# HEALTH IN US COUNTIES

The national estimates of US health trends measured by GBD 2010 are useful for informing policymaking and planning at a broad level, but county-level health data are crucial for informing actions across sectors and investments made by states, cities, and counties. As a result, IHME has developed innovative methods to estimate life expectancy and the prevalence of key risk factors in US counties. These results reveal important differences in health outcomes across counties.

## MASSIVE DISPARITIES IN LIFE EXPECTANCY ACROSS THE US

In the US, females are making less progress than males when it comes to extending life expectancy. As a result, male life expectancy is starting to catch up to female life expectancy. The gap between male life expectancy and female life expectancy in the US was 7.0 years in 1985, but that gap shrank to just 4.6 years in 2010. Females in the US are also making less progress in extending their life expectancy compared to females in other countries. In 1985, American females ranked 19th among all countries in the world for their life expectancy, but their rank dropped to 39th in 2010. American males' life expectancy ranking also slipped between 1990 and 2010 compared to other countries, but not as dramatically, from 29th to 40th.

Across US counties, disparities in life expectancy are increasing for both males and females. Figures 15a and 15b show the difference between the highest and lowest life expectancies for males and females in US counties (dashed lines) compared to the national average (solid line). In 1985, the county with the longest life expectancy for females was around nine years higher than the county with the shortest life expectancy, while the difference for males was nearly 12 years. By 2010, the difference between the counties with the highest life expectancy and the lowest life expectancy was much greater for both sexes: 12 and 18 years, respectively. These gaps between the life expectancy for the highest-performing and lowest-performing counties have continued to widen over time with the exception of male life expectancy between 1993 and 2002. The disparities between counties with the highest and lowest life expectancies were consistently greater for males compared to women. Figure 15b shows that, among US counties, the lowest life expectancy for females remained around 73 years between 1985 and 2010.

**Figure 15a: Maximum and minimum life expectancy across US counties compared to national average, males, 1985-2010**

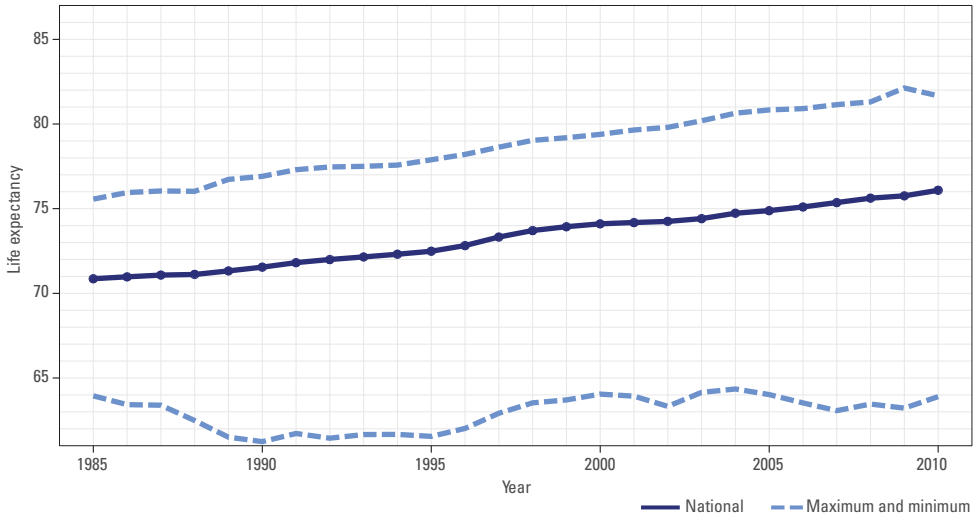
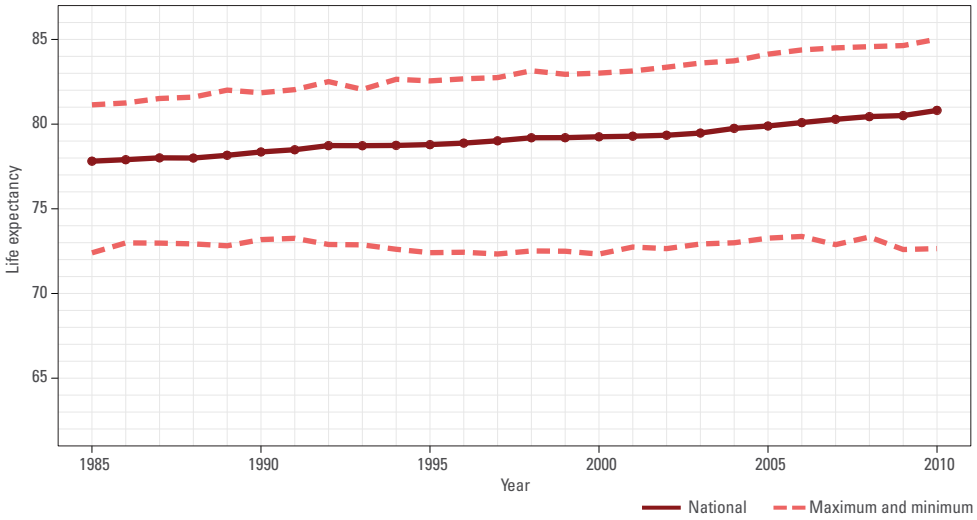


