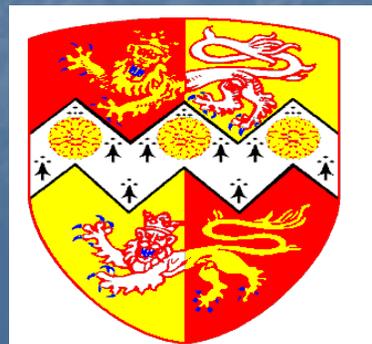


# Obesity

**Dr Ketan Dhatariya** MBBS MSc MD MS FRCP

Consultant in Diabetes and Endocrinology

Norfolk and Norwich University Hospital NHS Foundation Trust



# Let's Talk About Perception

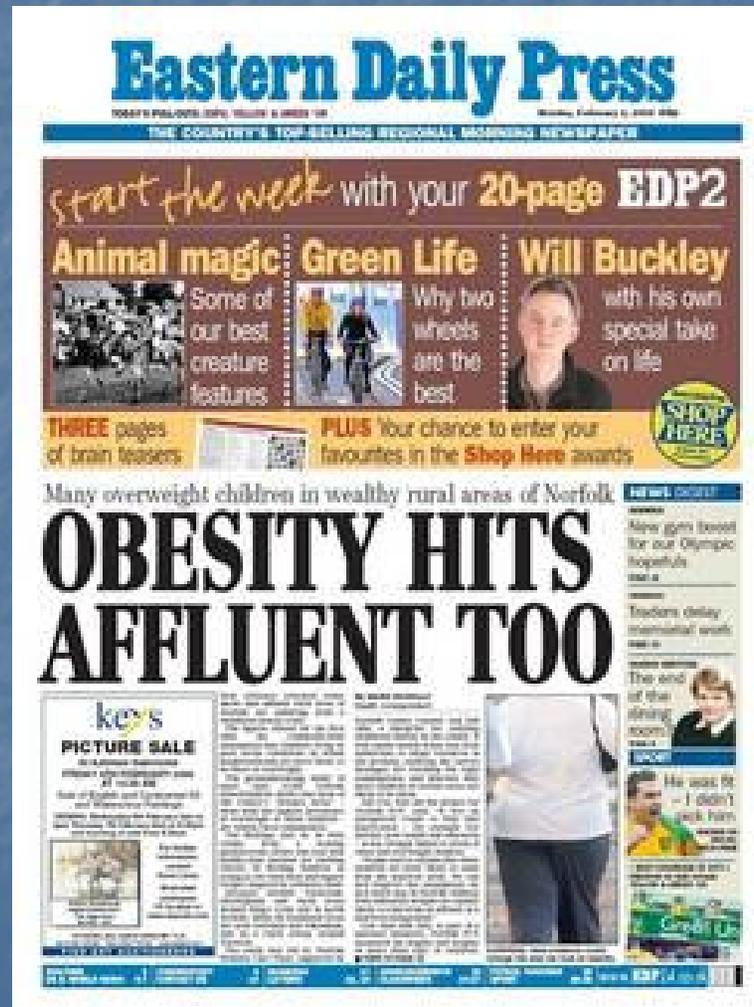








# EDP – 4<sup>th</sup> February 2008





Number of patients with weight issues treble in two years

# COUNTY FACING OBESITY CRISIS

By SARAH HALL  
Health correspondent

Fears of a "massive public health crisis" were raised last night as new figures showed the number of people admitted to hospital in Norfolk because of obesity had almost trebled in the past two years.

In the NHS Norfolk area there were 124 admissions to hospital in 2008/2009, compared to 67 the previous year and 44 in 2006/2007.

It was a similar picture for NHS Yarmouth and Waveney which had 18 admissions in 2008/2009, a rise from 13 the previous year and 11 the year before.

The figures refer to admissions where obesity is a predominant cause of ill health but it is believed hundreds more attend hospital outpatient departments with associated problems.

The news comes as a blow to health authorities which have worked hard to reduce obesity levels through a number of local and national initiatives.

Obesity can cause a wide range of health problems including heart disease, high blood pressure and



NEW APPROACH NEEDED: MP Norman Lamb.

diabetes, as well as some cancers.

North Norfolk MP Norman Lamb said: "This is yet more evidence highlighting this growing problem. "Obesity is a massive public health crisis, which causes misery to millions of people and has the potential to bankrupt the NHS."

Mr Lamb, health spokesman for the Liberal Democrats, said:

"Tackling this problem is going to mean looking at new approaches like incentives to get people off the sofa."

Earlier this year, a report by NHS Norfolk showed that 18.3pc of 10 and 11-year-olds were classed as obese - a rise from 16.2pc last year.

Obesity is calculated using a formula known as Body Mass Index (BMI) based on height and weight. If it is higher than 25, someone is considered overweight and they are classed obese if it is above 30.

Across England, hospital admissions for obesity have risen on average 60pc in the past year and by 360pc compared to five years ago, according to the statistics released by the NHS Information Centre.

In 2006, beds at the Norfolk and Norwich University Hospital had to be reinforced and mortuary slabs strengthened because of the increasing number of obese patients.

The James Paget University Hospital in Gorleston has had to make similar investments to deal with the obesity crisis and three

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drive24



Find out who's won the Community Chest Challenge

PAGE 3

Puzzles 8 pages



Going the extra mile to help make our children healthier

PAGES 14 - 15



# Some Definitions.....

Table 1. Standard BMI classification

<b>BMI range (kg/m<sup>2</sup>)</b>	<b>Classification</b>
< 17	Malnourished
17–<20	Underweight
20–<25	Normal weight
25–<30	Overweight
30–<40	Obese
≥ 40	Morbidly obese



Health Profile of England 2008

## Executive summary

What the Health Profile of England 2008 shows – the general picture

- there are areas of concern, eg:
  - increasing levels of obesity in adults and children

## Health Profile of England 2008

- The prevalence of obesity in England is the highest in the EU-15 countries, and one of the highest in the wider cohort of OECD countries

# Trends on Obesity over Time

1 year ago 5 years ago

Physically active children (PE and school sport) (d)	2007/08		90	%	86	62
Obese children (aged 2 to 10) (e) (v)	2007		15.4	%	15.2	13.8
Healthy eating (Five a day) - children (f) (v)	2007		21	%	21	11

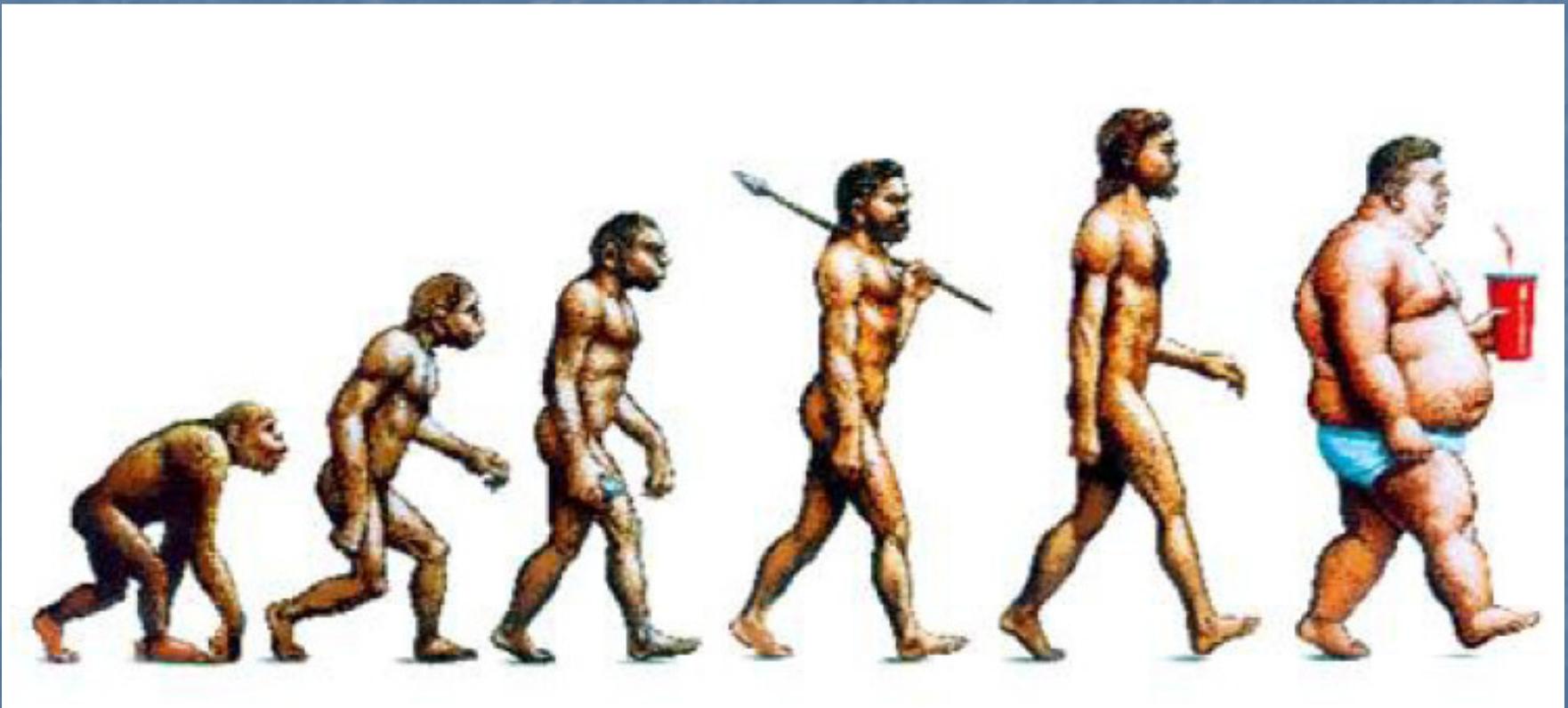
11.5 % rise over 5 years

Healthy eating (Five a day) - adult females (f) (h)	2007		31	%	32	26
Healthy eating (Five a day) - adult males (f) (h)	2007		27	%	28	22
Physically active adults - females (g) (h)	2006		28	%	25	24
Physically active adults - males (g) (h)	2006		40	%	37	36
Obese adults - females (h) (i)	2007		24.4	%	24.2	23.0
Obese adults - males (h) (i)	2007		23.6	%	23.7	22.2

