**Supplementary Table 1: Stepwise study cohort selection criteria for patients with biologically favorable DCIS**

| Parameter | No. of Subjects |
|---|---|
| Start: DCIS diagnosed between 2004-2017 | 339,600 |
| Exclude Male | 337,873 |
| Exclude if histology not 8500, 8501, 8010, 8050, 8522, 8504, 8201, 8230 | 207,305 |
| Exclude if surgery = unknown | 200,731 |
| Exclude patients younger than 40 or older than 99 | 195,464 |
| Exclude patients with high grade | 88,306 |
| Exclude patients with ER and PR negative | 74,868 |
| Exclude patients with unknown duration between surgery and diagnosis | 74,367 |

**Supplementary Table 2**: Demographics of the Biologically Favorable DCIS Cohort

| Variable | Surgery | Active Surveillance | p-value* |
|---|---|---|---|
| **Patients** | 71983 (96.8%) | 2384 (3.2%) | |
| **Age (mean ± SD)** | 59.8 ± 11.3 | 62.2 ± 13.3 | <0.01 |
| **Year of Diagnosis** | | | |
| 2004-2009 | 21397 (29.7%) | 654 (27.4%) | |
| 2010-2013 | 23975 (33.3%) | 739 (31.0%) | |
| 2014-2017 | 26611 (37.0%) | 991 (41.6%) | |
| **Race** | | | <0.01 |
| White | 58067 (81.5%) | 1683 (72.9%) | |
| Black | 9075 (12.7%) | 456 (19.8%) | |
| Other | 4140 (5.8%) | 168 (7.3%) | |
| Unknown | 701 | 77 | |
| **Insurance Status** | | | <0.01 |
| Private | 43038 (60.5%) | 1192 (51.6%) | |
| Medicaid | 3275 (4.6%) | 112 (4.9%) | |
| Medicare | 23033 (32.4%) | 904 (39.2%) | |
| Other Government | 756 (1.1%) | 34 (1.5%) | |
| Not Insured | 1011 (1.4%) | 67 (2.9%) | |
| **Facility Type** | | | <0.01 |
| Academic | 20044(27.8%) | 768 (32.2%) | |
| Community Cancer | 18035 (25.1%) | 595 (25.0%) | |
| Comprehensive Community Program | 33904 (47.1%) | 1021 (42.8%) | |
| **Facility Location** | | | <0.01 |
| Northeast | 16245 (22.6%) | 521 (21.9%) | |
| South | 26073 (36.2%) | 1076 (45.1%) | |
| Midwest | 19425 (27.0%) | 465 (19.5%) | |
| West | 10240 (14.2%) | 322 (13.5%) | |
| **Charlson Comorbidity Index** | | | <0.01 |
| 0 | 61910 (86.0%) | 2190 (92.0%) | |
| 1 | 8206 (11.4%) | 138 (5.8%) | |
| 2 | 1403 (2.0%) | 36 (1.5%) | |
| 3+ | 464 (0.6%) | 20 (0.8%) | |
| **Tumor Size** | | | <0.01 |
| <1 cm | 25013 (34.8%) | 446 (18.7%) | |
| 1-<2 cm | 10320 (14.3%) | 164 (6.9%) | |
| 2-<3 cm | 3651 (5.1%) | 71 (3.0%) | |
| 3-<4 cm | 1377 (1.9%) | 37 (1.6%) | |
| 4-<5 cm | 890 (1.2%) | 21 (0.9%) | |
| $\geq$ 5 cm | 1450 (2.0%) | 69 (2.9%) | |
| Unknown | 29282 (40.7%) | 1576 (66.1%) | |

| Endocrine Therapy | | | <0.01 |
|---|---|---|---|
| Yes | 34599 (48.1%) | 307 (12.9%) | |
| No | 33233 (46.2%) | 1822 (76.4%) | |
| Unknown | 4151 (5.7%) | 255 (10.7%) | |

\* P values were determined using Wilcoxon rank-sum tests for continuous variables and chi-square tests or Fisher's exact tests for categorical variables.

