

Supplementary Online Content

Venigalla S, Carmona R, Guttman DM, et al. Use and effectiveness of adjuvant endocrine therapy for hormone receptor–positive breast cancer in men. *JAMA Oncol*. Published online May 24, 2018. doi:10.1001/jamaoncol.2018.1114

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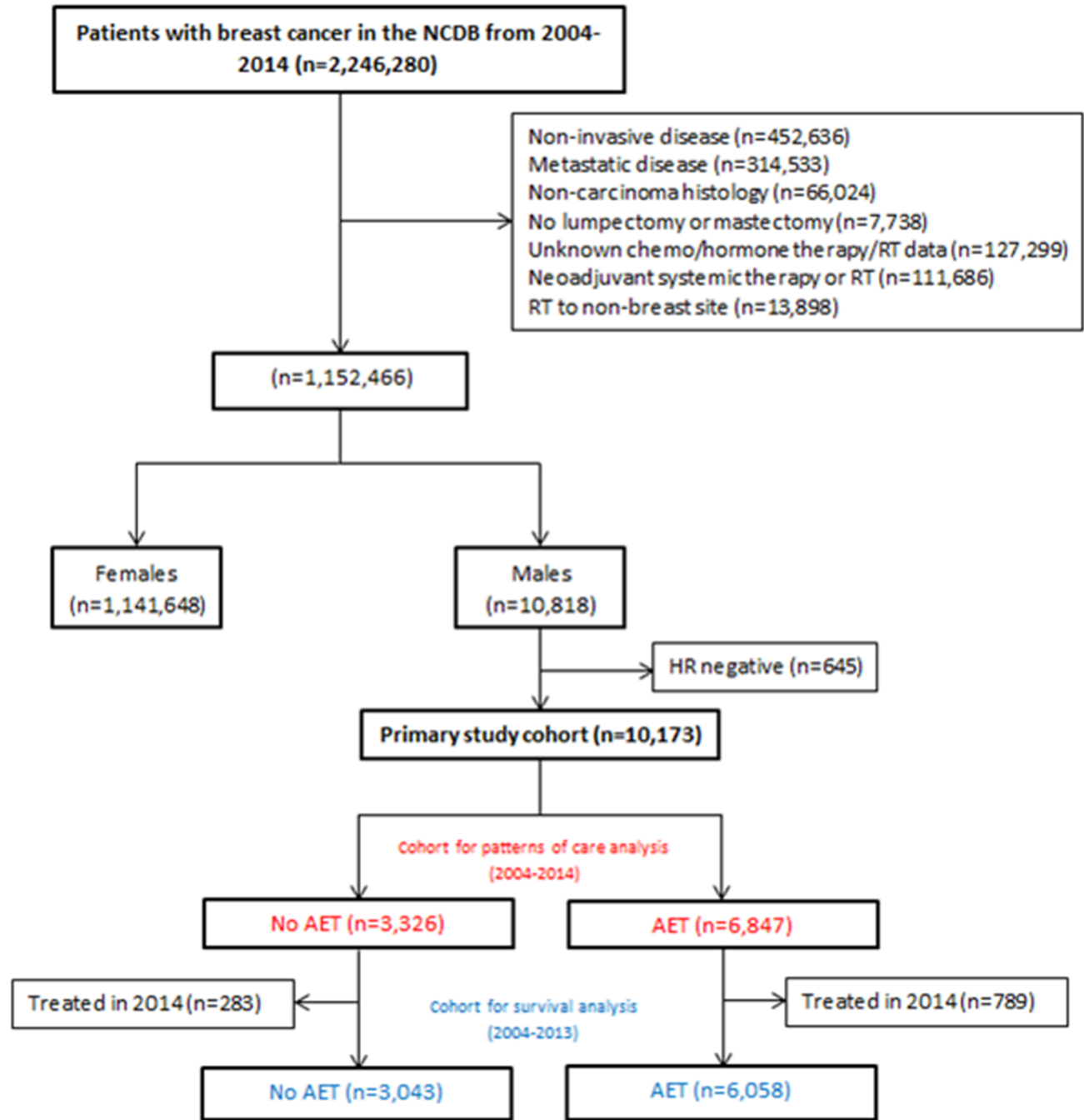
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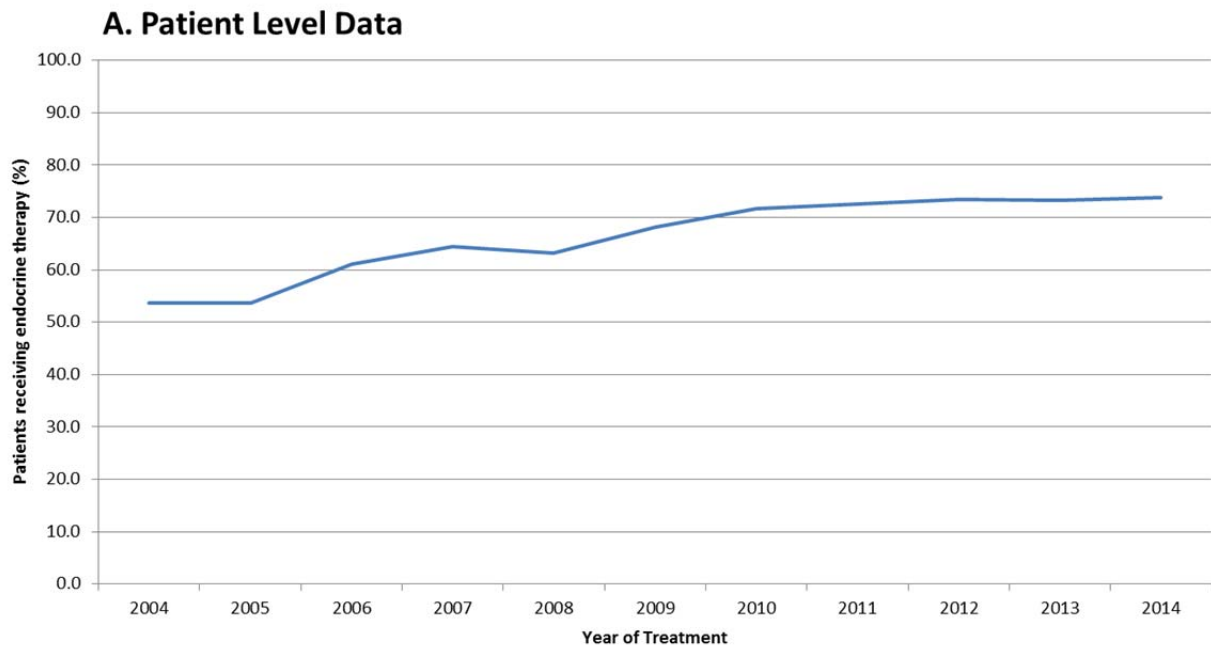
This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. Consolidated Standards of Reporting Trials (CONSORT) Diagram.

