

Diabetes and Obesity in Women of Childbearing Age

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A Few Perceptions

- What causes obesity?
 - Your lifestyle has changed thus you have put on weight – i.e. it's YOUR OWN FAULT!
 - There is an abundance of food being made available 24/7 and no longer any reason or incentive to do physical activity – i.e. it's SOCIETY'S FAULT
 - 'It's my genes' – i.e. it's YOUR PARENTS FAULT

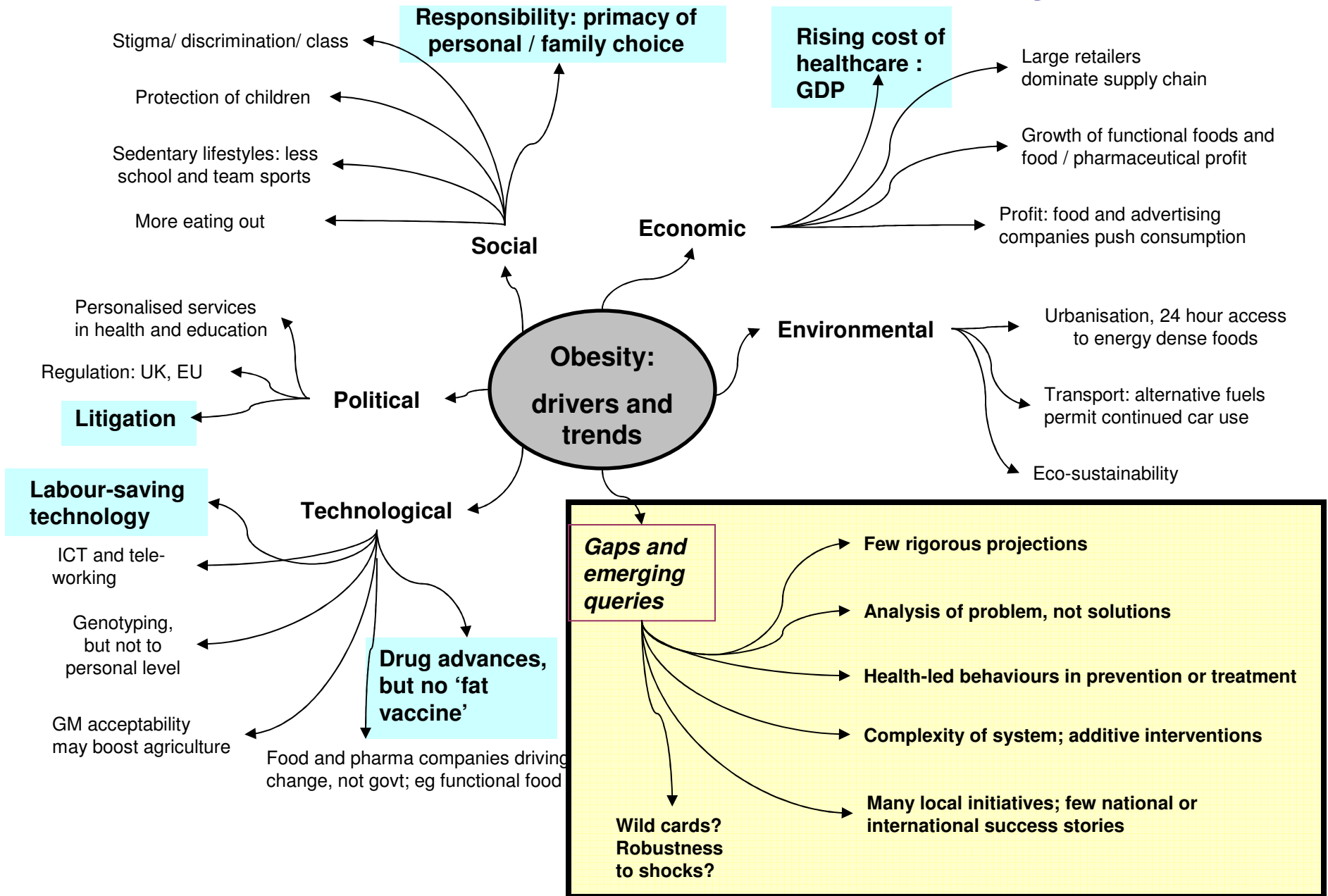
Genetics?

- Studies looking at MZ and DZ twins separated at birth in Sweden in the 1950's show that BMI is 70% genetic