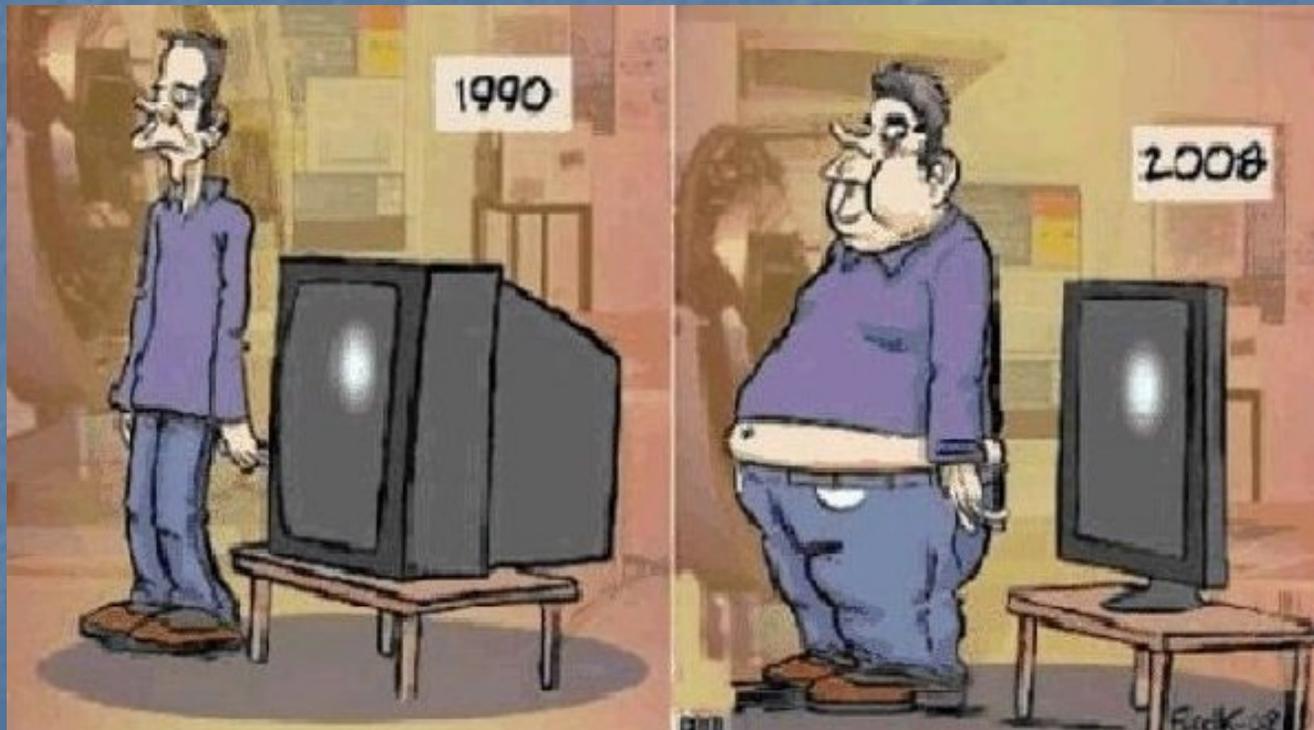
People with diabetes - adult females (i) (a)	2006		4.2	%	nd	3.4
People with diabetes - adult males (i) (a)	2006		5.6	%	nd	4.3

23.5 % rise over 5 years in women  
30.2 % rise over 5 years in men

# The Shape of Things to Come?



# A Plausible Explanation?



# The Reality



Time 23<sup>rd</sup> June 2008

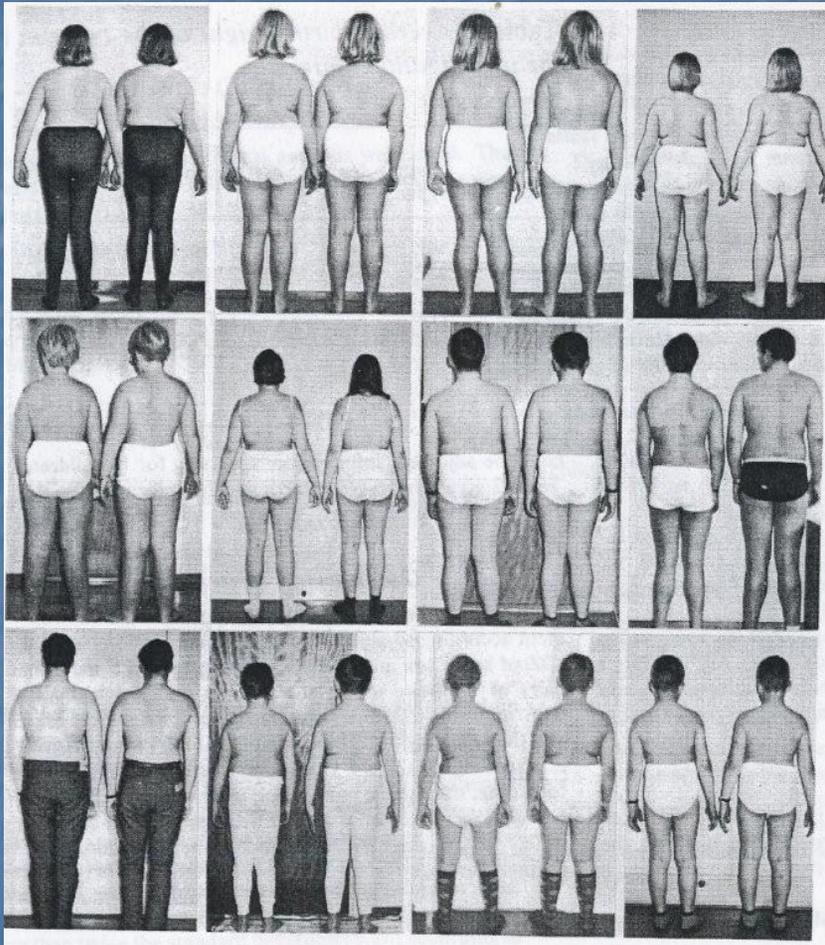
# The Numbers

- A 5 point rise in BMI is associated with a 30% rise in mortality
- Diet, exercise and CBT only really work in a small number of very motivated people

