Supplemental Table 1: Complete CBCSC cohort description, by all baseline model variables (N=12,098)

| Variable | | Racial/ethnic Group | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Non Latina  Whites | African  Americans | Latinas | Asian  Americans | Total |
| Total1 |  | 6501 (54%) | 2060 (17%) | 2032 (17%) | 1505 (12%) | 12098 (100%) |
| AJCC stage | Stage I | 3416 (53%) | 827 (40%) | 911 (45%) | 729 (48%) | 5883 (49%) |
| Stage II | 2486 (38%) | 923 (45%) | 868 (43%) | 629 (42%) | 4906 (41%) |
| Stage III | 312 ( 5%) | 143 ( 7%) | 145 ( 7%) | 90 ( 6%) | 690 ( 6%) |
| Stage IV | 102 ( 2%) | 58 ( 3%) | 34 ( 2%) | 19 ( 1%) | 213 ( 2%) |
| Unknown | 185 ( 3%) | 109 ( 5%) | 74 ( 4%) | 38 ( 3%) | 406 ( 3%) |
| Grade | Grade I | 1522 (23%) | 280 (14%) | 306 (15%) | 215 (14%) | 2323 (19%) |
| Grade II | 2537 (39%) | 639 (31%) | 780 (38%) | 594 (39%) | 4550 (38%) |
| Grade III | 1769 (27%) | 874 (42%) | 721 (35%) | 569 (38%) | 3933 (33%) |
| Unknown | 673 (10%) | 267 (13%) | 225 (11%) | 127 ( 8%) | 1292 (11%) |
| Tumor size | < 1 cm | 1135 (17%) | 235 (11%) | 300 (15%) | 267 (18%) | 1937 (16%) |
| < 5 cm | 4730 (73%) | 1512 (73%) | 1495 (74%) | 1084 (72%) | 8821 (73%) |
| ≥ 5 cm | 346 ( 5%) | 176 ( 9%) | 120 ( 6%) | 92 ( 6%) | 734 ( 6%) |
| Unknown | 290 ( 4%) | 137 ( 7%) | 117 ( 6%) | 62 ( 4%) | 606 ( 5%) |
| Nodal positivity | No positive nodes | 4338 (67%) | 1208 (59%) | 1244 (61%) | 981 (65%) | 7771 (64%) |
| Positive nodes | 1984 (31%) | 737 (36%) | 713 (35%) | 499 (33%) | 3933 (33%) |
| Unknown | 179 ( 3%) | 115 ( 6%) | 75 ( 4%) | 25 ( 2%) | 394 ( 3%) |
| ER/PR status | ER+ PR+ | 4019 (62%) | 957 (46%) | 1099 (54%) | 830 (55%) | 6905 (57%) |
| ER+ PR- | 739 (11%) | 184 ( 9%) | 206 (10%) | 126 ( 8%) | 1255 (10%) |
| ER- PR+ | 90 ( 1%) | 66 ( 3%) | 45 ( 2%) | 39 ( 3%) | 240 ( 2%) |
| ER- PR- | 868 (13%) | 453 (22%) | 406 (20%) | 199 (13%) | 1926 (16%) |
| ER? PR? | 785 (12%) | 400 (19%) | 276 (14%) | 311 (21%) | 1772 (15%) |
| Prior tumor | No | 5972 (92%) | 1906 (93%) | 1924 (95%) | 1445 (96%) | 11247 (93%) |
| Yes | 529 ( 8%) | 154 ( 7%) | 108 ( 5%) | 60 ( 4%) | 851 ( 7%) |
| Chemotherapy | No chemotherapy | 3922 (60%) | 1197 (58%) | 1074 (53%) | 795 (53%) | 6988 (58%) |
| Some chemotherapy | 2490 (38%) | 828 (40%) | 923 (45%) | 670 (45%) | 4911 (41%) |
| Unknown | 89 ( 1%) | 35 ( 2%) | 35 ( 2%) | 40 ( 3%) | 199 ( 2%) |
| Radiation | No radiation | 2860 (44%) | 1120 (54%) | 985 (48%) | 883 (59%) | 5848 (48%) |
| Some radiation | 3641 (56%) | 940 (46%) | 1047 (52%) | 622 (41%) | 6250 (52%) |