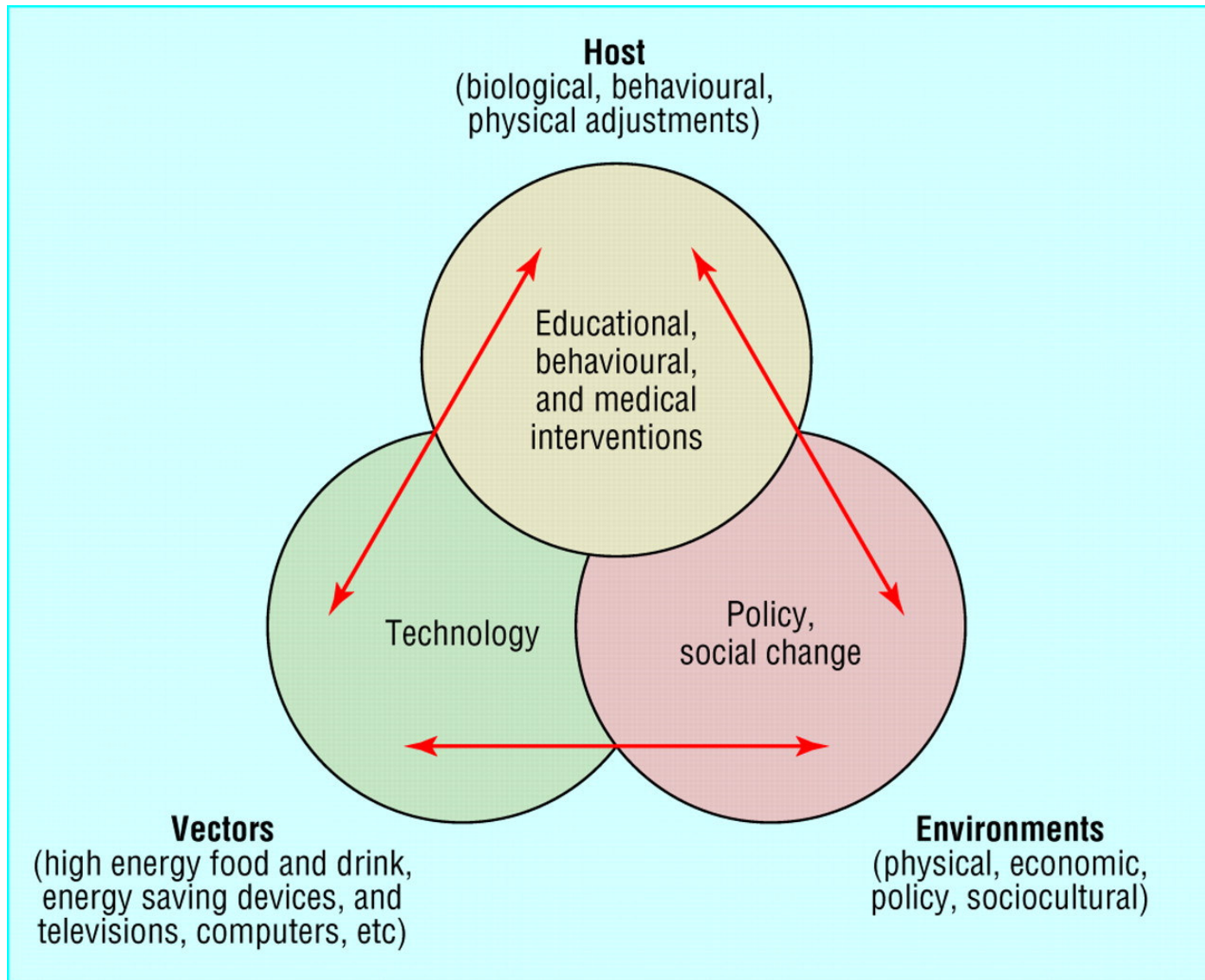
Stunkard et al NEJM 1990;322:1483-1487

- Recently the melanocortin receptor gene *MC4R* has been implicated to be abnormal in 1:1000 UK population, and may account for up to 5% of the obese population

But That is Not the Whole Story

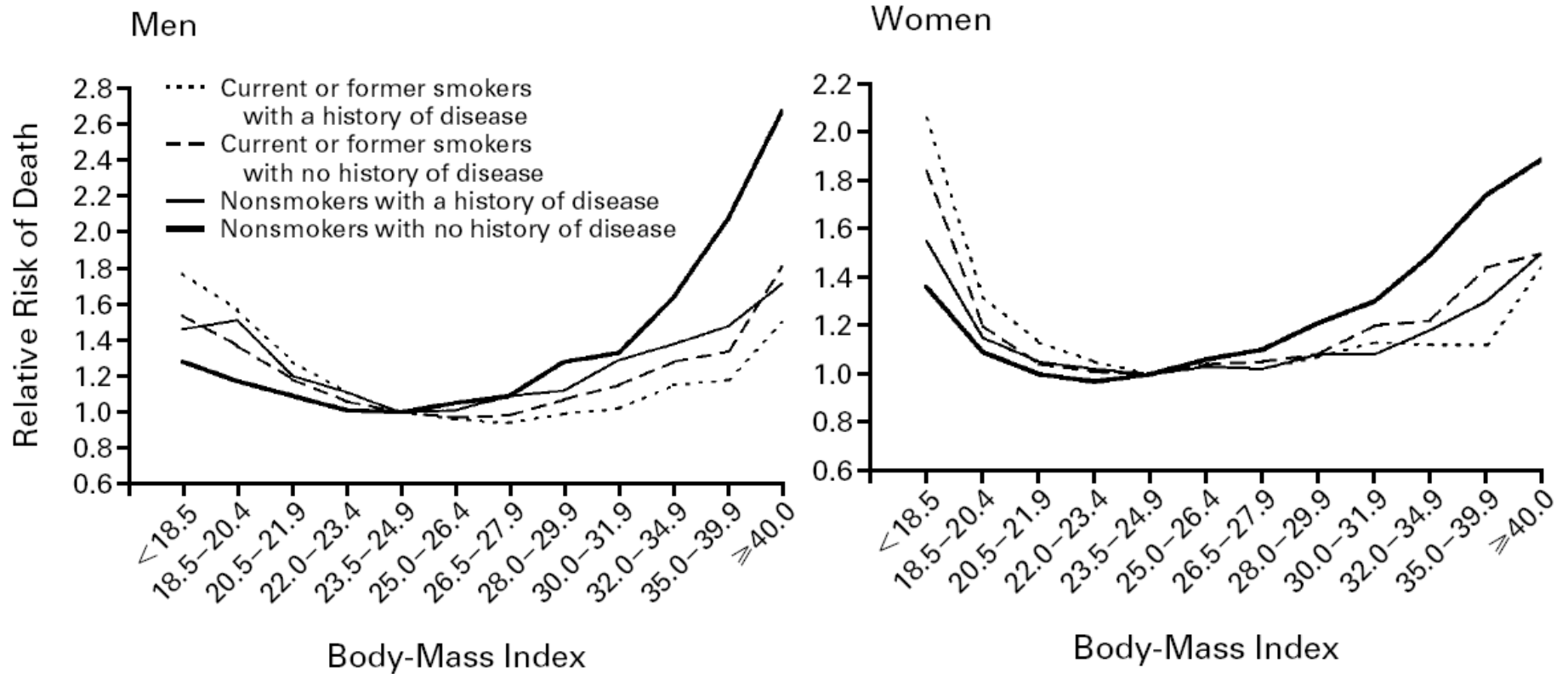


This Can be Summarised



Why is Obesity Important?

