

Food and Nutrition Factors Related to Urban Health

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Methods

- Epidemiology
- Experimental animal models
- Cell or tissue culture



Epidemiological data

- Mortality – good for EU, USA
- Morbidity – good for cancer
- Consumption – good for nothing



Epidemiological data – consumption

- Obtained by questionnaire
- Problems with memory
- Problems with over/under reporting



Epidemiological data - alcohol consumption

- Males over report
- Females under report
- Affected by age

(Thompson *et al* 1992)



Epidemiological data – consumption corroboration

- Smoking – cotinine ≥ 15 ng/ml saliva
- Alcohol - blood levels of gamma-glutamyl transpeptidase
- Diet – no single analysis
 - weighed intakes (1-7 d)
 - food frequency questionnaires
 - diet history
 - purchase/disappearance data



Development is characterized by:

- Increasing life expectancy, average age of population, average age at death
- Declining mortality from infections and undernutrition
- Increasing mortality from non-transmissible chronic diseases such as CVD, cancer, type II diabetes

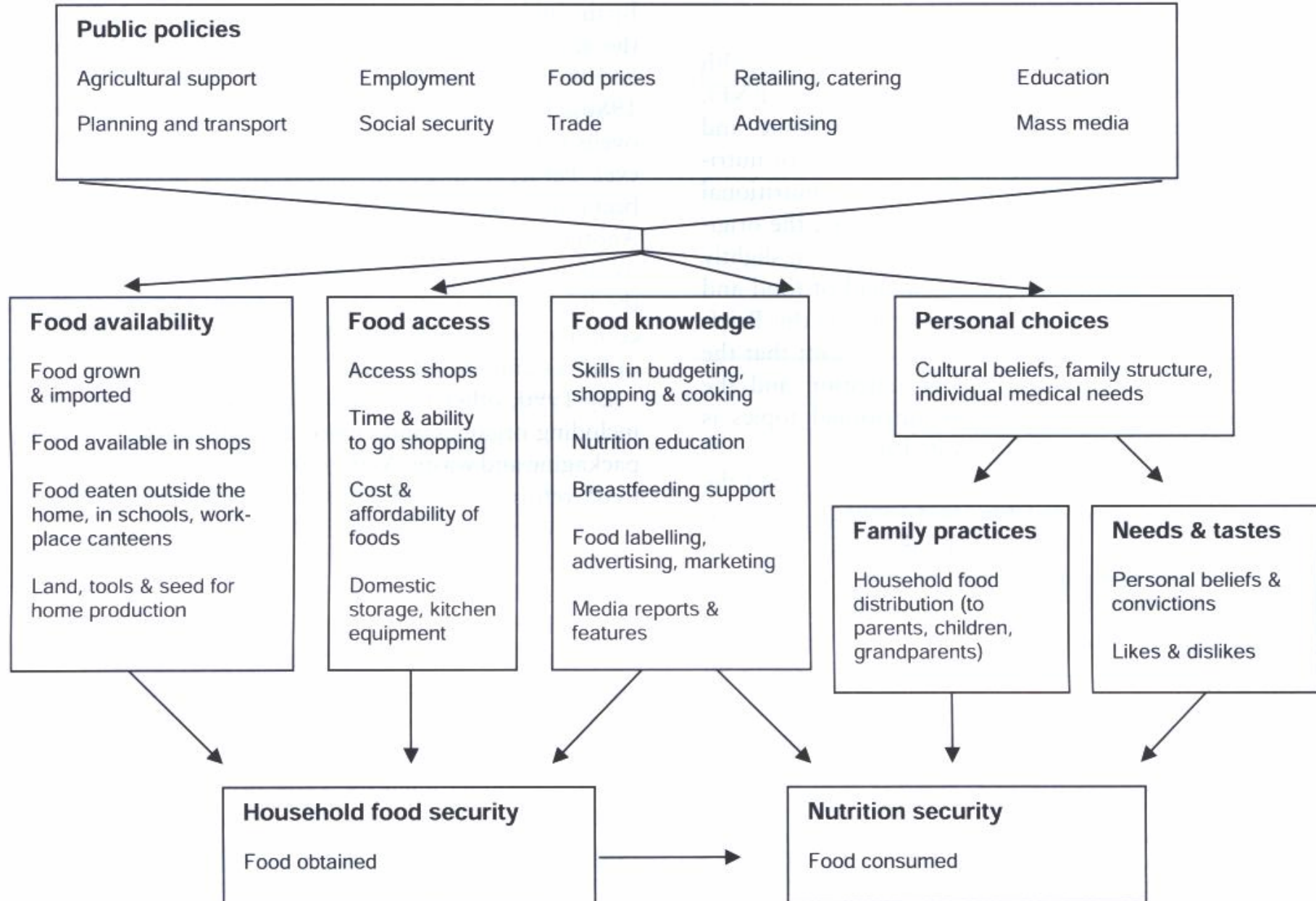


Development is characterized by:

- Increasing variety of foods available
- Reliance on purchased/imported foods
- More prepared food purchased outside the home (fast food, restaurants, street food)
- Food security dependent on personal wealth
- Reduction in daily energy expenditure



Influences on food choice (WHO 2003)



Development is characterized by
reduction in proportion of income spent
on food:

Indians are spending less on food:

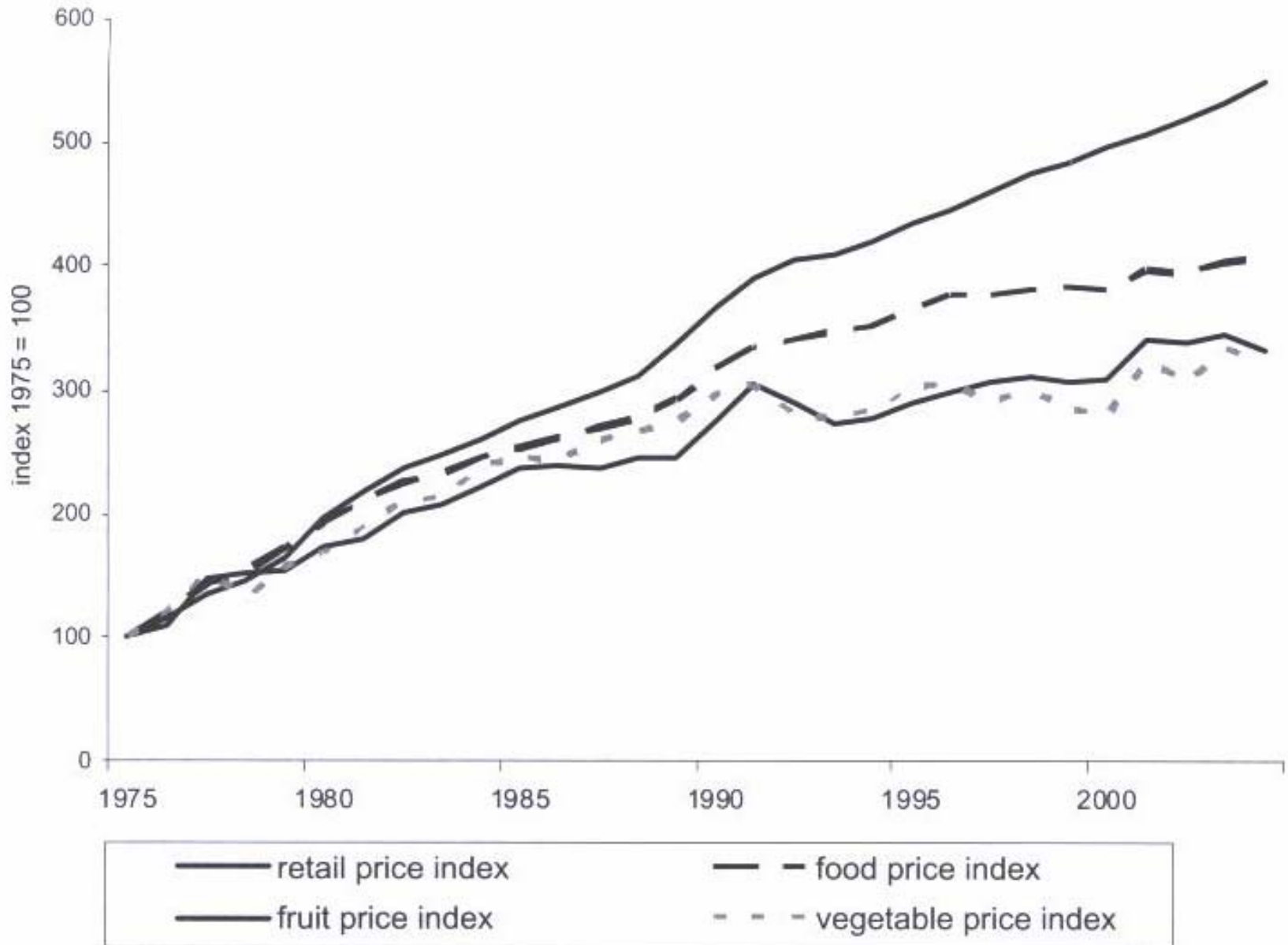
Between 1994-2005, declined by 8.2 & 12.2% in rural and urban areas respectively.

