**Supplemental Figure 1. Study inclusion and exclusion criteria.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Inclusion/exclusion criterion** | **CANCER COHORTS** | | |  | **NON-CANCER COHORTS** | | |
| **First primary diagnosis of breast, colorectal, lung, or prostate cancer 2007-2013** | **723,590** | | |  | **-** | | |
| **Not diagnosed at autopsy or death** | **714,179** | | |  | **-** | | |
| **Non-metastatic disease at diagnosis** | **484,005** | | |  | **-** | | |
| **Age ≥66 at diagnosis (non-cancer, has the same age, sex, race and region characteristics as the cancer cohort)** | **300,498** | | |  | **18,987,361** | | |
| **Continuous coverage in Medicare Parts A, B, D (-18 months through +24 months from diagnosis or index date)** | **49,803** | | |  | **5,103,111** | | |
| **Presence of MCC** | **34,414** | | |  | **3,173,172** | | |
|  | ***Diabetes*** | ***Hyperlipidemia*** | ***Hypertension*** |  | ***Diabetes*** | ***Hyperlipidemia*** | ***Hypertension*** |
| **Breast cancer, n=** | **1,972** | **6,474** | **10,307** |  | **9,226** | **31,612** | **50,582** |
| **Colorectal cancer, n=** | **1,233** | **3,559** | **5,720** |  | **5,631** | **17,145** | **27,774** |
| **Lung cancer, n=** | **624** | **2,455** | **3,570** |  | **2,905** | **11,920** | **17,511** |
| **Prostate cancer, n=** | **2,137** | **7,276** | **9,760** |  | **9,647** | **35,088** | **47,324** |

**A) Non-insulin anti-diabetics**

**B) Statins**

**C) Anti-hypertensives**

**Supplemental Figure 2A-C. Proportion of adherent patients by cardiometabolic condition cohort, cancer type, and phase of care.**

