**Supplementary Material 5. Association between changes in MetS and the risk of breast, endometrial cancer by change in MetS components**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MetS change  status | **Waist circumference** | | **Fasting glucose** | | **TG** | | **HDL** | | **BP** | |
| **Model 1** | **Model 2** | **Model 1** | **Model 2** | **Model 1** | **Model 2** | **Model 1** | **Model 2** | **Model 1** | **Model 2** |
| **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** | **HR (95% CI)** |
| **BREAST CANCER** | | | | | | | | | | |
| Total |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | **1.06 (1.03 - 1.10)** | 0.99 (0.95 - 1.03) | **1.04 (1.01 - 1.08)** | 1.02 (0.99 - 1.06) | **1.07 (1.04 - 1.11)** | 1.03 (1.00 - 1.07) | 1.02 (0.99 - 1.05) | 1.00 (0.97 - 1.03) | **1.08 (1.05 - 1.12)** | **1.04 (1.01 - 1.07)** |
| Developed | **1.06 (1.04 - 1.01)** | 1.08 (1.01 - 0.98) | **1.05 (1.02 - 1.09)** | 1.02 (0.99 - 1.05) | **1.08 (1.04 - 1.11)** | 1.03 (0.99 - 1.06) | **1.04 (1.01 - 1.08)** | 1.01 (0.98 - 1.04) | **1.04 (1.01 - 1.07)** | 0.99 (0.96 - 1.02) |
| Persistent | **1.09 (1.08 - 1.05)** | 1.11 (1.03 – 1.00) | **1.11 (1.08 - 1.14)** | 1.05 (1.02 - 1.08) | **1.13 (1.10 - 1.17)** | **1.06 (1.03 - 1.09)** | **1.08 (1.05 - 1.11)** | 1.03 (1.00 - 1.06) | **1.11 (1.08 - 1.14)** | 1.03 (1.00 - 1.06) |
| Premenopausal |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | 1.06 (0.98 - 0.93) | 1.04 (0.97 - 0.92) | 1.01 (0.96 - 1.07) | 1.00 (0.95 - 1.06) | 1.01 (0.95 - 1.08) | 0.99 (0.93 - 1.06) | 0.98 (0.93 - 1.04) | 0.97 (0.92 - 1.03) | 1.01 (0.96 - 1.07) | 1.00 (0.94 - 1.06) |
| Developed | 1.07 (0.99 - 0.93) | 1.04 (0.97 - 0.92) | 1.04 (0.99 - 1.10) | 1.03 (0.98 - 1.08) | 1.03 (0.97 - 1.10) | 1.01 (0.95 - 1.07) | 0.99 (0.93 - 1.04) | 0.97 (0.92 - 1.02) | 0.99 (0.94 - 1.04) | 0.97 (0.92 - 1.02) |
| Persistent | 1.05 (1.01 - 0.96) | 1.06 (0.99 - 0.94) | 1.01 (0.96 - 1.07) | 0.99 (0.93 - 1.05) | 1.01 (0.95 - 1.09) | 0.98 (0.91 - 1.05) | 1.01 (0.96 - 1.06) | 0.99 (0.94 - 1.04) | 1.05 (0.99 - 1.10) | 1.02 (0.96 - 1.07) |
| Perimenopausal |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | 1.14 (1.05 - 0.95) | 1.17 (1.03 - 0.93) | 1.04 (0.93 - 1.16) | 1.02 (0.91 - 1.14) | 1.04 (0.92 - 1.17) | 1.01 (0.89 - 1.14) | 1.05 (0.95 - 1.17) | 1.03 (0.93 - 1.15) | 1.10 (0.99 - 1.22) | 1.07 (0.97 - 1.19) |
