EMBMI
EAST MIDLANDS BARIATRIC & METABOLIC INSTITUTE

NHS
University Hospitals of Derby and Burton
NHS Foundation Trust

‘The Obesity Epidemic’

Dr David Hughes

Consultant & Honorary Assistant Professor of Diabetes, Endocrinology & Bariatric Medicine
Secretary of the Association for the Study of Obesity.

ASO
ASSOCIATION FOR THE STUDY OF OBESITY

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Commercial employment	**None to declare**
Consultancies or advisory roles	**None to declare**
Honoraria / Lecture fees	**None to declare**
Industry sponsored grants	**None to declare**
Patents or royalties	**None to declare**
Stock and Shares	**None to declare**

Medtronic

Abbott

Lilly

Boehringer Ingelheim

AstraZeneca

MSD

SANOFI

novo nordisk

Takeda

Shire

HOW DID WE DEFINE OBESITY?

1913 –Life Insurance data showed that body weight adjusted for height (Wt/Ht) was an independent determinant of life expectancy

1959 - Life Insurance Companies published population based tables of Wt/Ht. If >20% above ideal then they were overweight.

Table of the Size and Weight of Man at Different Ages.

Ages.	Size.	Weight.	Ratio of Weight to Size.	Size Observed.		Weight Observed.	
				Max.	Min.	Max.	Min.
	met.	kilog.		met.	met.	kilog.	kilog.
Birth,	0·496	3·20	6·19	0·532	0·438	4·50	2·34
1 year,	0·696	10·00	14·20	0·750	0·682	11·00	9·00
2 ..	0·797	12·00	15·00	0·824	0·730	13·50	10·50
3 ..	0·860	13·21	15·36	0·875	0·840	13·60	12·10
4 ..	0·932	15·07	16·32	0·965	0·840	18·20	12·50
5 ..	0·990	16·70	16·98	1·030	0·915	18·50	14·00
6 ..	1·046	18·04	17·44	1·115	0·960	20·40	15·80
7 ..	1·112	20·16	18·31	1.162	1·109	24·50	17·20
8 ..	1·170	22·26	18·92	1·260	1·120	28·50	19·00
9 ..	1·227	24·09	19·68	1·325	1·150	29·00	22·20
10 ..	1·282	26·12	20·37	1·325*	1·163	32·00	22·70
11 ..	1·327	27·85	21·58	1·405	1·215	33·80	25·00
12 ..	1·359	31·00	22·80	1·450	1·270	36·30	25·00
13 ..	1·403	35·32	25·30	1·490	1·300	39·50	34·60
14 ..	1·487	40·50	27·49	1·630	1·330	45·00	37·00
15 ..	1·559	46·41	29·88	1·658	1·380	61·50	37·00
16 ..	1·610	53·39	33·00	1·730	1·430	61·50	40·00
17 ..	1·670	57·40	34·25	1·790	1·467	65·50	45·00
18 ..	1·700	61·26	35·67	1·790	..	67·00	45·00
19 ..	1·706	63·32	37·00	1·800	..	70·00	48·20
20 ..	1·711	65·00	37·99	1·838	..	72·70	..
25 ..	1·722	68·29	39·66	1·890	..	90·50	..
30 ..	1·722	68·90	40·02	..	..	..	..
40 ..	1·713	68·81	40·03	..	..	..	..
50 ..	1·674	67·45	40·14	..	..	..	..
60 ..	1·639	65·50	40·01	..	..	..	..
70 ..	1·623	63·03	38·83	..	..	..	49·1
80 ..	1·613	61·22	37·96	1·820	1·467	83·00	49·7

Table of the Size and Weight of Woman at Different Ages.

Ages.	Size.	Weight.	Ratio of Weight to Size.	Size Observed.		Weight Observed.	
				Max.	Min.	Max.	Min.
	met.	kilog.		met.	met.	kilog.	kilog.
Birth,	0·483	2·91	6·15	0·555	0·438	4·25	1·12
1 year,	0·690	9·30	13·50	0·704	0·660	10·5	8·3
2 ..	0·780	11·40	14·50	0·798	0·720	12·0	8·3
3 ..	0·850	12·45	14·70	0·895	0·795	15·8	10·5
4 ..	0·910	14·18	15·10	0·950	0·810	15·8	11·5
5 ..	0·974	15·50	15·70	1·085	0·876	17·5	13·3
6 ..	1·032	16·74	16·24	1·085	0·956	20·3	13·3
7 ..	1·096	18·45	16·85	1·177	1·050	23·4	16·0
8 ..	1·139	19·82	17·45	1·330	1·050	23·4	16·0
9 ..	1·200	22·44	18·65	1·330	1·110	25·7	18·3
10 ..	1·248	24·24	19·45	1·330	1·160	28·3	20·3
11 ..	1·275	26·25	20·60	1·385	1·160	39·8	21·6
12 ..	1·327	30·54	23·00	1·476	1·160	42·3	21·6
13 ..	1·336	34·65	24·50	1·580	1·160	42·8	21·6
14 ..	1·447	38·10	25·35	1·580	1·160	51·0	32·0
15 ..	1·475	41·30	28·10	1·633	1·160	55·2	32·0
16 ..	1·500	44·44	29·62	1·638	1·160	57·6	32·0
17 ..	1·544	49·08	31·75	1·688	1·284	61·6	..
18 ..	1·562	53·10	34·05	1·740	..	79·9	..
20 ..	1·570	54·46	34·70	..	..	..	..
25 ..	1·577	55·08	35·26	..	..	..	..
30 ..	1·579	55·14	35·90	..	..	..	..
40 ..	1·555	56·65	36·50	..	..	..	..
50 ..	1·536	58·45	38·15	..	1·444	90·5	39·8
60 ..	1·516	56·73	37·28	..	1·436	..	..
70 ..	1·514	53·72	35·49	..	1·431	93·8	..
80 ..	1·506	51·52	34·21	1·701	1·408	72·5	38·0

HOW DO WE DEFINE OBESITY?

1972 – Mathematical modelling of adiposity suggesting BMI=Wt/Ht^2

- Keys commented: “not fully satisfactory, but at least as good as other indicators of relative obesity”.

1995 – WHO Expert Committee produces first international technical report on how obesity should be categorised. (updated in 1997)

WHO Technical Report Series
854

PHYSICAL STATUS: THE USE AND INTERPRETATION OF ANTHROPOMETRY

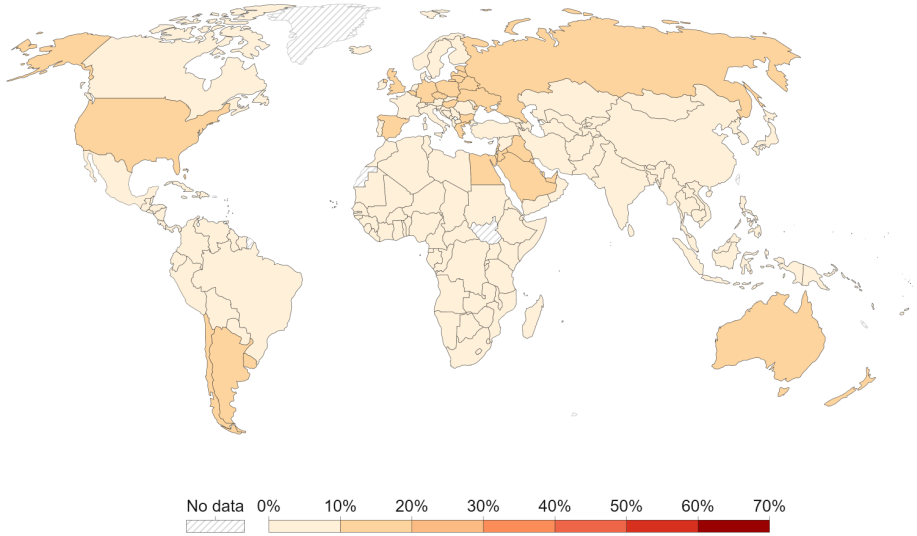
Report of a
WHO Expert Committee

Classification	BMI (kg/m^2)	Risk of co-morbidities
Underweight	< 18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight	≥ 25	
Pre-obese	25–29.9	Increased
Obese class I	30.0–34.9	Moderate
Obese class II	35.0–39.9	Severe
Obese class III	≥ 40.0	Very severe

Share of adults that are obese, 1976

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

Our World in Data



Source: WHO, Global Health Observatory (2022)

OurWorldInData.org/obesity • CC BY

Share of adults that are obese, 1976

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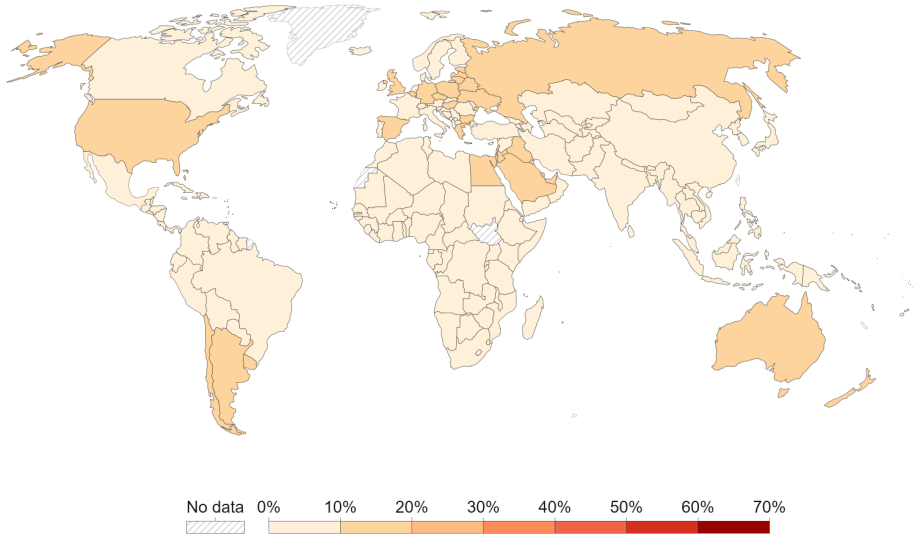

Source: WHO, Global Health Observatory (2022)

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Share of adults that are obese, 1986

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

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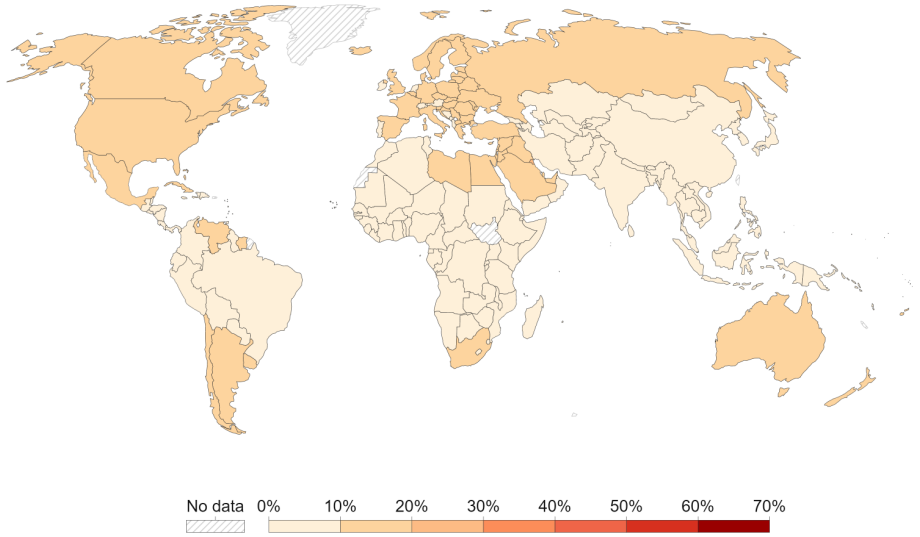

Source: WHO, Global Health Observatory (2022)

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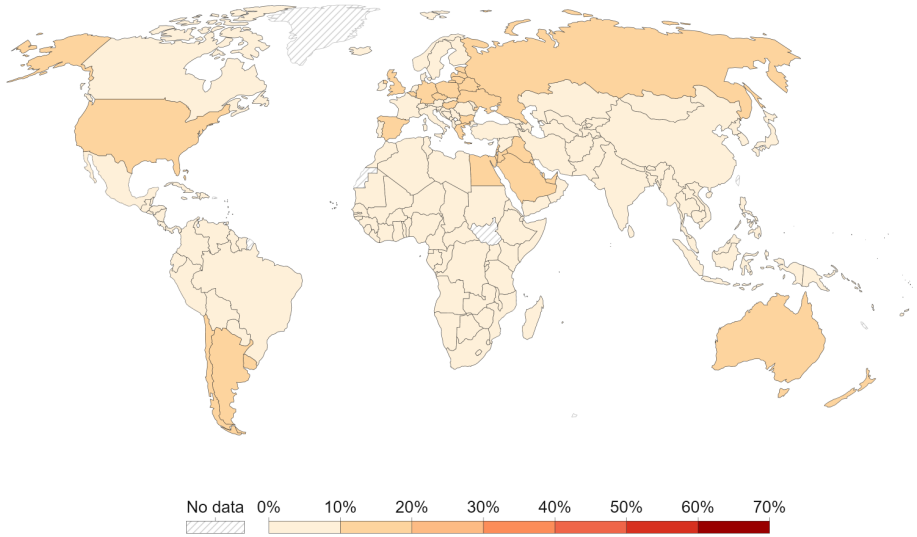
Share of adults that are obese, 1976

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

Our World in Data



Source: WHO, Global Health Observatory (2022)

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Share of adults that are obese, 1996

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

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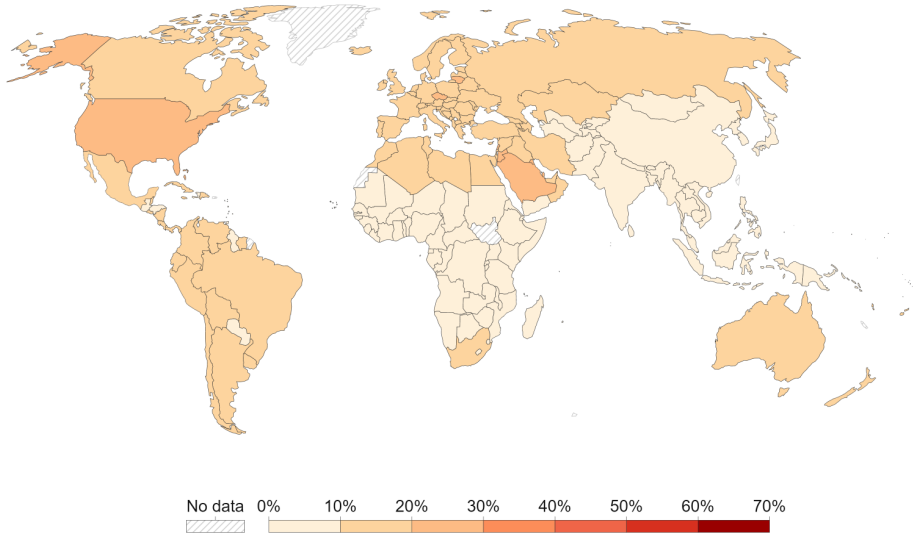

Source: WHO, Global Health Observatory (2022)

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Share of adults that are obese, 1976

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

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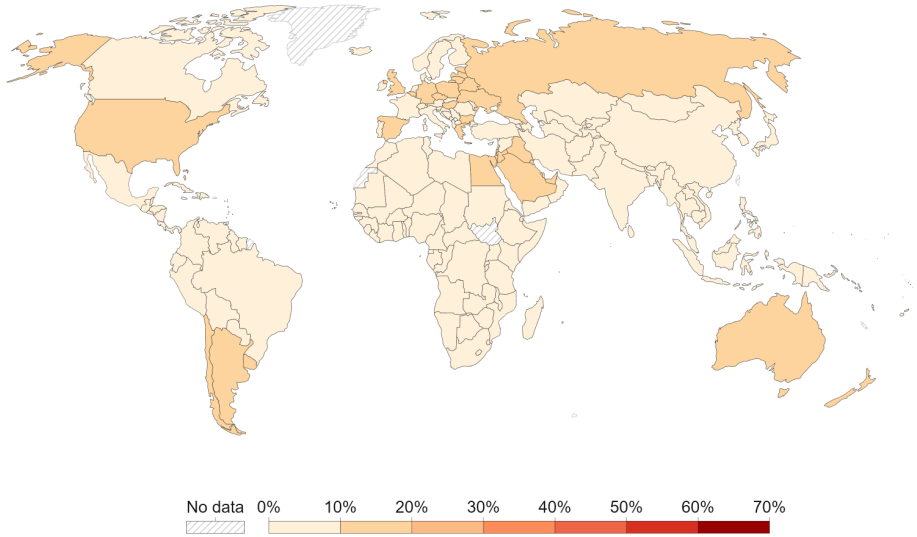

Source: WHO, Global Health Observatory (2022)

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Share of adults that are obese, 2006

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

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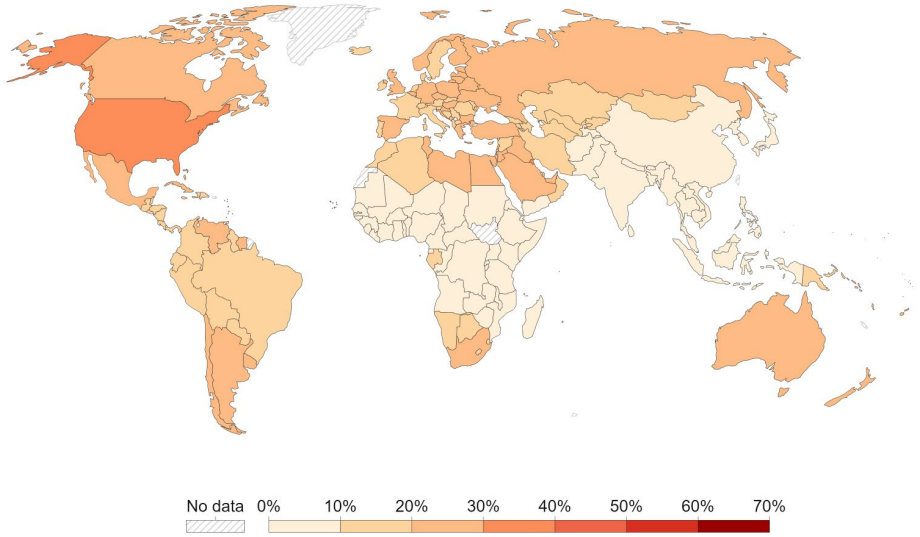

Source: WHO, Global Health Observatory (2022)

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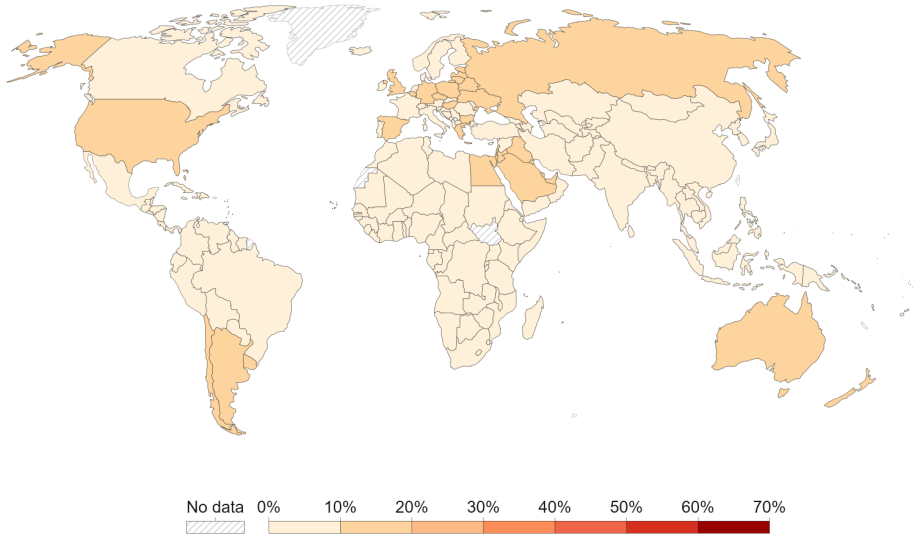
Share of adults that are obese, 1976

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

Our World in Data



Source: WHO, Global Health Observatory (2022)

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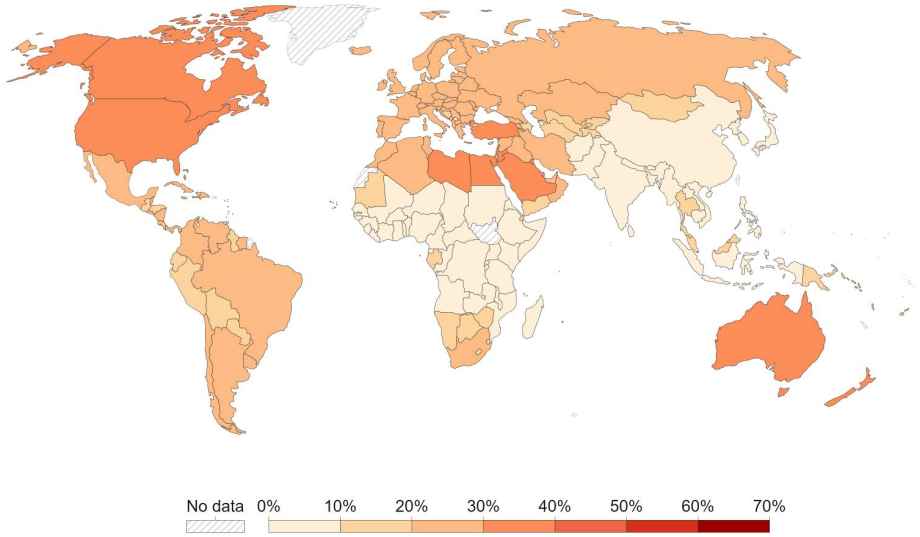
Share of adults that are obese, 2016

Obesity is defined as having a body-mass index (BMI) equal to, or greater than, 30. BMI is a person's weight (in kilograms) divided by their height (in meters) squared.

