Online-Only Supplemental Material

Association of a Healthy Lifestyle with All-Cause and Cause-Specific Mortality Among Individuals with Type 2 Diabetes: A Prospective Study in UK Biobank

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Assessment of lifestyle factors

All information on lifestyle factors was self-reported using a touchscreen questionnaire at baseline (2006-2010). Detailed questionnaires could be obtained through the UK Biobank website (https://biobank.ndph.ox.ac.uk/showcase/).

➢ Smoking: Participants were asked about their current smoking status through the following question: “Do you smoke tobacco now? i. yes, on most or all days, ii. only occasionally, iii. no, or iv. prefer not to answer”. Except for those who indicated they were currently smoking on most or all days, participants were further asked about their past smoking frequency through “In the past, how often have you smoked tobacco? i. smoked on most or all days, ii. smoked occasionally, iii. just tried once or twice, iv. I have never smoked, or v. prefer not to answer”. The smoking status was then categorized into three groups (current, previous, and never).

➢ Alcohol consumption: Participants were asked about their drinking frequency through the following question: “About how often do you drink alcohol? i. daily or almost daily, ii. three or four times a week, iii. once or twice a week, iv. one to three times a month, v. special occasions only, vi. never, or vii. prefer not to answer”. Depending on their reported frequency of alcohol drinking, participants were further asked how much red wine (glasses), champagne plus white wine (glasses), beer plus cider (pints), spirits (measures), fortified wine (glasses), and other alcoholic drinks (glasses) they drank on average in a week or month. We calculated the average amount of daily alcohol intake of each participant based on a previous UK Biobank study.(1) Alcohol consumption status was defined by integrated information on drinking frequency and estimated intake total.

➢ Physical activity: The number of days of moderate/vigorous physical activity was recorded by asking “In a typical week, on how many days did you do 10 minutes or more of moderate physical activities like carrying light loads, cycling at a normal pace? (not include walking)” and “In a typical week, how many days did you do 10 minutes or more of vigorous physical activity? (These are activities that make you sweat or breathe hard such as fast cycling, aerobics, heavy lifting)”. According to their reported number of days, participants were further asked about the duration of moderate/vigorous physical activity through the following questions: “How many minutes did you usually spend doing moderate activities on a typical day?” and “How many minutes did you usually spend doing vigorous activities on a typical day?”. We multiplied the number of days and the duration per day to calculate the weekly total amount of moderate or vigorous physical activity, respectively.

➢ Diet: According to a previous UK Biobank study,(2) we selected 10 food groups that have been recommended as dietary priorities for cardiometabolic health(3) to evaluate diet qualities. A
A healthy diet was defined as an adequate intake of at least half of the 10 recommended food groups. Details were shown as follows:

| Diet Component    | Intake Goal       | Field IDs                                                                 |
|-------------------|-------------------|---------------------------------------------------------------------------|
| Fruits            | ≥3 servings/day   | 1309.- "About how many pieces of FRESH fruit would you eat per DAY?"       |
|                   |                   | 1319.- "About how many pieces of DRIED fruit would you eat per DAY?"       |
| Vegetables        | ≥3 servings/day   | 1289.- "On average how many heaped tablespoons of COOKED vegetables would you eat per DAY?" |
|                   |                   | 1299.- "On average how many heaped tablespoons of SALAD or RAW vegetables would you eat per DAY?" |
| Whole grains      | ≥3 servings/day   | 1438.- "How many slices of bread do you eat each WEEK?"                   |
|                   |                   | 1448.- "What type of bread do you mainly eat?"                           |
|                   |                   | 1458.- "How many bowls of cereal do you eat a WEEK?"                     |
|                   |                   | 1468.- "What type of cereal do you mainly eat?"                          |
| (Shell)fish       | ≥2 servings/week  | 1329.- "How often do you eat oily fish? (e.g. sardines, salmon, mackerel, herring)" |
|                   |                   | 1339.- "How often do you eat other types of fish? (e.g. cod, tinned tuna, haddock)" |
| Dairy             | ≥2 servings/day   | 1408.- "How often do you eat cheese? (Include cheese in pizzas, quiches, cheese sauce etc.)" |
|                   |                   | 1418.- "What type of milk do you mainly use?"                            |
| Vegetable oils    | ≥2 servings/day   | 1428.- "What type of spread do you mainly use?"                         |
|                   |                   | 2654.- "What type of spread do you mainly use?"                         |
|                   |                   | 1438.- "How many slices of bread do you eat each WEEK?"                 |
| Refined grains    | ≤2 servings/day   | 1448.- "What type of bread do you mainly eat?"                           |
|                   |                   | 1458.- "How many bowls of cereal do you eat a WEEK?"                     |
|                   |                   | 1468.- "What type of cereal do you mainly eat?"                          |
| Processed meats   | ≤1 serving/week   | 1349.- "How often do you eat processed meats (such as bacon, ham, sausages, meat pies, kebabs, burgers, chicken nuggets)" |
| Unprocessed meats | ≤2 serving/week   | 1359.- "How often do you eat chicken, turkey or other poultry? (Do not count processed meats)" |
|                   |                   | 1369.- "How often do you eat beef? (Do not count processed meats)"       |
|                   |                   | 1379.- "How often do you eat lamb/mutton? (Do not count processed meats)" |
|                   |                   | 1389.- "How often do you eat pork? (Do not count processed meats such as bacon or ham)" |
| Sugar-sweetened   | Don’t drink       | 6144.- "Which of the following do you NEVER eat?"                        |

➢ Sleep duration: Total sleep duration was recorded as the number of reported hours of sleep by
asking “About how many hours sleep do you get in every 24 hours? (Please include naps)”.

➢ Television watching time: Time spent watching television was recorded as the number of hours watching television by asking “In a typical DAY, how many hours do you spend watching TV? (Put 0 if you do not spend any time doing it)”.

➢ Social connection: Participants were asked about their social connection status through the following three questions: [1] “Including yourself, how many people are living together in your household? Include those who usually live in the house such as students living away from home during term time, partners in the armed forces or professions such as pilots”; [2] “How often do you visit friends or family or have them visit you? i. almost daily, ii. 2-4 times a week, iii. about once a week, iv. about once a month, v. once every few months, vi. never or almost never, vii. no friends/family outside household, viii. do not know, or ix. prefer not to answer”; [3] “Which of the following [leisure/social activities] do you attend once a week or more often? You can select more than one: i. sports club or gym, ii. pub or social club, iii. religious group, iv. adult education class, v. other group activity, vi. none of the above, vii. prefer not to answer”. According to a previous UK Biobank study,(4) we assigned 1 point to participants reporting “living alone”, 1 point to those reporting “friends and family visit less than once a month”, and 1 point to those reporting “no participation in social activities at least weekly”. Individual scores were summed up to calculate an overall social score ranging from 0-3. We then defined the social connection status as “active” (score=0), “moderately active” (score=1), and “isolated” (score≥2) based on the social score.

**Construction of the weighted lifestyle score**

β coefficients of each lifestyle factor were estimated using a Cox proportional hazards model that included all seven lifestyle factors (coded as binary variables) and all-cause mortality as an outcome. The model was adjusted for age, sex, ethnicity, education, Townsend deprivation index, employment, family history of diabetes, body mass index, waist-to-hip ratio, prevalent diseases, diabetes duration, glycated hemoglobin level, diabetes-related microvascular disease, and diabetes medication use. The weighted lifestyle score was constructed as follows(5): the binary lifestyle variables were multiplied by the β coefficients, summed up, divided by the sum of β coefficients, and multiplied by 7. We then categorized it into five groups based on the distribution of the simple additive lifestyle score: 1, 2, 3, 4, and 5.

