

Supplementary Online Content

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eTable. Patient Characteristics According to Surgery Type: Bilateral Mastectomy, Breast-Conserving Surgery With Radiation, and Unilateral Mastectomy, Stages 0-III Breast Cancer, 1998-2011, California

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable. Patient Characteristics According to Surgery Type: Bilateral Mastectomy, Breast-Conserving Surgery With Radiation, and Unilateral Mastectomy, Stages 0-III Breast Cancer, 1998-2011, California (column percentages shown)

| Variable | Bilateral Mastectomy | | Breast Conserving Surgery with Radiation | | Unilateral Mastectomy | | Total |
|---|----------------------|---------------------------------|--|---------------------------------|-----------------------|---------------------------------|--------|
| | N | Column % (95% CI ^a) | N | Column % (95% CI ^a) | N | Column % (95% CI ^a) | |
| All Patients | 11692 | Not applicable | 104420 | Not applicable | 73622 | Not applicable | 189734 |
| Race/Ethnicity | | | | | | | |
| Non-Hispanic White | 8758 | 74.9% (74.1 - 75.7) | 73310 | 70.2% (69.9 - 70.5) | 44557 | 60.5% (60.2 - 60.9) | 126625 |
| Non-Hispanic Black | 416 | 3.6% (3.2 - 3.9) | 5483 | 5.3% (5.1 - 5.4) | 4057 | 5.5% (5.3 - 5.7) | 9956 |
| Hispanic | 1450 | 12.4% (11.8 - 13.0) | 14279 | 13.7% (13.5 - 13.9) | 13172 | 17.9% (17.6 - 18.2) | 28901 |
| Chinese | 172 | 1.5% (1.3 - 1.7) | 2520 | 2.4% (2.3 - 2.5) | 2570 | 3.5% (3.4 - 3.6) | 5262 |
| Japanese | 100 | 0.9% (0.7 - 1.0) | 1317 | 1.3% (1.2 - 1.3) | 989 | 1.3% (1.3 - 1.4) | 2406 |
| Filipina | 268 | 2.3% (2.0 - 2.6) | 2922 | 2.8% (2.7 - 2.9) | 3574 | 4.9% (4.7 - 5.0) | 6764 |
| Other Asian / Pacific Islander | 440 | 3.8% (3.4 - 4.1) | 3765 | 3.6% (3.5 - 3.7) | 4079 | 5.5% (5.4 - 5.7) | 8284 |
| Non-Hispanic American Indian / Other /Unknown | 88 | 0.8% (0.6 - 0.9) | 824 | 0.8% (0.7 - 0.8) | 624 | 0.8% (0.8 - 0.9) | 1536 |
| Age in Years at Diagnosis | | | | | | | |
| <40 | 1586 | 13.6% (12.9 - 14.2) | 4092 | 3.9% (3.8 - 4.0) | 4448 | 6.0% (5.9 - 6.2) | 10126 |
| 40-49 | 3898 | 33.3% (32.5 - 34.2) | 19175 | 18.4% (18.1 - 18.6) | 14636 | 19.9% (19.6 - 20.2) | 37709 |
| 50-64 | 4549 | 38.9% (38.0 - 39.8) | 43709 | 41.9% (41.6 - 42.2) | 25922 | 35.2% (34.9 - 35.6) | 74180 |
| ≥65 | 1659 | 14.2% (13.6 - 14.8) | 37444 | 35.9% (35.6 - 36.1) | 28616 | 38.9% (38.5 - 39.2) | 67719 |