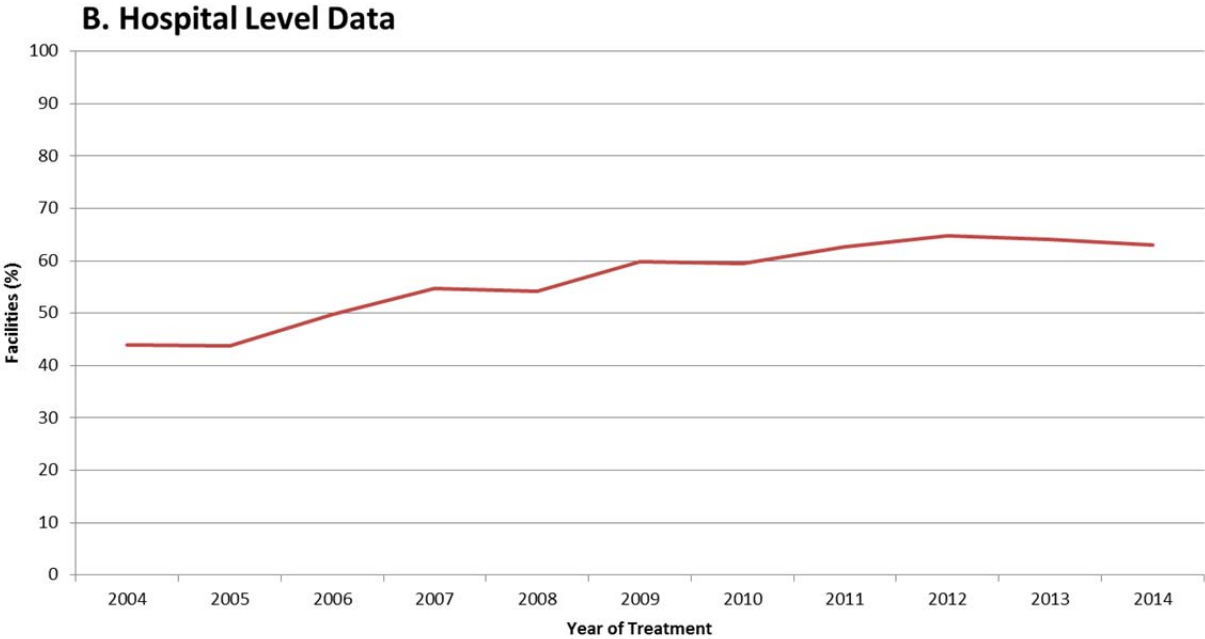


AET: Adjuvant endocrine therapy; RT: Radiotherapy.

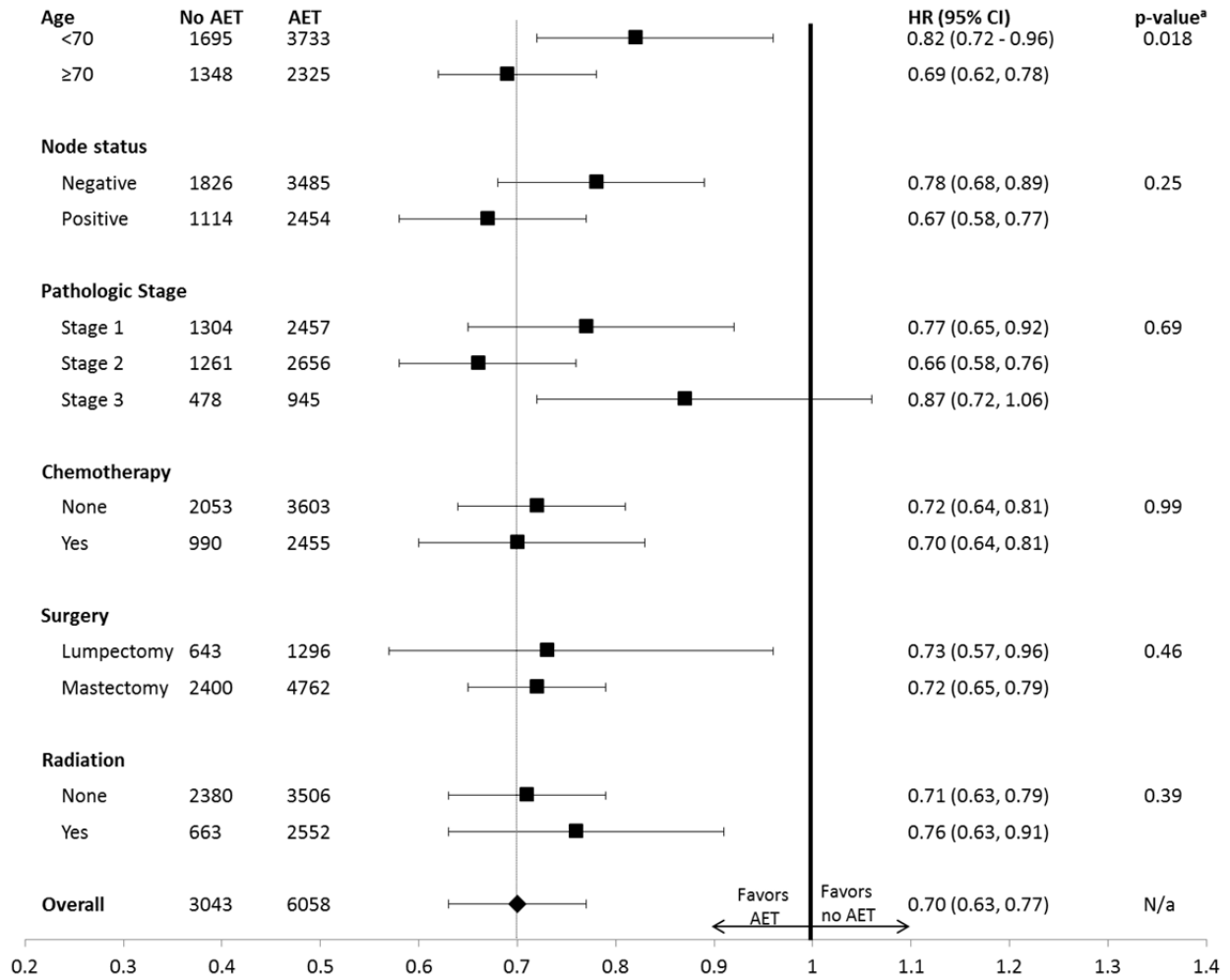
eFigure 2a. Percentage of Patients Receiving Adjuvant Endocrine Therapy by Year (*P* for trend < .001)



