# Supplemental Online Content

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Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) based on baseline diet assessment

**eTable 13.** Hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) based on simple updated diet assessment

**eTable 14.** Hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) by updating diet after diagnosis of chronic disease

**eTable 15.** Pooled hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) using random-effects meta-analysis

**eTable 16.** Pooled hazard ratios for death from specific causes according to four healthy eating scores using random-effects meta-analysis

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**eFigure 1.** The associations between four healthy eating scores and all-cause mortality using the restricted cubic spline analysis

This supplemental material has been provided by the authors to give readers additional information about their work.

# eMethods

## Assessment of dietary scores

The HEI-2015 included 9 adequacy components (total fruit, whole fruit, total vegetables, greens and beans, whole grains, dairy, total protein foods, seafood and plant protein, and fatty acids) and 4 moderation components (refined grains, sodium, percentage of energy from added sugars, and percentage of energy from saturated fatty acids).[1] Each of the components is scored on a density basis out of 1,000 calories, with the exception of ratio of unsaturated to saturated fatty acids. We modified the scoring for the sodium component due to the lack of brand specificity and information about discretionary use of salt on some questionnaires. We divided the participants into 11 equal groups on the basis of the distribution of reported sodium intake (mg/d) and assigned corresponding scores of 0 to 10 (higher score for less sodium consumed). The details of the scoring standards of the HEI-2015 are shown in eTable 1. The total HEI-2015 score ranges from 0 (non-adherence) to 100 (perfect adherence).

The AMED score was modified and adapted to the Mediterranean diet scale designed by Trichopoulou et al.[2] The AMED included 7 healthy components (vegetables, fruits, whole grains, nuts, legumes, fish, and ratio of monounsaturated fat to saturated fat), red and processed meat, and alcohol consumption (eTable 2). Each component, except alcohol consumption, was categorized into quintiles (Q). We assigned positive scores to 7 healthy components (Q1=1, Q2=2, Q3=3, Q4=4, Q5=5), and reverse scores to red and processed meat (Q5=1, Q4=2, Q3=3, Q2=4, Q1=5). For alcohol consumption (g/d), points were assigned as follows: 5-15=5, 0-5 or 15-25=4, 0 or 25-30=3, 30-35=2, and ≥35=1 for women and 10-30=5, 0-10 or 30-40=4, 0 or 40-45=3, 45-50=2, and ≥50=1 for men. Total AMED score ranged from 9 to 45, with a higher score representing closer resemblance to a healthy Mediterranean diet.

The HPDI was created with a similar approach to AMED.[3] We first created 18 food groups based on nutrients and culinary similarities (eTable 3). We further classified these 18 food groups into 3 larger categories of healthy plant foods (n=7; whole grains, fruits, vegetables, nuts, legumes, vegetable oils, and tea and coffee), less healthy plant foods (n=5; fruit juices, refined grains, potatoes, sugar-sweetened beverages, and sweets and desserts), and animal foods (n=6; animal fat including butter or lard, dairy, eggs, fish and seafood, meat, and miscellaneous animal-based foods). Intake of 18 food groups was categorized into quintiles, and each quintile was assigned a score between 1 and 5. With a similar approach to create AMED, we assigned positive scores to healthy plant food groups and reverse scores to less healthy plant and animal food groups. By summing scores of 18 food groups, the HPDI ranged from 18 to 90, with a higher score indicating a healthier plant-based diet.

The AHEI was based on a comprehensive review of foods and nutrients that have consistently been associated with lower risk of chronic disease in clinical and epidemiological investigations.[4] The score emphasized higher intake of vegetables, fruit, whole grains, nuts and legumes, long-chain n-3 fats, and polyunsaturated fatty acids and lower intake of sugar-sweetened beverages and fruit juice, red and processed meat, trans fat, sodium, and alcohol (eTable 4). All components were scored from 0 (unhealthy) to 10 (healthiest) and the total score ranged from 0 (non-adherence) to 100 (perfect adherence).

eTable 1. Healthy Eating Index 2015 components and criteria for scoring

| Component | Max score | Maximum Score | Score of 0 |
|---|---|---|---|
| Total fruit | 5 | ≥0.8 cups | 0 |
| Whole fruit | 5 | ≥0.4 cups | 0 |
| Total vegetables | 5 | ≥1.1 cups | 0 |
| Greens and beans | 5 | ≥0.2 cups | 0 |
| Whole grains | 10 | ≥1.5 oz | 0 |
| Total protein foods | 5 | ≥2.5 oz | 0 |
| Seafood and plant proteins | 5 | ≥0.8 oz | 0 |
| Total dairy | 10 | ≥1.3 cups | 0 |
| Fatty acid ratio | 10 | (PUFAs+MUFAs)/SFAs≥2.5 | (PUFAs+MUFAs)/SFAs≤1.2 |
| Sodium | 10 | Lowest decile | Highest decile |
| Refined grains | 10 | ≤1.8 oz | ≥4.3 oz |
| Added sugars | 10 | ≤6.5% of energy | ≥26% of energy |
| Saturated fats | 10 | ≤8% of energy | ≥16% of energy |
| Total | 100 | | |

Abbreviations: MUFA, monounsaturated fatty acid; PUFA, polyunsaturated fatty acid; SFA, saturated fatty acid.

All standards in HEI-2015 represent amounts per 1,000 kcal (sometimes shown as percentage of energy) except for fatty acids.

**eTable 2**. Alternate Mediterranean Diet Score components and criteria for scoring

| Component | Criteria for minimum score of 1 (mean intake in NHS and HPFS) | Criteria for maximum score of 5 (mean intake in NHS and HPFS) |
|---|---|---|
| Vegetables (excluding potatoes), serving/d | Lowest quintile (1.2, 1.0) | Highest quintile (5.5, 5.5) |
| Fruit, serving/d | Lowest quintile (0.3, 0.3) | Highest quintile (3.1, 3.7) |
| Whole grains, serving/d | Lowest quintile (0.1, 0.2) | Highest quintile (3.0, 3.9) |
| Nuts, serving/d | Lowest quintile (0.0, 0.0) | Highest quintile (0.9, 1.4) |
| Legumes, serving/d | Lowest quintile (0.1, 0.1) | Highest quintile (0.9, 1.0) |
| Red and processed meat, serving/d | Highest quintile (2.2, 2.6) | Lowest quintile (0.6, 0.5) |
| Fish, serving/d | Lowest quintile (0.0, 0.1) | Highest quintile (0.7, 0.9) |
| MUFA:SFA ratio | Lowest quintile (0.8, 0.9) | Highest quintile (1.2, 1.4) |
| Alcohol, g/d | >35 for women and >50 for men (45.7, 68.6) | 5-15 for women and 10-30 for men (9.6, 13.1) |
| Total | 9 | 45 |

Abbreviations: MUFA, monounsaturated fatty acid; SFA, saturated fatty acid.

**eTable 3.** Healthful Plant-based Diet Index components and criteria for scoring

| Component | Criteria for minimum score of 1 (mean intake NHS and HPFS) | Criteria for maximum score of 5 (mean intake NHS and HPFS) |
|---|---|---|
| Healthy Plant Food Groups, serving/d | | |
| Whole grains | Lowest quintile (0.1, 0.2) | Highest quintile (3.0, 3.9) |
| Fruits | Lowest quintile (0.3, 0.3) | Highest quintile (3.1, 3.7) |
| Vegetables | Lowest quintile (1.3, 1.1) | Highest quintile (6.1, 6.3) |
| Nuts | Lowest quintile (0.0, 0.0) | Highest quintile (0.9, 1.5) |
| Legumes | Lowest quintile (0.1, 0.1) | Highest quintile (0.9, 1.0) |
| Vegetable oils | Lowest quintile (0.1, 0.0) | Highest quintile (1.7, 0.8) |
| Tea & Coffee | Lowest quintile (0.6, 0.1) | Highest quintile (6.0, 5.4) |
| Unhealthy Plant Food Groups, serving/d | | |
| Fruit juices | Highest quintile (1.8, 2.1) | Lowest quintile (0.0, 0.0) |
| Refined grains | Highest quintile (3.9, 3.5) | Lowest quintile (0.4, 0.3) |
| Potatoes | Highest quintile (1.1, 1.2) | Lowest quintile (0.1, 0.1) |
| Sugar sweetened beverages | Highest quintile (1.2, 1.3) | Lowest quintile (0.0, 0.0) |
| Sweets and desserts | Highest quintile (2.7, 3.6) | Lowest quintile (0.2, 0.2) |
| Animal Food Groups, serving/d | | |
| Animal fat | Highest quintile (1.3, 1.1) | Lowest quintile (0.0, 0.0) |
| Dairy | Highest quintile (4.1, 4.3) | Lowest quintile (1.2, 0.5) |
| Egg | Highest quintile (0.5, 1.2) | Lowest quintile (0.1, 0.0) |
| Fish or seafood | Highest quintile (0.7, 0.9) | Lowest quintile (0.0, 0.1) |
| Meat | Highest quintile (2.2, 2.6) | Lowest quintile (0.6, 0.5) |
| Miscellaneous animal-based foods | Highest quintile (1.0, 2.3) | Lowest quintile (0.1, 0.0) |
| TOTAL | 18 | 90 |

