



Overview and Introduction

EDC101: Week 1

Dr. Calum Webb

Sheffield Methods Institute, the University of Sheffield
c.j.webb@sheffield.ac.uk

Sign in





Learning outcomes

What will I learn?

By the end of this week you will:

- Lecture: How the module will operate, where to find more information, how to navigate the module resources, and what we will be doing each week.
- Lecture: What is data visualisation, why do we do it, why does it matter, and how will we approach it?
- Workshop: First steps in **ggplot2** and **R**: how do we create visualisations of data in **R**

Who are we?

Calum Webb

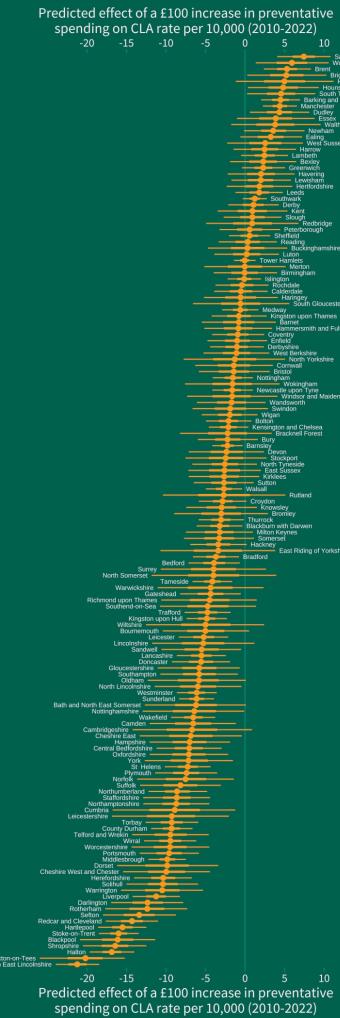
c.j.webb@sheffield.ac.uk

Research on poverty and the child welfare system in the UK using secondary survey and administrative data in **R**. My most recent project has been about how investment in services for children improves their welfare and safety.

For any general enquiries about administration during the module — registration, extensions, assessment submission, attendance, timetable issues, and so on — please contact the Student Experience team smi@sheffield.ac.uk who will be happy to help you. Remember, as per the module outline, that module leaders cannot grant extensions.

Here's some data visualisation I've done in my own work
and hobbies





Predicted CLA rate change for £100 per child increase in early help & family support services



CWIP APP



Welcome to the CWIP App

Data Dashboard

Spending Waffle Plots

Side-by-side Trends

Side-by-side Maps

CLA Rate by Ethnic Group

LA Similarity Clusters

Neighbourhood Maps

Neighbourhood Overlap Maps

Neighbourhood Correlations

LA ANOVA

Neighbourhood Regression

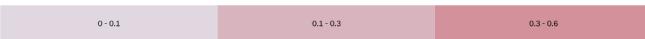
Discussion Board

Select one or more local authorities:

Sheffield

Select Red Variable:

(IMD2019 England Only) Income Deprivation Affecting Children Index (IDACI) Score (rate) (Higher Score = More Deprived) - (IncmDpACIS) - (IncmDpACIS)



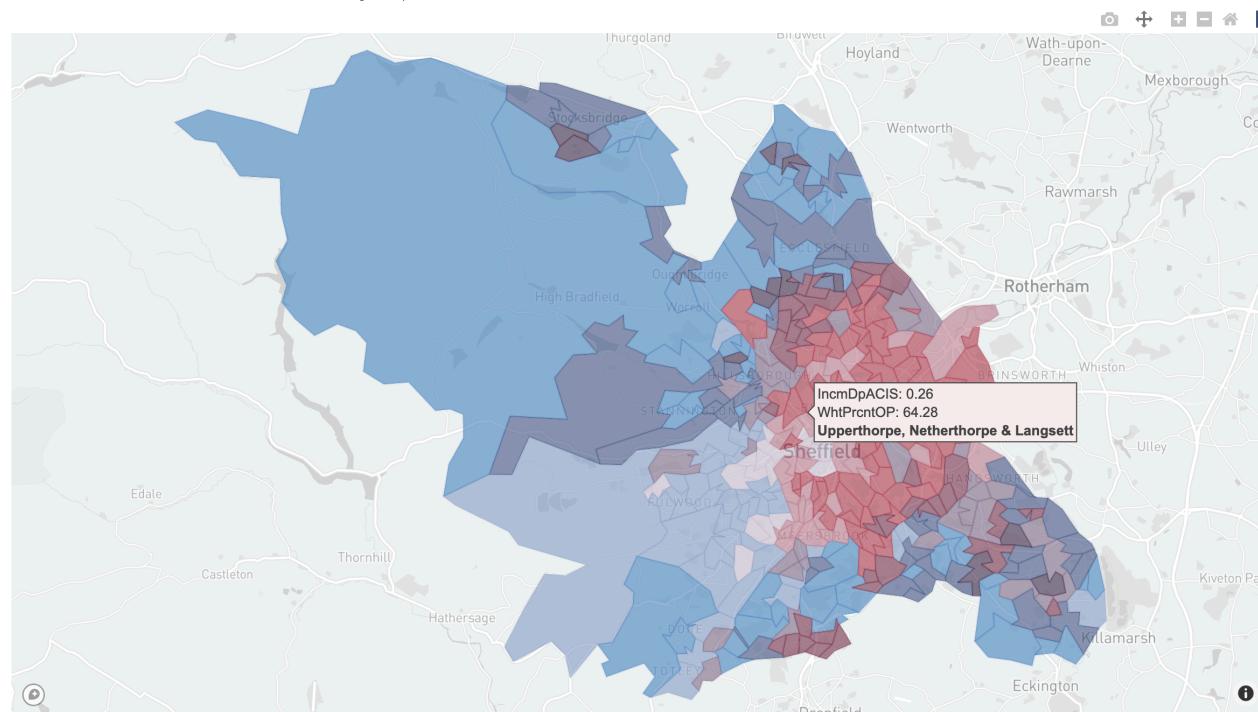
Higher IncmDpACIS →

Select Blue Variable:

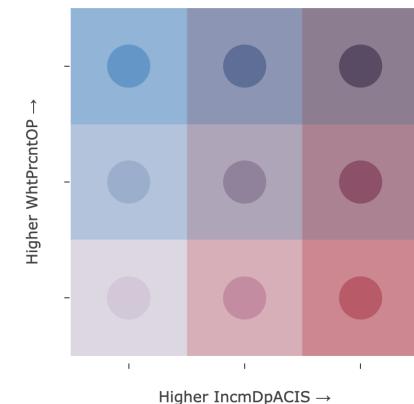
(Census2011) White (All Categories) % of Population - (WhtPrctOP) - (WhtPrctOP)



