Exploratory data analysis
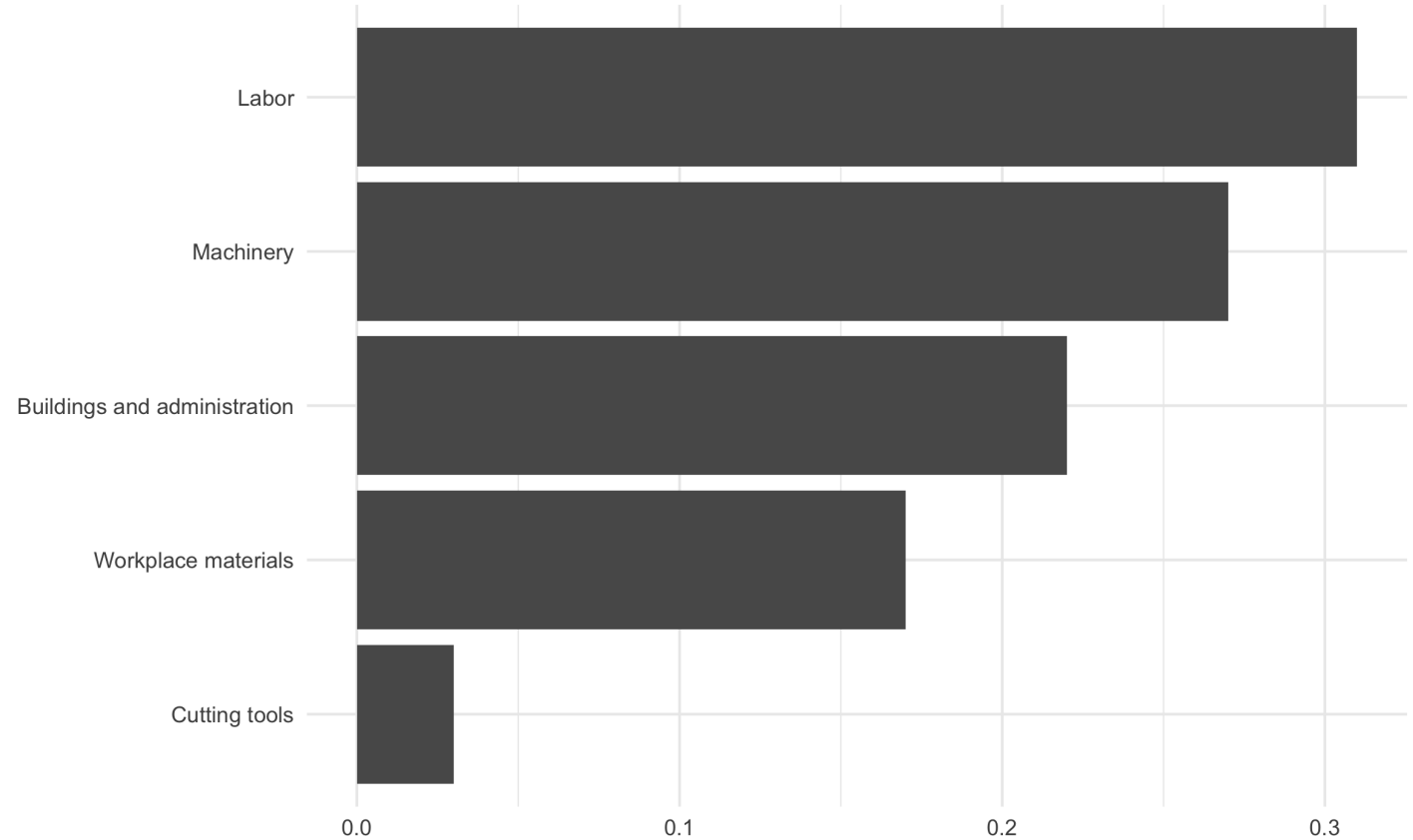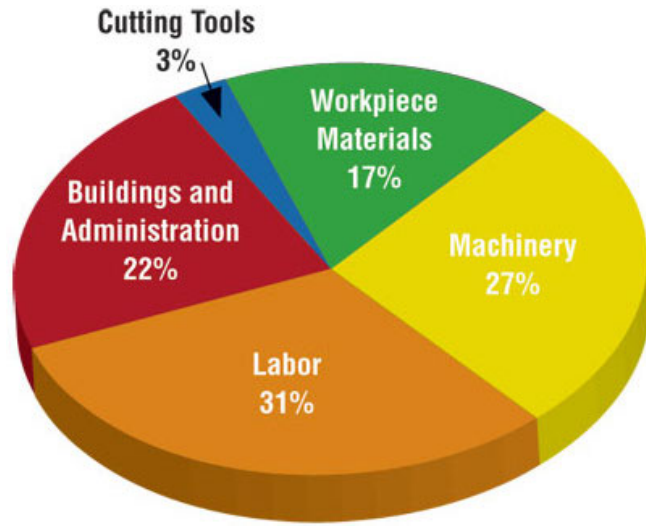
Tips for effective data visualization
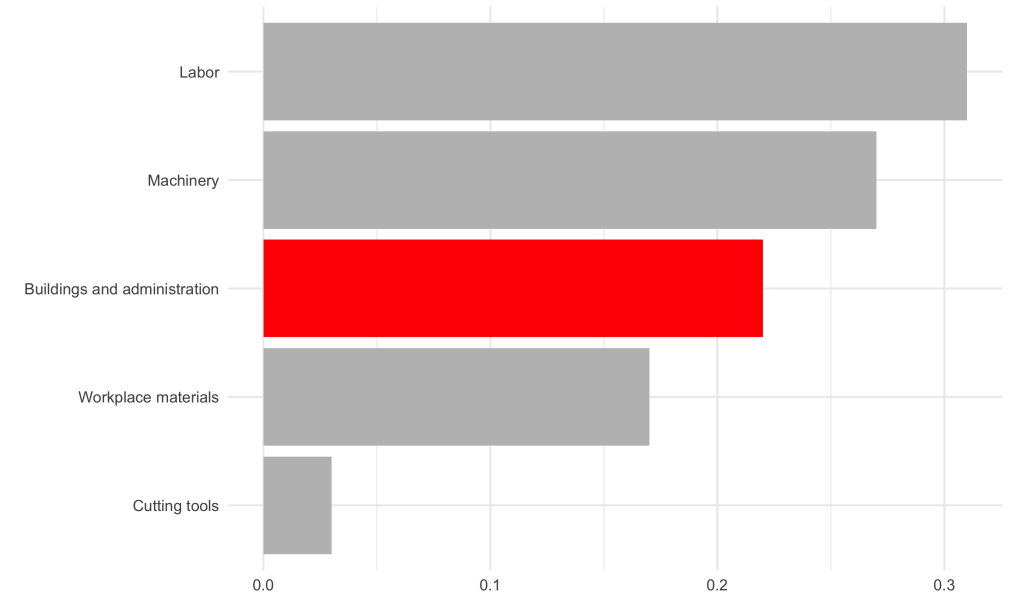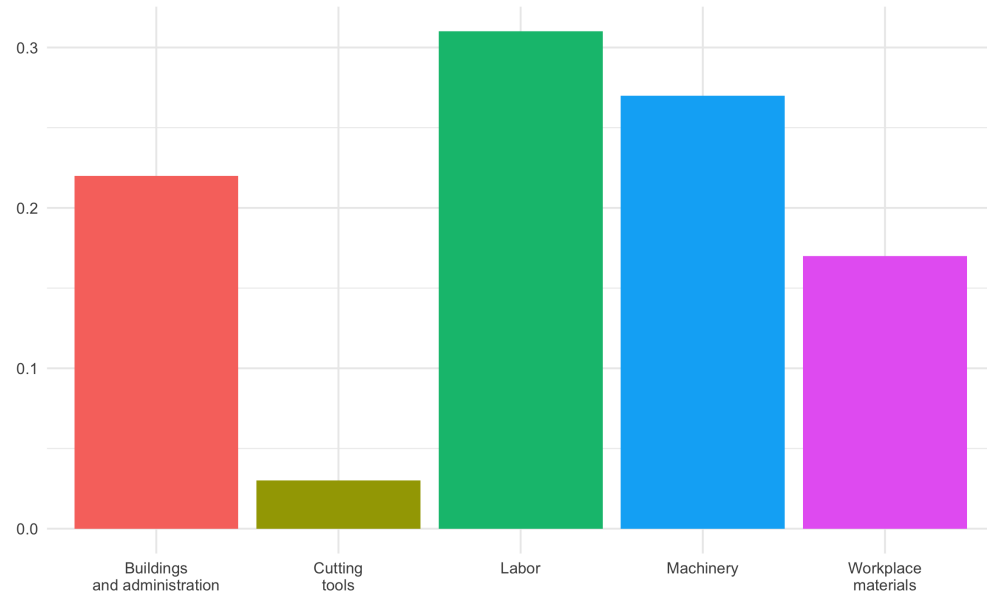**Prof. Dr. Jan Kirenz**

