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**eTable 1**. Census Region and Associated States.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Census Regions** | **Northeast** | **Midwest** | **South** | **West** |
| States | Connecticut  | Illinois | Alabama | Alaska  |
|   | Maine | Indiana | Arkansas | Arizona |
|   | Massachusetts | Iowa | Delaware | California |
|   | New Hampshire  | Kansas | District of Columbia | Colorado |
|   | New Jersey | Michigan | Florida  | Hawaii |
|   | New York  | Minnesota | Georgia | Idaho |
|   | Pennsylvania | Missouri | Kentucky | Montana |
|   | Rhode Island | Nebraska | Louisiana | Nevada  |
|   | Vermont | North Dakota | Maryland | New Mexico |
|   |   | Ohio | Mississippi | Oregon  |
|   |   | South Dakota | North Carolina | Utah  |
|   |   | Wisconsin | Oklahoma | Washington |
|   |   |   | South Carolina | Wyoming  |
|   |   |   | Tennessee |   |
|   |   |   | Texas |   |
|   |   |   | Virginia |   |
|   |   |   | West Virginia |   |

**eTable 2.** 2013 US County and County Equivalent Urbanization: Classification as Either Metropolitan or Non-metropolitan and Subclassified into Six Urbanization Levels Used for Analysis. Urbanization levels are determined by their metropolitan statistical area (MSA) derived from 2012 post-census estimates.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **County Classification** | **Urbanization Level** | **MSA Population** | **Number of Counties** | **Distribution of U.S. Resident Population (%)** |
| Metropolitan | Large Central Metro | ≥1,000,000 | 68 | 30.5 |
|  | Large Fringe Metro | 1,000,000 | 368 | 24.7 |
|  | Medium Metro | 250,000-999,999 | 373 | 20.9 |
|  | Small Metro | <250,000 | 358 | 9.2 |
| Non-Metropolitan | Micropolitan  | 10,000-49,000 | 641 | 8.7 |
|  | Non-Core  | \* | 1335 | 6.1 |

\*MSA population cannot be determined for Non-core and should be considered most rural

**eTable 3.** Annual Percentage Changes in Bladder Cancer Incidence Rates by Gender and Stage From 1999-2020 in the US.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gender** | **Average APC from 1999-2020 (95%CI)**  | **p value** | **Segment 1 years** | **AAPC** | **p value** | **Segment 2 years** | **AAPC** | **p value** | **Segment 3 years** | **AAPC** | **p value**  |
| All | -1.1\*\* (-1.4 , -0.8) | < 0.001 | 1999 - 2005 | 0.03 (-0.5 , 0.6) | 0.92 | 2005 - 2017 | -0.8\*\* (-1.0 , -0.6) | < 0.001 | 2017 - 2020 | -4.6\*\* (-6.1 , -3.0) | < 0.001 |
| Men | -1.3\*\* (-1.6 , -1.0) | < 0.001 | 1999 - 2008 | -0.3\*\* (-0.6 , -0.01) | 0.04 | 2008 - 2017 | -1.1\*\* (-1.5 , -0.8) | < 0.001 | 2017 - 2020 | -4.6\*\* (-6.1 , -3.0) | < 0.001 |
| Women | -1.5\*\* (-1.8 , -1.1) | < 0.001 | 1999 - 2018 | -0.9\*\* (-1.0 , -0.8) | < 0.001 | 2018 - 2020 | -6.8\*\* (-10.4 , -2.9) | < 0.001 | NA | NA | NA |
| *In situ malignant* |
| All | 0.1 (-0.3 , 0.6) | 0.61 | 1999 - 2004 | 6.2\*\* (5.0 , 7.4) | < 0.001 | 2004 - 2017 | -0.7\*\* (-1.0 , -0.4) | < 0.001 | 2017 - 2020 | -6.0\*\* (-8.4 , -3.6) | < 0.001 |
| Men | -0.0 (-0.5 , 0.5) | 0.89 | 1999 - 2004 | 6.1\*\* (4.7 , 7.4) | < 0.001 | 2004 - 2017 | -0.9\*\* (-1.2 , -0.6) | < 0.001 | 2017 - 2020 | -6.0\*\* (-8.5 , -3.3) | < 0.001 |
| Women | -0.2 (-0.6 , 0.3) | 0.47 | 1999 - 2004 | 6.0\*\* (4.9 , 7.0) | < 0.001 | 2004 - 2018 | -0.9\*\* (-1.1 , -0.7) | < 0.001 | 2018 - 2020 | -9.6\*\* (-13.4 , -5.6) | < 0.001 |
| *Localized malignant* |
| All | -1.4\*\* (-1.8 , -1.1) | < 0.001 | 1999 - 2004 | -3.2\*\* (-4.1 , -2.3) | < 0.001 | 2004 - 2016 | -0.4\*\* (-0.7 , -0.1) | 0.01 | 2016 - 2020 | -2.3\*\* (-3.6 , -0.9) | < 0.001 |
| Men | -2.3\*\* (-2.8 , -1.7) | < 0.001 | 1999 - 2004 | -3.9\*\* (-5.0 , -2.8) | < 0.001 | 2004 - 2018 | -1.4\*\* (-1.6 , -1.1) | < 0.001 | 2018 - 2020 | -4.2 (-8.9 , 0.6) | 0.08 |
| Women | -1.3\*\* (-1.8 , -0.7) | < 0.001 | 1999 - 2004 | -3.6\*\* (-5.7 , -1.5) | < 0.001 | 2004 - 2020 | -0.5\*\* (-0.9 , -0.2) | 0.01 | NA | NA | NA |
| *Regional malignant* |
| All | -1.4\*\* (-1.8 , -1.1) | < 0.001 | 1999 - 2004 | -3.2\*\* (-4.1 , -2.3) | < 0.001 | 2004 - 2016 | -0.4\*\* (-0.7 , -0.1) | 0.01 | 2016 - 2020 | -2.3\*\* (-3.6 , -0.9) | < 0.001 |
| Men | -1.7\*\* (-2.0 , -1.3) | < 0.001 | 1999 - 2004 | -3.4\*\* (-4.3 , -2.4) | < 0.001 | 2004 - 2016 | -0.6\*\* (-0.9 , -0.3) | < 0.001 | 2016 - 2020 | -2.8\*\* (-4.2 , -1.4) | < 0.001 |
| Women | -1.3\*\* (-1.8 , -0.7) | < 0.001 | 1999 - 2004 | -3.6\*\* (-5.7 , -1.5) | < 0.001 | 2004 - 2020 | -0.5\*\* (-0.9 , -0.2) | 0.01 | NA | NA | NA |
| *Metastatic malignant* |
| All | 1.6\*\* (1.0, 2.1) | < 0.001 | 1999 - 2016 | 2.1\*\* (1.8 , 2.4) | < 0.001 | 2016 - 2020 | -0.6 (-3.4 , 2.3) | 0.68 | NA | NA | NA |
| Men | 1.7\*\* (1.1 , 2.2) | < 0.001 | 1999 - 2013 | 2.5\*\* (2.0, 3.0) | < 0.001 | 2013 - 2020 | 0.05 (-1.4 , 1.5) | 0.95 | NA | NA | NA |
| Women | 1.4\*\* (1.1 , 1.7) | < 0.001 | 1999 - 2020 | 1.4\*\* (1.1 , 1.7) | < 0.001 | NA | NA | NA | NA | NA | NA |