Because the higher your BMI, the more likely you are to die



It All Starts in Childhood

WHO Region (dates of most recent surveys)	Most recent surveys		Projected 2006		Projected 2010	
	Overweight (inc obesity)%	Obesity%	Overweight (inc obesity)%	Obesity%	Overweight (inc obesity)%	Obesity%
Africa (1987–2003)	1.6	0.2	*	*	*	*
Americas (1988–2002)	27.7	9.6	40.0	13.2	46.4	15.2
Eastern Med (1992–2001)	23.5	5.9	35.3	9.4	41.7	11.5
Europe (1992–2003)	25.5	5.4	31.8	7.9	38.2	10.0
South East Asia (1997–2002)	10.6	1.5	16.6	3.3	22.9	5.3
West Pacific (1993–2000)	12.0	2.3	20.8	5.0	27.2	7.0

It All Starts in Childhood

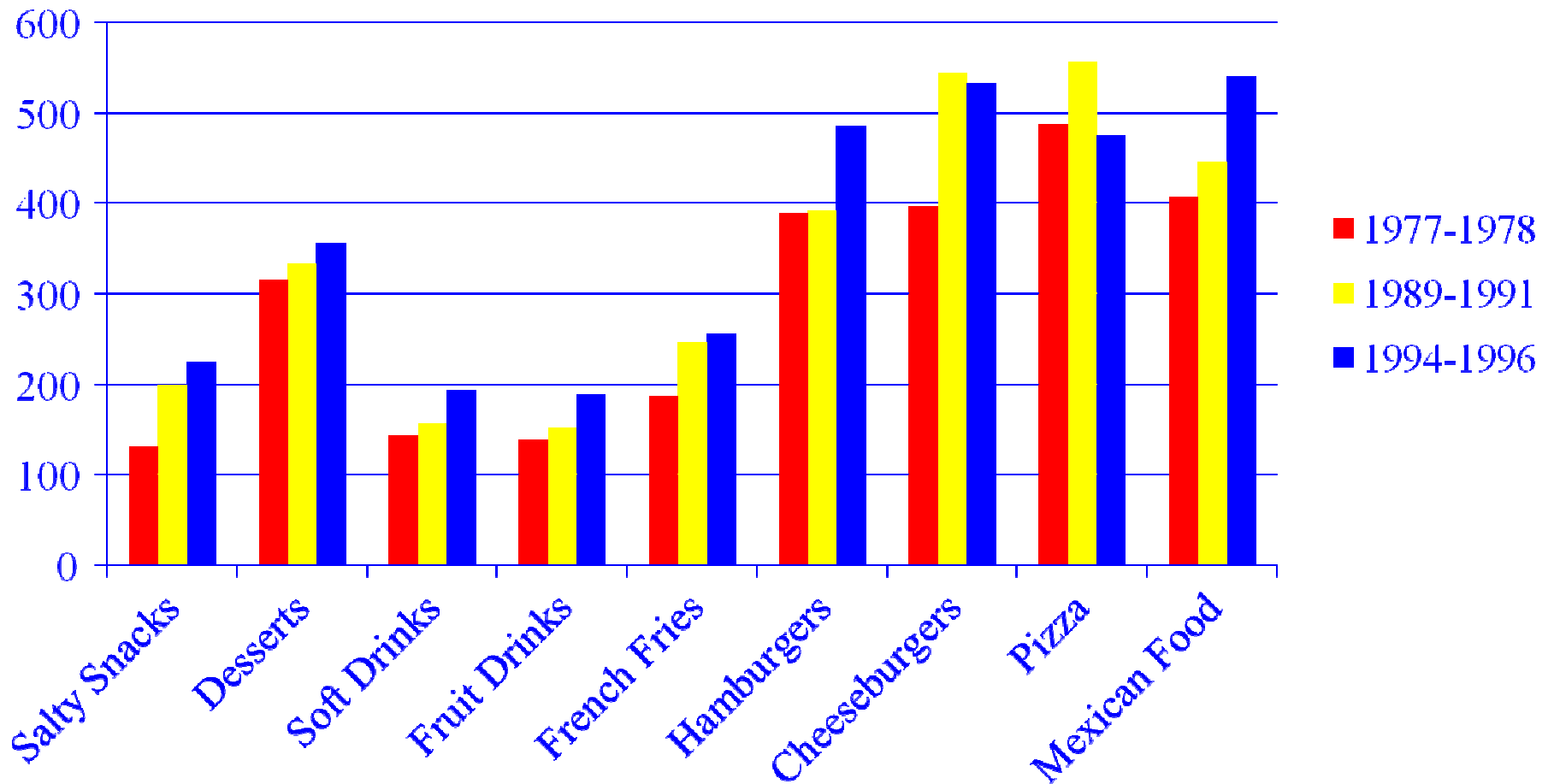
Prevalence of Risk of Overweight or Overweight by Age, % (SE)

	Male				Female			
	All (2-19 y)	2-5 y	6-11 y	12-19 y	All (2-19 y)	2-5 y	6-11 y	12-19 y
All†								
At risk of overweight or overweight‡								
1999-2000	28.9 (2.7)	21.9 (3.6)	31.9 (4.1)	30.0 (2.2)	27.4 (1.1)	22.2 (2.6)	27.4 (2.4)	30.0 (2.3)
2001-2002	30.6 (1.2)	24.2 (3.0)	32.6 (2.5)	31.5 (2.1)	29.4 (1.6)	22.8 (2.7)	31.6 (3.3)	30.6 (1.6)
2003-2004	34.8 (2.2)	27.3 (2.8)	36.5 (3.1)	36.8 (2.9)	32.4 (2.0)	25.2 (2.8)	38.0 (2.5)	31.7 (3.0)
Overweight§								
1999-2000	14.0 (1.2)	9.5 (2.3)	15.7 (1.8)	14.8 (1.3)	13.8 (1.1)	11.2 (2.5)	14.3 (2.1)	14.8 (1.0)
2001-2002	16.4 (1.0)	10.7 (2.4)	17.5 (1.9)	17.6 (1.3)	14.4 (1.3)	10.5 (1.8)	14.9 (2.4)	15.7 (1.9)
2003-2004	18.2 (1.5)	15.1 (1.7)	19.9 (2.0)	18.3 (1.9)	16.0 (1.4)	12.6 (2.4)	17.6 (1.3)	16.4 (2.3)

