

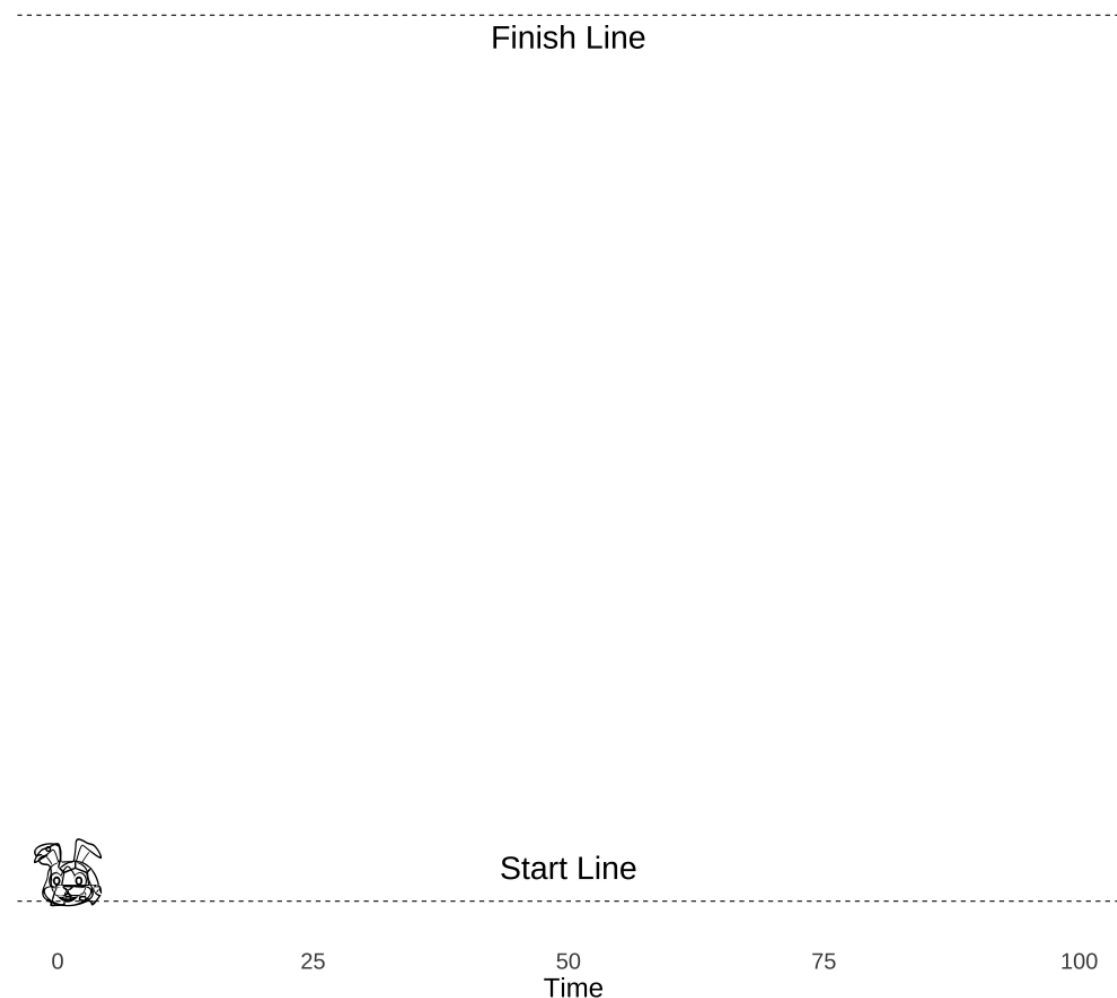
Tortoise and Hare Race

# Data Storytelling with R and ggplot

Kevin Tsang



2 July 2025





**Storytelling  
element 1:**

**Audience**

For data analysis  
and exploration

Yourself  
Your team

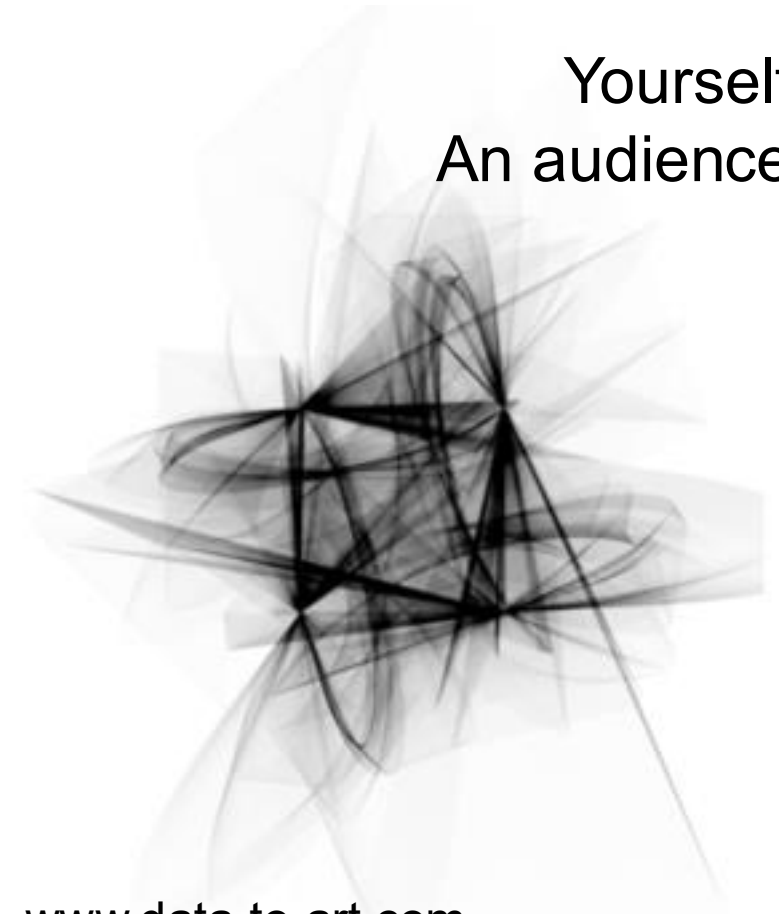
Adapted from: Julian Hoffmann

For data communication  
and dissemination

An audience

For art

Yourself  
An audience



[www.data-to-art.com](http://www.data-to-art.com)

# 5 ways to capture an audience

5

Number

“Any intelligent fool can make things bigger and more complex. It takes a touch of genius - and a lot of courage - to move in the opposite direction”

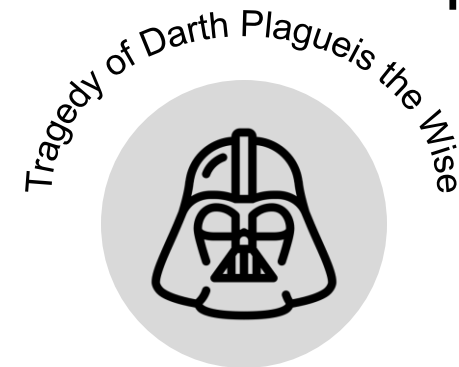
Quote



Picture



Movement



Story





**Storytelling  
element 2:**

**Setting**

# Data description

Immunisation coverage of children at 24 months old in New Zealand

1 January 2014 – 31 December 2024

<https://www.tewhatuora.govt.nz/health-services-and-programmes/vaccine-information/immunisation-coverage>

## Health targets

Target  
**90%**

### Faster cancer treatment

90% of patients to receive cancer management within 31 days of the decision to treat.

This target drives better coordinated, faster quality care for patients with cancer.

Target  
**95%**

### Improved immunisation

95% of children fully immunised at 24 months of age.

Countries such as Australia, the UK and Canada have a 95% target. It provides effective immunity for the New Zealand population.

Target  
**95%**

### Shorter stays in emergency departments

95% of patients to be admitted, discharged or transferred from an emergency department within six hours.

Emergency department wait times provide a barometer for the health of hospitals and the level of pressure in the system. Flows through this system need to improve.

Target  
**95%**

### Shorter wait times for first specialist assessment

95% of patients wait less than 4 months for a first specialist assessment.

Ensuring that New Zealanders get timely access when they are referred to a specialist is important so people have greater certainty about their conditions and whether they need further elective treatment.

Target  
**95%**

### Shorter wait times for elective treatment

95% of patients wait less than 4 months for elective treatment.

Not all New Zealanders have access to elective treatment at the right time. People will now have certainty that they will receive treatment in a reasonable time.

