

The first graph visualizes required amount of each antibiotic to stop the growth of every bacteria in the data set. A bar chart is an ideal visual encoding for this because it uses position judgments to compare the differences between the 3 antibiotics, which is the most accurate visual encoding. Additionally, bar charts also involve judgments of area, the penicillin bar has a far greater area than the other two antibiotics, which helps communicate the difference along with the position judgment.

The labeling on the Y axis also helps to show the significance of the graph. Penicillin reaches 3500, while the other two appear to be less than 100. Neomycin and streptomycin appear to require about the same amount, with the Neomycin being only slightly larger, which the area judgment helps demonstrate. The neomycin graph appears bigger as a larger rectangle, but only slightly.

The second graph shows for each bacteria how many antibiotics can stop it's growth with treatment of a gram or less. The available results for each bacteria are either 0, 1, 2, or 3. Because there are only a few possible Y values, it is preferable to use a marker over a bar to visualize that there are only a few options to choose from, as opposed to a bar that can appear to have varying values.

This helps communicates the potency of antibiotics. Most bacteria have a count of 2 or higher, meaning there are at least 2 antibiotics that will stop it's growth with a fraction of a gram. Seeing the position judgments as a whole makes this point clear.

The third graph focuses on the streptococcus (strep) bacteria and how much of each antibiotic is required to stop the growth of the three different strains of strep. Each strain has 3 corresponding y values, one for each antibiotic. For this reason, using a bar chart doesn't work due to overlapping bars. Using box markers is ideal in this case to use position judgments while being small enough to not overlap the other values. The markers are also color coded to help distinguish them from the other 2 on the y axis and to compare the effectiveness of each antibiotic across the other strep bacteria.

Use of position judgments are ideal for showing the contrast between the three different bacteria. The labels on the Y axis show how all 3 antibiotics for strep fecalis require less than 5 grams, significantly less than the other two with strep hemolyticus varying slightly more with less than 15 grams, and strep viridans varying widely compared to the other two, going as high as 40 grams.