**TITLE:** Weight History, All-Cause and Cause-Specific Mortality in Three Prospective Cohort Studies

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**APPENDIX**

**FIGURES**

S1. Visual depiction of the study design……………………………………………...……...……3

S2. Distribution of time since maximum BMI in the NHS………………………………….……4

S3. Distribution of time since maximum BMI in the HPFS...……………………………..…..…5

S4. Distribution of time since maximum BMI in the NHS2..……………………………...…..…6

**TABLES**

S1. Hazard ratios according to weight history length and smoking status…………………..……7

*ALL INDIVIDUALS*

S2. Standard Maximum BMI for all outcomes………….………………………………………..9

S3. Fine maximum BMI for all outcomes……………………………………………………10-11

S4. Baseline BMI for all outcomes……………………………………………………………. ..12

S5. Fine baseline BMI for all outcomes…………………………………………………..….13-14

S6. Maximum BMI x Baseline BMI for all-cause mortality…………………………………….15

*NEVER SMOKERS*

S7. Descriptive statistics of never smokers at baseline…………………………………..…..17-18

S8. Standard Maximum BMI for all outcomes………….……….………………………..……..19

S9. Fine maximum BMI for all outcomes………………………………………………..…..20-21

S10. Baseline BMI for all outcomes…………………………………………………….…..…..22

S11. Fine baseline BMI for all outcomes……………………………………………….……23-24

S12. Maximum BMI x Baseline BMI for all-cause mortality…………………………..…...…..25

*OTHER TABLES*

S13. Maximum BMI comparing baseline disease exclusions………………………………….27

S14. Maximum BMI comparing missing data exclusions………………………………….28-29

S15. Maximum BMI comparing baseline physical activity………………………………….. 30

S16. Maximum BMI comparing exclusion of observations with missing data …..………….. 31

S17. Extended weight history in the NHS among all individuals..……………………....…… 32

S18. Extended weight history in the NHS among never-smokers..……………………....…… 33

**FIGURE S1.** Diagram of the study design. Weight history is set to 16 years in the main analysisMaximum BMI is the highest recorded BMI in the weight history period. Baseline BMI is the BMI recorded only at baseline (also equivalent to a weight history of 0 years).



**FIGURE S2.** Histogram of years between baseline (1992) and date of maximum BMI in the NHS.



**FIGURE S3.** Histogram of years between baseline (2002) and date of maximum BMI in the HPFS.



**FIGURE S4.** Histogram of years between baseline (2005) and date of maximum BMI in the NHS2.

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**TABLE S1.** Hazard ratios for all-cause mortality and maximum BMI for three cohorts (NHS/NHSII/HPFS) according to weight history. Cumulative differences in AIC (Akaike information criterion) from the model with no weight history vs. current model are also included to assess model fit (greater negative value signifies better model fit of current model compared to model with no weight history).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Weight History | Underweight(<18.5 kg/m2) | Normal(18.5-24.9 kg/m2) | Overweight(25.0-29.9 kg/m2) | Obese I(30.0-34.9 kg/m2) | Obese II(≥35.0 kg/m2) | Cumulative Δ AIC |
| NHS | NHS II | HPFS |
| All Individuals |
| 0 years (Baseline) | 1.88 (1.75, 2.01) | 1 (Reference) | 0.96 (0.94, 0.99) | 1.14 (1.10, 1.18) | 1.57 (1.50, 1.64) | 0.0 | 0.0 | 0.0 |
| 2 years | 1.90 (1.74, 2.07) | 1 (Reference) | 0.98 (0.96, 1.01) | 1.15 (1.11, 1.19) | 1.61 (1.54, 1.68) | 0.9 | 6.0 | 0.4 |
| 4 years | 1.90 (1.73, 2.09) | 1 (Reference) | 1.00 (0.98, 1.03) | 1.16 (1.13, 1.20) | 1.64 (1.57, 1.71) | -0.6 | -10.7 | -6.6 |
| 6 years | 1.86 (1.68, 2.07) | 1 (Reference) | 1.01 (0.99, 1.04) | 1.17 (1.13, 1.21) | 1.65 (1.58, 1.72) | -3.0 | -17.5 | -7.6 |
| 8 years | 1.84 (1.65, 2.06) | 1 (Reference) | 1.02 (0.99, 1.04) | 1.19 (1.15, 1.23) | 1.65 (1.59, 1.72) | -2.3 | -15.5 | -9.7 |
| 10 years | 1.72 (1.52, 1.94) | 1 (Reference) | 1.02 (1.00, 1.05) | 1.19 (1.16, 1.24) | 1.68 (1.61, 1.75) | 2.9 | -22.8 | -23.1 |
| 12 years | 1.68 (1.47, 1.92) | 1 (Reference) | 1.02 (1.00, 1.05) | 1.20 (1.16, 1.24) | 1.69 (1.62, 1.76) | -7.3 | -22.2 | -31.4 |
| 14 years | 1.65 (1.42, 1.90) | 1 (Reference) | 1.03 (1.00, 1.05) | 1.21 (1.17, 1.25) | 1.70 (1.63, 1.77) | -17.4 | -22.3 | -41.8 |
| 16 years | 1.54 (1.31, 1.82) | 1 (Reference) | 1.03 (1.00, 1.05) | 1.21 (1.17, 1.25) | 1.71 (1.65, 1.78) | -25.1 | -21.5 | -49.4 |
| Never Smokers |
| 0 years (Baseline) | 1.62 (1.43, 1.84) | 1 (Reference) | 1.04 (1.00, 1.08) | 1.29 (1.22, 1.36) | 1.89 (1.77, 2.03) | 0.0 | 0.0 | 0.0 |
| 2 years | 1.58 (1.35, 1.84) | 1 (Reference) | 1.07 (1.03, 1.12) | 1.29 (1.22, 1.36) | 1.97 (1.84, 2.10) | -31.2 | -5.3 | -1.3 |
| 4 years | 1.59 (1.34, 1.88) | 1 (Reference) | 1.07 (1.03, 1.12) | 1.31 (1.24, 1.38) | 1.96 (1.83, 2.09) | -34.1 | -15.6 | -8.3 |
| 6 years | 1.59 (1.32, 1.91) | 1 (Reference) | 1.08 (1.04, 1.13) | 1.31 (1.25, 1.39) | 1.97 (1.84, 2.10) | -45.2 | -18.1 | -10.9 |
| 8 years | 1.60 (1.31, 1.95) | 1 (Reference) | 1.09 (1.05, 1.14) | 1.32 (1.25, 1.40) | 1.95 (1.83, 2.08) | -41.8 | -19.8 | -13.7 |
| 10 years | 1.53 (1.23, 1.90) | 1 (Reference) | 1.09 (1.05, 1.14) | 1.32 (1.25, 1.39) | 1.96 (1.84, 2.09) | -47.6 | -23.7 | -19.8 |
| 12 years | 1.49 (1.18, 1.88) | 1 (Reference) | 1.10 (1.05, 1.15) | 1.32 (1.25, 1.40) | 1.96 (1.84, 2.09) | -45.8 | -22.0 | -26.7 |
| 14 years | 1.49 (1.16, 1.90) | 1 (Reference) | 1.09 (1.05, 1.14) | 1.32 (1.25, 1.39) | 1.97 (1.85, 2.10) | -56.5 | -21.7 | -29.9 |
| 16 years | 1.48 (1.13, 1.94) | 1 (Reference) | 1.09 (1.05, 1.14) | 1.32 (1.25, 1.39) | 1.97 (1.85, 2.10) | -59.5 | -21.5 | -34.4 |

Multivariate adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Analyses among all individuals adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day). Follow-up duration is from (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**ALL INDIVIDUALS**

