

SUPPLEMENTARY MATERIAL

Body Mass Index Progression, Development of Complications and Healthcare Costs Over 8 Years in UK Individuals Living With Overweight/Obesity

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SUPPLEMENTARY FIGURES

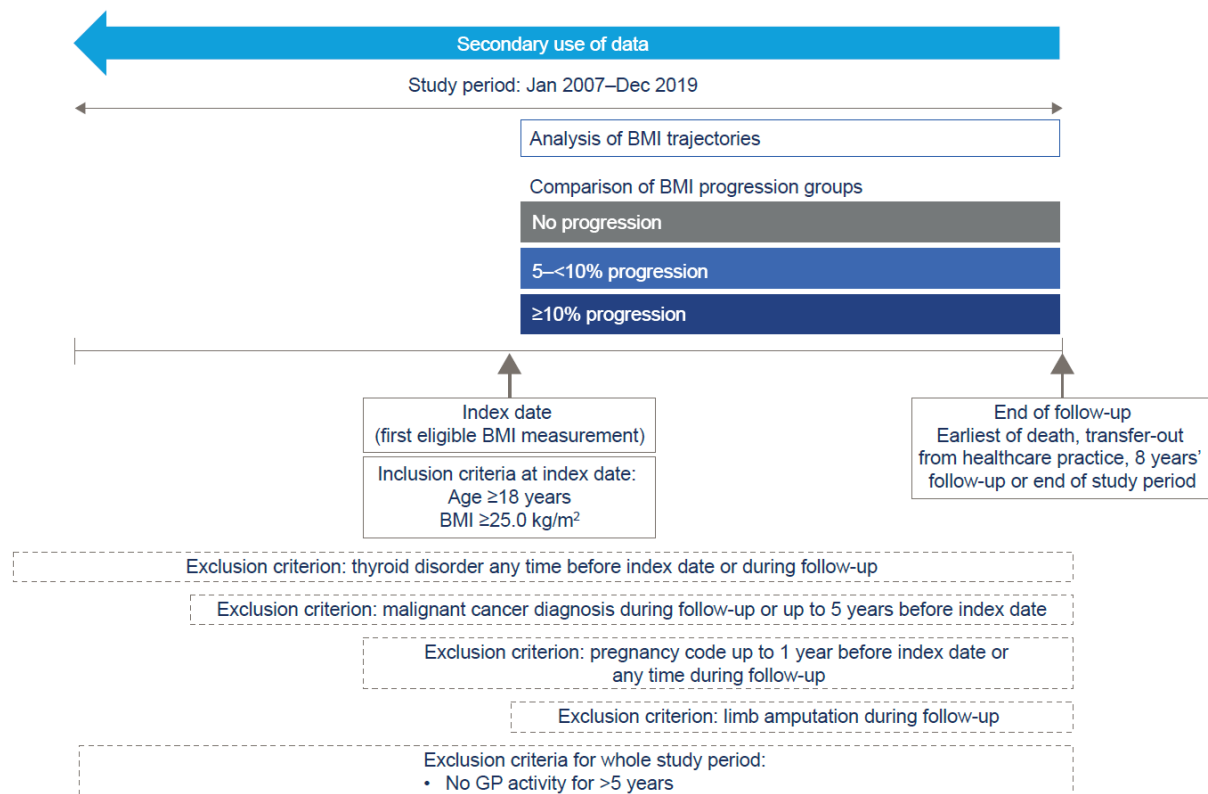


Fig. S1 Study design. *BMI* body mass index, *GP* general practitioner

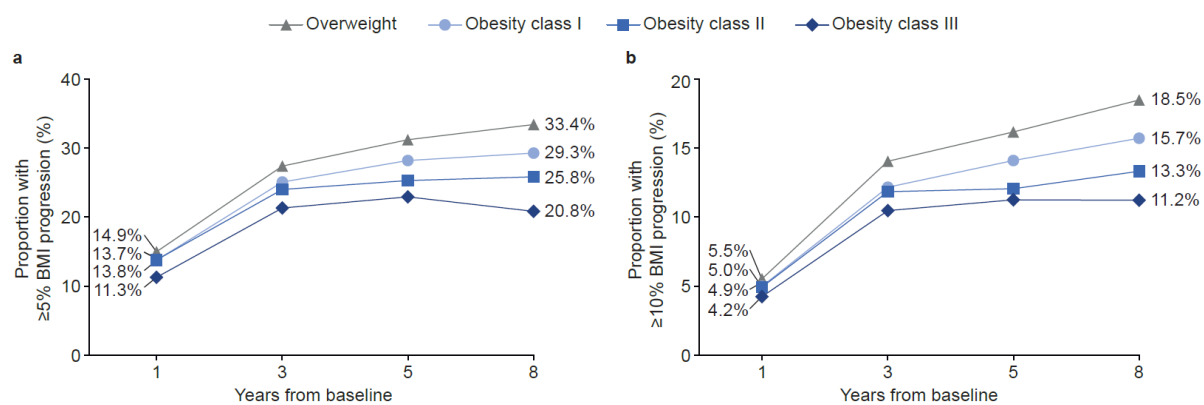


Fig. S2 Proportions of individuals with BMI progression of $\geq 5\%$ (a) and $\geq 10\%$ (b) over the 8-year study period, by BMI group. *BMI* body mass index