\*\* indicates the p-value is significant after Holm-Bonferroni correction. \* indicates the p-value is <0.05, but not significant after Holm-Bonferroni correction.

**eTable 4.** Annual Percentage Changes in Bladder Cancer Incidence Rates by Ethnicity, Gender and Stage From 1999-2020 in the US.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ethnicity**  | **Average APC from 1999-2020 (95%CI)**  | **p value** | **Segment 1 years** | **AAPC** | **p value** | **Segment 2 years** | **AAPC** | **p value** | **Segment 3 years** | **AAPC** | **p value** |
| *In Situ Malignant* |
| *All* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | 0.1 (-0.7 , 1.0) | 0.76 | 1999 - 2005 | 5.8\*\* (4.4 , 7.3) | < 0.001 | 2005 - 2018 | -1.0\*\* (-1.5 , -0.5) | < 0.001 | 2018 - 2020 | -8.5\*\* (-15.7 , -0.7) | 0.04 |
| Non-Hispanic | 0.2 (-0.2 , 0.7) | 0.30 | 1999 - 2004 | 6.2\*\* (5.0 , 7.5) | < 0.001 | 2004 - 2017 | -0.6\*\* (-0.9 , -0.3) | < 0.001 | 2017 - 2020 | -5.8\*\* (-8.2 , -3.4) | < 0.001 |
| *Men* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | 0.1 (-0.7 , 1.0) | 0.80 | 1999 - 2005 | 5.9\*\* (4.2 , 7.7) | < 0.001 | 2005 - 2017 | -1.1\*\* (-1.7 , -0.4) | < 0.001 | 2017 - 2020 | -6.3\*\* (-10.7 , -1.6) | 0.01 |
| Non-Hispanic | 0.08 (-0.4 , 0.6) | 0.75 | 1999 - 2004 | 6.1\*\* (4.8 , 7.4) | < 0.001 | 2004 - 2017 | -0.8\*\* (-1.1 , -0.4) | < 0.001 | 2017 - 2020 | -5.8\*\* (-8.4 , -3.1) | < 0.001 |
| *Women* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | 0.7 (-0.6 , 2.0) | 0.30 | 1999 - 2004 | 7.4\*\* (1.9 , 13.1) | 0.01 | 2004 - 2020 | -1.3\*\* (-2.2 , -0.4) | 0.01 | NA | NA | NA |
| Non-Hispanic | 0.03 (-0.5 , 0.6) | 0.92 | 1999 - 2004 | 5.9\*\* (4.5 , 7.4) | < 0.001 | 2004 - 2017 | -0.6\*\* (-1.0 , -0.3) | < 0.001 | 2017 - 2020 | -6.5\*\* (-9.3 , -3.5) | < 0.001 |
| *Localized Malignant*  |
| *All* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | -2.6\*\* (-2.9 , -2.3) | < 0.001 | 1999 - 2020 | -2.6\*\* (-2.9 , -2.3) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | -1.9\*\* (-2.2 , -1.6) | < 0.001 | 1999 - 2004 | -3.7\*\* (-4.8 , -2.5) | < 0.001 | 2004 - 2020 | -1.3\*\* (-1.5, -1.1) | < 0.001 | NA | NA | NA |
| *Men* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | -2.8\*\* (-3.1 , -2.5) | < 0.001 | 1999 - 2020 | -2.8\*\* (-3.1 , -2.5) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | -1.9\*\* (-2.3 , -1.6) | < 0.001 | 1999 - 2004 | -3.7\*\* (-4.9 , -2.5) | < 0.001 | 2004 - 2020 | -1.4\*\* (-1.6 , -1.1) | < 0.001 | NA | NA | NA |
| *Women* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | -2.3\*\* (-2.9 , -1.8) | < 0.001 | 1999 - 2020 | -2.3\*\* (-2.9 , -1.8) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | -2.3\*\* (-2.7 , -2.0) | < 0.001 | 1999 - 2004 | -3.9\*\* (-5.3 , -2.6) | < 0.001 | 2004 - 2020 | -1.8\*\* (-2.0 , -1.6) | < 0.001 | NA | NA | NA |
| *Regional Malignant* |
| *All* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | -1.4\*\* (-2.1 , -0.6) | < 0.001 | 1999 - 2020 | -1.4\*\* (-2.1 , -0.6) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | -1.3\*\* (-1.7, -1.0) | < 0.001 | 1999 - 2004 | -3.1\*\* (-4.1 , -2.1) | < 0.001 | 2004 - 2016 | -0.3\* (-0.6 , -0.005) | 0.05 | 2016 - 2020 | -2.2\*\* (-3.6 , -0.8) | 0.01 |
| *Men* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | -1.4\*\* (-2.1 , -0.6) | < 0.001 | 1999 - 2020 | -1.4\*\* (-2.1 , -0.6) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | -1.6\* \* (-2.0 , -1.1) | < 0.001 | 1999 - 2005 | -2.8\*\* (-3.8 , -1.9) | < 0.001 | 2005 - 2016 | -0.4 (-0.8 , 0.1) | 0.10 | 2016 - 2020 | -2.9\*\* (-4.7 , -1.1) | < 0.001 |
| *Women* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | -1.0 (-2.2 , 0.2) | 0.10 | 1999 - 2020 | -1.0 (-2.2 , 0.2) | 0.10 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | -1.2\*\* (-1.8 , -0.6) | < 0.001 | 1999 - 2004 | -3.4\*\* (-5.7 , -1.1) | 0.01 | 2004 - 2020 | -0.5\*\* (-0.9 , -0.1) | 0.03 | NA | NA | NA |
| *Metastatic Malignant* |
| *All* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | 1.1\*\* (0.4 , 1.7) | < 0.001 | 1999 - 2020 | 1.1\*\* (0.4 , 1.7) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | 1.7\*\* (1.1 , 2.2) | < 0.001 | 1999 - 2016 | 2.2\*\* (1.9 , 2.6) | < 0.001 | 2016 - 2020 | -0.7 (-3.6 , 2.2) | 0.62 | NA | NA | NA |
| *Men* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | 0.8\*\* (0.2 , 1.5) | 0.02 | 1999 - 2020 | 0.8\*\* (0.2 , 1.5) | 0.02 | NA | NA | NA | NA | NA | NA |
| Non-Hispanic | 1.7\*\* (1.1 , 2.3) | < 0.001 | 1999 - 2014 | 2.6\*\* (2.1 , 3.1) | < 0.001 | 2014 - 2020 | -0.3 (-2.3, 1.6) | 0.72 | NA | NA | NA |
| *Women* |  |  |  |  |  |  |  |  |  |  |   |
| Hispanic | 3.2 (-0.2 , 6.9) | 0.07 | 1999 - 2001 | 36.2 (-6.2 , 97.8) | 0.10 | 2001 - 2020 | 0.3 (-0.8 , 1.4) | 0.60 | NA | NA | NA |
| Non-Hispanic | 1.5\*\* (1.2 , 1.7) | < 0.001 | 1999 - 2020 | 1.5\*\* (1.2 , 1.7) | < 0.001 | NA | NA | NA | NA | NA | NA |

