## Economics of obesity

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### Obesity

The issue

Theory

Income and body weight.

Policy.

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### References.

This lecture does not draw on the textbook. See

Philipson and Posner (2008) "Is the obesity epidemic a public health problem? A decade of research on the economics of obesity," NBER working paper #14010. http://www.nber.org/papers/w14010

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# The obesity epidemic.

- Obesity is defined as a Body Mass Index (weight in kg over height in meters squared) of 30 or more.
- Overweight is defined as a BMI between 25 and 30.
- Obesity in the U.S. has doubled from 15% circa 1980 to 30.4% in 2004. In Canada obesity rates have risen dramatically from 5.6% in 1985 to 23.1% in 2004.
- About 60% of Canadian adults are overweight and 65% of Americans.

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## Economic questions.

- Why are people getting heavier over time? The major determinant of body weight is genetics, but genetics do not change rapidly over time. That means that the increase in body weights is due to changes in eating or exercise, which are behaviors. This is an economic/social science issue.
- What, if anything, should the government do in response?

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### Theories.

- Basic idea: body weight depends on energy balance: if you eat more calories than you burn, you get heavier.
- (graph: marginal costs and benefits of body weight)
- We should then think about things that affect energy balance: what has changed that affects how many calories people eat? What has changed that affects how many calories people burn?

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# Food prices.

- The price of a calorie has fallen since about 1960 due to technological improvements in food production and distribution.
- It is now cheaper to buy a calorie, both in terms of monetary cost and in terms of time—many more opportunities to buy snack foods.
- All else equal, when food is cheaper the opportunity cost of maintaining a higher body weight is lower, so we should expect to see body weights rise.

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# Relative prices of "good" and "bad" foods.

- Not only has food become cheaper, but at the same time the relative cost of buying energy dense foods has fallen.
- Energy dense foods are foods which have high calories per unit mass. Ice cream is energy dense, spinach is not.
- When high energy dense foods become relatively cheaper people will eat relatively more of them.
- When people eat more dense foods they tend to eat more calories for physiological reasons.

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# The opportunity cost of burning a calorie has gone up.

- Now think about the expenditures side of the energy balance relationship: how many calories do people burn?
- Stylized story: in 1950 people were paid to exercise while they worked. In 2011 people sit in office chairs and pay a gym in order to exercise.
- Upshot: it is more costly to burn a calorie now than it was. All else equal, we expect body weights to rise in response.

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# Summarizing the core economic argument.

- The above ideas capture the core of the economic explanation for the increase in obesity: it's cheaper to acquire a calorie, that calorie is more likely to come from an energy dense source, and it's more expensive to exercise to burn it than it used to be.
- How much "traction" this explanation has is a matter of empirical debate.
- Most experts think this is at least a big part of what's going on, but it isn't the whole story.

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### Other economic causes.

- Decline in smoking: Smoking causes lower body weight by suppressing appetite. Some of the increase in body weights we've seen can be attributed to lower smoking rates.
- Rise of women's labor force participation: some evidence that children are more likely to be overweight if both parents work.

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### Income.

- Relationship between income and body weight is complicated.
- Empirical regularity: people in poor households more likely to obese.
- Story: increases in income increase the body weight of very poor, underweight people who cannot afford to buy enough calories, but otherwise probably push people closer to "ideal" body weight—e.g., if you're overweight, spend some of your extra money on activities which will reduce your body weight.

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### Figure 1: Kernel density estimates of the distribution of BMI

Note: Kernel density estimates of Body Mass Index. Epanechnikov kernel with optimal bandwidths evaluated at 300 points in each figure.

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Note: Figure shows regression point estimates as presented in Table 5. Education, race, age, and living arrangements have been held constant. The income categories are as follows. 0=\$0=\$15k, 1=15-30k, 2=30-50k, 3=50-80k, 4=80k or more. All incomes measured in 2001 Canadian dollars.

#### Figure 2: Income-BMI gradients by sex and country

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### Income cont.

- But even correlation between income and body weight complex: for women, low income is associated with obesity, but for men income and body weight are positively correlated.
- Studies that exploit "random" variation in income, such as from changes in social assistance programs, find a very small *positive* effect of income on body weight, which contradicts the notion that poverty causes obesity.
- Lots of evidence that body weight is *correlated* with income (low income people are more likely to be obese) but little evidence that income *causes* body weight.
- Upshot: changes in income distribution unlikely to explain much of the change in the distribution of body weight.

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# Policy.

- Whether the government ought to respond to the obesity epidemic depends on why people have tended to become heavier: adults who eat too much or don't exercise enough know that such behavior will increase their weight. Intervention would then be paternalistic.
- We might still consider "nudge" policies which correct "internalities."
- Some external effects through socialized health insurance: not as much evidence as for smoking, but it appears that, unlike smokers, obese people have higher life cycle health care costs than otherwise identical non-obese people.

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- The most commonly advocated policy responses are taxes on various foods, notably taxes on soft drinks.
- Also support for subsidies for fruits and vegetables.
- The idea behind both proposals is to increase the relative price of energy dense foods.
- These are tentative suggestions because there is not much good evidence, and the evidence we do have suggests these policies will have at most small effects.

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