

# The Global Obesity Epidemic

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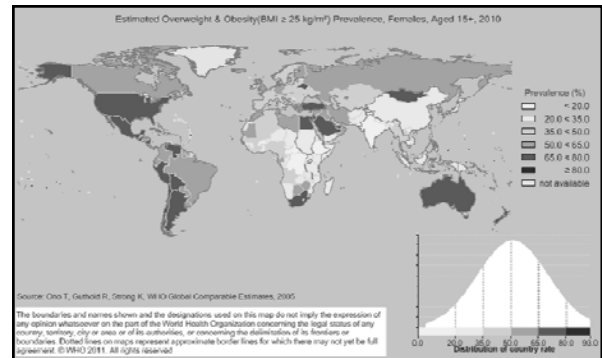


<http://www.obesityindia.in/obesity.html>

## Obesity

### Outline

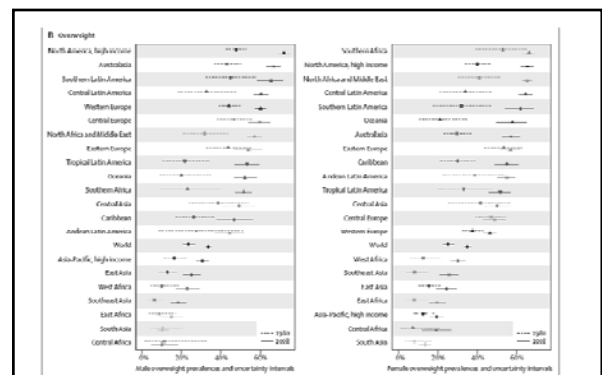
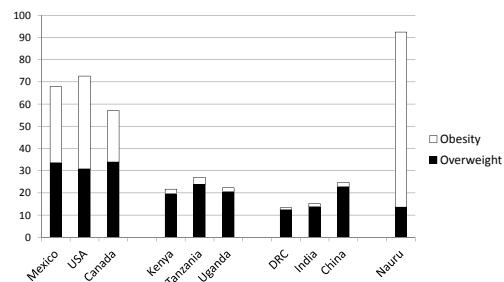
- The Problem
- Causes
- Focus on children
- Interventions



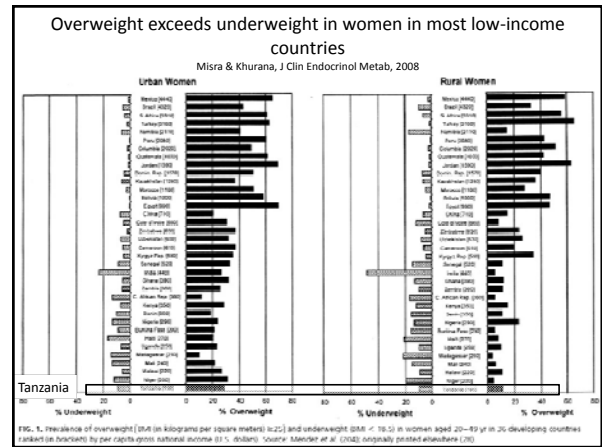
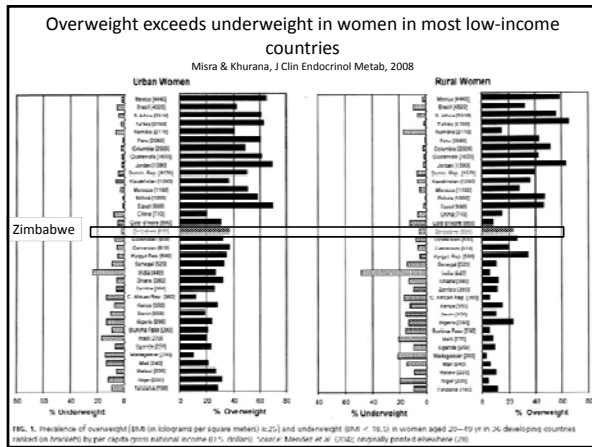
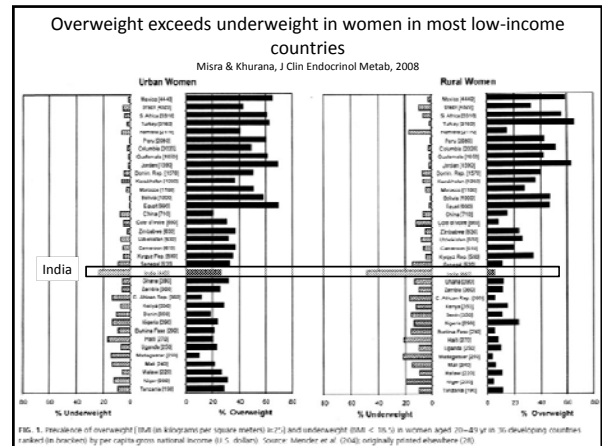
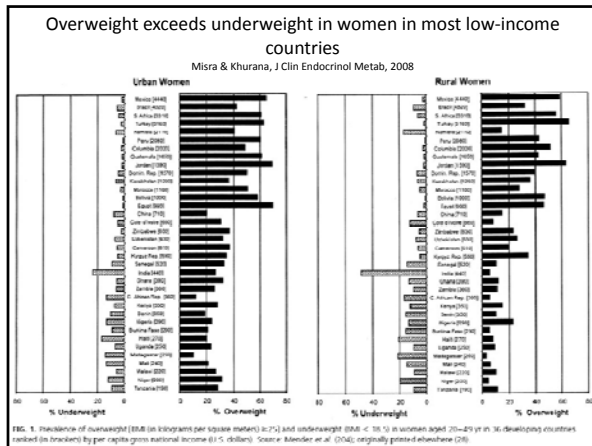
### The magnitude of the problem