**References**

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4. Smith RW, Barnes I, Green J, Reeves GK, Beral V, Floud S. Social isolation and risk of heart disease and stroke: analysis of two large UK prospective studies. Lancet Public Health. 2021 Mar 1;

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Table S1. International Classification of Diseases (ICD) codes used for identification of cause-specific mortality*

| Cause of Death                  | ICD-10                      |
|--------------------------------|-----------------------------|
| Cancer                         | C00-C97                     |
| Cardiovascular Disease         | I00-I99                     |
| Respiratory disease            | J09-J98                     |
| Digestive disease              | K20-K93                     |
| Neurodegenerative disease      | F01-03,G122,G20,G21,G231-233,G238,G239,G30,G31 |

*Other mortality refers to death from other causes other than cancer, cardiovascular disease, respiratory disease, digestive disease, and neurodegenerative disease.
**Table S2.** Codes used in the UK Biobank study to identify prevalent diseases

| Prevalent diseases                          | Self-reported          | ICD-9          | ICD-10          |
|--------------------------------------------|------------------------|----------------|-----------------|
| Cancer                                     | 20001                  | 140-208        | C00-C97         |
| Cardiovascular Disease*                    | 6150 (1,2,3), 20002 (1074,1075,1081,1083,1086, 1491) | 410-414, 430-434, 436 | I20-I25, I60-I64 |
| Hypertension                               | 6150 (4), 20002 (1065,1072), 6153 (2), 6177 (2) | 401-405        | I10-I13, I15, O10 |
| Hyperlipidemia                             | 20002 (1473), 6153 (1), 6177 (1) | 272            | E78             |
| Depression                                 | 20002 (1286,1531)      | -              | F32-F34, F38-F39 |
| Neurodegenerative disease                  | 20002 (1259,1262,1263) | 290.0-290.4, 294.1, 294.2, 331.0-331.2, 331.6-331.9, 332, 335.2 | F01-03, G122, G20, G21, G231-233, G238, G239, G30, G31 |
| Respiratory disease†                       | 20002 (1112,1113,1472), 6152 (6) | 491, 492, 496  | J40-J44, J47    |
| Digestive disease‡                         | 20002 (1158,1604)      | 571            | K70-K77         |
| Diabetes-related microvascular disease      | -                      | 2503, V420, 7910, 5845, 5846, 5847, 5848, 5849, 5859, 5869, V451, V560, V568, 2504, 2505, 3574, 3620 | E112, E142, Z940, N083, R80, N391, N170, N171, N172, N178, N179, N180, N181, N182, N183, N184, N185, N188, N189, N19, Z992, Z490, Z491, Z492, E113, E143, H280, H360, E114, E144, G730, G990, G590, G632 |

*Contains coronary heart disease and stroke.
†Contains chronic obstructive pulmonary disease and emphysema.
‡Contains liver diseases.
Table S3. Characteristics of participants with type 2 diabetes included in or excluded from the current study

| Characteristics                        | Excluded* | Included |
|----------------------------------------|-----------|----------|
| No of participants                    | 13,599    | 13,366   |
| Age, years                             | 62.0 [57.0, 66.0] | 61.0 [55.0, 65.0] |
| Women                                  | 5,369 (39.5) | 4,775 (35.7) |
| Ethnicity                              |           |          |
| White British                          | 10,791 (79.4) | 10,935 (81.8) |
| Missing†                               | 200 (1.5)  | 53 (0.4) |
| Townsend deprivation index             | -0.7 [-2.9, 2.7] | -1.5 [-3.3, 1.6] |
| Missing†                               | 22 (0.2)   | 21 (0.2) |
| Education                              |           |          |
| College/university degree              | 4,126 (30.3) | 5,668 (42.4) |
| Missing†                               | 695 (5.1)  | 134 (1.0) |
| Employment                             |           |          |
| Currently employed                     | 4,364 (32.1) | 6,219 (46.5) |
| Missing†                               | 296 (2.2)  | 105 (0.8) |
| Family history of diabetes             | 5,864 (43.1) | 5,988 (44.8) |
| BMI, kg/m²                              | 31.1 [27.8, 35.1] | 30.6 [27.4, 34.5] |
| Missing†                               | 185 (1.4)  | 94 (0.7) |
| Low waist-to-hip ratio                 | 2033 (14.9) | 2239 (16.8) |
| Missing†                               | 104 (0.8)  | 55 (0.4) |
| Prevalent diseases                     |           |          |
| Hypertension                           | 10,111 (74.4) | 8,575 (64.2) |
| Hyperlipidemia                         | 10,230 (75.2) | 9,083 (68.0) |
| Depression                             | 1,201 (8.8)  | 911 (6.8) |
| Respiratory disease                    | 820 (6.0)   | 428 (3.2) |
| Diabetes-related microvascular disease | 552 (4.1)   | 272 (2.0) |
| Digestive disease                      | 277 (2.0)   | 156 (1.2) |
| Neurodegenerative disease              | 67 (0.5)    | 30 (0.2) |
| Diabetes medication                    |           |          |
| OAD only                               | 6,594 (48.5) | 6,458 (48.3) |
| Insulin                                | 1,698 (12.5) | 1,394 (10.4) |
| Neither                                | 5,307 (39.0) | 5,514 (41.3) |
| HbA1c, mmol/mol                        | 50.0 [44.0, 57.8] | 50.0 [43.9, 58.1] |
| HbA1c, %                               | 6.7 [6.2, 7.4] | 6.7 [6.2, 7.5] |
| Missing†                               | 1,074 (7.9)  | 808 (6.0) |
| Diabetes duration, years               | 4.0 [1.0, 9.0] | 4.0 [1.0, 8.0] |
| Missing†                               | 230 (1.7)   | 144 (1.1) |

Values are median [interquartile range] for continuous variables or numbers (percentages) for categorical variables. Abbreviations: HbA1c, glycated hemoglobin.

*Participants with missing information on lifestyle factors, or reporting implausible values (for sleep duration, television watching time, and physical activity time), or with existing cancer and cardiovascular disease at baseline were excluded.
†Values are percentages for missing variables.
Table S4. Association of individual and combined emerging low-risk lifestyle factors with all-cause mortality risk among participants with different adherence to conventional low-risk lifestyle factors*

| Number of Conventional Low-risk Factors† | 0-1 | 2 | 3-4 |
|-----------------------------------------|-----|---|-----|
| **No. of Cases/Person-Years**           | HR (95% CI) | No. of Cases/Person-Years | HR (95% CI) | No. of Cases/Person-Years | HR (95% CI) |
| **Television watching time, hours/day** |     |     |     |     |     |
| 0                                       | 19/1,222 | 1.11 (0.69, 1.78) | 11/1,335 | 0.91 (0.50, 1.68) | 10/775 | 1.62 (0.83, 3.16) |
| 0-4                                     | 262/28,238 | 0.75 (0.64, 0.89) | 333/37,405 | 1.05 (0.89, 1.25) | 162/23,045 | 0.84 (0.66, 1.08) |
| ≥4                                      | 373/23,509 | 1 | 267/25,001 | 1 | 124/13,036 | 1 |
| **Sleep duration, hours/day**           |     |     |     |     |     |
| ≤6                                      | 197/15,298 | 1 | 159/16,653 | 1 | 87/9,261 | 1 |
| 7-8                                     | 357/31,454 | 0.87 (0.73, 1.04) | 357/39,993 | 0.93 (0.77, 1.13) | 176/23,888 | 0.74 (0.57, 0.96) |
| ≥9                                      | 100/6,218 | 0.96 (0.75, 1.23) | 95/7,095 | 1.14 (0.88, 1.48) | 33/3,708 | 0.73 (0.48, 1.11) |
| **Social connection**                   |     |     |     |     |     |
| Isolated                                | 141/8,318 | 1 | 98/6,970 | 1 | 40/3,782 | 1 |
| Moderately active                       | 302/22,940 | 0.78 (0.64, 0.96) | 265/25,905 | 0.72 (0.57, 0.92) | 106/13,907 | 0.74 (0.51, 1.08) |
| Active                                  | 211/21,712 | 0.57 (0.46, 0.72) | 248/30,866 | 0.56 (0.44, 0.71) | 150/19,168 | 0.75 (0.52, 1.07) |
| **Number of emerging low-risk factors‡**|     |     |     |     |     |
| 0-1                                     | 248/14,379 | 1 | 173/13,429 | 1 | 76/6,789 | 1 |
| 2                                       | 262/22,427 | 0.74 (0.62, 0.89) | 249/27,320 | 0.79 (0.65, 0.97) | 124/15,601 | 0.70 (0.52, 0.94) |
| 3                                       | 144/16,164 | 0.63 (0.51, 0.78) | 189/22,993 | 0.76 (0.61, 0.94) | 96/14,466 | 0.65 (0.47, 0.88) |
| **P for trend**                         | <0.001 | 0.017 | 0.009 |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).

