**SUPPLEMENTARY TABLES**

# Supplementary Table 1 - Details of the multiple imputation procedure.

|  |  |
| --- | --- |
| Software used: | IBM SPSS Statistics 21 |
| Imputation method and key settings: | Markov Chain Monte Carlo (MCMC) method |
| Number of imputed data sets created: | 5 |
| Variable included in the imputation procedure (imputed or used as predictors of missing data): | Waist circumference, BMI, smoking, age of menopause, family history of breast cancer, parity, education level, age of first pregnancy, hormone use, physical activity (MET hours), total fat intake, total iron intake, alcohol intake, estrogen level, SHBG level, total cholesterol.  Age, breast cancer diagnosis, energy-adjusted total red meat intake, energy-adjusted unprocessed red meat intake, energy-adjusted processed meat intake, energy-adjusted poultry intake, energy-adjusted total fish intake, energy-adjusted lean fish intake, energy-adjusted fatty fish intake, energy-adjusted shellfish intake, energy-adjusted total seafood intake, energy-adjusted total dairy intake, energy-adjusted total milk intake, energy-adjusted cheese intake, energy-adjusted yoghurt intake, energy-adjusted egg intake, energy-adjusted nuts and seeds intake, energy-adjusted pulses intake, energy-adjusted soy and tofu intake. |
| Treatment of non-normally distributed variables: | Predictive mean matching |
| Treatment of binary/categorical variables: | Logistic regression models |

# Supplementary table 2 – Comparison between original data and after the multiple imputation procedure

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | Baseline | After multiple imputation | |
|  | | Total population (n) = 3209 | | |
| Start age (years)  Missing (n,%) | | 68.0 (8.04)  - | | 68.0  - |
| Alcohol intake (gram/day) | | 1.31 (0.0 – 104.8)\*\* | | 6.11 |
| Smoking status (n,%) | |  | |  |
|  | Never | 1643 (51.2%) | | 1650 (51.4%)\* |
|  | Former | 931 (29.0%) | | 940 (29.3%)\* |
|  | Current | 614 (19.1%) | | 618 (19.3%)\* |
|  | Missing | 21 (0.7%) | | - |
| BMI (kg/m2) | | 26.71 (4.01) | | 26.8 |
|  | ≥24,9 (n,%) | 1106 (34.5%) | | 1141 (35.5%)\* |
|  | 25 - 29,9 (n,%) | 1398 (43.6%) | | 1434 (44.7%)\* |
|  | >30 (n,%) | 632 (19.7%) | | 635 (19.8%)\* |
|  | Missing | 73 (2.3%) | | - |
| Family history of breast cancer (n,%) | |  | |  |
|  | Yes | 264 (8.2%) | | 539 (16.8%)\* |
|  | No | 1361 (42.4%) | | 2670 (83.2%)\* |
|  | Missing | 1584 (49.4%) | | - |
| Physical activity (MET hours per week) | | 63.7 (0 - 288)\* | | 63.7 (0 - 288)\* |
|  | Missing | 883 (27.5%) | | - |
| Education (n,%) | |  | |  |
|  | Primary | 1350 (42.1%) | | 1356 (42.2%)\* |
|  | Higher education | 1844 (57.5%) | | 1853 (57.8%)\* |
|  | Missing | 15 (0.5%) | | - |
| Parity (n,%) | |  | |  |
|  | 0 - 2 pregnancies | 1102 (34.3%) | | 1975 (61.5%)\* |
|  | ≥3 pregnancies | 854 (26.6%) | | 1234 (38.5%)\* |
|  | Missing | 1253 (39.0%) | | - |
| Age of menopause (years)  Missing (n,%) | | 48.9 (5.1)  - | | 49.1 |
| Hormonal therapy (n,%) | |  | |  |
|  | Yes | 128 (4%) | | 192 (6%)\* |
|  | No | 1945 (60.6%) | | 3017 (94%)\* |
|  | Missing | 1136 (35.4%) | | - |
| History of breast feeding (n,%) | |  | |  |
|  | Yes | 1526 (47.6%) | | 2524 (78.7%) |
|  | No | 349 (10.8%) | | 649 (20.2%) |
|  | N.A. | 457 (14.2%) | | - |
|  | Missing | 877 (27.3%) | | - |
| Total energy intake (kcal/day)  Missing (n,%) | | 1786.32 (403.87)  - | | 1786.32  - |
| Total fat intake (g/day) | | 72.73 (23.36) | | 72.7 |
| Iron intake (mg/day) | | 11.09 (2.53) | | 11.09 |
| Age of first pregnancy (n,%) | | 24.55 (6,63) | |  |
|  | < 30 | 1620 (50.5%) | | 2077 (64.7%) |
|  | >31 | 223 (6.9%) | | 406 (12.7%) |
|  | Never | 76 (2.4%) | | 726 (22.6%) |
|  | Missing | 1289 (40.2%) | | - |
| Waist circumference  Missing (n,%) | | 87.24 (11,27)  211 (6.5%) | | 87.3 |
| Cholesterol level (mmol/litre)  Missing (n,%) | | 6.9 (1.2)  23 (0.7%) | | 6.9 |
| Estradiol (pmol/litre)  Missing (n,%) | | 21.40 (18.4 – 980.3)\*  1274 (40%) | | 34.7 |
| SHBG (nmol/litre)  Missing (n,%) | | 70.08 (34.3)  1274 (40%) | | 72.4 |
| Values expressed as mean (SD) unless noted otherwise . \*median(range) | | | | |