The following content is based on Mine Çetinkaya-Rundel's excellent book Data Science in a Box
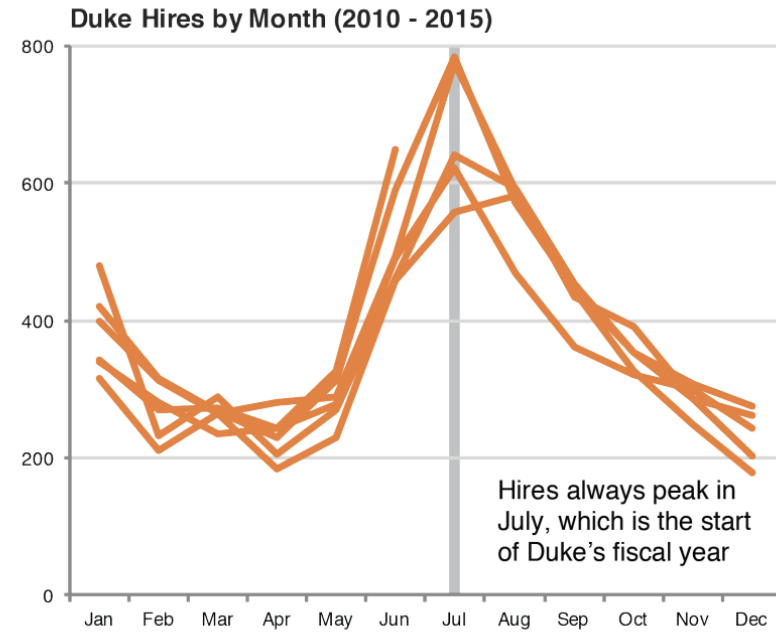
Designing effective visualizations

Keep it simple
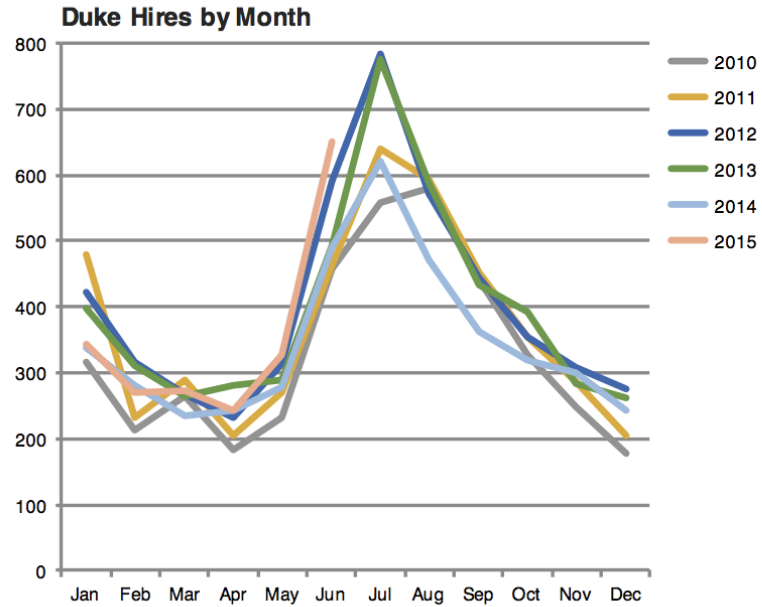
Use color to draw attention

Tell a story

Duke Hires by Month

Duke Hires by Month (2010 - 2015)

Hires always peak in July, which is the start of Duke's fiscal year

Credit: Angela Zoss and Eric Monson, Duke DVS

Principles for effective visualizations

Principles for effective visualizations

- Order matters
- Put long categories on the y-axis
- Keep scales consistent
- Select meaningful colors
- Use meaningful and nonredundant labels

Data

In September 2019, YouGov survey asked 1,639 GB adults the following question:

> In hindsight, do you think Britain was right/wrong to vote to leave EU?
>
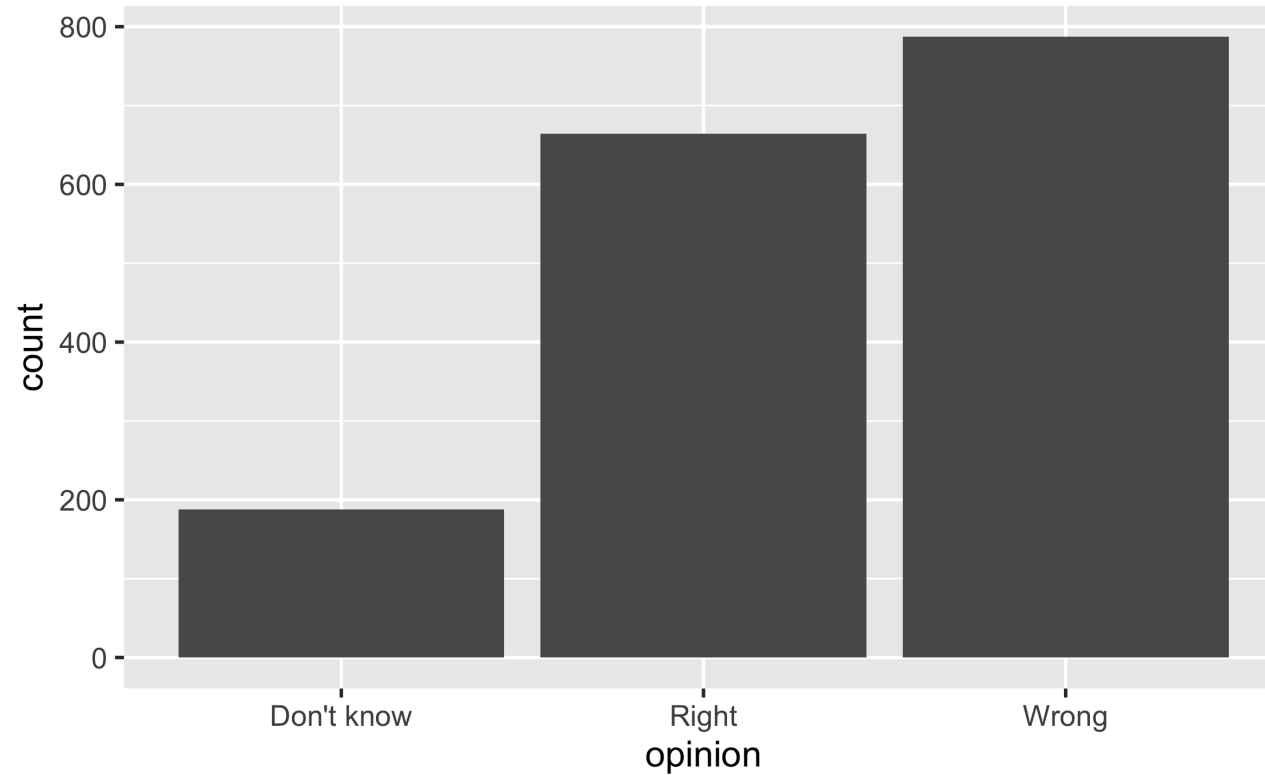> - Right to leave
> - Wrong to leave
> - Don't know
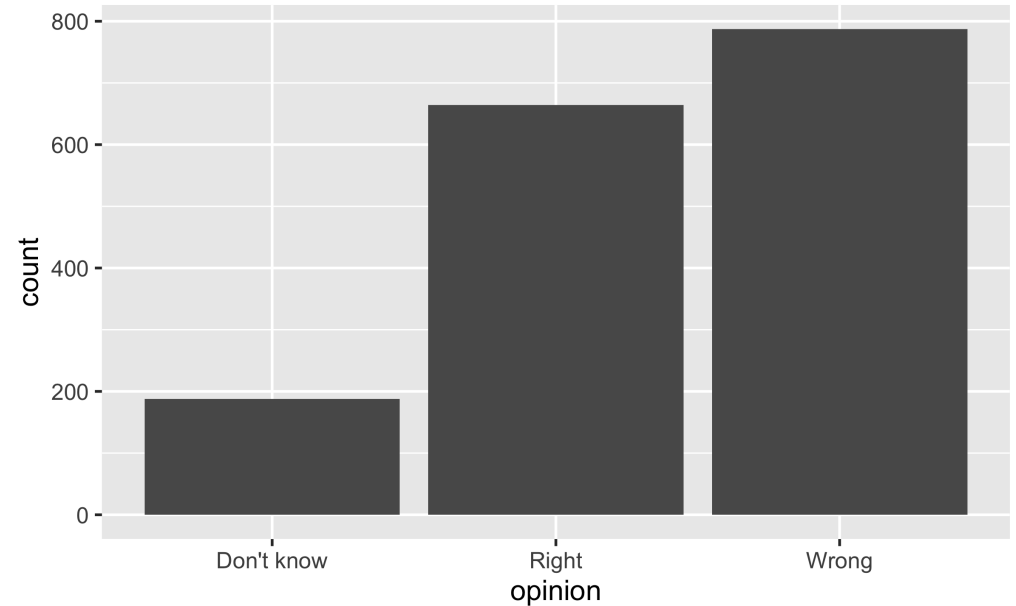
Source: YouGov Survey Results, retrieved Oct 7, 2019

