

Congratulations to the Bureau of Labor Statistics for Creating an Excellent Graph

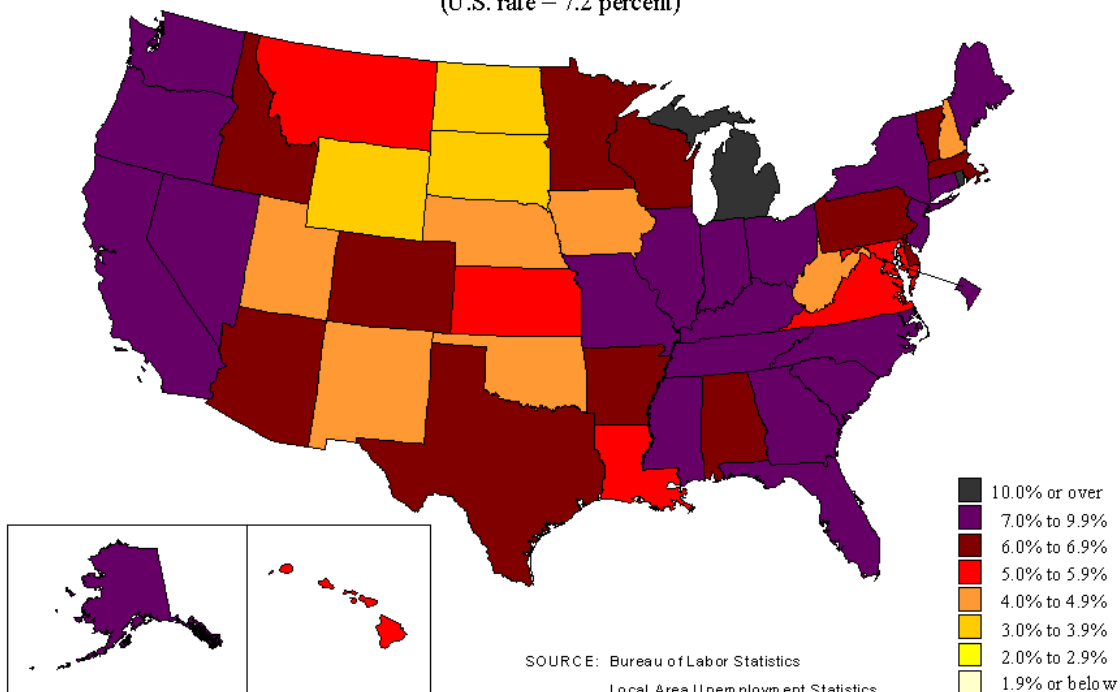
By Jeffrey A. Shaffer

12/16/2011

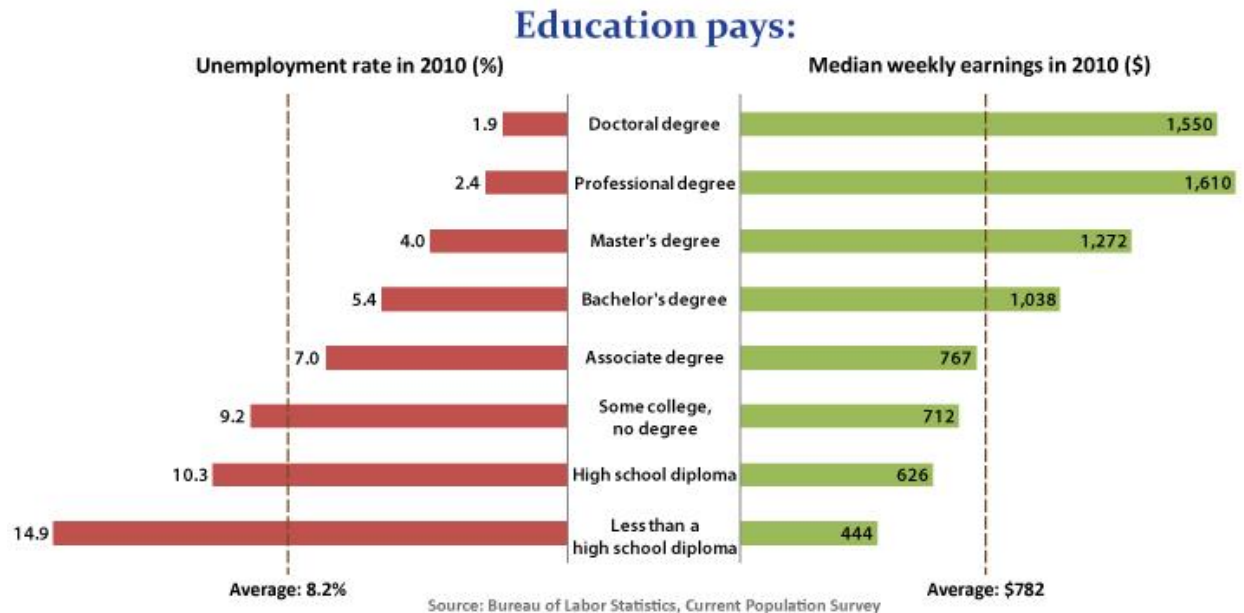
The Bureau of Labor Statistics (BLS) has published some really bad graphs and maps over the years. Below is an example of a map they publish monthly for the “Unemployment Rates for States”. In this map they are attempting to have a sequential color scheme, going from light to dark to represent low to high unemployment rates, but because of poor color choices it has unintentionally become categorical. Black, which is the highest rate, seems muted against the other colors. The bright red, which is a middle value of 5%-5.9% unemployment, seems to dominate the map more than the darker red or purple color which is actually a higher rate.

Unemployment rates by state, seasonally adjusted, December 2008

(U.S. rate = 7.2 percent)



However, the highlight for today is a refreshingly well done graph on the unemployment rate and median earnings when compared to education attained.