**TABLE S2.** Summary of pooled mortality hazard ratios in the NHS/NHS II/HPFS for maximum BMI among all individuals with 16 years of weight history**.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcome** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II**(≥35.0 kg/m2) |
| **All-Cause Mortality** |  |  |  |  |  |
| Events (n) / 1,000 p-yrs | 148 / 9.7 | 11183 / 1,060.8 | 12520 / 995.1 | 5362 / 429.9 | 3358 / 263.7 |
| Age adjusted HR | 1.54 (1.31, 1.82) | 1 (Reference) | 1.08 (1.05, 1.11) | 1.30 (1.26, 1.34) | 1.87 (1.80, 1.95) |
| Multivariate HR | 1.47 (1.25, 1.74) | 1 (Reference) | 1.06 (1.03, 1.08) | 1.24 (1.20, 1.29) | 1.73 (1.66, 1.80) |
| **Cardiovascular Disease (includes coronary heart disease and stroke)** |  |  |  |  |  |
| Events (n) | 29 | 2359 | 3180 | 1439 | 1010 |
| Multivariate HR | 1.41 (0.98, 2.05) | 1 (Reference) | 1.21 (1.15, 1.28) | 1.63 (1.52, 1.74) | 2.74 (2.53, 2.97) |
| ***Coronary Heart Disease*** |  |  |  |  |  |
| Events (n) | 12 | 890 | 1428 | 655 | 425 |
| Multivariate HR | 1.64 (0.92, 2.92) | 1 (Reference) | 1.32 (1.21, 1.44) | 1.97 (1.78, 2.19) | 3.34 (2.95, 3.79) |
| ***Stroke*** |  |  |  |  |  |
| Events (n) | 9 | 718 | 766 | 305 | 200 |
| Multivariate HR | 1.36 (0.70, 2.65) | 1 (Reference) | 1.02 (0.91, 1.13) | 1.11 (0.97, 1.28) | 1.72 (1.46, 2.03) |
| **Cancer** |  |  |  |  |  |
| Events (n) | 37 | 4054 | 4290 | 1744 | 1010 |
| Multivariate HR | 1.01 (0.73, 1.40) | 1 (Reference) | 1.01 (0.97, 1.06) | 1.06 (1.01, 1.13) | 1.28 (1.19, 1.38) |
| **Respiratory Disease** |  |  |  |  |  |
| Events (n) | 31 | 1102 | 953 | 367 | 154 |
| Multivariate HR | 2.87 (1.99, 4.15) | 1 (Reference) | 0.82 (0.75, 0.90) | 0.92 (0.82, 1.04) | 0.93 (0.78, 1.10) |
| **Other Causes (excludes CVD, cancer, and respiratory disease)** |  |  |  |  |  |
| Events (n) | 51 | 3663 | 4093 | 1808 | 1175 |
| Multivariate HR | 1.57 (1.19, 2.08) | 1 (Reference) | 1.07 (1.02, 1.12) | 1.28 (1.21, 1.36) | 1.82 (1.69, 1.95) |

Multivariate adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration from (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**TABLE S3.** Summary of pooled hazard ratios using fine maximum BMI categories in the NHS / NHS II / HPFS among all individuals.

|  |  |
| --- | --- |
| **Outcome** | **Fine Maximum BMI Categories (kg/m2)** |
| <18.5 | 18.5-19.9 | 20.0-22.4 | 22.5-24.9 | 25.0-27.4 | 27.5-29.9 |
| **All-Cause Mortality** |  |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 148 / 9.7 | 567 / 54.2 | 3765 / 381.2 | 6851 / 625.5 | 7639 / 615.5 | 4881 / 379.6 |
| Age adjusted HR | 1.59 (1.35, 1.87) | 1.24 (1.14, 1.35) | 1.03 (0.99, 1.07) | 1 (Reference) | 1.06 (1.03, 1.10) | 1.17 (1.13, 1.21) |
| Multivariate HR | 1.51 (1.28, 1.78) | 1.19 (1.09, 1.30) | 1.03 (0.99, 1.08) | 1 (Reference) | 1.04 (1.00, 1.07) | 1.14 (1.10, 1.18) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |  |  |
| Events (n) | 29 | 97 | 748 | 1514 | 1945 | 1235 |
| Multivariate HR | 1.41 (0.97, 2.04) | 1.03 (0.84, 1.27) | 1.00 (0.91, 1.09) | 1 (Reference) | 1.16 (1.08, 1.24) | 1.29 (1.20, 1.39) |
| ***Coronary Heart Disease*** |  |  |  |  |  |  |
| Events (n) | 12 | 39 | 235 | 616 | 880 | 548 |
| Multivariate HR | 1.55 (0.87, 2.77) | 1.16 (0.83, 1.62) | 0.85 (0.73, 0.99) | 1 (Reference) | 1.22 (1.10, 1.35) | 1.36 (1.21, 1.53) |
| ***Stroke*** |  |  |  |  |  |  |
| Events (n) | 9 | 23 | 261 | 434 | 470 | 296 |
| Multivariate HR | 1.42 (0.73, 2.77) | 0.84 (0.55, 1.28) | 1.14 (0.98, 1.34) | 1 (Reference) | 1.03 (0.90, 1.17) | 1.10 (0.94, 1.28) |
| **Cancer** |  |  |  |  |  |  |
| Events (n) | 37 | 184 | 1379 | 2491 | 2610 | 1680 |
| Multivariate HR | 1.03 (0.74, 1.42) | 1.04 (0.90, 1.21) | 1.01 (0.94, 1.08) | 1 (Reference) | 0.98 (0.93, 1.04) | 1.05 (0.99, 1.12) |
| **Respiratory Disease** |  |  |  |  |  |  |
| Events (n) | 31 | 97 | 393 | 612 | 582 | 371 |
| Multivariate HR | 3.26 (2.25, 4.73) | 2.23 (1.79, 2.78) | 1.19 (1.04, 1.35) | 1 (Reference) | 0.88 (0.78, 0.99) | 0.97 (0.85, 1.11) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |  |  |
| Events (n) | 51 | 188 | 1243 | 2232 | 2501 | 1592 |
| Multivariate HR | 1.61 (1.21, 2.13) | 1.19 (1.02, 1.38) | 1.04 (0.97, 1.11) | 1 (Reference) | 1.06 (1.00, 1.12) | 1.16 (1.08, 1.23) |

Multivariate HR adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S3 (cont’d).** Summary of pooled hazard ratios using fine maximum BMI categories in the NHS / NHS II / HPFS among all individuals

|  |  |
| --- | --- |
| **Outcome** | **Fine Maximum BMI Categories (kg/m2)** |
| 30.0-32.4 | 32.5-34.9 | 35.0-39.9 | ≥40.0 |
| **All-Cause Mortality** |  |  |  |  |
| Events (n) / 1000 p-yrs | 3318 / 265.1 | 2044 / 164.8 | 2014 / 163.2 | 1344 / 100.6 |
| Age adjusted HR | 1.28 (1.23, 1.34) | 1.41 (1.34, 1.48) | 1.69 (1.60, 1.77) | 2.44 (2.29, 2.59) |
| Multivariate HR | 1.23 (1.18, 1.28) | 1.35 (1.29, 1.42) | 1.58 (1.50, 1.67) | 2.18 (2.05, 2.32) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |
| Events (n) | 868 | 571 | 609 | 401 |
| Multivariate HR | 1.51 (1.39, 1.65) | 1.85 (1.68, 2.04) | 2.43 (2.20, 2.68) | 3.51 (3.11, 3.96) |
| ***Coronary Heart Disease*** |  |  |  |  |
| Events (n) | 386 | 269 | 269 | 156 |
| Multivariate HR | 1.70 (1.49, 1.94) | 2.24 (1.93, 2.60) | 2.90 (2.49, 3.38) | 3.91 (3.23, 4.74) |
| ***Stroke*** |  |  |  |  |
| Events (n) | 196 | 109 | 122 | 78 |
| Multivariate HR | 1.15 (0.97, 1.37) | 1.17 (0.95, 1.45) | 1.58 (1.29, 1.95) | 2.32 (1.80, 2.98) |
| **Cancer** |  |  |  |  |
| Events (n) | 1080 | 664 | 643 | 367 |
| Multivariate HR | 1.04 (0.97, 1.12) | 1.12 (1.02, 1.22) | 1.24 (1.14, 1.36) | 1.40 (1.25, 1.57) |
| **Respiratory Disease** |  |  |  |  |
| Events (n) | 221 | 146 | 88 | 66 |
| Multivariate HR | 0.96 (0.82, 1.12) | 1.16 (0.96, 1.39) | 0.87 (0.69, 1.09) | 1.43 (1.10, 1.85) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |
| Events (n) | 1145 | 663 | 669 | 506 |
| Multivariate HR | 1.30 (1.21, 1.40) | 1.34 (1.23, 1.47) | 1.59 (1.45, 1.74) | 2.44 (2.19, 2.70) |