Order matters

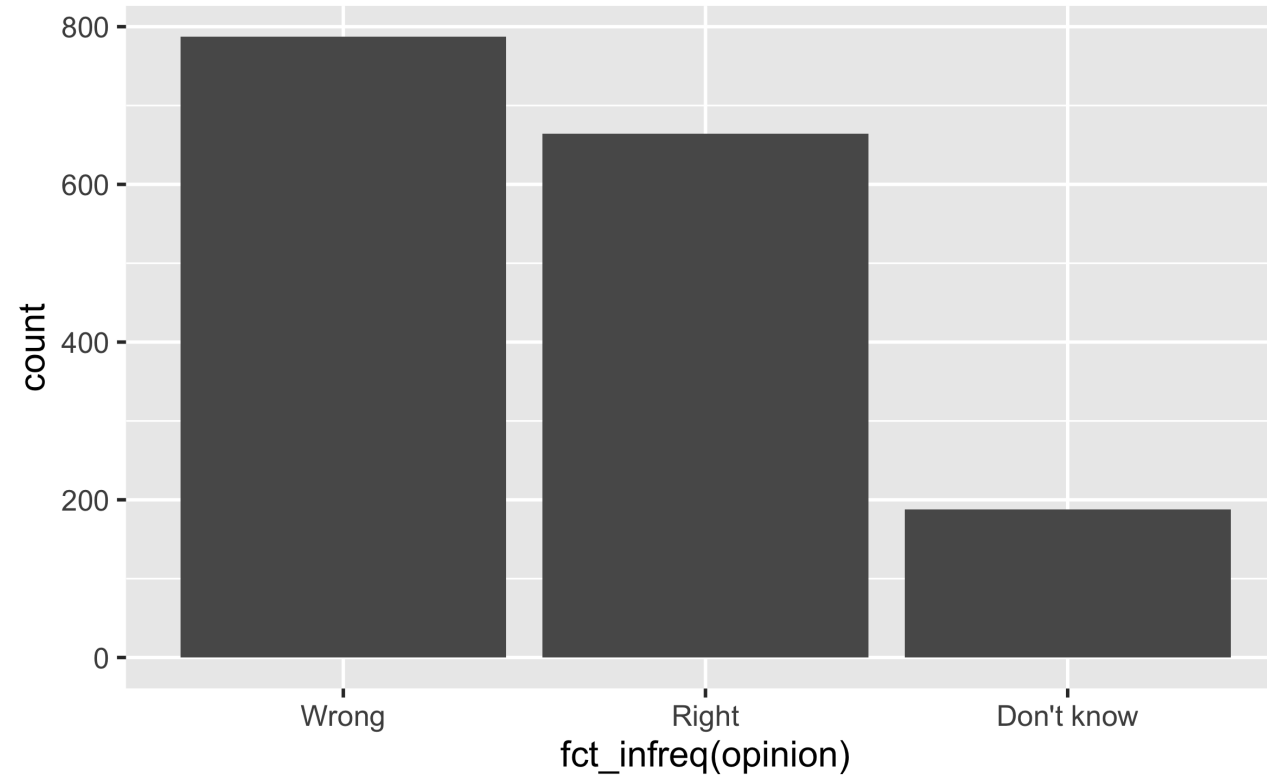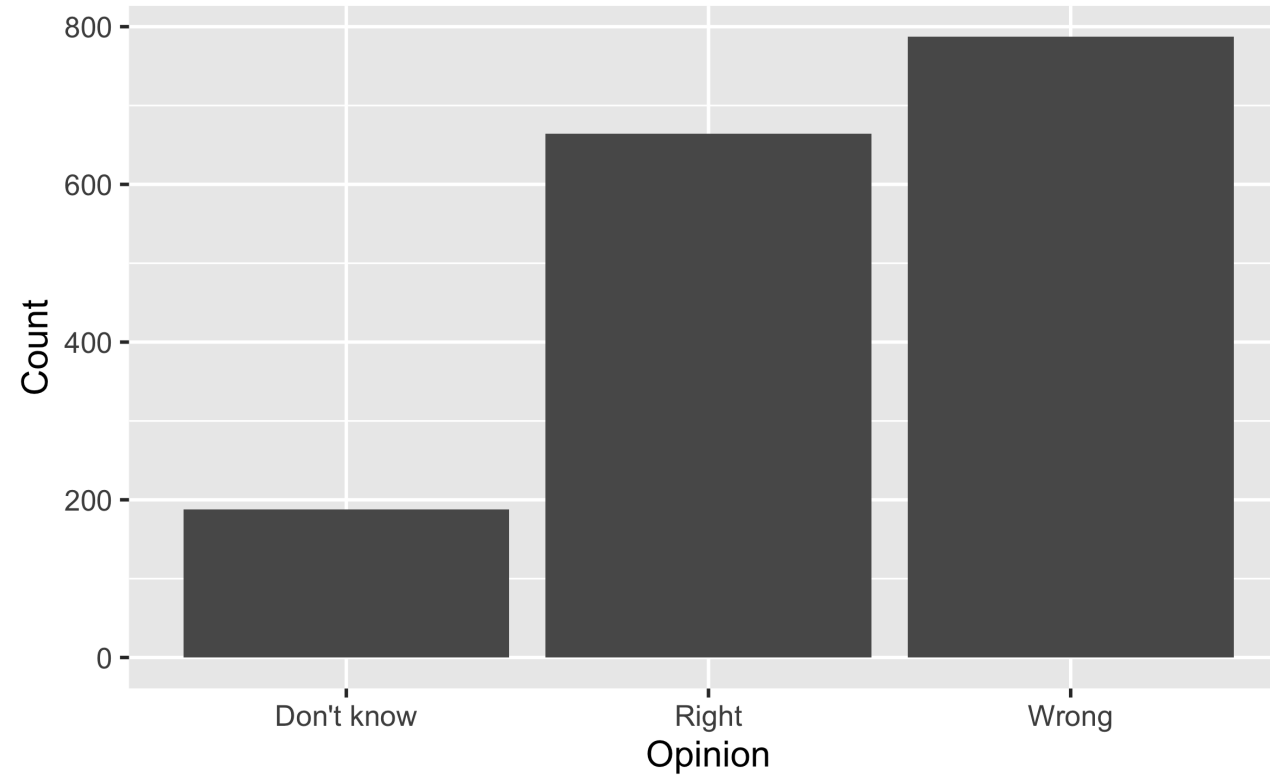# Alphabetical order is rarely ideal
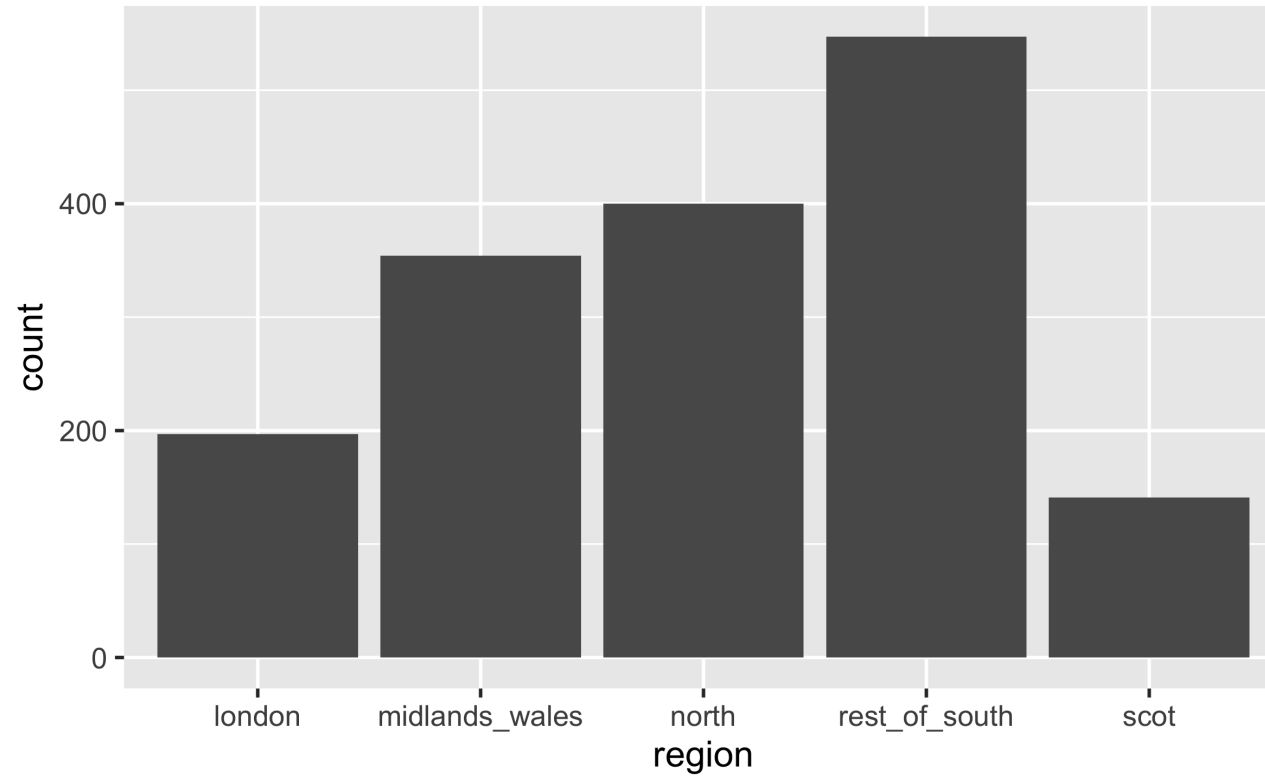
Order by frequency

