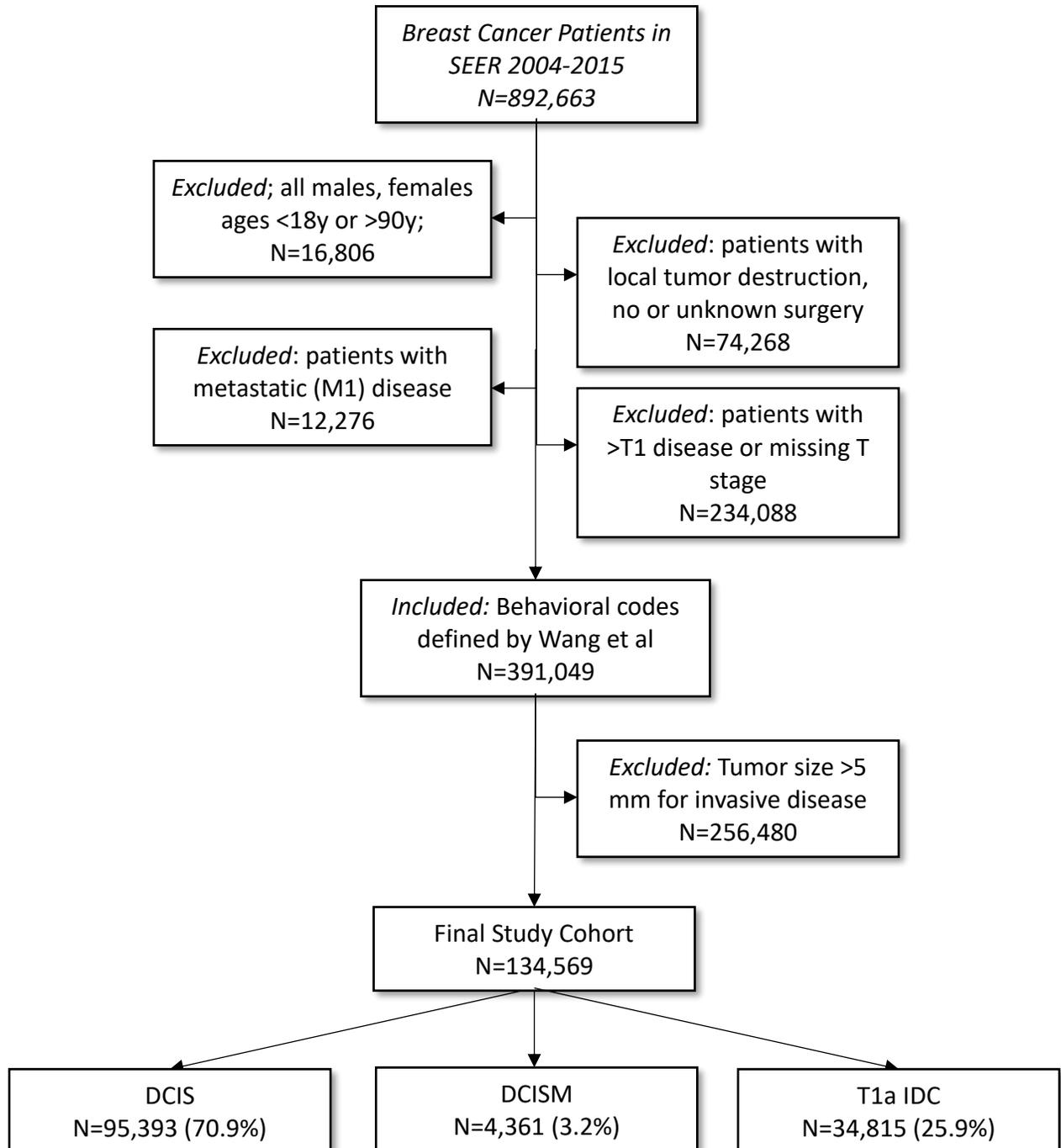
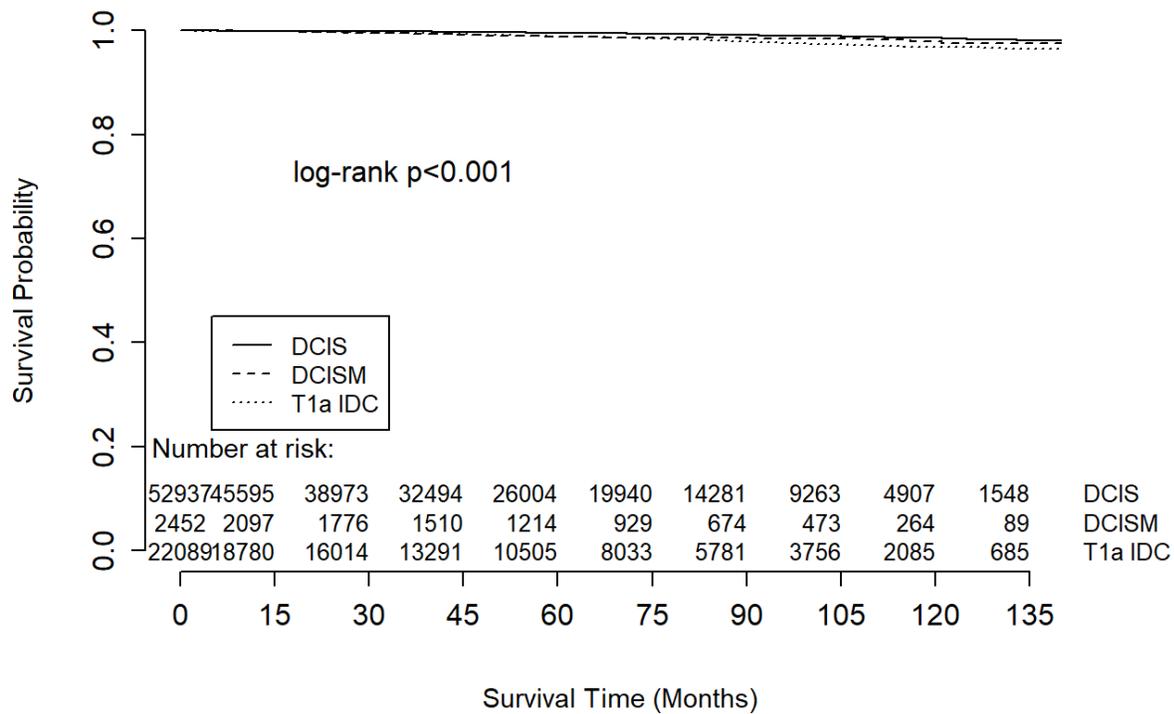


Supplemental Figure 1. Patient selection diagram using the SEER database from 2004-2015, applying the defined inclusion and exclusion criteria. DCIS: ductal carcinoma in situ. DCISM: DCIS with microinvasion. IDC: invasive ductal carcinoma.