Multivariate HR adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S4.** Summary of pooled mortality hazard ratios in the NHS/NHS II/HPFS for baseline BMI among all individuals.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcome** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II**(≥35.0 kg/m2) |
| **All-Cause Mortality** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 833 / 29.7 | 14380 / 1,236.5 | 10826 / 924.1 | 4256 / 369.9 | 2276 / 199.0 |
| Age adjusted HR | 2.28 (2.12, 2.44) | 1 (Reference) | 0.98 (0.95, 1.00) | 1.18 (1.14, 1.22) | 1.72 (1.64, 1.80) |
| Multivariate HR | 1.88 (1.75, 2.01) | 1 (Reference) | 0.96 (0.94, 0.99) | 1.14 (1.10, 1.18) | 1.57 (1.50, 1.64) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |  |
| Events (n) | 188 | 3311 | 2701 | 1159 | 658 |
| Multivariate HR | 1.76 (1.52, 2.04) | 1 (Reference) | 1.05 (0.99, 1.10) | 1.45 (1.36, 1.56) | 2.34 (2.14, 2.55) |
| ***Coronary Heart Disease*** |  |  |  |  |  |
| Events (n) | 91 | 1348 | 1189 | 531 | 251 |
| Multivariate HR | 2.19 (1.77, 2.72) | 1 (Reference) | 1.10 (1.02, 1.20) | 1.73 (1.56, 1.92) | 2.51 (2.18, 2.90) |
| ***Stroke*** |  |  |  |  |  |
| Events (n) | 37 | 929 | 652 | 242 | 138 |
| Multivariate HR | 1.14 (0.82, 1.59) | 1 (Reference) | 0.92 (0.83, 1.02) | 1.04 (0.90, 1.21) | 1.65 (1.37, 1.99) |
| **Cancer** |  |  |  |  |  |
| Events (n) | 193 | 4963 | 3878 | 1398 | 703 |
| Multivariate HR | 1.25 (1.08, 1.44) | 1 (Reference) | 1.00 (0.96, 1.04) | 1.02 (0.96, 1.08) | 1.23 (1.13, 1.33) |
| **Respiratory Disease** |  |  |  |  |  |
| Events (n) | 175 | 1290 | 762 | 277 | 103 |
| Multivariate HR | 3.90 (3.32, 4.59) | 1 (Reference) | 0.77 (0.70, 0.84) | 0.88 (0.77, 1.01) | 0.93 (0.76, 1.14) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |  |
| Events (n) | 275 | 4811 | 3479 | 1420 | 805 |
| Multivariate HR | 1.89 (1.67, 2.14) | 1 (Reference) | 0.93 (0.89, 0.97) | 1.12 (1.05, 1.19) | 1.62 (1.50, 1.75) |

Multivariate HR adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**TABLE S5.** Summary of pooled hazard ratios using fine baseline BMI categories in the NHS / NHS II / HPFS among all individuals.

|  |  |
| --- | --- |
| **Outcome** | **Fine Baseline BMI Categories (kg/m2)** |
| <18.5 | 18.5-19.9 | 20.0-22.4 | 22.5-24.9 | 25.0-27.4 | 27.5-29.9 |
| **All-Cause Mortality** |  |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 833 / 29.7 | 1462 / 101.4 | 5499 / 481.7 | 7419 / 653.3 | 6849 / 584.3 | 3977 / 339.8 |
| Age adjusted HR | 2.46 (2.29, 2.64) | 1.53 (1.44, 1.62) | 1.13 (1.09, 1.17) | 1 (Reference) | 1.03 (0.99, 1.06) | 1.11 (1.07, 1.16) |
| Multivariate HR | 2.02 (1.88, 2.17) | 1.45 (1.37, 1.53) | 1.12 (1.08, 1.16) | 1 (Reference) | 1.01 (0.98, 1.04) | 1.09 (1.05, 1.13) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |  |  |
| Events (n) | 188 | 290 | 1226 | 1795 | 1704 | 997 |
| Multivariate HR | 1.82 (1.56, 2.12) | 1.24 (1.09, 1.40) | 1.07 (1.00, 1.16) | 1 (Reference) | 1.04 (0.98, 1.12) | 1.17 (1.08, 1.26) |
| ***Coronary Heart Disease*** |  |  |  |  |  |  |
| Events (n) | 91 | 122 | 448 | 778 | 762 | 427 |
| Multivariate HR | 2.14 (1.71, 2.67) | 1.32 (1.09, 1.61) | 0.97 (0.86, 1.09) | 1 (Reference) | 1.07 (0.97, 1.18) | 1.17 (1.04, 1.32) |
| ***Stroke*** |  |  |  |  |  |  |
| Events (n) | 37 | 74 | 372 | 483 | 423 | 229 |
| Multivariate HR | 1.21 (0.86, 1.69) | 1.07 (0.83, 1.36) | 1.13 (0.99, 1.30) | 1 (Reference) | 0.97 (0.85, 1.10) | 0.98 (0.84, 1.15) |
| **Cancer** |  |  |  |  |  |  |
| Events (n) | 193 | 479 | 1883 | 2601 | 2427 | 1451 |
| Multivariate HR | 1.30 (1.12, 1.51) | 1.27 (1.15, 1.41) | 1.06 (0.99, 1.12) | 1 (Reference) | 1.01 (0.96, 1.07) | 1.09 (1.02, 1.17) |
| **Respiratory Disease** |  |  |  |  |  |  |
| Events (n) | 175 | 197 | 530 | 563 | 486 | 276 |
| Multivariate HR | 5.01 (4.20, 5.97) | 2.53 (2.15, 2.98) | 1.42 (1.26, 1.60) | 1 (Reference) | 0.95 (0.84, 1.07) | 1.02 (0.88, 1.18) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |  |  |
| Events (n) | 275 | 494 | 1860 | 2457 | 2229 | 1250 |
| Multivariate HR | 2.05 (1.80, 2.32) | 1.49 (1.35, 1.64) | 1.14 (1.08, 1.22) | 1 (Reference) | 0.99 (0.94, 1.05) | 1.02 (0.96, 1.10) |

Multivariate HR adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S5 (continued).** Summary of pooled hazard ratios using fine baseline BMI categories in the NHS / NHS II / HPFS among all individuals.

|  |  |
| --- | --- |
| **Outcome** | **Fine Baseline BMI Categories (kg/m2)** |
| 30.0-32.4 | 32.5-34.9 | 35.0-39.9 | ≥40.0 |
| **All-Cause Mortality** |  |  |  |  |
| Events (n) / 1000 p-yrs | 2698 / 230.4 | 1558 / 139.5 | 1438 / 130.5 | 838 / 68.5 |
| Age adjusted HR | 1.25 (1.19, 1.30) | 1.33 (1.26, 1.41) | 1.63 (1.54, 1.73) | 2.43 (2.26, 2.62) |
| Multivariate HR | 1.19 (1.14, 1.25) | 1.28 (1.21, 1.35) | 1.49 (1.41, 1.58) | 2.17 (2.01, 2.34) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |
| Events (n) | 712 | 447 | 413 | 245 |
| Multivariate HR | 1.40 (1.28, 1.53) | 1.70 (1.53, 1.89) | 2.07 (1.85, 2.31) | 3.29 (2.86, 3.79) |
| ***Coronary Heart Disease*** |  |  |  |  |
| Events (n) | 318 | 213 | 160 | 91 |
| Multivariate HR | 1.53 (1.34, 1.75) | 2.04 (1.74, 2.38) | 2.10 (1.75, 2.51) | 3.35 (2.66, 4.21) |
| ***Stroke*** |  |  |  |  |
| Events (n) | 157 | 85 | 90 | 48 |
| Multivariate HR | 1.09 (0.91, 1.31) | 1.12 (0.89, 1.42) | 1.56 (1.24, 1.97) | 2.30 (1.70, 3.11) |
| **Cancer** |  |  |  |  |
| Events (n) | 902 | 496 | 467 | 236 |
| Multivariate HR | 1.07 (0.99, 1.15) | 1.06 (0.96, 1.17) | 1.23 (1.11, 1.36) | 1.43 (1.25, 1.64) |
| **Respiratory Disease** |  |  |  |  |
| Events (n) | 172 | 105 | 58 | 45 |
| Multivariate HR | 1.06 (0.90, 1.26) | 1.22 (0.99, 1.50) | 0.91 (0.69, 1.20) | 1.93 (1.41, 2.63) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |
| Events (n) | 910 | 510 | 494 | 311 |
| Multivariate HR | 1.20 (1.11, 1.29) | 1.24 (1.13, 1.37) | 1.51 (1.37, 1.67) | 2.38 (2.10, 2.69) |

Multivariate HR adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

|  |  |
| --- | --- |
| **Hazard Ratios** | **Maximum BMI** |
| **Baseline BMI** | Underweight | Normal | Overweight | Obese I | Obese II |
| Underweight | 1.54 (1.30, 1.81) | 1.83 (1.68, 1.98) | 1.24 (1.19, 1.29) | 2.13 (1.85, 2.46) | 2.60 (2.00, 3.40) |
| Normal |  | 1 (Reference) |
| Overweight |  |  | 1.02 (0.99, 1.05) | 1.33 (1.26, 1.40) | 2.25 (1.95, 2.60) |
| Obese I |  |  |  | 1.21 (1.16, 1.26) | 1.67 (1.55, 1.80) |
| Obese II |  |  |  |  | 1.77 (1.68, 1.85) |

**TABLE S6.** Hazard ratios for all-cause mortality from NHS/NHS II/HPFS stratified by maximum BMI and baseline BMI among all individuals. The maximum obese – current underweight categories were collapsed with the maximum obese – current normal categories due to sparse cells.