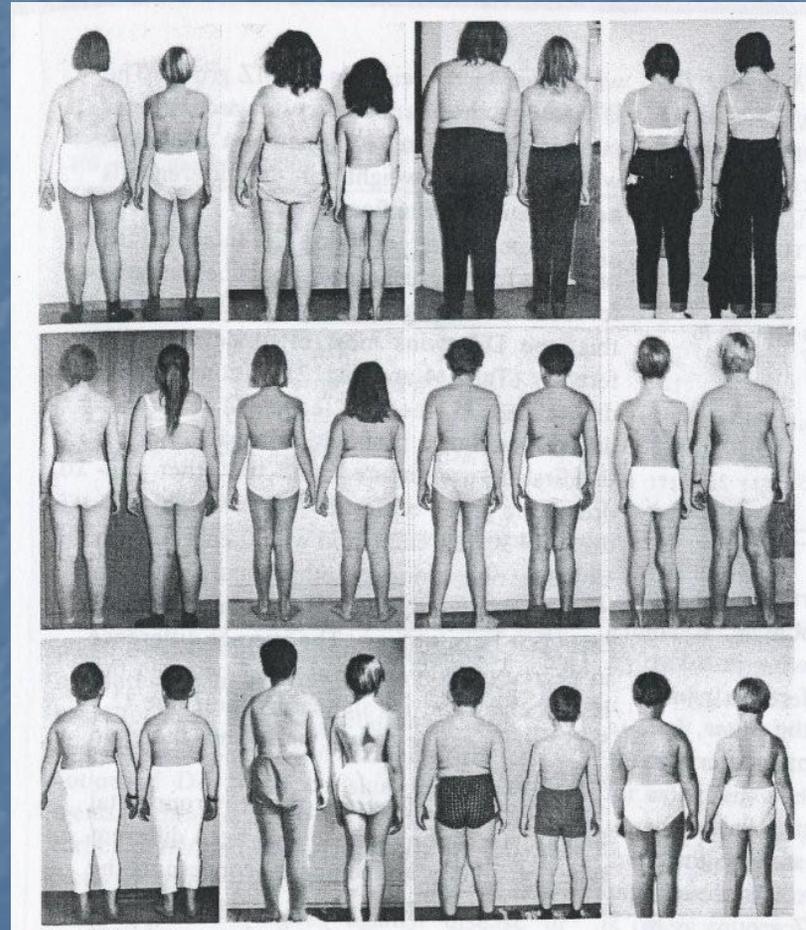
# A Few Perceptions

- 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

# Is it All in The Genes?



Monozygotic Twins



Dizygotic Twins

Borjeson M Acta Paed Scand 1976;65:279-287

# Is it Portion Size?



# It Could Be

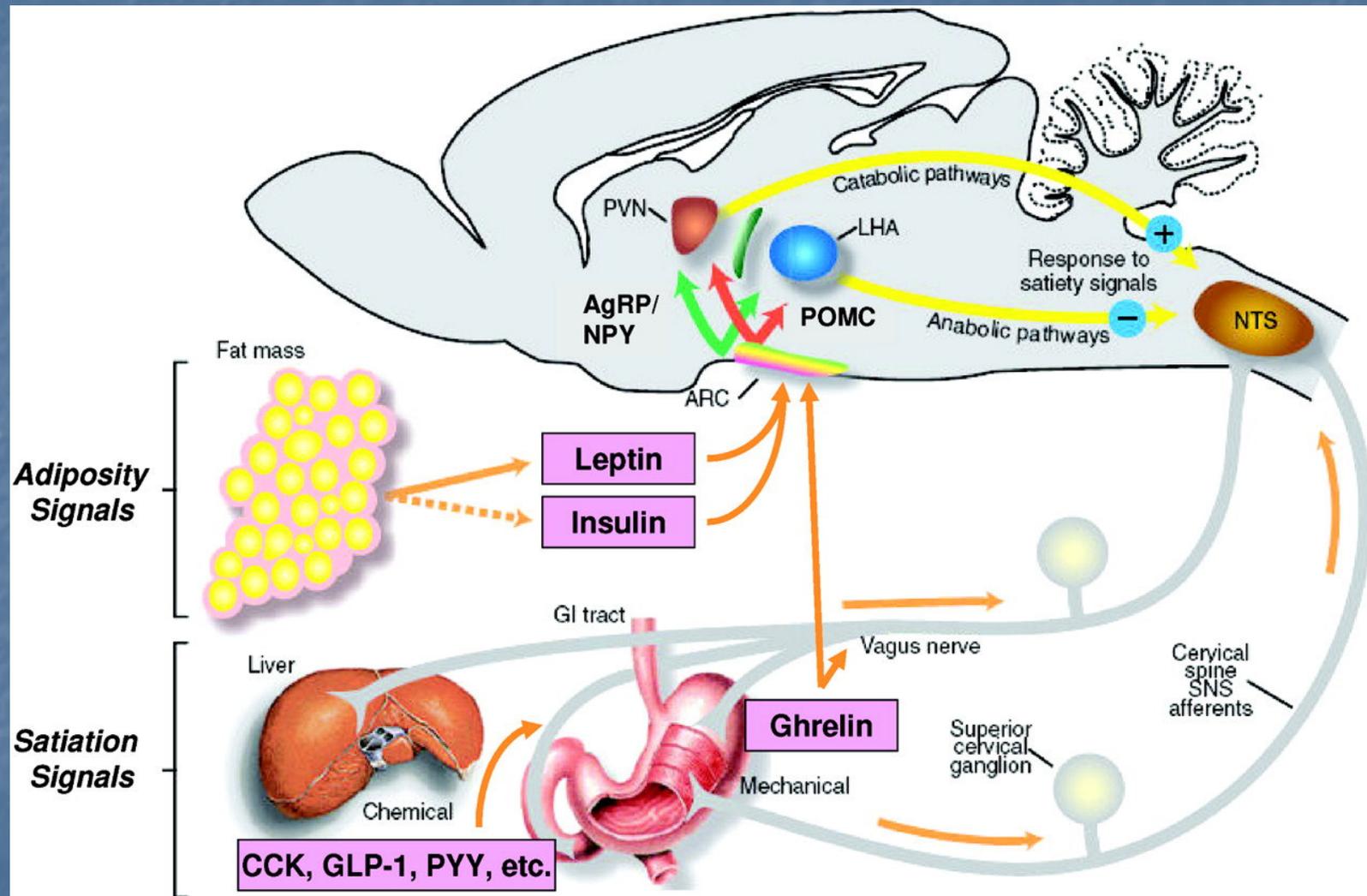
**Table 2. Usual Intake of Added Sugars (in Teaspoons),\* 2001–2004**

Age, y	n	Mean
1–3	1515	12.2
4–8	1701	21.0
Males 9–13	1061	29.2
Males 14–18	1424	34.3
Males $\geq 19$	4650	25.4
Females 9–13	1112	23.2
Females 14–18	1362	25.2
Females $\geq 19$	5063	18.3
All persons $\geq 1$	17 888	22.2

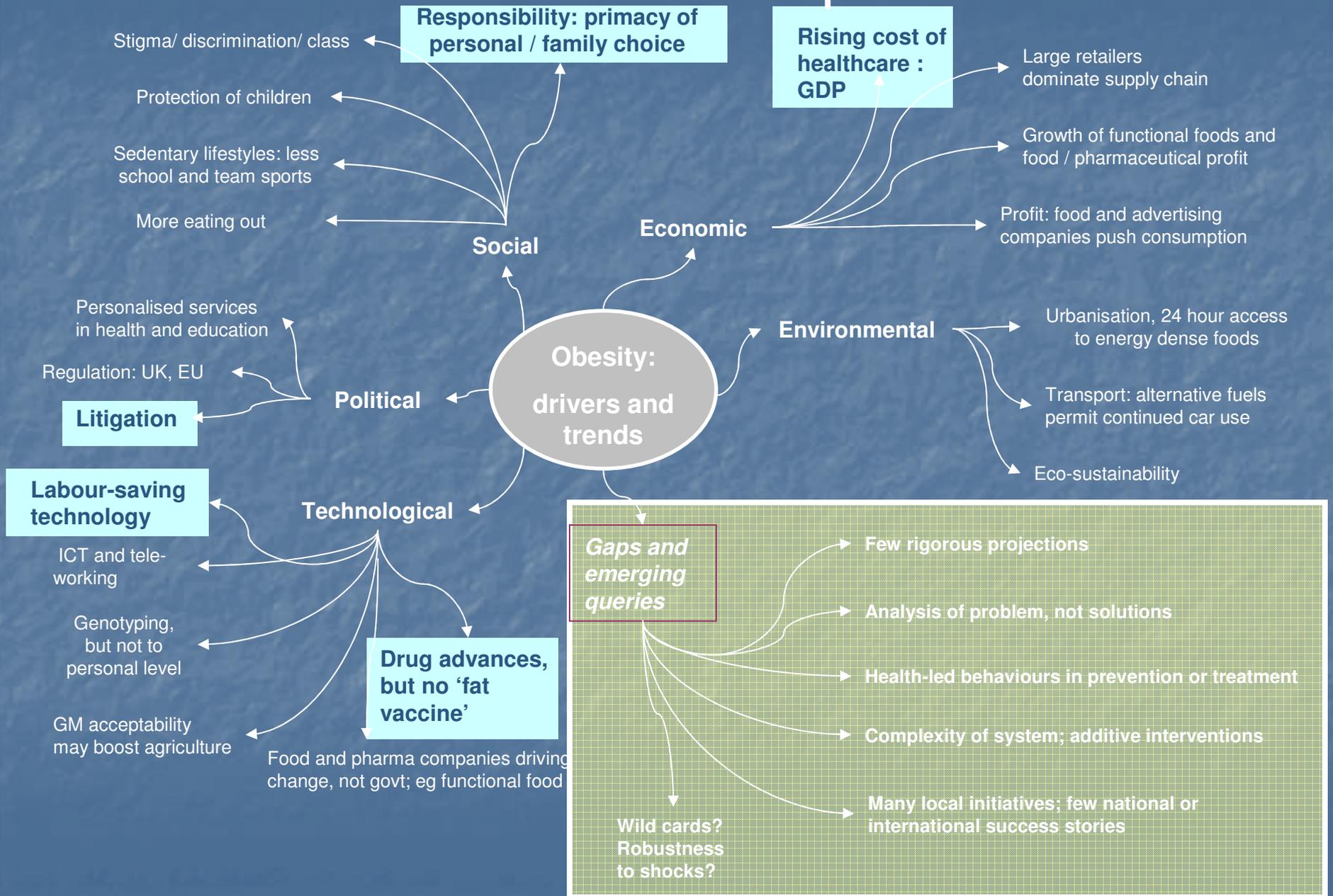
# Let's Work That Out

- Between 1970 and 2005, there was an average increased intake of sugar of 76 kcal per day
- $76 \times 365 = 27,740$
- $27,740/9000 = \sim 3$
- That's 3 kg of fat per year per person extra calories

