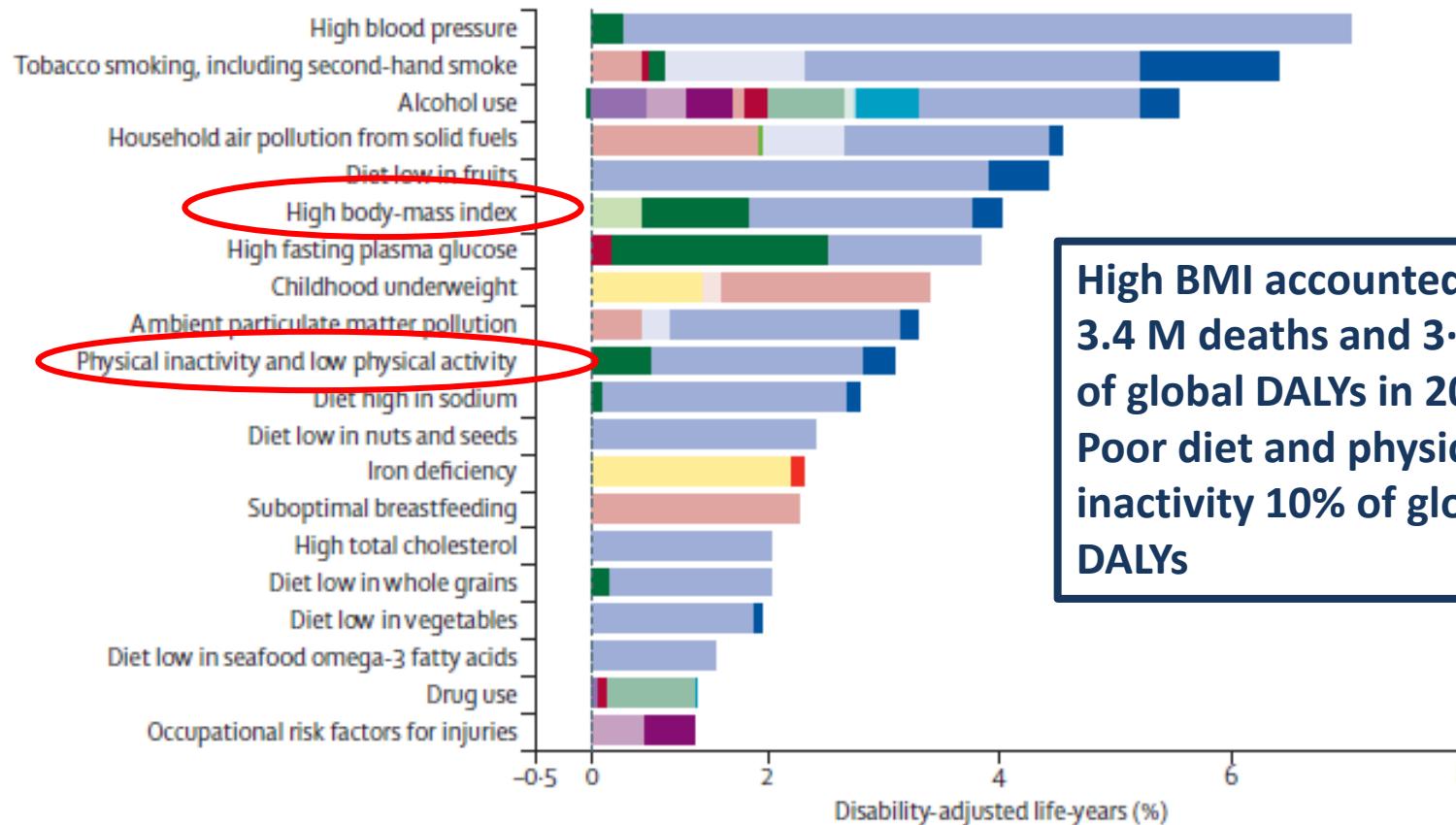
www.thelancet.com Vol 380 December 15/22/29, 2012

Goal 1
Eradicate extreme poverty and hunger

TARGET

Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

Burden of disease attributable to 20 leading risk factors in 2010, as a % of global DALYs



**High BMI accounted for
3.4 M deaths and 3.8%
of global DALYs in 2010
Poor diet and physical
inactivity 10% of global
DALYs**

The double burden of malnutrition

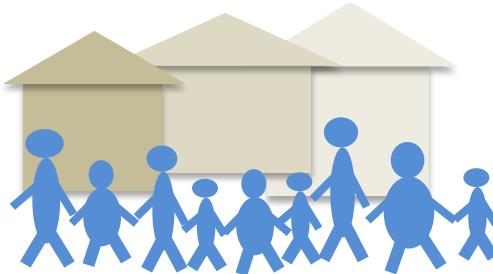
The Double Burden of Malnutrition can occur...



Within
individuals



Within families
and households



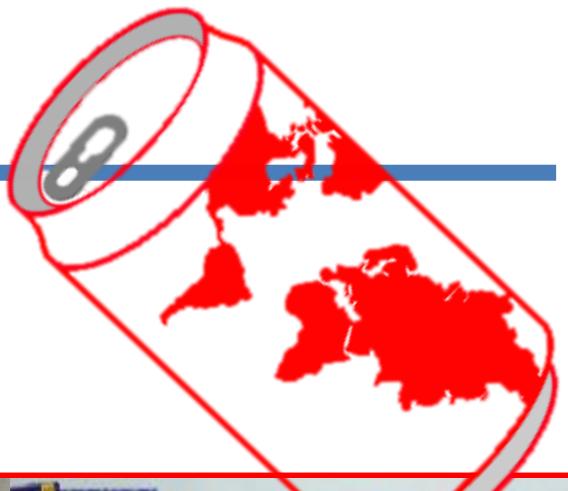
Within communities



Within countries

Changing context

Globalization, rapid urbanization and transformation of food systems



New, unsustainable and distorted food and eating systems

Easy access to calorie-rich, nutrient-poor food





Pizza Hut

DOUBLE Delight

The new talk
of the town!

New Flavor!
Sausage Beef
Mushroom

Also available in
ALOHA flavor

2 slices
for

P 55



You'll want more and more! HawaiianOVERLOAD



Sweet Juicy Pineapples • Overflowing Cheese • 3 Types of Meat

Only
P 99
6" SOLO SIZE



HEALTHY CHOICES



195 Beer Battered Crispy Fish Fillet

050



P 195 Creamy Mushroom Fish Fillet

059



175 Kaylan with Garlic

070

Hongkong's
FAVORITE VEGGIE



P 175 Polonchay with Garlic

071

55
45
55
55
45
45
ICE CHARGE



I  Wellness

A large, hand-drawn style sign on a white wall. It says "I" in green, followed by a large red heart outline, and then "Wellness" in green. The "I" and "Wellness" are written with a green marker or paint. A metal railing is in the foreground.

Nutrition Power for Kids



Nutrition Power for Kids





Manufacturing an epidemic?



Global monitoring framework (NCD Action Plan)

Mortality & Morbidity

Unconditional probability of dying between ages 30 and 70 years from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases

Cancer incidence by type of cancer

Risk Factors

- Harmful use of alcohol (3)
- Low fruit and vegetable intake
- Physical inactivity (2)
- Salt intake
- Saturated fat intake
- Tobacco use (2)
- Raised blood glucose/diabetes
- Raised blood pressure
- Overweight and obesity (2)
- Raised total cholesterol

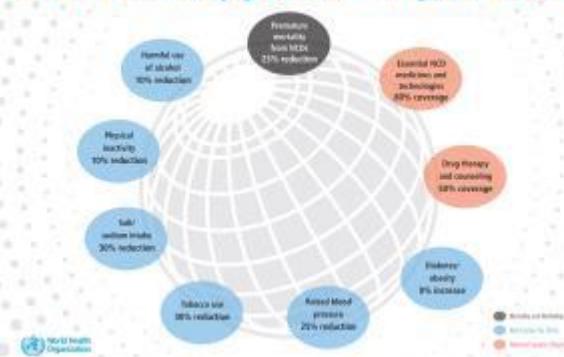
Total number of related indicators in brackets

National Systems Response

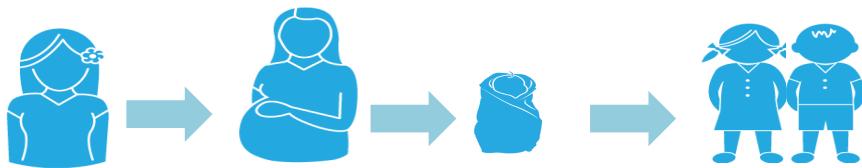
- Cervical cancer screening
- Drug therapy and counseling
- Essential NCD medicines & technologies
- Hepatitis B vaccine
- Human Papilloma Virus vaccine
- Marketing to children
- Access to palliative care
- Policies to limit saturated fats and virtually eliminate trans fats

25 Indicators

Set of 9 voluntary global NCD targets for 2025

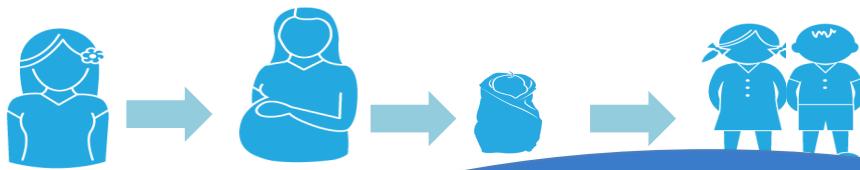


Actions for healthy diets



- Protect, promote and support Breastfeeding
- Optimal complementary feeding (dietary diversity)
- Set of recommendations of marketing
- Healthy food options in schools
- Economic tools (e.g. taxes)
- Labeling (FOP)
- Engage food industry: food reformulation

Actions for healthy diets



- Protect mothers and babies from early initiation and duration of BF
 - Optimize feeding practices during complementary feeding
 - Set standards for food quality
 - Healthy, safe food environments
 - Economic tools (e.g. taxes)
 - Labeling (FOP)
 - Engage food industry: food reformulation
- Don't engage food industry

Global nutrition targets

endorsed by the WHA in May 2012

-  1 40% REDUCTION IN THE NUMBER OF CHILDREN UNDER 5 WHO ARE STUNTED
-  6 REDUCE AND MAINTAIN CHILDHOOD WASTING TO LESS THAN 5%
-  2 50% REDUCTION OF ANAEMIA IN WOMEN OF REPRODUCTIVE AGE
-  5 INCREASE THE RATE OF EXCLUSIVE BREASTFEEDING IN THE FIRST 6 MONTHS UP TO AT LEAST 50%.
-  4 NO INCREASE ON CHILDHOOD OVERWEIGHT
-  3 30% REDUCTION IN LOW BIRTH WEIGHT

Regional Action Plan to reduce the double burden

Action Plan to Reduce the Double Burden of Malnutrition in the Western Pacific Region (2015–2020)

Five objectives

1. Elevate nutrition in the national development agenda
2. Protect, promote and support optimal breastfeeding and complementary feeding practices
3. Strengthen and enforce legal frameworks that protect, promote and support healthier diets
4. Improve accessibility, quality and implementation of nutrition services across public health programmes and settings
5. Use financing mechanisms to reinforce healthier diets

Food and Nutrition Security

- Healthy food availability
- Food of appropriate quality
- Healthy food accessibility
- Food safety
- Utilization of food through adequate diet, clean water, sanitation and health care



Enabling food environment to help people make healthy choices

Key messages

- Global nutrition needs are not adequately being met
- Globally more overweight than undernourished
- Risk factors and disease patterns are changing
- Enabling food environment to help people make healthy choices
- Enhance nutrition through dietary diversity (*food*)
- Ensure policy making is free from conflict of interest





Thank you



Global Food Security Forum 2014

Case Study: Asia

Khor Geok Lin PhD, FASc

**Professor of Nutrition
International Medical University, Malaysia**

**Emeritus Professor
Universiti Putra Malaysia**

7-8 July 2014

**Crops for the Future Research Center (CFFRC)
The University of Nottingham Malaysia Campus**

Outline of presentation

- **Concept and Dimensions of Food Insecurity in Asia**
- **Nutrition Transition from Under-nutrition to NCDs**
- **Concluding remarks**



widely accepted definition

Food security is defined as the existence of the necessary conditions for human beings to have physical and economic access, *in socially acceptable ways*, to food that is safe, nutritious and in keeping with their cultural preferences, so as to meet their dietary needs and live productive and healthy lives. (World Food Summit, FAO, 1996)

The term “socially acceptable ways” was added to the 1996 definition in 2002.

DIMENSIONS OF FOOD SECURITY

Having appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation

Having sufficient economic, social and physical resources to obtain appropriate foods for a nutritious diet.

Having sufficient quantities of food available on a consistent basis

Food utilisation

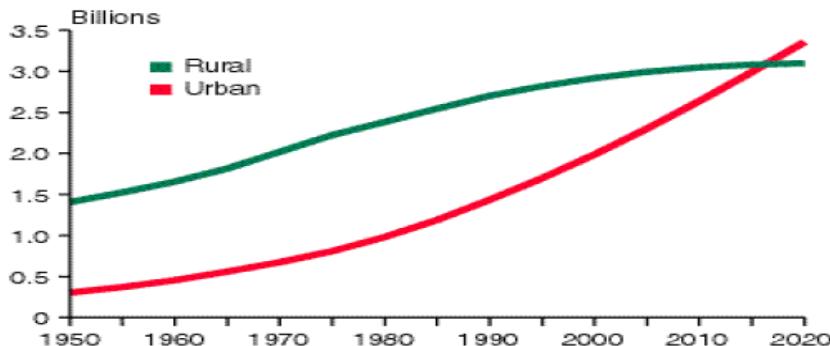
Food accessibility

Food availability

Stability

Macro-factors that affect food security

Figure 1—Urban and rural population levels in developing countries, 1950–2020



Source: United Nations, *World Urbanization Prospects: The 1996 Revision* (New York: UN, 1996).