Multivariate HR adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**NEVER SMOKERS**

**TABLE S7.** Characteristics of never smokers at baseline in the NHS – 1986 / NHS II – 1999 / HPFS – 1996.

|  |  |  |  |
| --- | --- | --- | --- |
|  | NHS(n=45,154) | NHS II(n=60,890) | HPFS(n=17,678) |
| Age (y) | 58.4 ± 7.4 | 50.1 ± 6.6 | 67.4 ± 9.0 |
| Maximum BMI (%)Under (<18.5 kg/m2)Normal (18.5-24.9 kg/m2)Over (25.0-29.9 kg/m2)Obese I (30.0-34.9 kg/m2)Obese II (>34.9 kg/m2) | 0.439.734.815.99.2 | 0.437.329.816.615.8 | 0.131.051.813.83.3 |
| Baseline BMI (%)Under (<18.5 kg/m2)Normal (18.5-24.9 kg/m2)Over (25.0-29.9 kg/m2)Obese I (30.0-34.9 kg/m2)Obese II (>34.9 kg/m2) | 1.145.532.813.86.8 | 1.143.128.515.012.4 | 0.541.145.910.22.4 |
| White (%) | 92.9 | 95.4 | 89.1 |
| Family history CVD (%) | 14.9 | 20.7 | 32.2 |
| Family history Cancer (%) | 15.0 | 9.6 | 16.5 |
| Menopause (%)PrePostUnsure/Dubious | 17.373.98.7 | 48.742.87.1 |  |
| Oral contraceptive use (%)NeverEverCurrent |  | 13.180.25.1 |  |
| Hormone replacement therapy (%)NeverEverCurrentUnsure/Dubious | 40.928.515.49.3 | 40.529.316.214.1 |  |
| Parity (%)NulliparousOneTwoThreeFour+ | 5.66.927.927.530.3 | 15.411.937.020.17.7 |  |
| Alcohol at baseline (%)Never (0 g/d)Very Light (0.1 – 4.9 g/d)Light (5.0 – 9.9 g/d)Moderate (10.0 – 14.9 g/d)Heavy (>14.9 g/d) | 53.030.47.74.34.6 | 46.234.210.25.34.1 | 20.632.417.011.718.3 |
| Total energy intake at baseline (kcal/d) | 1783 ± 494 | 1836 ± 534 | 1990 ± 535 |

**TABLE S8.** Pooled hazard ratios for all-cause and cause-specific mortality in the NHS/NHS II/HPFS for maximum BMI among never-smokers with 16 years of weight history**.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcome** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II****(≥**35.0 kg/m2) |
| **All-Cause Mortality** |  |  |  |  |  |
| Events (n) / 1,000 p-yrs | 55 / 5.0 | 4180 / 543.3 | 4801 / 497.2 | 2185 / 221.0 | 1545 / 145.5 |
| Age adjusted | 1.51 (1.15, 1.98) | 1 (Reference) | 1.13 (1.09, 1.18) | 1.44 (1.37, 1.52) | 2.25 (2.12, 2.39) |
| Multivariate | 1.46 (1.11, 1.91) | 1 (Reference) | 1.10 (1.05, 1.15) | 1.34 (1.27, 1.41) | 1.98 (1.86, 2.11) |
| **Cardiovascular Disease (includes coronary heart disease and stroke)** |  |  |  |  |  |
| Events (n) | 13 | 935 | 1234 | 577 | 483 |
| Multivariate | 1.77 (1.01, 3.10) | 1 (Reference) | 1.23 (1.13, 1.35) | 1.71 (1.53, 1.90) | 3.23 (2.86, 3.65) |
| ***Coronary Heart Disease***  |  |  |  |  |  |
| Events (n) | 4 | 354 | 534 | 247 | 190 |
| Multivariate | 1.66 (0.61, 4.54) | 1 (Reference) | 1.35 (1.18, 1.55) | 2.10 (1.77, 2.50) | 4.07 (3.33, 4.96) |
| ***Stroke***  |  |  |  |  |  |
| Events (n) | 8 | 244 | 235 | 99 | 46 |
| Multivariate | 2.25 (0.90, 5.60) | 1 (Reference) | 1.03 (0.87, 1.21) | 1.13 (0.91, 1.39) | 2.12 (1.68, 2.69) |
| **Cancer**  |  |  |  |  |  |
| Events (n) | 11 | 1354 | 1509 | 690 | 446 |
| Multivariate | 1.07 (0.59, 1.95) | 1 (Reference) | 1.05 (0.98, 1.14) | 1.20 (1.09, 1.32) | 1.50 (1.34, 1.68) |
| **Respiratory Disease** |  |  |  |  |  |
| Events (n) | 8 | 244 | 235 | 99 | 46 |
| Multivariate | 2.86 (1.37, 6.01) | 1 (Reference) | 0.92 (0.77, 1.11) | 1.15 (0.90, 1.47) | 1.23 (0.88, 1.71) |
| **Other Causes (excludes CVD, cancer, and respiratory disease)** |  |  |  |  |  |
| Events (n) | 23 | 1646 | 1820 | 816 | 567 |
| Multivariate | 1.49 (0.98, 2.27) | 1 (Reference) | 1.07 (1.00, 1.15) | 1.26 (1.15, 1.37) | 1.82 (1.64, 2.02) |

Multivariate adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**TABLE S9.** Summary of pooled hazard ratios using fine maximum BMI categories in the NHS / NHS II / HPFS among never-smokers.

|  |  |
| --- | --- |
| **Outcome** | **Fine Maximum BMI Categories (kg/m2)** |
| <18.5 | 18.5-19.9 | 20.0-22.4 | 22.5-24.9 | 25.0-27.4 | 27.5-29.9 |
| **All-Cause Mortality** |  |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 55 / 5.0 | 204 / 30.2 | 1362 / 196.5 | 2614 / 316.5 | 2862 / 306.7 | 1939 / 190.5 |
| Age adjusted HR | 1.53 (1.17, 2.01) | 1.20 (1.04, 1.39) | 0.99 (0.93, 1.06) | 1 (Reference) | 1.06 (1.01, 1.12) | 1.25 (1.18, 1.33) |
| Multivariate HR | 1.48 (1.13, 1.95) | 1.19 (1.03, 1.38) | 0.99 (0.93, 1.06) | 1 (Reference) | 1.04 (0.99, 1.10) | 1.20 (1.13, 1.28) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |  |  |
| Events (n) | 13 | 30 | 296 | 609 | 758 | 476 |
| Multivariate HR | 1.70 (0.97, 2.99) | 0.88 (0.61, 1.28) | 1.01 (0.87, 1.16) | 1 (Reference) | 1.18 (1.05, 1.31) | 1.31 (1.16, 1.49) |
| ***Coronary Heart Disease*** |  |  |  |  |  |  |
| Events (n) | 4 | 9 | 93 | 252 | 338 | 196 |
| Multivariate HR | 1.48 (0.54, 4.07) | 0.73 (0.37, 1.44) | 0.83 (0.65, 1.06) | 1 (Reference) | 1.24 (1.05, 1.46) | 1.34 (1.10, 1.62) |
| ***Stroke*** |  |  |  |  |  |  |
| Events (n) | 5 | 12 | 103 | 182 | 194 | 126 |
| Multivariate HR | 2.34 (0.94, 5.87) | 1.20 (0.66, 2.19) | 1.11 (0.86, 1.42) | 1 (Reference) | 1.02 (0.83, 1.25) | 1.14 (0.90, 1.44) |
| **Cancer** |  |  |  |  |  |  |
| Events (n) | 11 | 60 | 432 | 862 | 905 | 604 |
| Multivariate HR | 1.06 (0.58, 1.95) | 1.03 (0.79, 1.34) | 0.93 (0.83, 1.05) | 1 (Reference) | 0.99 (0.90, 1.09) | 1.08 (0.97, 1.20) |
| **Respiratory Disease** |  |  |  |  |  |  |
| Events (n) | 8 | 19 | 84 | 141 | 138 | 97 |
| Multivariate HR | 3.13 (1.48, 6.64) | 2.51 (1.50, 4.20) | 1.10 (0.83, 1.46) | 1 (Reference) | 0.91 (0.72, 1.16) | 1.15 (0.88, 1.50) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |  |  |
| Events (n) | 23 | 95 | 550 | 1001 | 1061 | 759 |
| Multivariate HR | 1.55 (1.02, 2.38) | 1.39 (1.12, 1.73) | 1.03 (0.93, 1.15) | 1 (Reference) | 1.02 (0.94, 1.12) | 1.24 (1.12, 1.36) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S9 (cont’d).** Summary of pooled hazard ratios using fine maximum BMI categories in the NHS / NHS II / HPFS among never-smokers.