# Data exploration (for you)



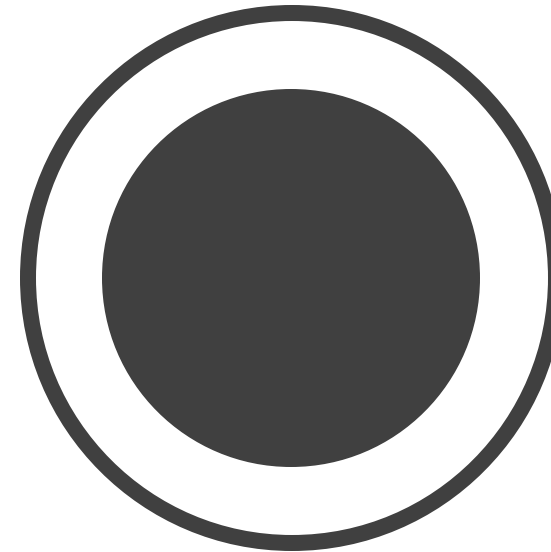
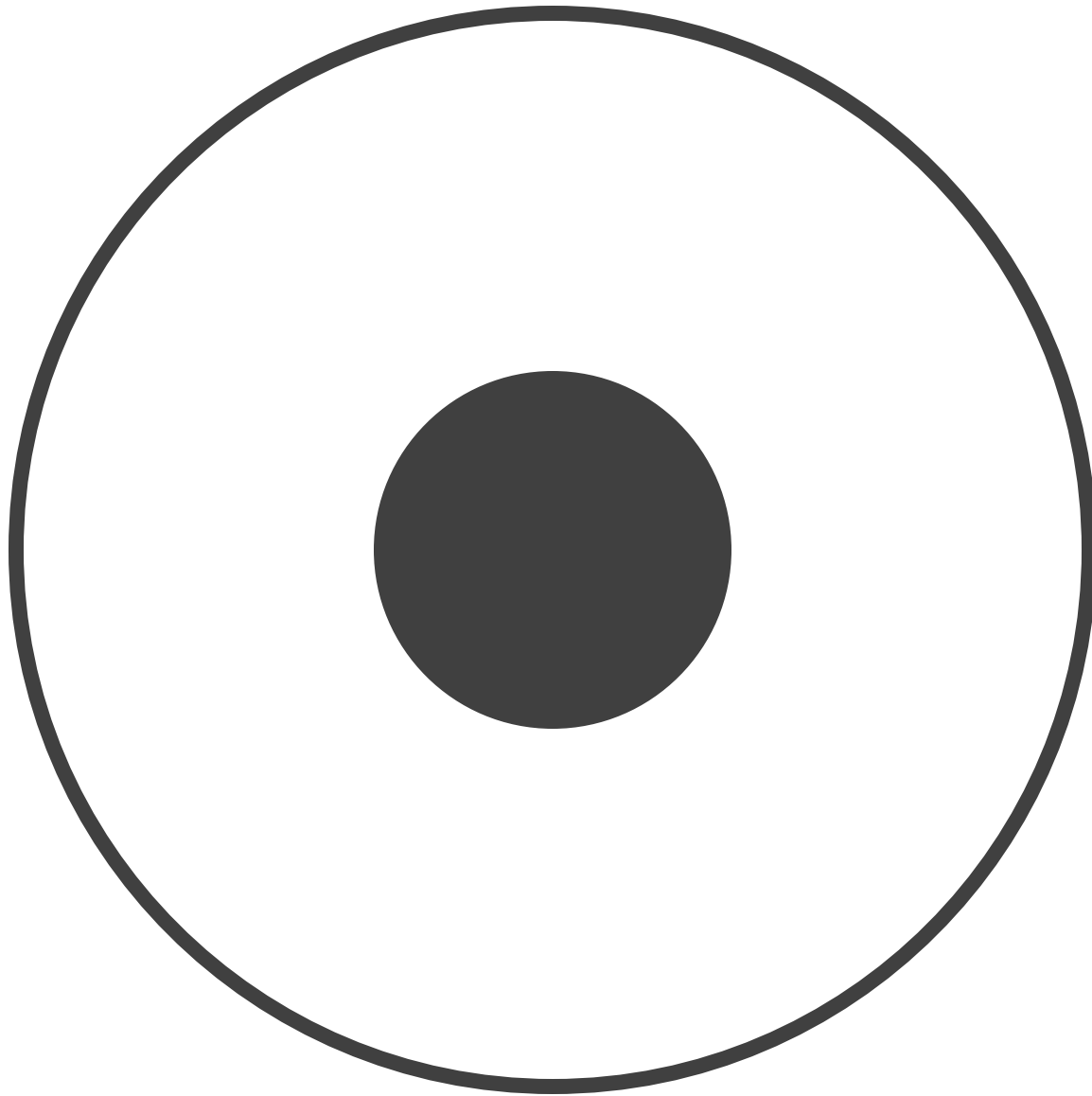
Formulate questions



