

**Supplementary Table 1:** Cardiogenic Shock related mortalities in Older Adults with Essential Hypertension and Type 2 Diabetes Mellitus, Stratified by Sex and Race in the United States, 1999 to 2023

| Deaths |         |        |        |          |          |                                  |          |            |
|--------|---------|--------|--------|----------|----------|----------------------------------|----------|------------|
| Year   | Overall | Women  | Men    | NH White | NH Black | American Indian or Alaska Native | Hispanic | Population |
| 1999   | 3,485   | 1,318  | 2,167  | 2,785    | 448      | 21                               | 150      | 34,797,841 |
| 2000   | 10,075  | 3,893  | 6,182  | 8,148    | 1,221    | 41                               | 473      | 34,991,753 |
| 2001   | 11,329  | 4,512  | 6,817  | 9,069    | 1,363    | 58                               | 605      | 35,290,291 |
| 2002   | 12,612  | 5,239  | 7,373  | 10,038   | 1,546    | 82                               | 681      | 35,522,207 |
| 2003   | 13,584  | 5,691  | 7,893  | 10,848   | 1,637    | 96                               | 738      | 35,863,529 |
| 2004   | 14,783  | 6,144  | 8,639  | 11,842   | 1,743    | 95                               | 781      | 36,203,319 |
| 2005   | 16,146  | 6,810  | 9,336  | 12,755   | 1,965    | 113                              | 982      | 36,649,798 |
| 2006   | 16,937  | 7,290  | 9,647  | 13,245   | 2,123    | 92                               | 1,099    | 37,164,107 |
| 2007   | 18,057  | 7,741  | 10,316 | 14,119   | 2,143    | 127                              | 1,236    | 37,825,711 |
| 2008   | 19,098  | 8,269  | 10,829 | 14,921   | 2,170    | 100                              | 1,385    | 38,777,621 |
| 2009   | 19,669  | 8,802  | 10,867 | 15,158   | 2,316    | 141                              | 1,520    | 39,623,175 |
| 2010   | 20,729  | 9,241  | 11,488 | 15,855   | 2,460    | 140                              | 1,700    | 40,267,984 |
| 2011   | 22,308  | 10,128 | 12,180 | 16,846   | 2,697    | 127                              | 1,928    | 41,394,141 |
| 2012   | 23,771  | 10,937 | 12,834 | 17,730   | 2,894    | 186                              | 2,164    | 43,145,356 |
| 2013   | 22,502  | 10,541 | 11,961 | 16,686   | 2,589    | 176                              | 2,193    | 44,704,074 |
| 2014   | 22,609  | 10,686 | 11,923 | 16,498   | 2,595    | 203                              | 2,359    | 46,243,211 |
| 2015   | 24,803  | 11,919 | 12,884 | 18,019   | 2,784    | 213                              | 2,598    | 47,760,852 |
| 2016   | 28,918  | 14,126 | 14,792 | 20,821   | 3,349    | 216                              | 3,182    | 49,244,195 |
| 2017   | 32,291  | 15,697 | 16,594 | 23,081   | 3,671    | 292                              | 3,642    | 50,858,679 |
| 2018   | 35,124  | 17,621 | 17,503 | 24,926   | 3,985    | 311                              | 4,009    | 52,431,193 |
| 2019   | 37,250  | 18,874 | 18,376 | 26,429   | 4,166    | 324                              | 4,278    | 54,058,263 |
| 2020   | 52,018  | 26,517 | 25,501 | 34,732   | 6,317    | 527                              | 7,354    | 55,659,365 |
| 2021   | 54,738  | 28,357 | 26,381 | 37,025   | 6,097    | 493                              | 7,658    | 55,847,953 |
| 2022   | 53,326  | 27,594 | 25,732 | 37,082   | 5,923    | 418                              | 6,613    | 57,794,852 |
| 2023   | 50,629  | 26,408 | 24,221 | 35,138   | 5,591    | 401                              | 6,270    | 59,248,361 |
| 2024   | 52,518  | 27,468 | 25,050 | 36,422   | 5,919    | 407                              | 6,495    | 59,248,361 |