| Surgery type | No surgery | 115 ( 2%) | 98 ( 5%) | 36 ( 2%) | 18 ( 1%) | 267 ( 2%) |
| Mastectomy | 2547 (39%) | 843 (41%) | 926 (46%) | 792 (53%) | 5108 (42%) |
| Breast conserving surgery | 3827 (59%) | 1116 (54%) | 1069 (53%) | 693 (46%) | 6705 (55%) |
| Other | 12 ( 0%) | 3 ( 0%) | 1 ( 0%) | 2 ( 0%) | 18 ( 0%) |
| Marital status | Single, never married | 677 (10%) | 391 (19%) | 267 (13%) | 192 (13%) | 1527 (13%) |
| Married | 4113 (63%) | 821 (40%) | 1197 (59%) | 1069 (71%) | 7200 (60%) |
| Separated/Divorced | 758 (12%) | 423 (21%) | 254 (13%) | 77 ( 5%) | 1512 (12%) |
| Widowed | 838 (13%) | 357 (17%) | 263 (13%) | 142 ( 9%) | 1600 (13%) |
| Unknown | 115 ( 2%) | 68 ( 3%) | 51 ( 3%) | 25 ( 2%) | 259 ( 2%) |
| Residency region | Monterey Bay Area | 615 ( 9%) | 57 ( 3%) | 456 (22%) | 30 ( 2%) | 1158 (10%) |
| Central California | 365 ( 6%) | 7 ( 0%) | 19 ( 1%) | 5 ( 0%) | 396 ( 3%) |
| Sacramento Sierra | 831 (13%) | 44 ( 2%) | 39 ( 2%) | 44 ( 3%) | 958 ( 8%) |
| Central Coast | 216 ( 3%) | 0 ( 0%) | 8 ( 0%) | 7 ( 0%) | 231 ( 2%) |
| Desert Sierra | 268 ( 4%) | 50 ( 2%) | 35 ( 2%) | 4 ( 0%) | 357 ( 3%) |
| Northern California | 411 ( 6%) | 2 ( 0%) | 18 ( 1%) | 4 ( 0%) | 435 ( 4%) |
| San Diego & Imperial County | 341 ( 5%) | 23 ( 1%) | 13 ( 1%) | 6 ( 0%) | 383 ( 3%) |
| San Francisco Area | 1436 (22%) | 582 (28%) | 689 (34%) | 79 ( 5%) | 2786 (23%) |
| Los Angeles | 1635 (25%) | 1289 (63%) | 738 (36%) | 1314 (87%) | 4976 (41%) |
| Orange County | 383 ( 6%) | 6 ( 0%) | 17 ( 1%) | 12 ( 1%) | 418 ( 3%) |
| Neighorhood SES | Lowest SES | 201 ( 3%) | 559 (27%) | 263 (13%) | 137 ( 9%) | 1160 (10%) |
| Lower-middle SES | 591 ( 9%) | 528 (26%) | 402 (20%) | 251 (17%) | 1772 (15%) |
| Middle SES | 1119 (17%) | 420 (20%) | 430 (21%) | 288 (19%) | 2257 (19%) |
| Higher-middle SES | 1717 (26%) | 338 (16%) | 447 (22%) | 376 (25%) | 2878 (24%) |
| Highest SES | 2657 (41%) | 177 ( 9%) | 440 (22%) | 420 (28%) | 3694 (31%) |
| Unknown | 216 ( 3%) | 38 ( 2%) | 50 ( 2%) | 33 ( 2%) | 337 ( 3%) |
| Smoking | Never | 3150 (48%) | 721 (35%) | 903 (44%) | 1174 (78%) | 5948 (49%) |
| Past ≤1 pack | 1704 (26%) | 465 (23%) | 313 (15%) | 217 (14%) | 2699 (22%) |
| Past >1 pack | 504 ( 8%) | 39 ( 2%) | 20 ( 1%) | 16 ( 1%) | 579 ( 5%) |
| Current ≤1 pack | 379 ( 6%) | 283 (14%) | 139 ( 7%) | 77 ( 5%) | 878 ( 7%) |
| Current >1 pack | 127 ( 2%) | 29 ( 1%) | 8 ( 0%) | 5 ( 0%) | 169 ( 1%) |
| Unknown | 637 (10%) | 523 (25%) | 649 (32%) | 16 ( 1%) | 1825 (15%) |