### Overweight and obesity in selected countries % prevalence, from WHO Global Infobase

<https://apps.who.int/infobase/report.aspx?iso=UGA&rid=111&goButton=Go>



Lancet 2008; 372: 857-67



**Three transitions:**

- **Nutrition transition:** increasing consumption of foods high in fats and sugars, declining intake of cereals, intake of fruits and vegetables remains inadequate.

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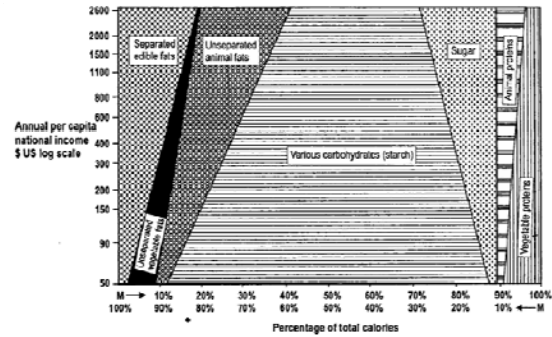
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- **Demographic transition:** declining fertility rate and longer life expectancy
- **Epidemiologic transition:** declining infectious disease and increasing non-communicable diseases (NCDs)

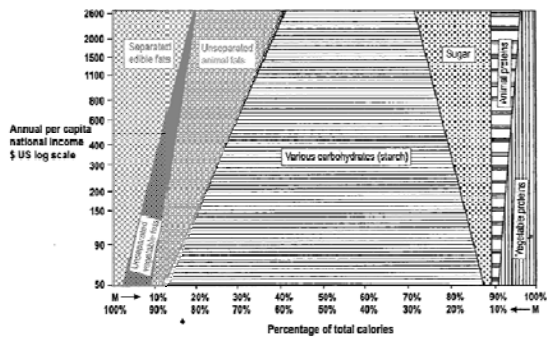
### Relationship of income to diet—national level

Drewnowski & Popkin. Nutrition Reviews 1997.



