Supplementary Online Content

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**eReferences**

This supplementary material has been provided by the authors to give readers additional information about their work.
eMethods. Commission on Cancer Acknowledgment, Staging Strategy, NCDB Definition of Immunotherapy, Rationale Behind Selection of Study Periods, Missing Data Strategy, and Clinical Trial Variable

Commission on Cancer Acknowledgment
The Commission on Cancer (CoC), the NCDB, and participating hospitals have not verified and are not responsible for the statistical validity of the data analysis or the conclusions derived by the authors.

Staging Strategy
For all included cases of NSCLC and RCC, disease stage was recorded according to the AJCC Staging Manual 7th Edition prior to 2018, and according to the 8th Edition from 2018. For melanoma of the skin, the study spanned the 6th and 7th editions of the AJCC Staging Manual. The staging criteria for stage IV RCC remained unchanged across the included time frame. Changes of the staging criteria for stage IV NSCLC and melanoma across the editions did not affect the classification of stage IV in our study and therefore no corrective measures were employed.

NCDB Definition of Immunotherapy
The NCDB datafield defines immunotherapy as any drug categorized as “Biologic therapy (Biologic response modifier, immunotherapy)” in the SEER*Rx Interactive Antineoplastic Drugs Database. Overall, >400 drugs are classified as immunotherapy, including a range of interleukins, interferons, antiangiogenic drugs, tumor vaccines, monoclonal antibodies, and checkpoint inhibitors. The database also lists drugs that are currently only available in clinical trials. In 2013, six drugs were reclassified from chemotherapy to immunotherapy: alemtuzumab, bevacizumab, rituximab, trastuzumab, pertuzumab, and cetuximab.

Rationale Behind Selection of Study Periods
The NCDB provides data as annual aggregates. The eras around FDA approval for the included cancers were determined relative to the following FDA approval dates:

- NSCLC - nivolumab for metastatic NSCLC (Mar 4, 2015 for squamous NSCLC and Oct 9, 2015 for non-squamous NSCLC) and pembrolizumab for metastatic NSCLC (Oct 2, 2015). Therefore, the “pre-approval era” was considered to be 2011 to 2014 and the “early post-approval era” was 2015 to 2017.
- RCC - nivolumab for metastatic RCC (Nov 23, 2015). Therefore, the “pre-approval era” was considered to be 2012 to 2015 and the “early post-approval era” was 2016 to 2018. Because the drug was approved at the end of 2015, the approval year was included in the pre-approval era.
- Melanoma - ipilimumab for metastatic melanoma (Mar 25, 2011). Therefore, the “pre-approval era” was considered to be 2007 to 2010 and the “early post-approval era” was 2011 to 2013. In 2014, pembrolizumab (Sep 4, 2014) and nivolumab (Dec 22, 2014) were FDA-approved for metastatic melanoma.

We limited the pre-FDA approval period in our study to the four years before the respective approval date for two reasons:

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1) Clinical stage reporting only became mandatory in the NCDB in 2008,\textsuperscript{10} which is why >50% of staging information was missing (for melanoma) in early diagnosis years from 2004-2008.

2) The phase III trials of the first approved checkpoint inhibitors for NSCLC (NCT01295827 KEYNOTE-001)\textsuperscript{11} and RCC (NCT01668784 CheckMate 025)\textsuperscript{12} started in 2011 and 2012 respectively.

The clinical trial that led to approval of ipilimumab for melanoma started in 2004 (NCT00094653)\textsuperscript{13}. However, to keep time frames consistent, we limited the pre-approval era for melanoma to the four years prior to FDA-approval, analogous to NSCLC and RCC.

For checkpoint inhibitors approved within the first 6 months of a calendar year the approval year was included in the post-approval era and when the FDA approval was in the second half of the calendar year the approval year was included in the pre-approval era. The early post-FDA approval era was limited to the first three years following FDA-approval as these were available for all three cancers.

**Missing Data Strategy**
Values were imputed for the following variables: race; ethnicity; insurance status; income; educational level; receipt of surgery, radiation, and chemotherapy; area of residence, and distance to treatment facility. In the NCDB, facility type and location are suppressed for all patients aged 39 years or younger to protect patient privacy. No patients aged 40 years or older had missing values for facility type and location. Therefore, facility type and location were not included as input variables in our multiple imputation model.

**Clinical Trial Variable**
Due to likely underreporting in the NCDB, clinical trial participation could not be verified.
eFigure. Patient Selection Steps

Patients with cancer in the NCDB from 2004 to 2018

1772978 with NSCLC

1121498 Excluded
172 Age <20
4411 Noninvasive disease
1114215 Not AJCC clinical stage group IV
2700 Immunotherapy receipt unknown

615519 with RCC

538046 Excluded
256 Age <20
13349 Noninvasive disease
523905 Not AJCC clinical stage group IV
536 Immunotherapy receipt unknown

704041 with melanoma

677237 Excluded
1371 Age <20
183128 Noninvasive disease
492441 Not AJCC clinical stage group IV
297 Immunotherapy receipt unknown

651489 Patients with invasive, stage IV NSCLC

304247 Patients diagnosed from 2004-2010 and in 2018

347233 Patients with invasive, stage IV NSCLC diagnosed 2011-2017

77473 Patients with invasive, stage IV RCC

33759 Patients diagnosed from 2004-2011

43714 Patients with invasive, stage IV RCC diagnosed 2012-2018

24804 Patients with invasive, stage IV melanoma

15062 Patients diagnosed from 2004-2006 and 2014-2018

11742 Patients with invasive, stage IV melanoma diagnosed 2007-2013

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### eTable 1. Tumor Histological Characteristics

|                      | Pre-FDA approval era<sup>a</sup> | Early post-FDA approval era<sup>a</sup> |
|----------------------|----------------------------------|----------------------------------------|
|                      | All patients | Immunotherapy recipients<sup>b</sup> | P value | All patients | Immunotherapy recipients<sup>b</sup> | P value |
| **NSCLC**            |              |                                    |         |              |                                    |         |
| NSCLC, NOS<sup>c</sup> | 21995        | 487 (2.2)                           | .01     | 13406        | 1924 (14.4)                         | <.001   |
| SCC                  | 38585        | 289 (0.8)                           |         | 29750        | 3043 (10.2)                         |         |
| Adenocarcinoma       | 111012       | 4939 (4.5)                          |         | 93244        | 16938 (18.2)                        |         |
| Large cell carcinoma | 4380         | 86 (2)                              |         | 2811         | 248 (8.8)                           |         |
| Other<sup>d</sup>    | 17574        | 470 (2.7)                           | <.001   | 14476        | 1755 (12.1)                         | <.001   |
| **RCC**              |              |                                    |         |              |                                    |         |
| Clear cell carcinoma | 9527         | 699 (7.3)                           |         | 8139         | 1922 (23.6)                         |         |
| Papillary carcinoma  | 924          | 29 (3.1)                            |         | 713          | 127 (17.8)                          |         |
| RCC, NOS<sup>c</sup> | 8618         | 297 (3.5)                           |         | 7132         | 1229 (17.2)                         |         |
| Other<sup>d</sup>    | 4893         | 130 (2.7)                           | <.001   | 3768         | 612 (16.2)                          | <.001   |
| **Melanoma**         |              |                                    |         |              |                                    |         |
| Cutaneous melanoma   | 761          | 89 (11.7)                           |         | 829          | 219 (26.4)                          |         |
| Acral lentiginous melanoma | 21 | 1 (4.8) | 9 (24.3) | 37 | 5047 | 915 (18.1) | .01 |
| Other/NOS<sup>e</sup> | 5047         | 414 (8.2)                           | .01     | 5047         | 915 (18.1)                          | <.001   |