1Percentages in the “Total” row are row percentages, whereas other percentages are column percentages for the variable.

Supplemental Table 2: Project specific sub-cohort description

| Variable | | Racial/ethnic group | | | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | | Non Latina  Whites | African  Americans | Latinas | Asian  Americans | Total |
| Contextual factors (Project 1) cohort variables (N = 9,635) | | | | | | |
| Total1 |  | 4622 (48%) | 1832 (19%) | 1848 (19%) | 1333 (14%) | 9635 (100%) |
| Total business count | 1st quartile | 1603 (35%) | 206 (11%) | 307 (17%) | 212 (16%) | 2328 (24%) |
| 2nd quartile | 1138 (25%) | 398 (22%) | 516 (28%) | 300 (23%) | 2352 (24%) |
| 3rd quartile | 860 (19%) | 633 (35%) | 507 (27%) | 342 (26%) | 2342 (24%) |
| 4th quartile | 877 (19%) | 563 (31%) | 466 (25%) | 447 (34%) | 2353 (24%) |
| Unknown | 144 ( 3%) | 32 ( 2%) | 52 ( 3%) | 32 ( 2%) | 260 ( 3%) |
| Housing crowding | 1st quartile | 1758 (38%) | 190 (10%) | 216 (12%) | 177 (13%) | 2341 (24%) |
| 2nd quartile | 1426 (31%) | 294 (16%) | 311 (17%) | 316 (24%) | 2347 (24%) |
| 3rd quartile | 919 (20%) | 572 (31%) | 483 (26%) | 373 (28%) | 2347 (24%) |
| 4th quartile | 380 ( 8%) | 743 (41%) | 795 (43%) | 439 (33%) | 2357 (24%) |
| Unknown | 139 ( 3%) | 33 ( 2%) | 43 ( 2%) | 28 ( 2%) | 243 ( 3%) |
| Urban/rural categorization | Rural | 283 ( 6%) | 6 ( 0%) | 25 ( 1%) | 6 ( 0%) | 320 ( 3%) |
| Town | 140 ( 3%) | 1 ( 0%) | 2 ( 0%) | 2 ( 0%) | 145 ( 2%) |
| City | 1062 (23%) | 71 ( 4%) | 190 (10%) | 37 ( 3%) | 1360 (14%) |
| Metro. suburban | 2604 (56%) | 1012 (55%) | 1074 (58%) | 954 (72%) | 5644 (59%) |
| Metro. urban | 395 ( 9%) | 712 (39%) | 514 (28%) | 307 (23%) | 1928 (20%) |
| Unknown | 138 ( 3%) | 30 ( 2%) | 43 ( 2%) | 27 ( 2%) | 238 ( 2%) |
| Population density | 1st quartile | 1285 (28%) | 119 ( 6%) | 187 (10%) | 130 (10%) | 1721 (18%) |
| 2nd quartile | 1479 (32%) | 217 (12%) | 331 (18%) | 320 (24%) | 2347 (24%) |
| 3rd quartile | 1124 (24%) | 494 (27%) | 572 (31%) | 413 (31%) | 2603 (27%) |
| 4th quartile | 597 (13%) | 972 (53%) | 715 (39%) | 443 (33%) | 2727 (28%) |
| Unknown | 137 ( 3%) | 30 ( 2%) | 43 ( 2%) | 27 ( 2%) | 237 ( 2%) |
| Commuting via public transportation | 1st quartile | 1651 (36%) | 167 ( 9%) | 224 (12%) | 291 (22%) | 2333 (24%) |
| 2nd quartile | 1320 (29%) | 221 (12%) | 409 (22%) | 398 (30%) | 2348 (24%) |
| 3rd quartile | 927 (20%) | 450 (25%) | 576 (31%) | 402 (30%) | 2355 (24%) |
| 4th quartile | 585 (13%) | 961 (52%) | 596 (32%) | 214 (16%) | 2356 (24%) |
| Unknown | 139 ( 3%) | 33 ( 2%) | 43 ( 2%) | 28 ( 2%) | 243 ( 3%) |
| Restaurant environment index | 1st quartile | 1275 (28%) | 233 (13%) | 364 (20%) | 232 (17%) | 2104 (22%) |
| 2nd quartile | 858 (19%) | 358 (20%) | 472 (26%) | 377 (28%) | 2065 (21%) |
| 3rd quartile | 781 (17%) | 502 (27%) | 457 (25%) | 336 (25%) | 2076 (22%) |
| 4th quartile | 824 (18%) | 638 (35%) | 410 (22%) | 272 (20%) | 2144 (22%) |
| Unknown | 884 (19%) | 101 ( 6%) | 145 ( 8%) | 116 ( 9%) | 1246 (13%) |
