

Supplementary Information A:

Management of missing BMI values during the 26 years follow-up.

Among the 11 784 participants, 6 524 (55%) had at least one missing value of body mass index during the 26 years follow-up. Among them, 42% had only one missing value over the 26-year follow-up (see table A1).

There were two types of missing values depending on when they occur during the follow-up: intermittent missing values (one or more), which are located between non-missing values), and monotone missing values, which are located at one extremity of the series of values (in our case only at the start of the follow-up because we excluded individuals with missing value of BMI in 2015).

Intermittent missing values were the most common, with gaps no longer than one value in 53% of the cases. Imputation was restricted to individuals with gaps no larger than 7 missing values (93% of participants with intermittent missing values) and used the 'Copy Mean' method¹, which is based on linear interpolation corrected for the average difference between prediction and observation in the study population.

Less than 10% of participants had monotone missing values, often one missing value. Imputation was restricted to single monotone missing values (61% of participants with monotone missing values) and used the 'Global Slope' method², which is based on linear extrapolation of the function defined by the first and last values.

Eventually, 90% of individuals with missing BMI values benefits from imputation

Supplementary Information References

1. Genolini C, Écochard R, Jacqmin-Gadda H. Copy Mean: A New Method to Impute Intermittent Missing Values in Longitudinal Studies. *Open J Stat.* 2013;03(04):26-40. doi:10.4236/ojs.2013.34A004
2. Genolini C. longitudinalData: Longitudinal data, R package version 2.4.1. 2016. <https://cran.r-project.org/package=longitudinalData>.

Supplementary Information Table

Table A1: Number of missing values of body mass index (BMI) according to age groups, among participants with missing values

Number of missing values of BMI	All	Aged 60-65	Aged 65-75	Aged 75-85
1	42%	41%	42%	47%
2	18%	18%	18%	15%
3	10%	10%	10%	11%
4	7%	7%	7%	6%
5 and more	22%	23%	24%	22%