<sup>a</sup>Data are presented as number (percentage) of patients unless otherwise indicated. Percentages might not total 100% owing to approximation.

<sup>b</sup>Percentages are presented as row percent.

<sup>c</sup>Non-small cell lung cancer (NSCLC), no other specification; renal cell carcinoma (RCC), no other specification.

<sup>d</sup>Non-small cell lung cancer (NSCLC), not further defined; renal cell carcinoma (RCC), not further defined.

<sup>e</sup>Melanoma of the skin, not further defined and no further specification combined due to small sample size.
**eTable 2. Patient, Treatment, and Facility Characteristics for NSCLC, RCC, and Melanoma in the Pre–FDA Approval Era**

| Variables                  | NSCLC 2011-2014, No. (%) | RCC 2012-2015, No. (%) | Melanoma 2007-2010, No. (%) |
|----------------------------|--------------------------|------------------------|-----------------------------|
|                            | All patient              | Immunotherapy recipients | All patients              | Immunotherapy recipients | All patients              | Immunotherapy recipients |
| n                         | 193546                   | 6271                   | 23962                      | 1155                      | 5325                      | 504                       |
| Age, median (IQR), years  | 68 (60-76)               | 64 (57-71)             | 66 (58-75)                 | 60 (53-67)                | 64 (53-75)                | 56 (46-63)                |
| <.001                      |                          |                        |                             |                           |                           |                           |
| Age category, years        |                          |                        |                             |                           |                           |                           |
| <=55                       | 29070                    | 1326 (4.6)             | 4720                       | 404 (8.6)                 | 1759                      | 249 (14.2)                |
| 56-65                      | 51835                    | 2095 (4)               | 7102                       | 411 (5.8)                 | 1414                      | 155 (11)                  |
| 66-75                      | 61835                    | 2083 (3.4)             | 6634                       | 252 (3.8)                 | 1233                      | 76 (6.2)                  |
| >75                        | 50806                    | 767 (1.5)              | 5506                       | 88 (1.6)                  | 1423                      | 24 (1.7)                  |
| Sex                        |                          |                        |                             |                           |                           |                           |
| Male                       | 105484                   | 3279 (3.1)             | 16010                      | 833 (5.2)                 | 3936                      | 333 (8.5)                 |
| Female                     | 88062                    | 2992 (3.4)             | 7952                       | 322 (4.1)                 | 1893                      | 171 (9)                   |
| Race                       |                          |                        |                             |                           |                           |                           |
| Black                      | 23932                    | 635 (2.7)              | 2367                       | 85 (3.6)                  | 106                       | 7 (6.6)                   |
| White                      | 160924                   | 5336 (3.3)             | 20530                      | 1003 (4.9)                | 5615                      | 492 (8.8)                 |
| Other                      | 7384                     | 258 (3.5)              | 856                        | 54 (6.3)                  | 64                        | 4 (6.3)                   |
| Missing                    | 1306                     | 42 (3.2)               | 209                        | 13 (6.2)                  | 44                        | 1 (2.3)                   |
| Ethnicity                  |                          |                        |                             |                           |                           |                           |
| Hispanic                   | 6489                     | 174 (2.7)              | 1790                       | 71 (4)                    | 164                       | 4 (2.4)                   |
| Non-Hispanic               | 180627                   | 5980 (3.3)             | 21561                      | 1067 (5)                  | 5295                      | 479 (9.1)                 |
| Missing                    | 6430                     | 117 (1.8)              | 611                        | 17 (2.8)                  | 370                       | 21 (5.7)                  |
| Insurance                  |                          |                        |                             |                           |                           |                           |
| Not Insured                | 8849                     | 202 (2.3)              | 1051                       | 21 (2)                    | 336                       | 26 (7.7)                  |
| Private                    | 52080                    | 2479 (4.8)             | 8189                       | 633 (7.7)                 | 2308                      | 316 (13.7)                |

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| Medicaid       | 15456 | 475 (3.1) | 1865 | 76 (4.1) | 439 | 38 (8.7) |
|---------------|-------|-----------|------|----------|-----|---------|
| Medicare      | 110808| 2927 (2.6)| 11859| 357 (3)  | 2551| 105 (4.1)|
| Other Government| 2845 | 71 (2.5)  | 360  | 17 (4.7) | 101 | 12 (11.9)|
| Missing       | 3508  | 117 (3.3) | .001 | 638      | 51  | 8 (7.5)  |

| Income quartiles | Medicaid       | Medicare      | Other Government| Missing |
|------------------|----------------|---------------|-----------------|---------|
| $<38,000         | 37831 | 1047 (2.8)    | 4094            | 149 (3.6) | 798 | 54 (6.8) |
| $38,000 - $47,999| 46207 | 1410 (3.1)    | 5420            | 205 (3.8) | 1368| 96 (7)    |
| $48,000 - $62,999| 49989 | 1677 (3.4)    | 6337            | 263 (4.2) | 1577| 126 (8)   |
| $>=63,000        | 52742 | 1826 (3.5)    | 6728            | 405 (6)   | 1954| 213 (10.9)|
| Missing          | 6777  | 311 (4.6)     | 1383            | 133 (9.6) | 132 | 15 (11.4) |

| Charlson-Deyo score | Medicaid       | Medicare      | Other Government| Missing |
|---------------------|----------------|---------------|-----------------|---------|
| 0                   | 116892         | 4211 (3.6)    | 16537           | 898 (5.4) | 4459| 440 (9.9) |
| 1                   | 51054          | 1558 (3.1)    | 5154            | 197 (3.8) | 936 | 56 (6)    |
| >=2                 | 25600          | 502 (2)       | 2271            | 60 (2.6)  | 434 | 8 (1.8)   |