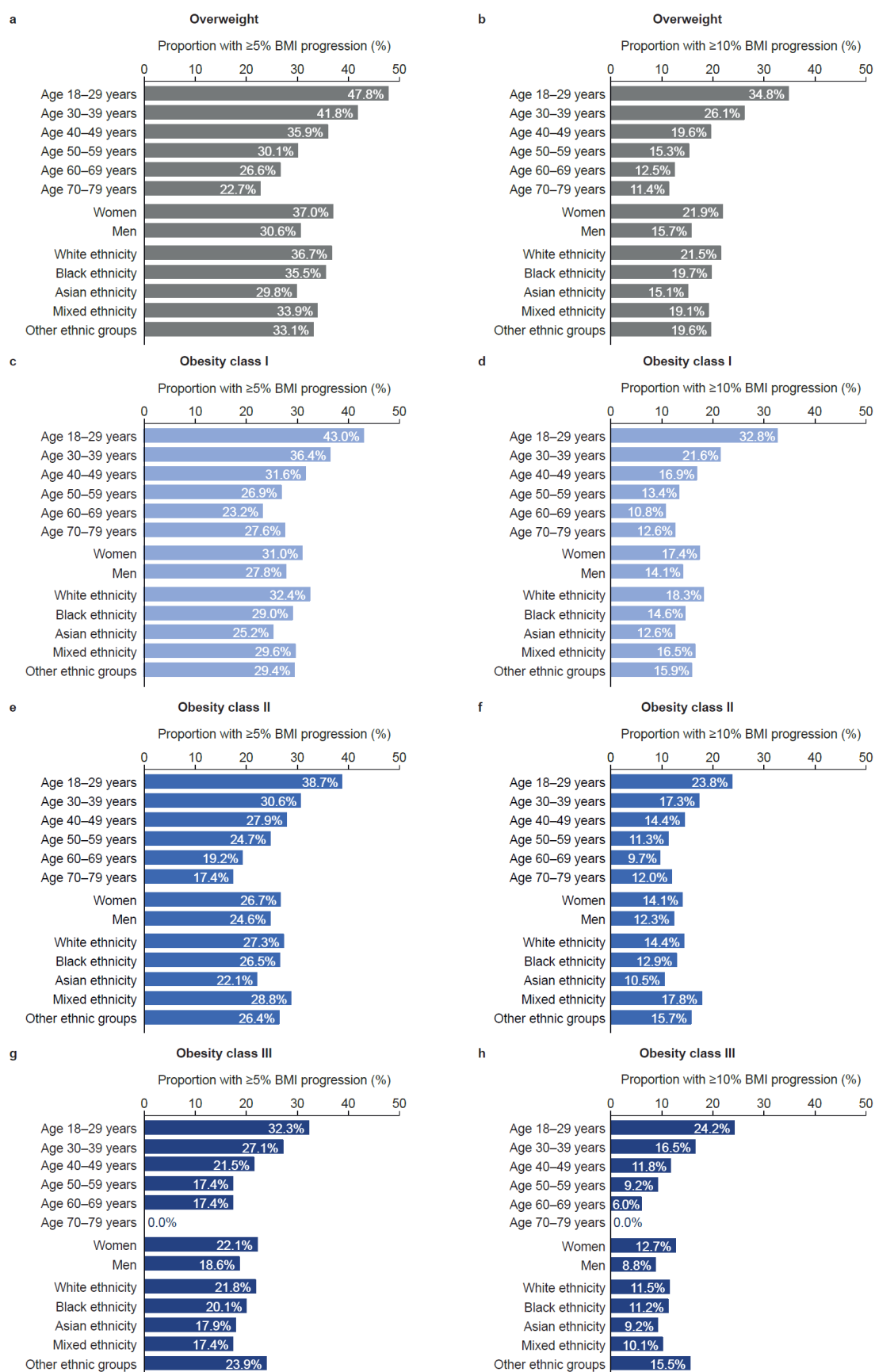


Fig. S3 Proportions of individuals by BMI group and demographic subgroup with BMI progression of $\geq 5\%$ (a, c, e and g) and $\geq 10\%$ (b, d, f and h). *BMI* body mass index