†Conventional low-risk factors: no current smoking, regular physical activity (150+ minutes of moderate activity per week or 75+ minutes of vigorous activity per week or an equivalent combination), healthy diet (adequate intake of at least half of 10 recommended food groups), and moderate alcohol consumption (no more than 1 drink/day for women and 2 drinks/day for men).

‡Emerging low-risk factors: adequate sleep duration (7-8 hours/day), less television watching time (<4h/day), and appropriate social connection (not isolated).
### Table S5. Population attributable risks (PARs) of modifiable lifestyle risk factors for all-cause mortality among individuals with type 2 diabetes

| Modifiable Risk Factors and Alternative Levels | % of Participants Shifted | PAR*, % |
|-----------------------------------------------|---------------------------|---------|
| **Smoking†**                                  |                           |         |
| Current → previous, never                      | 10.77                     | 0.66 (0.43, 0.88) |
| Previous, current → never‡                    | 52.96                     | 7.86 (4.57, 11.16) |
| **Alcohol consumption†**                      |                           |         |
| Non-moderate → moderate                       | 72.65                     | 12.24 (6.59, 17.90) |
| **Diet†**                                     |                           |         |
| <5 → ≥5 recommended components                | 78.97                     | 6.35 (-0.68, 13.38) |
| **Physical activity†**                        |                           |         |
| Non-regular → regular                         | 48.61                     | 4.11 (1.75, 6.47) |
| **Sleep duration†**                           |                           |         |
| ≤6 or ≥9 → 7-8 hours/day                      | 38.16                     | 2.07 (0.55, 3.59) |
| **Television watching†**                      |                           |         |
| ≥4 → <4 hours/day                            | 40.41                     | 1.81 (-0.05, 3.66) |
| **Social connection†**                        |                           |         |
| Isolated → moderately active, active          | 12.73                     | 0.68 (0.40, 0.96) |
| **Body mass index‡**                          |                           |         |
| <18.5 or ≥25 → 18.5-25 kg/m²                  | 89.47                     | 0.86 (-11.87, 13.59) |
| ≥30 → <30 kg/m²                               | 54.36                     | 3.97 (1.04, 6.89) |

*The percentage of all-cause mortality theoretically attributable to adherence to modifiable lifestyle risk factors among participants included in the current study. Population attributable risk at the median follow-up time of the study population was reported.

†Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither). Imputed covariates include ethnicity, Townsend deprivation index, education, employment, body mass index, waist-to-hip ratio, diabetes duration, and glycated hemoglobin level. Individual lifestyle risk factors were mutually adjusted: smoking (current or not), alcohol consumption (non-moderate or not), diet (<5 recommended components or not), physical activity (non-regular or not), sleep duration (inadequate or not), television watching (≥4 hours/day or not), and social connection (isolated or not).

‡Smoking was redefined as current/previous or never.

§Participants with missing information on body mass index were excluded (n=13,272). Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral antidiabetic drugs only, insulin, or neither). Individual lifestyle risk factors were mutually adjusted: smoking (current or not), alcohol consumption (non-moderate or not), diet (<5 recommended components or not), physical activity (non-regular or not), sleep duration (inadequate or not), television watching (≥4 hours/day or not), social connection (isolated or not), and body mass index (<18.5/≥25 kg/m² or not; ≥30 kg/m² or not).
Table S6. Association between lifestyle score and all-cause mortality risk stratified by diabetes severity status (n=12,435)*

| No. of Diabetes Severity Factors† | No. of Participants | No. of Cases/ Person-Years | HR‡ (95% CI) | P for Interaction |
|----------------------------------|---------------------|-----------------------------|--------------|-------------------|
| None                             | 3,508               | 364/40,517                  | 0.82 (0.76, 0.89) | 0.738             |
| One                              | 4,651               | 499/53,573                  | 0.82 (0.77, 0.89) |                   |
| Two                              | 3,079               | 394/35,359                  | 0.78 (0.72, 0.84) |                   |
| Three or four                    | 1,197               | 206/13,488                  | 0.77 (0.69, 0.86) |                   |

*Participants with missing information on diabetes duration, glycated hemoglobin level, diabetes-related microvascular disease, and diabetes medication use were excluded.
†Includes four factors: glycated hemoglobin level ≥53 mmol/mol [7.0%], diabetes duration ≥10 years, had a diabetes-related microvascular disease, and diabetes medication use.
‡Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), and prevalent diseases (yes or no).
Table S7. Association of lifestyle score with all-cause and cause-specific mortality risk using multiple imputations with chained equations to assign missing covariate values (n=13,366)*

|                               | Lifestyle Score | P for Trend | HR (95% CI) per Score Point |
|-------------------------------|-----------------|-------------|----------------------------|
| **All-cause**                 |                 |             |                            |
| No. of Cases/Person-Years     |                 |             |                            |
| HR (95% CI)                  |                 |             |                            |
| 0-2                          | 308/18,245      | 1           | 0.72 (0.62, 0.83)          |
| 3                            | 400/33,792      | <0.001      | 0.57 (0.50, 0.67)          |
| 4                            | 436/47,722      |             | 0.50 (0.43, 0.59)          |
| 5                            | 299/37,006      |             | 0.42 (0.34, 0.52)          |
| 6-7                          | 118/16,803      |             | 0.81 (0.78, 0.84)          |
| **Cancer**                   |                 |             |                            |
| No. of Cases/Person-Years     |                 |             |                            |
| HR (95% CI)                  |                 |             |                            |
| 0-2                          | 106/18,245      | <0.001      | 0.74 (0.58, 0.96)          |
| 3                            | 147/33,792      |             | 0.66 (0.52, 0.84)          |
| 4                            | 181/47,722      |             | 0.61 (0.47, 0.80)          |
| 5                            | 133/37,006      |             | 0.57 (0.41, 0.79)          |
| 6-7                          | 58/16,803       |             | 0.87 (0.82, 0.93)          |
| **Cardiovascular disease**   |                 |             |                            |
| No. of Cases/Person-Years     |                 |             |                            |
| HR (95% CI)                  |                 |             |                            |
| 0-2                          | 77/18,245       | <0.001      | 0.61 (0.45, 0.84)          |
| 3                            | 86/33,792       |             | 0.60 (0.45, 0.81)          |
| 4                            | 114/47,722      |             | 0.46 (0.33, 0.65)          |
| 5                            | 69/37,006       |             | 0.35 (0.22, 0.56)          |
| 6-7                          | 24/16,803       |             | 0.79 (0.73, 0.86)          |
| **Respiratory disease**      |                 |             |                            |
| No. of Cases/Person-Years     |                 |             |                            |
| HR (95% CI)                  |                 |             |                            |
| 0-2                          | 27/18,245       | <0.001      | 0.64 (0.38, 1.08)          |
| 3                            | 31/33,792       |             | 0.53 (0.32, 0.89)          |
| 4                            | 34/47,722       |             | 0.35 (0.19, 0.65)          |
| 5                            | 17/37,006       |             | 0.25 (0.10, 0.63)          |
| 6-7                          | 6/16,803        |             | 0.73 (0.63, 0.84)          |
| **Neurodegenerative disease**|                 |             |                            |
| No. of Cases/Person-Years     |                 |             |                            |
| HR (95% CI)                  |                 |             |                            |
| 0-2                          | 8/18,245        | <0.001      | 1.48 (0.65, 3.36)          |
| 3                            | 22/33,792       |             | 0.65 (0.27, 1.57)          |
| 4                            | 15/47,722       |             | 0.96 (0.40, 2.26)          |
| 5                            | 19/37,006       |             | 1.00 (0.38, 2.64)          |
| 6-7                          | 10/16,803       |             | 0.94 (0.78, 1.13)          |
| **Digestive disease†**       |                 |             |                            |
| No. of Cases/Person-Years     |                 |             |                            |
| HR (95% CI)                  |                 |             |                            |
| 0-2                          | 25/18,245       | <0.001      | 0.42 (0.23, 0.78)          |
| 3                            | 18/33,792       |             | 0.38 (0.21, 0.69)          |
| 4                            | 21/47,722       |             | 0.27 (0.14, 0.53)          |
| 5                            | 17/53,809       |             | 0.67 (0.56, 0.80)          |
| **Other**                    |                 |             |                            |
| No. of Cases/Person-Years     |                 |             |                            |
| HR (95% CI)                  |                 |             |                            |
| 0-2                          | 65/18,245       | <0.001      | 0.85 (0.62, 1.17)          |
| 3                            | 96/33,792       |             | 0.48 (0.34, 0.68)          |
| 4                            | 71/47,722       |             | 0.40 (0.27, 0.59)          |
| 5                            | 45/37,006       |             | 0.35 (0.21, 0.60)          |
| 6-7                          | 19/16,803       |             | 0.74 (0.68, 0.81)          |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (<0.85/0.90 or ≥0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither). Imputed covariates include ethnicity, Townsend deprivation index, education, employment, body mass index, waist-to-hip ratio, diabetes duration, and glycated hemoglobin level.

†Lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case numbers.
Table S8. Association of lifestyle score with all-cause and cause-specific mortality risk using multiple imputations with chained equations to assign missing values of exposure and covariates (n=19,244)*

|                       | Lifestyle Score | P for Trend | HR (95% CI) per Score Point |
|-----------------------|----------------|-------------|------------------------------|
| **All-cause**         |                | 0-2         | 3                            | 4                            | 5                            | 6-7                         |
| No. of Cases/Person-Years | 499/29,708   | 632/50,974  | 648/67,862                   | 434/50,561                   | 171/22,556                   |
| HR (95% CI)           | 1              | 0.74 (0.65, 0.84) | 0.60 (0.53, 0.68) | 0.55 (0.48, 0.63) | 0.45 (0.37, 0.54) | <0.001 | 0.82 (0.80, 0.85) |
| **Cancer**            |                |             |                              |                              |                              |
| No. of Cases/Person-Years | 165/29,708   | 212/50,974  | 246/67,862                   | 183/50,561                   | 81/22,556                    |
| HR (95% CI)           | 1              | 0.75 (0.60, 0.92) | 0.65 (0.53, 0.80) | 0.66 (0.53, 0.82) | 0.60 (0.44, 0.81) | <0.001 | 0.88 (0.84, 0.93) |
| **Cardiovascular disease** |            |             |                              |                              |                              |
| No. of Cases/Person-Years | 139/29,708   | 154/50,974  | 163/67,862                   | 110/50,561                   | 35/22,556                    |
| HR (95% CI)           | 1              | 0.64 (0.50, 0.81) | 0.58 (0.46, 0.75) | 0.49 (0.37, 0.65) | 0.35 (0.24, 0.52) | <0.001 | 0.79 (0.74, 0.85) |
| **Respiratory disease** |            |             |                              |                              |                              |
| No. of Cases/Person-Years | 41/29,708    | 58/50,974   | 54/67,862                    | 26/50,561                    | 11/22,556                    |
| HR (95% CI)           | 1              | 0.78 (0.48, 1.29) | 0.58 (0.35, 0.96) | 0.44 (0.25, 0.78) | 0.36 (0.17, 0.73) | <0.001 | 0.77 (0.69, 0.87) |
| **Neurodegenerative disease** |          |             |                              |                              |                              |
| No. of Cases/Person-Years | 18/29,708    | 41/50,974   | 26/67,862                    | 24/50,561                    | 12/22,556                    |
| HR (95% CI)           | 1              | 1.19 (0.66, 2.16) | 0.61 (0.31, 1.18) | 0.70 (0.36, 1.35) | 0.67 (0.31, 1.44) | 0.044 | 0.86 (0.75, 1.00) † |
| **Digestive disease‡** |            |             |                              |                              |                              |
| No. of Cases/Person-Years | 41/29,708    | 34/50,974   | 36/67,862                   | 26/73,117                    |
| HR (95% CI)           | 1              | 0.53 (0.32, 0.88) | 0.44 (0.26, 0.73) | 0.32 (0.19, 0.54) | <0.001 | 0.70 (0.61, 0.80) |
| **Other**             |                |             |                              |                              |                              |
| No. of Cases/Person-Years | 95/29,708    | 133/50,974  | 123/67,862                  | 68/50,561                    | 29/22,556                    |
| HR (95% CI)           | 1              | 0.88 (0.64, 1.20) | 0.62 (0.47, 0.83) | 0.49 (0.35, 0.70) | 0.43 (0.28, 0.67) | <0.001 | 0.80 (0.74, 0.87) |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither). Imputed covariates include ethnicity, Townsend deprivation index, education, employment, body mass index, waist-to-hip ratio, diabetes duration, glycated hemoglobin level, and lifestyle factors.
†P value was 0.054.
‡Lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case numbers.
Table S9. Association between lifestyle score and risk of mortality from respiratory disease, neurodegenerative disease, or digestive disease among participants without the corresponding disease at baseline*

|                    | Lifestyle Score |  |  |  |                  |                  |
|--------------------|----------------|---|---|---|------------------|------------------|
|                    | 0-2            | 3 | 4 | 5 | 6-7              |                  |
| Respiratory disease†|                |   |   |   |                  |                  |
| No. of Cases/Person-Years | 20/17,105      | 27/32,420 | 30/46,532 | 15/36,272 | 6/16,571          |                  |
| HR (95% CI)        | 1              | 0.75 (0.42, 1.33) | 0.63 (0.35, 1.12) | 0.41 (0.21, 0.82) | 0.33 (0.13, 0.85) | 0.002 | 0.77 (0.65-0.90) |
| Neurodegenerative disease‡|              |   |   |   |                  |                  |
| No. of Cases/Person-Years | 7/18,179       | 20/33,728 | 15/47,614 | 18/36,968 | 10/16,781         |                  |
| HR (95% CI)        | 1              | 1.52 (0.63, 3.63) | 0.71 (0.28, 1.79) | 1.01 (0.41, 2.50) | 1.12 (0.41, 3.06) | 0.656 | 0.96 (0.79-1.17) |
| Digestive disease§ |                |   |   |   |                  |                  |
| No. of Cases/Person-Years | 22/17,837      | 14/33,379 | 19/47,217 | 15/53,481 |                  |                  |
| HR (95% CI)        | 1              | 0.36 (0.18, 0.71) | 0.37 (0.20, 0.70) | 0.26 (0.13, 0.51) |                  | <0.001 | 0.67 (0.55, 0.80) |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).
†Excluding participants with the existing respiratory disease at baseline (n=428).
‡Excluding participants with the existing neurodegenerative disease at baseline (n=30).
§Excluding participants with the existing digestive disease at baseline (n=156); The lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case numbers.
### Table S10. Association of lifestyle score with cause-specific mortality risk using competing risk regression*

| Cause                          | Lifestyle Score | P for Trend | SHR (95% CI per Score Point) |
|-------------------------------|-----------------|-------------|-----------------------------|
|                               | 0-2             | 3           | 4                           | 5                           | 6-7                        |
| **Cancer**                    |                 |             |                             |                             |                            |
| No. of Cases/Person-Years     | 106/18,245      | 147/33,792  | 181/47,722                  | 133/37,006                  | 58/16,803                  |
| SHR (95% CI)                  | 1               | 0.77 (0.60, 0.99) | 0.69 (0.54, 0.88) | 0.64 (0.50, 0.83) | 0.60 (0.43, 0.83) |
| **Cardiovascular disease**    |                 |             |                             |                             |                            |
| No. of Cases/Person-Years     | 77/18,245       | 86/33,792   | 114/47,722                  | 69/37,006                   | 24/16,803                  |
| SHR (95% CI)                  | 1               | 0.63 (0.46, 0.86) | 0.63 (0.47, 0.85) | 0.49 (0.35, 0.68) | 0.37 (0.23, 0.59) |
| **Respiratory disease**       |                 |             |                             |                             |                            |
| No. of Cases/Person-Years     | 27/18,245       | 31/33,792   | 34/47,722                   | 17/37,006                   | 6/16,803                   |
| SHR (95% CI)                  | 1               | 0.68 (0.41, 1.12) | 0.58 (0.35, 0.96) | 0.38 (0.20, 0.71) | 0.28 (0.11, 0.70) |
| **Neurodegenerative disease** |                 |             |                             |                             |                            |
| No. of Cases/Person-Years     | 8/18,245        | 22/33,792   | 15/47,722                   | 19/37,006                   | 10/16,803                  |
| SHR (95% CI)                  | 1               | 1.57 (0.69, 3.56) | 0.72 (0.29, 1.74) | 1.10 (0.47, 2.57) | 1.14 (0.44, 2.95) |
| **Digestive disease†**        |                 |             |                             |                             |                            |
| No. of Cases/Person-Years     | 25/18,245       | 18/33,792   | 21/47,722                   | 17/53,809                   |                            |
| SHR (95% CI)                  | 1               | 0.45 (0.25, 0.81) | 0.42 (0.24, 0.73) | 0.31 (0.16, 0.57) |                            |
| **Other**                     |                 |             |                             |                             |                            |
| No. of Cases/Person-Years     | 65/18,245       | 96/33,792   | 71/47,722                   | 45/37,006                   | 19/16,803                  |
| SHR (95% CI)                  | 1               | 0.90 (0.65, 1.23) | 0.51 (0.36, 0.72) | 0.42 (0.29, 0.63) | 0.40 (0.23, 0.67) |