**Supplementary Table 2: Place-of-death counts (1999-2024)**

| Year | Medical facility | Nursing home /<br>LTCF | Hospice | Home   |
|------|------------------|------------------------|---------|--------|
| 1999 | 1,464            | 996                    | —       | 919    |
| 2000 | 4,561            | 3,050                  | —       | 2,240  |
| 2001 | 4,949            | 3,529                  | —       | 2,514  |
| 2002 | 5,255            | 4,021                  | —       | 2,985  |
| 2003 | 5,553            | 4,230                  | 14      | 3,310  |
| 2004 | 5,758            | 4,769                  | 34      | 3,657  |
| 2005 | 6,174            | 5,182                  | 132     | 4,099  |
| 2006 | 6,355            | 5,312                  | 187     | 4,454  |
| 2007 | 6,648            | 5,693                  | 295     | 4,705  |
| 2008 | 6,827            | 5,792                  | 401     | 5,195  |
| 2009 | 6,561            | 5,813                  | 512     | 5,688  |
| 2010 | 7,064            | 6,234                  | 541     | 6,061  |
| 2011 | 7,298            | 6,789                  | 669     | 6,640  |
| 2012 | 7,553            | 7,165                  | 857     | 7,185  |
| 2013 | 6,886            | 6,655                  | 797     | 7,153  |
| 2014 | 6,707            | 6,647                  | 891     | 7,464  |
| 2015 | 7,440            | 7,031                  | 866     | 8,563  |
| 2016 | 8,215            | 8,115                  | 1,367   | 10,010 |
| 2017 | 8,899            | 9,159                  | 1,556   | 11,209 |
| 2018 | 9,413            | 9,843                  | 1,488   | 12,836 |
| 2019 | 9,944            | 9,945                  | 1,735   | 13,932 |
| 2020 | 15,414           | 12,342                 | 1,873   | 20,195 |
| 2021 | 17,417           | 10,890                 | 2,266   | 21,619 |
| 2022 | 14,725           | 11,260                 | 2,565   | 21,857 |
| 2023 | 13,217           | 11,635                 | 2,649   | 20,771 |
| 2024 | 13,368           | 11,964                 | 2,727   | 21,502 |

**Supplementary Table 3:** Joinpoint regression – Annual Percent Change (APC)

| Annual Percent<br>age Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) | Annual<br>Percent<br>age<br>Change<br>(APC) |
|---------------------------------------|---|---|---|---|---|---|---|---|
| Cohort                                | Segmen<br>t                                 | Lower<br>Endpoi<br>nt                       | Upper<br>Endpoi<br>nt                       | APC   | Lower CI                                    | Upper CI                                    | Test<br>Statistic                           | P-Value                                     |
| Overall -<br>3<br>Joinpoint<br>s      | 1   | 1999  | 2001  | 59.9904<br>*                                | 18.945                                      | 103.688<br>8                                | --  | <<br>0.00000<br>1                           |
| Overall -<br>3<br>Joinpoint<br>s      | 2   | 2001  | 2016  | 2.8355*                                     | 0.7817                                      | 3.8228                                      | --  | 0.02679<br>5                                |
| Overall -<br>3<br>Joinpoint<br>s      | 3   | 2016  | 2021  | 12.5707<br>*                                | 8.5744                                      | 20.2583                                     | --  | 0.0004                                      |
| Overall -<br>3<br>Joinpoint<br>s      | 4   | 2021  | 2024  | -3.5358                                     | -<br>10.2783                                | 1.3515                                      | --  | 0.18076<br>4                                |
| Female -<br>3<br>Joinpoint<br>s       | 1   | 1999  | 2001  | 65.2691<br>*                                | 25.2811                                     | 105.661<br>7                                | --  | <<br>0.00000<br>1                           |
| Female -<br>3<br>Joinpoint<br>s       | 2   | 2001  | 2017  | 2.4656*                                     | 0.763                                       | 3.4018                                      | --  | 0.01919<br>6                                |
| Female -<br>3<br>Joinpoint<br>s       | 3   | 2017  | 2021  | 13.4100<br>*                                | 7.8238                                      | 20.5137                                     | --  | 0.002                                       |
| Female -<br>3<br>Joinpoint<br>s       | 4   | 2021  | 2024  | -4.312                                      | -<br>11.8777                                | 0.8614                                      | --  | 0.11837<br>6                                |
| Male - 3<br>Joinpoint<br>s            | 1   | 1999  | 2001  | 66.5376<br>*                                | 24.3465                                     | 106.151                                     | --  | <<br>0.00000<br>1                           |
| Male - 3<br>Joinpoint<br>s            | 2   | 2001  | 2017  | 3.9243*                                     | 2.6245                                      | 4.805                                       | --  | 0.0016                                      |
| Male - 3<br>Joinpoint<br>s            | 3   | 2017  | 2021  | 14.9295<br>*                                | 10.1685                                     | 20.6672                                     | --  | <<br>0.00000<br>1                           |

|                     |   |      |      |         |         |        |    |          |
|---------------------|---|------|------|---------|---------|--------|----|----------|
| Male - 3 Joinpoints | 4 | 2021 | 2024 | -3.7423 | -9.3355 | 0.8924 | -- | 0.119576 |
|---------------------|---|------|------|---------|---------|--------|----|----------|

| Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Cohort                         | Segment                        | Lower Endpoint                 | Upper Endpoint                 | APC                            | Lower CI                       | Upper CI                       | Test Statistic                 | P-Value                        |
| Northeast - 3 Joinpoints       | 1                              | 1999                           | 2001                           | 43.2263*                       | 10.5049                        | 72.7205                        | --                             | < 0.000001                     |
| Northeast - 3 Joinpoints       | 2                              | 2001                           | 2017                           | 1.5291                         | -0.3165                        | 2.3378                         | --                             | 0.067187                       |
| Northeast - 3 Joinpoints       | 3                              | 2017                           | 2020                           | 19.7637*                       | 10.6799                        | 24.8543                        | --                             | < 0.000001                     |
| Northeast - 3 Joinpoints       | 4                              | 2020                           | 2024                           | -3.2579                        | -8.9955                        | 0.0658                         | --                             | 0.05239                        |
| Midwest - 3 Joinpoints         | 1                              | 1999                           | 2001                           | 62.5535*                       | 19.3922                        | 112.0404                       | --                             | < 0.000001                     |
| Midwest - 3 Joinpoints         | 2                              | 2001                           | 2018                           | 2.3338                         | -0.4052                        | 3.2701                         | --                             | 0.060388                       |
| Midwest - 3 Joinpoints         | 3                              | 2018                           | 2021                           | 15.5503*                       | 6.3414                         | 20.5961                        | --                             | 0.013197                       |
| Midwest - 3 Joinpoints         | 4                              | 2021                           | 2024                           | -4.9841                        | -14.6085                       | 0.8808                         | --                             | 0.083583                       |
| South - 4 Joinpoints           | 1                              | 1999                           | 2001                           | 61.0508*                       | 26.0889                        | 99.0719                        | --                             | < 0.000001                     |
| South - 4 Joinpoints           | 2                              | 2001                           | 2010                           | 4.1398*                        | 2.2523                         | 8.0513                         | --                             | 0.011598                       |

|                         |   |      |      |          |          |         |    |           |
|-------------------------|---|------|------|----------|----------|---------|----|-----------|
| South - 4<br>Joinpoints | 3 | 2010 | 2015 | -2.3295  | -9.3293  | 1.4318  | -- | 0.219156  |
| South - 4<br>Joinpoints | 4 | 2015 | 2021 | 12.4108* | 9.7934   | 20.302  | -- | 0.0004    |
| South - 4<br>Joinpoints | 5 | 2021 | 2024 | -2.4712  | -10.3789 | 2.5435  | -- | 0.30194   |
| West - 3<br>Joinpoints  | 1 | 1999 | 2001 | 62.6711* | 10.1789  | 132.9   | -- | <0.000001 |
| West - 3<br>Joinpoints  | 2 | 2001 | 2018 | 6.569    | -1.7618  | 7.4628  | -- | 0.070786  |
| West - 3<br>Joinpoints  | 3 | 2018 | 2021 | 17.1132* | 9.7167   | 21.4578 | -- | <0.000001 |
| West - 3<br>Joinpoints  | 4 | 2021 | 2024 | -4.4429* | -11.3613 | -0.097  | -- | 0.045991  |

| Annual<br>Percentage<br>Change<br>(APC)                     | Annual<br>Percentage<br>Change<br>(APC) | Annual<br>Percentage<br>Change<br>(APC) | Annual<br>Percentage<br>Change<br>(APC) | Annual<br>Percentage<br>Change<br>(APC) | Annual<br>Percentage<br>Change<br>(APC) | Annual<br>Percentage<br>Change<br>(APC) | Annual<br>Percentage<br>Change<br>(APC) | Annual<br>Percentage<br>Change<br>(APC) |
|---|---|---|---|---|---|---|---|---|
| Cohort  | Segment                                 | Lower<br>Endpoint                       | Upper<br>Endpoint                       | APC                                     | Lower CI                                | Upper CI                                | Test<br>Statistic                       | P-Value                                 |
| American<br>Indian or<br>Alaska<br>Native - 3<br>Joinpoints | 1                                       | 1999                                    | 2002                                    | 50.9823*                                | 18.5776                                 | 141.9132                                | --                                      | <0.000001                               |
| American<br>Indian or<br>Alaska<br>Native - 3<br>Joinpoints | 2                                       | 2002                                    | 2016                                    | 2.1764                                  | -3.2464                                 | 3.7776                                  | --                                      | 0.190362                                |
| American<br>Indian or<br>Alaska<br>Native - 3<br>Joinpoints | 3                                       | 2016                                    | 2021                                    | 12.6129*                                | 7.4944                                  | 21.8071                                 | --                                      | <0.000001                               |