\*\* indicates the p-value is significant after Holm-Bonferroni correction. \* indicates the p-value is <0.05, but not significant after Holm-Bonferroni correction.

**eTable 5.** Annual Percentage Changes in Bladder Cancer Incidence Rates by Race, Gender and Stage From 1999-2020 in the US.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Race** | **Average APC from 1999-2020 (95%CI)**  | **p value** | **Segment 1 years** | **AAPC** | **p value** | **Segment 2 years** | **AAPC** | **p value** | **Segment 3 years** | **AAPC** | **p value** | **Segment 4 years** | **AAPC** | **p value** |
| *In Situ Malignant* |
| *All* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | -0.8\*\* (-1.5 , -0.02) | 0.05 | 1999 - 2020 | -0.8\*\* (-1.5 , -0.02) | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -1.3\*\* (-1.6 , -0.9) | < 0.001 | 1999 - 2020 | -1.3\*\* (-1.6 , -0.9) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | -1.0\*\* (-1.2 , -0.8) | < 0.001 | 1999 - 2020 | -1.0\*\* (-1.2 , -0.8) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -1.8\*\* (-2.1 , -1.5) | < 0.001 | 1999 - 2004 | -3.8\*\* (-4.9 , -2.7) | < 0.001 | 2004 - 2020 | -1.2\*\* (-1.4 , -1.0) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | -0.3 (-2.7 , 2.2) | 0.81 | 1999 - 2002 | -13.9 (-27.6 , 2.3) | 0.08 | 2002 - 2020 | 2.2\*\* (1.1 , 3.3) | < 0.001 | NA | NA | NA | NA | NA | NA |
| *Men* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | 1.7\*\* (0.6 , 2.8) | < 0.001 | 1999 - 2020 | 1.7\*\* (0.6 , 2.8) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -0.1 (-0.8 , 0.6) | 0.79 | 1999 - 2006 | 2.6\*\* (0.8 , 4.4) | 0.01 | 2006 - 2020 | -1.4\*\* (-2.0 , -0.8) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | 1.6\*\* (0.7 , 2.4) | < 0.001 | 1999 - 2005 | 7.9\*\* (6.2 , 9.6) | < 0.001 | 2005 - 2017 | 0.8\*\* (0.1, 1.4) | 0.02 | 2017 - 2020 | -7.2\*\* (-11.4 , -2.8) | < 0.001 |  |  |   |
| Non Hispanic White | 0.1 (-0.4 , 0.6) | 0.67 | 1999 - 2004 | 6.1\*\* (4.8 , 7.5) | < 0.001 | 2004 - 2017 | -0.7\*\* (-1.1 , -0.4) | < 0.001 | 2017 - 2020 | -5.8\*\* (-8.4 , -3.1) | < 0.001 |  |  |   |
| Non Hispanic Unknown  | 4.1\*\* (2.2 , 6.1) | < 0.001 | 1999 - 2007 | 8.3\*\* (3.9 , 12.8) | < 0.001 | 2007 - 2020 | 1.7 (-0.3 , 3.7) | 0.09 | NA | NA | NA | NA | NA | NA |
| *Women* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | 1.6(-0.2 , 3.4) | 0.07 | 1999 - 2020 | 1.6(-0.2 , 3.4) | 0.07 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -0.4 (-1.1 , 0.2) | 0.21 | 1999 - 2005 | 2.6\*\* (1.3 , 3.9) | < 0.001 | 2005 - 2017 | -0.7\*\* (-1.2 , -0.2) | 0.01 | 2017 - 2020 | -5.0\*\* (-8.7 , -1.3) | 0.01 | NA | NA | NA |
| Non Hispanic Black | 1.6\*\* (0.9 , 2.3) | < 0.001 | 1999 - 2004 | 8.5\*\* (6.5 , 10.6) | < 0.001 | 2004 - 2016 | 1.2\*\* (0.6 , 1.8) | < 0.001 | 2016 - 2020 | -5.3\*\* (-7.8 , -2.7) | < 0.001 | NA | NA | NA |
| Non Hispanic White | 0.04 (-0.5 , 0.6) | 0.87 | 1999 - 2004 | 6.1\*\* (5.0 , 7.3) | < 0.001 | 2004 - 2018 | -0.6\*\* (-0.9 , -0.4) | < 0.001 | 2018 - 2020 | -9.4\*\* (-13.7 , -4.9) | < 0.001 | NA | NA | NA |
| Non Hispanic Unknown  | 3.7\*\* (1.3 , 6.1) | < 0.001 | 1999 - 2009 | 9.2\*\* (5.2 , 13.4) | < 0.001 | 2009 - 2020 | -1.1 (-4.3 , 2.1) | 0.47 | NA | NA | NA | NA | NA | NA |
| *Localized Malignant*  |
| *All* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | -0.8\*\* (-1.5 , -0.02) | 0.05 | 1999 - 2020 | -0.8\*\* (-1.5 , -0.02) | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -1.3\*\* (-1.6 , -0.9) | < 0.001 | 1999 - 2020 | -1.3\*\* (-1.6 , -0.9) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | -1.0\*\* (-1.2 , -0.8) | < 0.001 | 1999 - 2020 | -1.0\*\* (-1.2 , -0.8) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -1.8\*\* (-2.1 , -1.5) | < 0.001 | 1999 - 2004 | -3.8\*\* (-4.9 , -2.7) | < 0.001 | 2004 - 2020 | -1.2\*\* (-1.4 , -1.0) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | -0.3 (-2.7 , 2.2) | 0.81 | 1999 - 2002 | -13.9 (-27.6 , 2.3) | 0.08 | 2002 - 2020 | 2.2\*\* (1.1 , 3.3) | < 0.001 | NA | NA | NA | NA | NA | NA |
| *Men* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | -0.3 (-1.4 , 0.7) | 0.51 | 1999 - 2020 | -0.3 (-1.4 , 0.7) | 0.51 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -1.3\*\* (-1.7 , -0.9) | < 0.001 | 1999 - 2020 | -1.3\*\* (-1.7 , -0.9) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | -1.1\*\* (-1.3 , -0.8) | < 0.001 | 1999 - 2020 | -1.1\*\* (-1.3 , -0.8) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -1.9\*\* (-2.2 , -1.6) | < 0.001 | 1999 - 2004 | -3.8\*\* (-5.0 , -2.6) | < 0.001 | 2004 - 2020 | -1.3\*\* (-1.5, -1.1) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | -0.5 (-2.6 , 1.7) | 0.64 | 1999 - 2004 | -10.9\*\* (-18.3 , -2.9) | 0.01 | 2004 - 2020 | 3.0\*\* (1.5 , 4.5) | < 0.001 | NA | NA | NA | NA | NA | NA |