*Subdistribution hazard ratios were calculated in proportional subdistribution hazards regression models (Fine and Gray) after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).

†Lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case numbers.
Table S11. Association of lifestyle score with all-cause and cause-specific mortality risk among diagnosed type 2 diabetes patients (n=11,407)*

| All-cause                  | Lifestyle Score | P for Trend | HR (95% CI) per Score Point |
|----------------------------|----------------|-------------|----------------------------|
| No. of Cases/Person-Years  | 0-2            | 3           | 4                         | 5                         | 6-7                     |
| HR (95% CI)                | 1              | 0.72 (0.61, 0.84) | 0.58 (0.49, 0.68) | 0.50 (0.42, 0.60) | 0.43 (0.34, 0.54) | <0.001 | 0.81 (0.78, 0.85) |
| Cancer                     | No. of Cases/Person-Years 85/15,110 | 120/28,436 | 162/40,602 | 116/32,091 | 50/14,594 |
| HR (95% CI)                | 1              | 0.74 (0.56, 0.98) | 0.72 (0.55, 0.94) | 0.64 (0.48, 0.85) | 0.59 (0.41, 0.84) | 0.002 | 0.88 (0.82, 0.95) |
| Cardiovascular disease     | No. of Cases/Person-Years 66/15,110 | 78/28,436 | 92/40,602 | 61/32,091 | 24/14,594 |
| HR (95% CI)                | 1              | 0.64 (0.46, 0.89) | 0.55 (0.40, 0.76) | 0.45 (0.31, 0.64) | 0.39 (0.24, 0.62) | <0.001 | 0.80 (0.73, 0.87) |
| Respiratory disease†       | No. of Cases/Person-Years 23/15,110 | 27/28,436 | 29/40,602 | 18/46,686 |
| HR (95% CI)                | 1              | 0.65 (0.37, 1.15) | 0.53 (0.30, 0.93) | 0.29 (0.15, 0.55) | <0.001 | 0.70 (0.59, 0.82) |
| Neurodegenerative disease  | No. of Cases/Person-Years 8/15,110 | 20/28,436 | 14/40,602 | 18/32,091 | 10/14,594 |
| HR (95% CI)                | 1              | 1.31 (0.57, 3.01) | 0.57 (0.23, 1.40) | 0.87 (0.36, 2.07) | 0.96 (0.36, 2.54) | 0.503 | 0.94 (0.77, 1.14) |
| Digestive disease†         | No. of Cases/Person-Years 20/15,110 | 16/28,436 | 20/40,602 | 16/46,686 |
| HR (95% CI)                | 1              | 0.46 (0.24, 0.90) | 0.43 (0.23, 0.81) | 0.28 (0.14, 0.56) | 0.001 | 0.69 (0.57, 0.83) |
| Other                      | No. of Cases/Person-Years 60/15,110 | 83/28,436 | 66/40,602 | 41/32,091 | 19/14,594 |
| HR (95% CI)                | 1              | 0.79 (0.57, 1.11) | 0.48 (0.34, 0.69) | 0.38 (0.25, 0.58) | 0.38 (0.22, 0.64) | <0.001 | 0.75 (0.68, 0.82) |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).

†Lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case numbers.
Table S12. Association of weighted lifestyle score with all-cause and cause-specific mortality risk*

| Weighted Lifestyle Score Category† | 1          | 2          | 3          | 4          | 5          | P for Trend | HR (95% CI per Score Point) |
|-----------------------------------|------------|------------|------------|------------|------------|------------|-----------------------------|
| All-cause                         |            |            |            |            |            |            |                             |
| No. of Cases/Person-Years         | 298/18,139 | 404/33,462 | 436/48,228 | 309/35,901 | 114/17,838 |            |                             |
| HR (95% CI)                       | 1          | 0.68 (0.58, 0.79) | 0.53 (0.45, 0.61) | 0.50 (0.43, 0.59) | 0.34 (0.27, 0.43) | <0.001   | 0.79 (0.76, 0.82)           |
| Cancer                            |            |            |            |            |            |            |                             |
| No. of Cases/Person-Years         | 114/18,139 | 138/33,462 | 185/48,228 | 134/35,901 | 54/17,838  |            |                             |
| HR (95% CI)                       | 1          | 0.60 (0.47, 0.78) | 0.56 (0.44, 0.72) | 0.55 (0.43, 0.71) | 0.40 (0.29, 0.56) | <0.001   | 0.83 (0.78, 0.88)           |
| Cardiovascular disease            |            |            |            |            |            |            |                             |
| No. of Cases/Person-Years         | 73/18,139  | 93/33,462  | 105/48,228 | 72/35,901  | 27/17,838  |            |                             |
| HR (95% CI)                       | 1          | 0.62 (0.45, 0.85) | 0.51 (0.38, 0.69) | 0.47 (0.34, 0.66) | 0.33 (0.21, 0.52) | <0.001   | 0.78 (0.72, 0.84)           |
| Respiratory disease               |            |            |            |            |            |            |                             |
| No. of Cases/Person-Years         | 22/18,139  | 32/33,462  | 32/48,228  | 20/35,901  | 9/17,838   |            |                             |
| HR (95% CI)                       | 1          | 0.75 (0.43, 1.30) | 0.57 (0.33, 0.99) | 0.50 (0.27, 0.92) | 0.39 (0.18, 0.87) | 0.004   | 0.75 (0.65, 0.86)           |
| Neurodegenerative disease         |            |            |            |            |            |            |                             |
| No. of Cases/Person-Years         | 7/18,139   | 22/33,462  | 17/48,228  | 19/35,901  | 9/17,838   |            |                             |
| HR (95% CI)                       | 1          | 1.41 (0.59, 3.35) | 0.68 (0.28, 1.68) | 0.97 (0.39, 2.39) | 0.82 (0.29, 2.28) | 0.413   | 0.93 (0.76, 1.14)           |
| Digestive disease‡                |            |            |            |            |            |            |                             |
| No. of Cases/Person-Years         | 20/18,139  | 28/33,462  | 14/48,228  | 19/53,739  |            |            |                             |
| HR (95% CI)                       | 1          | 0.77 (0.43, 1.39) | 0.29 (0.14, 0.58) | 0.35 (0.18, 0.68) |            | <0.001   | 0.69 (0.59, 0.81)           |
| Other                             |            |            |            |            |            |            |                             |
| No. of Cases/Person-Years         | 62/18,139  | 91/33,462  | 83/48,228  | 48/35,901  | 12/17,838  |            |                             |
| HR (95% CI)                       | 1          | 0.75 (0.54, 1.05) | 0.52 (0.37, 0.73) | 0.42 (0.28, 0.61) | 0.19 (0.10, 0.36) | <0.001   | 0.74 (0.68, 0.81)           |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).

†The weighted standardized lifestyle score was grouped into five ordered categories (1-5) based on the distribution of the unweighted score; A higher level indicates higher adherence to a healthy lifestyle.

