**Supplemental Table 1: Characteristics of Study Population**

|  |  |  |
| --- | --- | --- |
|  |  | **Postmenopausal Women** |
|  |  | **Cases****n=1,696** | **Controls n=2,711** |  |
|  |  |  |
|  |  | **n** | **% 1** | **n** | **% 1** | ***P* 2** |
| Study |  |  |  |  |  |
|  | San Francisco Bay Area Breast Cancer Study | 837 | 49 | 1152 | 42 |  |
|  | 4-Corners Breast Cancer Study | 859 | 51 | 1559 | 58 |  |
|  |  |  |  |  |  |  |
| Estrogen receptor (ER) and progesterone receptor (PR) status |  |  |  |  |  |
|  | ER+PR+ | 1151 | 68 |  |  |  |
|  | ER+PR- | 231 | 14 |  |  |  |
|  | ER-PR+ | 28 | 2 |  |  |  |
|  | ER-PR- | 286 | 17 |  |  |  |
|  |  |  |  |  |  |  |
| Age 3 (years) |  |  |  |  |  |
|  | <50 | 165 | 10 | 260 | 10 |  |
|  | 50-59 | 562 | 33 | 835 | 31 |  |
|  | ≥60 | 969 | 57 | 1616 | 60 |  |
|  |  |  |  |  |  |  |
| Ethnicity/English language acculturation |  |  |  |  |  |
|  | Hispanic - low acculturation | 112 | 7 | 220 | 8 | 0.01 |
|  | Hispanic - moderate acculturation | 342 | 20 | 636 | 24 |  |
|  | Hispanic - high acculturation | 305 | 18 | 408 | 15 |  |
|  | Non-Hispanic White | 937 | 55 | 1447 | 53 |  |
|  |  |  |  |  |  |  |
| Percent Indigenous American admixture 4 |  |  |  |  |  |
|  | ≤44 | 260 | 38 | 425 | 62 | 0.39 |
|  | >44 | 233 | 36 | 420 | 64 |  |
|  |  |  |  |  |  |  |
| Education |  |  |  |  |  |
|  | Some high school or less | 390 | 23 | 688 | 25 | 0.04 |
|  | High school graduate | 397 | 23 | 649 | 24 |  |
|  | Some college or higher | 909 | 54 | 1374 | 51 |  |
|  |  |  |  |  |  |  |
| Family history of breast cancer in first-degree relatives |  |  |  |  |  |
|  | No | 1355 | 80 | 2320 | 86 | <0.01 |
|  | Yes | 341 | 20 | 391 | 14 |  |
|  |  |  |  |  |  |  |
| Age at menarche (years) |  |  |  |  |  |
|  | <12 | 418 | 25 | 556 | 21 | <0.01 |
|  | 12-13 | 848 | 50 | 1347 | 50 |  |
|  | ≥14 | 430 | 25 | 808 | 30 |  |
|  |  |  |  |  |  |  |
| Full-term pregnancies |  |  |  |  |  |
|  | Nulliparous | 208 | 12 | 262 | 10 | <0.01 |
|  | 1-2 | 638 | 38 | 876 | 32 |  |
|  | 3-4 | 613 | 36 | 1032 | 38 |  |
|  | ≥5 | 237 | 14 | 541 | 20 |  |
|  |  |  |  |  |  |  |
| Age at first full-term pregnancy (years) |  |  |  |  |  |
|  | Nulliparous | 208 | 12 | 262 | 10 | 0.01 |
|  | <25 | 981 | 58 | 1647 | 61 |  |
|  | 25-29 | 343 | 20 | 564 | 21 |  |
|  | ≥30 | 164 | 10 | 238 | 9 |  |
|  |  |  |  |  |  |  |
| Lifetime breastfeeding (months) |  |  |  |  |  |
|  | Nulliparous | 208 | 12 | 262 | 10 | <0.01 |
|  | 0 | 614 | 36 | 872 | 32 |  |
|  | 1-12 | 524 | 31 | 887 | 33 |  |
|  | 13-24 | 170 | 10 | 331 | 12 |  |
|  | ≥25 | 180 | 11 | 359 | 13 |  |
|  |  |  |  |  |  |
| Menopausal hormone therapy use |  |  |  |  |  |
|  | Current | 772 | 46 | 920 | 34 | <0.01 5 |
|  | Former | 348 | 21 | 885 | 33 |  |
|  | Never | 560 | 33 | 890 | 33 |  |
|  | Unknown | 16 | 1 | 16 | 1 |  |
|  |  |  |  |  |  |  |
| Alcohol consumption (g/day) 6 |  |  |  |  |  |
|  | 0 | 963 | 57 | 1600 | 59 | 0.03 |
|  | 0.1-9.9 | 478 | 28 | 767 | 28 |  |
|  | 10.0-19.9 | 138 | 8 | 196 | 7 |  |
|  | ≥20.0 | 117 | 7 | 152 | 6 |  |