| *Women* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | -2.3\*\* (-4.6 , -0.03) | 0.05 | 1999 - 2020 | -2.3\*\* (-4.6 , -0.03) | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -1.3\*\* (-2.1 , -0.5) | < 0.001 | 1999 - 2020 | -1.3\*\* (-2.1 , -0.5) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | -1.0\*\* (-1.4 , -0.7) | < 0.001 | 1999 - 2020 | -1.0\*\* (-1.4 , -0.7) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -2.4\*\*(-2.7 , -2.0) | < 0.001 | 1999 - 2005 | -3.9\*\* (-5.0, -2.8) | < 0.001 | 2005 - 2020 | -1.7\*\* (-2.1 , -1.5) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | 0.6 (-0.6 , 1.8) | 0.30 | 1999 - 2020 | 0.6 (-0.6 , 1.8) | 0.30 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Regional Malignant*  |
| *All* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | 0.6 (-1.9 , 3.0) | 0.64 | 1999 - 2020 | 0.6 (-1.9 , 3.0) | 0.64 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -1.9\*\* (-2.5 , -1.3) | < 0.001 | 1999 - 2020 | -1.9\*\* (-2.5 , -1.3) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | -1.4\*\* (-2.1 , -0.7) | < 0.001 | 1999 - 2006 | -3.8\*\* (-5.6 , -2.0) | < 0.001 | 2006 - 2020 | -0.2 (-0.8 , 0.5) | 0.57 | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -1.2\*\* (-1.6, -0.8) | < 0.001 | 1999 - 2004 | -2.8\*\* (-3.8 , -1.8) | < 0.001 | 2004 - 2016 | -0.2 (-0.5 , 0.1) | 0.21 | 2016 - 2020 | -2.2\*\* (-3.6 , -0.8) | 0.01 | NA | NA | NA |
| Non Hispanic Unknown  | 2.0 (-4.1, 8.5) | 0.54 | 1999 - 2016 | -2.6 (-6.0 , 0.9) | 0.13 | 2016 - 2020 | 24.0 (-9.6, 70.1) | 0.17 | NA | NA | NA | NA | NA | NA |
| *Men* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -2.3\*\* (-3.0 , -1.7) | < 0.001 | 1999 - 2020 | -2.3\*\* (-3.0 , -1.7) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | -1.4\*\* (-2.4 , -0.3) | 0.01 | 1999 - 2006 | -4.3\*\* (-7.0 , -1.5) | 0.01 | 2006 - 2020 | 0.1 (-0.9 , 1.1) | 0.86 | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -1.4\*\* (-2.0, -0.7) | < 0.001 | 1999 - 2001 | -0.6 (-4.7 , 3.8) | 0.77 | 2001 - 2004 | -4.1 (-8.1 , 0.1) | 0.05 | 2004 - 2016 | -0.3\*\* (-0.6 , -0.01) | 0.04 | 2016 - 2020 | -2.9\*\* (-4.2 , -1.5) | < 0.001 |
| Non Hispanic Unknown  | 1.1 (-5.2 , 7.8) | 0.75 | 1999 - 2016 | -4.2\*\* (-7.7 , -0.7) | 0.02 | 2016 - 2020 | 27.1 (-8.8 , 77.3) | 0.15 | NA | NA | NA | NA | NA | NA |
| *Women* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | -0.7 (-3.1 , 1.7) | 0.55 | 1999 - 2020 | -0.7 (-3.1 , 1.7) | 0.55 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | -1.5\*\* (-2.1 , -0.9) | < 0.001 | 1999 - 2020 | -1.5\*\* (-2.1 , -0.9) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -1.0\*\* (-1.6 , -0.4) | < 0.001 | 1999 - 2004 | -3.1\*\* (-5.5 , -0.6) | 0.02 | 2004 - 2020 | -0.3 (-0.8 , 0.1) | 0.11 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | NA |   |   |   |   |   |   |   |   |   |   |   |   |   |
| *Metastatic Malignant*  |
| *All* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | 1.1 (-0.5 , 2.7) | 0.18 | 1999 - 2006 | -2.0 (-5.9, 2.2) | 0.33 | 2006 - 2020 | 2.6\*\* (1.1 , 4.1) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | 0.7 (-0.2 , 1.6) | 0.11 | 1999 - 2012 | 1.8\*\* (0.9 , 2.8) | < 0.001 | 2012 - 2020 | -1.0 (-3.0, 1.0) | 0.28 | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | 1.7\*\* (1.2 , 2.2) | < 0.001 | 1999 - 2015 | 2.5\*\* (2.1 , 2.8) | < 0.001 | 2015 - 2020 | -0.6 (-2.6 , 1.3) | 0.50 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Men* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | 2.4\*\* (0.3, 4.6) | 0.02 | 1999 - 2011 | -0.03 (-2.6, 2.6) | 0.98 | 2011 - 2020 | 5.8\*\* (1.7 , 10.1) | 0.01 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | 1.4\*\* (0.3 , 2.5) | 0.01 | 1999 - 2008 | 3.5\*\* (1.5 , 5.6) | < 0.001 | 2008 - 2019 | -0.3 (-1.7 , 1.2) | 0.69 | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | -0.7 (-1.9 , 0.6) | 0.29 | 1999 - 2018 | 2.4\*\* (2.0 , 2.8) | < 0.001 | 2018 - 2020 | -25.3\*\* (-34.6 , -14.6) | < 0.001 | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Women* |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Non Hispanic American Indian or Alaska Native  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Asian or Pacific Islander | 0.4 (-1.8 , 2.7) | 0.71 | 1999 - 2020 | 0.4 (-1.8 , 2.7) | 0.71 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Black | 0.3 (-0.5 , 1.0) | 0.45 | 1999 - 2020 | 0.3 (-0.5 , 1.0) | 0.45 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic White | 1.7\*\* (1.4 , 2.0) | < 0.001 | 1999 - 2020 | 1.7\*\* (1.4 , 2.0) | < 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non Hispanic Unknown  | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