| Traffic density | 1st quartile | 1598 (35%) | 210 (11%) | 295 (16%) | 229 (17%) | 2332 (24%) |
| 2nd quartile | 1192 (26%) | 376 (21%) | 464 (25%) | 317 (24%) | 2349 (24%) |
| 3rd quartile | 948 (21%) | 565 (31%) | 475 (26%) | 353 (26%) | 2341 (24%) |
| 4th quartile | 740 (16%) | 649 (35%) | 562 (30%) | 402 (30%) | 2353 (24%) |
| Unknown | 144 ( 3%) | 32 ( 2%) | 52 ( 3%) | 32 ( 2%) | 260 ( 3%) |
| Hospital SES composition | low SES | 579 (13%) | 416 (23%) | 225 (12%) | 325 (24%) | 1545 (16%) |
| mixed SES | 1226 (27%) | 757 (41%) | 498 (27%) | 457 (34%) | 2938 (30%) |
| high SES | 2817 (61%) | 659 (36%) | 1125 (61%) | 551 (41%) | 5152 (53%) |
| Physical activity (Project 2) cohort variables (N = 4,608) | | | | | | |
| Total1 |  | 1166 (25%) | 1112 (24%) | 1204 (26%) | 1126 (25%) | 4608 (100%) |
| Avg. hours of activity, ages 10 to 19 | Zero | 291 (25%) | 428 (38%) | 660 (55%) | 258 (23%) | 1637 (36%) |
| 1st +Tertile | 335 (29%) | 310 (28%) | 188 (16%) | 156 (14%) | 989 (21%) |
| 2nd +Tertile | 232 (20%) | 148 (13%) | 173 (14%) | 436 (39%) | 989 (21%) |
| 3rd +Tertile | 308 (26%) | 226 (20%) | 183 (15%) | 276 (25%) | 993 (22%) |
| Avg. hours of activity, ages 10 to diagnosis | Zero | 162 (14%) | 297 (27%) | 337 (28%) | 141 (13%) | 937 (20%) |
| 1st +Tertile | 249 (21%) | 253 (23%) | 316 (26%) | 384 (34%) | 1202 (26%) |
| 2nd +Tertile | 321 (28%) | 237 (21%) | 291 (24%) | 381 (34%) | 1230 (27%) |
| 3rd +Tertile | 434 (37%) | 325 (29%) | 260 (22%) | 220 (20%) | 1239 (27%) |
| Avg. hours of activity, decade before diagnosis | Zero | 288 (25%) | 423 (38%) | 609 (51%) | 640 (57%) | 1960 (43%) |
| 1st +Tertile | 273 (23%) | 229 (21%) | 188 (16%) | 189 (17%) | 879 (19%) |
| 2nd +Tertile | 293 (25%) | 220 (20%) | 200 (17%) | 173 (15%) | 886 (19%) |
| 3rd +Tertile | 312 (27%) | 240 (22%) | 207 (17%) | 124 (11%) | 883 (19%) |
| Body size (Project 3) cohort variables (N = 11,021) | | | | | | |
| Total1 |  | 5986 (55%) | 1788 (16%) | 1802 (16%) | 1444 (13%) | 11020 (100%) |
| Pre-diagnosis BMI | Underweight/normal | 3315 (55%) | 541 (30%) | 600 (33%) | 952 (66%) | 5408 (49%) |
| Overweight | 1672 (28%) | 602 (34%) | 620 (34%) | 386 (27%) | 3280 (30%) |
| Obese | 999 (17%) | 645 (36%) | 582 (32%) | 106 ( 7%) | 2332 (21%) |
| Comorbidity (Project 4) cohort variables (N = 10,106) | | | | | | |
| Total1 |  | 6096 (60%) | 1277 (13%) | 1379 (14%) | 1354 (13%) | 10106 (100%) |
| Hypertension | Yes | 1390 (23%) | 399 (31%) | 270 (20%) | 392 (29%) | 2451 (24%) |
| No | 4255 (70%) | 482 (38%) | 656 (48%) | 946 (70%) | 6339 (63%) |
| Unknown | 451 ( 7%) | 396 (31%) | 453 (33%) | 16 ( 1%) | 1316 (13%) |
| Diabetes | Yes | 170 ( 3%) | 101 ( 8%) | 104 ( 8%) | 109 ( 8%) | 484 ( 5%) |
| No | 5402 (89%) | 771 (60%) | 808 (59%) | 1221 (90%) | 8202 (81%) |
| Unknown | 524 ( 9%) | 405 (32%) | 467 (34%) | 24 ( 2%) | 1420 (14%) |
| Myocardial infarction | Yes | 96 ( 2%) | 21 ( 2%) | 5 ( 0%) | 12 ( 1%) | 134 ( 1%) |
| No | 5409 (89%) | 751 (59%) | 313 (23%) | 1326 (98%) | 7799 (77%) |
| Unknown | 591 (10%) | 505 (40%) | 1061 (77%) | 16 ( 1%) | 2173 (22%) |