Rapid
population
growth

Changing
demographics

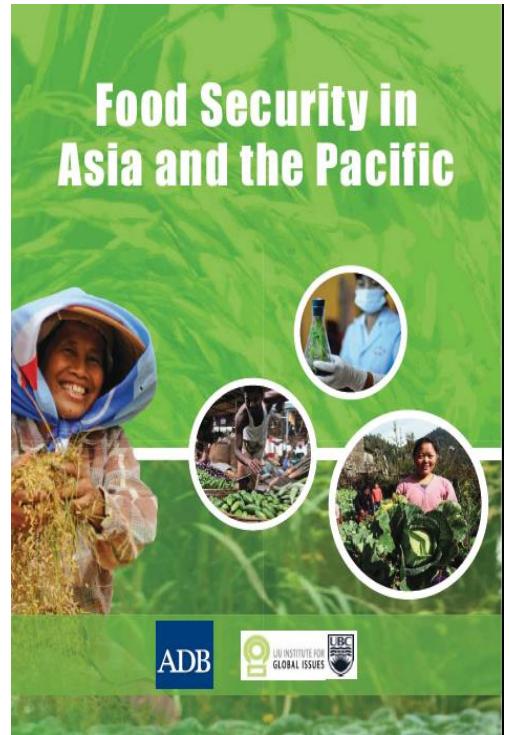
Urbanisation
Changing food
production and
consumption
patterns

Escalating
costs for food,
housing,
education,
health care

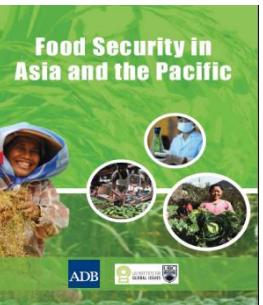
In Asia, strong growth generally has been key to the sharp decline in poverty and undernourishment

The economies of developing Asia grew an average 7.6% a year between 1990 and 2010, far exceeding the 3.4% global average.

But hunger remains stubbornly high in many countries and regions.

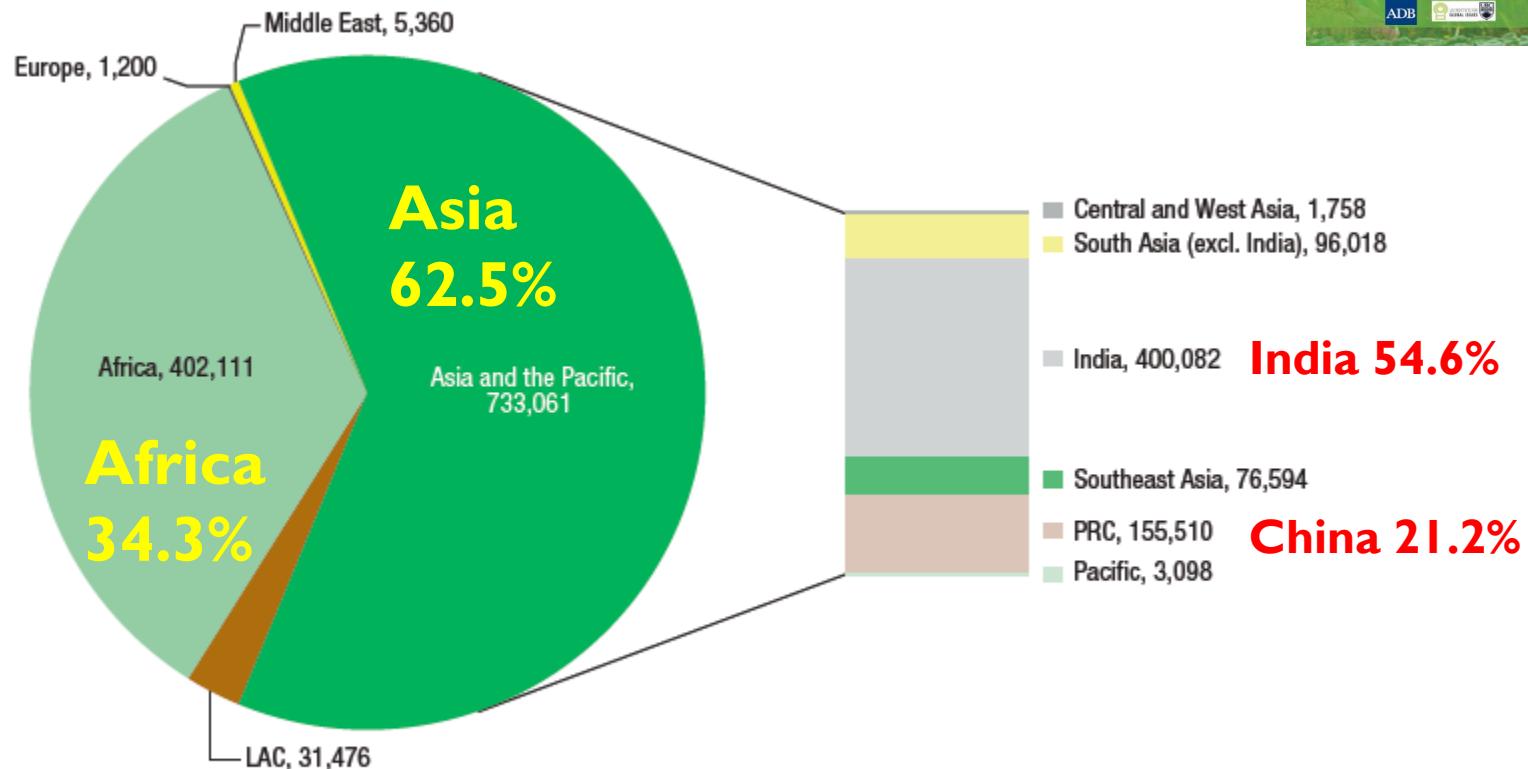


2013



The World's Poor, 2010 Estimates

Total: 1,173.2 million

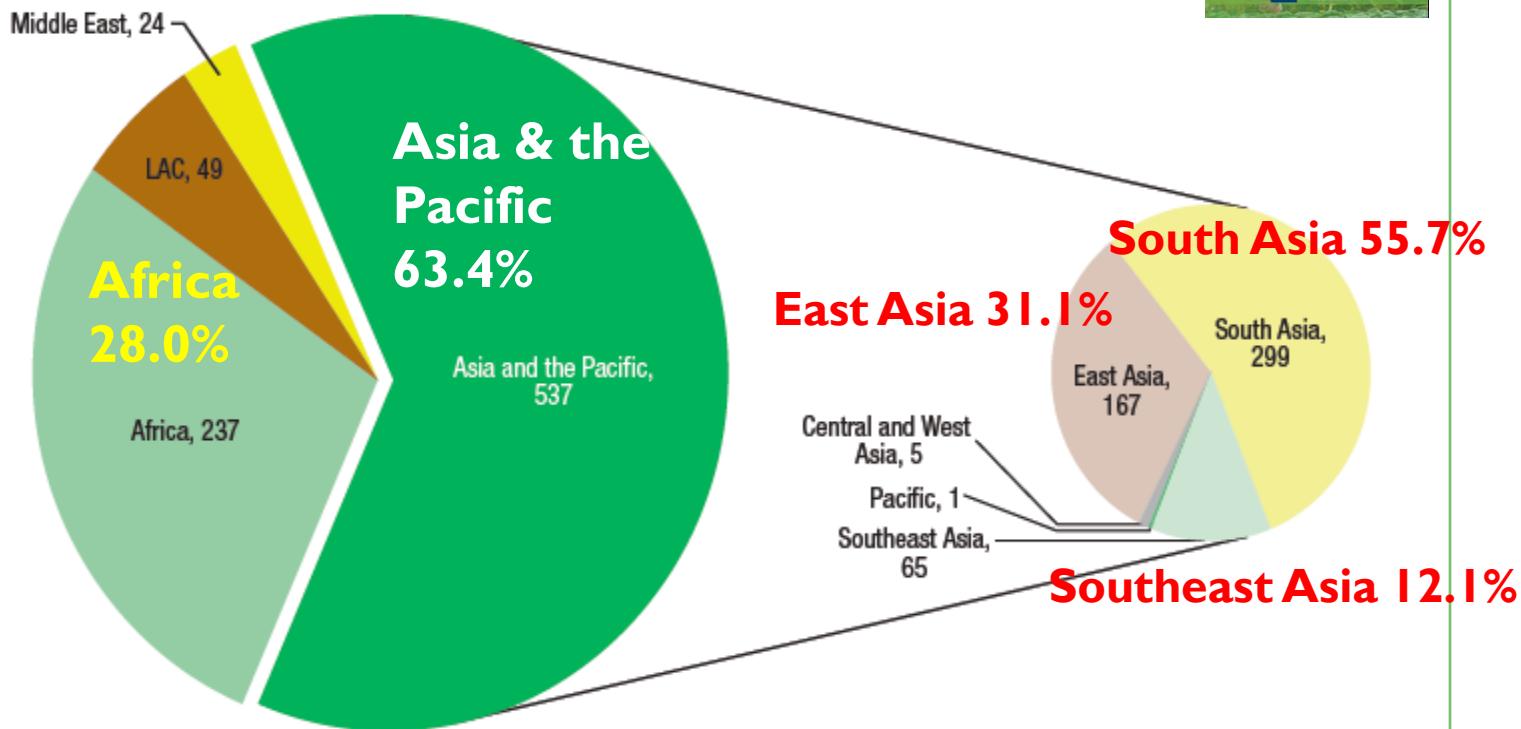
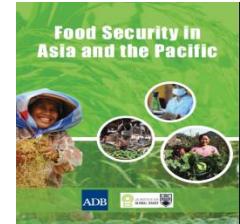


PRC = People's Republic of China, excl. = excluding, LAC = Latin America and the Caribbean.

Notes:

1. The poor are those living on less than \$1.25 a day (2005 purchasing power parity [PPP]).
2. Refer to Appendix A for a list of economies in each region.

The World's Undernourished Total: 847 million (2010-2012)



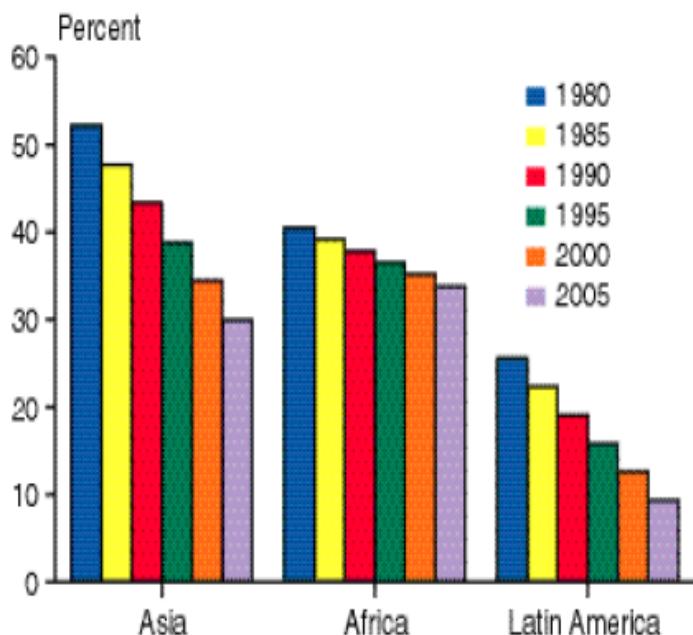
LAC = Latin America and the Caribbean.

Notes:

1. The undernourished are those with a caloric intake less than the minimum daily requirement. Averages for 1990–1992 and 2010–2012 are shown.
2. Refer to Appendix A for a list of economies in each region.

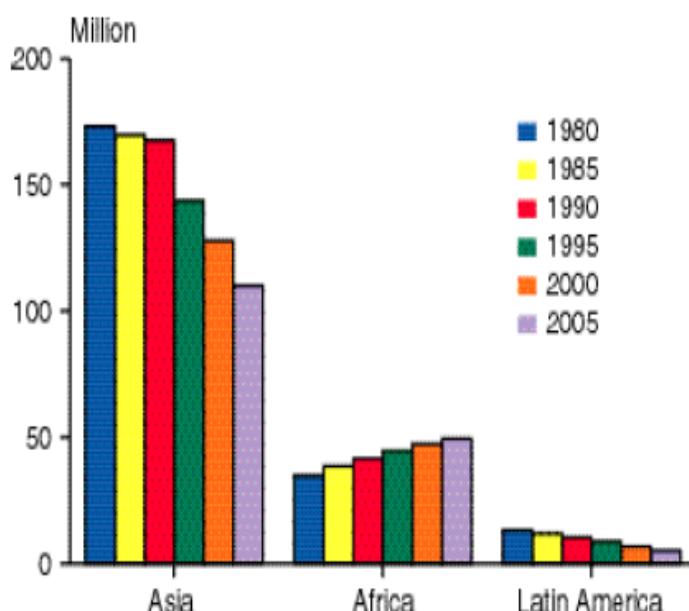
Source: ADB calculations based on economy-level estimates from the FAO Food Security Indicators, <http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/> (accessed 23 April 2013).

Figure 19—Estimated prevalence of stunted children, 1995–2020



Source: Subcommittee on Nutrition of the United Nations Administrative Committee on Coordination/International Food Policy Research Institute (SCN/IFPRI), "Fourth Report on the World Nutrition Situation" (SCN/IFPRI, Washington, D.C., July 1999, photocopy).