Identify patterns

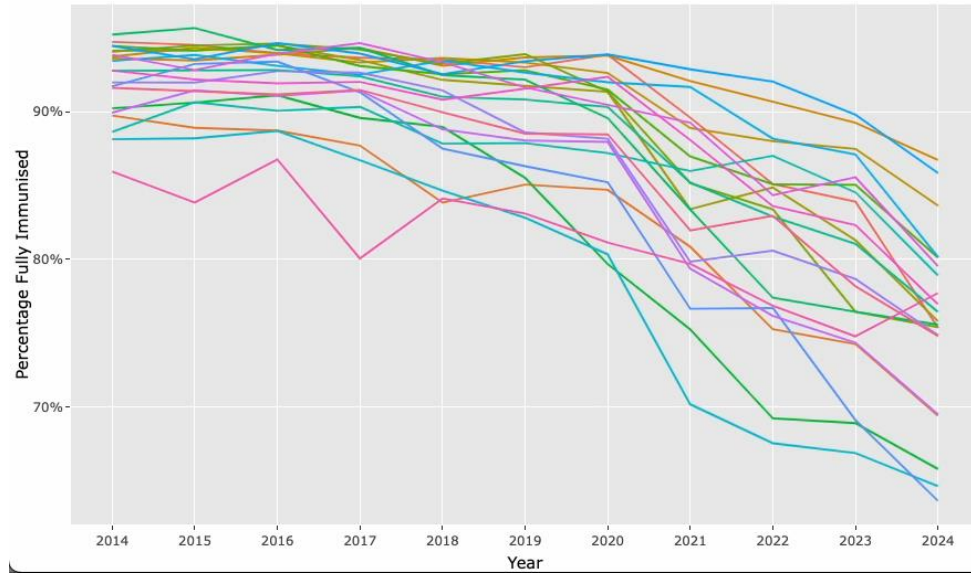


Understand the landscape



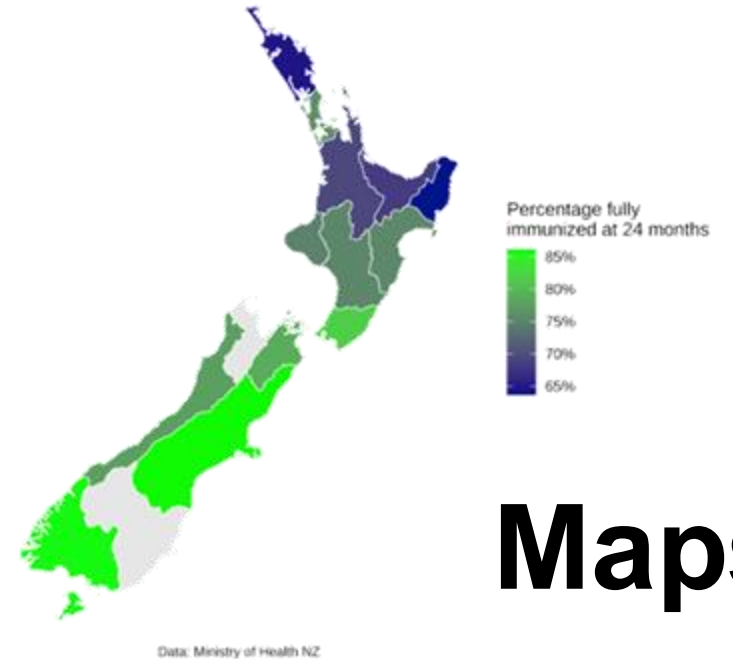


Immunisation Coverage of 24-month-old Children in New Zealand

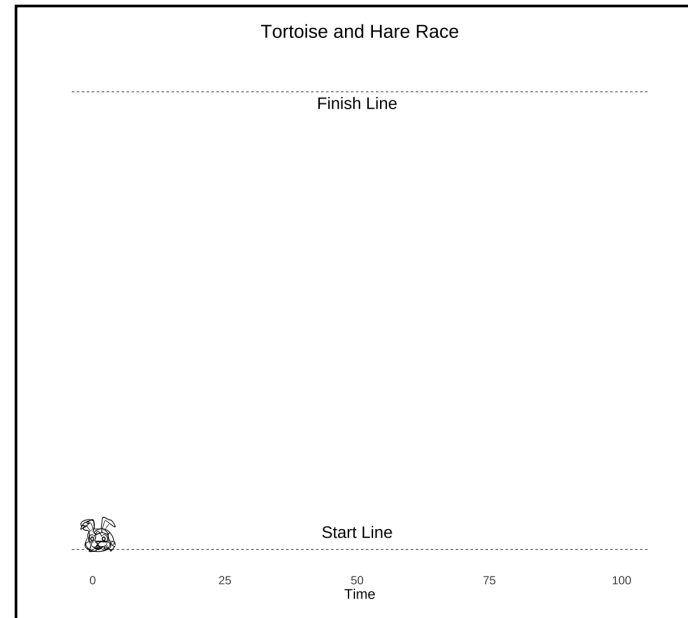


Childhood Immunization Rates by Region (2024)