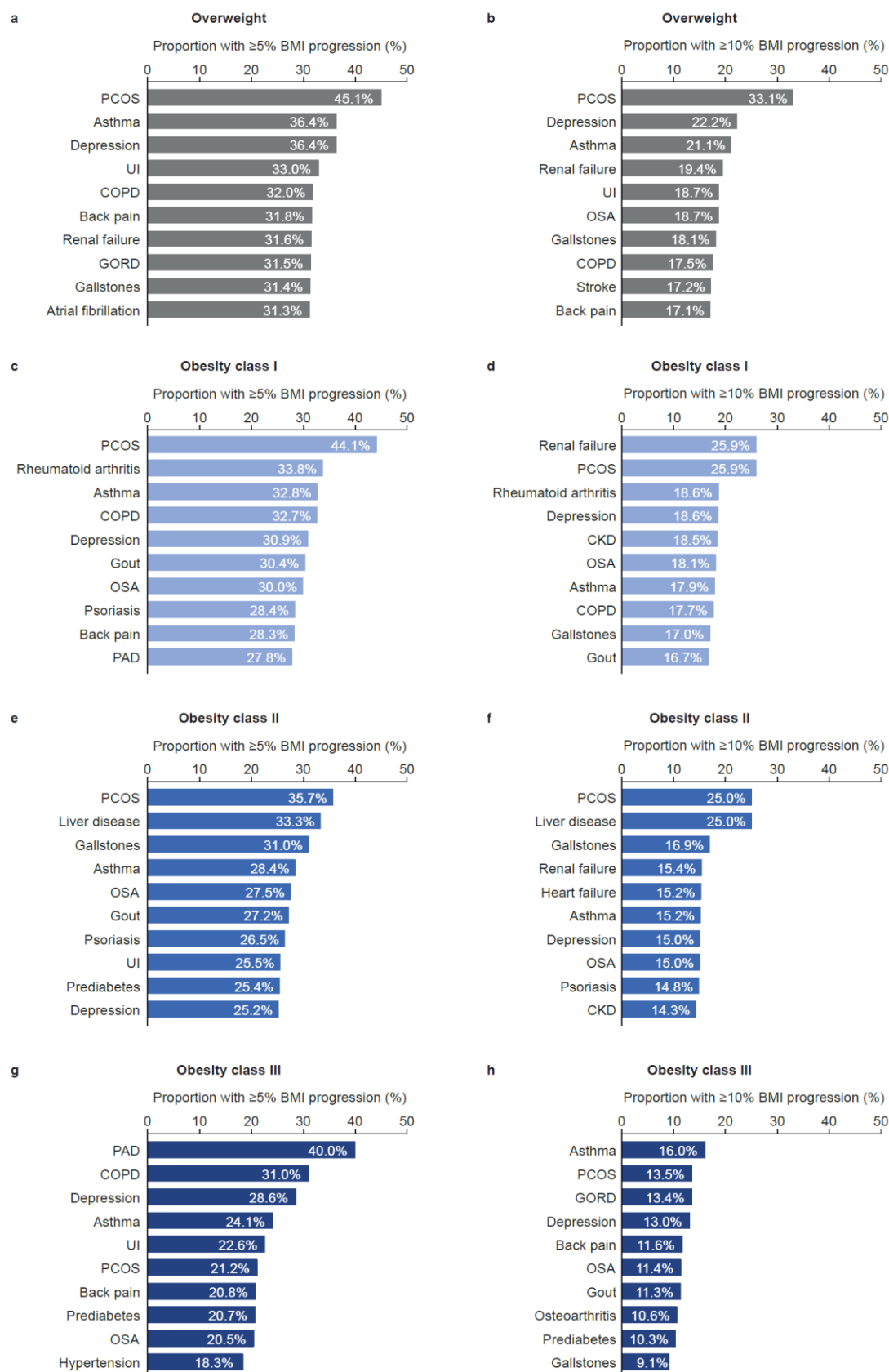


Fig. S4 Proportions of individuals by BMI group and ORC subgroups with BMI progression of $\geq 5\%$ (a, c, e and g) and $\geq 10\%$ (b, d, f and h) 8 years from baseline. CKD was defined as

stage 3–5/renal replacement therapy (dialysis/transplantation). Renal failure was defined as CKD stage 5/renal replacement therapy (dialysis/transplantation). For each BMI group, the 10 ORC subgroups with the greatest proportions of individuals with BMI progression of $\geq 5\%$ and $\geq 10\%$ are shown. *BMI* body mass index, *CKD* chronic kidney disease, *COPD* chronic obstructive pulmonary disease, *GORD* gastro-oesophageal reflux disease, *ORC* obesity-related complication, *OSA* obstructive sleep apnoea, *PAD* peripheral arterial disease, *PCOS* polycystic ovary syndrome, *UI* urinary incontinence