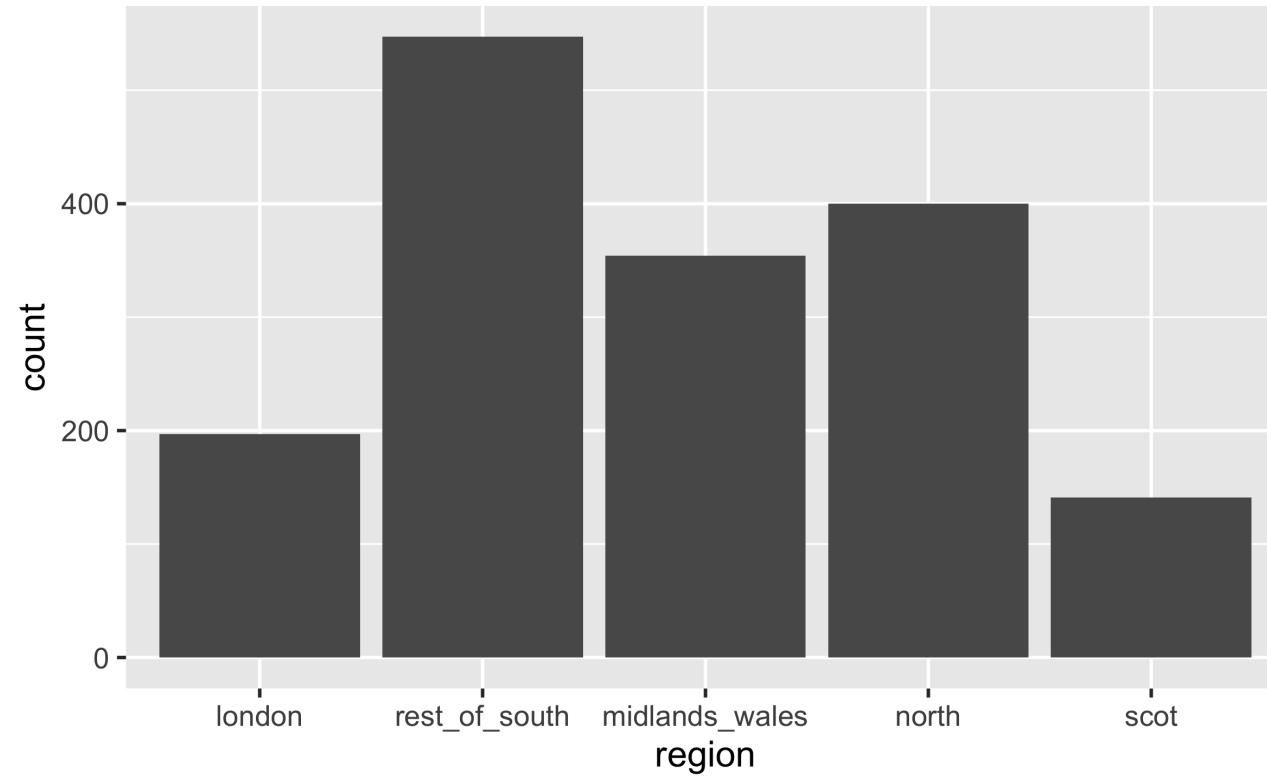Plot   Code

Clean up labels

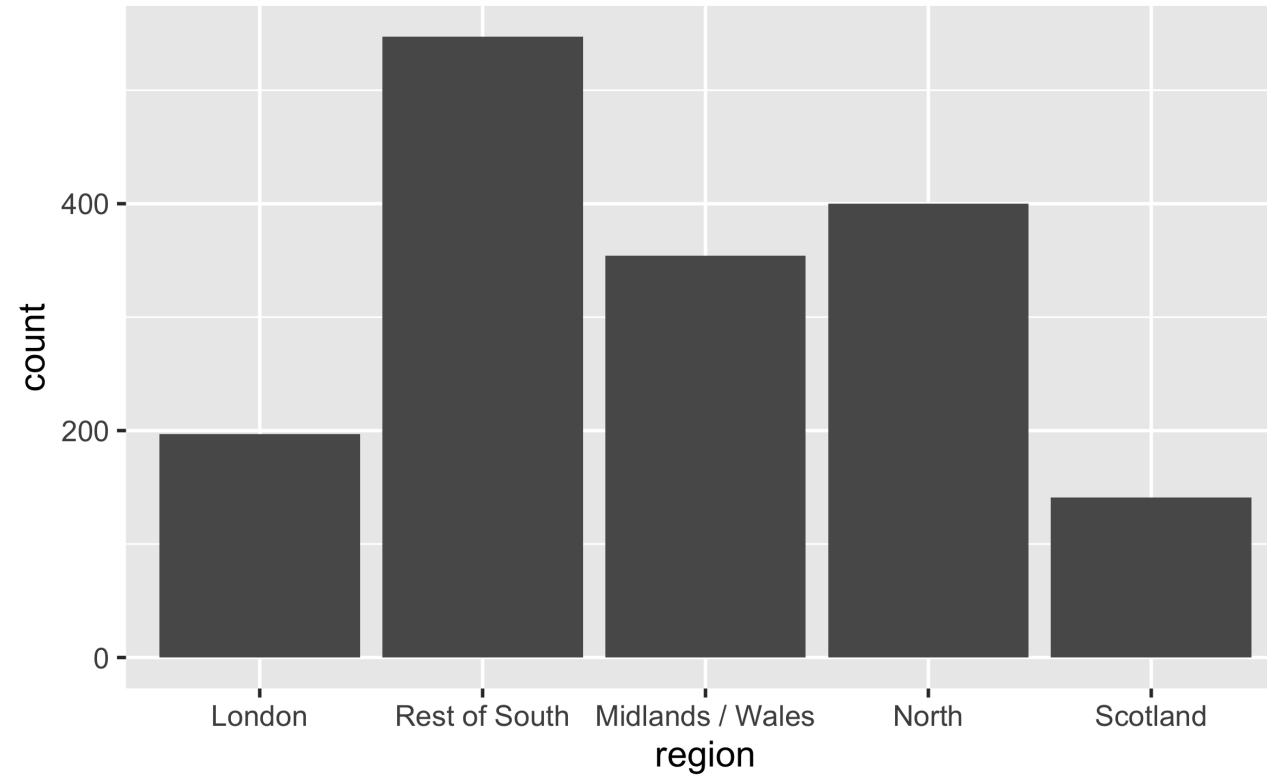# Alphabetical order is rarely ideal

Plot　　Code

Use inherent level order

Clean up labels