| Educational level, % | Medicaid       | Medicare      | Other Government| Missing |
|----------------------|----------------|---------------|-----------------|---------|
| ≥21.0%               | 35439          | 903 (2.6)     | 4258            | 146 (3.4) | 805 | 51 (6.3) |
| 13.0%-20.9%          | 52355          | 1582 (3)      | 6185            | 248 (4)  | 1429| 103 (7.2)|
| 7.0%-12.9%           | 60710          | 2042 (3.4)    | 7299            | 354 (4.9) | 1958| 179 (9.1)|
| <7%                  | 38368          | 1436 (3.7)    | 4846            | 275 (5.7) | 1508| 156 (10.3)|
| Missing              | 6674           | 308 (4.6)     | 1374            | 132 (9.6) | 129 | 15 (11.6) |

| Surgery | Medicaid       | Medicare      | Other Government| Missing |
|---------|----------------|---------------|-----------------|---------|
| No      | 187399         | 6110 (3.3)    | 15142           | 427 (2.8) | 4200| 301 (7.2) |
| Yes     | 5839           | 156 (2.7)     | 8763            | 727 (8.3) | 1619| 202 (12.5)|
| Missing | 308            | 5 (1.6)       | 57              | 1 (1.8)   | 10 | 1 (10)    |

| Radiation | Medicaid       | Medicare      | Other Government| Missing |
|-----------|----------------|---------------|-----------------|---------|
| No        | 101484         | 3491 (3.4)    | 17075           | 771 (4.5) | 3449| 349 (10.1)|
|                          | Yes     | 2690 (3.1) | 6383 | 367 (5.8) | 2231 | 149 (6.7) |               | Chemotherapy |
|--------------------------|---------|------------|------|-----------|------|-----------|---------------|--------------|
|                          | Missing | 90 (1.5)   | 504  | 17 (3.4)  | <.001| 149       | 6 (4)         |              |
|                          |         |            |      |           |      |           |               |              |
|                          | No      | 83533      | 11177| 669 (6)   | 3509 | 327 (9.3) |               |              |
|                          | Yes     | 104608     | 12070| 480 (4)   | 2152 | 163 (7.6) |               |              |
|                          | Missing | 5405       | 715  | 6 (0.8)   | <.001| 168       | 14 (8.3)      | <.001        |
| Facility type            |         |            |      |           |      |           |               |              |
|                          | Non-academic⁷ | 135002 | 4160 | 506 (3.5) | 3452 | 209 (6.1) |               |              |
|                          | Academic | 57198      | 2030 | 608 (6.6) | 1977 | 210 (10.6)|               |              |
|                          | Unknown¹ | 1346       | 81   | 41 (9.3)  | <.001| 400       | 85 (21.3)     | <.001        |
| Facility location        |         |            |      |           |      |           |               |              |
|                          | Northeast| 40514      | 1295 | 256 (5.6) | 1123 | 83 (7.4)  |               |              |
|                          | Midwest | 51274      | 1779 | 280 (4.5) | 1267 | 110 (8.7) |               |              |
|                          | South   | 73920      | 2354 | 387 (4.3) | 2075 | 161 (7.8) |               |              |
|                          | West    | 26492      | 762  | 191 (5)   | 964  | 65 (6.7)  |               |              |
|                          | Unknown¹ | 1346       | 81   | 41 (9.3)  | <.001| 400       | 85 (21.3)     | <.001        |
| Area of residence        |         |            |      |           |      |           |               |              |
|                          | Metropolitan | 155400 | 5010 | 931 (4.9) | 4704 | 427 (9.1) |               |              |
|                          | Urban   | 28880      | 933  | 152 (4.2) | 817  | 58 (7.1)  |               |              |
|                          | Rural   | 4247       | 149  | 31 (6.2)  | 130  | 7 (5.4)   |               |              |
|                          | Missing | 5019       | 179  | 41 (5.4)  | .42  | 178       | 12 (6.7)      | .10          |
| Travel distance          |         |            |      |           |      |           |               |              |
|                          | 0-20 miles | 137643 | 4109 | 580 (3.9) | 3633 | 246 (6.8) |               |              |
|                          | >20-40 miles | 27000 | 994  | 173 (5)   | 917  | 96 (10.5) |               |              |
|                          | >40-60 miles| 10056 | 356  | 84 (5.4)  | 401  | 42 (10.5) |               |              |
|                          | >60 miles | 12273     | 511  | 188 (6.9) | 751  | 105 (14) |               |              |
|                          | Missing | 6574       | 301  | 130 (9.6) | <.001| 127       | 15 (11.8)     | <.001        |
| Travel distance | Median (IQR), miles | 11 (4.8-25.8) | <.001 | 11.5 (4.8-29.4) | <.001 | 12.3 (5-32.1) | <.001 | 16.2 (6.5-42.7) | <.001 | 20 (8.4-49.4) | <.001 |
|-----------------|---------------------|----------------|--------|-----------------|--------|---------------|--------|-----------------|--------|---------------|--------|

*Data are presented as number (percentage) of patients unless otherwise indicated. Percentages might not total 100% owing to approximation.

*b Percentages are presented as row percent.

*c Median annual income of people in the patient’s ZIP code area.

*d Percent of people in the patient’s ZIP code area with no high-school diploma.

*e Includes community cancer program, comprehensive cancer program, integrated network cancer program, and other specified types of cancer programs.

*f Suppressed by the National Cancer Database for patients aged 0-39 years to protect patient privacy.
eTable 3. Patient, Treatment, and Facility Characteristics for NSCLC, RCC, and Melanoma in the Early Post–FDA Approval Era

