

# Gluttony in England? Long-term change in diet

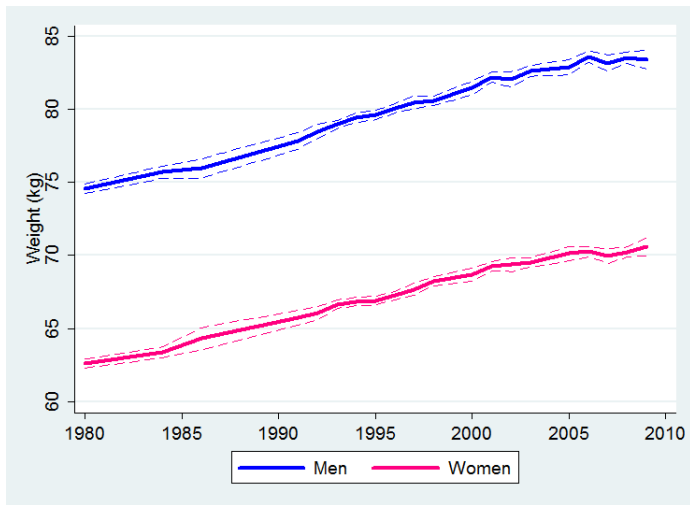
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# Motivation

- Many health and policy interventions motivated by obesity
- ...and its correlation with metabolic disease:  
diabetes, hypertension, lipid problems, cardiovascular disease,  
fatty liver disease, joint problems, (increased mortality)
- worldwide phenomenon, but very prevalent in England: over 25%  
of adults obese,  
and around 70% at least overweight

Weight gain since 1980:  
7-8 kg on average for both sexes



# Increase in body mass index - do only some get heavier?

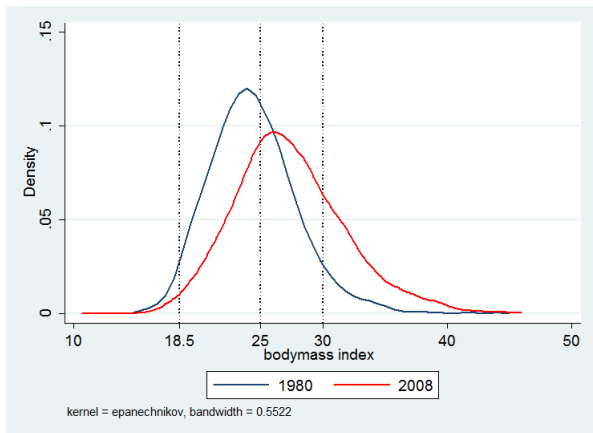


Figure: Table: Distribution of Body mass index, males, 1980 vs 2009

# Is excess consumption the main driver?

- US: increase in calorie consumption driving weight gain (Cutler, Glaeser and Shapiro 2003)
- UK: decline in calories from food consumed at home in earlier years (Prentice and Jebb 1995)
- but: micro-data with individual or household-level information on nutrition is rare
- data that covers all foods and drinks is virtually non-existent

# Data on food spending, diet and nutrition

- National Food Survey and its successors
- representative survey of the English population with ca. 8000 households per year
- Microdata on (detailed) food expenditure, diet and associated calories over three decades
  - previous studies mainly use aggregate food balance sheets data
  - no long-run intake diaries (since 2008: Diet and Nutrition Survey)
  - food intake surveys (based on eating diaries) severely underreport calorie intakes:  
15.7%(w) and 9.5%(m) relative to recommended levels
- data on *all* foods and drinks, including eating out & alcohol  
→ combine imputation methods and observed data

# Imputation

- Calories from alcohol and eating out, snacks and soft drinks observed fully after 2001
- we impute them separately for the period before, based on:
  - knowledge about the evolution of prices for these goods
  - knowledge about expenditures on these goods
  - socio-demographic information on the households in our representative sample
- we use multiple imputation technique, combined with backcasting

# Long-run trends in calories from all foods and drinks?



## Decline in calories from all foods and drinks

Single under 50	
<i>Calories purchased, per household per day</i>	
1980	3076
1985	2757
1990	2752
1995	2701
2000	2891
2005	2517
2009	2457
<i>Percentage change 1980-2009</i>	

**Table:** Calorie purchased, all food and drinks, 1980-2009

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<i>Percentage change 1980-2009</i>	
-20.1	