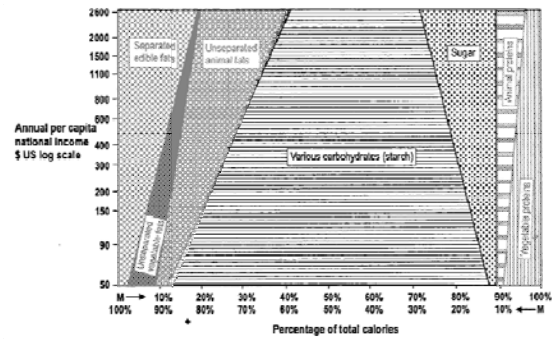
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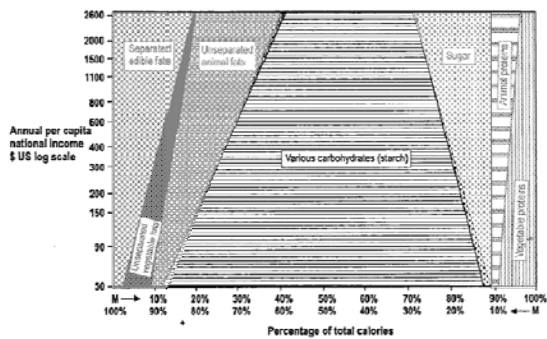
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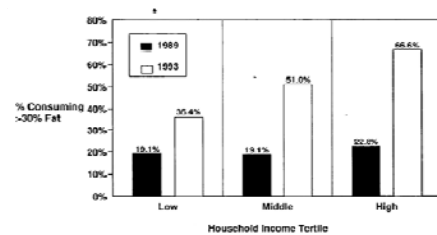


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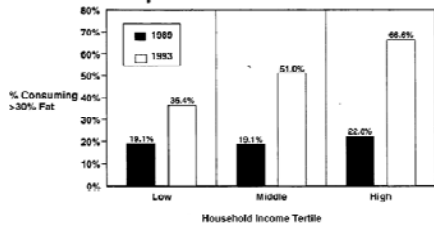
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### Nutrition transition has been extremely rapid in China



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"Dietary transitions that took more than 5 decades in Japan have occurred in less than 2 decades in China." p 953. Chopra et al., Bull WHO 2002.

### By early 1990's, obesity consumed 2-7% of total health care expenditures of developed countries

(Lobstein et al., IOTF task force 2004)

Table 10 Estimates of the direct costs of adult obesity

Country	Year	Estimated direct costs	National health care costs
Australia	1989/90	AU\$464 million	>2%
France	1992	FF12 000 million	2%
Netherlands	1981-9	Guilders 1000 million	4%
USA	1990	US\$458 000 million	6.8%

Source: WHO (16).

### Obesity is not equally distributed in societies: In high-income countries, less-educated more obese

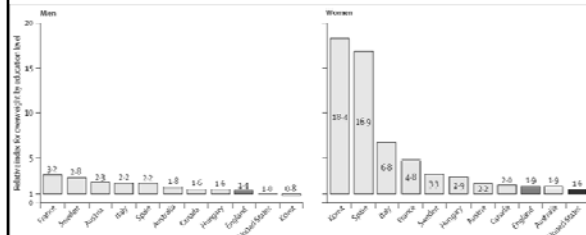


Figure 2: Relative index of inequality in obesity by education level. The relative index of inequality provides a measure of how many times more likely to be obese are those at the lower end of the education spectrum relative to those at the upper end. Reproduced from the Organisation for Economic Co-operation and Development.

www.thebmcc.com Vol 228 August 22, 2011

### Phases of the nutrition transition

Misra & Khurana, J Clin Endocrinol Metab 2008.

1. Hunter-gatherer. High in CHO, protein and fiber, low in fat. High activity, lean body.
2. Agrarian, food insecure. Low calories, protein and fat. High activity, childhood malnutrition, lean body.
3. Increasing consumption of F&V, animal protein, increasing inactivity.
4. Increasing affluence, fat intakes, stress. Markedly sedentary lifestyle, overweight>>underweight.
5. Awareness of benefits of balanced diet and activity. Healthy behavior adapted initially by affluent educated people.

### THE BIG QUESTION:

How to promote economic growth AND prevent the undesirable health effects of the nutrition transition?