Higher WhtPrctOP →

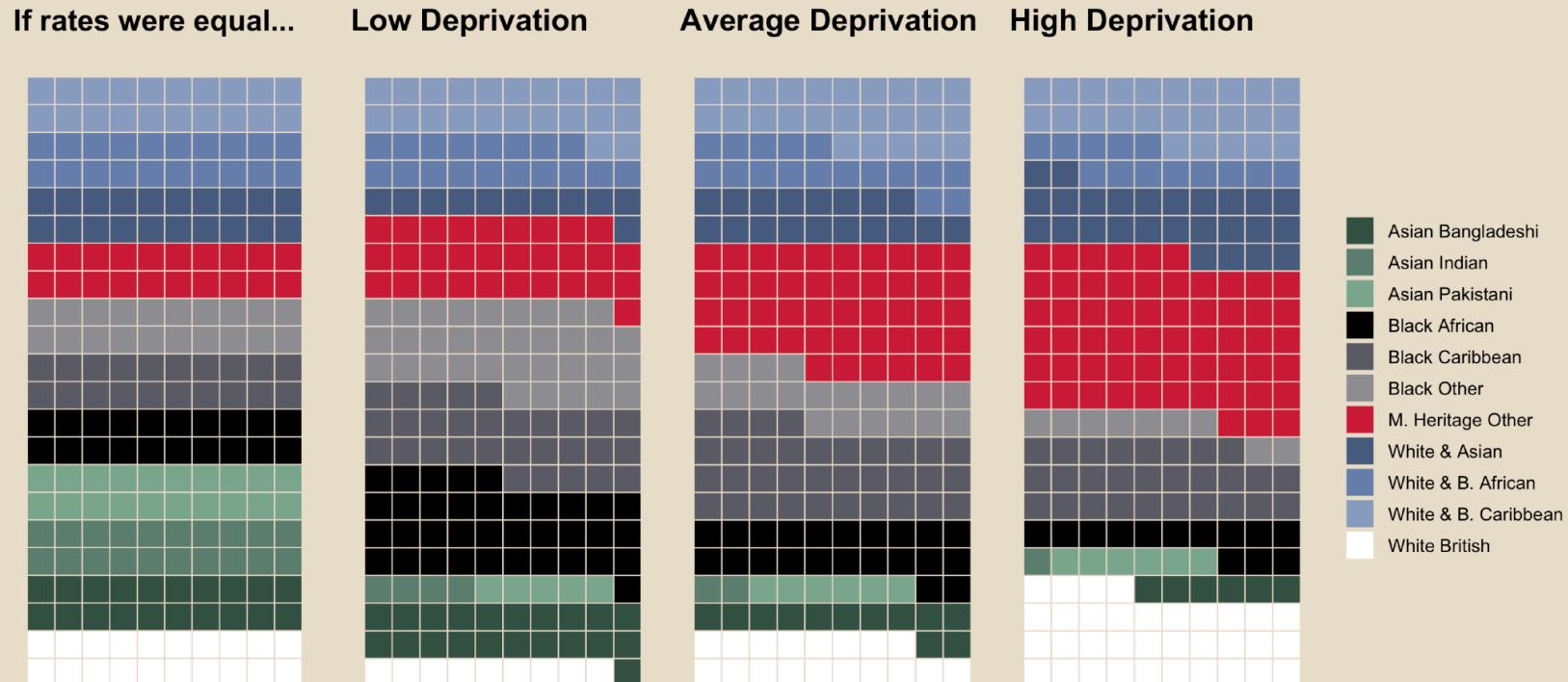


Use the key below to show only areas with that combination of scores. Click once on the legend to activate it, then left click on one of the circles inside the key to redraw the map for just the combination, click on a different circle to change the selected colour. You can add more than one combination by holding down the Shift key and left clicking on additional circles. To reset the map, double-click either on the map itself or anywhere outside of the circles on the key.



What would the ethnic profile of 220 Children Looked After look like in a Low, Average, and High Deprivation Neighbourhood if all neighbourhoods had identical ethnic population sizes?

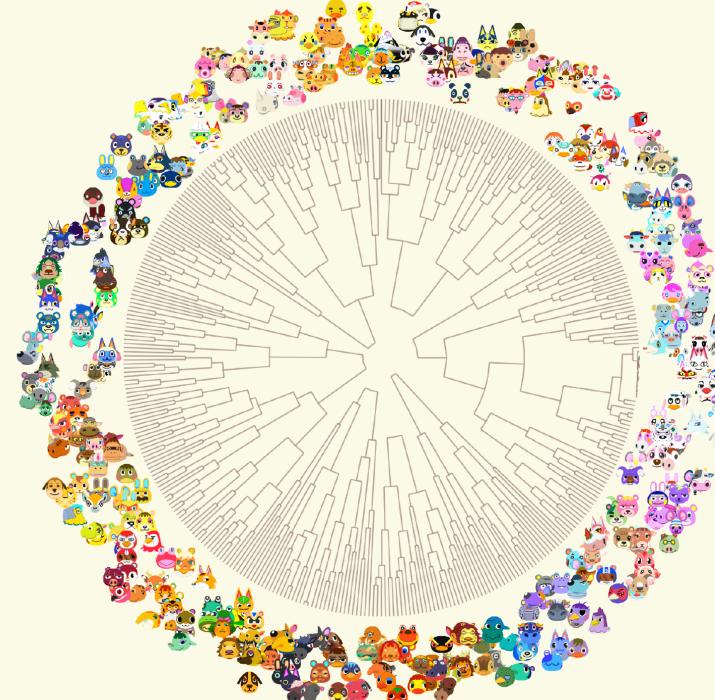
Calum Webb, the University of Sheffield



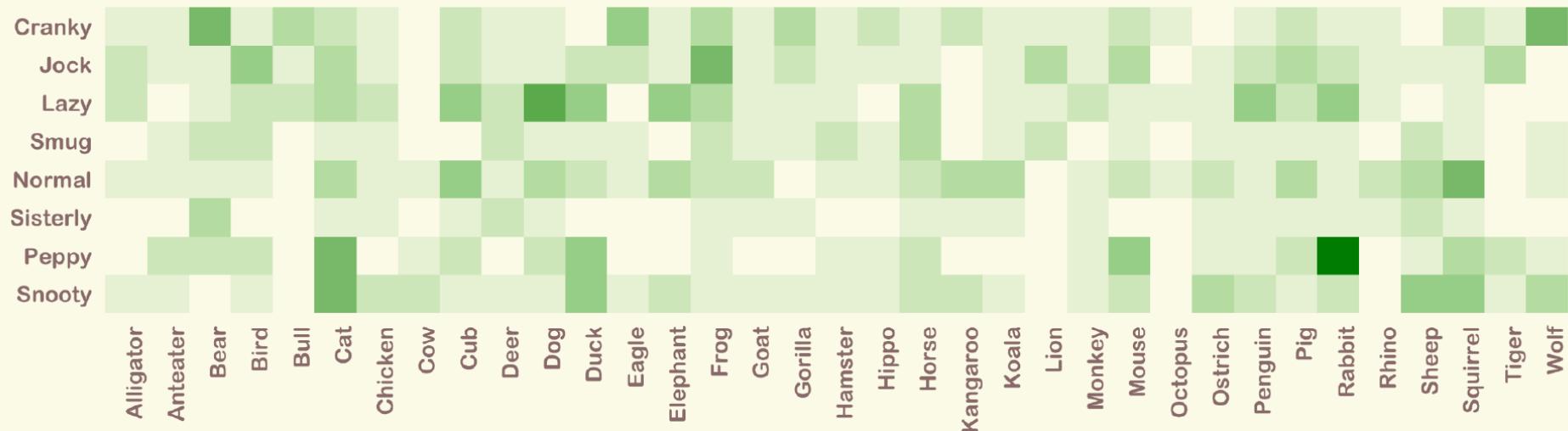
Visualising the Villagers

datavis meets Animal Crossing

Sources: Animal Crossing Icons (Nookipedia), species, and personality data (animalcrossing.fandom), Villager Popularity Rankings compiled by Pandoria, Mairen, & bloobelle from the Bell Tree Forums (28th March 2020)



I did a lot of Animal Crossing visualisation over the pandemic...

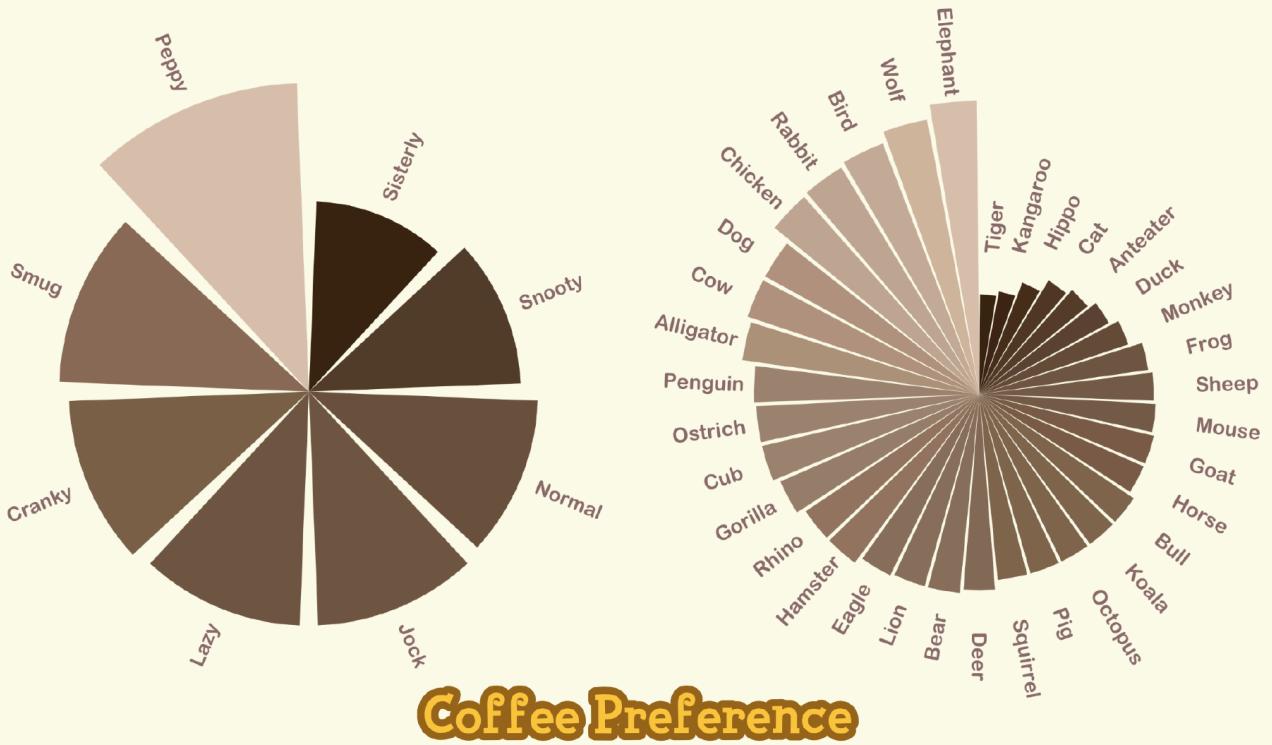


Personality x Species Combinations

Are some personality-species combinations more common than others?

