**Supplementary Table 1 Baseline characteristics of the subjects according to serum AST levels**

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| --- | --- | --- | --- | --- | --- |
| **Variables** | **Serum AST levels** | | | | ***P*-value** |
| **Quartile 1** | **Quartile 2** | **Quartile 3** | **Quartile 4** |
| N (%) | 3335 (19.42) | 4823 (28.08) | 4657 (27.12) | 4358 (25.38) |  |
| Age (years) | 62.28 ± 8.47 | 63.16 ± 7.94 | 63.65 ± 7.59 | 63.76 ± 7.56 | < 0.001 |
| Male, n (%) | 1206 (36.16) | 1909 (39.58) | 2126 (45.65) | 2133 (48.94) | < 0.001 |
| Family history of diabetes, n (%) | 153 (4.7) | 190 (4.06) | 162 (3.57) | 140 (3.3) | 0.04 |
| Smoking, n (%) |  |  |  |  | < 0.001 |
| Never | 2384 (72.22) | 3512 (73.41) | 3282 (71.05) | 3041 (70.18) |  |
| Ever | 276 (8.36) | 462 (9.66) | 576 (12.47) | 583 (13.45) |  |
| Current | 641 (19.42) | 810 (16.93) | 761 (16.48) | 709 (16.36) |  |
| Drinking, n (%) |  |  |  |  | < 0.001 |
| Never | 2601 (78.2) | 3742 (77.68) | 3501 (75.24) | 3123 (71.69) |  |
| Ever | 167 (5.02) | 210 (4.36) | 254 (5.46) | 239 (5.49) |  |
| Current | 558 (16.78) | 865 (17.96) | 898 (19.3) | 994 (22.82) |  |
| Exercise, n (%) |  |  |  |  | < 0.001 |
| Yes | 2936 (88.04) | 4299 (89.14) | 4217 (90.55) | 3888 (89.22) |  |
| No | 399 (11.96) | 524 (10.86) | 440 (9.45) | 470 (10.78) |  |
| BMI (kg/m2) | 24.31 ± 3.25 | 24.34 ± 3.26 | 24.31 ± 3.35 | 24.50 ± 3.56 | 0.03 |
| Waist circumference (cm) | 82.86 ± 9.71 | 82.27 ± 9.18 | 81.97 ± 9.26 | 82.80 ± 9.88 | < 0.001 |
| Fasting plasma glucose (mmol/L) | 5.51 ± 0.58 | 5.51 ± 0.58 | 5.52 ± 0.57 | 5.57 ± 0.59 | < 0.001 |
| Systolic blood pressure (mmHg) | 128.06 ± 18.86 | 127.70 ± 18.40 | 127.91 ± 18.06 | 129.20 ± 18.07 | < 0.001 |
| Diastolic blood pressure (mmHg) | 77.86 ± 11.07 | 77.42 ± 11.02 | 77.25 ± 10.52 | 77.56 ± 10.76 | 0.09 |
| LDL-C (mmol/L) | 3.04 ± 0.81 | 3.01 ± 0.76 | 3.02 ± 0.89 | 2.98 ± 0.82 | 0.021 |
| HDL-C (mmol/L) | 1.38 ± 0.37 | 1.44 ± 0.40 | 1.47 ± 0.41 | 1.49 ± 0.42 | < 0.001 |
| TG (mmol/L) | 1.37 ± 1.01 | 1.35 ± 0.75 | 1.36 ± 0.88 | 1.44 ± 0.97 | < 0.001 |
| TC (mmol/L) | 5.11 ± 0.97 | 5.16 ± 0.91 | 5.18 ± 0.94 | 5.19 ± 0.97 | 0.001 |
| ALT (U/L) | 14 (12-17) | 17 (14-21) | 21 (17-26) | 31 (24-42) | < 0.001 |
| Incident diabetes n (%) | 216 (6.48) | 285 (5.91) | 308 (6.61) | 350 (8.03) | < 0.001 |

AST, aspartate aminotransferase; BMI, body mass index; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; TG, triglycerides; TC, total cholesterol; ALT, alanine aminotransferase.

**Supplementary Table 2 Hazard Ratios (HRs) for risks of diabetes associated with a 1-SD increment in the natural log of ALT**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Cases/person-years** | **Model 1** | **Model 2** | **Model 3** | ***P-*interaction** |
| **Over all** | 1159/77089 | 1.32 (1.26-1.39) | 1.33 (1.27-1.40) | 1.26 (1.19-1.33) |  |
| **Stratified by sex** | |  |  |  | 0.37 |
| Male | 508/32602 | 1.44 (1.34-1.55) | 1.44 (1.33-1.55) | 1.32 (1.21-1.44) |  |
| Female | 651/44487 | 1.36 (1.27-1.46) | 1.38 (1.29-1.49) | 1.30 (1.21-1.41) |  |
| **Stratified by family history of diabetes** | |  |  |  | 0.29 |
| Yes | 59/2911 | 1.56 (1.27-1.91) | 1.57 (1.26-1.96) | 1.43 (1.13-1.81) |  |
| No | 1074/72144 | 1.40 (1.32-1.47) | 1.40 (1.33-1.48) | 1.30 (1.23-1.38) |  |
| **Stratified by current drinking** | |  |  |  | 0.84 |
| Yes | 234/14823 | 1.34 (1.17-1.52) | 1.35 (1.18-1.55) | 1.20 (1.04-1.38) |  |
| No | 925/62170 | 1.41 (1.33-1.49) | 1.42 (1.35-1.50) | 1.33 (1.25-1.42) |  |
| **Stratified by BMI** | |  |  |  | 0.66 |
| Normal | 303/36134 | 1.29 (1.15-1.43) | 1.30 (1.17-1.45) | 1.29 (1.15-1.44) |  |
| Overweight/obesity | 843/39928 | 1.33 (1.25-1.42) | 1.34 (1.26-1.43) | 1.31 (1.23-1.40) |  |
| **Stratified by waist circumference** | |  |  |  | 0.83 |
| Normal | 348/36472 | 1.31 (1.18-1.44) | 1.34 (1.21-1.48) | 1.29 (1.16-1.44) |  |
| Abdominal obesity | 794/39138 | 1.37 (1.28-1.46) | 1.38 (1.29-1.47) | 1.32 (1.23-1.41) |  |

Model 1: adjusted for age, sex.

Model 2: adjusted for variables in model 1 plus drinking, smoking, exercise, and family history of diabetes.

Model 3: adjusted for variables in model 2 plus baseline BMI and waist circumference. Except for the stratified variable.