Our World in Data



Source: WHO, Global Health Observatory (2022)

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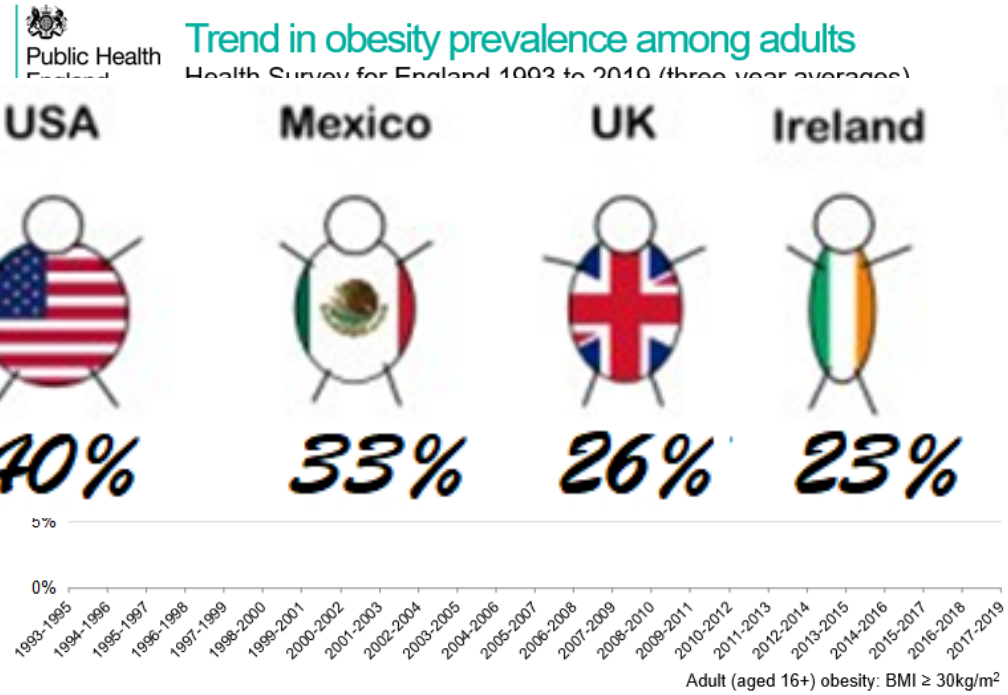
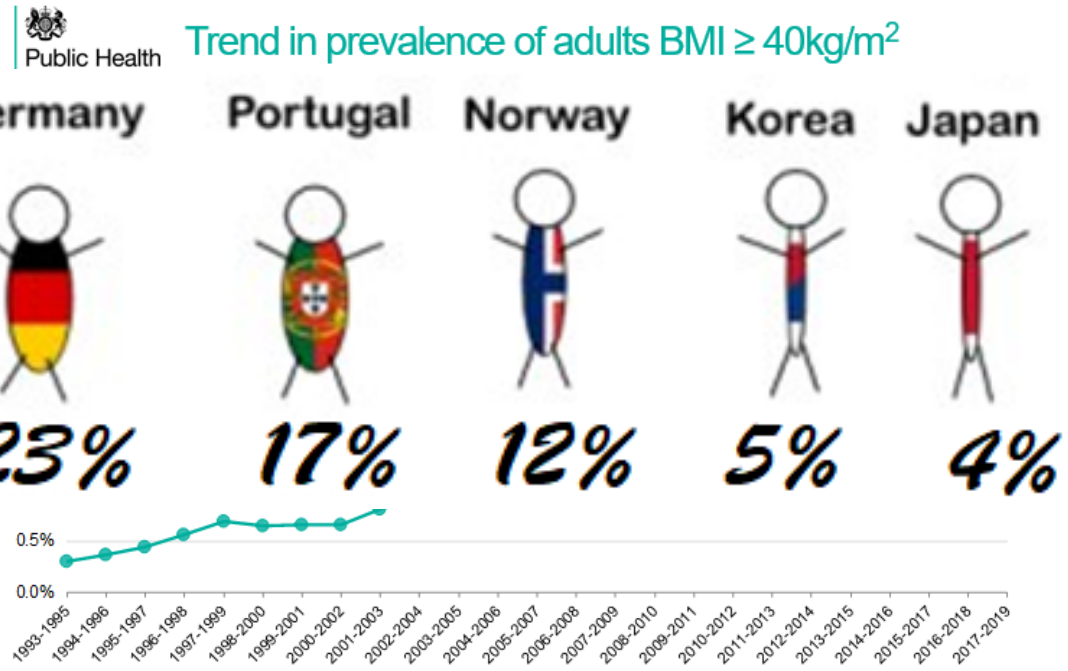
UK – BMI ≥30



UK - BMI ≥40



Map of excess weight

Adults aged 16 or over. England, January 2012 to January 2013

Top three (fattest), by % excess weight

Copeland (Cumbria)
75.9%

Doncaster (south Yorkshire)
74.4

East Lindsey (Lincolnshire)
73.8

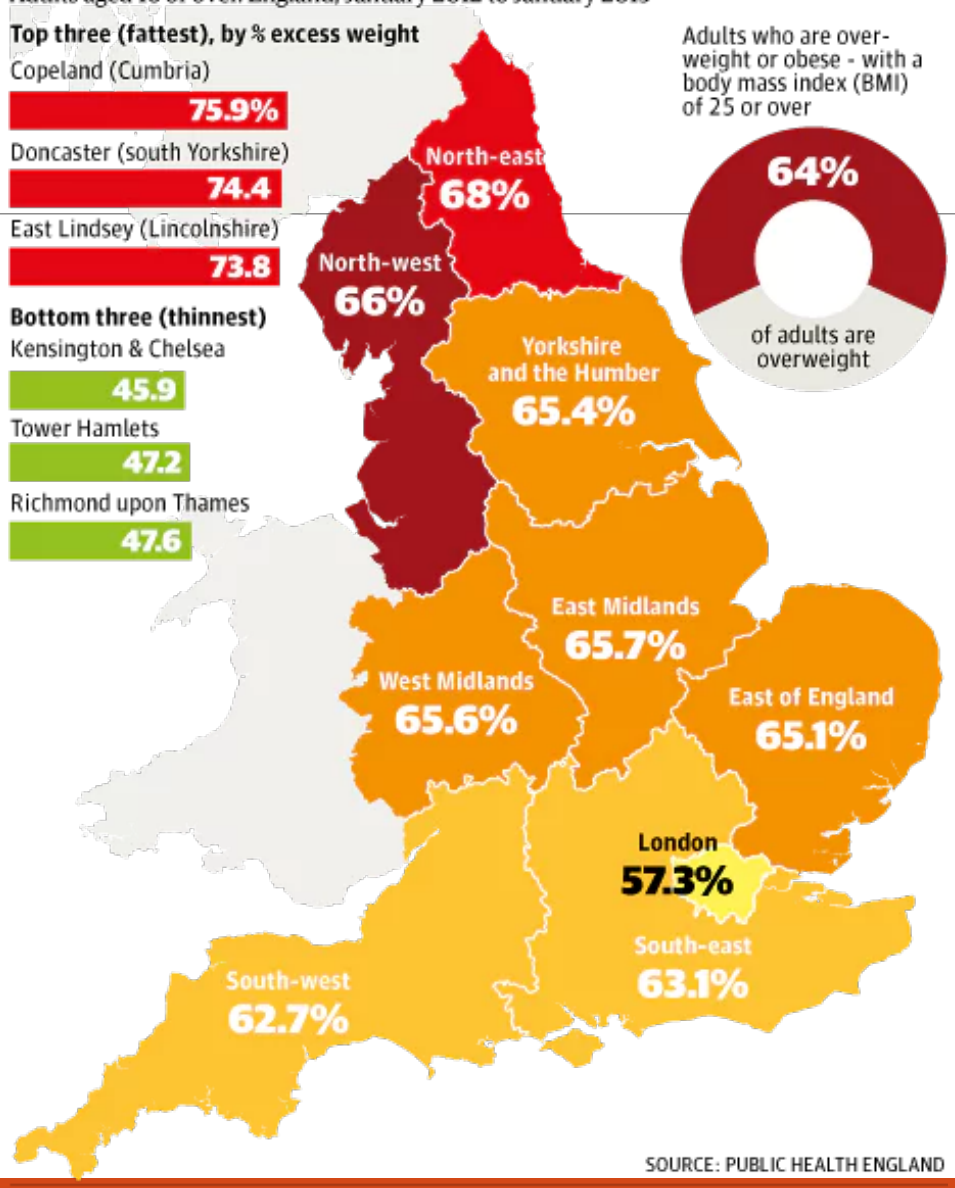
Bottom three (thinnest)

Kensington & Chelsea
45.9

Tower Hamlets
47.2

Richmond upon Thames
47.6

Adults who are overweight or obese - with a body mass index (BMI) of 25 or over



SOURCE: PUBLIC HEALTH ENGLAND

Psychosocial
- Depression
- Low self-esteem
- Risk of suicide
- Discrimination
- Social isolation

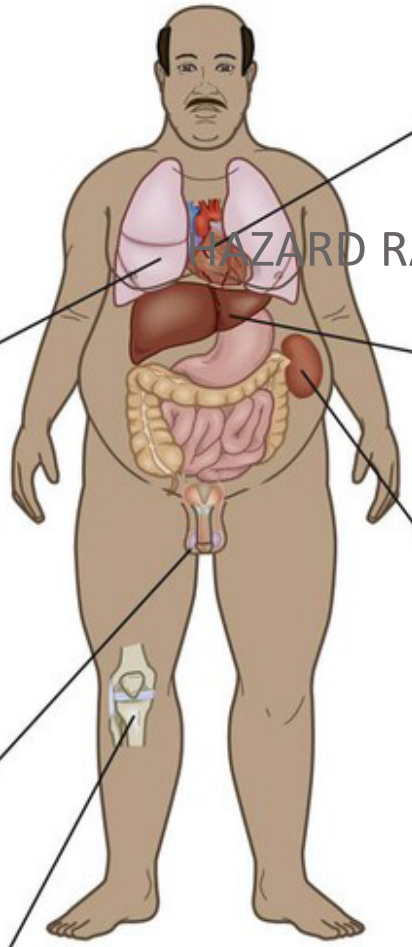
Endocrine/Metabolic
- Type 2 diabetes mellitus
- Metabolic syndrome
- Polycystic ovary syndrome

Respiratory
- Obesity hypoventilation syndrome
- Sleep apnea
- Asthma
- Pulmonary hypertension
- Exercise intolerance

Reproductive (Women)
- Menstrual irregularities
- Infertility
- Gestational diabetes

Reproductive (Men)
- Hypogonadism
- Gynecomastia
- Sexual dysfunction

Musculoskeletal
- Osteoarthritis
- Impaired mobility and flexibility
- Gout
- Lumbar disk disease
- Chronic low back pain



Cardiovascular
- Hyperlipidemia
- Sudden cardiac death
- Right-sided heart failure
- Left ventricular hypertrophy
- Coronary artery disease
- Deep venous thrombosis
- Atrial fibrillation
- Hypertension
- Cardiomyopathy
- Venous stasis
- Varicose veins

HAZARD RATIO (OBESITY VS CONTROL)

Gastrointestinal
- Nonalcoholic steatohepatitis (NASH)
- Gallstones
- Gastroesophageal reflux disease (GERD)

Genitourinary
- Kidney cancer
- Chronic kidney disease
- Stress incontinence

Cancer
- Esophagus, pancreas, thyroid, colorectal, and gallbladder cancer (both genders)
- Endometrial, breast, and ovarian cancer (women)

Obesity increases deaths

THE LANCET
Volume 388, Issue 10046, 20–26 August 2016, Pages 776-786

Articles

Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents

The Global BMI Mortality Collaboration†

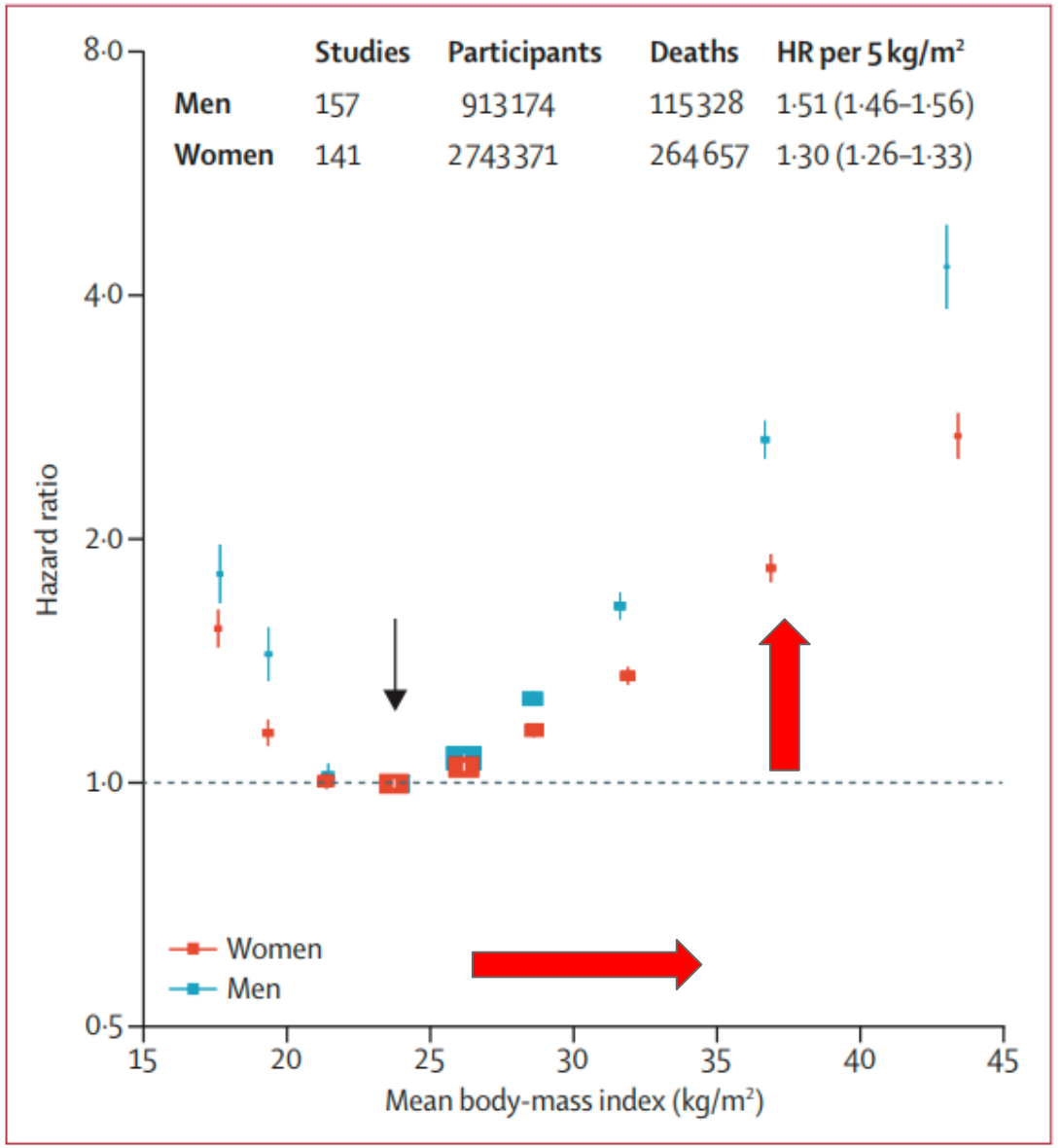


Figure 3: Association of body-mass index with all-cause mortality, by sex

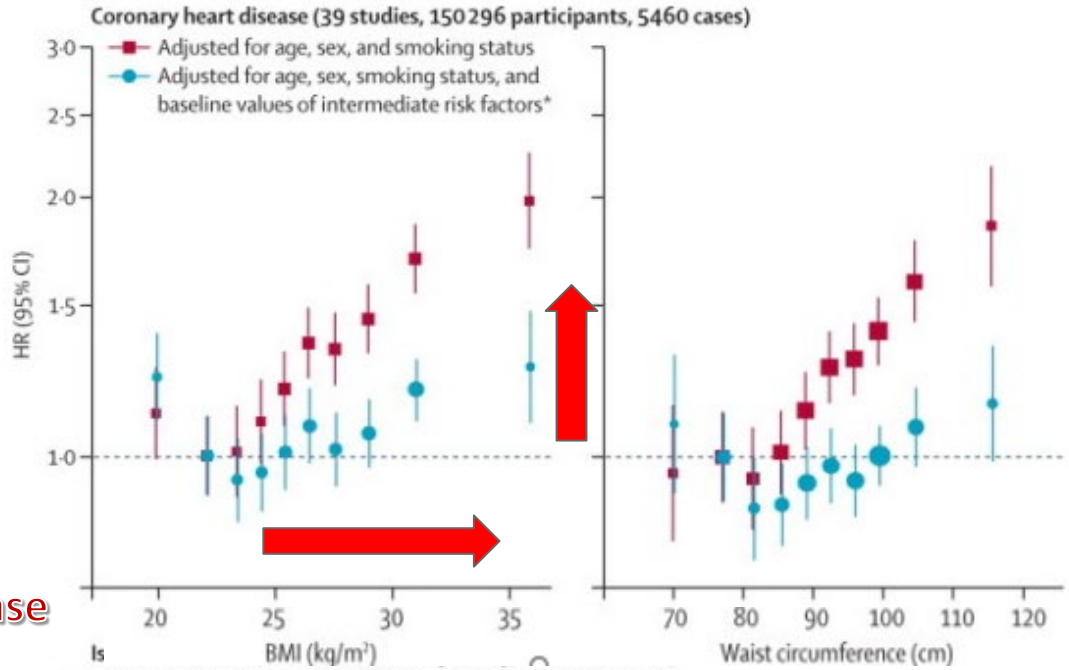
Separate and combined associations of body-mass index and abdominal adiposity with cardiovascular disease: collaborative analysis of 58 prospective studies

The Emerging Risk Factors Collaboration[‡*]

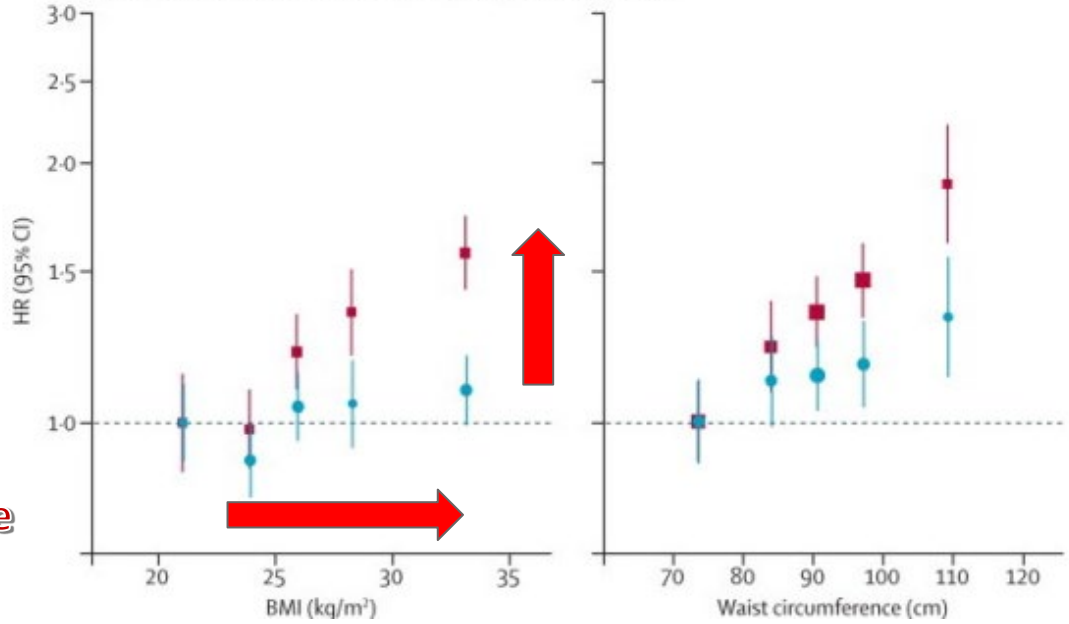
Lancet. 2011 Mar 11; 377(9784): 1085–1095.

Obesity increases Risk of MI & Stroke

Coronary Heart Disease



Ischaemic Stroke



Björck et al. BMC Cardiovascular Disorders (2015) 15:19
DOI 10.1186/s12872-015-0008-2

BMC Cardiovascular Disorders

RESEARCH ARTICLE Open Access

Body weight in midlife and long-term risk of developing heart failure-a 35-year follow-up of the primary prevention study in Gothenburg, Sweden

Lena Björck[1,2*], Masu

Heart failure

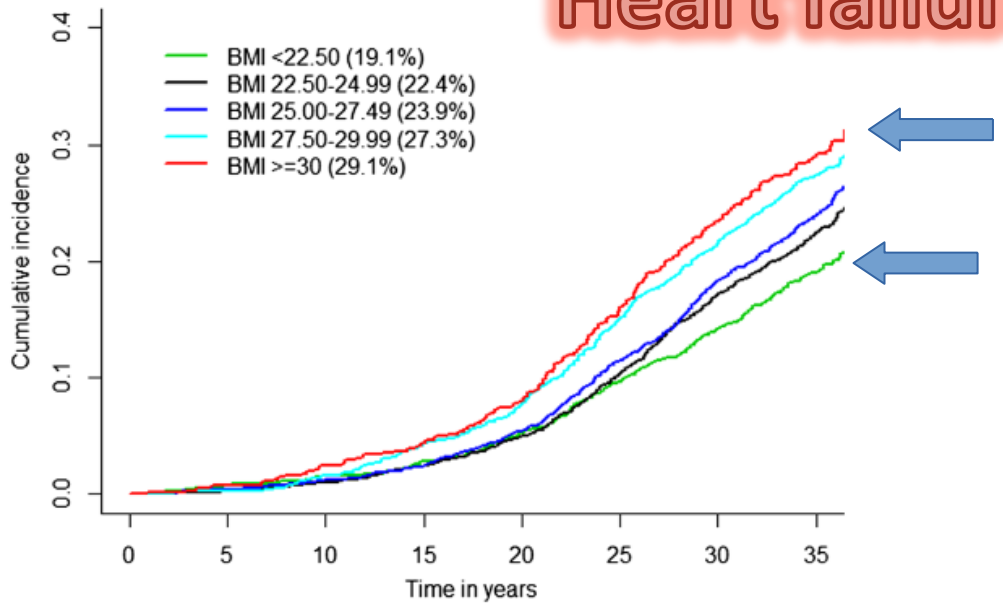


Figure 1 Cumulative incidence and long-term risk of developing heart failure by BMI group.

