

## Data Visualization Project 2 Part B Write-up

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We decided on using a grouped bar graph to represent the data. For the layout, we put the months on the x-axis in chronological order from left to right, with a bar each for the death rates from preventable disease, wounds, and others. On the y-axis we had the percent of the army that died from the particular cause of death. We scaled the data so that the highest bar spanned most of the height of the space and the entire width was taken up. The legend was placed in the empty white space above the months where there were low mortality rates, and months where important events occurred had their highest bar labeled. In terms of encoding, we chose to use the same colors as Nightingale, as the particular hues we chose were irrelevant to the cause of death that they represented, so blue for preventable disease, red for wounds, and gray for others. We considered using stacked bar graphs as well, but we chose the grouped bar graph as they have lower absolute judgment errors from viewers as demonstrated in the Cleveland & McGill readings.

Nightingale's visualization effectively showed the different rates (preventable death, infection from wounds, etc.). However, because her visualization is round, it is hard to tell quickly which way the data is changing and where the data starts and ends - especially since each of her round visualizations starts in April and ends next year in March. Moreover, there are two visualizations, one starting from 1854 and one starting from 1855 - strangely, she put the one starting from 1855 (later date) on the left which is also opposite of viewer's intuition of reading things from left to right. Because there are two separate visualizations, it is not easy to compare how the rate is changing between them. Finally, she represented the rate in terms of area, which makes it harder for humans to process ratio relations between values according to the power law of theoretical psychophysics in the Stevens reading. To improve these problems, our visualization puts all the rates on the x-axis with the date labeled, so viewers can see the change in rate with the progression in time, so there is a common y-axis to compare data month by month. Also, the bar graph makes the elementary perceptual task into length rather than area, which improves upon the accuracy of the perception of a viewer.

Our visualization clearly shows that the arrival of the sanitary commission did indeed lead to decrease the death rate from disease, which supports her cause of improving public sanitation to prevent disease. However, it also shows that there was already a decrease in deaths before the commission arrived, which kind of undermines her cause. The effectiveness of the sanitary commission (which started in March) could be brought into question since the disease death rate was clearly already decreasing in our bar chart, but it isn't as clear in hers because she made a different visualization with a different scale for the time after they arrived.