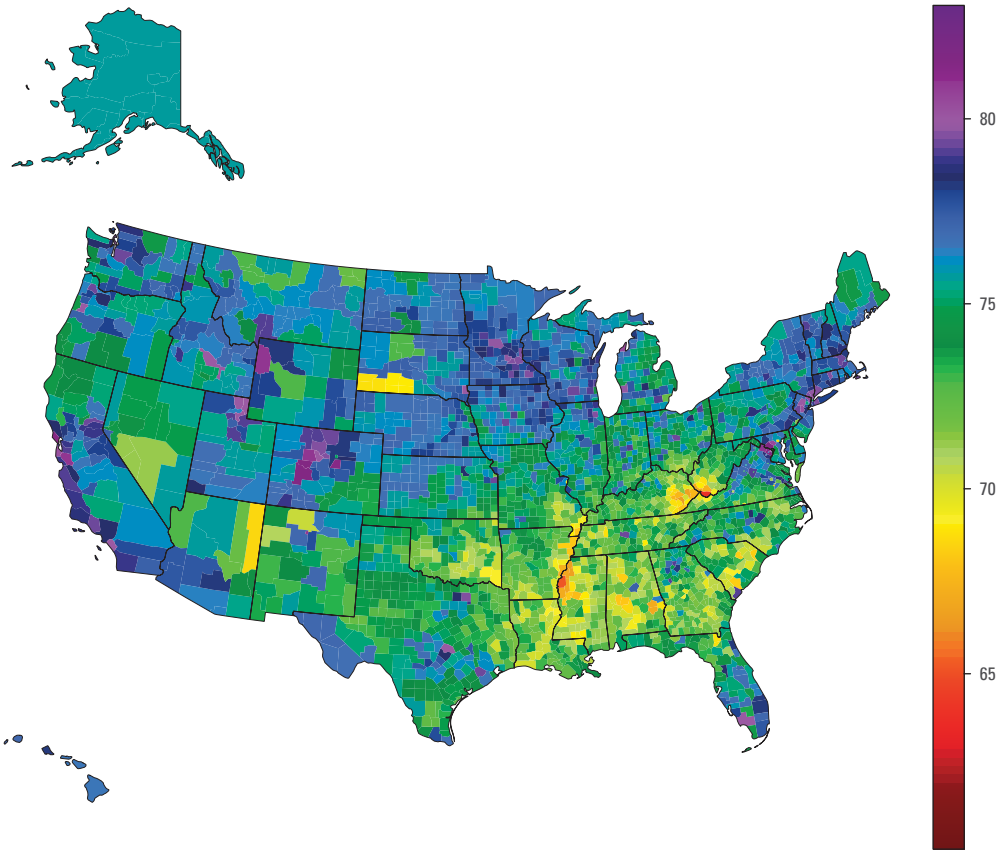

**Figure 15b: Maximum and minimum life expectancy across US counties compared to national average, females, 1985-2010**



Figures 16 and 17 map disparities in male and female life expectancy in the US in 2010. The regions with the lowest life expectancy in the country were the South, the Mississippi Basin, Kentucky, West Virginia, and counties in the West and Midwest with large numbers of Native Americans living on reservations. In 2010, females with the highest life expectancy (85.0 years) lived in Marin County, California, while females with the lowest life expectancy (72.7 years) lived in Perry County, Kentucky. Males living in Fairfax County, Virginia, had the highest life expectancy (81.7 years) in 2010, but males in nearby McDowell County, West Virginia, had the lowest life expectancy in the country (63.9 years), as shown in Table 1a.

To put these life expectancies in an international context, the top-performing US counties for females (Marin County, California, and Montgomery County, Maryland) have life expectancies that rivaled countries with the highest life expectancies in the

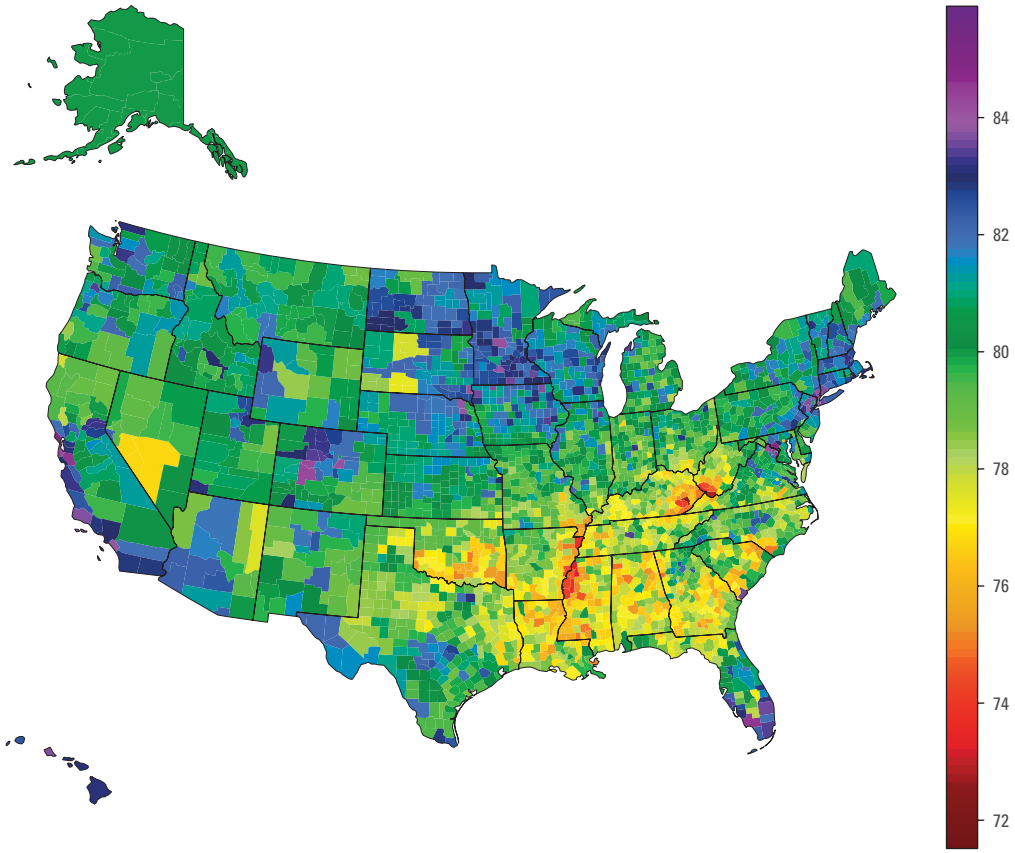
**Figure 16: US life expectancy by county, males, 2010**



world such as France, Spain, and Switzerland. For US counties where males live the longest (Fairfax County, Virginia, and Gunnison County, Colorado), life expectancy actually surpasses those in countries where males have the highest life expectancies, such as Japan and Switzerland. Some of the lowest-performing counties had life expectancies lower than those seen in countries that receive foreign aid, such as Algeria and Bangladesh.

In addition to the vast differences seen in life expectancy across US counties, improvements in life expectancy over time have been uneven across the country. Between 1985 and 2010, the same parts of the country tended to experience progress in life expectancy, including certain areas of California, Colorado, Iowa, most of Nevada, rural Minnesota, parts of North and South Dakota, some Northeastern states, and parts of Florida. Table 1b lists the 10 highest- and 10 lowest-performing

**Figure 17: US life expectancy by county, females, 2010**



counties in terms of changes in life expectancy between 1985 and 2010. The largest increases during this period occurred in three New York City counties, in Marin and San Francisco counties in California, and in counties in Colorado, New Jersey, South Carolina, and Virginia. Female life expectancy actually decreased in some counties in Georgia, Kentucky, and Oklahoma, and counties with the smallest gains in male life expectancy were located in Alabama, Kentucky, Mississippi, Oklahoma, Virginia, and West Virginia.

Figure 18 shows how much progress different US counties have made in increasing female and male life expectancy between 1985 and 2010. The red shading indicates the counties where life expectancy declined significantly over this period. In total,

