Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.
### eTable 1. Detailed cohort definitions

| Cohort | Drug names and approval date | New indication (all metastatic unless indicated) | Cohort definition** | Outcome* Subsequent claim for… |
|--------|-----------------------------|-------------------------------------------------|---------------------|---------------------------------|
| Breast cancer; ER/PR+, ERBB2 negative, 1st line | palbociclib 2/3/15 | 1st line with letrozole | 1) Stage IV breast cancer 2) SEER: ER or PR positive, HER2 negative | 1: palbociclib + letrozole 0: anastrozole, exemestane, everolimus, fulvestrant, letrozole without palbociclib within 28 days, tamoxifen |
| Breast cancer; ER/PR+, ERBB2 negative, 2nd line | palbociclib 2/19/16 abemacicib 9/28/17 | 2nd line after disease progression on endocrine therapy | 1) Stage IV breast cancer 2) SEER: ER or PR positive, HER2 negative 3) claim for endocrine therapy – anastrozole, letrozole, exemestane 4) no claim for palbociclib, abemacicib or ribociclib prior to or in conjunction with endocrine therapy | 1: palbociclib, abemacicib (after 9/28/17) 0: anastrozole, exemestane, everolimus, fulvestrant alone, letrozole, tamoxifen (all: if not part of first line therapy) |
| Colon cancer | ramucirumab 4/24/15 | 2nd line with FOLFIRI after 1st line FOLFOX-bevacizumab | 1) Stage IV colon cancer 2) claims for first line 5-FU, oxaliplatin, bevacizumab 3) no preceding claim for irinotecan | 1: 5-FU + irinotecan + ramucirumab 0: 5-FU + irinotecan |
| Melanoma | nivolumab 12/22/14 pembrolizumab 12/18/15 ipilimumab + nivolumab 10/30/15 | 1st line | 1) Stage IV melanoma 2) No claims for first line treatment with dabrafenib, trametinib, vemurafenib, cobimetinib, binimetinib, encorafenib | 1: ipilimumab + nivolumab (starting 10/30/15), pembrolizumab (starting 1/23/16) or nivolumab (starting 12/22/14) 0: ipilimumab |
| Non-small cell lung cancer: ALK+ | alectinib 12/11/15 | 2nd line after progression or intolerance to crizotinib | 1) Stage III/IIIC/IV NSCLC 2) claim for first line crizotinib | 1: alectinib 0: docetaxel, etoposide, gemcitabine, nab-paclitaxel, paclitaxel, pembrolizumab, pemetrexed, vinorelbine |
| Non-small cell lung cancer: EGFR+ | osimertinib 11/13/15 | 2nd line with T790M mutation | 1) Stage III/IIIC/IV NSCLC 2) claim for first line erlotinib, gefitinib or afatinib | 1: osimertinib 0: erlotinib or afatinib (if not first line therapy); docetaxel, etoposide, gemcitabine, nab-paclitaxel, paclitaxel, pembrolizumab, pemetrexed, vinorelbine |
| Non-small cell lung cancer: PDL1+50% | nivolumab: 3/14/15 (squamous histology only) 10/9/15 (all histologies) pembrolizumab 10/2/15 | 2nd line after platinum chemotherapy | 1) Stage IV NSCLC 2) claim for first line chemotherapy that includes pemetrexed, paclitaxel, etoposide, docetaxel, gemcitabine, topotecan, nab-paclitaxel, or vinorelbine given with carboplatin or cisplatin | 1: nivolumab or pembrolizumab (starting 10/9/15) 0: pemetrexed, paclitaxel, etoposide, docetaxel, gemcitabine, topotecan, nab-paclitaxel, vinorelbine (all: if not part of first line therapy) |
| Pancreatic cancer | liposomal irinotecan 10/22/15 | 2nd line after gemcitabine-containing regimen | 1) Stage IV pancreatic adenocarcinoma 2) claim for first-line gemcitabine | 1: liposomal irinotecan +/- 5FU 0: irinotecan, oxaliplatin |
| Renal cell carcinoma | lenvatinib 5/13/16 cabozasitnib 4/25/16 nivolumab 11/23/15 | 2nd line after anti-angiogenesis | 1) Primary site cancer of RCC, any stage 2) claim for first line axitinib, bevacizumab, pazopanib, sorafenib, sunitinib | 1: nivolumab (11/23/15), lenvatinib (after 5/13/16) or cabozasitnib (after 4/25/16) 0: alesdesleukin (IL-2), axitinib, bevacizumab, everolimus, pazopanib, sorafenib, sunitinib, temsirolimus (all: if not part of first line therapy) |
| Urothelial cancer | atezolizumab 5/18/16 nivolumab 2/2/17 durvalumab 5/1/17 avelumab 5/9/17 pembrolizumab 5/18/17 | 2nd line after platinum chemotherapy; or 2nd line after platinum chemo for adjuvant/neoadjuvant with disease progression within 12 months | 1) Stage = II-IV urothelial cancer 2) claim for first line carboplatin or cisplatin | 1: atezolizumab, nivolumab (starting 2/2/17), durvalumab (starting 5/1/17), avelumab (after 5/9/17), pembrolizumab (after 5/18/17) 0: docetaxel, doxorubicin, gemcitabine, ifosfamide, methotrexate, paclitaxel (all: if not part of first line therapy) If Stage II-III, outcome claim must be within 12 months of last platinum claim. |

* Some novel therapy cohorts eventually have more than one novel therapy with the same indication. The date of the first novel therapy approval established the two-year evaluation period for the cohort. Patients receiving subsequently-approved novel therapies were included if their first treatment claim occurred after the subsequent novel therapy’s FDA approval, as reflected by the dates in the table.