\*\* indicates the p-value is significant after Holm-Bonferroni correction. \* indicates the p-value is <0.05, but not significant after Holm-Bonferroni correction.

**eTable 6.** Annual Percentage Changes in Bladder Cancer Death Rates by Age Group and Gender From 1999-2020 in the US.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Age Groups** | **Average APC from 1999-2020 (95%CI)**  | **p value** | **Segment 1 years** | **AAPC** | **p value** | **Segment 2 years** | **AAPC** | **p value** | **Segment 3 years** | **AAPC** | **p-value** |
| *All* |
| 35-39 years | -3.5\*\* (-5.6 , -1.4) | <0.001 | 1999 - 2020 | -3.5\*\* (-5.6 , -1.4) | <0.001 | NA | NA | NA | NA | NA | NA |
| 40-44 years | -3.8\*\* (-5.4 , -2.1) | <0.001 | 1999 - 2020 | -3.8\*\* (-5.4 , -2.1) | <0.001 | NA | NA | NA | NA | NA | NA |
| 45-49 years | -3.2\*\* (-4.5 , -1.9) | <0.001 | 1999 - 2020 | -3.2\*\* (-4.5 , -1.9) | <0.001 | NA | NA | NA | NA | NA | NA |
| 50-54 years | -2.9\*\* (-4.1 , -1.6) | <0.001 | 1999 - 2020 | -2.9\*\* (-4.1 , -1.6) | <0.001 | NA | NA | NA | NA | NA | NA |
| 55-59 years | -1.7 (-3.9 , 0.7) | 0.17 | 1999 - 2001 | 19.9\* (3.4 , 39.1) | 0.02 | 2001 - 2004 | -17.8\*\* (-29.2 , -4.7) | 0.01 | 2004 - 2020 | -0.8\*\* (-1.3 , -0.2) | 0.01 |
| 60-64 years | -1.7\*\* (-3.0 , -0.5) | 0.01 | 1999 - 2001 | 14.7\*\* (5.9 , 24.2) | <0.001 | 2001 - 2004 | -14.7\*\* (-21.3 , -7.7) | <0.001 | 2004 - 2020 | -1.0\*\* (-1.3 , -0.7) | <0.001 |
| 65-69 years | -1.7\* (-3.3 , -0.1) | 0.03 | 1999 - 2001 | 14.6\*\* (3.7 , 26.5) | 0.01 | 2001 - 2004 | -13.5\*\* (-21.6, -4.4) | 0.01 | 2004 - 2020 | -1.3\*\* (-1.6 , -0.9) | <0.001 |
| 70-74 years | -1.4 (-3.1 , 0.2) | 0.09 | 1999 - 2001 | 10.7 (-0.4 , 33.0) | 0.06 | 2001 - 2004 | -11.6\* (-20.4 , -1.8) | 0.02 | 2004 - 2020 | -0.9\*\* (-1.3 , -0.5) | <0.001 |
| 75-79 years | -0.9 (-2.3 , 0.5) | 0.23 | 1999 - 2001 | 13.5\*\* (3.9 , 24.1) | 0.01 | 2001 - 2004 | -10.4\* (-18.0, -2.1) | 0.02 | 2004 - 2020 | -0.7\*\* (-1.0 , -0.3) | <0.001 |
| 80-84 years | -0.09 (-0.4 , 0.3) | 0.64 | 1999 - 2014 | 0.7\*\* (0.4 , 1.0) | <0.001 | 2014 - 2020 | -2.0\*\* (-3.1 , -0.9) | <0.001 | NA | NA | NA |
| 85+ years | 0.8\*\* (0.5 , 1.1) | <0.001 | 1999 - 2016 | 1.1\*\* (0.9 , 1.3) | <0.001 | 2016 - 2020 | -0.3 (-1.7 , 1.1) | 0.65 | NA | NA | NA |
| *Men* |
| 40-44 years | -1.6 (-4.5 , 1.4) | 0.30 | 1999 - 2002 | 9.1 (-11.8 , 34.9) | 0.40 | 2002 - 2020 | -3.3\*\* (-4.6, -1.9) | <0.001 | NA | NA | NA |
| 45-49 years | -1.7\* (-3.1 , -0.2) | 0.02 | 1999 - 2003 | 6.0 (-1.6 , 14.1) | 0.12 | 2003 - 2020 | -3.4\*\* (-4.2 , -2.6) | <0.001 | NA | NA | NA |