DHBs aggregated to regions



Interactive

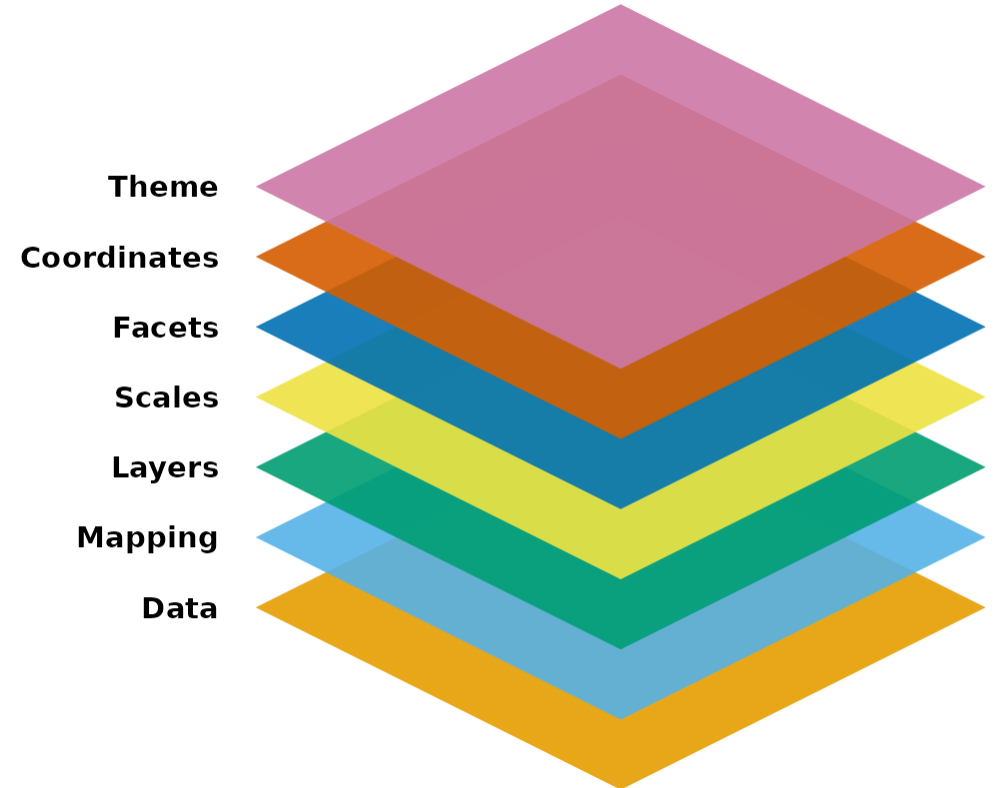


Maps

Animated

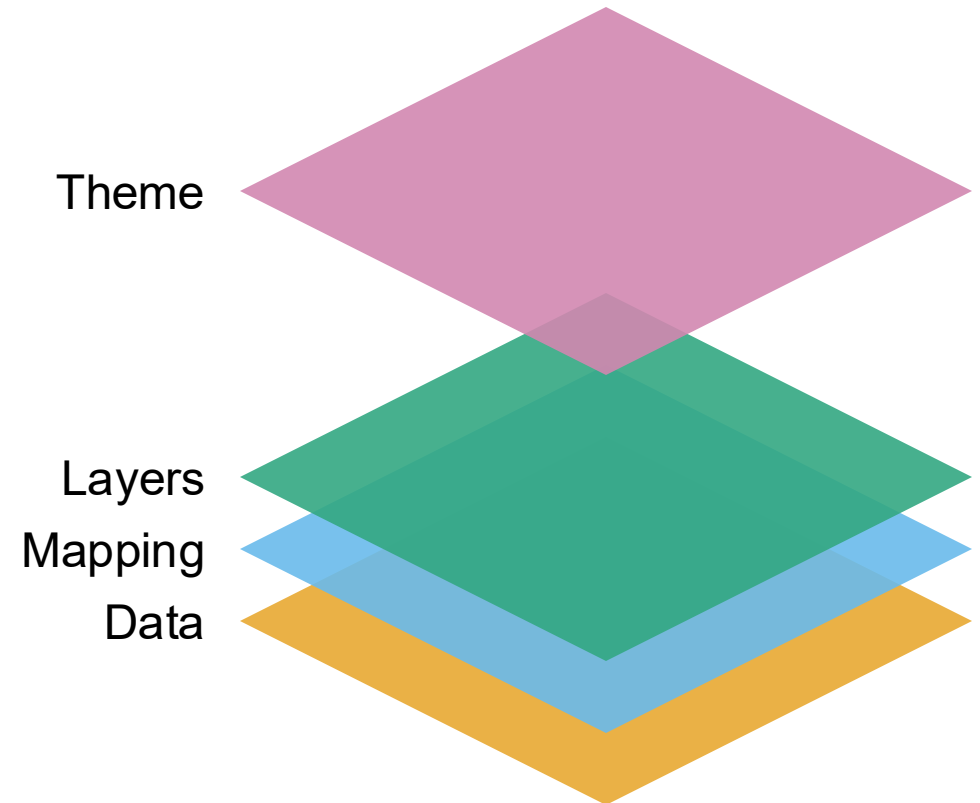
# ggplot2

```
ggplot(<data>, aes(<mapping>)) +  
  <layers_function>() +  
  <scales_function>() +  
  <facets>() +  
  <coord_function>() +  
  <theme_function>()
```



# ggplot2

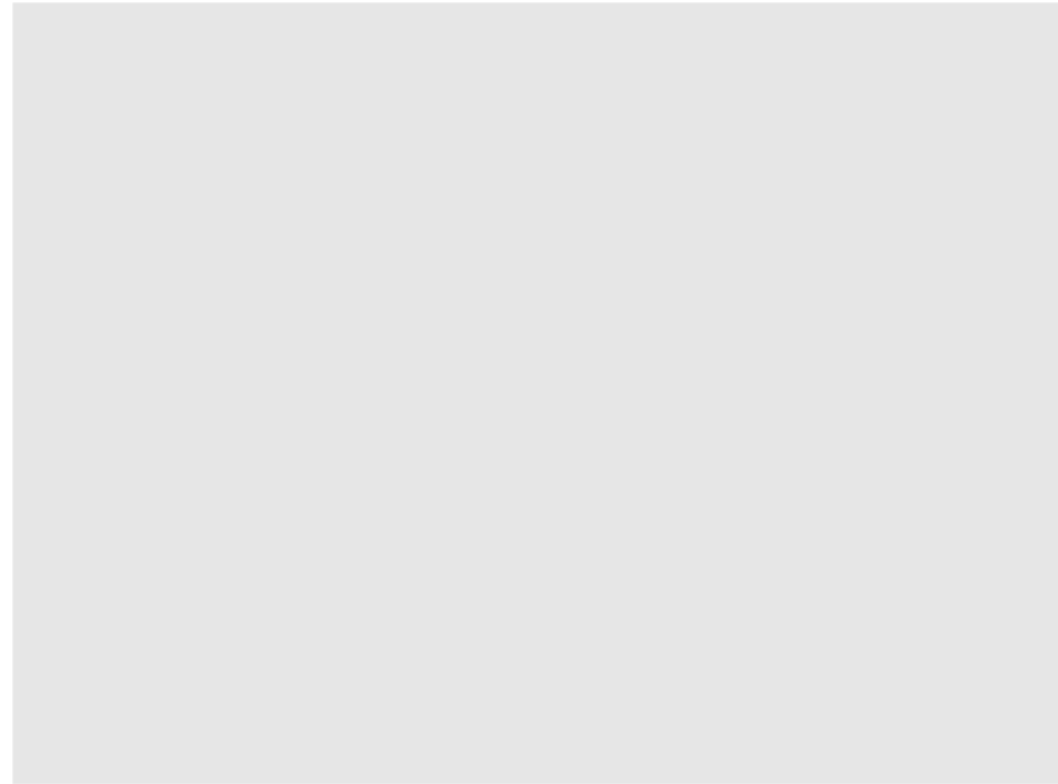
```
ggplot(<data>,  
  aes(<mapping>)  
) +  
  <geom_function>() +  
  <theme_function>()
```




