**Supplemental Table 1. Covariate characteristics of cases controls in the AMBER Consortium stratified by study**

|   | **CBCS N (%)** | **WCHS N (%)** | **MEC N (%)** | **BWHS N (%)** | **Total N (%)** |
| --- | --- | --- | --- | --- | --- |
|  | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** | **Cases** | **Controls** |
| Total | 781 (15.3) | 784 (4.6) | 1,220 (23.9) | 1,216 (7.1) | 1,134 (22.2) | 4,431 (25.7) | 1,973 (38.6) | 10,799 (62.7) | 5,108 (100.0) | 17,230 (100.0) |
| Age at study entry |  |  |  |  |  |  |  |  |  |  |
| <40 | 131 (16.8) | 104 (13.3) | 148 (12.1) | 164 (13.5) | 0 (0.0) | 0 (0.0) | 161 (8.2) | 1,100 (10.2) | 440 (8.6) | 1,368 (7.9) |
| 40-49 | 254 (32.5) | 285 (36.4) | 348 (28.5) | 335 (27.6) | 16 (1.4) | 61 (1.4) | 582 (29.5) | 3,192 (29.6) | 1,200 (23.5) | 3,873 (22.5) |
| 50-59 | 177 (22.7) | 185 (23.6) | 419 (34.3) | 459 (37.8) | 170 (15.0) | 658 (14.9) | 636 (32.2) | 3,487 (32.3) | 1,402 (27.5) | 4,789 (27.8) |
| 60-69 | 155 (19.9) | 140 (17.9) | 227 (18.6) | 216 (17.8) | 365 (32.2) | 1,431 (32.3) | 433 (21.9) | 2,184 (20.2) | 1,180 (23.1) | 3,971 (23.1) |
| 70+ | 64 (8.2) | 70 (8.9) | 78 (6.4) | 42 (3.5) | 583 (51.4) | 2,281 (51.5) | 161 (8.2) | 836 (7.7) | 886 (17.4) | 3,229 (18.7) |
| Years of education |  |  |  |  |  |  |  |  |  |  |
|  <12 | 230 (29.5) | 225 (28.7) | 167 (13.7) | 135 (11.1) | 139 (12.4) | 594 (13.6) | 47 (2.4) | 375 (3.5) | 583 (11.5) | 1,329 (7.8) |
|  12 | 239 (30.6) | 243 (31.0) | 379 (31.1) | 300 (24.7) | 280 (25.0) | 1,256 (28.8) | 317 (16.1) | 1,769 (16.4) | 1,215 (23.9) | 3,568 (20.8) |
|  13-15 | 174 (22.3) | 176 (22.5) | 325 (26.6) | 363 (29.9) | 415 (37.0) | 1,596 (36.6) | 571 (28.9) | 3,153 (29.2) | 1,485 (29.2) | 5,288 (30.8) |
|  16 | 99 (12.7) | 94 (12.0) | 223 (18.3) | 263 (21.6) | 132 (11.8) | 472 (10.8) | 445 (22.6) | 2,421 (22.4) | 899 (17.7) | 3,250 (19.0) |
|  >16 | 39 (5.0) | 45 (5.8) | 126 (10.3) | 155 (12.8) | 155 (13.8) | 445 (10.2) | 590 (30.0) | 3,069 (28.5) | 910 (17.9) | 3,714 (21.7) |
|  Missing | 0 | 1 | 0 | 0 | 13 | 68 | 3 | 12 | 16 | 81 |
| Body Mass Index (BMI) |  |  |  |  |  |  |  |  |  |  |
| <18.5 | 8 (1.1) | 8 (1.1) | 6 (0.5) | 6 (0.5) | 13 (1.2) | 47 (1.1) | 14 (0.7) | 56 (0.5) | 41 (0.8) | 117 (0.7) |
| 18.5-24.9 | 133 (17.6) | 135 (17.8) | 208 (17.4) | 231 (19.3) | 246 (22.2) | 1,029 (23.3) | 477 (24.4) | 2,465 (23.1) | 1,064 (21.2) | 3,860 (22.6) |
|  25.0-29.9 | 220 (29.1) | 221 (29.1) | 351 (29.4) | 347 (29.0) | 387 (34.9) | 1,657 (37.6) | 678 (34.6) | 3,565 (33.4) | 1,636 (32.6) | 5,790 (34.0) |
|  30+ | 394 (52.2) | 396 (52.1) | 630 (52.7) | 611 (51.1) | 462 (41.7) | 1,680 (38.1) | 789 (40.3) | 4,600 (43.1) | 2,275 (45.4) | 7,287 (42.7) |
| Missing | 26 | 24 | 25 | 21 | 26 | 18 | 15 | 113 | 92 | 176 |
| HT Use  |  |  |  |  |  |  |  |  |  |  |
| Never | 741 (94.9) | 754 (96.2) | 1,181 (97.5) | 1,169 (96.3) | 819 (81.4) | 3,443 (84.2) | 1,692 (85.8) | 9,435 (87.4) | 4,433 (89.2) | 14,801 (87.6) |