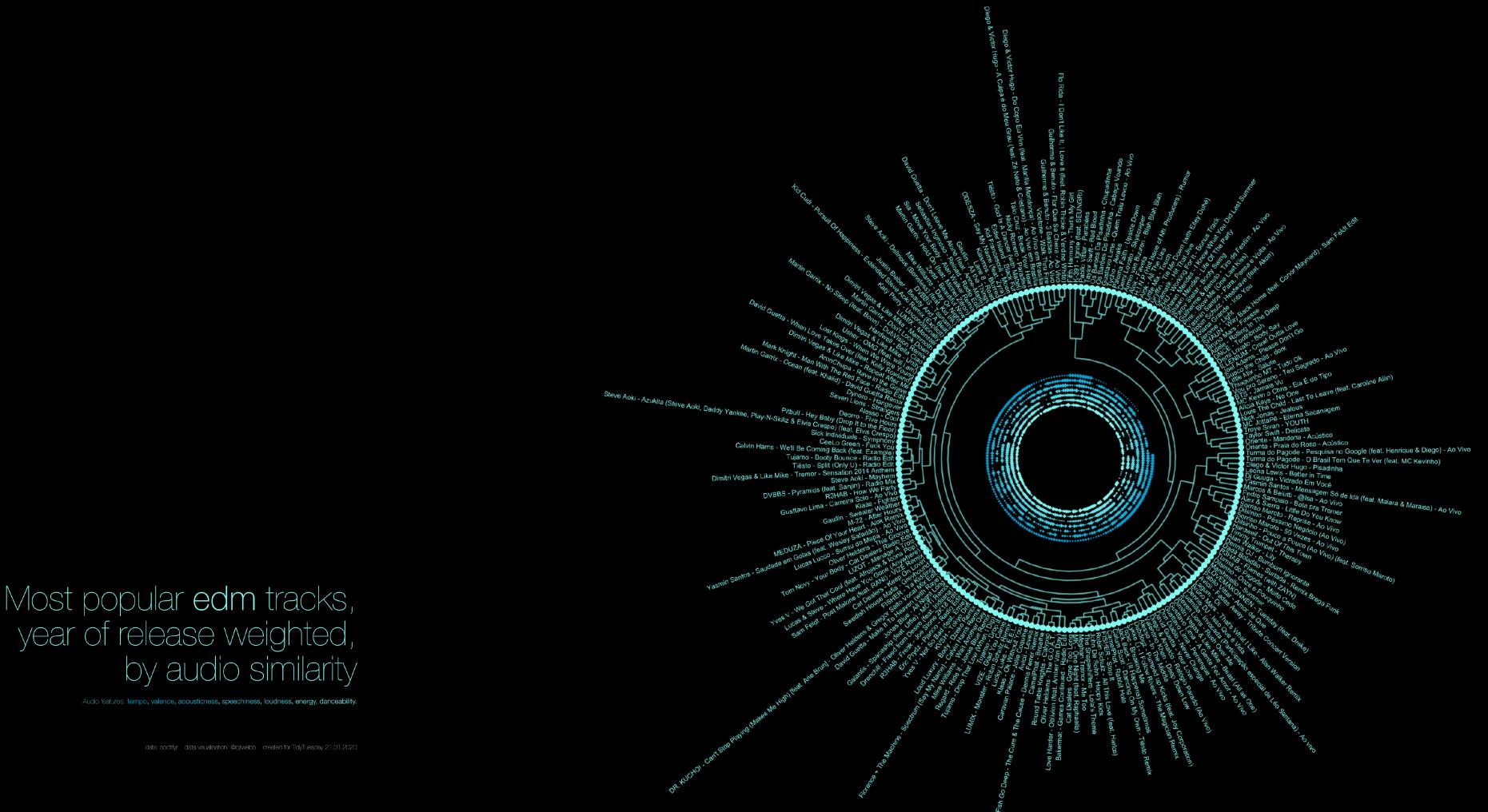
A heatmap showing the numbers of each villager species and personality combination. Darker colours indicate more villagers of that combination (max = 8), completely transparent colours means no villagers of that combination. Cranky is the most common personality for Wolf and Bear villagers, Lazy is the most common for Dogs. The most common species and villager combination is Peppy Rabbits.

Like...



Sisterly/Uchi villagers are more partial to darker coffee with less sugar, while Peppy villagers prefer more sugar and milk in their brew. Sugar filled lattes are more common among elephants, wolf, bird, rabbit and chicken villagers while black coffee is more popular with tiger, kangaroo, hippo, and cat villagers.

A lot.



**Enough about me, let me
ask something about you.**

Go to Wooclap.com and enter code: **FNJKHC**



Part I

Overview of the module: How will it work?

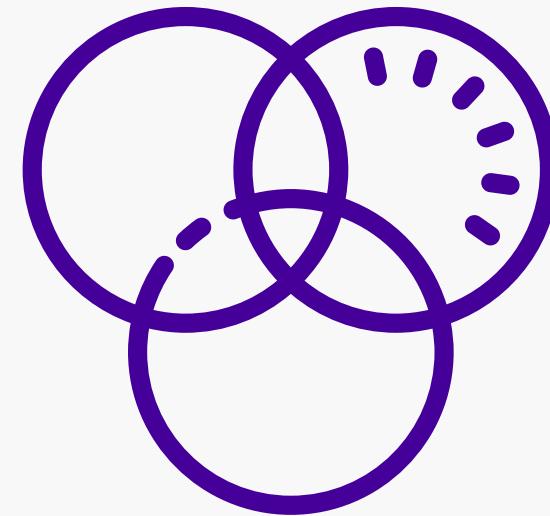


By the end of this module, you should know about:

- The **theory** of data visualisation
- The **practice** of data visualisation
- How to be **critical** about both the theory and practice of data visualisation

To do that, you will be learning how to *create* data visualisations using **R**, how to *design* data visualisations using best practice, and how to be *critical* of the data visualisations you make and see.

We don't assume you know anything about data visualisation, coding, or information design before starting this class!

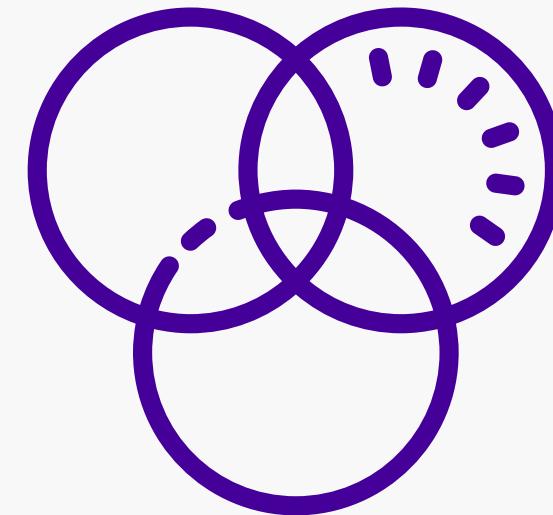


By the end of this module, you should know about:

- The **theory** of data visualisation
 - **Why is the data visualised in the way it is?**
- The **practice** of data visualisation
 - **How are key ideas implemented to create effective data visualisation?**
- How to be **critical** about both the theory and practice of data visualisation
 - **What is the impact of the things we visualise and the way we visualise them on society and culture?**

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- **Two** teaching sessions per week: ~1 hour lecture & ~2 hour practical workshop

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- **Workshops** will focus on the practice of creating data visualisations
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- Slides and worksheets will be posted on Blackboard, usually worksheets will be posted after the workshops.
- Lectures will be recorded either via Encore Lecture Capture or Blackboard Collaborate. **We do our best to ensure all lectures are recorded, but cannot guarantee this. You are expected to attend all lectures and workshops in person.**

Lecture recordings and uploaded worksheets are not a replacement for attending lectures and worksheets.



If attendance at lectures and workshops becomes very poor, we will stop providing lecture recordings.



Weekly Tasks

- For most weeks there are **core** and **supplementary** tasks.
 - **You are required to complete core weekly tasks.** These are *formative* (ungraded) assessments; you will receive group feedback in the weekly workshops to help you improve and prepare for your *summative* (graded) assessments.
 - A full breakdown of all weekly tasks and topics is available [in the module handbook/resource list](#).
 - You are not required to complete the supplementary tasks, but you will probably do better in your assessment if you do.

This is a 10-credit module and therefore it is expected it will require 100 study hours per student. Formal teaching hours for this module will take 30 hours (lectures and workshops). Therefore, as a rough guide, this means you should expect to devote around 4.5 hours of study time per week to this module during a 15-week semester.