Figure 20—Estimated number of stunted children, 1995–2020



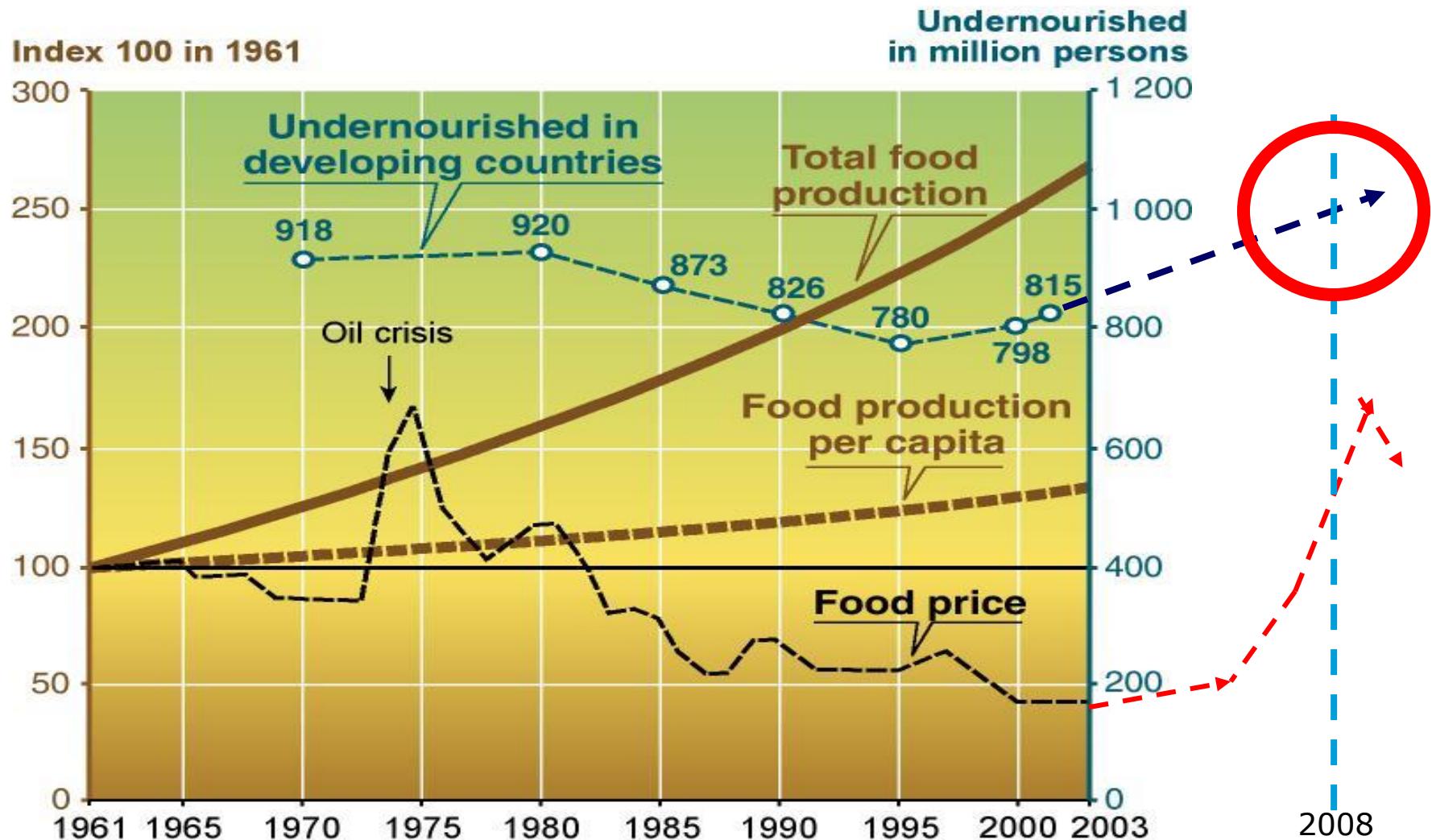
Source: Subcommittee on Nutrition of the United Nations Administrative Committee on Coordination/International Food Policy Research Institute (SCN/IFPRI), "Fourth Report on the World Nutrition Situation" (SCN/IFPRI, Washington, D.C., July 1999, photocopy).

World Food Prospects: Critical Issues for the Early 21st Century (IFPRI)

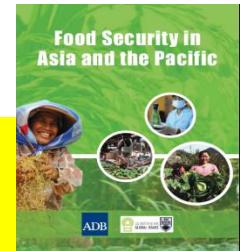
Per Pinstrup-Andersen, Rajul Pandya-Lorch,
and Mark W. Rosegrant

Global context and recent trends

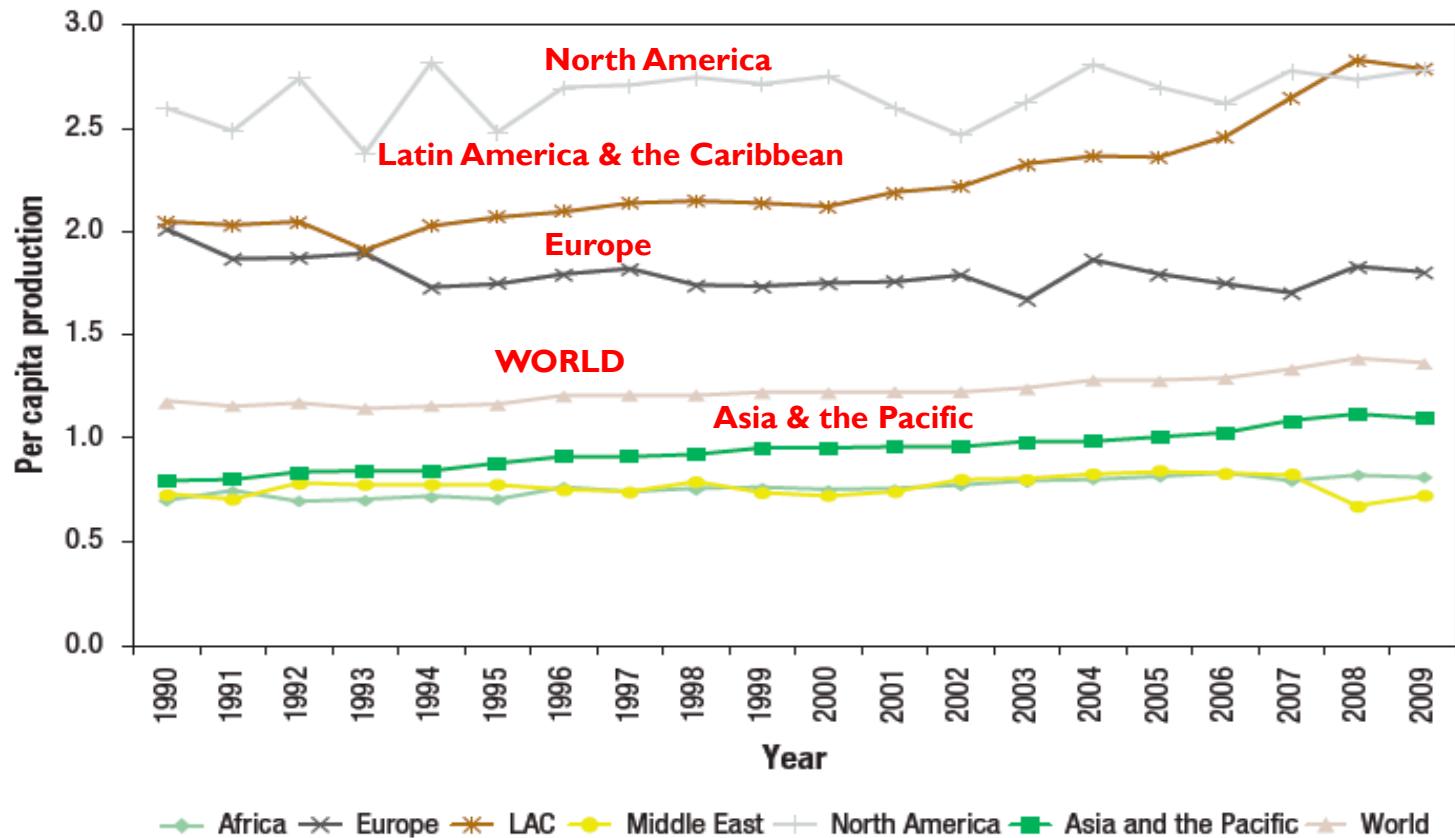
Unprecedented increase in agricultural productivity through R&D



Sources: FAOSTATS, SOFI, Millennium Ecosystem Assessment

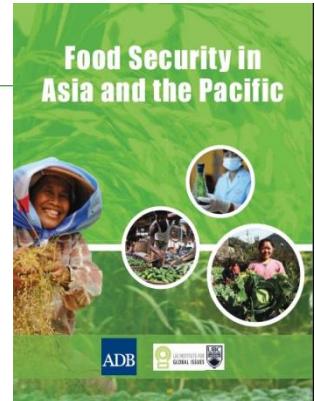


Production per capita by region 1999-2009 (ton/capita)

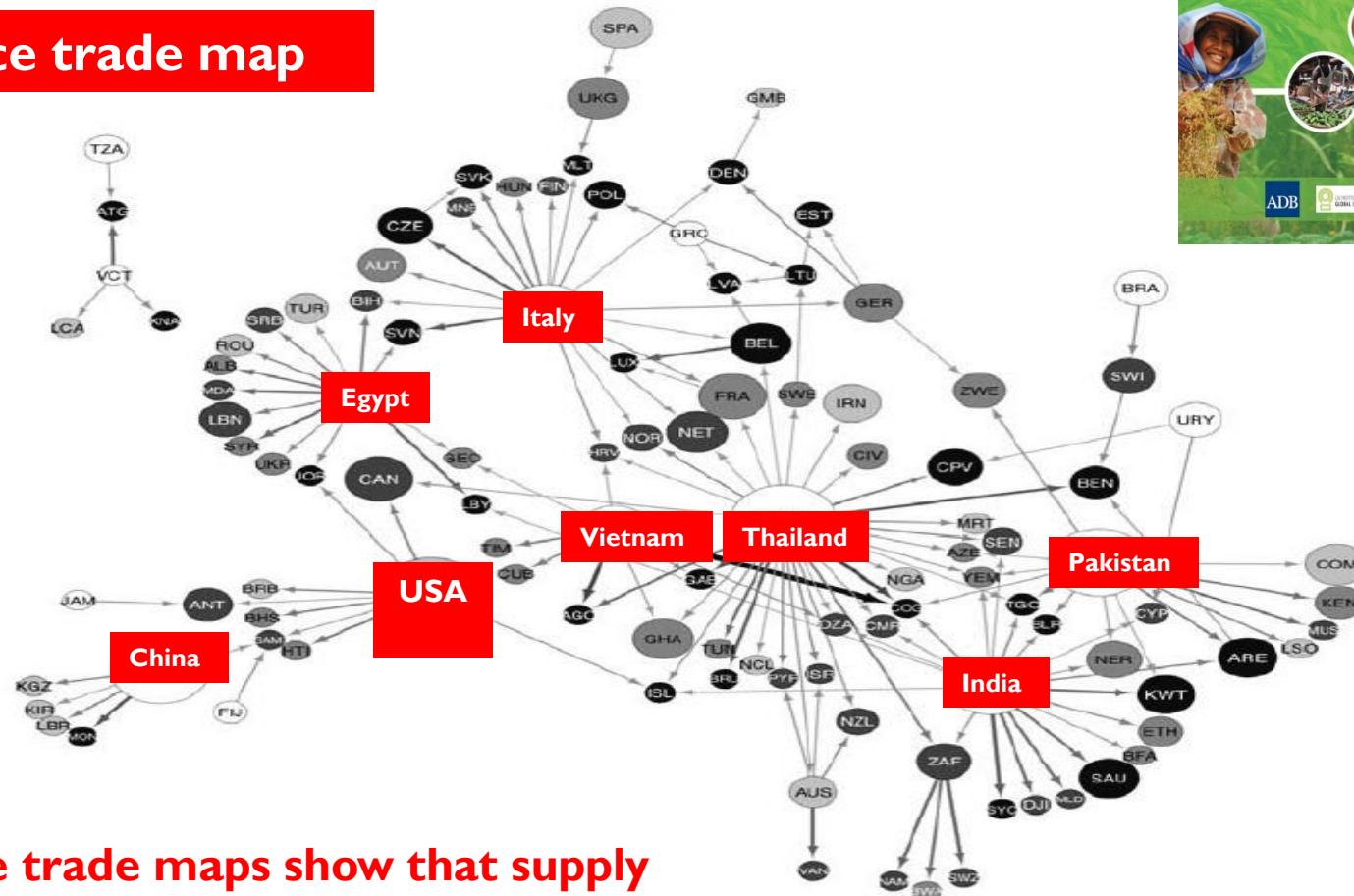


LAC = Latin America and the Caribbean.

People's Republic of China (PRC), India, Pakistan, Thailand, and Viet Nam are important hubs in Asia's rice trade



Rice trade map



The trade maps show that supply disruptions in these key countries can trigger global food price hikes, and show which importing countries are most likely to be immediately affected.

