**Supplemental Material 1.** Baseline general characteristics of study participants based on the presence of metabolic syndrome stratified according to the body mass index categories

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| --- | --- | --- | --- |
|  | BMI <23.0 kg/m2 | BMI 23.0-24.9 kg/m2 | BMI ≥25.0 kg/m2 |
|  | (N=2,668,255) | (N=1,518,530) | (N=1,954,932) |
|  | MetS (-)(N=2,432,786) | MetS (+) (N=235,469) | p-value | MetS (-)(N=1,151,059) | MetS (+) (N=367,471) | p-value | MetS (-)(N=1,048,290) | MetS (+) (N=906,642) | p-value |
| Age, mean (SD) |  |  |  |  |  |  |  |  |  |
|  Years  | 50.6 (10.2) | 61.0 (10.7) | < 0.001 | 53.0 ( 9.8) | 60.3 (10.0) | < 0.001 | 54.4 (10.1) | 59.1 (10.2) | < 0.001 |
| Smoking, N (%) |  |  |  |  |  |  |  |  |  |
|  Never | 2,296,950 (94.4) | 221,806 (94.2) | < 0.001 | 1,102,048 (95.7) | 350,260 (95.3) | < 0.001 | 1,003,546 (95.7) | 863,591 (95.3) | < 0.001 |
| Ever | 123,054 ( 5.1) | 12,508 ( 5.3) |  | 42,723 ( 3.7) | 15,314 ( 4.2) |  | 39,029 ( 3.7) | 38,321 ( 4.2) |  |
| Missing | 12,782 ( 0.5) | 1,155 ( 0.5) |  | 6,288 ( 0.6) | 1,897 ( 0.5) |  | 5,715 ( 0.6) | 4,730 ( 0.5) |  |
| Drinking, N (%) |  |  |  |  |  |  |  |  |  |
| No | 1,856,748 (76.3) | 201,743 (85.7) | < 0.001 | 892,614 (77.6) | 312,663 (85.1) | < 0.001 | 826,870 (78.9) | 762,410 (84.1) | < 0.001 |
|  1 day/week | 350,491 (14.4) | 17,680 ( 7.5) |  | 153,857 (13.4) | 29,801 ( 8.1) |  | 129,926 (12.4) | 80,242 ( 8.9) |  |
|  ≥2 days/week  | 202,796 ( 8.3) | 13,695 ( 5.8) |  | 93,509 ( 8.1) | 21,254 ( 5.8) |  | 81,419 ( 7.8) | 55,201 ( 6.1) |  |
|  Missing | 2,275 ( 0.9) | 2,351 ( 1.0) |  | 11,079 ( 1.0) | 3,753 ( 1.0) |  | 10,075 ( 1.0) | 8,789 ( 1.0) |  |
| Vigorous physical activity, N (%) |  |  |  |  |  |  |  |  |
|  No | 1,678,805 (69.0) | 175,490 (74.5) | < 0.001 | 773,953 (67.2) | 268,255 (73.0) | < 0.001 | 728,647 (69.5) | 670,546 (74.0) | < 0.001 |
|  1-2 days/week | 408,128 (16.8) | 30,681 (13.0) |  | 191,555 (16.6) | 49,164 (13.4) |  | 161,389 (15.4) | 117,980 (13.0) |  |
|  ≥3 days/week  | 327,723 (13.5) | 27,693 (11.8) |  | 177,271 (15.4) | 47,443 (12.9) |  | 151,090 (14.4) | 111,965 (12.4) |  |
|  Missing | 18,130 ( 0.8) | 1,605 ( 0.7) |  | 8,280 ( 0.7) | 2,609 ( 0.7) |  | 7,164 ( 0.7) | 6,151 ( 0.7) |  |
| Moderate physical activity, N (%) |  |  |  |  |  |  |  |  |
