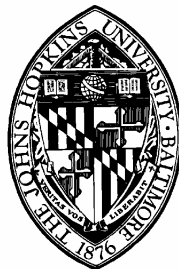


La Transición Nutricional en el Mundo Moderno: Lecciones y Perspectivas

Benjamin Caballero, M.D., Ph.D.

Center for Human Nutrition

Johns Hopkins Bloomberg School of Public Health





BEIJING BABY FAT: Some 30 million Chinese children are overweight, a number that could double in a decade

QUANG NGU—REUTERS

H E A L T H

Obesity Goes GLOBAL

Children around the world are eating more like Americans—and getting dangerously fat as a result

By J. MADELEINE NASH HELSINKI

EIGHT-YEAR-OLD HANNAH MCGOEY lives in an upstairs apartment on a busy thoroughfare in London. She has no yard to play in, and her school holds physical-education classes just two days a week. Her busy parents tried to be careful about nutrition, giving up their Friday fish and chips, for example. But over the years, Hannah only became plumper. By the time she turned 6, children's sizes no longer fit her. "I would have to buy jeans for 12- and 14-year-olds," her mother Julia remembers, "and then cut a foot and a half off the leg."

But things began to change when a school nurse told the McGoeyes about a program called MEND (mind, exercise, nutrition, diet), started by Paul Sacher, a dietitian at London's Great Ormond Street Hospital for Children. Hannah enrolled

In Numbers, the Heavy Now Match the Starved

By **BARBARA CROSSETTE**

UNITED NATIONS, Jan. 17 — The number of overweight people in the world now rivals the number of hungry, underfed people, a study of global trends reported this weekend.

Drawing on research from a

the percentage of overweight people in the population jumped to 15 percent from 9 percent in three years in the early 1990's. In Brazil, with 31 percent, and Colombia, with 43 percent, the percentage of overweight people is reaching a par with several countries of

The New York Times

BC



PREVENTING AND
MANAGING
THE GLOBAL
EPIDEMIC

Report of a WHO
Consultation on Obesity
Geneva, 3-5 June 1997

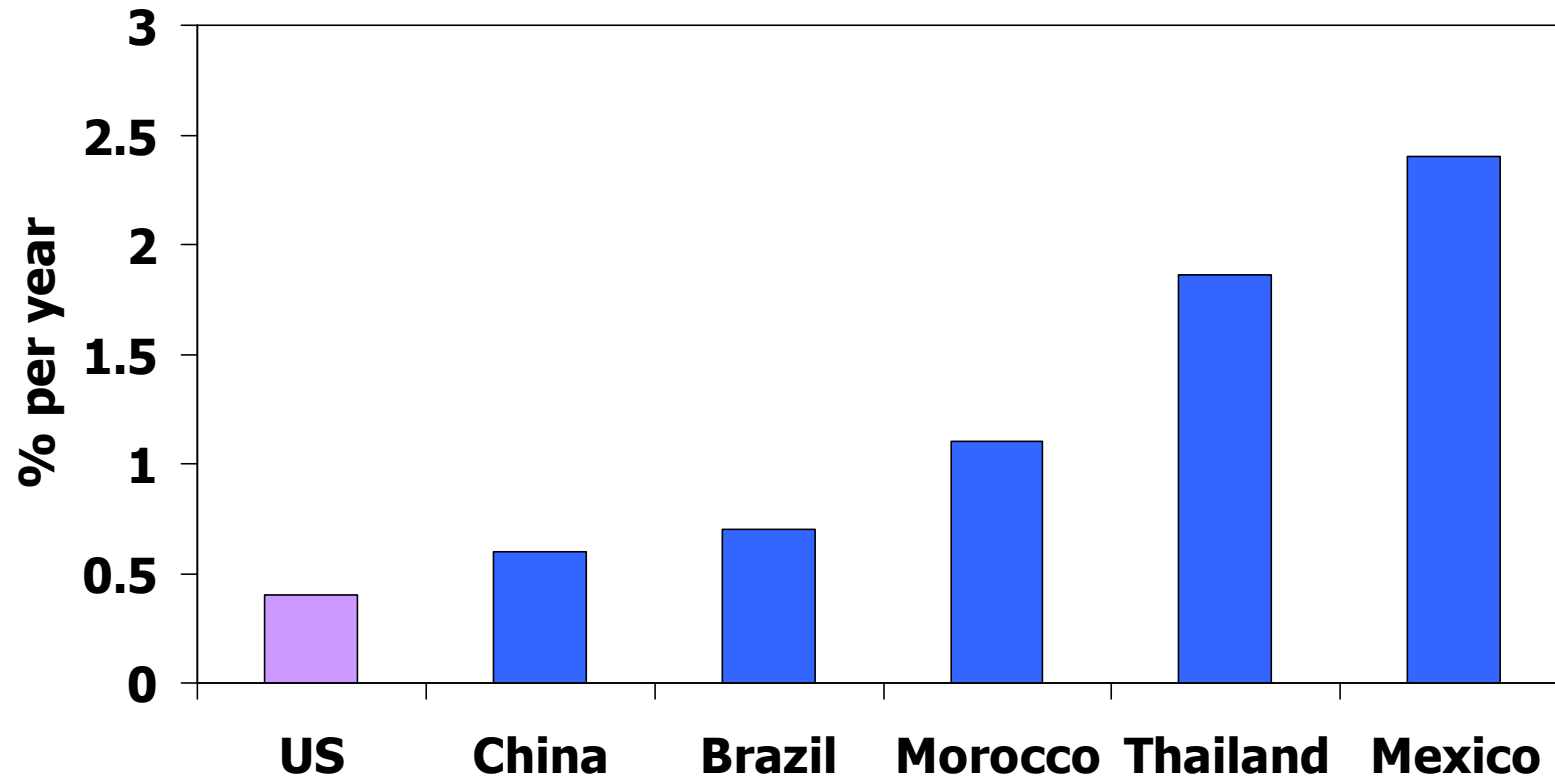


Division of
Noncommunicable Diseases

World Health Organization
Geneva

Programme of Nutrition
Family and Reproductive Health

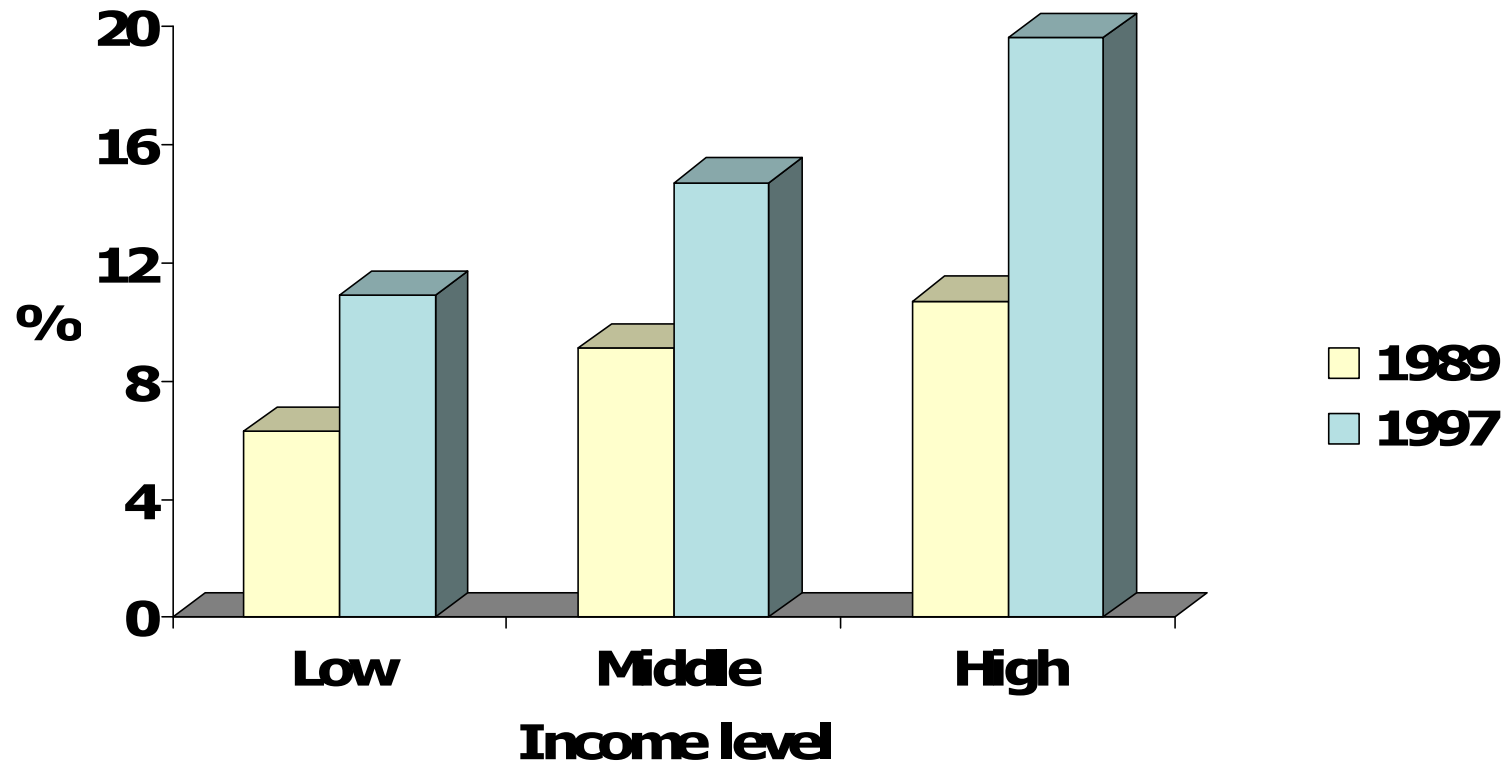
Annual increase in obesity rates in selected countries (women)



Popkin and Gordon-Larsen, 2004

China: trends in obesity

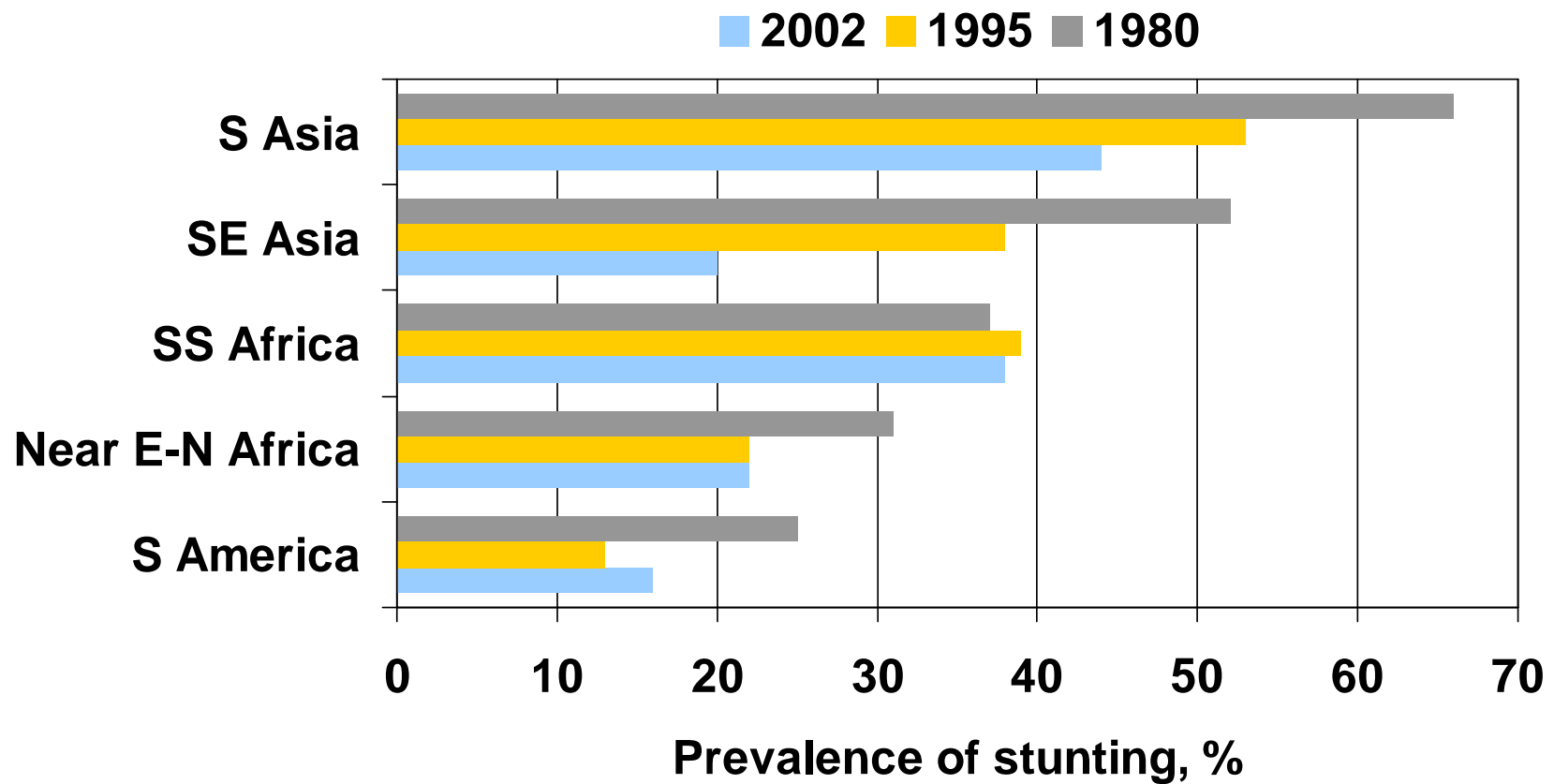
Population with BMI > 25



Du et al, SSM 2004

¿Estamos superando la subnutrición
y pasando a sobrenutrición?

Prevalence of stunting in < 5 yr/old children



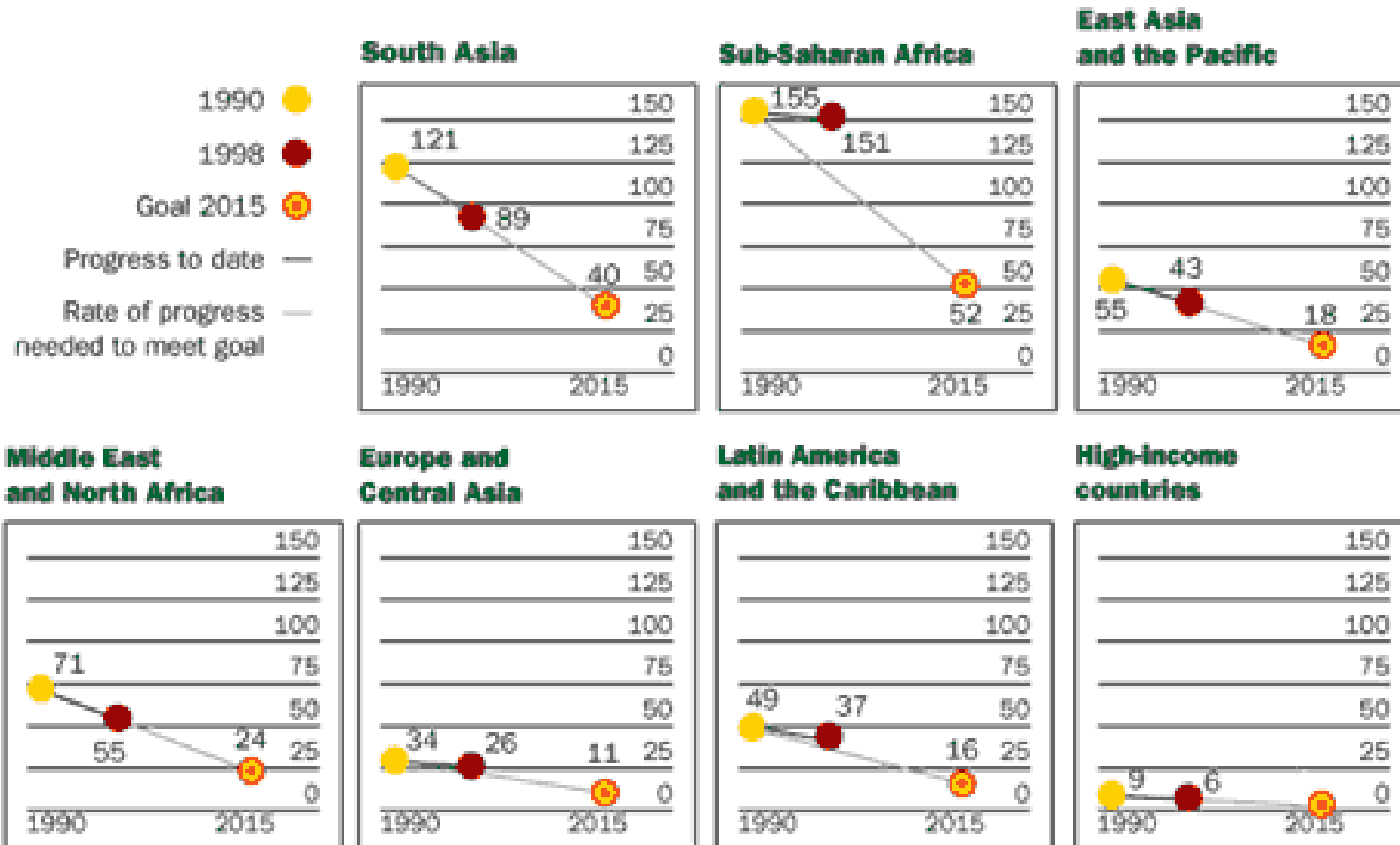
World poverty, 1981-2001

% of people living with <US\$2 per day

	1981	1990	2001
South Asia	89.1	85.5	77.2
Sub-Saharan Africa	73.3	75.0	76.6
South E Asia & Oceania	84.8	69.9	47.4
Latin American & Caribbean	26.9	28.4	24.5
North Africa & Middle E	28.9	21.4	23.2
Europe & Central Asia	4.7	4.9	19.7

