**Supplementary Table 1.** Sensitivity analysis of metabolic obesity phenotypes at baseline with risk of all-cause mortality when Obesity defined by WC.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Metabolically healthy and obesity status** | **No. of deaths** | **Person-years** | **Mortality a** | **HR (95% CI) b** | ***P* value b** | **HR (95% CI) c** | ***P* value c** |
| **Excluding participants who died within 1 year (n=15,640)** |
| **MHNO (n=1,898)** | 58 | 11,654.94 | 4.98 | 1.00 (ref) | - | 1.00 (ref) | - |
| **MHO (n=436)** | 9 | 2,676.41 | 3.36 | 1.06 (0.96-1.18) | 0.2545 | 0.99 (0.89-1.10) | 0.8527 |
| **MUNO (n=6,554)** | 409 | 38,648.73 | 10.58 | 1.27 (1.21-1.34) | <0.0001 | 1.20 (1.14-1.26) | <0.0001 |
| **MUO (n=6,752)** | 324 | 39,791.18 | 8.14 | 1.37 (1.30-1.44) | <0.0001 | 1.20 (1.13-1.27) | <0.0001 |
| **Excluding participants with diabetes at baseline** **(n=14,423)** |
| **MHNO (n=1,903)** | 63 | 11,657.21 | 5.40 | 1.00 (ref) | - | 1.00 (ref) | - |
| **MHO (n=439)** | 12 | 2,677.71 | 4.48 | 1.06 (0.96-1.18) | 0.2511 | 0.99 (0.89-1.10) | 0.7870 |
| **MUNO (n=6,212)** | 388 | 36,596.08 | 10.60 | 1.26 (1.20-1.33) | <0.0001 | 1.19 (1.13-1.25) | <0.0001 |
| **MUO (n=5,869)** | 265 | 34,670.97 | 7.64 | 1.34 (1.27-1.41) | <0.0001 | 1.18 (1.11-1.24) | <0.0001 |
| **Excluding participants who smoke (n=11,491)** |
| **MHNO (n=1,091)** | 31 | 6,647.33 | 4.66 | 1.00 (ref) | - | 1.00 (ref) | - |
| **MHO (n=367)** | 8 | 2,237.98 | 3.57 | 1.04 (0.93-1.18) | 0.4827 | 0.96 (0.85-1.09) | 0.5406 |
| **MUNO (n=4,257)** | 241 | 24,996.85 | 9.64 | 1.26 (1.18-1.35) | <0.0001 | 1.18 (1.10-1.26) | <0.0001 |
| **MUO (n=5,776)** | 292 | 33,883.26 | 8.62 | 1.34 (1.25-1.43) | <0.0001 | 1.16 (1.09-1.24) | <0.0001 |

Abbreviations: CI, confidence interval; HR, hazard ratio; MHNO, metabolically healthy non-obesity; MHO, metabolically healthy obesity; MUNO, metabolically unhealthy non-obesity; MUO, metabolically unhealthy obesity; WC, waist circumference; WHtR, waist-to-height ratio.

a Per 1000 person-years.

b Unadjusted model.

c Adjusted for sex, age, alcohol drinking, smoking, physical activity level, education.

**Supplementary Table 2.** Sensitivity analysis of metabolic obesity phenotypes at baseline with risk of all-cause mortality when Obesity defined by WHtR.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Metabolically healthy and obesity status** | **No. of deaths** | **Person-years** | **Mortality a** | **HR (95% CI) b** | ***P* value b** | **HR (95% CI) c** | ***P* value c** |
| **Excluding participants who died within 1 year (15,640)** |
| **MHNO (n=1,604)** | 41 | 9,891.18 | 4.15 | 1.00 (ref) | - | 1.00 (ref) | - |
| **MHO (n=730)** | 26 | 4,440.17 | 5.86 | 1.08 (0.99-1.18) | 0.0799 | 1.00 (0.91-1.09) | 0.9988 |
| **MUNO (n=4,417)** | 266 | 26,170.12 | 10.16 | 1.24 (1.17-1.32) | <0.0001 | 1.18 (1.12-1.26) | <0.0001 |
| **MUO (n=8,889)** | 467 | 52,269.79 | 9.93 | 1.39 (1.31-1.47) | <0.0001 | 1.21 (1.14-1.28) | <0.0001 |
| **Excluding participants with diabetes at baseline (n=14,423)** |
| **MHNO (n=1,607)** | 44 | 9,892.26 | 4.45 | 1.00 (ref) | - | 1.00 (ref) | - |
| **MHO (n=735)** | 31 | 4,442.66 | 6.98 | 1.08 (0.99-1.18) | 0.0773 | 1.00 (0.91-1.09) | 0.9472 |
| **MUNO (n=4,250)** | 256 | 25,147.12 | 10.18 | 1.24 (1.16-1.31) | <0.0001 | 1.18 (1.11-1.25) | <0.0001 |
| **MUO (n=7,831)** | 397 | 46,119.93 | 8.61 | 1.37 (1.29-1.44) | <0.0001 | 1.19 (1.13-1.26) | <0.0001 |
| **Excluding participants who smoke (n=11,491)** |
| **MHNO (n=935)** | 20 | 5,726.95 | 3.49 | 1.00 (ref) | - | 1.00 (ref) | - |
| **MHO (n=523)** | 19 | 3,158.36 | 6.02 | 1.05 (0.94-1.17) | 0.3610 | 0.96 (0.86-1.07) | 0.4210 |
| **MUNO (n=2,918)** | 155 | 17,252.60 | 8.98 | 1.21 (1.12-1.31) | <0.0001 | 1.15 (1.07-1.24) | 0.0003 |
| **MUO (n=7,115)** | 378 | 41,627.51 | 9.08 | 1.36 (1.27-1.46) | <0.0001 | 1.17 (1.09-1.26) | <0.0001 |

Abbreviations: CI, confidence interval; HR, hazard ratio; MHNO, metabolically healthy non-obesity; MHO, metabolically healthy obesity; MUNO, metabolically unhealthy non-obesity; MUO, metabolically unhealthy obesity; WC, waist circumference; WHtR, waist-to-height ratio.

a Per 1000 person-years.

b Unadjusted model.

c Adjusted for sex, age, alcohol drinking, smoking, physical activity level, education.