Asian countries generally are undergoing a rapid nutritional transition

Characterized by a shift from

- a high proportion of locally grown staple grains, legumes, low animal based food

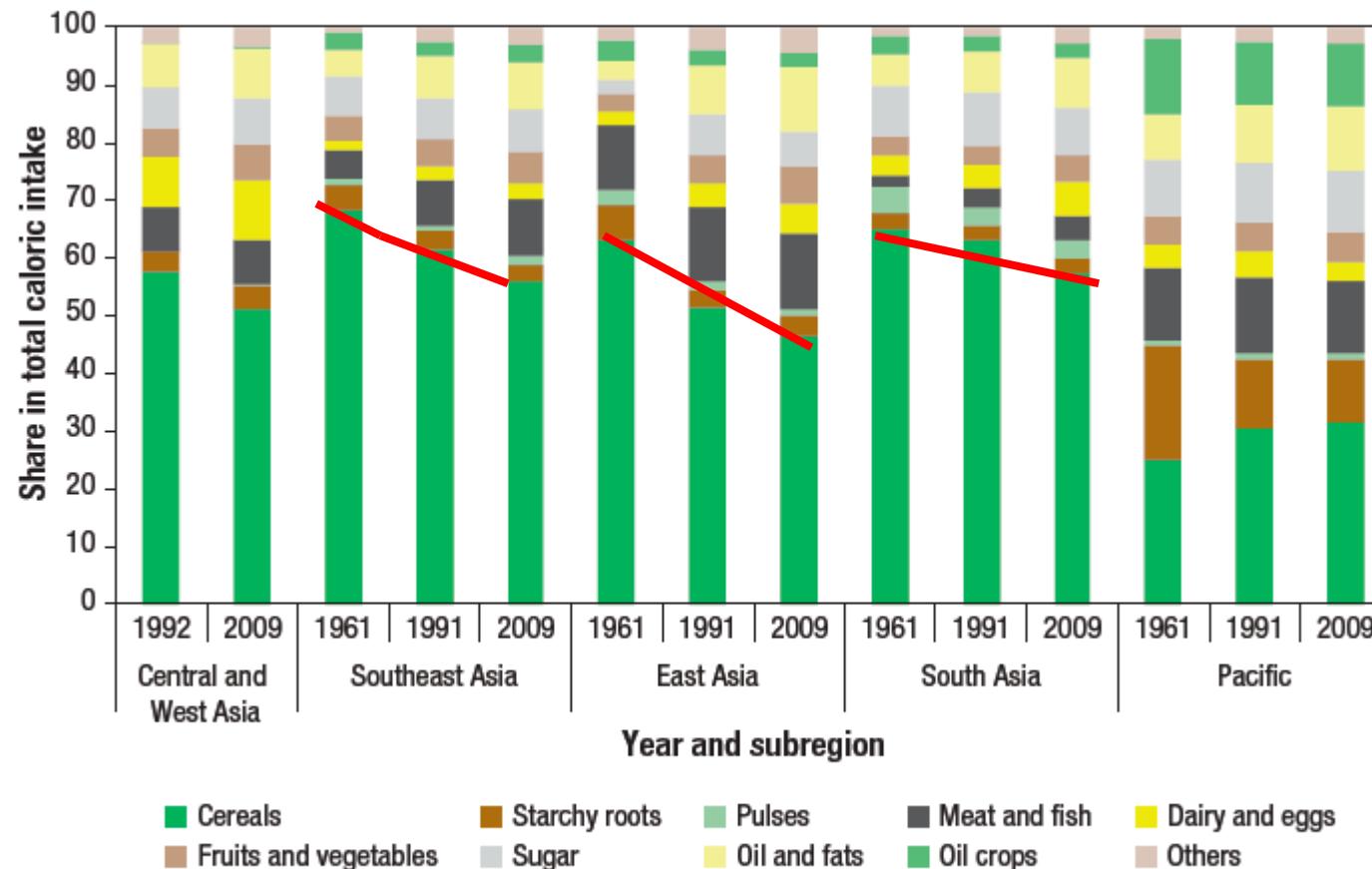
Toward more varied diets

- comprising more refined, energy-dense, animal based and processed food generally high in sugar and fat, and low in carbohydrate content.

which has a huge impact on

- the rising prevalence of chronic non-communicable diseases like diabetes, obesity and other associated diseases

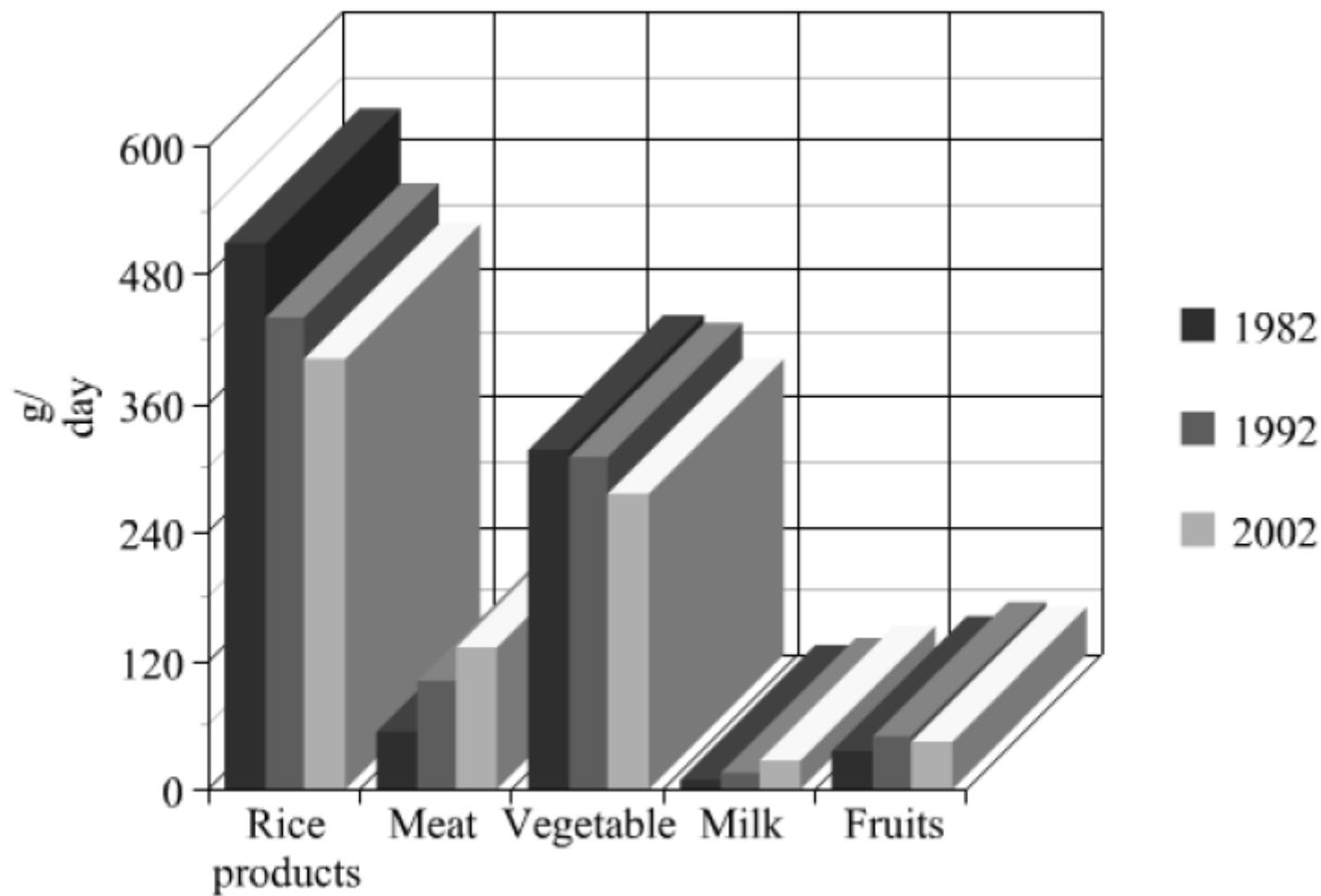
Figure 2.2: Changing Dietary Composition in Asia and the Pacific,
1961–2009 (%)



Note: Refer to Appendix A for a list of economies in each region.

Source: ADB estimates based on the Food Balance Sheets, FAOSTAT. <http://faostat.fao.org/site/368/default.aspx#ancor> (accessed 10 April 2013).

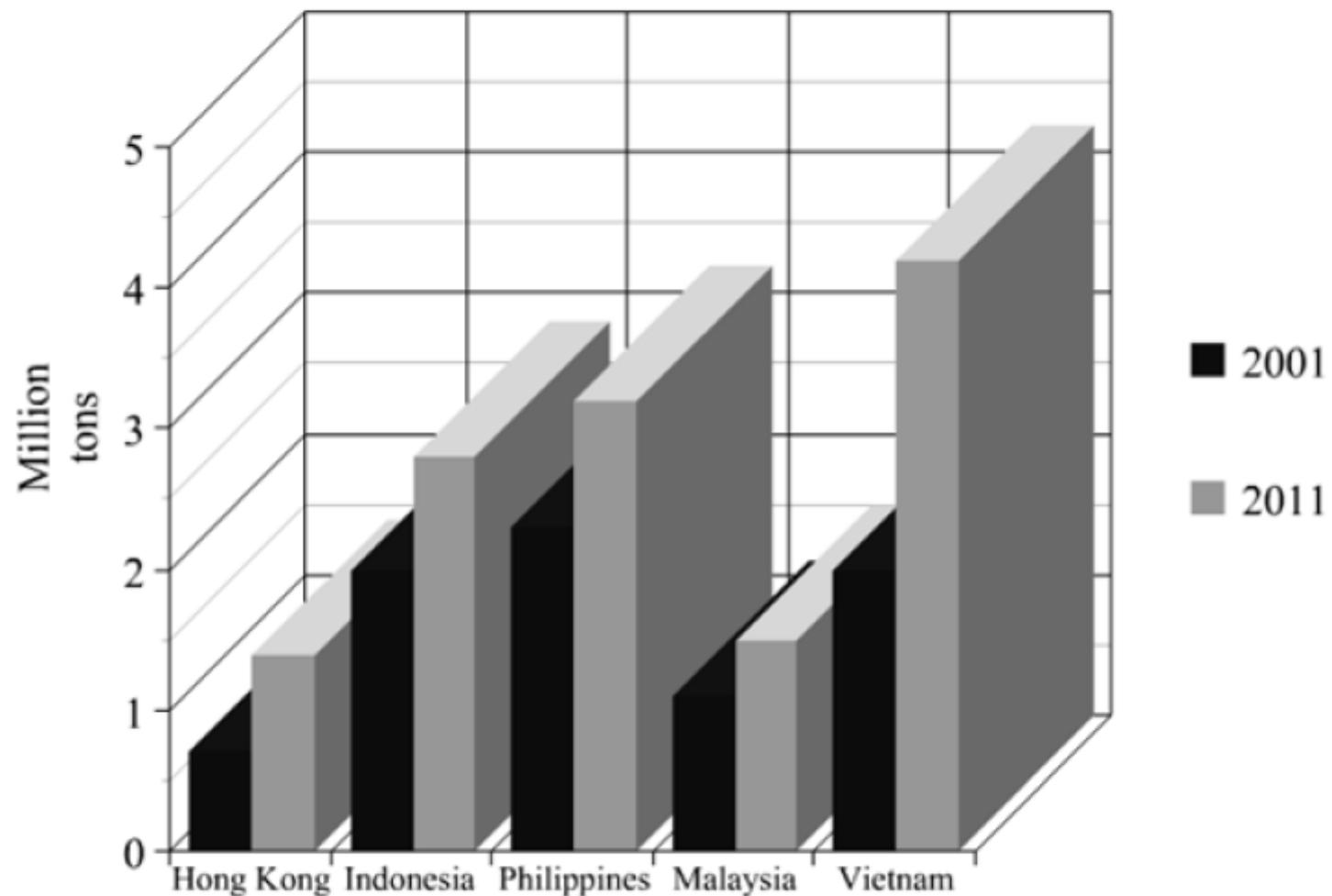
Figure 2: Trend in consumption of different food items in China