**Table 1a: Top 10 and bottom 10 counties in terms of life expectancy by sex, 2010**

| Top counties | | | | | Bottom counties | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Rank (top) | Name | Life expectancy | Lower | Upper | Rank (bottom) | Name | Life expectancy | Lower | Upper |
| **Females** | | | | | | | | | |
| 1 | Marin, California | 85.02 | 84.46 | 85.56 | 1 | Perry, Kentucky | 72.65 | 71.31 | 73.79 |
| 2 | Montgomery, Maryland | 84.87 | 84.53 | 85.19 | 2 | McDowell, West Virginia | 72.9 | 71.37 | 74.29 |
| 3 | Collier, Florida | 84.62 | 84.09 | 85.1 | 3 | Tunica, Mississippi | 73.36 | 71.69 | 74.63 |
| 4 | Santa Clara, California | 84.54 | 84.29 | 84.8 | 4 | Quitman, Mississippi | 73.36 | 71.69 | 74.63 |
| 5 | Fairfax County, Virginia | 84.52 | 84.19 | 84.84 | 5 | Petersburg, Virginia | 73.69 | 72.11 | 75.19 |
| 6 | San Francisco, California | 84.38 | 84.02 | 84.73 | 6 | Sunflower, Mississippi | 73.85 | 72.26 | 75.16 |
| 7 | Gunnison, Colorado | 84.33 | 83.04 | 85.47 | 7 | Mississippi, Arkansas | 73.85 | 72.7 | 74.95 |
| 8 | Pitkin, Colorado | 84.33 | 83.04 | 85.47 | 8 | Mingo, West Virginia | 73.92 | 72.79 | 74.95 |
| 9 | San Mateo, California | 84.3 | 83.94 | 84.7 | 9 | Washington, Mississippi | 74.09 | 72.93 | 75.19 |
| 10 | Bergen, New Jersey | 84.26 | 83.95 | 84.56 | 10 | Leslie, Kentucky | 74.12 | 72.96 | 75.16 |
| **Males** | | | | | | | | | |
| 1 | Fairfax County, Virginia | 81.67 | 81.32 | 82.02 | 1 | McDowell, West Virginia | 63.9 | 62.04 | 65.61 |
| 2 | Gunnison, Colorado | 81.65 | 80.39 | 82.84 | 2 | Bolivar, Mississippi | 65.03 | 63.52 | 66.46 |
| 3 | Pitkin, Colorado | 81.65 | 80.39 | 82.84 | 3 | Perry, Kentucky | 66.52 | 65.15 | 67.73 |
| 4 | Montgomery, Maryland | 81.57 | 81.23 | 81.91 | 4 | Floyd, Kentucky | 66.59 | 65.22 | 67.86 |
| 5 | Marin, California | 81.44 | 80.91 | 82.01 | 5 | Tunica, Mississippi | 66.7 | 65.18 | 68.04 |
| 6 | Douglas, Colorado | 81.41 | 80.77 | 82.01 | 6 | Quitman, Mississippi | 66.7 | 65.18 | 68.04 |
| 7 | Eagle, Colorado | 81.01 | 79.83 | 82.18 | 7 | Sunflower, Mississippi | 66.92 | 65.57 | 68.33 |
| 8 | Loudoun, Virginia | 81 | 80.37 | 81.65 | 8 | Coahoma, Mississippi | 66.92 | 65.32 | 68.49 |
| 9 | Santa Clara, California | 80.98 | 80.69 | 81.25 | 9 | Washington, Mississippi | 67.1 | 65.75 | 68.5 |
| 10 | Teton, Wyoming | 80.93 | 79.85 | 81.84 | 10 | Macon, Alabama | 67.19 | 65.71 | 68.55 |

life expectancy declined in just one county for males (Floyd County, Kentucky), but declined in 72 counties for females. Also, stagnation in life expectancy has been much more pronounced for females than males between 1985 and 2010, as shown by the yellow shading in the maps. Overall, life expectancy for males improved in 95% of US counties during this time period, but only improved in 55% of counties for females.

Despite the fact that females in many US counties lagged far behind males in terms of progress in life expectancy, there is evidence that the outlook for women may be brightening, as indicated in Figure 19. Figure 19 shows changes in female and male life expectancy during three periods: 1985 to 1993, 1993 to 2002, and 2002 to 2010.

**Table 1b: Top 10 and bottom 10 counties in terms of change in life expectancy by sex, 1985-2010**

| Top counties | | | | | Bottom counties | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Rank (top) | Name | Change in life expectancy | Lower | Upper | Rank (bottom) | Name | Change in life expectancy | Lower | Upper |
| **Females** | | | | | | | | | |
| 1 | New York, New York | 8.37 | 7.91 | 8.79 | 1 | Fayette, Alabama | -3.47 | -5.41 | -1.71 |
| 2 | Loudoun, Virginia | 7.77 | 6.59 | 8.99 | 2 | Harmon, Oklahoma | -3.39 | -5.07 | -1.6 |
| 3 | Kings, New York | 6.7 | 6.37 | 7.03 | 3 | Beckham, Oklahoma | -3.39 | -5.07 | -1.6 |
| 4 | Bronx, New York | 6.39 | 5.91 | 6.85 | 4 | Leslie, Kentucky | -3.17 | -4.75 | -1.59 |
| 5 | Gunnison, Colorado | 6.28 | 4.58 | 7.91 | 5 | Clay, Kentucky | -3.17 | -4.75 | -1.59 |
| 6 | Pitkin, Colorado | 6.28 | 4.58 | 7.91 | 6 | Seminole, Oklahoma | -2.73 | -4.35 | -1.13 |
| 7 | Marin, California | 6.27 | 5.47 | 7.07 | 7 | Haralson, Georgia | -2.58 | -4.46 | -0.89 |
| 8 | Prince William, Virginia | 6.09 | 5.02 | 7.13 | 8 | Murray, Oklahoma | -2.58 | -4.06 | -1.17 |
| 9 | San Francisco, California | 6.05 | 5.52 | 6.61 | 9 | Garvin, Oklahoma | -2.58 | -4.06 | -1.17 |
| 10 | Beaufort, South Carolina | 6.02 | 4.78 | 7.28 | 10 | Perry, Kentucky | -2.57 | -4.34 | -0.92 |
| **Males** | | | | | | | | | |
| 1 | New York, New York | 12.97 | 12.55 | 13.41 | 1 | Floyd, Kentucky | -1.49 | -3.23 | 0.3 |
| 2 | San Francisco, California | 10.6 | 10.05 | 11.18 | 2 | Mcdowell, West Virginia | -1.45 | -3.62 | 0.75 |
| 3 | Kings, New York | 9.76 | 9.39 | 10.12 | 3 | Bolivar, Mississippi | -0.98 | -2.91 | 1.1 |
| 4 | Loudoun, Virginia | 9.59 | 8.51 | 10.75 | 4 | Perry, Alabama | -0.87 | -2.76 | 1.27 |
| 5 | Bronx, New York | 9.57 | 9.08 | 10.1 | 5 | Hale, Alabama | -0.87 | -2.76 | 1.27 |
| 6 | Washington, DC | 9.37 | 8.67 | 10.09 | 6 | Creek, Oklahoma | -0.69 | -2.1 | 0.74 |
| 7 | Forsyth, Georgia | 9.16 | 7.71 | 10.74 | 7 | Wyoming, West Virginia | -0.65 | -2.44 | 1.27 |
| 8 | Goochland, Virginia | 9.15 | 7.51 | 10.89 | 8 | Cherokee, Kansas | -0.56 | -2.3 | 1.19 |
| 9 | Alexandria, Virginia | 8.84 | 7.48 | 10.13 | 9 | Grundy, Tennessee | -0.55 | -2.88 | 1.5 |
| 10 | Hudson, New Jersey | 8.63 | 8.06 | 9.23 | 10 | Danville, Virginia | -0.36 | -1.99 | 1.34 |

Blue shading indicates counties with no significant decreases in male and female life expectancy, yellow shading indicates counties with significant decreases in male life expectancy but no decreases in female life expectancy, orange represents counties with significant decreases in female life expectancy but not in male life expectancy, and red represents counties with significant decreases in both male and female life expectancy.

