**Supplementary Table A** : Characteristics of the 7627 Whitehall II participants according to survival status over 22-y of follow-up.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | All | Alive | Deceased |  |
| **Characteristics at baseline** |  | N= 7627 | N= 6626 | N= 1001 | P value |
|  |  | (%) or m± sd | **%** | **%** |  |
| **Socio demographic** | | |  |  |  |
| Sex | Men | 5308 (69.6) | 69.7 | 68.8 | 0.57 |
| Women | 2319 (30.4) | 30.3 | 31.2 |  |
| Age, years | | 50.1 ± 6.0 | 49.5 ± 5.9 | 53.7 ± 5.8 |  |
| Ethnicity | White | 6968 (91.4) | 91.5 | 90.1 | 0.29 |
| South Asian | 405 (5.3) | 5.2 | 5.9 |  |
| Black | 254 (3.3) | 3.2 | 4.0 |  |
| Occupational Grade | Low | 1233 (16.2) | 15.3 | 22.0 | <0.001 |
| Intermediate | 3460 (45.4) | 45.7 | 43.2 |  |
| High | 2934 (38.5) | 39.0 | 34.9 |  |
| Marital status | Married cohabited | 5856 (76.8) | 77.1 | 74.9 | 0.13 |
| Living alone | 1771 (23.2) | 22.9 | 25.1 |  |
| **Health behaviours** | | |  |  |  |
| Total energy intake, kcal/day | | 2094 ± 634 | 2096 ± 624 | 2081 ± 695 | 0.52 |
| Smoking Status | Non smoker | 3844 (50.4) | 51.7 | 41.8 | <0.001 |
| Ex-smoker | 2636 (36.6) | 34.7 | 32.9 |  |
| Current smoker | 1147 (15.0) | 13.6 | 24.4 |  |
| Alcohol intake | None | 1460 (19.1) | 18.6 | 22.9 | <0.001 |
| Moderate | 4849 (63.6) | 64.5 | 57.2 |  |
| Heavy | 1318 (17.3) | 16.9 | 19.9 |  |
| Physical activity | Low | 1538 (20.2) | 19.5 | 24.5 | <0.001 |
| Intermediate | 2156 (28.3) | 28.2 | 28.5 |  |
| High | 3933 (51.6) | 52.2 | 47.0 |  |
| **Health Status** | |  |  |  |  |
| Body mass index, kg/m² | | 25.3 ± 3.7 | 25.2 ± 3.6 | 26.0 ± 4.2 |  |
| Hypertension | No | 6168 (80.9) | 82.3 | 71.2 | <0.001 |
|  | Yes | 1459 (19.1) | 17.7 | 28.9 |  |
| Type 2 diabetes | No | 7390(96.9) | 97.3 | 93.9 | <0.001 |
|  | Yes | 237 (3.1) | 2.7 | 6.1 |  |
| Antecedent of CVD | No | 7390 (96.9) | 97.5 | 92.8 | <0.001 |
|  | Yes | 237 (3.1) | 2.5 | 7.2 |  |
| HDL cholesterol, mmol/L | | 1.43 ± 0.41 | 1.44 ±0.41 | 1.38 ±0.42 | <0.001 |
| Use of lipids lowering drugs | No | 7571 (99.3) | 99.3 | 99.3 | 0.88 |
| Yes | 56 (0.73) | 0.74 | 0.70 |  |
| Longstanding illness | No | 5053 (66.2) | 67.3 | 59.3 | <0.001 |
|  | Yes | 2574 (33.7) | 32.7 | 40.7 |  |
| **Dietary exposure** |  |  |  |  |  |
| AHEI-2010 | T1 | 2640 (34.6) | 33.5 | 41.8 | <0.001 |
|  | T2 | 2332 (30.6) | 30.9 | 28.1 |  |
|  | T3 | 2655 (34.8) | 35.5 | 30.2 |  |
|  |  |  |  |  |  |
| DII | T1 | 2542 (33.3) | 33.6 | 31.4 | <0.001 |
|  | T2 | 2543 (33.3) | 33.8 | 30.3 |  |
|  | T3 | 2542 (33.3) | 32.6 | 38.4 |  |

CVD: Cardiovascular disease; AHEI-2010: Alternative Healthy Eating Index 2010; DII: dietary inflammatory Index; T : Tertile

Occupational position with the use of current (or last for retired participants) British civil service employment grade, was defined on the basis of salary and grouped into 3 categories: high (senior administrators) / intermediate (executives, professionals, and technical staff) / low (clerical and office support staff) grades.