Source: China Health and Nutrition Survey

Bishwajit et al., 2014

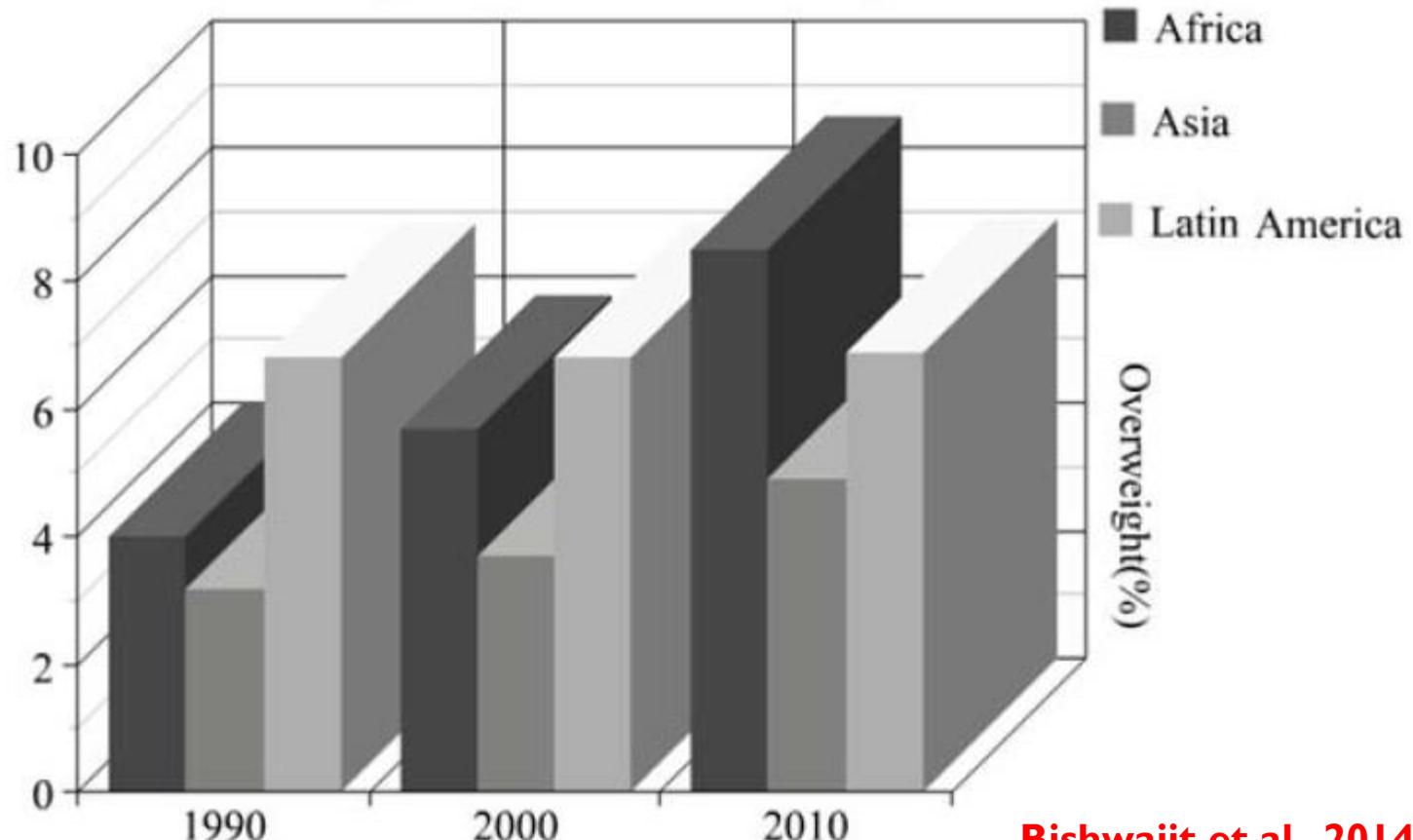
Figure 3: Trend of meat consumption in selected Asian countries



Bishwajit et al., 2014

This shift in dietary habit, accompanied by reduced physical activity and leisure period lead to increase in overweight and obesity over time

Figure 1: Situation of overweight in Asia



Bishwajit et al., 2014

Source: Adapted from WHO data

Association between body mass index and cardiovascular disease mortality in east Asians and south Asians: pooled analysis of prospective data from the Asia Cohort Consortium. Chen et al., BMJ 2013;347:f5446

Total N=1,124,897; South Asians: 289,815; East Asians: 835,082

East Asians: China, Taiwan, Singapore, Korea, and Japan

South Asians: Bangladesh and India

What this study adds

- Higher body mass index is a risk factor for mortality from overall cardiovascular disease, coronary heart disease, ischaemic stroke, and haemorrhagic stroke in east Asians, especially in middle aged men and women
- Very low body mass index is also associated with an increased risk of death from cardiovascular disease in east Asians
- Higher body mass index is a weak risk factor for death from cardiovascular disease in south Asians

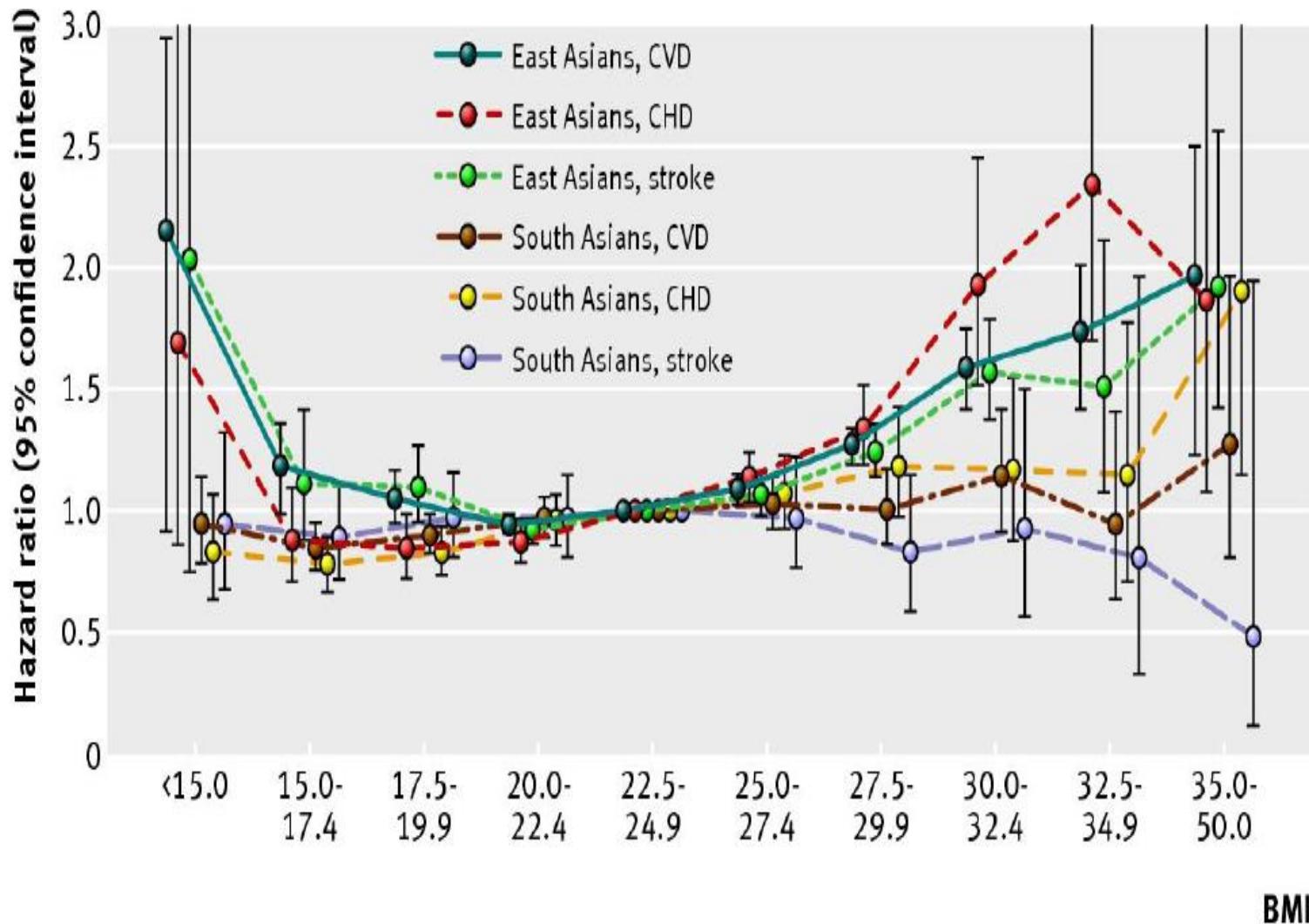
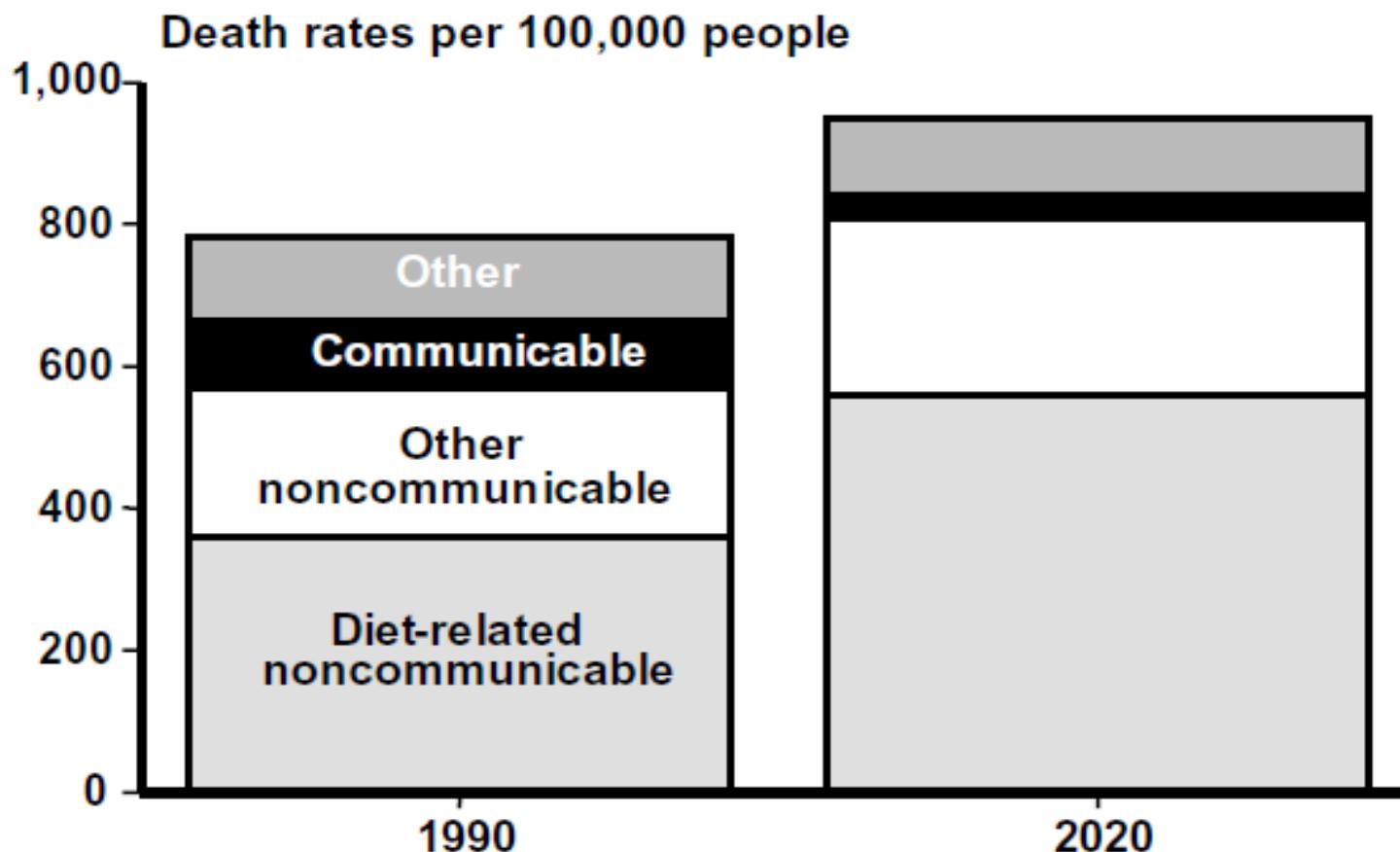


Fig 1 Association between BMI and CVD mortality in east Asians and south Asians. Analyses for the calculation of hazard ratios were adjusted for baseline age, sex, cigarette smoking, alcohol consumption, educational attainment, marital status, urban residence, and baseline status of cancer. All analyses excluded first three years of follow-up

Total N=1,124,897; South Asians: 289,815; East Asians: 835,082

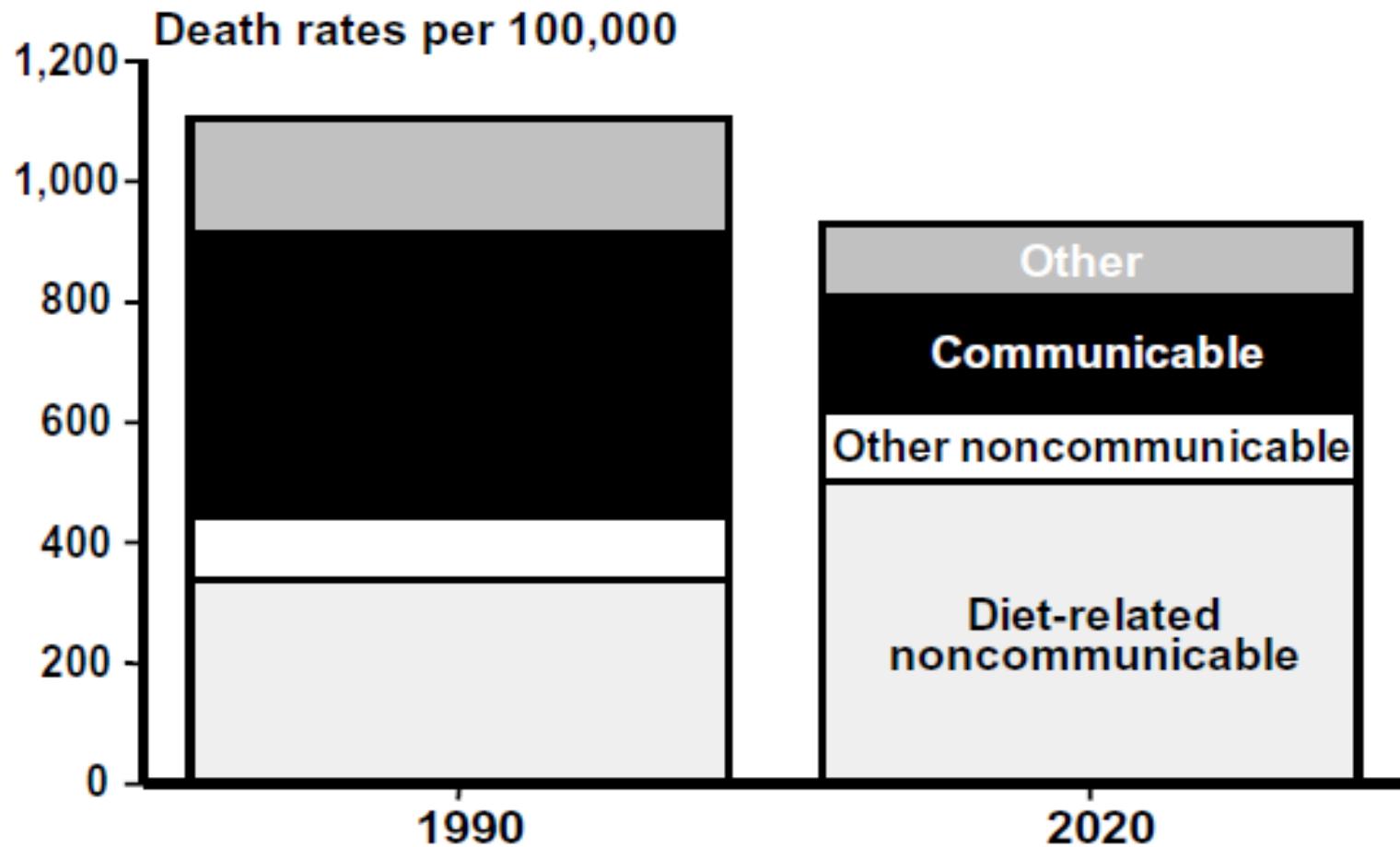
Chen et al., 2013

Mortality trends in China, 1990 and 2020



Source: B. Popkin, S. Horton, S. Kim, A. Mahal, S. Jin. 2001.
"Diet-related Noncommunicable Disease in China and India:
The Economic Costs of the Nutrition Transition." *Nutrition Reviews*
59: 379-390.