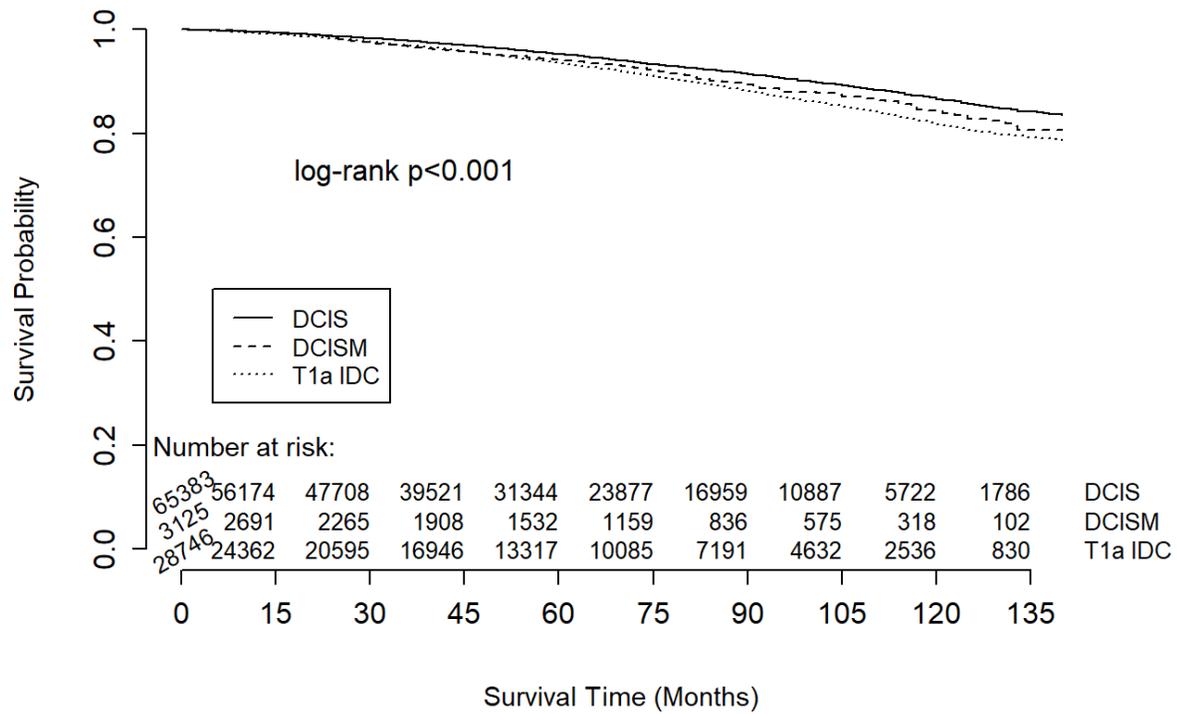
Supplemental Figure 2. Unadjusted survival for select women with breast cancer in the SEER database from 2004-2015, stratified by diagnosis and subdivided by HR status. (A) HR-positive cancer-specific survival; (B) HR-positive overall survival; (C) HR-negative cancer-specific survival; (D) HR-negative overall survival. HR: hormone receptor. DCIS: ductal carcinoma in situ. DCISM: DCIS with microinvasion. IDC: invasive ductal carcinoma.

(2A)



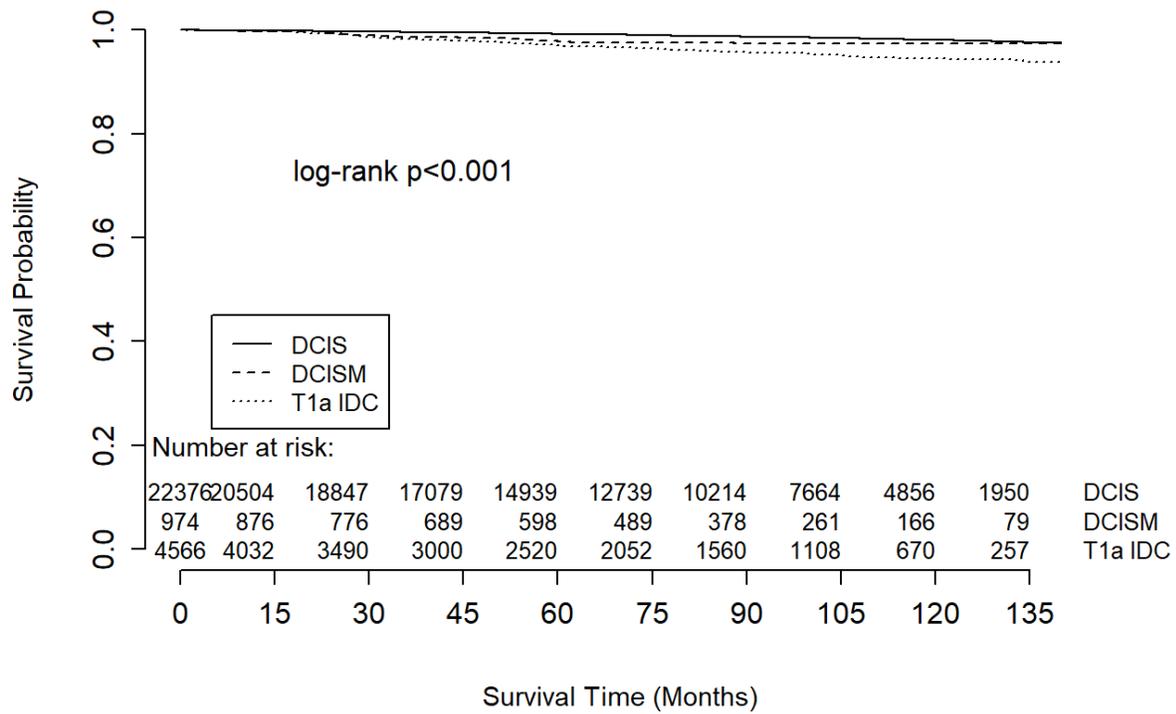
	Total	Breast Cancer-Specific Deaths	5-year Survival (95% CI)	10-year Survival (95% CI)
DCIS	52937	301	1 (1, 1)	0.99 (0.98, 0.99)
DCISM	2452	26	0.99 (0.98, 0.99)	0.98 (0.97, 0.99)
T1a IDC	22089	291	0.99 (0.99, 0.99)	0.97 (0.96, 0.97)
Total	77478	618	0.99 (0.99, 0.99)	0.98 (0.98, 0.98)