**Table:** Calorie purchased, all food and drinks, 1980-2009

## Decline in calories from all foods and drinks

	Single under 50	Single 50+
<i>Calories purchased, per household per day</i>		
1980	3076	3174
1985	2757	3119
1990	2752	2953
1995	2701	2817
2000	2891	2920
2005	2517	2699
2009	2457	2709
<i>Percentage change 1980-2009</i>		
	-20.1	-14.6

**Table:** Calorie purchased, all food and drinks, 1980-2009

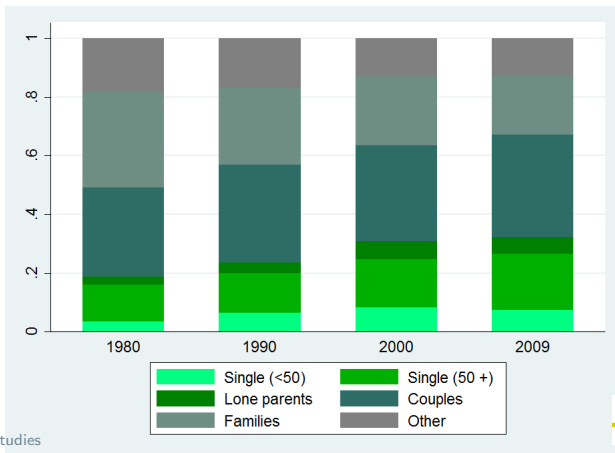
## Decline in calories from all foods and drinks

	Single under 50	Single 50+	Lone parent	Couple	Family	Other
<i>Calories purchased, per household per day</i>						
1980	3076	3174	7152	6354	10383	11906
1985	2757	3119	7007	5950	9328	11030
1990	2752	2953	5840	5714	8941	10028
1995	2701	2817	5953	5491	8487	9304
2000	2891	2920	6173	5430	8418	9237
2005	2517	2699	5486	5252	7936	9121
2009	2457	2709	5436	5084	7580	8335
<i>Percentage change 1980-2009</i>						
	-20.1	-14.6	-24.0	-20.0	-27.0	-30.0

Table: Calorie purchased, all food and drinks, 1980-2009

# Dynamics in household size and composition, 1980-2009

- Shrinking household size and composition changes mostly happen *across*, not *within* household types:  
e.g. (young and old) single households ↑; couples with children ↓



# Calorie sources

We distinguish three sources of calories:

- Food at home
- Eating out, snacks and softdrinks
- Alcohol

# Calories from food at home

# The *even larger* decline in total calories from food at home

Single under 50	
<i>Calories purchased, per household per day</i>	
1980	2323
1990	1940
2000	2185
2009	1887
<i>Percentage change 1980-2009</i>	
-18.8	

**Table:** Calorie purchased for consumption at home, 1980-2009



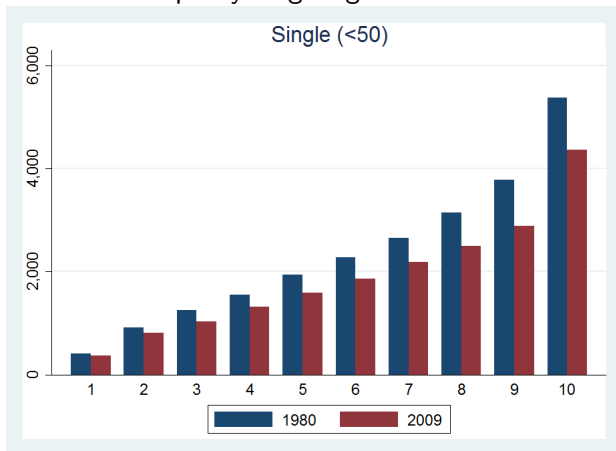
# The *even larger* decline in calories from food at home

	Single under 50	Single 50+	Lone parent	Couple	Family	Other	All
<i>Calories purchased, per household per day</i>							
1980	2323	2902	6229	5581	8927	10031	7050
1990	1940	2619	4638	4731	7111	7839	5410
2000	2185	2548	4747	4472	6554	7162	4821
2009	1887	2310	4101	4184	5942	6522	4304
<i>Percentage change 1980-2009</i>							
	-18.8	-20.4	-34.2	-25.0	-33.4	-35.0	-27.2