Risk of New-Onset Atrial Fibrillation in Relation to Body Mass Index FREE

Sascha Dublin, MD, PhD; Benjamin French, MS; Nicole L. Glazer, MPH; Kerri L. Wiggins, MS, RD; Thomas Lumley, PhD; Bruce M. Psaty, MD, PhD; Nicholas L. Smith, PhD; Susan R. Heckbert, MD, PhD

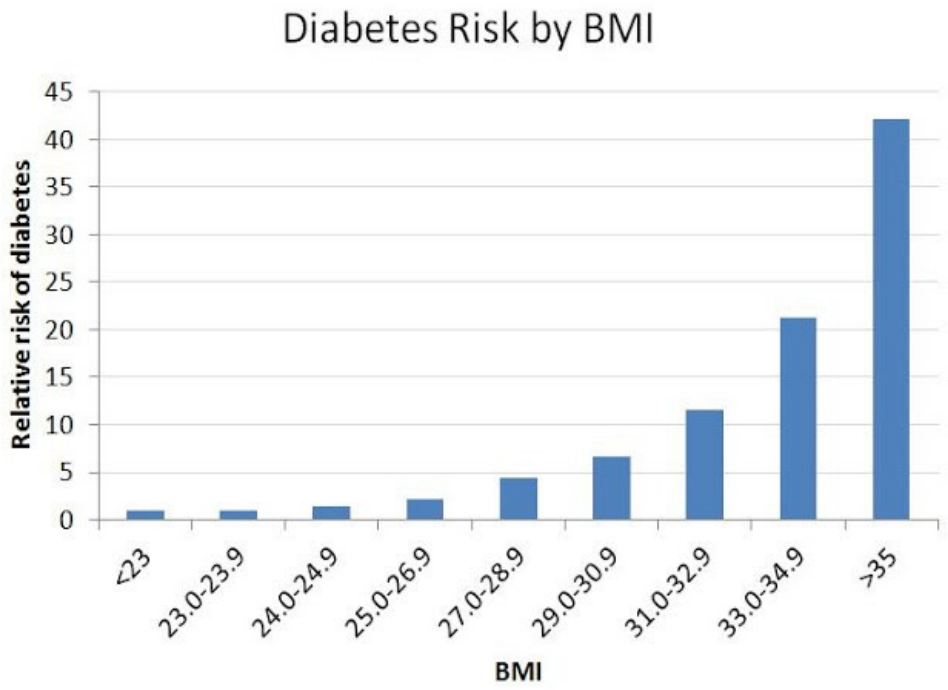
Atrial fibrillation

Table 3. Risk of New-Onset Atrial Fibrillation According to BMI*

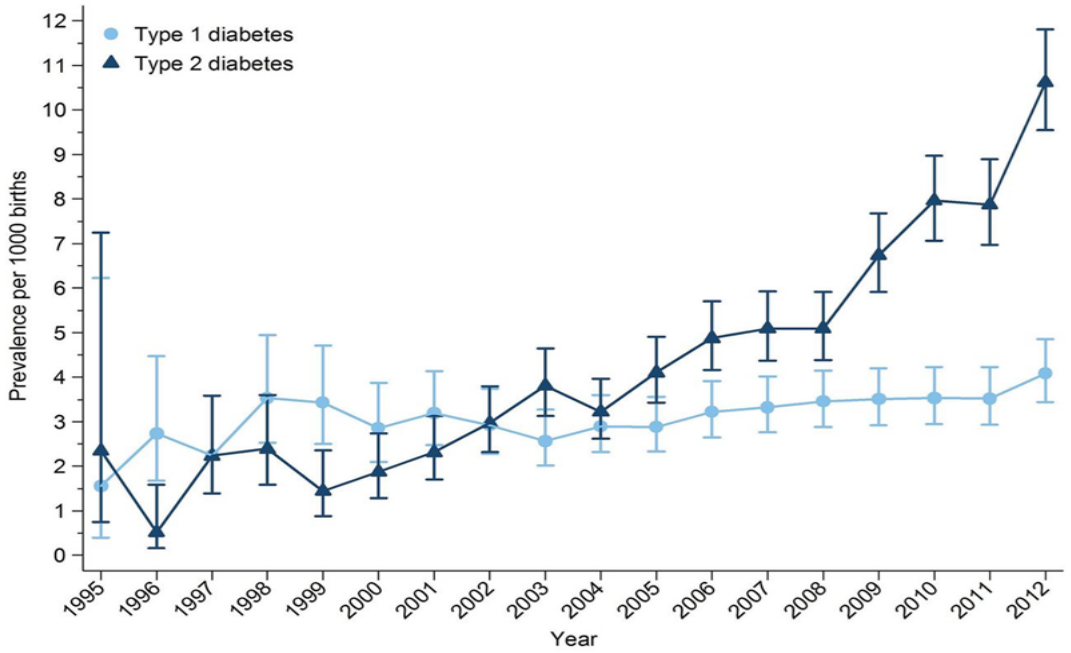
BMI Measure	Cases, No. (n = 425)	Controls, No. (n = 707)	OR (95% CI)	*P* Value
Categorical				.002 For trend
Normal (18.5-24.9)	100	147	1.00	
Overweight (25.0-29.9)	138	252	0.97 (0.68-1.38)	
Obese class 1 (30.0-34.9)	99	171	1.18 (0.80-1.73)	
Obese class 2 (35.0-39.9)	44	82	1.34 (0.82-2.18)	
Obese class 3 (≥40.0)	44	55	2.31 (1.36-3.91)	
Per-unit incremental	425	707	1.03 (1.01-1.05)	.001

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); CI, confidence interval; OR, odds ratio.
*Models are adjusted for sex, treated hypertension, and age (cubic spline). Adjustment for additional potential confounding factors did not alter risk estimates substantially.

Diabetes



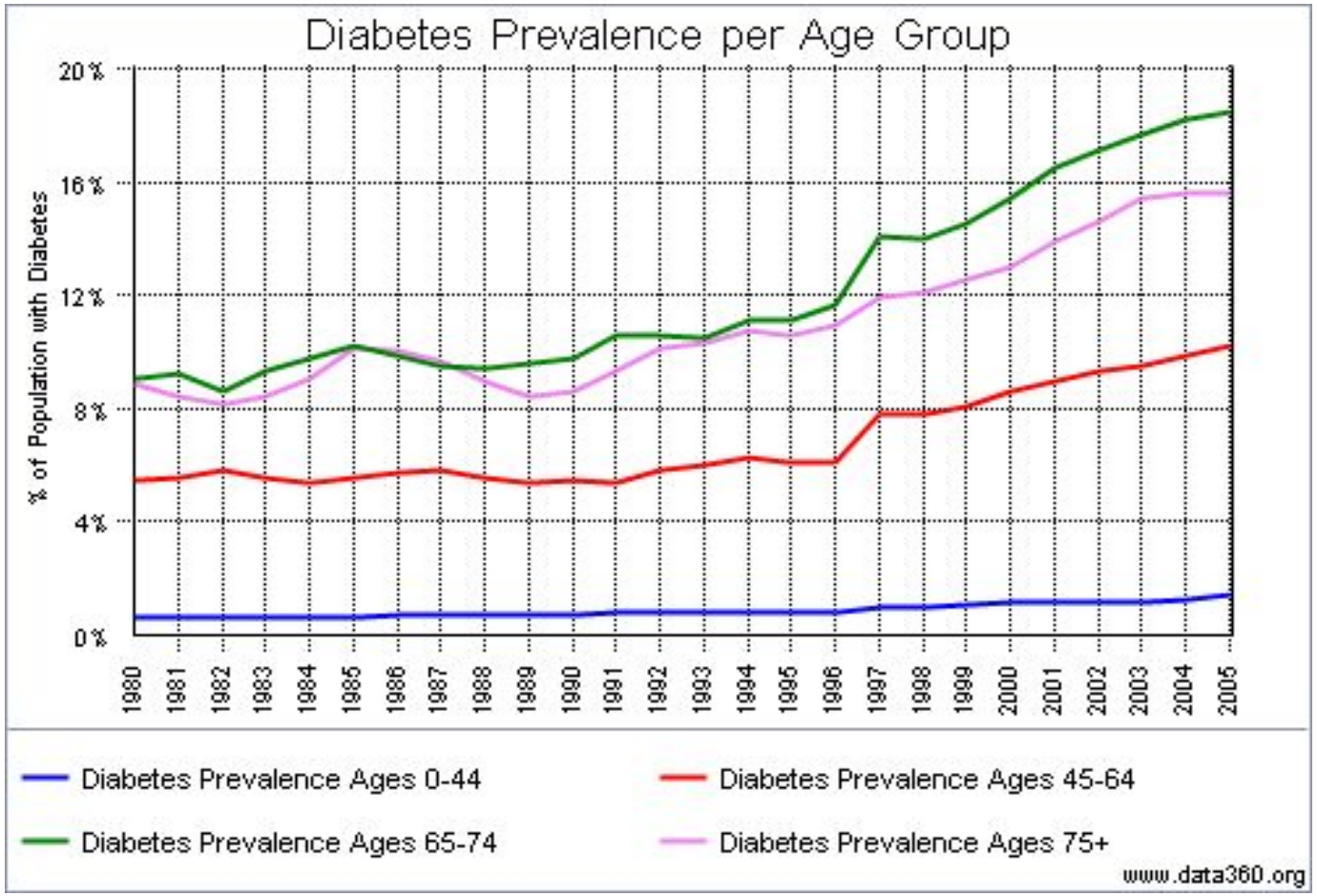
Prevalence of pregestational diabetes mellitus in pregnancy by year and diabetes type.



Sonia J Coton et al. BMJ Open 2016;6:e009494

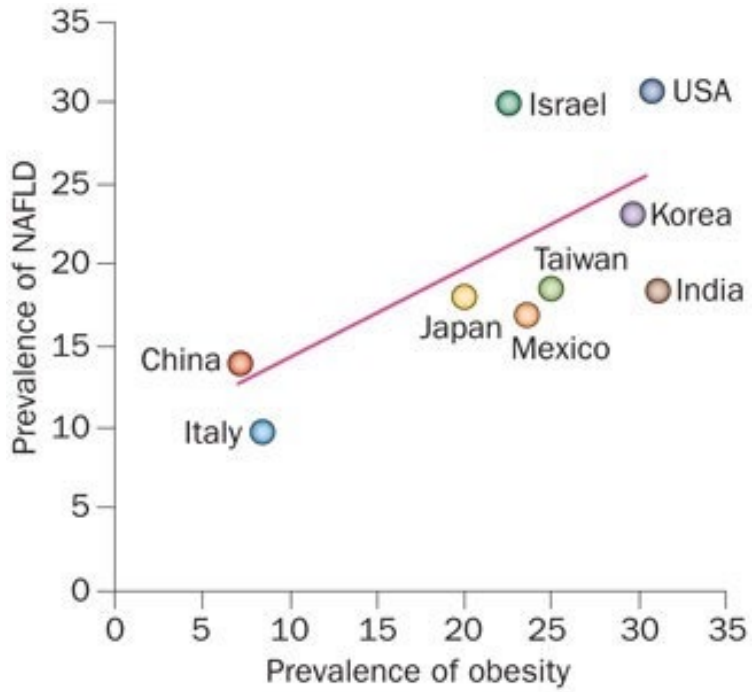
BMJ Open

Diabetes



People living with diabetes in the UK
2001 ~ 2.0 million
2011 ~ 2.5 million
2021 ~ 3.9 million
2031 – estimated ~5.5million

Obesity increases NAFLD / NASH and need for liver tranplants



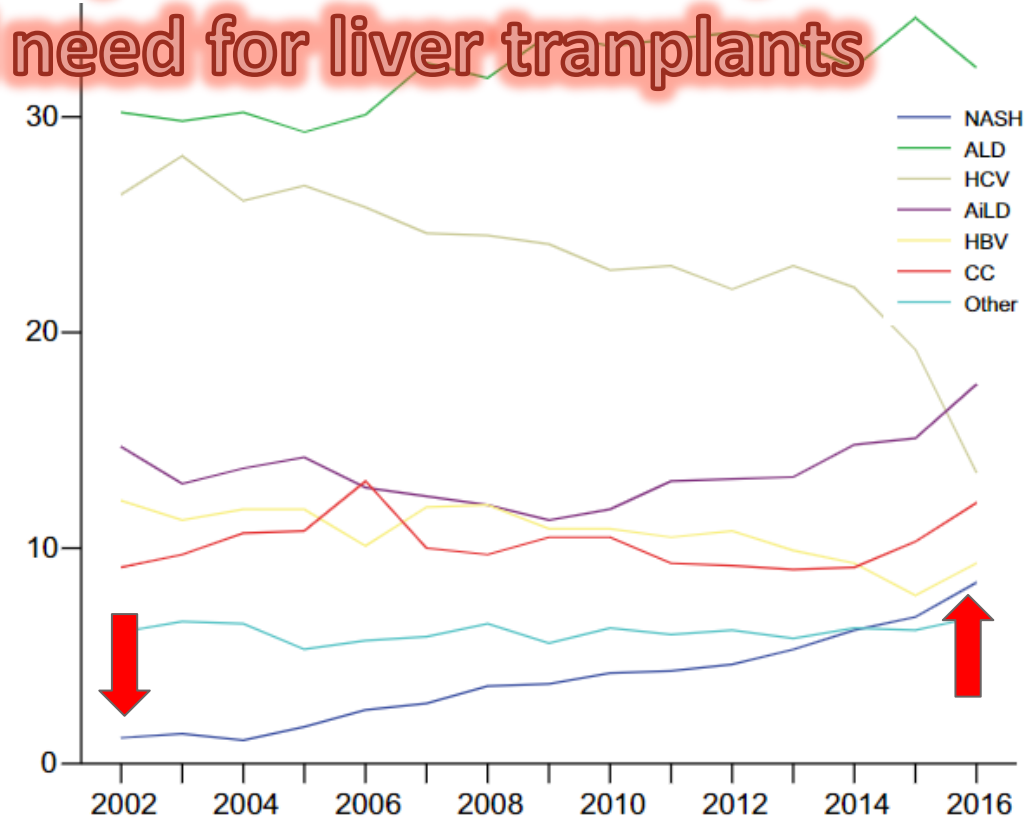


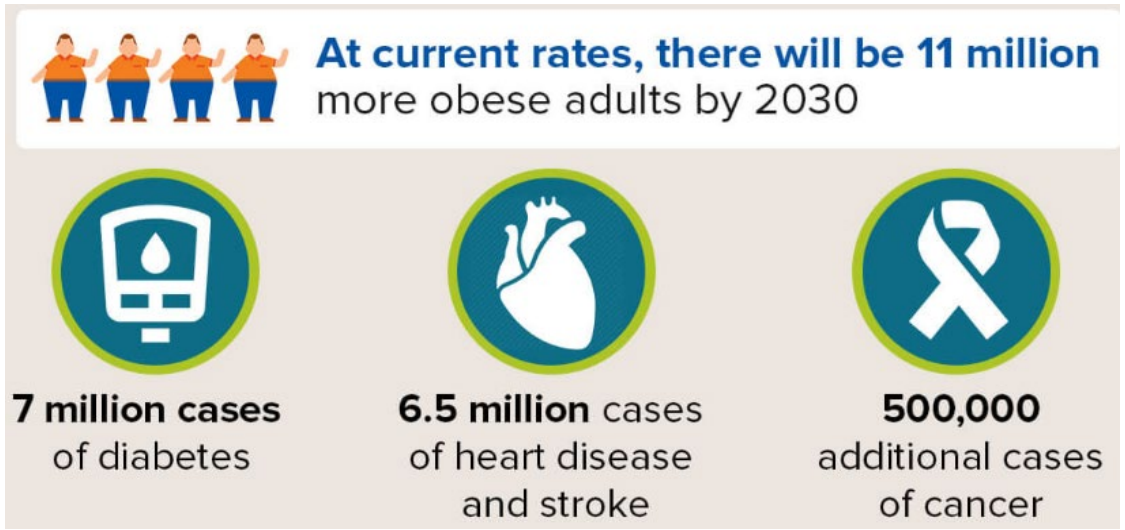
Fig. 2. Trends of annual primary liver transplants performed for different indications in the ELTR region.

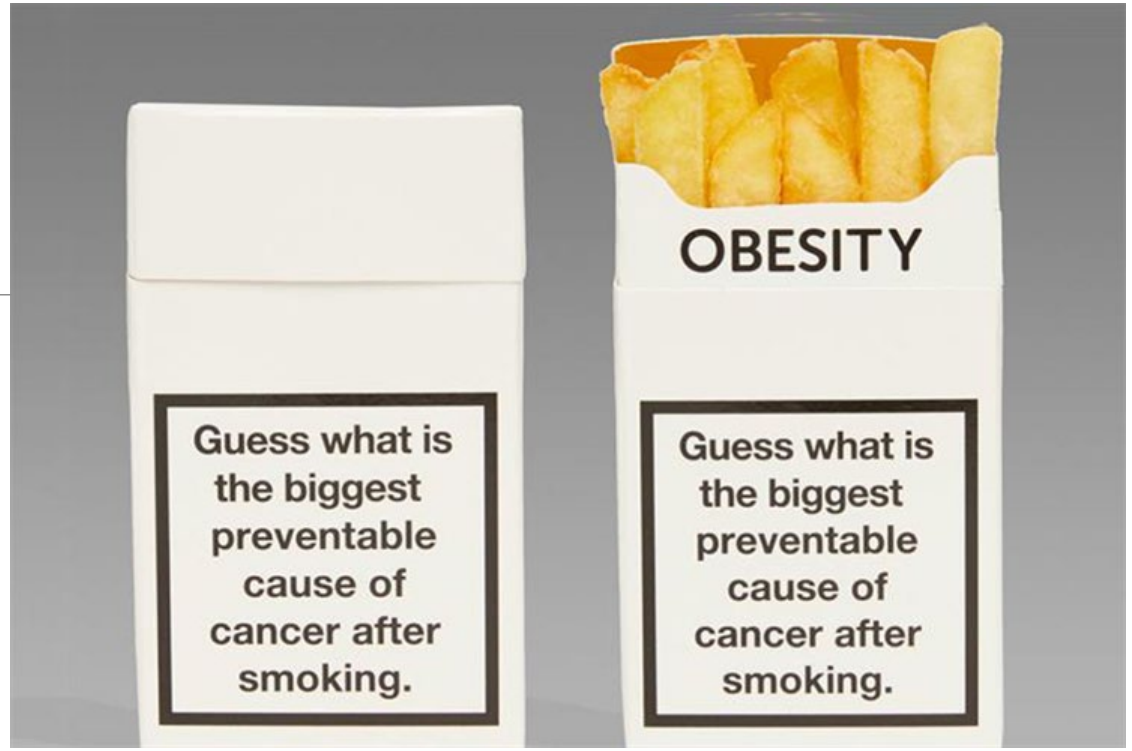
Outcomes of liver transplantation for non-alcoholic steatohepatitis
A European Liver Transplant Registry study

Journal of Hepatology **2019** vol. 71 | 313–322

Cancer

CANCER RESEARCH UK



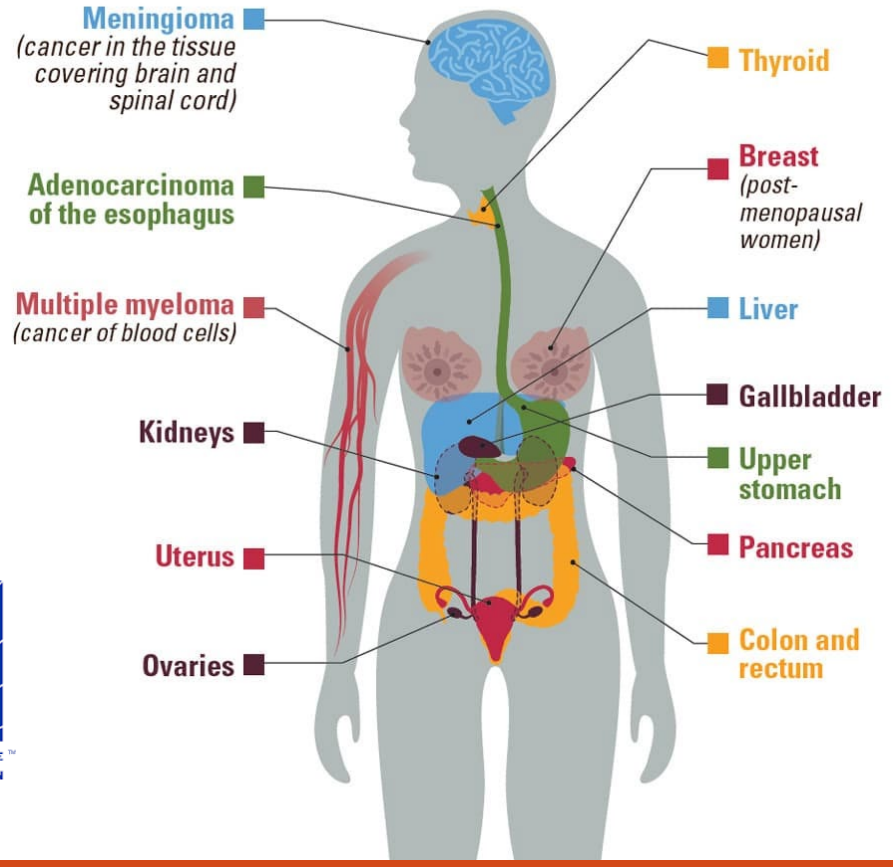


OB_S__Y

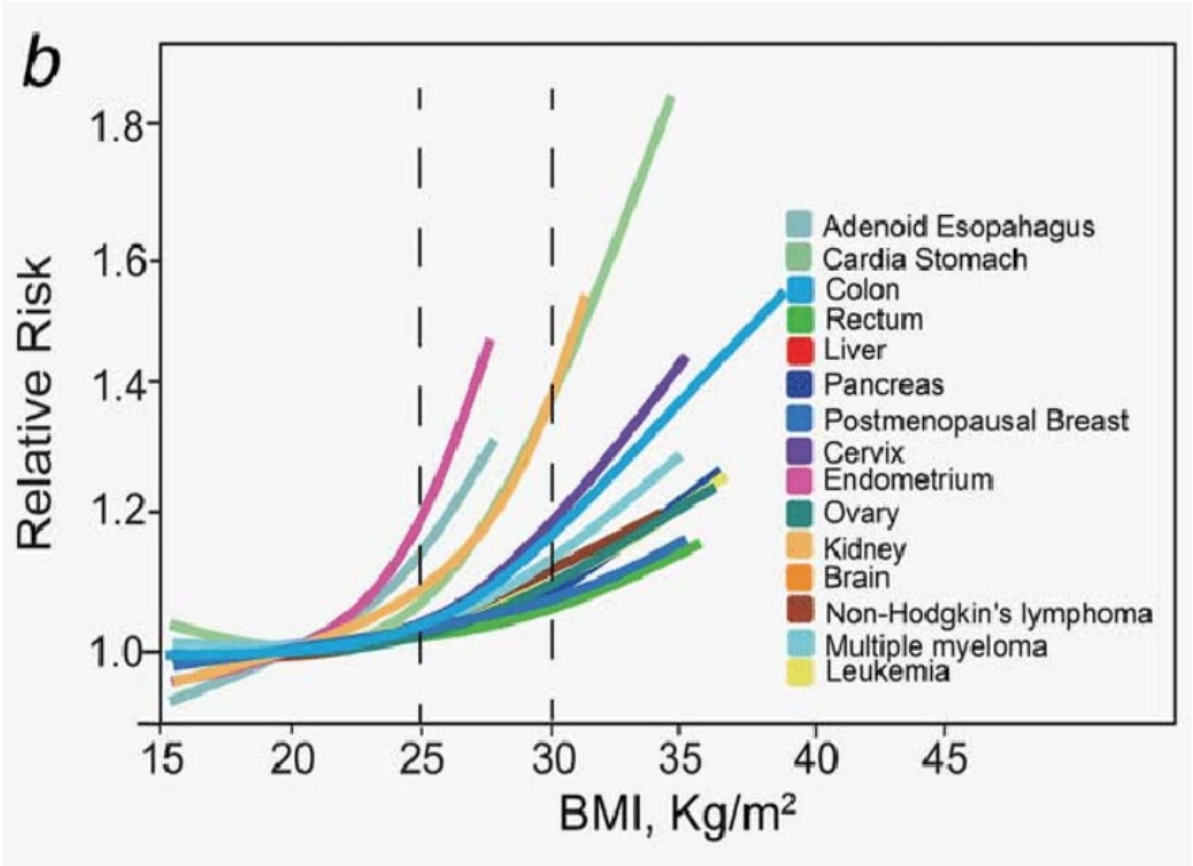
is a cause of cancer

Cancer

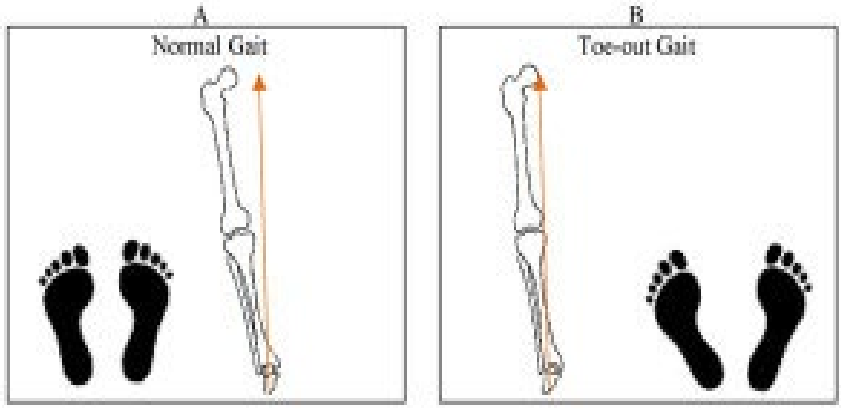
13 cancers are associated with overweight and obesity