# ggplot2

```
ggplot(child_imm_2014_dhb)
```

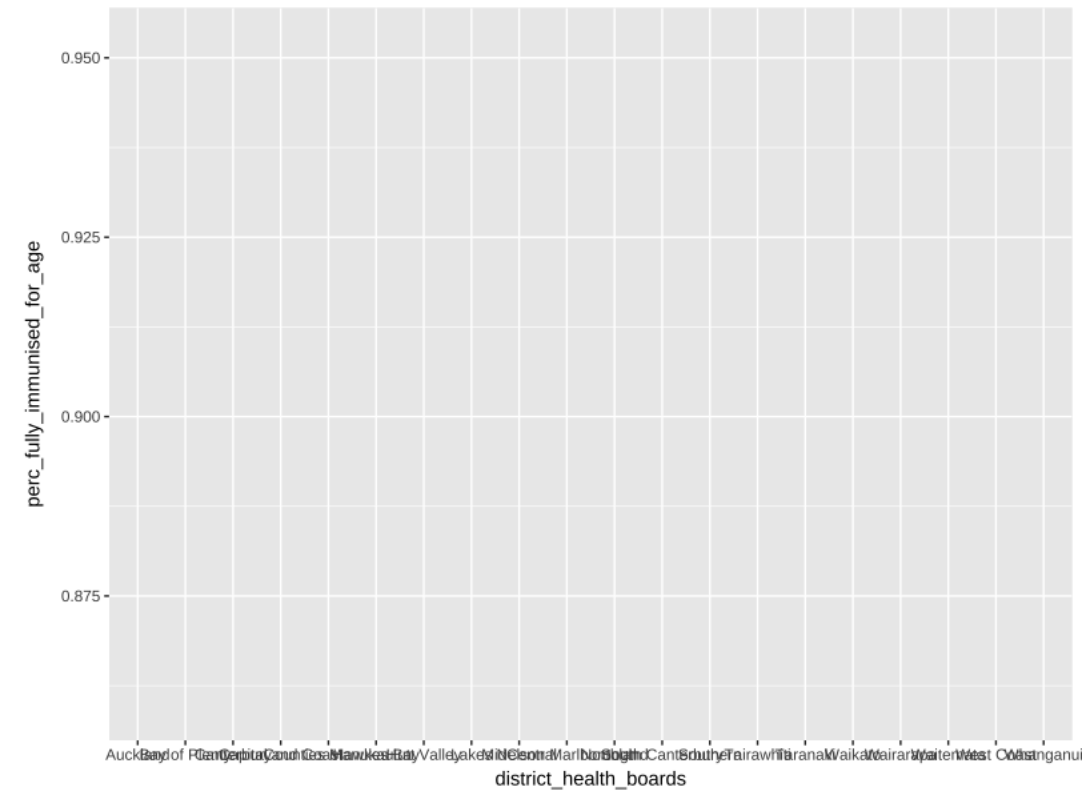
Data



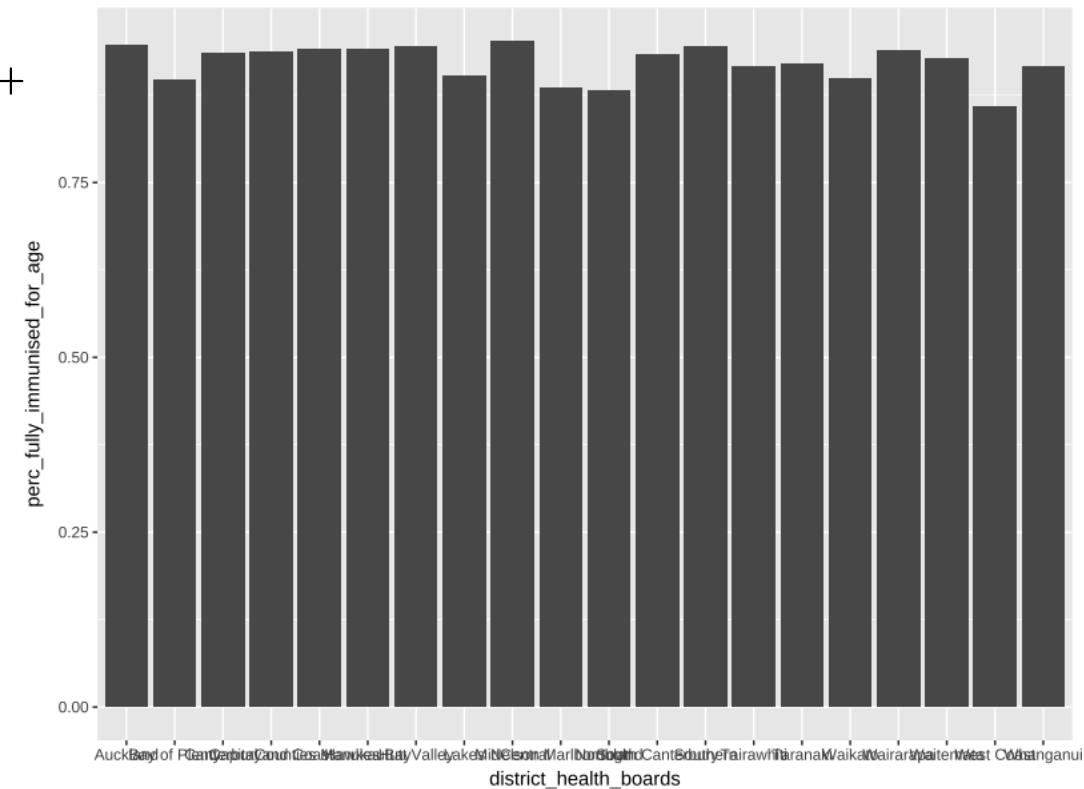




Mapping Data

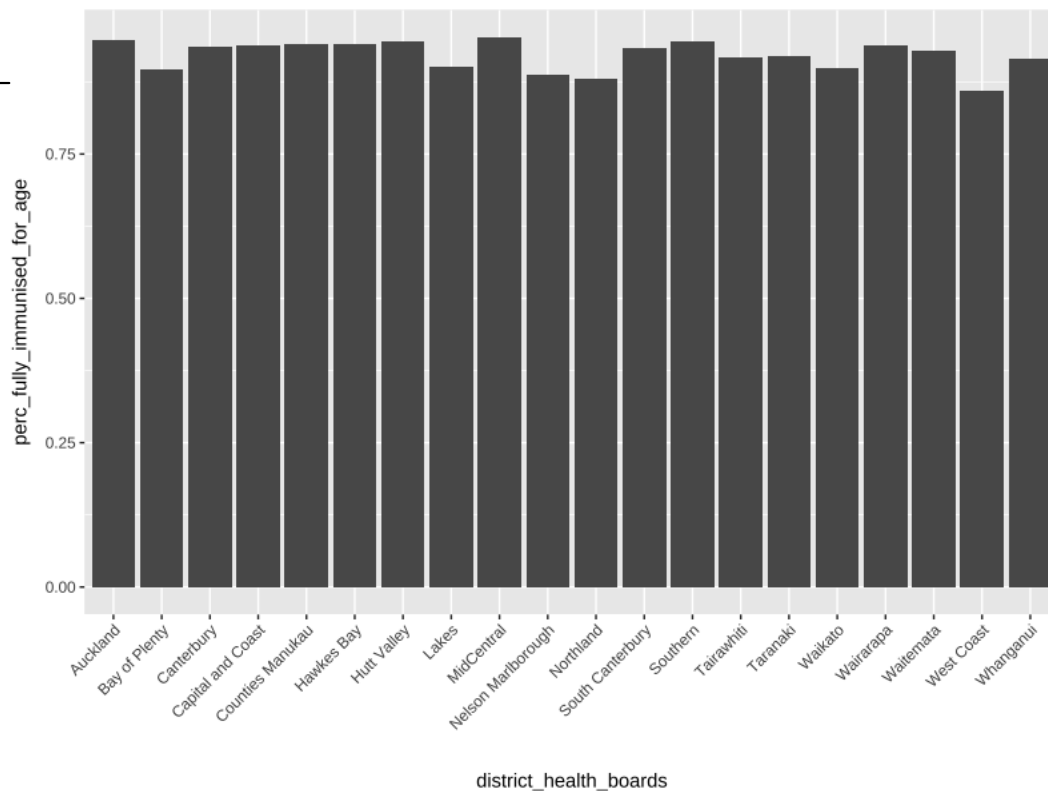
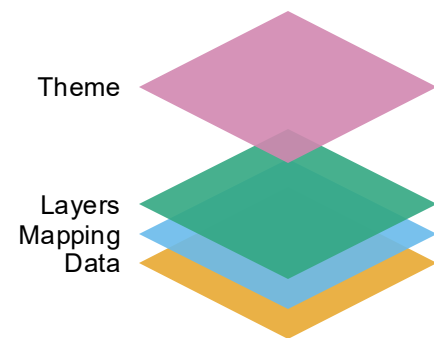


A diagram consisting of three stacked, semi-transparent diamond-shaped layers. The top layer is green and labeled 'Layers'. The middle layer is light blue and labeled 'Mapping'. The bottom layer is orange and labeled 'Data'. The labels are positioned to the left of their respective layers.



# ggplot2

```
ggplot(child_imm_2014_dhb,
  aes(x = district_health_boards,
      y = perc_fully_immunised_for_age)) +
  geom_col() +
  theme(axis.text.x = element_text(
    angle = 45,
    hjust = 1))
```