1Percentages in the “Total” row are row percentages, whereas other percentages are column percentages for the variable.

Supplemental Table 3: Hazard ratio (HR) estimates and 95% confidence intervals from Cox regression analysis of breast cancer-specific mortality, for the racial/ethnic groups only model vs the full baseline model. *(AJCC Stage I-II cases only)*

|  |  |  |
| --- | --- | --- |
|  | All cases (N = 10,789) | |
| Racial/ethnic group | **Racial/ethnic group**  **only model1** | **Baseline**  **model2** |
| Non Latina White | 1 (Ref) | 1 (Ref) |
| African American | 1.79  (1.51, 2.13) | 1.28  (1.05, 1.55) |
| Latina | 0.93  (0.75, 1.15) | 0.79  (0.63, 0.98) |
| Asian | 0.59  (0.35, 1.01) | 0.62  (0.36, 1.07) |
| *Disparity (D)* | *0.30* | *0.21* |
| *% Change in D* |  | *-30%* |
| *Overall χ2(df)3* |  | *763 (61)* |
| *P-Value3* |  | *<0.0001* |
| *Disparity χ2(df)4* |  | *20 (3)* |
| *P-Value4* |  | *0.0002* |

1Model including racial/ethnic group, and stratified by study and adjusted for age at diagnosis only.

2Model including racial/ethnic group and all other variables in Table 1, stratified by study and adjusted for age at diagnosis.

3Cox partial likelihood ratio *χ2*comparing left model to right model in each section. *df* = degrees of freedom.