**Supplemental Table 1. Characteristics of 12 study populations defined by cancer type and chronic condition.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Breast cancer | | | | | |  | Colorectal cancer | | | | | |  | Lung cancer | | | | | |  | Prostate cancer\* | | | | | |
|  | HL | | DM | | HT | |  | HL | | DM | | HT | |  | HL | | DM | | HT | |  | HL | | DM | | HT | |
|  | n | % | n | % | n | % |  | n | % | n | % | n | % |  | n | % | n | % | n | % |  | n | % | n | % | n | % |
| **Characteristic** | 6474 |  | 1972 |  | 10307 |  |  | 3559 |  | 1233 |  | 5720 |  |  | 2455 |  | 624 |  | 3570 |  |  | 7276 |  | 2137 |  | 9760 |  |
| Cardiometabolic conditions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hyperlipidemia only | 1193 | 18 | - | - | - | - |  | 610 | 17 | - | - | - | - |  | 435 | 18 | - | - | - | - |  | 1668 | 23 | - | - | - | - |
| Diabetes only | - | - | 193 | 10 | - | - |  | - | - | 154 | 12 | - | - |  | - | - | 49 | 8 | - | - |  | - | - | 252 | 12 | - | - |
| Hypertension only | - | - | - | - | 4552 | 44 |  | . | . | . | . | 2483 | 43 |  | - | - | - | - | 1415 | 40 |  | - | - | - | - | 3751 | 38 |
| Hyperlipidemia and diabetes | 138 | 2 | 138 | 7 | - | - |  | 96 | 3 | 96 | 8 | - | - |  | 51 | 2 | 51 | 8 | - | - |  | 199 | 3 | 199 | 9 | - | - |
| Hyperlipidemia and hypertension | 4114 | 64 | - | - | 4114 | 40 |  | 2254 | 63 | - | - | 2254 | 39 |  | 1631 | 66 | - | - | 1631 | 46 |  | 4323 | 59 | - | - | 4323 | 44 |
| Diabetes and hypertension | - | - | 612 | 31 | 612 | 6 |  | - | - | 384 | 31 | 384 | 7 |  | - | - | 186 | 30 | 186 | 5 |  | - | - | 600 | 28 | 600 | 6 |
| Hyperlipidemia, diabetes and Hypertension | 1029 | 16 | 1029 | 52 | 1029 | 10 |  | 599 | 17 | 599 | 49 | 599 | 10 |  | 338 | 14 | 338 | 54 | 338 | 9 |  | 1086 | 15 | 1086 | 51 | 1086 | 11 |
| Age (year), Mean,std | 76 | 6 | 76 | 6 | 77 | 7 |  | 77 | 7 | 77 | 7 | 78 | 7 |  | 75 | 6 | 75 | 6 | 75 | 6 |  | 73 | 5 | 73 | 5 | 74 | 5 |
| 66-69 years | 1186 | 18 | 386 | 20 | 1749 | 17 |  | 508 | 14 | 197 | 16 | 727 | 13 |  | 480 | 20 | 124 | 20 | 711 | 20 |  | 2032 | 28 | 586 | 27 | 2539 | 26 |
| 70-74 years | 1799 | 28 | 561 | 28 | 2653 | 26 |  | 889 | 25 | 342 | 28 | 1373 | 24 |  | 783 | 32 | 191 | 31 | 1049 | 29 |  | 2721 | 37 | 782 | 37 | 3590 | 37 |
| 75-79 years | 1609 | 25 | 483 | 24 | 2442 | 24 |  | 845 | 24 | 291 | 24 | 1296 | 23 |  | 620 | 25 | 179 | 29 | 924 | 26 |  | 1617 | 22 | 471 | 22 | 2198 | 23 |
| 80+ years | 1880 | 29 | 542 | 27 | 3463 | 34 |  | 1317 | 37 | 403 | 33 | 2324 | 41 |  | 572 | 23 | 130 | 21 | 886 | 25 |  | 906 | 12 | 298 | 14 | 1433 | 15 |
| Female | 6427 | 99 | 1956 | 99 | 10232 | 99 |  | 2182 | 61 | 690 | 56 | 3603 | 63 |  | 1487 | 61 | 368 | 59 | 2231 | 62 |  | 7276 | 100 | 2137 | 100 | 9760 | 100 |
| Race/ethnicity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| White | 5425 | 84 | 1495 | 76 | 8536 | 83 |  | 2895 | 81 | 929 | 75 | 4510 | 79 |  | 2062 | 84 | 498 | 80 | 2968 | 83 |  | 6078 | 84 | 1582 | 74 | 7690 | 79 |
| Black | 487 | 8 | 222 | 11 | 955 | 9 |  | 213 | 6 | 89 | 7 | 489 | 9 |  | 160 | 7 | 47 | 8 | 297 | 8 |  | 484 | 7 | 242 | 11 | 1018 | 10 |
| Asian | 247 | 4 | 118 | 6 | 368 | 4 |  | 242 | 7 | 111 | 9 | 390 | 7 |  | 152 | 6 | 46 | 7 | 189 | 5 |  | 311 | 4 | 123 | 6 | 444 | 5 |
| Hispanic | 146 | 2 | 68 | 3 | 208 | 2 |  | 80 | 2 | 45 | 4 | 136 | 2 |  | 25 | 1 | 12 | 2 | 46 | 1 |  | 166 | 2 | 92 | 4 | 269 | 3 |
| Native American Indian/Other\* | 169 | 2 | 69 | 3 | 240 | 2 |  | 129 | 3 | 59 | 4 | 195 | 3 |  | 56 | 2 | 21 | 3 | 70 | 2 |  | 237 | 3 | 98 | 4 | 339 | 3 |
| Cancer stage† |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Stage I (or =6 Gleason) | 3878 | 60 | 1065 | 54 | 5888 | 57 |  | 1283 | 36 | 424 | 34 | 1991 | 35 |  | 1587 | 65 | 385 | 62 | 2318 | 65 |  | 2832 | 39 | 801 | 37 | 3717 | 38 |
| Stage II (or 7 Gleason) | 2095 | 32 | 719 | 36 | 3552 | 34 |  | 1272 | 36 | 454 | 37 | 2082 | 36 |  | 211 | 9 | 62 | 10 | 315 | 9 |  | 3056 | 42 | 860 | 40 | 4048 | 41 |
| Stage III (or 8-10 Gleason) | 501 | 8 | 188 | 10 | 867 | 8 |  | 1004 | 28 | 355 | 29 | 1647 | 29 |  | 657 | 27 | 177 | 28 | 937 | 26 |  | 1248 | 17 | 424 | 20 | 1800 | 18 |

Abbreviations: HL=hyperlipidemia, DM=diabetes mellitus, HT=hypertension

\*Native American Indian and Other were combined due to small cell sizes.

†Approximately 2% of each prostate-cardiometabolic cohort was missing Gleason score.