eFigure 2b. Hospital-Level Guideline Concordance of Adjuvant Endocrine Therapy by Year (*P* for trend < .001)



eFigure 3. Subgroup Analyses of Overall Survival



Dashed line represents overall hazard ratio. *AET*: Adjuvant endocrine therapy; *HR*: Hazard ratio; ^ap-value denotes test for interaction.

eTable 1. Baseline Characteristics, Male Cohort (Complete Table)							
	No AET (%)		AET (%)		Total (%)		p (chi2)
Total no.	3,326	33	6,847	67	10,173	100	
Age (years)							<0.001
18-49	379	11	795	12	1,174	12	
50-69	1,487	45	3,401	50	4,888	48	
70+	1,460	44	2,651	39	4,111	40	
Race							0.003
Non-Hispanic White	2,694	81	5,737	84	8,431	83	
Non-Hispanic Black	380	11	704	10	1084	11	
Hispanic	117	4	185	3	302	3	
Other	135	4	221	3	356	3	
Location							<0.001
East	570	17	1626	24	2196	22	
South	1,376	41	2133	31	3,509	34	
Central	757	23	1971	29	2,728	27	
West	548	16	980	14	1,528	15	
Unknown	75	2	137	2	212	2	
County size							<0.001
Metropolitan	2,840	85	5,695	83	8,535	84	
Urban	319	10	871	13	1,190	12	
Rural	38	1	92	1	130	1	
Unknown	129	4	189	3	318	3	
Facility type							0.001
Non-Academic	2,400	72	4712	69	7,112	70	
Academic	851	26	1,998	29	2,849	28	
Unknown	75	2	137	2	212	2	
Distance to Treatment							0.001
≤30 miles	2,899	87	5,916	86	8,815	87	
>30 miles	383	12	882	13	1,265	12	
Unknown	44	1	49	1	93	1	
Insurance Status							0.15
Commercial Insurance	1378	41	2962	43	4,340	43	
Medicare	1679	50	3389	49	5,068	50	
Medicaid	107	3	223	3	330	3	
Uninsured	71	2	111	2	182	2	
Other/Unknown	91	3	162	2	253	2	