# Supplementary table 3 – Cox regression analyses without multiple imputation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Quartiles of intake | | | | *P* for trend |
|  |  | Lowest quartile | 2nd quartile | 3rd quartile | highest quartile |
| **Red meat** | |  |  |  |  |  |
|  | Number of cases | 48 | 58 | 48 | 45 |  |
|  | Age-adjusted | Reference | 1.18 (0.81 – 1.74) | 0.95 (0.64 – 1.42) | 0.91 (0.61 – 1.37) | *0.43* |
|  | Multivariate | Reference | 0.44 (0.15 – 1.28) | 0.59 (0.20 – 1.70) | 0.57 (0.24 – 1.40) | *0.32* |
| **Processed meat** | |  |  |  |  |  |
|  | Number of cases | 47 | 52 | 54 | 46 | - |
|  | Age-adjusted | Reference | 1.12 (0.75 – 1.66) | 1.15 (0.78 – 1.70) | 0.99 (0.66 – 1.48) | *>0.99* |
|  | Multivariate | Reference | 1.75 (0.60 – 5.07) | 1.48 (0.51 – 4.30) | 1.16 (0.38 – 3.53) | *0.92* |
| **Poultry** | |  |  |  |  |  |
|  | Number of cases | 39 | 56 | 61 | 43 |  |
|  | Age-adjusted | Reference | 1.40 (0.93 – 2.11) | 1.47 (0.98 – 2.21) | 1.01 (0.66 – 1.57) | *0.93* |
|  | Multivariate | Reference | 3.48 (0.96 – 12.60) | 3.39 (0.95 – 12.18) | 0.78 (0.15 – 3.90) | *0.59* |
| **Total fish** | |  |  |  |  |  |
|  | Number of cases | 45 | 45 | 52 | 57 |  |
|  | Age-adjusted | Reference | 1.02 (0.67 – 1.54) | 1.13 (0.75 – 1.68) | 1.24 (0.84 – 1.83) | *0.24* |
|  | Multivariate | Reference | 1.00 (0.37 – 2.73) | 1.40 (0.56 – 3.50) | 0.59 (0.18 – 1.99) | *0.93* |
| **Fatty fish** | |  |  |  |  |  |
|  | Number of cases | 54 | 49 | 39 | 57 |  |
|  | Age-adjusted | Reference | 0.90 (0.61 – 1.32) | 0.70 (0.47 – 1.06) | 1.00 (0.69 – 1.45) | *0.74* |
|  | multivariate | Reference | 1.24 (0.47 – 3.29) | 0.68 (0.21 – 2.15) | 1.27 (0.46 – 3.51) | *0.93* |
| **Lean fish** | |  |  |  |  |  |
|  | Number of cases | 43 | 41 | 62 | 53 |  |
|  | Age-adjusted | Reference | 0.98 (0.64 – 1.50) | 1.44 (0.97 – 2.13) | 1.21 (0.81 – 1.82) | *0.13* |
|  | multivariate | Reference | 1.22 (0.40 – 3.68) | 2.32 (0.88 – 6.09) | 0.85 (0.24 – 3.05) | *0.63* |
| **Total dairy** | |  |  |  |  |  |
|  | Number of cases | 45 | 55 | 56 | 43 |  |
|  | Age-adjusted | Reference | 1.29 (0.87 – 1.91) | 1.29 (0.87 – 1.91) | 0.99 (0.65 – 1.51) | *0.99* |
|  | Multivariate | Reference | 2.86 (0.99 – 8.17) | 1.78 (0.58 – 5.51) | 1.03 (0.30 – 3.63) | *0.74* |
| **Cheese** | |  |  |  |  |  |
|  | Number of cases | 45 | 50 | 50 | 54 |  |
|  | Age-adjusted | Reference | 1.09 (0.73 – 1.63) | 1.06 (0.71 – 1.58) | 1.11 (0.75 – 1.65) | *0.65* |
|  | Multivariate | Reference | 1.50 (0.55 – 4.08) | 1.26 (0.45 – 3.48) | 0.79 (0.26 – 2.37) | *0.62* |
| **Milk** | |  |  |  |  |  |
|  | Number of cases | 41 | 60 | 48 | 50 |  |
|  | Age-adjusted | Reference | 1.59 (1.06 – 2.36)\* | 1.22 (0.81 – 1.86) | 1.34 (0.88 – 2.02) | *0.40* |
|  | Multivariate | Reference | 1.86 (0.60 – 5.76) | 2.58 (0.90 – 7.41) | 1.56 (0.47 – 5.18) | *0.31* |
| **Yoghurt** | |  |  |  |  |  |
|  | Number of cases | 48 | 58 | 45 | 48 |  |
|  | Age-adjusted | Reference | 1.16 (0.79 – 1.70) | 0.89 (0.60 – 1.34) | 0.97 (0.65 – 1.45) | *0.57* |
|  | Multivariate | Reference | 0.60 (0.23 – 1.54) | 0.84 (0.34 – 2.06) | 0.21 (0.06 – 0.78)\* | *0.04\** |
| **Eggs** | |  |  |  |  |  |
|  | Number of cases | 34 | 46 | 56 | 63 |  |
|  | Age-adjusted | Reference | 1.33 (0.85 – 2.07) | 1.63 (1.06 – 2.50)\* | 1.87 (1.23 – 2.83)\* | *<0.01\** |
|  | Multivariate | Reference | 1.72 (0.56 – 5.31) | 0.67 (0.19 – 2.37) | 1.61 (0.57 – 4.61) | *0.60* |
| HR: hazard ratio; CI: confidence interval; Multivariate model: Age-adjusted model + adjustment for physical activity (continuously in MET scores), smoking status (former, never of current smoker), history of breast cancer in first degree relatives (yes or no), history of hormone use after menopause (yes or no), parity (0 to 2 pregnancies or >3 pregnancies), breast feeding history (yes or no) and age of menopause (continuously). Additional adjustment for educational level, alcohol intake, iron intake did not alter the HRs with more than 10%. \*p < 0.05 | | | | | | | |