(2B)



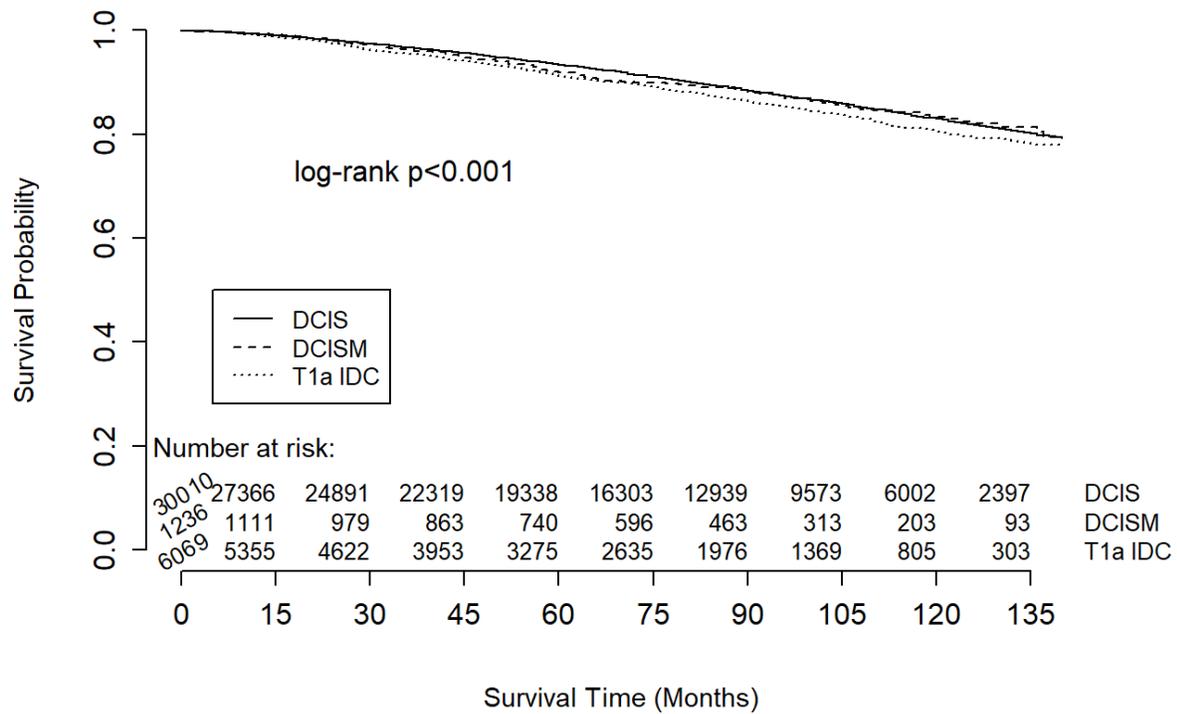
	Total	All-Cause Deaths	5-year Survival (95% CI)	10-year Survival (95% CI)
DCIS	65383	3818	0.95 (0.95, 0.95)	0.87 (0.86, 0.87)
DCISM	3125	230	0.94 (0.93, 0.95)	0.84 (0.82, 0.87)
T1a IDC	28746	2264	0.93 (0.93, 0.94)	0.82 (0.81, 0.83)
Total	97254	6312	0.95 (0.94, 0.95)	0.85 (0.85, 0.86)

(2C)



	Total	Breast Cancer-Specific Deaths	5-year Survival (95% CI)	10-year Survival (95% CI)
DCIS	22376	269	0.99 (0.99, 0.99)	0.98 (0.98, 0.98)
DCISM	974	19	0.98 (0.97, 0.99)	0.97 (0.96, 0.99)
T1a IDC	4566	145	0.97 (0.96, 0.98)	0.95 (0.94, 0.96)
Total	27916	433	0.99 (0.99, 0.99)	0.98 (0.97, 0.98)