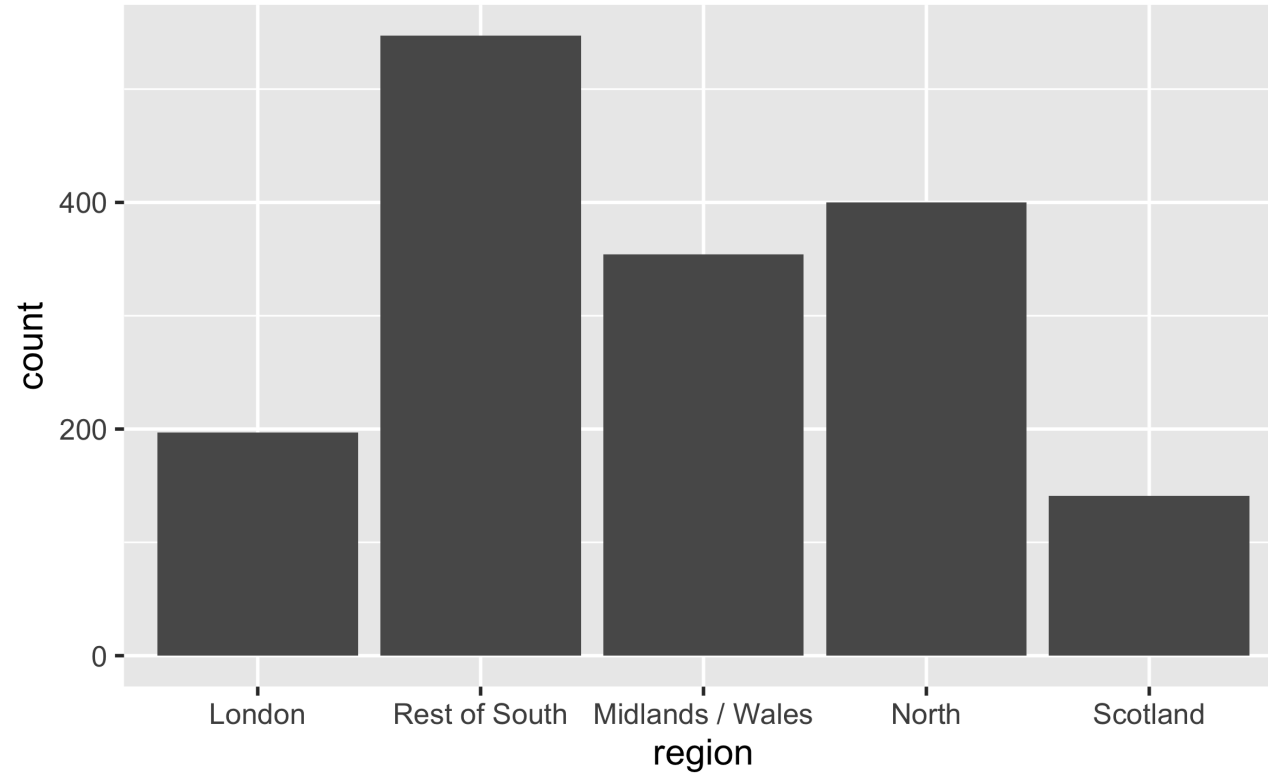
Put long categories on the y-axis

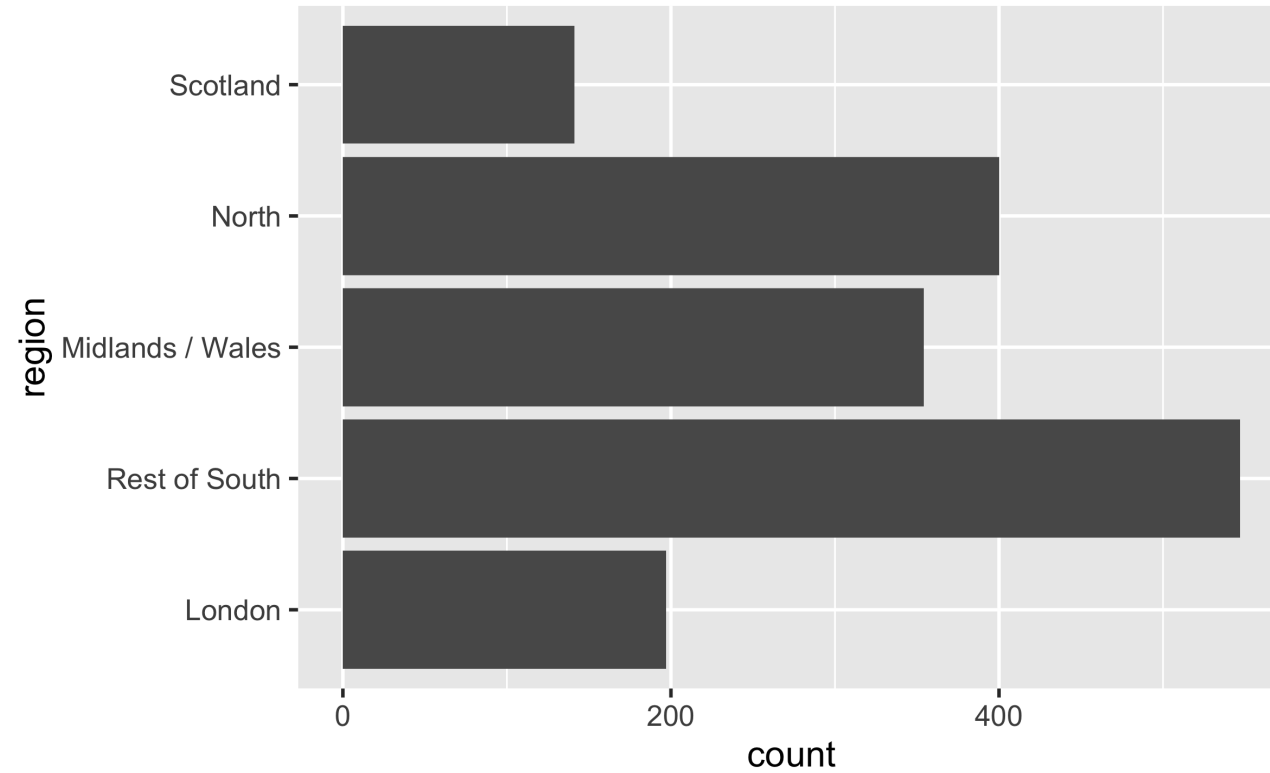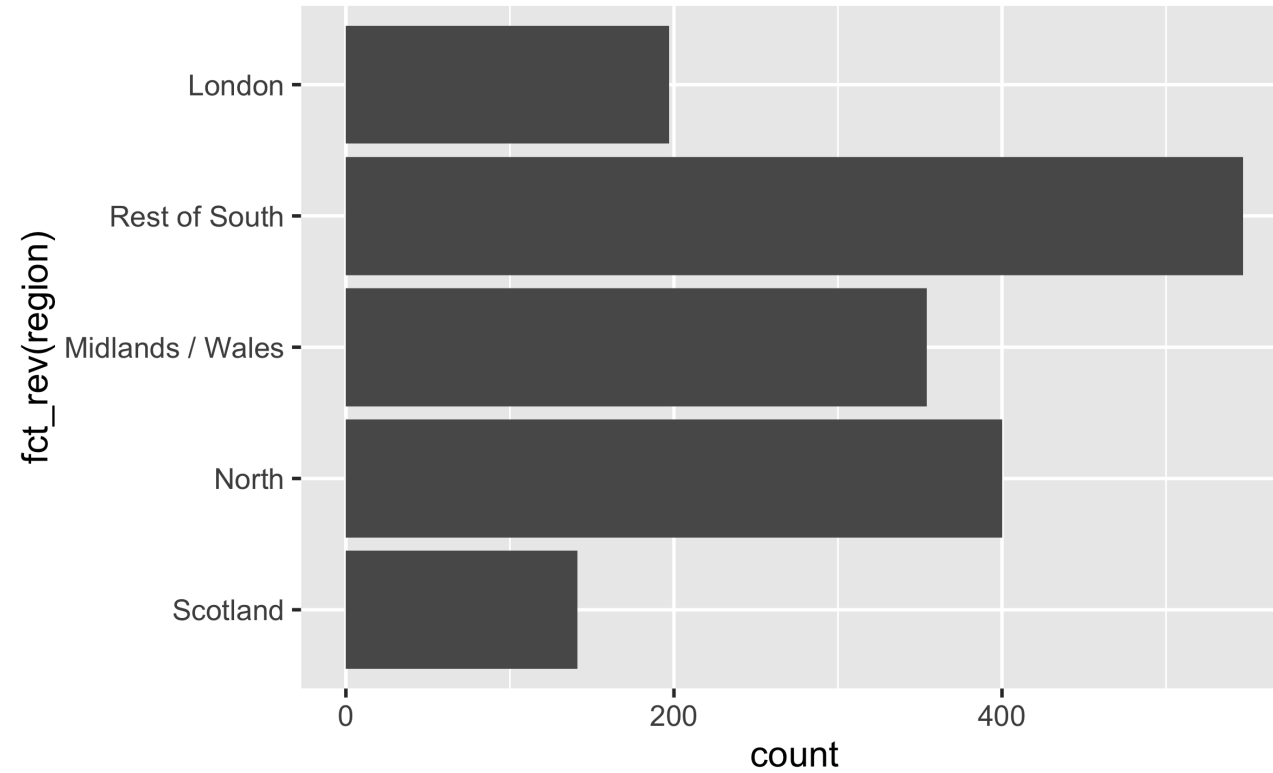# Long categories can be hard to read