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** All cohort definitions also included: cohort diagnosis is the first reported cancer, continuous Medicare coverage for Parts A/B (and Part D if oral drugs are part of the cohort definition or outcomes) for 3 months prior to diagnosis and until the outcome, and no systemic therapy prior to diagnosis.
**eTable 2. Demographic Characteristics by Oncology Care Model status—unmatched cohort**

| Characteristic | Total N=3,310 | Non-OCM N=2,546 | OCM N=764 | Standardized Difference |
|---------------|--------------|-----------------|----------|------------------------|
| Median age at outcome, yrs (interquartile range) | 72.7 (68.2-77.5) | 72.4 (68.2-77.6) | 73.1 (68.7-77.3) | -0.08 |
| Sex (% Female) | 1,843 (55.7%) | 1,406 (55.2%) | 437 (57.2%) | 0.04 |
| Race | | | | 0.14 |
| White | 2,815 (85.0%) | 2,143 (84.2%) | 672 (88.0%) | |
| Black | 268 (8.1%) | 210 (8.2%) | 58 (7.6%) | |
| Asian, Pacific Islander, Other and Unknown | 227 (6.9%) | 193 (7.6%) | 34 (4.5%) | |
| Hispanic | 218 (6.6%) | 168 (6.6%) | 50 (6.5%) | <0.01 |
| Marital status | 0.11 | | | |
| Unmarried | 1,137 (34.4%) | 886 (34.8%) | 251 (32.9%) | |
| Married | 1,765 (53.3%) | 1,367 (53.7%) | 398 (52.1%) | |
| Unknown | 408 (12.3%) | 293 (11.5%) | 115 (15.1%) | |
| Charlson comorbidity score | 0.06 | | | |
| 0 | 1,281 (38.7%) | 985 (38.7%) | 296 (38.7%) | |
| 1 | 930-940 (28.0-29.0%) | 700-710 (27.0-28.0%) | 220-230 (29.0-30.0%) | |
| >2 | 1,084 (32.7%) | 847 (33.3%) | 237 (31.0%) | |
| Missing | <11 (0-2%) | <11 (0-2%) | <11 (0-2%) | |
| Cohort | 0.16 | | | |
| Lung- ALK | 33 (1.0%) | 20-30 (1.0-2.0%) | <11 (0-2%) | |
| Lung- EGFR | 177 (5.3%) | 147 (5.8%) | 30 (3.9%) | |
| Lung- 2nd line immunotherapy | 1,044 (31.5%) | 782 (30.7%) | 262 (34.3%) | |
| Bladder | 160 (4.8%) | 132 (5.2%) | 28 (3.7%) | |
| Pancreas | 817 (24.7%) | 615 (24.2%) | 202 (26.4%) | |
| Colon | 239 (7.2%) | 192 (7.5%) | 47 (6.2%) | |
| Kidney | 208 (6.3%) | 167 (6.6%) | 41 (5.4%) | |
| Breast- first line | 434 (13.1%) | 331 (13.0%) | 103 (13.5%) | |
| Breast- second line | 109 (3.3%) | 83 (3.3%) | 26 (3.4%) | |
| Melanoma | 89 (2.7%) | 70-80 (2.0-3.0%) | 10-20 (2.0-3.0%) | |
| Time period | 0.10 | | | |
| Q1/2 2015 | 144 (4.4%) | 117 (4.6%) | 27 (3.5%) | |
| Q3/4 2015 | 395 (11.9%) | 310 (12.2%) | 85 (11.1%) | |
| Q1/2 2016 | 964 (29.1%) | 726 (28.5%) | 238 (31.2%) | |
| Q3/4 2016 | 895 (27.0%) | 685 (26.9%) | 210 (27.5%) | |
| Q1/2 2017 | 572 (17.3%) | 441 (17.3%) | 131 (17.1%) | |
| Q3/4 2017 | 286 (8.6%) | 228 (9.0%) | 58 (7.6%) | |
| Q1/2 2018 | 54 (1.6%) | 39 (1.5%) | 15 (2.0%) | |
| Urbanicity | 0.19 | | | |
| Metro | 2,817 (85.1%) | 2,130 (83.7%) | 687 (89.9%) | |
| Non-metro | 493 (14.9%) | 416 (16.3%) | 77 (10.1%) | |
| Census tract poverty rate | 0.23 | | | |
| 0% - <5% | 809 (24.4%) | 577 (22.7%) | 232 (30.4%) | |
| 5% - <10% | 780 (23.6%) | 585 (23.0%) | 195 (25.5%) | |
| 10% - <15% | 908 (27.4%) | 725 (28.5%) | 183 (24.0%) | |
| 15% - <20% | 564 (17.0%) | 450 (17.7%) | 114 (14.9%) | |
| Unknown | 249 (7.5%) | 209 (8.2%) | 40 (5.2%) | |

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| Treating oncologist | 91 (2.7%) | 80-90 (3.0-2.0%) | <11 (0-2%) |
|---------------------|-----------|------------------|------------|
| Low volume          | 1,215 (36.7%) | 910-920 (35.0-36.0%) | 290-300 (38.0-39.0%) |
| Specialist          | 2,004 (60.5%) | 1,548 (60.8%) | 456 (59.7%) |

