

Estimating the future prevalence, costs and clinical impact of overweight and obesity classes I, II and III in the UK

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Objectives

- Overweight (body mass index [BMI] ≥ 25 and < 30 kg/m²) and obesity (BMI ≥ 30 kg/m²) are associated with an increased risk of obesity-related complications (ORCs), including cardiovascular conditions and type 2 diabetes, compared with healthy weight (BMI ≥ 18.5 and < 25 kg/m²).^{1,2}
- Consequently, obesity has a substantial economic impact. A global meta-analysis found that mean total annual healthcare costs are 36% higher for individuals living with obesity than for those with healthy weight.³
- By 2030, more than 1 billion people globally are expected to be living with obesity.⁴
 - However, the projected burden of overweight and obesity stratified by BMI class is not frequently reported.
- We estimated the future prevalence of overweight and obesity classes, and associated costs and health outcomes in the UK from 2020 to 2033.

Methods

- The analysis considered adults aged ≥ 20 years with overweight (BMI $25 < 30$ kg/m²) or obesity class I ($30 < 35$ kg/m²), II ($35 < 40$ kg/m²) or III (≥ 40 kg/m²).
- Projections of the future prevalence of obesity were calculated assuming that obesity prevalence will increase linearly over time, in accordance with estimates published in the World Obesity Atlas (2022).
 - BMI category prevalence data were obtained from the Health Survey for England Overweight and Obesity Tables (2019) and the Discover electronic health record data set (2019).
 - Population projections were derived from the Office for National Statistics population projections (person counts) based on 2020 population estimates.
- The Discover electronic health record data set (2019) was used to estimate the number of people with ORCs, annual per-person direct healthcare costs and the incidence of major adverse cardiovascular events (MACE).
 - Discover covers 2.8 million individuals across 365 primary care practices in North West London, UK.⁵
 - ORCs were identified using International Classification of Diseases 10th Revision (ICD-10) codes in patient records.
 - MACE was defined as a composite of acute myocardial infarction, stroke and cardiovascular death.

Table 1. Estimated healthcare costs and occurrences of MACE associated with overweight and obesity in 2020 and 2033

	2020	2033	Absolute increase from 2020 to 2033	Relative increase from 2020 to 2033 (%)
Healthcare costs, billions (£)				
Overweight	21.8	32.5	10.7	49.1
Obesity overall	21.1	31.2	10.1	48.2
Obesity class I	12.8	19.0	6.2	48.6
Obesity class II	5.1	7.6	2.5	48.6
Obesity class III	3.2	4.6	1.5	45.8
MACE, n				
Overweight	121,129	203,085	81,956	67.7
Obesity overall	84,184	138,600	54,416	64.6
Obesity class I	56,776	93,734	36,959	65.1
Obesity class II	19,507	32,205	12,698	65.1
Obesity class III	7901	12,661	4759	60.2

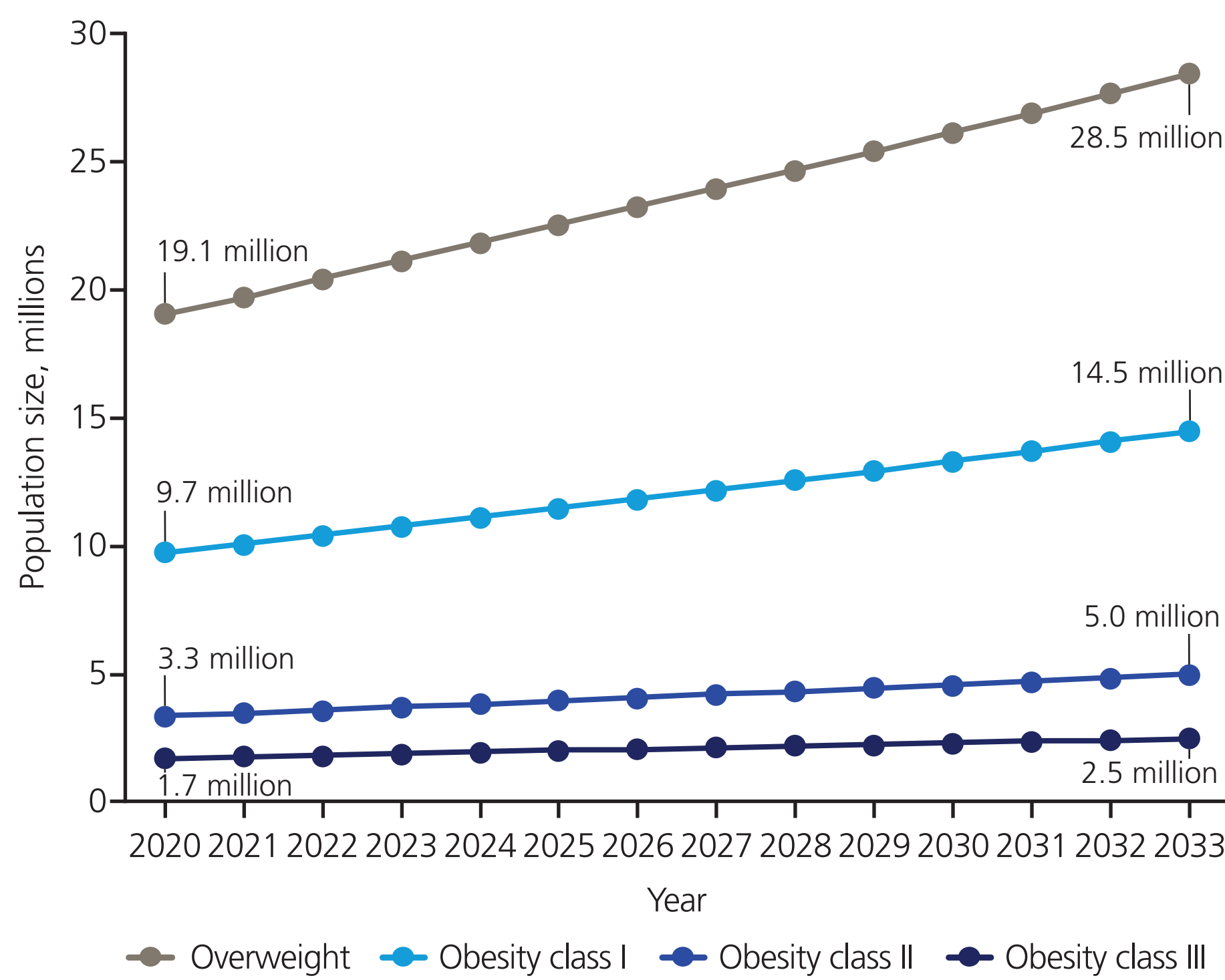
MACE, major adverse cardiovascular events.