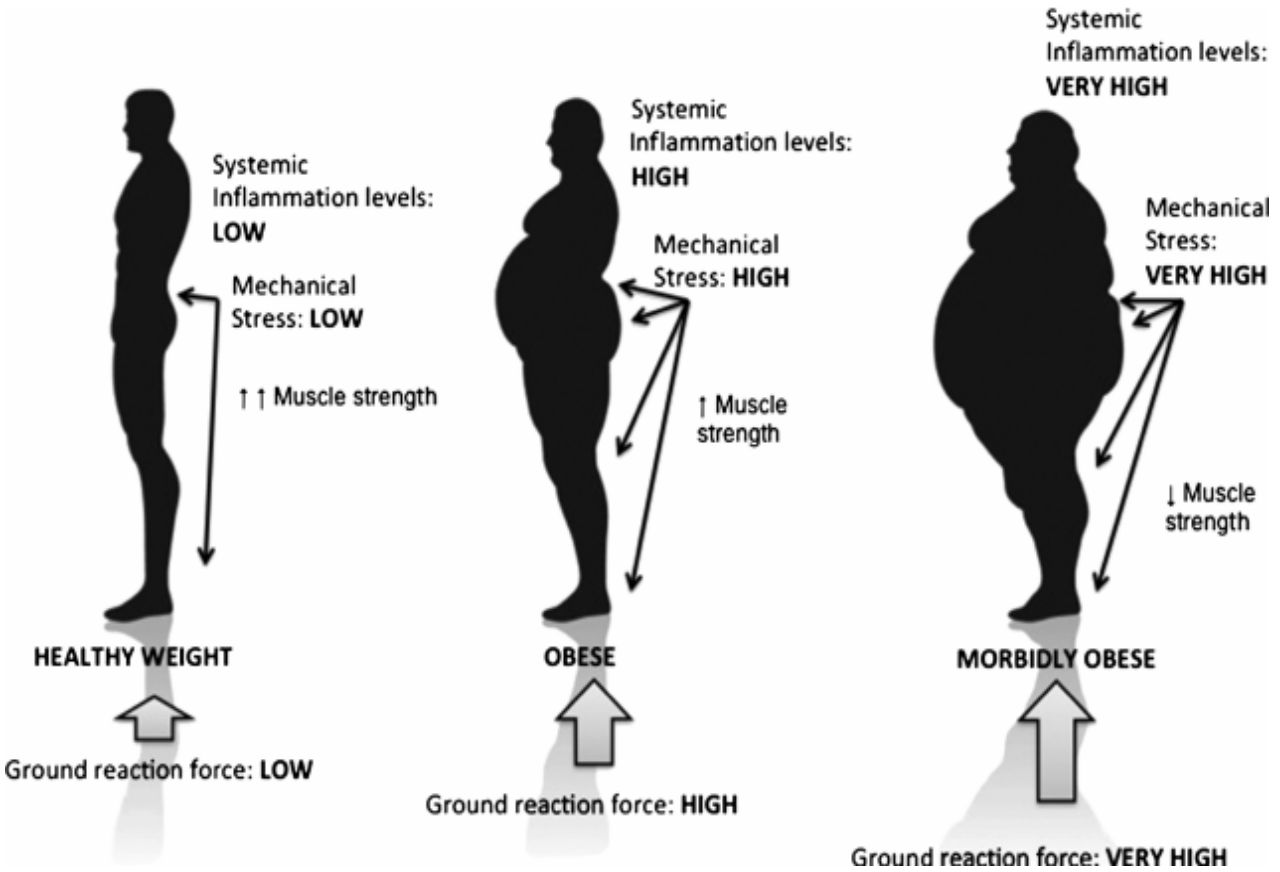


CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

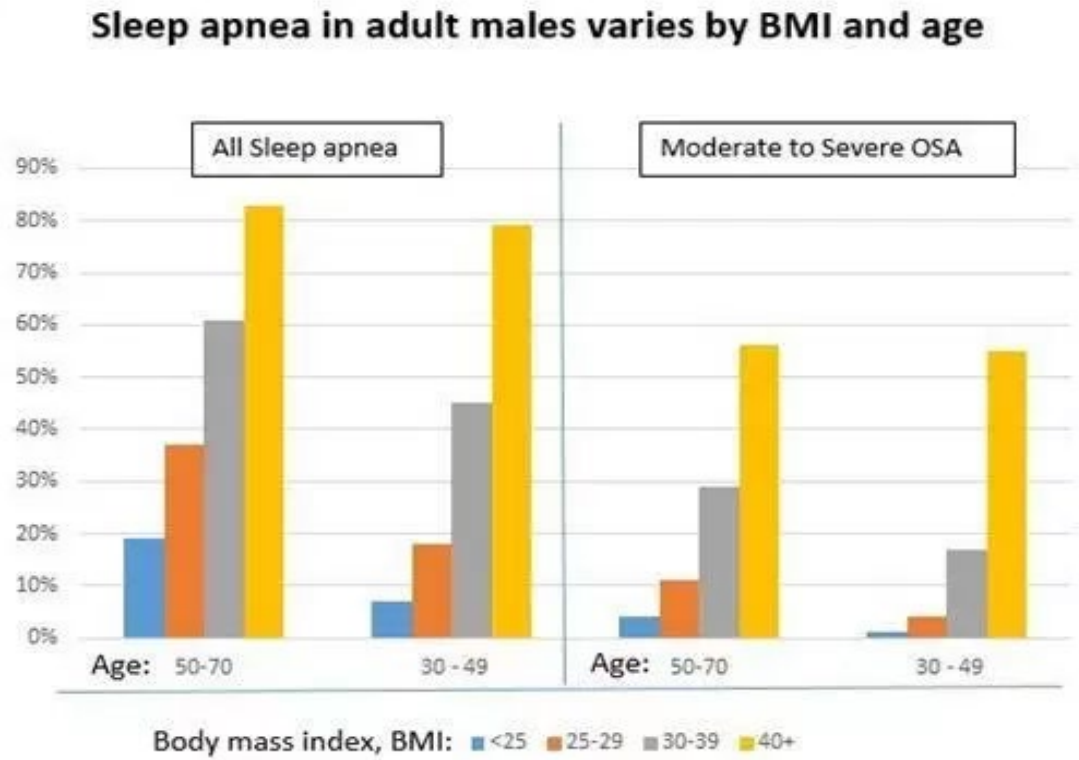


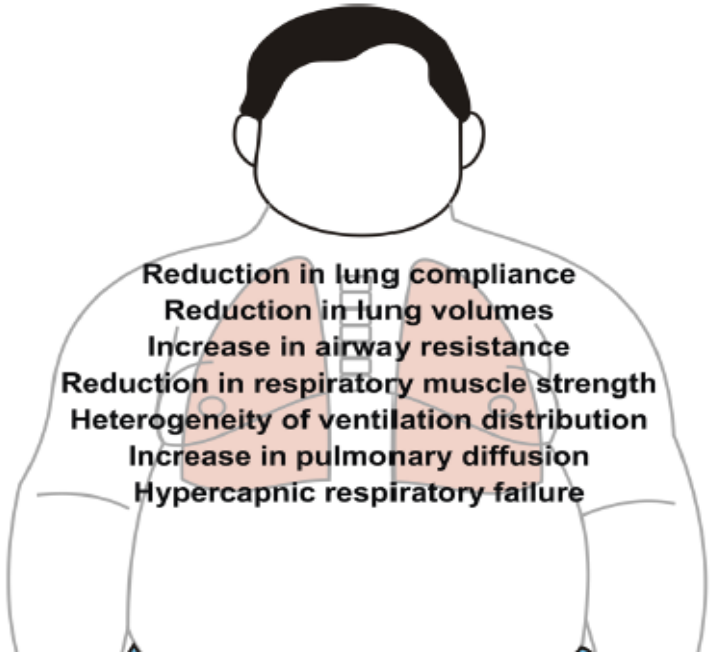
Musculoskeletal

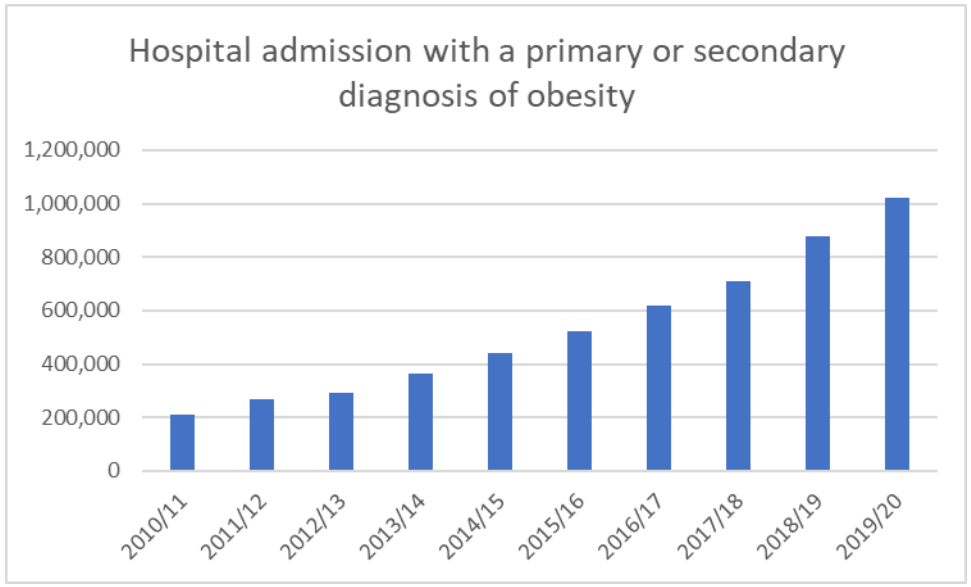




Obstructive Sleep Apnoea







Statistics on Obesity, Physical Activity and Diet, England, 2020

Official statistics, National statistics

NHS Digital

Publication Date:	5 May 2020
Geographic Coverage:	England
Geographical Granularity:	Country, Clinical Commissioning Groups, Local Authorities
Date Range:	01 Apr 2018 to 31 Dec 2019

Position	Reason
1st	Maternal
2nd	Musculoskeletal
3rd	Cardiac

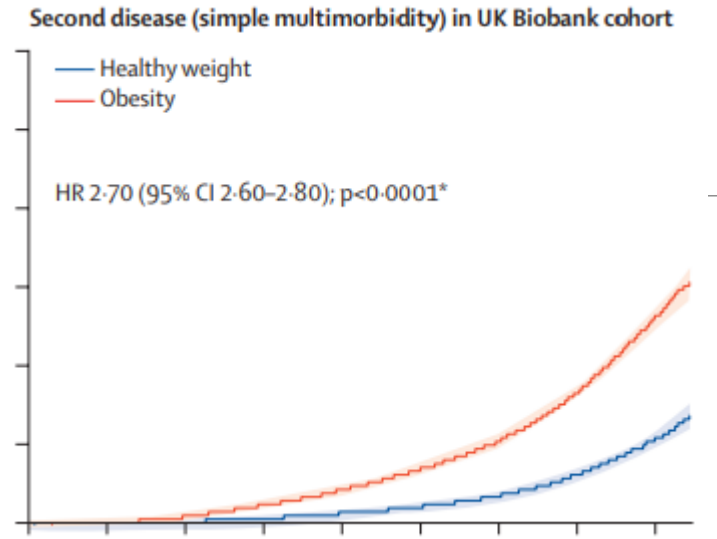
Lancet Diabetes Endocrinol
2022; 10: 253-63

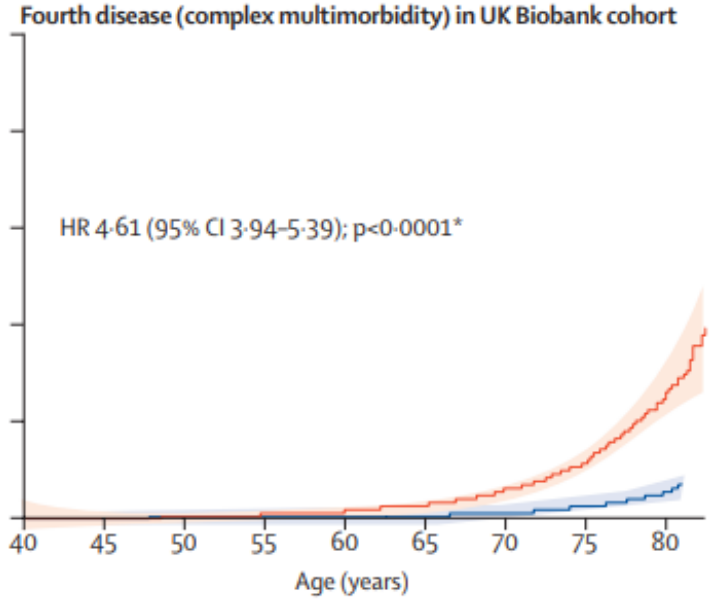
Body-mass index and risk of obesity-related complex multimorbidity: an observational multicohort study

Mika Kivimäki, Timo Strandberg, Jaana Pentti, Solja T Nyberg, Philipp Frank, Markus Jokela, Jenni Ervasti, Sakari B Suominen, Jussi Vaht..., Pyry N Sipilä, Joni V Lindbohm, Jane E Ferrie

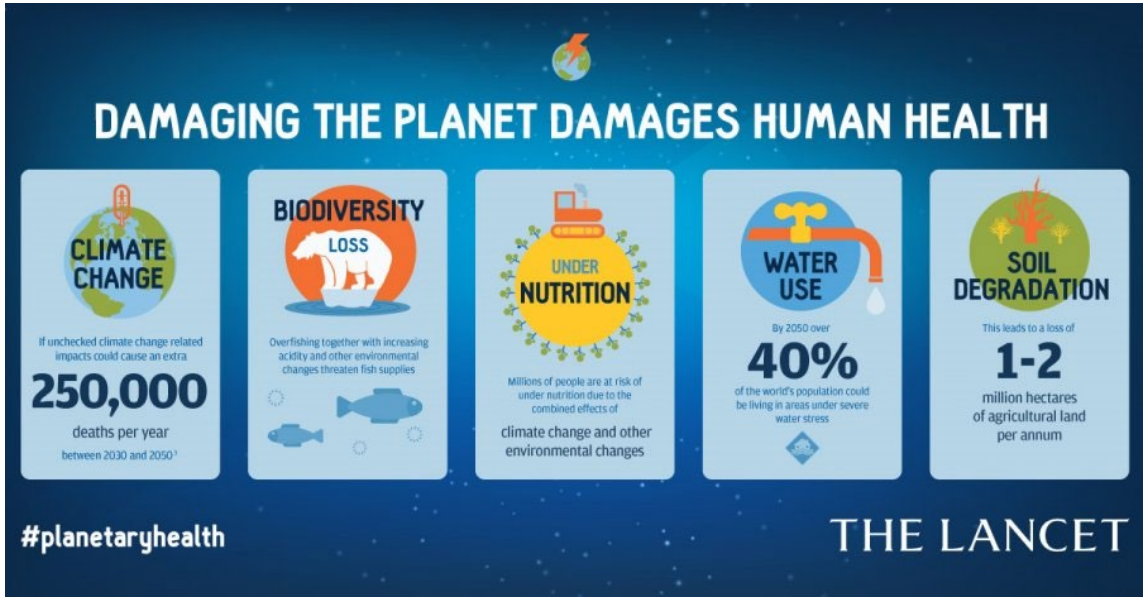
biobank uk
Enabling scientific discoveries that improve human health

	HR
Gout	5.27
Diabetes	4.53
Sleep disorders	4.1
Heart failure	3.24
Geststional diabetes	3.01
Osteoarthritis	2.56
Renal failure	2.32
Skin infection	2.31
Asthma	2.23
Liver disease	2.22
DVT	2.07
Hypertension	1.98
Back pain	1.83
Ischaemic Heart Disease	1.75
Infection	1.37
Stroke	1.27



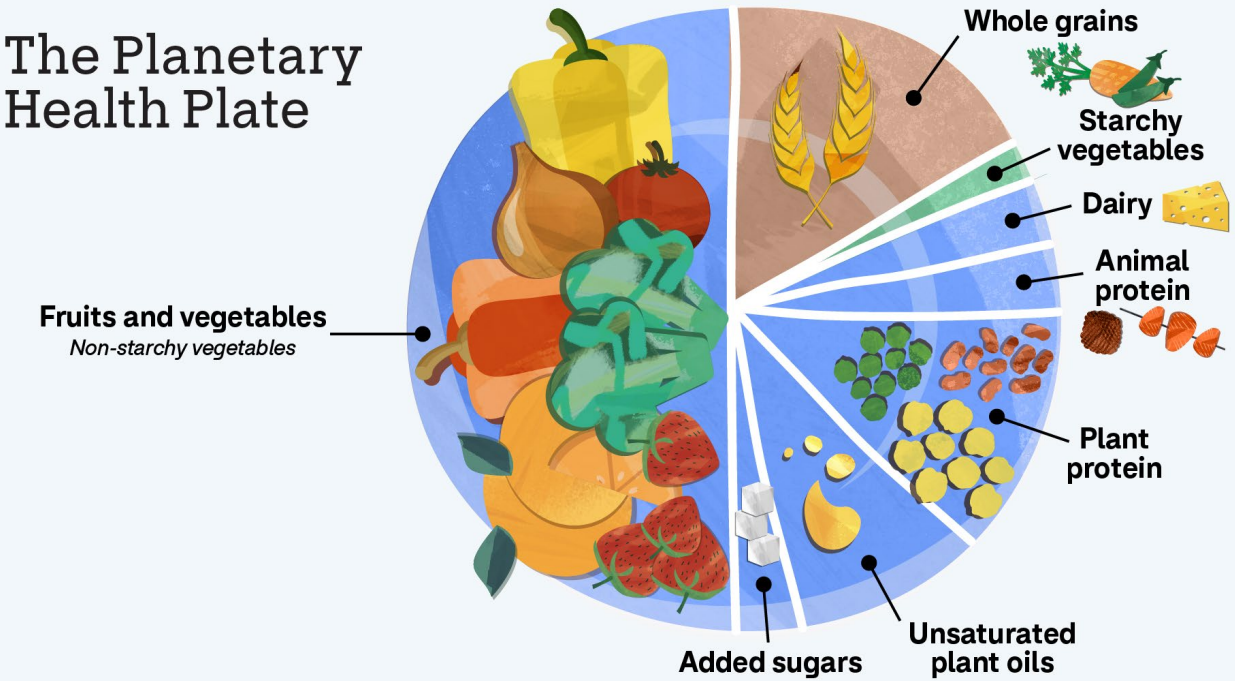


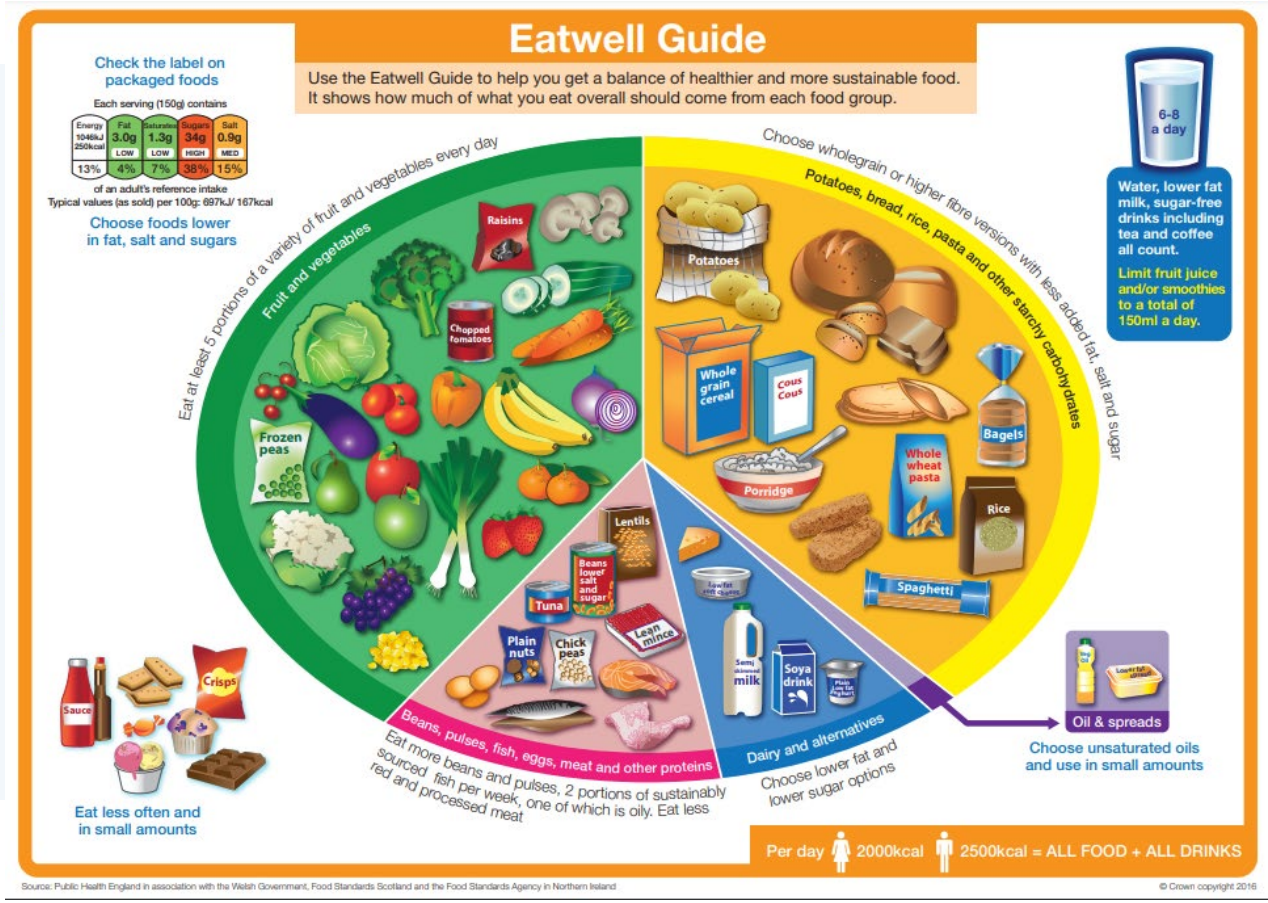
WHY DOES IT MATTER



WHY DOES IT MATTER

The Planetary Health Plate





WHY DOES IT MATTER

James Gandolfini – MI aged 45yrs

John Candy – MI aged 43yrs

NICE National Institute for Health and Care Excellence

Obesity: identification, assessment and management of overweight and obesity in children, young people and adults