‡Category 4 and 5 were combined due to limited case numbers.
### Table S13. Hazard ratio (95% confidence interval) of all-cause and cause-specific mortality risk according to lifestyle score with further inclusion of body mass index (n=13,272)*

| Lifestyle Score | 0-2 | 3   | 4   | 5   | 6-8   | P for Trend | HR (95% CI) per Score Point |
|-----------------|-----|-----|-----|-----|-------|------------|-----------------------------|
| **All-cause**   |     |     |     |     |       |            |                             |
| No. of Cases/Person-Years | 280/16,892 | 385/32,016 | 425/45,798 | 306/36,370 | 149/21,449 | <0.001 | 0.82 (0.78, 0.85) |
| HR (95% CI)     | 1   | 0.74 (0.63, 0.86) | 0.58 (0.50, 0.68) | 0.52 (0.44, 0.62) | 0.42 (0.34, 0.52) |
| Cancer          |     |     |     |     |       |            |                             |
| No. of Cases/Person-Years | 100/16,892 | 134/32,016 | 185/45,798 | 134/36,370 | 70/21,449 | <0.001 | 0.88 (0.83, 0.94) |
| HR (95% CI)     | 1   | 0.70 (0.54, 0.91) | 0.69 (0.53, 0.88) | 0.62 (0.47, 0.81) | 0.53 (0.39, 0.73) |
| Cardiovascular disease |     |     |     |     |       |            |                             |
| No. of Cases/Person-Years | 73/16,892 | 80/32,016 | 111/45,798 | 70/36,370 | 29/21,449 | <0.001 | 0.78 (0.72, 0.85) |
| HR (95% CI)     | 1   | 0.58 (0.42, 0.80) | 0.58 (0.43, 0.78) | 0.45 (0.32, 0.63) | 0.31 (0.20, 0.49) |
| Respiratory disease |     |     |     |     |       |            |                             |
| No. of Cases/Person-Years | 24/16,892 | 31/32,016 | 31/45,798 | 21/36,370 | 7/21,449 | <0.001 | 0.74 (0.64, 0.86) |
| HR (95% CI)     | 1   | 0.71 (0.42, 1.22) | 0.53 (0.31, 0.91) | 0.45 (0.25, 0.82) | 0.24 (0.10, 0.57) |
| Neurodegenerative disease |     |     |     |     |       |            |                             |
| No. of Cases/Person-Years | 7/16,892 | 20/32,016 | 12/45,798 | 20/36,370 | 13/21,449 | 0.875 | 0.99 (0.82, 1.19) |
| HR (95% CI)     | 1   | 1.44 (0.60, 3.42) | 0.57 (0.22, 1.46) | 1.08 (0.45, 2.63) | 1.12 (0.43, 2.89) |
| Digestive disease |     |     |     |     |       |            |                             |
| No. of Cases/Person-Years | 20/16,892 | 23/32,016 | 19/45,798 | 14/36,370 | 5/21,449 | <0.001 | 0.70 (0.59, 0.83) |
| HR (95% CI)     | 1   | 0.66 (0.36, 1.20) | 0.41 (0.21, 0.78) | 0.38 (0.19, 0.78) | 0.23 (0.08, 0.62) |
| Other           |     |     |     |     |       |            |                             |
| No. of Cases/Person-Years | 56/16,892 | 97/32,016 | 67/45,798 | 47/36,370 | 25/21,449 | <0.001 | 0.76 (0.69, 0.83) |
| HR (95% CI)     | 1   | 0.98 (0.70, 1.36) | 0.50 (0.35, 0.72) | 0.44 (0.30, 0.66) | 0.40 (0.24, 0.65) |

*Participants with missing information on body mass index were excluded; Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).
Table S14. Association of lifestyle score with all-cause and cause-specific mortality risk, redefining low-risk alcohol consumption as no heavy drinking*

| All-cause | Lifestyle Score | P for Trend | HR (95% CI) per Score Point |
|-----------|----------------|-------------|-----------------------------|
|           | 0-2            | 3           | 4                          | 5                          | 6-7                        |
| No. of Cases/Person-Years | 197/11,050 | 342/26,998 | 456/45,459 | 374/43,794 | 192/26,267 |
| HR (95% CI) | 1          | 0.70 (0.59, 0.83) | 0.61 (0.52, 0.72) | 0.53 (0.44, 0.63) | 0.45 (0.37, 0.55) | <0.001 | 0.84 (0.80, 0.87) |
| Cancer | No. of Cases/Person-Years | 65/11,050 | 133/26,998 | 168/45,459 | 173/43,794 | 86/26,267 |
| HR (95% CI) | 1          | 0.82 (0.61, 1.11) | 0.66 (0.49, 0.88) | 0.71 (0.53, 0.95) | 0.59 (0.42, 0.82) | 0.002 | 0.90 (0.84, 0.96) |
| Cardiovascular disease | No. of Cases/Person-Years | 55/11,050 | 70/26,998 | 118/45,459 | 88/43,794 | 39/26,267 |
| HR (95% CI) | 1          | 0.51 (0.36, 0.73) | 0.57 (0.41, 0.78) | 0.44 (0.31, 0.63) | 0.34 (0.22, 0.51) | <0.001 | 0.81 (0.75, 0.88) |
| Respiratory disease | No. of Cases/Person-Years | 18/11,050 | 28/26,998 | 36/45,459 | 22/43,794 | 11/26,267 |
| HR (95% CI) | 1          | 0.64 (0.35, 1.17) | 0.55 (0.31, 0.99) | 0.36 (0.19, 0.68) | 0.31 (0.14, 0.66) | <0.001 | 0.75 (0.65, 0.87) |
| Neurodegenerative disease† | No. of Cases/Person-Years | 19/38,048 | 22/45,459 | 15/43,794 | 18/26,267 |
| HR (95% CI) | 1          | 0.94 (0.50, 1.76) | 0.64 (0.32, 1.28) | 1.12 (0.57, 2.20) | 0.887 | 1.01 (0.83, 1.22) |
| Digestive disease‡ | No. of Cases/Person-Years | 18/11,050 | 17/26,998 | 22/45,459 | 24/70,061 |
| HR (95% CI) | 1          | 0.41 (0.21, 0.80) | 0.37 (0.20, 0.70) | 0.28 (0.15, 0.53) | 0.001 | 0.71 (0.60, 0.85) |
| Other | No. of Cases/Person-Years | 39/11,050 | 77/26,998 | 90/45,459 | 58/43,794 | 32/26,267 |
| HR (95% CI) | 1          | 0.79 (0.54, 1.17) | 0.64 (0.44, 0.94) | 0.44 (0.29, 0.66) | 0.39 (0.24, 0.63) | <0.001 | 0.79 (0.72, 0.86) |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).

†Lifestyle score was categorized into four groups (0-3, 4, 5, 6-7) due to limited case numbers.

‡Lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case numbers.
Table S15. Associations between lifestyle score and all-cause mortality risk stratified by self-rated health status (n=13,306)*

| Self-rated Health Status | No. of Participants | No. of Cases/ Person-Years | HR (95% CI) | P for Interaction |
|--------------------------|---------------------|----------------------------|-------------|------------------|
| Poor                     | 1,387               | 258/15,399                 | 0.79 (0.71, 0.88) | 0.196            |
| Fair                     | 5,213               | 634/59,689                 | 0.81 (0.76, 0.86) |                  |
| Good                     | 6,706               | 659/77,787                 | 0.87 (0.82, 0.93) |                  |