World Bank, 2004

Under 5 mortality rates (deaths/1000 live births)

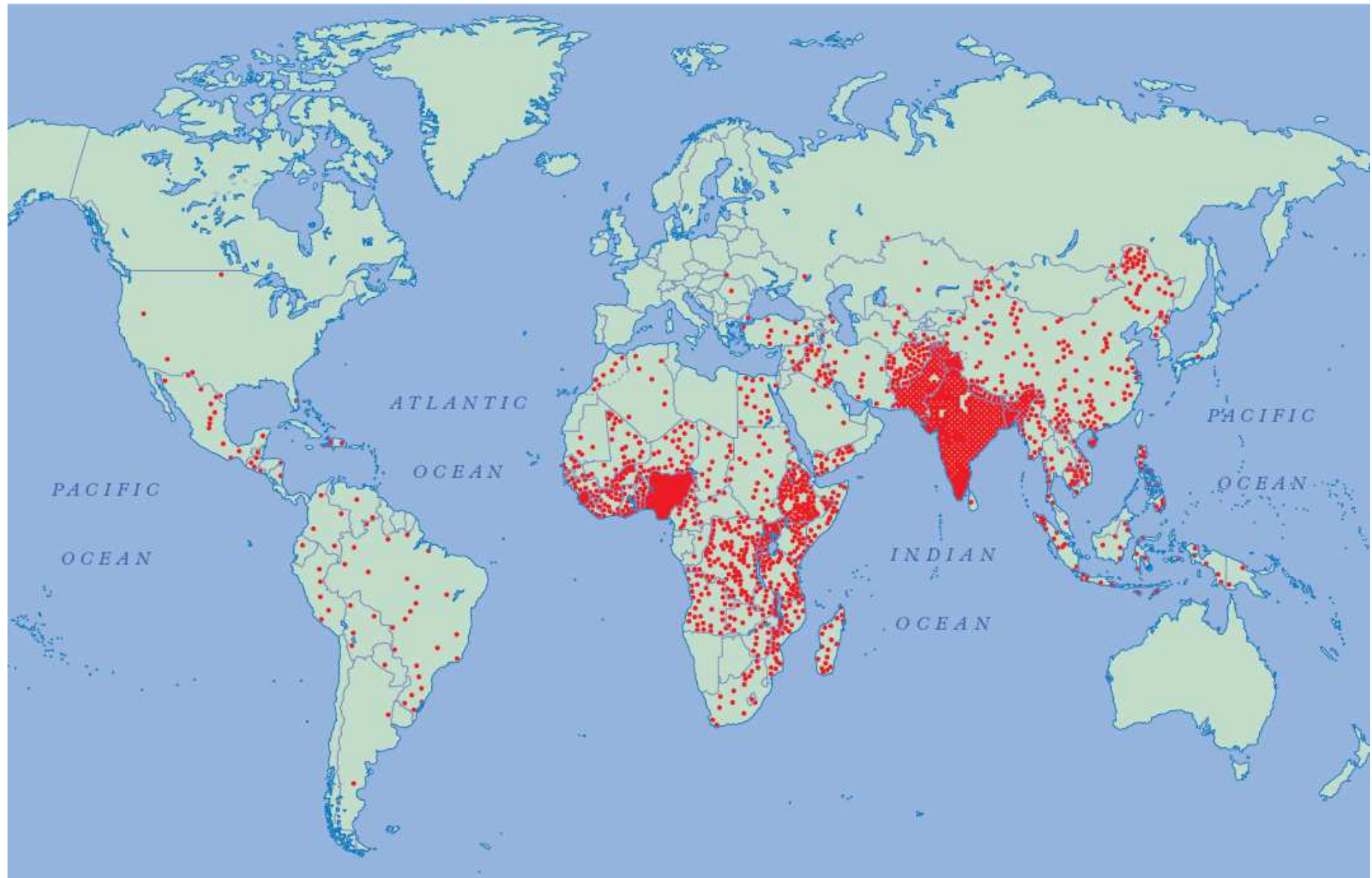


World Bank, 2000

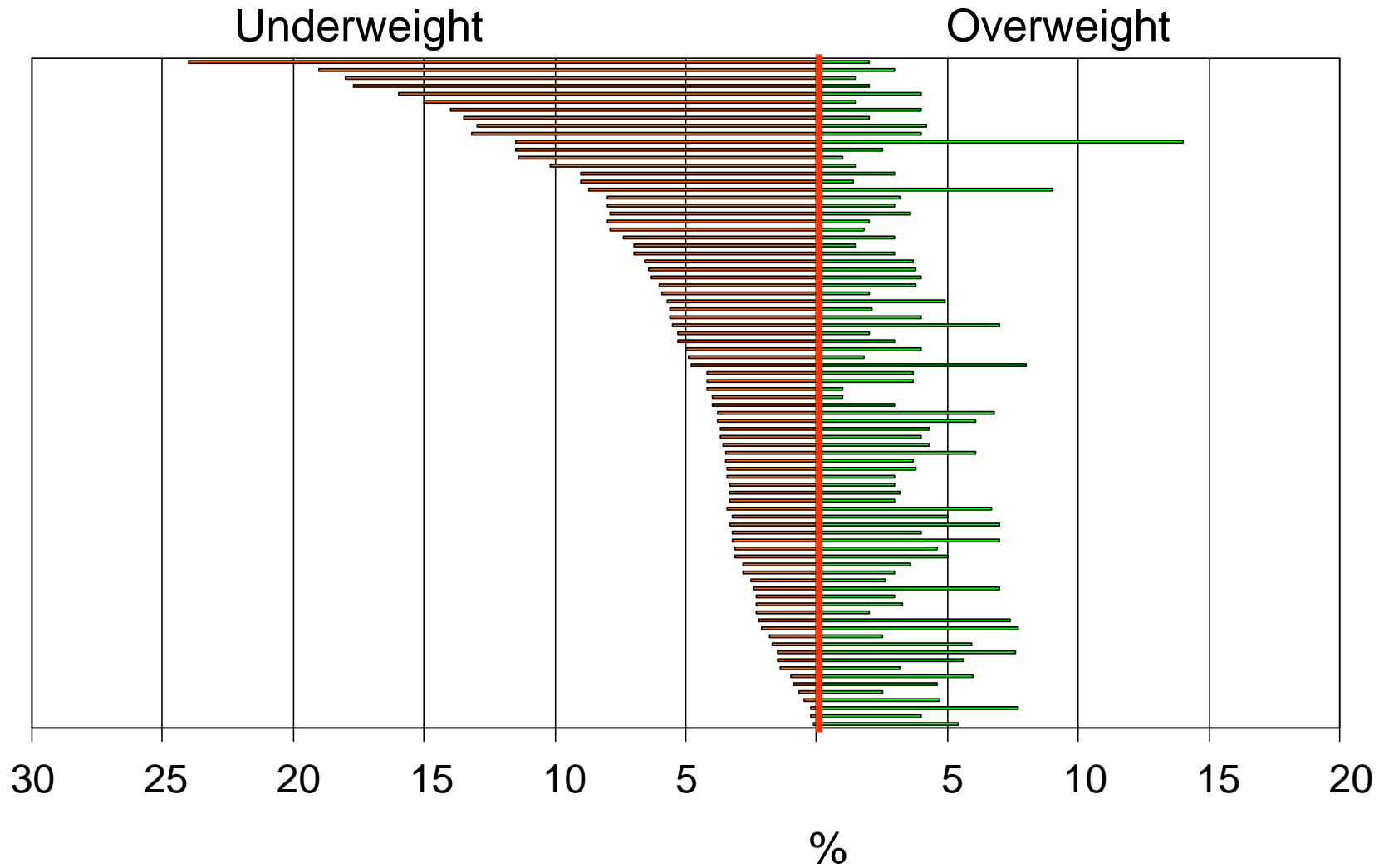
Contrasts

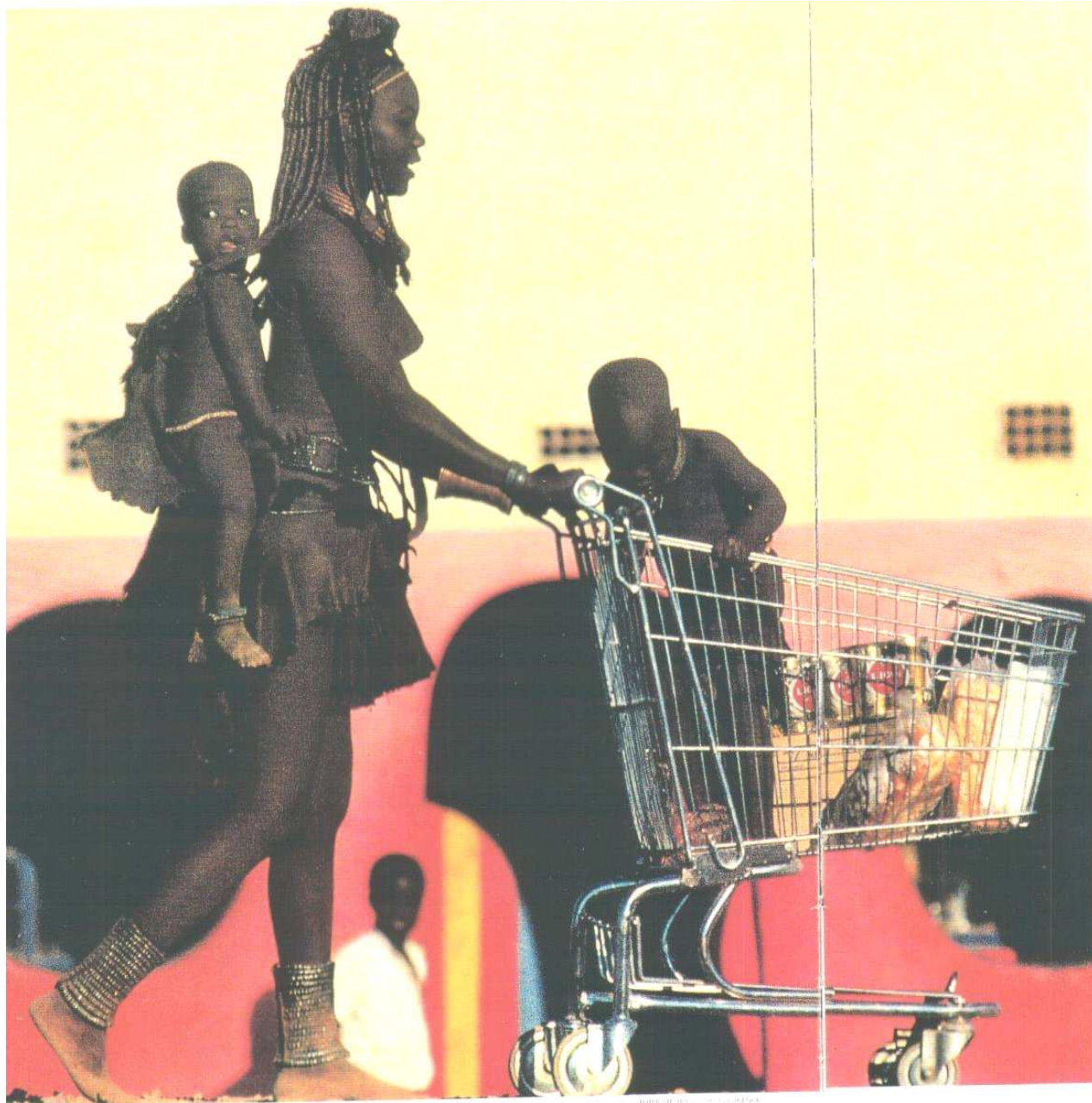
n of underweight children	180 million
n of obese adults	300 million
n of overweight adults	1.1 Billion

World distribution of 10 million/year child deaths (●=5000 deaths)



Under- and overweight, 0-5 yr/old children







The Nutrition Transition

Diet and Disease in the Developing World



Benjamin Caballero
Barry M. Popkin
EDITORS



Food Science and Technology, International Series



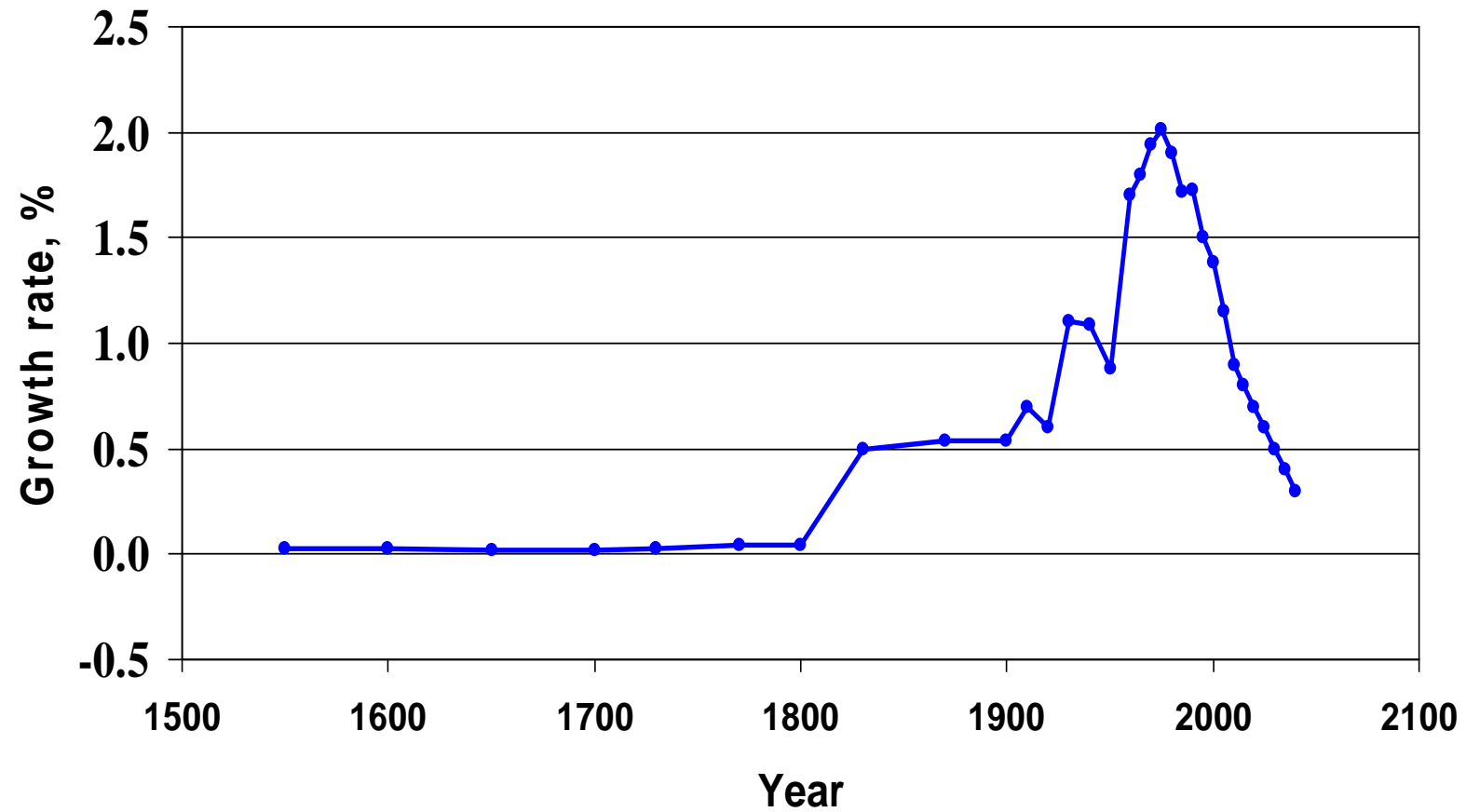
La transición nutricional

- Cambios demográficos
- Disponibilidad y costo de alimentos
- Estilos de vida (actividad física)