| Ever | 40 (5.1) | 30 (3.8) | 30 (2.5) | 45 (3.7) | 187 (18.6) | 648 (15.8) | 281 (14.2) | 1,364 (12.6) | 538 (10.8) | 2,087 (12.4) |
| Missing |  | 0 | 9 | 2 | 128 | 340 | 0 | 0 | 137 | 342 |
| Parity |  |  |  |  |  |  |  |  |  |  |
| Nulliparous | 111 (14.2) | 86 (11.0) | 184 (15.1) | 193 (15.9) | 147 (13.2) | 584 (13.4) | 409 (20.7) | 2,391 (22.1) | 851 (16.7) | 3,254 (19.0) |
| 1 | 124 (15.9) | 134 (17.1) | 265 (21.7) | 273 (22.5) | 184 (16.5) | 752 (17.3) | 504 (25.5) | 2,564 (23.7) | 1,077 (21.2) | 3,723 (21.7) |
| 2 | 173 (22.2) | 196 (25.0) | 348 (28.6) | 333 (27.4) | 224 (20.1) | 892 (20.5) | 552 (27.9) | 2,950 (27.3) | 1,297 (25.5) | 4,371 (25.5) |
| 3 | 146 (18.7) | 138 (17.6) | 200 (16.4) | 210 (17.3) | 206 (18.5) | 683 (15.7) | 271 (13.7) | 1,564 (14.5) | 823 (16.2) | 2,595 (15.1) |
| ≥4 | 227 (29.1) | 230 (29.3) | 222 (18.2) | 207 (17.0) | 352 (31.6) | 1,448 (33.2) | 237 (12.0) | 1,330 (12.3) | 1,038 (20.4) | 3,215 (18.7) |
| Missing | 0 | 0 | 1 | 0 | 21 | 72 | 0 | 0 | 22 | 72 |
| Age at Menarche (years) |  |  |  |  |  |  |  |  |  |  |
| <11 | 78 (10.0) | 66 (8.5) | 161 (13.2) | 140 (11.5) | 101 (9.1) | 327 (7.5) | 218 (11.1) | 1,196 (11.1) | 558 (11.0) | 1,729 (10.1) |
| 11-12  | 329 (42.2) | 311 (39.8) | 474 (38.9) | 476 (39.2) | 475 (42.6) | 1,758 (40.4) | 922 (46.9) | 4,672 (43.4) | 2,200 (43.3) | 7,217 (42.2) |
| 13-14  | 277 (35.5) | 290 (37.1) | 430 (35.3) | 435 (35.8) | 422 (37.8) | 1,661 (38.2) | 662 (33.7) | 3,803 (35.4) | 1,791 (35.2) | 6,189 (36.2) |
| ≥15  | 96 (12.3) | 114 (14.6) | 155 (12.7) | 164 (13.5) | 118 (10.6) | 608 (14.0) | 164 (8.3) | 1,084 (10.1) | 533 (10.5) | 1,970 (11.5) |
| Missing | 1 | 3 | 0 | 1 | 18 | 77 | 7 | 44 | 26 | 125 |

**Supplemental Table 2. Recent alcohol intake (drinks per week) in relation to invasive breast cancer stratified by smoking status in the AMBER Consortium**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Controls** | **Cases** | **Basic modela** | **Controls** | **Cases** | **MV modelb** |
|  | **N (%)** | **N (%)** | **OR (95% CI)** | **N (%)** | **N (%)** | **OR (95% CI)** |
|  | **Never Smoker**  |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
| Never drinkers | 5,197 (54.7) | 1,746 (61.2) | 1.14 (1.01-1.28) | 4,528 (54.8) | 1,502 (61.1) | 1.11 (0.97-1.27) |
| >0-<4 | 2,030 (21.4) | 485 (17.0) | Ref. | 1,742 (21.1) | 420 (17.1) | Ref. |
| ≥4-<7 | 328 (3.5) | 88 (3.1) | 1.08 (0.83-1.41) | 275 (3.3) | 75 (3.1) | 1.07 (0.80-1.44) |
| ≥7 | 285 (3.0) | 92 (3.2) | 1.22 (0.93-1.59) | 253 (3.1) | 79 (3.2) | 1.15 (0.86-1.53) |
| Past drinkers | 1,659 (17.5) | 444 (15.6) | 1.10 (0.95-1.28) | 1,462 (17.7) | 382 (15.5) | 1.08 (0.92-1.28) |
|  p-trend\* |  |  | 0.20 |  |  | 0.39 |
|  | **Current Smoker**  |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
| Never drinkers | 852 (26.8) | 262 (29.4) | 0.99 (0.81-1.24) | 728 (26.8) | 217 (29.1) | 1.01 (0.79-1.28) |
| >0-<4 | 906 (28.5) | 235 (26.4) | Ref. | 781 (28.7) | 194 (26.0) | Ref. |