|   |   |      |      |           |          |         |    |           |
|---|---|------|------|-----------|----------|---------|----|-----------|
| American Indian or Alaska Native - 3 Joinpoints | 4 | 2021 | 2024 | -12.1191* | -21.2249 | -5.3706 | -- | <0.000001 |
| Black or African American - 3 Joinpoints        | 1 | 1999 | 2001 | 63.4719*  | 9.6341   | 129.547 | -- | <0.000001 |
| Black or African American - 3 Joinpoints        | 2 | 2001 | 2018 | 2.2375    | -5.6686  | 3.2737  | -- | 0.155169  |
| Black or African American - 3 Joinpoints        | 3 | 2018 | 2021 | 15.6388*  | 6.1031   | 21.4845 | -- | 0.010798  |
| Black or African American - 3 Joinpoints        | 4 | 2021 | 2024 | -5.4802   | -16.0261 | 1.0117  | -- | 0.077984  |
| White - 3 Joinpoints                            | 1 | 1999 | 2001 | 55.8527*  | 20.0917  | 86.5789 | -- | <0.000001 |
| White - 3 Joinpoints                            | 2 | 2001 | 2018 | 3.2950*   | 2.1607   | 3.9815  | -- | 0.003199  |
| White - 3 Joinpoints                            | 3 | 2018 | 2021 | 16.4237*  | 9.6763   | 20.3292 | -- | 0.0016    |
| White - 3 Joinpoints                            | 4 | 2021 | 2024 | -3.0617   | -10.5442 | 1.5504  | -- | 0.15037   |
| Hispanics - 2 Joinpoints                        | 1 | 1999 | 2018 | 5.8228*   | 3.5242   | 7.2613  | -- | 0.019996  |
| Hispanics - 2 Joinpoints                        | 2 | 2018 | 2021 | 19.7043*  | 10.1572  | 25.333  | -- | <0.000001 |

|                          |   |      |      |           |          |         |    |        |
|--------------------------|---|------|------|-----------|----------|---------|----|--------|
| Hispanics - 2 Joinpoints | 3 | 2021 | 2024 | -10.0175* | -19.5366 | -4.1578 | -- | 0.0012 |
|--------------------------|---|------|------|-----------|----------|---------|----|--------|

| Annual Percentage Change (APC)  | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) | Annual Percentage Change (APC) |
|---------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Cohort                          | Segment                        | Lower Endpoint                 | Upper Endpoint                 | APC                            | Lower CI                       | Upper CI                       | Test Statistic                 | P-Value                        |
| Metropolitan - 2 Joinpoints     | 1                              | 1999                           | 2001                           | 53.6957*                       | 18.0437                        | 83.2161                        | --                             | < 0.000001                     |
| Metropolitan - 2 Joinpoints     | 2                              | 2001                           | 2018                           | 3.8209*                        | 2.5303                         | 4.5272                         | --                             | 0.009598                       |
| Metropolitan - 2 Joinpoints     | 3                              | 2018                           | 2020                           | 20.0591*                       | 9.02                           | 27.1014                        | --                             | < 0.000001                     |
| Non-Metropolitan - 2 Joinpoints | 1                              | 1999                           | 2001                           | 71.9437*                       | 23.4709                        | 121.011                        | --                             | < 0.000001                     |
| Non-Metropolitan - 2 Joinpoints | 2                              | 2001                           | 2018                           | 2.3601                         | -0.0386                        | 3.2729                         | --                             | 0.05159                        |
| Non-Metropolitan - 2 Joinpoints | 3                              | 2018                           | 2020                           | 23.0206*                       | 7.0504                         | 32.0056                        | --                             | < 0.000001                     |