| Variables                  | NSCLC 2015-2017, No. (%)a | RCC 2016-2018, No. (%)b | Melanoma 2011-2013, No. (%)b |
|----------------------------|---------------------------|-------------------------|-------------------------------|
|                            | All patients              | Immunotherapy recipientsb | P value                       | All patients              | Immunotherapy recipientsb | P value                       | All patients              | Immunotherapy recipientsb | P value |
|                            | n = 153887                | n = 23908                |                               | n = 19752                  | n = 3890                  |                               | n = 5913                  | n = 1143                  |         |
| Age, years                 |                           |                         |                               |                             |                           |                               |                             |                           |         |
| median (IQR)               | 68 (60-76)                | 66 (59-74)              | <.001                         | 66 (58-75)                | 64 (56-72)              | <.001                         | 65 (55-75)                | 61 (51-70)              | <.001   |
| Age category, years        |                           |                         |                               |                             |                           |                               |                             |                           |         |
| <=55                       |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 19580                     | 3715 (19)               |                               | 3594                       | 900 (25)                 |                               | 1574                       | 409 (26)                 |         |
| 56-65                      |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 42506                     | 7514 (17.7)             |                               | 5794                       | 1254 (21.6)             |                               | 1486                       | 309 (20.8)              |         |
| 66-75                      |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 50402                     | 7970 (15.8)             | <.001                         | 5771                       | 1082 (18.8)             |                               | 1389                       | 275 (19.8)              |         |
| >75                        |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 41199                     | 4709 (11.4)             | <.001                         | 4593                       | 654 (14.2)              | <.001                         | 1464                       | 150 (10.3)              | <.001   |
| Sex                        |                           |                         |                               |                             |                           |                               |                             |                           |         |
| Male                       |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 82308                     | 12512 (15.2)            |                               | 13344                      | 2758 (20.7)             |                               | 3999                       | 764 (19.1)              |         |
| Female                     |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 71379                     | 11396 (16)              | <.001                         | 6408                       | 1132 (17.7)             | <.001                         | 1914                       | 379 (19.8)              | .53     |
| Race                       |                           |                         |                               |                             |                           |                               |                             |                           |         |
| Black                      |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 19057                     | 2639 (13.9)             |                               | 1968                       | 314 (16)                 |                               | 97                         | 16 (16.5)                |         |
| White                      |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 126246                    | 20070 (15.9)            |                               | 16823                      | 3395 (20.2)             |                               | 5695                       | 1104 (19.4)             |         |
| Other                      |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 7370                      | 1046 (14.2)             |                               | 808                        | 153 (18.9)              |                               | 71                         | 15 (21.1)                |         |
| Missing                    |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 1014                      | 153 (15.1)              | <.001                         | 153                        | 28 (18.3)               | <.001                         | 50                         | 8 (16)                   | .80     |
| Ethnicity                  |                           |                         |                               |                             |                           |                               |                             |                           |         |
| Hispanic                   |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 5581                      | 757 (13.6)              |                               | 1603                       | 271 (16.9)              |                               | 136                        | 27 (19.9)                |         |
| Non-Hispanic               |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 144960                    | 22753 (15.7)            |                               | 17822                      | 3563 (20)               |                               | 5609                       | 1089 (19.4)             |         |
| Missing                    |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 3146                      | 398 (12.7)              | <.001                         | 327                        | 56 (17.1)               | .01                            | 168                        | 27 (16.1)                | .55     |
| Insurance                  |                           |                         |                               |                             |                           |                               |                             |                           |         |
| Not Insured                |                           |                          |                               |                             |                           |                               |                             |                           |         |
|                           | 4603                      | 529 (11.5)              |                               | 688                        | 103 (15)                |                               | 358                        | 52 (14.5)                |         |
| Private | 40189 | 7805 (19.4) | 6654 | 1634 (24.6) | 2139 | 546 (25.5) |
| Medicaid | 13491 | 1907 (14.1) | 1585 | 291 (18.4) | 446 | 77 (17.3) |
| Medicare | 90571 | 13026 (14.4) | 10307 | 1780 (17.3) | 2764 | 433 (15.7) |
| Other Government | 2633 | 341 (13) | 275 | 47 (17.1) | 96 | 15 (15.6) |
| Missing | 2200 | 300 (13.6) | <.001 | 243 | 35 (14.4) | <.001 |

**Income quartiles**

| Income quartile | 27090 | 3538 (13.1) | 3054 | 493 (16.1) | 825 | 138 (16.7) |
| $38,000 - $47,999 | 33676 | 4806 (14.3) | 4161 | 734 (17.6) | 1344 | 224 (16.7) |
| $48,000 - $62,999 | 37283 | 5863 (15.7) | 4799 | 977 (20.4) | 1632 | 317 (19.4) |
| >= $63,000 | 39724 | 6662 (16.8) | 5002 | 1117 (22.3) | 1852 | 396 (21.4) |
| Missing | 15914 | 3039 (19.1) | <.001 | 2736 | 569 (20.8) | <.001 |

**Educational level, %**

| Educational level | 25593 | 3272 (12.8) | 3263 | 566 (17.4) | 773 | 113 (14.6) |
| 13.0%-20.9% | 38740 | 5465 (14.1) | 4611 | 862 (18.7) | 1431 | 256 (17.9) |
| 7.0%-12.9% | 44760 | 7180 (16) | 5587 | 1111 (19.9) | 1921 | 380 (19.8) |
| <7% | 28756 | 4957 (17.2) | 3565 | 785 (22) | 1532 | 327 (21.3) |
| Missing | 15838 | 3034 (19.2) | <.001 | 2726 | 566 (20.8) | <.001 |

**Charlson-Deyo score**

| Charlson-Deyo score | 95818 | 15921 (16.6) | 13290 | 2809 (21.1) | 4399 | 944 (21.5) |
| 1 | 34251 | 5095 (14.9) | 3384 | 622 (18.4) | 1062 | 157 (14.8) |
| >=2 | 23618 | 2892 (12.2) | <.001 | 3078 | 459 (14.9) | <.001 |

**Surgery**

| Surgery | 149468 | 23343 (15.6) | 13234 | 2530 (19.1) | 4406 | 814 (18.5) |
| Yes | 3896 | 543 (13.9) | 6466 | 1354 (20.9) | 1499 | 328 (21.9) |
| Missing | 323 | 22 (6.8) | <.001 | 52 | 6 (11.5) | .004 |