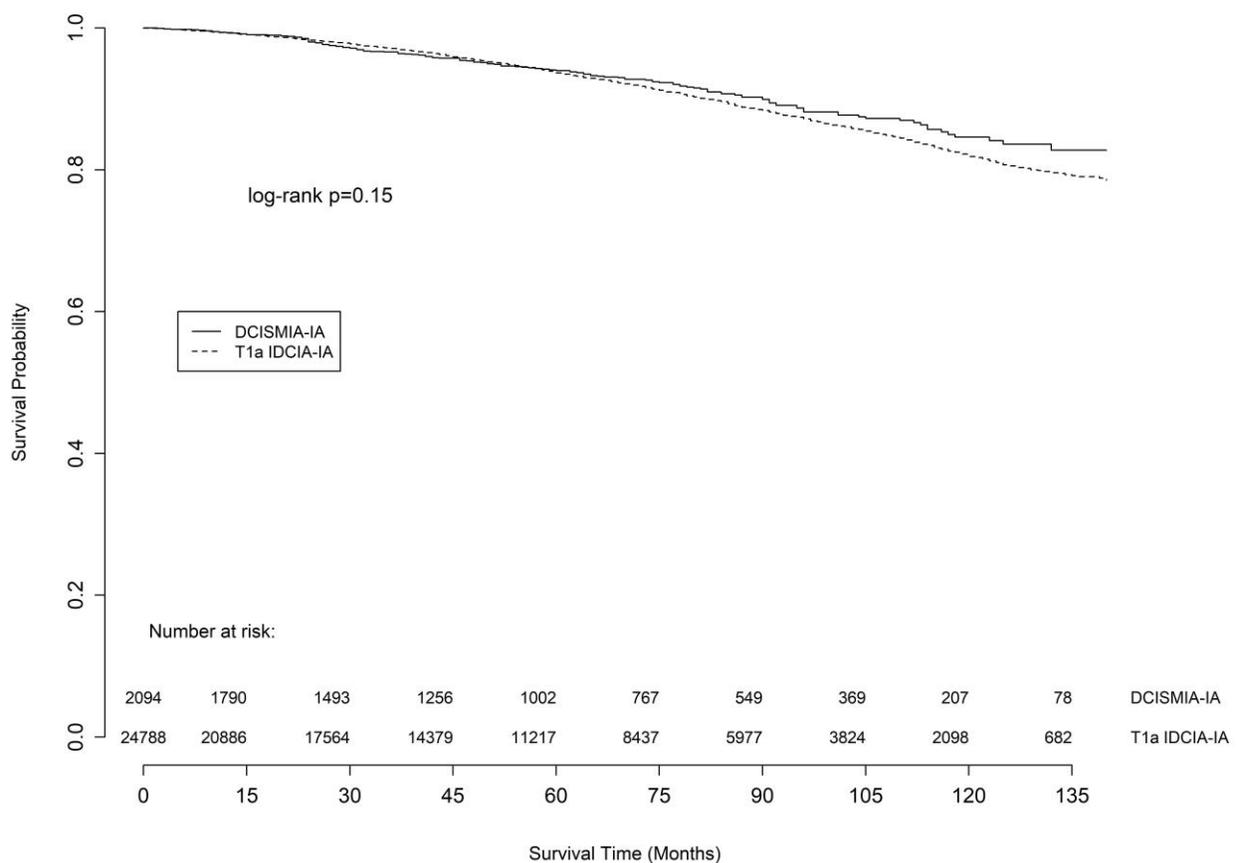
(2D)



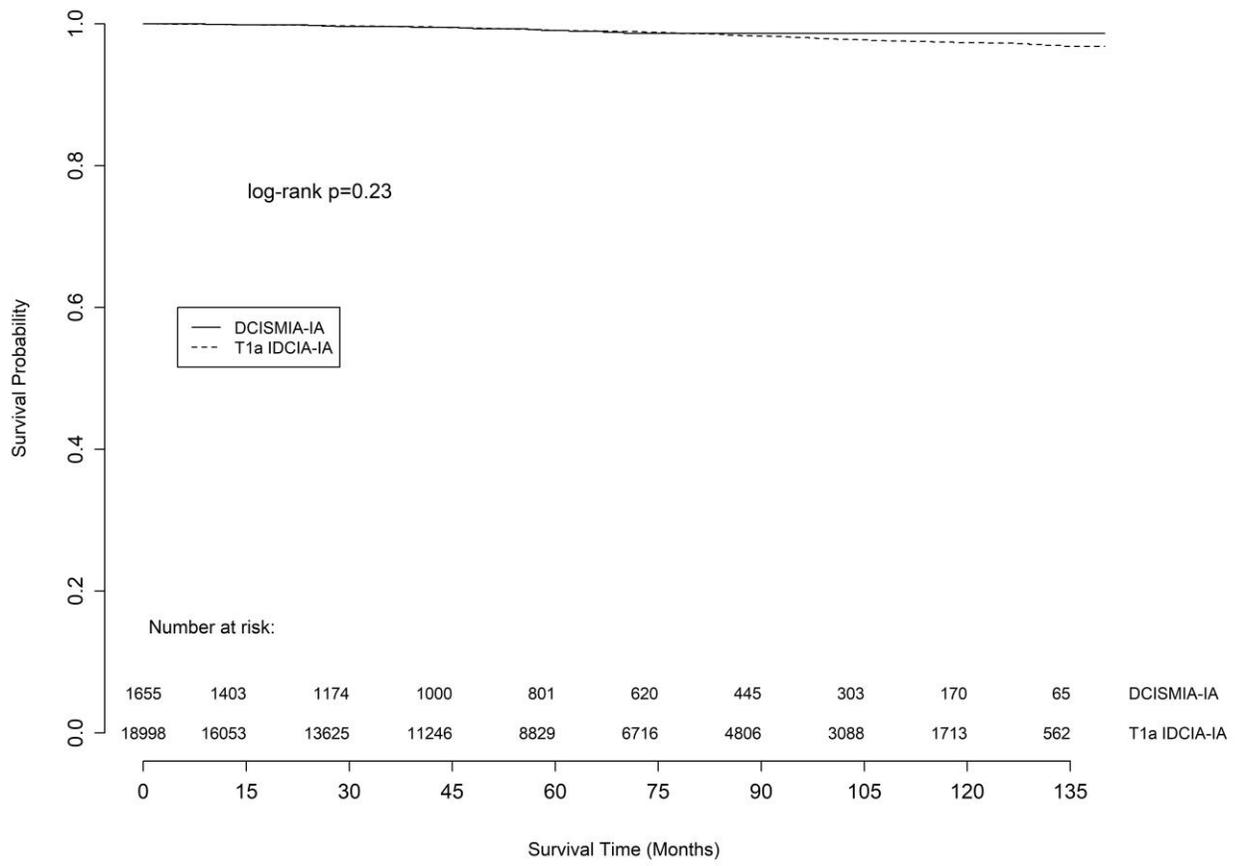
	Total	All-Cause Deaths	5-year Survival (95% CI)	10-year Survival (95% CI)
DCIS	30010	3274	0.93 (0.93, 0.94)	0.83 (0.82, 0.84)
DCISM	1236	127	0.92 (0.9, 0.94)	0.83 (0.8, 0.86)
T1a IDC	6069	658	0.91 (0.9, 0.92)	0.81 (0.79, 0.82)
Total	37315	4059	0.93 (0.93, 0.93)	0.83 (0.82, 0.83)