* Ranges provided for some values to comply with CMS’s cell suppression policy.
**eTable 3. Demographic Characteristics by Oncology Care Model status—matched cohort**

|                              | Total          | Non-OCM        | OCM            | Standardized Difference |
|------------------------------|----------------|----------------|----------------|-------------------------|
|                              | N=2,839        | N=2,079        | N=760          |                         |
| **Median age at outcome, yrs (interquartile range)** | 72.7 (68.3-77.6) | 72.4 (68.2-77.7) | 73.2 (68.7-77.4) | -0.09 |
| **Sex (% Female)** | 1,591 (56.0%)  | 1,155 (55.6%)  | 436 (57.4%)    | 0.04                   |
| **Race**                    |                |                |                | 0.13                   |
| White                       | 2,426 (85.5%)  | 1,756 (84.5%)  | 670 (88.2%)    |                         |
| Black                       | 232 (8.2%)     | 175 (8.4%)     | 57 (7.5%)      |                         |
| Asian, Pacific Islander, Other and Unknown | 181 (6.4%) | 148 (7.1%) | 33 (4.3%) |                         |
| **Hispanic**                | 184 (6.5%)     | 134 (6.4%)     | 50 (6.6%)      | <0.01                  |
| **Marital status**          |                |                |                | 0.09                   |
| Unmarried                   | 970 (34.2%)    | 721 (34.7%)    | 249 (32.8%)    |                         |
| Married                     | 1,504 (53.0%)  | 1,107 (53.2%)  | 397 (52.2%)    |                         |
| Unknown                     | 365 (12.9%)    | 251 (12.1%)    | 114 (15.0%)    |                         |
| **Charlson comorbidity score** |                |                |                | 0.03                   |
| 0                            | 1,091 (38.4%)  | 796 (38.3%)    | 295 (38.8%)    |                         |
| 1                            | 820-830 (29.0-30.0%) | 590-600 (28.0-29.0%) | 220-230 (29.5-30.5%) |                         |
| >2                           | 918 (32.3%)    | 681 (32.8%)    | 237 (31.2%)    |                         |
| **Missing**                 | <11 (0-2%)     | <11 (0-2%)     | <11 (0-2%)     |                         |
| **Cohort**                  |                |                |                | 0.05                   |
| Lung- ALK                   | <11 (0-2%)     | <11 (0-2%)     | <11 (0-2%)     |                         |
| Lung- EGFR                  | 113 (4.0%)     | 84 (4.0%)      | 29 (3.8%)      |                         |
| Lung- 2nd line immunotherapy | 994 (35.0%) | 732 (35.2%) | 262 (34.5%) |                         |
| Bladder                     | 105 (3.7%)     | 77 (3.7%)      | 28 (3.7%)      |                         |
| Pancreas                    | 753 (26.5%)    | 551 (26.5%)    | 202 (26.6%)    |                         |
| Colon                       | 181 (6.4%)     | 134 (6.4%)     | 47 (6.2%)      |                         |
| Kidney                      | 155 (5.5%)     | 115 (5.5%)     | 40 (5.3%)      |                         |
| Breast- first line          | 376 (13.2%)    | 273 (13.1%)    | 103 (13.6%)    |                         |
| Breast- second line         | 91 (3.2%)      | 65 (3.1%)      | 26 (3.4%)      |                         |
| Melanoma                    | 50-60 (1.0-3.0%) | 30-40 (1.0-2.0%) | 10-20 (1.0-3.0%) |                         |
| **Time period**             |                |                |                | 0.04                   |
| Q1/2 2015                   | 97 (3.4%)      | 70 (3.4%)      | 27 (3.6%)      |                         |
| Q3/4 2015                   | 299 (10.5%)    | 215 (10.3%)    | 84 (11.1%)     |                         |
| Q1/2 2016                   | 882 (31.1%)    | 645 (31.0%)    | 237 (31.2%)    |                         |
| Q3/4 2016                   | 797 (28.1%)    | 589 (28.3%)    | 208 (27.4%)    |                         |
| Q1/2 2017                   | 496 (17.5%)    | 365 (17.6%)    | 131 (17.2%)    |                         |
| Q3/4 2017                   | 220 (7.7%)     | 162 (7.8%)     | 58 (7.6%)      |                         |
| Q1/2 2018                   | 48 (1.7%)      | 33 (1.6%)      | 15 (2.0%)      |                         |
| **Urbanicity**              |                |                |                | 0.19                   |
| Metro                       | 2,423 (85.3%)  | 1,739 (83.6%)  | 684 (90.0%)    |                         |
| Non-metro                   | 416 (14.7%)    | 340 (16.4%)    | 76 (10.0%)     |                         |
| **Census tract poverty rate** |                |                |                | 0.24                   |
| 0% - <=5%                   | 689 (24.3%)    | 457 (22.0%)    | 232 (30.5%)    |                         |
| 5% - <10%                   | 672 (23.7%)    | 478 (23.0%)    | 194 (25.5%)    |                         |
| 10% - <=15%                 | 801 (28.2%)    | 620 (29.8%)    | 181 (23.8%)    |                         |
| 15% - <=20%                 | 473 (16.7%)    | 360 (17.3%)    | 113 (14.9%)    |                         |
| **Unknown**                 | 204 (7.2%)     | 164 (7.9%)     | 40 (5.3%)      |                         |
| **Treating oncologist**     |                |                |                | 0.04                   |
| Low volume                  | 32 (1.1%)      | 20-30 (1.0-3.0%) | <11 (0-2%) |                         |
|                  | Count (Percentage) | Range (Percentage)       | Range (Percentage)       |
|------------------|--------------------|--------------------------|--------------------------|
| Specialist       | 1,067 (37.6%)      | 760-770 (36.0-37.0%)     | 290-300 (38.5-39.5%)     |
| Generalist       | 1,740 (61.3%)      | 1,286 (61.9%)            | 454 (59.7%)              |

* Ranges provided for some values to comply with CMS's cell suppression policy.
eTable 4. Receipt of Novel Therapies by Oncology Care Model Status, Before and After Intervention, Black vs White Patients

|                  | Pre-OCM (% receiving novel therapy) | Post-OCM (% receiving novel therapy) | Adjusted Difference-in-Differences (percentage points)* | Adjusted Triple differences (percentage points) |
|------------------|-------------------------------------|--------------------------------------|--------------------------------------------------------|-----------------------------------------------|
| **White patients** |                                     |                                      |                                                        |                                               |
| OCM              | 40.8                                | 49.9                                 | 9.1                                                    |                                               |
| Non-OCM          | 33.7                                | 41.1                                 | 7.4                                                    |                                               |
|                  |                                     |                                      |                                                        | 1.8                                           |
| **Black patients** |                                     |                                      |                                                        |                                               |
| OCM              | 27.8                                | 54.1                                 | 26.3                                                   |                                               |
| Non-OCM          | 25.8                                | 29.0                                 | 3.2                                                    |                                               |
|                  |                                     |                                      |                                                        | 23.0                                          |
|                  |                                     |                                      |                                                        | 21.2                                          |

