# FLHealthCHARTS.com Statistical Brief

## Association Between Florida County Demographic Statistics and Age-Adjusted Death Rates in 2016

The Florida Department of Health recently added many new demographic statistics to the long list of Public Health Statistics available in the online FLHealthCHARTS.com. CHARTS stands for Community Health Assessment Resource Tool Set and is designed to be a source for a broad range of statistics relevant to Public Health. The internet address for CHARTS is:

http://www.flhealthcharts.com/charts/Default.aspx

Commonly used demographic indicators were selected for analysis and are listed below. The first two are recommended by the CDC as life course measures and are obtained from the Florida Department of Education. The third through sixth are often used in assessments of the built environment and are obtained from Florida Environmental Public Health Tracking. The seventh through eleventh are included in many of CHARTS' profile reports and are from the U.S Census American Community Survey.:

1. Grade 4 Florida Standards Assessments English Language Arts
2. Grade 4 Florida Standards Assessments Mathematics
3. Population Living within ½ mile of a Fast Food Restaurant
4. Population Living within ½ mile of a Healthy Food Source
5. Population Living within ½ mile of a Park
6. Population Living within ½ mile of an Off-Street Trail System
7. Median household income
8. Percentage of civilian labor force which is unemployed
9. Percentage of individuals 25 years and over with no high school diploma
10. Percentage of individuals below poverty level
11. Percentage of Owner-Occupied Housing Unit

The Division of Public Health Statistics and Performance Management of the Florida Department of Health analyzed these measures to determine if they were associated with the 2016 county-specific, age-adjusted death rates (AADR). It was found that all but two of the indicators were significantly correlated with the AADR. Table 1 shows the correlation statistics for the 11 indicators.

For example, the first indicator in Table 1 shows a correlation coefficient of -0.29 in the first column. The negative correlation means that counties with high levels for this indicator tend to have lower AADRs. The second column is the proportion of the variability in the AADR that is associated with the measure. For the first indicator, this is 0.08 which means 8% of the total variation in the AADR is associated with the first indicator. The third column in Table 1 is the p value for the correlation coefficient. The p value is the probability of the squared correlation coefficient being equal to or greater than the value in column 2, if there is no association between the measure and AADR. For example, the p value for the first measure is 0.02. This is the probability that the squared correlation coefficient would be 0.08 or higher if there was no association between the first measure and AADR for the 67 Florida counties. This is a low

probability so it would support the conclusion that there is an association between the first measure and AADR.

**Table 1**

**Correlation Between Age Adjusted Death Rates in 2016 and Demographic Statistics for Florida Counties**

| Measure | AADR Correlation Coefficient | AADR Squared Correlation Coefficient | AADR Correlation Coefficient p value |
|---|---|---|---|
| Grade 4 Florida Standards Assessments English Language Arts, 2017 | -0.29 | 0.08 | 0.02 |
| Grade 4 Florida Standards Assessments Mathematics, 2017 | -0.06 | 0.00 | 0.61 |
| Population Living within ½ mile of a Fast Food Restaurant, 2016 | -0.49 | 0.24 | 0.00 |
| Population Living within ½ mile of a Healthy Food Source, 2016 | -0.50 | 0.25 | 0.00 |
| Population Living within ½ mile of a Park, 2016 | -0.43 | 0.19 | 0.00 |
| Population Living within ½ mile of an Off-Street Trail System, 2016 | -0.29 | 0.08 | 0.02 |
| Median household income, 2015 | -0.53 | 0.29 | 0.00 |
| Percentage of civilian labor force which is unemployed, 2015 | 0.30 | 0.09 | 0.01 |
| Percentage of individuals 25 years and over with no high school diploma, 2015 | 0.57 | 0.33 | 0.00 |
| Percentage of individuals below poverty level, 2015 | 0.45 | 0.20 | 0.00 |
| Percentage of Owner-Occupied Housing Units, 2015 | 0.17 | 0.03 | 0.18 |

Table 2 shows the actual AADR and the predicted AADR based on the values of the 11 social and demographic measures for each county. Multiple regression was used to develop the formula for calculating the predicted AADRs from the values of the demographic variables. For example, in Table 2 the AADR for Alachua County is 742.1 deaths per 100,000 population. Based on the values of the 11 demographic measures for Alachua County, the predicted AADR is 701.8. The actual AADR is therefore 5.7% higher than the predicted AADR for Alachua County but the difference is not statistically significant at the alpha = 0.05 level.