Supplemental Figure 3. Unadjusted survival for women with DCISM or T1a invasive ductal carcinoma stratified by the prognostic cancer stage, as determined by the AJCC Cancer Staging Manual, 8th edition, excluding Oncotype DX scores due to data restrictions (SEER database from 2004-2015). **(A)** Cancer-specific survival for prognostic stage IA. **(B)** Overall survival for prognostic stage IA. **(C)** Cancer-specific survival for prognostic stage IB. **(D)** Overall survival for prognostic stage IB. **(E)** Cancer-specific survival for prognostic stage II/III. **(F)** Overall survival for prognostic stage II/III.

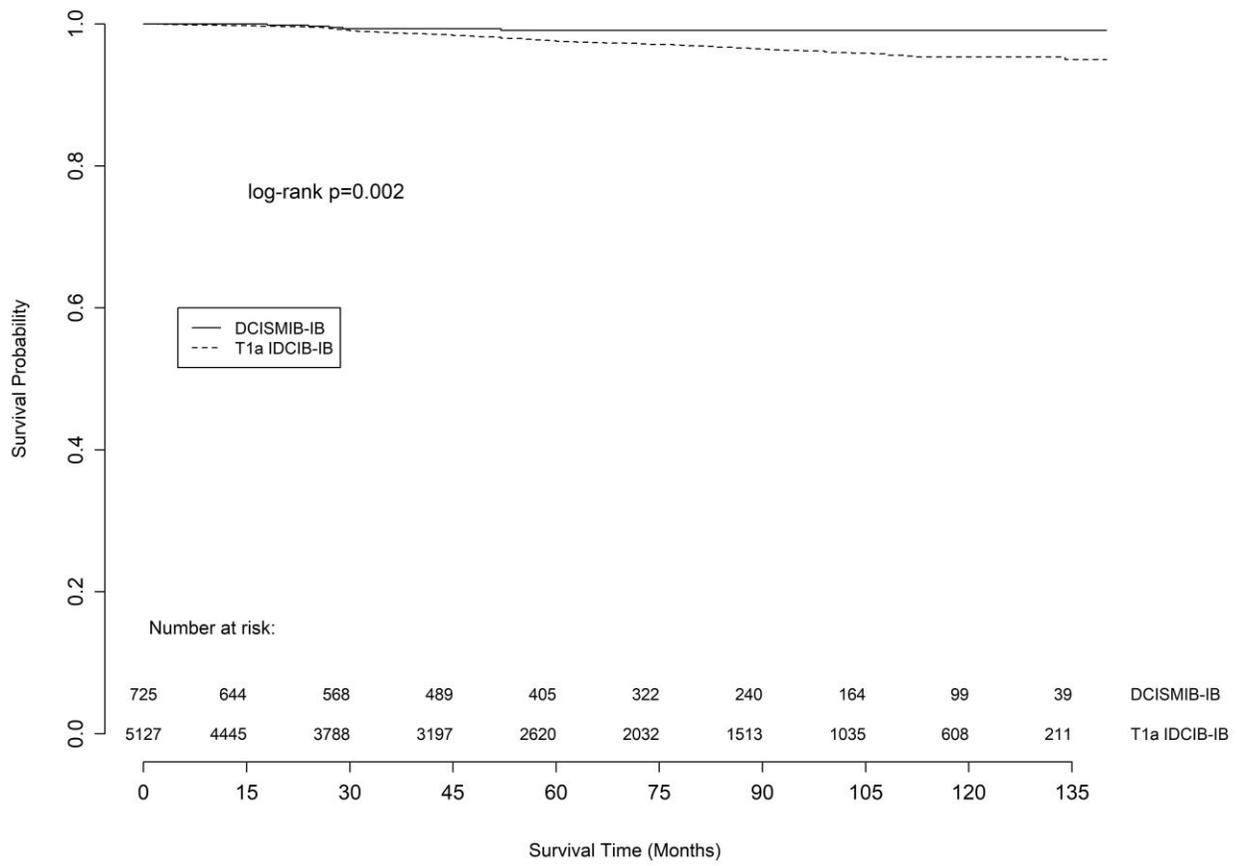
(3A)