* Differences may not add up due to rounding.
## Appendix 1. Parallel trends regression output

Mixed-effects logistic regression  
Number of obs = 1,273  
Number of groups = 348  
Obs per group:  
  min = 2  
  avg = 3.7  
  max = 4  
Integration method: mvaghermite  
Integration pts. = 7  
Wald chi2(30) = 176.99  
Prob > chi2 = 0.0000

| outcome | Odds Ratio | Std. Err. | z     | P>|z|       | [95% Conf. Interval] |
|---------|------------|-----------|-------|----------|---------------------|
| Quarter | 1.559896   | .1350359  | 5.14  | 0.000    | 1.316465 1.84834    |
| altocm  | 9.421751   | 11.23917  | 1.88  | 0.060    | .9093619 97.61723  |
| altocm#c.Quarter | .8132178 .1084143 | -1.55 | 0.121 | .6262227 1.056051 |
| agegrp  | 65-69      | .9557352  | .2769244 | -0.16 | 0.876    | .541629 1.686449   |
|         | 70-74      | 1.003951  | .285512  | 0.01   | 0.989    | .5749644 1.75301   |
|         | 75-79      | 1.549284  | .44962   | 1.51   | 0.131    | .8772083 2.736274  |
|         | 80+        | .8169643  | .2535128 | -0.65 | 0.515    | .4446989 1.50086   |
| 1.SEX   |            | 1.12848   | .1863739 | 0.73  | 0.464    | .8164201 1.559818  |
| race    | Black      | .5837749  | .1679906 | -1.87 | 0.061    | .3321227 1.026106  |
|         | Asian, Pacific Islander, Ot. | 1.046783 | .3078007 | 0.16 | 0.876    | .5882547 1.86272   |
|         | 1.hispanic | 1.455724  | .4681644 | 1.17  | 0.243    | .7750511 2.734182  |
| marriage| Married     | 1.094645  | .258531  | 0.55  | 0.581    | .794112 1.508914   |
|         | Unknown     | .8041205  | .2458542 | -0.71 | 0.476    | .441644 1.464098   |
| urbanrural | Non-metro | .8688095  | .1873492 | -0.65 | 0.514    | .5693408 1.325796  |
| poverty | 5% - <10%   | .8128745  | .1697673 | -0.99 | 0.321    | .5398234 1.224039  |
|         | 10% - <15%  | .7491853  | .1550072 | -1.40 | 0.163    | .4994302 1.123838  |
|         | 15% - <20%  | .7926447  | .1912014 | -0.96 | 0.335    | .4940286 1.27176   |
|         | Unknown     | .6806882  | .230282  | -1.14 | 0.256    | .3507359 1.321041  |
| cohort  | Lung- EGFR  | .331775   | .3200302 | -1.14 | 0.253    | .0500927 2.197419  |
|         | Lung- 2nd line immunotherapy | .2781601 | .2523249 | -1.41 | 0.158    | .0470058 1.64603   |
|         | Pancreas    | .0340452  | .0317847 | -3.62 | 0.000    | .0054623 2.2121976 |
|         | Colon       | .016367   | .016739  | -4.02 | 0.000    | .0022051 1.124826  |
|         | Kidney      | 1.777283  | 2.054928 | 0.50  | 0.619    | .1834237 17.13688  |
|         | Breast- first line | .1710546 | .1573354 | -1.92 | 0.055    | .028197 1.037688  |
|         | Breast- second line | .1831655 | .1985586 | -1.57 | 0.117    | .0218831 1.533132  |
|         | Melanoma    | 1.576144  | 1.625636 | 0.44  | 0.659    | .2087688 11.89942  |
|         | Charlson    |            |          |       |          | .8818282 .6258278 |
|         | 1           | .8818282  | .1542877 | -0.72 | 0.472    | .6258278 1.245248  |
|         | >2          | .7985992  | .1409367 | -1.27 | 0.203    | .5650787 1.128623  |
|         | providerclass | Specialist | .4453698 .3185495 | -1.13 | 0.258    | .1096229 1.809423  |
|         |         | Generalist | .4274224 .3036447 | -1.20 | 0.232    | .1062077 1.720119  |

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|       |           |         |     |   |        |        |
|-------|-----------|---------|-----|---|--------|--------|
| est   | SE        | z      | p   | LR| chibar2| Prob   |
|-------|-----------|---------|-----|---|--------|--------|
| _cons | 0.126129  | 0.17771 | -1.47 | 0.141 | 0.080864 | 1.982455 |
| _MatchID | var(_cons) | 0.1919462 | 0.1679595 | 0.0345421 | 1.06662 |

Note: Estimates are transformed only in the first equation.
Note: _cons estimates baseline odds (conditional on zero random effects).
LR test vs. logistic model: chibar2(01) = 1.63 Prob >= chibar2 = 0.1009
### Mixed-effects logistic regression