The 301 Skills Centre offer workshops and resources on time management and study skills. I would strongly recommend booking onto some of these!



Assessment

There are two assessments:

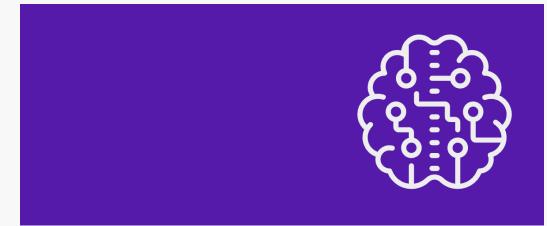
- **Assessment 1:** due in November, is worth **30% of final grade**. You will be provided with some real contemporary data and asked to produce several different graphs and reflect on what they tell us about the topic.
- **Assessment 2:** due in January, is worth **70% of final grade**. You will be asked to critique and reflect on a published article that contains a data visualisation, and consider how it might be improved. Then, you will need to improve it using the same or related data, explaining the decisions you took.



Academic Misconduct & Integrity

Types of academic misconduct:

- **Plagiarism**
 - You must not resubmit already submitted work (self-plagiarism) in assessment, even if that work was used in a different course/institution. You must ensure all sources are adequately and correctly cited.
- **Essay or code buying**
 - Self-explanatory: all of your work must be your own.
- **Collusion**
 - While I encourage you to work together on the class exercises and weekly ungraded tasks, you must not work together on your assessments. I'd encourage you to pick different research topics than your friends so that you can still chat about your assessments without collusion.
- **Fabrication**
 - You'll be expected to use real data and you must not fabricate data for the purpose of assessment. Fabricated/generated data is incredibly easy to spot. You will be caught.
- **Generative AI (False Authorship)**
 - You must not use generative AI to write any of your code for you or to conduct any analysis used in your assessment.



Academic Misconduct & AI Module Guidance

Last updated: July, 2025

The general guidance has been updated to fit with this module:
Module code: EDC101

If ticked, the following sections have been modified to fit better with the module, please review them closely. Note that module convenors may choose to write more general guidance for their module in the guidance summary or general module specific guidance section, rather than breaking their guidance up over good practice areas:

Guidance Summary	<input checked="" type="checkbox"/>
How do I complete my ADE cover sheet?	<input type="checkbox"/>
Good practice: introduction	<input type="checkbox"/>
Good practice: planning	<input type="checkbox"/>
Good practice: working with literature	<input type="checkbox"/>
Good practice: writing code	<input type="checkbox"/>
Good practice: quantitative research	<input type="checkbox"/>
Good practice: qualitative research	<input type="checkbox"/>
Good practice: academic writing	<input type="checkbox"/>
Other general module specific guidance	<input type="checkbox"/>

Generative AI Guidance Available on the Blackboard Pages under Assessment Information

Getting help with your studies

- **Consultation and Feedback hours**

I run two Consultation and Feedback hours per week, you can ask me questions about EDC101.

If you want to book an appointment with me, please use the calendar [here](#) or on Blackboard. If no times suit you please get in touch with me by email.

- **Blackboard Discussion Board**

If you have any questions about the module or any tasks, including errors with [R](#) code, you can post for help on the Blackboard Discussion boards. Also, try to help other students with their questions — it will help you learn!



Additional Resources & Workshops from the University

Library

Research Skills and Critical Thinking (RSCT) workshops:

- Discovering Information: Getting Started
- Discovering Information: A masterclass

Online resources:

- How to read a journal article
- Active reading for understanding
- Tutorials A-Z

301 Skills Centre

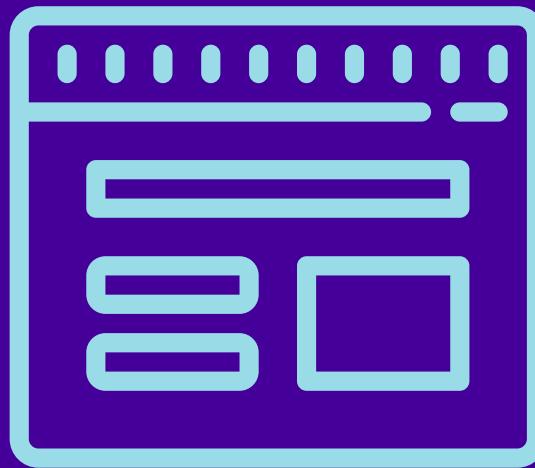
- Academic skills refresher
- Reading and note-taking at university
- Managing your time and avoiding distractions
- Study Skills 1-to-1s

M.A.S.H.

Statistics resources:

- First steps in R
- R/Excel/SPSS for Ultra-Beginners
- 1-to-1 Support

Let's take a quick tour of the
Blackboard page for
EDC101



Part II

Introduction to Data Visualisation



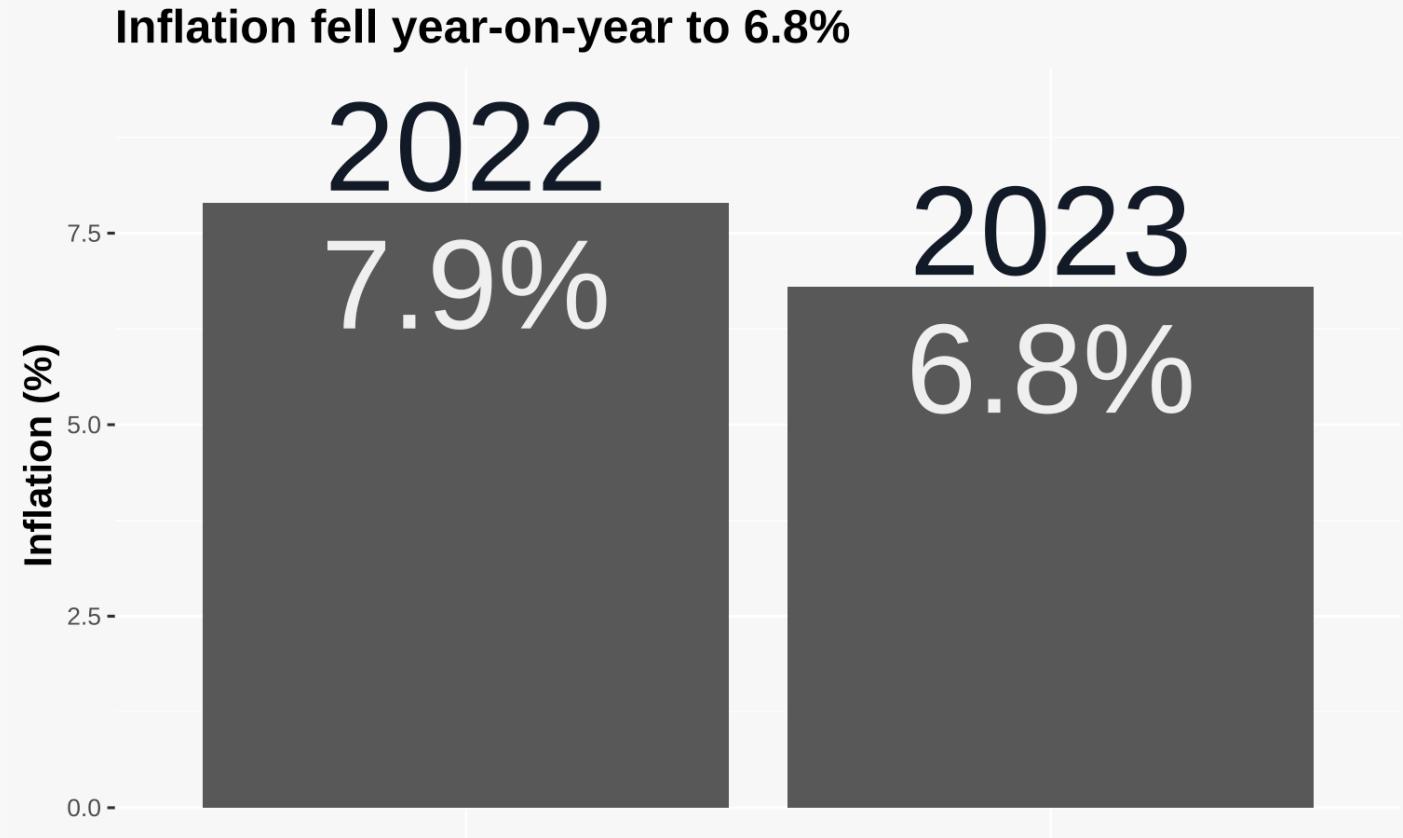
What is the purpose of data visualisation? Why do we do it?

- Re-open the wooclap.com app and go to Question/Activity 2



Data Visualisation 1

What is the main purpose?