Amount in 1993-94 was 42.5 % and 55 % respectively.

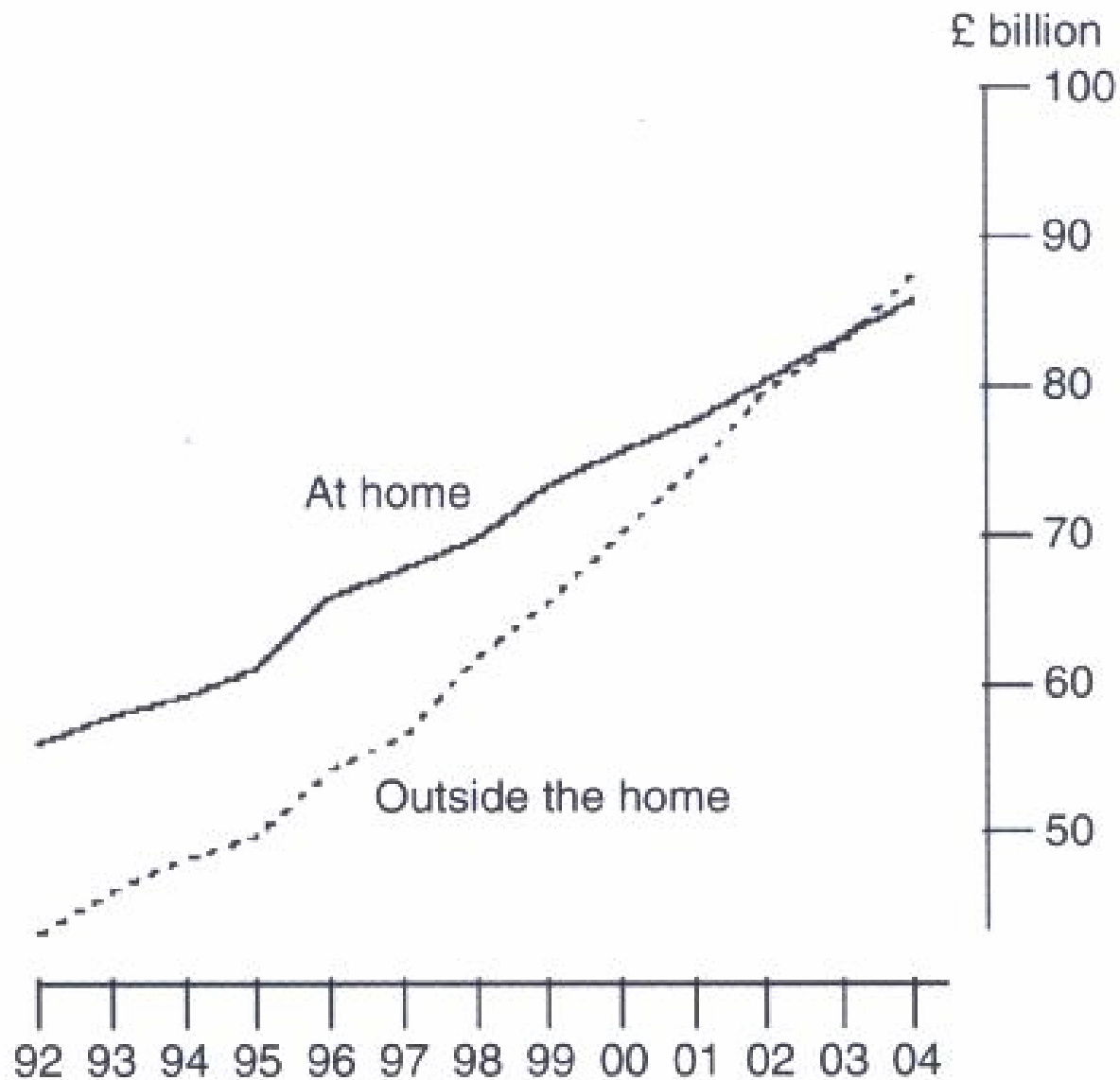
Av. fat intake increased from 31.4 to 35.5 g (13.1 %) in rural areas and from 42 to 47.5 g (13 %) in urban areas.