**Supplemental Table 2. Data points underlying Figure 2A-C and Supplemental Figure 2A-C.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mean Proportion of Days Covered** | | | | | | | | | | | | | | | |
| **Antidiabetics** | | | | | | | | | | | | | | | |
|  | **Breast** | | |  | **Colorectal** | | |  | **Lung** | | |  | **Prostate** | | |
| **Period** | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |
| **Cancer cohort** | 0.85 | 0.85 | 0.83 |  | 0.86 | 0.82 | 0.80 |  | 0.84 | 0.81 | 0.77 |  | 0.84 | 0.85 | 0.85 |
| **Cancer-free cohort** | 0.84 | 0.82 | 0.80 |  | 0.85 | 0.83 | 0.81 |  | 0.84 | 0.83 | 0.82 |  | 0.85 | 0.84 | 0.82 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Statins** | | | | | | | | | | | | | | | |
|  | **Breast** | | |  | **Colorectal** | | |  | **Lung** | | |  | **Prostate** | | |
| **Period** | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |
| **Cancer cohort** | 0.78 | 0.76 | 0.74 |  | 0.77 | 0.72 | 0.71 |  | 0.78 | 0.75 | 0.72 |  | 0.77 | 0.77 | 0.77 |
| **Cancer-free cohort** | 0.77 | 0.75 | 0.74 |  | 0.79 | 0.77 | 0.76 |  | 0.78 | 0.75 | 0.75 |  | 0.77 | 0.77 | 0.75 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Antihypertensive** | | | | | | | | | | | | | | | |
|  | **Breast** | | |  | **Colorectal** | | |  | **Lung** | | |  | **Prostate** | | |
| **Period** | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |
| **Cancer cohort** | 0.92 | 0.93 | 0.93 |  | 0.91 | 0.92 | 0.91 |  | 0.91 | 0.92 | 0.90 |  | 0.91 | 0.93 | 0.93 |
| **Cancer-free cohort** | 0.91 | 0.91 | 0.91 |  | 0.91 | 0.91 | 0.92 |  | 0.90 | 0.91 | 0.91 |  | 0.90 | 0.91 | 0.91 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Proportion of Adherent Patients (80%+ Proportion of Days Covered)** | | | | | | | | | | | | | | | |
| **Antidiabetics** | | | | | | | | | | | | | | | |
|  | **Breast** | | |  | **Colorectal** | | |  | **Lung** | | |  | **Prostate** | | |
| **Period** | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |
| **Cancer cohort** | 0.75 | 0.76 | 0.75 |  | 0.74 | 0.72 | 0.71 |  | 0.72 | 0.68 | 0.66 |  | 0.75 | 0.76 | 0.76 |
| **Cancer-free cohort** | 0.71 | 0.70 | 0.69 |  | 0.72 | 0.72 | 0.71 |  | 0.72 | 0.71 | 0.71 |  | 0.73 | 0.74 | 0.72 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Statins** | | | | | | | | | | | | | | | |
|  | **Breast** | | |  | **Colorectal** | | |  | **Lung** | | |  | **Prostate** | | |
| **Period** | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |
| **Cancer cohort** | 0.62 | 0.62 | 0.61 |  | 0.63 | 0.58 | 0.58 |  | 0.64 | 0.61 | 0.59 |  | 0.63 | 0.64 | 0.65 |
| **Cancer-free cohort** | 0.61 | 0.60 | 0.59 |  | 0.64 | 0.62 | 0.63 |  | 0.63 | 0.62 | 0.62 |  | 0.62 | 0.64 | 0.63 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Antihypertensive** | | | | | | | | | | | | | | | |
|  | **Breast** | | |  | **Colorectal** | | |  | **Lung** | | |  | **Prostate** | | |
| **Period** | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |  | **Pre-diagnosis** | **Initial treatment** | **Survivorship** |
| **Cancer cohort** | 0.87 | 0.89 | 0.89 |  | 0.86 | 0.87 | 0.88 |  | 0.86 | 0.88 | 0.87 |  | 0.86 | 0.89 | 0.90 |
| **Cancer-free cohort** | 0.85 | 0.86 | 0.87 |  | 0.85 | 0.87 | 0.88 |  | 0.84 | 0.86 | 0.87 |  | 0.84 | 0.86 | 0.86 |

**Supplemental Table 3. Overall difference-in-difference estimates (%) for changes in proportion of adherent patients by cancer type, cardiometabolic condition, and phase of carea**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Cancer Type** | | | | | | |
|  | **Breast** Difference-in-difference (95% CI) | | **Colorectal** Difference-in-difference (95% CI) | | **Lung** Difference-in-difference (95% CI) | | **Prostate** Difference-in-difference (95% CI) | |
| **Comorbid condition** | Initial vs. pre-diagnosis phase | Survivorship vs. pre-diagnosis phase | Initial vs. pre-diagnosis phase | Survivorship vs. pre-diagnosis phase | Initial vs. pre-diagnosis phase | Survivorship vs. pre-diagnosis phase | Initial vs. pre-diagnosis phase | Survivorship vs. pre-diagnosis phase |
| Diabetes  mellitus | 2.39\* (0.24, 4.53) | 2.22 (-0.38, 4.83) | -2.06 (-5.34, 1.21) | -2.82 (-6.43, 0.79) | -3.24 (-7.96, 1.47) | -5.55\* (-11.05, -0.06) | 0.79 (-1.48, 3.07) | 2.93\* (0.08, 5.78) |
| Hyper-  lipidemia | 1.3 (-0.39, 2.98) | 0.77 (-1.28, 2.81) | -3.53\* (-6.63, -0.42) | -3.22\* (-6.24, -0.19) | -2.22 (-5.60, 1.16) | -4.14\* (-7.97, -0.31) | 0.02 (-1.62, 1.67) | 1.27 (-0.71, 3.24) |
| Hyper-  tension | 0.86 (-0.3, 2.03) | 0.36 (-0.93, 1.66) | 0.31 (-1.13, 1.75) | -0.77 (-2.5, 0.96) | -0.16 (-1.69, 1.37) | -2.42\*\* (-4.16, -0.68) | 1.26\* (0.23, 2.29) | 1.04 (-0.46, 2.54) |

\*\*: P<0.01, \*: P<0.05

a All point estimates and 95% confidence intervals are multiplied by 100 to represent percentages.