| ≥4-<7 | 266 (8.4) | 72 (8.1) | 1.08 (0.79-1.47) | 231 (8.5) | 64 (8.6) | 1.18 (0.85-1.65) |
| ≥7 | 399 (12.6) | 147 (16.5) | 1.24 (0.96-1.59) | 340 (12.5) | 120 (16.1) | 1.23 (0.93-1.63) |
| Past drinkers | 755 (23.8) | 175 (19.6) | 0.87 (0.69-1.09) | 639 (23.5) | 151 (20.2) | 0.94 (0.73-1.22) |
|  p-trend\* |  |  | 0.09 |  |  | 0.13 |
|  | **Former Smoker**  |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
| Never drinkers | 1,418 (31.7) | 493 (37.0) | 1.20 (1.00-1.43) | 1,220 (31.0) | 415 (36.2) | 1.24 (1.02-1.50) |
| >0-<4 | 1,169 (26.1) | 299 (22.4) | Ref. | 1,016 (25.8) | 248 (21.7) | Ref. |
| ≥4-<7 | 281 (6.3) | 62 (63.5) | 0.81 (0.59-1.10) | 244 (6.2) | 53 (4.6) | 0.86 (0.61-1.22) |
| ≥7 | 365 (8.2) | 126 (9.5) | 1.19 (0.92-1.53) | 335 (8.5) | 109 (9.5) | 1.14 (0.87-1.50) |
| Past drinkers | 1,241 (27.7) | 354 (26.5) | 0.96 (0.79-1.15) | 1,123 (28.5) | 320 (28.0) | 1.04 (0.85-1.27) |
|  p-trend\* |  |  | 0.38 |  |  | 0.53 |
| **a**Basic model adjusted for age, study, time period and geographic region. |
| **b**Multivariable model adjusted for age, study, time period, geographic region, education, age at menarche, BMI, menopausal status (pre-/post-), HT use (ever/never), parity, and duration of oral contraceptive use\*p-trend excludes never and past drinkers |

**Supplemental Table 3. Recent alcohol intake (drinks per week) in relation to invasive breast cancer stratified by lifetime duration of oral contraceptive use in the AMBER consortium**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Controls** | **Cases** | **Basic Modela**  | **Controls** | **Cases** | **MV modelb** |
|  | **N (%)** | **N (%)** | **OR (95% CI)** | **N (%)** | **N (%)** | **OR (95% CI)** |
|  | **Never Used Oral Contraceptives** |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
| Never drinkers | 4,073 (47.4) | 1,321 (53.2) | 1.14 (0.99-1.29) | 3,616 (47.4) | 1,133 (52.8) | 1.13 (0.97-1.30) |
| >0-<4 | 1,791 (20.9) | 422 (17.0) | Ref. | 1,572 (20.6) | 357 (16.6) | Ref. |
| ≥4-<7 | 356 (4.2) | 98 (4.0) | 1.16 (0.90-1.50) | 312 (4.1) | 90 (4.2) | 1.29 (0.98-1.70) |
| ≥7 | 534 (6.2) | 180 (7.3) | 1.22 (0.99-1.51) | 486 (6.4) | 152 (7.1) | 1.19 (0.95-1.49) |
| Past drinkers | 1,833 (21.4) | 461 (18.6) | 0.96 (0.83-1.13) | 1,644 (21.6) | 415 (19.3) | 1.04 (0.88-1.23) |
|  p-trend\* |  |  | 0.05 |  |  | 0.15 |
|  | **1-9 years of use** |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
| Never drinkers | 2,467 (40.3) | 805 (44.9) | 1.05 (0.91-1.22) | 2,147 (40.5) | 689 (45.4) | 1.00 (0.85-1.18) |
| >0-<4 | 1,592 (26.0) | 413 (23.0) | Ref. | 1,360 (25.6) | 352 (23.2) | Ref. |
| ≥4-<7 | 356 (5.8) | 83 (4.6) | 0.84 (0.64-1.11) | 308 (5.8) | 64 (4.2) | 0.75 (0.55-1.02) |
| ≥7 | 354 (5.8) | 122 (6.8) | 1.17 (0.92-1.50) | 309 (5.8) | 102 (6.7) | 1.10 (0.84-1.44) |
| Past drinkers | 1,354 (22.1) | 371 (20.7) | 1.05 (0.89-1.24) | 1183 (22.3) | 312 (20.5) | 0.99 (0.82-1.19) |
|  p-trend\* |  |  | 0.55 |  |  | 0.86 |
|  | **10 or more years of use** |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