**Figure 18: Map of significant changes in life expectancy by county, 1985-2010**

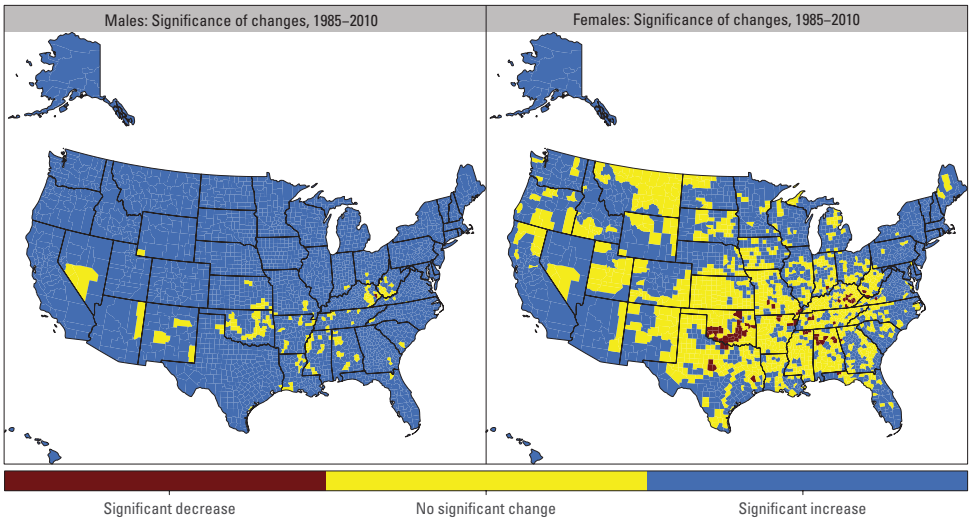
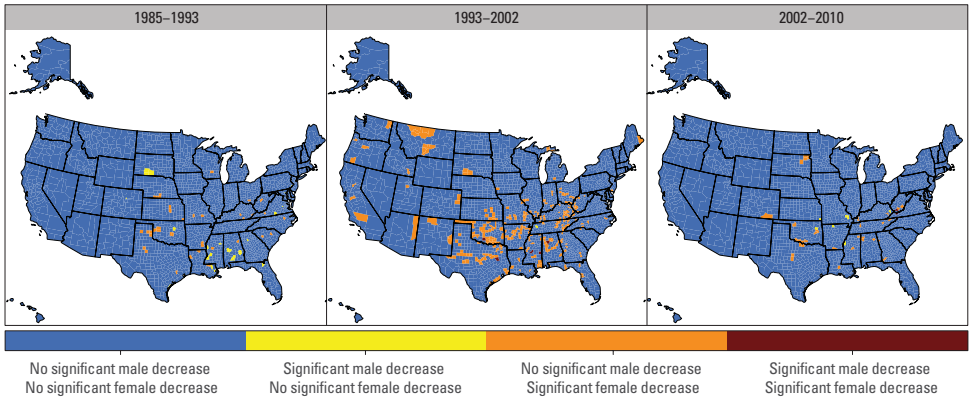



**Figure 19: Map of significant decreases in life expectancy, males and females, 1985-1993, 1993-2002, and 2002-2010**



The period 1993 to 2002 was plagued by significant decreases in female life expectancy in many counties, but the number of counties with declining female life expectancy were markedly lower in the most recent period (2002 to 2010). Tables 2a, 2b, and 2c show the breakdown of the number of counties experiencing significant increases and decreases in life expectancy over these three periods as well as the number of counties that did not experience significant changes in life expectancy.

**Table 2a: Number of counties with significant changes in males versus females, 1985-1993**

| | Males | | | |
|---|---|---|---|---|
| **Females** | **Significant increase** | **No significant change** | **Significant decrease** | **Total** |
| **Significant increase** | 632 | 147 | 7 | 786 |
| **No significant change** | 880 | 1,411 | 24 | 2,315 |
| **Significant decrease** | 3 | 38 | 1 | 42 |
| **Total** | 1,515 | 1,596 | 32 | 3,143 |

**Table 2b: Number of counties with significant changes in males versus females, 1993-2002**

| | Males | | | |
|---|---|---|---|---|
| **Females** | **Significant increase** | **No significant change** | **Significant decrease** | **Total** |
| **Significant increase** | 573 | 33 | 0 | 606 |
| **No significant change** | 1,612 | 624 | 1 | 2,237 |
| **Significant decrease** | 143 | 152 | 5 | 300 |
| **Total** | 2,328 | 809 | 6 | 3,143 |

**Table 2c: Number of counties with significant changes in males versus females, 2002-2010**

| | Males | | | |
|---|---|---|---|---|
| **Females** | **Significant increase** | **No significant change** | **Significant decrease** | **Total** |
| **Significant increase** | 1,095 | 332 | 0 | 1,427 |
| **No significant change** | 788 | 884 | 7 | 1,679 |
| **Significant decrease** | 12 | 23 | 2 | 37 |
| **Total** | 1,895 | 1,239 | 9 | 3,143 |

The causes driving the disparities in levels of and improvements in life expectancy across the US are not fully understood. The following factors could potentially explain why life expectancy has stagnated or declined in certain counties: 1) migration of healthy individuals away from counties with lower life expectancy into counties with higher life expectancies, 2) socioeconomic factors such as poverty and education, 3) lack of access to health care, 4) poor quality of health care for those with access, and 5) potentially avoidable risk factors. For example, the fact that females started smoking later than males in the US may explain the large number of counties experiencing declines in female life expectancy from 1993 to 2002.

Rising obesity during this period may further explain the declines in female life expectancy, as GBD 2010 quantified the adverse effects of high BMI in terms of premature mortality and disability. Despite the need to identify the causes behind poor and outstanding performance of US counties in terms of life expectancy, county-level data on risk factors for premature mortality, such as dietary risk factors and smoking, are not readily available. Improved data collection and detailed assessment of the impact of different factors on county-level life expectancy are urgently needed to help policymakers improve health.

## MORE AMERICANS GET RECOMMENDED LEVELS OF EXERCISE, BUT OBESITY CONTINUES TO RISE

To better understand the factors driving health outcomes such as life expectancy in the US, IHME sought to measure at the county level three important and interrelated risk factors identified in the US burden of disease analysis: dietary risks, high BMI, and physical inactivity and low physical activity. Prevalence of high BMI is particularly important to assess at the county level given GBD 2010's finding that it increased in the US by 45% in terms of DALYs between 1990 and 2010. IHME was unable to measure the primary risk factor for disease burden in the US, dietary risks, due to lack of data on the 14 different components that make up this risk factor.

Although physical inactivity and low physical activity is an important risk factor in the US as a whole, the county-level analysis revealed huge variation in physical activity levels across the country. Table 3 lists the top 10 and bottom 10 counties as measured by rates of physical activity. Douglas County, Colorado, had the highest rate of physical activity in the US (89.9%) for males in 2011, while Marin County, California, had highest rate for females (89.5%). As mentioned elsewhere, Marin County was also the county that ranked the highest in the US for female life expectancy in 2010. The lowest rates of any physical activity were Wolfe County, Kentucky (54.7%), for men, and McDowell County, West Virginia (50.9%), for women. In general, the counties along the Texas and Mexico border, the Mississippi Valley, the South, and West Virginia had the lowest levels of any physical activity for both males and women. Physical activity rates also varied widely within states. For example, for males in Virginia, rates ranged from 85.1% in Arlington County to 57.7% in Dickenson County. While the rates of physical activity in some counties changed between 2001 and 2009, overall, there was no major improvement in the rate of people engaging in physical activity in the country as a whole.