- Outcomes were assessed for separate BMI groups and for subgroups of individuals living with obesity and ≥ 1 , ≥ 2 or ≥ 3 ORCs.
 - The following conditions were considered to be ORCs: asthma, atherosclerotic cardiovascular disease, back pain, chronic kidney disease, dyslipidaemia, gastro-oesophageal reflux disease, heart failure, hypertension, obstructive sleep apnoea, osteoarthritis of the knee, polycystic ovary syndrome, prediabetes, psoriasis, type 2 diabetes and urinary incontinence.

Results

- Approximately 50 million individuals are expected to be living with overweight and obesity in the UK in 2033 (**Figure 1**), representing a 49% increase from 34 million such individuals in 2020.
- As shown in **Figure 1**, the greatest change is expected in the number of individuals with overweight (absolute increase of 9.3 million), with an additional 7.1 million individuals with obesity, comprising:
 - obesity class I: 4.7 million
 - obesity class II: 1.6 million
 - obesity class III: 0.8 million.

Figure 1. Projected prevalence of overweight and obesity between 2020 and 2033



- The increased prevalence of overweight and obesity is expected to result in an additional £21 billion in healthcare costs, equating to a 49% increase from 2020 to 2033 (**Table 1**).
 - Approximately £11 billion of these costs is expected to arise from an increase in overweight, and £10 billion from obesity.
- An additional 136,372 occurrences of MACE are projected to occur between 2020 and 2033 as a result of overweight and obesity (66% increase), the majority of which will arise as a result of an increase in overweight (**Table 1**).