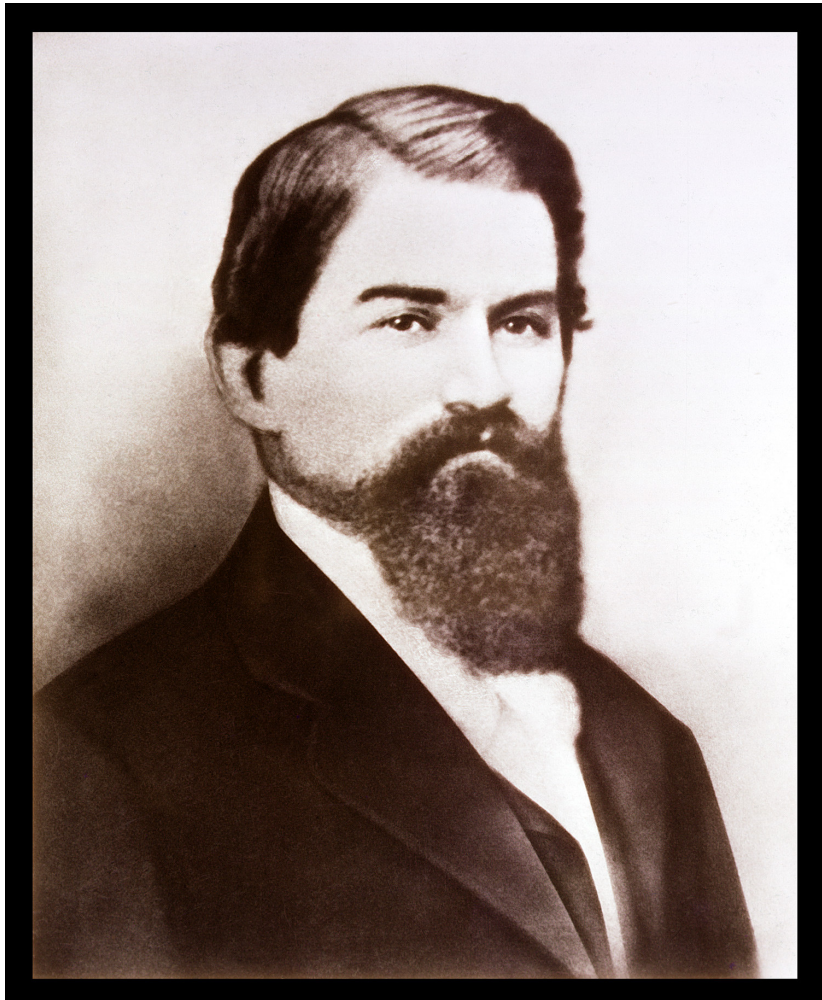
20% rise and 30% rise in 5 years

18.2% rise and 16% rise in 5 years

Trends in Energy Intake of Key Food Items for Americans aged 2 years and Older (kcal)



Who is This?



John Pemberton

1831-1888

Pharmacist

Inventor Of Coca Cola

Parents Don't Recognise Obese Children

- Only 1.9% of parents of overweight children and 17.1% of parents of obese children described their child as overweight.
- Parents of 3-5 year olds show poor awareness of their child's current weight status
- Few parents perceived their overweight children as overweight, more expressed concern about their overweight child becoming overweight in the future.

Not all Obese Children go on to become Obese Adults

- But 9 out of 10 do
- Especially those who were largest and grew quickest in infancy

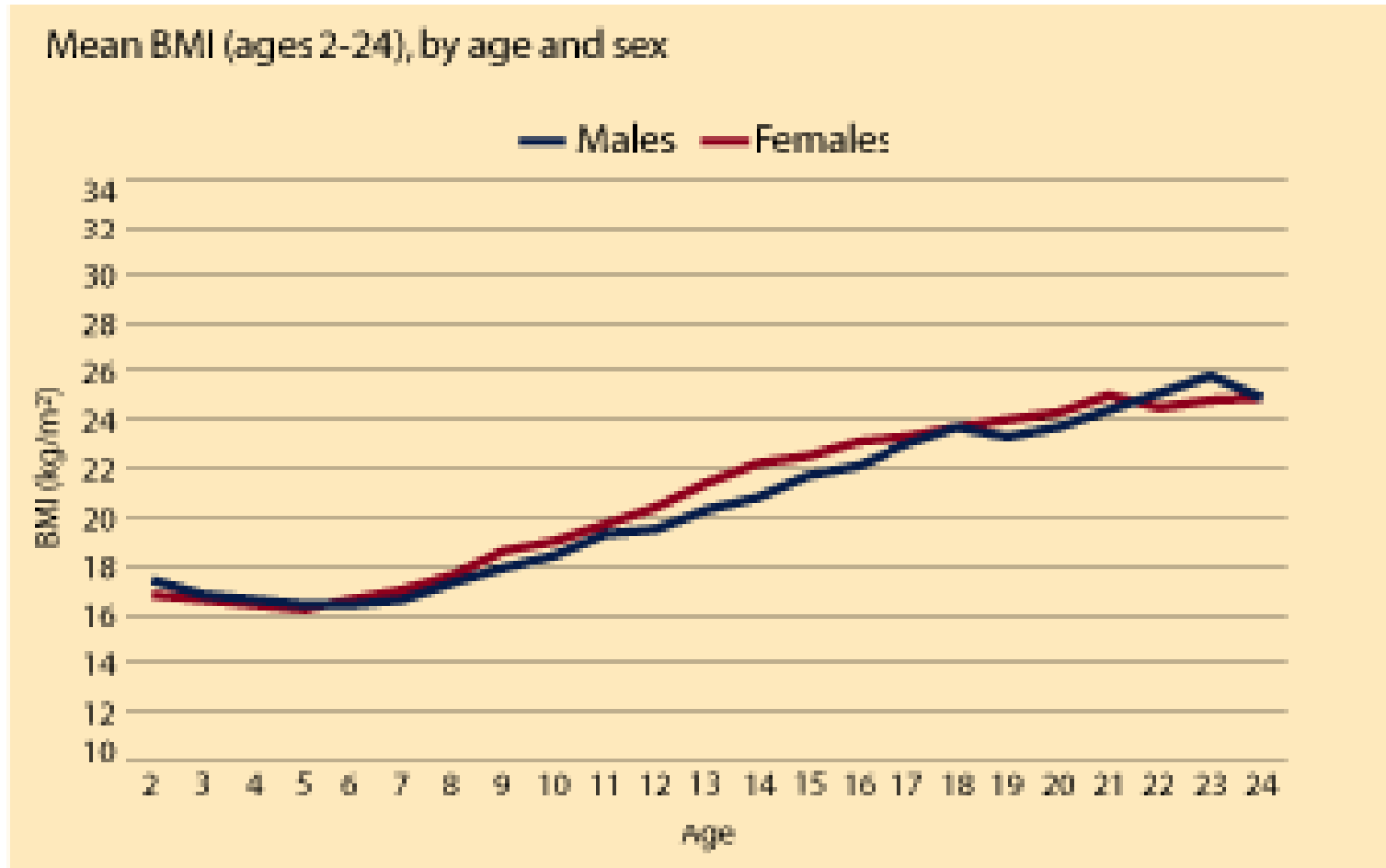
Fat Children Don't Necessarily Become Fat Adults