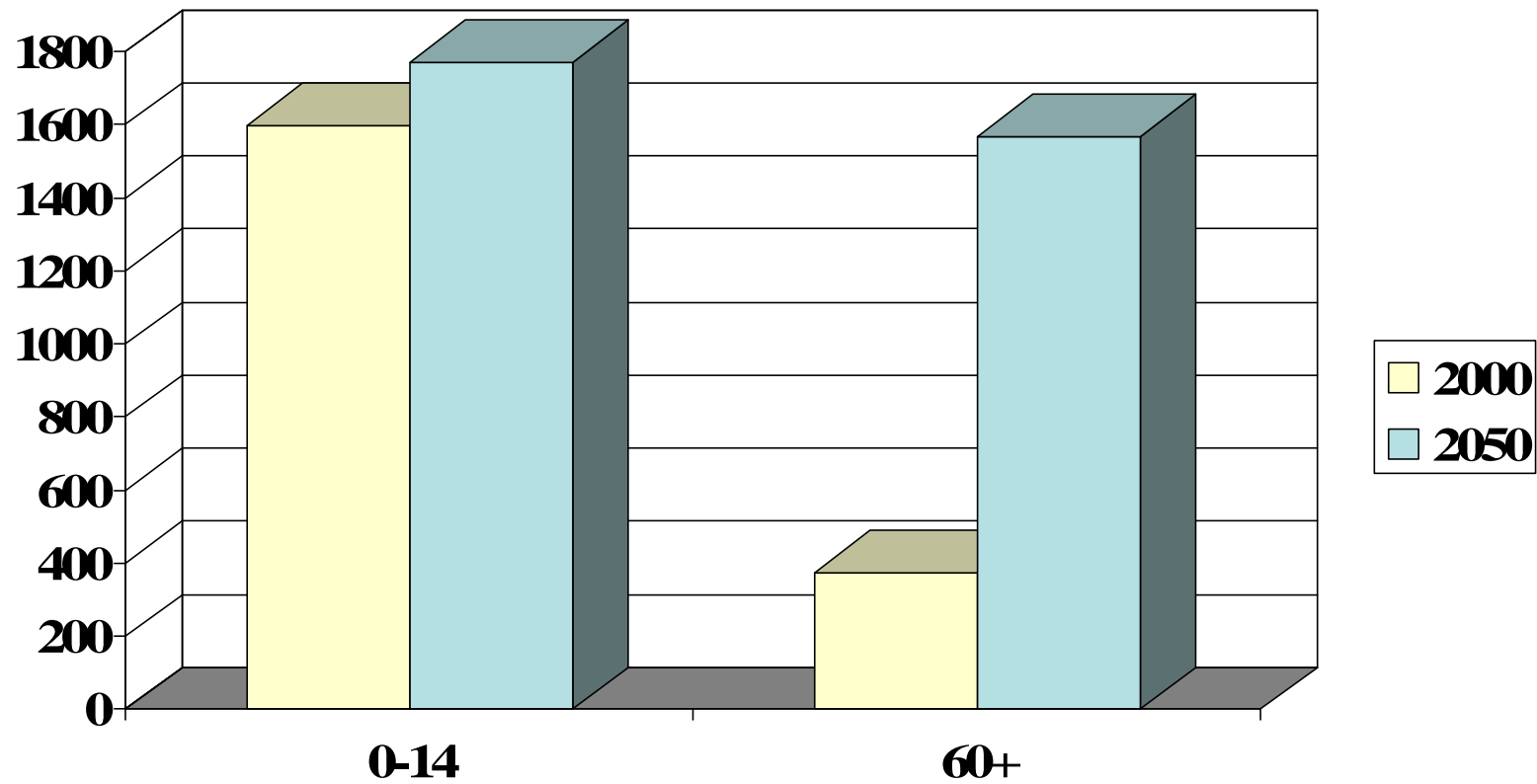
Tendencias demográficas

- ✦ Urbanización
- ✦ Cambios en el perfil poblacional
- ✦ Aumento en la expectativa de vida
- ✦ Reducción en mortalidad infantil