| 50-54 years | -2.3\*\* (-3.4 , -1.2) | <0.001 | 1999 - 2014 | -0.4 (-1.3 , 0.5) | 0.34 | 2014 - 2020 | -6.8\*\* (-10.1 , -3.4) | <0.001 | NA | NA | NA |
| 55-59 years | -1.9\*\* (-2.9 , -0.9) | <0.001 | 1999 - 2018 | -0.9\*\* (-1.2 , -0.6) | <0.001 | 2018 - 2020 | -11.1\*\* (-20.2 , -0.8) | 0.04 | NA | NA | NA |
| 60-64 years | -1.2\*\* (-1.5 , -1.0) | <0.001 | 1999 - 2020 | -1.2\*\* (-1.5 , -1.0) | <0.001 | NA | NA | NA | NA | NA | NA |
| 65-69 years | -1.4\*\* (-1.8 , -1.1) | <0.001 | 1999 - 2011 | -0.9\*\* (-1.3 , -0.4) | <0.001 | 2011 - 2020 | -2.2\*\* (-2.8, -1.5) | <0.001 | NA | NA | NA |
| 70-74 years | -1.4\*\* (-1.8 , -1.0) | <0.001 | 1999 - 2003 | -2.3\*\* (-3.9 , -0.7) | 0.01 | 2003 - 2013 | -0.2 (-0.7 , 0.3) | 0.34 | 2013 - 2020 | -2.6\*\* (-3.3 , -1.9) | <0.001 |
| 75-79 years | -0.9\*\* (-1.3 , -0.5) | <0.001 | 1999 - 2013 | -0.4\* (-0.7 , -0.0) | 0.03 | 2013 - 2020 | -1.9\*\* (-2.9 , -1.0) | <0.001 | NA | NA | NA |
| 80-84 years | -0.3 (-0.8 , 0.0) | 0.11 | 1999 - 2013 | 0.5\* (0.1 , 0.9) | 0.01 | 2013 - 2020 | -2.1\*\* (-3.2 , -1.0) | <0.001 | NA | NA | NA |
| 85+ years | 0.6\*\* (0.2 , 0.9) | <0.001 | 1999 - 2016 | 1.0\*\* (0.8, 1.2) | <0.001 | 2016 - 2020 | -1.2 (-2.9 , 0.5) | 0.15 | NA | NA | NA |
| *Women* |
| 40-44 years | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 45-49 years | 0.0 (-2.5 , 2.6) | 1.00 | 1999 - 2008 | 5.0 (-0.01 , 10.3) | 0.05 | 2008 - 2020 | -3.6\* (-6.6 , -0.5) | 0.03 | NA | NA | NA |
| 50-54 years | -0.2 (-1.3 , 0.9) | 0.68 | 1999 - 2020 | -0.2 (-1.3 , 0.9) | 0.68 | NA | NA | NA | NA | NA | NA |
| 55-59 years | -0.5\*\* (-0.8 , -0.2) | <0.001 | 1999 - 2020 | -0.5\*\* (-0.8 , -0.2) | <0.001 | NA | NA | NA | NA | NA | NA |
| 60-64 years | -1.1\*\* (-1.4 , -0.9) | <0.001 | 1999 - 2020 | -1.1\*\* (-1.4 , -0.9) | <0.001 | NA | NA | NA | NA | NA | NA |
| 65-69 years | -1.5\*\* (-1.8 , -1.1) | <0.001 | 1999 - 2020 | -1.5\*\* (-1.8 , -1.1) | <0.001 | NA | NA | NA | NA | NA | NA |
| 70-74 years | -1.4\*\* (-1.7 , -1.0) | <0.001 | 1999 - 2020 | -1.4\*\* (-1.7 , -1.0) | <0.001 | NA | NA | NA | NA | NA | NA |
| 75-79 years | -0.7 (-1.4 , 0.0) | 0.06 | 1999 - 2008 | 0.8 (-0.6, 2.2) | 0.27 | 2008 - 2020 | -1.8\*\* (-2.7 , -0.9) | <0.001 | NA | NA | NA |
| 80-84 years | -0.8\*\* (-1.2 , -0.3) | <0.001 | 1999 - 2017 | -0.2 (-0.4 , 0.0) | 0.06 | 2017 - 2020 | -4.1\*\* (-7.2 , -1.0) | 0.01 | NA | NA | NA |
| 85+ years | -0.1 (-0.3 , 0.0) | 0.10 | 1999 - 2020 | -0.1 (-0.3 , 0.0) | 0.10 | NA | NA | NA | NA | NA | NA |