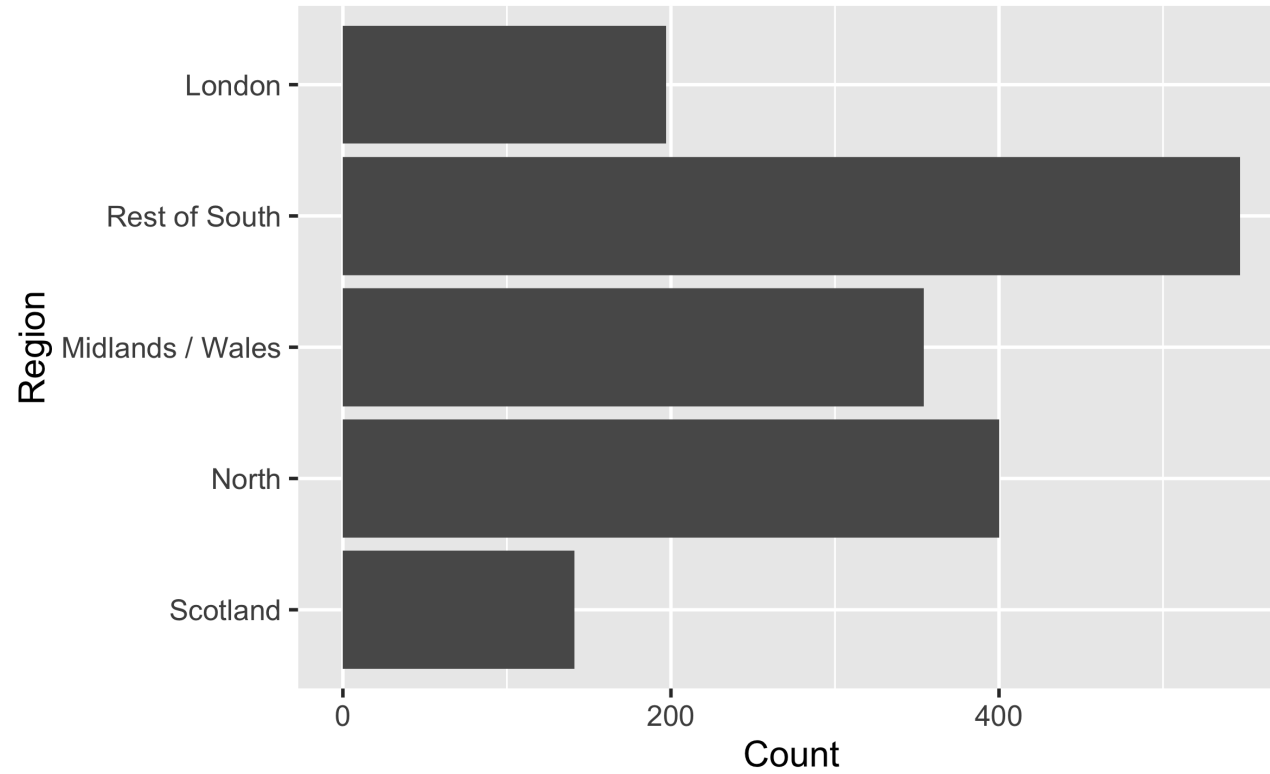# Move them to the y-axis

And reverse the order of levels

Clean up labels

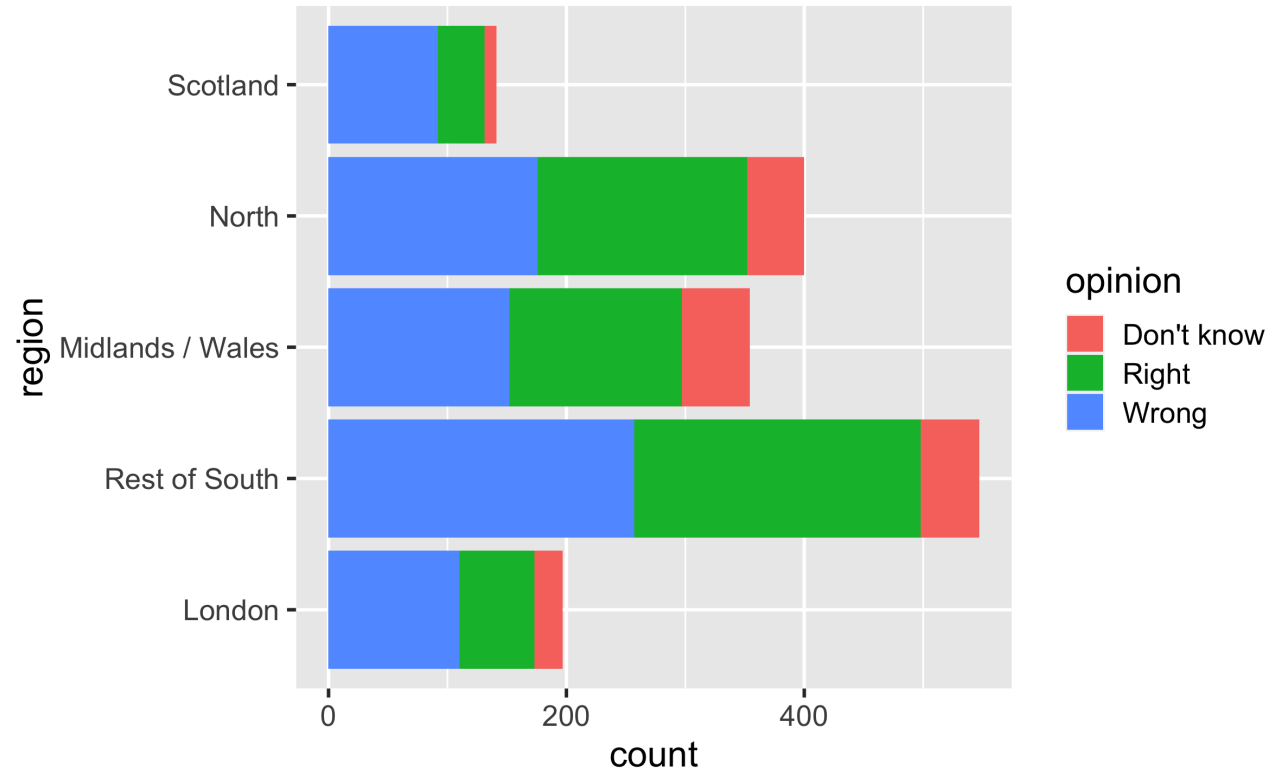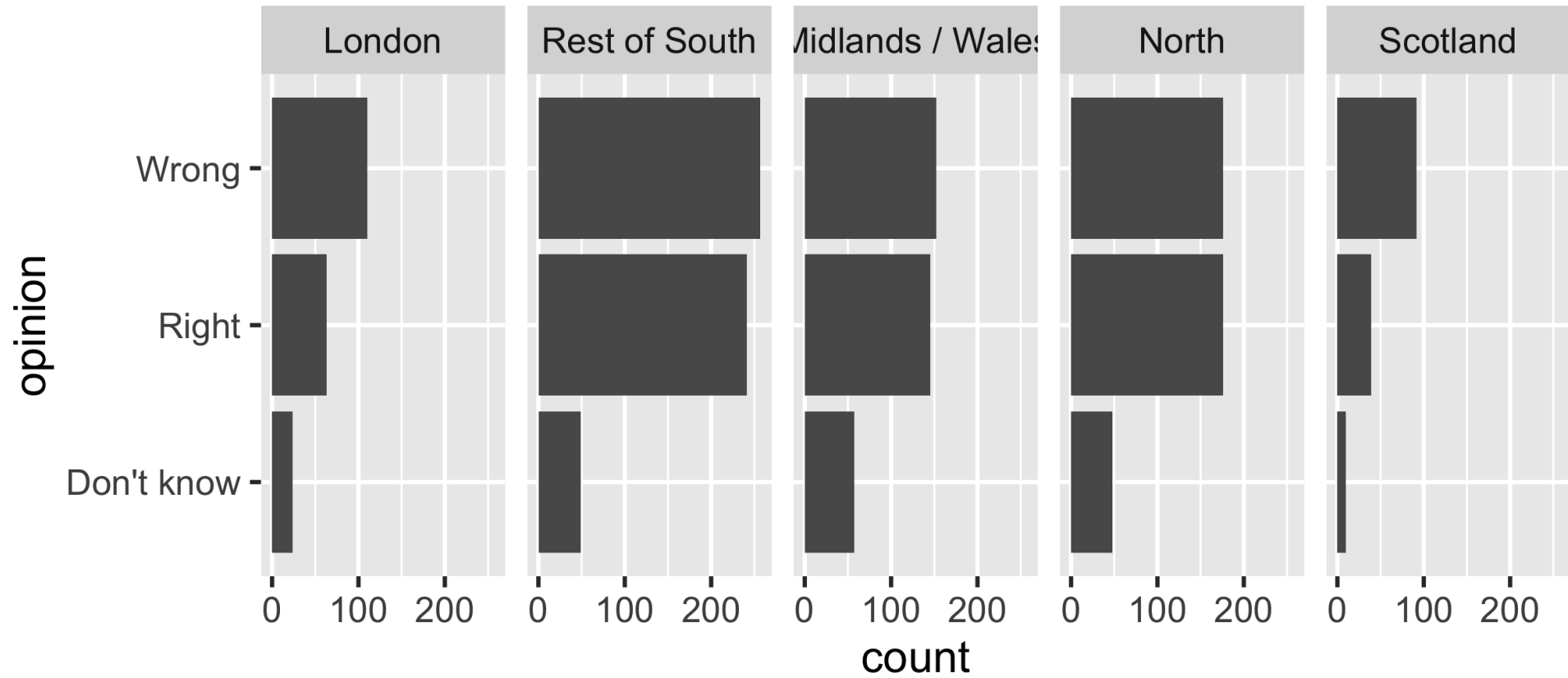# Pick a purpose

