

DARWIN EU® - Feasibility of capturing obesity, obesity-related variables, and anthropomorphic measurements in a network of 29 European real-world data sources

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Background

Few Real-World Data (RWD) studies on obesity have used anthropometric measurements, largely due to methodological challenges. This study evaluates the feasibility of using anthropometric measures to support scalable RWD studies on obesity. The objectives of this study were to characterize the reporting of anthropometric measurements and to estimate the timing between sequential BMI recordings per individual within an obese and general population. In addition, we aimed to characterise individuals with obesity based on disease codes vs those defined by BMI cutoff value.

Methods

A cohort study was conducted in the IPCI (Netherlands) as a feasibility for further execution in 29 data sources across 16 European countries. The study population included all adults (≥ 19 years old) present during the study period 01/01/2010–30/06/2025 with >365 days of observation. Individuals were defined as obese by a clinical diagnosis and/or when recorded BMI value exceeds 30kg/m^2 (first record=index date). The frequency, timing, and values of BMI measurements were summarised. Obese individuals were characterised at index date by demographic characteristics, and at any time occurrences of type 2 diabetes mellitus (T2DM), hypertension, ischemic heart disease (IHD), chronic kidney disease (CKD), and depression/anxiety.

Results

In 2.4 million individuals, 26% had a record of BMI measurements, 32% had weight measurements, and 2% had a recorded diagnosis of obesity. The prevalence of obesity in IPCI was 10.4%. The median number of BMI measurements were 3 [IQR: 1–8] in obese individuals and 0 [0–1] overall. 39.4% of obese individuals and 9.4% of the general population had ≥ 5 measurements. The median value of the first BMI measurement was 33.9 kg/m^2 [31.6–37.4] in obese females, 27.6 kg/m^2 [24.0–32.0] in females overall, 32.7 kg/m^2 [31.0–35.4] in obese males, and 27.4 kg/m^2 [24.9–30.5] in males overall (Figure 1). The temporal distance between the 1st and 2nd measurement was 198 days in obese individuals and 283 days overall (Figure 2). The BMI-defined obese population was older (median age 57 vs 49) and had fewer females (57% vs 67%) than the obese population identified via clinical diagnosis records. There were also fewer records of depression/anxiety among the BMI-defined obese population than among the obese population identified via clinical diagnosis records (21.6 vs 29.2%), but a greater proportion of CKD (9.1 vs 6.2%), hypertension (41.0 vs 33.2%), IHD (9.9 vs 6.6%), and T2DM (22.1 vs 17.8%) diagnoses. 74.4% of individuals were defined as obese by BMI cut-off values only vs 8.6 % by clinical diagnosis only (17.0% overlap).