Issued: November 2014

NICE clinical guideline 189

guidance.nice.org.uk/cg189

National Institute for Health and Clinical Excellence

Cardiovascular Disease Risk

	BMI	Men <102cm (40in); Women <88cm (35in)	Men >102cm (40in); Women >88cm (35in)	Co-morbidities
Normal	18.5-24.9			
Overweight	25-29.9	Increased	High	High
Obese I	30-34.9	High	Very High	Very High
Obese II	35-39.9	Very High	Very High	Extremely High
Obese III	>40	Extremely High	Extremely High	Extremely High

1.10.7 In addition to the criteria listed in 1.10.1, bariatric surgery is the option of choice (instead of lifestyle interventions or drug treatment) for adults with a BMI of more than 50 kg/m^2 when other interventions have not been effective. **[2006, amended 2014]**

Clinical Commissioning Groups

Accessed via Tier 3 specialist centres in line with NHS England policy

Referral to Tier 3 following suboptimal weight loss maintenance with Tiers 1&2 via GP/ Primary Care

Local Authorities

Primary care to advise and support lifestyle management:

Diet
Physical activity
Behavioural changes

Tier 4
Bariatric surgery

Tier 3
Specialist weight management

Tier 2
Lifestyle management

Tier 1
Universal services

Preoperative assessment for specialised complex obesity services (including bariatric surgery)

Low-energy liquid diets, AOMs, assessment for bariatric surgery and/or referral for endocrine investigation

Primary care with community interventions (including referral to commercial weight loss programmes)

Primary care and community advice to identify and reinforce healthy eating and physical activity messages

NHS England

Local Government Association

Public Health England

Current Obesity Reports (2020) 9:530–543

HISTORY OF LIFESTYLE INTERVENTION?

1820 – Lord Byron's Vinegar and Water Diet

1925 – Lucky Strike – Diet on cigarettes

1963 – Weight watchers founded

1977 – Slimfast founded

1991 – Very low calorie diet in diabetes

1994 – Nutrition labelling

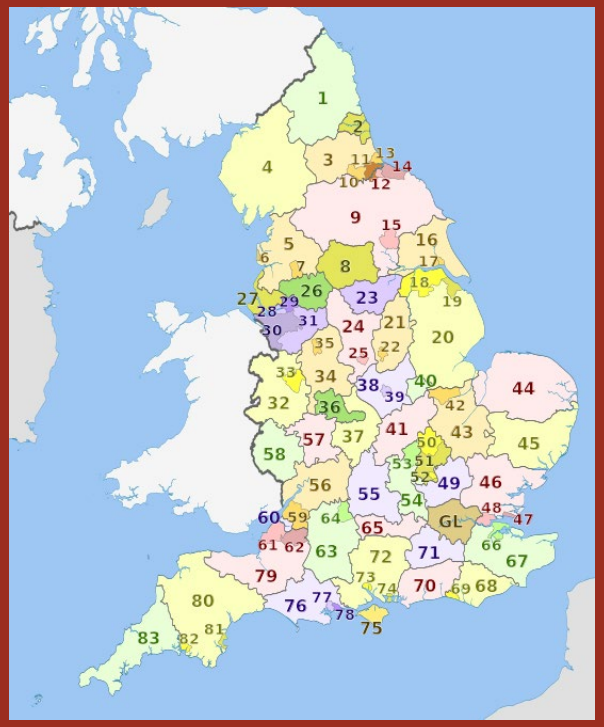
2005 – British Heart Foundation Booklet

2009 – 150min of exercise recommended

2012 – Local Government commission Tier 2 Services

Average weight loss 2.3kg

Tier 2 - Local government funded weight loss programs



Livewell Weight Management Programme

12 months' support

0 – 2 weeks:
- Weekly 1:1 support
- Community activity programme
- Food co-op

0 – 12 weeks:
- Healthy eating groups (6 weeks)
- Cook and eat sessions
- Weight management groups/1:1s (12wks)

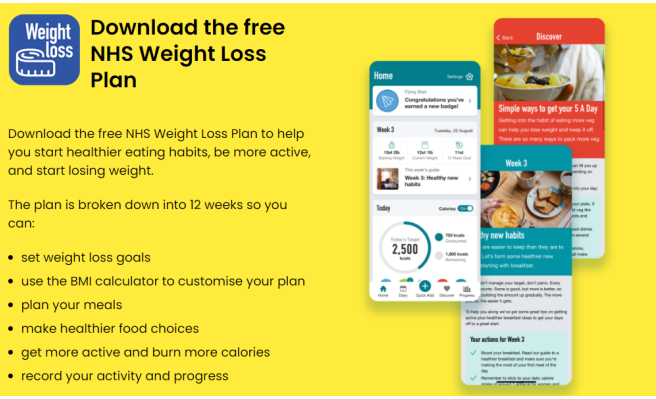
On-going for 12months:
- Drop ins
- Physical activity prescription
- Quarterly 1:1
- Cook and eat/healthy eating
- Community activities
- Food coop

6 week Cook & Eat & Healthy Eating

8 week weight management group workshops
8 weekly themed group sessions (EWP+ FAD diets, food labelling, portion sizes, sugars+fats+salts+alcohol, shopping, cooking)
Food triggers, cravings, action planning, self monitoring, mindfulness,, meal planning, healthy takeaways)

TIER 2 SERVICES

- Public Health England - National Audit Data 2021
  - ~75,000 Registered for Tier 2
  - ~43,000 (58%) Started the program
  - ~28,000 (38%) Completed the program
  - -2.24kg – enrolled mean weight loss
  - ~13,000 (17%) lose >5% body weight



NHS BETTER HEALTH APP

Digital only 12 week weight loss app

- UK Government outcome data 2020-21
  - ~726,000 Downloaded & registered with the app
  - ~69,000 (58%) Started the program
  - ~8,000 (38%) Completed the program
  - -2.35kg - enrolled mean weight loss
  - ~13,000 (2%) lose >5% body weight

2022

NHS Digital Weight Management Programme

If you are living with obesity, you may be eligible to join a free, 12-week online programme to help manage your weight and improve your health.

NHS Digital Weight Management Programme

Currently commissioned

High intensity offer

- NHS Diabetes Prevention programme. England-wide service providing face-to-face (currently remote) and digital products for people at high risk of diabetes*
- 9 month programme, min. 16 hours contact over min. 13 sessions

New offer

Intermediate offer

- Medium intensity intervention through NHS Digital Weight Management Programme. Supported digital or remote 12 week intervention, at three levels of

NHS Choices

Universal offer: low intensity intervention

- Recently launched 'Better Health' NHS app based on the revised NHS Choices 12 week weight loss programme.

HEALTHIER YOU
NHS DIABETES PREVENTION PROGRAMME

120k adults/year Non-diabetic hyperglycemia

Level 3: Digital with human coaching plus

Level 2: Digital with human coaching

Level 1: Digital only

Adults living with overweight or obesity (BMI 25+, with adjustment for ethnicity) Approx. **4.6m adults**

Adults living with overweight or obesity (BMI 25+, with adjustment for ethnicity) Approx. **26m adults**

Complement services commissioned by local government by providing a digital offer and additional capacity

Private Partnerships

Better Health NHS Let's do this

Slimming World

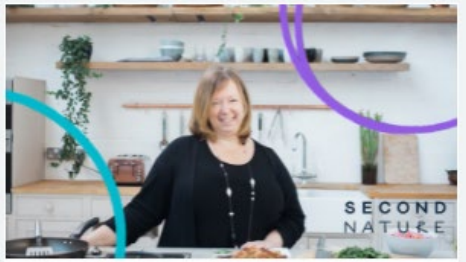
GetSlim

MAN v FAT Football

Pharmacy

Noom

WW – Weight Watchers



Second Nature

Tier 3 – commissioned by CCG

1999 – 481 Primary Care Groups

2001 – 303 Primary Care Trusts

2010 - 211 Clinical Commissioning Groups

2021 – 106 Clinical Commissioning Groups

2022 – 42 Integrated Care Boards

2014 NHS Commissioning guide: "CCG's should be reassured that set-up costs of Tier 3 clinics would be offset by potential savings from reduced medication costs, consultation costs and hospital visits ..."

2017

Commissioning guide:

Weight assessment and management clinics (tier 3)

Joint-sponsoring organisations:
Associations of British Clinical Diabetologists
Association for Clinical Biochemistry & Laboratory Medicine
Association of Physicians Specialising in Obesity
Association for the Study of Obesity
British Association of Paediatric Surgeons
British Dietetic Association
British Psychological Society
Diabetes UK
Faculty of Public Health
Royal College of Anaesthetists
Royal College of General Practitioners
Royal College of Nursing
Royal College of Obstetrics and Gynaecology
Royal College of Paediatrics and Child Health
Royal College of Physicians (London)
Royal College of Pathologists
Royal College of Psychiatrists
Society for Endocrinology
Society for Obesity and Bariatric Anaesthesia
Weight Loss Surgery Info (WLSinfo)

TIER 3 WEIGHT SERVICES

Objectives

- Provide individualised non-surgical interventions to aid weight loss
- Optimise obesity related comorbidities
- Prepare and act as gateway to Tier 4 surgical services.

REFERRAL CRITIERA

Local variations in service, but usually:

- BMI of ≥ 35 kg/m2 (or ethnicity adjusted) + obesity-related comorbidity
  - Sleep apnoea, diabetes, functional disability, infertility, etc.
- BMI of ≥ 40 kg/m2

Tier 3 – MDT Team

Doctor with a special interest on obesity (physician or GP)

Specialist nurse

Psychologist

Dietitian

Specialist exercise therapist / physiotherapist

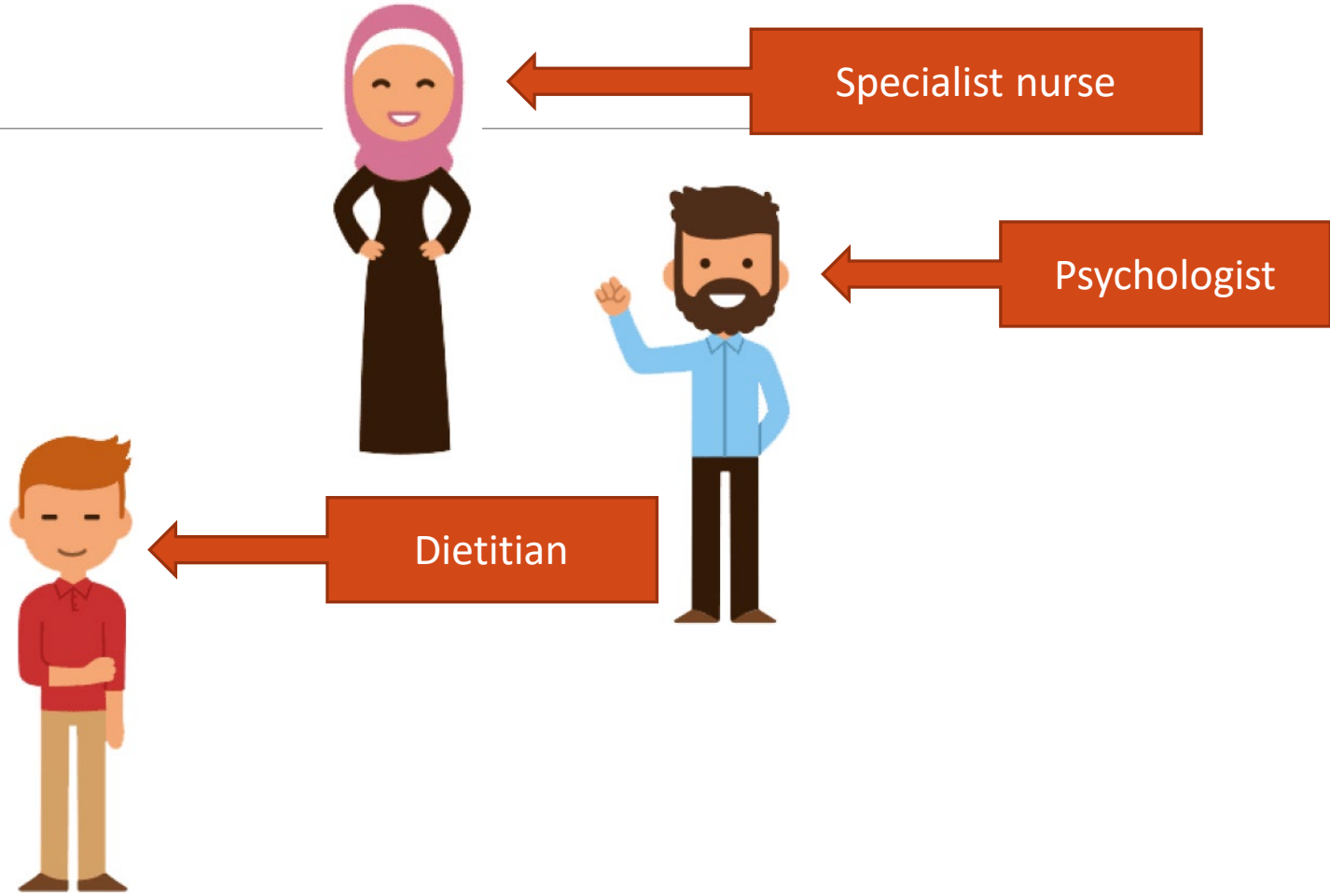
Team Variations

Doctor with a special interest on obesity (physician or GP)

Psychologist

Dietitian

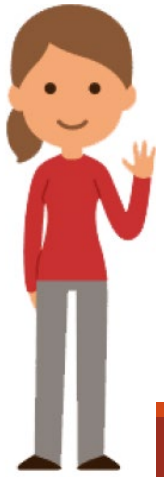
Team Variations



Team Variations

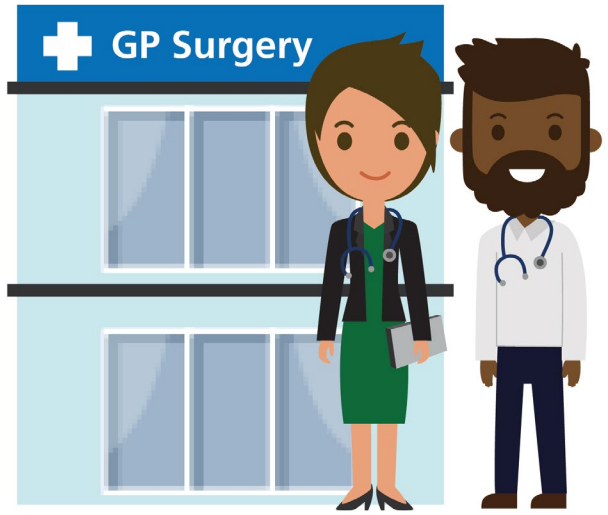
Doctor with a special interest on obesity (physician or GP)

Specialist nurse



Specialist exercise therapist / physiotherapist

Joint Up Care



Two way conversation with Primary care

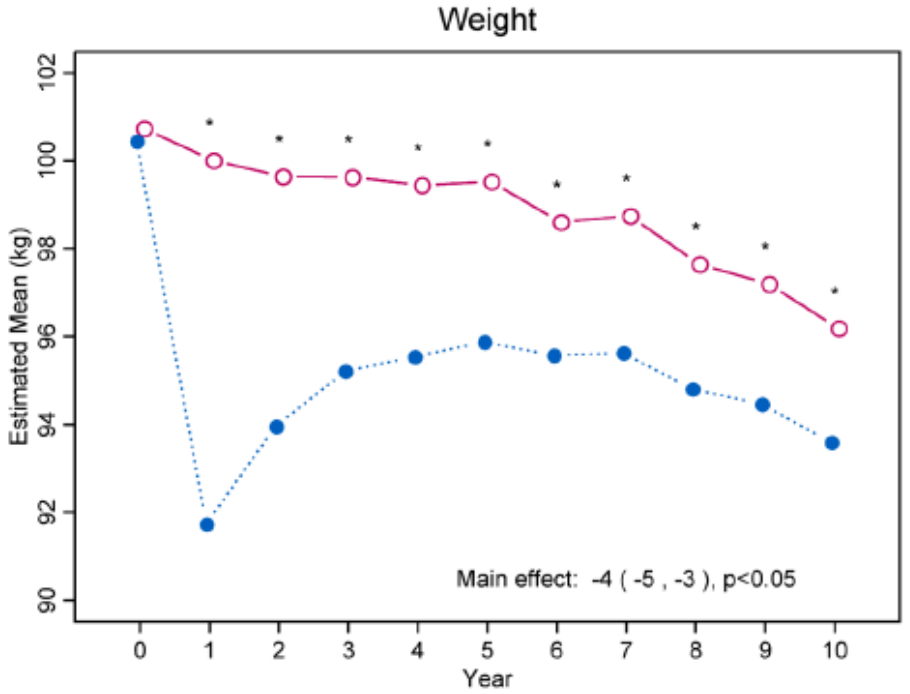
Two way conversation with secondary care services.

- Gastroenterology
- Lymphoedema Service
- Radiology
- Hepatology
- Respiratory
- Cardiology
- Diabetes
- Renal

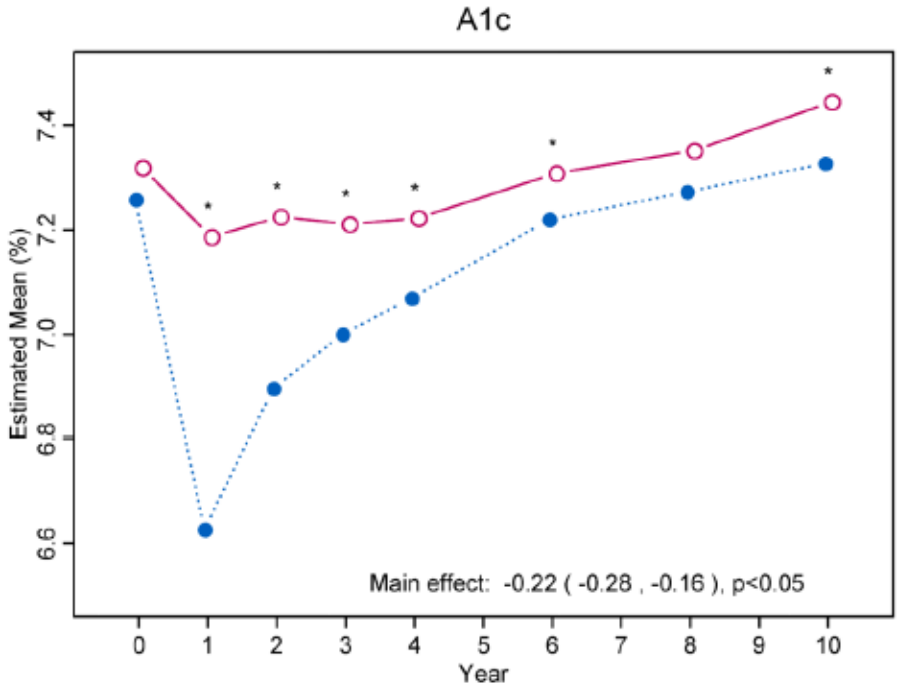
HOW LONG DOES TREATMENT WORK?