|  |  |
| --- | --- |
| **Outcome** | **Fine Maximum BMI Categories (kg/m2)** |
| 30.0-32.4 | 32.5-34.9 | 35.0-39.9 | ≥40.0 |
| **All-Cause Mortality** |  |  |  |  |
| Events (n) / 1000 p-yrs | 1355 / 135.7 | 830 / 85.3 | 928 / 89.4 | 617 / 56.0 |
| Age adjusted HR | 1.40 (1.31, 1.50) | 1.54 (1.42, 1.67) | 2.01 (1.86, 2.17) | 2.88 (2.63, 3.16) |
| Multivariate HR | 1.29 (1.21, 1.38) | 1.45 (1.34, 1.57) | 1.80 (1.66, 1.94) | 2.48 (2.26, 2.73) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |
| Events (n) | 346 | 231 | 287 | 196 |
| Multivariate HR | 1.55 (1.35, 1.78) | 2.01 (1.71, 2.35) | 2.79 (2.39, 3.24) | 4.27 (3.57, 5.11) |
| ***Coronary Heart Disease*** |  |  |  |  |
| Events (n) | 147 | 100 | 117 | 73 |
| Multivariate HR | 1.74 (1.40, 2.15) | 2.36 (1.84, 3.02) | 3.21 (2.51, 4.10) | 5.29 (3.98, 7.03) |
| ***Stroke*** |  |  |  |  |
| Events (n) | 85 | 48 | 70 | 41 |
| Multivariate HR | 1.15 (0.88, 1.50) | 1.23 (0.89, 1.71) | 2.04 (1.52, 2.74) | 2.68 (1.86, 3.85) |
| **Cancer** |  |  |  |  |
| Events (n) | 425 | 265 | 284 | 162 |
| Multivariate HR | 1.15 (1.02, 1.29) | 1.25 (1.08, 1.43) | 1.42 (1.24, 1.63) | 1.63 (1.37, 1.94) |
| **Respiratory Disease** |  |  |  |  |
| Events (n) | 60 | 39 | 31 | 15 |
| Multivariate HR | 1.16 (0.85, 1.59) | 1.42 (0.98, 2.04) | 1.33 (0.88, 2.00) | 1.41 (0.81, 2.46) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |
| Events (n) | 521 | 295 | 324 | 243 |
| Multivariate HR | 1.28 (1.15, 1.42) | 1.34 (1.17, 1.53) | 1.63 (1.42, 1.85) | 2.46 (2.10, 2.87) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S10.** Summary of pooled person-years, events, and hazard ratios in the NHS/NHS II/HPFS for baseline BMI among never smokers.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcome** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II**(≥35.0 kg/m2) |
| **All-Cause Mortality** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 273 / 14.2 | 5458 / 629.5 | 4222 / 465.8 | 1770 / 191.8 | 1043 / 110.6 |
| Age adjusted HR | 2.14 (1.89, 2.42) | 1 (Reference) | 1.02 (0.98, 1.07) | 1.31 (1.24, 1.39) | 2.01 (1.88, 2.15) |
| Multivariate HR | 1.83 (1.62, 2.07) | 1 (Reference) | 0.99 (0.96, 1.04) | 1.21 (1.15, 1.28) | 1.75 (1.64, 1.88) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |  |
| Events (n) | 66 | 1325 | 1039 | 483 | 329 |
| Multivariate HR | 1.77 (1.38, 2.27) | 1 (Reference) | 1.03 (0.95, 1.12) | 1.51 (1.36, 1.68) | 2.79 (2.45, 3.17) |
| ***Coronary Heart Disease*** |  |  |  |  |  |
| Events (n) | 33 | 530 | 439 | 204 | 123 |
| Multivariate HR | 2.36 (1.65, 3.37) | 1 (Reference) | 1.10 (0.97, 1.25) | 1.80 (1.52, 2.14) | 3.17 (2.56, 3.92) |
| ***Stroke*** |  |  |  |  |  |
| Events (n) | 14 | 385 | 274 | 112 | 81 |
| Multivariate HR | 1.19 (0.69, 2.03) | 1 (Reference) | 0.92 (0.79, 1.08) | 1.10 (0.88, 1.36) | 2.18 (1.70, 2.81) |
| **Cancer** |  |  |  |  |  |
| Events (n) | 52 | 1691 | 1395 | 566 | 306 |
| Multivariate HR | 1.16 (0.88, 1.54) | 1 (Reference) | 1.04 (0.96, 1.11) | 1.15 (1.04, 1.26) | 1.37 (1.21, 1.56) |
| **Respiratory Disease** |  |  |  |  |  |
| Events (n) | 36 | 293 | 199 | 75 | 29 |
| Multivariate HR | 4.43 (3.11, 6.31) | 1 (Reference) | 0.90 (0.75, 1.07) | 1.10 (0.85, 1.42) | 1.16 (0.78, 1.72) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |  |
| Events (n) | 119 | 2146 | 1586 | 645 | 376 |
| Multivariate HR | 1.91 (1.58, 2.30) | 1 (Reference) | 0.96 (0.90, 1.02) | 1.11 (1.01, 1.21) | 1.59 (1.42, 1.79) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is from (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**TABLE S11.** Summary of pooled hazard ratios using fine baseline BMI categories in the NHS / NHS II / HPFS among never-smokers.

|  |  |
| --- | --- |
| **Outcome** | **Fine Baseline BMI Categories (kg/m2)** |
| <18.5 | 18.5-19.9 | 20.0-22.4 | 22.5-24.9 | 25.0-27.4 | 27.5-29.9 |
| **All-Cause Mortality** |  |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 273 / 14.2 | 525 / 53.4 | 2078 / 247.2 | 2855 / 328.9 | 2589 / 293.9 | 1633 / 171.9 |
| Age adjusted HR | 2.26 (1.99, 2.56) | 1.41 (1.28, 1.55) | 1.09 (1.03, 1.15) | 1 (Reference) | 1.01 (0.96, 1.07) | 1.21 (1.14, 1.29) |
| Multivariate HR | 1.93 (1.70, 2.19) | 1.34 (1.22, 1.48) | 1.09 (1.03, 1.15) | 1 (Reference) | 0.98 (0.93, 1.04) | 1.17 (1.10, 1.25) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |  |  |
| Events (n) | 66 | 100 | 497 | 728 | 643 | 396 |
| Multivariate HR | 1.78 (1.38, 2.29) | 1.04 (0.84, 1.28) | 1.05 (0.93, 1.17) | 1 (Reference) | 0.98 (0.88, 1.09) | 1.18 (1.04, 1.33) |
| ***Coronary Heart Disease*** |  |  |  |  |  |  |
| Events (n) | 33 | 42 | 179 | 309 | 280 | 159 |
| Multivariate HR | 2.22 (1.54, 3.20) | 1.10 (0.79, 1.52) | 0.93 (0.77, 1.12) | 1 (Reference) | 1.01 (0.86, 1.19) | 1.17 (0.96, 1.42) |
| ***Stroke*** |  |  |  |  |  |  |
| Events (n) | 14 | 26 | 156 | 203 | 179 | 95 |
| Multivariate HR | 1.24 (0.72, 2.15) | 0.92 (0.61, 1.40) | 1.14 (0.92, 1.40) | 1 (Reference) | 0.96 (0.79, 1.18) | 0.97 (0.76, 1.24) |
| **Cancer** |  |  |  |  |  |  |
| Events (n) | 52 | 148 | 626 | 917 | 843 | 552 |
| Multivariate HR | 1.18 (0.89, 1.57) | 1.17 (0.98, 1.39) | 1.00 (0.90, 1.11) | 1 (Reference) | 0.98 (0.89, 1.08) | 1.17 (1.05, 1.30) |
| **Respiratory Disease** |  |  |  |  |  |  |
| Events (n) | 36 | 36 | 117 | 140 | 117 | 82 |
| Multivariate HR | 5.19 (3.54, 7.60) | 1.85 (1.28, 2.70) | 1.23 (0.96, 1.58) | 1 (Reference) | 0.91 (0.71, 1.17) | 1.26 (0.96, 1.66) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |  |  |
| Events (n) | 119 | 240 | 838 | 1068 | 984 | 602 |
| Multivariate HR | 2.11 (1.74, 2.56) | 1.64 (1.42, 1.89) | 1.16 (1.06, 1.27) | 1 (Reference) | 1.01 (0.92, 1.10) | 1.15 (1.04, 1.27) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S11 (continued).** Summary of pooled hazard ratios using fine baseline BMI categories in the NHS / NHS II / HPFS among never-smokers.