- But, fat female children who remain overweight as adults have significantly lower overall income, due to poorer employment, as well as poorer relationship outcomes
- Overweight workers find it harder to get jobs than their slim counterparts

Risks of Obesity in Childhood

- Diabetes
- Metabolic Syndrome
- Hyperandrogenism
- Cardiovascular factors
 - Heart disease
 - Hypertension
- Respiratory factors
 - Asthma
 - Sleep disorders
- Visceral factors
 - Non alcoholic fatty liver disease
 - Gall bladder disease
- Orthopaedic factors – SUFE, OA
- Dermatologic factors – e.g. acanthosis nigricans
- Neurological factors

Mean BMI in UK Children in 2002



Why is it Important?

- Cardiovascular mortality is directly related to BMI

<u>Risk Factor</u>	<u>Relative Risk</u>
BMI	
25 kg/m ²	1.1
30 kg/m ²	1.5
35 kg/m ²	2.5
Diastolic BP of 100 mmHg	2.0
Diastolic BP of 120 mmHg	5.0
Cholesterol of 6.7 mmol/l	1.8
Cholesterol of 8.3 mmol/l	4.0

Death Rates are Declining in Men but Not Women

Figure 1. Age-adjusted all-cause mortality rates among the U.S. population age 35 to 74 years with and without diabetes, by cohort and sex.

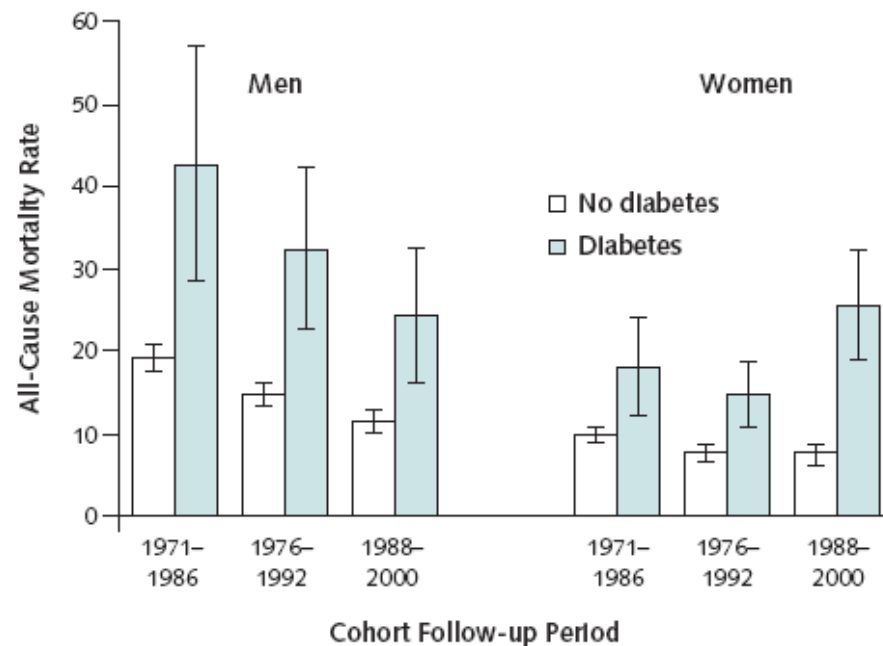
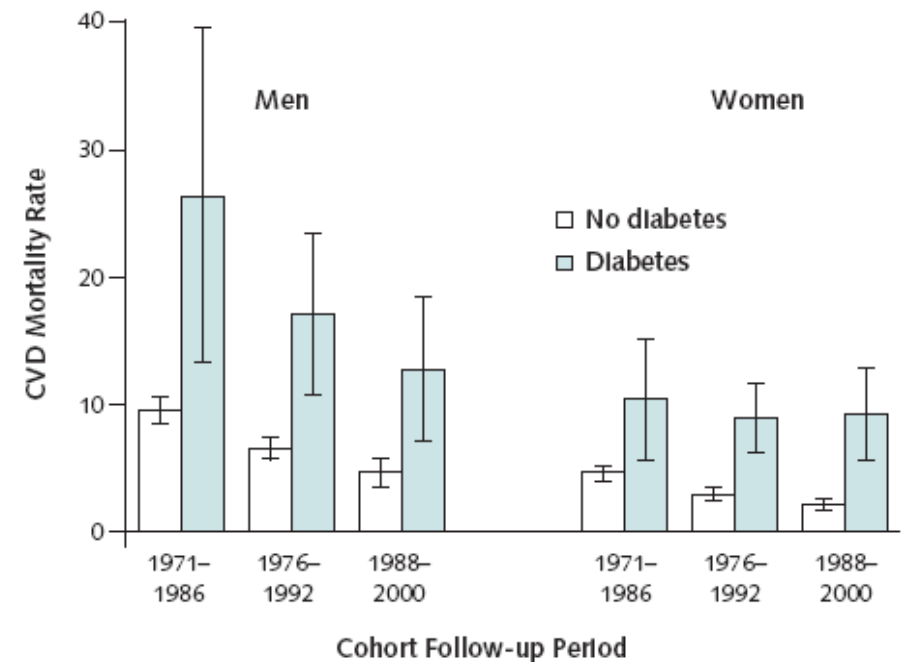


Figure 2. Age-adjusted cardiovascular disease mortality rates among the U.S. population age 35 to 74 years with and without diabetes, by cohort and sex.