**Supplementary Table 3:** Endocrine therapy rates among AS patients by age

| Age | Endocrine Therapy Use* | | |
|---|---|---|---|
| | Yes (%) | No (%) | Unknown (%) |
| <50 years (n=493) | 35 (7.1%) | 391 (79.3%) | 67 (13.6%) |
| 50-64 years (n=882) | 94 (10.7%) | 690 (78.2%) | 98 (11.1%) |
| Age >/=65 (n=1009) | 178 (17.6%) | 741 (73.4%) | 90 (8.9%) |
| Total  (2384) | 307 | 1822 | 255 |

*P value < 0.01 for association between endocrine therapy use and age based on chi-square test.
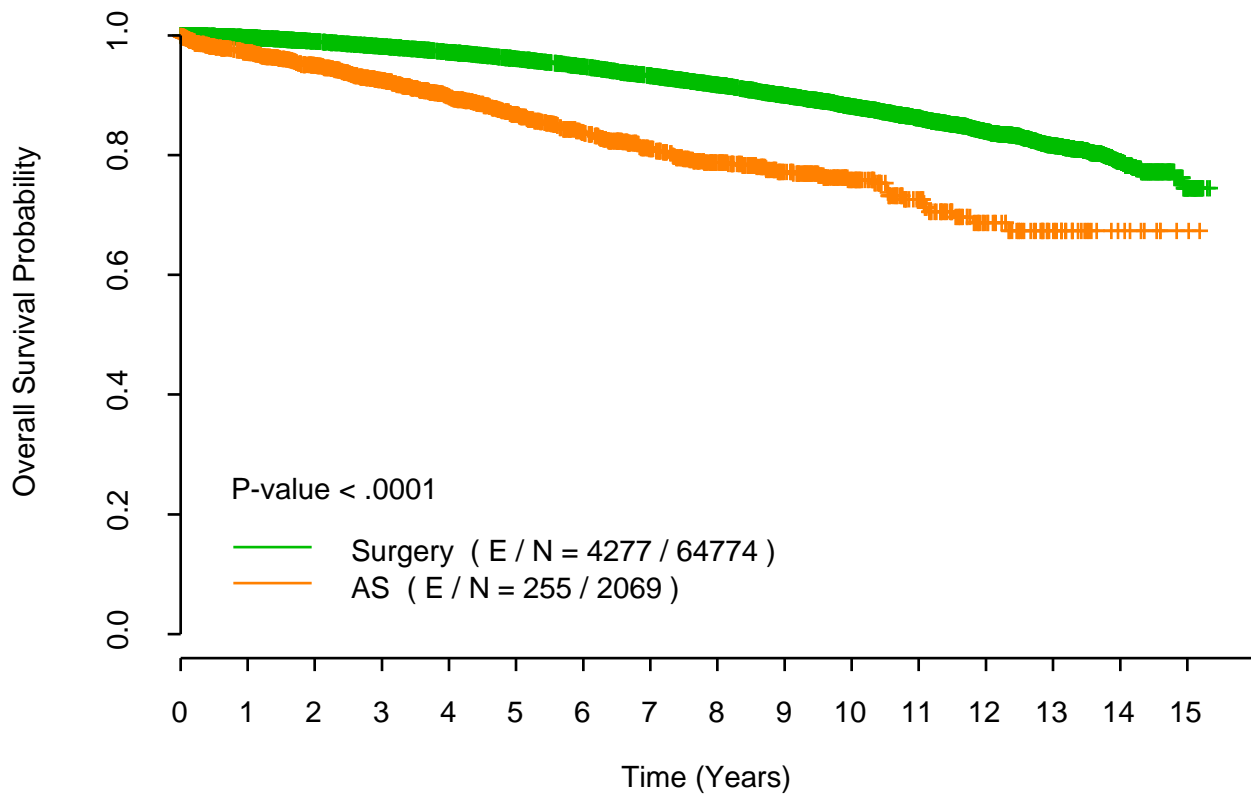
**Supplementary Figure 1** Kaplan Meier Survival Curves of Immediate Surgery vs Active Surveillance
**(AS) for the entire cohort of patients with Biologically Favorable DCIS Cohort.** A log-rank test was
employed to compare survival curves between two groups.