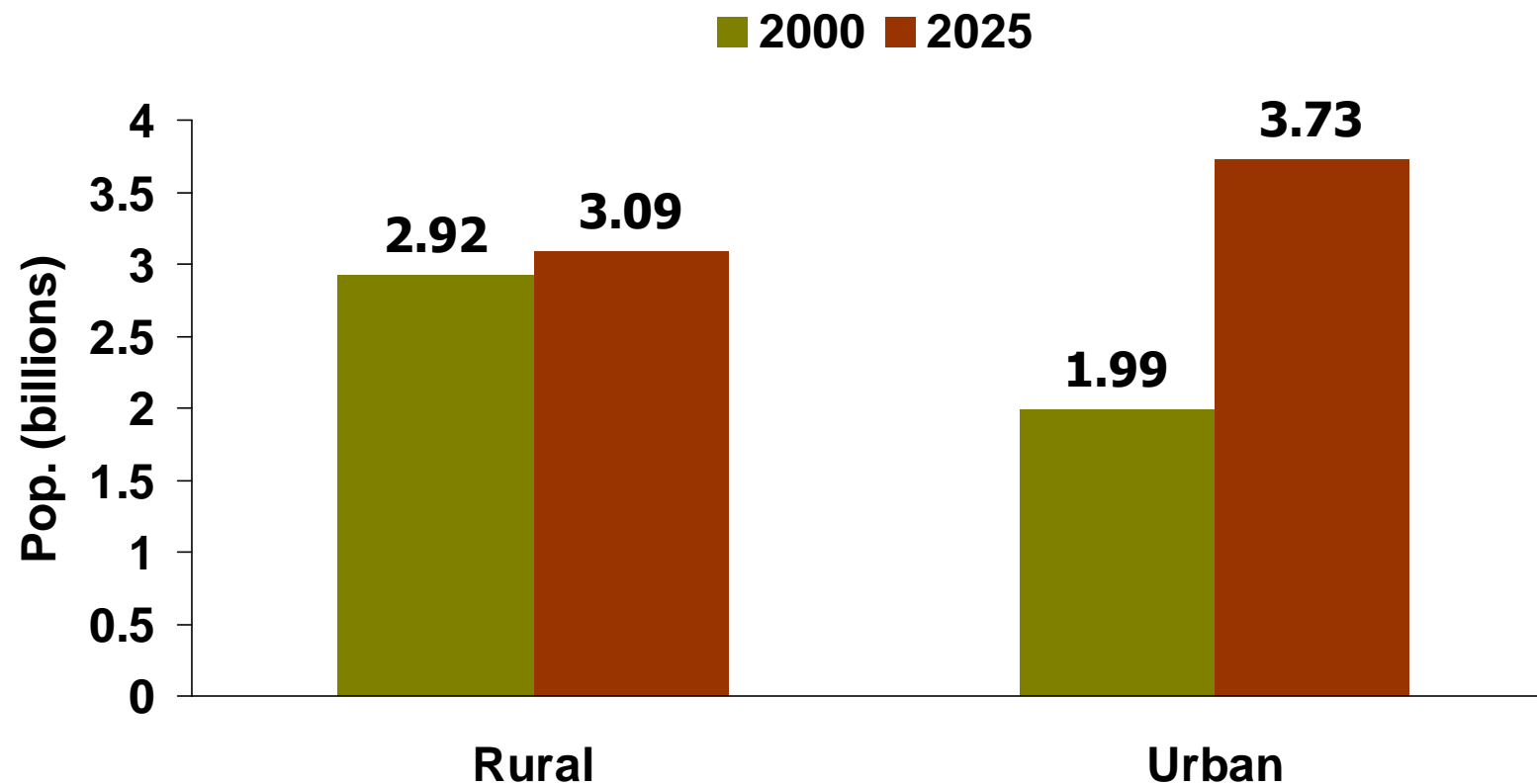
World population growth, 1500-2100



Shifts in population age

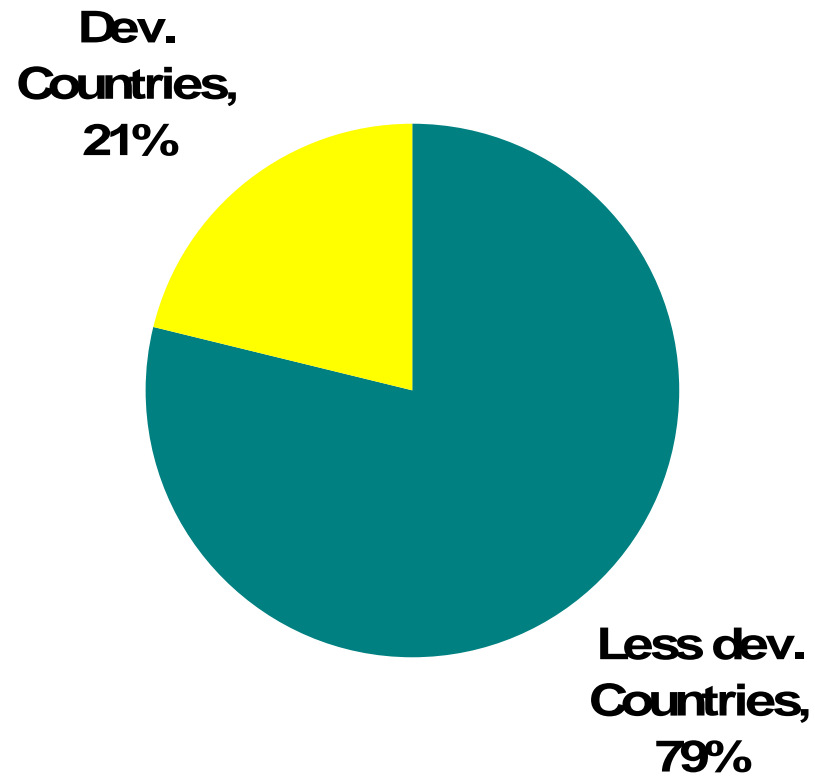


Projected population growth in the developing world, 2000 - 2025

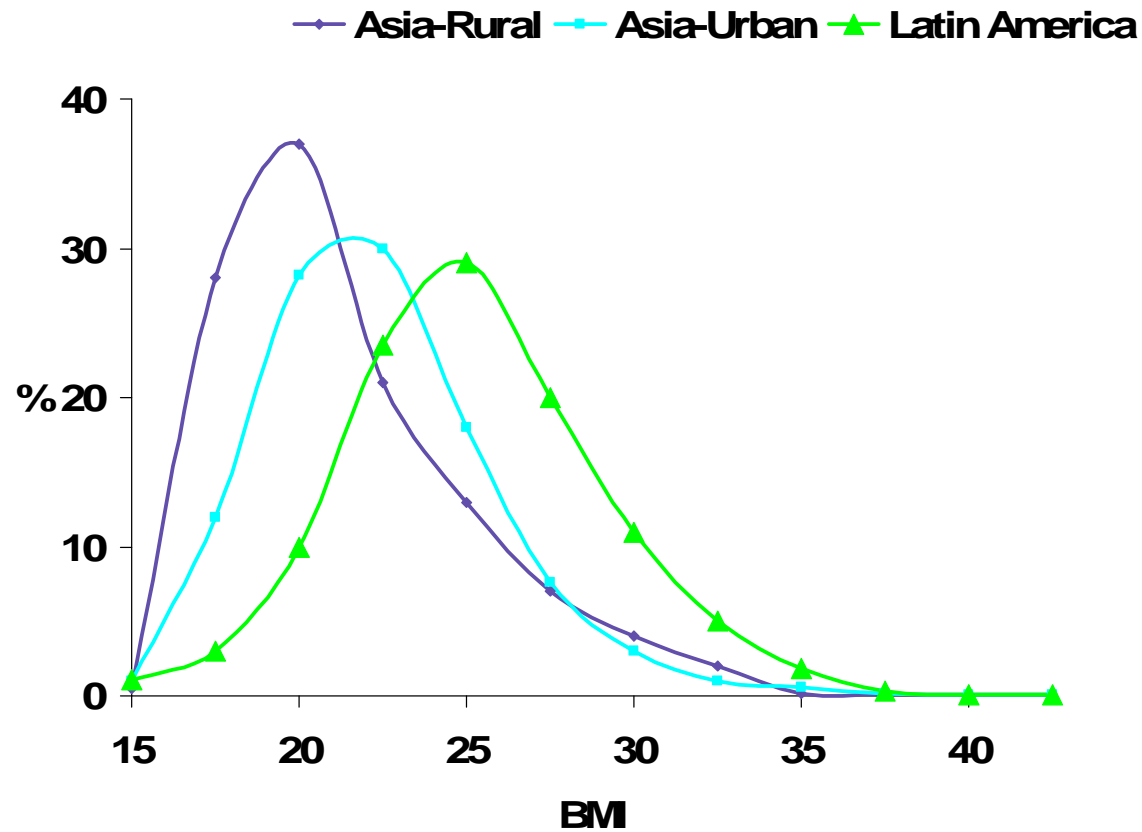


United Nations, 1998

Distribution of urban population, 2030



Urbanization and body mass index

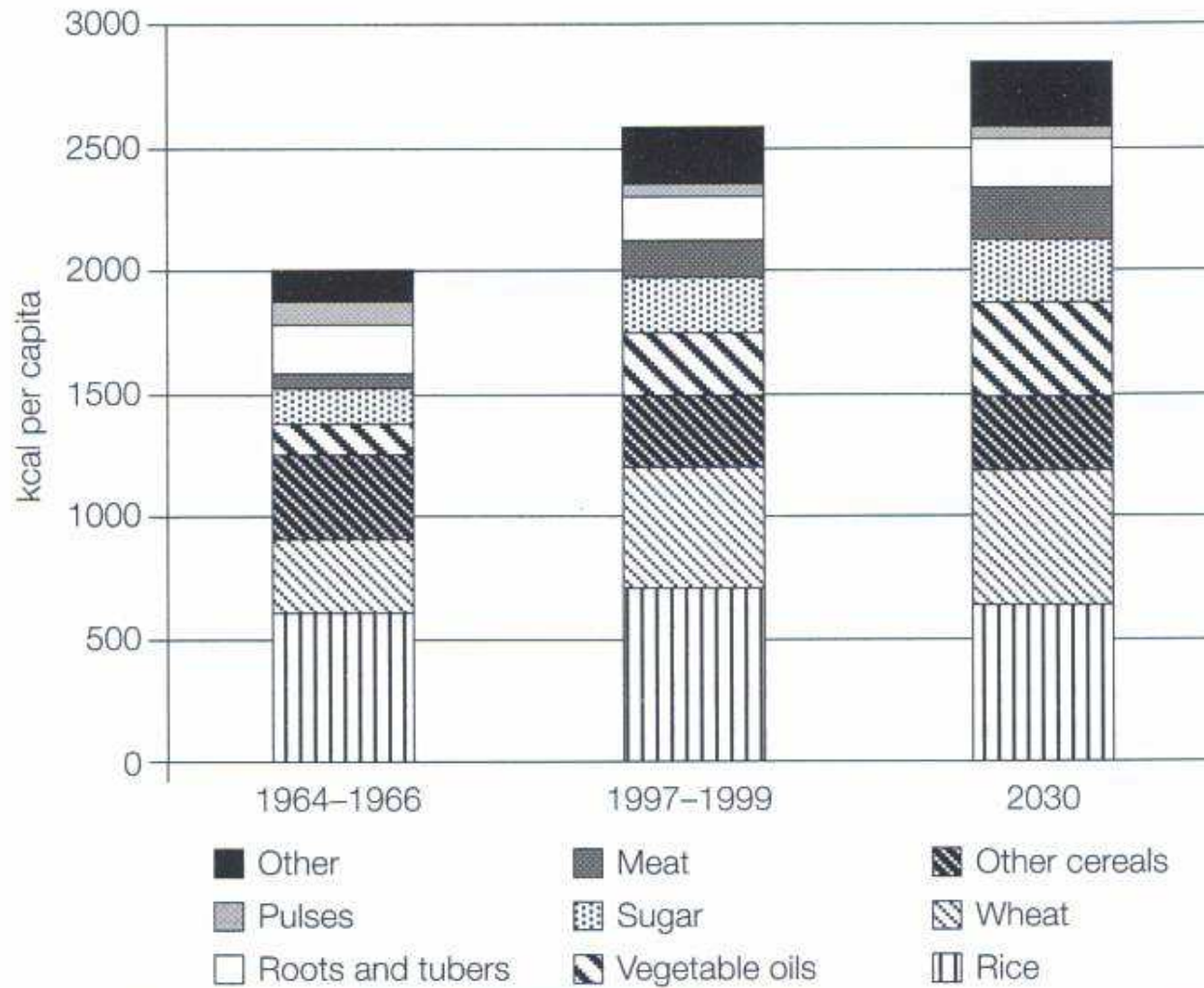


INCLLEN, 1996

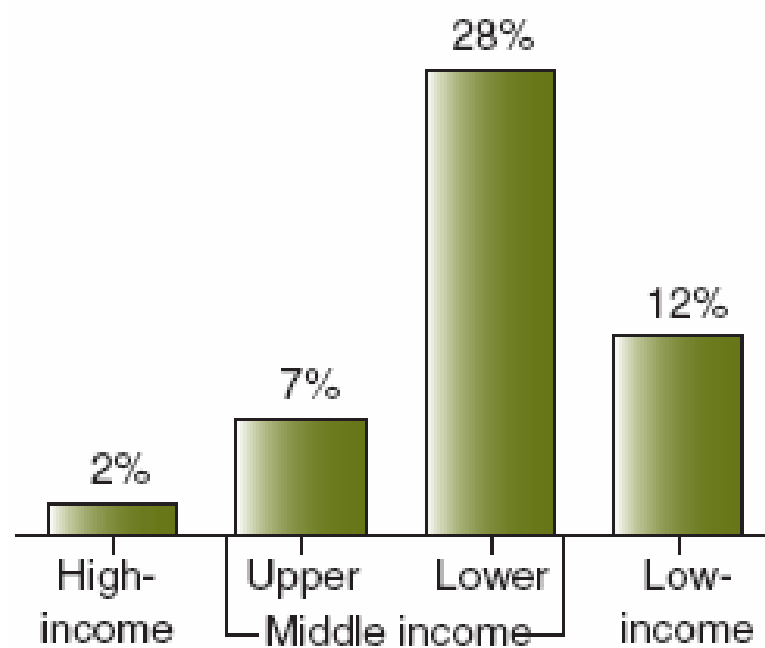
Cambios en dieta

- ✦ Tipo, disponibilidad y costo de alimentos
- ✦ Patrones de consumo

Food commodities – Global trends

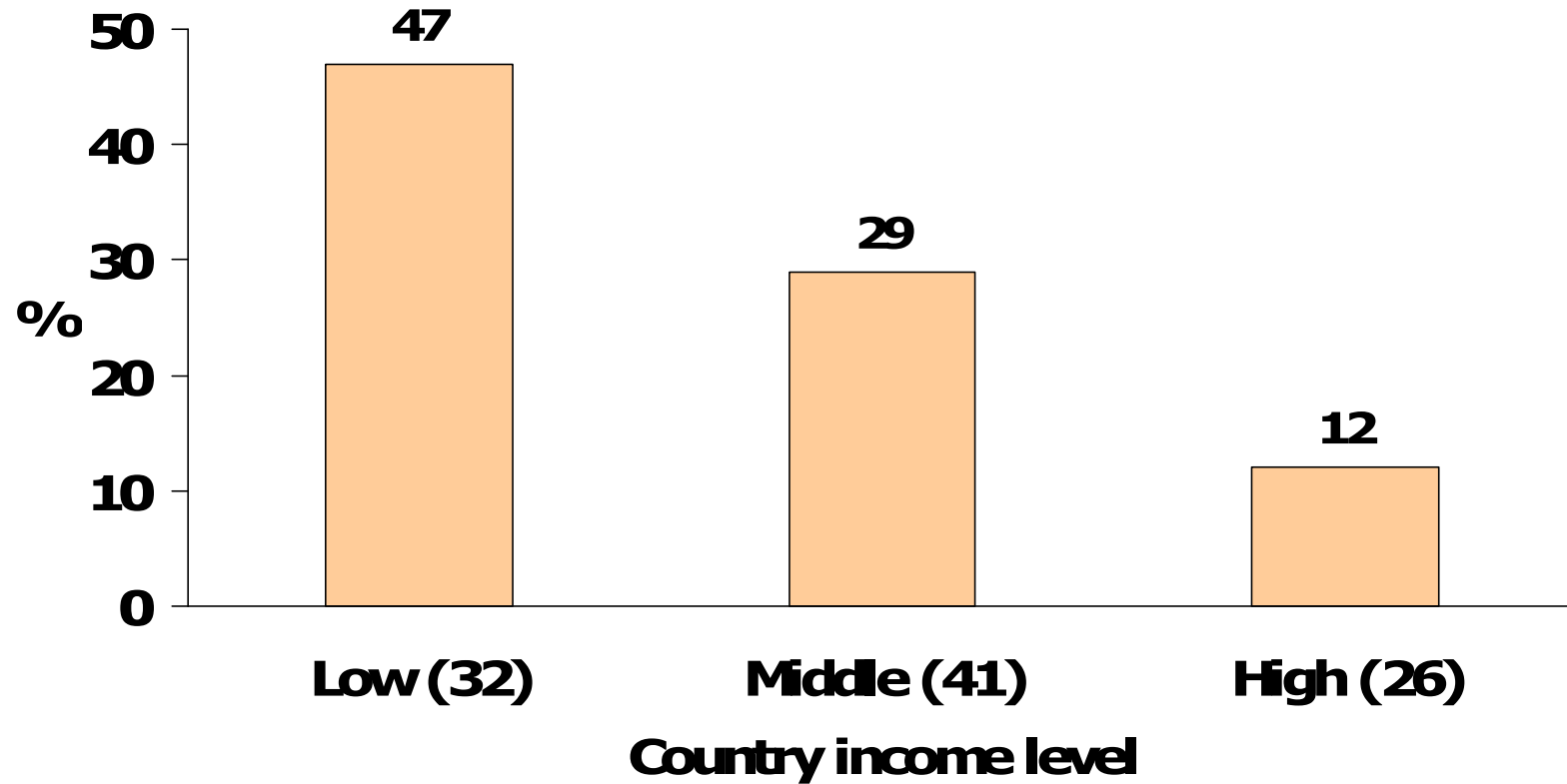


Growth in processed food market by GNI 1996-2002



USDA ERS-Euromonitor, 2003 – World Bank country classification

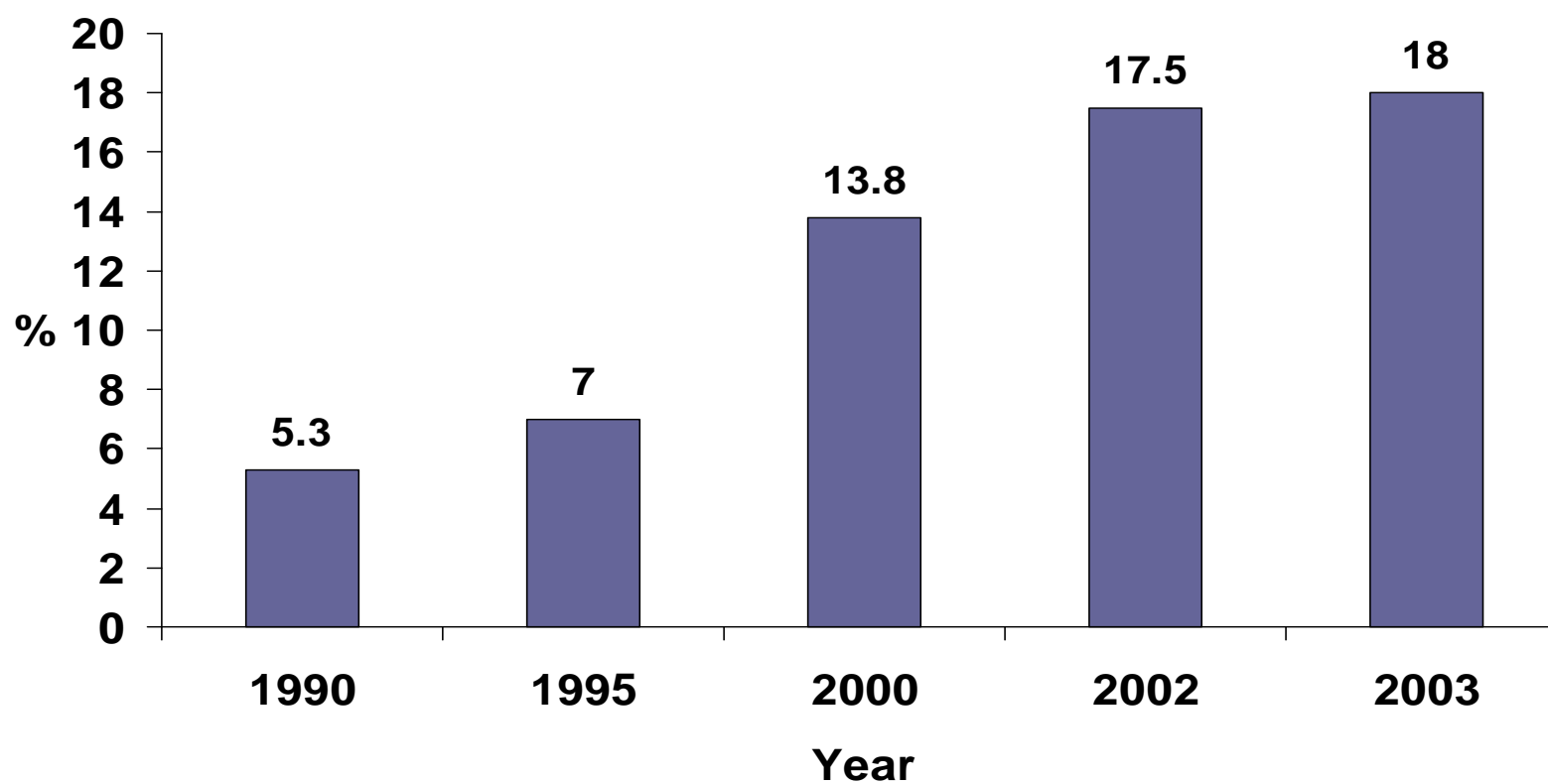
Food cost: household budget share



L=<15%, M=15-50%, H=>50% of U.S. median

USDA ERS WRS-01-1

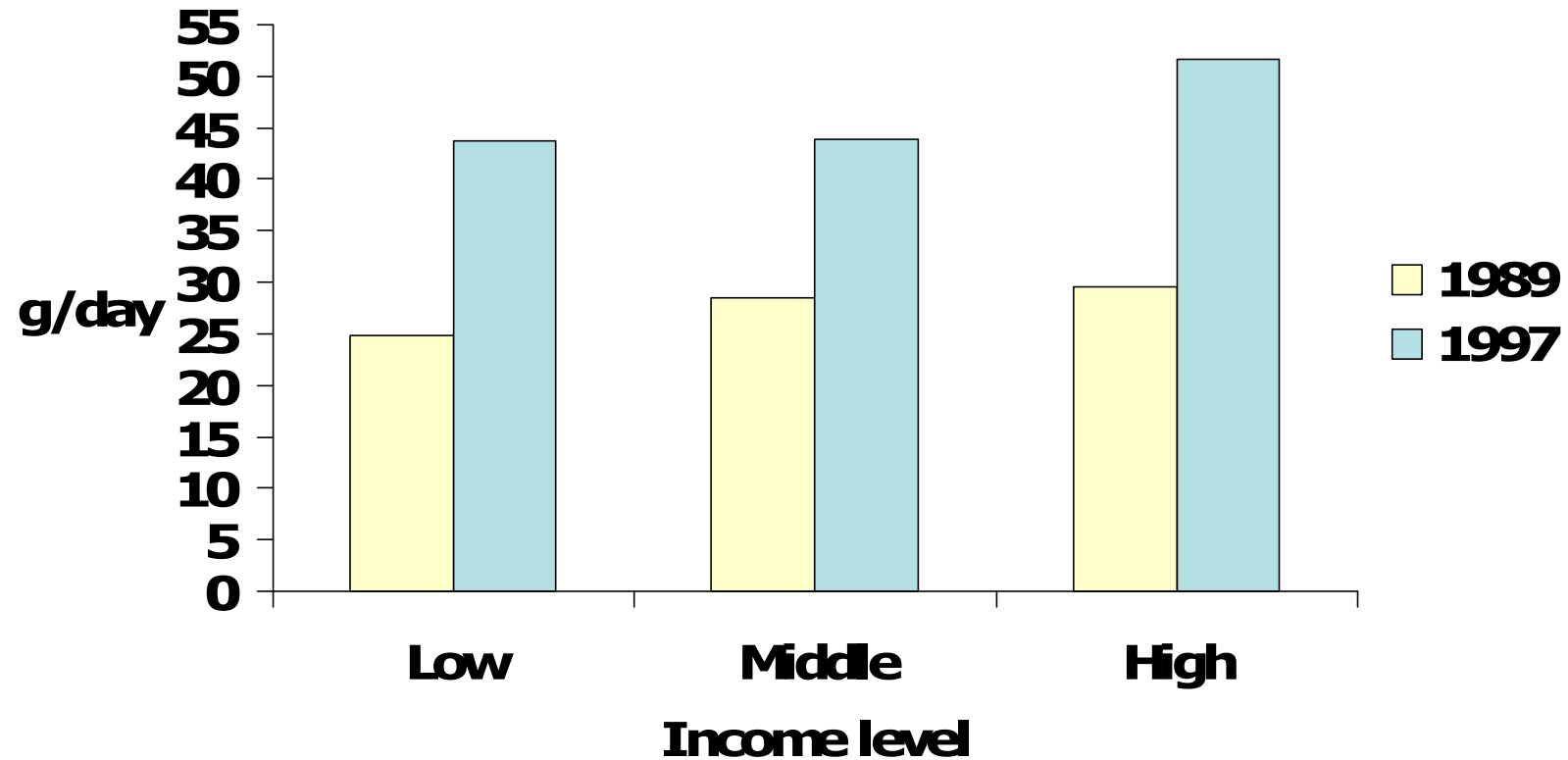
Expenditure in food away from home in rural China as % of food budget



China National Bureau of Statistics

China: dietary trends

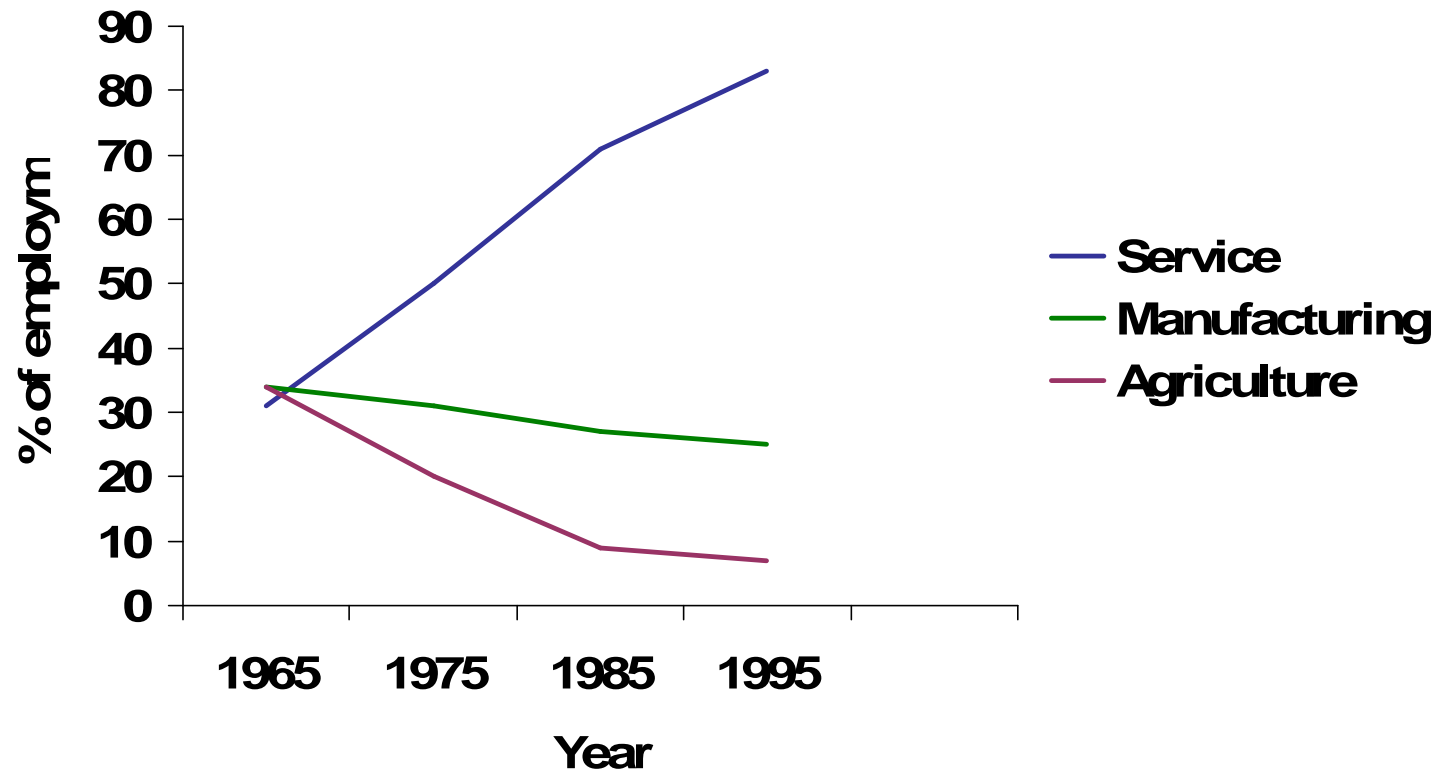
Consumption of edible oils



Estilos de vida

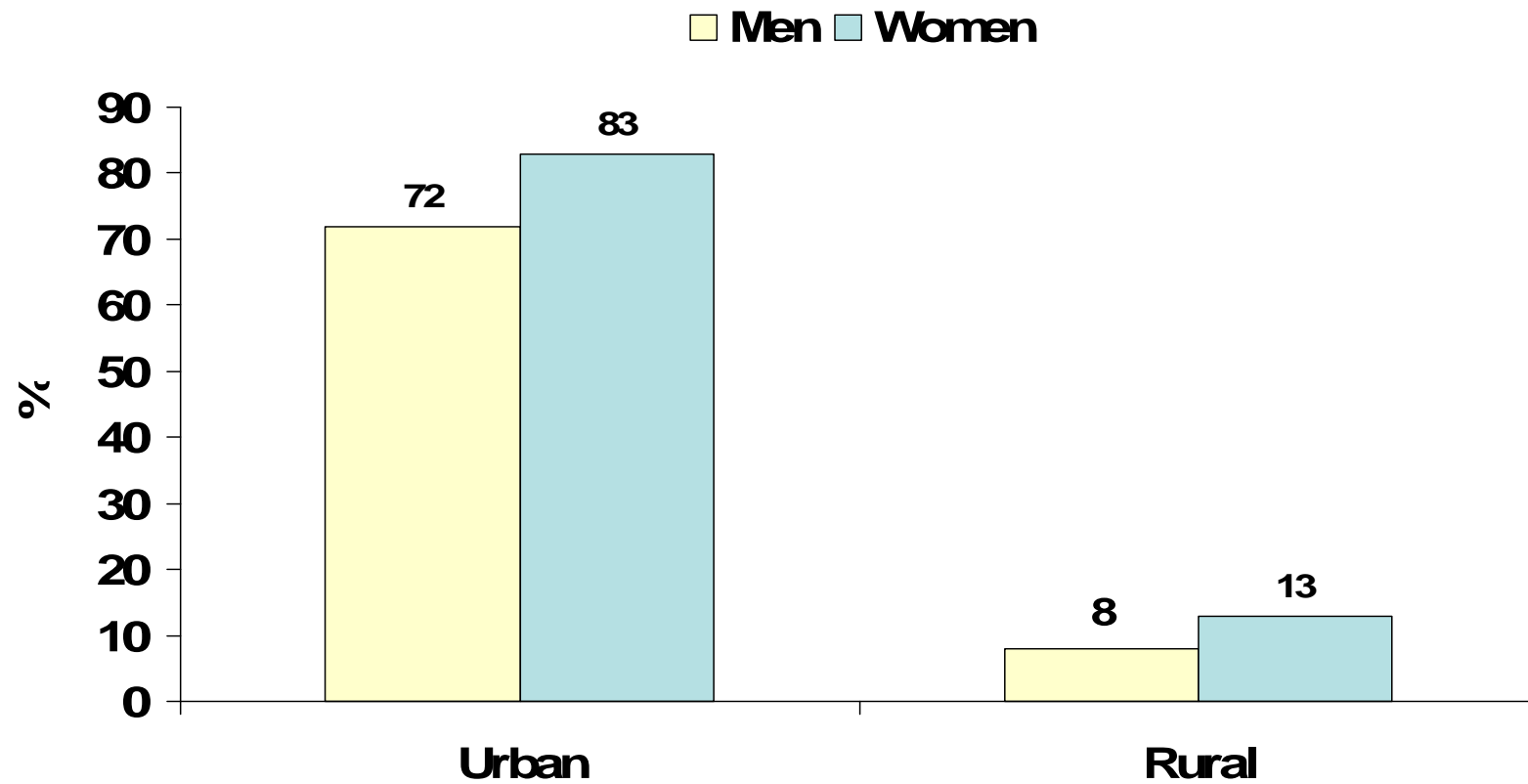
- ⊕ Menor gasto energético en el trabajo
- ⊕ Menor demanda energética para actividades básicas de subsistencia
- ⊕ Poca actividad física recreativa
- ⊕ Televisión

Trends in employment type in South Asian transitional countries



Popkin et al, 1998

The nutrition transition in China: Prevalence of sedentary occupational activity



In New York Tickets, Ghana Sees Orderly City

By ROBERT F. WORTH

If you are caught playing your radio too loudly in Times Square, selling ice cream while parked in a Harlem crosswalk or dumping your kitchen trash in Prospect Park, your ticket does not just go to City Hall to be processed.