1 Percentages may not add up to 100% due to rounding.

2  Mantel-Haenszel Chi-square test for difference between postmenopausal cases and controls.

3  Age at diagnosis (cases) or selection into the study (controls).

4 Among Hispanics only; based on the median in postmenopausal controls.

5 Chi-square test excludes unknown category.

6 In the reference year.

**Supplemental Table 2: Body Size Characteristics among Postmenopausal Controls, by Ethnicity and Genetic Admixture among Hispanics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Non-Hispanic Whites** **n=1,447** | **Hispanics****n=1,264** | **Hispanics** |  |
|  |  |  |  |  | **Indigenous** **American** **Admixture 1,2** **≤44%****n=425** | **Indigenous** **American** **Admixture 1,2** **>44%****n=420** |  |
|  | **n** | **% 3** | **n** | **% 3** | ***P* 4** | **n** | **% 3** | **n** | **% 3** | ***P* 5** |
| Current height (cm) 6,7 |  |  |  |  |  |  |  |  |  |  |
|  | Q1: <154.0 | 151 | 11 | 527 | 42 | <0.01 | 153 | 36 | 193 | 46 | <0.01 |
|  | Q2: 154.0-158.8 | 344 | 24 | 384 | 31 |  | 129 | 30 | 120 | 29 |  |
|  | Q3: 158.9-163.5 | 395 | 27 | 227 | 18 |  | 85 | 21 | 77 | 18 |  |
|  | Q4: >163.5 | 551 | 38 | 123 | 10 |  | 57 | 13 | 28 | 7 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Young-adult BMI (kg/m2) 6,8 |  |  |  |  |  |  |  |  |  |
|  | Q1: <20.0 | 438 | 31 | 215 | 18 | <0.01 | 84 | 20 | 69 | 17 | 0.10 |
|  | Q2: 20.0-21.7 | 394 | 28 | 265 | 22 |  | 94 | 23 | 90 | 22 |  |
|  | Q3: 21.8-24.0 | 334 | 23 | 322 | 27 |  | 113 | 28 | 107 | 27 |  |
|  | Q4: >24.0 | 260 | 18 | 396 | 33 |  | 118 | 29 | 137 | 34 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Current BMI (kg/m2) 9 |  |  |  |  |  |  |  |  |  |  |
|  | <25.0 | 619 | 43 | 267 | 21 | <0.01 | 100 | 24 | 69 | 16 | 0.01 |
|  | 25.0-29.9  | 422 | 29 | 478 | 38 |  | 150 | 35 | 157 | 38 |  |
|  | ≥30.0 | 400 | 28 | 515 | 41 |  | 174 | 41 | 192 | 46 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Weight gain (kg) 10 |  |  |  |  |  |  |  |  |  |  |
|  | Q1: <8.2 | 341 | 27 | 259 | 23 | 0.12 | 95 | 25 | 72 | 18 | 0.49 |
|  | Q2: 8.2-14.5 | 317 | 25 | 280 | 25 |  | 79 | 21 | 99 | 26 |  |
|  | Q3: 14.6-23.4 | 296 | 23 | 292 | 26 |  | 99 | 26 | 115 | 30 |  |
|  | Q4: >23.4 | 315 | 25 | 279 | 25 |  | 108 | 28 | 101 | 26 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Waist (cm) 11,12 |  |  |  |  |  |  |  |  |  |  |
|  | Q1: <80.7 | 263 | 34 | 150 | 17 | <0.01 | 46 | 17 | 50 | 17 | 0.44 |
|  | Q2: 80.7-89.1 | 187 | 24 | 226 | 26 |  | 61 | 23 | 79 | 26 |  |
|  | Q3: 89.2-98.8 | 164 | 21 | 253 | 29 |  | 67 | 25 | 86 | 29 |  |
|  | Q4: >98.8 | 157 | 20 | 254 | 29 |  | 89 | 34 | 84 | 28 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Hip (cm) 11,12 |  |  |  |  |  |  |  |  |  |  |
|  | Q1: <100.1 | 205 | 27 | 207 | 23 | 0.01 | 57 | 22 | 73 | 24 | 0.39 |
|  | Q2: 100.1-106.7 | 214 | 28 | 211 | 24 |  | 58 | 22 | 76 | 25 |  |
|  | Q3: 106.8-115.6 | 186 | 24 | 216 | 24 |  | 62 | 24 | 71 | 24 |  |
|  | Q4: >115.6 | 166 | 22 | 248 | 28 |  | 86 | 33 | 79 | 26 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Waist-to-hip ratio 11,12 |  |  |  |  |  |  |  |  |  |  |
|  | Q1: <0.78 | 290 | 38 | 124 | 14 | <0.01 | 49 | 19 | 32 | 11 | 0.02 |
|  | Q2: 0.78-0.83 | 182 | 24 | 231 | 26 |  | 55 | 21 | 83 | 28 |  |
|  | Q3: 0.84-0.87 | 170 | 22 | 243 | 28 |  | 79 | 30 | 83 | 28 |  |
|  | Q4: >0.87 | 129 | 17 | 284 | 32 |  | 80 | 30 | 101 | 34 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Waist-to-height ratio 11,12 |  |  |  |  |  |  |  |  |  |  |
|  | Q1: <0.51 | 295 | 38 | 119 | 13 | <0.01 | 44 | 17 | 30 | 10 | 0.03 |
|  | Q2: 0.51-0.57 | 203 | 26 | 210 | 24 |  | 56 | 21 | 81 | 27 |  |
|  | Q3: 0.58-0.63 | 149 | 19 | 265 | 30 |  | 64 | 24 | 90 | 30 |  |
|  | Q4: >0.63 | 124 | 16 | 289 | 33 |  | 99 | 38 | 98 | 33 |  |