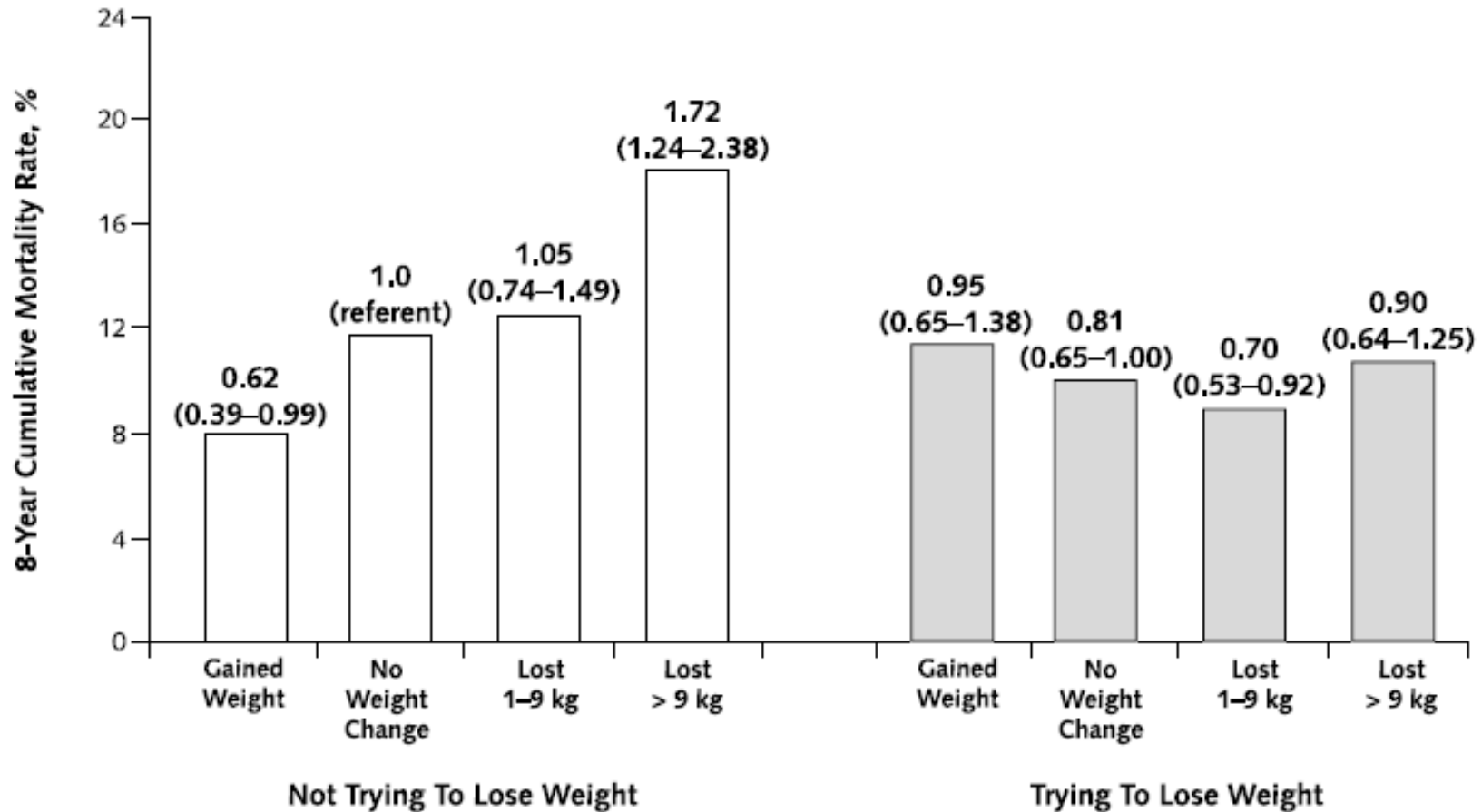
Moderate Weight Loss is Beneficial (10% Weight Loss from 100 kg Bodyweight)

Mortality	↓ 20-25% total ↓ 30-40% diabetes related ↓ 40-50% obesity-related cancer
Blood pressure	↓ 10 mmHg systolic & diastolic
Diabetes	↓ 50% in diabetes risk ↓ 30-50% in fasting glucose ↓ 15% in HbA _{1c}
Lipids	↓ 10% total cholesterol ↓ 15% LDL cholesterol ↓ 30% triglycerides ↑ 8% HDL

+ psychological, physical and other metabolic benefits

Adapted from Royal College of Physicians Guidelines. December, 1998

Even *Trying* to Lose Weight is Associated With Lower Mortality



Some Simple Maths

- 1 Kg of fat = 9,000 kcal
- Realistic sustainable weight loss is about 1 pound per week
- 1 lb ~ 4,100 kcal
- $4,100/7 = 600$ kcal per day
- This means about 300 kcal doing more and 300 kcal eating less

Or, To Put it Another Way

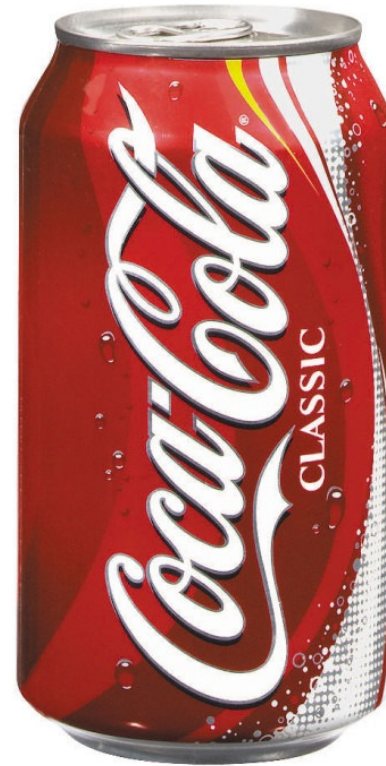
- Average dietary intake 2,500 Calories per day
- $\times 365 = 912,500$ per year
- 1% too little expenditure = 9125 calories kept on board = 1Kg weight gain per year