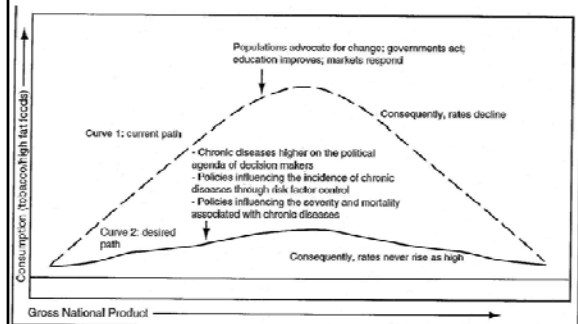


Figure 6-10 Chronic Disease Consumption Curve.

### Causes

**Processes of globalization that are critical to the nutrition transition**

- Liberalization of international food trade

Source: C Hawkes. Globalization and the Nutrition Transition: A Case Study. 2007

**Processes of globalization that are critical to the nutrition transition**

- Liberalization of foreign direct investment
  - FDI in developing countries increased 6-fold from 1990-2000, faster than GDP or trade.
  - Now the largest source of external financing for developing countries.

Source: C Hawkes. Globalization and the Nutrition Transition: A Case Study. 2007

**Processes of globalization that are critical to the nutrition transition**

- Emergence of global agribusiness and transnational food companies
  - TFC's (e.g. McD's and KFC): US \$5.7 billion in 1998

Source: C Hawkes. Globalization and the Nutrition Transition: A Case Study. 2007

**Processes of globalization that are critical to the nutrition transition**

- Retail restructuring (esp. transnational supermarkets)
  - US Supermarkets: US \$13 billion in 1999

Source: C Hawkes. Globalization and the Nutrition Transition: A Case Study. 2007

**Processes of globalization that are critical to the nutrition transition**

- Global food advertising and promotion:
  - Globalization of: TFC's + ad/marketing agencies + communication technologies

Source: C Hawkes. Globalization and the Nutrition Transition: A Case Study. 2007

**Case study: Mexico**

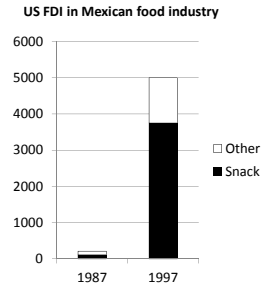
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## Case study: Mexico

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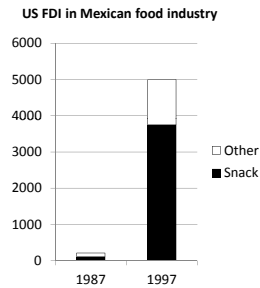
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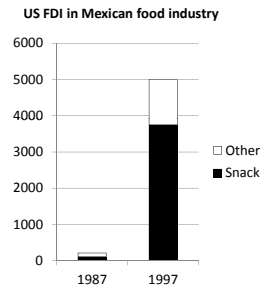
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- Transnational food retailers 55% of all food sales in Mexico in 2007
- Overweight + obesity rate in Mexican women recently surpassed the US prevalence, at >70%.



## Major Causes of the Obesity Pandemic

Popkin 2009 (assigned reading)

- Human innate preferences for fat and sugar.
- Thus, higher incomes lead to higher fat and sugar purchases.
- Lower food prices, especially vegetable oil.
- Globalization/centralization of the media to promote certain aspects of food culture.
- Technological factors that affect work and leisure, productivity and effort.
- Other changes in household purchasing patterns and time, e.g. meals eaten outside of home.

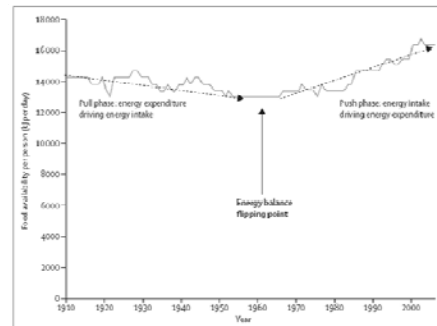
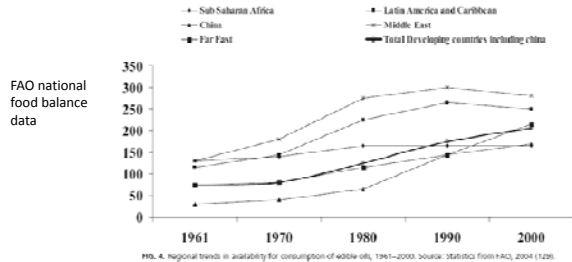


Figure 3. Food availability for the USA, 1910-2006<sup>6</sup>  
 There are two distinct phases: a decrease in food energy supply (contributed to be pulled down by reduced energy expenditure requirements for daily living), followed by an increase in food energy supply (contributed to be pushed up by increasing food access). An energy balance flipping point is proposed, marking the change in how the US population generally achieved energy balance.