**eTable 4**. Alternate Healthy Eating Index components and criteria for scoring

| Component | Criteria for minimum score of 0 | Criteria for maximum score of 10 |
|---|---|---|
| Whole fruit | 0 | ≥4 servings/d |
| Vegetable (excluding potatoes) | 0 | ≥5 servings/d |
| Whole grains | 0 | Women: ≥75 g/d; Men: ≥90 g/d |
| Red and processed meat | ≥1.5 servings/d | 0 |
| Nuts and legumes | 0 | ≥1 serving/d |
| Long-chain (ω-3) fats (EPA+DHA) | 0 | ≥250 mg/d |
| Polyunsaturated fatty acids | ≤2% of energy | ≥10% of energy |
| Trans fat | ≥4% of energy | ≤0.5% of energy |
| SSBs and fruit juice | ≥1 serving/d | 0 |
| Sodium | Highest decile | Lowest decile |
| Total | 0 | 100 |

Abbreviations: EPA, eicosapentaenoic acids; DHA, docosahexaenoic acids; SSB, Sugar-sweetened beverage.

**e**Table 5. Hazard ratios for death from specific causes according to quintiles of the Healthy Eating Index-2015 (HEI-2015)

| Cause of Death | Quintiles of dietary scores | | | | | P for trend |
|---|---|---|---|---|---|---|
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **NHS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1170 | 1204 | 1212 | 1206 | 1336 | |
| HR (95% CI) | 1.00 (ref.) | 0.93 (0.86, 1.01) | 0.88 (0.81, 0.96) | 0.82 (0.76, 0.89) | 0.79 (0.72, 0.86) | <0.001 |
| **Heart disease** | | | | | | |
| No. of deaths | 852 | 877 | 859 | 837 | 905 | |
| HR (95% CI) | 1.00 (ref.) | 0.94 (0.86, 1.04) | 0.87 (0.79, 0.96) | 0.80 (0.73, 0.89) | 0.76 (0.69, 0.84) | <0.001 |
| **Stroke** | | | | | | |
| No. of deaths | 318 | 327 | 353 | 369 | 431 | |
| HR (95% CI) | 1.00 (ref.) | 0.91 (0.78, 1.06) | 0.90 (0.77, 1.05) | 0.87 (0.75, 1.02) | 0.86 (0.74, 1.00) | 0.03 |
| **Cancer** | | | | | | |
| No. of deaths | 1852 | 1675 | 1718 | 1718 | 1770 | |
| HR (95% CI) | 1.00 (ref.) | 0.88 (0.82, 0.94) | 0.87 (0.81, 0.93) | 0.84 (0.78, 0.90) | 0.80 (0.75, 0.86) | <0.001 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 678 | 513 | 500 | 410 | 390 | |
| HR (95% CI) | 1.00 (ref.) | 0.71 (0.63, 0.80) | 0.66 (0.59, 0.74) | 0.51 (0.45, 0.58) | 0.43 (0.38, 0.49) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 756 | 930 | 1032 | 1094 | 1192 | |
| HR (95% CI) | 1.00 (ref.) | 1.10 (1.00, 1.21) | 1.14 (1.04, 1.25) | 1.14 (1.04, 1.25) | 1.04 (0.95, 1.15) | 0.362 |
| **HPFS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1210 | 1289 | 1340 | 1369 | 1433 | |
| HR (95% CI) | 1.00 (ref.) | 1.01 (0.93, 1.09) | 1.00 (0.93, 1.09) | 0.98 (0.91, 1.06) | 1.00 (0.92, 1.08) | 0.379 |
| **Heart disease** | | | | | | |
| No. of deaths | 996 | 1050 | 1085 | 1120 | 1135 | |
| HR (95% CI) | 1.00 (ref.) | 1.00 (0.91, 1.09) | 0.98 (0.90, 1.08) | 0.98 (0.90, 1.07) | 0.96 (0.88, 1.05) | 0.098 |
| **Stroke** | | | | | | |
| No. of deaths | 214 | 239 | 255 | 249 | 298 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| HR (95% CI) | 1.00 (ref.) | 1.06 (0.88, 1.28) | 1.09 (0.91, 1.32) | 1.01 (0.83, 1.22) | 1.16 (0.96, 1.41) | 0.205 |
| **Cancer** | | | | | | |
| No. of deaths | 1237 | 1142 | 1110 | 1085 | 1136 | |
| HR (95% CI) | 1.00 (ref.) | 0.89 (0.82, 0.97) | 0.84 (0.77, 0.91) | 0.80 (0.74, 0.87) | 0.83 (0.76, 0.91) | <0.001 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 397 | 363 | 342 | 314 | 322 | |
| HR (95% CI) | 1.00 (ref.) | 0.90 (0.78, 1.04) | 0.84 (0.72, 0.97) | 0.73 (0.63, 0.86) | 0.73 (0.63, 0.86) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 377 | 401 | 413 | 441 | 469 | |
| HR (95% CI) | 1.00 (ref.) | 0.98 (0.85, 1.13) | 0.98 (0.85, 1.13) | 0.96 (0.83, 1.10) | 0.98 (0.85, 1.14) | 0.676 |
| **Pooled** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 2380 | 2493 | 2552 | 2575 | 2769 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.92, 1.03) | 0.94 (0.89, 1.00) | 0.90 (0.85, 0.96) | 0.89 (0.84, 0.94) | <0.001 |
| **Heart disease** | | | | | | |
| No. of deaths | 1848 | 1927 | 1944 | 1957 | 2040 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.91, 1.04) | 0.93 (0.87, 1.00) | 0.90 (0.84, 0.96) | 0.86 (0.81, 0.92) | <0.001 |
| **Stroke** | | | | | | |
| No. of deaths | 532 | 566 | 608 | 618 | 729 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.86, 1.09) | 0.97 (0.86, 1.10) | 0.92 (0.82, 1.04) | 0.97 (0.86, 1.09) | 0.401 |
| **Cancer** | | | | | | |
| No. of deaths | 3089 | 2817 | 2828 | 2803 | 2906 | |
| HR (95% CI) | 1.00 (ref.) | 0.89 (0.84, 0.93) | 0.86 (0.81, 0.90) | 0.82 (0.78, 0.87) | 0.81 (0.77, 0.86) | <0.001 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 1075 | 876 | 842 | 724 | 712 | |
| HR (95% CI) | 1.00 (ref.) | 0.78 (0.71, 0.86) | 0.72 (0.66, 0.79) | 0.59 (0.54, 0.65) | 0.54 (0.48, 0.59) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 1133 | 1331 | 1445 | 1535 | 1661 | |
| HR (95% CI) | 1.00 (ref.) | 1.06 (0.98, 1.15) | 1.09 (1.00, 1.18) | 1.08 (1.00, 1.17) | 1.02 (0.95, 1.11) | 0.598 |

* Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol

drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study; PY= person-years.