**Supplementary Table 4:** Overall & sex-stratified age-adjusted mortality rates

| Age-Adjusted Rate<br>(95% CI) | Age-Adjusted Rate<br>(95% CI) | Age-Adjusted Rate<br>(95% CI) | Age-Adjusted Rate<br>(95% CI) |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Year                          | Men                           | Women                         | Overall                       |
| 1999                          | 10.1 (9.5 to 10.6)            | 10.1 (9.7 to 10.5)            | 10.1 (9.8 to 10.4)            |
| 2000                          | 29.3 (28.4 to 30.2)           | 28.5 (27.8 to 29.2)           | 28.9 (28.3 to 29.5)           |
| 2001                          | 33.3 (32.4 to 34.3)           | 31.0 (30.2 to 31.7)           | 32.1 (31.5 to 32.7)           |
| 2002                          | 38.3 (37.3 to 39.4)           | 33.3 (32.6 to 34.1)           | 35.4 (34.8 to 36.0)           |
| 2003                          | 40.7 (39.7 to 41.8)           | 35.3 (34.6 to 36.1)           | 37.6 (37.0 to 38.2)           |
| 2004                          | 43.5 (42.4 to 44.6)           | 38.3 (37.5 to 39.1)           | 40.5 (39.8 to 41.1)           |
| 2005                          | 47.1 (45.9 to 48.2)           | 40.8 (40.0 to 41.7)           | 43.5 (42.8 to 44.1)           |
| 2006                          | 49.3 (48.1 to 50.4)           | 41.6 (40.7 to 42.4)           | 44.9 (44.2 to 45.6)           |
| 2007                          | 51.2 (50.1 to 52.4)           | 43.8 (42.9 to 44.6)           | 47.0 (46.3 to 47.7)           |
| 2008                          | 53.4 (52.2 to 54.5)           | 45.2 (44.3 to 46.1)           | 48.7 (48.0 to 49.4)           |
| 2009                          | 55.3 (54.1 to 56.5)           | 44.7 (43.8 to 45.5)           | 49.2 (48.6 to 49.9)           |
| 2010                          | 57.2 (56.0 to 58.4)           | 46.6 (45.7 to 47.5)           | 51.1 (50.4 to 51.8)           |
| 2011                          | 60.5 (59.3 to 61.7)           | 48.4 (47.5 to 49.2)           | 53.5 (52.8 to 54.2)           |
| 2012                          | 63.1 (61.9 to 64.3)           | 49.5 (48.6 to 50.4)           | 55.3 (54.6 to 56.0)           |
| 2013                          | 58.7 (57.5 to 59.8)           | 45.3 (44.5 to 46.1)           | 51.0 (50.3 to 51.7)           |
| 2014                          | 57.2 (56.1 to 58.3)           | 44.2 (43.4 to 45.0)           | 49.8 (49.2 to 50.5)           |
| 2015                          | 61.9 (60.8 to 63.0)           | 46.8 (46.0 to 47.6)           | 53.2 (52.6 to 53.9)           |
| 2016                          | 71.3 (70.1 to 72.5)           | 52.6 (51.8 to 53.5)           | 60.6 (59.9 to 61.3)           |
| 2017                          | 76.8 (75.6 to 78.0)           | 57.6 (56.7 to 58.5)           | 65.9 (65.2 to 66.6)           |
| 2018                          | 83.2 (81.9 to 84.4)           | 59.3 (58.5 to 60.2)           | 69.6 (68.9 to 70.3)           |
| 2019                          | 86.4 (85.1 to 87.6)           | 60.9 (60.0 to 61.8)           | 72.0 (71.3 to 72.7)           |
| 2020                          | 117.7 (116.3 to 119.2)        | 83.1 (82.0 to 84.1)           | 98.1 (97.3 to 99.0)           |
| 2021                          | 127.8 (126.3 to 129.3)        | 89.5 (88.4 to 90.6)           | 106.1 (105.2 to 107.0)        |
| 2022                          | 120.0 (118.6 to 121.4)        | 81.7 (80.7 to 82.7)           | 98.0 (97.2 to 98.9)           |
| 2023                          | 111.9 (110.6 to 113.3)        | 77.2 (76.2 to 78.2)           | 92.3 (91.5 to 93.1)           |
| 2024                          | 116.5 (115.1 to 117.9)        | 80.0 (79.0 to 81.0)           | 95.9 (95.0 to 96.7)           |