**Outcome:** postOCM, altocm, postOCM#altocm

**Group variable:** MatchID

- **Number of obs:** 2,833
- **Number of groups:** 760

**Obs per group:**
- **min:** 2
- **avg:** 3.7
- **max:** 4

**Integration method:** mvaghermite

- **Integration pts.:** 7

**Log likelihood:** -1557.3771

**Wald chi2(31):** 383.07

**Prob > chi2:** 0.0000

| outcome | Odds Ratio | Std. Err. | z    | P>|z|  | [95% Conf. Interval] |
|---------|------------|-----------|------|------|----------------------|
| postOCM |            |           |      |      |                      |
| Post    | 1.479894   | .1785226  | 3.25 | 0.001| 1.168284 1.874618    |
| altocm  |            |           |      |      |                      |
| OCM     | 1.466395   | .2209095  | 2.54 | 0.011| 1.091489 1.970075    |
| postOCM#altocm | 1.185962 | .2394865  | 0.84 | 0.398| .7983328 1.761804    |
| agegrp  |            |           |      |      |                      |
| 65-69   | .9440269   | .1739832  | -0.31| 0.755| .6578226 1.354753    |
| 70-74   | 1.083553   | .1984944  | 0.44 | 0.661| .7566933 1.551602    |
| 75-79   | 1.389753   | .263565   | 1.74 | 0.083| .9583145 2.015426    |
| 80+     | 1.154709   | .2277148  | 0.73 | 0.466| .7845325 1.69955     |
| 1 SEX   |            |           |      |      |                      |
| 1      | 1.026918   | .1066806  | 0.26 | 0.798| .8377399 1.258816    |
| race    |            |           |      |      |                      |
| Black   | .6119065   | .1153714  | -2.61| 0.009| .4228593 0.8854707   |
| Asian, Pacific Islander, Ot. | 1.041884 | .1976893 | 0.22 | 0.829| .7183079 1.511222  |
| 1 hispanic | .9312589 | .1868228 | -0.36 | 0.723| .6285042 1.379853    |
| marriage|            |           |      |      |                      |
| Married | 1.002412   | .1061081  | 0.02 | 0.982| .8145998 1.233526    |
| Unknown | .6366298   | .1118337  | -2.57| 0.010| .451191 0.8982837    |
| urbanrural |        |           |      |      |                      |
| Non-metro | .8899028 | .1250653 | -0.83 | 0.407| .6756414 1.172111    |
| poverty |            |           |      |      |                      |
| 5% - <10% | .8748658 | .1159094 | -1.01 | 0.313| .6747879 1.134268    |
| 10% - <155%| .8533478 | .111095  | -1.22 | 0.223| .661166 1.101391    |
| 15% - <20% | .8359725 | .1313468 | -1.14 | 0.254| .6144016 1.137448    |
| Unknown | .7282856   | .1508223  | -1.56| 0.120| .4802313 1.088061    |
| cohort  |            |           |      |      |                      |
| Lung- EGFR | .8275649 | .5850669 | -0.27 | 0.789| .2070259 3.308107    |
| Lung- 2nd line immunotherapy | .7312314 | .4925701 | -0.46 | 0.642| .1952859 2.738034    |
| Bladder | 3.460971   | 2.545082  | 1.69 | 0.091| .8189416 14.62659    |
| Pancreas | .16025    | .1089533  | -2.69 | 0.007| .0422737 0.6074718   |
| Kidney  | 2.479545   | 1.756236  | 1.28 | 0.200| .6186923 9.937319    |
| Colon   | .0018576   | .0244428  | -4.49 | 0.000| .00070816 1.433172   |
| Breast- first line | .2293813 | .1569131 | -2.15 | 0.031| .0600172 0.8766787   |
| Breast- second line | 1.103719 | .7445973 | 0.05 | 0.959| .2539749 4.235778    |
| Melanoma | 5.140568  | 4.065018  | 2.07 | 0.038| 1.091201 24.21685    |
| Charlson |            |           |      |      |                      |
| 1      | .7955131   | .091266   | -1.99| 0.046| .6353199 0.996093    |
| >2     | .8164413   | .0922566  | -1.79| 0.073| .6542452 1.018848    |

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providerclass |
Specialist    | .7379821 .3399949  -.66  0.510    .2991505  1.820547  
Generalist   | .7268647 .3331315  -.70  0.486    .2960308  1.784721   
_cons        | 1.676043 1.405667   0.62  0.538    .32389    8.673068 

MatchID      |
var(_cons)   | .2730109 .1097865 .1241321 .6004485 

Note: Estimates are transformed only in the first equation.
Note: _cons estimates baseline odds (conditional on zero random effects).
LR test vs. logistic model: chibar2(01) = 8.46        Prob >= chibar2 = 0.0018

Predictive margins Number of obs   =   2,833
Model VCE    : OIM
Expression   : Marginal predicted mean, predict()  

| Delta-method |
| Margin       | Std. Err. | z    | P>|z| | [95% Conf. Interval] |
|-------------|

postOCM#altocm |
Pre#Non-OCM   | .3315077 .0151807  21.84  0.000    .3017541    .3612613 
Pre#OCM       | .3989276 .0238513  16.73  0.000    .3521799    .4456752 
Post#Non-OCM  | .4005897 .0139109  28.80  0.000    .3733247    .4278547 
Post#OCM      | .5031169 .0224456  22.41  0.000    .4591244    .5471094 

Contrasts of average marginal effects
Model VCE    : OIM
Expression   : Marginal predicted mean, predict()  
dy/dx w.r.t. : 1.postOCM  

| df | chi2 | P>|chi2|     
|----|
| 0b.postOCM   | altocm | (omitted) |
| 1.postOCM    | altocm | 1  0.92  0.3378 |

| Contrast            | Delta-method |
| dy/dx               | Std. Err.    | [95% Conf. Interval] |
|---------------------|--------------|
| 0.postOCM           | (base outcome) |
| 1.postOCM           | altocm       | (OCM vs Non-OCM) | .0351073  .0366303  -.0366868  .1069015 |

Note: dy/dx for factor levels is the discrete change from the base level.
### eAppendix 3. Difference-in-differences regression output for second-line immunotherapy in lung cancer cohort