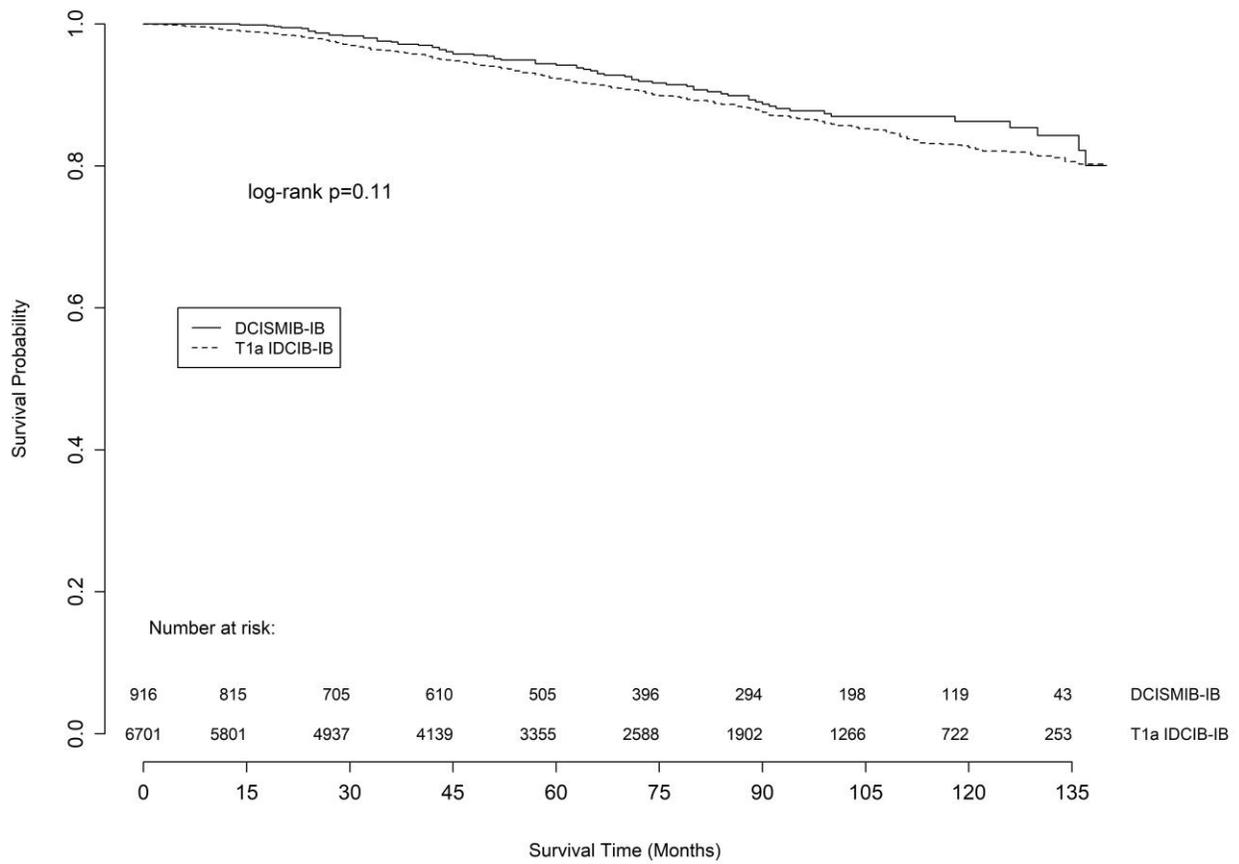
(3B)



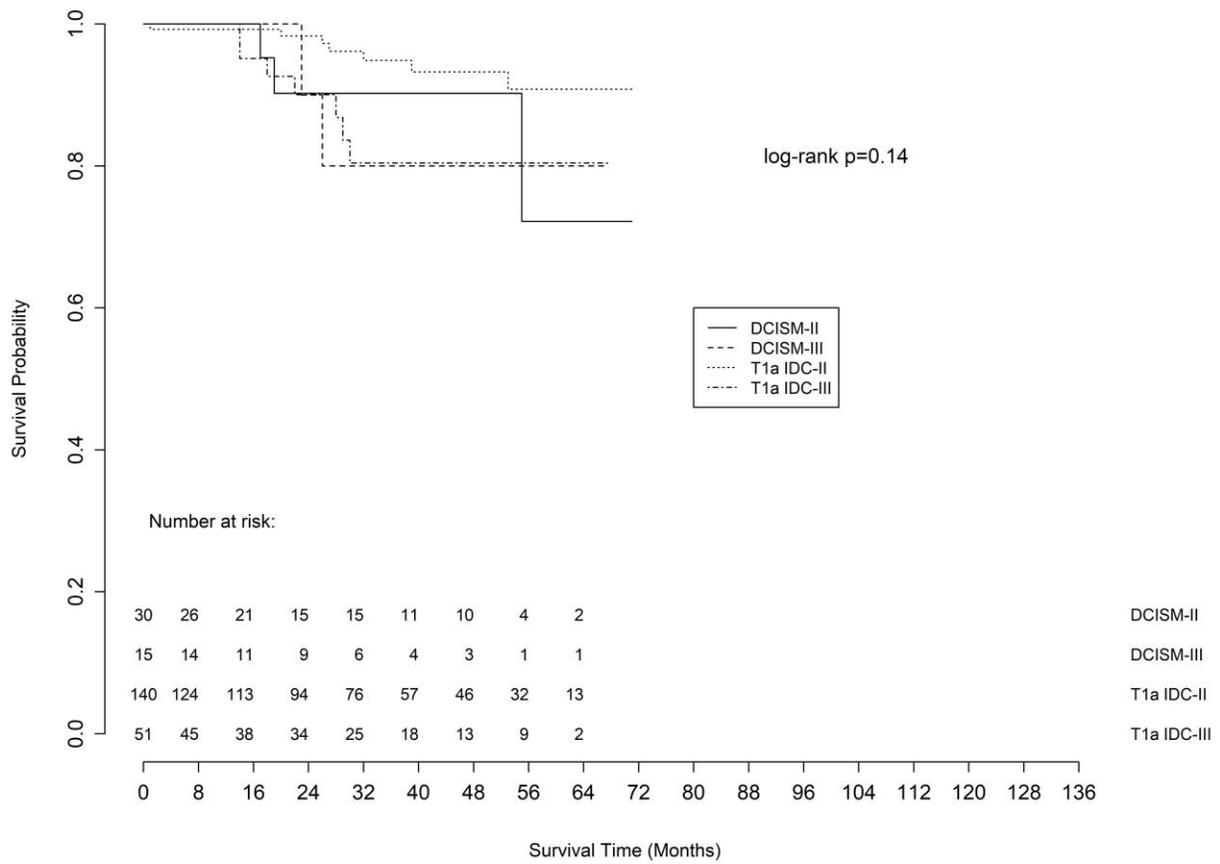
(3C)