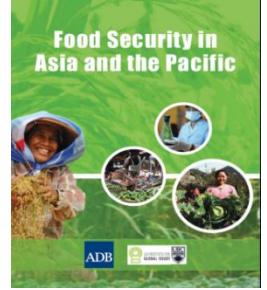
Mortality trends in India, 1990 and 2020



Concluding remarks



(Centre for International Security Studies,
University of Sydney, Australia, 2013)



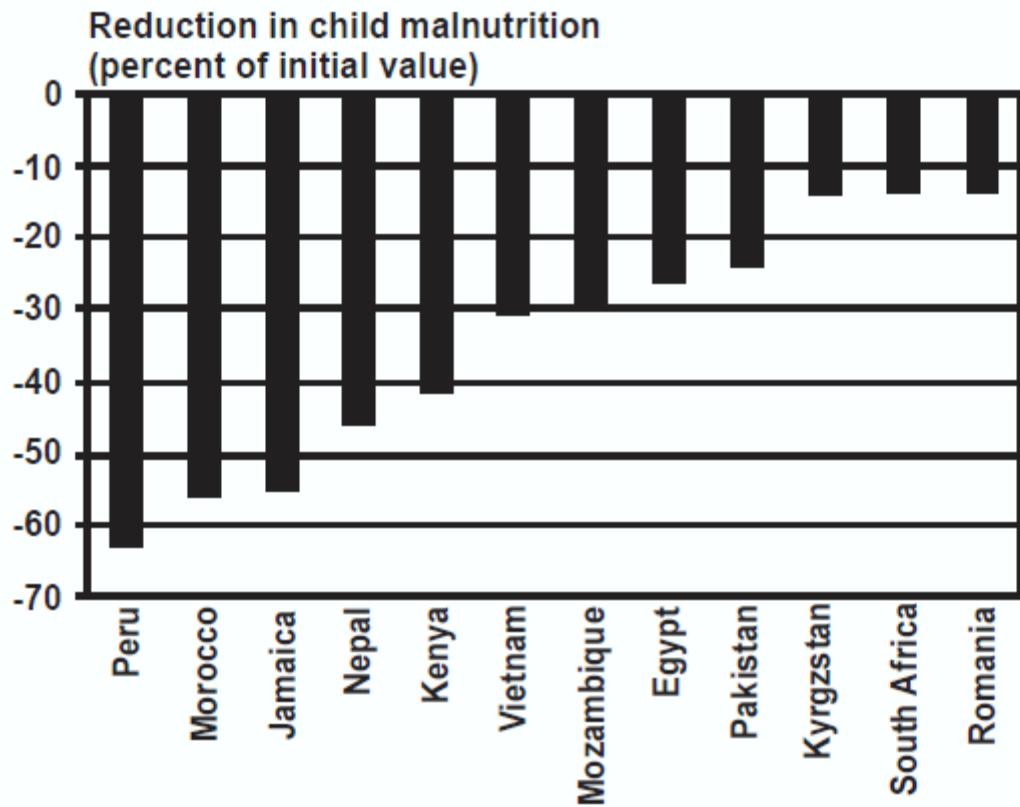
“Trends in population, economic growth, industrialization, urbanization, and changing dietary patterns have largely encumbered already scarce natural resources.”

- Total arable land per person in East and South Asia has been shrinking, falling from almost one-quarter hectare per person 50 years ago to an estimated one-tenth hectare by 2050.
- Water resources are also strained. Across Asia, between 60% and 90% of water is used for agriculture.

“Over a 20-year period, from now to 2020, can a 2.5 percent growth rate in real per capita annual income halve child underweight rates?” Of the 12 countries in Figure 1, for only 3, Morocco, Peru, and Jamaica, were we able to project a halving of malnutrition rates. A growth of 2.5 percent sustained over a 20 year period is a wonderful rate of economic growth, but it only does the business of halving malnutrition by 2020 for 3 countries.

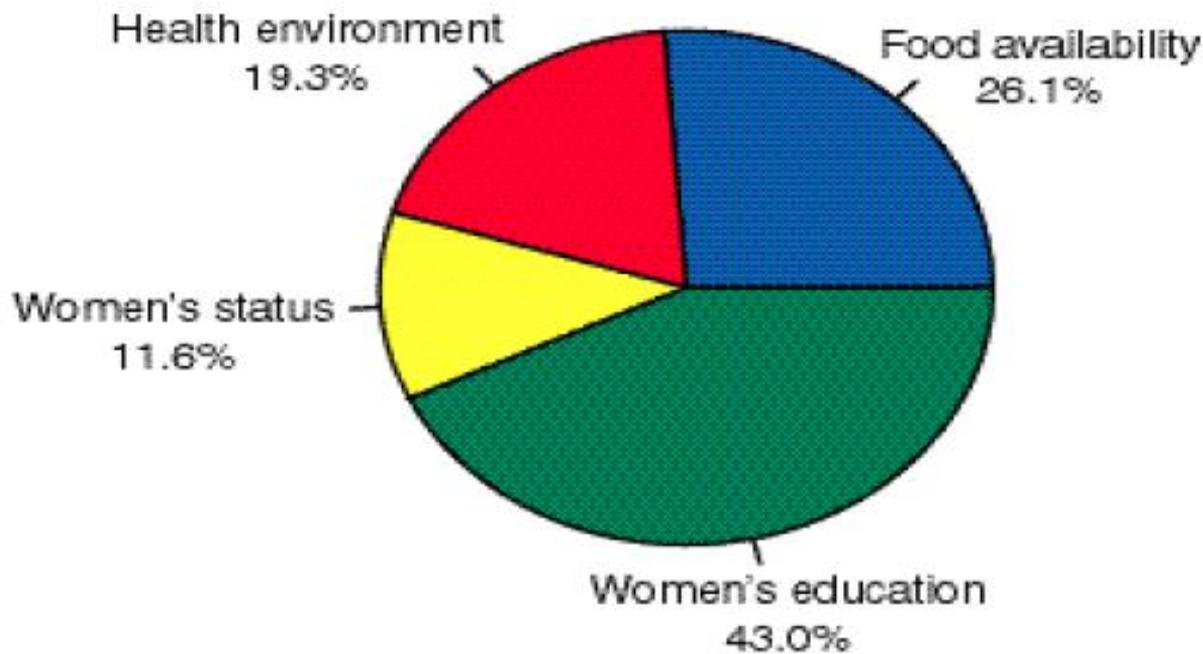
Haddard et al 2002, IFPRI

Decline in child malnutrition due to 2.5 percent annual growth in per capita income: 1990s to 2015



Source: Haddad, L., et al., 2002, "Reducing Malnutrition: How Far Can Income Growth Take Us?" Forthcoming FCND discussion paper, IFPRI.

Figure 22—Estimated contribution of major determinants to reductions in child malnutrition, 1970–95



Source: L. Smith and L. Haddad, "Overcoming Child Malnutrition in Developing Countries: Past Performance, Future Possibilities," Draft 2020 Vision for Food, Agriculture, and the Environment Discussion Paper (International Food Policy Research Institute, Washington, D.C., photocopy).
Note: Malnourished children refers to underweight children.

“Across Asia, as in other parts of the world, governments continue to interpret food security in terms of food availability and self-sufficiency in staples.

Current food security policies in Asia tend to lack a holistic and comprehensive approach, and invariably focus on the economics of food supply and demand, and ‘the challenge of procuring, and distributing, scarce resources amongst the world’s population.

These interpretations of food security are limited when compared with the definition provided by the FAO (1996).”



FOOD SECURITY IN
ASIA
A REPORT FOR
POLICYMAKERS

Centre for International
Security Studies
University of Sydney,
Australia
2013

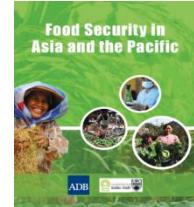


Table A: Summary of Food Security Policies

| Actions | National | Regional/Global |
|---|---|---|
| Interventions to Meet Immediate Needs | <ul style="list-style-type: none"> • Provide emergency food assistance and enhance social safety nets • Offer programmed cash transfers • Target interventions at nutrition | <ul style="list-style-type: none"> • Provide timely and reliable data and information • Coordinate crisis policy responses • Facilitate flows of emergency assistance • Reduce agricultural trade restrictions and market distortions |
| Actions to Improve Medium- to Long-Term Resilience | <ul style="list-style-type: none"> • Promote agriculture and rural development • Invest in human development • Improve nutrition awareness • Consider building an emergency fund for disaster relief • Introduce insurance and disaster mitigation measures • Establish national and regional food reserves and crisis management systems | <ul style="list-style-type: none"> • Promote research and development, knowledge exchange, and capacity building • Improve monitoring and surveillance of food market conditions • Promote food trade liberalization • Consider mechanisms to promote price stability • Enhance collaboration on climate change and accelerate adaptation measures |

Thank you



Global Nutrition Needs

Case study: Europe

I A Macdonald
School of Life Sciences
Faculty of Medicine & Health Sciences
Nottingham

Nutritional challenges in Europe

- Obesity, Cardiovascular disease and Type 2DM
- Healthy ageing: maintain muscle and bone mass, reduce musculoskeletal disease, maintain cognitive capacity
- Economic development in Eastern European countries – consequences of previous poor nutrition (similar to Asean/Asian/Africa regions) and of reduction in manual jobs
- Evidence-based Health and Nutrition claims – European Food Safety Authority (EFSA)

Prevalence of obesity

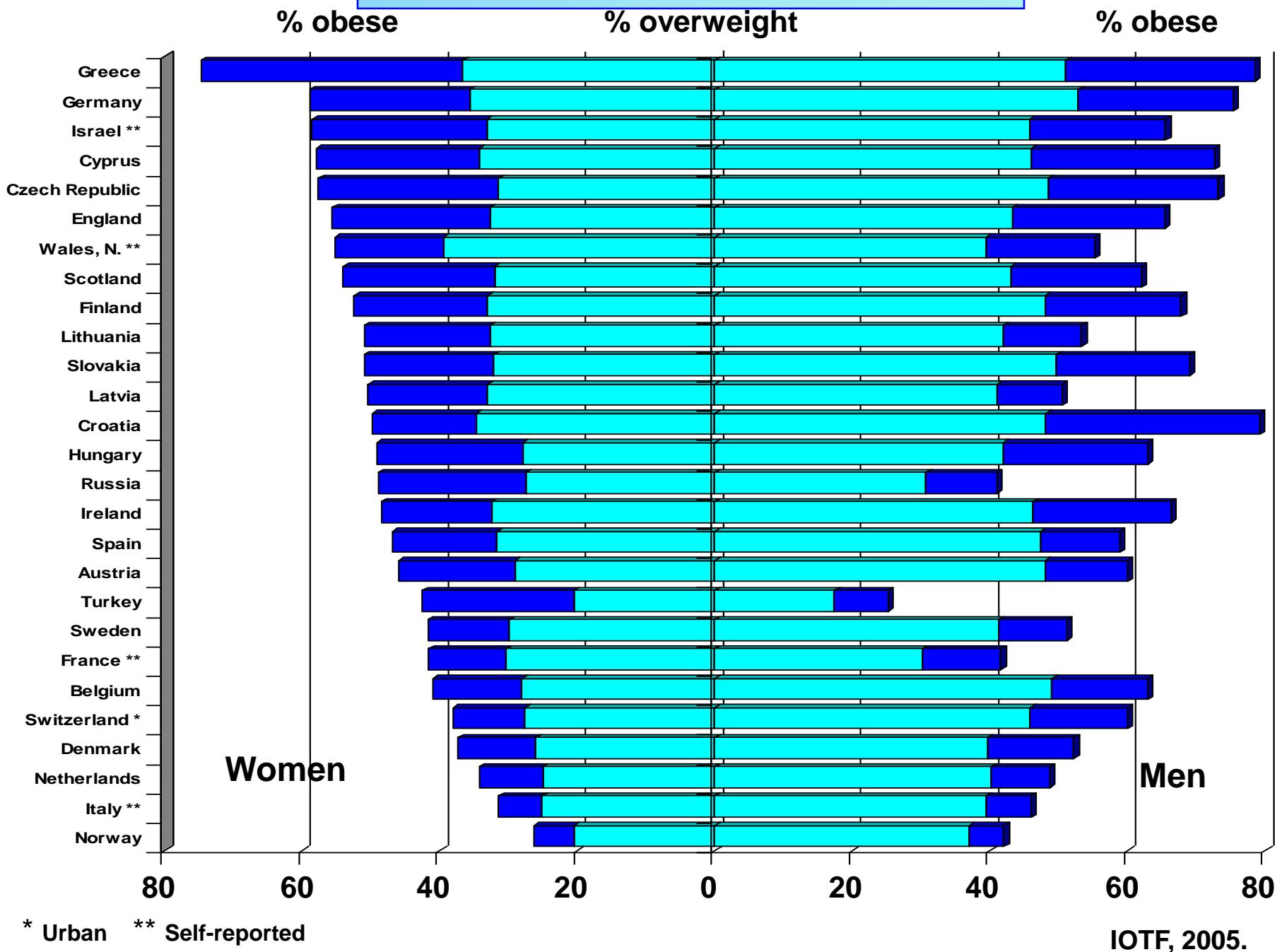
Increasing in:

N America, Western Europe, Eastern Europe,
Australia, Japan,

Transition Economies (China / India),

Developing Countries.