**Table 3: Top 10 and bottom 10 counties in terms of physical activity, sufficient physical activity, and obesity, 2011**

| Top 10, Males | | Bottom 10, Males | | Top 10, Females | | Bottom 10, Females | |
|---|---|---|---|---|---|---|---|
| **Percent reporting any physical activity** | | | | | | | |
| Douglas, CO | 89.9 (88.0, 91.7) | Wolfe, KY | 54.7 (45.8, 62.9) | Marin, CA | 89.5 (87.2, 91.3) | McDowell, WV | 50.9 (45.6, 56.5) |
| Teton, WY | 87.9 (84.6, 90.5) | McDowell, WV | 54.9 (47.6, 61.8) | San Juan, WA | 88.0 (85.8, 89.9) | Issaquena, MS | 51.3 (44.0, 58.3) |
| Los Alamos, NM | 87.7 (84.1, 90.6) | Owsley, KY | 55.2 (46.1, 63.4) | Pitkin, CO | 87.8 (84.9, 90.4) | Dunklin, MO | 52.4 (46.0, 58.3) |
| Routt, CO | 87.1 (83.7, 89.7) | Issaquena, MS | 57.0 (48.1, 65.1) | Routt, CO | 87.5 (84.5, 89.8) | Wolfe, KY | 53.8 (46.3, 60.6) |
| Marin, CA | 86.9 (83.7, 89.7) | Clinton, KY | 57.6 (48.8, 65.8) | Teton, WY | 86.9 (84.4, 89.1) | Owsley, KY | 54.0 (46.6, 61.2) |
| Kauai, HI | 86.8 (84.0, 89.1) | Dickenson, VA | 57.7 (49.7, 65.6) | Douglas, CO | 86.3 (84.5, 88.1) | East Carroll, LA | 54.0 (47.2, 61.0) |
| Summit, UT | 86.7 (84.1, 89.0) | Mingo, WV | 57.9 (51.7, 64.3) | Santa Cruz, CA | 85.7 (82.9, 88.2) | Pemiscot, MO | 54.0 (47.7, 60.5) |
| San Juan, WA | 86.6 (83.6, 89.2) | Holmes, OH | 58.2 (49.7, 67.0) | Island, WA | 85.7 (83.3, 87.7) | Lee, AR | 54.1 (47.5, 60.8) |
| Orange, NC | 86.5 (83.7, 88.8) | Leslie, KY | 58.6 (49.7, 66.8) | Summit, UT | 85.5 (83.1, 87.5) | Mississippi, MO | 54.2 (46.8, 61.0) |
| Island, WA | 86.4 (83.7, 89.0) | Starr, TX | 58.8 (50.1, 66.6) | Summit, CO | 85.5 (81.6, 88.3) | La Salle, TX | 54.3 (47.0, 61.1) |
| **Percent reporting sufficient physical activity** | | | | | | | |
| Teton, WY | 77.5 (72.0, 82.4) | Owsley, KY | 33.1 (24.8, 42.6) | Routt, CO | 74.7 (70.2, 78.7) | Issaquena, MS | 28.4 (22.5, 35.0) |
| Summit, UT | 73.2 (68.0, 77.3) | Holmes, OH | 33.7 (25.4, 42.6) | Marin, CA | 74.2 (69.8, 78.3) | Noxubee, MS | 29.0 (22.6, 35.9) |
| Routt, CO | 72.9 (66.9, 78.4) | Wolfe, KY | 34.2 (25.6, 44.3) | Teton, WY | 72.7 (67.9, 76.7) | Quitman, MS | 29.1 (22.7, 35.5) |
| Summit, CO | 72.7 (65.2, 79.0) | Issaquena, MS | 34.6 (26.1, 44.2) | Pitkin, CO | 72.4 (66.8, 77.7) | Tallahatchie, MS | 30.7 (24.8, 37.7) |
| Jefferson, WA | 72.2 (66.0, 77.8) | McDowell, WV | 34.7 (27.0, 43.2) | San Juan, WA | 71.6 (67.5, 75.5) | Haywood, TN | 30.7 (24.3, 37.5) |
| Nevada, CA | 71.9 (64.9, 78.0) | Casey, KY | 34.8 (27.7, 43.2) | Summit, UT | 69.6 (65.6, 73.5) | Tunica, MS | 30.7 (24.2, 37.6) |
| La Plata, CO | 71.9 (66.2, 76.9) | Clay, KY | 35.8 (27.9, 45.3) | Eagle, CO | 69.6 (64.6, 75.0) | McDowell, WV | 30.8 (25.4, 37.1) |
| Wasatch, UT | 71.7 (67.0, 76.1) | Mingo, WV | 36.0 (29.3, 43.9) | Barnstable, MA | 69.2 (65.4, 72.7) | Humphreys, MS | 30.9 (24.7, 38.4) |
| Kauai, HI | 71.6 (66.9, 75.8) | Clinton, KY | 36.1 (27.2, 45.8) | Benton, OR | 69.1 (63.8, 74.3) | East Carroll, LA | 31.2 (25.2, 38.7) |
| Los Alamos, NM | 71.4 (64.2, 77.3) | Taliaferro, GA | 36.4 (27.7, 46.3) | Rio Blanco, CO | 68.8 (61.3, 75.1) | Taliaferro, GA | 31.3 (25.0, 38.2) |
| **Percent obese (BMI ≥ 30)** | | | | | | | |
| San Francisco, CA | 18.3 (16.4, 22.2) | Owsley, KY | 46.9 (41.0, 53.4) | Falls Church City, VA | 17.6 (13.8, 21.3) | Issaquena, MS | 59.3 (52.5, 64.9) |
| New York, NY | 19.1 (16.8, 22.2) | Issaquena, MS | 46.7 (40.4, 53.4) | Pitkin, CO | 18.5 (15.1, 21.9) | Humphreys, MS | 59.1 (52.7, 64.4) |
| Falls Church City, VA | 19.5 (15.6, 23.7) | East Carroll, LA | 46.6 (40.5, 52.8) | Douglas, CO | 18.6 (16.5, 20.9) | East Carroll, LA | 58.9 (52.1, 64.2) |
| Santa Fe, NM | 21.0 (18.9, 24.1) | Holmes, OH | 46.4 (40.2, 52.8) | Routt, CO | 19.0 (15.9, 22.0) | Quitman, MS | 58.1 (51.8, 63.8) |
| Pitkin, CO | 21.3 (17.9, 26.0) | Starr, TX | 46.2 (39.6, 52.5) | Teton, WY | 19.6 (16.7, 22.5) | Greene, AL | 58.0 (51.0, 63.7) |
| Teton, WY | 21.6 (18.6, 25.1) | Lewis, KY | 46.1 (41.7, 51.7) | Summit, UT | 20.0 (17.4, 22.7) | Allendale, SC | 58.0 (51.6, 63.9) |
| Eagle, CO | 22.0 (18.9, 26.5) | McDowell, WV | 46.0 (40.4, 51.5) | San Francisco, CA | 20.9 (17.8, 23.7) | Wilcox, AL | 57.8 (51.0, 63.5) |
| Fairfax City, VA | 22.0 (17.7, 26.4) | Lincoln, WV | 45.9 (40.3, 51.8) | Eagle, CO | 20.9 (17.3, 24.0) | Shannon, SD | 57.7 (50.2, 64.0) |
| Washington, DC | 22.4 (20.6, 24.8) | Allen, LA | 45.6 (39.8, 50.9) | Marin, CA | 21.1 (17.5, 23.7) | Jefferson, MS | 57.7 (51.0, 63.7) |
| Summit, UT | 22.4 (20.0, 26.5) | Union, FL | 45.5 (41.3, 50.3) | Gallatin County and Yellowstone National Park, MT | 21.9 (19.5, 24.4) | Holmes, MS | 57.6 (52.2, 62.0) |

