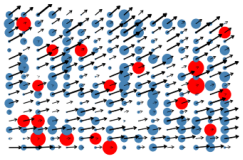


Report sheet: CSC0826_SA01 – Summative Assignment - Outbreak

Name: Simon Irvine **Student ID:** 210449787

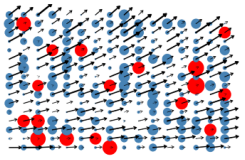
Please fill this in within the boxes to describe how you completed the task, references can be added after the table. This should in total be no more than three pages long.

Part One Task	Description of how your submission achieved this.

Fit to task: does the visualization allow the identification of areas most and least in need of aid.	The visualization presents all relevant data (including some measures/features) in order to allow a decision maker to identify areas of most/least need.[1]
	
	• **Slicer Selections**
	  ○ Filter by scenario case: Data bins (categories) based on a imputed measure, *f(CoV and estimated infected per location)*[2] -> likely, possible, unlikely, all scenarios
	  ○ Filter by postcode: Search and multiselect
	  ○ Filter by likelihood: 0-100% (non-linear) scale based on CoV
	• **Indicators**
	  ○ Impact score: 0-100% gauge visual with guidance on higher impact/priority, i.e. >90%. Supporting smart text summary.
	  ○ Estimated infected: Average estimated infection with indication of population sample. Supported by smart text summary.
	  ○ Estimated infected (as % of local population): to provide high level picture of population affected.
	• **Impacted Areas**
	  ○ Map: Lon/lat of filtered data points with associated size (infected) and colour (% of total impact).
	  ○ Impacted Areas Table: Filtered list of suburbs as presented on map with matching colour rules (% of total impact).[3]
	  ○ Average windspeed: Filtered average to highlight assumptions.

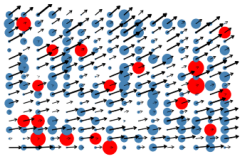
Use of visual channels	Goal was to control the data's appearance by using magnitude channels for ordered data (i.e., infected number) and identify channels for categorical data (postcode and binning).
	
	• **Channels/tools**
	  ○ Scales and gauges: Ordered data that required customization (between X and Y), or with a clearly defined minimum and maximum.
	  ○ Tables and text: To explain or summarise visualization (germane cognitive load optimization).
	  ○ Maps: To support tactical decision making -> reducing intrinsic cognitive load for quicker processing.
	• **Channel Principles**
	  ○ Position on common scale: indicator gauges

[1] James V Stone (2015). Information Theory, 'Chapter 1: What is information?'. 1-20.
[2] Ridley, A. L., & Birchall, C. (2020). Evaluating data visualization: Broadening the measurements of success. In M. Engebretsen & H. Kennedy (Eds.), Data Visualization in Society (pp. 127–140). Amsterdam University Press.
[3] Cole Nussbaumer Knaflic (2015). Storytelling with data, 'Chapter 6: Dissecting your model's visuals'.151-164.



	○ Area (2D): map plots size according to infected number ○ Colour luminance/saturation: within colour scale on map plots ○ Spatial region: lon/lat plotting of impacted locations ○ Colour hue: within indicator gauges (impact score)
Gestalt design principles	Gestalt means "unified" – the whole is greater than the sum of its parts.[4] • **Proximity:** Indicators and slicers supported by text within 0.5rem distance. • **Similarity:** Map plots similar shape (and relative size/colour) to communicate similar data. Headings and text similar in colour, size and style. • **Enclosure:** Vertical dividers used to guide users (left-to-right) through each step of the visualization. • **Closure:** None specific. • **Continuity:** Objects aligned vertically and horizontally. • **Connection:** Dividers imply connection between vertically stacked elements (slicers and indcators).
Use of colour	• **Colour deficient users** ○ Colours selected for colour-deficiencies (deuteranope palette), use of light/dark when using red and green for greater contrast. Not relying exclusively on colour as distinguishing characteristics (scales, etc.). • **Dark colours**[5] ○ Use of dark background for map to maximize contrast when displaying the plots of infected areas. Mapbox custom map to create more contrast with placenames to ease identification. • **Red/Green** ○ Red: negative/low/bad ○ Green: positive/high/good
Use of interaction	Interaction limited to control how user processes the visuals and focused on the following areas: • **Slicer Selections** ○ Categorical multi-select to allow quick comparisons. ○ Search bar to filter large group ○ Scale (between X and Y) to allow fine-tuning ○ Reset buttons created to zero visuals to present optimal information as required by a decision maker • **Impacted Areas** ○ Maps: Users can hover over plot to list tooltip variables. Auto-zoom and manual controls. ○ Table: Drill down by area (multi-location) to observe patterns or reveal indicator data without requiring postcode.
Use of language and text	• **Style and presentation:** Simple English (non-statistical) with a bias for non-transitive verbs and nouns. • **Titles:** Capitalize each word with action words (i.e., slicer, indicators, filter)

[4] Grolemund, G., & Wickham, H. (2014). A Cognitive Interpretation of Data Analysis. International Statistical Review / Revue Internationale de Statistique, 82(2), 184–204.
[5] Schwabish, J. A. (2014). An Economist's Guide to Visualizing Data. The Journal of Economic Perspectives, 28(1), 209–233.



	• **Instructions:** Remove ambiguity with 'select all' functions which cannot be removed from Power BI. • **Smart summary:** To describe scales, KPI/success metrics with further text to support non-standard scales or metrics (impact score). Includes variables to add context to visuals so user can identify whether a number is large/small or average.[6]
Technical aspects: performance, reliability, fit on desktop screen.	• **Performance:** Limit number of visuals on page (9), remove/edit unnecessary interactions (7), minimize complex measures, and pushed calculated column to source (2), limited number of slicers (3). • **Reliability:** Tested across different devices and monitor setups. • **Fit:** 1920x1080 page to fit well on most desktop monitors to maximize real-estate.
Part Two Task	

Fit to task: does the visualization allow the identification of areas most and least in need of aid.	As per Part 1, with additional elements.[7]
	• **Slicer Selections**
	  ○ Filter by wind angle and speed: Two slicers with user instructions.
	• **Impacted Areas**
	  ○ Map: Slicers (wind angle and speed) allow identification of areas most/least in need across multiple runs and weather conditions.
	  ○ Wind angle & speed: Simple visual of average angle and speed across a filter sample.

Effective visual representation of the data variations over multiple runs.	The visualization allows user to modify visuals using slicers to specify multiple runs (i.e., from SSW with >15 km/h) and to visualize the effect of high wind speed on dispersion.
Report Contents	
Logical content structure, range and quality of referencing.	Non-standard visuals • Mapbox with custom map - tested • Advanced Gauge (xViz) – no pro features used. Reverse gauge.

[6] David Spiegelhalter (2021). The Art of Statistics: Learning from data. Chapter 8: Probability – the language of uncertainty and variability. 205-228.

[7] Winton Centre (2021). Various toolkits and resources. https://wintoncentre.maths.cam.ac.uk/resources/resources-civil-servants-and-government-officials/