**Supplementary information**

**Definitions of smoking**

For smoking, if the participant's ever-smoking status is 0, we coded it as 0; otherwise, we used the reported maximum number of cigarettes (or pipes/cigars) consumed daily in the past or present (Data-Field: 20116, 2887, and 3456).

**Definitions of drinking**

For drinking, if the participant's ever-drinking status is 0, we coded it as 0; otherwise, we added up the average amount of different types of alcohol these drinkers consumed per week (Data-Field: 20117). Those who reported drinking less than once a week were asked about the average amount of different types of alcohol per month. Finally, we added up the total alcohol consumption for each drinker each month and divided it by 4 to get their weekly alcohol consumption.

**Definitions of physical activity (PA)**

PA was assessed using the International Physical Activity Questionnaire (IPAQ)1, which captures the frequency (days/weeks) of physical activity across three intensity levels (UK Biobank field id: 864,884 and 904) and duration (minutes/day) (UK Biobank field id: 874,894 and 914), including walking, moderate and vigorous exercise 1. For each category, participants were asked to report how many days per week they participated in activities of 10 minutes or more. Furthermore, participants reported how many days in each category and were then asked to answer how many minutes per day they typically spent on those activities. Any activity with a PA of less than 10 minutes per day is recorded as 0. For each activity category, multiply the number of days reported by the number of minutes reported in a typical day to generate a weekly activity duration in minutes. Metabolic equivalent (METs) was used to measure PA. Total MET values for each category from the IPAQ were: 3.3 for walking, 4.0 for moderate physical activity, and 8.0 for vigorous physical activity.

**Definitions of dietary diversity score (DDS)**

Based on previously published literature2, we calculated participants' dietary diversity scores using the UK Biobank 24-hour dietary recall survey data. We divided the food items into five categories: grain products, vegetables, fruits, meat and protein alternatives, and dairy products. Then, these five categories were subdivided into 18 subgroups, which can be seen in Supplementary Table S1. We averaged the number of repeated dietary assessments. For each category, the score increases if a participant consumes any food in that category. However, within the same subgroup, there is no double counting for different food items intake. The value of DDS is the sum of the scores of all 18 subgroups, ranging from 1 to 18. A higher DDS reflects a richer diet.

**Reference**

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2. Zheng G, Cai M, Liu H, Li R, Qian Z, Howard SW, Keith AE, Zhang S, Wang X, Zhang J, Lin H, Hua J. Dietary Diversity and Inflammatory Diet Associated with All-Cause Mortality and Incidence and Mortality of Type 2 Diabetes: Two Prospective Cohort Studies. *Nutrients*. 2023;15(9). doi:10.3390/nu15092120