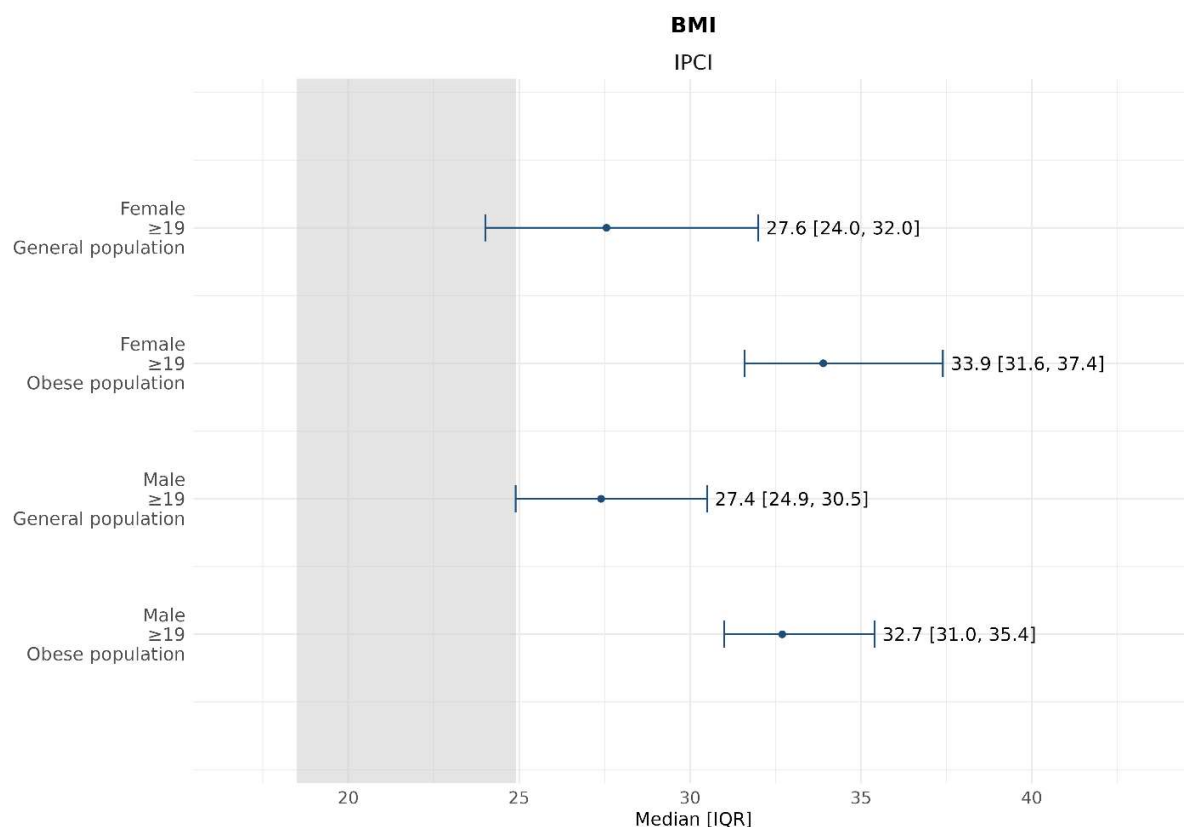


Figure 1. The median BMI (kg/m²) and IQR in the adult population (≥ 19), overall and obese subgroup, by sex, 2010–2025.

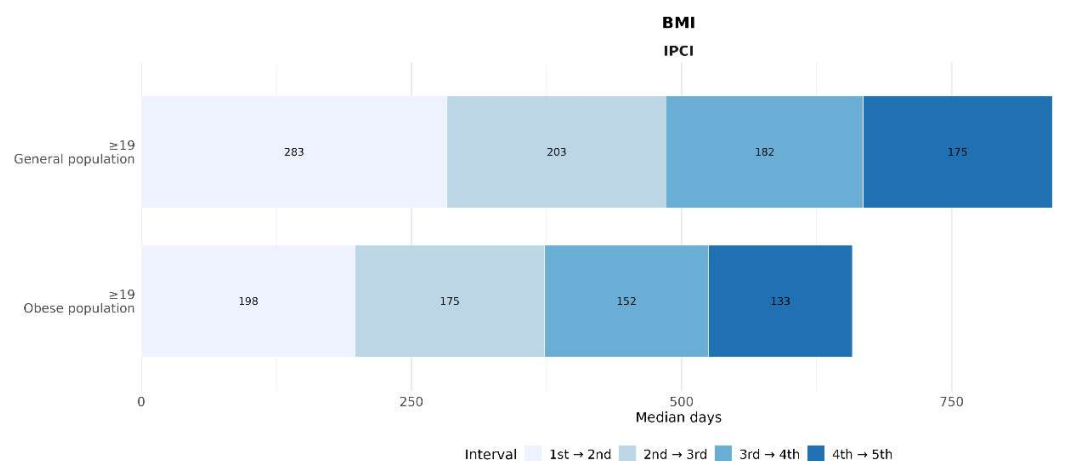


Figure 2. The median time (in days) interval between sequential BMI measurements per individual within the general adult population and obese adult population in the study period 2010 to 2025.

Conclusions

Defining individuals as obese by BMI or by a recorded clinical diagnosis results in different study populations. Data characterisation across a network of European data sources will improve the knowledge of the use of BMI and other obesity-related variables for future RWD studies.

Disclaimer

This study was funded by EMA and performed via DARWIN EU® (EUPAS1000000820). The study funder was involved in revising the study protocol and the objectives and reviewing the study abstract including the results. Data partners' role is only to execute code at their data source. They do not have an investigator role. This communication represents the views of the DARWIN EU® Coordination Centre only and cannot be interpreted as reflecting those of the EMA or the European Medicines Regulatory Network.