**Radiation**

| Radiation | 52 | 6 (11.5) | .004 | 8 | 1 (12.5) | .01 |
|                      | Chemotherapy | Facility type | Facility location | Area of residence | Travel distance |
|----------------------|--------------|---------------|-------------------|-------------------|----------------|
|                      | No           | Yes           | Missing           | No                | Yes            |
|                      | 82120        | 66355         | 5212              | 12062 (14.7)      | 11367 (17.1)   |
|                      | 14159        | 5229          | 479 (9.2)         | 2534 (17.9)       | 1320 (25.2)    |
|                      | 3529         | 2248          | <.001             | 669 (19)          | 467 (20.8)     |
| Chemotherapy         | No           | Yes           | Missing           | Non-academic×     | Academic       |
|                      | 71675        | 78547         | 3465              | 105379            | 47251          |
|                      | 8281 (11.6)  | 15589 (19.9)  | 38 (1.1)          | 16016 (15.2)      | 7712 (16.3)    |
|                      | 10638        | 8718          | <.001             | 2155 (18.1)       | 11925          |
|                      | 2762 (26)    | 1116 (12.8)   | 12 (3)            | 3400              | 1639 (22.1)    |
|                      | 4067         | 1691          | <.001             | 520 (15.3)        | 2193           |
|                      | 961 (23.6)   | 166 (9.8)     | 155              | 531 (24.2)        | 2108           |
| Facility type        | No           | Yes           | Missing           | Northeast         | Midwest        |
|                      | 31486        | 47251         | 1057              | 31486             | 39911          |
|                      | 5324 (16.9)  | 7712 (16.3)   | 180 (17)          | 5324 (16.9)       | 6389 (16)     |
|                      | 3648         | 4992          | <.001             | 3648              | 4992          |
|                      | 770 (21.1)   | 995 (19.9)    | 397               | 770 (21.1)        | 995 (19.9)    |
|                      | 1099         | 1351          | 96 (24.2)         | 1099              | 1351          |
|                      | 249 (22.7)   | 261 (19.3)    | .01               | 249 (22.7)        | 261 (19.3)    |
| Facility location    | No           | Yes           | Missing           | South             | West           |
|                      | 39257        | 21976         | 1057              | 39257             | 3196 (14.5)   |
|                      | 8819 (14.9)  | 3196 (14.5)   | 180 (17)          | 8819 (14.9)       | 3196 (14.5)   |
|                      | 7452         | 3263          | <.001             | 7452              | 3263          |
|                      | 1404 (18.8)  | 625 (19.2)    | 397               | 1404 (18.8)       | 625 (19.2)    |
|                      | 2108         | 1035          | 96 (24.2)         | 2108              | 1035          |
|                      | 350 (16.6)   | 191 (18.5)    | .01               | 350 (16.6)        | 191 (18.5)    |
|                      | 16 (10.3)    | 92 (28.8)     | <.001             | 16 (10.3)         | 92 (28.8)     |
| Area of residence    | No           | Yes           | Missing           | Metropolitan      | Urban          |
|                      | 123946       | 22834         | 3831              | 123946            | 3336 (14.6)   |
|                      | 19523 (15.8) | 3336 (14.6)   | 638 (16.7)        | 19523 (15.8)      | 3336 (14.6)   |
|                      | 15821        | 3018          | <.001             | 15821             | 3018          |
|                      | 3119 (19.7)  | 573 (19)      | 542               | 3119 (19.7)       | 573 (19)      |
|                      | 4699         | 893           | 115               | 4699              | 893           |
|                      | 923 (19.6)   | 153 (17.1)    | 115               | 923 (19.6)        | 153 (17.1)    |
| Travel distance      | No           | Yes           | Missing           | Rural             | Missing       |
|                      | 99232        | 20869         | 3831              | 99232             | 3311 (15.9)   |
|                      | 14733 (14.9) | 3311 (15.9)   | 638 (16.7)        | 14733 (14.9)      | 3311 (15.9)   |
|                      | 11051        | 2729          | <.001             | 11051             | 2729          |
|                      | 2016 (18.2)  | 601 (22)      | 542               | 2016 (18.2)       | 601 (22)      |
|                      | 3580         | 917           | 115               | 3580              | 917           |
|                      | 605 (16.9)   | 185 (20.2)    | 115               | 605 (16.9)        | 185 (20.2)    |
|                      | >20-40 miles | >40-60 miles  | >60 miles         | >20-40 miles      | >40-60 miles   |
|                      | 20869        | 8036          | 9783              | 20869             | 8036          |
|                      | 3311 (15.9)  | 1239 (15.4)   | 1597 (16.3)       | 3311 (15.9)       | 1239 (15.4)   |
|                      | 2729         | 1240          | 2011              | 2729              | 1240          |
|                      | 601 (22)     | 258 (20.8)    | 450 (22.4)        | 601 (22)          | 258 (20.8)    |
|                      | 917          | 427           | 735               | 917               | 427           |
|                      | 185 (20.2)   | 86 (20.1)     | 200 (27.2)        | 185 (20.2)        | 86 (20.1)     |

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| Missing | 15767 | 3028 (19.2) | <.001 | 2721 | 565 (20.8) | <.001 | 254 | 67 (26.4) | <.001 |
|---------|-------|-------------|--------|------|-------------|--------|-----|---------|--------|
| Travel distance | | | | | | | | | |
| median (IQR), miles | 9.5 (4.2-22.7) | 10.2 (4.6-23.8) | <.001 | 11.7 (5-30) | 13.8 (5.8-34.2) | <.001 | 12.5 (5.3-32) | 16.3 (6.7-43.8) | <.001 |

*Data are presented as number (percentage) of patients unless otherwise indicated. Percentages might not total 100% owing to approximation.*

*Percentages are presented as row percent*

*Median annual income of people in the patient’s ZIP code area.*

*Percent of people in the patient’s ZIP code area with no high-school diploma.*

*Includes community cancer program, comprehensive cancer program, integrated network cancer program, and other specified types of cancer programs.*

*Suppressed by the National Cancer Database for patients aged 0-39 years to protect patient privacy.*
### eTable 4. Multivariable Logistic Regression Models for NSCLC in the Pre–FDA Approval and Early Post–FDA Approval Eras

|                         | NSCLC 2011-2014 |                | NSCLC 2015-2017 |                |
|-------------------------|-----------------|---------------|-----------------|---------------|
|                         | OR (95% CI)b     | P value       | OR (95% CI)b     | P value       |
| **Sex**                 |                 |               |                 |               |
| Male                    | Ref             |               | Ref             |               |
| Female                  | 0.97 (0.92-1.02)| .30           | 0.99 (0.96-1.02)| .37           |
| **Age category, years** |                 |               |                 |               |
| <=55                    | 1.1 (1.03-1.19) | .01           | 1.08 (1.04-1.13)| <.001         |
| 56-65                   | Ref             |               | Ref             |               |
| 66-75                   | 0.88 (0.82-0.95)| .001          | 0.86 (0.83-0.9) | <.001         |
| >75                     | 0.38 (0.35-0.42)| <.001         | 0.58 (0.55-0.61)| <.001         |
| **Race**                |                 |               |                 |               |
| Black                   | 0.78 (0.71-0.85)| <.001         | 0.87 (0.83-0.91)| <.001         |
| White                   | Ref             |               | Ref             |               |
| Other                   | 0.9 (0.79-1.03) | .12           | 0.79 (0.74-0.84)| <.001         |
| **Ethnicity**           |                 |               |                 |               |
| Hispanic                | 0.79 (0.67-0.92)| .003          | 0.85 (0.79-0.92)| <.001         |
| Non-Hispanic            | Ref             |               | Ref             |               |
| **Insurance**           |                 |               |                 |               |
| Not Insured             | 0.48 (0.42-0.56)| <.001         | 0.57 (0.52-0.63)| <.001         |
| Private                 | Ref             |               | Ref             |               |
| Medicaid                | 0.68 (0.62-0.76)| <.001         | 0.73 (0.69-0.77)| <.001         |
| Medicare                | 0.83 (0.78-0.89)| <.001         | 0.94 (0.9-0.97) | .001          |
| Other Government        | 0.62 (0.48-0.78)| <.001         | 0.72 (0.64-0.82)| <.001         |
| **Income quartiles**c   |                 |               |                 |               |
| <$38,000                | 0.92 (0.85-1)   | .05           | 0.8 (0.76-0.83) | <.001         |
| $38,000 - $47,999       | 0.95 (0.89-1.02)| .19           | 0.86 (0.82-0.89)| <.001         |
| $48,000 - $62,999       | 1.02 (0.95-1.09)| .62           | 0.94 (0.9-0.97)| .001          |
| >= $63,000              | Ref             |               | Ref             |               |
| **Charlson-Deyo score** |                 |               |                 |               |
| 0                       | Ref             |               | Ref             |               |
| 1                       | 0.93 (0.88-0.99)| .03           | 0.92 (0.89-0.95)| <.001         |
| >=2                     | 0.65 (0.59-0.71)| <.001         | 0.78 (0.74-0.81)| <.001         |
| **Histology**           |                 |               |                 |               |
| NSCLC, NOSd             | 0.49 (0.45-0.54)| <.001         | 0.76 (0.72-0.8) | <.001         |
| Squamous cell carcinoma | 0.17 (0.15-0.2) | <.001         | 0.54 (0.52-0.56)| <.001         |
| Adenocarcinoma          | Ref             |               | Ref             |               |
| Large cell carcinoma    | 0.42 (0.34-0.53)| <.001         | 0.43 (0.38-0.49)| <.001         |
| Othere                 | 0.59 (0.53-0.65)| <.001         | 0.61 (0.58-0.65)| <.001         |