Alcohol intake categories were defined as none : 0 glass per day ; moderate:< 2 (3) glasses per day for women (men); and heavy consumption : ≥ 2 (3) glasses per day for women (men).

Physical activity was categorized into 3 groups (high, intermediate, low) according to frequency of participation in “vigorous” (eg, running, hard swimming, playing squash), “moderately energetic” (eg, dancing, cycling, leisurely swimming), and “mildly energetic” physical activity.

**Supplementary Table B** : Associations between cumulative average of Dietary Inflammatory Index (DII) tertiles and all-cause mortality risk over 22 y of follow-up for the 7627 Whitehall II participants stratified on tertiles of total energy intake.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **In first tertile of total energy intake** | | | **In second tertile of total energy intake** | | | **In third tertile of total energy intake** | | |
| *N cases* | *179* | | | *135* | | | *136* | | |
| *N non-cases* | *2460* | | | *2195* | | | *2517* | | |
| DII | **HR** |  |  | **HR** | **(95% CI)** | **p** | **HR** | **(95% CI)** | **p** |
| T1 | *Ref* |  |  | *Ref* |  |  | *Ref* |  |  |
| T2 | 1.02 | 0.62 to 1.69 | 0.92 | 1.69 | 1.15 to 2.49 | 0.001 | 0.85 | 0.62 to 1.17 | 0.32 |
| T3 | 1.72 | 1.08 to 2.72 | 0.02 | 1.42 | 0.91 to 2.22 | 0.12 | 1.19 | 0.79 to 1.80 | 0.39 |
| DII score (continuous variable) | 1.23 | 1.08 to 1.39 | 0.001 | 1.13 | 0.98 to 1.32 | 0.10 | 1.02 | 0.88 to 1.17 | 0.79 |

Cox proportional hazards models were performed for each dietary index. In these multivariate models the covariates were time varying variables. The models were adjusted for age, sex, ethnicity, occupational grade, marital status, smoking habits, alcohol consumption, physical activity, body mass index, antecedent of CVD, use of lipids lowering drugs, HDL cholesterol, hypertension, type 2 diabetes and longstanding illness

***a*** We calculated a test for trend across the tertiles of the DII score by treating the categories as an ordinal variable in a proportional hazards model.

**Supplementary Table C:** Associations between cumulative average of Alternative Healthy Eating Index 2010 (AHEI-2010), Dietary Inflammatory Index (DII) tertiles and all-cause mortality risk over 22 y of follow-up for the 7627 Whitehall II participants.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Effect of cumulative average of AHEI-2010 scores categorised in tertiles on mortality risk** | | | | | | | | |
|  | **Tertile 1** | **Tertile 2** | | | **Tertile 3** | | |  |
|  |  | **HR** | **(95% CI)** | **p** | **HR** | **(95% CI)** | **p** | ***P trendd*** |
| Model 1a | *Ref* | 0.71 | 0.60 to 0.84 | <0.001 | 0.61 | 0.51 to 0.72 | <0.001 | <0.001 |
| Model 2b | *Ref* | 0.77 | 0.69 to 0.97 | 0.003 | 0.69 | 0.58 to 0.83 | 0.005 | <0.001 |
| Model 3c | *Ref* | 0.79 | 0.66 to 0.93 | 0.006 | 0.73 | 0.61 to 0.87 | <0.001 | <0.001 |
|  | | | | | | | | |
| **Effect of cumulative average of DII 2010 scores categorised in tertiles on mortality risk** | | | | | | | | |
|  | **Tertile 1** | **Tertile 2** | | | **Tertile 3** | | |  |
|  |  | HR | (95% CI) | p | HR | (95% CI) | p | *P trendd* |
| Model 1a | *Ref* | 1.09 | 0.91 to 1.31 | 0.36 | 1.41 | 1.17 to 1.70 | <0.001 | <0.001 |
| Model 2b | *Ref* | 1.12 | 0.92 to 1.35 | 0.26 | 1.42 | 1.15 to 1.75 | 0.001 | 0.001 |
| Model 3c | *Ref* | 1.16 | 0.96 to 1.41 | 0.13 | 1.47 | 1.19 to 1.82 | <0.001 | <0.001 |