*Participants with missing information on self-rated health status were excluded. Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).
Table S16. Association of lifestyle score with all-cause and cause-specific mortality risk, excluding patients with poor self-rated health (n=11,919)*

| Lifestyle Score | 0-2 | 3   | 4   | 5   | 6-7 | P for Trend | HR (95% CI) per Score Point |
|-----------------|-----|-----|-----|-----|-----|------------|-----------------------------|
| **All-cause**   |     |     |     |     |     |            |                             |
| No. of Cases/ Person-Years | 196/13,493 | 327/28,873 | 385/43,603 | 272/35,149 | 113/16,358 | <0.001 | 0.83 (0.80, 0.87) |
| HR (95% CI) | 1   | 0.81 (0.68, 0.97) | 0.66 (0.56, 0.79) | 0.57 (0.47, 0.69) | 0.49 (0.39, 0.62) | <0.001 | 0.83 (0.80, 0.87) |
| **Cancer**      |     |     |     |     |     |            |                             |
| No. of Cases/ Person-Years | 72/13,493 | 132/28,873 | 171/43,603 | 124/35,149 | 57/16,358 | 0.004 | 0.89 (0.83, 0.95) |
| HR (95% CI) | 1   | 0.87 (0.65, 1.16) | 0.77 (0.59, 1.02) | 0.69 (0.51, 0.93) | 0.66 (0.46, 0.94) | 0.004 | 0.89 (0.83, 0.95) |
| **Cardiovascular disease** |     |     |     |     |     |            |                             |
| No. of Cases/ Person-Years | 48/13,493 | 67/28,873 | 100/43,603 | 64/35,149 | 23/16,358 | 0.001 | 0.84 (0.76, 0.92) |
| HR (95% CI) | 1   | 0.68 (0.47, 0.99) | 0.71 (0.50, 1.01) | 0.56 (0.38, 0.82) | 0.43 (0.26, 0.72) | 0.001 | 0.84 (0.76, 0.92) |
| **Respiratory disease** |     |     |     |     |     |            |                             |
| No. of Cases/ Person-Years | 14/13,493 | 22/28,873 | 24/43,603 | 12/35,149 | 6/16,358 | 0.006 | 0.77 (0.65, 0.93) |
| HR (95% CI) | 1   | 0.77 (0.39, 1.51) | 0.61 (0.31, 1.18) | 0.38 (0.17, 0.84) | 0.39 (0.15, 1.04) | 0.006 | 0.77 (0.65, 0.93) |
| **Neurodegenerative disease** |     |     |     |     |     |            |                             |
| No. of Cases/ Person-Years | 6/13,493 | 21/28,873 | 14/43,603 | 17/35,149 | 10/16,358 | 0.373 | 0.92 (0.75, 1.12) |
| HR (95% CI) | 1   | 1.64 (0.65, 4.13) | 0.65 (0.25, 1.74) | 0.89 (0.34, 2.34) | 1.05 (0.37, 3.00) | 0.373 | 0.92 (0.75, 1.12) |
| **Digestive disease†** |     |     |     |     |     |            |                             |
| No. of Cases/ Person-Years | 14/13,493 | 10/28,873 | 17/43,603 | 15/51,507 | 15/51,507 | 0.016 | 0.73 (0.59, 0.90) |
| HR (95% CI) | 1   | 0.35 (0.16, 0.80) | 0.43 (0.21, 0.88) | 0.32 (0.15, 0.68) | 0.73 (0.59, 0.90) | 0.016 | 0.73 (0.59, 0.90) |
| **Other**       |     |     |     |     |     |            |                             |
| No. of Cases/ Person-Years | 42/13,493 | 75/28,873 | 59/43,603 | 41/35,149 | 16/16,358 | <0.001 | 0.73 (0.66, 0.81) |
| HR (95% CI) | 1   | 0.89 (0.61, 1.31) | 0.50 (0.33, 0.75) | 0.42 (0.27, 0.66) | 0.33 (0.18, 0.60) | <0.001 | 0.73 (0.66, 0.81) |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).

†Lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case number.
Table S17. Association of lifestyle score with all-cause and cause-specific mortality risk, excluding deaths that occurred within the first 2 or 4 years of follow-up*

| Lifestyle Score | 0-2 | 3 | 4 | 5 | 6-7 | P for Trend | HR (95% CI) per Score Point |
|-----------------|-----|---|---|---|-----|------------|---------------------------|
| **Excluding deaths that occurred within the first 2 years of follow-up (n=13,284)** |     |   |   |   |     |            |                           |
| **All-cause**   |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 290/18,225 | 382/33,771 | 415/47,695 | 281/36,986 | 111/16,796 | 0.001   | 0.81 (0.77, 0.84) |
| HR (95% CI)     | 1   | 0.72 (0.62, 0.84) | 0.58 (0.50, 0.68) | 0.50 (0.42, 0.59) | 0.42 (0.34, 0.53) | <0.001 |                           |
| **Cancer**      |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 100/18,225 | 135/33,771 | 173/47,695 | 124/36,986 | 57/16,796 | 0.001   | 0.89 (0.83, 0.95) |
| HR (95% CI)     | 1   | 0.73 (0.56, 0.95) | 0.68 (0.53, 0.87) | 0.62 (0.47, 0.81) | 0.61 (0.44, 0.86) | <0.001 |                           |
| **Cardiovascular disease** |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 71/18,225 | 84/33,771 | 105/47,695 | 64/36,986 | 22/16,796 | 0.001   | 0.78 (0.72, 0.85) |
| HR (95% CI)     | 1   | 0.64 (0.47, 0.89) | 0.59 (0.44, 0.81) | 0.46 (0.32, 0.65) | 0.34 (0.21, 0.56) | <0.001 |                           |
| **Respiratory disease** |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 26/18,225 | 30/33,771 | 33/47,695 | 17/36,986 | 5/16,796 | 0.001   | 0.72 (0.62, 0.84) |
| HR (95% CI)     | 1   | 0.63 (0.37, 1.08) | 0.52 (0.31, 0.89) | 0.35 (0.19, 0.66) | 0.21 (0.08, 0.57) | <0.001 |                           |
| **Neurodegenerative disease** |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 8/18,225 | 22/33,771 | 15/47,695 | 19/36,986 | 10/16,796 | 0.472   |                           |
| HR (95% CI)     | 1   | 1.47 (0.65, 3.35) | 0.64 (0.26, 1.53) | 0.95 (0.40, 2.24) | 1.00 (0.38, 2.63) | <0.001 | 0.94 (0.78, 1.13) |
| **Digestive disease†** |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 24/18,225 | 18/33,771 | 21/47,695 | 17/36,986 | 5/16,796 | 0.001   | 0.67 (0.57, 0.80) |
| HR (95% CI)     | 1   | 0.44 (0.24, 0.82) | 0.40 (0.22, 0.72) | 0.28 (0.15, 0.55) | <0.001 |                           |
| **Other**       |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 61/18,225 | 93/33,771 | 68/47,695 | 41/36,986 | 16/16,796 | <0.001  | 0.73 (0.66, 0.80) |
| HR (95% CI)     | 1   | 0.87 (0.63, 1.21) | 0.49 (0.34, 0.69) | 0.38 (0.25, 0.57) | 0.31 (0.18, 0.54) | <0.001 |                           |
| **Excluding deaths that occurred within the first 4 years of follow-up (n=13,124)** |     |   |   |   |     |            |                           |
| **All-cause**   |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 254/18,116 | 343/33,771 | 367/47,548 | 248/36,881 | 107/16,784 | <0.001  | 0.81 (0.78, 0.85) |
| HR (95% CI)     | 1   | 0.74 (0.63, 0.87) | 0.59 (0.50, 0.69) | 0.50 (0.42, 0.60) | 0.46 (0.37, 0.58) | <0.001 |                           |
| **Cancer**      |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 86/18,116 | 112/33,771 | 156/47,548 | 109/36,881 | 55/16,784 | 0.028   | 0.91 (0.85, 0.98) |
| HR (95% CI)     | 1   | 0.71 (0.53, 0.94) | 0.72 (0.55, 0.94) | 0.64 (0.48, 0.86) | 0.70 (0.50, 1.00) | <0.001 |                           |
| **Cardiovascular disease** |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years | 64/18,116 | 80/33,771 | 89/47,548 | 53/36,881 | 21/16,784 | <0.001  | 0.77 (0.70, 0.84) |
| HR (95% CI)     | 1   | 0.68 (0.49, 0.94) | 0.56 (0.40, 0.77) | 0.42 (0.29, 0.61) | 0.37 (0.22, 0.60) | <0.001 |                           |
| **Respiratory disease** |     |   |   |   |     |            |                           |
| No. of Cases/ Person-Years |       |   |   |   |     |            |                           |
| HR (95% CI)     | 1   | 0.68 (0.49, 0.94) | 0.56 (0.40, 0.77) | 0.42 (0.29, 0.61) | 0.37 (0.22, 0.60) | <0.001 |                           |
|                      | No. of Cases/ Person-Years | 24/18,116 | 29/33,645 | 30/47,548 | 15/36,881 | 5/16,784 |
|----------------------|-----------------------------|-----------|-----------|-----------|-----------|---------|
| HR (95% CI)          | 1                           | 0.65 (0.38, 1.12) | 0.50 (0.29, 0.87) | 0.33 (0.17, 0.64) | 0.23 (0.08, 0.60) | <0.001 |