European National Obesity Rates

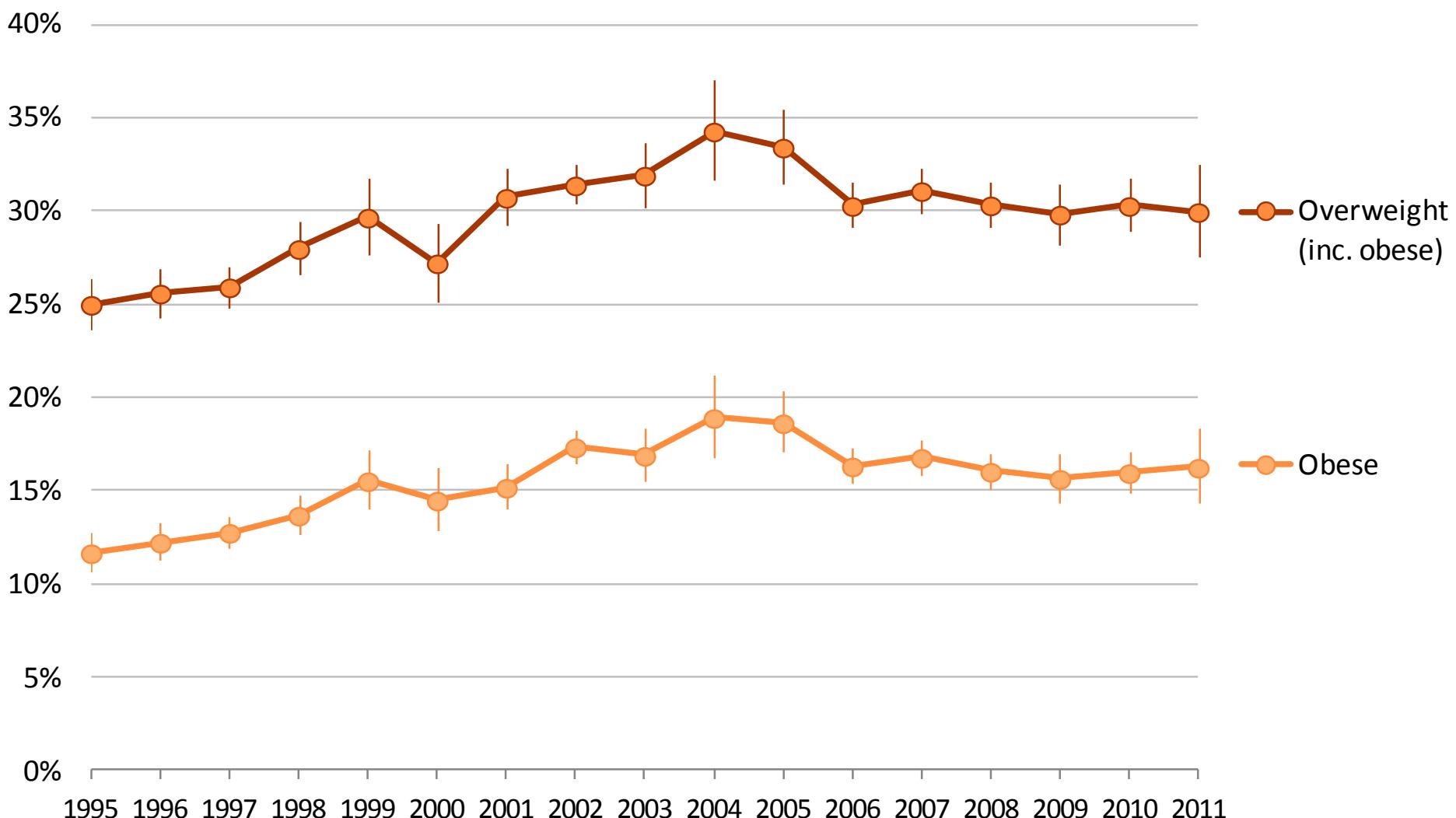


UK Prevalence of Obesity

- Now approx 25% adult men and women have BMI > 30
- 20 years ago, 6% men and 8% women were obese
- Increased prevalence in lower Socioeconomic groups, over 40's and ethnic minorities
(Abdominal obesity a particular problem)

Prevalence of overweight and obesity among children aged 2-15 years

Health Survey for England 1995-2011



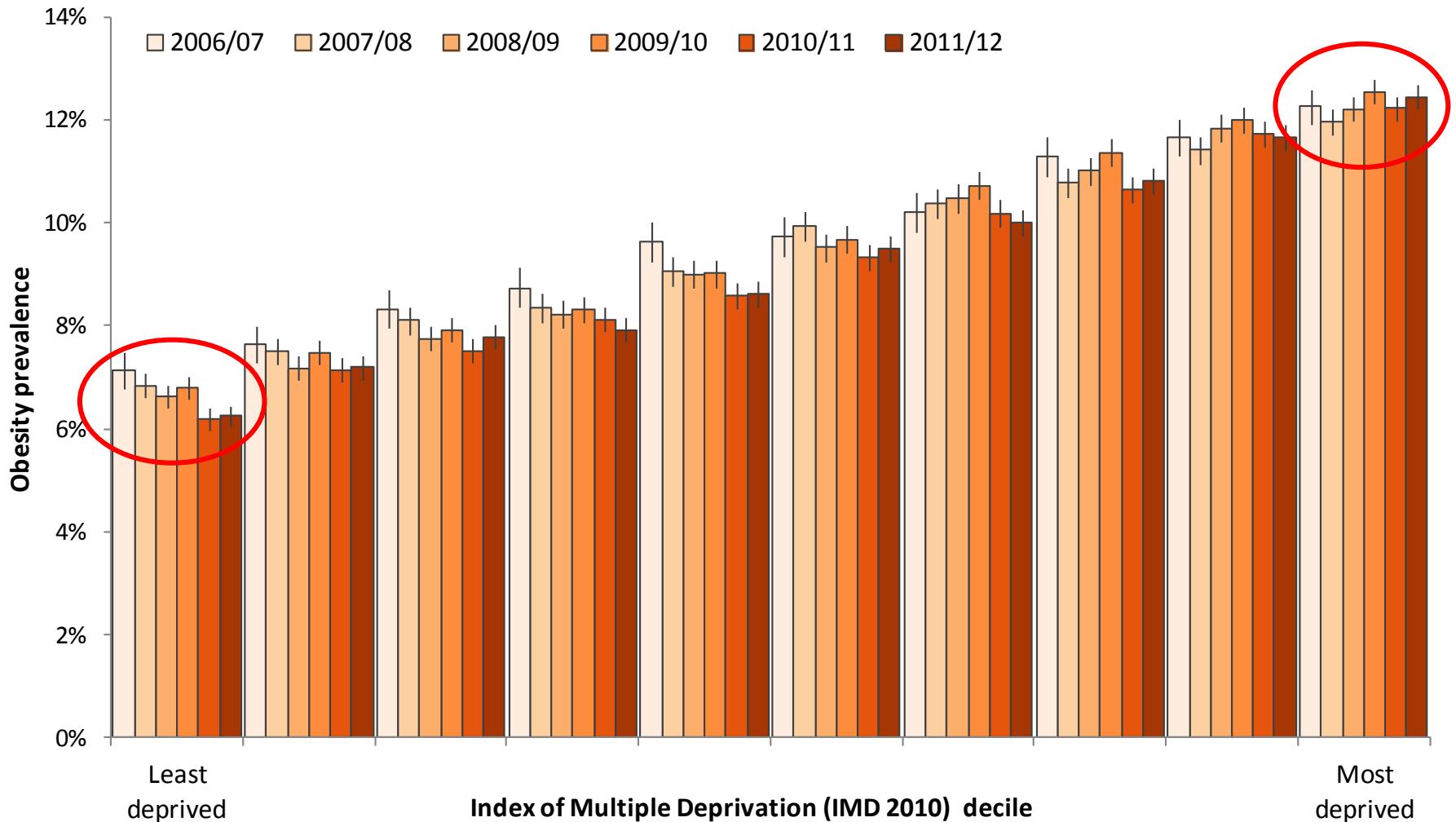
Child overweight including obese (excess weight): $BMI \geq 85^{\text{th}}$ centile of the UK90 growth reference

Child obesity: $BMI \geq 95^{\text{th}}$ centile of the UK90 growth reference

95% confidence intervals are displayed on the chart

Prevalence of obesity by deprivation decile, Reception children (5yr olds)

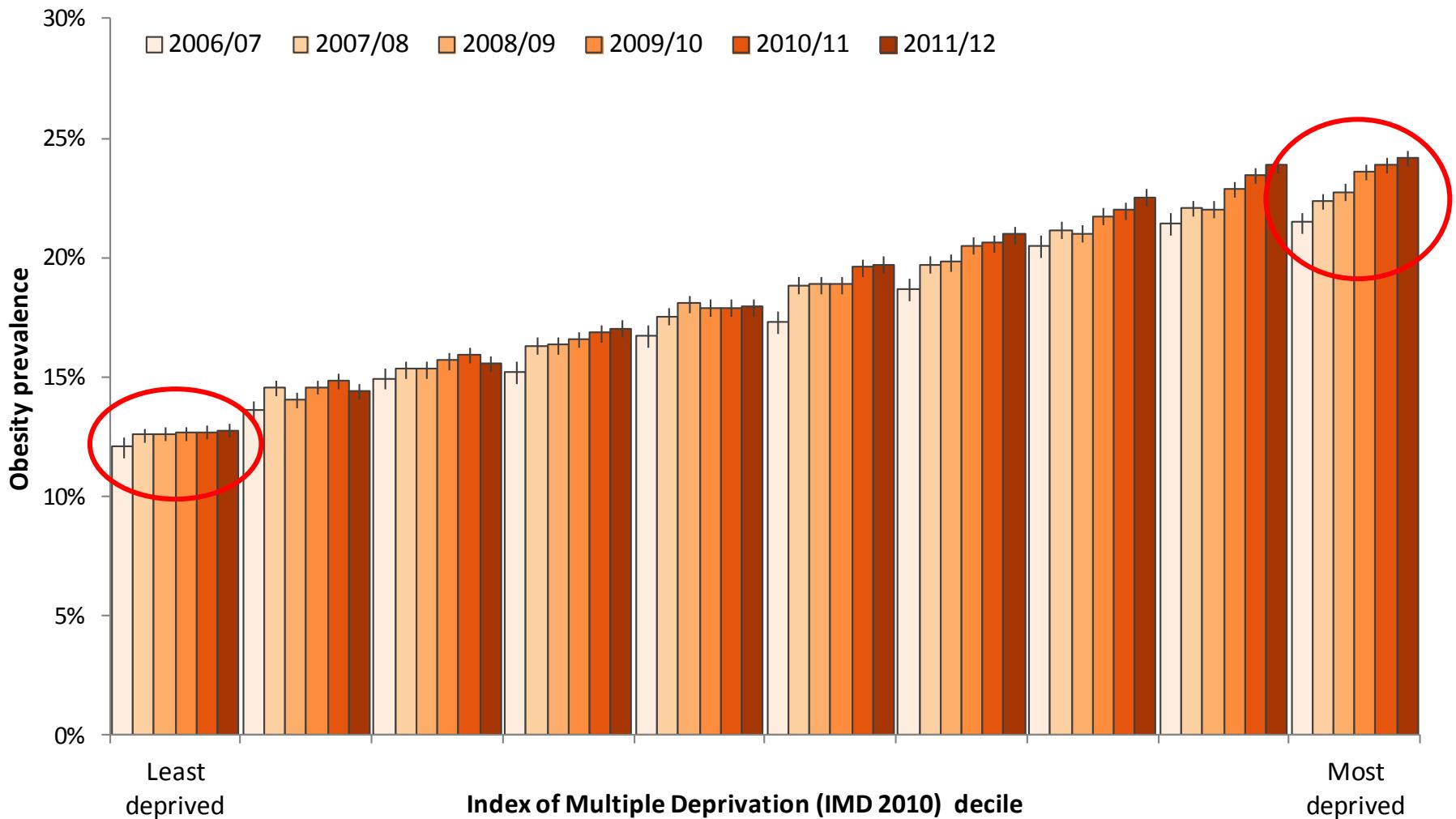
National Child Measurement Programme 2006/07 to 2011/12