HR: hazard ratio and its confidence interval at 95 %;

Cox proportional hazards models were performed for each dietary index. In these multivariate models the covariates were time varying variables.

a Model 1 : Model adjusted for age, sex and ethnicity

b Model 2: Model 1 further adjusted for occupational grade, marital status, smoking habits, alcohol consumption (for DII only), physical activity and total energy intake

c Model 3 : Model 2 further adjusted for body mass index, antecedent of CVD, use of lipids lowering drugs, HDL cholesterol, hypertension, type 2 diabetes and longstanding illness

d We calculated a test for trend across the tertiles of the AHEI-2010 and DII score by treating the categories as an ordinal variable in a proportional hazards model.

**Supplementary Table D.** Associations between cumulative average of Alternative Healthy Eating Index 2010 (AHEI-2010), Dietary Inflammatory Index (DII) tertiles and cardiovascular mortality risk over 22 y of follow-up in Whitehall II Study.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Effect of cumulative average of AHEI-2010 scores categorised in tertiles (T) on cardiovascular mortality risk** | | | | | | | | | | | | |
|  | | **T1** | | **T2** | | | **T3** | | | | |  |
| *N cases* | | *112* | | *73* | | | *79* | | | | |  |
| *N non-cases* | | *2527* | | *2257* | | | *2574* | | | | |  |
|  | | **HR** | | **HR** | **(95% CI)** | **p** | **HR** | | **(95% CI)** | | **p** | ***P trendd*** |
| Model 1a | | *Ref* | | 0.49 | 0.35 to 0.69 | <0.001 | 0.50 | | 0.36 to 0.69 | | <0.001 | <0.001 |
| Model 2b | | *Ref* | | 0.55 | 0.39 to 0.77 | <0.001 | 0.59 | | 0.43 to 0.83 | | 0.002 | 0.002 |
| Model 3c | | *Ref* | | 0.59 | 0.42 to 0.83 | 0.002 | 0.68 | | 0.48 to 0.95 | | 0.03 | 0.02 |
|  | | | | | | | | | | | | |
| **Effect of cumulative average of DII scores categorised in tertiles (T) on cardiovascular mortality risk** | | | | | | | | | | | | |
|  | **T1** | | **T2** | | | | **T3** | | | | |  |
| *N cases* | *84* | | *73* | | | | *107* | | | | |  |
| *N non-cases* | *2456* | | *2468* | | | | *2434* | | | | |  |
|  | **HR** | | **HR** | | **(95% CI)** | **p** | **HR** | **(95% CI)** | | **p** | | ***P trendd*** |
| Model 1a | *Ref* | | 0.86 | | 0.60 to 1.22 | 0.39 | 1.52 | 1.10 to2.10 | | 0.01 | | 0.01 |
| Model 2b | *Ref* | | 0.82 | | 0.57 to 1.19 | 0.29 | 1.36 | 0.93 to 1.99 | | 0.11 | | 0.09 |
| Model 3c | *Ref* | | 0.89 | | 0.62 to 1.29 | 0.54 | 1.46 | 1.00 to 2.13 | | 0.05 | | 0.04 |

HR: hazard ratio and its confidence interval at 95 %; T: tertiles

Cox proportional hazards models were performed for each dietary index. In these multivariate models the covariates were time varying variables.

a Model 1 : Model adjusted for age, sex and ethnicity

b Model 2: Model 1 further adjusted for occupational grade, marital status, smoking habits, alcohol consumption (for DII only), physical activity and total energy intake

c Model 3 : Model 2 further adjusted for body mass index, antecedent of CVD, use of lipids lowering drugs, HDL cholesterol, hypertension, type 2 diabetes and longstanding illness

d We calculated a test for trend across the tertiles of the AHEI-2010 and DII score by treating the categories as an ordinal variable in a proportional hazards model.

