

Communication Goal

The visualization is aimed to show the effectiveness of three antibiotics on bacteria of different gram staining.

From the boxplots and circles' distribution in the visualization, we can see that Penicillin generally has the greatest effects on Gram-positive bacteria and the worst effects on Gram-negative bacteria. As for Streptomycin and Neomycin, on average they both have similar effects on Gram-positive and Gram-negative bacteria, and effects on Gram-positive bacteria both show greater variations. The average effects of Neomycin are generally better than that of Streptomycin.

Design Rationale

For the choices of marks, scatter plots and boxplots are chosen so that the distribution of antibiotics' effectiveness can be intuitively conveyed through the position distributions in the planer position scale. The scatter plots show the direct distribution of the effectiveness, while the boxplots clearly reveal some underlying information like the median, the Q3 values, and etc.

1/MIC is calculated and used as the y scale to show the effectiveness of antibiotics where the higher value of 1/MIC implies better effects on bacteria, which adheres to people's intuition. Log scale is adopted to generate a denser distribution which is easier to observe. As for the x scale, the antibiotics' names as nominal values are chosen so that the effectiveness of three antibiotics can be compared in a common scale. The order of Penicillin, Strptomycin, and Neomycin corresponds to the apparent increasing of effectiveness on Gram-negative bacteria. Last but not least, the color is chosen based on the Gram staining of bacteria where red plots correspond to Gram-positive bacteria, and blue plots correspond to Gram-negative bacteria. The choices of colors make sense considering the people's intuitive impression on positiveness and negativeness. Also, the contrasting colors make it easy to separate the plots for Gram-positive and Gram-negative bacteria.