**Additional file 4. Expected and observed number of breast cancer in the test subcohort of China Kadoorie Biobank (CKB) and Shanghai Women's Health Study (SWHS) using the corresponding local rates**

| | Test subcohort of CKB[a] | | | SWHS[b] | | |
|---|---|---|---|---|---|---|
| | *E* | *O* | *E/O* (95% CI) | *E* | *O* | *E/O* (95% CI) |
| Overall | 765 | 751 | 1.02 (0.95-1.10) | 1,423 | 1,409 | 1.01 (0.96-1.06) |
| Age at enrollment, years | | | | | | |
| <50 | 372 | 357 | 1.04 (0.94-1.16) | 793 | 688 | 1.15 (1.07-1.24) |
| 50-59 | 278 | 256 | 1.08 (0.96-1.23) | 391 | 394 | 0.99 (0.90-1.10) |
| ≥60 | 115 | 138 | 0.84 (0.71-0.99) | 239 | 327 | 0.73 (0.65-0.82) |
| Residence | | | | | | |
| Rural | 264 | 267 | 0.99 (0.88-1.12) | -- | -- | -- |
| Urban | 501 | 484 | 1.03 (0.95-1.13) | -- | -- | -- |
| Highest education | | | | | | |
| Primary school or lower | 299 | 299 | 1.00 (0.89-1.12) | 160 | 195 | 0.82 (0.71-0.95) |
| Middle school | 226 | 212 | 1.07 (0.93-1.23) | 522 | 503 | 1.04 (0.95-1.14) |
| High school or higher | 239 | 240 | 1.00 (0.88-1.14) | 740 | 711 | 1.04 (0.97-1.12) |
| BMI, kg/m$^2$ | | | | | | |
| <18.5 | 19 | 17 | 1.13 (0.71-1.94) | 37 | 38 | 0.98 (0.72-1.39) |
| 18.5-23.9 | 334 | 326 | 1.03 (0.92-1.15) | 678 | 660 | 1.03 (0.95-1.11) |
| 24.0-27.9 | 288 | 282 | 1.02 (0.91-1.15) | 513 | 512 | 1.00 (0.92-1.10) |
| ≥28 | 123 | 126 | 0.98 (0.82-1.18) | 195 | 199 | 0.98 (0.85-1.13) |
| Height, cm | | | | | | |
| <150.2 | 127 | 122 | 1.04 (0.87-1.26) | 93 | 119 | 0.78 (0.65-0.94) |
| 150.2-154.1 | 168 | 151 | 1.11 (0.95-1.31) | 200 | 199 | 1.01 (0.88-1.16) |
| 154.2-158.1 | 206 | 217 | 0.95 (0.83-1.09) | 389 | 387 | 1.00 (0.91-1.11) |
| ≥158.2 | 263 | 261 | 1.01 (0.89-1.14) | 741 | 704 | 1.05 (0.98-1.13) |
| No. of first-degree relatives diagnosed with overall cancer | | | | | | |
| 0 | 598 | 573 | 1.04 (0.96-1.14) | 1,000 | 1,023 | 0.98 (0.92-1.04) |
| 1 | 136 | 144 | 0.95 (0.80-1.12) | 340 | 329 | 1.03 (0.93-1.15) |
| ≥2 | 30 | 34 | 0.89 (0.64-1.28) | 83 | 57 | 1.45 (1.12-1.91) |
| No. of live birth | | | | | | |
| Nulliparous | 14 | 12 | 1.18 (0.68-2.29) | 56 | 58 | 0.96 (0.75-1.27) |
| 1 | 376 | 353 | 1.07 (0.96-1.19) | 914 | 822 | 1.11 (1.04-1.19) |
| ≥2 | 374 | 386 | 0.97 (0.88-1.07) | 453 | 529 | 0.86 (0.79-0.93) |
| Age at menarche, years | | | | | | |
| <12 | 60 | 60 | 1.00 (0.77-1.31) | 127 | 105 | 1.21 (1.00-1.48) |
| 13-14 | 255 | 266 | 0.96 (0.85-1.09) | 599 | 567 | 1.06 (0.97-1.15) |
| 15-16 | 276 | 275 | 1.00 (0.89-1.13) | 519 | 553 | 0.94 (0.86-1.02) |
| ≥17 | 173 | 150 | 1.16 (0.99-1.37) | 178 | 184 | 0.97 (0.84-1.12) |

Abbreviations: BMI, body mass index; PY, person-year; RR, relative risk; CI, confidence interval; E, expected number of cases; O, observed number of cases; --, not applicable.

[a]Absolute risk was recalibrated using the breast cancer incidence rates and non-breast cancer mortality rates in the CKB.

[b]Absolute risk was recalibrated using the breast cancer incidence rates and non-breast cancer mortality rates in Shanghai (Additional file 2).