**Supplementary Table E:** Associations between cumulative average of Alternative Healthy Eating Index 2010 (AHEI-2010), Dietary Inflammatory Index (DII) tertiles and cancer mortality risk over 22 y of follow-up in Whitehall II Study.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Effect of cumulative average of AHEI-2010 scores categorised in tertiles (T) on cancer mortality risk** | | | | | | | | | | | | | |
|  | | **T1** | | **T2** | | | **T3** | | | | | |  |
| *N cases* | | *179* | | *135* | | | *136* | | | | | |  |
| *N non-cases* | | *2460* | | *2195* | | | *2517* | | | | | |  |
|  | | **HR** | | **HR** | **(95% CI)** | **p** | **HR** | | **(95% CI)** | | **p** | | ***P trendd*** |
| Model 1a | | *Ref* | | 0.89 | 0.69 to 1.13 | 0.34 | 0.71 | | 0.55 to 0.92 | | 0.009 | | 0.009 |
| Model 2b | | *Ref* | | 0.93 | 0.72 to 1.19 | 0.56 | 0.77 | | 0.59 to 1.01 | | 0.06 | | 0.06 |
| Model 3c | | *Ref* | | 0.95 | 0.74 to 1.21 | 0.66 | 0.81 | | 0.61 to 1.06 | | 0.13 | | 0.13 |
| **Effect of cumulative average of DII scores categorised in tertiles (T) on cancer mortality risk** | | | | | | | | | | | | | |
|  | **T1** | | **T2** | | | | **T3** | | | | | | |
| *N cases* | *139* | | *139* | | | | *172* | | | | |  | |
| *N non-cases* | *2401* | | *2402* | | | | *2369* | | | | |  | |
|  | **HR** | | **HR** | | **(95% CI)** | **p** | **HR** | **(95% CI)** | | **p** | | ***P trendd*** | |
| Model 1a | *Ref* | | 1.22 | | 0.95 to 1.57 | 0.12 | 1.42 | 1.10 to 1.84 | | 0.007 | | 0.007 | |
| Model 2b | *Ref* | | 1.23 | | 0.95 to 1.61 | 0.12 | 1.39 | 1.04 to 1.87 | | 0.03 | | 0.02 | |
| Model 3c | *Ref* | | 1.27 | | 0.98 to 1.66 | 0.07 | 1.44 | 1.07 to 1.94 | | 0.01 | | 0.01 | |

HR: hazard ratio and its confidence interval at 95 %; T: tertiles

Cox proportional hazards models were performed for each dietary index. In these multivariate models the covariates were time varying variables.

a Model 1 : Model adjusted for age, sex and ethnicity

b Model 2: Model 1 further adjusted for occupational grade, marital status, smoking habits, alcohol consumption, physical activity and total energy intake

c Model 3 : Model 2 further adjusted for body mass index, antecedent of CVD, use of lipids lowering drugs, HDL cholesterol, hypertension, type 2 diabetes and longstanding illness

d We calculated a test for trend across the tertiles of the AHEI-2010 and DII score by treating the categories as an ordinal variable in a proportional hazards model.