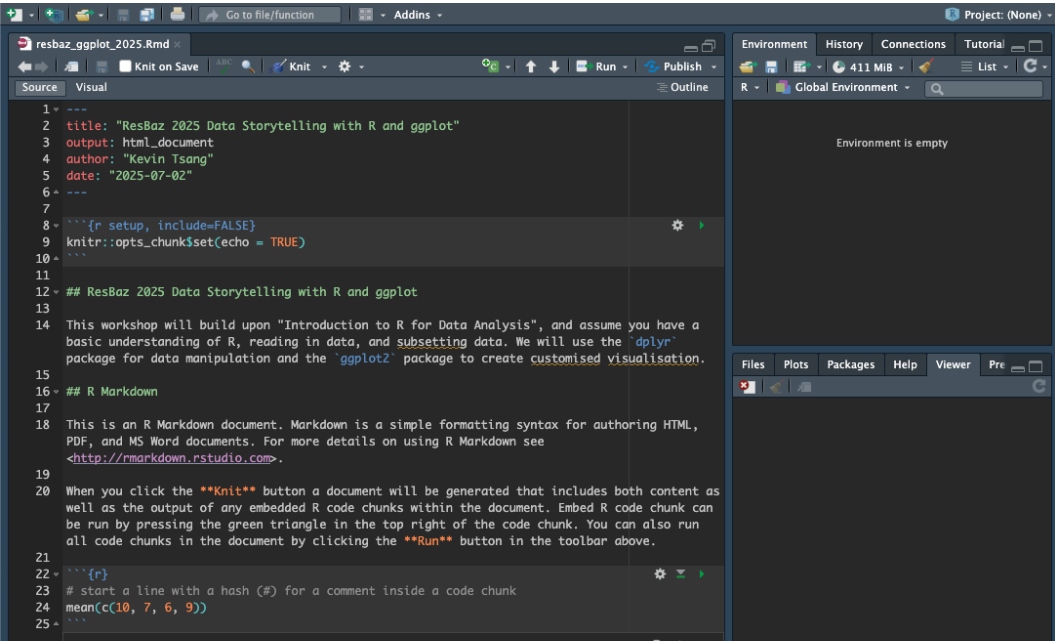


# To RStudio...

You will need to download 2 files:

resbaz\_ggplot\_2025.Rmd

childhood\_immunisation\_2014\_2024.csv



	year	age	district_health_boards	region	ethnicity	num_eligible	fully_immunised_for_age
1	2014	24 months	Auckland	Northern	Total	6401	6064
2	2014	24 months	Auckland	Northern	NZ European	1636	1533
3	2014	24 months	Auckland	Northern	Maori	772	727
4	2014	24 months	Auckland	Northern	Pacific	1208	1175
5	2014	24 months	Auckland	Northern	Asian	1895	1830
6	2014	24 months	Auckland	Northern	Other	890	799
7	2014	24 months	Bay of Plenty	Te Manawa Taki	Total	3121	2801
8	2014	24 months	Bay of Plenty	Te Manawa Taki	NZ European	1261	1126
9	2014	24 months	Bay of Plenty	Te Manawa Taki	Maori	1300	1189
10	2014	24 months	Bay of Plenty	Te Manawa Taki	Pacific	71	69
11	2014	24 months	Bay of Plenty	Te Manawa Taki	Asian	189	184
12	2014	24 months	Bay of Plenty	Te Manawa Taki	Other	300	233
13	2014	24 months	Canterbury	Te Waipounamu	Total	6280	5879
14	2014	24 months	Canterbury	Te Waipounamu	NZ European	3259	3105
15	2014	24 months	Canterbury	Te Waipounamu	Maori	966	903
16	2014	24 months	Canterbury	Te Waipounamu	Pacific	299	289
17	2014	24 months	Canterbury	Te Waipounamu	Asian	709	674
18	2014	24 months	Canterbury	Te Waipounamu	Other	1047	908
19	2014	24 months	Capital and Coast	Central	Total	3880	3637
20	2014	24 months	Capital and Coast	Central	NZ European	1469	1387





**Storytelling  
element 3:**

**Characters**

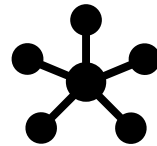
# Who or what is the story about

For example:



One data point –  
one district health board  
experiencing a change in policy

Group of data points –  
data points from one region



A derived variable –  
year-on-year difference  
in coverage

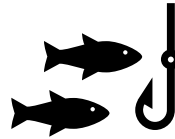
# Who else is in the story

For example:



Characters on the same journey

Characters who changes  
main character's trajectory



Characters who reveal new  
dimensions of the main character



# Storytelling element 4: Message

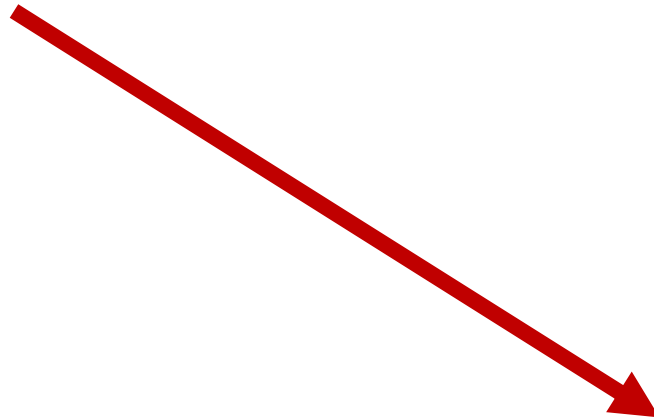


# A title should capture the message

Don't be afraid to use text elements like subtitles

Annotations guides the reader

Look here



What actions does your data visualisation inform?

Captions can be used to add additional context or information

A black and white photograph of an elderly man in a hat and a young child looking at each other.

**Audience**

What stories will  
you tell with  
data?

A black and white photograph of a film set with crew members and equipment.

**Setting**

A close-up photograph of a turtle's head and shell.

**Characters**

 kevin.tsang@ucl.ac.uk

 kcht

A collage of various posters and notices, including one for "AN EVENING WITH KRZYSZTOF SAWCZYK".

**Message**