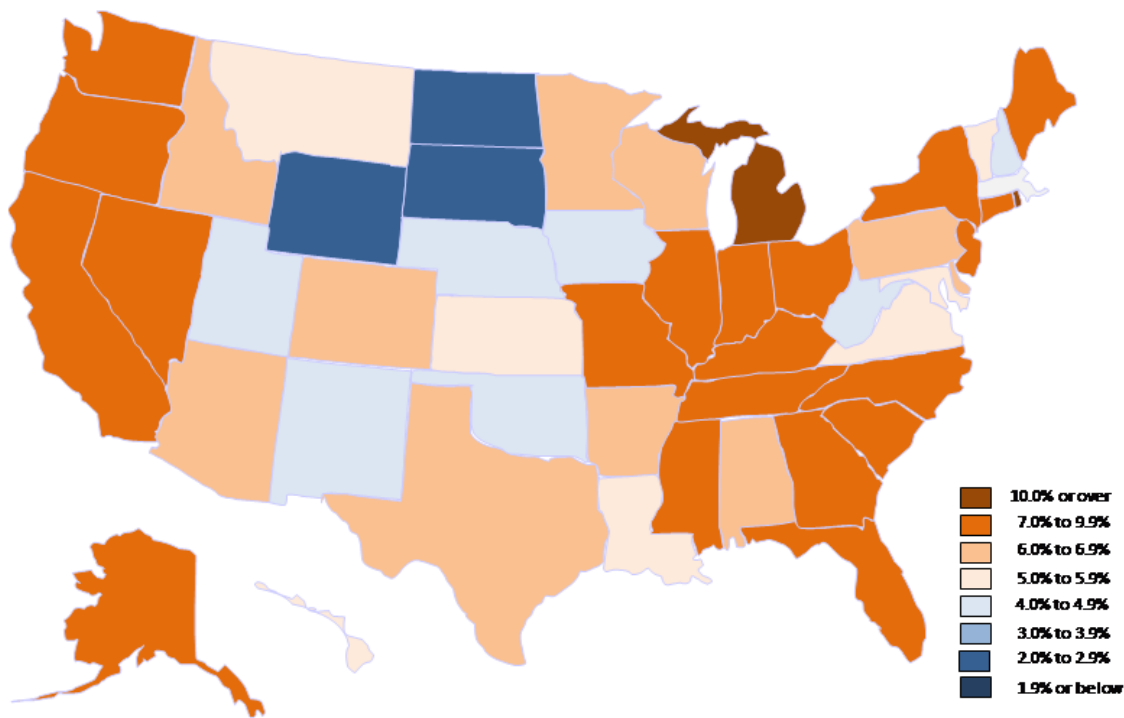


This graph is very well done. Notice the following characteristics.

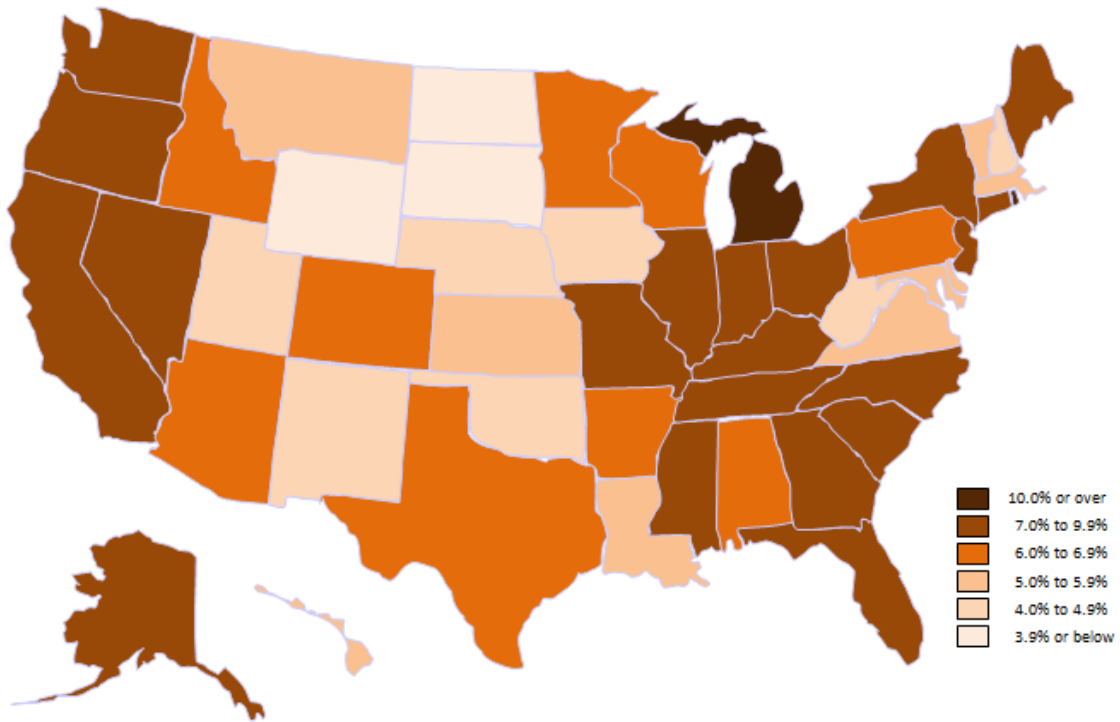
- Simple bar graph used for comparison. The choice of the bar graph allows the reader to easily compare the categories.
- Consolidated labeling and diverging horizontal scale allows for combined axis labels in the middle.
- There are no extra gridlines, no horizontal axis line, no axis scale and no border around the chart (unfortunately the webpage coding added an unnecessary border on their website at http://www.bls.gov/emp/ep_chart_001.htm)
- The data points are placed on the bars themselves providing additional information to the story.
- The addition of a very clean reference line (in this case the average) gives additional context to the story and provides a context for each bar to be compared against.
- Formatting is very clean. A single decimal place is consistent for the unemployment rate and the median income is not cluttered with decimal places, but includes a comma for thousands.
- The use of color is simple. Someone who is color blind may not be able to distinguish between the red and the green easily, but since the color is not crucial to the story nothing will be lost.
- Great care was taken to have the negative statistic, in this case the unemployment rate, increase horizontally to the left, while the positive indicator of median weekly earnings increase to the right.