Education^a							<0.001
≥21%	514	15	799	12	1,313	13	
13%-20.9%	766	23	1565	23	2,331	23	
7%-12.9%	1,080	32	2369	35	3,449	34	
<7%	922	28	2,063	30	2,985	29	
Unknown	44	1	51	1	95	1	
Income (\$)							0.004
<38,000	529	16	954	14	1483	15	
38,000-47,999	696	21	1457	21	2,153	21	
48,000-62,999	839	25	1,827	27	2,666	26	
>63,000	1,217	37	2,554	37	3,771	37	
Unknown	45	1	55	1	100	1	
Charlson/Deyo Comorbidity Score							0.28
0	2,571	77	5,364	78	7,935	78	
1	569	17	1147	17	1,716	17	
2	186	6	336	5	522	5	
Laterality							0.70
Right	1581	48	3195	47	4776	47	
Left	1742	52	3645	53	5387	53	
Unknown	3	0	7	0	10	0	
Histology							0.27
Invasive ductal carcinoma	2986	90	6171	90	9157	90	
Invasive lobular carcinoma	191	6	413	6	604	6	
Adenocarcinoma NOS	149	4	263	4	412	4	
Size							
≤2cm	1,841	55	3,816	56	5,657	56	0.30
2.1-5cm	1,359	41	2,816	41	4,175	41	
>5cm	108	3	191	3	299	3	
Unknown	18	1	24	0	42	0	
Grade							0.024
1	511	15	1,087	16	1,598	16	
2	1,651	50	3,477	51	5,128	50	
3	982	30	1,998	29	2,980	29	
Unknown	182	5	285	4	467	5	
Node status							<0.001
Negative	1981	60	3945	58	5926	58	
Positive	1,233	37	2766	40	3,999	39	
Unknown	112	3	136	2	248	2	

Pathologic Stage							0.009
Stage 1	1,421	43	2756	40	4177	41	
Stage 2	1371	41	3041	44	4412	43	
Stage 3	534	16	1050	15	1584	16	
Type of Surgery							0.61
Lumpectomy	693	21	1,457	21	2,150	21	
Mastectomy	2,633	79	5,390	79	8,023	79	
Surgical Margins							0.065
No Residual disease	3,165	95	6579	96	9,744	96	
Residual disease	128	4	204	3	332	3	
Unknown	33	1	64	1	97	1	
Chemotherapy							<0.001
No	2,237	67	4,141	60	6,378	63	
Yes	1,089	33	2,706	40	3,795	37	
Radiotherapy							<0.001
None	2,607	78	3984	58	6,591	65	
Yes	719	22	2863	42	3,582	35	

Abbreviation: *AET*: Adjuvant endocrine therapy.

^a% population in the patient's zip code without a high school degree.

eTable 2. Baseline Characteristics, Male vs Female Cohorts							
	Male		Female		Total		p (chi2)
Total no.	10,818	%	1,141,648	%	1,152,466	%	
Hormone Receptor Status							<0.001
ER- and PR-	645	6	179,972	16	180,617	16	
ER+ or PR+	10,173	94	961,676	84	971,849	84	
Receipt of Adjuvant Endocrine Treatment (HR+ patients only)							<0.001
No	3,326	33	202,061	21	205,387	21	
Yes	6847	67	759615	79	766462	79	
Age (years)							<0.001
18-49	1,326	12	230,257	20	231,583	20	
50-69	5,219	48	583,606	51	588,825	51	
70+	4,273	39	327,785	29	332,058	29	
Race							<0.001
Non-Hispanic White	8,919	82	931,268	82	940,187	82	
Non-Hispanic Black	1185	11	109578	10	110763	10	
Hispanic	331	3	50024	4	50355	4	
Other	383	4	50778	4	51161	4	
Facility type							<0.001
Non-Academic	7589	70	779,541	68	787,130	68	
Academic	2,970	27	316,523	28	319,493	28	
Unknown	259	2	45,584	4	45,843	4	
Charlson/Deyo Comorbidity Score							<0.001
0	8,486	78	962,715	84	971,201	84	
1	1791	17	147,009	13	148,800	13	
2	541	5	31924	3	32465	3	
Laterality							<0.001
Right	5082	47	564639	49	569721	49	
Left	5725	53	576130	50	581855	50	
Unknown	11	0	879	0	890	0	
Histology							<0.001
Invasive ductal carcinoma	9764	90	916505	80	926269	80	
Invasive lobular carcinoma	618	6	182081	16	182699	16	
Adenocarcinoma NOS	436	4	43062	4	43498	4	
Size							
≤2cm	6,003	55	784,454	69	790,457	69	<0.001
2.1-5cm	4,434	41	307,459	27	311,893	27	
>5cm	336	3	44,287	4	44,623	4	