|  |  |
| --- | --- |
| **Outcome** | **Fine Baseline BMI Categories (kg/m2)** |
| 30.0-32.4 | 32.5-34.9 | 35.0-39.9 | ≥40.0 |
| **All-Cause Mortality** |  |  |  |  |
| Events (n) / 1000 p-yrs | 1121 / 118.4 | 649 / 73.4 | 651 / 72.1 | 392 / 38.5 |
| Age adjusted HR | 1.35 (1.26, 1.45) | 1.46 (1.34, 1.59) | 1.86 (1.71, 2.03) | 2.82 (2.52, 3.15) |
| Multivariate HR | 1.23 (1.15, 1.32) | 1.37 (1.26, 1.49) | 1.62 (1.49, 1.77) | 2.46 (2.20, 2.75) |
| **Cardiovascular Disease (includes CHD, stroke)** |  |  |  |  |
| Events (n) | 293 | 190 | 206 | 123 |
| Multivariate HR | 1.39 (1.21, 1.59) | 1.82 (1.54, 2.15) | 2.40 (2.04, 2.83) | 3.87 (3.16, 4.74) |
| ***Coronary Heart Disease*** |  |  |  |  |
| Events (n) | 122 | 82 | 79 | 44 |
| Multivariate HR | 1.49 (1.20, 1.86) | 2.15 (1.66, 2.77) | 2.56 (1.97, 3.34) | 3.96 (2.83, 5.52) |
| ***Stroke*** |  |  |  |  |
| Events (n) | 71 | 41 | 56 | 25 |
| Multivariate HR | 1.12 (0.85, 1.47) | 1.43 (1.01, 2.02) | 2.15 (1.58, 2.94) | 2.72 (1.77, 4.18) |
| **Cancer** |  |  |  |  |
| Events (n) | 372 | 194 | 198 | 108 |
| Multivariate HR | 1.19 (1.05, 1.34) | 1.12 (0.95, 1.31) | 1.30 (1.11, 1.52) | 1.68 (1.36, 2.06) |
| **Respiratory Disease** |  |  |  |  |
| Events (n) | 44 | 31 | 17 | 12 |
| Multivariate HR | 1.11 (0.79, 1.58) | 1.64 (1.10, 2.44) | 1.09 (0.65, 1.84) | 2.24 (1.22, 4.10) |
| **Other (excludes CVD, cancer, respiratory)** |  |  |  |  |
| Events (n) | 411 | 234 | 228 | 148 |
| Multivariate HR | 1.18 (1.05, 1.33) | 1.30 (1.13, 1.50) | 1.49 (1.29, 1.73) | 2.39 (1.99, 2.88) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S12.** Hazard ratios for all-cause mortality from NHS/NHS II/HPFS stratified by maximum BMI and baseline BMI among never-smokers. The maximum obese – current underweight categories were collapsed with the maximum obese – current normal categories due to sparse cells.

|  |  |
| --- | --- |
| **Hazard Ratios** | **Maximum BMI** |
| **Baseline BMI** | Underweight | Normal | Overweight | Obese I | Obese II |
| Underweight | 1.52 (1.16, 1.99) | 1.82 (1.57, 2.11) | 1.30 (1.22, 1.39) | 2.36 (1.87, 2.97) | 2.54 (1.71, 3.76) |
| Normal |  | 1 (Reference) |
| Overweight |  |  | 1.06 (1.01, 1.11) | 1.44 (1.32, 1.56) | 2.74 (2.22, 3.40) |
| Obese I |  |  |  | 1.29 (1.21, 1.38) | 1.93 (1.73, 2.15) |
| Obese II |  |  |  |  | 2.02 (1.88, 2.17) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration is from (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**OTHER TABLES**