Notice that they utilized some of the same techniques that were discussed in the recent [“Make Category Comparisons Much Easier with these Redesigns”](#) post on the Making Data Meaningful blog. Now some may argue the overall message of this graph, which is, higher education will lead directly to higher income. This may or may not be the case; however, the BLS has done an excellent job at presenting this data. **Congratulations to the Bureau of Labor Statistics for creating an excellent graph.**

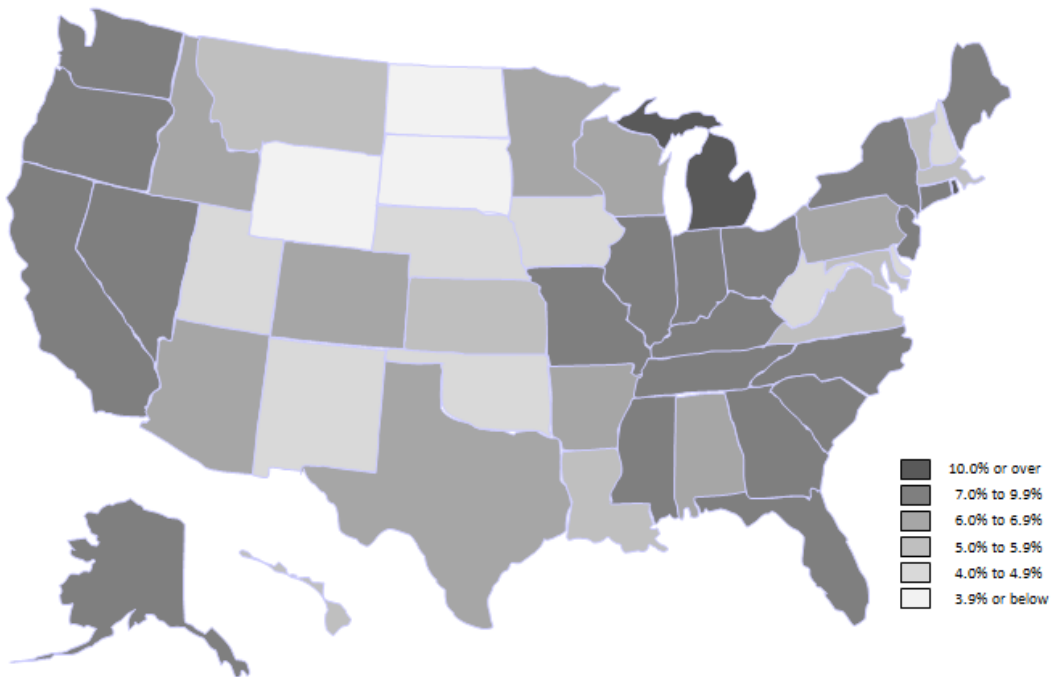
As it relates to the first unemployment map, simply changing the color scheme would solve the categorical color problem. Here is the same map using a color blind friendly blue-orange diverging color scheme. More importantly though, examine the difference in the emphasis on the orange and dark orange states and very little emphasis on Montana, Kansas, Louisiana and Virginia which were bright red in the original version.



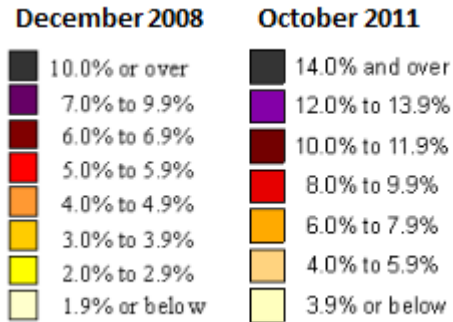
However, when using this diverging color scheme the blue still attracts attention to the low percentage states. This kind of color contrast might work well for a political map, for example Republican vs. Democrat, but for a low to high scale this can be confusing. A better version of this could be achieved by using a single color, light to dark, and removing a few of the bands, for example 5 or 6 bands instead of 8. Here is the same map using the sequential color palette but only using orange and 6 bands. This is similar to the original map, but avoids the purple and dark red being interpreted as categorical.