The graph on page 7 shows the actual AADR on the vertical axis plotted against the predicted AADR on the horizontal axis. As the graph shows, the actual and predicted AADRs are highly correlated with an r squared of 0.4984. The r squared indicates that 49.84% of the variation in the AADR is explained by the variation in the 11 social and demographic measures.

## Table 2

### Actual Versus Predicted Age Adjusted Death Rates

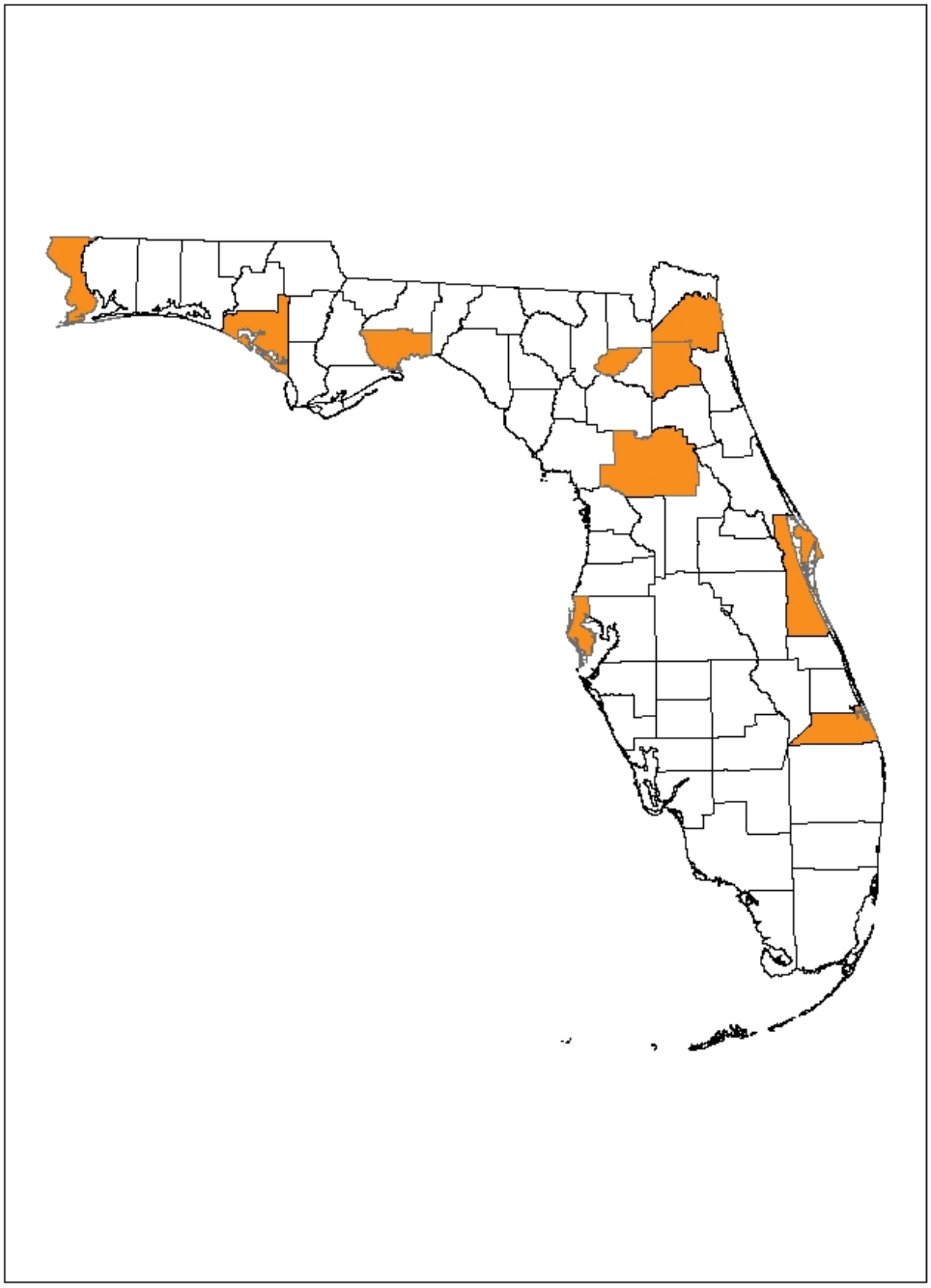
| County | 2016 AADR | Predicted 2016 AADR Based on Demographic Statistics | Percent Difference Actual / Predicted | Statistical Significance of Percent Difference |
|---|---|---|---|---|
| Alachua | 742.1 | 701.8 | 5.7% | |
| Baker | 928.1 | 846.9 | 9.6% | |
| Bay | 889.1 | 811.8 | 9.5% | H |
| Bradford | 875.6 | 886.8 | -1.3% | |
| Brevard | 790.0 | 742.4 | 6.4% | H |
| Broward | 656.0 | 662.6 | -1.0% | |
| Calhoun | 983.9 | 968.2 | 1.6% | |
| Charlotte | 657.1 | 802.8 | -18.1% | L |