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a Data are multiply imputed.
b Odds ratio (95% confidence interval) of receiving immunotherapy vs not receiving immunotherapy.
c Median annual income of people in the patient’s ZIP code area.
d Non-small cell lung cancer (NSCLC), no other specification.
e Non-small cell lung cancer (NSCLC), not further defined.
### eTable 5. Multivariable Logistic Regression Models for RCC in the Pre–FDA Approval and Early Post–FDA Approval Eras

|                        | RCC 2012-2015 |           | P value | RCC 2016-2018 |           | P value |
|------------------------|---------------|-----------|---------|---------------|-----------|---------|
|                        | OR (95% CI)b  | P value   |         | OR (95% CI)b  | P value   |         |
| **Sex**                |               |           |         |               |           |         |
| Male                   | Ref           |           |         | Ref           |           |         |
| Female                 | 0.87 (0.76-1) | .05       |         | 0.87 (0.8-0.94) | <.001     |         |
| **Age category, years**|               |           |         |               |           |         |
| <=55                   | 1.54 (1.33-1.79) | <.001     |         | 1.23 (1.11-1.36) | <.001     |         |
| 56-65                  | Ref           |           |         | Ref           |           |         |
| 66-75                  | 0.74 (0.61-0.9) | .002      |         | 0.88 (0.79-0.98) | .02       |         |
| >75                    | 0.35 (0.27-0.45) | <.001     |         | 0.66 (0.58-0.75) | <.001     |         |
| **Race**               |               |           |         |               |           |         |
| Black                  | 0.84 (0.66-1.06) | .14       |         | 0.82 (0.72-0.93) | .003      |         |
| White                  | Ref           |           |         | Ref           |           |         |
| Other                  | 1.19 (0.89-1.59) | .24       |         | 0.92 (0.76-1.1) | .34       |         |
| **Ethnicity**          |               |           |         |               |           |         |
| Hispanic               | 0.79 (0.61-1.02) | .07       |         | 0.81 (0.7-0.93) | .003      |         |
| Non-Hispanic           | Ref           |           |         | Ref           |           |         |
| **Insurance**          |               |           |         |               |           |         |
| Not Insured            | 0.31 (0.2-0.48) | <.001     |         | 0.6 (0.48-0.75) | <.001     |         |
| Private                | Ref           |           |         | Ref           |           |         |
| Medicaid               | 0.56 (0.44-0.71) | <.001     |         | 0.76 (0.66-0.87) | <.001     |         |
| Medicare               | 0.76 (0.64-0.91) | .004      |         | 0.91 (0.82-1.01) | .07       |         |
| Other Government       | 0.7 (0.43-1.16) | .17       |         | 0.74 (0.54-1.03) | .07       |         |
| **Income quartiles**   |               |           |         |               |           |         |
| <$38,000               | 0.7 (0.58-0.85) | <.001     |         | 0.74 (0.64-0.84) | <.001     |         |
| $38,000 - $47,999      | 0.66 (0.56-0.78) | <.001     |         | 0.78 (0.7-0.87) | <.001     |         |
| $48,000 - $62,999      | 0.7 (0.6-0.83) | <.001     |         | 0.9 (0.81-0.99) | .04       |         |
| >= $63,000             | Ref           |           |         | Ref           |           |         |
| **Charlson-Deyo score**|               |           |         |               |           |         |
| 0                      | Ref           |           |         | Ref           |           |         |
| 1                      | 0.8 (0.68-0.93) | .01       |         | 0.86 (0.78-0.95) | .003      |         |
| >=2                    | 0.61 (0.47-0.8) | <.001     |         | 0.72 (0.64-0.8) | <.001     |         |
| **Histology**          |               |           |         |               |           |         |
| Clear cell carcinoma   | Ref           |           |         | Ref           |           |         |
| Papillary carcinoma    | 0.44 (0.3-0.64) | <.001     |         | 0.75 (0.61-0.92) | .005      |         |
| RCC, NOSa              | 0.54 (0.47-0.62) | <.001     |         | 0.73 (0.67-0.79) | <.001     |         |
| Other*                 | 0.43 (0.36-0.52) | <.001     |         | 0.69 (0.62-0.77) | <.001     |         |

*a* Data are multiply imputed.  
*b* Odds ratio (95% confidence interval) of receiving immunotherapy vs not receiving immunotherapy.  
*c* Median annual income of people in the patient’s ZIP code area.  
*d* Renal cell carcinoma (RCC), no other specification.  
*e* Renal cell carcinoma (RCC), not further defined.
eTable 6. Multivariable Logistic Regression Models for Melanoma in the Pre–FDA Approval and Early Post–FDA Approval Eras

| Sex          | Melanoma 2007-2010 | Melanoma 2011-2013 |
|--------------|--------------------|--------------------|
| Male         | Ref                | Ref                |
| Female       | 1.02 (0.84-1.24)   | .85                |
|              | 1.02 (0.88-1.17)   | .82                |

| Age category, years | Melanoma 2007-2010 | Melanoma 2011-2013 |
|---------------------|--------------------|--------------------|
| <=55                | 1.33 (1.06-1.66)   | .01                |
| 56-65               | Ref                | Ref                |
| 66-75               | 0.67 (0.47-0.95)   | .02                |
| >75                 | 0.18 (0.11-0.29)   | <.001              |

| Race          | Melanoma 2007-2010 | Melanoma 2011-2013 |
|---------------|--------------------|--------------------|
| Black         | 0.84 (0.38-1.85)   | .66                |
| White         | Ref                | Ref                |
| Other         | 0.59 (0.21-1.67)   | .33                |