How to Consume Less

500 mls = 215 kcal

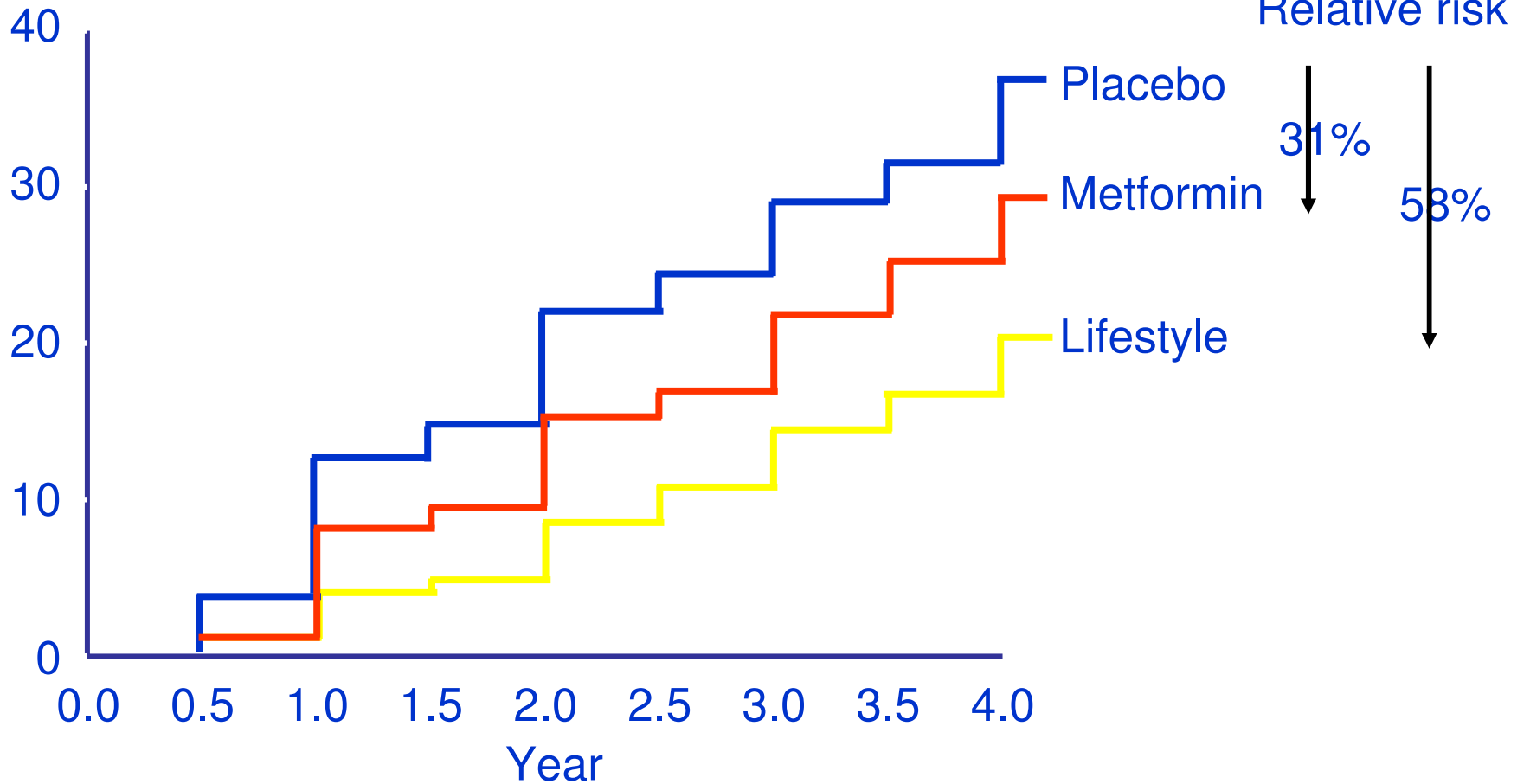
330 mls = 142 kcal

A saving of 73 kcal



Diabetes Prevention Program

Cumulative incidence of diabetes (%)