# It's My Hormones Doctor



# Who or What is Responsible?



# Lots of Factors

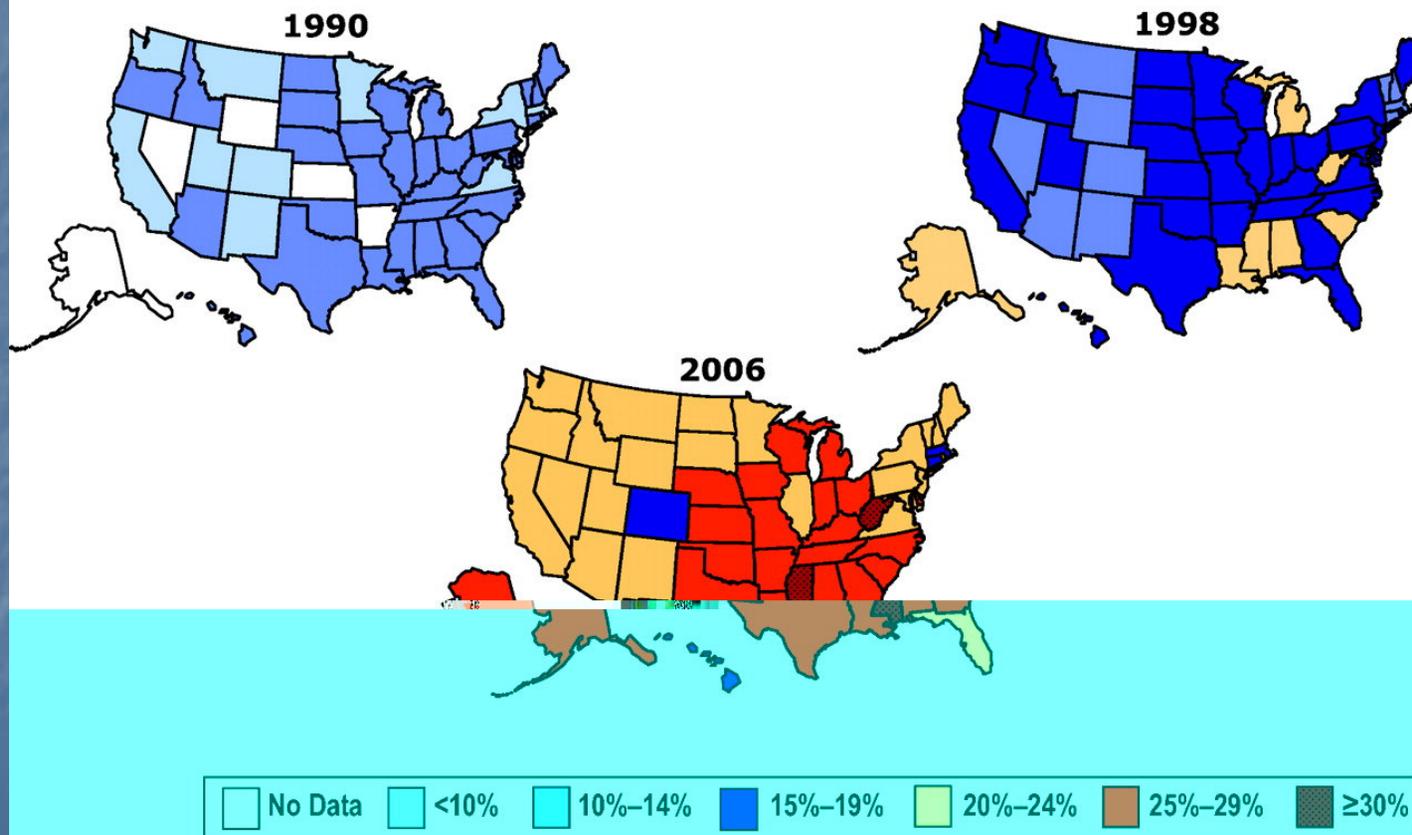


# The USA is Getting Bigger

## Obesity Trends\* Among U.S. Adults

**BRFSS, 1990, 1998, 2006**

(\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person)





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Gaglecartoons.com

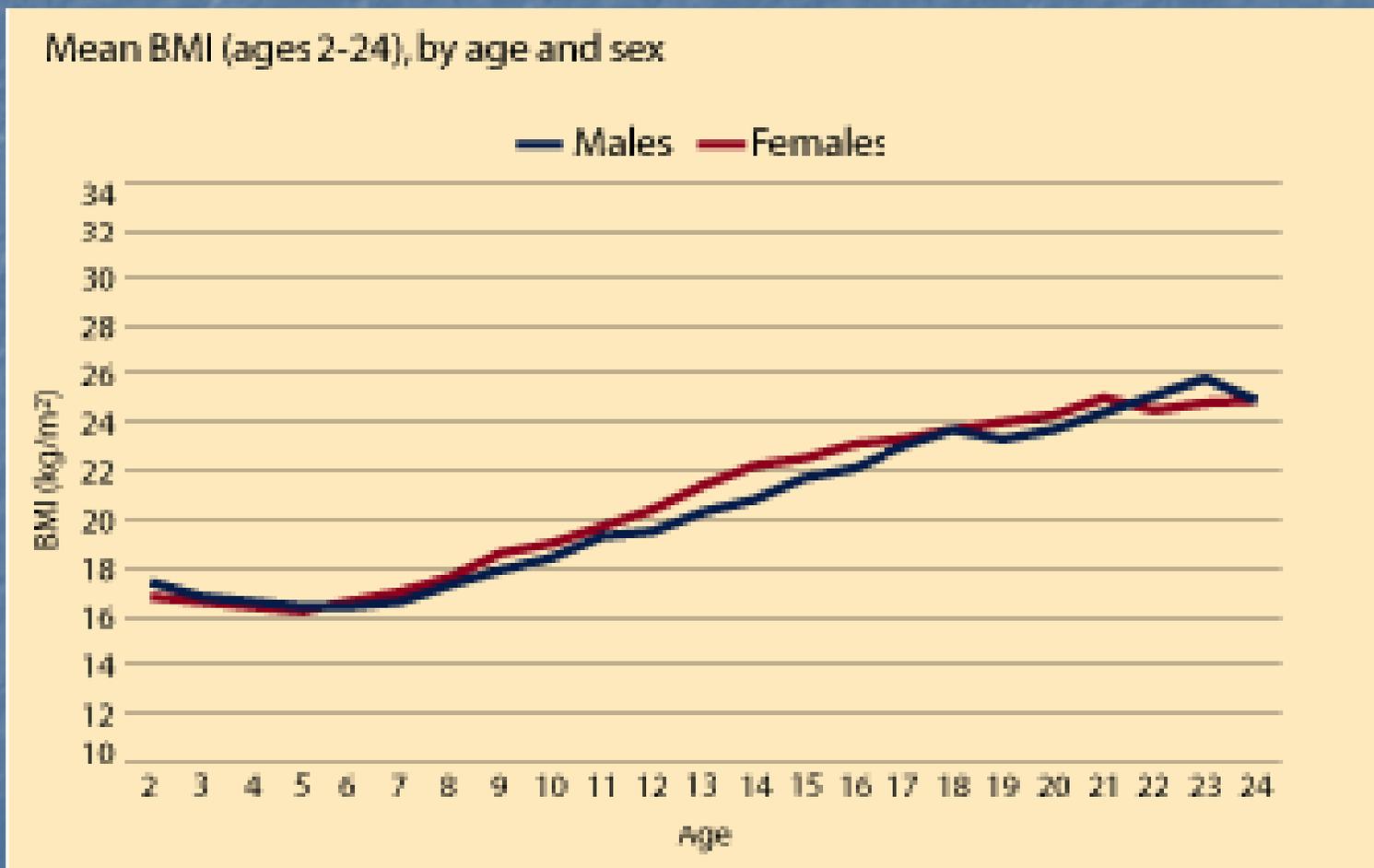


CHILDHOOD OBESITY EPIDEMIC..

# Obesity Associated Adverse Outcomes in Children

- Metabolic
  - Type 2 diabetes mellitus
  - Metabolic syndrome
- Orthopaedic
  - Slipped capital femoral epiphysis
  - Blount's disease
- Cardiovascular
  - Dyslipidaemia
  - Hypertension
  - Left ventricular hypertrophy
  - Atherosclerosis
- Psychological
  - Depression
  - Poor quality of life
- Neurological
  - Pseudotumor cerebri
- Hepatic
  - Non-alcoholic fatty liver disease
  - Non-alcoholic steatohepatitis
- Pulmonary
  - Obstructive sleep apnoea
  - Asthma (exacerbation)
- Renal
  - Proteinuria