Unknown	45	0	5448	0	5493	0	
Grade							<0.001
1	1,617	15	271,467	24	273,084	24	
2	5,262	49	485,646	43	490,908	43	
3	3,436	32	323,161	28	326,597	28	
Unknown	503	5	61,374	5	61,877	5	
Node status							<0.001
Negative	6364	59	804440	70	810804	70	
Positive	4198	39	310,208	27	314,406	27	
Unknown	256	2	27,000	2	27,256	2	
Pathologic Stage							<0.001
Stage 1	4455	41	663,208	58	667663	58	
Stage 2	4695	43	373366	33	378061	33	
Stage 3	1668	15	105074	9	106742	9	
Type of Surgery							<0.001
Lumpectomy	2,480	23	675,629	59	678,109	59	
Mastectomy	8,338	77	466,019	41	474,357	41	
Surgical Margins							<0.001
No Residual disease	10354	96	1,084,367	95	1,094,721	95	
Residual disease	363	3	47,587	4	47,950	4	
Unknown	101	1	9,694	1	9,795	1	
Chemotherapy							0.92
No	6,594	61	695,302	61	701,896	61	
Yes	4,224	39	446,346	39	450,570	39	
Radiotherapy							<0.001
None	6916	64	463,719	41	470,635	41	
Yes	3902	36	677,929	59	681,831	59	

ER: Estrogen-receptor; PR: Progesterone-receptor; HR: Hormone-receptor.

eTable 3. Factors Associated With Receipt of Adjuvant Endocrine Therapy		
	Multivariable analysis	
	OR [95% CI]	p
Age (years)		
≤49	-	-
50-69	1.10 [0.94, 1.29]	0.23
≥70	0.92 [0.76, 1.10]	0.35
Race		
Non-Hispanic White	-	-
Non-Hispanic Black	0.98 [0.85, 1.14]	0.82
Hispanic	0.96 [0.74, 1.24]	0.77
Other	0.78 [0.62, 0.99]	0.039
County size		
Metropolitan	-	-
Urban	1.36 [1.15, 1.59]	<0.001
Rural	1.42 [0.94, 2.14]	0.092
Unknown	0.84 [0.64, 1.10]	0.20
Facility Location		
East	-	-
South	0.55 [0.49, 0.63]	<0.001
Central	0.84 [0.73, 0.96]	0.013
West	0.65 [0.56, 0.76]	<0.001
Unknown	0.70 [0.49, 0.98]	0.039
Facility type		
Non-academic	-	-
Academic	1.13 [1.02, 1.25]	0.022
Unknown	-	-
Distance to Treatment		
≤30 miles	-	-
>30 miles	1.08 [0.93, 1.26]	0.32
Unknown	0.51 [0.12, 2.19]	0.36
Insurance status		
Commercial Insurance	-	-
Medicare	1.13 [1.01, 1.27]	0.034
Medicaid	0.94 [0.73, 1.22]	0.66
Uninsured	0.78 [0.57, 1.08]	0.13