1 Based on median percent genetic admixture among postmenopausal Hispanic controls.

2 Information on genetic admixture was available for a subset of 493 postmenopausal Hispanic cases and 845 postmenopausal Hispanic controls for whom a blood or mouthwash sample was collected.

3 Percentages may not add up to 100% due to rounding.

4 Mantel-Haenszel Chi-square test for difference between postmenopausal Hispanic and NHW controls.

5 Mantel-Haenszel Chi-square test for difference between genetic ancestry groups among postmenopausal Hispanic controls.

6 Based on quartiles among all postmenopausal controls.

7 Based on measured height at interview (or self-reported adult height when measured height was not available).

8 Based on self-reported averaged weight at age 15 and age 30 for 4-CBCS cases and controls, self-reported weight in the 20's for SFBCS cases and controls (between ages 25-30 for cases diagnosed from April 1995 to April 1998 and matched controls and between ages 20-29 for cases diagnosed from May 1998 to April 2002 and matched controls), and measured height at interview (or self-reported adult height when measured height was not available).

9 Based on self-reported weight in reference year (or measured weight at interview when self-reported weight in reference year was not available) and measured height at interview (or self-reported adult height when measured height was not available).

10 Based on self-reported weight in reference year (or measured weight at interview when self-reported weight was not available) minus self-reported young-adult weight.

11 Based on quartiles among postmenopausal controls interviewed <12 months after selection into study.

12 Among 400 postmenopausal cases and 1,740 postmenopausal controls interviewed <12 months after diagnosis or selection into the study.