\*\* indicates the p-value is significant after Holm-Bonferroni correction. \* indicates the p-value is <0.05, but not significant after Holm-Bonferroni correction.

**eTable 7.** Annual Percentage Changes in Metastatic Malignant Bladder Cancer Incidence Rates by Age Group and Gender From 1999-2020 in the US.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Age Groups Metastatic Malignant** | **Average APC from 1999-2020 (95%CI)**  | **p value** | **Segment 1 years** | **AAPC** | **p value** | **Segment 2 years** | **AAPC** | **p value** | **Segment 3 years** | **AAPC** | **p-value** |
| *All* |
| 35-39 years | 1.5 (-0.1, 3.2) | 0.07 | 1999 - 2020 | 1.5 (-0.1, 3.2) | 0.07 | NA | NA | NA | NA | NA | NA |
| 40-44 years | 0.05 (-1.2 , 1.3) | 0.93 | 1999 - 2020 | 0.05 (-1.2 , 1.3) | 0.93 | NA | NA | NA | NA | NA | NA |
| 45-49 years | 0.3 (-1.5 , 2.2) | 0.74 | 1999 - 2010 | 3.2\* (0.6 , 6.0) | 0.02 | 2010 - 2020 | -2.8 (-5.7 , 0.1) | 0.06 | NA | NA | NA |
| 50-54 years | 0.5 (-1.4 , 2.4) | 0.60 | 1999 - 2017 | 2.2\*\* (1.3 , 3.0) | < 0.001 | 2017 - 2020 | -8.8 (-20.1 , 4.0) | 0.16 | NA | NA | NA |
| 55-59 years | 1.3\*\* (0.6 , 2.0) | < 0.001 | 1999 - 2020 | 1.3\*\* (0.6 , 2.0) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 60-64 years | 2.0\*\* (1.7 , 2.4) | < 0.001 | 1999 - 2020 | 2.0\*\* (1.7 , 2.4) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 65-69 years | 1.5\*\* (1.0 , 2.0) | < 0.001 | 1999 - 2020 | 1.5\*\* (1.0 , 2.0) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 70-74 years | 1.2 (-0.3 , 2.7) | 0.11 | 1999 - 2017 | 2.1\*\*(1.4 , 2.8) | < 0.001 | 2017 - 2020 | -4.1 (-13.5 , 6.3) | 0.40 | NA | NA | NA |
| 75-79 years | 1.9\*\* (1.0 , 2.8) | < 0.001 | 1999 - 2008 | 3.3\*\* (1.6 , 5.1) | < 0.001 | 2008 - 2020 | 0.9 (-0.2 ,2.0) | 0.11 | NA | NA | NA |
| 80-84 years | 2.4\*\* (2.0 , 2.8) | < 0.001 | 1999 - 2020 | 2.4\*\* (2.0 , 2.8) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 85+ years | 2.5\*\* (2.0 , 2.9) | < 0.001 | 1999 - 2020 | 2.5\*\* (2.0 , 2.9) | < 0.001 | NA | NA | NA | NA | NA | NA |
| *Men* |
| 35-39 years | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 40-44 years | -0.6 (-2.4 , 1.3) | 0.52 | 1999 - 2020 | -0.6 (-2.4 , 1.3) | 0.52 | NA | NA | NA | NA | NA | NA |
| 45-49 years | -0.3 (-2.4 , 1.9) | 0.79 | 1999 - 2010 | 2.6 (-0.5, 5.7) | 0.10 | 2010 - 2020 | -3.3 (-6.6 , 0.1) | 0.06 | NA | NA | NA |
| 50-54 years | 0.08 (-2.0 , 2.2) | 0.94 | 1999 - 2017 | 1.6\*\* (0.7 , 2.6) | < 0.001 | 2017 - 2020 | -8.7 (-21.1 , 5.6) | 0.20 | NA | NA | NA |
| 55-59 years | 1.2\*\* (0.4 , 2.0) | 0.01 | 1999 - 2020 | 1.2\*\* (0.4 , 2.0) | 0.01 | NA | NA | NA | NA | NA | NA |
| 60-64 years | 2.2\*\* (1.7 , 2.8) | < 0.001 | 1999 - 2020 | 2.2\*\* (1.7 , 2.8) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 65-69 years | 1.8\*\* (1.2 , 2.3) | < 0.001 | 1999 - 2020 | 1.8\*\* (1.2 , 2.3) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 70-74 years | 1.1 (-0.5 , 2.7) | 0.19 | 1999 - 2017 | 2.2\*\* (1.5 , 3.0) | < 0.001 | 2017 - 2020 | -5.6 (-15.8 , 5.9) | 0.31 | NA | NA | NA |
| 75-79 years | 1.8\*\* (0.7 , 2.9) | < 0.001 | 1999 - 2009 | 3.4\*\* (1.5 , 5.3) | < 0.001 | 2009 - 2020 | 0.4 (-1.2 , 1.9) | 0.63 | NA | NA | NA |
| 80-84 years | 1.8 (-0.08 , 3.8) | 0.06 | 1999 - 2001 | -5.6 (-21.1 , 12.8) | 0.50 | 2001 - 2008 | 5.4\*\* (2.3 , 8.7) | < 0.001 | 2008 - 2020 | 1.1 (-0.01 , 2.1) | 0.05 |
| 85+ years | 2.6\*\* (1.9 , 3.2) | < 0.001 | 1999 - 2020 | 2.6\*\* (1.9 , 3.2) | < 0.001 | NA | NA | NA | NA | NA | NA |
| *Women* |
| 35-39 years | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 40-44 years | 1.0 (-0.6 , 2.6) | 0.21 | 1999 - 2020 | 1.0 (-0.6 , 2.6) | 0.21 | NA | NA | NA | NA | NA | NA |
| 45-49 years | 1.2 (-1.6 , 4.0) | 0.40 | 1999 - 2011 | 4.1\* (0.5 , 7.7) | 0.02 | 2011 - 2020 | -2.5 (-7.5 , 2.7) | 0.32 | NA | NA | NA |
| 50-54 years | 2.5\*\* (0.9 , 4.1) | < 0.001 | 1999 - 2020 | 2.5\*\* (0.9 , 4.1) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 55-59 years | 1.6\* (0.4 , 2.7) | 0.01 | 1999 - 2020 | 1.6\* (0.4 , 2.7) | 0.01 | NA | NA | NA | NA | NA | NA |
| 60-64 years | 1.6\*\* (0.7 , 2.5) | < 0.001 | 1999 - 2020 | 1.6\*\* (0.7 , 2.5) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 65-69 years | 0.8 (-0.2 , 1.7) | 0.11 | 1999 - 2020 | 0.8 (-0.2 , 1.7) | 0.11 | NA | NA | NA | NA | NA | NA |
| 70-74 years | 1.3\*\* (0.5 , 2.2) | < 0.001 | 1999 - 2020 | 1.3\*\* (0.5 , 2.2) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 75-79 years | 2.1\* (0.4 , 3.8) | 0.01 | 1999 - 2001 | 13.3 (-5.4 , 35.7) | 0.16 | 2001 - 2020 | 1.0\*\* (0.5 , 1.5) | < 0.001 | NA | NA | NA |
| 80-84 years | 1.6\*\* (0.9 , 2.3) | < 0.001 | 1999 - 2020 | 1.6\*\* (0.9 , 2.3) | < 0.001 | NA | NA | NA | NA | NA | NA |
| 85+ years | 1.3\*\* (0.6 , 2.0) | < 0.001 | 1999 - 2020 | 1.3\*\* (0.6 , 2.0) | < 0.001 | NA | NA | NA | NA | NA | NA |

\*\* indicates the p-value is significant after Holm-Bonferroni correction. \* indicates the p-value is <0.05, but not significant after Holm-Bonferroni correction.