| Never drinkers | 695 (30.6) | 354 (45.6) | 1.40 (1.12-1.75) | 713 (36.0) | 312 (45.7) | 1.47 (1.15-1.89) |
| >0-<4 | 695 (30.6) | 181 (23.3) | Ref. | 607 (30.7) | 153 (22.4) | Ref. |
| ≥4-<7 | 157 (6.9) | 40 (5.2) | 0.98 (0.66-1.47) | 130 (6.6) | 38 (5.6) | 1.25 (0.81-1.92) |
| ≥7 | 154 (6.8) | 63 (8.1) | 1.36 (0.95-1.95) | 133 (6.7) | 54 (7.9) | 1.40 (0.94-2.09) |
| Past drinkers | 444 (19.6) | 139 (17.9) | 1.13 (0.87-1.48) | 397 (20.1) | 126 (18.5) | 1.19 (0.89-1.59) |
|  p-trend\* |  |  | 0.12 |  |  | 0.08 |
| **a**Basic model adjusted for age, study, time period and geographic region. |
| **b**Multivariable model adjusted for age, study, time period, geographic region, education, age at menarche, BMI, menopausal status(pre-/post-), HT use (ever/never), parity, and smoking status\*p-trend excludes never and past drinkers |

**Supplemental Table 4. Recent alcohol intake (drinks per week) in relation to invasive breast cancer stratified by menopausal status in the AMBER consortium**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Controls****N (%)** | **Cases****N (%)** | **Basic modela****OR (95% CI)** | **Controls****N (%)** | **Cases****N (%)** | **MV Modelb****OR (95% CI)** |
|  | **Premenopausal** |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
|  Never drinkers | 2,411 (44.5) | 888 (51.8) | 1.12 (0.96-1.30) | 2,350 (44.4) | 850 (51.2) | 1.06 (0.91-1.24) |
|  >0-<4 | 1,414 (26.1) | 374 (21.8) | Ref. | 1,384 (26.1) | 367 (22.1) | Ref. |
|  ≥4-<7 | 281 (5.2) | 79 (4.6) | 1.08 (0.81-1.45) | 271 (5.1) | 78 (4.7) | 1.14 (0.85-1.53) |
|  ≥7 | 266 (4.9) | 120 (7.0) | 1.26 (0.97-1.63) | 260 (4.9) | 115 (6.9) | 1.28 (0.98-1.68) |
|  Past drinkers | 1,050 (19.4) | 253 (14.8) | 0.93 (0.77-1.13) | 1,032 (19.5) | 249 (15.0) | 0.95 (0.78-1.16) |
|  p-trend\* |  |  | 0.11 |  |  | 0.07 |
|  | **Postmenopausal** |
| Number of alcoholic drinks per week |  |  |  |  |  |  |
|  Never drinkers | 4,539 (44.1) | 1,432 (49.0) | 1.10 (0.98-1.24) | 4,126 (42.9) | 1,284 (47.7) | 1.15 (1.01-1.30) |
|  >0-<4 | 2,270 (22.1) | 535 (18.3) | Ref. | 2,155 (22.4) | 495 (18.4) | Ref. |
|  ≥4-<7 | 501 (4.9) | 121 (4.1) | 0.96 (0.77-1.21) | 479 (5.0) | 114 (4.2) | 0.98 (0.77-1.24) |
|  ≥7 | 695 (6.8) | 210 (7.2) | 1.17 (0.97-1.41) | 668 (6.9) | 193 (7.2) | 1.15 (0.94-1.40) |
|  Past drinkers | 2,290 (22.2) | 626 (21.4) | 1.03 (0.90-1.18) | 2,192 (22.8) | 604 (22.5) | 1.08 (0.94-1.25) |
|  p-trend\* |  |  | 0.18 |  |  | 0.37 |

|  |
| --- |
| **a**Basic model adjusted for age, study, time period and geographic region. |
| **b**Multivariable model adjusted for age, study, time period, geographic region, education, age at menarche, BMI, HT use (ever/never), parity, smoking status, and duration of oral contraceptive use\*p-trend excludes never and past drinkers |

**Supplemental Figure 1.** Flexible modeling of drinks per week as a squared term versus the log odds (95% confidence interval) of breast cancer in the AMBER consortium