LOOK AHEAD Study

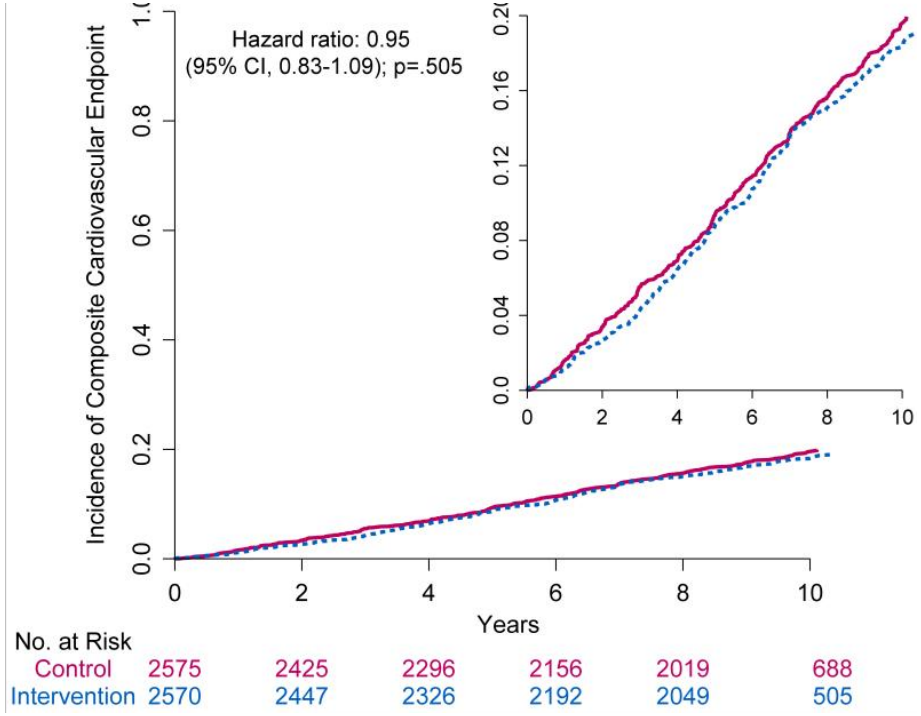
- Obese DMT2 randomised to intensive lifestyle intervention or standard diabetes education.
  - Initially weekly visits or phone calls for 6months then fortnightly for 6 months
    - 1200-1800cal per day
    - 175min exercise per week



EFFECT ON DIABETES



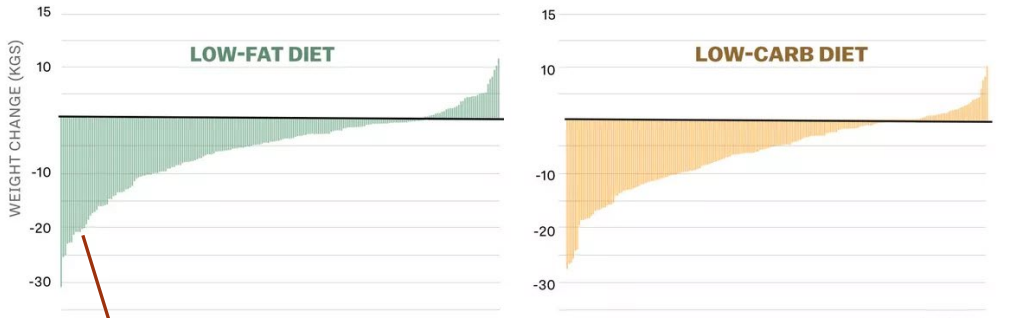
EFFECT ON CVD ENDPOINTS



DOES LOW FAT OR LOW CARB MATTER?

People have wildly different responses to low-carb and low-fat diets

12-month weight change for each participant in the DIETFITS study



Source: JAMA

Vox

Super Responders

DOES EXERCISE MATTER?

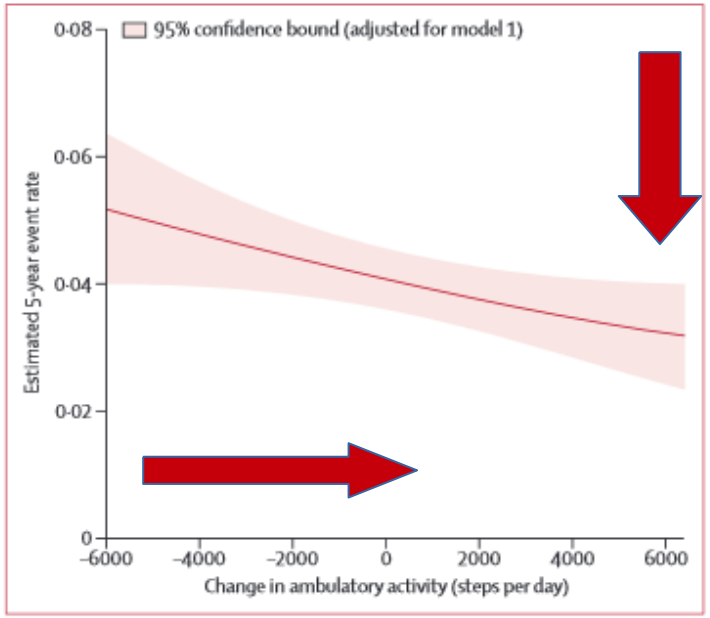


Figure: Relation between change in ambulatory activity and adjusted 5-year cardiovascular event rates

Association between change in daily ambulatory activity and cardiovascular events in people with impaired glucose tolerance (NAVIGATOR trial): a cohort analysis

Thomas Yates, Steven M Haffner, Phillip J Schulte, Laine Thomas, Kim M Huffman, Connie W Bales, Robert M Califf, Rury R Holman, John J V McMurray, M Angelyn Bethel, Jaakko Tuomilehto, Melanie J Davies, William E Kraus

Summary

Background The extent to which change in physical activity can modify the risk of cardiovascular disease in individuals

Lancet 2014; 383: 1059-66

DRUGS - ORLISTAT

Lipase inhibitor

UK License: BMI >30 (or 28) with DMT2, hypertension or high cholesterol

At 12 weeks if <5% weight loss then stop.

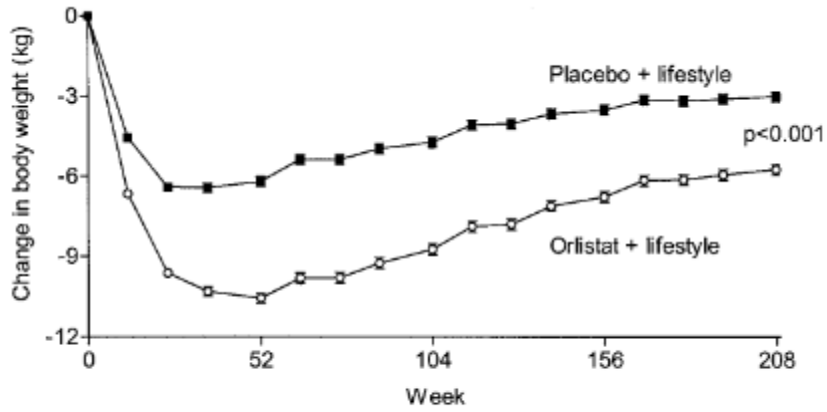
~£28 a month

XENical in the Prevention of Diabetes in Obese Subjects (XENDOS) Study

A randomized study of orlistat as an adjunct to lifestyle changes for the prevention of type 2 diabetes in obese patients

JARL S. TORGERSON, MD, PHD[1]
JONATHAN HAUPTMAN, MD[2]
MARK N. BOLDRIN, MS[2]
LARS SJÖSTRÖM MD, PHD[1]

with type 2 diabetes are either overweight or obese (5). The World Health Organization has estimated that the number of



-2.8kg

Figure 2—*Weight loss (means ± SEM) during 4 years of treatment with orlistat plus lifestyle changes or placebo plus lifestyle changes in obese patients (LOCF data).*

EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

DRUGS GLP-1'S - APPROVED FOR TYPE 2 DIABETES

2006 - Exenatide (Byetta)

2009 - Liraglutide (Victoza)

2013 - Lixisenatide (Lyxumia)

2014 - Albiglutide (Eperzan)

2014- Dulaglutide (Trulicity)

2018 - Semaglutide (Ozempic)

SANOFI MERCK gsk BAYER NOVARTIS Abbott Pfizer Johnson&Johnson abbvie Roche

GLP-1'S - APPROVED FOR OBESITY ONLY

2015 - Liraglutide (Saxenda 3mg)

- ~£200 a month

2023 - Semaglutide (Wegovy 2.4mg)

- Awaiting price & UK launch

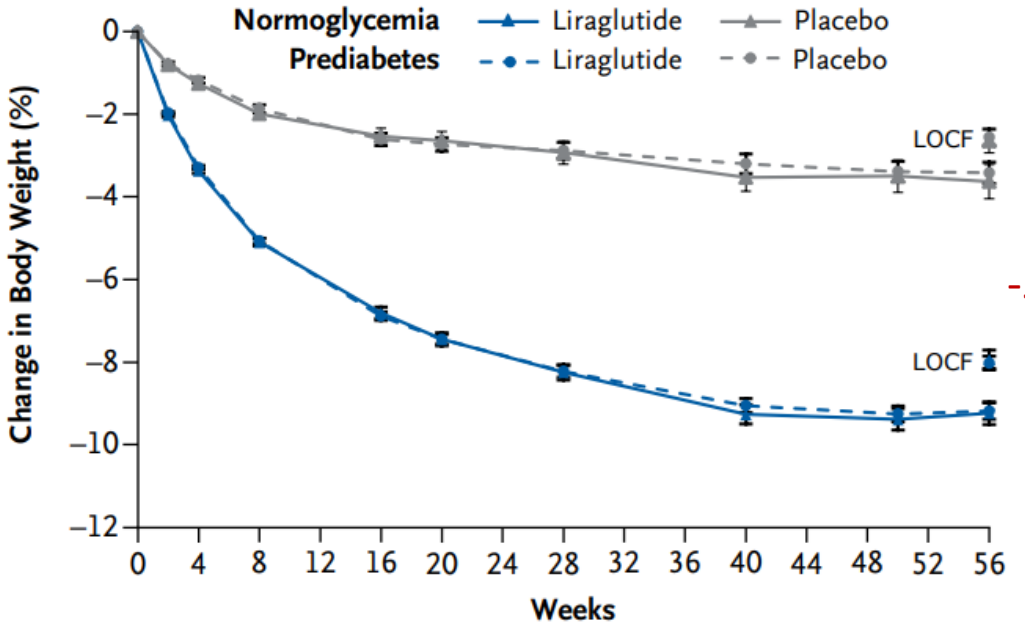
LIRAGLUTIDE (SAXENDA) – NO DMT2

N Engl J Med 2015;373:11-22

Double-blind randomised placebo controlled trial involving 3731 patients with BMI>30 and no diabetes.

Sub-group analysis of patients with pre-diabetes.

	Placebo (n=1,941) %	Saxenda® (n=3,384) %
Nausea	13.8	39.3
Diarrhea	9.9	20.9
Constipation	8.5	19.4
Vomiting	3.9	15.7



-5.6kg

Liraglutide (Saxenda) – Obesity only

NICE
National Institute for Health and Care Excellence

Liraglutide for managing overweight and obesity

Technology appraisal guidance
Published: 9 December 2020
www.nice.org.uk/guidance/ta664

NICE Recommendations

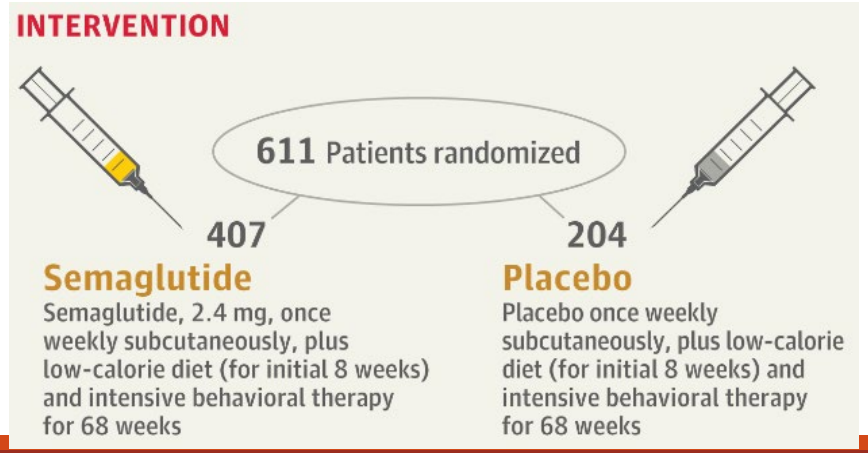
Liraglutide is recommended as an option for managing obesity alongside a reduced-calorie diet and increased physical activity in adults, only if:

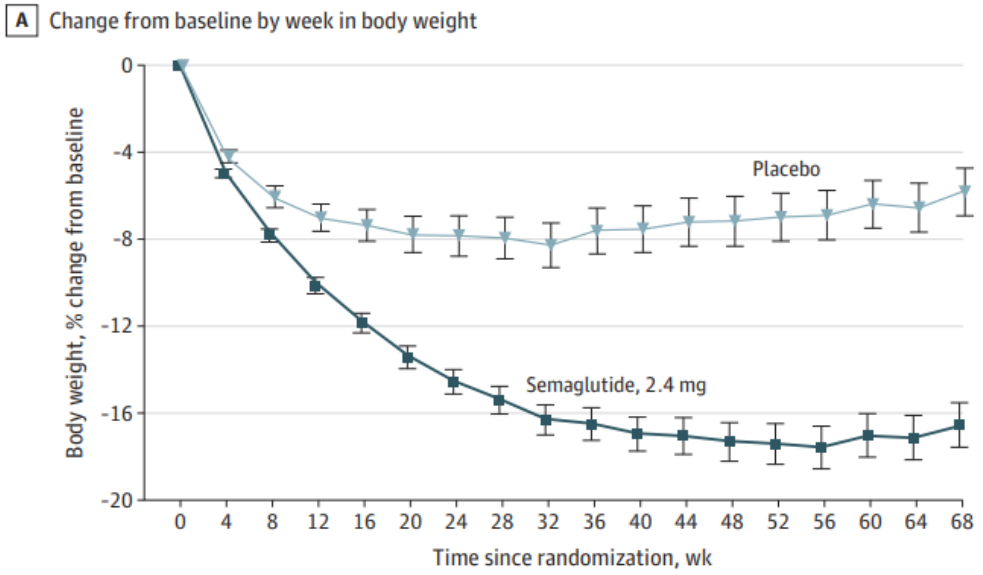
- BMI >35 (or >32.5 if ethnic minority)
- AND HbA1c between 42-27 (pre-diabetes)
- AND has hypertension and high cholesterol (high cardiovascular risk)
- AND prescribed in Secondary Care Tier 3 service with commercial agreement.

SEMAGLUTIDE (WEGOVY) – OBESITY ONLY

JAMA. 2021;325(14):1403-1413

Randomized, double-blind, parallel-group, 68-week in 611 adults without diabetes with BMI > 30 or BMI > 27 with 1 or more weight-related comorbidities, without diabetes.





-10.6kg

SEMAGLUTIDE (WEGOVY) – NO DMT2

Draft NICE recommendations:

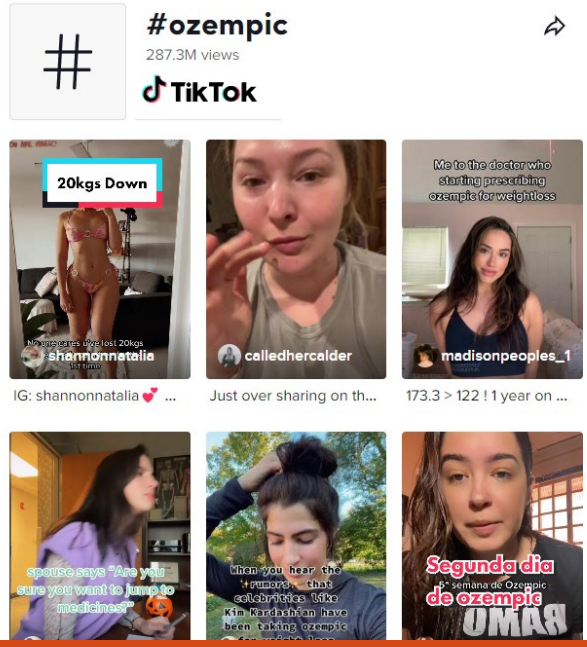
Recommended as an option for weight management, including weight loss and weight maintenance, alongside a reduced calorie diet and increased physical activity in adults, only if:

- used for a maximum of 2 years, and within a specialist weight management service providing multidisciplinary management of overweight or obesity (including but not limited to tiers 3 and 4)
- BMI >35 or >30 with obesity related comorbidity
- It is stopped if <5% weight loss after 6 months.

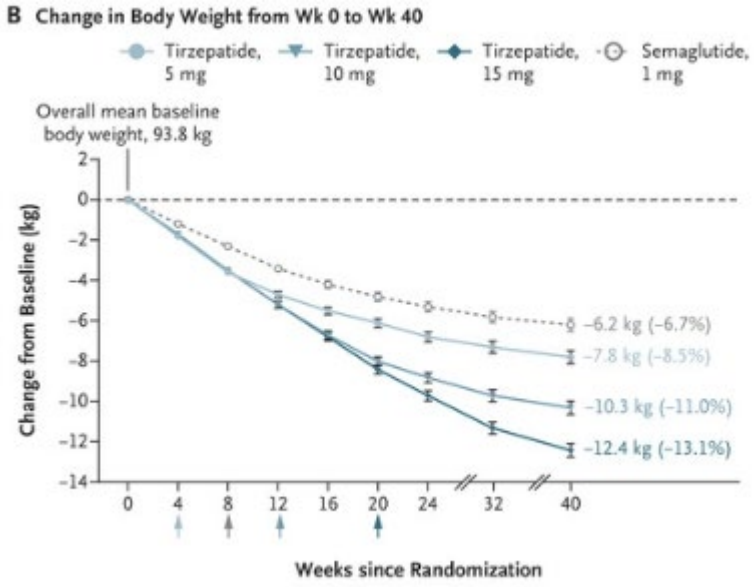
Home » Health and Wellness » Weight Loss

Kim Kardashian Weight Loss Secrets– Lose 70 Pounds Like A Pro

Diabetes Injections, Hollywood's New Secret to Losing Weight



COMING SOON - TIRAZEPATIDE



-12.4kg

FUTURE NEW DRUGS

- Oral GLP-1
  - Rybelsus (oral semaglutide), Danuglipron,
- GIP/GLP-1 drugs are in development
  - Pemvidutide, BI 456906, CT-868, AMG 133 ,

RYBELSUS® semaglutide tablets

Estimated Primary Completion Date : March 27, 2023

Estimated Study Completion Date : May 15, 2023

Gastric band

Sleeve Gastrectomy

Roux-en-Y
Gastric Bypass

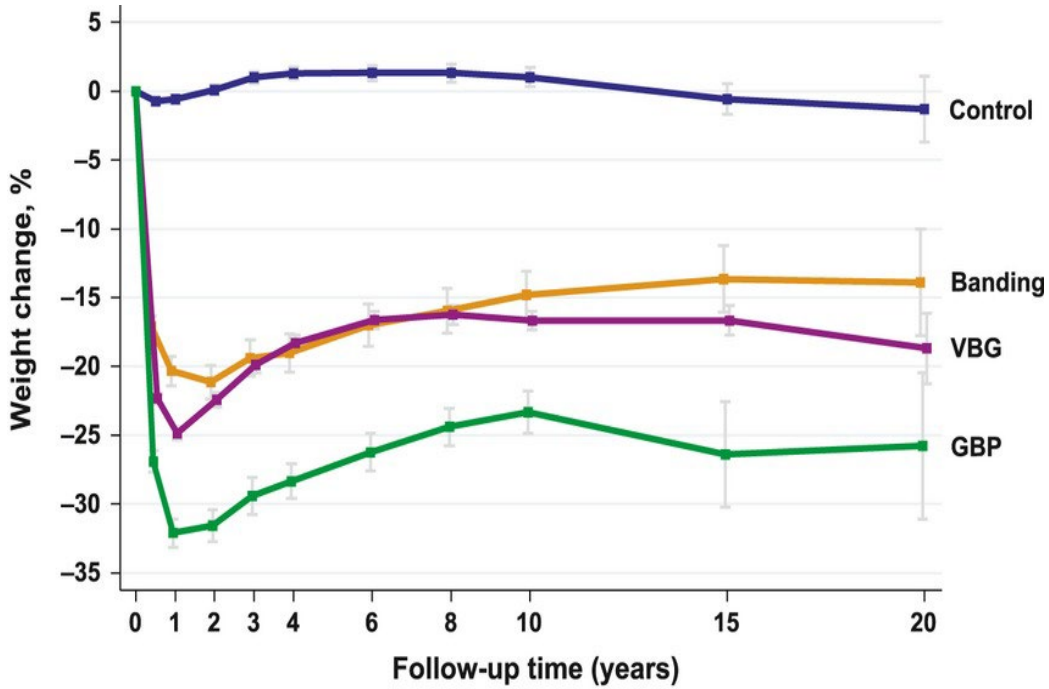
Biliopancreatic diversion with
a duodenal switch

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 AUGUST 23, 2007 VOL. 357 NO. 8

Effects of Bariatric Surgery on Mortality in Swedish Obese Subjects

Lars Sjöström, M.D., Ph.D., Kristina Narbro, Ph.D., C. David Sjöström, M.D., Ph.D., Kristjan Karason, M.D., Ph.D., Bo Larsson, M.D., Ph.D., Hans Wedel, Ph.D., Ted Lystig, Ph.D., Marianne Sullivan, Ph.D., Claude Bouchard, Ph.D., Björn Carlsson, M.D., Ph.D., Calle Bengtsson, M.D., Ph.D., Sven Dahlgren, M.D., Ph.D., Anders Gummesson, M.D., Peter Jacobson, M.D., Ph.D., Jan Karlsson, Ph.D., Anna-Karin Lindroos, Ph.D., Hans Lönroth, M.D., Ph.D., Ingmar Näslund, M.D., Ph.D., Torsten Olbers, M.D., Ph.D., Kaj Stenlöf, M.D., Ph.D., Jarl Torgerson, M.D., Ph.D., Göran Ågren, M.D., and Lena M.S. Carlsson, M.D., Ph.D., for the Swedish Obese Subjects Study