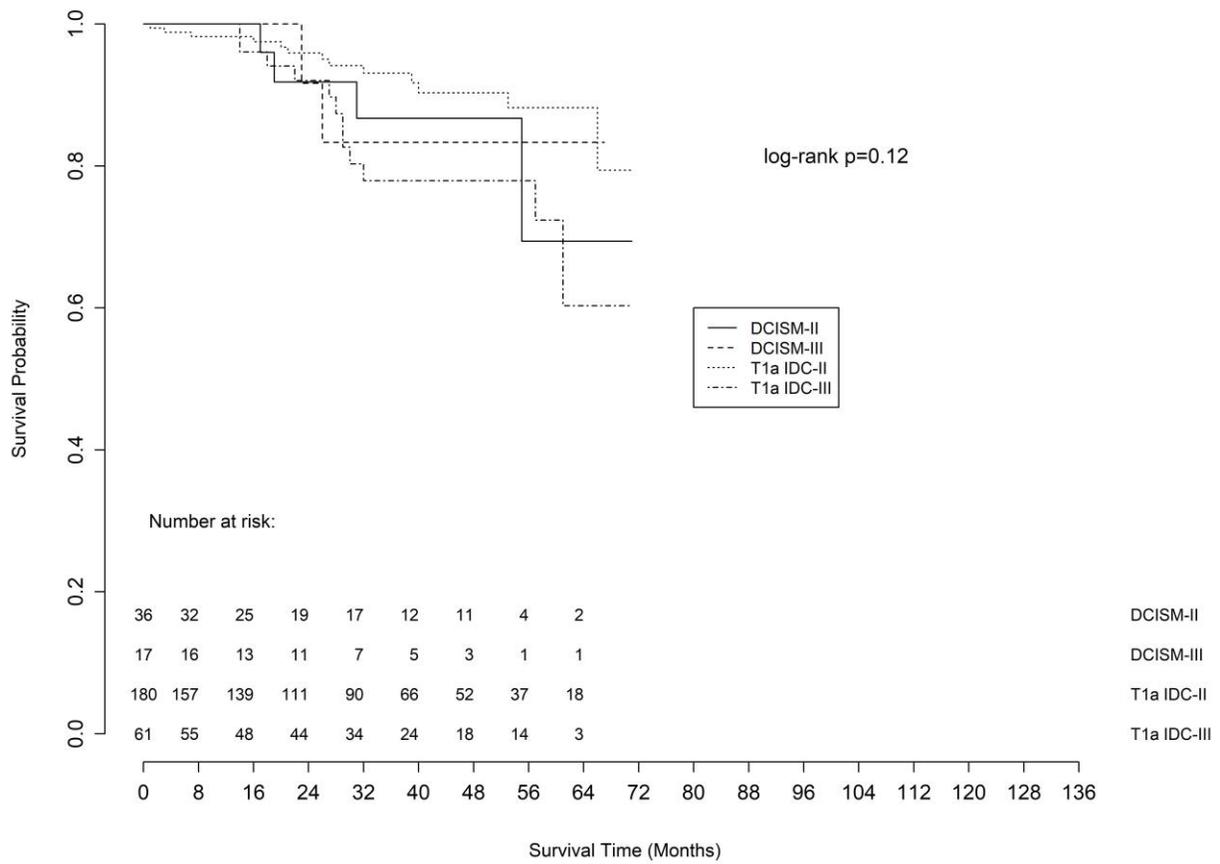
(3D)



(3E)



(3F)



Supplemental Table 1. Disease characteristics for select women with breast cancer in the SEER database from 2004-2015, stratified by diagnosis group (DCISM, DCIS, T1a IDC). DCIS: ductal carcinoma in situ. DCISM: DCIS with microinvasion. IDC: invasive ductal carcinoma. ER: estrogen receptor. PR: progesterone receptor. HER2: human-epidermal-growth-factor-receptor-2.

	All Patients	DCISM	DCIS	T1a IDC	P-Value
If ER reported	115,181 (100%)	4,084 (3.6%)	77,539 (67.3%)	33,558 (29.1%)	<0.001
Positive	96,258 (83.6%)	3,087 (75.6%)	64,691 (83.4%)	28,480 (81.8%)	
Negative/Borderline	18,923 (16.4%)	997 (24.4%)	12,848 (16.6%)	5,078 (15.1%)	
If PR reported	110,095 (100%)	4,007 (3.6%)	72,807 (66.1%)	33,281 (30.2%)	<0.001
Positive	79,606 (72.3%)	2,457 (61.3%)	53,005 (72.8%)	24,144 (72.5%)	
Negative/Borderline	30,489 (27.7%)	1,550 (38.7%)	19,802 (27.2%)	9,137 (27.5%)	
If HER2 reported	26,247 (100%)	1,725 (6.6%)	6,339 (24.1%)	18,183 (69.3%)	<0.001
Positive	5,016 (80.9%)	456 (26.4%)	1,902 (30.0%)	2,658 (14.6%)	
Negative/Borderline	21,231 (19.1%)	1,269 (73.6%)	4,437 (70.0%)	15,525 (85.4%)	
If Grade reported	119,489 (100%)	3,333 (2.8%)	82,806 (69.3%)	33,350 (27.9%)	<0.001
Grade 1	26,306 (22.0%)	938 (28.1%)	12,337 (14.9%)	13,031 (39.1%)	
Grade 2	48,521 (40.6%)	1,458 (43.7%)	32,617 (39.4%)	14,446 (43.3%)	
Grade 3	44,662 (37.4%)	937 (28.1%)	37,852 (45.7%)	5,873 (17.6%)	

Supplemental Table 2. Disease characteristics for select women with DCISM in the SEER database from 2004-2015, stratified by patient age. DCISM: ductal carcinoma in situ with microinvasion. LN: lymph nodes. ER: estrogen receptor. PR: progesterone receptor. HER2: human-epidermal-growth-factor-receptor-2.