**Supplemental Table 3: Abdominal Adiposity Associations with Breast Cancer Risk in Hispanic Postmenopausal Women Measured <12 Months after Diagnosis/Selection, by Use of Hormone Therapy**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Non-current HT Users** | **Current HT Users** |
|  |  | **Cases n=81** | **Controls n=741** |  | **Cases n=45** | **Controls n=165** |  |
|  |  | **n** | **n** | **OR (95%CI) 1** | **n** | **n** | **OR (95%CI) 1** |
| Waist (cm) 2 |  |  |  |  |  |  |
|  | T1: <86.4 | 23 | 223 | 1.0 | 22 | 67 | 1.0 |
|  | T2: 86.4-96.6 | 25 | 243 | 0.97 0.48-1.93 | 11 | 46 | 0.91 0.33-2.51 |
|  | T3: >96.6 | 28 | 248 | 1.36 0.57-3.24 | 12 | 50 | 1.31 0.35-4.84 |
|  |  |  |  | *P* trend = 0.49 |  |  | *P* trend = 0.77 |
|  |  |  |  |  |  |  |  |
|  | Per 2 cm |  |  | 1.03 0.97-1.09 |  |  | 1.01 0.93-1.11 |
|  |  |  |  |  |  |  |  |
| Hip (cm) 2 |  |  |  |  |  |  |
|  | T1: <102.9 | 19 | 226 | 1.0 | 20 | 65 | 1.0 |
|  | T2: 102.9-112.7 | 25 | 240 | 1.48 0.74-2.97 | 13 | 46 | 1.55 0.57-4.20 |
|  | T3: >112.7 | 32 | 247 | 2.73 1.13-6.63 | 12 | 52 | 1.57 0.44-5.55 |
|  |  |  |  | *P* trend = 0.02 |  |  | *P* trend = 0.41 |
|  |  |  |  |  |  |  |  |
|  | Per 2 cm |  |  | 1.06 0.99-1.13 |  |  | 0.97 0.87-1.08 |
|  |  |  |  |  |  |  |  |
| Waist-to-hip ratio 2 |  |  |  |  |  |  |
|  | T1: <0.82 | 23 | 224 | 1.0 | 24 | 66 | 1.0 |
|  | T2: 0.82-0.87 | 23 | 237 | 1.01 0.53-1.93 | 9 | 52 | 0.50 0.18-1.42 |
|  | T3: >0.87 | 30 | 252 | 0.94 0.50-1.78 | 12 | 45 | 1.02 0.37-2.86 |
|  |  |  |  | *P* trend = 0.84 |  |  | *P* trend = 0.90 |
|  |  |  |  |  |  |  |  |
|  | Per 0.1 |  |  | 0.90 0.58-1.38 |  |  | 1.25 0.70-2.24 |
|  |  |  |  |  |  |  |  |
| Waist-to-height ratio 2 |  |  |  |  |  |  |
|  | T1: <0.56 | 26 | 220 | 1.0 | 23 | 69 | 1.0 |
|  | T2: 0.56-0.63 | 26 | 239 | 0.81 0.41-1.59 | 10 | 50 | 0.88 0.30-2.55 |
|  | T3: >0.63 | 24 | 255 | 0.66 0.27-1.58 | 12 | 44 | 1.79 0.49-6.54 |
|  |  |  |  | *P* trend = 0.35 |  |  | *P* trend = 0.45 |
|  |  |  |  |  |  |  |  |
|  | Per 0.1 |  |  | 1.08 0.65-1.78 |  |  | 1.09 0.52-1.29 |

1 Odds ratios and 95% confidence intervals, adjusted for age (years, continuous), study (SFBCS, 4-CBCS), English language acculturation (low, moderate, high), education (less than high school, high school graduate, post high school education), family history of breast cancer in first degree relatives (no, yes), age at menarche (<12, 12, 13, ≥14), number of full-term pregnancies (nulliparous, 1-2, 3-4, ≥5), age at first full-term pregnancy (<20, 20-24, 25-29, ≥30, nulliparous), lifetime number of months of breastfeeding (nulliparous, 0, 1-6, 7-12, 13-24, >24), average alcohol consumption in reference year (g/day; 0, 0.1-4.9, 5-9.9, 10-19.9, ≥20), and current BMI (continuous).