On the other hand, more people reported levels of sufficient physical activity over time across US counties, which is defined as 150 minutes of moderate physical activity, 75 minutes of vigorous physical activity, or equivalent combination per week. While males tended to have higher levels of sufficient physical activity (Figure 20), females had larger increases in sufficient physical activity (Figure 21). Across states, Florida, Georgia, Kentucky, Montana, Nebraska, and parts of California experienced the most dramatic growth in levels of sufficient physical activity in the country, as shown in Figure 21. Specifically, the counties showing the biggest growth were in Concho County, Texas, for men, with an increase from 41.4% in 2001 to 58.2% in 2009, a 16.7 percentage-point increase, and in Morgan County, Kentucky, for women, with an increase from 25.7% in 2001 to 44.0% in 2009, an 18.3 percentage-point increase. The counties with the highest levels of sufficient physical activity were Teton County, Wyoming (77.5%), for males and Routt County, Colorado (74.7%), for women, while the counties with the lowest levels were Owsley County, Kentucky (33.1%), for males, and Issaquena County, Mississippi (28.4%), for females (Table 3).

As sufficient physical activity in the US increased, the percentage of obese people in the country grew during the same period (Figure 22). In fact, obesity prevalence only decreased in nine counties in the country between 2001 and 2009, but none of these reductions were statistically significant. Table 4 shows that the largest increases in obesity occurred in Lewis County, Kentucky, for males, with a change from 28.9% in 2001 to 44.7% in 2009, and in Berkeley County, South Carolina, for females, with a change from 31.6% to 47.9% during the same period. The county with the highest rate of obesity for males was Owsley County, Kentucky (46.9%), and for women, it was Issaquena County, Mississippi (59.3%). San Francisco County, California (18.3%), had the lowest obesity prevalence for males, while Falls Church City, Virginia (17.6%) had the lowest rates for women. Obesity prevalence was generally higher among females (Figure 23).

Rising levels of sufficient physical activity across US counties appear to have done little to mitigate increases in obesity. For every one percentage point increase in sufficient physical activity, obesity prevalence only decreased by 0.11 percentage points.