Mixed-effects logistic regression

| Number of obs | Number of groups |
|---------------|------------------|
| 994           | 262              |

| Obs per group: |
|---------------|
| min = 2       |
| avg = 3.8     |
| max = 4       |

Integration method: mvaghermite

| Integration pts. | 7 |

Log likelihood = -624.83618

| Wald chi2(22) | Prob > chi2 |
|---------------|-------------|
| 94.39         | 0.0000      |

| Outcome | Odds Ratio | Std. Err. | z    | P>|z| | [95% Conf. Interval] |
|---------|------------|-----------|------|------|----------------------|
| postOCM |            |           |      |      |                      |
| Post    | 1.308788   | .2366481  | 1.49 | 0.137| .9182473 1.865431   |
| altocm  |            |           |      |      |                      |
| OCM     | 1.494058   | .3226243  | 1.86 | 0.063| .9784988 2.281258   |
| postOCM#altocm | | | | | |
| Post#OCM | 2.462592 | .8215845  | 2.70 | 0.007| 1.280589 4.735604   |
| agegrp  |            |           |      |      |                      |
| 65-69   | .9145317   | .2590876  | -0.32| 0.752| .5248711 1.593474   |
| 70-74   | 1.438383   | .4093878  | 1.28 | 0.201| .8237942 2.513046   |
| 75-79   | 2.696624   | .801521   | 3.34 | 0.001| 1.505972 4.828632   |
| 80+     | 2.562848   | .8253005  | 2.92 | 0.003| 1.363374 4.817601   |
| 1.SEX   |            |           |      |      |                      |
| Black   | .6566339   | .1881604  | -1.47| 0.142| .374463 1.15143     |
| Asian, Pacific Islander, Ot.. | 1.123937 | .3439697 | 0.38 | 0.703| .6169362 2.047593  |
| 1.hispanic | .644373 | .2452557  | -1.15| 0.248| .3056049 1.358671   |
| marriage |            |           |      |      |                      |
| Married  | .9602361   | .1571842  | -0.25| 0.804| .696694 1.32347     |
| Unknown  | .2740326   | .1258382  | -2.82| 0.005| .1114096 .6740336  |
| urbanrural |          |           |      |      |                      |
| Non-metro | .5351051 | .1184699  | -2.82| 0.005| .3467264 .8258312  |
| poverty  |            |           |      |      |                      |
| 5% - <10% | .7557594 | .1649014  | -1.28| 0.199| .4927849 1.15907    |
| 10% - <15%| .9332617 | .1966738  | -0.33| 0.743| .61748 .1410536    |
| 15% - <20%| .8617498 | .2136736  | -0.60| 0.548| .5300575 1.401004  |
| Unknown  | .743602   | .2380689  | -0.93| 0.355| .3970296 1.392702  |
| Charlson |            |           |      |      |                      |
| 1       | .6945171   | .1284472  | -1.97| 0.049| .4833456 .9979485  |
| >2      | .6780703   | .1227965  | -2.15| 0.032| .475417 .9669961   |
| providerclass |      |           |      |      |                      |
| Specialist | .3585782 | .2997138  | -1.23| 0.220| .0696813 1.845235   |
| Generalist | .4731749 | .3921597  | -0.90| 0.367| .0932309 2.401506  |
| _cons   | 1.875952   | 1.679707  | 0.70 | 0.482| .3243883 10.84871   |

Note: Estimates are transformed only in the first equation.
Note: _cons estimates baseline odds (conditional on zero random effects).
LR test vs. logistic model: chibar2(01) = 6.44 Prob >= chibar2 = 0.0056

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. margins postOCM#altocm

Predictive margins Number of obs = 994
Model VCE : OIM
Expression : Marginal predicted mean, predict()

| Delta-method |          |          |          |          | [95% Conf. Interval] |
|--------------|----------|----------|----------|----------|----------------------|
|              | Margin   | Std. Err. | z        | P>|z|     |                     |
|--------------|----------|----------|----------|----------|----------------------|
| postOCM#altocm |          |          |          |          |                      |
| Pre#Non-OCM  | .4184403 | .0259974 | 16.10    | 0.000    | .3674864 .4693943    |
| Pre#OCM      | .5034004 | .0407281 | 12.36    | 0.000    | .4235748 .5832259    |
| Post#Non-OCM | .4751974 | .0276395 | 17.19    | 0.000    | .4210251 .5293698    |
| Post#OCM     | .7346387 | .0392178 | 18.73    | 0.000    | .6577734 .8115041    |

. margins r.altocm, dydx(postOCM)

Contrasts of average marginal effects
Model VCE : OIM
Expression : Marginal predicted mean, predict()
dy/dx w.r.t. : 1.postOCM

| df | chi2 | P>|chi2|
|----|-----|------|
| 0b.postOCM | altocm | (omitted) |
| 1.postOCM | altocm | 1     | 7.33 | 0.0068 |

| Contrast | Delta-method |
|----------|--------------|
|          | dy/dx | Std. Err. | [95% Conf. Interval] |
| 0.postOCM | (base outcome) |
| 1.postOCM | altocm | (OCM vs Non-OCM) | .1744812 | .0644641 | .0481338 | .3008286 |