2 Based on tertiles among postmenopausal Hispanic controls measured <12 months after selection into the study.

**Supplemental Table 4: Abdominal Adiposity Associations with Breast Cancer Risk in NHW Postmenopausal Women Measured <12 Months after Diagnosis/Selection, by Use of Hormone Therapy**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Non-current HT Users** | **Current HT Users** |
|  |  | **Cases n=122** | **Controls n=512** |  | **Cases n=150** | **Controls n=310** |  |
|  |  | **n** | **n** | **OR (95%CI) 1** | **n** | **n** | **OR (95%CI) 1** |
| Waist (cm) 2 |  |  |  |  |  |  |
|  | T1: <80.1 | 23 | 150 | 1.0 | 54 | 101 | 1.0 |
|  | T2: 80.1-91.8 | 32 | 154 | 1.09 0.58-2.08 | 38 | 101 | 0.67 0.38-1.18 |
|  | T3: >91.8 | 60 | 165 | 1.61 0.76-3.42 | 52 | 95 | 0.87 0.41-1.84 |
|  |  |  |  | *P* trend = 0.21 |  |  | *P* trend = 0.60 |
|  |  |  |  |  |  |  |  |
|  | Per 2 cm |  |  | 1.03 0.97-1.08 |  |  | 0.99 0.94-1.04 |
|  |  |  |  |  |  |  |  |
| Hip (cm) 2 |  |  |  |  |  |  |
|  | T1: <101.6 | 32 | 156 | 1.0 | 48 | 99 | 1.0 |
|  | T2: 101.6-110.5 | 30 | 156 | 0.88 0.48-1.61 | 38 | 97 | 0.65 0.37-1.17 |
|  | T3: >110.5 | 53 | 157 | 1.06 0.52-2.16 | 57 | 101 | 0.95 0.45-2.03 |
|  |  |  |  | *P* trend = 0.89 |  |  | *P* trend = 0.79 |
|  |  |  |  |  |  |  |  |
|  | Per 2 cm |  |  | 0.96 0.91-1.02 |  |  | 1.04 0.97-1.11 |
|  |  |  |  |  |  |  |  |
| Waist-to-hip ratio 2 |  |  |  |  |  |  |
|  | T1: <0.77 | 21 | 138 | 1.0 | 55 | 114 | 1.0 |
|  | T2: 0.77-0.84 | 28 | 165 | 0.69 0.35-1.37 | 51 | 88 | 1.17 0.71-1.94 |
|  | T3: >0.84 | 66 | 166 | 1.80 0.94-3.42 | 38 | 95 | 0.75 0.42-1.31 |
|  |  |  |  | *P* trend = 0.01 |  |  | *P* trend = 0.37 |
|  |  |  |  |  |  |  |  |
|  | Per 0.1 |  |  | 1.51 1.05-2.17 |  |  | 0.84 0.61-1.14 |
|  |  |  |  |  |  |  |  |
| Waist-to-height ratio 2 |  |  |  |  |  |  |
|  | T1: <0.50 | 27 | 150 | 1.0 | 55 | 103 | 1.0 |
|  | T2: 0.50-0.57 | 32 | 151 | 0.96 0.51-1.81 | 41 | 101 | 0.70 0.40-1.24 |
|  | T3: >0.57 | 56 | 168 | 1.08 0.51-2.31 | 48 | 93 | 0.75 0.34-1.63 |
|  |  |  |  | *P* trend = 0.83 |  |  | *P* trend = 0.39 |
|  |  |  |  |  |  |  |  |
|  | Per 0.1 |  |  | 1.22 0.79-1.89 |  |  | 0.85 0.56-1.30 |

1 Odds ratios and 95% confidence intervals, adjusted for age (years, continuous), study (SFBCS, 4-CBCS), education (less than high school, high school graduate, post high school education), family history of breast cancer in first degree relatives (no, yes), age at menarche (<12, 12, 13, ≥14), number of full-term pregnancies (nulliparous, 1-2, 3-4, ≥5), age at first full-term pregnancy (<20, 20-24, 25-29, ≥30, nulliparous), lifetime number of months of breastfeeding (nulliparous, 0, 1-6, 7-12, 13-24, >24), average alcohol consumption in reference year (g/day; 0, 0.1-4.9, 5-9.9, 10-19.9, ≥20), and current BMI (continuous).