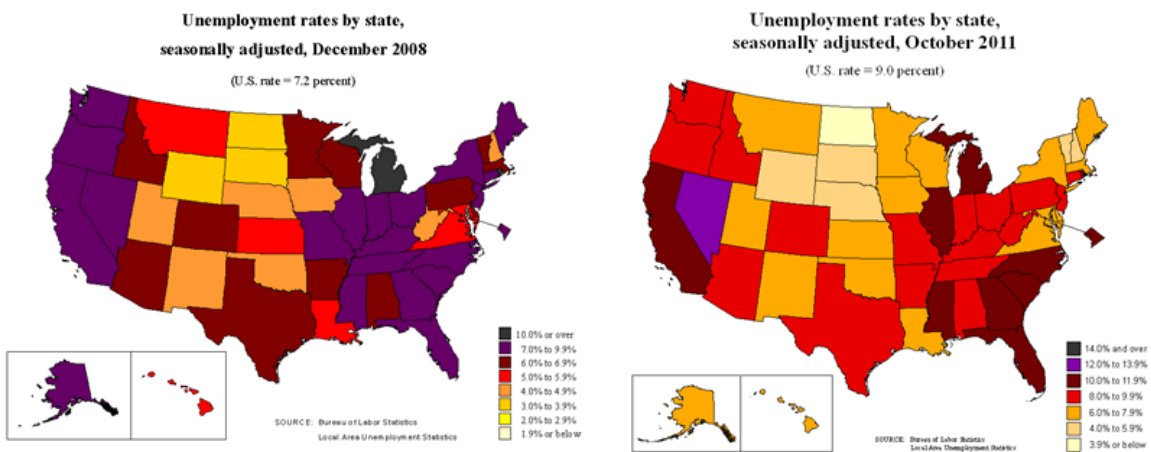
Here is the same map using only gray scale as the sequential coloring.



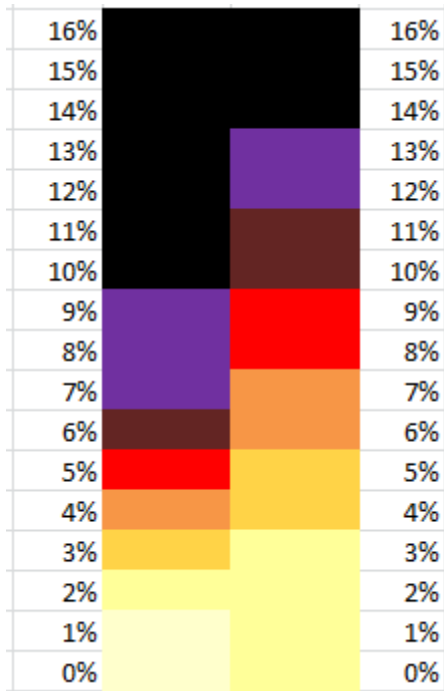
Another major issue with these charts though is the difference in scales from month to month and what appears to be an arbitrary grouping of states. Here's a comparison of the legend for the map in December 2008 and October 2011. Notice the different scale for the two legends as well as the groupings within each color.



Compare the maps side by side.



In the December 2008 version the groupings start within a band of 0-1.9% and then move in 1% increments until the purple band which has 3%. In the October 2011 the bands are grouped differently. Below is a straight line band of 1% to outline the color difference.



By changing this color scheme it makes it impossible to have an apples-to-apples comparison from one time period to the next. This is a shame because this type of map would make an excellent trellis charts to compare month by month or year over year. Also, the color choice and band selection will have a dramatic impact on the visual story. This inconsistency allows for the creator to manage the story. Hopefully, the future graphs of the BLS will continue to follow the good example.