Key result

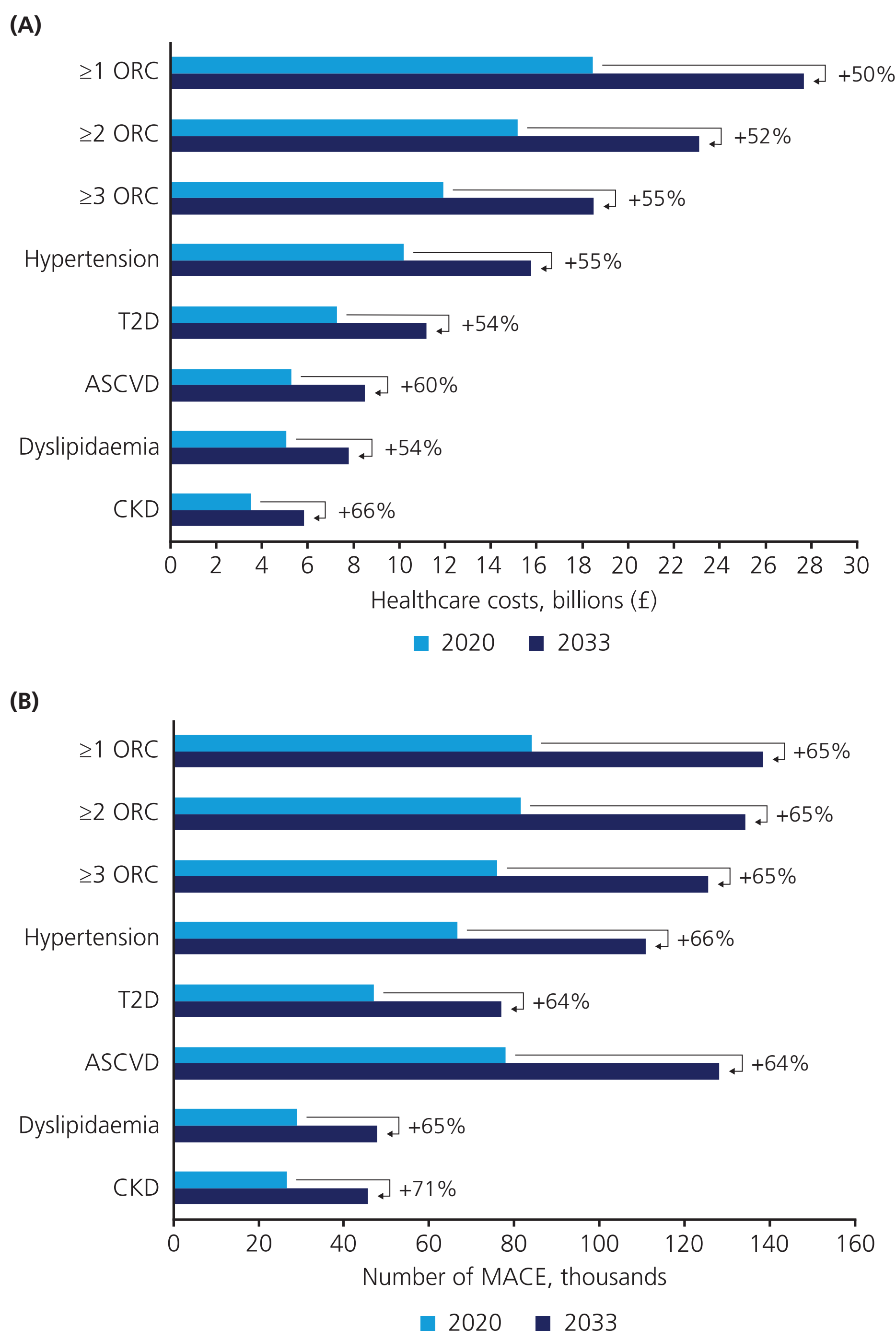
Table 2. Estimated number of individuals in obesity subgroups

ORC	2020	2033	Absolute increase from 2020 to 2033	Relative increase from 2020 to 2033 (%)
Estimated population size, millions				
≥ 1 ORC	11.8	17.6	5.9	49.9
≥ 2 ORCs	8.5	13.0	4.4	51.8
≥ 3 ORCs	5.7	8.7	3.1	53.9
Hypertension	5.6	8.7	3.0	54.0
T2D	3.5	5.4	1.9	53.4
Dyslipidaemia	3.1	4.7	1.6	53.1
ASCVD	1.7	2.6	0.9	57.0
CKD	0.9	1.5	0.6	61.3

ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; ORC, obesity-related complication; T2D, type 2 diabetes.

- Between 2020 and 2033, the group with obesity and ≥ 1 ORC is estimated to increase by 5.9 million people (**Table 2**).
 - An additional 4.4 million people are projected to have obesity and ≥ 2 ORCs and 3.1 million to have obesity and ≥ 3 ORCs in 2033 relative to 2020.
 - An additional 3.0 million people are projected to have obesity and hypertension in 2033 relative to 2020.
- Substantial healthcare costs and numerous occurrences of MACE are expected to arise as a result of increases in the size of these subgroups (**Figure 2**).
 - An increase in the prevalence of people with obesity and ≥ 1 ORC is expected to lead to an additional £9.2 billion in healthcare costs and an additional 54,305 occurrences of MACE between 2020 and 2033.

Figure 2. Estimated (A) healthcare costs and (B) occurrences of MACE associated with obesity subgroups



Percentages indicate relative increases. ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; MACE, major adverse cardiovascular events; ORC, obesity-related complication; T2D, type 2 diabetes.

Strengths and limitations

- This study used robust methodology combining individual-level estimates from a large electronic health record database with published national statistics to obtain country-level estimates of the projected burden of overweight, obesity and separate obesity classes. The structure of this analysis permits adaptation of the methodology for different countries.
- For the purposes of this analysis, it was assumed that the relative annual increase of obesity prevalence is the same across all age groups, obesity categories and comorbidity subgroups. Therefore, the results may not be generalizable to all populations.

Conclusions

- In the coming decade, substantial increases are expected in the number of individuals living with overweight and obesity in the UK, and associated healthcare costs and MACE, with implications for healthcare systems, affected individuals and the wider economy.
- Predicting these trends and identifying relevant subgroups can help to pinpoint areas of unmet need for weight management support.