eTable 6. Hazard ratios for death from specific causes according to quintiles of the Alternate Mediterranean Diet score (AMED)

| Cause of Death | Quintiles of dietary scores | | | | | P for trend |
|---|---|---|---|---|---|---|
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **NHS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1215 | 1343 | 1225 | 1216 | 1129 | |
| HR (95% CI) | 1.00 (ref.) | 0.95 (0.88, 1.03) | 0.86 (0.80, 0.94) | 0.84 (0.77, 0.92) | 0.81 (0.74, 0.89) | <0.001 |
| **Heart disease** | | | | | | |
| No. of deaths | 876 | 966 | 844 | 873 | 771 | |
| HR (95% CI) | 1.00 (ref.) | 0.95 (0.87, 1.04) | 0.83 (0.76, 0.92) | 0.85 (0.77, 0.93) | 0.78 (0.70, 0.87) | <0.001 |
| **Stroke** | | | | | | |
| No. of deaths | 339 | 377 | 381 | 343 | 358 | |
| HR (95% CI) | 1.00 (ref.) | 0.95 (0.81, 1.10) | 0.94 (0.81, 1.10) | 0.84 (0.71, 0.98) | 0.89 (0.76, 1.05) | 0.029 |
| **Cancer** | | | | | | |
| No. of deaths | 1837 | 1795 | 1689 | 1668 | 1744 | |
| HR (95% CI) | 1.00 (ref.) | 0.90 (0.84, 0.96) | 0.87 (0.81, 0.93) | 0.84 (0.78, 0.90) | 0.91 (0.85, 0.98) | 0.020 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 635 | 603 | 474 | 452 | 327 | |
| HR (95% CI) | 1.00 (ref.) | 0.80 (0.72, 0.90) | 0.62 (0.55, 0.70) | 0.56 (0.50, 0.64) | 0.40 (0.35, 0.46) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 804 | 1025 | 1115 | 1019 | 1041 | |
| HR (95% CI) | 1.00 (ref.) | 1.06 (0.96, 1.16) | 1.10 (1.00, 1.20) | 0.97 (0.88, 1.07) | 0.97 (0.87, 1.07) | 0.125 |
| **HPFS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1202 | 1304 | 1334 | 1414 | 1387 | |
| HR (95% CI) | 1.00 (ref.) | 0.98 (0.91, 1.06) | 0.95 (0.87, 1.02) | 0.99 (0.92, 1.07) | 1.00 (0.92, 1.09) | 0.871 |
| **Heart disease** | | | | | | |
| No. of deaths | 981 | 1059 | 1085 | 1138 | 1123 | |
| HR (95% CI) | 1.00 (ref.) | 0.98 (0.90, 1.07) | 0.94 (0.86, 1.03) | 0.98 (0.90, 1.07) | 1.00 (0.91, 1.10) | 0.886 |
| **Stroke** | | | | | | |
| No. of deaths | 221 | 245 | 249 | 276 | 264 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| HR (95% CI) | 1.00 (ref.) | 1.00 (0.83, 1.21) | 0.95 (0.79, 1.15) | 1.03 (0.86, 1.24) | 0.99 (0.82, 1.20) | 0.656 |
| **Cancer** | | | | | | |
| No. of deaths | 1139 | 1180 | 1164 | 1151 | 1076 | |
| HR (95% CI) | 1.00 (ref.) | 0.99 (0.91, 1.08) | 0.92 (0.84, 1.00) | 0.91 (0.84, 1.00) | 0.87 (0.80, 0.95) | <0.001 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 396 | 358 | 351 | 338 | 295 | |
| HR (95% CI) | 1.00 (ref.) | 0.83 (0.72, 0.96) | 0.77 (0.67, 0.89) | 0.73 (0.63, 0.85) | 0.63 (0.54, 0.74) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 374 | 405 | 464 | 432 | 426 | |
| HR (95% CI) | 1.00 (ref.) | 0.94 (0.81, 1.08) | 0.99 (0.86, 1.14) | 0.91 (0.79, 1.05) | 0.87 (0.75, 1.01) | 0.030 |
| **Pooled** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 2417 | 2647 | 2559 | 2630 | 2516 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.91, 1.02) | 0.91 (0.86, 0.96) | 0.92 (0.87, 0.97) | 0.91 (0.85, 0.96) | <0.001 |
| **Heart disease** | | | | | | |
| No. of deaths | 1857 | 2025 | 1929 | 2011 | 1894 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.91, 1.03) | 0.89 (0.83, 0.95) | 0.92 (0.86, 0.98) | 0.90 (0.84, 0.96) | <0.001 |
| **Stroke** | | | | | | |
| No. of deaths | 560 | 622 | 630 | 619 | 622 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.86, 1.09) | 0.95 (0.84, 1.07) | 0.91 (0.81, 1.03) | 0.93 (0.82, 1.06) | 0.198 |
| **Cancer** | | | | | | |
| No. of deaths | 2976 | 2975 | 2853 | 2819 | 2820 | |
| HR (95% CI) | 1.00 (ref.) | 0.93 (0.88, 0.98) | 0.89 (0.84, 0.94) | 0.87 (0.82, 0.91) | 0.89 (0.85, 0.95) | <0.001 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 1031 | 961 | 825 | 790 | 622 | |
| HR (95% CI) | 1.00 (ref.) | 0.81 (0.74, 0.89) | 0.68 (0.62, 0.74) | 0.63 (0.57, 0.69) | 0.49 (0.44, 0.55) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 1178 | 1430 | 1579 | 1451 | 1467 | |
| HR (95% CI) | 1.00 (ref.) | 1.02 (0.94, 1.10) | 1.06 (0.98, 1.15) | 0.95 (0.88, 1.03) | 0.93 (0.86, 1.01) | 0.012 |

\* Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol

drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study; PY= person-years.

**eTable 7. Hazard ratios for death from specific causes according to quintiles of the Healthful Plant-based Diet Index (HPDI)**

| Cause of Death | Quintiles of dietary scores | | | | | P for trend |
| --- | --- | --- | --- | --- | --- | --- |
|  | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **NHS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1113 | 1214 | 1237 | 1328 | 1236 | |
| HR (95% CI) | 1.00 (ref.) | 0.94 (0.87, 1.02) | 0.88 (0.81, 0.96) | 0.90 (0.83, 0.98) | 0.83 (0.76, 0.90) | <0.00 |
| **Heart disease** | | | | | | |
| No. of deaths | 795 | 897 | 859 | 934 | 845 | |
| HR (95% CI) | 1.00 (ref.) | 0.99 (0.89, 1.09) | 0.87 (0.79, 0.96) | 0.90 (0.82, 1.00) | 0.82 (0.74, 0.91) | <0.001 |
| **Stroke** | | | | | | |
| No. of deaths | 318 | 317 | 378 | 394 | 391 | |
| HR (95% CI) | 1.00 (ref.) | 0.84 (0.72, 0.98) | 0.90 (0.78, 1.05) | 0.89 (0.76, 1.04) | 0.85 (0.73, 1.00) | 0.411 |
| **Cancer** | | | | | | |
| No. of deaths | 1646 | 1716 | 1755 | 1812 | 1804 | |
| HR (95% CI) | 1.00 (ref.) | 0.94 (0.88, 1.01) | 0.91 (0.85, 0.98) | 0.92 (0.86, 0.99) | 0.92 (0.86, 0.99) | 0.008 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 555 | 579 | 499 | 452 | 406 | |
| HR (95% CI) | 1.00 (ref.) | 0.89 (0.79, 1.01) | 0.70 (0.62, 0.79) | 0.60 (0.53, 0.69) | 0.53 (0.46, 0.61) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 816 | 961 | 1068 | 1068 | 1091 | |
| HR (95% CI) | 1.00 (ref.) | 0.98 (0.89, 1.08) | 1.02 (0.93, 1.12) | 0.98 (0.89, 1.08) | 0.95 (0.87, 1.05) | 0.370 |
| **HPFS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1164 | 1302 | 1382 | 1411 | 1382 | |
| HR (95% CI) | 1.00 (ref.) | 1.00 (0.92, 1.08) | 1.02 (0.94, 1.10) | 1.01 (0.93, 1.10) | 1.05 (0.97, 1.14) | 0.629 |
| **Heart disease** | | | | | | |
| No. of deaths | 958 | 1052 | 1138 | 1131 | 1107 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.89, 1.06) | 1.02 (0.93, 1.11) | 0.98 (0.90, 1.07) | 1.02 (0.93, 1.12) | 0.792 |
| **Stroke** | | | | | | |
| No. of deaths | 206 | 250 | 244 | 280 | 275 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| HR (95% CI) | 1.00 (ref.) | 1.09 (0.90, 1.31) | 1.01 (0.83, 1.22) | 1.13 (0.94, 1.37) | 1.18 (0.97, 1.43) | 0.134 |
| **Cancer** | | | | | | |
| No. of deaths | 1134 | 1193 | 1132 | 1180 | 1071 | |
| HR (95% CI) | 1.00 (ref.) | 0.95 (0.88, 1.03) | 0.89 (0.82, 0.97) | 0.89 (0.82, 0.97) | 0.88 (0.81, 0.96) | 0.003 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 337 | 373 | 360 | 348 | 320 | |
| HR (95% CI) | 1.00 (ref.) | 1.01 (0.87, 1.17) | 0.93 (0.80, 1.08) | 0.88 (0.75, 1.03) | 0.86 (0.73, 1.01) | 0.017 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 370 | 426 | 473 | 416 | 416 | |
| HR (95% CI) | 1.00 (ref.) | 1.06 (0.92, 1.22) | 1.09 (0.94, 1.25) | 0.93 (0.80, 1.08) | 0.97 (0.84, 1.13) | 0.289 |
| **Pooled** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 2277 | 2516 | 2619 | 2739 | 2618 | |
| HR (95% CI) | 1.00 (ref.) | 0.97 (0.92, 1.03) | 0.95 (0.90, 1.01) | 0.96 (0.90, 1.01) | 0.94 (0.88, 1.00) | 0.023 |
| **Heart disease** | | | | | | |
| No. of deaths | 1753 | 1949 | 1997 | 2065 | 1952 | |
| HR (95% CI) | 1.00 (ref.) | 0.98 (0.92, 1.05) | 0.95 (0.89, 1.01) | 0.95 (0.88, 1.01) | 0.93 (0.86, 0.99) | 0.004 |
| **Stroke** | | | | | | |
| No. of deaths | 524 | 567 | 622 | 674 | 666 | |
| HR (95% CI) | 1.00 (ref.) | 0.94 (0.84, 1.06) | 0.94 (0.84, 1.06) | 0.98 (0.87, 1.10) | 0.97 (0.86, 1.10) | 0.683 |
| **Cancer** | | | | | | |
| No. of deaths | 2780 | 2909 | 2887 | 2992 | 2875 | |
| HR (95% CI) | 1.00 (ref.) | 0.94 (0.90, 1.00) | 0.90 (0.86, 0.95) | 0.91 (0.86, 0.96) | 0.91 (0.86, 0.96) | <0.001 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 892 | 952 | 859 | 800 | 726 | |
| HR (95% CI) | 1.00 (ref.) | 0.94 (0.85, 1.03) | 0.78 (0.71, 0.86) | 0.70 (0.64, 0.78) | 0.65 (0.58, 0.72) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 1186 | 1387 | 1541 | 1484 | 1507 | |
| HR (95% CI) | 1.00 (ref.) | 1.00 (0.93, 1.09) | 1.04 (0.96, 1.13) | 0.97 (0.89, 1.05) | 0.96 (0.88, 1.04) | 0.179 |

\* Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol

drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study; PY= person-years.

**eTable 8.** Hazard ratios for death from specific causes according to quintiles of the Alternate Healthy Eating Index (AHEI)

| Cause of Death | Quintiles of dietary scores | | | | | P for trend |
|---|---|---|---|---|---|---|
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **NHS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1217 | 1283 | 1259 | 1262 | 1107 | |
| HR (95% CI) | 1.00 (ref.) | 0.90 (0.83, 0.97) | 0.84 (0.78, 0.91) | 0.83 (0.76, 0.90) | 0.75 (0.69, 0.81) | <0.001 |
| **Heart disease** | | | | | | |
| No. of deaths | 888 | 908 | 893 | 894 | 747 | |
| HR (95% CI) | 1.00 (ref.) | 0.88 (0.80, 0.96) | 0.83 (0.75, 0.91) | 0.82 (0.75, 0.90) | 0.71 (0.65, 0.79) | <0.001 |
| **Stroke** | | | | | | |
| No. of deaths | 329 | 375 | 366 | 368 | 360 | |
| HR (95% CI) | 1.00 (ref.) | 0.95 (0.82, 1.10) | 0.88 (0.76, 1.02) | 0.85 (0.73, 0.99) | 0.84 (0.72, 0.98) | 0.016 |
| **Cancer** | | | | | | |
| No. of deaths | 1804 | 1770 | 1772 | 1733 | 1654 | |
| HR (95% CI) | 1.00 (ref.) | 0.89 (0.83, 0.95) | 0.86 (0.81, 0.92) | 0.84 (0.79, 0.90) | 0.82 (0.77, 0.88) | <0.001 |
| **Respiratory disease** | | | | | | |
| No. of deaths | 604 | 585 | 529 | 440 | 333 | |
| HR (95% CI) | 1.00 (ref.) | 0.82 (0.73, 0.92) | 0.72 (0.64, 0.81) | 0.59 (0.52, 0.67) | 0.46 (0.40, 0.52) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
| No. of deaths | 825 | 1033 | 1068 | 1039 | 1039 | |
| HR (95% CI) | 1.00 (ref.) | 1.08 (0.99, 1.19) | 1.06 (0.97, 1.16) | 1.02 (0.93, 1.12) | 0.98 (0.89, 1.07) | 0.106 |
| **HPFS** | | | | | | |
| **Cardiovascular disease** | | | | | | |
| No. of deaths | 1184 | 1340 | 1351 | 1380 | 1386 | |
| HR (95% CI) | 1.00 (ref.) | 1.02 (0.94, 1.10) | 0.98 (0.91, 1.06) | 0.98 (0.90, 1.06) | 0.98 (0.91, 1.07) | 0.334 |
| **Heart disease** | | | | | | |
| No. of deaths | 988 | 1083 | 1102 | 1108 | 1105 | |
| HR (95% CI) | 1.00 (ref.) | 0.98 (0.90, 1.07) | 0.96 (0.88, 1.04) | 0.94 (0.86, 1.02) | 0.94 (0.86, 1.03) | 0.062 |
| **Stroke** | | | | | | |
| No. of deaths | 196 | 257 | 249 | 272 | 281 | |

| | 1.00 (ref.) | | | | | |
|---|---|---|---|---|---|---|
| HR (95% CI) | 1.00 (ref.) | 1.19 (0.98, 1.43) | 1.09 (0.91, 1.32) | 1.17 (0.97, 1.41) | 1.19 (0.98, 1.44) | 0.129 |
| **Cancer** | | | | | | |
|   No. of deaths | 1189 | 1203 | 1132 | 1054 | 1132 | |
|   HR (95% CI) | 1.00 (ref.) | 0.95 (0.87, 1.03) | 0.86 (0.79, 0.94) | 0.80 (0.73, 0.87) | 0.86 (0.79, 0.94) | <0.001 |
| **Respiratory disease** | | | | | | |
|   No. of deaths | 384 | 378 | 352 | 318 | 306 | |
|   HR (95% CI) | 1.00 (ref.) | 0.91 (0.79, 1.05) | 0.84 (0.73, 0.97) | 0.74 (0.64, 0.86) | 0.71 (0.61, 0.83) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
|   No. of deaths | 361 | 431 | 407 | 476 | 426 | |
|   HR (95% CI) | 1.00 (ref.) | 1.07 (0.93, 1.23) | 0.94 (0.81, 1.08) | 1.04 (0.91, 1.20) | 0.90 (0.78, 1.04) | 0.121 |
| **Pooled** | | | | | | |
| **Cardiovascular disease** | | | | | | |
|   No. of deaths | 2401 | 2623 | 2610 | 2642 | 2493 | |
|   HR (95% CI) | 1.00 (ref.) | 0.96 (0.90, 1.01) | 0.91 (0.86, 0.96) | 0.90 (0.85, 0.95) | 0.86 (0.81, 0.91) | <0.001 |
| **Heart disease** | | | | | | |
|   No. of deaths | 1876 | 1991 | 1995 | 2002 | 1852 | |
|   HR (95% CI) | 1.00 (ref.) | 0.93 (0.87, 0.99) | 0.90 (0.84, 0.95) | 0.88 (0.83, 0.94) | 0.83 (0.78, 0.89) | <0.001 |
| **Stroke** | | | | | | |
|   No. of deaths | 525 | 632 | 615 | 640 | 641 | |
|   HR (95% CI) | 1.00 (ref.) | 1.04 (0.92, 1.16) | 0.96 (0.85, 1.08) | 0.97 (0.86, 1.09) | 0.96 (0.85, 1.09) | 0.460 |
| **Cancer** | | | | | | |
|   No. of deaths | 2993 | 2973 | 2904 | 2787 | 2786 | |
|   HR (95% CI) | 1.00 (ref.) | 0.91 (0.87, 0.96) | 0.86 (0.82, 0.91) | 0.82 (0.78, 0.87) | 0.84 (0.79, 0.88) | <0.001 |
| **Respiratory disease** | | | | | | |
|   No. of deaths | 988 | 963 | 881 | 758 | 639 | |
|   HR (95% CI) | 1.00 (ref.) | 0.86 (0.78, 0.94) | 0.77 (0.70, 0.84) | 0.65 (0.59, 0.71) | 0.55 (0.50, 0.62) | <0.001 |
| **Neurodegenerative disease** | | | | | | |
|   No. of deaths | 1186 | 1464 | 1475 | 1515 | 1465 | |
|   HR (95% CI) | 1.00 (ref.) | 1.08 (1.00, 1.16) | 1.02 (0.95, 1.11) | 1.03 (0.95, 1.11) | 0.95 (0.88, 1.03) | 0.027 |

\* Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol

drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study.