| Marital Status | | | | | | | |
|--|------|---------------------|-------|---------------------|-------|---------------------|--------|
| Not married | 3698 | 31.6% (30.8 - 32.5) | 38936 | 37.3% (37.0 - 37.6) | 29954 | 40.7% (40.3 - 41.0) | 72588 |
| Married | 7753 | 66.3% (65.5 - 67.2) | 63433 | 60.7% (60.5 - 61.0) | 41884 | 56.9% (56.5 - 57.2) | 113070 |
| Unknown | 241 | 2.1% (1.8 - 2.3) | 2051 | 2.0% (1.9 - 2.0) | 1784 | 2.4% (2.3 - 2.5) | 4076 |
| Neighborhood Quintile, Socioeconomic Status (SES)^b | | | | | | | |
| 1 (Lowest) | 795 | 6.8% (6.3 - 7.3) | 9339 | 8.9% (8.8 - 9.1) | 10101 | 13.7% (13.5 - 14.0) | 20235 |
| 2 | 1480 | 12.7% (12.1 - 13.3) | 15621 | 15.0% (14.7 - 15.2) | 13752 | 18.7% (18.4 - 19.0) | 30853 |
| 3 | 2164 | 18.5% (17.8 - 19.2) | 20904 | 20.0% (19.8 - 20.3) | 15665 | 21.3% (21.0 - 21.6) | 38733 |
| 4 | 2899 | 24.8% (24.0 - 25.6) | 26008 | 24.9% (24.6 - 25.2) | 16790 | 22.8% (22.5 - 23.1) | 45697 |
| 5 (Highest) | 4354 | 37.2% (36.4 - 38.1) | 32548 | 31.2% (30.9 - 31.5) | 17314 | 23.5% (23.2 - 23.8) | 54216 |
| Insurance Status | | | | | | | |
| Private | 9477 | 81.1% (80.3 - 81.8) | 68395 | 65.5% (65.2 - 65.8) | 44894 | 61.0% (60.6 - 61.3) | 122766 |
| Medicare | 782 | 6.7% (6.2 - 7.1) | 13722 | 13.1% (12.9 - 13.3) | 9876 | 13.4% (13.2 - 13.7) | 24380 |
| Military | 99 | 0.8% (0.7 - 1.0) | 835 | 0.8% (0.7 - 0.9) | 695 | 0.9% (0.9 - 1.0) | 1629 |
| Not insured or self-pay | 80 | 0.7% (0.5 - 0.8) | 693 | 0.7% (0.6 - 0.7) | 718 | 1.0% (0.9 - 1.0) | 1491 |
| Public or Medicaid | 1072 | 9.2% (8.6 - 9.7) | 15762 | 15.1% (14.9 - 15.3) | 15768 | 21.4% (21.1 - 21.7) | 32602 |
| Unknown | 182 | 1.6% (1.3 - 1.8) | 5013 | 4.8% (4.7 - 4.9) | 1671 | 2.3% (2.2 - 2.4) | 6866 |
| American Joint Committee on Cancer Stage | | | | | | | |
| 0 | 1779 | 15.2% (14.6 - 15.9) | 14697 | 14.1% (13.9 - 14.3) | 6864 | 9.3% (9.1 - 9.5) | 23340 |
| I | 4376 | 37.4% (36.6 - 38.3) | 57946 | 55.5% (55.2 - 55.8) | 24436 | 33.2% (32.9 - 33.5) | 86758 |
| II | 4641 | 39.7% (38.8 - 40.6) | 29397 | 28.2% (27.9 - 28.4) | 35669 | 48.4% (48.1 - 48.8) | 69707 |
| III | 896 | 7.7% (7.2 - 8.1) | 2380 | 2.3% (2.2 - 2.4) | 6653 | 9.0% (8.8 - 9.2) | 9929 |
| Tumor Size | | | | | | | |
| <1 centimeter (cm) | 2366 | 20.2% (19.5 - 21.0) | 28022 | 26.8% (26.6 - 27.1) | 10310 | 14.0% (13.8 - 14.3) | 40698 |
| 1-1.9 cm | 3933 | 33.6% (32.8 - 34.5) | 46936 | 44.9% (44.6 - 45.3) | 23047 | 31.3% (31.0 - 31.6) | 73916 |
| 2-2.9 cm | 2786 | 23.8% (23.1 - 24.6) | 20044 | 19.2% (19.0 - 19.4) | 19507 | 26.5% (26.2 - 26.8) | 42337 |
| 3-3.9 cm | 1419 | 12.1% (11.5 - 12.7) | 6395 | 6.1% (6.0 - 6.3) | 11400 | 15.5% (15.2 - 15.7) | 19214 |
| 4-5 cm | 1188 | 10.2% (9.6 - 10.7) | 3023 | 2.9% (2.8 - 3.0) | 9358 | 12.7% (12.5 - 13.0) | 13569 |