**Supplementary Table 5: Age-adjusted mortality rates by U.S. Census Region**

| <b>Year</b> | <b>Census Region 1:<br/>Northeast</b> | <b>Census Region 2:<br/>Midwest</b> | <b>Census Region 3:<br/>South</b> | <b>Census Region 4:<br/>West</b> |
|-------------|---------------------------------------|-------------------------------------|-----------------------------------|----------------------------------|
| 1999        | 9.9 (9.1 to 10.6)                     | 13.3 (12.5 to 14.0)                 | 8.4 (7.9 to 8.9)                  | 9.6 (8.9 to 10.4)                |
| 2000        | 25.4 (24.2 to 26.5)                   | 36.8 (35.5 to 38.1)                 | 28.3 (27.3 to 29.2)               | 24.2 (23.1 to 25.4)              |
| 2001        | 26.1 (24.9 to 27.2)                   | 40.3 (39.0 to 41.7)                 | 32.5 (31.5 to 33.5)               | 27.9 (26.7 to 29.2)              |
| 2002        | 27.5 (26.3 to 28.7)                   | 44.5 (43.0 to 45.9)                 | 35.9 (34.9 to 37.0)               | 31.7 (30.4 to 33.0)              |
| 2003        | 28.5 (27.3 to 29.7)                   | 48.5 (47.0 to 50.0)                 | 37.7 (36.6 to 38.7)               | 34.2 (32.9 to 35.6)              |
| 2004        | 31.2 (29.9 to 32.4)                   | 51.1 (49.6 to 52.6)                 | 39.9 (38.8 to 41.0)               | 38.5 (37.1 to 39.9)              |
| 2005        | 31.5 (30.3 to 32.8)                   | 54.0 (52.5 to 55.6)                 | 44.4 (43.3 to 45.6)               | 41.9 (40.4 to 43.3)              |
| 2006        | 30.7 (29.5 to 32.0)                   | 54.6 (53.1 to 56.2)                 | 46.6 (45.5 to 47.8)               | 44.8 (43.3 to 46.3)              |
| 2007        | 30.7 (29.5 to 32.0)                   | 58.3 (56.8 to 59.9)                 | 47.2 (46.0 to 48.3)               | 49.9 (48.3 to 51.4)              |
| 2008        | 31.8 (30.5 to 33.0)                   | 59.6 (58.0 to 61.2)                 | 45.9 (44.7 to 47.0)               | 57.8 (56.2 to 59.5)              |
| 2009        | 32.3 (31.0 to 33.5)                   | 58.4 (56.8 to 60.0)                 | 48.7 (47.6 to 49.9)               | 56.3 (54.7 to 57.9)              |
| 2010        | 34.5 (33.3 to 35.8)                   | 58.3 (56.7 to 59.8)                 | 49.7 (48.5 to 50.8)               | 61.4 (59.7 to 63.1)              |
| 2011        | 35.0 (33.7 to 36.3)                   | 62.2 (60.6 to 63.8)                 | 50.5 (49.3 to 51.6)               | 66.6 (64.8 to 68.3)              |
| 2012        | 37.6 (36.3 to 38.9)                   | 62.8 (61.2 to 64.3)                 | 51.5 (50.4 to 52.7)               | 69.9 (68.2 to 71.6)              |
| 2013        | 32.2 (31.0 to 33.4)                   | 55.7 (54.2 to 57.2)                 | 47.0 (46.0 to 48.1)               | 69.7 (68.0 to 71.4)              |
| 2014        | 31.3 (30.1 to 32.5)                   | 54.6 (53.2 to 56.1)                 | 45.1 (44.1 to 46.1)               | 69.4 (67.7 to 71.0)              |
| 2015        | 34.5 (33.2 to 35.7)                   | 59.3 (57.8 to 60.8)                 | 46.6 (45.5 to 47.6)               | 74.7 (73.0 to 76.4)              |
| 2016        | 37.5 (36.2 to 38.8)                   | 67.0 (65.4 to 68.6)                 | 55.1 (54.0 to 56.2)               | 83.4 (81.7 to 85.2)              |
| 2017        | 39.8 (38.5 to 41.1)                   | 71.9 (70.3 to 73.5)                 | 58.7 (57.6 to 59.9)               | 94.3 (92.5 to 96.2)              |
| 2018        | 43.7 (42.4 to 45.0)                   | 73.8 (72.1 to 75.4)                 | 62.7 (61.6 to 63.9)               | 99.0 (97.1 to 100.8)             |
| 2019        | 44.8 (43.5 to 46.2)                   | 75.8 (74.2 to 77.4)                 | 65.0 (63.9 to 66.2)               | 102.7 (100.8 to 104.5)           |
| 2020        | 65.4 (63.8 to 67.0)                   | 102.2 (100.3 to 104.0)              | 87.4 (86.1 to 88.7)               | 139.3 (137.2 to 141.5)           |
| 2021        | 64.4 (62.7 to 66.0)                   | 108.3 (106.3 to 110.2)              | 94.9 (93.5 to 96.3)               | 158.3 (156.0 to 160.7)           |
| 2022        | 57.6 (56.1 to 59.1)                   | 98.3 (96.4 to 100.1)                | 89.5 (88.2 to 90.8)               | 145.9 (143.7 to 148.0)           |
| 2023        | 55.2 (53.7 to 56.6)                   | 93.1 (91.4 to 94.9)                 | 84.8 (83.5 to 86.0)               | 135.0 (133.0 to 137.1)           |