|  No | 1,468,293 (60.4) | 157,278 (66.8) | < 0.001 | 690,287 (60.0) | 241,855 (65.8) | < 0.001 | 651,436 (62.1) | 603,357 (66.6) | < 0.001 |
|  1-2 days/week | 482,669 (19.8) | 35,543 (15.1) |  | 214,265 (18.6) | 55,784 (15.2) |  | 183,608 (17.5) | 137,140 (15.1) |  |
|  ≥3 days/week  | 460,913 (19.0) | 40,457 (17.2) |  | 236,564 (20.6) | 66,345 (18.1) |  | 204,129 (19.5) | 157,664 (17.4) |  |
|  Missing | 20,911 ( 0.9) | 2,191 ( 0.9) |  | 9,943 ( 0.9) | 3,487 ( 1.0) |  | 9,117 ( 0.9) | 8,481 ( 0.9) |  |
| Walking, N (%) |  |  |  |  |  |  |  |  |  |
|  No | 787,426 (32.4) | 87,525 (37.2) | < 0.001 | 379,891 (33.0) | 134,621 (36.6) | < 0.001 | 368,667 (35.2) | 343,398 (37.9) | < 0.001 |
| 1-3 days/week | 848,844 (34.9) | 70,879 (30.1) |  | 381,848 (33.2) | 110,263 (30.0) |  | 332,531 (31.7) | 272,627 (30.1) |  |
| 4-6 days/week  | 504,162 (20.7) | 43,232 (18.4) |  | 240,971 (20.9) | 69,471 (18.9) |  | 208,350 (19.9) | 164,027 (18.1) |  |
|  7 days/week | 276,134 (11.4) | 32,122 (13.6) |  | 140,621 (12.2) | 50,384 (13.7) |  | 131,590 (12.6) | 119,926 (13.2) |  |
|  Missing | 16,220 ( 0.7) | 1,711 ( 0.7) |  | 7,728 ( 0.7) | 2,732 ( 0.7) |  | 7,152 ( 0.7) | 6,664 ( 0.7) |  |
| Age at menarche, N (%) |  |  |  |  |  |  |  |  |
|  <15 years  | 621,995 (25.6) | 31,897 (13.6) | < 0.001 | 261,327 (22.7) | 52,114 (14.2) | < 0.001 | 228,396 (21.8) | 151,324 (16.7) | < 0.001 |
|  15-16 years | 925,458 (38.0) | 82,788 (35.2) |  | 440,664 (38.3) | 132,101 (36.0) |  | 390,570 (37.3) | 324,669 (35.8) |  |
|  ≥17 years | 608,046 (25.0) | 101,568 (43.1) |  | 341,019 (29.6) | 153,955 (41.9) |  | 335,599 (32.0) | 357,837 (39.5) |  |
| Missing | 277,287 (11.4) | 19,216 ( 8.2) |  | 108,049 ( 9.4) | 29,301 ( 8.0) |  | 93,725 ( 8.9) | 72,812 ( 8.0) |  |
| Age at menopause, N (%) |  |  |  |  |  |  |  |  |
|  Premenopausal | 1,244,144 (51.1) | 51,303 (21.8) | < 0.001 | 505,877 (44.0) | 83,853 (22.8) | < 0.001 | 419,640 (40.0) | 243,101 (26.8) | < 0.001 |
|  <45 years  | 64,225 ( 2.6) | 14,337 ( 6.1) |  | 33,106 ( 2.9) | 19,447 ( 5.3) |  | 36,259 ( 3.5) | 46,656 ( 5.2) |  |
|  45-52 years | 631,338 (26.0) | 110,643 (47.0) |  | 354,204 (30.8) | 164,853 (44.9) |  | 344,114 (32.8) | 374,685 (41.3) |  |
|  ≥53 years | 183,504 ( 7.5) | 35,896 (15.2) |  | 129,065 (11.2) | 63,349 (17.2) |  | 136,158 (13.0) | 153,153 (16.9) |  |