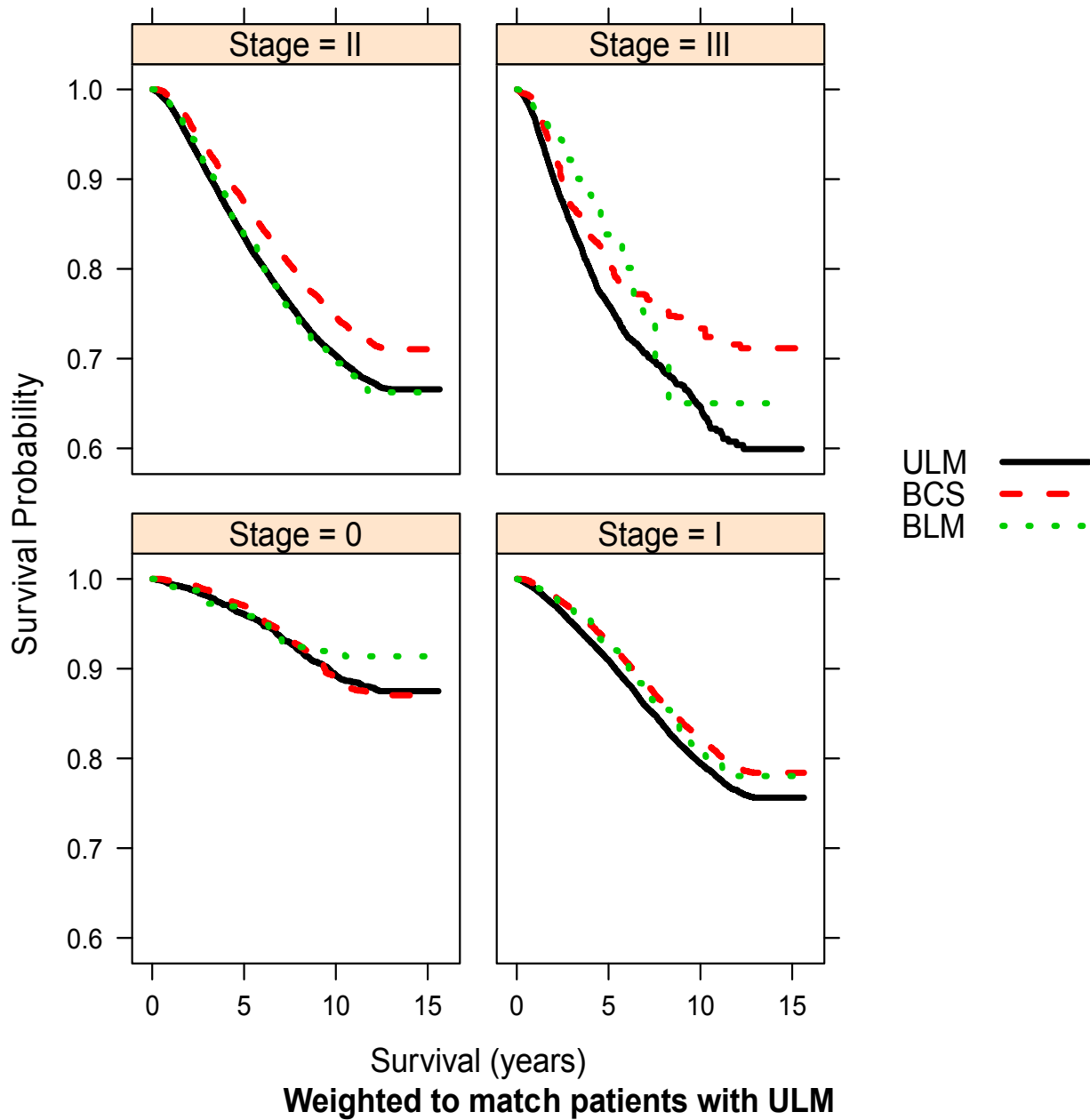
| Grade (for Stages 0-III) | | | | | | | |
|--|------|---------------------|-------|---------------------|-------|---------------------|--------|
| Grade I | 1962 | 16.8% (16.1 - 17.5) | 26134 | 25.0% (24.8 - 25.3) | 11694 | 15.9% (15.6 - 16.1) | 39790 |
| Grade II | 4610 | 39.4% (38.5 - 40.3) | 42862 | 41.0% (40.7 - 41.3) | 29219 | 39.7% (39.3 - 40.0) | 76691 |
| Grade III | 4421 | 37.8% (36.9 - 38.7) | 30525 | 29.2% (29.0 - 29.5) | 28159 | 38.2% (37.9 - 38.6) | 63105 |
| Unknown | 699 | 6.0% (5.5 - 6.4) | 4899 | 4.7% (4.6 - 4.8) | 4550 | 6.2% (6.0 - 6.4) | 10148 |
| Histology | | | | | | | |
| Ductal | 9706 | 83.0% (82.3 - 83.7) | 90011 | 86.2% (86.0 - 86.4) | 62336 | 84.7% (84.4 - 84.9) | 162053 |
| Lobular (or lobular component) | 1290 | 11.0% (10.5 - 11.6) | 6070 | 5.8% (5.7 - 6.0) | 6134 | 8.3% (8.1 - 8.5) | 13494 |
| Other | 696 | 6.0% (5.5 - 6.4) | 8339 | 8.0% (7.8 - 8.2) | 5152 | 7.0% (6.8 - 7.2) | 14187 |
| Estrogen/Progesterone Receptor (ER/PR) Status | | | | | | | |
| Negative (ER and PR negative) | 1974 | 16.9% (16.2 - 17.6) | 13914 | 13.3% (13.1 - 13.5) | 12870 | 17.5% (17.2 - 17.8) | 28758 |
| Positive (ER or PR positive) | 8536 | 73.0% (72.2 - 73.8) | 79457 | 76.1% (75.8 - 76.4) | 50213 | 68.2% (67.9 - 68.5) | 138206 |