DPP. N Engl J Med 2002; 346: 393-403

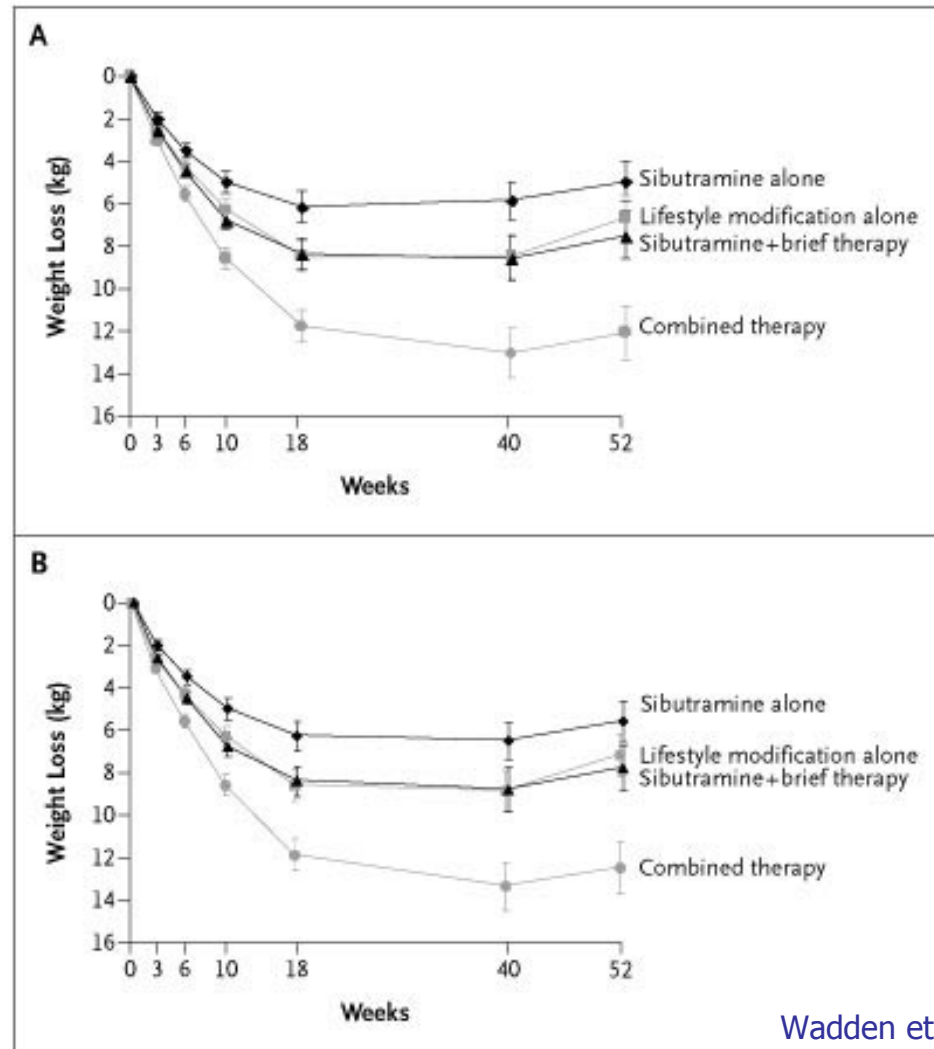
Weight Loss Drugs

- Orlistat
- Sibutramine
- Rimonabant

Recent Data

- Comparing weight loss of MTF (\pm SU) with orlistat or placebo
- Threefold greater reduction in weight with orlistat compared with placebo recipients (5.0% vs. 1.8%; $P < 0.0001$)
- Also significant reductions in
 - HbA1C
 - Waist circumference
 - Fasting glucose
 - Fasting cholesterol

Effect of Sibutramine or Lifestyle on Weight Loss





£2-a-day tablet that reduces weight by 10% is now available in Britain ...

IT'S HERE! PILL THAT CUTS YOUR WEIGHT

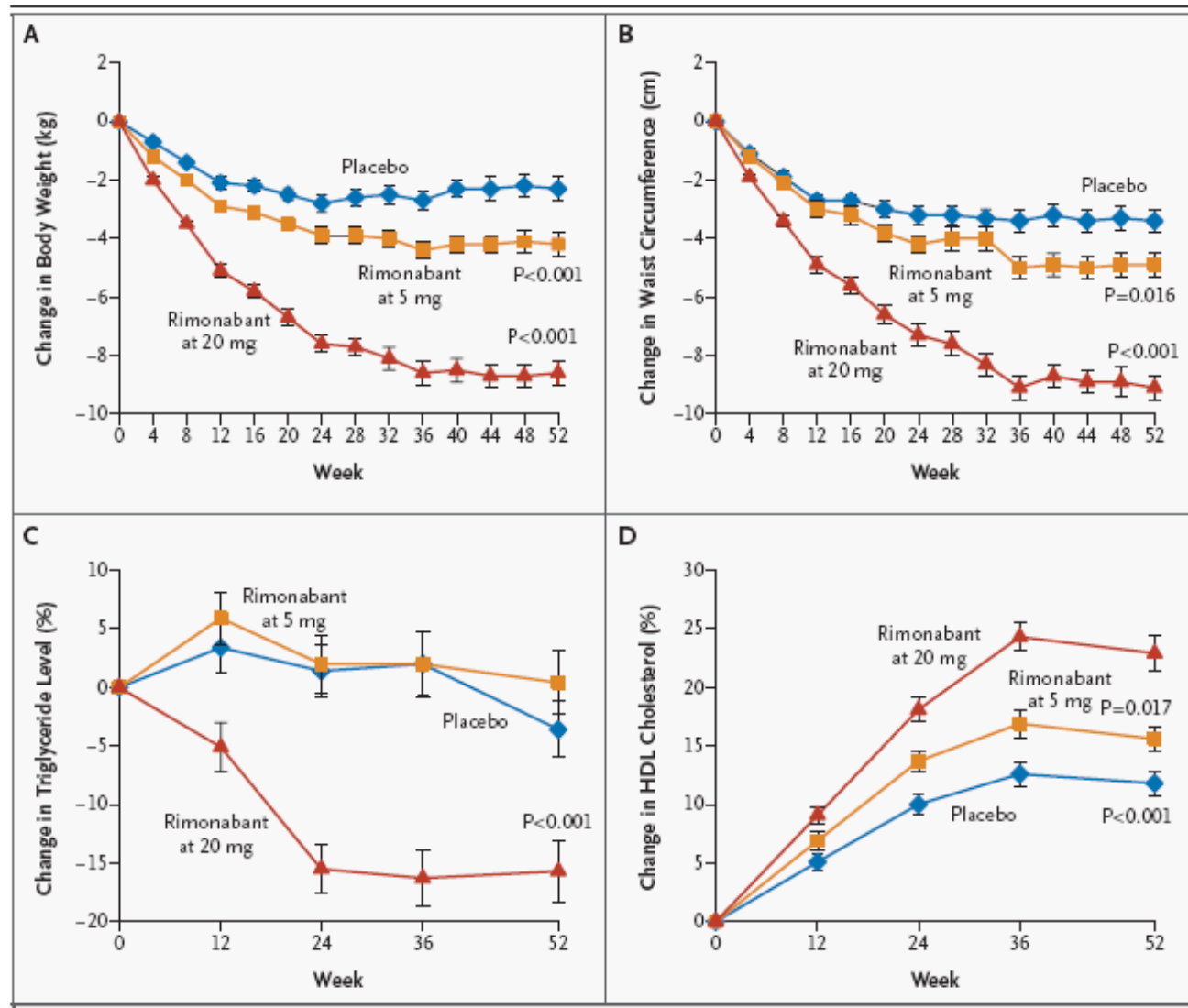
A DRUG which can cut ten per cent of body weight in a year by reducing the desire to eat is now available in the UK.

The once-a-day pill, named Acemiplia, is

By **Julie Wheldon**
Science Correspondent

it following its UK launch yesterday. In all cases patients must have already tried diet and exercise to shed excess weight before getting the drug and continue with such effort.

Effect of Rimonabant on Weight Loss



Any Questions?