Segmented bar plots can be hard to read

Use facets
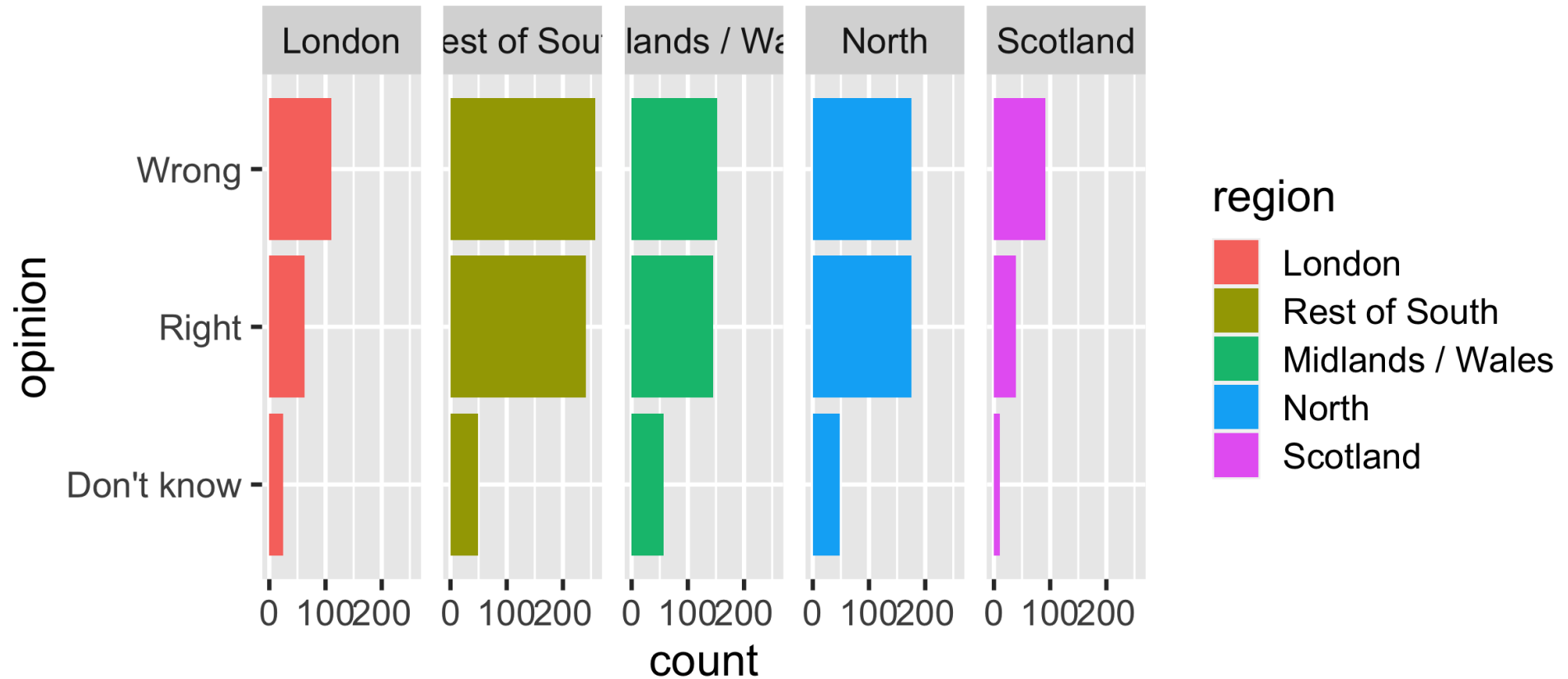
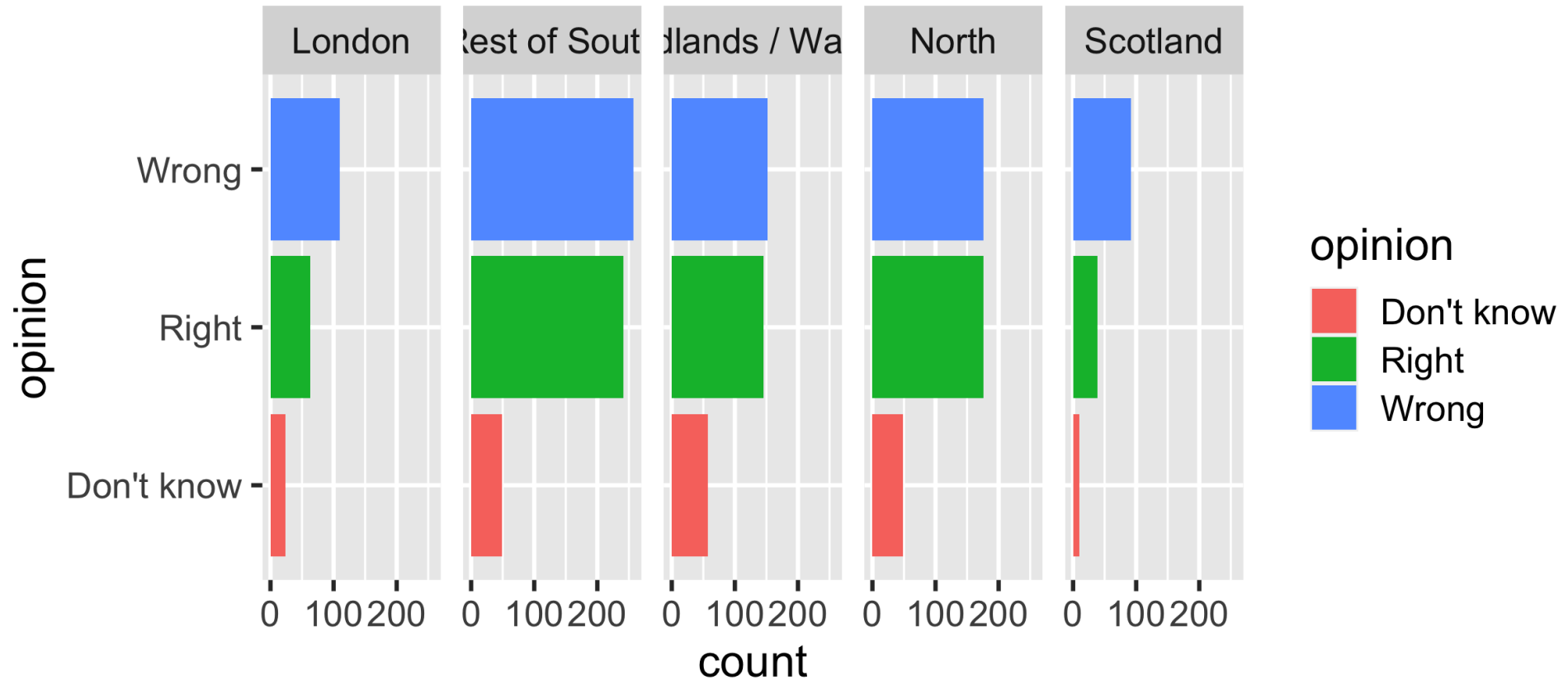# Avoid redundancy?
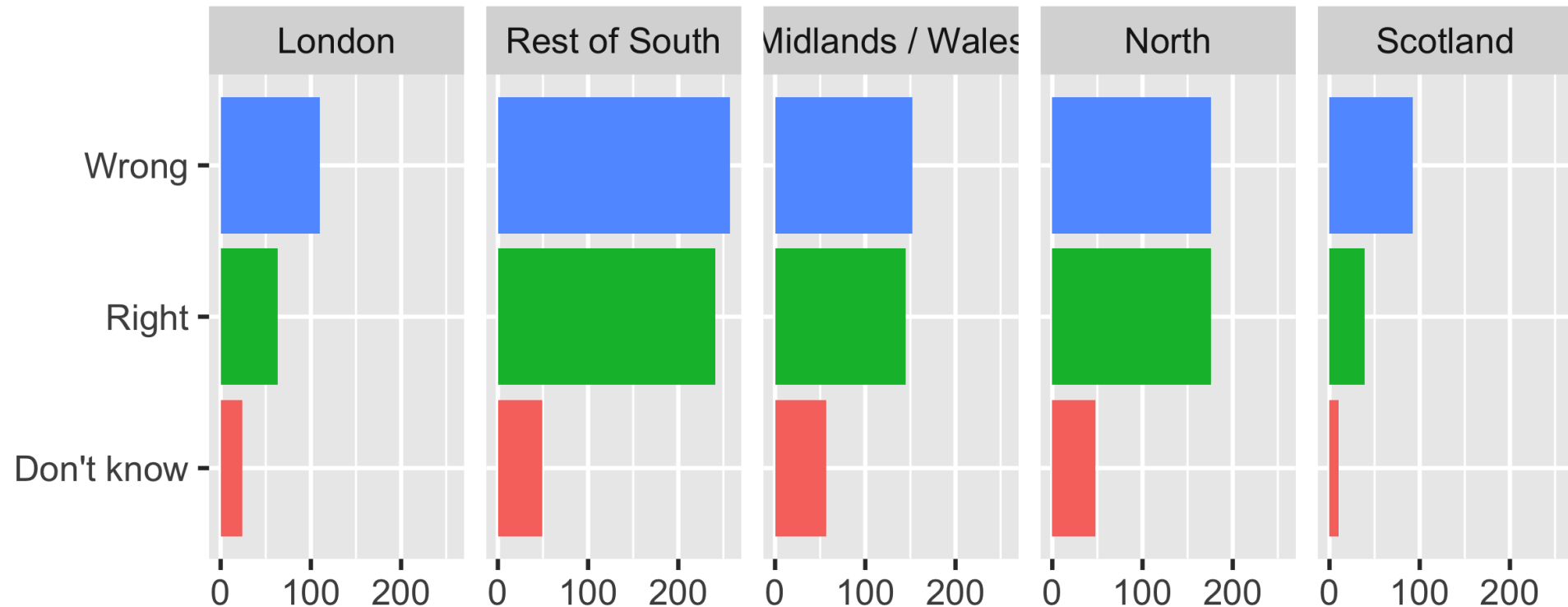
Redundancy can help tell a story