Other Government/Unknown	0.95 [0.71, 1.26]	0.70
Education^a		
≥21%	-	-
13%-20.9%	1.29 [1.10, 1.51]	0.002
7%-12.9%	1.36 [1.15, 1.61]	<0.001
<7%	1.49 [1.23, 1.81]	<0.001
Unknown	1.18 [0.14, 9.78]	0.88
Income (\$)		
<38,000	-	-
38,000-47,999	1.01 [0.86, 1.19]	0.87
48,000-62,999	1.02 [0.87, 1.21]	0.78
>63,000	0.93 [0.77, 1.12]	0.43
Unknown	2.03 [0.34, 12.2]	0.44
Lymph node Status		
Negative	-	-
Positive	0.93 [0.82, 1.05]	0.22
Unknown	0.67 [0.51, 0.87]	0.003
Pathologic Stage		
Stage I	-	-
Stage II	1.10 [0.98, 1.23]	0.11
Stage III	0.73 [0.61, 0.87]	<0.001
Grade		
1	-	-
2	1.05 [0.92, 1.19]	0.48
3	0.97 [0.84, 1.12]	0.66
Unknown	0.70 [0.56, 0.88]	0.002
Surgical Margin Status		
Negative	-	-
Positive	0.81 [0.64, 1.03]	0.086
Unknown	1.17 [0.75, 1.85]	0.49
Receipt of Radiotherapy		
No	-	-
Yes	2.83 [2.55, 3.15]	<0.001
Receipt of Chemotherapy		
No	-	-
Yes	1.20 [1.07, 1.34]	0.001
Year of Treatment		
2004 - 2007	-	-
2008 - 2011	1.65 [1.49, 1.83]	<0.001

2012 - 2014	2.05 [1.84, 2.29]	<0.001
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^a% population in the patient's zip code without a high school degree.

eTable 4. Factors Associated With Overall Survival (Complete Table)				
	Multivariable		IPTW	
	OR [95% CI]	p	HR [95% CI]	p
Adjuvant Endocrine Tx				
None	-	-	-	-
Yes	0.72 [0.65, 0.79]	<0.001	0.70 [0.63, 0.77]	<0.001
Age (years)				
≤49	-	-		
50-69	1.37 [1.09, 1.73]	0.007		
≥70	2.77 [2.17, 3.53]	<0.001		
Race				
Non-Hispanic White	-	-		
Non-Hispanic Black	1.09 [0.94, 1.26]	0.27		
Hispanic	0.52 [0.37, 0.74]	<0.001		
Other	0.66 [0.49, 0.88]	0.005		
Facility Location				
East	-	-		
South	0.80 [0.70, 0.90]	<0.001		
Central	0.92 [0.81, 1.05]	0.22		
West	0.85 [0.73, 0.98]	0.031		
Unknown	1.13 [0.70, 1.81]	0.62		
Facility type				
Community	-	-		
Academic	0.81 [0.73, 0.91]	<0.001		
Unknown	omitted	-		
Insurance status				
Commercial Insurance	-	-		
Medicare	1.42 [1.25, 1.60]	<0.001		
Medicaid	1.59 [1.21, 2.10]	0.001		
Uninsured	1.53 [1.07, 2.18]	0.019		
Other Government/Unknown	1.55 [1.15, 2.09]	0.004		
Charlson/Deyo Comorbidity Score				
0	-	-		
1	1.46 [1.31, 1.63]	<0.001		
2	2.46 [2.13, 2.85]	<0.001		
Lymph node Status				
Negative	-	-		
Positive	1.43 [1.26, 1.62]	<0.001		

Unknown	2.01 [1.61, 2.51]	<0.001		
Pathologic Stage				
Stage I	-	-		
Stage II	1.07 [0.90, 1.27]	0.43		
Stage III	1.88 [1.52, 2.34]	<0.001		
Grade				
1	-	-		
2	1.26 [1.09, 1.47]	0.002		
3	1.60 [1.36, 1.87]	<0.001		
Unknown	1.12 [0.84, 1.49]	0.43		
Tumor Size				
≤2cm	-	-		
2.1-5cm	1.50 [1.31, 1.71]	<0.001		
>5cm	1.68 [1.32, 2.13]	<0.001		
Unknown	1.31 [0.74, 2.34]	0.36		
Receipt of Radiotherapy				
No	-	-		
Yes	0.79 [0.71, 0.88]	<0.001		
Receipt of Chemotherapy				
No	-	-		
Yes	0.63 [0.57, 0.71]	<0.001		

Abbreviations: *IPW*: Inverse probability of treatment weighting; *HR*: Hazard ratio.

^aOnly statistically significant factors are displayed.

^bIPW hazard ratio for the primary outcome of interest alone is provided.