

# Effects of obesity and cardiovascular risk status on healthcare utilisation in a large population representative database study: results from the UK CPRD retrospective study

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**Background:** Obesity and cardiovascular diseases (CVD) often co-occur, likely increasing the intensity of healthcare utilisation (HCU). The aim of this retrospective, observational database study was to examine the joint effect of obesity and cardiovascular risk status on HCU in the UK.

**Methods:** Patient demographics and data on cardiovascular disease and body mass index (BMI) were obtained from the UK Clinical Practice Research Datalink (CPRD). Cardiovascular risk status, calculated using the Framingham risk score, was used to categorise people into high-risk (score  $\geq 20\%$ ) and low-risk (score  $< 20\%$ ) groups, while the CVD diagnosis captured in the database was used to define the established CVD group. Obesity categories were assigned according to BMI using the standard WHO classifications. For each CVD and BMI category, the mean number of annual general practitioner (GP) contacts, hospital admissions and prescriptions was estimated.

**Results:** Data were available for 1,613,323 people in the CPRD for the period 1 January 2011 to 31 December 2017 (Table 1). Data on CVD status were available on just over one-quarter of the sample (28.4%), largely due to the lack of data on cholesterol required by the Framingham Risk Equation. We were able to classify slightly less than half (43.4%) of patients according to BMI category. At each BMI category, patients with the lowest CVD risk had the fewest GP contacts (Figure 1a) and fewest number of prescriptions (Figure 1b). The number of GP contacts and prescriptions increased consistently with increasing BMI category for each of the three CVD risk groups, and the increase seems fairly consistent across all BMI groups and CVD risk categories. Most (60.1%) GP contacts were administrative in nature, with slightly more than one-third (36.4%) being in-person and only a small proportion (3.4%) were registered as phone/mail contacts. The low and high CVD risk groups were comparable in terms of hospital admissions, whereas the CVD group were more frequently admitted (Figure 1c).

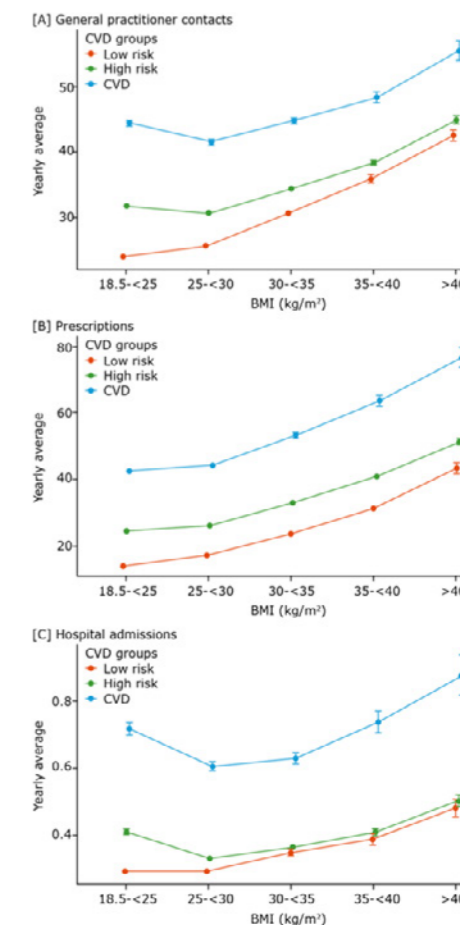
**Conclusions:** Increasing BMI category and CVD risk group both affected several indicators of healthcare utilisation. These findings highlight the importance of timely obesity management and treatment of CV risk factors as means of preventing increasing HCU.

**Table 1.** Study population

Variable	Total population N=1,613,323	Missing (% of total)
Male, N (%)	846,297 (52.5)	0
Mean age, years (SD)	52.9 (18.1)	0
BMI group, N (% of non-missing)		56.6%
18.5-<25 kg/m <sup>2</sup>	220,682 (31.5)	
25-<30 kg/m <sup>2</sup>	250,354 (35.8)	
30-<35 kg/m <sup>2</sup>	141,776 (20.2)	
35-<40 kg/m <sup>2</sup>	56,220 (8.0)	
$\geq 40$ kg/m <sup>2</sup>	31,150 (4.4)	
Mean study length, days (SD)	1,070 (679.0)	0
Mean total GP consultations, counts/yr (SD)	27.3 (37.7)	0
Mean prescriptions, counts/yr (SD)	25.4 (52.7)	0
Mean hospital admissions, counts/yr (SD)	0.453 (2.98)	0
Mean total cholesterol, mmol/L (SD)	4.99 (1.2)	67.6%
Mean HDL-cholesterol, mmol/L (SD)	1.42 (0.4)	71.2%
Mean diastolic blood pressure, mmHg (SD)	77.3 (10.1)	41.9%
Mean systolic blood pressure, mmHg (SD)	131 (16.7)	41.9%
Blood pressure treatment, N (%)	422,596 (26.2)	0
Smoking (Ever), N (% of non-missing)	816,923 (51.6)	1.9%
Type 2 diabetes, N (%)	112,116 (6.9)	0%
CVD risk group, N (% of non-missing)		71.6%
Low*	109,373 (23.9)	
High*	239,297 (52.3)	
Established CVD	109,266 (23.9)	

\*Based on Framingham Risk equation

**Figure 1.** Estimated frequency of all general practitioner contacts, number of prescriptions, and hospital admissions for patients in the CPRD, based on obesity level and cardiovascular risk



Values are mean with 95% confidence intervals estimated from a negative binomial distribution with age and gender as additional covariates. Frequency is calculated for a male with baseline age 50 years.

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