|  Missing | 309,575 (12.7) | 23,290 ( 9.9) |  | 128,807 (11.2) | 35,969 ( 9.8) |  | 112,119 (10.7) | 89,047 ( 9.8) |  |
| Parity, N (%) |  |  |  |  |  |  |  |  |
|  Never | 278,117 (11.4) | 15,768 (6.7) | < 0.001 | 102,250 ( 8.9) | 22,889 ( 6.2) | < 0.001 | 82,979 ( 7.9) | 57,777 ( 6.4) | < 0.001 |
|  Ever | 1,916,243 (78.8) | 204,758 (87.0) |  | 959,872 (83.4) | 322,086 (87.7) |  | 889,466 (84.9) | 792,606 (87.4) |  |
|  Missing | 238,426 ( 9.8) | 14,943 ( 6.4) |  | 88,937 ( 7.7) | 22,496 ( 6.1) |  | 75,845 ( 7.2) | 56,259 ( 6.2) |  |
| Breastfeeding duration, N (%) |  |  |  |  |  |  |  |  |
|  Never | 445,099 (18.3) | 19,137 ( 8.1) | < 0.001 | 155,543 (13.5) | 26,737 ( 7.3) | < 0.001 | 112,359 (10.7) | 64,239 ( 7.1) | < 0.001 |
|  <6 months | 502,570 (20.7) | 37,521 (15.9) |  | 238,782 (20.7) | 58,909 (16.0) |  | 196,961 (18.8) | 141,771 (15.6) |  |
|  ≥6 months | 1,237,109 (50.9) | 163,009 (69.2) |  | 663,788 (57.7) | 257,969 (70.2) |  | 659,313 (62.9) | 640,965 (70.7) |  |
|  Missing | 248,008 (10.2) | 15,802 ( 6.7) |  | 92,946 ( 8.1) | 23,856 ( 6.5) |  | 79,657 ( 7.6) | 59,667 ( 6.6) |  |
| Oral contraceptive use, N (%) |  |  |  |  |  |  |  |  |
|  Never | 1,806,043 (74.2) | 178,180 (75.7) | < 0.001 | 857,661 (74.5) | 273,531 (74.4) | < 0.001 | 775,381 (74.0) | 669,895 (73.9) | < 0.001 |
|  Ever | 385,443 (15.8) | 41,851 (17.8) |  | 202,740 (17.6) | 70,627 (19.2) |  | 195,349 (18.6) | 178,774 (19.7) |  |
|  Missing | 241,300 ( 9.9) | 15,438 ( 6.6) |  | 90,658 ( 7.9) | 23,313 ( 6.3) |  | 77,560 ( 7.4) | 57,973 ( 6.4) |  |
| Family history of cancer, N (%) |  |  |  |  |  |  |  |  |
|  No | 1,764,501 (72.5) | 188,166 (79.9) | < 0.001 | 859,257 (74.7) | 291,206 (79.3) | < 0.001 | 797,005 (76.0) | 717,492 (79.1) | < 0.001 |
|  Yes | 470,783 (19.4) | 36,209 (15.4) |  | 223,269 (19.4) | 60,058 (16.3) |  | 194,044 (18.5) | 148,509 (16.4) |  |
|  Missing | 197,502 ( 8.1) | 11,094 ( 4.7) |  | 68,533 ( 6.0) | 16,207 ( 4.4) |  | 57,241 ( 5.5) | 40,641 ( 4.5) |  |
| Follow-up years, mean (SD) |  |  |  |  |  |  |  |  |
|  Years | 8.7 ( 1.3) | 8.5 ( 1.6) | < 0.001 | 8.7 ( 1.3) | 8.6 ( 1.5) | < 0.001 | 8.7 ( 1.4) | 8.6 ( 1.5) | < 0.001 |

Abbreviation: BMI, body mass index; MetS (-), participants without metabolic syndrome; MetS (+), participants with metabolic syndrome; SD, standard deviation; N, the number of participants.