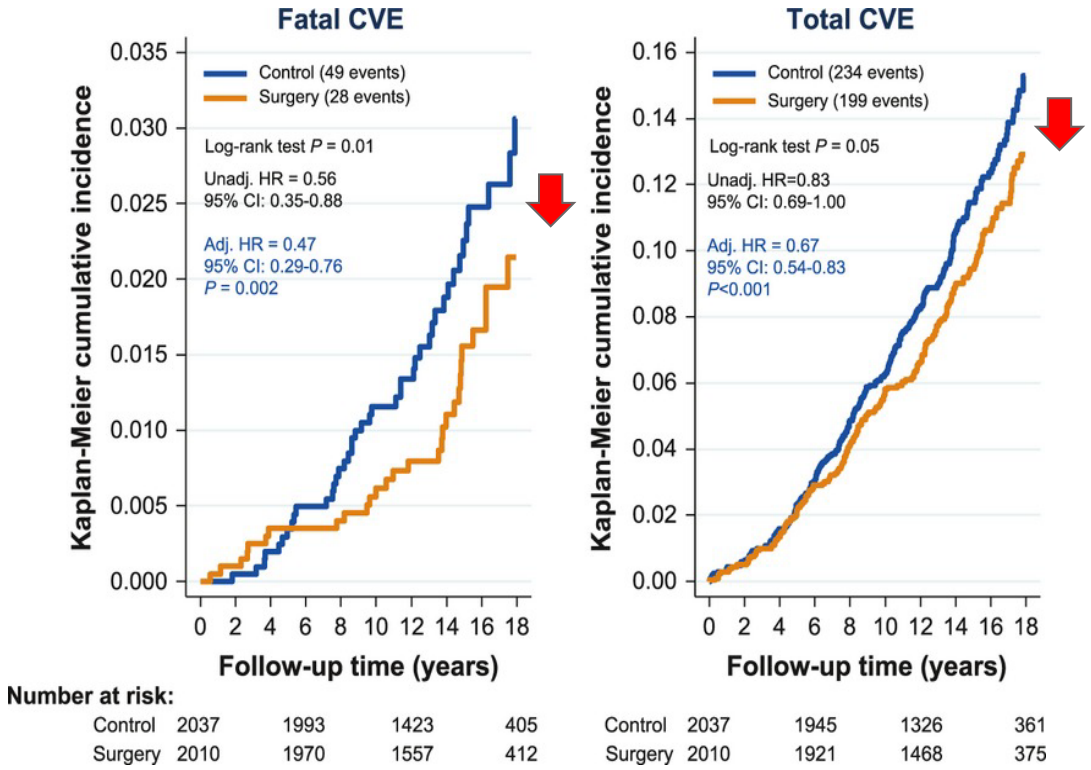
~13kg

~19kg

~30kg

No. examined

Control	2037	1490	1242	1267	556	176
Banding	376	333	284	284	150	50
VBG	1369	1086	987	1007	489	82
GBP	265	209	184	180	37	13



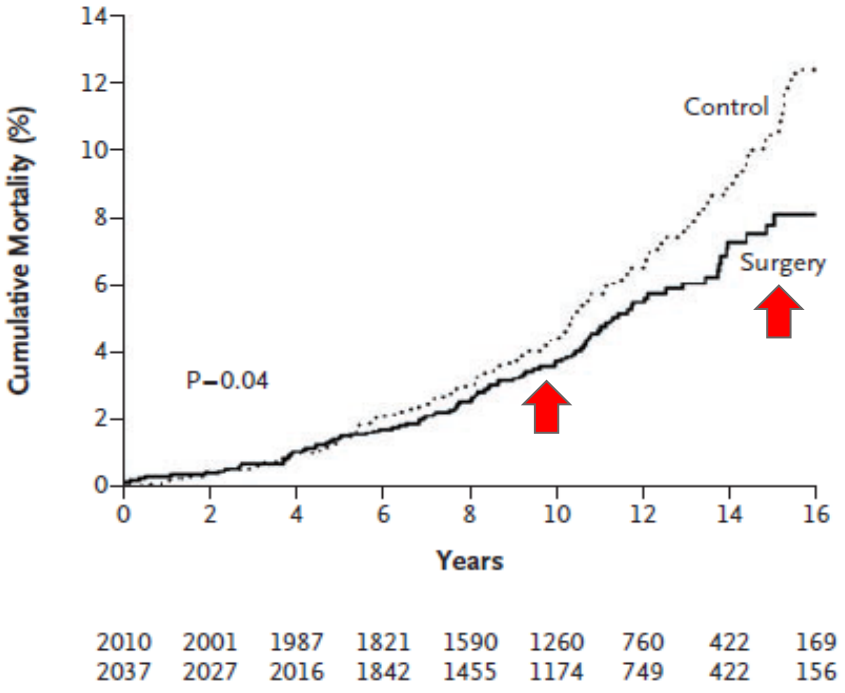
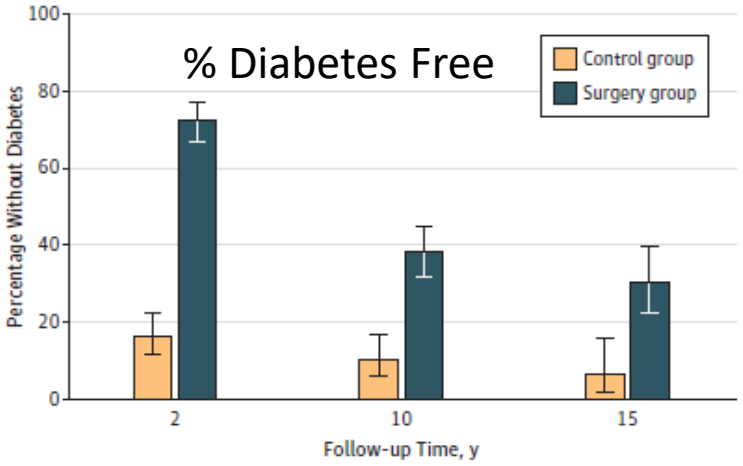


Figure 2. Unadjusted Cumulative Mortality.

The hazard ratio for subjects who underwent bariatric surgery, as compared with control subjects, was 0.76 (95% confidence interval, 0.59 to 0.99; P=0.04), with 129 deaths in the control group and 101 in the surgery group.

Figure 1. Prevalence of Diabetes Remission in the Bariatric Surgery and Control Groups



Total participants			
Control	207	135	62
Surgery	303	236	115
Odds ratio (95% CI)	13.3 (8.5-20.7)	5.3 (2.9-9.8)	6.3 (2.1-18.9)

Diabetes remission was defined as fasting blood glucose levels lower than 110 mg/dL and no diabetes medication. Odds ratios (ORs) are unadjusted and calculated using logistic regression analysis. The control group was the reference group. $P < .001$ for the 2- and 10-year follow-up; $P = .001$ for the 15-year follow-up. Error bars indicate 95% CIs.

Original Investigation

Association of Bariatric Surgery With Long-term Remission of Type 2 Diabetes and With Microvascular and Macrovascular Complications

Lars Sjöström, MD, PhD; Markku Peltonen, PhD; Peter Jacobson, MD, PhD; Sofie Ahlin, MD, PhD; Johanna Andersson-Assarsson, PhD; Åsa Anveden, MD; Claude Bouchard, PhD; Björn Carlsson, MD, PhD; Kristjan Karason, MD, PhD; Hans Lönroth, MD, PhD; Ingmar Näslund, MD, PhD; Elisabeth Sjöström, MD; Magdalena Taube, PhD; Hans Wedel, PhD; Per-Arne Svensson, PhD; Kajsa Sjöholm, PhD; Lena M. S. Carlsson, MD, PhD

Sleep. 2007 Jun 1; 30(6): 703–710. PMCID: PMC1978357

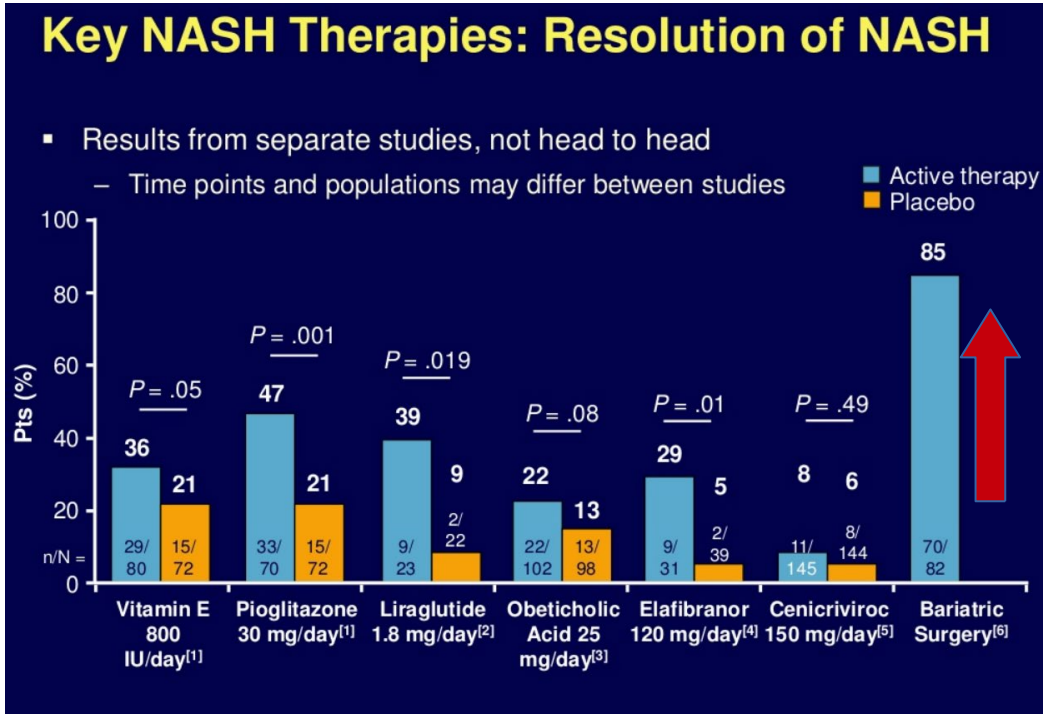
Two Year Reduction In Sleep Apnea Symptoms and Associated Diabetes Incidence After Weight Loss In Severe Obesity

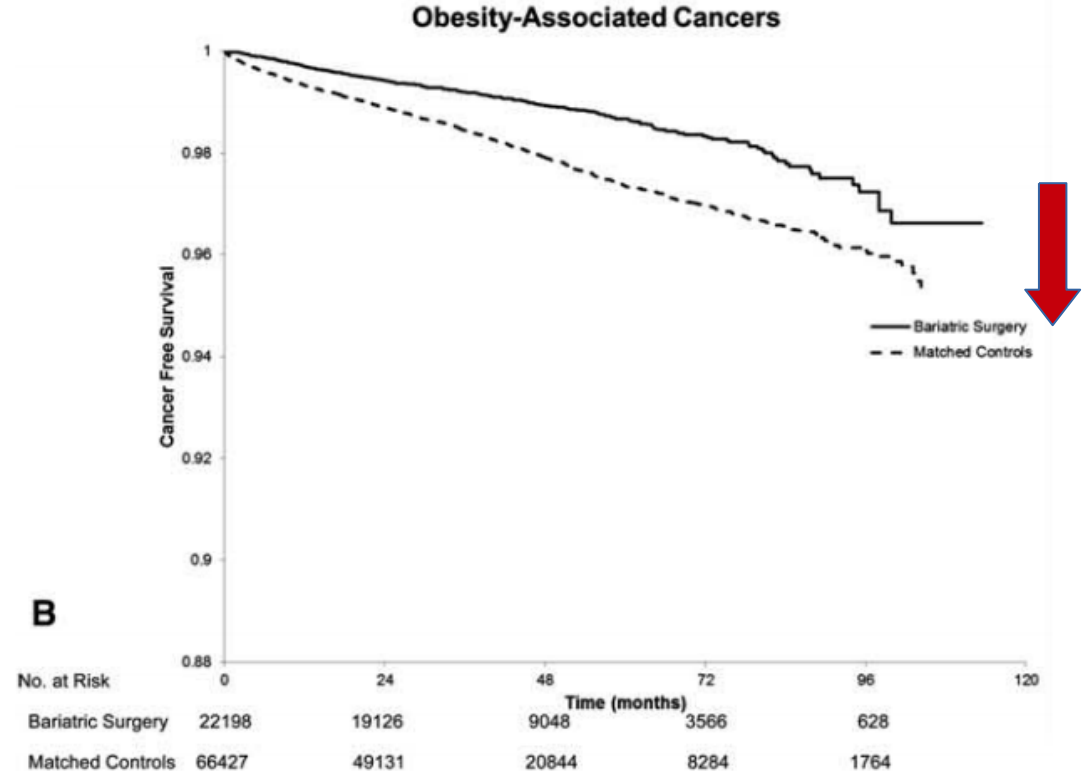
Ronald R. Grunstein, MD, PhD,[1,3] Kaj Stenlöf, MD, PhD,[2] Jan A. Hedner, MD, PhD,[1,3] Markku Peltonen, PhD,[4] Kristjan Karason, MD, PhD,[5] and Lars Sjöström, MD, PhD[2]

Table 2—Sleep Apnea Symptoms in Surgery and Control Groups

	Surgery	Control	P-value	OR (95% CI)
Number of subjects	1592	1431		
Freq. apneas				
Baseline, %	24.0	21.8	0.149	
Follow-up, %	8.3	20.8	<0.001	
Incidence, %	2.3	6.7	<0.001	0.28 (0.16 to 0.49)
Persistence, %	27.9	71.3	<0.001	0.16 (0.10 to 0.23)
Freq. snoring				
Baseline, %	44.5	35.6	<0.001	
Follow-up, %	10.8	29.8	<0.001	
Incidence, %	2.1	10.0	<0.001	0.18 (0.10 to 0.32)
Persistence, %	21.6	65.5	<0.001	0.14 (0.10 to 0.19)
Freq. daytime sleepiness				
Baseline, %	25.8	20.4	<0.001	
Follow-up, %	12.7	17.8	<0.001	
Incidence, %	5.9	8.4	0.018	0.66 (0.45 to 0.96)
Persistence, %	32.6	54.6	<0.001	0.44 (0.30 to 0.63)

Incidence: proportion of subjects with symptoms at 2-year among those *without* reported symptoms at baseline
Persistence: proportion of subjects with symptoms at 2-year among those *with* reported symptoms at baseline
Proportions are unadjusted values. P-value: Fischer's exact test, unadjusted
OR (95% CI): odds-ratio (95% confidence interval), adjusted for age, sex, BMI, smoking, diabetes, alcohol, and neck circumference at baseline


Key NASH Therapies: Resolution of NASH
Results from separate studies, not head to head
Time points and populations may differ between studies
Active therapy
Placebo
Pts (%)
100
80
60
40
20
0
n/N =
P = .05
36
21
29/ 80
15/ 72
P = .001
47
21
33/ 70
15/ 72
P = .019
39
9
9/ 23
2/ 22
P = .08
22
13
22/ 102
13/ 98
P = .01
29
5
9/ 31
2/ 39
P = .49
8
6
11/ 145
8/ 144
85
70/ 82
Vitamin E 800 IU/day[1]
Pioglitazone 30 mg/day[1]
Liraglutide 1.8 mg/day[2]
Obeticholic Acid 25 mg/day[3]
Elafibranor 120 mg/day[4]
Cenicriviroc 150 mg/day[5]
Bariatric Surgery[6]


Obesity-Associated Cancers
Cancer Free Survival
1
0.98
0.96
0.94
0.92
0.9
0.88
Bariatric Surgery
Matched Controls
B
No. at Risk
0
24
48
72
96
120
Time (months)
Bariatric Surgery 22198 19126 9048 3566 628
Matched Controls 66427 49131 20844 8284 1764

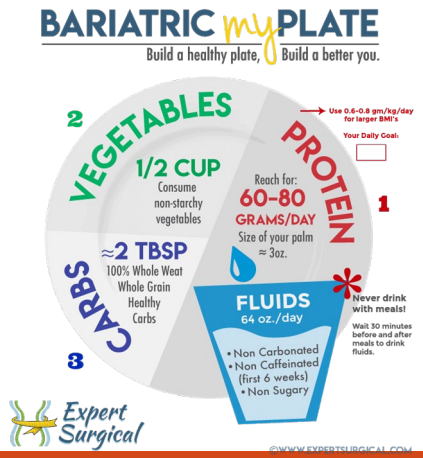
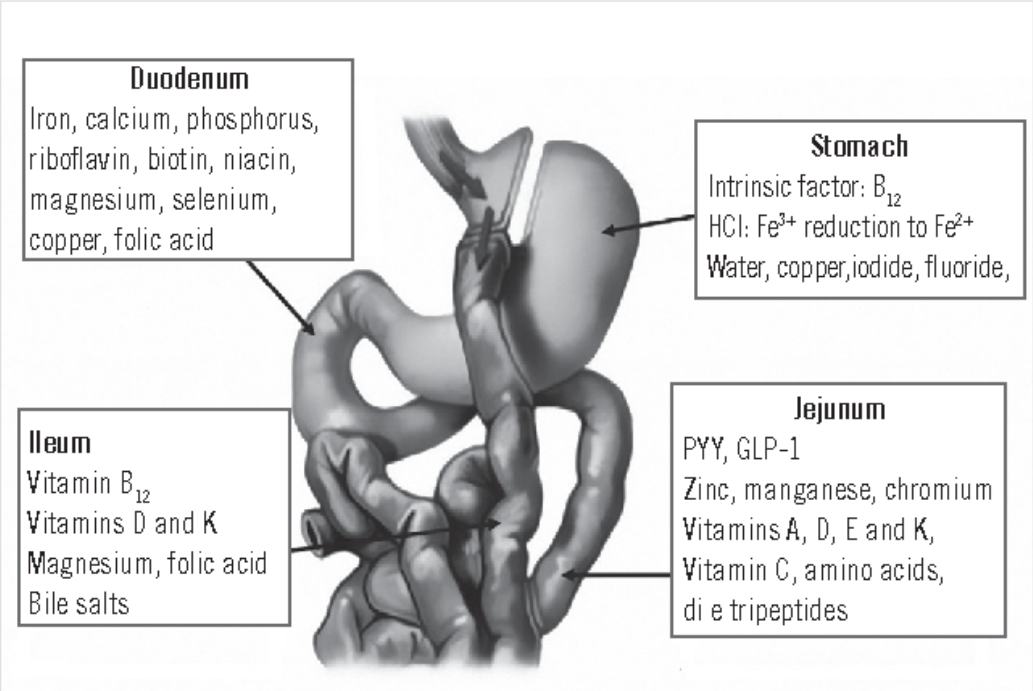


Table 3. Adverse Events during the First 90 Days after Surgery among the 1658 Participants in the Bariatric-Surgery Group.*

Event	Incidence	
	no. of events	*% of participants*
Death	3	0.2
Pulmonary complication	79	4.8
Thromboembolism	16	1.0
Vomiting	53	3.2
Wound infection	35	2.1
Other infections	24	1.4
Hemorrhage	18	1.1
Anastomotic leak, peritonitis, or abscess	23	1.4
Ileus	8	0.5
Wound dehiscence	9	0.5
Other complications	16	1.0

NUTRITIONAL DEFICIENCIES



GASTRIC DUMPING

1. Early (onset 20 to 60 mins)
   a. Small bowel fluid shift.
   b. Symptoms: gastrointestinal AND vasomotor
2. Late (onset 1-4hrs)
   a. Results of hyperinsulinemic hypoglycemia.
   b. Symptoms similar to early dumping, but with hypoglycaemia
   c. Ify neuroglycemia occurs (blackout) - DVLA

PREGNANCY

Increases incidence perinatal mortality (OR=1.38) & small for gestational age (OR=2.72)

Malabsorptive procedures as susceptible to deficiencies in nutrients.

- Essential for pre-pregnancy counselling and nutrient monitoring.
- Fetal growth scans at 24 and 30 weeks.
- **Abdominal pain with vomiting could be an internal hernia.**

PREGNANCY

Vitamin A supplementation with retinoic acid is teratogenic supplementation should be in the form of beta carotene.

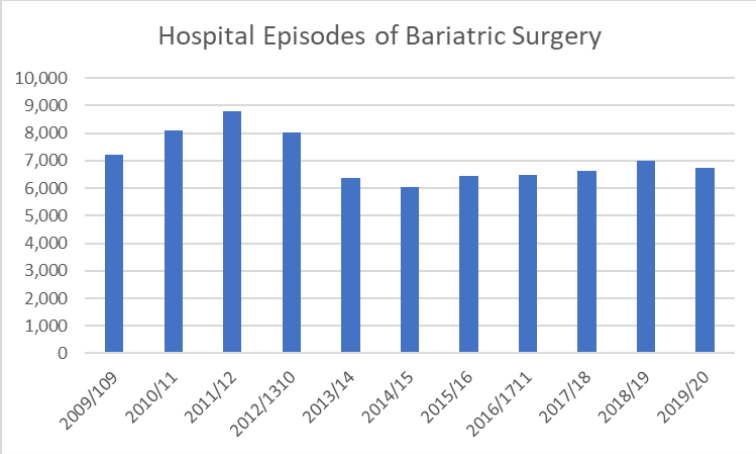
NUMBER HAVING BARIATRIC SURGERY

The NBSR NATIONAL BARIATRIC SURGERY REGISTRY of The British Obesity & Metabolic Surgery Society

2020

Primary surgery for adults:

	NHS	Private
2019	4,509	1,526



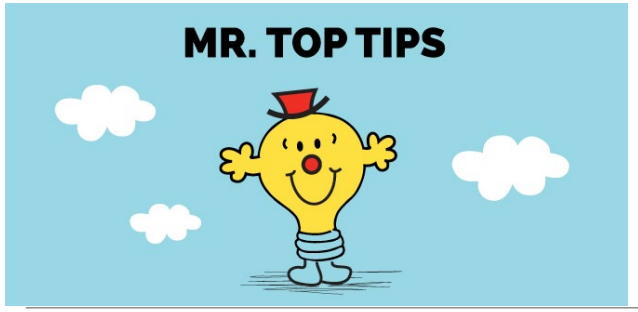
BMI >40 =

2,213,673

MIND THE GAP

6,035

(<0.27%)



CONSULTATION TIPS

AVOID using language such as: fat & obese!

ALWAYS - Address the patients chief complaint first, independent of weight.

ONLY THEN - open discussions:

- How are things going with your weight?

NEVER JUDGE - your ideas on ease of weight loss might not be the same.

REMEMBER - Most patients are already trying to loose weight.

CONSIDER SCREENING FOR COMORBIDITES

ALWAYS – code weight & height

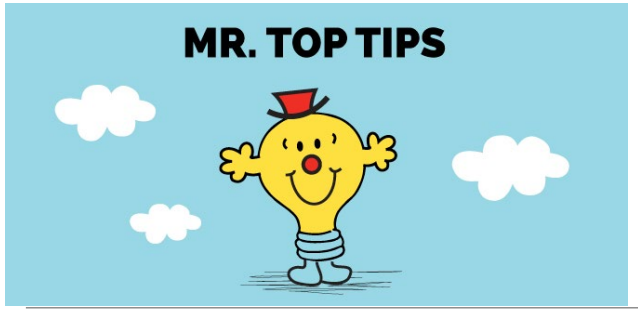
MAY CHECK Sleep – snoring, choking, Epworth

MAY CHECK Fertility –PCOS, ED

MAY CHECK Metabolic syndrome – HbA1c, Lipids, Fib-4 score

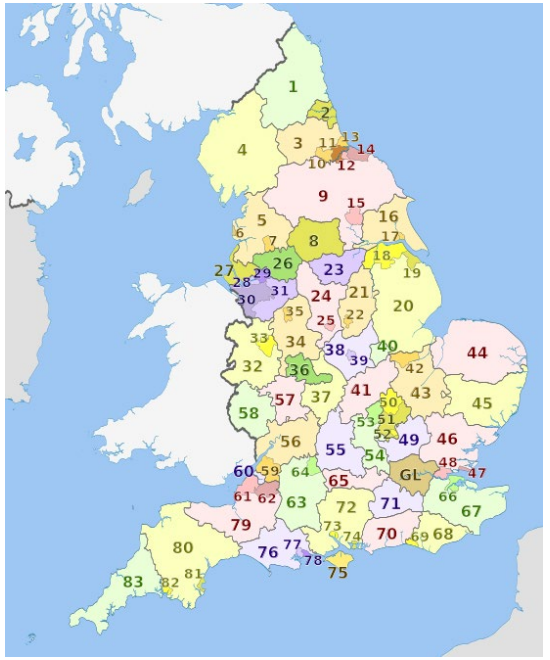
IF APPROPRIATE ASK - Psychological Triggers & eating behaviour & refer to talking therapies

ALWAYS – offer help!