| Unknown or borderline (ER or PR) | 1182 | 10.1% (9.6 - 10.7) | 11049 | 10.6% (10.4 - 10.8) | 10539 | 14.3% (14.1 - 14.6) | 22770 |
| Lymph Node Involvement | | | | | | | |
| Negative | 7824 | 66.9% (66.1 - 67.8) | 84655 | 81.1% (80.8 - 81.3) | 44667 | 60.7% (60.3 - 61.0) | 137146 |
| Positive | 3868 | 33.1% (32.2 - 33.9) | 19765 | 18.9% (18.7 - 19.2) | 28955 | 39.3% (39.0 - 39.7) | 52588 |
| Year of Cancer Diagnosis | | | | | | | |
| 1998 | 249 | 2.1% (1.9 - 2.4) | 6453 | 6.2% (6.0 - 6.3) | 5790 | 7.9% (7.7 - 8.1) | 12492 |
| 1999 | 298 | 2.5% (2.3 - 2.8) | 6566 | 6.3% (6.1 - 6.4) | 5702 | 7.7% (7.6 - 7.9) | 12566 |
| 2000 | 400 | 3.4% (3.1 - 3.8) | 7226 | 6.9% (6.8 - 7.1) | 5730 | 7.8% (7.6 - 8.0) | 13356 |
| 2001 | 483 | 4.1% (3.8 - 4.5) | 7286 | 7.0% (6.8 - 7.1) | 5842 | 7.9% (7.7 - 8.1) | 13611 |
| 2002 | 509 | 4.4% (4.0 - 4.7) | 7341 | 7.0% (6.9 - 7.2) | 5591 | 7.6% (7.4 - 7.8) | 13441 |
| 2003 | 605 | 5.2% (4.8 - 5.6) | 7310 | 7.0% (6.8 - 7.2) | 5107 | 6.9% (6.8 - 7.1) | 13022 |
| 2004 | 704 | 6.0% (5.6 - 6.5) | 7468 | 7.2% (7.0 - 7.3) | 5111 | 6.9% (6.8 - 7.1) | 13283 |
| 2005 | 642 | 5.5% (5.1 - 5.9) | 8117 | 7.8% (7.6 - 7.9) | 4920 | 6.7% (6.5 - 6.9) | 13679 |