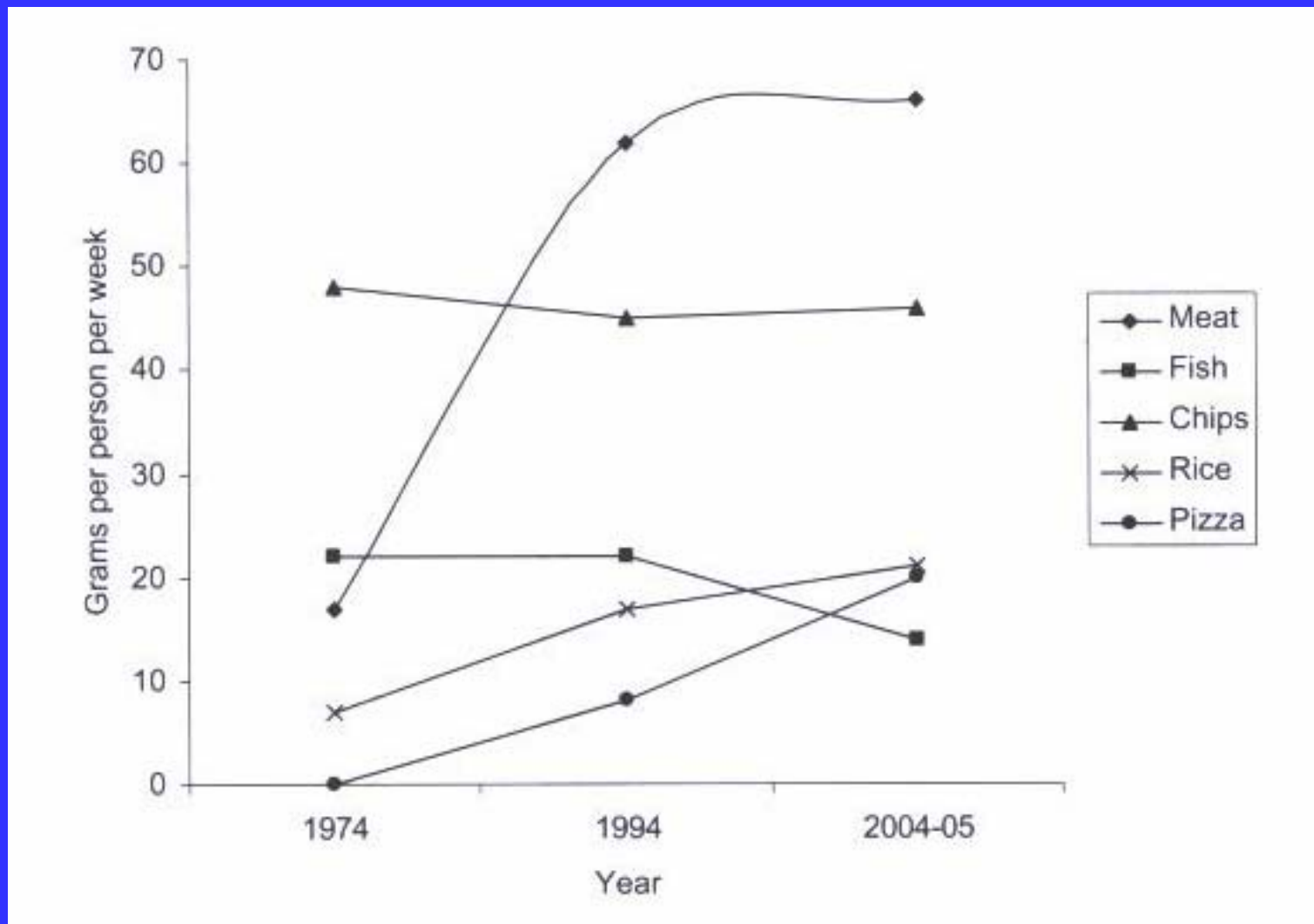
Price changes since 1975 (DEFRA 2006)