**Supplementary Table F:** Comparison of fixed-effects and random-effects meta-analyses

**Outcome: All-cause mortality**

Fixed effects model

Study | HR [95% Conf. Interval]

---------------------+---------------------------------------------------

Whitehall II | 1.130 1.060 1.205

SUVIMAX | 1.090 0.990 1.200

NHANES II | 1.040 1.020 1.060

Swedish Mammography | 1.050 1.010 1.092

Iowa Women's Health | 1.030 1.010 1.050

---------------------+---------------------------------------------------

I-V pooled ES | 1.041 1.028 1.054

---------------------+---------------------------------------------------

Heterogeneity chi-squared = 8.53 (d.f. = 4) p = 0.074

I-squared (variation in ES attributable to heterogeneity) = 53.1%

Test of ES=1 : z= 6.25 p = 0.000

Random effects model

Study | HR [95% Conf. Interval]

---------------------+---------------------------------------------------

Whitehall II | 1.130 1.060 1.205

SUVIMAX | 1.090 0.990 1.200

NHANES II | 1.040 1.020 1.060

Swedish Mammography | 1.050 1.010 1.092

Iowa Women's Health | 1.030 1.010 1.050

---------------------+---------------------------------------------------

D+L pooled ES | 1.049 1.026 1.073

---------------------+---------------------------------------------------

Heterogeneity chi-squared = 8.53 (d.f. = 4) p = 0.074

I-squared (variation in ES attributable to heterogeneity) = 53.1%

Estimate of between-study variance Tau-squared = 0.0003

Test of ES=1 : z= 4.20 p = 0.000

**Outcome: Cardiovascular disease mortality**

Fixed effects model

Study | HR [95% Conf. Interval]

---------------------+---------------------------------------------------

Whitehall II | 1.170 1.030 1.329

NHANES II | 1.060 1.020 1.102

Swedish Mammography | 1.040 0.980 1.104

Iowa Women's Health | 1.040 1.010 1.071

---------------------+---------------------------------------------------

I-V pooled ES | 1.050 1.027 1.072

---------------------+---------------------------------------------------

Heterogeneity chi-squared = 3.51 (d.f. = 3) p = 0.319

I-squared (variation in ES attributable to heterogeneity) = 14.6%

Test of ES=1 : z= 4.44 p = 0.000

Random effects model

Study | HR [95% Conf. Interval]

---------------------+---------------------------------------------------

Whitehall II | 1.170 1.030 1.329

NHANES II | 1.060 1.020 1.102

Swedish Mammography | 1.040 0.980 1.104

Iowa Women's Health | 1.040 1.010 1.071

---------------------+---------------------------------------------------

D+L pooled ES | 1.051 1.025 1.077

---------------------+---------------------------------------------------

Heterogeneity chi-squared = 3.51 (d.f. = 3) p = 0.319

I-squared (variation in ES attributable to heterogeneity) = 14.6%

Estimate of between-study variance Tau-squared = 0.0001

Test of ES=1 : z= 3.96 p = 0.000

**Outcome: Cancer mortality**

Fixed effects model

Study | HR [95% Conf. Interval]

---------------------+---------------------------------------------------

Whitehall II | 1.120 1.020 1.230

SUVIMAX | 1.180 1.040 1.339

NHANES II | 1.040 0.970 1.115

Swedish Mammography | 1.040 0.990 1.093

Iowa Women's Health | 1.040 1.010 1.071

---------------------+---------------------------------------------------

I-V pooled ES | 1.049 1.025 1.073

---------------------+---------------------------------------------------

Heterogeneity chi-squared = 5.73 (d.f. = 4) p = 0.220

I-squared (variation in ES attributable to heterogeneity) = 30.2%

Test of ES=1 : z= 4.13 p = 0.000

Random effects model

Study | HR [95% Conf. Interval]

---------------------+---------------------------------------------------

Whitehall II | 1.120 1.020 1.230

SUVIMAX | 1.180 1.040 1.339

NHANES II | 1.040 0.970 1.115

Swedish Mammography | 1.040 0.990 1.093

Iowa Women's Health | 1.040 1.010 1.071

---------------------+---------------------------------------------------

D+L pooled ES | 1.055 1.022 1.089

---------------------+---------------------------------------------------

Heterogeneity chi-squared = 5.73 (d.f. = 4) p = 0.220

I-squared (variation in ES attributable to heterogeneity) = 30.2%

Estimate of between-study variance Tau-squared = 0.0004

Test of ES=1 : z= 3.32 p = 0.001