| | | | | | | | |
|--|-------|---------------------|--------|---------------------|-------|---------------------|--------|
| 2006 | 821 | 7.0% (6.6 - 7.5) | 7746 | 7.4% (7.3 - 7.6) | 4905 | 6.7% (6.5 - 6.8) | 13472 |
| 2007 | 1017 | 8.7% (8.2 - 9.2) | 8053 | 7.7% (7.6 - 7.9) | 4979 | 6.8% (6.6 - 6.9) | 14049 |
| 2008 | 1209 | 10.3% (9.8 - 10.9) | 7852 | 7.5% (7.4 - 7.7) | 5148 | 7.0% (6.8 - 7.2) | 14209 |
| 2009 | 1437 | 12.3% (11.7 - 12.9) | 7541 | 7.2% (7.1 - 7.4) | 4987 | 6.8% (6.6 - 7.0) | 13965 |
| 2010 | 1550 | 13.3% (12.6 - 13.9) | 7687 | 7.4% (7.2 - 7.5) | 5021 | 6.8% (6.6 - 7.0) | 14258 |
| 2011 | 1768 | 15.1% (14.5 - 15.8) | 7774 | 7.4% (7.3 - 7.6) | 4789 | 6.5% (6.3 - 6.7) | 14331 |
| Seen at a National Cancer Institute-Designated Cancer Center | | | | | | | |
| No | 10860 | 92.9% (92.4 - 93.4) | 98658 | 94.5% (94.3 - 94.6) | 70559 | 95.8% (95.7 - 96.0) | 180077 |
| Yes | 832 | 7.1% (6.6 - 7.6) | 5762 | 5.5% (5.4 - 5.7) | 3063 | 4.2% (4.0 - 4.3) | 9657 |
| Patient SES Quintile Distribution^b of Reporting Hospital | | | | | | | |
| >50% of patients in quintiles 1-2 | 1587 | 13.6% (13.0 - 14.2) | 15773 | 15.1% (14.9 - 15.3) | 16286 | 22.1% (21.8 - 22.4) | 33646 |
| >50% of patients in quintiles 4-5 | 7044 | 60.2% (59.4 - 61.1) | 57514 | 55.1% (54.8 - 55.4) | 32701 | 44.4% (44.1 - 44.8) | 97259 |
| Mixed SES distribution | 3061 | 26.2% (25.4 - 27.0) | 31133 | 29.8% (29.5 - 30.1) | 24635 | 33.5% (33.1 - 33.8) | 58829 |
| Radiation Therapy | | | | | | | |
| No | 9869 | 84.4% (83.8 - 85.1) | 0 | Not applicable | 61811 | 84.0% (83.7 - 84.2) | 71680 |
| Yes | 1823 | 15.6% (14.9 - 16.2) | 104420 | 100.0% | 11811 | 16.0% (15.8 - 16.3) | 118054 |
| Chemotherapy | | | | | | | |
| No | 6392 | 54.7% (53.8 - 55.6) | 71382 | 68.4% (68.1 - 68.6) | 44296 | 60.2% (59.8 - 60.5) | 122070 |
| Yes | 5300 | 45.3% (44.4 - 46.2) | 33038 | 31.6% (31.4 - 31.9) | 29326 | 39.8% (39.5 - 40.2) | 67664 |
| Chemotherapy Timing | | | | | | | |
| After Surgery | 3753 | 32.1% (31.3 - 32.9) | 29123 | 27.9% (27.6 - 28.2) | 24583 | 33.4% (33.1 - 33.7) | 57459 |
| Before Surgery | 1490 | 12.7% (12.1 - 13.3) | 2874 | 2.8% (2.7 - 2.9) | 3963 | 5.4% (5.2 - 5.5) | 8327 |
| No chemotherapy | 6392 | 54.7% (53.8 - 55.6) | 71382 | 68.4% (68.1 - 68.6) | 44296 | 60.2% (59.8 - 60.5) | 122070 |
| Unknown | 57 | 0.5% (0.4 - 0.6) | 1041 | 1.0% (0.9 - 1.1) | 780 | 1.1% (1.0 - 1.1) | 1878 |
| Adjuvant Treatment (chemotherapy and/or radiation) | | | | | | | |
| No | 6143 | 52.5% (51.6 - 53.4) | 71382 | 68.4% (68.1 - 68.6) | 41892 | 56.9% (56.5 - 57.3) | 119417 |
| Yes | 5549 | 47.5% (46.6 - 48.4) | 33038 | 31.6% (31.4 - 31.9) | 31730 | 43.1% (42.7 - 43.5) | 70317 |