2 Based on tertiles among postmenopausal non-Hispanic white controls measured <12 months after selection into the study.

**Supplemental Table 5: Overall Adiposity Associations with ER+PR+ Breast Cancer in Postmenopausal Hispanic Women not Currently Using Hormone Therapy, by Genetic Ancestry**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Indigenous****American Ancestry 1,2****≤ 44%** | **Indigenous****American Ancestry 1,2****> 44%** |
|  |  | **ER+PR+****Cases****(n=88)** | **Controls****(n=299)** |  | **ER+PR+****Cases****(n=92)** | **Controls****(n=317)** |  |
|  |  | **n** | **n** | **OR 3 (95%CI)** | **n** | **n** | **OR 3 (95%CI)** |
| Current BMI (kg/m2) 4,5 |  |  |  |  |
|  | <25.0 | 26 | 65 | 1.0 | 17 | 42 | 1.0 |
|  | 25.0-29.9  | 26 | 100 | 0.43 0.20-0.96 | 30 | 122 | 0.53 0.23-1.24 |
|  | ≥30.0 | 36 | 133 | 0.31 0.12-0.83 | 45 | 153 | 0.69 0.27-1.79 |
|  |  |  |  | *P* trend = 0.02 |  |  | *P* trend = 0.66 |
|  |  |  |  |  |  |  |  |
|  | Per 5 kg/m2  |  |  | 0.38 0.23-0.65 |  |  | 0.68 0.45-1.02 |
|  |  |  |  |  |  |  |  |
| Weight gain (kg) 6,7,8 |  |  |  |  |
|  | T1: <11.3 | 20 | 88 | 1.0 | 26 | 86 | 1.0 |
|  | T2: 11.3-21.3 | 28 | 89 | 2.50 1.19-5.28 | 23 | 113 | 0.94 0.46-1.89 |
|  | T3: >21.3 | 27 | 88 | 3.46 1.26-9.52 | 31 | 97 | 1.90 0.80-4.56 |
|  |  |  |  | *P* trend = 0.01 |  |  | *P* trend = 0.18  |
|  |  |  |  |  |  |  |  |
|  | Per 5 kg  |  |  | 1.41 1.13-1.76 |  |  | 1.15 0.94-1.40 |

1 Based on median percent genetic admixture among postmenopausal Hispanic controls for whom a blood or mouthwash sample was collected.

2 Information on genetic admixture was available for a subset of 493 postmenopausal Hispanic cases and 845 postmenopausal Hispanic controls for whom a blood or mouthwash sample was collected.

3 Odds ratios and 95% confidence intervals, adjusted for age (years, continuous), study (4-CBCS, SFBCS), English language acculturation (low, moderate, high), education (some high school or less, high school graduate, some college or higher), family history of breast cancer in first-degree relatives (no, yes), age at menarche (<12, 12, 13, ≥14), number of full-term pregnancies (nulliparous, 1-2, 3-4, ≥5), age at first full-term pregnancy(<20, 20-24, 25-29, ≥30, nulliparous), lifetime number of months of breast-feeding (nulliparous, 0, 1-6, 7-12, 13-24, >24), and alcohol consumption in reference year (g/day; 0, 0.1-4.9, 5-9.9, 10-19.9, ≥20).

4 Based on self-reported weight in reference year (or measured weight at interview when self-reported weight in reference year was not available) and measured height at interview (or self-reported adult height when measured height was not available).

5 Adjusted additionally for weight gain (continuous).

6 Based on tertiles among postmenopausal Hispanic controls not currently using hormone therapy for whom a blood or mouthwash sample was collected.

7 Adjusted additionally for current BMI (continuous).

8 Based on self-reported weight in reference year (or measured weight at interview when self-reported weight was not available) minus self-reported young-adult weight.