## Is vegetable oil the major driver?

"The nutrition transition in China has been based until now on greatly increased domestic production and imports of vegetable oils, and not on imports of Western foods and a Western way of eating. . . . The late stages of the nutrition transition in Japan are characterized by greater consumption of meat and milk products and increased imports of processed foods." p 42 Drewnowski & Popkin Nutrition Reviews 1997.



## What's the story on edible oil?

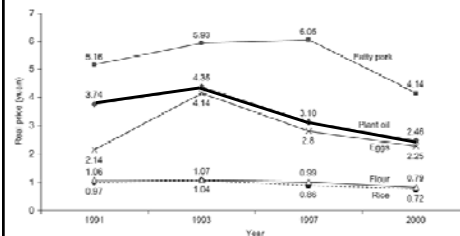
- Production:
  - World oil crop production (soybean, canola, palm) increased by >60% from 1990-2003.
  - Growth concentrated in Latin America and Asia:
    - China: 2-fold increase
    - Brazil: 50% increase (now 2<sup>nd</sup> largest producer and exporter)
    - Argentina: 2-fold increase (world's largest exporter)
    - Malaysia: 66% increase
- Consumption in the same period:
  - US & Western Europe: 25% increase
  - India: 50% increase
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"Today, prices of edible oils in India are now more affected by soybean output in Argentina, Brazil and the US than by domestic production!" p 5, Hawkes.

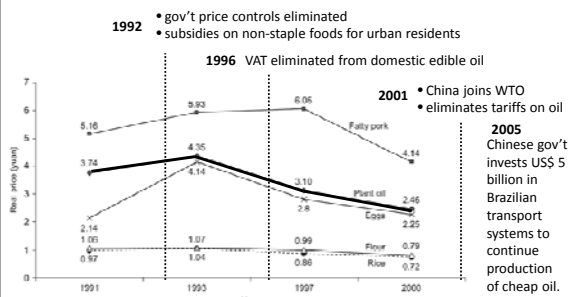
## Increased supply + trade liberalization = cheap edible oil



Pre-WTO real prices of select food items in China, 1991-2000

Sources: Ng et al., Soc Sci Med 2008; Hawkes, 2007.

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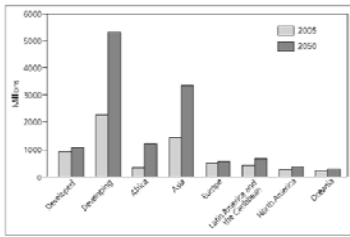
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Linked to urbanization

## Urbanization

URBAN POPULATION BY REGION, 2005-2050

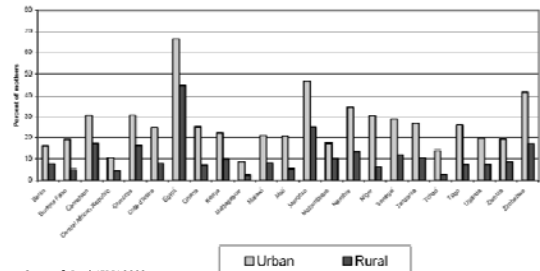


- In 2008, we passed a milestone, with >50% of the world's people living in cities.
- Apart from Latin America and the Caribbean, which have stabilized, developing countries are experiencing the fastest rate of urbanization worldwide
- Of the global regions, SSA is the least urbanized, but has the fastest rate of urbanization.

Source: UN Habitat 2009. <http://www.unhabitat.org/documents/GRHS09/mapsindd.pdf>

## Rural/urban disparity greatest in African data (remember: Opposite direction in US)

Figure 3 Percent overweight mothers (DHS, 23 African countries)



Source: Garrett & Ruel, IFPRI 2003