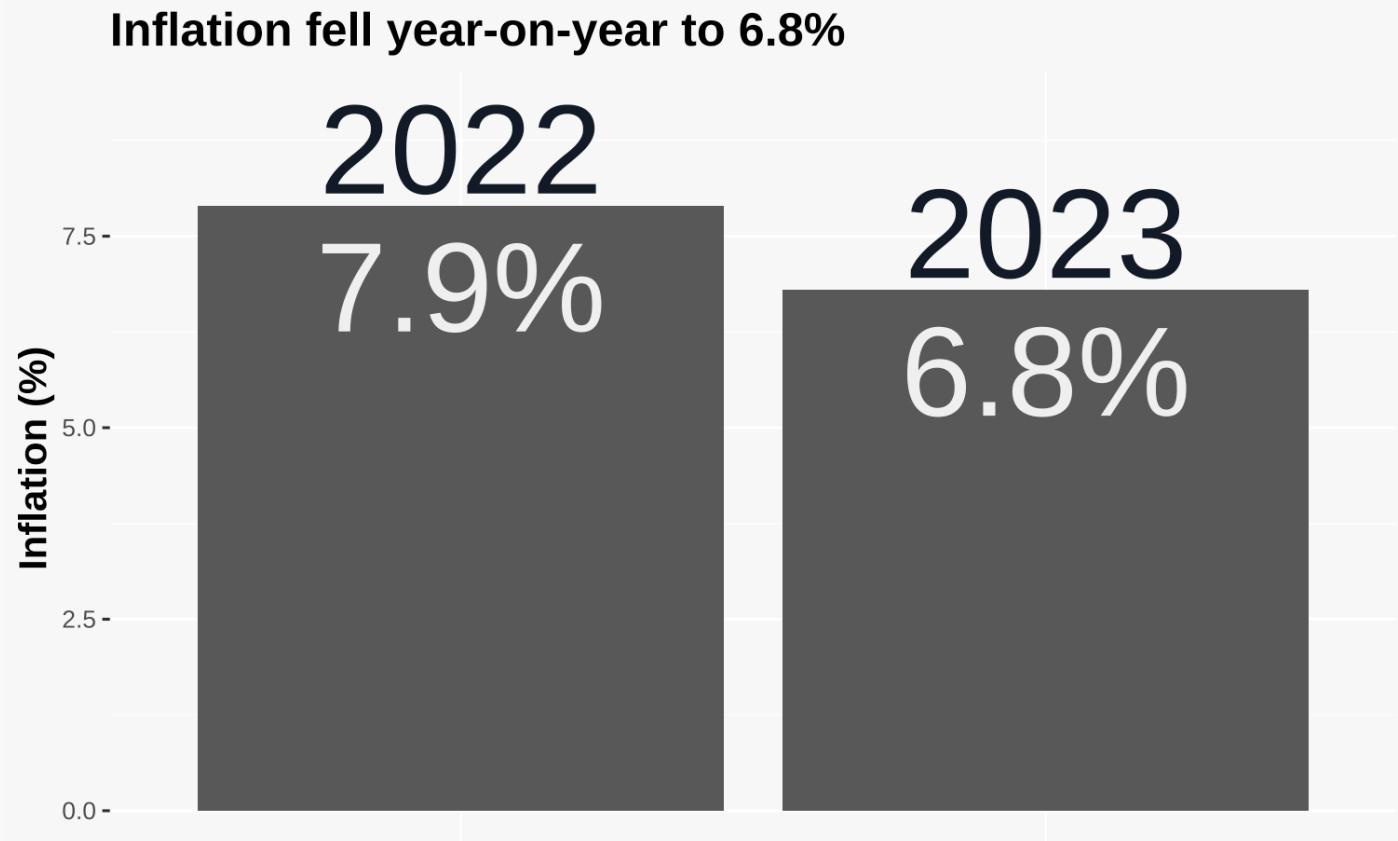


Wooclap event code: app.wooclap.com/FNJKHC (Activity 2)

Data Visualisation 1

What is the main purpose?

- To communicate information.

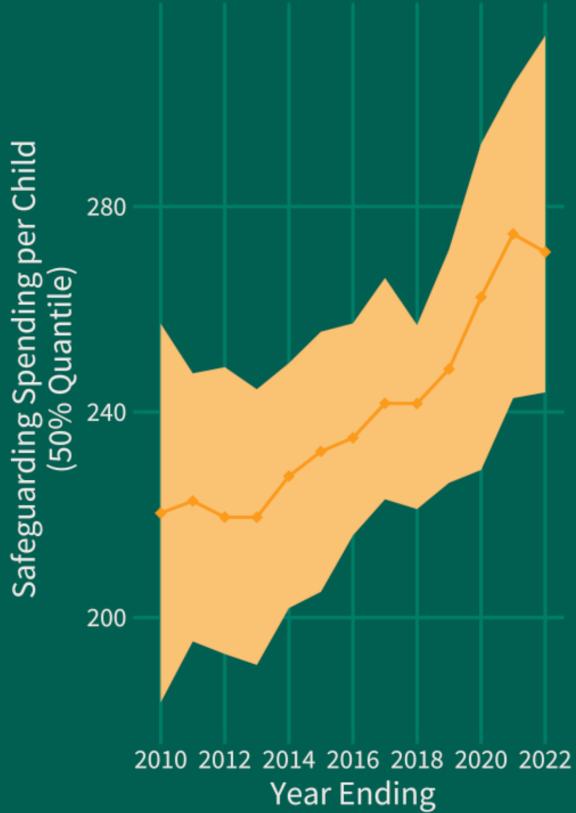
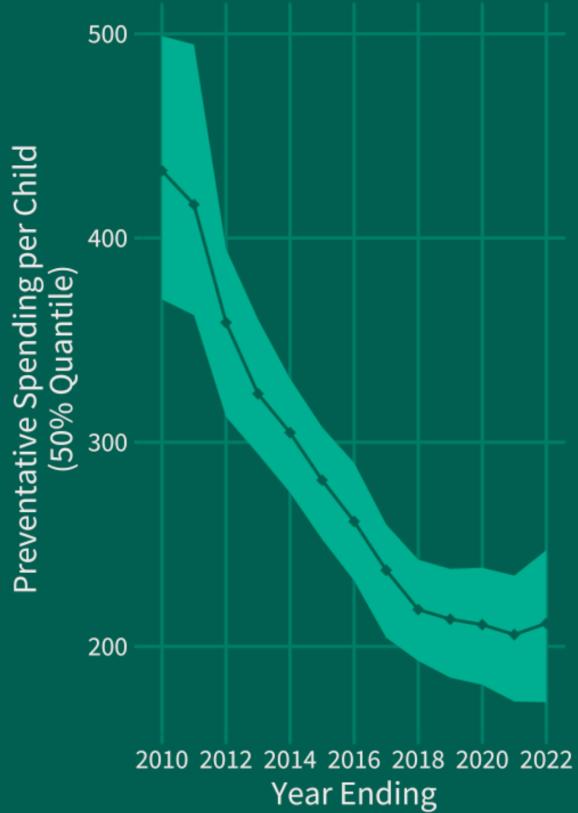


Wooclap event code: app.wooclap.com/FNJKHC (Activity 2)

Data Visualisation 2

What is the main purpose?

- To communicate information

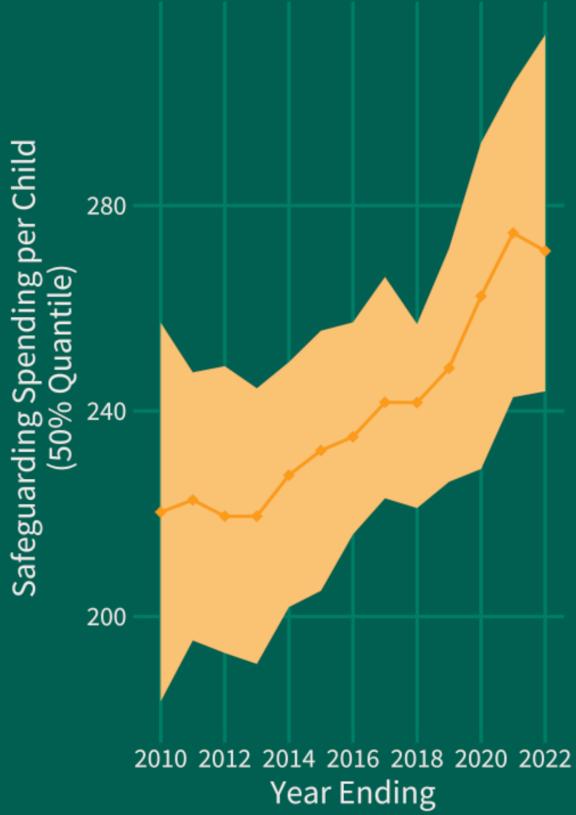
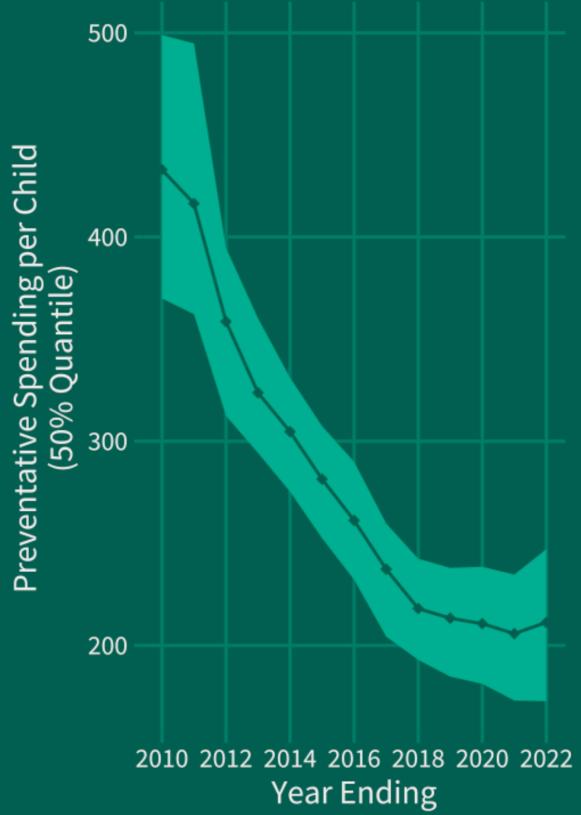


