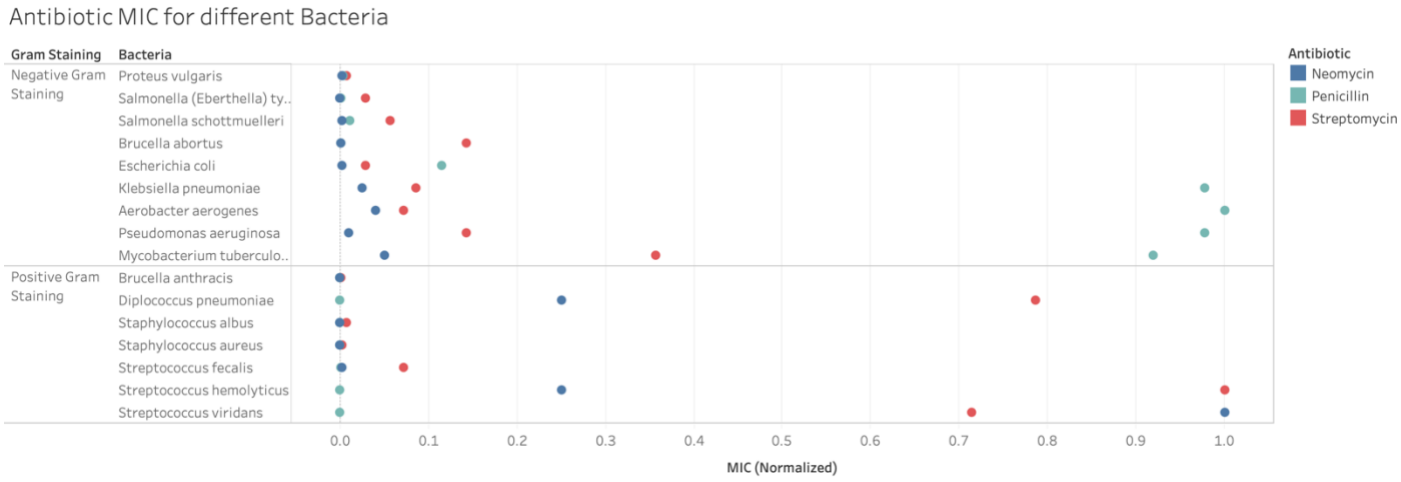
Antibiotic MIC for Different Bacteria



This visualization communicates the difference in effectiveness of 3 antibiotics against different bacteria. The graph is designed to be used in two distinct ways. Each bacterium can be considered separately to compare the relative MIC values of the 3 different antibiotics for the particular bacteria. The bacteria are also grouped by their gram staining value (positive/negative) to predict the effectiveness of an antibiotic against a new bacterium based on its gram staining characteristic.

The MIC value is encoded with position on the x-axis because position is the most effective visual encoding, and this is the most important value to represent for the goals of the visualization (Principle of Importance Ordering). The y-axis was considered for this variable, but because a viewer could mistakenly perceive a higher position as better, and in the case of MIC, lower is better, the x-axis was chosen instead. Additionally, the 3 different antibiotics are encoded with color which is highly effective for nominal data.

The positive/negative gram staining value is encoded with position on the y-axis, to group the bacteria together. While gram staining and bacteria are both nominal variables and they are encoded in position, this grouping makes it easy to predict the effectiveness of new bacteria against a particular antibiotic based on their gram staining characteristic. This also aligns with Jock Mackinlay's Principle of Importance Ordering to give a highly effective encoding to the most important variable.

As for data transformation, the MIC scale is normalized across different bacteria/antibiotic relationships because then different bacteria can all be lined up on the same axis and scale for easy comparison. Without this transformation, large values make small ones impossible to differentiate. In terms of expressiveness, this visualization is not fully expressive of the data because it loses the actual values of the MIC from the data as the scales are normalized. However, all other aspects of the data are expressed in the graph. The circles are used to mark the MIC values as opposed to bars, so viewers do not mistakenly perceive height or volume to mean effectiveness of the antibiotic.

Tools used: Tableau