4Portion of the likelihood ratio *χ2* attributable to change in disparity measure (see methods)

Supplemental Table 4: Hazard ratio (HR) estimates and 95% confidence intervals from Cox regression analysis of breast cancer-specific mortality, for the full baseline model vs the baseline model + specific domain variables, for the subsets of cases for which domain data were available*(AJCC stage I-II cases Only)*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Contextual factors**  **subset3**  **(N = 8,479)** | | **Physical activity**  **subset**  **(N = 4,083)4** | | **Body size**  **subset**  **(N = 9,865)5** | | **Comorbidity**  **subset**  **(N = 9,085)6** | |
| **Racial/ethnic group** | **Baseline**  **model1** | **Baseline +**  **domain**  **variables2** | **Baseline**  **model1** | **Baseline +**  **domain**  **variables2** | **Baseline**  **model1** | **Baseline +**  **domain**  **variables2** | **Baseline**  **model1** | **Baseline +**  **domain**  **variables2** |
| **Non Latina White** | 1 (Ref) | 1 (Ref) | 1 (Ref) | 1 (Ref) | 1 (Ref) | 1 (Ref) | 1 (Ref) | 1 (Ref) |
| **African American** | 1.34  (1.08, 1.65) | 1.28  (1.03, 1.61) | 1.40  (1.09, 1.80) | 1.42  (1.11, 1.83) | 1.23  (1.01, 1.51) | 1.24  (1.01, 1.52) | 1.40  (1.13, 1.74) | 1.40  (1.12, 1.74) |
| **Latina** | 0.87  (0.69, 1.11) | 0.84  (0.66, 1.08) | 0.89  (0.67, 1.20) | 0.92  (0.69, 1.24) | 0.74  (0.58, 0.94) | 0.75  (0.59, 0.95) | 0.79  (0.61, 1.02) | 0.73  (0.56, 0.96) |
| **Asian** | 0.83  (0.45, 1.54) | 0.86  (0.46, 1.60) | (omitted) | (omitted) | 0.58  (0.32, 1.03) | 0.57  (0.32, 1.03) | 0.65  (0.32, 1.33) | 0.67  (0.33, 1.36) |
| ***Disparity (D)*** | *0.15* | *0.14* | *0.15* | *0.16* | *0.23* | *0.23* | *0.21* | *0.22* |
| ***% Change in D*** |  | *-6.7%* |  | *<±1%* |  | *1.1%* |  | *2.2%* |
| ***Overall χ2(df)7*** |  | *33.6 (26)* |  | *8.0 (8)* |  | *1.45 (2)* |  | *16.6 (6)* |
| ***P-Value7*** |  | *0.14* |  | *0.43* |  | *0.49* |  | *0.011* |
| ***Disparity χ2(df)8*** |  | *0.15(†)* |  | *0.04(†)* |  | *0.00 (3)* |  | *0.34 (3)* |
| ***P-Value8*** |  | *†* |  | *†* |  | *>0.95* |  | *>0.95* |

1Model including racial/ethnic group and all other variables in Table 1, stratified by study and adjusted for age at diagnosis. Analysis excludes cases from studies that did not collect variables relevant to the specific domain. Additionally some cases with missing data relevant to the domain are also excluded.

2Includes all variables in the baseline model plus domain-specific variables.

3LACE excluded; 4Physical Activity – CTS, LACE, MEC excluded; 5Body Size – None excluded; 6Comorbidity – MEC excluded.

7Cox partial likelihood ratio test comparing left model to right model in each section.

8Portion of the likelihood ratio *χ2* attributable to change in disparity measure (see methods)

*†*Could not be computed because of parameter aliasing.

|  |
| --- |
|  |
| Supplemental Figure 1: Same as Figure 1, but with analysis restricted to AJCC stage I-II cases only. (Upper panel) Hazard ratios (HR) for breast cancer-specific mortality of African Americans, Latinas, and Asian Americans compared to NL Whites. (Lower panel) Univariable and multivariable relative influence of individual variables in the baseline model. |