**eTable 9**. Hazard ratios for death from top three cancers among men and women according to four healthy eating scores*

| Cause of Death | | No. | Dietary scores | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | | | HEI2015 | AMED | HPDI | AHEI |
| **NHS** | | | | | | |
| Breast cancer | | 1243 | 0.79 (0.67, 0.94) | 1.00 (0.90, 1.12) | 0.85 (0.71, 1.01) | 0.83 (0.70, 1.97) |
| Lung cancer | | 2006 | 0.62 (0.55, 0.71) | 0.78 (0.71, 0.85) | 0.82 (0.72, 0.95) | 0.64 (0.56, 0.73) |
| Colorectal cancer | | 733 | 0.90 (0.72, 1.13) | 1.11 (0.96, 1.29) | 0.91 (0.72, 1.14) | 0.96 (0.78, 1.18) |
| **HPFS** | | | | | | |
| Prostate cancer | | 889 | 1.03 (0.85, 1.25) | 1.06 (0.94, 1.20) | 1.05 (0.87, 1.28) | 0.99 (0.84, 1.18) |
| Lung cancer | | 971 | 0.63 (0.53, 0.76) | 0.75 (0.67, 0.85) | 0.79 (0.66, 0.95) | 0.71 (0.60, 0.84) |
| Colorectal cancer | | 539 | 0.71 (0.56, 0.91) | 0.86 (0.73, 1.00) | 0.76 (0.59, 0.98) | 0.75 (0.60, 0.94) |

* Calculated per 25-percentile increment in four healthy eating scores (25 points for HEI-2015, 9 points for AMED, 18 points for HPDI, and 25 points for AHEI-2010).

Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study.

eTable 10. Baseline characteristics of participants according to racial/ethnic groups in NHS

| | Non-Hispanic White | Non-Hispanic Black | Hispanic | Other |
|---|---|---|---|---|
| **NHS (1984)** | | | | |
| No. of participants | 70 564 | 834 | 597 | 3235 |
| HEI-2015 | 65.5 (9.6) | 66.5 (9.6) | 66.4 (8.9) | 65.4 (9.7) |
| AMED | 27.2 (5.6) | 27.6 (5.6) | 27.2 (5.6) | 27.1 (5.8) |
| HPDI | 54.4 (7.4) | 55.0 (7.1) | 56.4 (7.0) | 55.0 (7.4) |
| AHEI | 43.1 (10.2) | 46.1 (10.2) | 45.4 (9.8) | 44.4 (10.4) |
| Age (year) | 50.2 (7.2) | 50.2 (6.6) | 50.7 (6.6) | 51.0 (7.2) |
| Body mass index (kg/m$^2$) | 24.9 (4.6) | 26.7 (4.8) | 24.9 (4.7) | 25.0 (4.8) |
| Physical activity (MET-h/w) | 13.1 (19.3) | 11.8 (18.3) | 12.3 (17.6) | 14.3 (27.2) |
| Never smoker (%) | 44 | 47 | 52 | 47 |
| Never drinker (%) | 30 | 43 | 37 | 35 |
| Premenopausal (%) | 42 | 37 | 38 | 42 |
| Married (%) | 69 | 44 | 68 | 69 |
| Live alone (%) | 10 | 12 | 9 | 11 |
| Total Calories intake (kcal/d) | 1747 (530) | 1671 (581) | 1722 (554) | 1723 (532) |
| Multivitamin supplement use (%) | 37 | 32 | 37 | 37 |
| Aspirin use (%) | 71 | 54 | 70 | 69 |
| Family history (%) | | | | |
|     Diabetes | 28 | 38 | 33 | 31 |
|     Myocardial infarction | 25 | 18 | 21 | 23 |
|     Cancer | 14 | 14 | 11 | 13 |

Data were expressed as mean (SD) unless otherwise specified.

All variables except age are age standardized.

Abbreviations: AMDI, Alternate Mediterranean Diet Index; AHEI=Alternate Healthy Eating Index; HEI-2015, Healthy Eating Index-2015; HPDI, Healthful Plant-based Diet Index; MI, myocardial infarction.

**eTable 11** Hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI), further adjusting for pack-years of smoking

| | Quintiles of dietary scores | | | | | P for trend |
|---|---|---|---|---|---|---|
| | **Quintile 1** | **Quintile 2** | **Quintile 3** | **Quintile 4** | **Quintile 5** | |
| **HEI-2015** | | | | | | |
| NHS | 1.00 (ref.) | 0.93 (0.90, 0.96) | 0.93 (0.89, 0.96) | 0.88 (0.85, 0.92) | 0.84 (0.81, 0.87) | <0.001 |
| HPFS | 1.00 (ref.) | 0.99 (0.95, 1.04) | 0.97 (0.93, 1.01) | 0.93 (0.89, 0.97) | 0.95 (0.90, 0.99) | <0.001 |
| Pooled | 1.00 (ref.) | 0.96 (0.93, 0.98) | 0.95 (0.92, 0.97) | 0.90 (0.88, 0.93) | 0.88 (0.86, 0.91) | <0.001 |
| **AMED** | | | | | | |
| NHS | 1.00 (ref.) | 0.94 (0.91, 0.98) | 0.92 (0.88, 0.95) | 0.86 (0.83, 0.89) | 0.85 (0.81, 0.88) | <0.001 |
| HPFS | 1.00 (ref.) | 0.98 (0.94, 1.02) | 0.95 (0.91, 0.99) | 0.92 (0.88, 0.96) | 0.92 (0.88, 0.96) | <0.001 |
| Pooled | 1.00 (ref.) | 0.96 (0.93, 0.98) | 0.93 (0.90, 0.95) | 0.88 (0.86, 0.91) | 0.88 (0.85, 0.90) | <0.001 |
| **HPDI** | | | | | | |
| NHS | 1.00 (ref.) | 0.94 (0.91, 0.98) | 0.90 (0.87, 0.94) | 0.89 (0.86, 0.93) | 0.83 (0.79, 0.86) | <0.001 |
| HPFS | 1.00 (ref.) | 1.01 (0.97, 1.05) | 0.98 (0.94, 1.02) | 0.97 (0.93, 1.01) | 0.97 (0.93, 1.01) | <0.001 |
| Pooled | 1.00 (ref.) | 0.97 (0.94, 1.00) | 0.94 (0.91, 0.96) | 0.93 (0.90, 0.95) | 0.89 (0.86, 0.91) | <0.001 |
| **AHEI** | | | | | | |
| NHS | 1.00 (ref.) | 0.92 (0.89, 0.95) | 0.89 (0.86, 0.93) | 0.86 (0.83, 0.89) | 0.79 (0.76, 0.82) | <0.001 |
| HPFS | 1.00 (ref.) | 0.99 (0.95, 1.03) | 0.93 (0.89, 0.97) | 0.90 (0.87, 0.94) | 0.90 (0.86, 0.94) | <0.001 |
| Pooled | 1.00 (ref.) | 0.95 (0.92, 0.97) | 0.91 (0.88, 0.93) | 0.88 (0.85, 0.90) | 0.84 (0.81, 0.86) | <0.001 |

Adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), pack-years of smoking (never smoker; past smoker with <5, 5-20, or >20pack-years; or current smoker with <5, 5-20, or > 20 pack-years), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholerolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study;