Spending on food and drink (ONS 2006)



Take-away purchases by type since 1974 (DEFRA 2007)



Urban-rural comparison – Malaysia

409 adults assessed using 3 d food record

	<u>Urban</u>	<u>Rural</u>
Mean energy intake (MJ/d) – combined sexes	9.05 ± 2.21	7.19 ± 1.60
Mean energy intake (MJ/d) – males ($P < 0.05$)	9.52	8.47
% energy intake – P, F, C	14, 30, 55	13, 20, 66
Meeting RDA for nutrients	- Ca, Fe	- Ca, Fe, riboflavin, niacin, vit A (females)

(Chee *et al*, 1997, *Malaysian J Nutr* 3)



Urban-rural comparison – Guatemalan men

161 men, born and raised in same villages

	<u>Guatemala city</u>	<u>Village of birth</u>
Sedentary lifestyle (%)	79	27
Body fat (%)	15.3 ± 5.3	13.3 ± 5.7
Serum cholesterol (mmol/l)	4.27 ± 0.75	3.90 ± 0.70
LDL-cholesterol (mmol/l)	2.66 ± 0.72	2.30 ± 0.62
Smoking (%)	41	37
Ex-smokers (%)	11	13
Dietary differences	+ SFA + red meat + sweetened drinks	+ legumes

(Torun *et al*, 2002, *Int J Epidemiol* 31, 218-226)



Urban-rural comparison –Chinese women

- 499 women over 10 sites provided:
 - 24 h duplicate food sample
 - a blood sample
 - an interview on health history
 - including anthropometry
 - blood pressure measurement.
- urban women consumed more energy, protein (especially animal) and lipid (especially animal) than rural women.

(Qu *et al*, 2000, *Eu J Clin Nutr* 54, 741-748.)



Food intake in children in Pakistan

Hakeem *et al* (1999) showed that, compared with rural counterparts, urban children consumed more:

milk, meat curry, chicken curry, chocolates, cakes, ice-cream, fruit and raw vegetables.

Urban children had a higher mean daily intakes of:

energy, sugar, protein, total fats, cholesterol, calcium, sodium, potassium, niacin, vitamin B₁₂, folic acid, vitamins A, C and E