| Citrus | 845.3 | 870.1 | -2.9% | |
| Clay | 822.3 | 697.0 | 18.0% | H |
| Collier | 503.8 | 669.9 | -24.8% | L |
| Columbia | 881.0 | 825.6 | 6.7% | |
| Miami-Dade | 598.9 | 879.7 | -31.9% | L |
| Desoto | 964.2 | 964.0 | 0.0% | |
| Dixie | 842.9 | 877.3 | -3.9% | |
| Duval | 833.8 | 792.2 | 5.3% | H |
| Escambia | 865.6 | 800.8 | 8.1% | H |
| Flagler | 709.9 | 765.7 | -7.3% | |
| Franklin | 899.3 | 849.0 | 5.9% | |
| Gadsden | 938.9 | 911.4 | 3.0% | |
| Gilchrist | 698.0 | 909.5 | -23.3% | L |
| Glades | 745.9 | 933.1 | -20.1% | |
| Gulf | 844.2 | 884.6 | -4.6% | |
| Hamilton | 768.9 | 785.1 | -2.1% | |
| Hardee | 936.3 | 963.2 | -2.8% | |
| Hendry | 904.8 | 988.0 | -8.4% | |
| Hernando | 811.6 | 798.6 | 1.6% | |
| Highlands | 756.0 | 766.8 | -1.4% | |
| Hillsborough | 764.0 | 758.0 | 0.8% | |
| Holmes | 955.7 | 929.7 | 2.8% | |
| Indian River | 698.7 | 790.6 | -11.6% | L |
| Jackson | 900.3 | 955.9 | -5.8% | |
| Jefferson | 991.0 | 832.0 | 19.1% | |