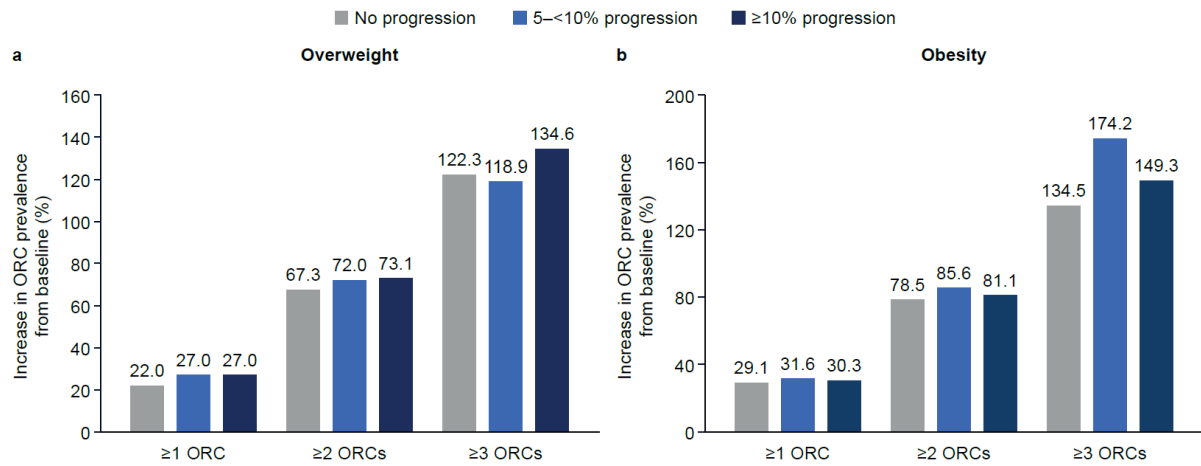


Fig. S5 Increases in proportions of individuals with ≥ 1 , ≥ 2 or ≥ 3 ORCs from baseline in individuals with and without BMI progression for groups with overweight (a) and obesity (b). ORCs considered in this part of the analysis were asthma, atherosclerotic cardiovascular disease, back pain, CKD, dyslipidaemia, gastro-oesophageal reflux disease, gout, heart failure, hypertension, knee osteoarthritis, OSA, PCOS, prediabetes, psoriasis, T2D and urinary incontinence. *BMI* body mass index, *CKD* chronic kidney disease, *ORC* obesity-related complication, *OSA* obstructive sleep apnoea, *PCOS* polycystic ovary syndrome, *T2D* type 2 diabetes