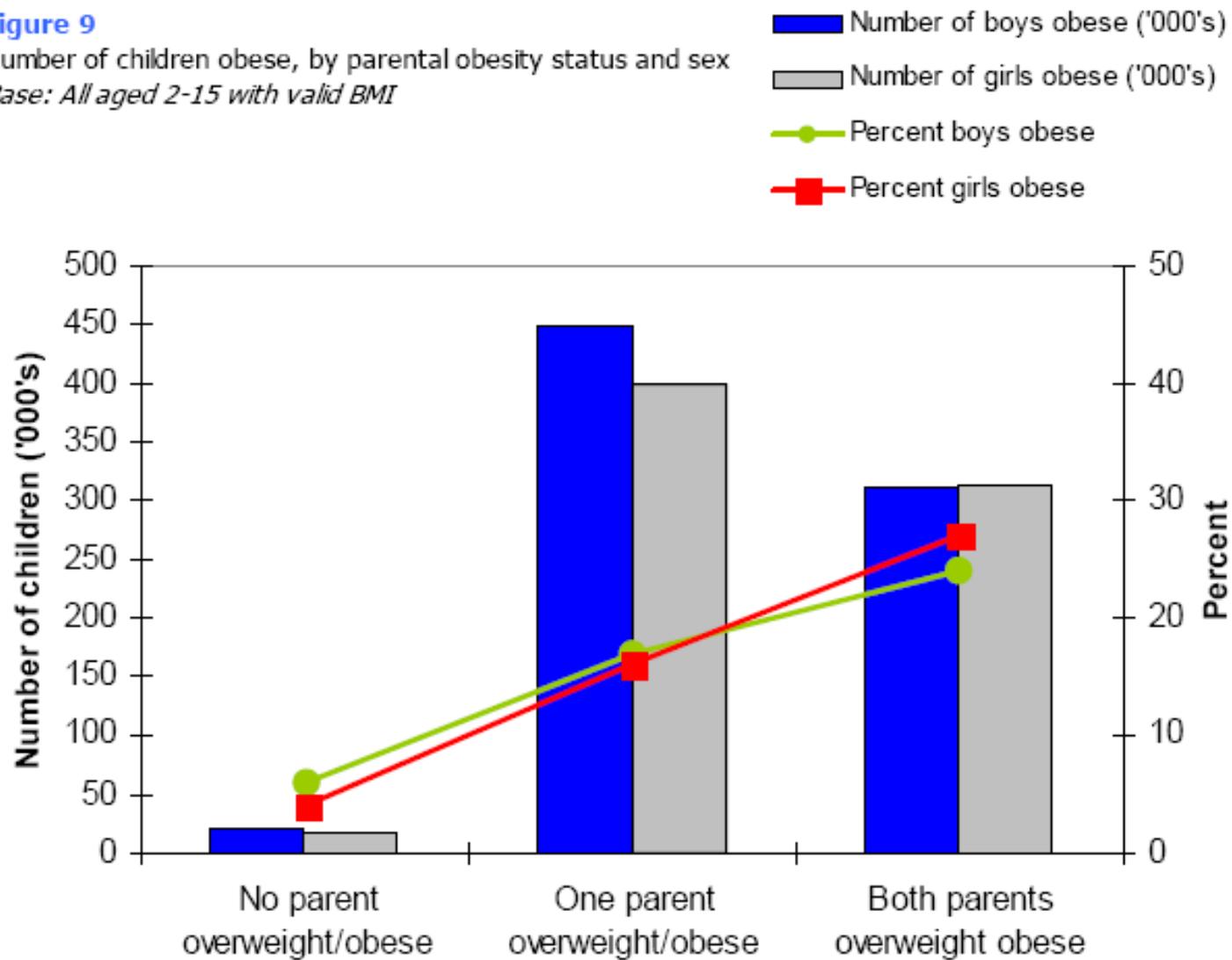
# Mean BMI in UK Children in 2002



# Estimated Prevalence of Obesity

**Figure 9**

Number of children obese, by parental obesity status and sex  
*Base: All aged 2-15 with valid BMI*



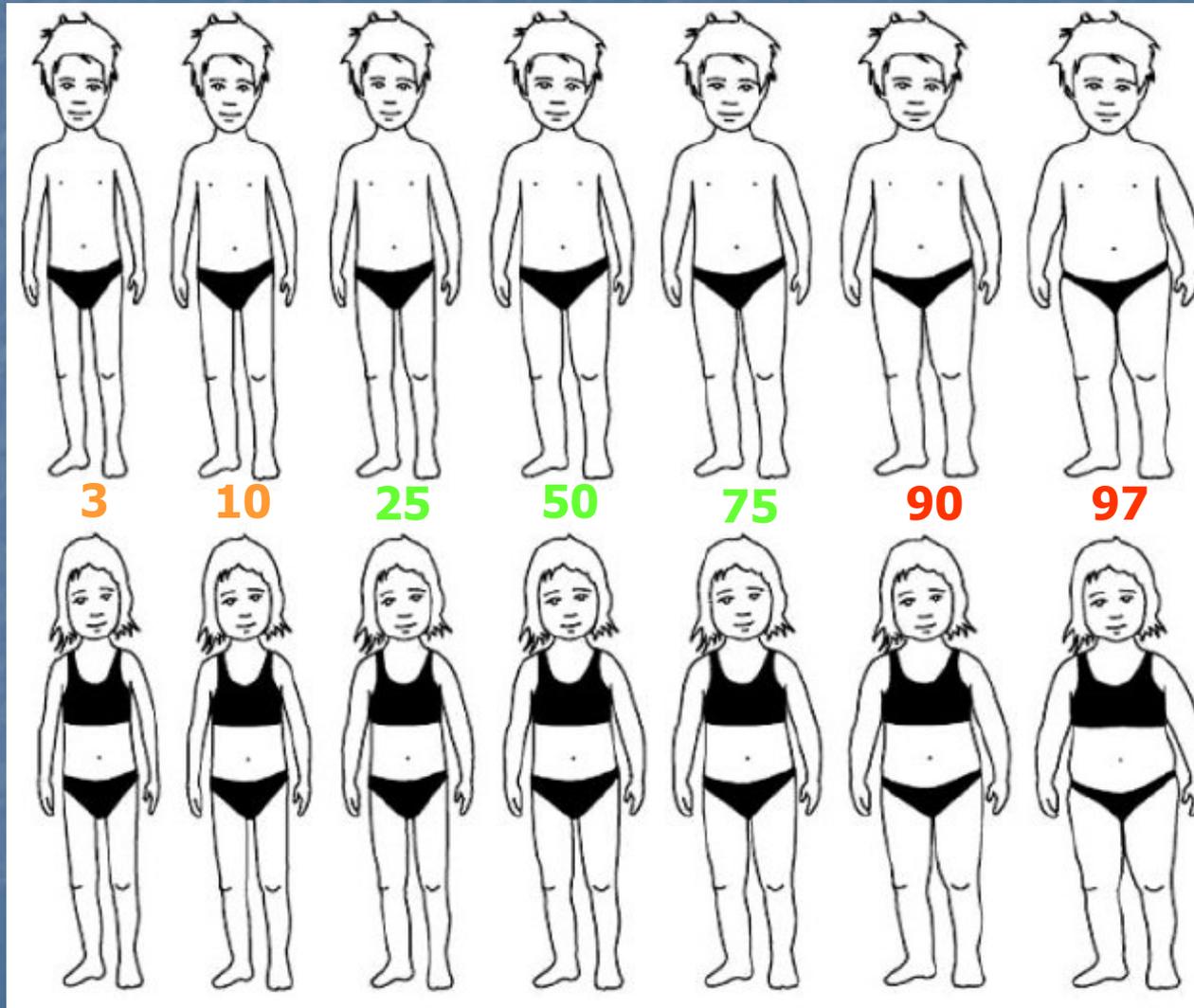
# Parents Don't Recognise Obese Children

- Less than 2% of parents of overweight children and 17% 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

# Parents Don't Recognise Obese Children

5 – 6  
years old

Weight  
centiles



# Parents Don't Recognise Obese Children

- Only 64.5% recognised the overweight or obese ones
- Only 48.8% knew that being overweight had associated health risks
- Only 38.7% knew that being overweight had associated mental health risks
- Only 40.3% chose the correct silhouette that corresponded to their own child

# 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

# Back to Perception



# Obesity Associated Adverse Outcomes in Adults

- Cardiovascular diseases, diabetes, and related conditions
  - Coronary heart disease (CHD)
  - Type 2 diabetes
- CHD risk factors
  - Type 2 diabetes
  - Hypertension
  - Dyslipidaemia
  - Inflammation
  - Hypercoagulability
  - Autonomic nervous system dysfunction
- Heart failure
- Stroke
- Deep venous thrombosis
- Pulmonary disease (including obesity hypoventilation syndrome, obstructive sleep apnoea)
- Other outcomes\*
- Absenteeism from work
- Alzheimer's disease
- Asthma
- Cancer (including breast [postmenopausal], endometrial, oesophageal, colorectal, kidney, and prostate)
- Disability, physical
- Erectile dysfunction
- Fertility and pregnancy complications
- Gallstones/cholecystitis
- Gastro-oesophageal reflux disease
- Gout
- Healthcare costs
- Impaired quality of life
- Kidney stones
- Liver (spectrum of non-alcoholic fatty liver disease)
- Mortality
- Obesity-related glomerulopathy
- Osteoarthritis
- Psychological disorders (e.g., depression, aggressive behaviours)
- Surgical complications

# Increasing Risk of Cancer

A 5 kg/m<sup>2</sup> increase in BMI is strongly associated with the following cancer risk

## ■ Men

- oesophageal adenocarcinoma (RR 1.52)
- thyroid (1.33)
- colon (1.24)
- renal (1.24)
- rectal cancer (<1.2)
- malignant melanoma (<1.2)

## ■ Women

- endometrial (1.59)
- gallbladder (1.59)
- oesophageal adenocarcinoma (1.51)
- renal (1.34)
- postmenopausal breast (<1.2)
- pancreatic (<1.2)
- thyroid (<1.2)
- colon cancers (<1.2)

# Costs – in the US

- Indirect costs attributed to Diabetes

Cost Component	Total (\$ billions)	Proportion of costs (%)
Absent from work	2.6	4
Reduced work performance	20.0	34
Reduced productivity	0.8	1
Permanent disability	7.9	14
Mortality	26.9	46
<b>TOTAL</b>	<b>58.2</b>	<b>100</b>