Note: dy/dx for factor levels is the discrete change from the base level.
### eAppendix 4. Difference-in-difference-in-differences regression output for race

| Mixed-effects logistic regression | Number of obs = 2,833 |
|----------------------------------|-----------------------|
| Group variable: _MatchID         | Number of groups = 760|
| Obs per group:                   |                       |
|   min = 2                        |                       |
|   avg = 3.7                      |                       |
|   max = 4                        |                       |
| Integration method: mvaghermite   | Integration pts. = 7  |
| Log likelihood = -1555.6654      | Wald chi2(37) = 384.51|
|                                  | Prob > chi2 = 0.0000  |

| outcome | Odds Ratio | Std. Err. | z     | P>|z| | [95% Conf. Interval] |
|---------|------------|-----------|-------|-----|-----------------------|
| postOCM |            |           |       |     |                       |
| Post    | 1.513759   | .1951955  | 3.22  | 0.001 | 1.175699 1.949023     |
| altocm  |            |           |       |     |                       |
| OCM     | 1.488762   | .2417192  | 2.45  | 0.014 | 1.082984 2.046579     |
| postOCM#altocm | | 1.078996 | .2337956 | 0.35 | 0.726 | .7056389 1.649899     |
| agegrp  |            |           |       |     |                       |
| 65-69   | .9432606   | .1740811  | -0.32 | 0.752 | .6569622 1.354325     |
| 70-74   | 1.082179   | .1986774  | 0.43  | 0.667 | .7551388 1.550855     |
| 75-79   | 1.386539   | .2634     | 1.72  | 0.085 | .9554985 2.01203      |
| 80+     | 1.159404   | .2291934  | 0.75  | 0.454 | .7869867 1.708056     |
| 1.SEX   |            |           |       |     |                       |
| Black   | .613715    | .1980646  | -1.51 | 0.130 | .3260303 1.155249     |
| Asian, Pacific Islander, Ot. | 1.082346 | .3511448 | 0.24  | 0.807 | .573075 2.044188     |
| race#altocm |            |           |       |     |                       |
| Black#OCM | .7679486 | .4675071  | -0.43 | 0.664 | .2328857 2.532337     |
| Asian, Pacific Islander, Ot. # | 1.07821  | .7153948  | 0.11  | 0.910 | .2937173 3.958016     |
| race#postOCM |            |           |       |     |                       |
| Black#Post | .8101041 | .3478427  | -0.49 | 0.624 | .3491819 1.879446     |
| Asian, Pacific Islander, Ot. # | .8803851 | .3666783  | -0.31 | 0.760 | .3891789 1.991572     |
| race#altocm#postOCM | | 3.270622 | 2.665859 | 1.45 | 0.146 | .6619458 16.15989     |
| Asian, Pacific Islander, Ot. # | 1.171238 | 1.093088  | 0.17  | 0.866 | .1880352 7.295434     |
| 1.hispanic |            |           |       |     |                       |
| .9285109 | .1864045  | -0.37     | 0.712 | .6264738 | 1.376167    |
| marriage |            |           |       |     |                       |
| Married | 1.004519   | .1064429  | 0.04  | 0.966 | .8161343 1.236389     |
| Unknown | .6386162   | .1122437  | -2.55 | 0.011 | .452514  .9012553     |
| urbanrural |            |           |       |     |                       |
| Non-metro | .8839386 | .124447   | -0.88 | 0.381 | .670786 1.164824     |
| poverty |            |           |       |     |                       |
| 5% - <10% | .873471   | .1158545  | -1.02 | 0.308 | .6735157 1.13279      |
| 10% - <15% | .8559778 | .1116064  | -1.19 | 0.233 | .6629472 1.105213     |
| 15% - <20% | .8362434 | .1315826  | -1.14 | 0.256 | .6143225 1.138332     |
| Unknown | .7268139   | .1516156  | -1.53 | 0.126 | .4829031 1.093922     |
| cohort               | Lung - EGFR | .8273083 | .5844653 | -0.27 | 0.788 | .2071678 | 3.30379 |
|---------------------|-------------|----------|----------|--------|--------|----------|---------|
|                     | Lung - 2nd line immunotherapy | .7256062 | .4882887 | -0.48 | 0.634 | .1940413 | 2.713362 |
|                     | Bladder     | 3.495794 | 2.568879 | 1.70   | 0.089 | .8280218 | 14.75876 |
|                     | Pancreas    | .1595215 | .1083564 | -2.70  | 0.007 | .042134  | .6039562 |
|                     | Colon       | .0317294 | .0243308 | -4.50  | 0.000 | .007059  | .14262  |
|                     | Kidney      | 2.468409 | 1.747143 | 1.28   | 0.202 | .6165034 | 9.883224 |
|                     | Breast - first line | .2268545 | .15505   | -2.17  | 0.030 | .0594251 | .8660135 |
|                     | Breast - second line | 1.009606 | .724393  | 0.01   | 0.989 | .2474084 | 4.119928 |
|                     | Melanoma    | 5.142736 | 4.064149 | 2.07   | 0.038 | 1.092736 | 24.20322 |
| Charlson            | 1           | .7971792 | .0915246 | -1.97  | 0.048 | .6365448 | .9983502 |
|                     | >2          | .8205413 | .0929697 | -1.75  | 0.081 | .6571384 | 1.024576 |
| providerclass       | Specialist  | .7140769 | .3295444 | -0.73  | 0.466 | .2890133 | 1.764298 |
|                     | Generalist  | .704227  | .3232721 | -0.76  | 0.445 | .2864003 | 1.731621 |
|                     | _cons       | 1.726761 | 1.448357 | 0.65   | 0.515 | .3336331 | 8.937073 |

Note: Estimates are transformed only in the first equation.

Note: _cons estimates baseline odds (conditional on zero random effects).