Wooclap event code: app.wooclap.com/FNJKHC (Activity 2)

Data Visualisation 2

What is the main purpose?

- To communicate information
- To tell a story



Wooclap event code: app.wooclap.com/FNJKHC (Activity 2)

Data Visualisation 3

What is the main purpose?

- To communicate information
- To tell a story

On a piece of paper in your notebook (if you have one), or by drawing with your finger or describing to your neighbour, draw a representation of the following table to illustrate the difference between "Party A"'s £2million commitment to spending and "Party B"'s £2billion commitment to spending.

Party	Spending Commitment
Party A	£2million
Party B	£2billion

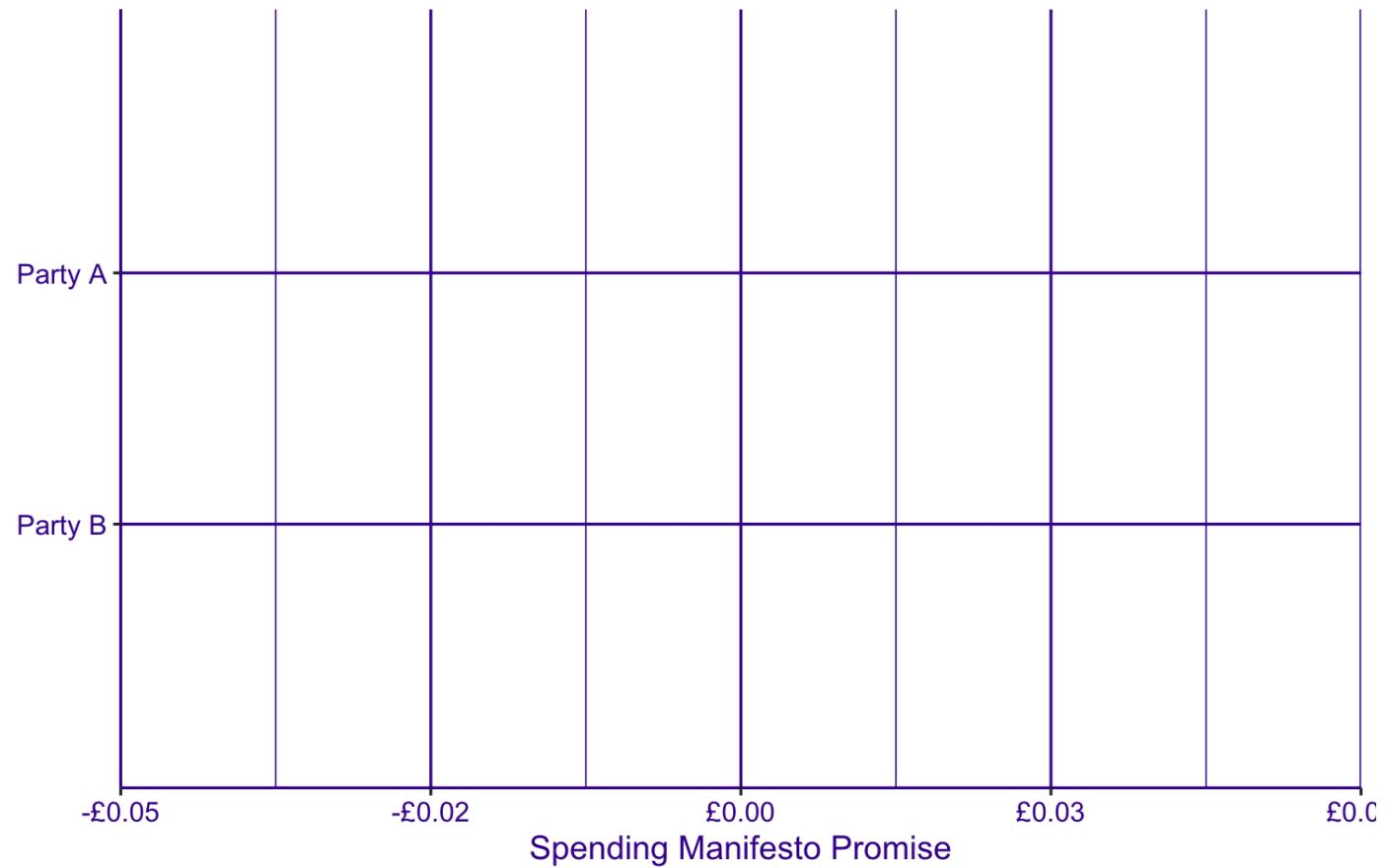
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Data Visualisation 3

What is the main purpose?

- To communicate information
- To tell a story
- To use our visual sense to understand data, detect patterns, etc., rather than language and logical processing

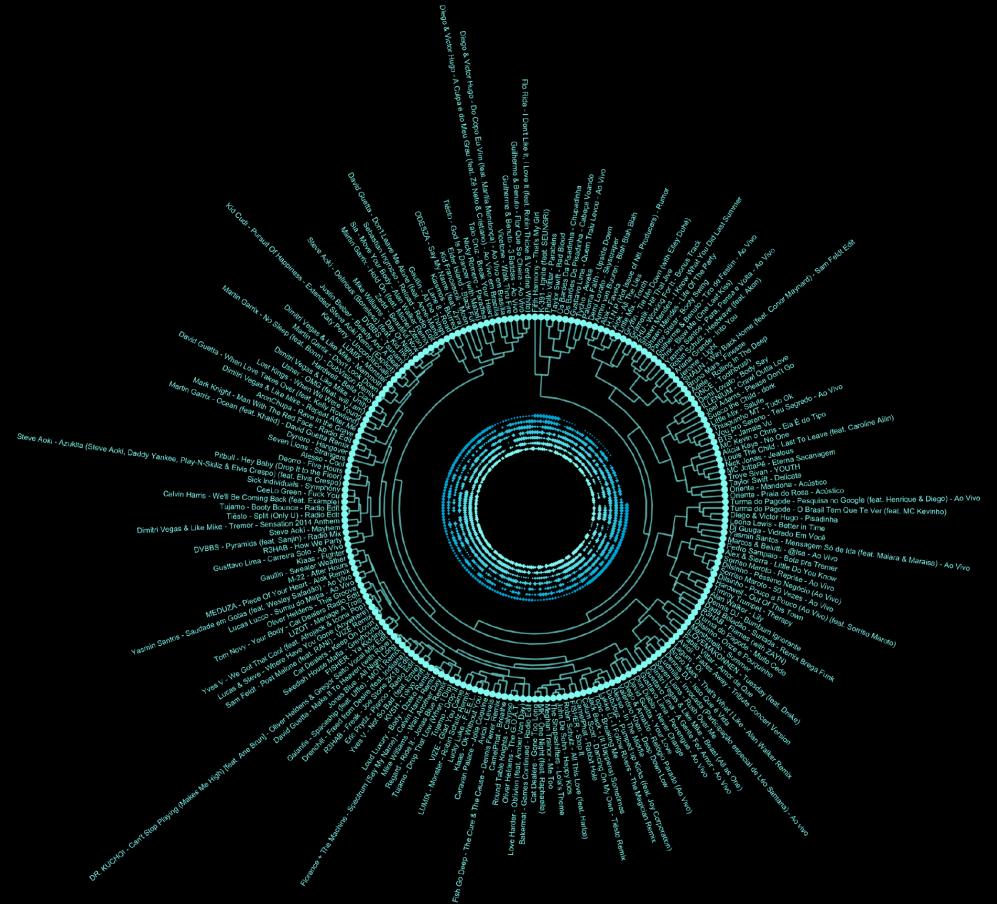


Woolap event code: app.woolap.com/FNJKHC (Activity 2)

Data Visualisation 4

What is the main purpose?