	All Patients N=4,361 (100%)	18-39y N=160 (3.7%)	40-55y N=1,556 (35.7%)	56-70y N=1,786 (40.9%)	>70y N=859 (19.7%)	Overall P-Value
N Stage						<0.001
N0	3,920 (89.9%)	128 (80%)	1,383 (88.9%)	1,612 (90.3%)	797 (92.8%)	
N1	328 (7.5%)	29 (18.1%)	126 (8.1%)	129 (7.2%)	44 (5.1%)	
N2	56 (1.3%)	2 (1.3%)	26 (1.7%)	22 (1.2%)	6 (0.7%)	
N3	36 (0.8%)	1 (0.6%)	14 (0.9%)	14 (0.8%)	7 (0.8%)	
NX	21 (0.5%)	0 (0%)	7 (0.4%)	9 (0.5%)	5 (0.6%)	
Grade						<0.001
1	938 (21.5%)	22 (13.8%)	286 (18.4%)	378 (21.2%)	252 (29.3%)	
2	1,458 (33.4%)	51 (31.9%)	505 (32.5%)	620 (34.7%)	282 (32.8%)	
3	937 (21.5%)	48 (30%)	379 (24.4%)	376 (21.1%)	134 (15.6%)	
Unknown	1,028 (23.6%)	39 (24.4%)	386 (24.8%)	412 (23.1%)	191 (22.2%)	
ER Status						0.004
Positive	3,087 (70.8%)	105 (65.6%)	1,073 (69%)	1,266 (70.9%)	643 (74.9%)	
Negative/Borderline	997 (22.9%)	43 (26.9%)	383 (24.6%)	418 (23.4%)	153 (17.8%)	
Unknown	277 (6.4%)	12 (7.5%)	100 (6.4%)	102 (5.7%)	63 (7.3%)	
PR Status						0.17
Positive	2,457 (56.3%)	85 (53.1%)	889 (57.1%)	978 (54.8%)	505 (58.8%)	
Negative/Borderline	1,550 (35.5%)	61 (38.1%)	546 (35.1%)	668 (37.4%)	275 (32%)	
Unknown	354 (8.1%)	14 (8.8%)	121 (7.8%)	140 (7.8%)	79 (9.2%)	
HER2 Status						<0.001
Positive	456 (10.5%)	15 (9.4%)	215 (13.8%)	178 (10%)	48 (5.6%)	
Negative/Borderline	1,269 (29.1%)	36 (22.5%)	405 (26%)	542 (30.3%)	286 (33.3%)	
Unknown	512 (11.7%)	24 (15%)	159 (10.2%)	223 (12.5%)	106 (12.3%)	
Diagnosed before 2010*	2,124 (48.7%)	85 (53.1%)	777 (49.9%)	843 (47.2%)	419 (48.8%)	

*Patients diagnosed before 2010 did not routinely have HER2 status reported in the database.

Supplemental Table 3. Disease characteristics for select women with DCISM in the SEER database from 2004-2015, stratified by patient age (18-39y, 40-55y, 56-70y, >70y), excluding those with missing data. DCISM: ductal carcinoma in situ with microinvasion. ER: estrogen receptor. PR: progesterone receptor. HER2: human-epidermal-growth-factor-receptor-2.

	All Patients	18-39y	40-55y	56-70y	>70y	P-Value
Grade (if reported)	3,333 (100%)	121 (3.6%)	1170 (35.1%)	1,374 (41.2%)	668 (20.0%)	<0.001
1	938 (28.1%)	22 (18.2%)	286 (24.4%)	378 (27.5%)	252 (37.7%)	
2	1,458 (43.7%)	51 (42.1%)	505 (43.2%)	620 (45.1%)	282 (42.2%)	
3	937 (28.1%)	48 (39.7%)	379 (32.4%)	376 (27.4%)	134 (20.1%)	
ER (if reported)	4,084 (100%)	148 (3.6%)	1,456 (35.6%)	1,684 (41.2%)	796 (19.5%)	0.001
Positive	3,087 (75.6%)	105 (70.9%)	1,073 (73.7%)	1,266 (75.2%)	643 (80.8%)	
Negative/Borderline	997 (24.4%)	43 (29.0%)	383 (26.3%)	418 (24.8%)	153 (19.2%)	
PR (if reported)	4,007 (100%)	146 (3.6%)	1,435 (35.8%)	1,646 (41.1%)	780 (19.5%)	0.07
Positive	2,457 (61.3%)	85 (58.2%)	889 (61.9%)	978 (59.4%)	505 (64.7%)	
Negative/Borderline	1,550 (38.7%)	61 (41.8%)	546 (38.0%)	668 (40.6%)	275 (35.3%)	
HER2 (if reported)	1,735 (100%)	51 (3.0%)	620 (35.9%)	720 (41.7%)	334 (19.4%)	<0.001
Positive	456 (26.4%)	15 (29.4%)	215 (34.7%)	178 (24.7%)	48 (14.4%)	
Negative/Borderline	1,269 (73.6%)	36 (70.6%)	405 (65.3%)	542 (75.3%)	286 (85.6%)	

Supplemental Table 4. Comparison of unadjusted 5- and 10-year survival for women with DCISM and T1a invasive ductal carcinoma stratified by the prognostic cancer stage, as determined by the AJCC Cancer Staging Manual, 8th edition, excluding Oncotype DX scores due to data restrictions (SEER database from 2004-2015).

	DCISM	T1a IDC	DCISM	T1a IDC
<i>Cancer-specific Survival</i>	<i>5 years</i>	<i>5 years</i>	<i>10 years</i>	<i>10 years</i>
Stage IA	0.99 (0.99,1)	0.99 (0.99, 0.99)	0.99 (0.98, 0.99)	0.97 (0.97, 0.98)
Stage IB	0.99 (0.98 , 1)	0.98 (0.97, 0.98)	0.99 (0.98, 1)	0.95 (0.94, 0.96)
Stage II	0.72 (0.46 , 1)	0.91 (0.84, 0.98)	NE	NE
Stage III	0.80 (0.59 , 1)	0.80 (0.68, 0.95)	NE	NE
<i>Overall Survival</i>	<i>5 years</i>	<i>5 years</i>	<i>10 years</i>	<i>10 years</i>
Stage IA	0.94 (0.93 , 0.95)	0.94 (0.93, 0.94)	0.85 (0.82,0.87)	0.82 (0.81, 0.83)
Stage IB	0.94 (0.92 , 0.96)	0.92 (0.92, 0.93)	0.86 (0.83,0.90)	0.83 (0.81, 0.84)
Stage II	0.69 (0.43 , 1)	0.88 (0.82, 0.95)	NE	NE
Stage III	0.83 (0.65 , 1)	0.72 (0.58, 0.9)	NE	NE