| Ethnicity     | Melanoma 2007-2010 | Melanoma 2011-2013 |
|---------------|--------------------|--------------------|
| Hispanic      | 0.28 (0.1-0.76)    | .01                |
| Non-Hispanic  | Ref                | Ref                |

| Insurance     | Melanoma 2007-2010 | Melanoma 2011-2013 |
|---------------|--------------------|--------------------|
| Not Insured   | 0.54 (0.36-0.83)   | .01                |
| Private       | Ref                | Ref                |
| Medicaid      | 0.61 (0.42-0.87)   | .01                |
| Medicare      | 0.66 (0.48-0.91)   | .01                |
| Other Government | 1.17 (0.62-2.19) | .63                |

| Income quartiles³ | Melanoma 2007-2010 | Melanoma 2011-2013 |
|-------------------|--------------------|--------------------|
| <$38,000          | 0.65 (0.47-0.9)    | .01                |
| $38,000 - $47,999 | 0.64 (0.49-0.83)   | .00                |
| $48,000 - $62,999 | 0.73 (0.58-0.93)   | .01                |
| >= $63,000        | Ref                | Ref                |

| Charlson-Deyo score | Melanoma 2007-2010 | Melanoma 2011-2013 |
|---------------------|--------------------|--------------------|
| 0                   | Ref                | Ref                |
| 1                   | 0.74 (0.55-0.99)   | .04                |
| >=2                 | 0.22 (0.11-0.45)   | <.001              |

| Histology          | Melanoma 2007-2010 | Melanoma 2011-2013 |
|--------------------|--------------------|--------------------|
| Cutaneous melanoma | 1.59 (1.23-2.05)   | <.001              |
| Acral lentiginous melanoma | 0.71 (0.09-5.59) | .75                |
| Other/NOS²        | Ref                | Ref                |

⁴ Data are multiply imputed.
⁵ Odds ratio (95% confidence interval) of receiving immunotherapy vs not receiving immunotherapy.
⁶ Median annual income of people in the patient’s ZIP code area.
⁷ Melanoma of the skin, not further defined and no further specification combined due to small sample size.
**eTable 7. Pre-Post Multivariable Logistic Regression Models for NSCLC Assessing Racial and Ethnic Disparities and Socioeconomic Disparities Separately**

| Time period                        | NSCLC Race/Ethnicity | NSCLC Insurance/Income |
|------------------------------------|----------------------|------------------------|
|                                    | OR (95% CI)          | P value                | OR (95% CI)          | P value                |
| Pre-FDA approval era               | Ref                  | Ref                    | Ref                  | Ref                    |
| Early post-FDA approval era        | 5.59 (5.43-5.75)     | <.001                  | 5.57 (5.41-5.73)     | <.001                  |

**Sex**

| Age category, years | Pre-FDA approval era | Early post-FDA approval era |
|---------------------|----------------------|-----------------------------|
|                     | Ref                  | Ref                         |
| <=55                | 1.07 (1.03-1.11)     | 1.09 (1.05-1.13)            |
| 56-65               | 0.88 (0.86-0.91)     | 0.87 (0.84-0.90)            |
| >75                 | 0.55 (0.53-0.57)     | 0.54 (0.52-0.56)            |

**Race**

| Race       | Pre-FDA approval era | Early post-FDA approval era |
|------------|----------------------|-----------------------------|
| Black      | 0.78 (0.75-0.81)     | <.001                       |
| White      | Ref                  |                             |
| Other      | 0.81 (0.77-0.87)     | <.001                       |

**Ethnicity**

| Ethnicity      | Pre-FDA approval era | Early post-FDA approval era |
|----------------|----------------------|-----------------------------|
| Hispanic       | 0.78 (0.73-0.84)     | <.001                       |
| Non-Hispanic   | Ref                  |                             |

**Insurance**

| Insurance       | Pre-FDA approval era | Early post-FDA approval era |
|-----------------|----------------------|-----------------------------|
| Not Insured     | 0.54 (0.50-0.58)     |                             |
| Private         | Ref                  |                             |
| Medicaid        | 0.70 (0.66-0.73)     | <.001                       |
| Medicare        | 0.91 (0.88-0.95)     | <.001                       |
| Other Government| 0.70 (0.63-0.78)     |                             |

**Income quartiles**

| Income quartiles | Pre-FDA approval era | Early post-FDA approval era |
|------------------|----------------------|-----------------------------|
| <$38,000         | 0.80 (0.77-0.83)     | <.001                       |
| $38,000 - $47,999| 0.87 (0.84-0.91)     | .01                         |
| $48,000 - $62,999| 0.95 (0.92-0.99)     |                             |
| $63,000          | Ref                  |                             |

**Charlson-Deyo score**

| Charlson-Deyo score | Pre-FDA approval era | Early post-FDA approval era |
|---------------------|----------------------|-----------------------------|
| 0                   | Ref                  |                             |
| 1                   | 0.91 (0.88-0.94)     | <.001                       |
| >=2                 | 0.74 (0.71-0.77)     | <.001                       |

**Histology**

| Histology         | Pre-FDA approval era | Early post-FDA approval era |
|-------------------|----------------------|-----------------------------|
| NSCLC, NOS<sup>d</sup> | 0.68 (0.65-0.71)     | <.001                       |
| Squamous cell carcinoma | 0.44 (0.42-0.46)     | <.001                       |
| Adenocarcinoma    | Ref                  |                             |
| Large cell carcinoma | 0.42 (0.38-0.47)     | <.001                       |
| Other<sup>e</sup> | 0.61 (0.58-0.64)     | <.001                       |

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<sup>a</sup> Data are multiply imputed.

<sup>b</sup> Odds ratio (95% confidence interval) of receiving immunotherapy vs not receiving immunotherapy.

<sup>c</sup> Median annual income of people in the patient’s ZIP code area.

<sup>d</sup> Non-small cell lung cancer (NSCLC), no other specification.

<sup>e</sup> Non-small cell lung cancer (NSCLC), not further defined.