It goes to Ghana.

Just days after the tickets are written out on New York City streets, they are scanned and sent as digital photographs to computers in a small office in downtown Accra, Ghana's hot and crowded capital.

There, workers try to make out the unfamiliar street names (Dyckman, Flatbush, Hudson) while transcribing the handwritten scrawl of New York police officers into searchable databases.

sparkling clean. Why else would people be given tickets for not cleaning up after their dogs? "I know that New York is beautiful: the streets, the flowers, and the people too," said Susuana Okine, 28, whose only ties to the city are the maps she consults daily at work. "I can also testify that it must smell better than Accra."

Ms. Okine and her 40-odd co-workers spend their days typing out the contents of the city's environmental violation tickets for their employer, Data Management Internationale, a Delaware-based firm that has been

digitizing information for New York City since March. Before that, the work was done in India and Mexico for a Michigan-based company called Lason.

Charles Sturcken, chief of staff for the city's Department of Environmental Protection, which signed a two-year, \$810,000 contract with Data Management, said he had no idea that the work was being done in Ghana. Although many United States corporations and some other cities

Continued on Page A17

INSIDE

Superfund Money Restored

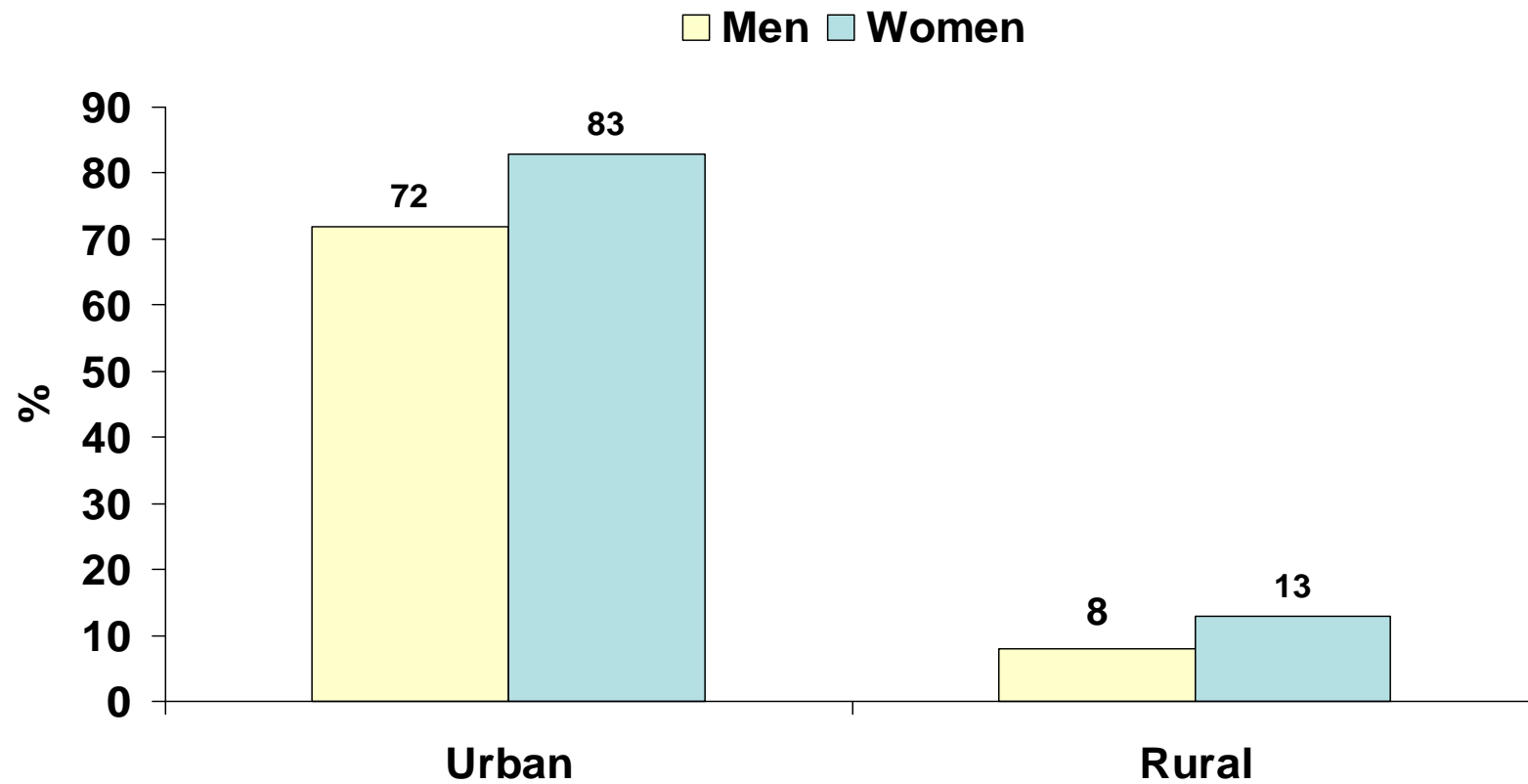
The Environmental Protection Agency has restored money to clean up 11