**eTable 12.** Hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) based on baseline diet assessment

| | Quintiles of dietary scores | | | | | P for trend |
|---|---|---|---|---|---|---|
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **HEI2015** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 53 (49-56) | 61 (59-62) | 66 (65-67) | 71 (70-72) | 78 (75-81) | |
| Cases/PYs | 5950/478 135 | 5925/476 846 | 6074/471 934 | 6420/466 808 | 6894/449 442 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.93 (0.89, 0.96) | 0.91 (0.88, 0.94) | 0.91 (0.87, 0.94) | 0.88 (0.85, 0.91) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 55 (51-58) | 63 (62-65) | 69 (68-70) | 75 (73-76) | 82 (80-85) | |
| Cases/PYs | 4496/252 432 | 4480/250 643 | 4610/243 818 | 4618/240 196 | 4693/228 831 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.96 (0.92, 1.00) | 0.95 (0.92,1.00) | 0.94 (0.90, 0.98) | 0.93 (0.89, 0.98) | 0.002 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.94 (0.91, 0.97) | 0.93 (0.90, 0.96) | 0.92 (0.89, 0.95) | 0.90 (0.88, 0.93) | <0.001 |
| **AMED** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 20 (18-21) | 24 (23-25) | 27 (26-28) | 30 (29-31) | 35 (34-37) | |
| Cases/PYs | 6584/501 203 | 5420/414 210 | 6129/467 165 | 7150/535 426 | 5980/425 141 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.94 (0.91, 0.98) | 0.91 (0.88, 0.94) | 0.86 (0.84, 0.90) | 0.86 (0.83, 0.89) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 20 (18-21) | 24 (23-25) | 27 (27-28) | 31 (30-32) | 35 (34-37) | |
| Cases/PYs | 4772/268 834 | 3815/208 757 | 5701/298 642 | 3698/192 563 | 4911/247 124 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.97 (0.93, 1.01) | 0.94 (0.90, 0.97) | 0.91 (0.87, 0.95) | 0.90 (0.86, 0.94) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.95 (0.93, 0.98) | 0.92 (0.90, 0.95) | 0.88 (0.86, 0.91) | 0.88 (0.85, 0.90) | <0.001 |
| **HPDI** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 45 (43-47) | 51 (50-52) | 53 (54-55) | 58 (57-59) | 64 (62-67) | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cases/PYs | 5976/516 531 | 5535/437 524 | 6591/489 354 | 5844/412 679 | 7317/487 057 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.98 (0.95, 1.02) | 0.95 (0.92, 0.99) | 0.94 (0.91, 0.98) | 0.89 (0.86, 0.92) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 45 (43-47) | 51 (50-52) | 54 (53-55) | 59 (58-60) | 65 (63-67) | |
| Cases/PYs | 4338/270 941 | 4091/227 136 | 4716/248 889 | 5126/255 254 | 4626/213 701 | |
| Multivariable adjusted * | 1.00 (ref.) | 1.02 (0.97, 1.06) | 1.00 (0.96, 1.04) | 0.99 (0.95, 1.03) | 0.96 (0.92, 1.01) | 0.04 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 1.00 (0.97, 1.02) | 0.97 (0.95, 1.00) | 0.96 (0.93, 0.99) | 0.92 (0.89, 0.94) | <0.001 |
| **AHEI** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 31 (28-33) | 37 (36-39) | 43 (41-44) | 48 (47-50) | 57 (54-61) | |
| Cases/PYs | 5898/478 895 | 5997/476 890 | 6295/467 105 | 6434/462 249 | 6639/458 005 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.94 (0.90, 0.97) | 0.93 (0.90, 0.96) | 0.90 (0.87, 0.93) | 0.85 (0.82, 0.88) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 33 (30-36) | 41 (39-42) | 47 (45-48) | 53 (51-54) | 61 (59-65) | |
| Cases/PYs | 4400/254 781 | 4452/247 504 | 4631/244 057 | 4635/240 119 | 4779/229 460 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.96 (0.92, 1.00) | 0.95 (0.91, 0.99) | 0.93 (0.89, 0.97) | 0.91 (0.87, 0.95) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.95 (0.92, 0.97) | 0.94 (0.91, 0.96) | 0.91 (0.89, 0.94) | 0.87 (0.85, 0.90) | <0.001 |

* Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study; PY= person-years.

**eTable 13.** Hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) based on simple updated diet assessment

| | Quintiles of dietary scores | | | | | P for trend |
|---|---|---|---|---|---|---|
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **HEI2015** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 56 (52-59) | 65 (63-67) | 71 (69-73) | 77 (74-79) | 84 (81-88) | |
| Cases/PYs | 7881/441 938 | 6664/454 881 | 6016/466 847 | 5554/481 633 | 5148/497 846 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.87 (0.84, 0.90) | 0.81 (0.78, 0.84) | 0.74 (0.71, 0.76) | 0.63 (0.61, 0.66) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 57 (52-60) | 66 (64-68) | 72 (70-73) | 77 (76-79) | 85 (82-87) | |
| Cases/PYs | 4944/234 308 | 4682/237 921 | 4633/241 295 | 4360/248 306 | 4278/254 091 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.96 (0.92, 1.00) | 0.94 (0.90, 0.98) | 0.89 (0.85, 0.93) | 0.84 (0.80, 0.88) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.90 (0.88, 0.93) | 0.86 (0.84, 0.88) | 0.80 (0.77, 0.82) | 0.71 (0.69, 0.73) | <0.001 |
| **AMED** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 19 (17-20) | 23 (22-24) | 27 (26-27) | 30 (29-31) | 34 (33-36) | |
| Cases/PYs | 7682/428 989 | 7193/477 994 | 5927/459 614 | 5725/472 105 | 4736/504 444 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.87 (0.84, 0.90) | 0.79 (0.76, 0.82) | 0.73 (0.70, 0.75) | 0.60 (0.58, 0.63) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 20 (18-21) | 24 (23-25) | 27 (26-28) | 30 (30-31) | 35 (34-37) | |
| Cases/PYs | 5104/244 357 | 4974/229 379 | 4113/231 856 | 4645/253 412 | 4061/256 915 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.95 (0.91, 0.98) | 0.90 (0.86, 0.94) | 0.87 (0.83, 0.90) | 0.78 (0.75, 0.82) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.90 (0.88, 0.92) | 0.83 (0.81, 0.86) | 0.78 (0.76, 0.80) | 0.68 (0.66, 0.70) | <0.001 |
| **HPDI** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 45 (43-47) | 51 (50-52) | 55 (54-56) | 59 (58-60) | 65 (63-67) | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cases/PYs | 7302/463 118 | 6797/463 449 | 6398/483 134 | 5860/464 532 | 4906/468 912 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.86 (0.84, 0.89) | 0.82 (0.79, 0.85) | 0.73 (0.71, 0.76) | 0.66 (0.63, 0.68) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 45 (43-47) | 51 (50-52) | 55 (54-56) | 59 (58-60) | 65 (63-68) | |
| Cases/PYs | 5264/257 114 | 4462/225 106 | 4677/246 946 | 4486/244 817 | 4008/241 937 | |
| Multivariable adjusted * | 1.00 (ref.) | 1.02 (0.98, 1.06) | 0.93 (0.90, 0.97) | 0.92 (0.88, 0.96) | 0.85 (0.82, 0.89) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.92 (0.90, 0.95) | 0.86 (0.84, 0.89) | 0.81 (0.78, 0.83) | 0.74 (0.71, 0.76) | <0.001 |
| **AHEI** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 34 (31-37) | 42 (40-44) | 48 (46-50) | 54 (51-56) | 63 (59-68) | |
| Cases/PYs | 7205/423 366 | 7046/452 261 | 6531/470 796 | 5746/487 131 | 4735/509 589 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.90 (0.87, 0.93) | 0.82 (0.79, 0.85) | 0.73 (0.70, 0.75) | 0.61 (0.59, 0.64) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 35 (32-38) | 43 (41-45) | 49 (47-51) | 55 (53-57) | 65 (61-69) | |
| Cases/PYs | 4549/223 859 | 4814/234 807 | 4753/243 273 | 4563/251 784 | 4218/262 197 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.95 (0.91, 1.00) | 0.90 (0.86, 0.94) | 0.83 (0.80, 0.87) | 0.76 (0.72, 0.79) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.92 (0.90, 0.94) | 0.85 (0.83, 0.87) | 0.77 (0.75, 0.79) | 0.67 (0.65, 0.69) | <0.001 |

   * Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study; PY= person-years.