Table 2 (continued)

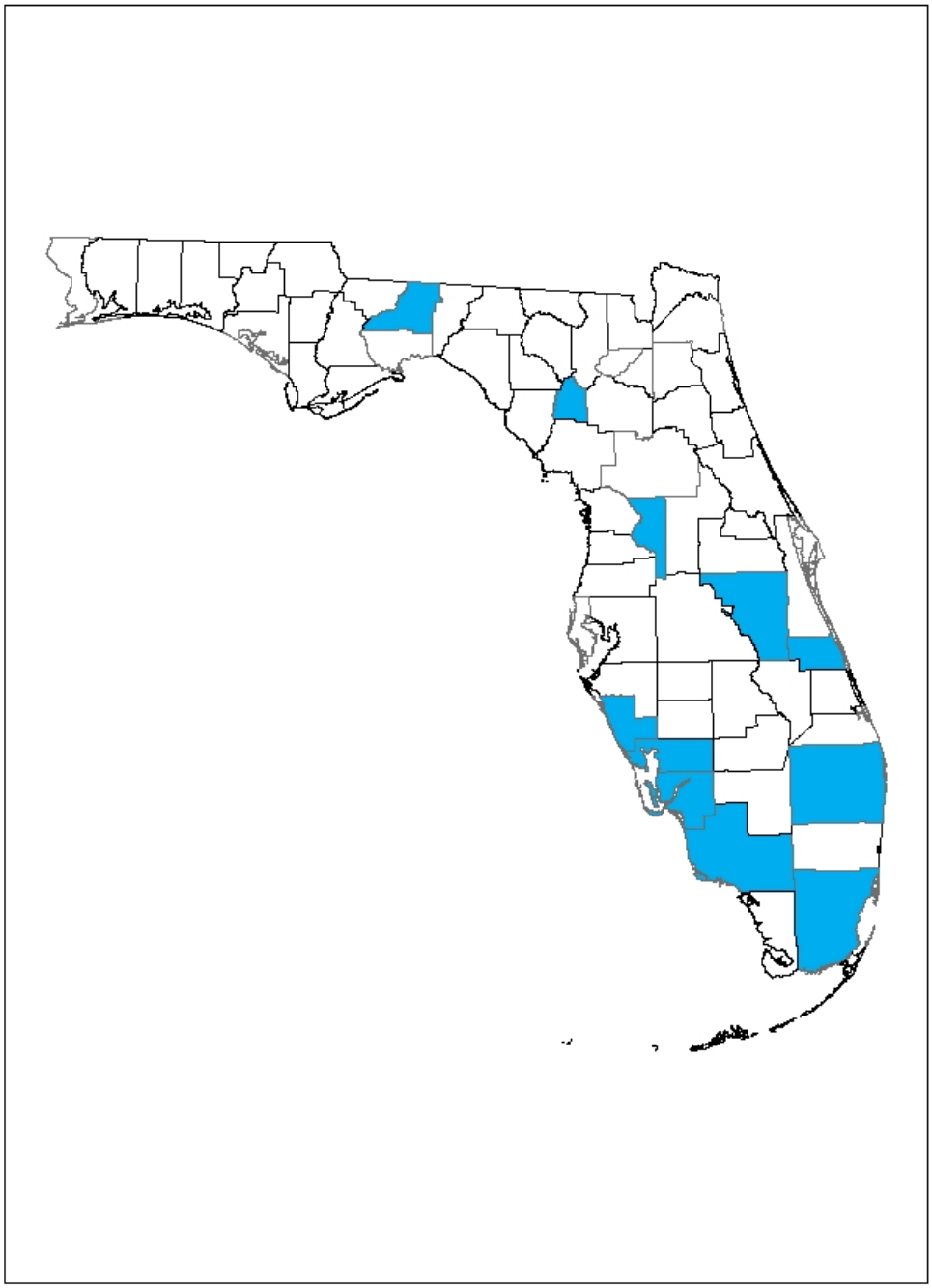
| County | 2016 AADR | Predicted 2016 AADR Based on Demographic Statistics | Percent Difference Actual / Adjusted | Statistical Significance of Percent Difference |
|---|---|---|---|---|
| Lafayette | 888.4 | 938.7 | -5.4% | |
| Lake | 752.2 | 717.4 | 4.9% | |
| Lee | 645.9 | 731.8 | -11.7% | L |
| Leon | 674.4 | 771.6 | -12.6% | L |
| Levy | 965.3 | 890.9 | 8.4% | |
| Liberty | 756.7 | 926.8 | -18.4% | |
| Madison | 891.4 | 803.2 | 11.0% | |
| Manatee | 710.0 | 747.0 | -5.0% | |
| Marion | 848.5 | 790.6 | 7.3% | H |
| Martin | 646.7 | 517.1 | 25.1% | H |
| Monroe | 728.9 | 655.6 | 11.2% | |
| Nassau | 815.6 | 798.1 | 2.2% | |
| Okaloosa | 764.0 | 765.2 | -0.2% | |
| Okeechobee | 1007.9 | 946.8 | 6.5% | |
| Orange | 692.4 | 705.1 | -1.8% | |
| Osceola | 704.6 | 757.4 | -7.0% | L |
| Palm Beach | 612.2 | 642.8 | -4.8% | L |
| Pasco | 792.2 | 760.5 | 4.2% | |
| Pinellas | 724.2 | 682.8 | 6.1% | H |
| Polk | 792.0 | 810.6 | -2.3% | |
| Putnam | 946.1 | 913.2 | 3.6% | |
| Saint Johns | 647.2 | 690.2 | -6.2% | |
| Saint Lucie | 746.8 | 782.9 | -4.6% | |
| Santa Rosa | 805.3 | 764.8 | 5.3% | |
| Sarasota | 627.0 | 697.7 | -10.1% | L |
| Seminole | 677.5 | 685.4 | -1.2% | |
| Sumter | 625.8 | 762.6 | -17.9% | L |
| Suwannee | 874.8 | 897.6 | -2.5% | |
| Taylor | 966.5 | 938.6 | 3.0% | |
| Union | 1439.7 | 1037.3 | 38.8% | H |
| Volusia | 834.4 | 830.5 | 0.5% | |
| Wakulla | 1010.9 | 776.6 | 30.2% | H |
| Walton | 830.8 | 859.3 | -3.3% | |
| Washington | 1084.0 | 915.9 | 18.4% | |