# Costs – in the UK

- To the UK, obesity costs over £1 billion per year in direct costs and a further £2.6 billion in indirect costs
- Projected to rise to £3.6 billion by 2010
- And £45 billion (half the ENTIRE NHS budget) by 2050

# Moderate Weight Loss is Beneficial (10% Weight Loss)

## 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<sub>1c</sub>
- 

## Lipids

- ↓ 10% total cholesterol
- ↓ 15% LDL cholesterol
- ↓ 30% triglycerides
- ↑ 8% HDL

+ psychological, physical and other metabolic benefits

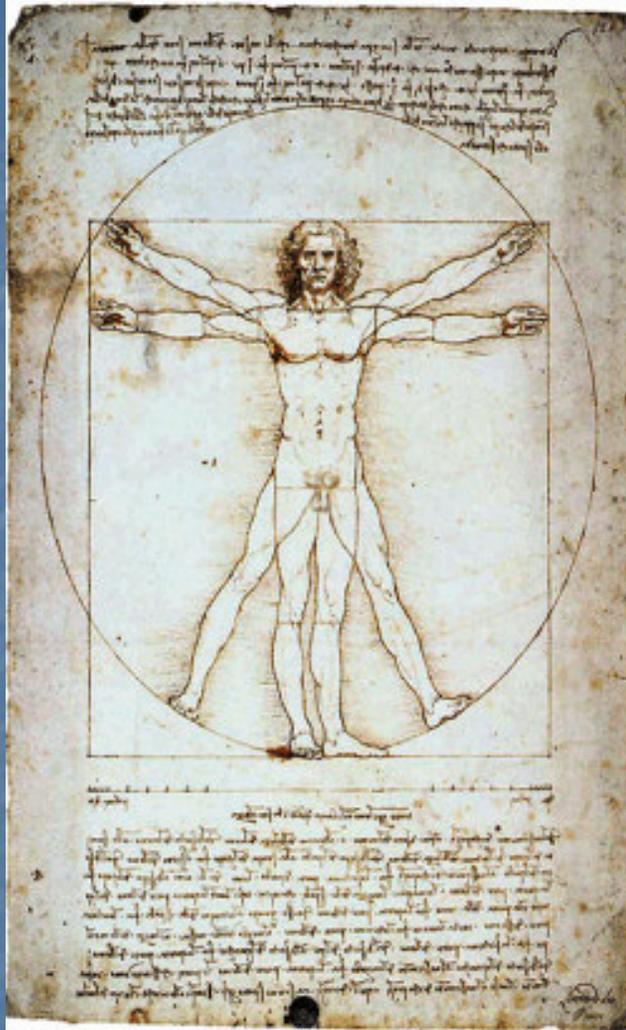
# Some Simple Maths

- 1 Kg of fat = 9,000 kcal
- Realistic sustainable weight loss is about 1 pound per week
- 1 lb  $\sim$  4,200 kcal
- $4,200/7 = 600$  kcal per day
- This means about 300 kcal doing more and 300 kcal eating less

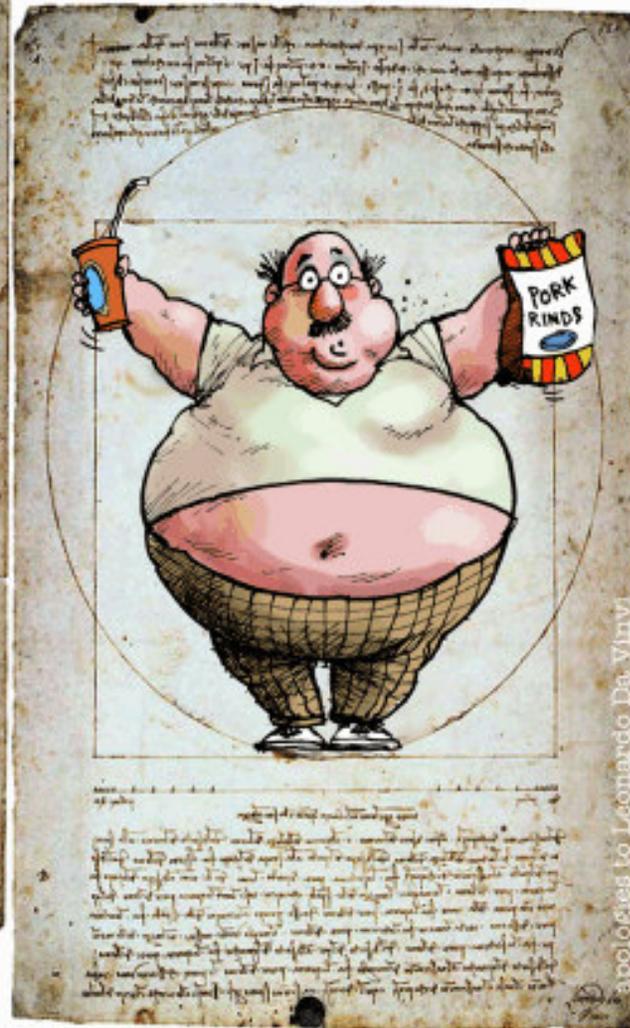
# Or, To Put it Another Way

- 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

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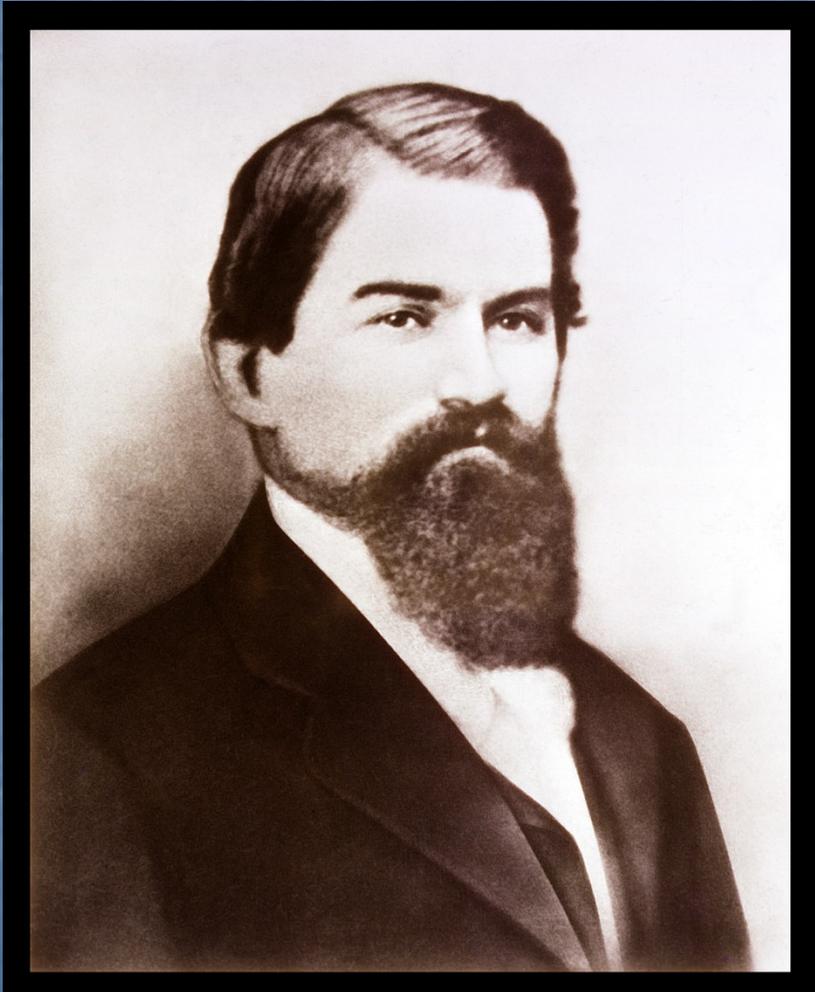
THEN..



NOW..