**Table:** Calorie purchased for consumption at home, 1980-2009

# Are some households reducing a lot and others very little?

Example: young single households



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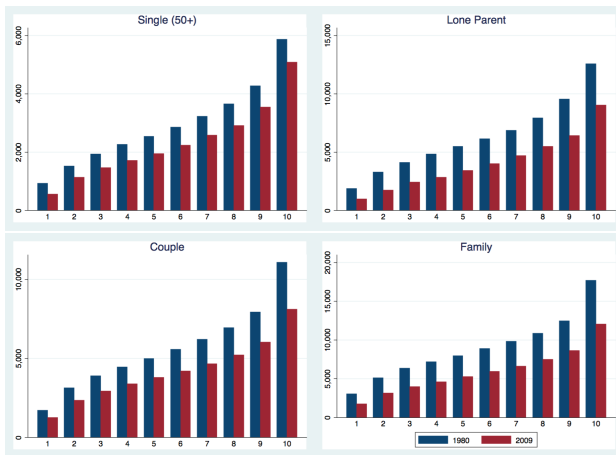
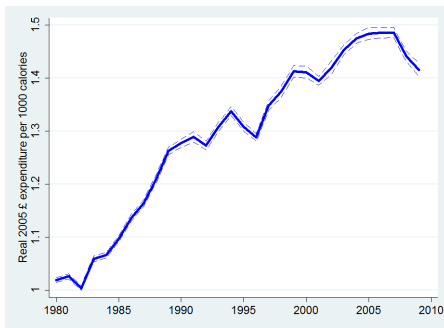


Figure: Table: Calories from food at home by decile, 1980 vs. 2009

# A shift towards more expensive calories?

- calories have fallen faster than real expenditure  
→ real expenditure per calorie has increased
- increase by ca. 50% from £1 to about £1.50
- shift towards more expensive calories, but recent reversal since 2007



Real expenditure measured in Dec 2005 prices, deflated by food prices

# Calories consumed at home and from other sources

This large *decrease* in calories from food at home is counteracted by....

an *increase* in calories from eating out, snacks and soft drinks

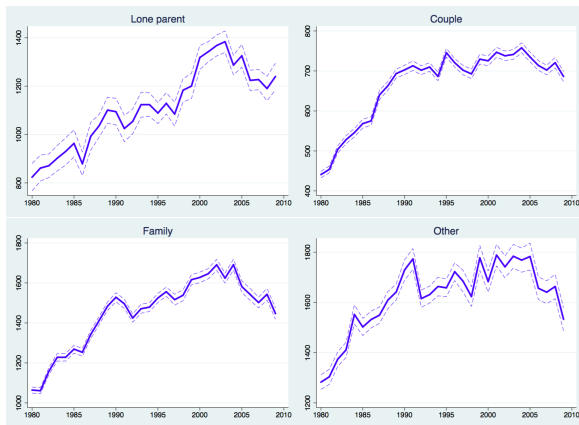
# Calories from eating out, soft drinks and snacks

## Increase in calories from eating out, soft drinks, and snacks

	Single < 50	Single 50+	Lone parent	Couple	Family	Other
<i>Calories purchased, per household per day</i>						
1980	435	178	823	441	1064	1283
2009	437	302	1240	686	1447	1533
<i>Percentage change 1980-2009</i>						
	0.4	69.7	50.7	55.6	36.0	19.5

**Table:** Calorie purchased for consumption out side of home, 1980-2009

# But diverging trends across households....





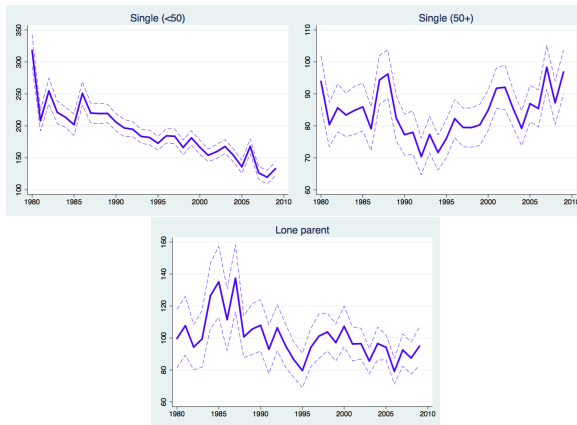
....particularly among single households