REFERRAL PATHWAYS

42 ICB & 83 PUBLIC HEALTH COUNCILS



Two Pills
Which one will you choose?

Blue

- Lowers cholesterol and blood sugar
- Reduces risk of CVD & Cancer

Red

- Raises cholesterol and blood sugar
- Increases risk of CVD & Cancer
- BUT it tastes really good!

THE RESTAURANTS IN THIS STUDY

Fast food ads viewed in 2009

Restaurant	2009 ad spend (in millions)	Ages 2-5	Ages 6-11	Ages 12-17
McDonald's	$898.1	309	368	284
Subway	$424.6	97	127	177
Wendy's	$282.6	46	58	113
Burger King	$281.6	152	185	189
KFC	$268.9	62	78	146
Taco Bell	$243.4	50	69	140
Pizza Hut	$221.8	54	69	125
Sonic	$185.1	27	37	68
Domino's	$180.8	35	46	85
Dunkin' Donuts	$120.9	11	15	28
Dairy Queen	$77.6	20	27	48
Starbucks	$28.9	--	--	--
All fast food	$4,217.7	1,021	1,272	1,723

Source: The Nielsen Company (2010)

cation of society

NHS
University Hospitals of Derby and Burton
NHS Foundation Trust

EMBMI
EAST MIDLANDS BARIATRIC & METABOLIC INSTITUTE

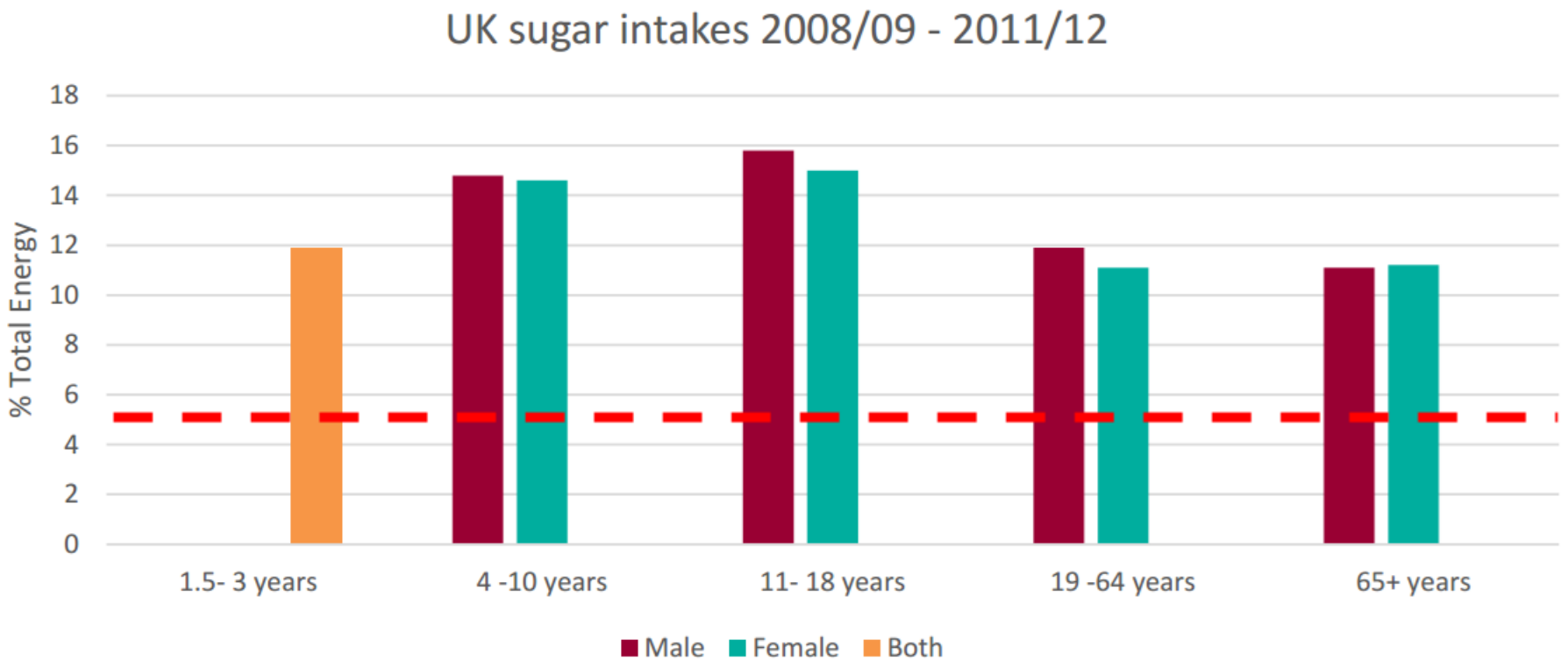
University of Nottingham
UK | CHINA | MALAYSIA

Thank you for listening!




Any questions ?

UK sugar intake compared to the recommended maximum of 5% energy



House of Commons

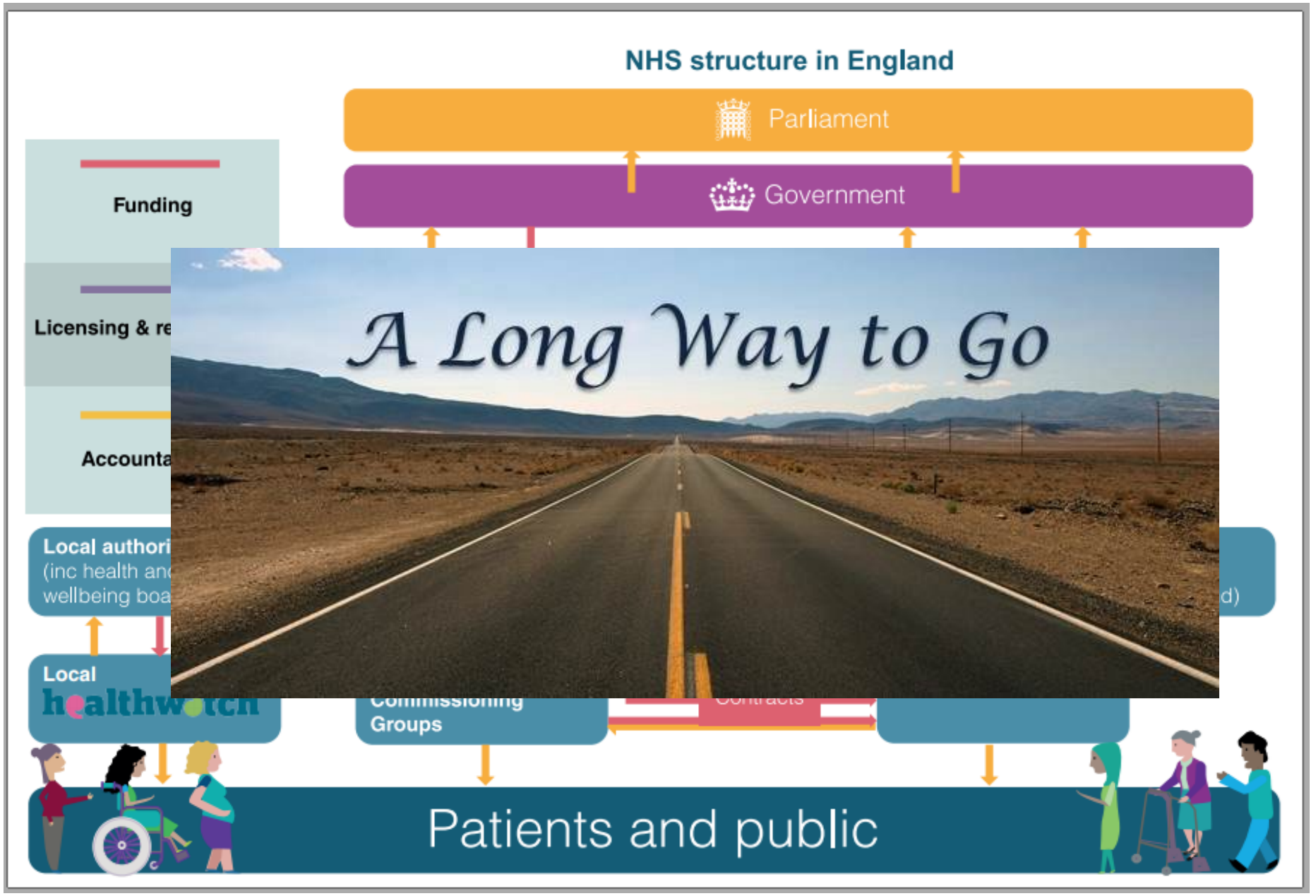
Health Committee

Childhood obesity: Time for action

Eighth Report of Session 2017–19

Report, together with formal minutes relating to the report

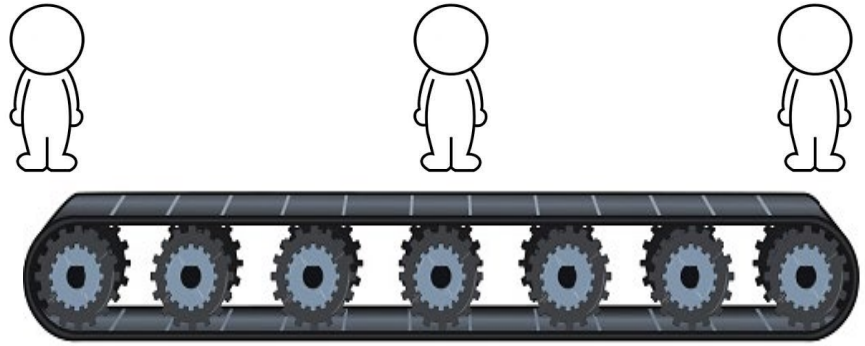
Ordered by the House of Commons to be printed 23 May 2018


NHS structure in England
Parliament
Government
Funding
Licensing & re
Accounta
A Long Way to Go
Local authori
(inc health an
wellbeing boa
d)
Local
healthwatch
Commissioning
Groups
Contracts
Patients and public

Covid effect on Tier 3 / 4 services

Prior to Covid

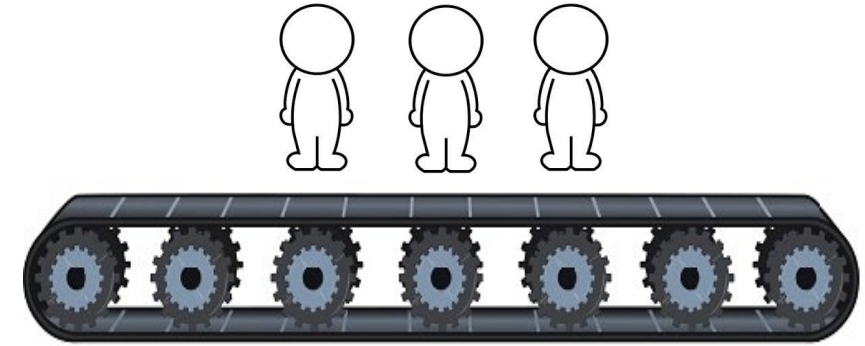
Regular monthly referrals



Regular monthly referrals for bariatric surgery

Start of Covid

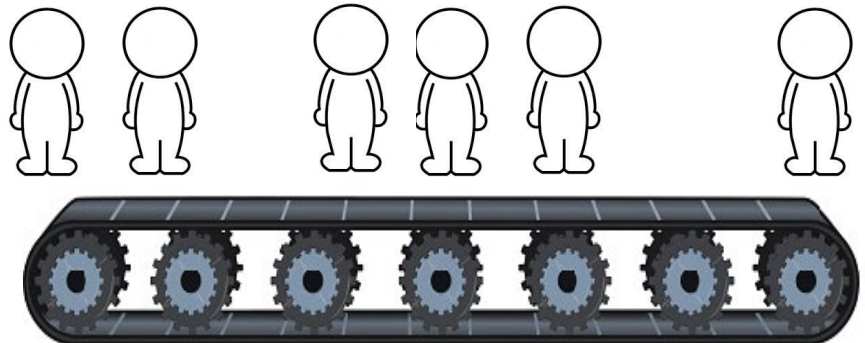
No monthly referrals



No referrals to tier 4

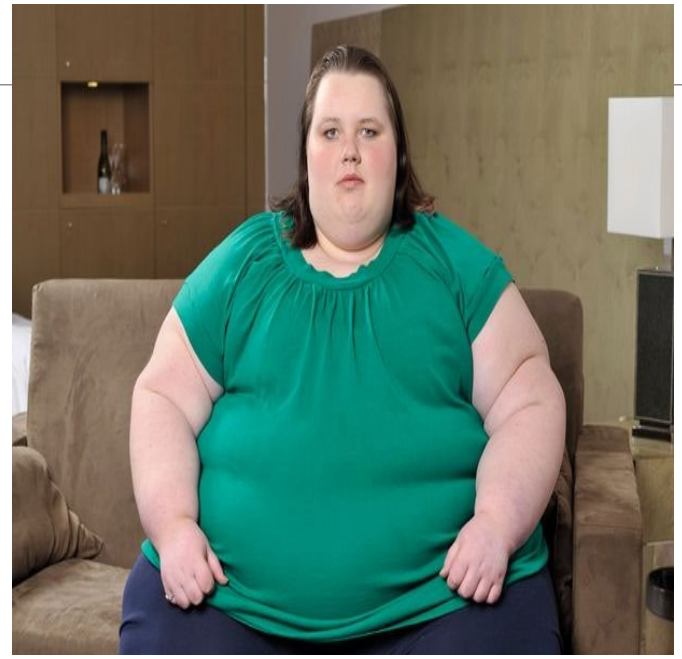
Recovering for Covid

Increased monthly referrals



Reduced number undergoing bariatric surgery

How would you split a £10 donation?



Income £634,808,043

Voluntary	£430.58m
Trading to raise funds	£91.66m
Investment	£5.96m
Charitable activities	£89.32m
Other	£17.28m
Total	£634.81m

Investment gains £17.4m

Spending £602,097,107

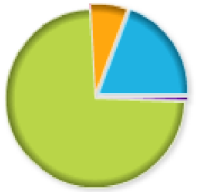
Generating voluntary income	£103.54m
Trading to raise funds	£73.18m
Investment management	£1.11m
Charitable activities	£422.67m
Governance	£1.59m
Other	£0.00m
Total	£602.10m

Income £41,808,000

Voluntary	£35.09m
Trading to raise funds	£3.78m
Investment	£0.18m
Charitable activities	£2.76m
Other	£0.00m
Total	£41.81m

Investment gains £315k

Spending £36,344,000



Generating voluntary income	£7.00m
Trading to raise funds	£2.41m
Investment management	£0.03m
Charitable activities	£26.62m
Governance	£0.27m
Other	£0.00m
Total	£36.34m

Income £633,047

Voluntary	£377.6k
Trading to raise funds	£0.0k
Investment	£0.0k
Charitable activities	£255.5k
Other	£0.0k
Total	£633.0k

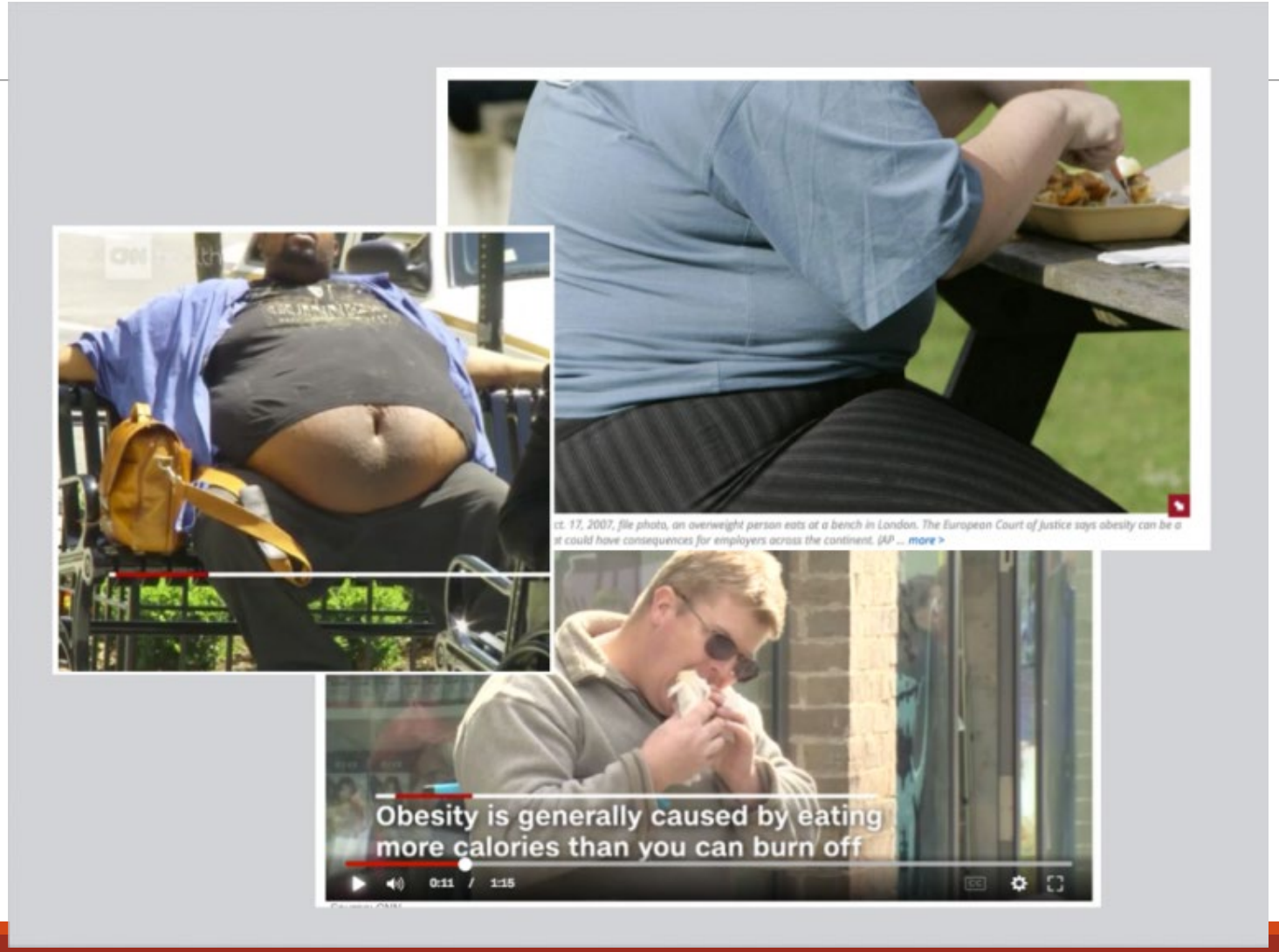
Investment gains £0

Spending £543,977

Generating voluntary income	£0.0k
Trading to raise funds	£0.0k
Investment management	£0.0k
Charitable activities	£504.3k
Governance	£39.7k
Other	£0.0k
Total	£544.0k

STIGMA!!!

Stigma can be overcome if we educate the media!



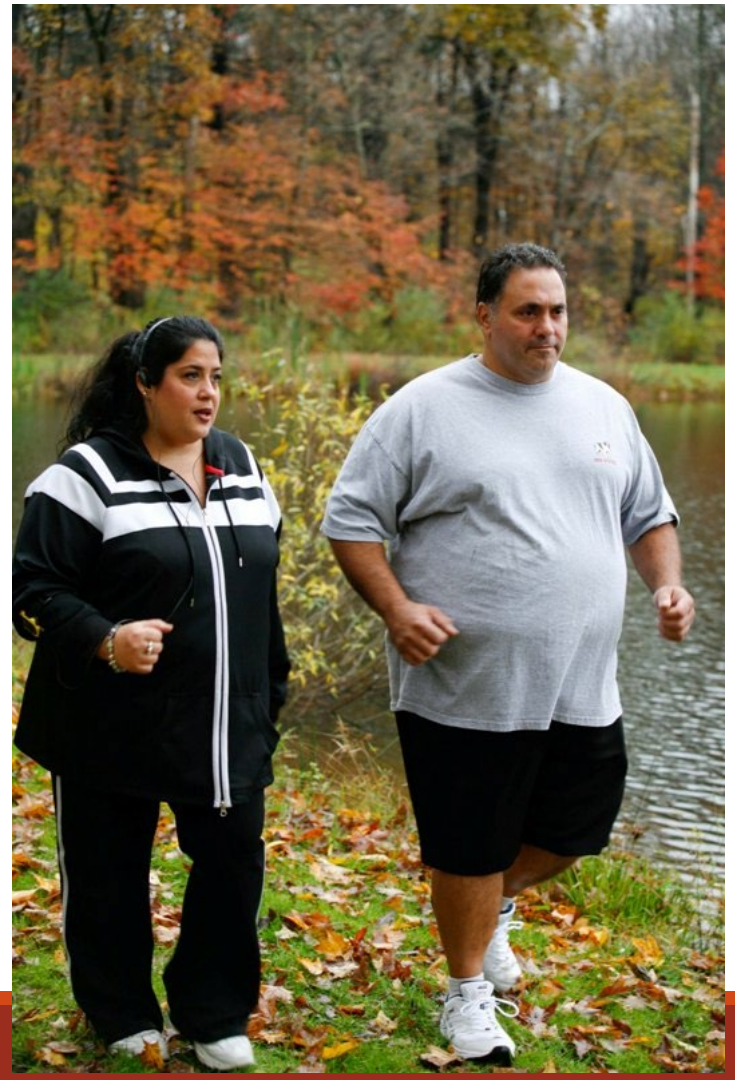
Rudd Center Media Gallery:

Combating Weight Bias in the Media

Background

obesity canada

Image Bank



UHDB Bariatric Team 2017.

Midlands Obesity Symposium – EMBMI/ASO Midlands

Monday 29 June 2020 – 09:30 – 16:30

Venue: Elgar Concert Hall, Bramall Music Building, University of Birmingham, Birmingham B15 2TT

ASO ASSOCIATION FOR THE STUDY OF OBESITY

EMBMI EAST MIDLANDS BARIATRIC & METABOLIC INSTITUTE