**eTable 8.** Annual Percentage Changes in Bladder Cancer Death Rates by Census Region and Gender From 1999-2020 in the US.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Census Regions** | **Average APC from 1999-2020(95%CI)** | **p value** | **Segment 1** | **p value** | **Segment 2** | **p value** | **Segment 3** | **p value** | **Segment 4** | **p value** | **Segment 5** | **p value** |
| *All* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |
| Northeast | -1.0\*\*(-1.4,-0.7) | <0.001 | 1999-2016 | -0.2\*(-0.4,0.0) | 0.03 | 2016-2020 | -4.4\*\*(-6.0,-2.7) | <0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Midwest | -0.3\*(-0.5,-0.1) | 0.017 | 1999-2013 | 0.3\*(0.1,0.5) | 0.015 | 2013-2020 | -1.4\*\*(-2.0,-0.8) | <0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| South | -0.1(-0.3,0.2) | 0.54 | 1999-2014 | 0.3\*\*(0.1,0.5) | 0.004 | 2014-2020 | -1.1\*\*(-1.9,-0.3) | 0.011 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| West | -0.4\*\*(-0.6,-0.2) | 0.001 | 1999-2020 | -0.4\*\*(-0.6,-0.2) | 0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Men* |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Northeast | -1.2\*\*(-1.9,-0.6) | <0.001 | 1999-2003 | -2.0\*\*(-3.1,-0.9) | 0.003 | 2003-2010 | 0.8\*(0.2,1.4) | 0.017 | 2010-2013 | -2.2(-5.5,1.3) | 0.18 | 2013-2016 | -0.2(-3.6,3.3) | 0.91 | 2016-2020 | -3.9\*\*(-5.0,-2.9) | <0.001 |
| Midwest | -0.3\*(-0.6,-0.1) | 0.018 | 1999-2010 | 0.3(-0.1,0.7) | 0.13 | 2010-2020 | -1.1\*\*(-1.5,-0.6) | <0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| South | -0.2(-0.4,0.1) | 0.29 | 1999-2013 | 0.4\*\*(0.1,0.7) | 0.006 | 2013-2020 | -1.3\*\*(-2.0,-0.5) | 0.003 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| West | -0.5\*(-0.9,-0.1) | 0.013 | 1999-2012 | 0.0(-0.4,0.4) | 0.83 | 2012-2020 | -1.3\*\*(-2.1,-0.5) | 0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Women* |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Northeast | -1.4\*\*(-1.9,-0.8) | <0.001 | 1999-2016 | -0.6\*\*(-0.9,-0.3) | 0.001 | 2016-2020 | -4.7\*\*(-7.3,-2.1) | 0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Midwest | -0.6\*\*(-1.0,-0.2) | 0.001 | 1999-2013 | -0.1(-0.4,0.3) | 0.61 | 2013-2020 | -1.6\*\*(-2.6,-0.7) | 0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| South | -0.5\*\*(-0.7,-0.3) | <0.001 | 1999-2020 | -0.5\*\*(-0.7,-0.3) | <0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| West | -0.8\*\*(-1.1,-0.5) | <0.001 | 1999-2020 | -0.8\*\*(-1.1,-0.5) | <0.001 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

\*\* indicates the p-value is significant after Holm-Bonferroni correction. \* indicates the p-value is <0.05, but not significant after Holm-Bonferroni correction.

**eTable 9.** Annual Percentage Changes in Bladder Cancer Death Rates by Urbanization and Gender From 1999-2020 in the US.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Urbanization** | **Average APC from 1999-2020(95%CI)** | **p value** | **Segment 1** | **p value** | **Segment 2** | **p value** |
| *All* |   |   |   |   |   |   |   |   |
| Large Central Metro | -0.9\*\*(-1.1,-0.6) | <0.001 | 1999-2015 | -0.2\*(-0.4,-0.1) | 0.014 | 2015-2020 | -2.9\*\*(-3.9,-1.9) | <0.001 |
| Large Fringe Metro | -0.5\*\*(-0.8,-0.2) | 0.003 | 1999-2014 | 0.1(-0.2,0.3) | 0.62 | 2014-2020 | -1.8\*\*(-2.8,-0.8) | 0.001 |
| Medium Metro | -0.5\*\*(-0.8,-0.2) | 0.001 | 1999-2017 | 0.0(-0.2,0.1) | 0.54 | 2017-2020 | -3.3\*\*(-5.4,-1.3) | 0.004 |
| Small Metro | -0.1(-0.3,0.1) | 0.35 | 1999-2020 | -0.1(-0.3,0.1) | 0.35 | NA | NA | NA |
| Micropolitan (Nonmetro) | 0.2(0.0,0.5) | 0.078 | 1999-2020 | 0.2(0.0,0.5) | 0.078 | NA | NA | NA |
| Non-Core (Nonmetro) | 0.3\*(0.1,0.6) | 0.015 | 1999-2011 | 0.9\*\*(0.6,1.3) | <0.001 | 2011-2020 | -0.5(-1.0,0.0) | 0.068 |
| *Men* |  |  |  |  |  |  |  |   |
| Large Central Metro | -1.0\*\*(-1.3,-0.8) | <0.001 | 1999-2020 | -1.0\*\*(-1.3,-0.8) | <0.001 | NA | NA | NA |
| Large Fringe Metro | -0.8\*\*(-1.1,-0.5) | <0.001 | 1999-2020 | -0.8\*\*(-1.1,-0.5) | <0.001 | NA | NA | NA |
| Medium Metro | -0.6\*\*(-1.0,-0.2) | 0.002 | 1999-2016 | -0.1(-0.4,0.1) | 0.2 | 2016-2020 | -2.7\*\*(-4.7,-0.7) | 0.011 |
| Small Metro | -0.2(-0.7,0.4) | 0.53 | 1999-2007 | 0.7(-0.6,1.9) | 0.27 | 2007-2020 | -0.7\*(-1.3,-0.1) | 0.025 |
| Micropolitan (Nonmetro) | 0.0(-0.3,0.3) | 0.83 | 1999-2020 | 0.0(-0.3,0.3) | 0.83 | NA | NA | NA |
| Non-Core (Nonmetro) | 0.2(-0.2,0.6) | 0.38 | 1999-2011 | 0.8\*\*(0.3,1.3) | 0.002 | 2011-2020 | -0.7(-1.4,0.0) | 0.065 |
| *Women* |   |   |   |   |   |   |   |   |
| Large Central Metro | -1.0\*\*(-1.3,-0.8) | <0.001 | 1999-2020 | -1.0\*\*(-1.3,-0.8) | <0.001 | NA | NA | NA |
| Large Fringe Metro | -0.8\*\*(-1.1,-0.5) | <0.001 | 1999-2020 | -0.8\*\*(-1.1,-0.5) | <0.001 | NA | NA | NA |
| Medium Metro | -0.6\*\*(-0.9,-0.3) | <0.001 | 1999-2020 | -0.6\*\*(-0.9,-0.3) | <0.001 | NA | NA | NA |
| Small Metro | -0.6\*\*(-0.9,-0.2) | 0.002 | 1999-2020 | -0.6\*\*(-0.9,-0.2) | 0.002 | NA | NA | NA |
| Micropolitan (Nonmetro) | -0.1(-0.5,0.3) | 0.63 | 1999-2020 | -0.1(-0.5,0.3) | 0.63 | NA | NA | NA |
| Non-Core (Nonmetro) | 0.0(-0.4,0.3) | 0.88 | 1999-2020 | 0.0(-0.4,0.3) | 0.88 | NA | NA | NA |

\*\* indicates the p-value is significant after Holm-Bonferroni correction. \* indicates the p-value is <0.05, but not significant after Holm-Bonferroni correction.