| Developed | 1.16 (1.05 - 0.94) | 1.17 (1.02 - 0.91) | 1.01 (0.91 - 1.12) | 0.98 (0.88 - 1.09) | 1.07 (0.96 - 1.20) | 1.04 (0.93 - 1.16) | 1.05 (0.94 - 1.17) | 1.02 (0.91 - 1.14) | 1.01 (0.91 - 1.12) | 0.98 (0.88 - 1.09) |
| Persistent | 1.31 (1.04 - 0.94) | 1.15 (1.00 - 0.90) | 1.10 (1.00 - 1.22) | 1.05 (0.95 - 1.16) | **1.24 (1.11 - 1.38)** | **1.18 (1.05 - 1.31)** | 1.04 (0.94 - 1.15) | 1.00 (0.90 - 1.11) | **1.14 (1.03 - 1.25)** | 1.08 (0.98 - 1.19) |
| Postmenopausal |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | 1.11 (1.05 – 1.00) | 1.09 (1.02 - 0.98) | **1.07 (1.03 - 1.12)** | 1.04 (1.00 - 1.09) | **1.11 (1.06 - 1.15)** | 1.06 (1.02 - 1.11) | 1.05 (1.00 - 1.09) | 1.02 (0.98 - 1.06) | **1.12 (1.08 - 1.17)** | **1.07 (1.02 - 1.11)** |
| Developed | **1.09 (1.08 - 1.04)** | 1.13 (1.04 – 1.00) | **1.07 (1.03 - 1.11)** | 1.02 (0.98 - 1.07) | **1.10 (1.06 - 1.15)** | 1.04 (1.00 - 1.09) | 1.08 (1.04 - 1.13) | 1.04 (1.00 - 1.09) | 1.08 (1.04 - 1.13) | 1.02 (0.98 - 1.06) |
| Persistent | **1.12 (1.13 - 1.09)** | **1.17 (1.08 - 1.04)** | **1.16 (1.12 - 1.20)** | **1.08 (1.04 - 1.12)** | **1.17 (1.12 - 1.21)** | **1.08 (1.04 - 1.12)** | 1.13 (1.09 - 1.17) | **1.08 (1.04 - 1.12)** | **1.14 (1.10 - 1.18)** | **1.04 (1.01 - 1.08)** |
| **ENDOMETRIAL CANCER** | | | | | | | | | | |
| Total |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | **1.18 (1.06 - 1.32)** | 1.00 (0.90 - 1.12) | 1.03 (0.93 - 1.13) | 0.97 (0.88 - 1.07) | **1.16 (1.05 - 1.28)** | 1.07 (0.97 - 1.17) | 1.08 (0.98 - 1.18) | 1.02 (0.93 - 1.12) | **1.11 (1.02 - 1.22)** | 1.01 (0.92 - 1.11) |
| Developed | 1.11 (1.04 - 0.95) | 1.15 (0.97 - 0.88) | 1.12 (1.02 - 1.22) | 1.03 (0.94 - 1.13) | **1.12 (1.02 - 1.24)** | 1.01 (0.91 - 1.11) | 1.04 (0.95 - 1.15) | 0.97 (0.88 - 1.06) | **1.13 (1.03 - 1.24)** | 1.01 (0.92 - 1.11) |
| Persistent | **1.23 (1.26 - 1.16)** | **1.37 (1.15 - 1.06)** | **1.21 (1.12 - 1.31)** | 1.06 (0.98 - 1.15) | **1.30 (1.19 - 1.42)** | **1.12 (1.02 - 1.23)** | **1.26 (1.16 - 1.37)** | **1.15 (1.06 - 1.24)** | **1.32 (1.22 - 1.43)** | **1.12 (1.03 - 1.21)** |
| Premenopausal |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | 1.30 (1.13 - 0.97) | 1.33 (1.06 - 0.91) | 1.05 (0.89 - 1.25) | 1.00 (0.85 - 1.18) | **1.21 (1.01 - 1.46)** | 1.08 (0.90 - 1.30) | 1.13 (0.97 - 1.33) | 1.06 (0.91 - 1.24) | 1.13 (0.96 - 1.34) | 1.02 (0.86 - 1.21) |
| Developed | 1.29 (0.99 - 0.84) | 1.18 (0.90 - 0.76) | **1.21 (1.03 - 1.41)** | 1.11 (0.95 - 1.29) | **1.24 (1.04 - 1.47)** | 1.08 (0.91 - 1.29) | 0.99 (0.84 - 1.18) | 0.90 (0.76 - 1.07) | **1.17 (1.00 - 1.37)** | 1.04 (0.88 - 1.22) |