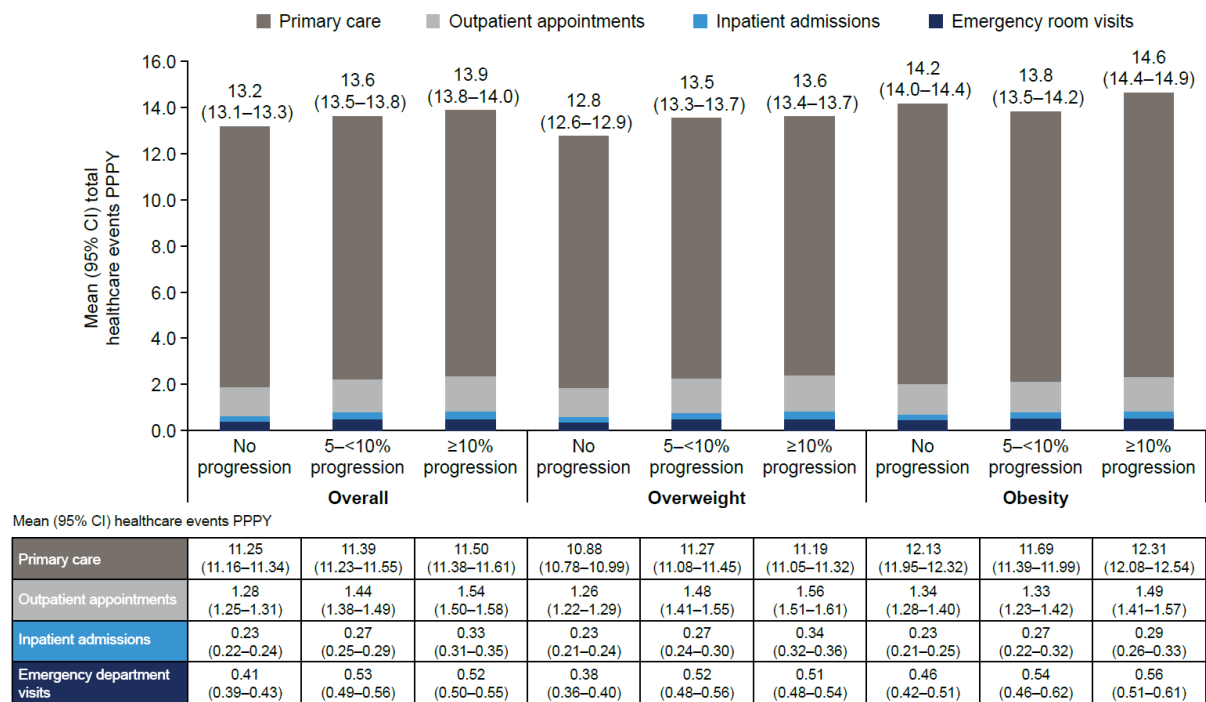


Fig. S6 Mean annual total HCRU events for individuals with and without BMI progression. Bar labels show total numbers of HCRU events across all categories. *BMI* body mass index, *CI* confidence interval, *HCRU* healthcare resource utilization, *PPPY* per person per year

SUPPLEMENTARY TABLES

Table S1 ORCs included in the analysis

Asthma
ASCVD
Atrial fibrillation
Back pain
CKD (stages 3–5/renal replacement therapy [dialysis/transplantation])
COPD
Depression
Dyslipidaemia
End-stage renal disease (CKD stage 5/renal replacement therapy [dialysis/transplantation])/renal failure
Gallstones
GORD
Gout
Heart failure
Hypertension
Ischaemic heart disease
Liver disease
Myocardial infarction
OSA
Osteoarthritis
Osteoarthritis of the knee
Parkinson's disease
Peripheral arterial disease
PCOS
Prediabetes
Psoriasis
Coronary/arterial revascularization
Rheumatoid arthritis
Stroke
T2D
UI