Dietary habits in the urban and rural Croatian schoolchildren

315 urban, 163 rural, mean age 12.6 y
- quantified FFQ

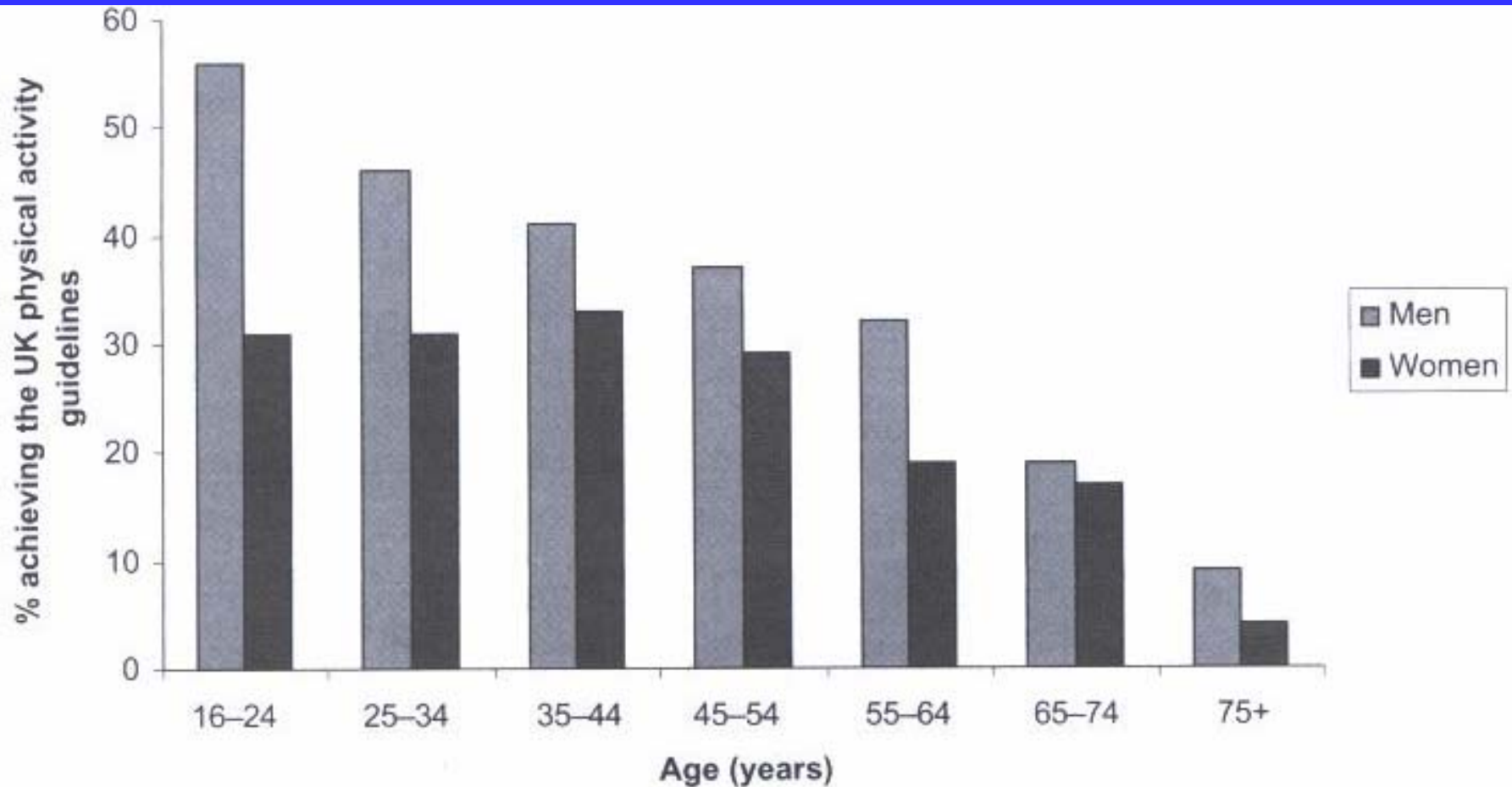
urban children reported more
consumption of:

- energy,
- protein,
- fast food,
- soft drinks,
- alcohol!

(Colić-Barić *et al*, 2004, *Eu J Nutr* **43**, 169-174.)



Percentage of adults achieving the UK physical activity guidelines (Lifestyle Statistics 2006)



Conclusions

- Health risks associated with smoking are substantial and interact with dietary factors
- Fat intake increases among all sectors as relatively inexpensive energy-dense foods become more available
- Competition depresses food prices and escalates portion sizes (value for money)
- Urban lifestyles are associated with low activity levels and this gets worse with age
- Studies are confounded by social class

Conclusions

Rise in obesity is probably due to excess food intake through :

- wider food choice
- more energy dense food
- bigger portions sizes
- more eating opportunities
- less physical activity

Obesity is associated with increased:

- mortality from all causes
- morbidity from CVD, cancers, type II diabetes, gallstones etc

Solution – radical changes in urban environment?