# Calories from alcohol

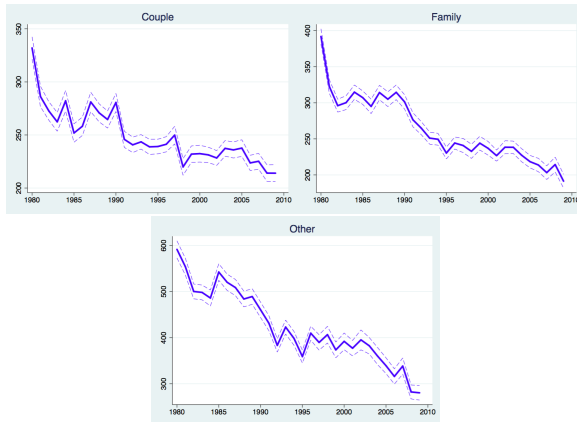
# Decline in Calories from alcohol

In single-adult households:

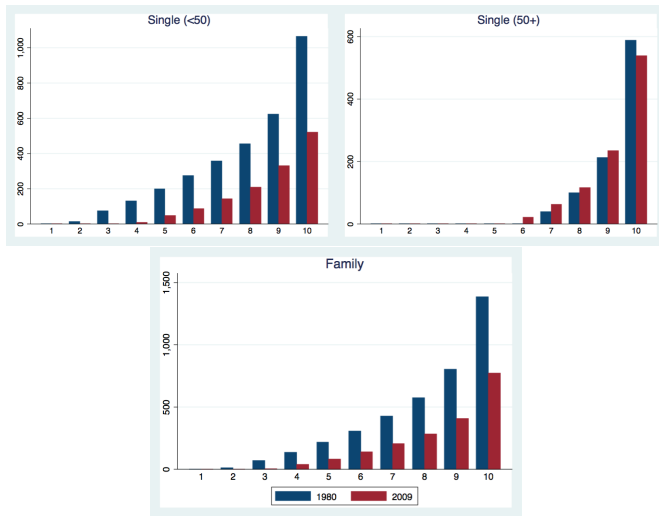


# Decline in Calories from alcohol

In multi-adult households:



...for some more than for others



# Adding the pieces of the puzzle together

- large decline calories from food purchased for home consumption
  - observed across all households
  - strongest among lone parents (-34%), couples with children (-33%) and other households
  - smallest decline in young single households (-19%)
- counteracted by an *increase* in calories from eating out, snacks and soft drinks
  - especially in older single, lone parent and couple households
  - but not in young single households
- for both foods, real expenditure per calorie has increased:
  - by ca. 50% for food at home
  - by ca. 20% for eating out, softdrinks and snacks
- a decline in calories from alcohol
  - strongest among young single households

# Diet composition: what is the main driver of the overall decline?

Food at home accounts for at least 70% of total calories

	Food at home	
	1980	2009
Single (< 50)	71.2	73.4
Single (50+)	90.6	82.9
Lone parent	86.1	73.6
Couple	86.3	80.5
Family	84.6	76.5
Other	83.2	76.6

# Diet composition: looking at calorie shares

- Alcohol accounts only for 2 to 6% of all calories
- its decline is similar to the general decline in calories
- calories from eating out, soft drinks and snacks account for at most a quarter of all calories
  - calories from all foods and drinks fall over time despite an increase in calories from eating out, soft drinks and snacks



# Should you believe our findings/data?

- our trends look identical to the one in the next report which uses different data
- we compared our alcohol results to clearance data
- we performed robustness checks using the National Accounts

# What could be driving obesity then?

- First law of thermodynamics:  
Weight gain = Energy in - Energy out  
where energy expended varies by bodyweight and (basal) metabolic rate
- weight gain is gradual, so small sustained imbalances suffice
- Could energy expenditure have declined, too?

# Ongoing work: Physical activity

In ongoing work we use additional measures of physical activity (PA)

- work has become more sedentary, due to the changing industry and occupation mix in Britain
- women reduce (manually strenuous) housework and increase their labour force participation and work hours
- but not a 1:1 substitution
- (largely sedentary) commuting time has increased (and become more sedentary)

Importance to link both physical activity *and* nutrition

→ maybe we are still eating too much given the reduction in physical activity?