apologies to Leonardo Da Vinci

# Who is This?



**John Pemberton**

**1831-1888**

**Pharmacist**

**Inventor Of Coca Cola**

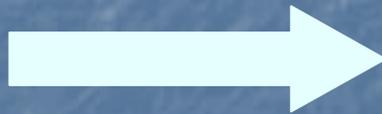
# How to Consume Less



500 mls = 215 kcal

330 mls = 142 kcal

A saving of 73 kcal

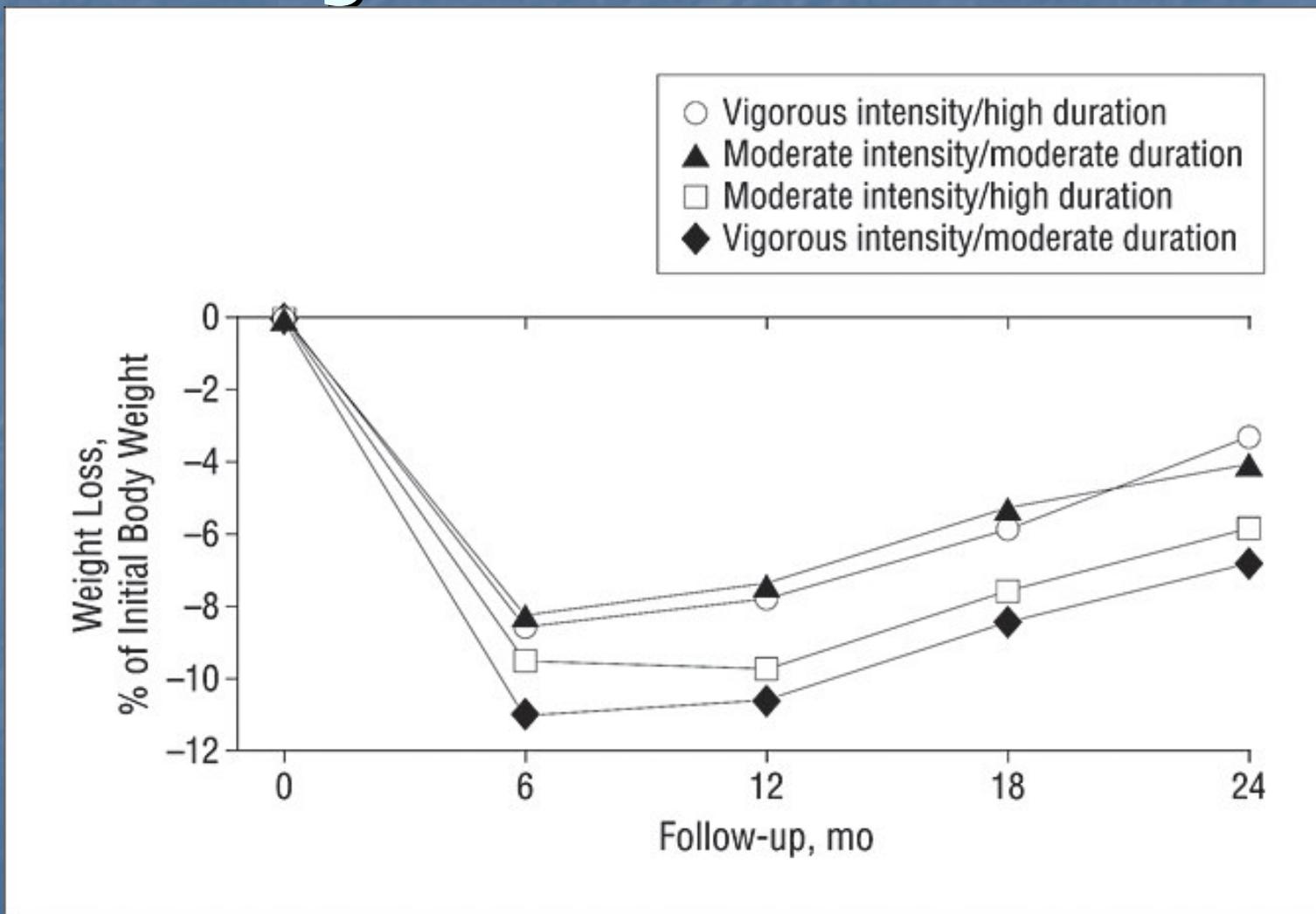


# Milk per 200 mls

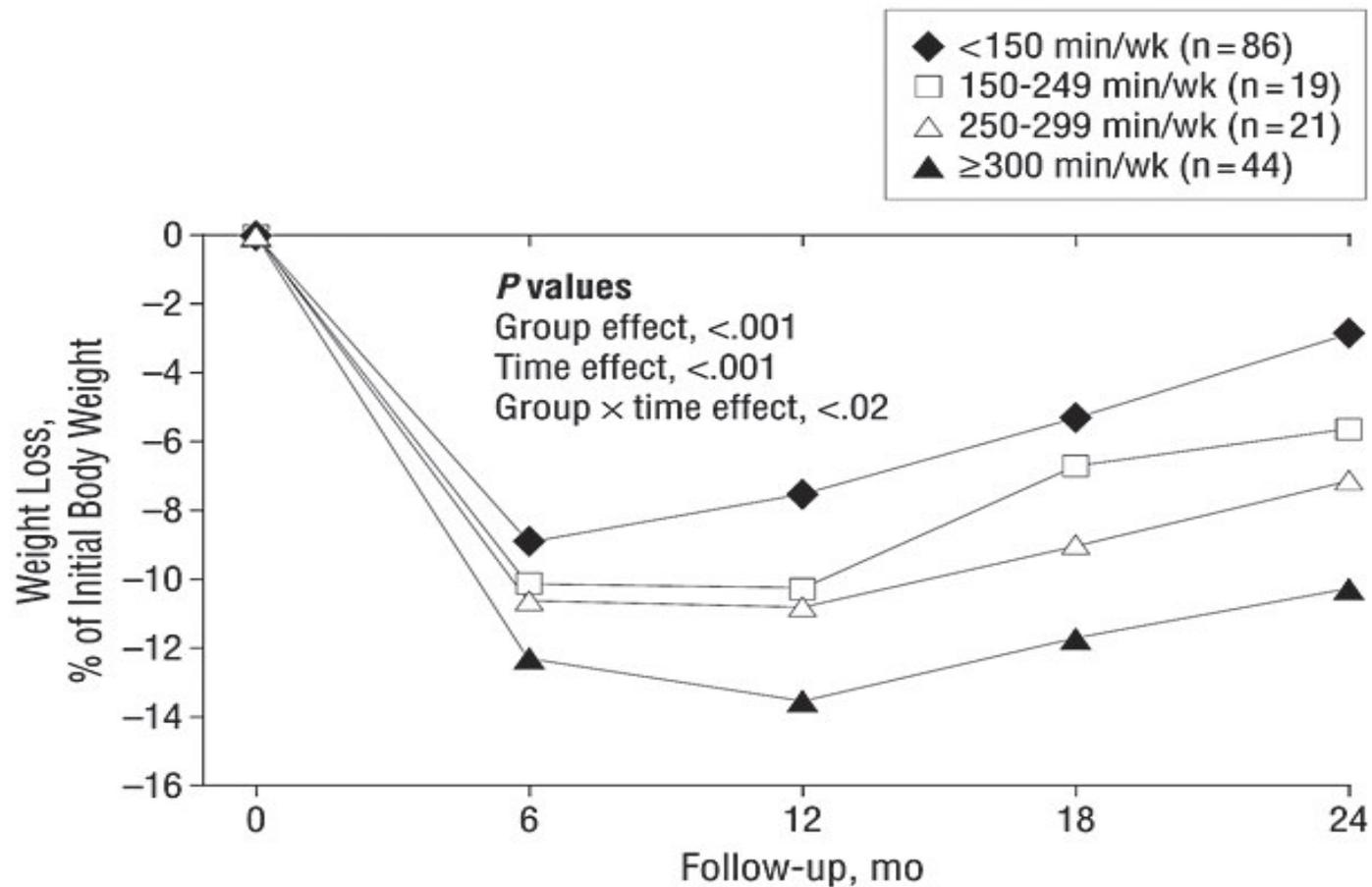
- Jersey 160 kcal
- Whole 130 kcal
- Semi skimmed 100 kcal
- Skimmed 75 kcal



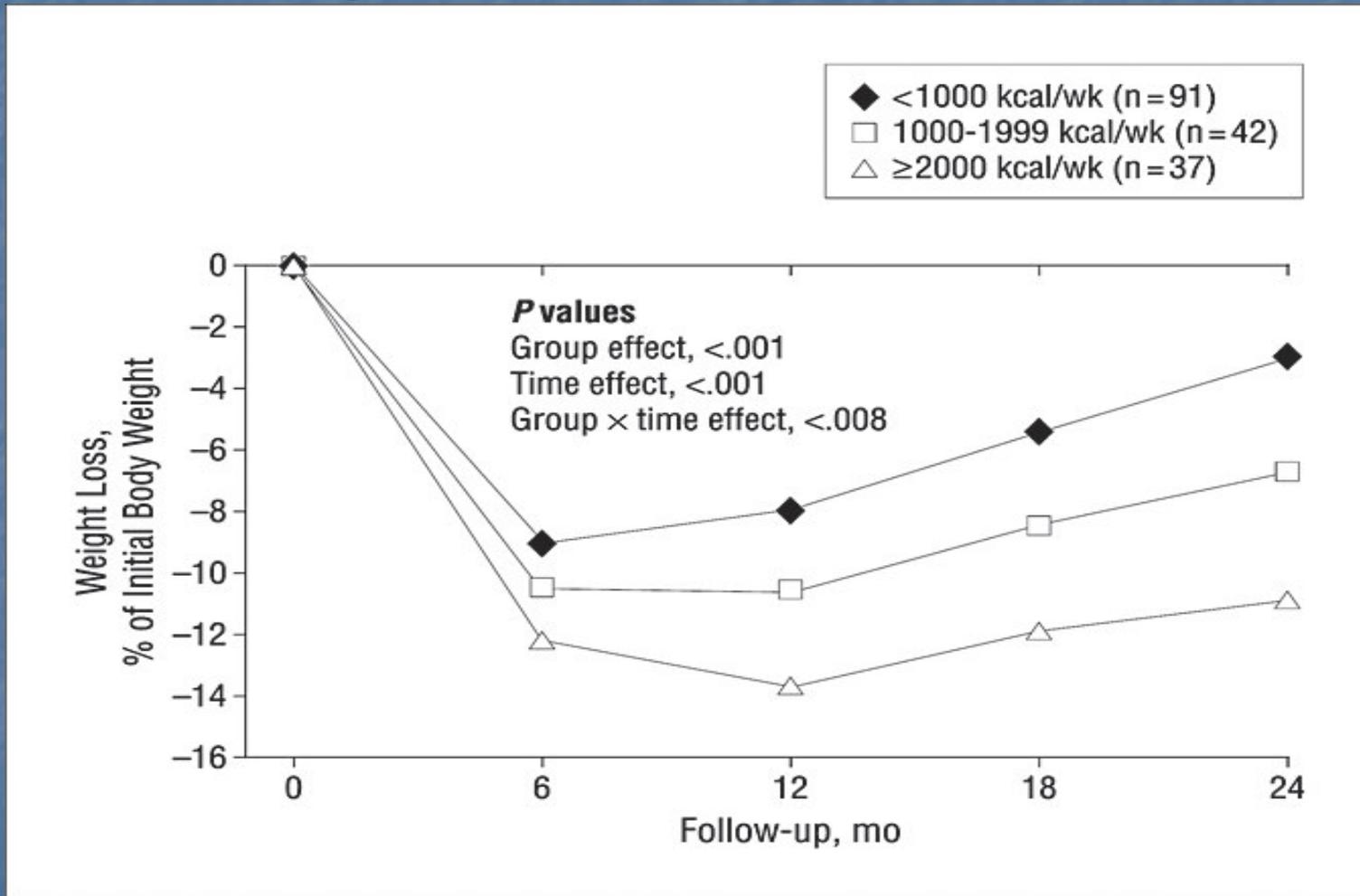
# But Weight Loss is HARD WORK!