# Supplementary table 4 – Sensitivity analysis after excluding cases within 2 years of follow up

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Quartiles of intake | | | |
| Lowest quartile | 2nd quartile | 3rd quartile | highest quartile |
| Red meat | | Reference | 1.05 (0.69 – 1.61) | 0.79 (0.51 – 1.24) | 0.56 (0.34 – 0.92)\* |
|  | Processed meat | Reference | 1.00 (0.64 – 1.56) | 1.09 (0.71 – 1.69) | 0.73 (0.45 – 1.18) |
| Poultry | | Reference | 1.35 (0.84 – 2.16) | 1.61 (1.02 – 2.55)\* | 0.97 (0.59 – 1.61) |
| Total fish | | Reference | 1.04 (0.65 – 1.67) | 1.17 (0.74 – 1.85) | 1.27 (0.80 – 1.99) |
|  | Fatty fish | Reference | 0.83 (0.53 – 1.32) | 0.79 (0.50 – 1.26) | 1.10 (0.71 – 1.69) |
|  | Lean fish | Reference | 0.79 (0.48 – 1.28) | 1.30 (0.85 – 2.01) | 1.07 (0.68 – 1.69) |
| Dairy | | Reference | 1.08 (0.70 – 1.69) | 1.10 (0.71 – 1.70) | 0.84 (0.52 – 1.35) |
|  | Cheese | Reference | 1.07 (0.67 – 1.69) | 1.04 (0.65 – 1.65) | 1.16 (0.74 – 1.83) |
|  | Milk | Reference | 1.71 (0.94 – 3.10) | 1.27 (0.93 – 2.32) | 1.14 (0.70 – 1.85) |
|  | Yoghurt | Reference | 1.20 (0.77 – 1.85) | 0.92 (0.58 – 1.47) | 0.89 (0.56 – 1.41) |
| Eggs | | Reference | 1.52 (0.93 – 2.48) | 1.59 (0.97 – 2.58) | 1.59 (0.98 – 2.59) |

HR: hazard ratio; CI: confidence interval; Age-adjusted model + adjustment for physical activity (continuously in MET scores), smoking status (former, never of current smoker), history of breast cancer in first degree relatives (yes or no), history of hormone use after menopause (yes or no), parity (0 to 2 pregnancies or >3 pregnancies), breast feeding history (yes or no) and age of menopause (continuously). Additional adjustment for educational level, alcohol intake, iron intake did not alter the HRs with more than 10%. \*p < 0.05