**Supplementary Table 6: Race-stratified age-adjusted mortality rates**

| Year | American Indian<br>or Alaska Native | Black or African<br>American | Hispanics            | White               |
|------|-------------------------------------|------------------------------|----------------------|---------------------|
| 1999 | 17.6 (10.8 to 27.2)                 | 16.6 (15.1 to 18.2)          | 8.7 (12.1 to 0.9)    | 9.4 (9.1 to 9.8)    |
| 2000 | 32.0 (22.9 to 43.6)                 | 44.7 (42.2 to 47.2)          | 28.0 (33.7 to 1.4)   | 27.4 (26.8 to 28.0) |
| 2001 | 44.0 (33.2 to 57.1)                 | 49.7 (47.1 to 52.4)          | 34.5 (40.6 to 1.6)   | 30.2 (29.6 to 30.9) |
| 2002 | 62.6 (49.5 to 78.2)                 | 55.6 (52.8 to 58.4)          | 36.7 (42.8 to 1.6)   | 33.2 (32.6 to 33.9) |
| 2003 | 73.7 (59.5 to 90.2)                 | 58.2 (55.4 to 61.0)          | 37.7 (43.7 to 1.5)   | 35.6 (34.9 to 36.3) |
| 2004 | 67.9 (54.6 to 83.4)                 | 61.5 (58.6 to 64.4)          | 38.6 (44.6 to 1.5)   | 38.5 (37.8 to 39.2) |
| 2005 | 77.7 (62.9 to 92.4)                 | 67.8 (64.8 to 70.8)          | 45.7 (51.9 to 1.6)   | 41.0 (40.3 to 41.7) |
| 2006 | 64.4 (51.6 to 79.3)                 | 71.7 (68.7 to 74.8)          | 49.2 (55.5 to 1.6)   | 42.0 (41.3 to 42.7) |
| 2007 | 82.0 (67.3 to 96.6)                 | 71.4 (68.3 to 74.4)          | 53.3 (59.7 to 1.6)   | 44.1 (43.4 to 44.8) |
| 2008 | 61.7 (49.2 to 74.1)                 | 70.4 (67.4 to 73.4)          | 56.9 (63.3 to 1.6)   | 45.9 (45.2 to 46.6) |
| 2009 | 84.1 (69.8 to 98.4)                 | 72.8 (69.9 to 75.8)          | 59.4 (65.7 to 1.6)   | 46.0 (45.3 to 46.8) |
| 2010 | 82.5 (68.5 to 96.5)                 | 75.6 (72.6 to 78.6)          | 64.3 (70.7 to 1.7)   | 47.5 (46.7 to 48.2) |
| 2011 | 67.3 (55.3 to 79.3)                 | 80.3 (77.3 to 83.4)          | 67.3 (73.7 to 1.6)   | 49.5 (48.7 to 50.2) |
| 2012 | 93.5 (79.7 to 107.4)                | 82.8 (79.7 to 85.8)          | 72.1 (78.5 to 1.6)   | 50.7 (49.9 to 51.4) |
| 2013 | 85.0 (72.1 to 97.9)                 | 71.4 (68.6 to 74.2)          | 68.6 (74.6 to 1.5)   | 46.8 (46.1 to 47.6) |
| 2014 | 89.6 (76.9 to 102.3)                | 68.4 (65.8 to 71.1)          | 69.2 (75.1 to 1.5)   | 45.4 (44.7 to 46.1) |
| 2015 | 90.1 (77.7 to 102.6)                | 70.5 (67.8 to 73.1)          | 71.3 (77.1 to 1.5)   | 48.8 (48.0 to 49.5) |
| 2016 | 85.2 (73.5 to 96.9)                 | 81.9 (79.1 to 84.7)          | 83.7 (89.8 to 1.6)   | 55.3 (54.5 to 56.0) |
| 2017 | 110.2 (97.2 to 123.2)               | 86.1 (83.3 to 88.9)          | 90.9 (97.0 to 1.6)   | 60.0 (59.3 to 60.8) |
| 2018 | 110.0 (97.4 to 122.5)               | 89.8 (87.0 to 92.7)          | 94.9 (101.0 to 1.6)  | 63.3 (62.5 to 64.1) |
| 2019 | 109.5 (97.3 to 121.7)               | 90.6 (87.8 to 93.4)          | 97.4 (103.5 to 1.6)  | 65.7 (64.9 to 66.5) |
| 2020 | 167.2 (152.6 to 181.9)              | 131.6 (128.3 to 134.9)       | 159.5 (167.1 to 1.9) | 85.1 (84.2 to 86.0) |
| 2021 | 168.5 (153.3 to 183.8)              | 130.1 (126.7 to 133.4)       | 163.7 (171.4 to 1.9) | 94.7 (93.8 to 95.7) |
| 2022 | 129.9 (117.2 to 142.6)              | 121.8 (118.6 to 125.0)       | 135.3 (142.1 to 1.7) | 89.9 (88.9 to 90.8) |
| 2023 | 119.8 (107.9 to 131.7)              | 112.1 (109.1 to 115.1)       | 124.3 (130.7 to 1.6) | 85.1 (84.2 to 86.0) |
| 2024 | 119.6 (107.7 to 131.4)              | 118 (115.7 to 121)           | 128.9 (135.5 to 1.7) | 88.3 (87.4 to 89.2) |

**Supplementary Table 7: Urban-rural age-adjusted mortality rates**

| <b>Year</b> | <b>Urban</b>        | <b>Rural</b>           |
|-------------|---------------------|------------------------|
| 1999        | 9.8 (9.5 to 10.2)   | 11.4 (10.6 to 12.2)    |
| 2000        | 27.1 (26.5 to 27.7) | 36.3 (34.9 to 37.7)    |
| 2001        | 30.0 (29.4 to 30.7) | 40.9 (39.4 to 42.4)    |
| 2002        | 32.5 (31.8 to 33.1) | 47.7 (46.0 to 49.3)    |
| 2003        | 34.7 (34.1 to 35.4) | 49.9 (48.2 to 51.5)    |
| 2004        | 37.6 (36.9 to 38.3) | 52.7 (51.0 to 54.4)    |
| 2005        | 40.3 (39.6 to 41.0) | 57.4 (55.6 to 59.1)    |
| 2006        | 42.3 (41.5 to 43.0) | 56.3 (54.6 to 58.1)    |
| 2007        | 43.7 (43.0 to 44.5) | 61.4 (59.6 to 63.2)    |
| 2008        | 45.7 (45.0 to 46.5) | 62.0 (60.1 to 63.8)    |
| 2009        | 46.4 (45.7 to 47.2) | 62.0 (60.2 to 63.8)    |
| 2010        | 48.8 (48.0 to 49.5) | 61.4 (59.6 to 63.2)    |
| 2011        | 50.9 (50.1 to 51.7) | 65.5 (63.7 to 67.4)    |
| 2012        | 53.0 (52.3 to 53.8) | 65.9 (64.1 to 67.8)    |
| 2013        | 49.3 (48.6 to 50.0) | 59.0 (57.3 to 60.8)    |
| 2014        | 48.3 (47.6 to 49.0) | 57.2 (55.5 to 58.9)    |
| 2015        | 51.4 (50.7 to 52.1) | 62.0 (60.3 to 63.7)    |
| 2016        | 59.0 (58.3 to 59.8) | 68.5 (66.7 to 70.3)    |
| 2017        | 63.7 (62.9 to 64.5) | 76.3 (74.4 to 78.1)    |
| 2018        | 67.3 (66.5 to 68.1) | 80.9 (78.9 to 82.8)    |
| 2019        | 69.5 (68.7 to 70.3) | 84.3 (82.4 to 86.3)    |
| 2020        | 94.9 (94.0 to 95.8) | 114.0 (111.7 to 116.2) |