ASCVD atherosclerotic cardiovascular disease, *CKD* chronic kidney disease, *COPD* chronic obstructive pulmonary disease, *GORD* gastro-oesophageal reflux disease, *ORC* obesity-related complication, *OSA* obstructive sleep apnoea, *PCOS* polycystic ovary syndrome, *T2D* type 2 diabetes, *UI* urinary incontinence

Table S2 Baseline ORCs in the study population

ORC	Prevalence (%)
Hypertension	19.1
Back pain	19.0
Asthma	12.9
T2D	10.4
Dyslipidaemia	7.8
Osteoarthritis	6.1
ASCVD	4.6
GORD	3.7
Ischaemic heart disease	3.6
Depression	3.5
Psoriasis	2.2
Osteoarthritis of the knee	2.0
Prediabetes	1.9
Gout	1.7
UI	1.6
Myocardial infarction	1.5
(Coronary/arterial) revascularization	1.5
PCOS	1.3
COPD	1.0
Gallstones	0.8
Stroke	0.7
Atrial fibrillation	0.6
CKD	0.6
OSA	0.5
Rheumatoid arthritis	0.5
Heart failure	0.4
Peripheral arterial disease	0.4
Liver disease	0.3
Renal failure	0.2
Parkinson's disease	0.1
≥ 2 ORCs	22.6
≥ 3 ORCs	8.3

ASCVD atherosclerotic cardiovascular disease, *CKD* chronic kidney disease, *COPD* chronic obstructive pulmonary disease, *GORD* gastro-oesophageal reflux disease, *ORC* obesity-related complication, *OSA* obstructive sleep apnoea, *PCOS* polycystic ovary syndrome, *T2D* type 2 diabetes, *UI* urinary incontinence

Table S3 Proportions of individuals with BMI progression of $\geq 5\%$ and $\geq 10\%$ over the 8-year study period, by BMI group

	Years from baseline			
	1	3	5	8
Proportion with BMI progression of $\geq 5\%$ (%)				
Overweight	14.9	27.4	31.2	33.4
Obesity class I	13.7	25.0	28.2	29.3
Obesity class II	13.8	24.0	25.3	25.8
Obesity class III	11.3	21.3	22.9	20.8
Proportion with BMI progression of $\geq 10\%$ (%)				
Overweight	5.5	14.0	16.2	18.5
Obesity class I	5.0	12.2	14.1	15.7
Obesity class II	4.9	11.8	12.1	13.3
Obesity class III	4.2	10.5	11.2	11.2

BMI body mass index

Table S4 Percentage increases in prevalence of ORCs from baseline in individuals with and without BMI progression