# But Weight Loss is HARD WORK!



# But Weight Loss is HARD WORK!



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NEW APPROACH NEEDED: MP Norman Lamb.

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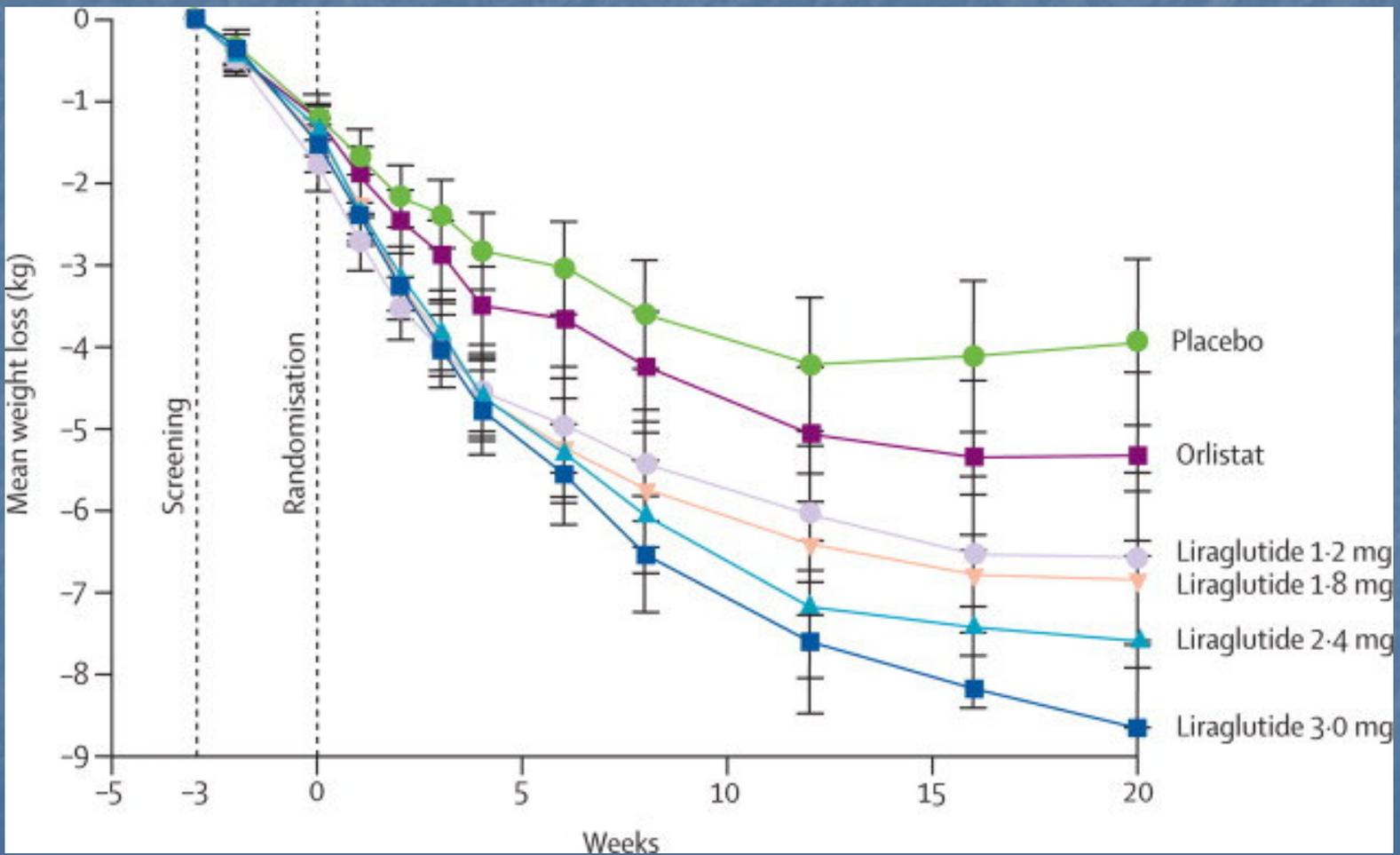


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## 2 Licensed Drugs Available

- Orlistat
- Sibutramine
  
- But the newer agents used in diabetes –  
GLP-1 agonists – may have a greater  
effect

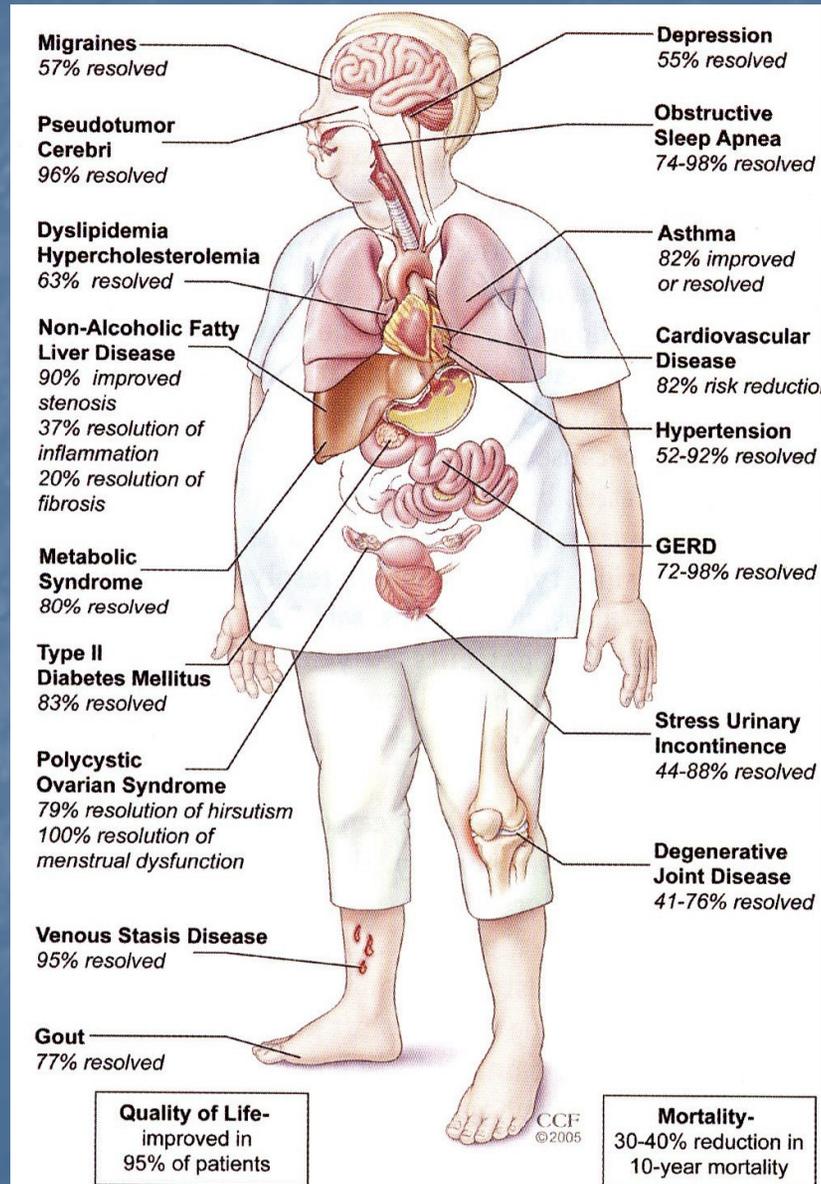
# Weight Loss with Liraglutide



# Surgery

- By far and away the best way of losing weight *and keeping it off*
- Most cost effective in the long run
- Patchy access across the UK

# Things That Improve with Surgery



# What Can You Do?

- Tackle it at every visit – get them from the ‘pre-contemplation stage’ to the ‘contemplation stage’
- Don’t be afraid to say their kids could do with losing a bit of weight
- Accept that TLC is hard and use the drugs early

# After 2 Years in the USA, Michelangelo's David is Returning to Italy...



**Before**



**After**

Thank You for Your Attention