LR test vs. logistic model: chibar2(01) = 8.37 Prob >= chibar2 = 0.0019
. ncom (_b[1.postOCM:r2vs1.altocm@2._at] - _b[1.postOCM:r2vs1.altocm@1bn._at])
   _nl_1: _b[1.postOCM:r2vs1.altocm@2._at] - _b[1.postOCM:r2vs1.altocm@1bn._at]

|            | Coef.   | Std. Err. | z    | P>|z| | [95% Conf. Interval] |
|------------|---------|-----------|------|------|----------------------|
| _nl_1      | .2128948| .1364749  | 1.56 | 0.119| -.0545911 -.4803807  |
Regression output for sensitivity analysis of primary difference-in-differences model using alternative specification of Oncology Care Model practices

| outcome | Odds Ratio | Std. Err. | z    | P>|z| | [95% Conf. Interval] |
|---------|------------|-----------|------|-----|------------------|
| postOCM |            |           |      |     |                  |
| Post    | 1.391171   | 0.215052  | 2.14 | 0.033 | 1.027541 - 1.883485 |
| altocm  |            |           |      |     |                  |
| OCM     | 1.760338   | 0.3260981 | 3.05 | 0.002 | 1.224371 - 2.530923 |
| postOCM#altocm |      |          |      |     |                  |
| Post#OCM | .9416811   | 0.2329019 | -0.24 | 0.808 | 0.5799357 - 1.529072 |
| agegrp  |            |           |      |     |                  |
| 65-69   | 1.000938   | 0.2397592 | 0.00 | 0.997 | .6259145 - 1.600661 |
| 70-74   | 1.173409   | 0.2779729 | 0.68 | 0.500 | .737573 - 1.866782 |
| 75-79   | 1.469289   | 0.3599746 | 1.57 | 0.116 | .9089996 - 2.374931 |
| 80+     | 1.162009   | 0.2943392 | 0.59 | 0.553 | .7072916 - 1.909064 |
| 1.SEX   |            |           |      |     |                  |
| Black   | .6184799   | 0.1461739 | -2.03 | 0.042 | .389179 - .982831 |
| Asian, Pacific Islander, Ot. | .9574592 | 0.2193617 | -0.19 | 0.850 | .611087 - 1.50016 |
| 1.hispanic | .8365471   | 0.2105725 | -0.69 | 0.488 | .5054175 - 1.38462 |
| marriage |            |           |      |     |                  |
| Married | 1.051766   | 0.1405491 | 0.38 | 0.706 | .8094159 - 1.366679 |
| Unknown | .8511737   | 0.1866229 | -0.73 | 0.462 | .5538462 - 1.308119 |
| urbanrural |            |           |      |     |                  |
| Non-metro | .9890494   | 0.1832515 | -0.06 | 0.953 | .687871 - 1.422096 |
| poverty |            |           |      |     |                  |
| 5% - <10% | .991822   | 0.1621312 | -0.05 | 0.960 | .7199286 - 1.366401 |
| 10% - <155% | .7961236 | 0.1293328 | -1.40 | 0.160 | .5790288 - 1.094614 |
| 15% - <20% | .835205   | 0.1669417 | -0.90 | 0.368 | .5644871 - 1.235754 |
| Unknown | .8026243   | 0.2130316 | -0.83 | 0.407 | .5770757 - 1.350322 |
| cohort  |            |           |      |     |                  |
| Lung- EGFR | 2.787101 | 2.055965 | 1.39 | 0.165 | .6565161 - 11.83205 |
| Lung- 2nd line immunotherapy | 1.846352 | 1.301173 | 0.87 | 0.384 | .4639277 - 7.34816 |
| Bladder | 8.183314   | 6.466757  | 2.66 | 0.008 | 1.738915 - 38.51059 |
| Pancreas | .3999201  | .2844241 | -1.29 | 0.198 | .0992195 - 1.611943 |
| Colon   | .1040871   | .0854264  | -2.76 | 0.006 | .0208352 - 0.519905 |
| Kidney  | 5.326752   | 3.962288  | 2.25 | 0.025 | 1.239649 - 22.88896 |
| Breast- first line | .5108939 | .3678605 | -0.93 | 0.351 | .1245768 - 2.095193 |
| Breast- second line | 2.147256 | 1.628335 | 1.01 | 0.314 | .4857239 - 9.492443 |
| Melanoma | 5.912005 | 4.728024 | 2.22 | 0.026 | 1.233108 - 28.34448 |
| Charlson |            |           |      |     |                  |
| 1      | .8875772   | .1265095  | -0.84 | 0.403 | .6712455 - 1.173629 |
| >2     | .9214635   | .1316268  | -0.57 | 0.567 | .6964469 - 1.219181 |

Log likelihood = -969.4363
Wald chi2(31) = 242.45
Prob > chi2 = 0.0000
providerclass |  .7021813   .4836265   -0.51   0.608   .1820477   2.708403
|  .686668   .472526   -0.55   0.585   .1782371   2.645425
|  .5962869   .6045658   -0.51   0.610   .0817402   4.349857

MatchID
|  var(_cons)|  .1914421   .1259693                      .0527163   .6952323

Note: Estimates are transformed only in the first equation.
Note: _cons estimates baseline odds (conditional on zero random effects).
LR test vs. logistic model: chibar2(01) = 2.90        Prob >= chibar2 = 0.0442

Predictive margins
Number of obs = 1,730
Model VCE : OIM
Expression : Marginal predicted mean, predict()

|            Delta-method
|            Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------
postOCM#altocm |  
Pre#Non-OCM  |  .3398412   .0203402    16.71   0.000     .2999751    .3797074
Pre#OCM       |  .4437285   .0291768    15.21   0.000     .3865431    .5009139
Post#Non-OCM  |  .3995796   .0178962    22.33   0.000     .3645037    .4346554
Post#OCM      |  .4951722   .0272047    18.20   0.000      .441852    .5484925

Contrasts of average marginal effects
Model VCE : OIM
Expression : Marginal predicted mean, predict()
dy/dx w.r.t. : 1.postOCM

|         df        chi2     P>chi2
-------------
0b.postOCM   |  (omitted)
-------------
1.postOCM    |
altocm       |          1        0.03     0.8575
-------------

|      Contrast Delta-method dy/dx Std. Err. [95% Conf. Interval]
-------------
0.postOCM    |  (base outcome)
-------------
1.postOCM    |
altocm       | - .0082946   .0462093   - .0988632    .0822739

Note: dy/dx for factor levels is the discrete change from the base level.