**Body mass index**

This document describes steps for one trait and one analysis:

* **Body mass index (BMI)**

**Overall procedure**

1. Extract trait measurements using measurement codes and calculations
2. Convert measurement units to expected units, if necessary
3. Apply measurement exclusion criteria, other than statistical outliers
4. Remove statistical outliers
5. Compute a single value per individual for inclusion in analysis
6. Calculate counts of flagged individuals

**Measurement codes and calculations**

The [primed\_consortia\_legacy\_project\_phenotypes GitHub repository](https://manning-lab.github.io/primed_consortia_legacy_project_phenotypes/) provides files containing codes for the following vocabularies. Files can be downloaded and used to identify measurements.

For BMI, weight and height are used to calculate BMI. Codes for both weight and height are available below.

Weight

* SNOMED:
  + Weight\_codes.csv
  + [Body weight measurement in Athena](https://athena.ohdsi.org/search-terms/terms/4099154)

Height

* SNOMED:
  + Height\_codes.csv
  + [Height measurement in Athena](https://athena.ohdsi.org/search-terms/terms/607590)

**BMI**

After extracting weight and height, compute BMI using the following formula. Weight and height should be from the same timepoint. You will likely obtain multiple BMI values per participant.

BMI (kg/m2) = (Weight in kg)/(Height in m)^2

**Medications**

Not applicable for this trait.

**Expected units**

Please convert values measured in other units of measurement to the following units:

* Weight: kg
* Height: meters
* BMI: kg/meter^2

**Exclusion criteria**

**Individual exclusion criteria**

Not applicable for this trait.

**Measurement exclusion criteria**

The following measurements should be excluded from the analysis. Other measurements from an individual may still be included in analysis.

* Age at measurement <18 years
* Exclude measurements taken at Inpatient or Emergency Department visits. Alternatively, keep only measurements taken at Outpatient visits. Take whichever approach is most appropriate for your EHR.
* Exclude measurements for individuals with any of these conditions at the time of BMI measurement:
* Cancer
* Pregnancy (on date of measurement)

**Remove statistical outliers**

* Remove measurements of height and weight on outliers +/-6SD (by sex) before calculating BMI
* Remove measurements that are outside +/- 6 SD (by sex) from the overall mean BMI i after applying all other exclusions

**Compute a single value per individual for inclusion in analysis**

After all exclusions are applied, the remaining measurements can be used to compute the final value for each individual for analysis.

* Calculate median BMI
* Calculate median age from the same measurements used to calculate median BMI

**Flagged individuals**

Not applicable for this analysis.