- To communicate information
- To tell a story
- To use our visual sense to understand data, detect patterns, etc., rather than language and logical processing

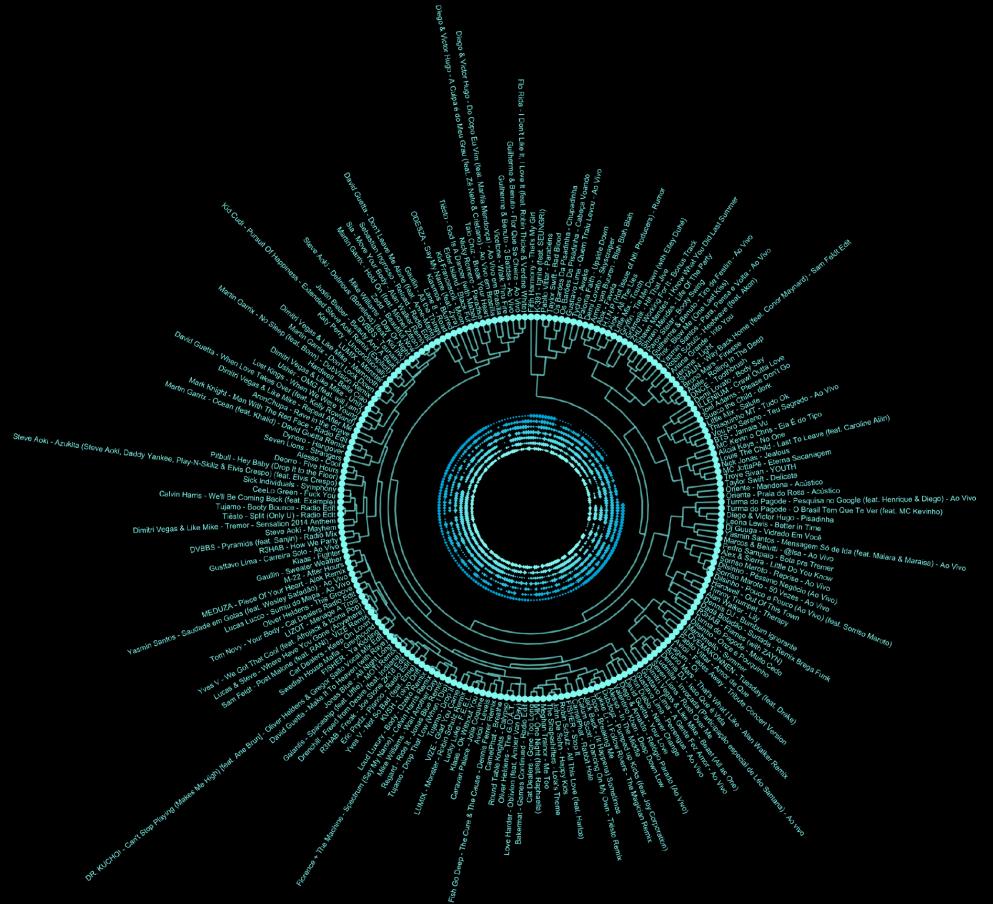


Wooclap event code: app.wooclap.com/FNJKHC (Activity 2)

Data Visualisation 4

What is the main purpose?

- To communicate information
- To tell a story
- To use our visual sense to understand data, detect patterns, etc., rather than language and logical processing
- To look cool! Data visualisation can be art. E.g. see Generative Data Visualisation Art by Thomas Lin Pedersen and Danielle Navarro



Wooclap event code: app.wooclap.com/FNJKHC (Activity 2)

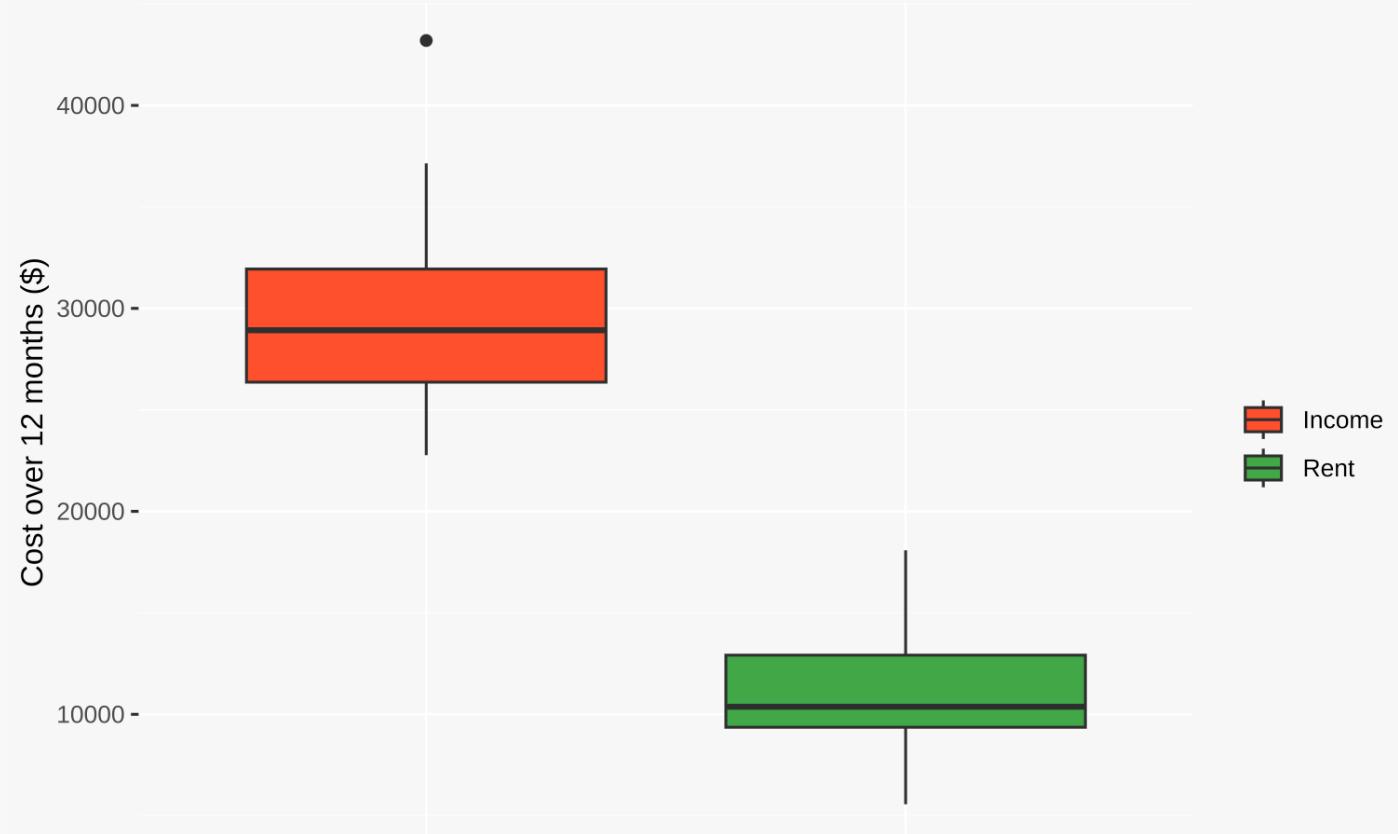
‘[Data visualisation is] the representation and presentation of data to facilitate understanding’

Andy Kirk, (2016), Data Visualisation: A Handbook for Data Driven Design

What assumptions do these data visualisations make, and reinforce, about society?