NEWS SUMMARY

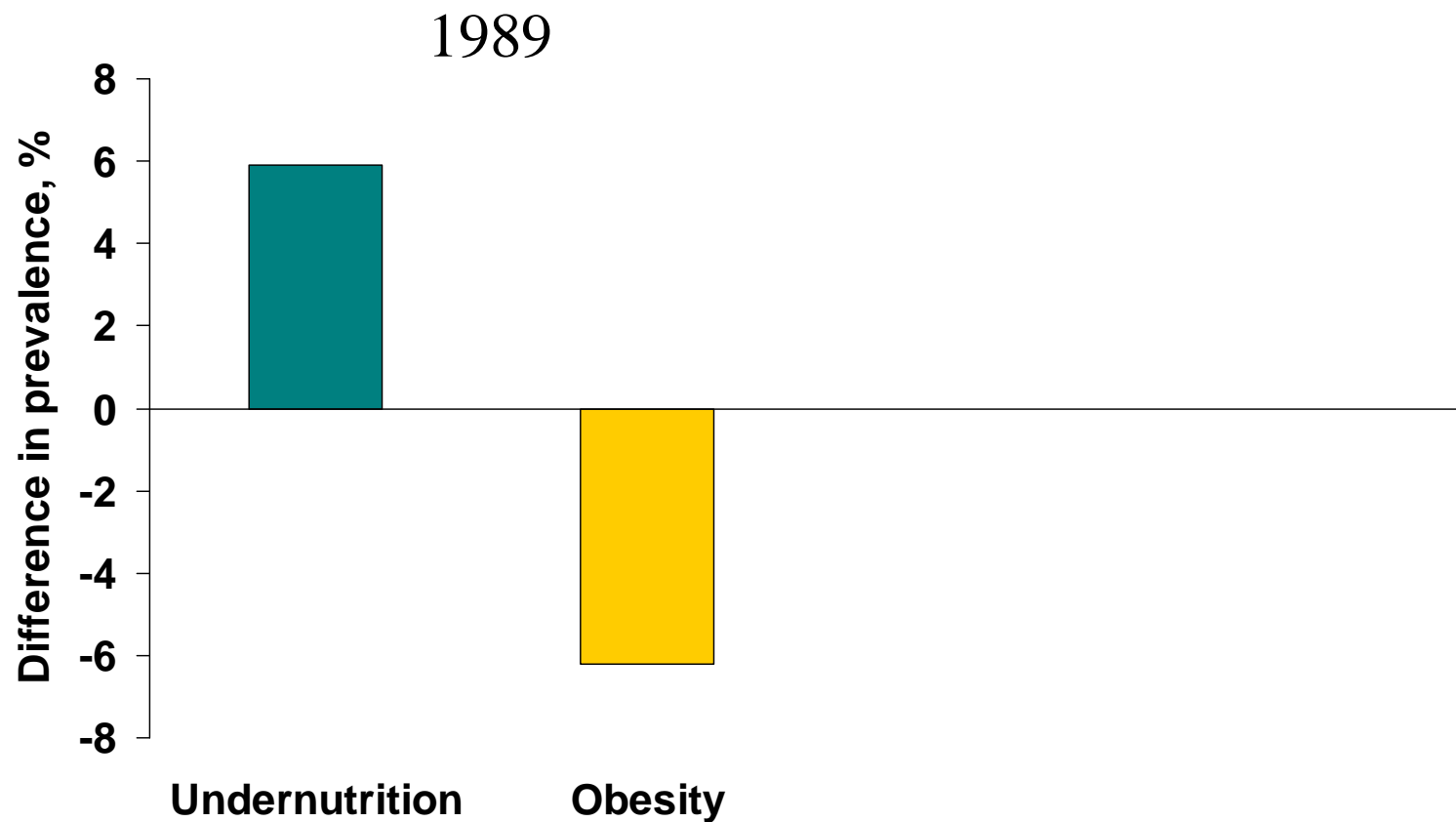
A2

Arts B1-10

The nutrition transition in China: Prevalence of sedentary occupational activity

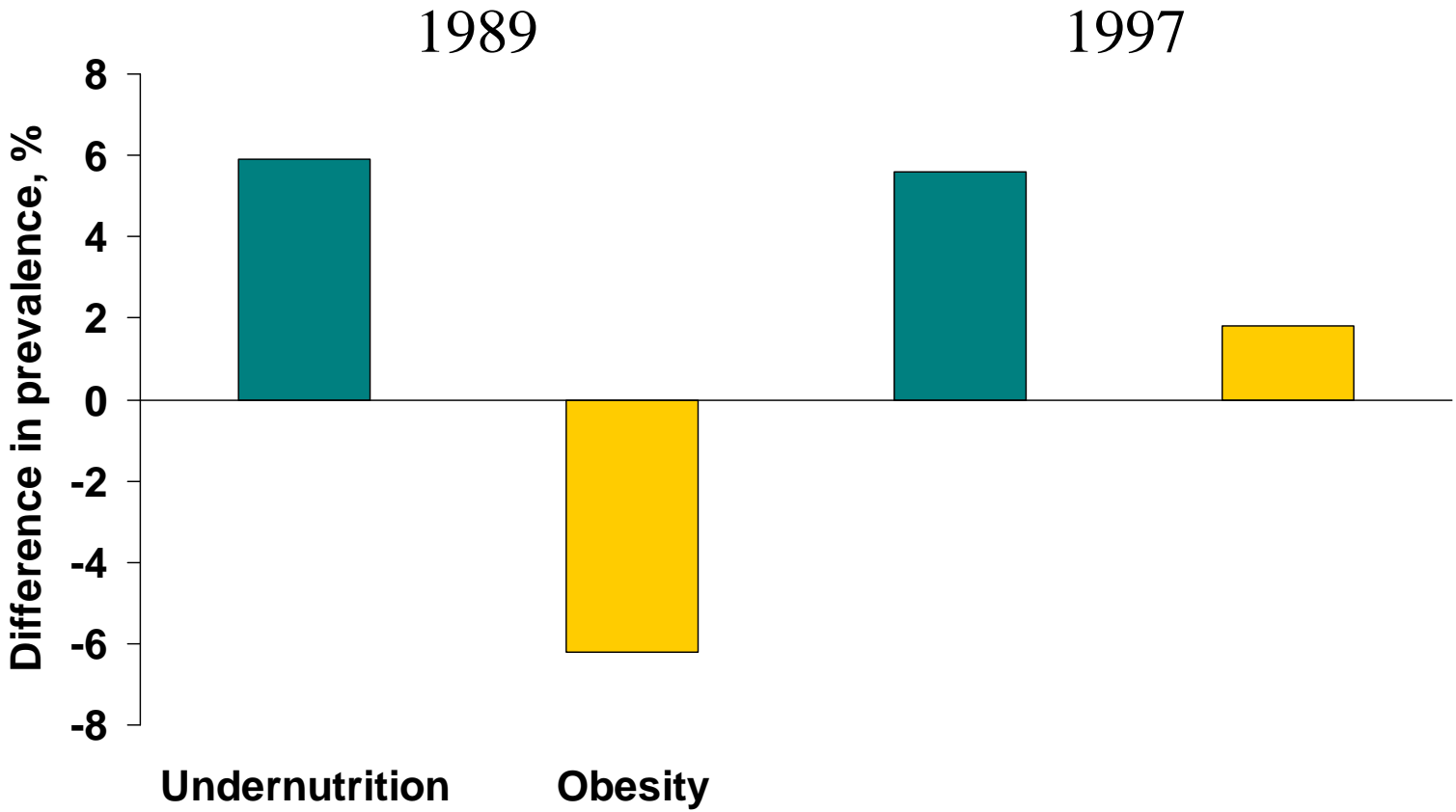


Difference in prevalence of underweight and obesity, low vs. high SES - Brazil

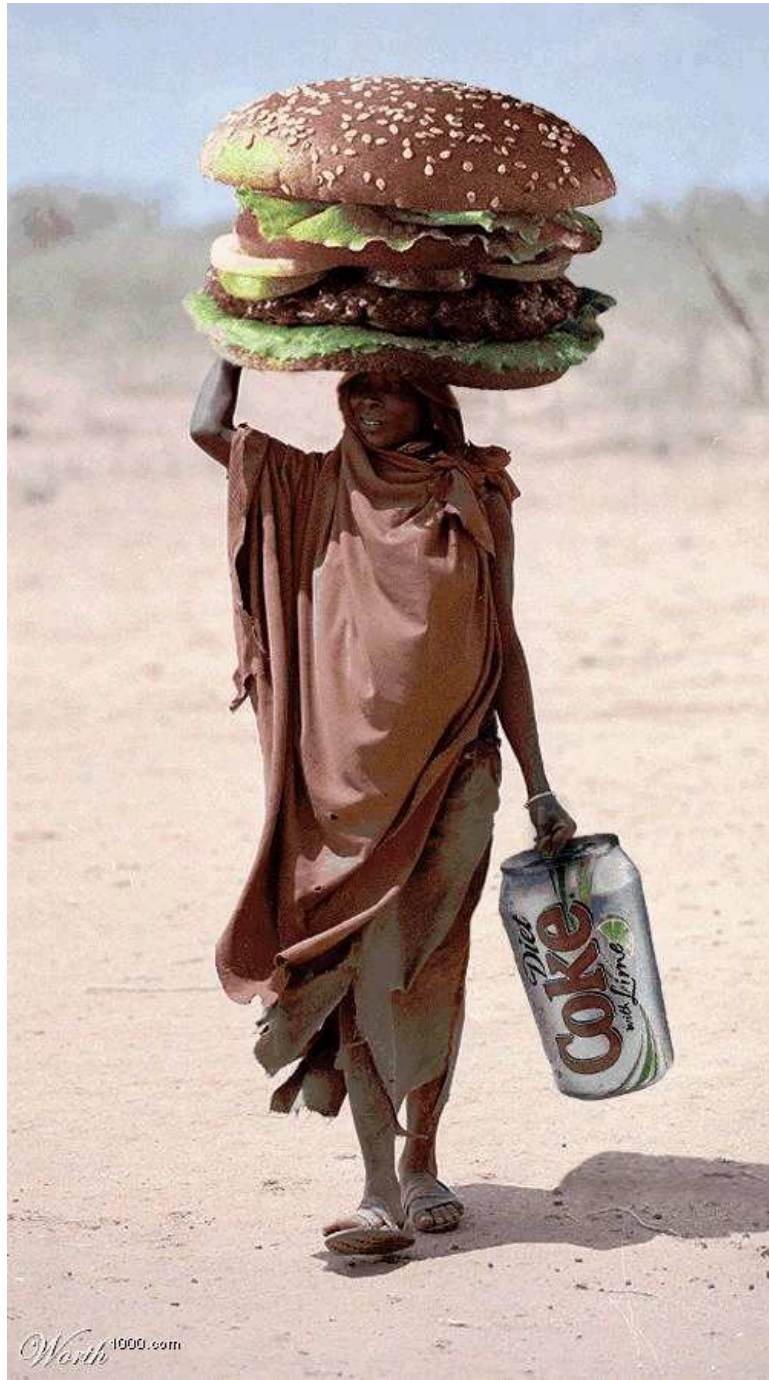


Monteiro, AJPH 2004

Difference in prevalence of underweight and obesity, low vs. high SES - Brazil



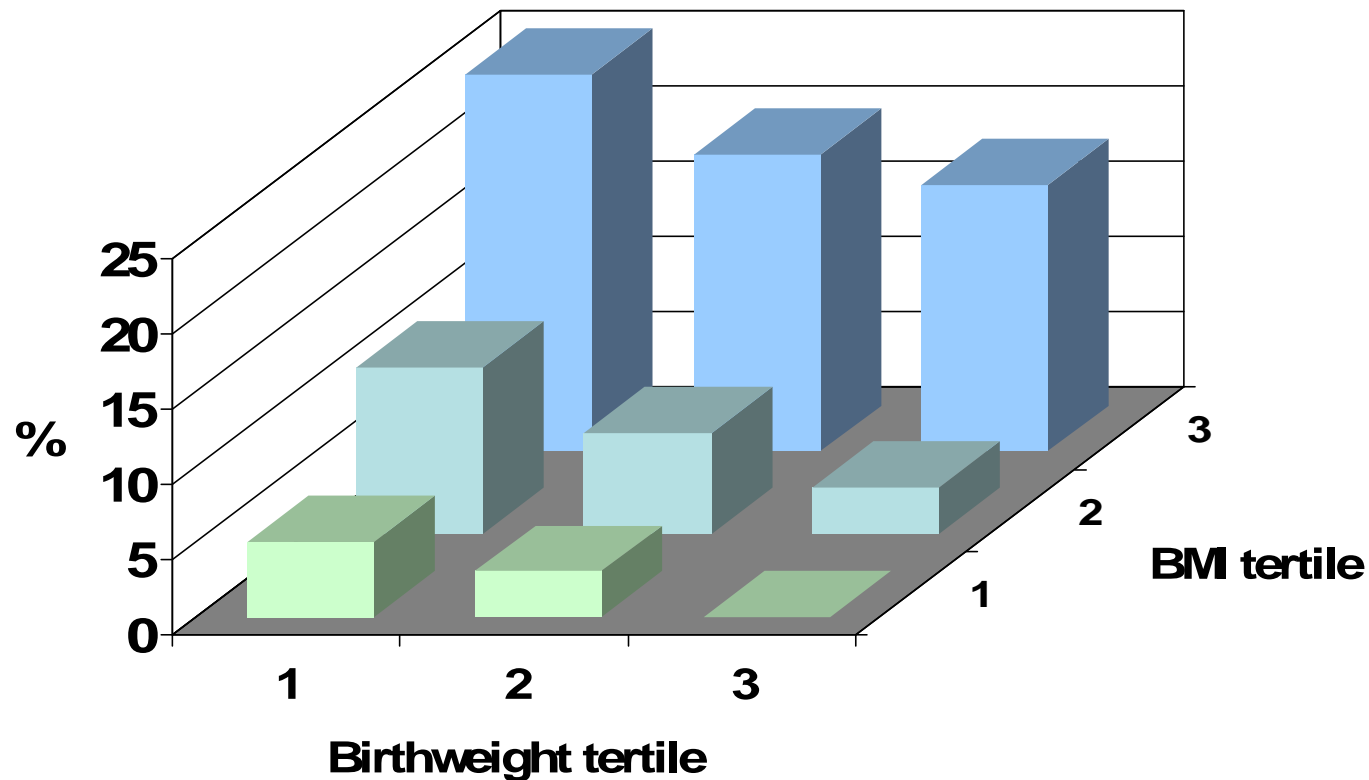
Monteiro, AJPB 2004



Subnutrición en el niño y enfermedad crónica en el adulto

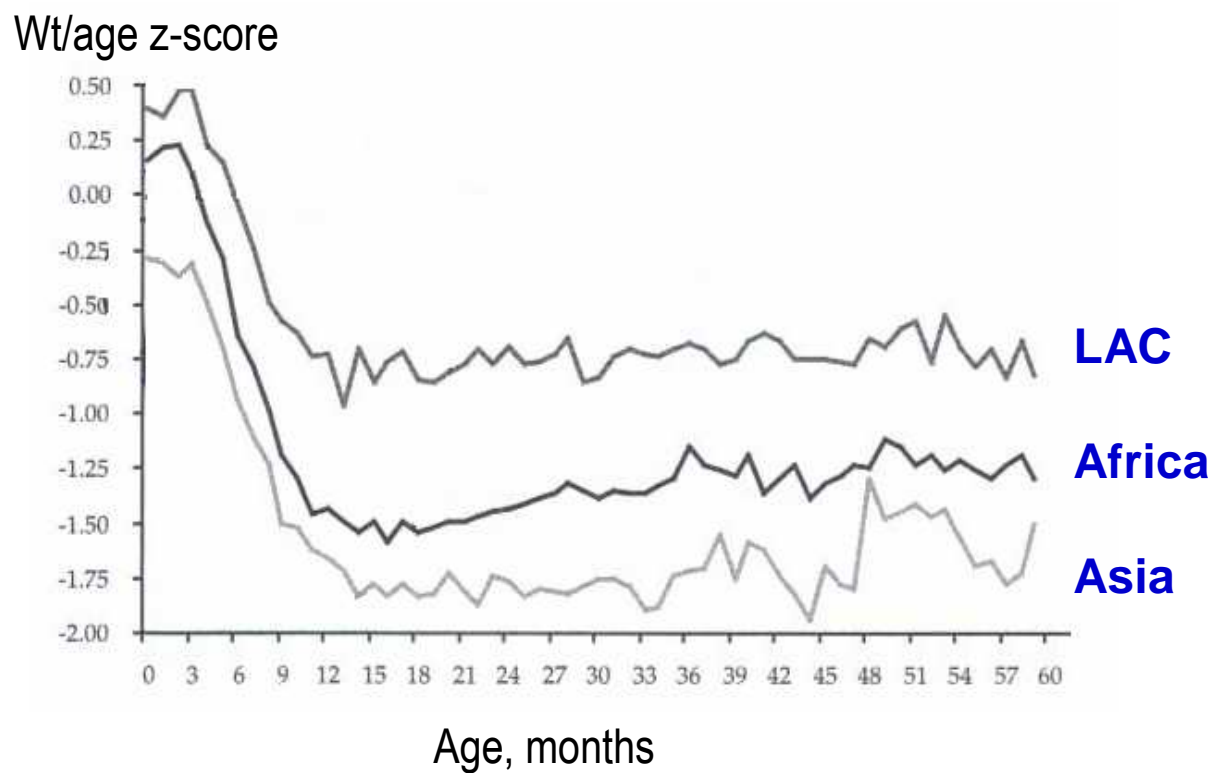
Effects of birthweight and adult BMI on prevalence of the insulin resistance syndrome

The San Antonio Heart Study

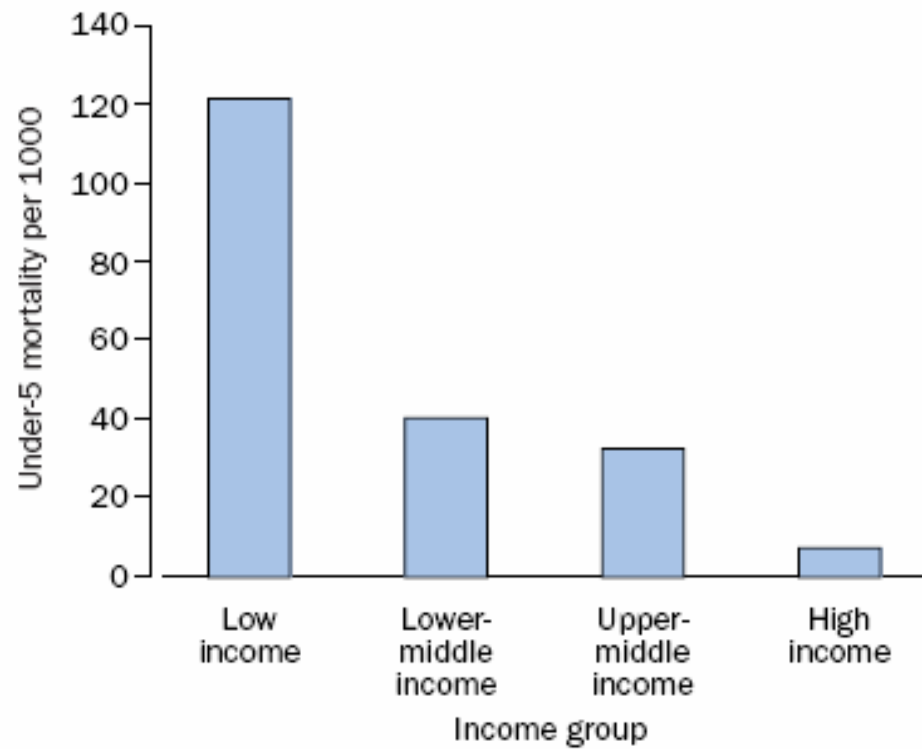


Valdez et al, Diabetologia, 1994

Global trends in weight-for-age

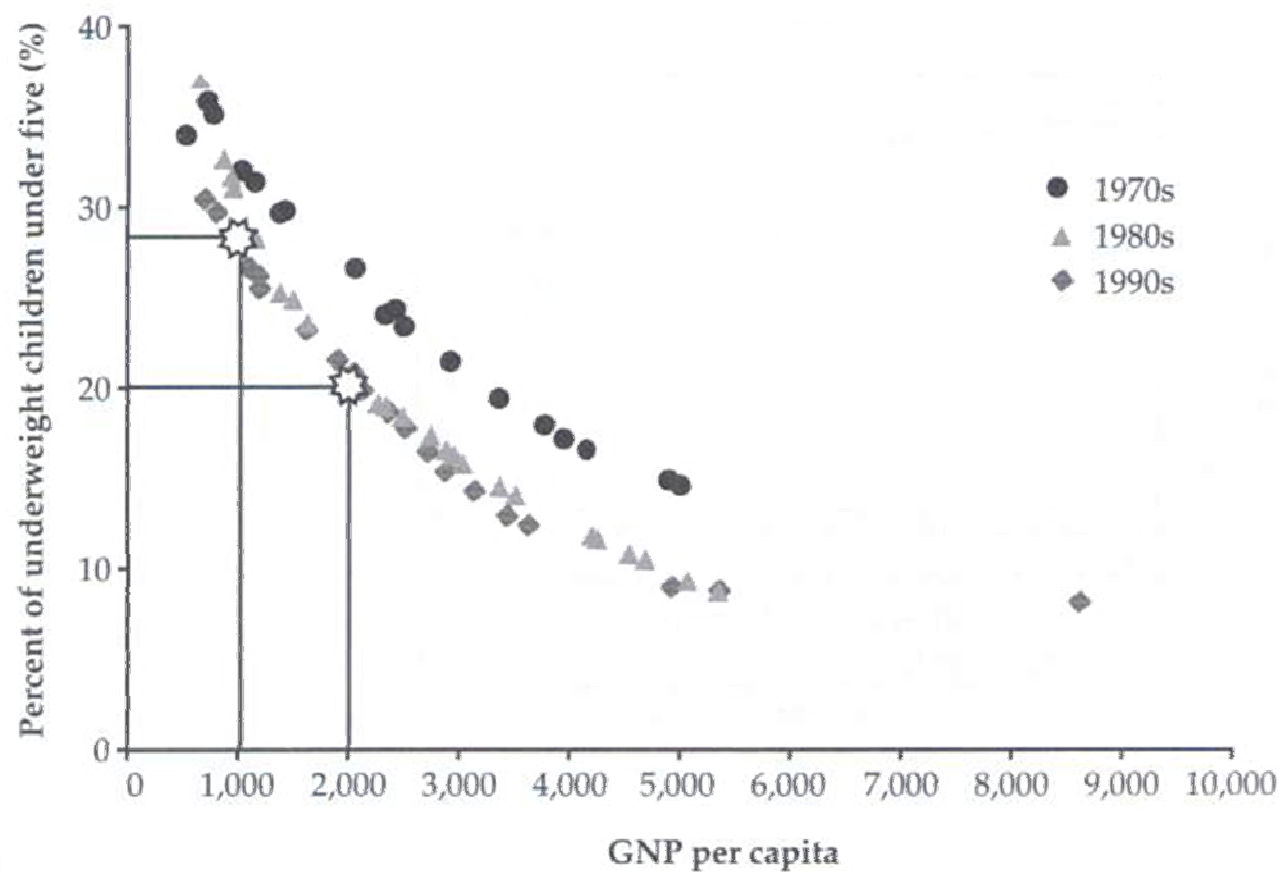


Under-5 mortality by income



Data from UNICEF and World Bank, Victora et al, 2003

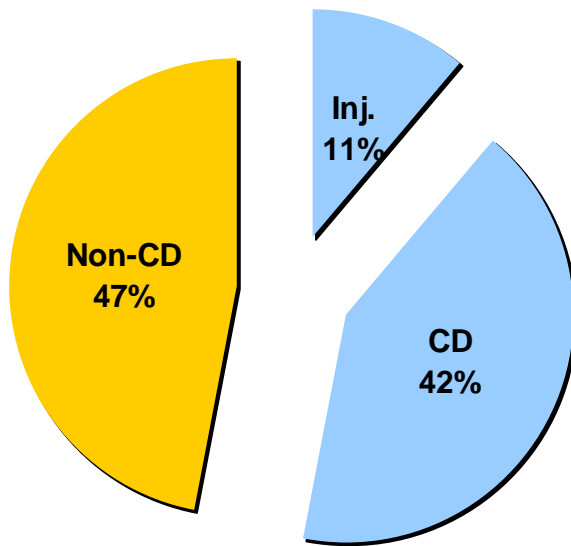
¿Mejora el estado nutricional el desarrollo económico?