**Neurodegenerative disease**

|                      | No. of Cases/ Person-Years | 8/18,116 | 22/33,645 | 14/47,548 | 19/36,881 | 10/16,784 |
|----------------------|-----------------------------|-----------|-----------|-----------|-----------|---------|
| HR (95% CI)          | 1                           | 1.47 (0.65, 3.35) | 0.60 (0.24, 1.45) | 0.96 (0.40, 2.26) | 1.01 (0.38, 2.65) | 0.492 |

**Digestive disease†**

|                      | No. of Cases/ Person-Years | 22/18,116 | 13/33,645 | 18/47,548 | 13/53,665 |
|----------------------|-----------------------------|-----------|-----------|-----------|-----------|
| HR (95% CI)          | 1                           | 0.33 (0.17, 0.67) | 0.35 (0.18, 0.66) | 0.21 (0.10, 0.44) | <0.001 |

**Other**

|                      | No. of Cases/ Person-Years | 50/18,116 | 87/33,645 | 60/47,548 | 40/36,881 | 15/16,784 |
|----------------------|-----------------------------|-----------|-----------|-----------|-----------|---------|
| HR (95% CI)          | 1                           | 0.99 (0.70, 1.41) | 0.52 (0.36, 0.77) | 0.45 (0.29, 0.69) | 0.35 (0.19, 0.63) | <0.001 |

*Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither).†Lifestyle score was categorized into four groups (0-2, 3, 4, 5-7) due to limited case numbers.
Table S18. Association between lifestyle score and incident neurodegenerative disease among individuals with type 2 diabetes (n=13,336)*

| Overall lifestyle† | No. of Cases/ Person-Years | HR (95%CI)‡ | Model1 | Model2 | Model3 |
|-------------------|-----------------------------|-------------|--------|--------|--------|
| 0-2               | 66/17,847                   | 1.04 (0.77, 1.40) | 1.04 (0.77, 1.41) | 1.03 (0.76, 1.39) | 1.03 (0.76, 1.39) |
| 3                 | 127/33,063                  | 0.81 (0.60, 1.09) | 0.82 (0.61, 1.11) | 0.82 (0.61, 1.11) | 0.82 (0.61, 1.11) |
| 4                 | 140/46,820                  | 0.79 (0.58, 1.08) | 0.81 (0.59, 1.11) | 0.81 (0.59, 1.11) | 0.81 (0.59, 1.11) |
| 5                 | 106/36,391                  | 0.66 (0.45, 0.98) | 0.68 (0.46, 1.01) | 0.68 (0.46, 1.00) | 0.68 (0.46, 1.00) |
| 6-7               | 44/16,510                   | 0.90 (0.84, 0.96) | 0.90 (0.84, 0.96) | 0.91 (0.84, 0.97) | 0.91 (0.84, 0.97) |
| P value for trend |                             | 0.005        | 0.009  | 0.01   |        |
| Per score point   |                             | 0.90 (0.84, 0.96) | 0.90 (0.84, 0.96) | 0.91 (0.84, 0.97) | 0.91 (0.84, 0.97) |

*Participants with the existing neurodegenerative disease at baseline were excluded.
†Low-risk lifestyle factors: no current smoking, regular physical activity (150+ minutes of moderate activity per week or 75+ minutes of vigorous activity per week or an equivalent combination), healthy diet (adequate intake of at least half of 10 recommended food groups), moderate alcohol consumption (no more than 1 drink/day for women and 2 drinks/day for men), adequate sleep duration (7-8 hours/day), less television watching time (<4h/day), and appropriate social connection (not isolated).
‡Hazard ratios were calculated in Cox proportional hazards model: Model 1, adjusted for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), and APOE ε4 carrier (0, 1, 2 or missing); Model 2, further adjusted for body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), and prevalent diseases (yes or no) based on model 1; Model 3, further adjusted for diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither) based on model 2.
Figure S1. Flowchart of participants included in the analysis. *Diagnostic thresholds were defined according to the 2020 American Diabetes Association guideline. †Self-reported medical history and medication data were used to assign prevalent diabetes and type according to the algorithms. ‡Cases were classified using ICD-9/ICD-10 codes: diabetes (250/E10-E14), type 2 diabetes (250.00, 250.10, 250.20, 250.90/E11), and type 1 diabetes (250.01, 250.11, 250.21, 250.91/E10). §We assumed that undiagnosed cases were type 2 diabetes because the age of participants in the UK Biobank at blood collection was ≥37 years old. Abbreviations: HbA1c, glycated hemoglobin.
Figure S2. The nVenn quasi-proportional diagrams of overlapping individuals with diabetes across different identification sources in the UKB study. (A) Patients identifying through self-reported medical history and medication data. (B) Patients identifying through hospital inpatient records. (C) Patients with subtype information of diabetes identifying through self-reported data and hospital inpatient records. (D) Undiagnosed patients identifying using self-reported data, hospital inpatient records, and blood biochemistry data. $S_1 =$ self-reported data; $S_2 =$ hospital inpatient records.
| Subgroup | Total No. of Participants | No. of Cases/Person-Years | Hazard Ratio (95% CI) | P Value |
|----------|--------------------------|---------------------------|-----------------------|---------|
| 0-1 conventional low-risk factor | | | | |
| 0-1 emerging low-risk factor | 1,291 | 248/14,379 | 1 [Reference] | |
| 2 emerging low-risk factors | 1,949 | 262/22,427 | 0.73 (0.62, 0.88) | <0.001 |
| 3 emerging low-risk factors | 1,393 | 144/16,164 | 0.61 (0.49, 0.75) | <0.001 |
| 2 conventional low-risk factors | | | | |
| 0-1 emerging low-risk factor | 1,181 | 173/13,429 | 0.70 (0.58, 0.85) | <0.001 |
| 2 emerging low-risk factors | 2,373 | 249/27,320 | 0.56 (0.47, 0.67) | <0.001 |
| 3 emerging low-risk factors | 1,988 | 189/22,993 | 0.54 (0.45, 0.66) | <0.001 |
| 3-4 conventional low-risk factors | | | | |
| 0-1 emerging low-risk factor | 600 | 76/5,789 | 0.62 (0.48, 0.80) | <0.001 |
| 2 emerging low-risk factors | 1,345 | 124/15,601 | 0.44 (0.35, 0.54) | <0.001 |
| 3 emerging low-risk factors | 1,246 | 96/14,466 | 0.40 (0.32, 0.51) | <0.001 |

**Figure S3.** Risk of all-cause mortality according to the conventional and emerging low-risk lifestyle factors. Hazard ratios were calculated in Cox proportional hazards model after adjusting for age (years), sex (women or men), ethnicity (white British or other), education (college/university degree or other), Townsend deprivation index (quintiles), employment (currently employed or not), family history of diabetes (yes or no), body mass index (<25.0, 25.0-29.9, or ≥30 kg/m²), waist-to-hip ratio (≤0.85/0.90 or >0.85/0.90 for women/men), prevalent diseases (yes or no), diabetes duration (<1, 1-5, 5-10, or ≥10 years), glycated hemoglobin level (<53 or ≥53 mmol/mol [7.0%]), diabetes-related microvascular disease (yes or no), and diabetes medication use (oral anti-diabetic drug only, insulin, or neither); Conventional low-risk factors: no current smoking, regular physical activity (150+ minutes of moderate activity per week or 75+ minutes of vigorous activity per week or an equivalent combination), healthy diet (adequate intake of at least half of 10 recommended food groups), and moderate alcohol consumption (no more than 1 drink/day for women and 2 drinks/day for men); Emerging low-risk factors: adequate sleep duration (7-8 hours/day), less television watching time (<4h/day), and appropriate social connection (not isolated).
Figure S4. Point estimates of the adjusted population attributable risk of all-cause mortality and the corresponding 95% CIs for participants adopting 0-5 low-risk lifestyle factors. Abbreviations: PAR, population attributable risk.