**TABLE S13.** Summary of hazard ratios for all-cause mortality according to maximum BMI in the NHS / NHS II / HPFS comparing the effect of excluding individuals with baseline disease.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exposure** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II**(≥35.0 kg/m2) |
| **All Individuals** |  |  |  |  |  |
| *No exclusions* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 148 / 9.7 | 11183 / 1,060.8 | 12520 / 995.1 | 5362 / 429.9 | 3358 / 263.7 |
| Multivariate HR | 1.47 (1.25, 1.74) | 1 (Reference) | 1.06 (1.03, 1.08) | 1.24 (1.20, 1.29) | 1.73 (1.66, 1.80) |
|  |  |  |  |  |  |
| *Excluding CVD and cancer at baseline* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 113 / 8.2 | 7835 / 916.3 | 8116 / 835.1 | 3572 / 362.5 | 2283 / 222.7 |
| Multivariate HR | 1.61 (1.34, 1.95) | 1 (Reference) | 1.05 (1.02, 1.08) | 1.24 (1.19, 1.29) | 1.76 (1.67, 1.85) |
|  |  |  |  |  |  |
| **Never Smokers Only** |  |  |  |  |  |
| *No exclusions* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 55 / 5.0 | 4180 / 543.3 | 4801 / 497.2 | 2185 / 221.0 | 1545 / 145.5 |
| Multivariate HR | 1.46 (1.11, 1.91) | 1 (Reference) | 1.10 (1.05, 1.15) | 1.34 (1.27, 1.41) | 1.98 (1.86, 2.11) |
|  |  |  |  |  |  |
| *Excluding CVD and cancer at baseline* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 37 / 4.2 | 2866 / 472.7 | 3145 / 423.7 | 1526 / 189.7 | 1052 / 124.3 |
| Multivariate HR | 1.56 (1.12, 2.17) | 1 (Reference) | 1.11 (1.05, 1.17) | 1.38 (1.30, 1.47) | 2.01 (1.87, 2.17) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), total daily energy intake (quintiles), menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Models with all individuals adjust for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day). Follow-up duration is from (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S14.** Summary of hazard ratios for all-cause mortality according to maximum BMI in the NHS / NHS II / HPFS comparing different exclusion criteria for missing BMI information during weight history.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exposure** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II**(≥35.0 kg/m2) |
| **All Individuals** |  |  |  |  |  |
| **All 8 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 66 / 5.2 | 5327 / 597.6 | 5652 / 529.1 | 2359 / 228.4 | 1573 / 147.8 |
| Multivariate HR | 1.59 (1.24, 2.03) | 1 (Reference) | 1.07 (1.03, 1.12) | 1.27 (1.21, 1.34) | 1.74 (1.64, 1.85) |
|  |  |  |  |  |  |
| **At least 7 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 93 / 7.2 | 7892 / 818.3 | 8650 / 747.8 | 3598 / 323.5 | 2362 / 204.3 |
| Multivariate HR | 1.41 (1.15, 1.74) | 1 (Reference) | 1.07 (1.04, 1.11) | 1.25 (1.20, 1.30) | 1.73 (1.65, 1.82) |
|  |  |  |  |  |  |
| **At least 6 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 110 / 8.1 | 9253 / 921.6 | 10315 / 856.5 | 4321 / 369.6 | 2752 / 230.6 |
| Multivariate HR | 1.44 (1.19, 1.74) | 1 (Reference) | 1.06 (1.03, 1.09) | 1.25 (1.20, 1.30) | 1.73 (1.66, 1.81) |
|  |  |  |  |  |  |
| **At least 5 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 121 / 8.8 | 10057 / 982.2 | 11354 / 920.0 | 4789 / 397.3 | 3017 / 246.0 |
| Multivariate HR | 1.46 (1.22, 1.75) | 1 (Reference) | 1.06 (1.03, 1.09) | 1.25 (1.21, 1.30) | 1.73 (1.66, 1.81) |
|  |  |  |  |  |  |
| **At least 4 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 129 / 9.1 | 10573 / 1,018.8 | 11944 / 956.7 | 5065 / 413.6 | 3191 / 255.1 |
| Multivariate HR | 1.45 (1.22, 1.73) | 1 (Reference) | 1.06 (1.03, 1.09) | 1.25 (1.21, 1.29) | 1.73 (1.66, 1.80) |
|  |  |  |  |  |  |
| **At least 3 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 141 / 9.4 | 10949 / 1,043.5 | 12303 / 979.4 | 5243 / 423.1 | 3295 / 260.4 |
| Multivariate HR | 1.46 (1.24, 1.73) | 1 (Reference) | 1.06 (1.03, 1.08) | 1.24 (1.20, 1.29) | 1.72 (1.65, 1.79) |
|  |  |  |  |  |  |
| **At least 2 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 148 / 9.7 | 11183 / 1,060.8 | 12520 / 995.1 | 5362 / 429.9 | 3358 / 263.7 |
| Multivariate HR | 1.47 (1.25, 1.74) | 1 (Reference) | 1.06 (1.03, 1.08) | 1.24 (1.20, 1.29) | 1.73 (1.66, 1.80) |
|  |  |  |  |  |  |
| **At least 1 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 148 / 9.7 | 11263 / 1,065.9 | 12567 / 998.5 | 5386 / 431.6 | 3370 / 264.7 |
| Multivariate HR | 1.48 (1.25, 1.74) | 1 (Reference) | 1.05 (1.03, 1.08) | 1.24 (1.20, 1.29) | 1.73 (1.66, 1.80) |
|  |  |  |  |  |  |
| **Never-Smokers** |  |  |  |  |  |
| **All 8 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 23 / 2.9 | 1982 / 321.5 | 2141 / 272.3 | 951 / 121.4 | 721 / 85.1 |
| Multivariate HR | 1.49 (0.97, 2.27) | 1 (Reference) | 1.12 (1.05, 1.20) | 1.38 (1.28, 1.50) | 2.00 (1.82, 2.19) |
|  |  |  |  |  |  |
| **At least 7 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 30 / 3.9 | 2934 / 432.1 | 3282 / 380.8 | 1467 / 168.8 | 1079 / 115.3 |
| Multivariate HR | 1.39 (0.96, 2.00) | 1 (Reference) | 1.12 (1.07, 1.18) | 1.39 (1.30, 1.48) | 1.97 (1.83, 2.13) |
|  |  |  |  |  |  |
| **At least 6 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 35 / 4.3 | 3441 / 482.0 | 3908 / 432.9 | 1762 / 191.7 | 1247 / 128.4 |
| Multivariate HR | 1.27 (0.91, 1.79) | 1 (Reference) | 1.09 (1.04, 1.14) | 1.36 (1.28, 1.45) | 1.97 (1.84, 2.11) |
|  |  |  |  |  |  |
| **At least 5 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 41 / 4.6 | 3740 / 508.8 | 4320 / 462.4 | 1925 / 204.9 | 1370 / 136.2 |
| Multivariate HR | 1.39 (1.02, 1.91) | 1 (Reference) | 1.09 (1.04, 1.14) | 1.34 (1.27, 1.42) | 1.99 (1.86, 2.12) |
|  |  |  |  |  |  |
| **At least 4 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 46 / 4.8 | 3958 / 524.5 | 4545 / 479.8 | 2048 / 212.8 | 1459 / 141.1 |
| Multivariate HR | 1.37 (1.02, 1.84) | 1 (Reference) | 1.09 (1.04, 1.14) | 1.34 (1.27, 1.41) | 1.97 (1.85, 2.10) |
|  |  |  |  |  |  |
| **At least 3 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 46 / 4.8 | 3958 / 524.5 | 4545 / 479.8 | 2048 / 212.8 | 1459 / 141.1 |
| Multivariate HR | 1.44 (1.09, 1.91) | 1 (Reference) | 1.09 (1.05, 1.14) | 1.33 (1.26, 1.41) | 1.97 (1.85, 2.10) |
|  |  |  |  |  |  |
| **At least 2 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 55 / 5.0 | 4180 / 543.3 | 4801 / 497.2 | 2185 / 221.0 | 1545 / 145.5 |
| Multivariate HR | 1.46 (1.11, 1.91) | 1 (Reference) | 1.10 (1.05, 1.15) | 1.34 (1.27, 1.41) | 1.98 (1.86, 2.11) |
|  |  |  |  |  |  |
| **At least 1 surveys** |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 55 / 5.0 | 4213 / 545.7 | 4821 / 498.8 | 2198 / 221.9 | 1554 / 146.0 |
| Multivariate HR | 1.46 (1.11, 1.91) | 1 (Reference) | 1.10 (1.05, 1.14) | 1.33 (1.27, 1.41) | 1.98 (1.86, 2.11) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), total daily energy intake (quintiles), menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Models with all individuals adjust for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day). Follow-up duration is from (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S15.** Summary of all-cause mortality hazard ratios for maximum BMI stratified by baseline physical activity.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Strata** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II**(≥35.0 kg/m2) |
| **All Individuals** |  |  |  |  |  |
| *< 3 MET-hr/wk* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 68 / 3.4 | 4403 / 329.0 | 4833 / 323.3 | 2442 / 162.0 | 1759 / 111.6 |
| Multivariate HR | 1.38 (1.08, 1.76) | 1 (Reference) | 1.01 (0.96, 1.05) | 1.14 (1.08, 1.20) | 1.58 (1.49, 1.68) |
|  |  |  |  |  |  |
| *≥ 3 MET-hr/wk* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 80 / 6.3 | 6780 / 731.9 | 7687 / 671.8 | 2920 / 267.9 | 1599 / 152.1 |
| Multivariate HR | 1.53 (1.22, 1.91) | 1 (Reference) | 1.07 (1.04, 1.11) | 1.30 (1.24, 1.36) | 1.81 (1.71, 1.92) |
|  |  |  |  |  |  |
| **Never-Smokers Only** |  |  |  |  |  |
| *< 3 MET-hr/wk* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 26 / 1.5 | 1499 / 150.3 | 1801 / 150.7 | 991 / 80.3 | 812 / 58.8 |
| Multivariate HR | 1.48 (0.99, 2.21) | 1 (Reference) | 1.06 (0.99, 1.14) | 1.24 (1.14, 1.34) | 1.87 (1.70, 2.05) |
|  |  |  |  |  |  |
| *≥ 3 MET-hr/wk* |  |  |  |  |  |
| Events (n) / 1000 p-yrs | 29 / 3.5 | 2681 / 393.0 | 3000 / 346.5 | 1194 / 140.6 | 733 / 86.6 |
| Multivariate HR | 1.53 (1.05, 2.23) | 1 (Reference) | 1.11 (1.05, 1.17) | 1.39 (1.29, 1.49) | 2.02 (1.85, 2.20) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Models with all individuals adjust for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day). Follow-up duration is (NHS – 1992 - 2012 / NHS II – 2005 – 2013 / HPFS – 2002 - 2012).