Child obesity: BMI $\geq 95^{\text{th}}$ centile of the UK90 growth reference
 Deprivation deciles assigned to the child area of residence using the Index of Multiple Deprivation 2010
 95% confidence intervals are displayed on the chart

Prevalence of obesity by deprivation decile, 11 Yr old children

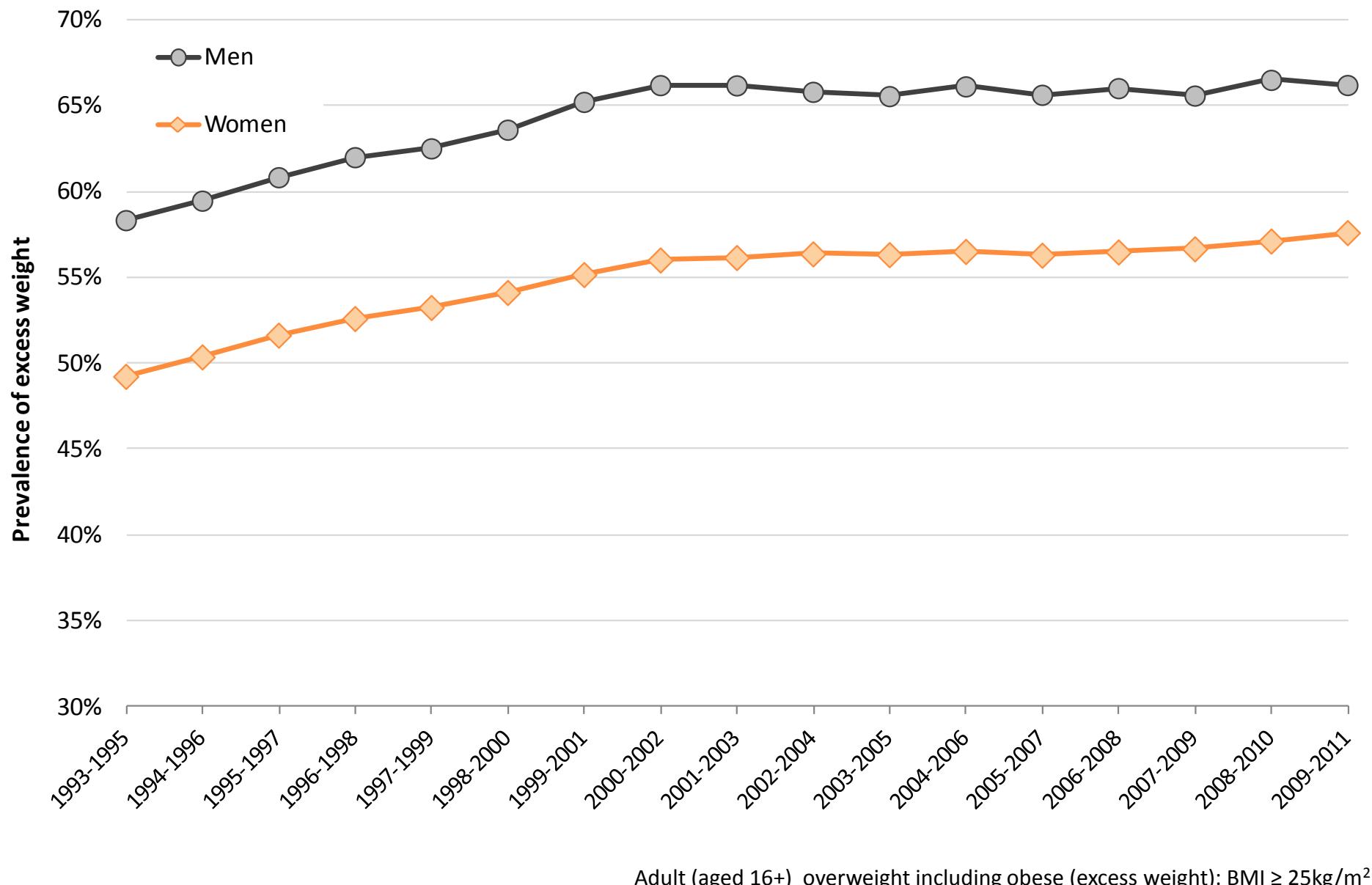
National Child Measurement Programme 2006/07 to 2011/12



Child obesity: BMI $\geq 95^{\text{th}}$ centile of the UK90 growth reference
 Deprivation deciles assigned to the child area of residence using the Index of Multiple Deprivation 2010
 95% confidence intervals are displayed on the chart

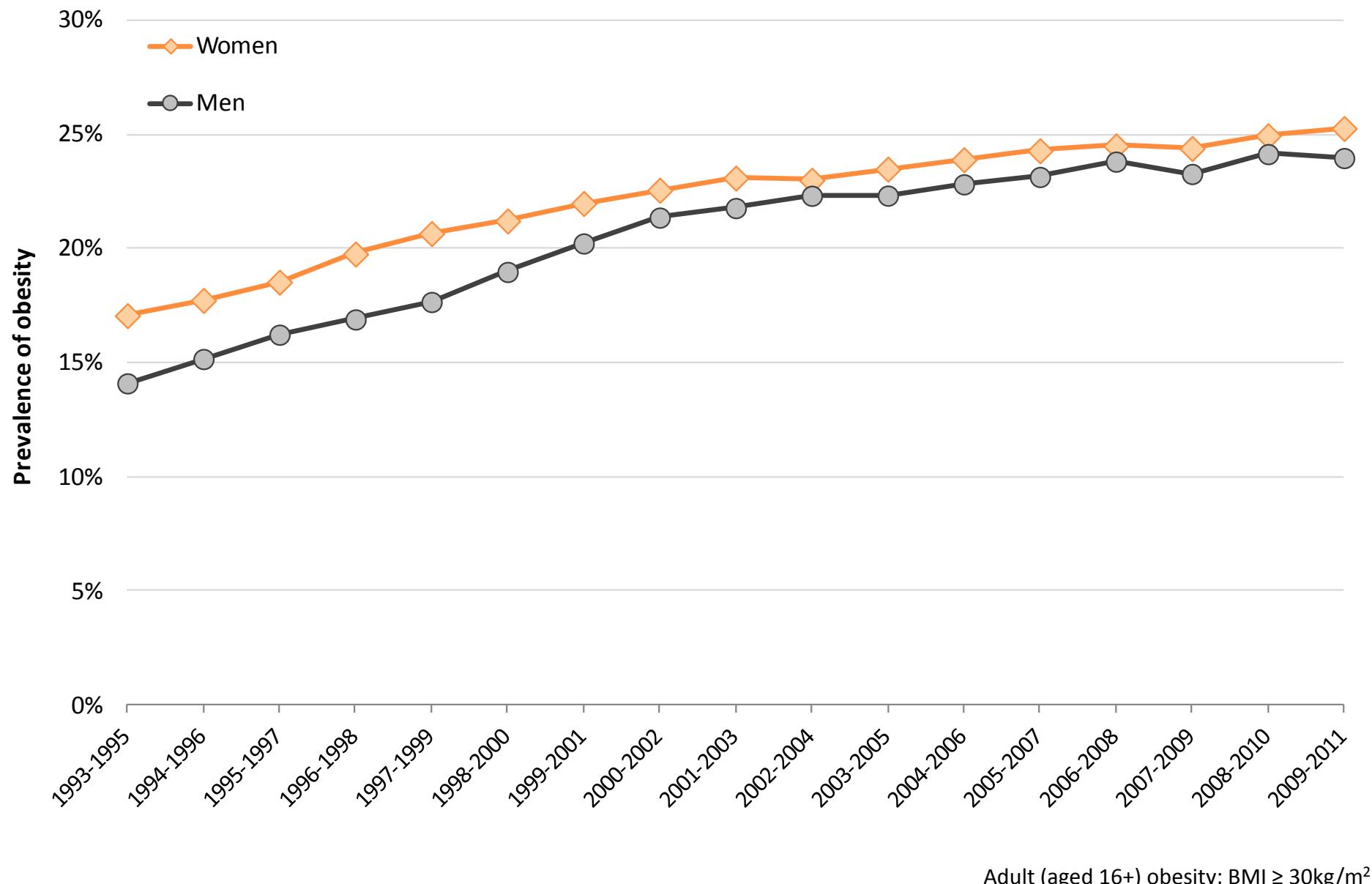
Prevalence of excess weight among adults aged 16+ years

Health Survey for England 1993-2011 (3-year average)



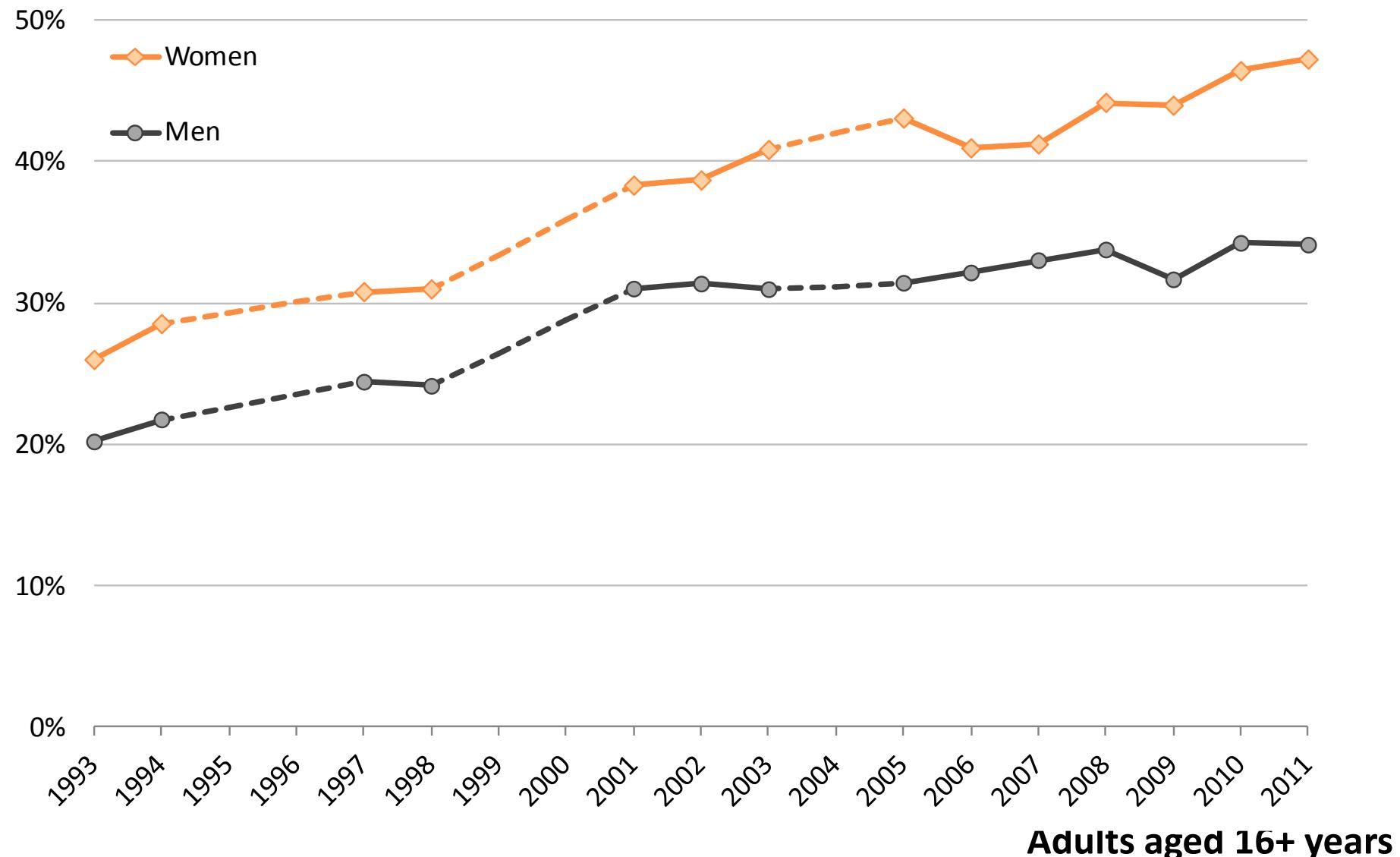
Prevalence of obesity among adults aged 16+ years

Health Survey for England 1993-2011 (3-year average)



Trend in raised waist circumference among adults

Health Survey for England, 1993 - 2011



Adults aged 16+ years
Raised waist circumference defined as >102cm for men and >88cm for women

Carbohydrates

- UK SACN Report on Carbohydrates and Health Recommendations:
 - Total CHO 50% energy
 - Fibre: 30g/d (CV health, gut health)
 - Free sugars 5% energy (teeth, obesity)
 - Sugars sweetened beverages should be minimised (obesity, T2DM risk)

Other nutritional issues

- Vitamin D: 25% of Adults in Northern Europe have sub-clinical D deficiency. Is supplementation/fortification justified?
- Folate: NTD prevention – needs fortification of flour/other foods. What about potential side effects?

EFSA approved Health Claims (mainly for CV health)

- Olive oil
- Water soluble Tomato Concentrate
- Cocoa flavanols

**US trial of cocoa flavanols on CV deaths will start
2015 – NIH, Harvard, Mars**

EUFP7 Preview project

Diabetes prevention in patients with IGT

Medium GI and medium protein
or

Low GI and higher protein
plus moderate or higher intensity
exercise

Duration 3 years – incidence of diabetes
the primary outcome (2018)

EU Horizon 2020 projects

- Obesity treatment – novel use of mobile technologies, developing novel food ingredients
- Nutrition in the Elderly
- Maintaining cognitive function