**Figure 20: Percent reporting sufficient physical activity by county, 2011**

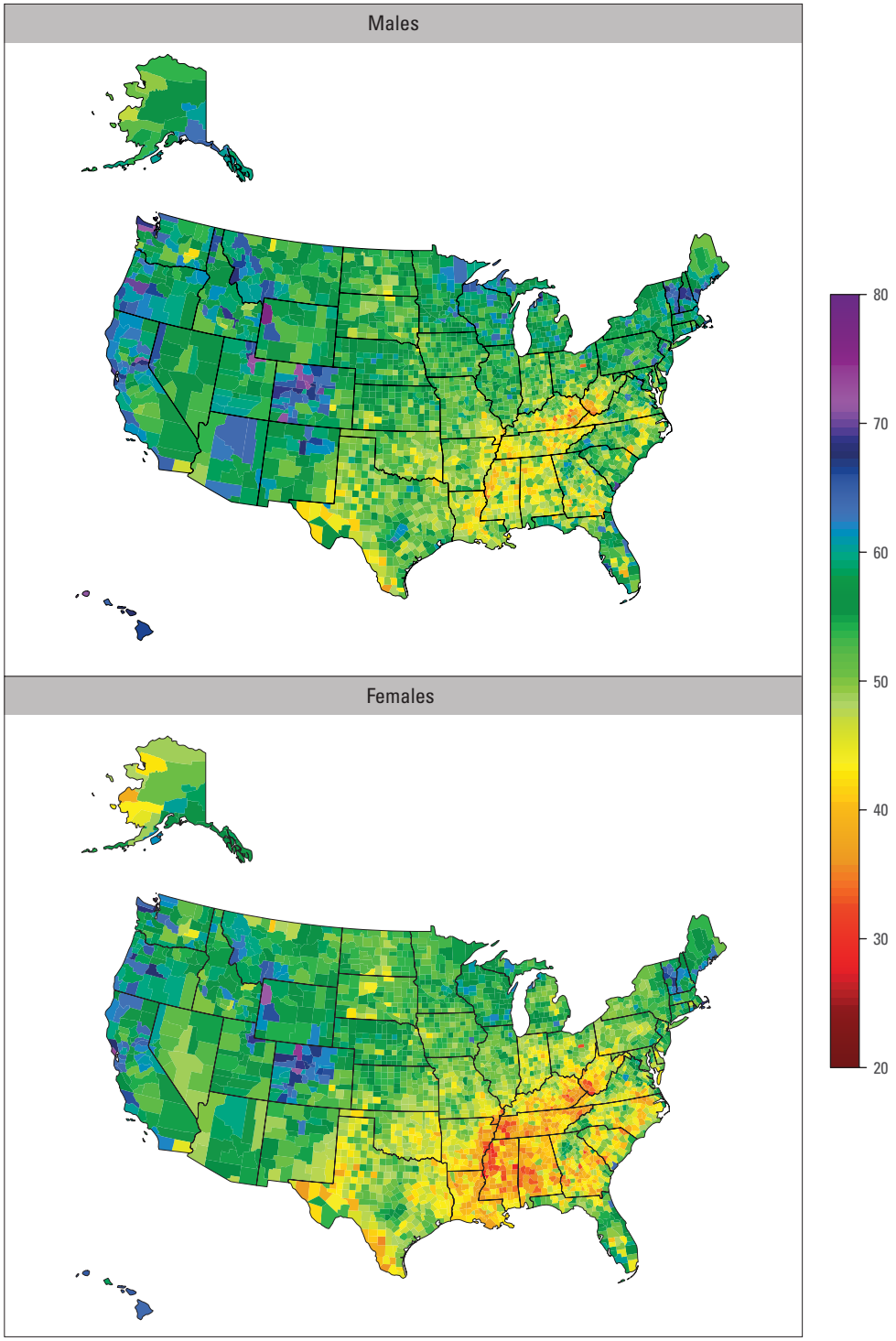


**Figure 21: Change in percent reporting sufficient physical activity by county, 2001-2009**

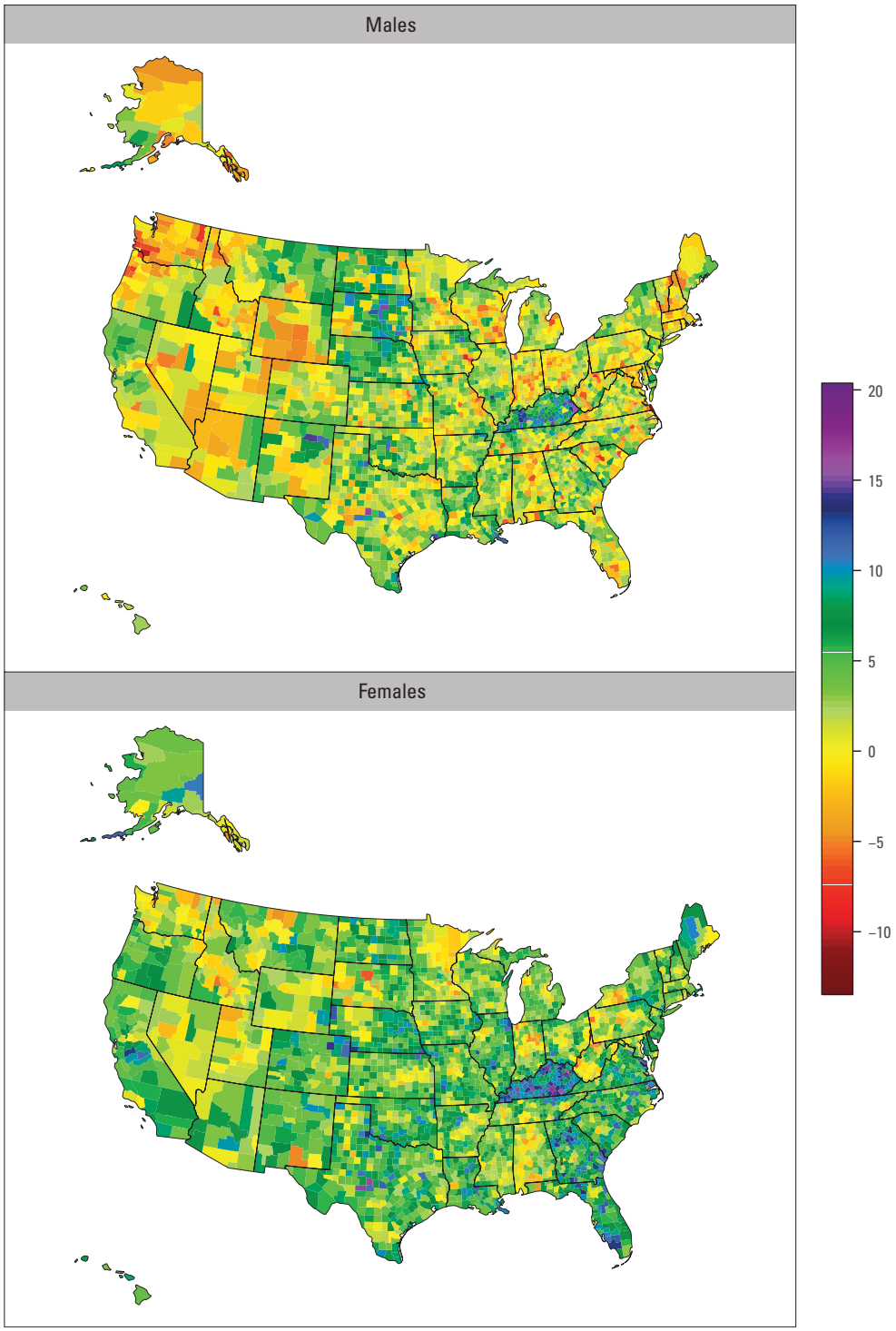


**Table 4: Top 10 and bottom 10 counties for change in physical activity, sufficient physical activity, and obesity, 2001-2009**

| Top 10, Males | | Bottom 10, Males | | Top 10, Females | | Bottom 10, Females | |
|---|---|---|---|---|---|---|---|
| **Change in percent reporting any physical activity** | | | | | | | |
| Concho, TX | 16.2 (7.4, 25.1) | Juneau City, AK | -7.5 (-10.3, -4.2) | Concho, TX | 13.3 (4.2, 21.9) | Dewey, SD | -9.6 (-18.0, -1.2) |
| Martin, KY | 14.6 (4.9, 24.9) | Fond du Lac, WI | -7.1 (-12.8, -1.5) | Emporia City, VA | 12.5 (3.7, 21.2) | Shannon, SD | -7.4 (-16.6, 1.4) |
| Floyd, KY | 12.5 (5.1, 19.4) | Cabell, WV | -7.1 (-12.2, -2.1) | Candler, GA | 11.5 (3.3, 19.8) | Cabell, WV | -7.3 (-12.1, -2.6) |
| Harrisonburg City, VA | 11.3 (4.1, 18.8) | Dickenson, VA | -6.9 (-16.3, 2.5) | Banks, GA | 11.4 (3.0, 19.9) | Lincoln, WV | -6.7 (-14.1, 1.0) |
| St. Martin, LA | 10.9 (2.8, 18.2) | Carbon, WY | -6.7 (-11.9, -1.3) | Evangeline, LA | 11.0 (3.6, 18.5) | Gallia, OH | -6.4 (-14.2, 1.3) |
| Sheridan, ND | 10.7 (1.6, 20.1) | York, NE | -6.7 (-12.0, -1.0) | West Feliciana, LA | 10.7 (1.9, 19.6) | Jackson, OH | -6.4 (-14.0, 1.8) |
| Schleicher, TX | 10.6 (2.1, 19.4) | Meade, SD | -6.5 (-11.2, -1.8) | Schleicher, TX | 10.7 (2.3, 19.2) | Bristol Bay, AK | -6.2 (-13.2, 0.0) |
| Candler, GA | 10.6 (1.2, 19.3) | Dodge, WI | -6.5 (-12.4, -0.5) | Union, TN | 10.6 (1.0, 19.8) | Grant, IN | -6.1 (-12.2, 0.3) |
| Childress, TX | 10.4 (2.8, 17.9) | Lander, NV | -6.4 (-14.9, 1.3) | Hancock, TN | 10.3 (0.6, 20.1) | Delaware, IN | -6.0 (-12.0, -0.4) |
| East Carroll, LA | 10.3 (0.1, 19.8) | Chemung, NY | -6.4 (-13.0, -0.2) | Childress, TX | 10.1 (1.5, 18.1) | Hill, MT | -5.9 (-9.9, -2.0) |
| **Change in percent reporting sufficient physical activity** | | | | | | | |
| Concho, TX | 16.7 (5.7, 27.2) | Virginia Beach City, VA | -11.4 (-19.2, -4.0) | Morgan, KY | 18.3 (11.6, 25.3) | Cabell, WV | -6.2 (-12.8, 0.3) |
| Pike, KY | 15.9 (9.0, 22.9) | Cowlitz, WA | -10.0 (-16.9, -2.3) | McCreary, KY | 18.2 (10.7, 25.6) | Dewey, SD | -6.0 (-15.5, 3.8) |
| Elliott, KY | 15.9 (5.8, 26.1) | Petersburg City, VA | -9.3 (-20.0, 1.8) | Manassas Park City, VA | 18.0 (8.5, 28.1) | Camas, ID | -5.7 (-16.1, 5.0) |
| Faulk, SD | 15.0 (4.2, 26.0) | Marion, WV | -8.5 (-16.4, -0.5) | Owen, KY | 17.6 (7.6, 26.4) | Monongalia, WV | -5.6 (-13.2, 1.5) |
| McCreary, KY | 14.9 (5.1, 23.8) | Fairfax City, VA | -8.5 (-16.9, 1.6) | Pulaski, KY | 17.2 (10.8, 23.3) | Miami, IN | -5.4 (-14.5, 3.8) |
| Martin, KY | 14.8 (5.5, 23.6) | Johnson, IA | -8.4 (-15.2, -1.1) | Perquimans, NC | 16.9 (8.1, 25.6) | Mercer, PA | -5.4 (-13.9, 2.3) |
| Mora, NM | 14.3 (4.1, 25.0) | Richland, SC | -8.0 (-13.8, -2.2) | Edmonson, KY | 16.7 (7.6, 25.9) | Lawrence, SD | -5.2 (-11.6, 1.3) |
| Muhlenberg, KY | 13.7 (4.3, 22.3) | Bristol, RI | -7.6 (-14.2, 0.1) | Concho, TX | 16.5 (7.0, 26.2) | Harrisonburg City, VA | -5.0 (-15.3, 4.7) |
| Bond, IL | 13.3 (2.9, 24.0) | Norfolk City, VA | -7.6 (-15.5, 0.5) | Elliott, KY | 16.1 (7.0, 24.9) | Porter, IN | -4.9 (-12.0, 2.8) |
| Ohio, KY | 12.7 (2.8, 22.4) | Columbia, OR | -7.5 (-15.3, 1.0) | Knox, KY | 15.5 (8.3, 22.2) | Otero, NM | -4.8 (-11.4, 1.1) |
| **Change in percent obese (BMI ≥ 30)** | | | | | | | |
| Buffalo, SD | -2.9 (-11.4, 5.3) | Lewis, KY | 15.8 (9.5, 22.0) | Keweenaw, MI | -1.4 (-6.8, 7.1) | Berkeley, SC | 16.4 (11.8, 20.2) |
| Ziebach, SD | -2.8 (-10.9, 5.8) | Webb, TX | 14.6 (8.5, 20.5) | Rio Blanco, CO | -1.4 (-6.7, 4.7) | Crowley, CO | 14.2 (6.6, 22.2) |
| Roosevelt, MT | -0.9 (-7.3, 6.2) | Allen, LA | 14.2 (6.7, 20.0) | Routt, CO | -0.5 (-4.6, 3.9) | Ionia, MI | 14.1 (6.9, 19.9) |
| Corson, SD | -0.6 (-7.7, 7.4) | Allen, OH | 14.1 (7.6, 20.3) | Pitkin, CO | -0.2 (-4.6, 4.4) | Barry, MI | 13.9 (7.9, 19.9) |
| Daniels, MT | 0.0 (-6.7, 7.1) | Tazewell, VA | 14.1 (7.5, 20.6) | Red Lake, MN | 0.1 (-6.8, 7.8) | Hancock, WV | 13.8 (7.7, 19.6) |
| Staunton City, VA | 0.2 (-5.3, 8.8) | Zapata, TX | 14.0 (5.8, 21.7) | Eagle, CO | 0.2 (-4.2, 4.5) | Owsley, KY | 13.6 (5.6, 22.0) |
| Menominee, WI | 0.2 (-7.8, 8.7) | Salem, NJ | 13.8 (8.1, 19.3) | La Plata, CO | 0.4 (-3.8, 4.9) | Lee, SC | 13.5 (6.8, 19.7) |
| McCreary, KY | 0.3 (-6.4, 7.8) | Ottawa, OH | 13.4 (5.5, 19.3) | Archuleta, CO | 0.5 (-4.5, 6.2) | Allen, OH | 13.3 (7.3, 19.4) |
| Glacier, MT | 0.5 (-6.1, 7.7) | Dallas, IA | 13.2 (8.0, 19.3) | Chaffee, CO | 0.6 (-4.4, 5.7) | Calhoun, FL | 13.1 (7.6, 17.8) |
| Apache, AZ | 0.5 (-5.8, 7.3) | Cambria, PA | 13.2 (6.3, 18.8) | Marion, AL | 0.7 (-5.3, 7.1) | Crittenden, AR | 13.1 (8.4, 19.5) |