**Supplementary Table 8:** State-specific age-adjusted mortality rates

| <b>State</b>         | <b>AAMR</b> | <b>Upper 95 % CI</b> | <b>Lower 95 % CI</b> |
|----------------------|-------------|----------------------|----------------------|
| Alabama              | 42.8        | 43.9                 | 41.7                 |
| Alaska               | 50.2        | 54.6                 | 45.8                 |
| Arizona              | 34.5        | 35.3                 | 33.7                 |
| Arkansas             | 36.2        | 37.4                 | 34.9                 |
| California           | 82.9        | 83.5                 | 82.3                 |
| Colorado             | 49.1        | 50.3                 | 47.8                 |
| Connecticut          | 26.1        | 27.1                 | 25.2                 |
| Delaware             | 40.4        | 42.7                 | 38.0                 |
| District of Columbia | 35.4        | 38.3                 | 32.5                 |
| Florida              | 32.1        | 32.5                 | 31.7                 |
| Georgia              | 29.5        | 30.3                 | 28.8                 |
| Hawaii               | 42.2        | 44.1                 | 40.3                 |
| Idaho                | 61.1        | 63.5                 | 58.8                 |
| Illinois             | 37.9        | 38.6                 | 37.3                 |
| Indiana              | 66.3        | 67.4                 | 65.1                 |
| Iowa                 | 69.7        | 71.3                 | 68.1                 |
| Kansas               | 49.0        | 50.5                 | 47.6                 |
| Kentucky             | 60.4        | 61.7                 | 59.0                 |
| Louisiana            | 23.0        | 23.8                 | 22.2                 |
| Maine                | 42.0        | 43.9                 | 40.2                 |
| Maryland             | 48.5        | 49.6                 | 47.4                 |
| Massachusetts        | 18.7        | 19.2                 | 18.1                 |
| Michigan             | 45.8        | 46.5                 | 45.0                 |
| Minnesota            | 73.6        | 74.9                 | 72.2                 |
| Mississippi          | 40.3        | 41.6                 | 38.9                 |
| Missouri             | 44.4        | 45.4                 | 43.5                 |
| Montana              | 46.8        | 49.1                 | 44.5                 |
| Nebraska             | 73.2        | 75.4                 | 71.0                 |
| Nevada               | 20.9        | 22.0                 | 19.8                 |
| New Hampshire        | 45.0        | 47.0                 | 42.9                 |
| New Jersey           | 29.3        | 30.0                 | 28.7                 |
| New Mexico           | 45.7        | 47.4                 | 43.9                 |
| New York             | 29.5        | 29.9                 | 29.0                 |
| North Carolina       | 55.6        | 56.5                 | 54.7                 |
| North Dakota         | 74.5        | 77.9                 | 71.0                 |
| Ohio                 | 84.2        | 85.1                 | 83.3                 |
| Oklahoma             | 75.5        | 77.1                 | 73.8                 |
| Oregon               | 71.8        | 73.3                 | 70.3                 |
| Pennsylvania         | 49.8        | 50.5                 | 49.2                 |
| Rhode Island         | 38.9        | 40.9                 | 36.9                 |
| South Carolina       | 53.5        | 54.8                 | 52.3                 |
| South Dakota         | 66.1        | 69.1                 | 63.1                 |
| Tennessee            | 71.5        | 72.7                 | 70.3                 |
| Texas                | 69.5        | 70.2                 | 68.8                 |
| Utah                 | 35.3        | 36.8                 | 33.7                 |
| Vermont              | 68.9        | 72.5                 | 65.3                 |
| Virginia             | 43.4        | 44.3                 | 42.5                 |

|               |      |      |      |
|---------------|------|------|------|
| Washington    | 63.4 | 64.6 | 62.3 |
| West Virginia | 88.1 | 90.4 | 85.9 |
| Wisconsin     | 54.9 | 56.0 | 53.8 |
| Wyoming       | 67.6 | 71.7 | 63.5 |