| Breast Reconstructive Surgery | | | | | | | |
|--------------------------------------|-------|---------------------|--------|---------------------|-------|---------------------|--------|
| No | 6428 | 55.0% (54.1 - 55.9) | 104229 | 99.8% (99.8 - 99.8) | 63529 | 86.3% (86.0 - 86.5) | 174186 |
| Yes | 5264 | 45.0% (44.1 - 45.9) | 191 | 0.2% (0.2 - 0.2) | 10093 | 13.7% (13.5 - 14.0) | 15548 |
| Vital Status | | | | | | | |
| Dead | 903 | 7.7% (7.2 - 8.2) | 13571 | 13.0% (12.8 - 13.2) | 17489 | 23.8% (23.4 - 24.1) | 31963 |
| Alive | 10789 | 92.3% (91.8 - 92.8) | 90849 | 87.0% (86.8 - 87.2) | 56133 | 76.2% (75.9 - 76.6) | 157771 |

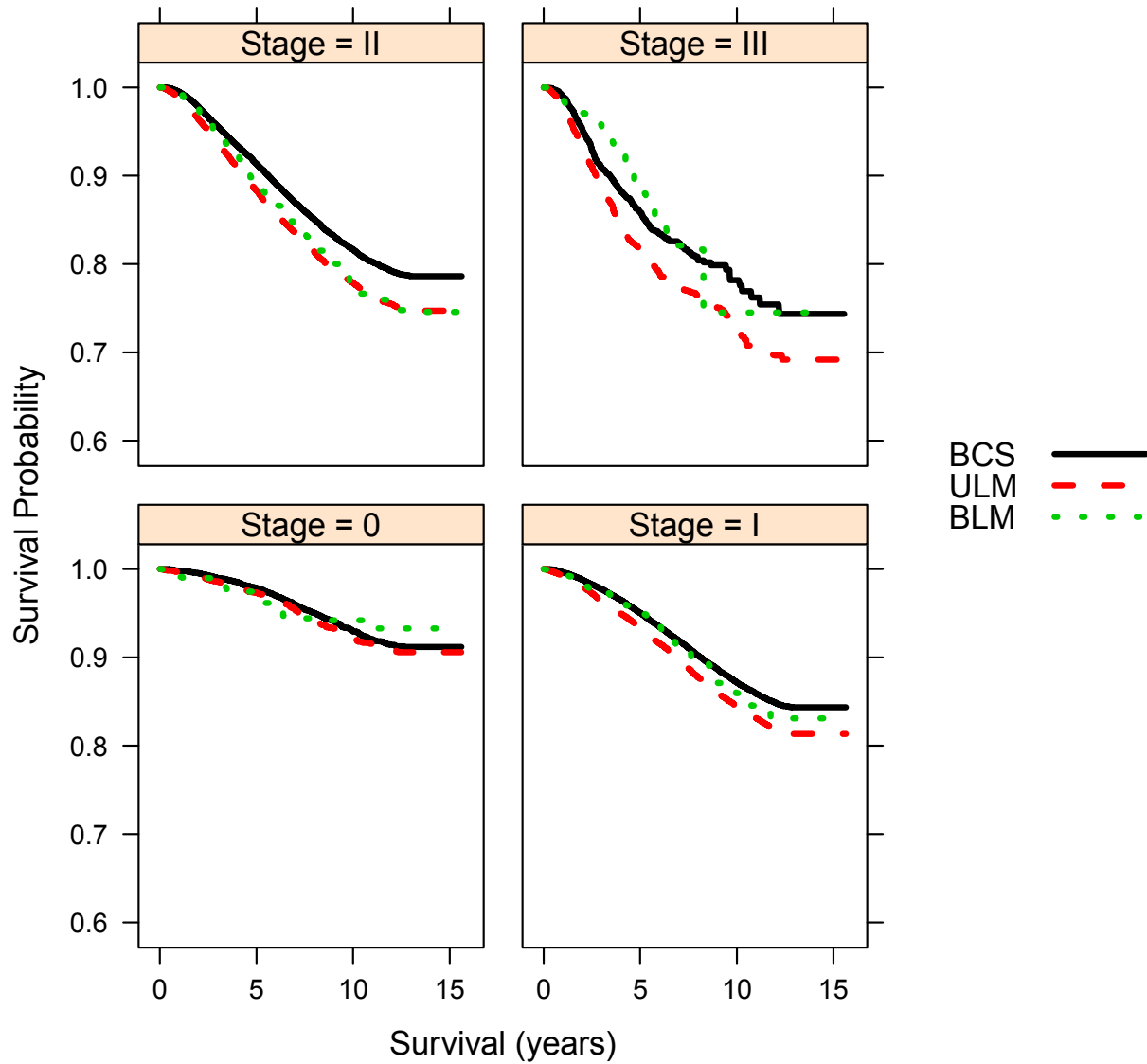
^a 95% confidence interval

^b SES distribution based on state-wide quintiles



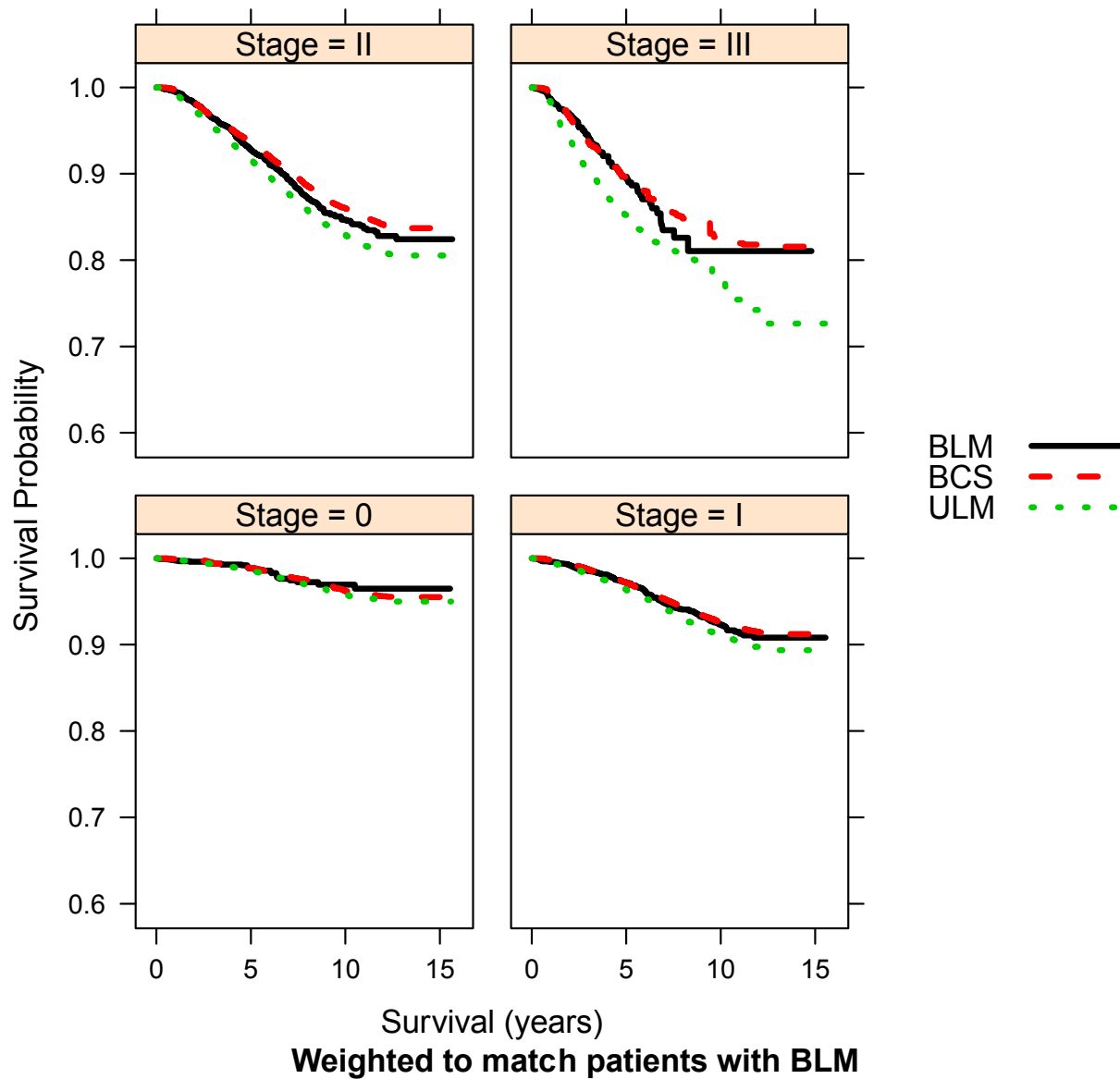
Supplemental Figure A: Weighted Kaplan-Meier survival curves by treatment for Stages 0, I, II, and III. Curves are based on weights for computing average treatment effect among the treated (ATT), using unilateral mastectomy (ULM) as the treatment. BCS, breast conserving surgery with radiation; BLM, bilateral mastectomy.

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Weighted to match patients with BCS

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 13 **Supplemental Figure B:** Weighted Kaplan-Meier survival curves by treatment for Stages 0, I, II, and III.
 14 Curves are based on weights for computing average treatment effect among the treated ATT, using breast
 15 conserving surgery with radiation (BCS) as the treatment. ULM, unilateral mastectomy; BLM, bilateral
 16 mastectomy.
 17



18
 19 **Supplemental Figure C:** Weighted Kaplan-Meier survival curves by treatment for Stages 0, I, II,
 20 and III. Curves are based on weights for computing average treatment effect among the treated ATT,
 21 using bilateral mastectomy (BLM) as the treatment. BCS, breast conserving surgery with radiation;
 22 ULM, unilateral mastectomy.

23