**Figure 22: Change in percent obese (BMI ≥ 30) by county, 2001-2009**

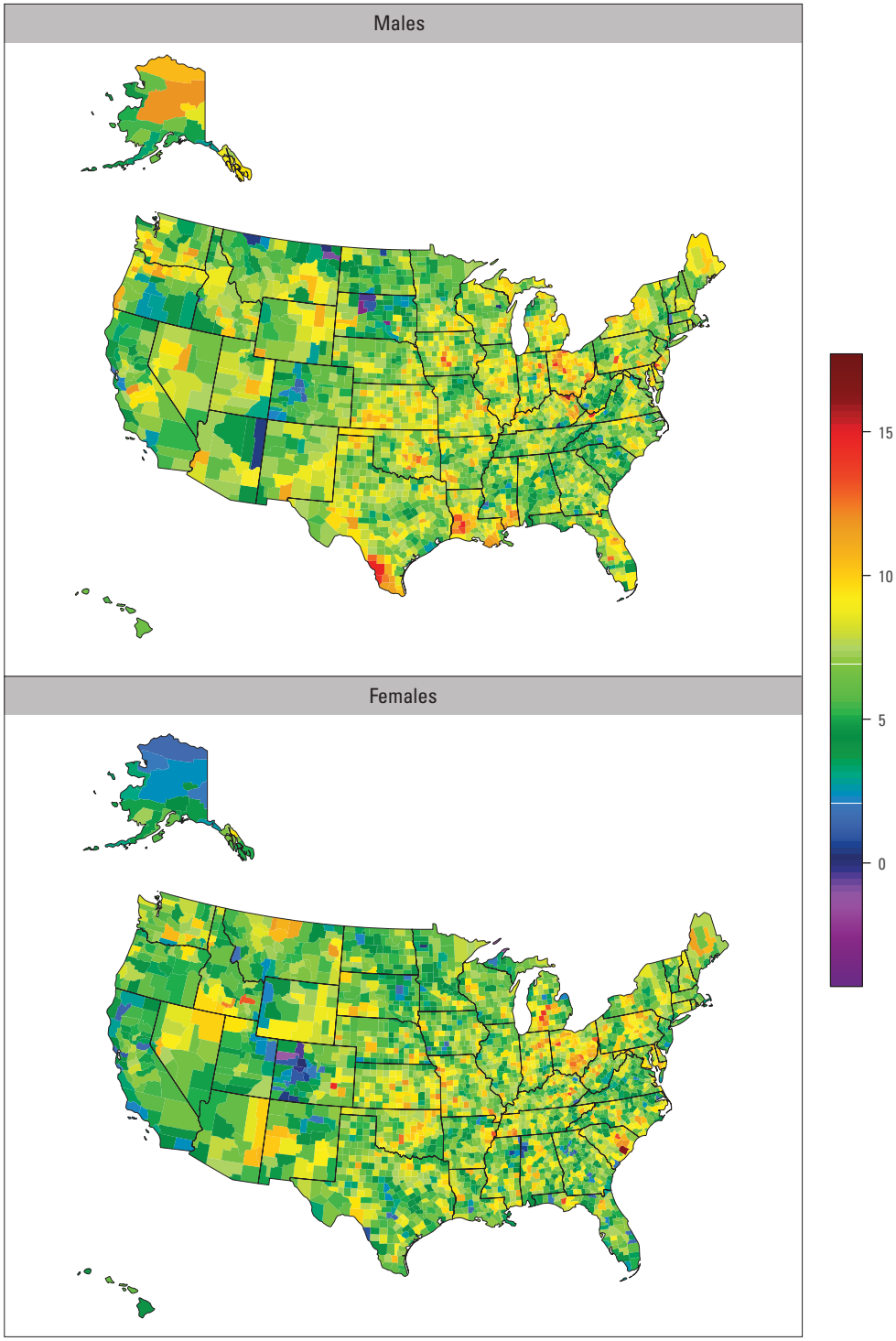


**Figure 23: Percent obese (BMI ≥ 30) by county, 2011**