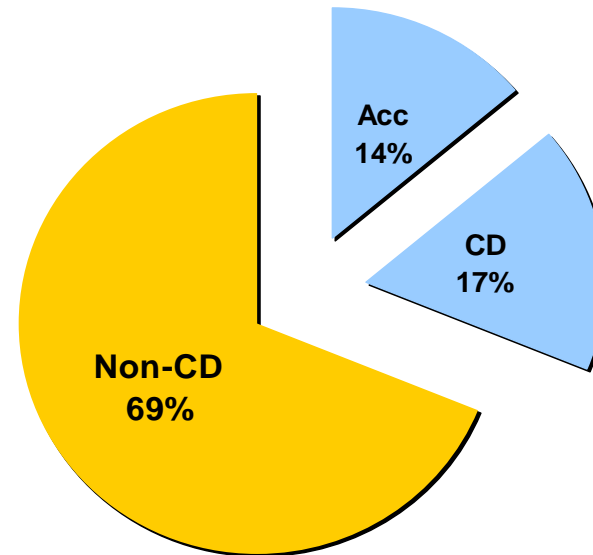
Haddad et al, 2002

Disease burden in the developing world

1990



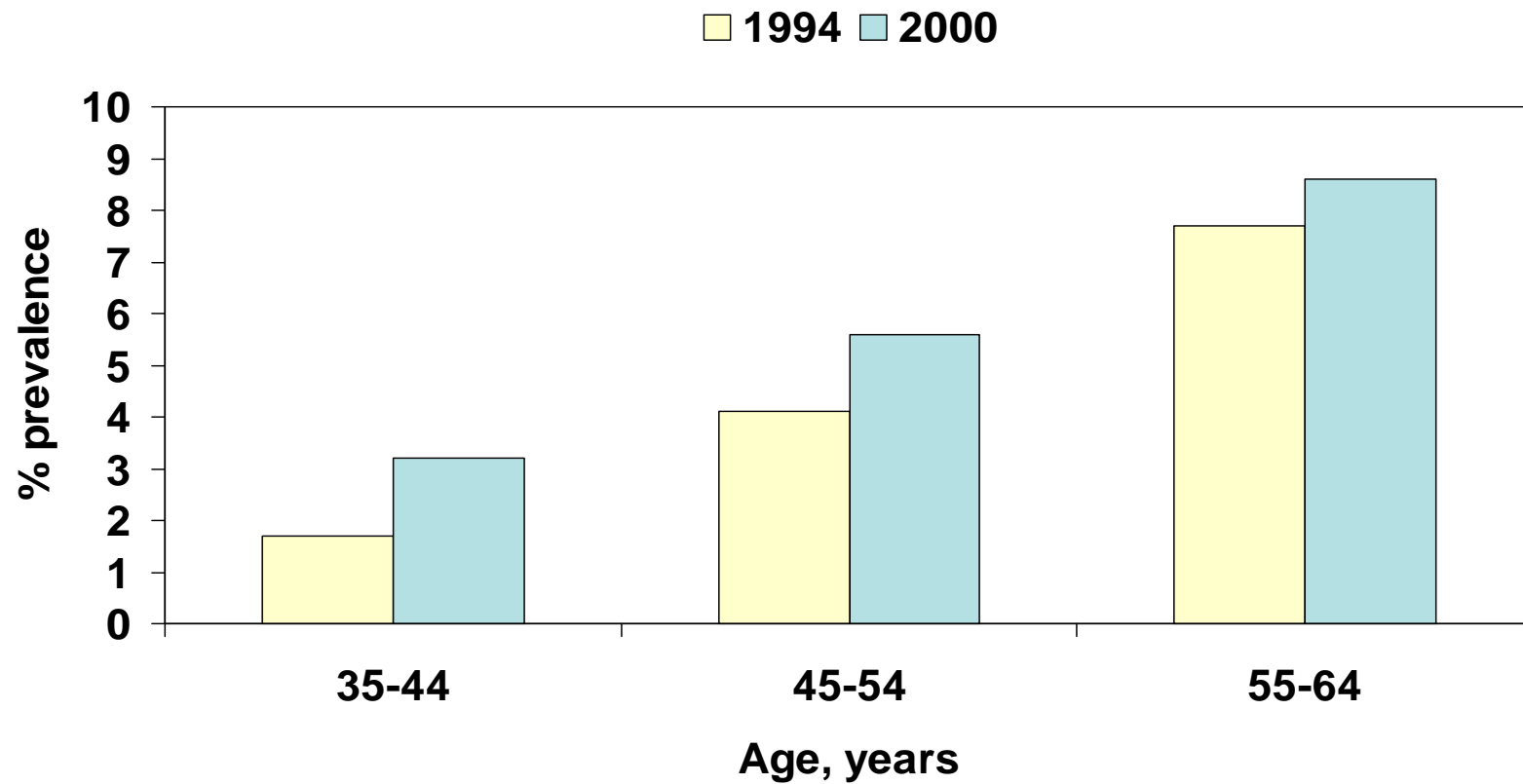
2020



Murray & Lopez, 1996

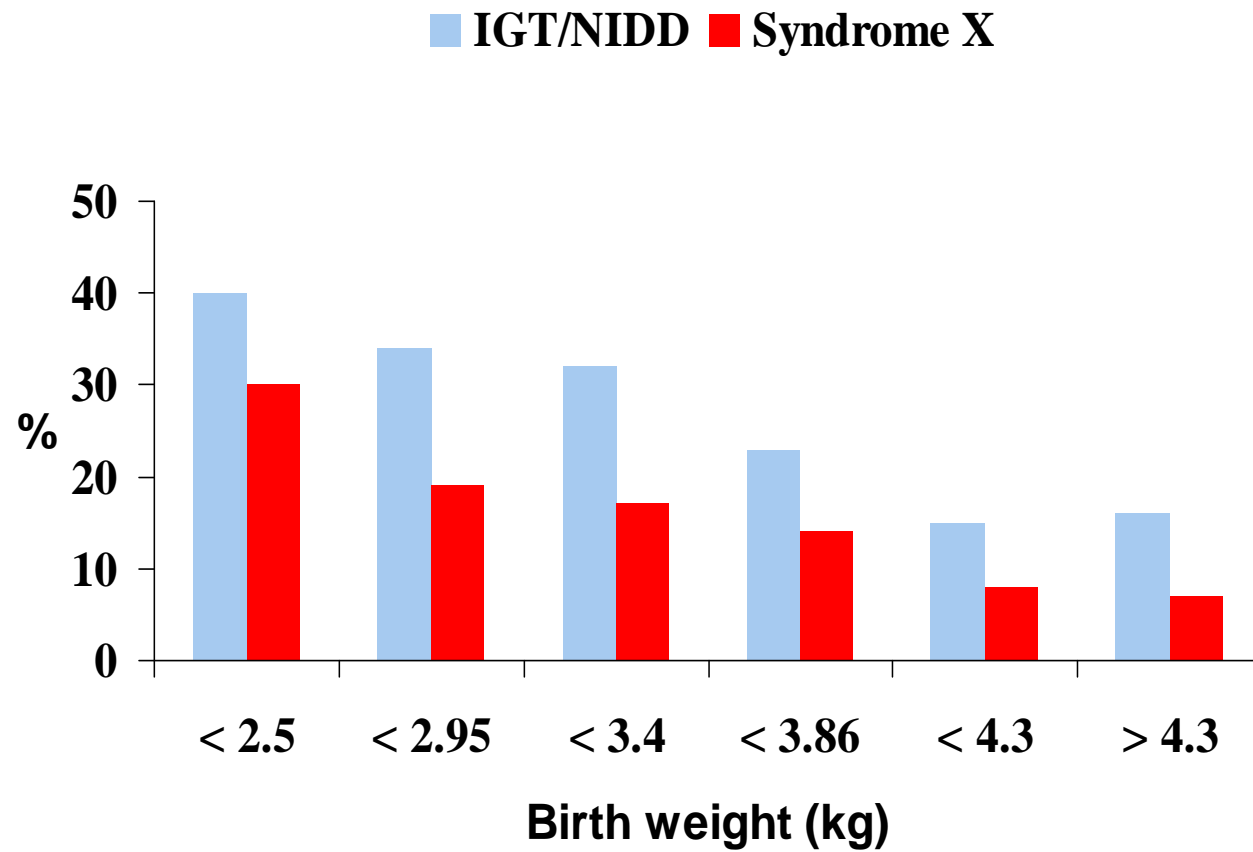
Trends in diabetes in China

Adults



China National Survey, InterAsia Study

Birth weight and risk of diabetes and Syndrome X



Phipps et al, 1993

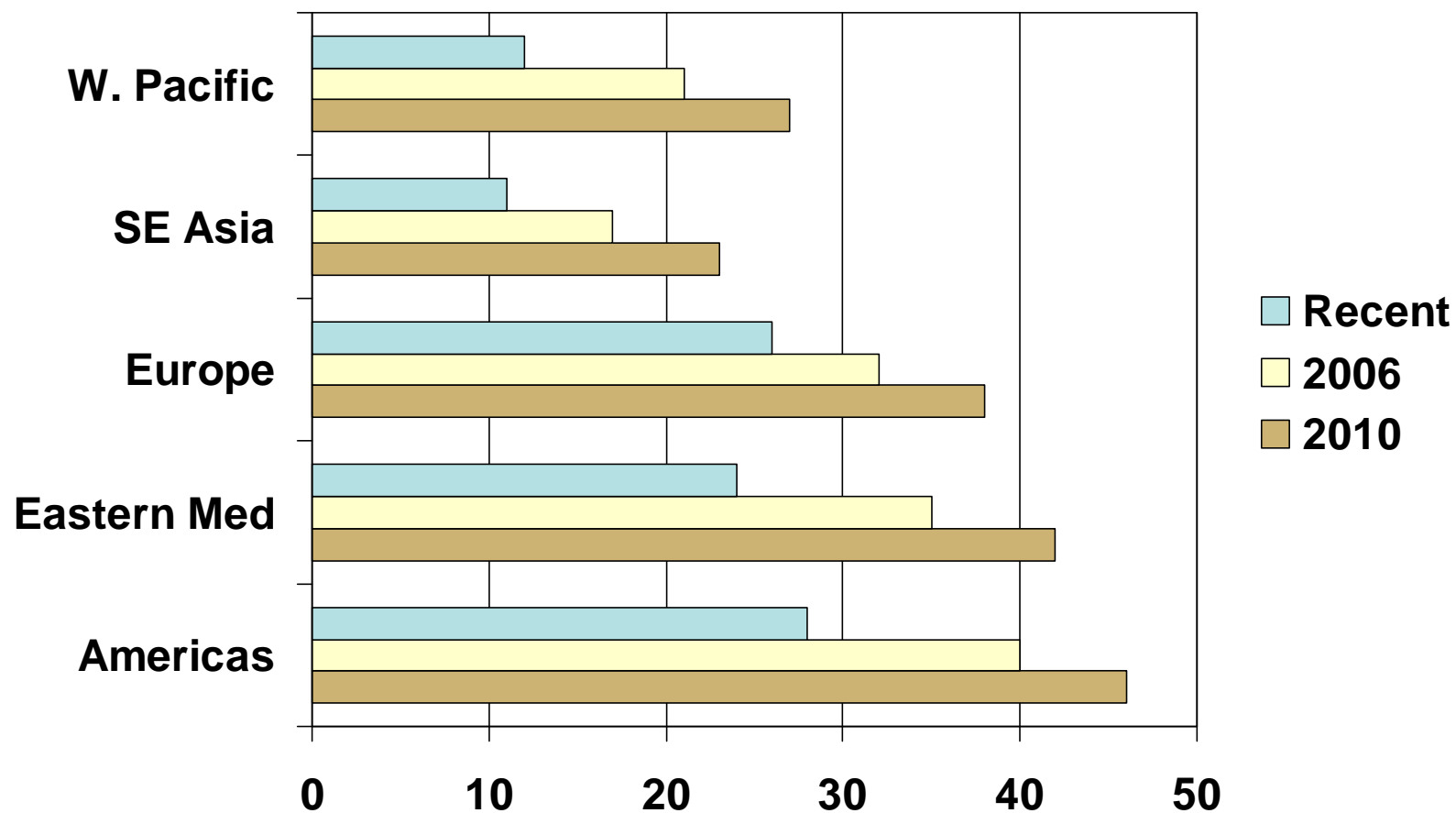
Diabetes in developing countries

- ✦ By the year 2025, 3 out of 4 diabetics will be in a developing country
- ✦ The largest number of diabetics will be in India, estimated at ~60 million

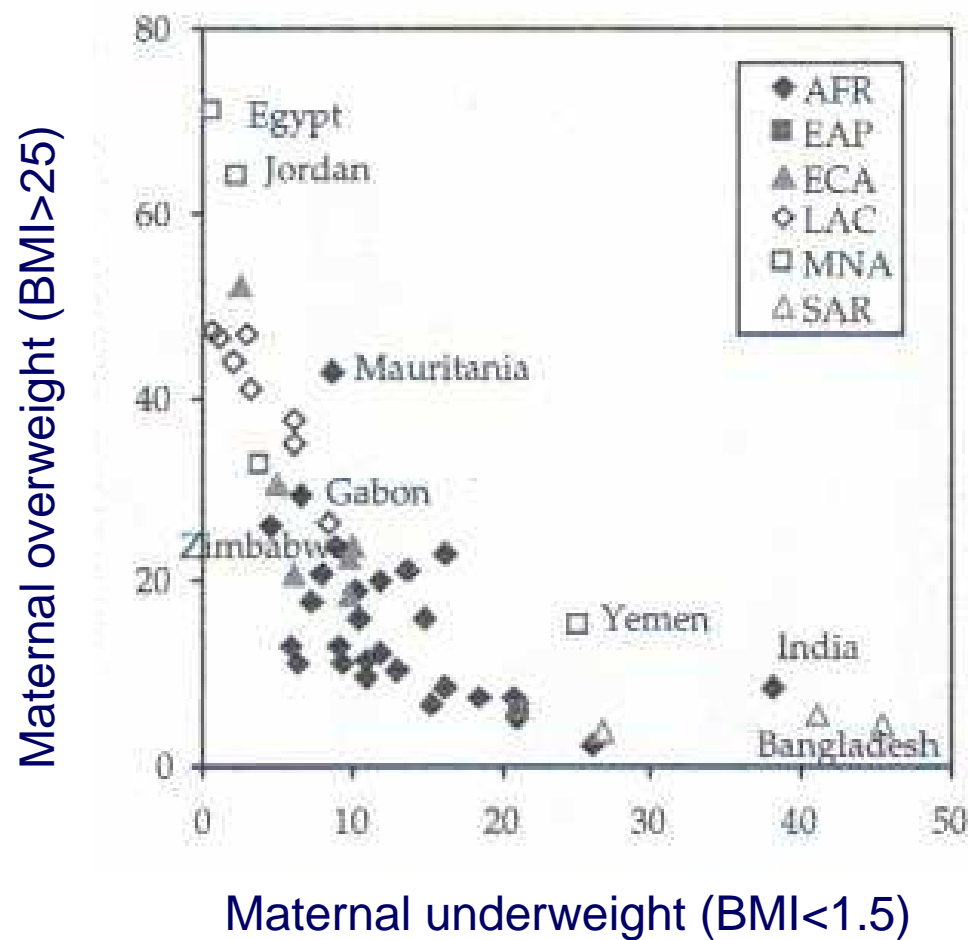
UN Millenium Development Goals

- ✦ Eradicate extreme poverty and hunger
- ✦ Achieve universal primary education
- ✦ Promote gender equality and empower women
- ✦ Reduce child mortality
- ✦ Improve maternal health
- ✦ Combat HIV/AIDS, malaria, and other diseases
- ✦ Ensure environmental sustainability
- ✦ Develop a global partnership for development

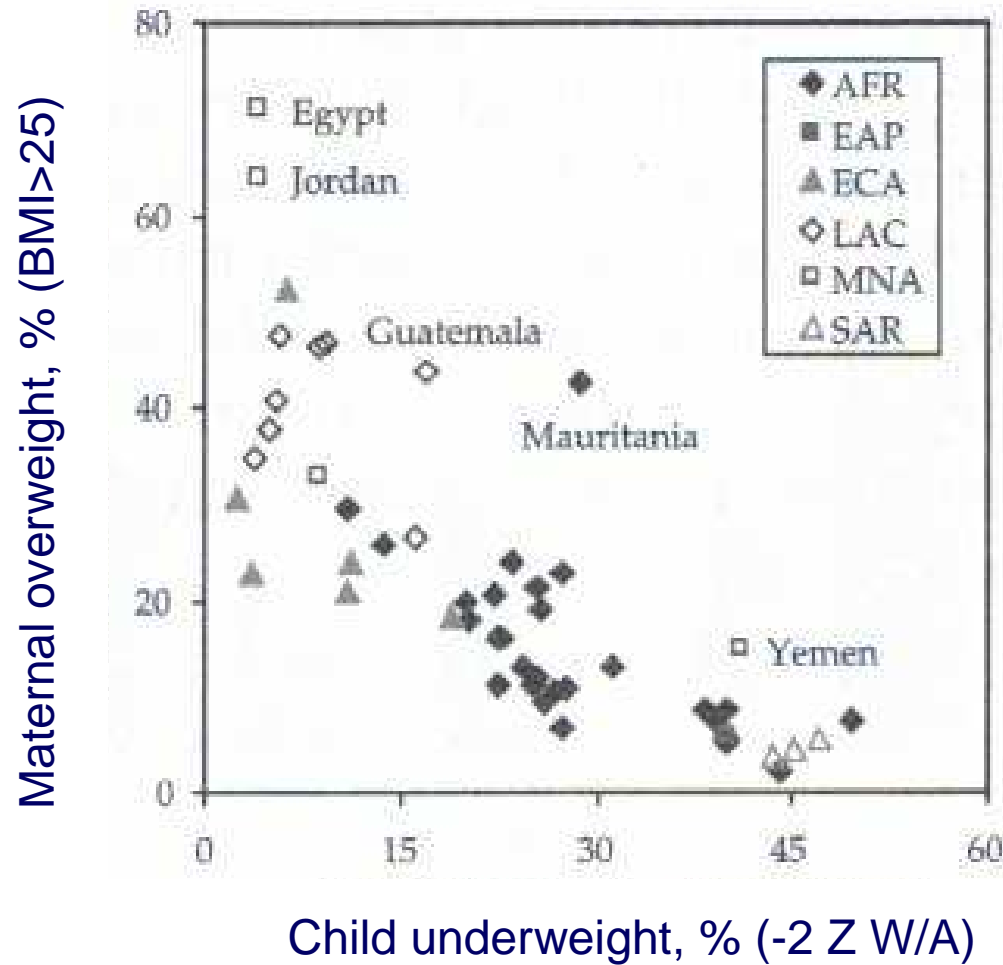
Current and projected prevalence of obesity in school-age children