ORC	Overall			Overweight			Obesity		
	No progression	5–<10% progression	≥ 10% progression	No progression	5–<10% progression	≥ 10% progression	No progression	5–<10% progression	≥ 10% progression
ASCVD	25.0%	35.4%	32.9%	23.2%	31.7%	33.7%	32.0%	43.2%	33.8%
Asthma	31.9%	38.9%	37.2%	32.9%	34.1%	35.4%	28.5%	51.1%	40.3%
Back pain	99.0%	110.5%	101.0%	95.0%	101.5%	101.0%	107.7%	132.2%	100.0%
CKD	437.5%	666.7%	757.1%	344.4%	650.0%	833.3%	614.3%	1125.0%	914.3%
Dyslipidaemia	93.0%	108.4%	95.3%	89.7%	110.1%	91.9%	97.3%	103.8%	101.0%
GORD	133.3%	157.9%	140.0%	133.3%	153.8%	148.8%	131.0%	164.9%	121.1%
Gout	73.9%	81.8%	87.0%	52.2%	100.0%	85.0%	116.7%	63.3%	90.0%
Heart failure	140.0%	50.0%	142.9%	125.0%	25.0%	225.0%	142.9%	183.3%	71.4%
Hypertension	27.7%	26.2%	27.8%	25.3%	26.8%	27.3%	31.7%	26.0%	29.4%
OSA	133.3%	300.0%	242.9%	175.0%	300.0%	240.0%	133.3%	322.2%	254.5%
Osteoarthritis of the knee	61.1%	85.7%	81.8%	58.1%	64.7%	85.7%	68.9%	112.8%	75.6%
PCOS	133.3%	209.1%	168.0%	125.0%	162.5%	160.0%	161.0%	267.6%	155.0%
Prediabetes	366.7%	580.0%	1057.1%	330.8%	580.0%	1000.0%	470.0%	644.4%	1700.0%
Psoriasis	77.3%	53.8%	100.0%	63.6%	60.0%	121.1%	87.5%	51.9%	72.4%
T2D	47.5%	38.9%	33.7%	34.3%	26.3%	25.7%	75.8%	66.8%	53.3%
UI	116.7%	114.3%	133.3%	112.5%	95.0%	161.1%	113.6%	172.7%	111.5%

ASCVD atherosclerotic cardiovascular disease, *BMI* body mass index, *CKD* chronic kidney disease, *GORD* gastro-oesophageal reflux disease, *ORC* obesity-related complication, *OSA* obstructive sleep apnoea, *PCOS* polycystic ovary syndrome, *T2D* type 2 diabetes, *UI* urinary incontinence

Table S5 Mean annual total healthcare costs for individuals with and without BMI progression

	Overall			Overweight			Obesity		
Mean total healthcare costs (95% CI) PPPY (£)	No progression	5-< 10% progression	≥ 10% progression	No progression	5-< 10% progression	≥ 10% progression	No progression	5-< 10% progression	≥ 10% progression
Primary care	269.02 (268.83– 269.22)	277.21 (276.74– 277.68)	284.62 (284.34– 284.89)	261.18 (260.94– 261.42)	274.03 (273.42– 274.65)	279.38 (279.07– 279.69)	287.94 (287.08– 288.81)	285.43 (283.49– 287.37)	299.04 (297.71– 300.37)
Prescriptions	293.14 (292.50– 293.78)	314.42 (313.19– 315.64)	326.25 (325.71– 326.79)	276.87 (275.89– 277.84)	305.20 (303.47– 306.94)	325.04 (324.28– 325.80)	331.51 (329.98– 333.04)	335.61 (331.41– 339.82)	329.91 (328.07– 331.76)
Outpatient appointments	147.30 (147.06– 147.53)	164.24 (163.59– 164.89)	178.72 (178.38– 179.06)	143.68 (143.39– 143.97)	167.75 (166.77– 168.73)	183.27 (182.79– 183.75)	156.56 (155.49– 157.62)	156.32 (154.32– 158.32)	168.64 (167.41– 169.87)
Inpatient admissions	247.02 (246.42– 247.62)	329.50 (326.80– 332.19)	401.00 (399.34– 402.66)	231.17 (230.43– 231.92)	320.99 (318.18– 323.80)	392.75 (390.48– 395.01)	286.71 (283.98– 289.43)	347.11 (333.75– 360.47)	428.22 (421.73– 434.71)
Emergency department visits	43.98 (43.87–44.09)	57.23 (56.82–57.65)	60.40 (60.23–60.57)	41.65 (41.52–41.77)	55.80 (55.31–56.29)	60.01 (59.77–60.26)	49.87 (49.35–50.39)	61.51 (59.56–63.46)	61.50 (60.89–62.12)
Total	1000.46 (999.32– 1001.59)	1142.60 (1138.83– 1146.36)	1250.99 (1248.77– 1253.21)	954.55 (953.04– 956.07)	1123.77 (1119.27– 1128.28)	1240.45 (1237.41– 1243.49)	1112.59 (1108.03– 1117.15)	1185.98 (1169.01– 1202.96)	1287.32 (1278.78– 1295.87)

BMI body mass index, CI confidence interval, PPPY per person per year