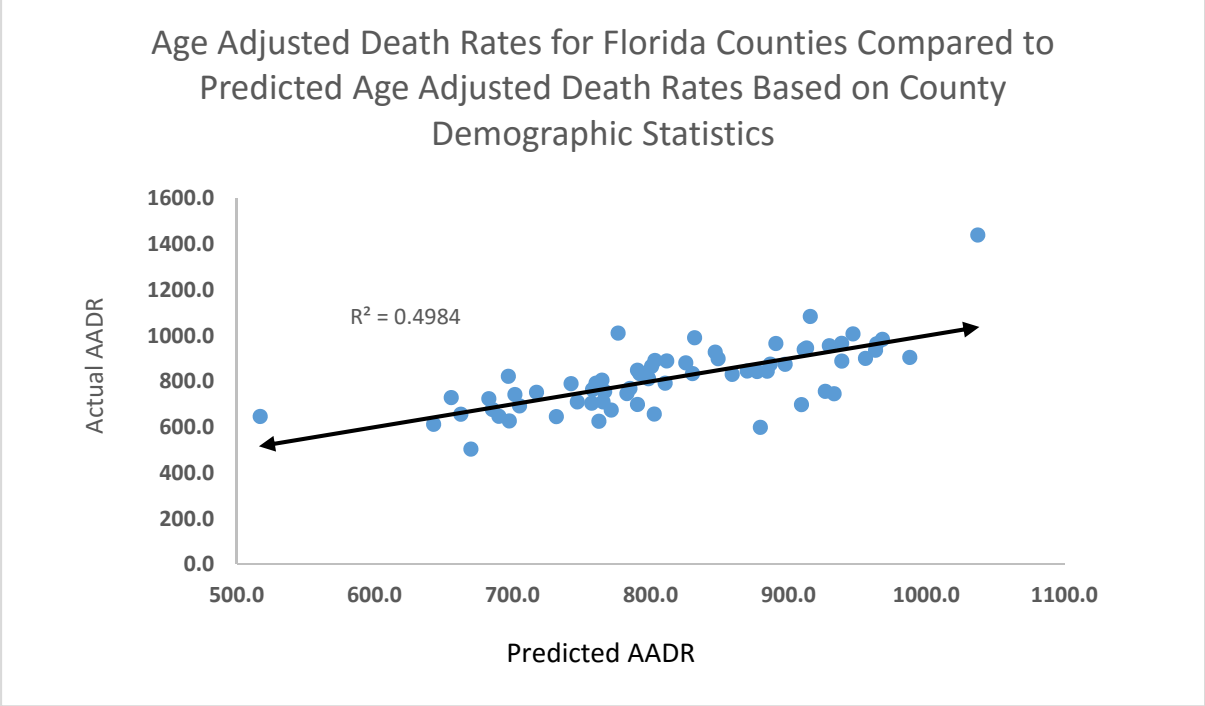
* H indicates the AADR is statistically significantly higher than the predicted AADR, and L indicates the AADR is statistically significantly lower than the predicted AADR. Blank indicates the two are not statistically significantly different. Two tailed alpha level = 0.05 is used to define statistical significance.

Counties in Table 2 with H designation



Counties from Table 2 with L designation






Discussion

The data presented here show that 9 of the 11 demographic statistics analyzed are significantly correlated with county AADRs. The strength of the correlations varies, but the two strongest correlations are for median income and the percentage of persons over 25 without a high school diploma. These account for 29% and 33% of the variation in the AADRs, respectively.

The conclusion of this analysis is AADRs and demographic characteristics are correlated in Florida. It should be noted this analysis pertains only to correlation and does not address potential causal relationships between AADRs and demographic factors. The data used for this analysis are not valid for addressing causal relationships but are well suited to analysis of correlations.