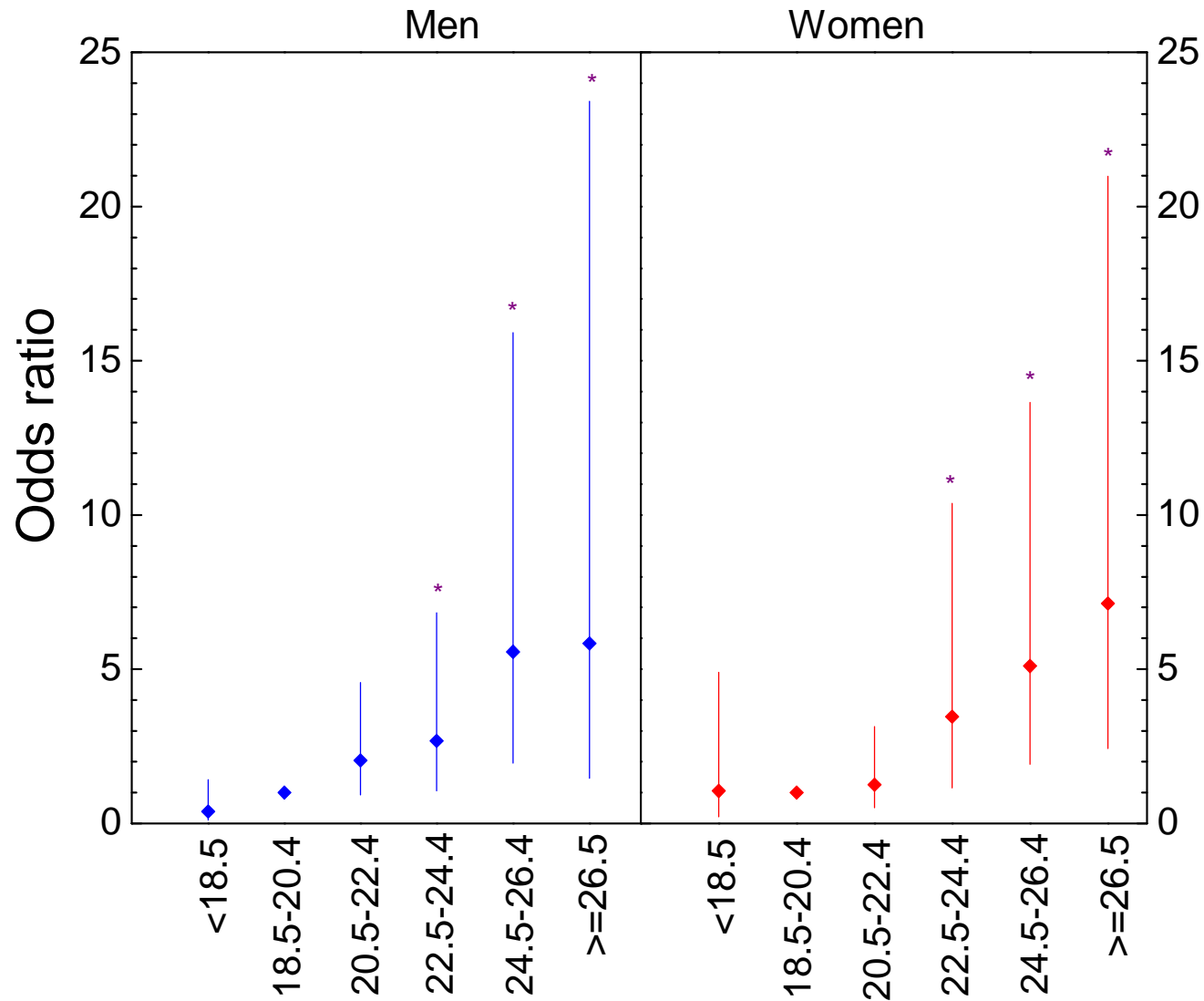
Coexistence of maternal under- and overweight



Coexistence of maternal overweight and child underweight

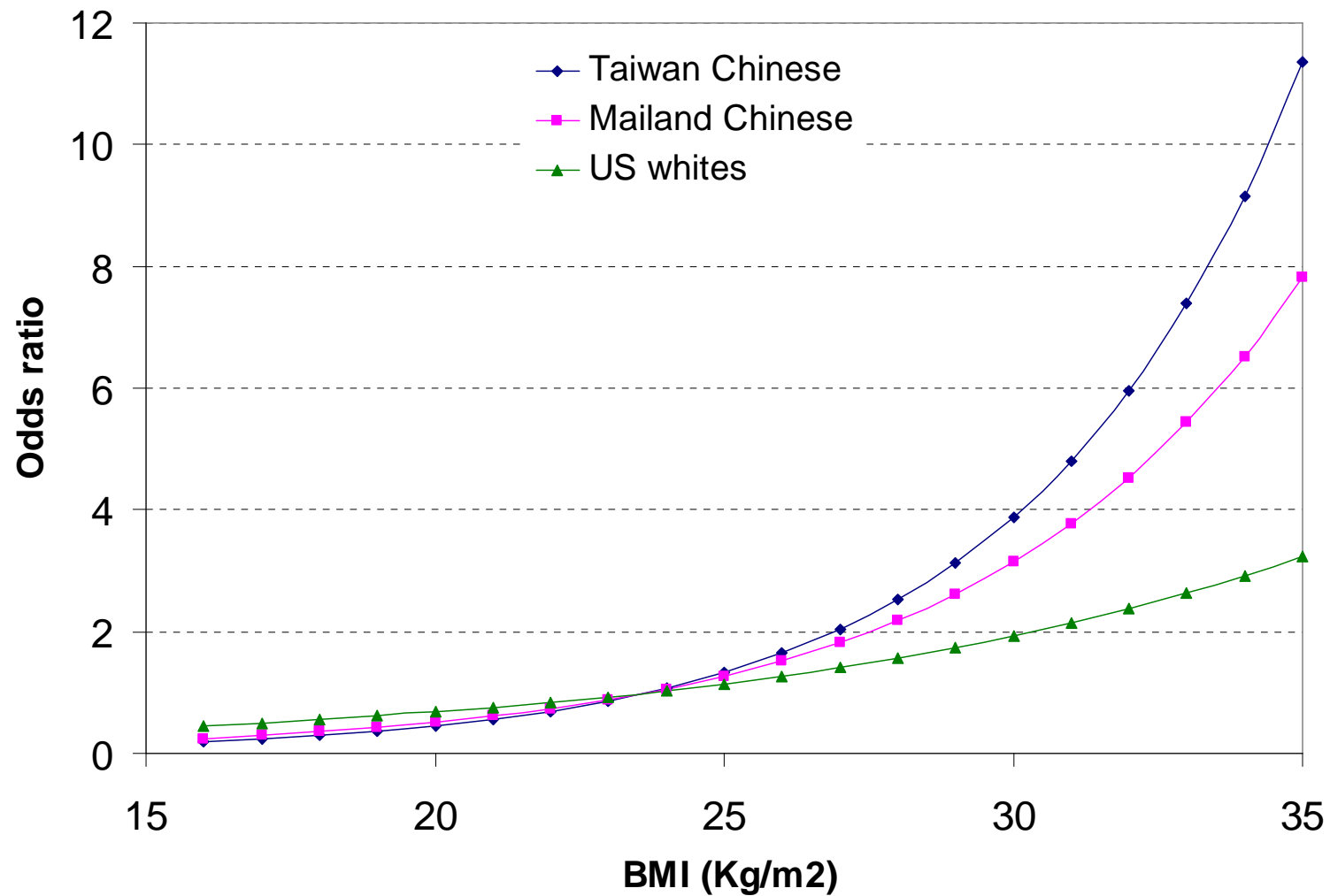


Odds ratios for obesity-related metabolic disorders by BMI



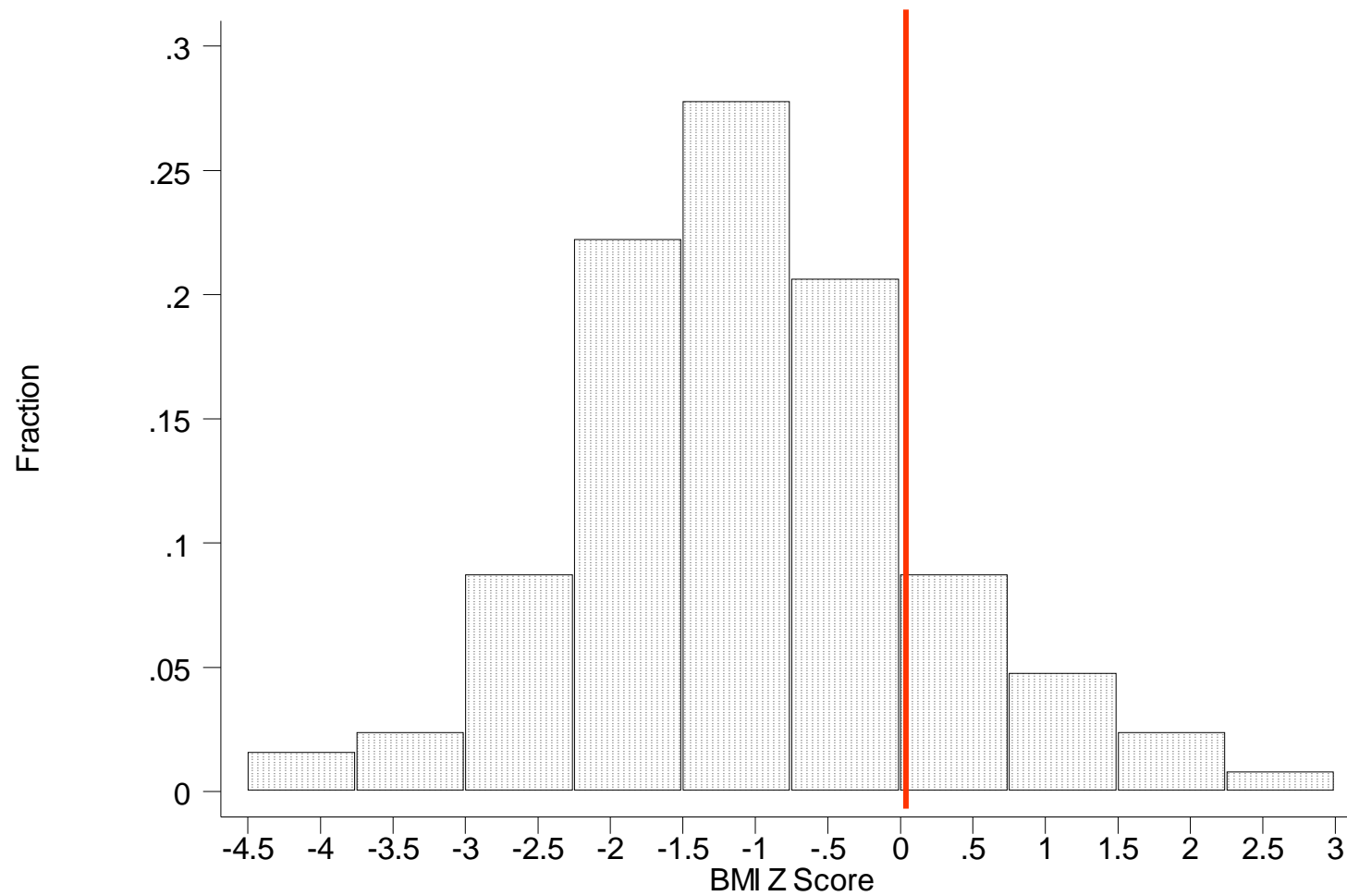
* Significantly higher than 1, $p < 0.05$

Odds ratio for hypertension relative to BMI (adjusted for age and gender)

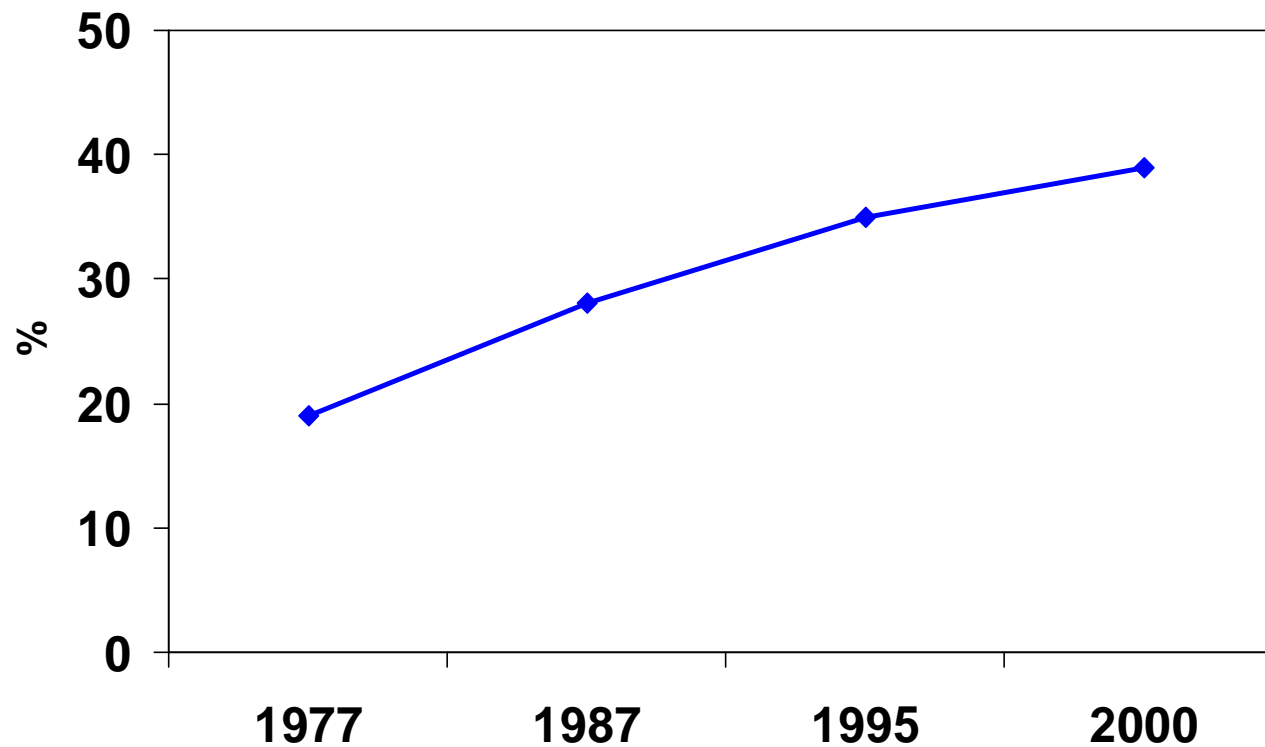


Data for Taiwan Chinese and US whites from Pan WH et al., Am J Clin Nutr, 2004

BMI distribution in children and adolescents (7-19 yrs of age)



Percent of daily calories consumed outside of home - U.S.A.



Source: USDA

Recent trends

- ✦ In intermediate-income countries, obesity is increasing more among the poor
- ✦ Obesity prevalence in rural populations is approaching the rates of urban areas

Diabetes in developing countries

- ✦ By the year 2025, 3 out of 4 diabetics will be in a developing country
- ✦ The largest number of diabetics will be in India, estimated at ~60 million

A Nutrition Paradox — Underweight and Obesity in Developing Countries

Benjamin Caballero, M.D., Ph.D.

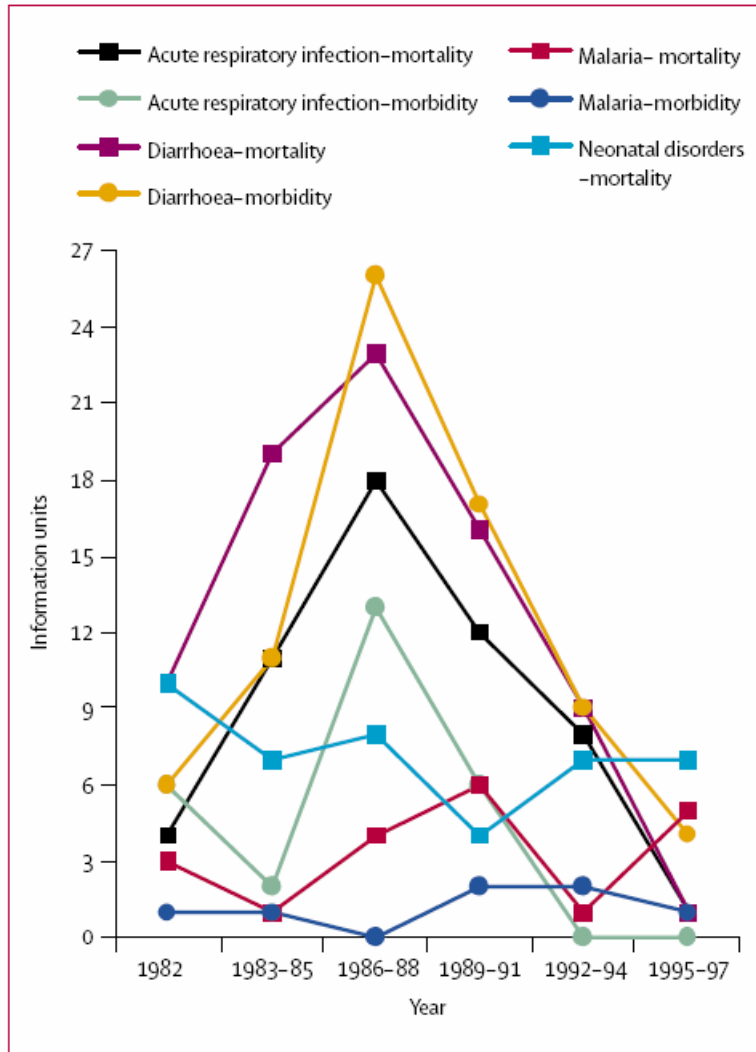
A few years ago, I was visiting a primary care clinic in the slums of São Paulo. The waiting room was full of mothers with thin, stunted young children, exhibiting the typical signs of chronic undernutrition. Their appearance, sadly, would surprise few who visit poor urban areas in the developing world. What might come as a surprise is that many of the mothers holding those undernourished infants

disease burden — right below underweight.² This is the same position held by overweight as a cause of disease burden in the developed world.

Traditionally, obesity has been linked with abundance, and it was anticipated that as developing countries improved their economic status and their GNP, undernutrition would decrease and obesity would begin to appear among members of the up-

N Engl J Med 352: 1514; 2005

Declining research on child health in developing countries



Information units on mortality or morbidity for ARI, diarrhea, malaria, or neonatal disorders in less-developed countries, 1980-2000

Information unit: one disease, one study site, M&M reported. Based on 232 publications meeting defined inclusion criteria.

Rudan et al, Lancet 2005