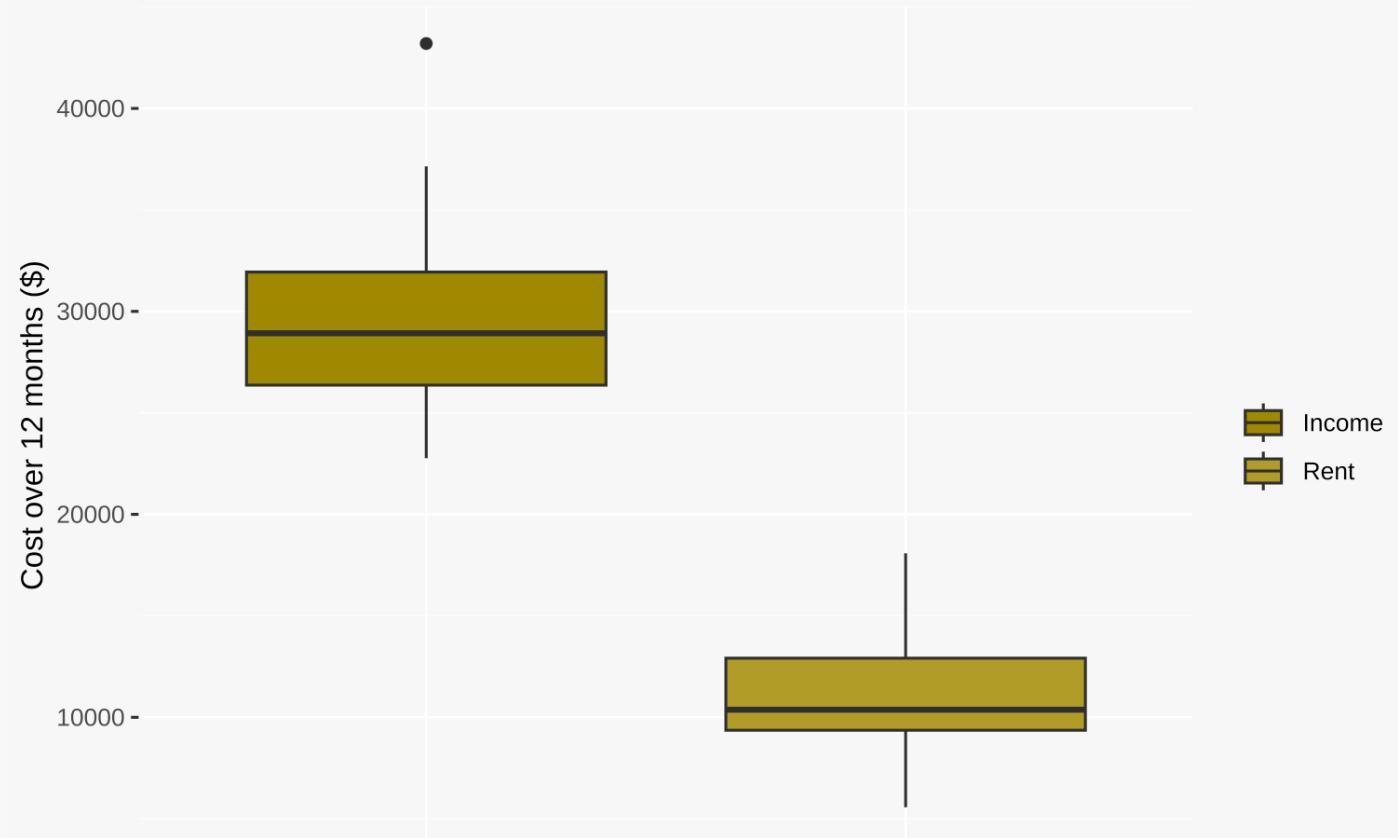
Data Visualisation 1



Wooclap event code: app.wooclap.com/FNJKHC (Activity 3)

Data Visualisation 1

- Assumes everyone is able to access red-green colour schemes



Wooclap event code: app.wooclap.com/FNJKHC (Activity 3)

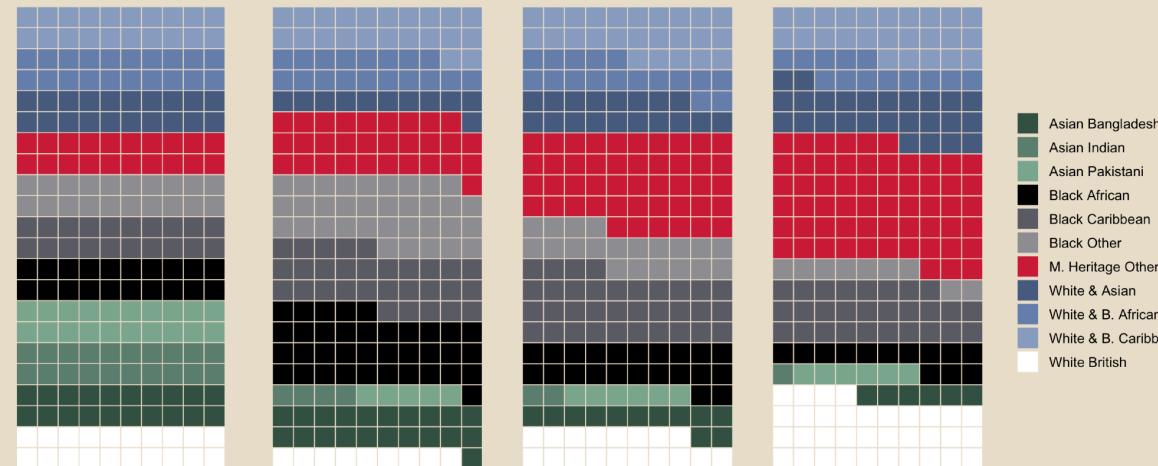
Data Visualisation 2

- Assumes everyone is able to access red-green colour schemes

What would the ethnic profile of 220 Children Looked After look like in a Low, Average, and High Deprivation Neighbourhood if all neighbourhoods had identical ethnic population sizes?

Calum Webb, the University of Sheffield

If rates were equal... Low Deprivation Average Deprivation High Deprivation



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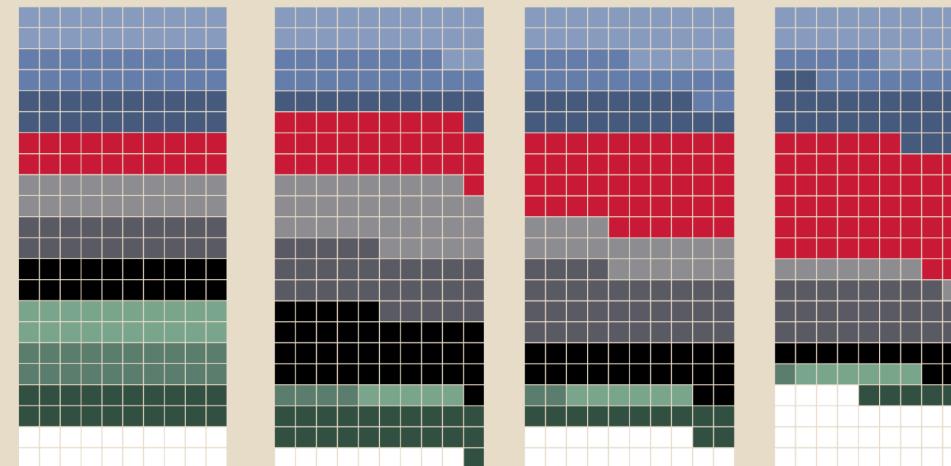
Data Visualisation 2

- Assumes everyone is able to access red-green colour schemes
- Reinforces the idea that ethnicity and race can be categorised into distinct groups

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Asian Bangladeshi
Asian Indian
Asian Pakistani
Black African
Black Caribbean
Black Other
M. Heritage Other
White & Asian
White & B. African
White & B. Caribbean
White British

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Data Visualisation 3

- Assumes everyone is able to access red-green colour schemes
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Data Visualisation 3

- Assumes everyone is able to access red-green colour schemes
- Reinforces the idea that ethnicity and race can be categorised into distinct groups
- Reinforces dominant (settler) forms of knowledge over other (indigenous) forms of knowledge



Wooclap event code: app.wooclap.com/FNJKHC (Activity 3)

“If you’re designing technology for society and you don’t know anything about society, you’re unqualified.”

Quote from Safiya Noble presenting her book Algorithms of Oppression, hosted by Open Data Manchester, 8th May 2018

“...some groups experience unearned advantages—because various systems have been designed by people like them and work for people like them—and other groups experience systematic disadvantages—because those same systems were not designed by them or with people like them in mind”

D'Ignazio, C. and Klein, L. (2020) Data Feminism (p.24)



Summary: So, what is data visualisation?

- Data visualisation is an **object** — a chart, a graph, a map — that follows a set of rules and principles, where parameters are defined by data

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- Data visualisation is an **object** — a chart, a graph, a map — that follows a set of rules and principles, where parameters are defined by data
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Summary: So, what is data visualisation?

- Data visualisation is an **object** — a chart, a graph, a map — that follows a set of rules and principles, where parameters are defined by data
- Data visualisation is also a **process** — an act of transformation and reproduction of best practice in order to tell a story or to make sense of the world visually
- Data visualisation is also a **social phenomenon** — it is related to power, can reinforce or challenges societal norms or assumptions, and shapes how people engage with information

The rest of this week:

Before week 2:

Core tasks:

- Before lecture: Read this module handbook in full
- Before workshop: If you've got a personal machine and would like to use it, get R and RStudio installed on it (instructions on how to do this will be in the Week 2 learning resources folder)
- Having done so, work through the workshop handout once again to check it works on your machine (if it doesn't, don't worry, we'll go through and troubleshoot it together)

Supplementary tasks:

- Before lecture: Read Top 5 things to look for in a visualisation on the Seeing Data website: <https://seeingdata.org/developing-visualisation-literacy/top-5-things-to-look-for-in-a-visualisation/>

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