**TABLE S16.** Summary of all-cause mortality hazard ratios for maximum BMI comparing the analysis including all observations or only observations with no missing data for any covariate.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Population** | **Underweight**(<18.5 kg/m2) | **Normal**(18.5-24.9 kg/m2) | **Overweight**(25.0-29.9 kg/m2) | **Obese I**(30.0-34.9 kg/m2) | **Obese II**(≥35.0 kg/m2) |
|  | **All Individuals** |
| **All Observations** |  |  |  |  |  |
| Events (n) / 1,000 p-yrs | 148 / 9.7 | 11183 / 1,060.8 | 12520 / 995.1 | 5362 / 429.9 | 3358 / 263.7 |
| Multivariate HR | 1.47 (1.25, 1.74) | 1 (Reference) | 1.06 (1.03, 1.08) | 1.24 (1.20, 1.29) | 1.73 (1.66, 1.80) |
| **Complete Case Analysis** |  |  |  |  |  |
| Events (n) / 1,000 p-yrs | 90 / 7.6 | 8379 / 872.5 | 9530 / 811.5 | 3753 / 337.6 | 2138 / 199.0 |
| Multivariate HR | 1.40 (1.13, 1.73) | 1 (Reference) | 1.06 (1.03, 1.09) | 1.25 (1.20, 1.30) | 1.73 (1.65, 1.82) |
|  |  |
|  | **Never-Smokers** |
| **All Observations** |  |  |  |  |  |
| Events (n) / 1,000 p-yrs | 55 / 5.0 | 4180 / 543.3 | 4801 / 497.2 | 2185 / 221.0 | 1545 / 145.5 |
| Multivariate | 1.46 (1.11, 1.91) | 1 (Reference) | 1.10 (1.05, 1.15) | 1.34 (1.27, 1.41) | 1.98 (1.86, 2.11) |
| **Complete Case Analysis** |  |  |  |  |  |
| Events (n) / 1,000 p-yrs | 29 / 3.8 | 3111 / 447.1 | 3495 / 400.5 | 1449 / 170.1 | 926 / 107.7 |
| Multivariate HR | 1.14 (0.78, 1.67) | 1 (Reference) | 1.10 (1.04, 1.15) | 1.37 (1.28, 1.46) | 2.03 (1.88, 2.20) |

Multivariate adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), and total daily energy intake (quintiles). NHS/NHSII additionally adjust for menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). NHS II also adjusts for oral contraceptive use (ever / never). Follow-up duration from (NHS – 1992- 2012 / NHS II – 2005 - 2013 / HPFS – 2002 - 2012).

**TABLE S17.** Estimates for all-cause mortality in the NHS and extended weight history among all individuals according to maximum BMI.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weight History | Underweight(<18.5 kg/m2) | Normal(18.5-24.9 kg/m2) | Overweight(25.0-29.9 kg/m2) | Obese I(30.0-34.9 kg/m2) | Obese II(≥35.0 kg/m2) |
| None | 2.12 (1.97, 2.28) | 1 (Reference) | 0.90 (0.86, 0.93) | 1.00 (0.95, 1.05) | 1.39 (1.32, 1.48) |
| 2 years | 2.02 (1.85, 2.21) | 1 (Reference) | 0.91 (0.88, 0.94) | 1.01 (0.97, 1.06) | 1.42 (1.34, 1.50) |
| 4 years | 1.89 (1.70, 2.09) | 1 (Reference) | 0.92 (0.88, 0.95) | 1.02 (0.98, 1.07) | 1.42 (1.35, 1.50) |
| 6 years | 1.77 (1.57, 1.99) | 1 (Reference) | 0.93 (0.90, 0.97) | 1.04 (1.00, 1.09) | 1.44 (1.36, 1.51) |
| 8 years | 1.77 (1.55, 2.02) | 1 (Reference) | 0.95 (0.91, 0.98) | 1.05 (1.01, 1.10) | 1.46 (1.39, 1.53) |
| 10 years | 1.82 (1.58, 2.10) | 1 (Reference) | 0.96 (0.92, 1.00) | 1.06 (1.02, 1.11) | 1.48 (1.41, 1.56) |
| 12 years | 1.91 (1.64, 2.23) | 1 (Reference) | 0.97 (0.94, 1.01) | 1.06 (1.02, 1.11) | 1.49 (1.42, 1.57) |
| 14 years | 1.85 (1.57, 2.17) | 1 (Reference) | 0.98 (0.94, 1.02) | 1.07 (1.02, 1.12) | 1.51 (1.44, 1.59) |
| 16 years | 1.78 (1.49, 2.12) | 1 (Reference) | 0.98 (0.94, 1.02) | 1.07 (1.03, 1.12) | 1.51 (1.44, 1.59) |
| 18 years | 1.77 (1.47, 2.13) | 1 (Reference) | 0.98 (0.95, 1.02) | 1.08 (1.03, 1.13) | 1.52 (1.45, 1.60) |
| 20 years | 1.79 (1.47, 2.19) | 1 (Reference) | 0.98 (0.95, 1.02) | 1.09 (1.04, 1.13) | 1.53 (1.45, 1.60) |
| 22 years | 1.73 (1.40, 2.15) | 1 (Reference) | 0.99 (0.95, 1.02) | 1.09 (1.04, 1.14) | 1.54 (1.46, 1.61) |
| 24 years | 1.59 (1.25, 2.02) | 1 (Reference) | 0.99 (0.95, 1.02) | 1.09 (1.04, 1.14) | 1.54 (1.47, 1.62) |

Multivariate HR adjusts for smoking (never / ever / 1-14 / 15-24 / ≥24 cigs/day), race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), total daily energy intake (quintiles), menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). Follow-up duration is from 2000 – 2012.

**TABLE S17.** Estimates for all-cause mortality in the NHS and extended weight history among never smokers according to maximum BMI.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Weight History | Underweight(<18.5 kg/m2) | Normal(18.5-24.9 kg/m2) | Overweight(25.0-29.9 kg/m2) | Obese I(30.0-34.9 kg/m2) | Obese II(≥35.0 kg/m2) |
| None | 1.75 (1.52, 2.00) | 1 (Reference) | 0.96 (0.90, 1.02) | 1.16 (1.08, 1.26) | 1.74 (1.59, 1.92) |
| 2 years | 1.62 (1.37, 1.92) | 1 (Reference) | 0.98 (0.93, 1.05) | 1.16 (1.07, 1.25) | 1.77 (1.62, 1.94) |
| 4 years | 1.56 (1.28, 1.89) | 1 (Reference) | 1.00 (0.94, 1.06) | 1.17 (1.09, 1.26) | 1.77 (1.63, 1.93) |
| 6 years | 1.38 (1.11, 1.73) | 1 (Reference) | 1.01 (0.95, 1.08) | 1.19 (1.10, 1.28) | 1.77 (1.63, 1.93) |
| 8 years | 1.45 (1.14, 1.84) | 1 (Reference) | 1.03 (0.97, 1.10) | 1.20 (1.11, 1.29) | 1.78 (1.64, 1.94) |
| 10 years | 1.44 (1.12, 1.86) | 1 (Reference) | 1.04 (0.98, 1.11) | 1.19 (1.11, 1.29) | 1.79 (1.65, 1.94) |
| 12 years | 1.45 (1.10, 1.91) | 1 (Reference) | 1.05 (0.99, 1.12) | 1.21 (1.12, 1.30) | 1.78 (1.64, 1.94) |
| 14 years | 1.44 (1.08, 1.92) | 1 (Reference) | 1.06 (0.99, 1.12) | 1.20 (1.11, 1.29) | 1.80 (1.66, 1.95) |
| 16 years | 1.46 (1.06, 2.00) | 1 (Reference) | 1.06 (0.99, 1.12) | 1.20 (1.12, 1.29) | 1.78 (1.64, 1.93) |
| 18 years | 1.46 (1.04, 2.04) | 1 (Reference) | 1.05 (0.99, 1.12) | 1.19 (1.10, 1.28) | 1.78 (1.64, 1.93) |
| 20 years | 1.39 (0.97, 1.98) | 1 (Reference) | 1.05 (0.99, 1.12) | 1.19 (1.11, 1.28) | 1.76 (1.62, 1.90) |
| 22 years | 1.44 (0.99, 2.09) | 1 (Reference) | 1.05 (0.99, 1.12) | 1.18 (1.10, 1.27) | 1.76 (1.63, 1.91) |
| 24 years | 1.51 (1.01, 2.25) | 1 (Reference) | 1.06 (0.99, 1.12) | 1.19 (1.10, 1.28) | 1.77 (1.64, 1.92) |

Multivariate HR adjusts for race (white / non-white), family history of CVD (yes / no), family history of cancer (yes / no), alcohol (categories), total daily energy intake (quintiles), menopause (pre / post/ unsure), post-menopausal hormone use (current / ever / never), and parity (0 / 1 / 2 / 3 / 4+). Follow-up duration is from 2000 – 2012.