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### Table 8. Pre-Post Multivariable Logistic Regression Models for RCC Assessing Racial and Ethnic Disparities and Socioeconomic Disparities Separately

| Time period                      | RCC 2012-2015 |          | RCC 2016-2018 |          |
|----------------------------------|---------------|----------|---------------|----------|
|                                  | OR (95% CI)\(^b\) | P value  | OR (95% CI)\(^b\) | P value  |
| Pre-FDA approval era             | Ref           | Ref      | Ref           | Ref      |
| Early post-FDA approval era      | 5.06 (4.72-5.43) | <.001    | 5.07 (4.73-5.43) | <.001    |
| **Sex**                          |               |          |               |          |
| Male                             |               |          |               |          |
| Female                           | 0.87 (0.81-0.93) | <.001    | 0.87 (0.81-0.93) | <.001    |
| **Age category, years**          |               |          |               |          |
| <=55                             | 1.31 (1.20-1.42) | <.001    | 1.33 (1.22-1.44) | <.001    |
| 56-65                            | Ref           | Ref      | Ref           | Ref      |
| 66-75                            | 0.82 (0.76-0.89) | <.001    | 0.85 (0.77-0.93) | .001     |
| >75                              | 0.57 (0.52-0.63) | <.001    | 0.60 (0.53-0.67) | <.001    |
| **Race**                         |               |          |               |          |
| Black                            | 0.74 (0.66-0.82) | <.001    |               |          |
| White                            | Ref           | Ref      |               |          |
| Other                            | 1.00 (0.85-1.16) | .95      |               |          |
| **Ethnicity**                    |               |          |               |          |
| Hispanic                         | 0.70 (0.62-0.79) | <.001    |               |          |
| Non-Hispanic                     | Ref           | Ref      |               |          |
| **Insurance**                    |               |          |               |          |
| Not Insured                      | 0.48 (0.39-0.58) | <.001    |               |          |
| Private                          | Ref           | Ref      |               |          |
| Medicaid                         | 0.66 (0.59-0.75) | <.001    |               |          |
| Medicare                         | 0.86 (0.79-0.94) | .001     |               |          |
| Other Government                 | 0.74 (0.56-0.97) | .03      |               |          |
| **Income quartiles**\(^c\)       |               |          |               |          |
| <=$38,000                        | 0.69 (0.62-0.77) | <.001    |               |          |
| $38,000 - $47,999                | 0.74 (0.67-0.81) | <.001    |               |          |
| $48,000 - $62,999                | 0.83 (0.77-0.91) | <.001    |               |          |
| >= $63,000                       | Ref           | Ref      |               |          |
| **Charlson-Deyo score**          |               |          |               |          |
| 0                                | Ref           | Ref      |               |          |
| 1                                | 0.83 (0.76-0.90) | <.001    | 0.84 (0.77-0.91) | <.001    |
| >=2                              | 0.69 (0.62-0.76) | <.001    | 0.70 (0.64-0.78) | <.001    |
| **Histology**                    |               |          |               |          |
| Clear cell carcinoma             | Ref           | Ref      |               |          |
| Papillary carcinoma              | 0.65 (0.55-0.78) | <.001    | 0.64 (0.53-0.76) | <.001    |
| RCC, NOS\(^d\)                  | 0.66 (0.61-0.70) | <.001    | 0.66 (0.62-0.71) | <.001    |
| Other\(^e\)                     | 0.62 (0.56-0.67) | <.001    | 0.61 (0.56-0.67) | <.001    |

\(^a\) Data are multiply imputed.

\(^b\) Odds ratio (95% confidence interval) of receiving immunotherapy vs not receiving immunotherapy.

\(^c\) Median annual income of people in the patient’s ZIP code area.

\(^d\) Renal cell carcinoma (RCC), no other specification.

\(^e\) Renal cell carcinoma (RCC), not further defined.
## eTable 9. Pre-Post Multivariable Logistic Regression Models for Melanoma Assessing Racial and Ethnic Disparities and Socioeconomic Disparities Separately

|                      | Melanoma Race/Ethnicity | Melanoma Insurance/Income |
|----------------------|--------------------------|---------------------------|
|                      | OR (95% CI)\(^b\)       | P value                   | OR (95% CI)\(^b\)       | P value                   |
| **Time period**      |                          |                           |                          |                           |
| Pre-FDA approval era | Ref                      | Ref                       | Ref                      | Ref                       |
| Early post-FDA approval era | 2.66 (2.37-2.98)       | <.001                     | 2.73 (2.44-3.07)       | <.001                     |
| **Sex**              |                          |                           |                          |                           |
| Male                 | Ref                      |                           | Ref                      |                           |
| Female               | 1.03 (0.92-1.15)         | .63                       | 1.02 (0.90-1.14)         | .80                       |
| **Age category, years** |                          |                           |                          |                           |
| <=55                 | 1.30 (1.14-1.49)         | <.001                     | 1.37 (1.20-1.58)         | <.001                     |
| 56-65                | Ref                      |                           | Ref                      |                           |
| 66-75                | 0.82 (0.70-0.95)         | .01                       | 0.84 (0.70-1.02)         | .07                       |
| >75                  | 0.34 (0.28-0.41)         | <.001                     | 0.35 (0.28-0.43)         | <.001                     |
| **Race**             |                          |                           |                          |                           |
| Black                | 0.76 (0.48-1.19)         | .22                       |                           |                           |
| White                | Ref                      |                           |                           |                           |
| Other                | 0.91 (0.55-1.50)         | .71                       |                           |                           |
| **Ethnicity**        |                          |                           |                          |                           |
| Hispanic             | 0.64 (0.43-0.93)         | .02                       |                           |                           |
| Non-Hispanic         | Ref                      |                           |                           |                           |
| **Insurance**        |                          |                           |                          |                           |
| Not Insured          | 0.48 (0.37-0.61)         | <.001                     |                           |                           |
| Private              | Ref                      |                           |                           |                           |
| Medicaid             | 0.59 (0.47-0.73)         | <.001                     |                           |                           |
| Medicare             | 0.83 (0.70-0.99)         | .04                       |                           |                           |
| Other Government     | 0.84 (0.55-1.28)         | .41                       |                           |                           |
| **Income quartiles** |                          |                           |                          |                           |
| <$38,000             | 0.69 (0.58-0.83)         | <.001                     |                           |                           |
| $38,000 - $47,999    | 0.69 (0.60-0.81)         | <.001                     |                           |                           |
| $48,000 - $62,999    | 0.82 (0.71-0.94)         | .004                      |                           |                           |
| >= $63,000           | Ref                      |                           |                           |                           |
| **Charlson-Deyo score** |                          |                           |                          |                           |
| 0                    | Ref                      |                           |                           |                           |
| 1                    | 0.70 (0.60-0.82)         | <.001                     | 0.71 (0.61-0.83)         | <.001                     |
| >=2                  | 0.36 (0.27-0.48)         | <.001                     | 0.37 (0.28-0.50)         | <.001                     |
| **Histology**        |                          |                           |                          |                           |
| Cutaneous melanoma   | 1.50 (1.30-1.72)         | <.001                     | 1.56 (1.35-1.80)         | <.001                     |
| Acral lentiginous melanoma | 1.24 (0.61-2.53)       | .55                       | 1.27 (0.63-2.60)         | .50                       |
| Other/NOS\(^d\)     | Ref                      |                           | Ref                      |                           |

\(^a\) Data are multiply imputed.

\(^b\) Odds ratio (95% confidence interval) of receiving immunotherapy vs not receiving immunotherapy.

\(^c\) Median annual income of people in the patient’s ZIP code area.

\(^d\) Melanoma of the skin, not further defined and no further specification combined due to small sample size.
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