**eTable 14.** Hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) by updating diet after diagnosis of chronic disease

| | Quintiles of dietary scores | | | | | P for trend |
| --- | --- | --- | --- | --- | --- | --- |
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **HEI2015** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 57 (53-59) | 64 (63-66) | 69 (68-70) | 73 (72-75) | 79 (77-82) | |
| Cases/PYs | 6524/456 391 | 6217/468 203 | 6188/473 812 | 6143/476 518 | 6191/468 220 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.91 (0.88, 0.94) | 0.89 (0.86, 0.92) | 0.83 (0.80, 0.87) | 0.76 (0.73, 0.79) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 57 (53-60) | 65 (64-67) | 71 (69-72) | 76 (74-77) | 82 (80-84) | |
| Cases/PYs | 4479/241 662 | 4578/246 754 | 4650/245 540 | 4612/245 471 | 4578/236 493 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.98 (0.94, 1.02) | 0.94 (0.90, 0.98) | 0.92 (0.88, 0.96) | 0.89 (0.85, 0.93) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.94(0.91, 0.96) | 0.91 (0.88, 0.93) | 0.87 (0.84, 0.89) | 0.81 (0.79, 0.84) | <0.001 |
| **AMED** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 20 (19-22) | 24 (23-25) | 27 (26-28) | 30 (29-30) | 33 (32-35) | |
| Cases/PYs | 6299/434 025 | 6938/476 792 | 6215/465 439 | 6251/492 346 | 5560/474 541 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.92 (0.89, 0.95) | 0.86 (0.83, 0.89) | 0.80 (0.77, 0.83) | 0.72 (0.69, 0.75) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 20 (19-22) | 24 (24-25) | 27 (27-28) | 30 (30-31) | 35 (33-36) | |
| Cases/PYs | 4438/241 703 | 4644/235 409 | 4816/256 039 | 4596/241 034 | 4403/241 736 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.95 (0.91, 0.99) | 0.93 (0.89, 0.97) | 0.87 (0.83, 0.91) | 0.83 (0.79, 0.87) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.93 (0.91, 0.96) | 0.89 (0.86, 0.91) | 0.83 (0.81, 0.85) | 0.77 (0.74, 0.79) | <0.001 |
| **HPDI** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 47 (44-48) | 52 (51-52) | 55 (54-56) | 58 (58-59) | 63 (62-66) | |
| Cases/PYs | 5927/467 547 | 6474/481 604 | 6408/470 439 | 6559/472 804 | 5895/450 751 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Multivariable adjusted * | 1.00 (ref.) | 0.96 (0.93, 1.00) | 0.90 (0.87, 0.94) | 0.87 (0.84, 0.90) | 0.77 (0.74, 0.80) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 46 (44-48) | 51 (50-52) | 55 (54-56) | 59 (58-60) | 64 (62-66) | |
| Cases/PYs | 4261/251 812 | 4677/246 144 | 4820/246 630 | 4792/243 520 | 4347/227 815 | |
| Multivariable adjusted * | 1.00 (ref.) | 1.00 (0.96, 1.04) | 0.98 (0.94, 1.02) | 0.96 (0.92, 1.00) | 0.92 (0.87, 0.96) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.98 (0.95, 1.00) | 0.93 (0.91, 0.96) | 0.91 (0.88, 0.93) | 0.83 (0.81, 0.86) | <0.001 |
| **AHEI** | | | | | | |
| **NHS** | | | | | | |
| Median score (IQR) | 35 (32-37) | 41 (40-43) | 46 (45-48) | 51 (50-53) | 59 (56-62) | |
| Cases/PYs | 6467/463 259 | 6755/478 892 | 6419/479 446 | 6228/473 558 | 5394/447 990 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.96 (0.93, 1.00) | 0.88 (0.85, 0.91) | 0.85 (0.82, 0.88) | 0.76 (0.73, 0.78) | <0.001 |
| **HPFS** | | | | | | |
| Median score (IQR) | 35 (32-38) | 43 (41-44) | 48 (47-49) | 53 (52-55) | 61 (59-65) | |
| Cases/PYs | 4371/242 988 | 4691/247 055 | 4705/247 260 | 4642/243 129 | 4488/235 488 | |
| Multivariable adjusted * | 1.00 (ref.) | 0.97 (0.93, 1.01) | 0.94 (0.90, 0.98) | 0.90 (0.87, 0.94) | 0.85 (0.82, 0.89) | <0.001 |
| **Pooled** | | | | | | |
| Multivariable adjusted * | 1.00 (ref.) | 0.97 (0.94, 0.99) | 0.90 (0.88, 0.93) | 0.87 (0.85, 0.90) | 0.80 (0.77, 0.82) | <0.001 |

* Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or $\geq$25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and $\geq$30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, $\geq$35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study; PY= person-years.

eTable 15. Pooled hazard ratios of death from any cause according to quintiles of the Healthy Eating Index-2015 (HEI-2015), Alternate Mediterranean Diet score (AMED), Healthful Plant-based Diet Index (HPDI), and Alternate Healthy Eating Index (AHEI) using random-effects meta-analysis

| | Quintiles of dietary scores | | | | | P for trend |
| --- | --- | --- | --- | --- | --- | --- |
| | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | |
| **HEI-2015** | | | | | | |
| **Pooled** | | | | | | |
| Age-adjusted | 1.00 (ref.) | 0.83 (0.77, 0.88) | 0.75 (0.70, 0.81) | 0.68 (0.61, 0.76) | 0.62 (0.52, 0.75) | <0.001 |
| Multivariable adjusted * | 1.00 (ref.) | 0.93 (0.86, 1.00) | 0.90 (0.84, 0.97) | 0.86 (0.79, 0.93) | 0.82 (0.70, 0.98) | 0.02 |
| **AMED** | | | | | | |
| **Pooled** | | | | | | |
| Age-adjusted | 1.00 (ref.) | 0.86 (0.80, 0.92) | 0.78 (0.73, 0.84) | 0.72 (0.66, 0.80) | 0.68 (0.62, 0.75) | <0.001 |
| Multivariable adjusted * | 1.00 (ref.) | 0.93 (0.87, 1.00) | 0.89 (0.84, 0.95) | 0.84 (0.76, 0.93) | 0.82 (0.73, 0.93) | 0.003 |
| **HPDI** | | | | | | |
| **Pooled** | | | | | | |
| Age-adjusted | 1.00 (ref.) | 0.92 (0.86, 0.98) | 0.85 (0.79, 0.93) | 0.82 (0.77, 0.88) | 0.78 (0.68, 0.89) | <0.001 |
| Multivariable adjusted * | 1.00 (ref.) | 0.96 (0.91, 1.03) | 0.93 (0.84, 1.01) | 0.91 (0.83, 1.00) | 0.87 (0.73, 1.03) | 0.10 |
| **AHEI** | | | | | | |
| **Pooled** | | | | | | |
| Age-adjusted | 1.00 (ref.) | 0.85 (0.80, 0.91) | 0.77 (0.73, 0.81) | 0.71 (0.66, 0.75) | 0.65 (0.57, 0.74) | <0.001 |
| Multivariable adjusted * | 1.00 (ref.) | 0.94 (0.87, 1.02) | 0.89 (0.84, 0.94) | 0.85 (0.78, 0.91) | 0.80 (0.69, 0.94) | 0.002 |

* Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study; PY= person-years.

eTable 16. Pooled hazard ratios for death from specific causes according to four healthy eating scores using random-effects meta-analysis*

| Cause of Death | Cases | Dietary scores | | | |
| --- | --- | --- | --- | --- | --- |
| | | HEI2015 | AMED | HPDI | AHEI |
| **Pooled** | | | | | |
| All causes | 54 163 | 0.82 (0.71, 0.94) | 0.88 (0.82, 0.95) | 0.87 (0.74, 1.01) | 0.81 (0.70, 0.94) |
| Cardiovascular disease | 12 769 | 0.87 (0.69, 1.08) | 0.93 (0.80, 1.08) | 0.93 (0.78, 1.12) | 0.86 (0.69, 1.09) |
|    Heart disease | 9716 | 0.84 (0.66, 1.05) | 0.92 (0.79, 1.08) | 0.90 (0.74, 1.10) | 0.83 (0.66, 1.05) |
|    Stroke | 3053 | 0.97 (0.75, 1.26) | 0.96 (0.84, 1.09) | 1.03 (0.86, 1.23) | 0.97 (0.74, 1.27) |
| Cancer | 14 443 | 0.82 (0.78, 0.86) | 0.93 (0.90, 0.97) | 0.90 (0.86, 0.95) | 0.84 (0.81, 0.88) |
| Respiratory disease | 4229 | 0.56 (0.35, 0.88) | 0.66 (0.49, 0.88) | 0.65 (0.39, 1.08) | 0.57 (0.36, 0.89) |
| Neurodegenerative disease | 7105 | 1.02 (0.95, 1.09) | 0.94 (0.90, 0.99) | 0.95 (0.89, 1.02) | 0.93 (0.87, 0.99) |

* Calculated per 25-percentile increment in four healthy eating scores (25 points for HEI-2015, 9 points for AMED, 18 points for HPDI, and 25 points for AHEI-2010).

Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index.

**eTable 17**. Hazard ratios for death from specific causes according to four healthy eating scores, applying a competing-risk regression model*

| Cause of Death | Cases | Dietary scores | | | |
|---|---|---|---|---|---|
| | | HEI2015 | AMED | HPDI | AHEI |
| **Pooled** | | | | | |
| Cardiovascular disease | 12 769 | 0.85 (0.81, 0.89) | 0.90 (0.87, 0.93) | 0.91 (0.86, 0.95) | 0.84 (0.80, 0.87) |
| Cancer | 14 443 | 0.85 (0.81, 0.89) | 0.93 (0.90, 0.95) | 0.92 (0.88, 0.97) | 0.87 (0.83, 0.91) |
| Respiratory disease | 4229 | 0.49 (0.45, 0.53) | 0.65 (0.61, 0.68) | 0.62 (0.57, 0.67) | 0.52 (0.48, 0.56) |
| Neurodegenerative disease | 7105 | 0.98 (0.92, 1.05) | 0.97 (0.93, 1.02) | 0.93 (0.87, 0.99) | 0.92 (0.86, 0.98) |
| **NHS** | | | | | |
| Cardiovascular disease | 6128 | 0.74 (0.69, 0.79) | 0.82 (0.78, 0.86) | 0.79 (0.74, 0.85) | 0.72 (0.67, 0.77) |
| Cancer | 8733 | 0.84 (0.79, 0.89) | 0.93 (0.89, 0.97) | 0.92 (0.87, 0.98) | 0.85 (0.80, 0.90) |
| Respiratory disease | 2491 | 0.40 (0.36, 0.45) | 0.58 (0.54, 0.63) | 0.50 (0.44, 0.56) | 0.43 (0.39, 0.48) |
| Neurodegenerative disease | 5004 | 0.98 (0.91, 1.06) | 1.00 (0.94, 1.05) | 0.92 (0.84, 1.00) | 0.91 (0.84, 0.98) |
| **HPFS** | | | | | |
| Cardiovascular disease | 6641 | 0.95 (0.89, 1.02) | 0.96 (0.92, 1.00) | 1.01 (0.95, 1.08) | 0.94 (0.88, 1.00) |
| Cancer | 5710 | 0.87 (0.81, 0.94) | 0.93 (0.89, 0.97) | 0.92 (0.86, 0.99) | 0.89 (0.83, 0.95) |
| Respiratory disease | 1738 | 0.63 (0.55, 0.71) | 0.73 (0.67, 0.79) | 0.80 (0.71, 0.91) | 0.63 (0.56, 0.72) |
| Neurodegenerative disease | 2101 | 0.97 (0.86, 1.09) | 0.93 (0.86, 1.00) | 0.95 (0.84, 1.07) | 0.93 (0.84, 1.04) |

* Calculated per 25-percentile increment in four healthy eating scores (25 points for HEI-2015, 9 points for AMED, 18 points for HPDI, and 25 points for AHEI-2010).

Multivariable adjusted for age, calendar year, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35). We applied a competing-risk regression model for cause-specific mortality by including healthy eating score as an unconstrained exposure, allowing the effects of the healthy eating score to vary across cause-specific mortality.

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index; HPFS= Health Professionals Follow-Up Study; NHS= Nurses' Health Study.

**eFigure 1.** The associations between four healthy eating scores and all-cause mortality using the restricted cubic spline analysis
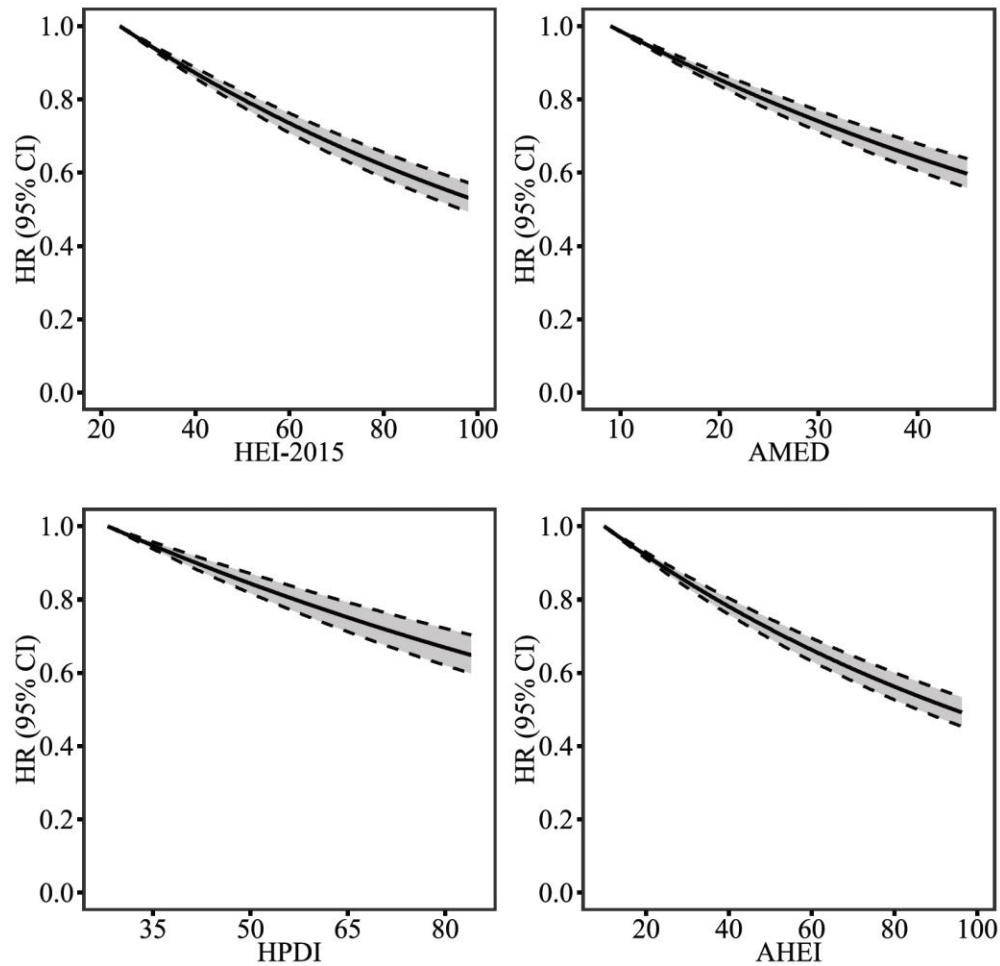


Data from two cohorts were pooled for the restricted cubic spline analysis. P for linearity for all four dietary scores <0.001; p for non-linearity = 0.001, <0.001, 0.04, and <0.001 for HEI-2015, AMED, HPDI, and AHEI, respectively. Model was adjusted for age, calendar year, cohort, race and ethnicity (NHS: Hispanic, no-Hispanic Black, non-Hispanic White, or other; HPFS: Black, White, or other), marriage status (married, divorced/separate/single, widowed); living status (alone or not), family history of myocardial infarction (yes/no), family history of diabetes (yes/no), family history of cancer (yes/no), menopausal status (pre or postmenopausal (never, past or current menopausal hormone use), NHS only), multivitamin use(yes/no), aspirin use(yes/no), total energy intake (quintile), smoking status (never smoker, former smoker, current smoker: 1-14, 15-24 or ≥25 cigarettes/d), alcohol drinking (g/d: 0, 0.1-4.9, 5.0-14.9, 15.0-19.9, 20.0-29.9 and ≥30), and physical activity (quintile), history of hypertension (yes/no), history of hypercholesterolemia (yes/no), and body mass index (kg/m$^2$: <21, 21-24.9, 25-29.9, 30-34.9, ≥35).

Abbreviations: AMED=Alternate Mediterranean Diet score; AHEI=Alternate Healthy Eating Index; HEI-2015=Healthy Eating Index-2015; HPDI=Healthful Plant-based Diet Index

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