Quantiles (5 classes)

Quantiles are determined by rank ordering data and dividing the classes so that each one has an equal number of observations. One minor issue with this though is that, dividing the entire number of observations into a certain number of classes may not have an integer in each class, such as 101.2. In order to fix this problem some classes will have more than others, such as one having 101 and the other 102, but they will only be off by one. However, another issue arises if two observations have the same value but are numbers 101 and 102 and would be split into different classes. Some manipulation is necessary and leads to more numbers put into some classes than others.

One positive aspect of quantile classification is that there is approximately the same number of observations per class shown on the map. This gives the colors on the map about equal area and the reader can sense the distribution nicely.

I used five classes for the quantile class system because five most accurately portrayed the data without overwhelming the reader with colors and it has enough observations in each class to show spatial patterns within the data. I chose a stock color scheme from ArcMap but changed the darkest red to an even darker “brick red” to further differentiate between the $4^{th}$ and $5^{th}$ quantiles. I also made the $1^{st}$ quantile one shade lighter. I feel that this map is easy to differentiate between all five classes.
Natural breaks classification is a system to consider natural groupings of data. However, this is a highly subjective method for determining where breaks occur. I chose to do this method with six classes. Generally four to seven classes are acceptable for the human eye to discern between hues, but most cartographers do not use more than five. With the amount of data we have here I decided that six would be useful to show minor changes. I started with a stock color scheme from ArcGIS and customized it to make the low values lighter (almost white) and the high ends darker (brick red). I believe that this map has enough difference between the classes for anyone to comprehend.

Due to having one extra class compared to the quantile method we can see changes on the map in trends. Especially in the south, on the quantile map most of the south was in the lowest class, now the south is spread between more than three classes.

One noticeable difference between the quantile method and the natural breaks map is the area each class covers. In the quantile map each class covers about the same number of observations. However, on the natural breaks map the highest and lowest classes have noticeably less area than the middle classes.
Bad example (manual)

Here we have a very bad example of a choropleth map.

Although, similar to the maps above, the data is split into five classes by manually decided natural breaks, the color system ruins the maps intentions. This map shows the same data in basically the same distribution as the above map. The main differences are the hues used and the order they are used in.

The first thing a reader would notice is the dull color. It is just not an attractive map. If a reader has not looked at the legend yet, they would undoubtedly have a hard time figuring out what each color represents. In the above maps the lighter colors represented smaller cancer rates and the color scheme is a scale of sorts that goes up to a dark red representing higher rates. This is an intuitive design. However, this map starts with a dull red as the lowest rate and a dark blue as the highest rate. Readers generally equate red with high/hot/worse values and blue with lower/cooler/better values. One final problem sometimes overlooked by cartographers is the color scheme. A reader of this map would have to look at the legend to determine what each hue represents.