| Persistent | **1.23 (1.26 - 1.10)** | 1.46 (1.11 - 0.96) | **1.28 (1.09 - 1.49)** | 1.09 (0.93 - 1.28) | **1.24 (1.03 - 1.50)** | 1.02 (0.84 - 1.23) | **1.26 (1.10 - 1.46)** | 1.11 (0.96 - 1.28) | **1.37 (1.18 - 1.58)** | 1.14 (0.98 - 1.32) |
| Perimenopausal |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | 1.49 (1.24 - 0.94) | 1.65 (1.17 - 0.88) | 1.11 (0.82 - 1.50) | 1.05 (0.78 - 1.42) | 1.22 (0.90 - 1.65) | 1.10 (0.81 - 1.49) | 1.24 (0.94 - 1.65) | 1.17 (0.88 - 1.55) | 1.11 (0.82 - 1.48) | 1.01 (0.75 - 1.35) |
| Developed | **1.05 (1.34 - 1.02)** | 1.77 (1.23 - 0.93) | 1.12 (0.84 - 1.49) | 1.03 (0.77 - 1.37) | 0.84 (0.61 - 1.17) | 0.75 (0.54 - 1.05) | **1.34 (1.02 - 1.77)** | 1.23 (0.93 - 1.63) | 1.29 (0.98 - 1.69) | 1.16 (0.88 - 1.52) |
| Persistent | 1.54 (1.20 - 0.91) | 1.58 (1.07 - 0.81) | 1.30 (1.00 - 1.68) | 1.12 (0.86 - 1.46) | **1.38 (1.04 - 1.82)** | 1.16 (0.87 - 1.54) | 1.20 (0.91 - 1.58) | 1.07 (0.81 - 1.41) | **1.53 (1.20 - 1.94)** | **1.30 (1.01 - 1.66)** |
| Postmenopausal |  |  |  |  |  |  |  |  |  |  |
| Free | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
| Recovered | 1.23 (1.02 - 0.90) | 1.16 (0.99 - 0.87) | 1.00 (0.88 - 1.14) | 0.95 (0.84 - 1.09) | **1.16 (1.03 - 1.31)** | 1.09 (0.96 - 1.23) | 1.02 (0.90 - 1.16) | 0.99 (0.87 - 1.12) | 1.10 (0.97 - 1.24) | 1.01 (0.89 - 1.14) |
| Developed | 1.18 (1.04 - 0.91) | 1.18 (0.98 - 0.86) | 1.07 (0.95 - 1.21) | 1.00 (0.88 - 1.13) | 1.12 (0.99 - 1.28) | 1.04 (0.91 - 1.18) | 1.04 (0.91 - 1.18) | 0.98 (0.86 - 1.11) | 1.06 (0.94 - 1.20) | 0.97 (0.86 - 1.09) |
| Persistent | **1.33 (1.30 - 1.17)** | **1.44 (1.21 - 1.09)** | **1.19 (1.07 - 1.32)** | 1.06 (0.95 - 1.17) | **1.34 (1.20 - 1.49)** | **1.19 (1.06 - 1.33)** | **1.30 (1.17 - 1.44)** | **1.21 (1.09 - 1.34)** | **1.26 (1.13 - 1.39)** | 1.09 (0.98 - 1.21) |

a Model 1 was adjusted for age at screening, age at menarche, child delivery, breastfeeding, oral contraceptive use, family history of breast cancer, vigorous or moderate physical activity, smoking status, alcohol consumption, and breast density. For perimenopausal and postmenopausal women, the model was additionally adjusted for age at menopause and the use of hormone replacement therapy.

d Model 2 was adjusted for covariates similar to Model 1 and with the addition of BMI.

CI, confidence interval; HR, hazard ratio; BMI, body mass index