Visualising Inflation in Singapore Across Various Industries

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Introduction

Previous Visualization

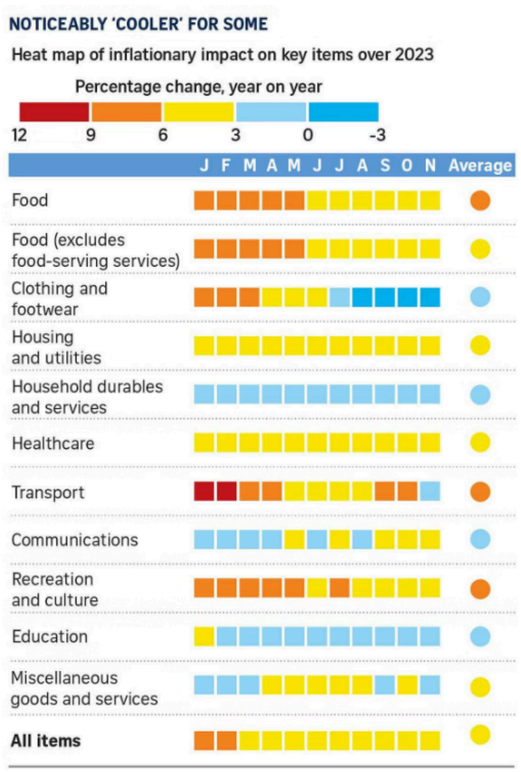

Figure 1: Heat map of inflationary impact on key items over 2023.

Strengths

- The use of heatmap design allows the data to be visually intuitive, enabling the users to determine changes in inflation rate more efficiently on a year on year basis.
- The heatmap has organized the information in different categories which allow users to compare the impact of inflation towards different domains over the months from 2022 to 2023.
- Each category is clearly labelled while being separated with padding and a line to ensure users can focus on one category at a time without accidentally reading information from another category. This eases the visual load of the user which reduces the time needed for the users to understand the heatmap
- The average column calculates the average change between the years which allows the users to see the overall impact of the inflation for the different domains.
- Data source has been credited at the end of the heatmap where the source is from the Singapore Department of Statistics

Suggested Improvements

1. *Add a plot title and a source note* so that the figure can be understood in isolation (e.g., when shared on social media).
2. *Identify missing data clearly.* Rendering unknown incidence fully transparent will distinguish it from zero incidence,
3. *Include labels for every state.* To avoid overplotting, use two-letter abbreviations instead of full state names and stagger the labels along the y-axis.
4. *Add a title to the color legend.*
5. *Avoid using a rainbow color palette.* It lacks a meaningful progression through color space and is not colorblind-friendly. Consider using a sequential ColorBrewer palette instead.[1]
6. *Use a discrete color palette.* Continuous palettes can make it challenging for humans to detect patterns below just noticeable color differences.
7. *Apply a logarithmic color scale* because most data are below the mean incidence.
8. *Add grid lines* in ten-year intervals along the x-axis and for every second state along the y-axis. Grid lines will aid in identifying states and years in the middle of the plot, even without the infotip.
9. Because there are more missing data on the right side of the plot, *shifting y-axis labels to the right* will improve visually matching states with corresponding grid lines.

Implementation

Data

- Weekly counts of measles cases by state were obtained from Project Tycho.[2] The data have missing weeks, which were treated as zero in **?@fig-wsj-on-poster**, potentially underestimating the annual total. Instead, we calculated the weekly mean case count on the basis of non-missing data only.
- Decennial U.S. census data for each state.[3]

Software

We used the Quarto publication framework and the R programming language, along with the following third-party packages:

- *readxl* for data import
- *tidyverse* for data transformation, including *ggplot2* for visualization based on the grammar of graphics
- *knitr* for dynamic document generation
- *zoo* for interpolating annual population data from the decennial U.S. census

Improved Visualization

Further Suggestions for Interactivity

Because our visualization was intended for a poster, we did not implement any interactive features, including the infotip. However, if the data are visualized in an HTML document, interactive features can be achieved using the R packages such as *plotly*. In that case, we recommend that the tile does not change its fill color. In contrast, the original visualization changes the fill color of the activated tile to light blue (see **?@fig-infotip_color_change**), which can be misinterpreted as a change in incidence. Instead, we suggest highlighting the activated tile by thickening its border.

Conclusion

We successfully implemented all suggested improvements for the non-interactive visualization. By labeling every state and choosing a colorblind-friendly palette, the revised plot is more accessible. The logarithmic color scale makes the decrease in incidence after the introduction of the vaccine less striking but enables readers to detect patterns in the low-incidence range more easily.

[1] https://colorbrewer2.org/#type=sequential&scheme=Reds&n=5
[2] https://doi.org/10.25337/T7/ptycho.v2.0/US.14189004
[3] https://www.stats.indiana.edu/population/PopTotals/historic_counts_states.asp

Email IDs (separated by commas)