Be selective with redundancy

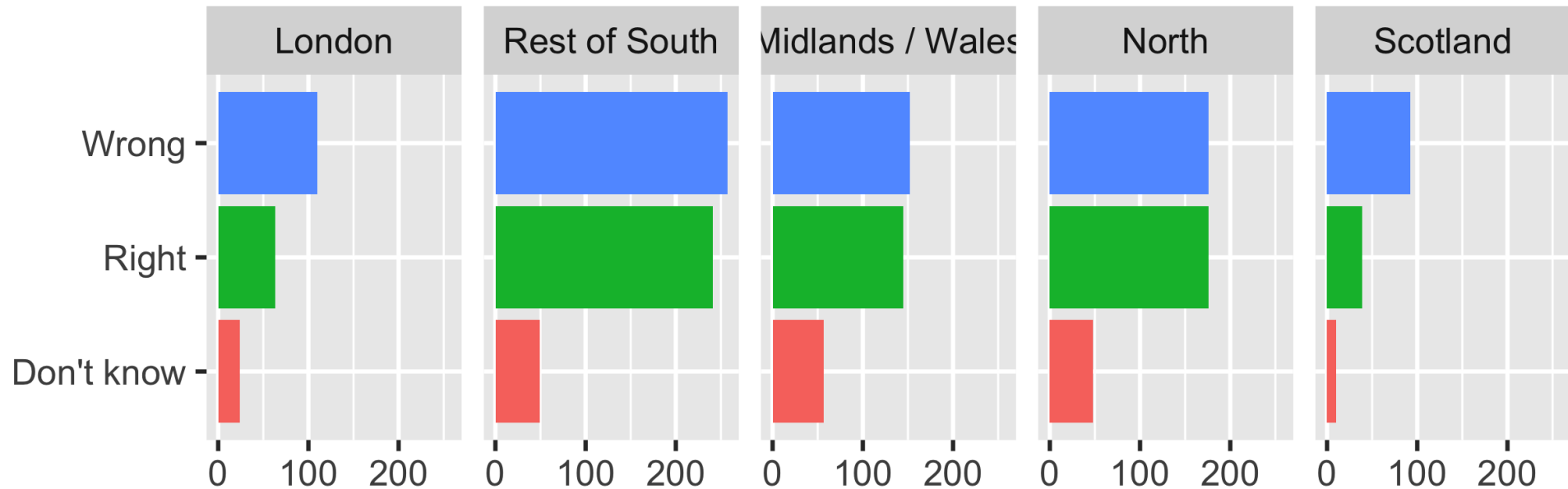# Use informative labels

Was Britain right/wrong to vote to leave EU?

A bit more info

Was Britain right/wrong to vote to leave EU?
YouGov Survey Results, 2-3 September 2019

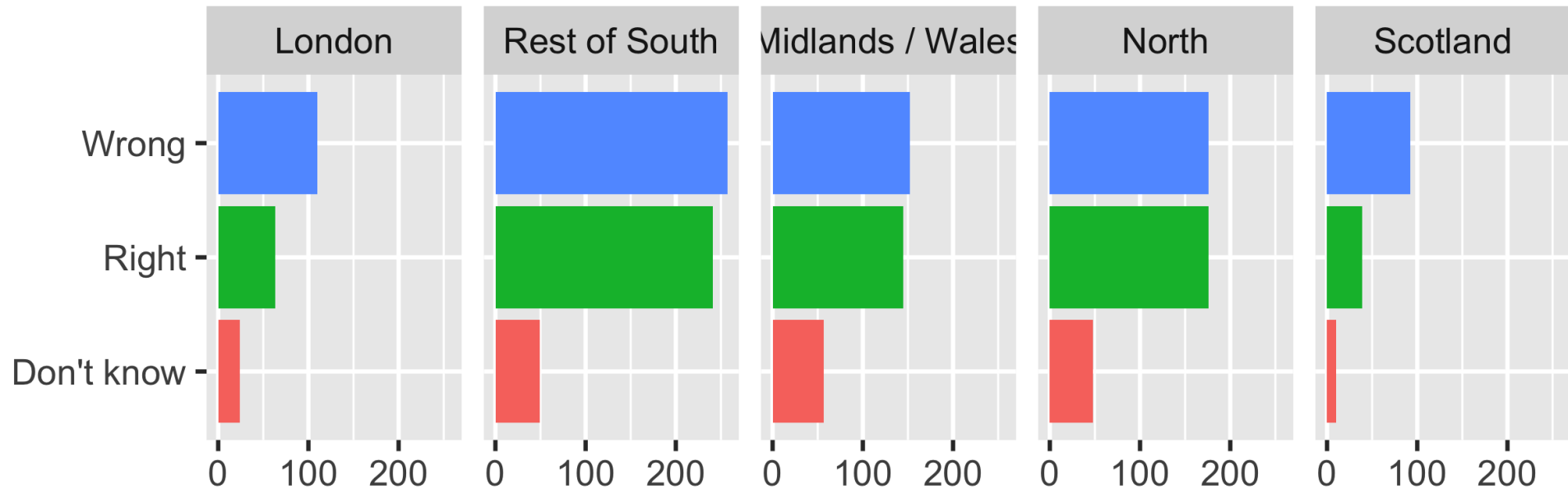cumulus_uploads/document/x0msmggx08/YouGov%20-%20Brexit%20and%202019%20election.pdf

Let's do better

Was Britain right/wrong to vote to leave EU?
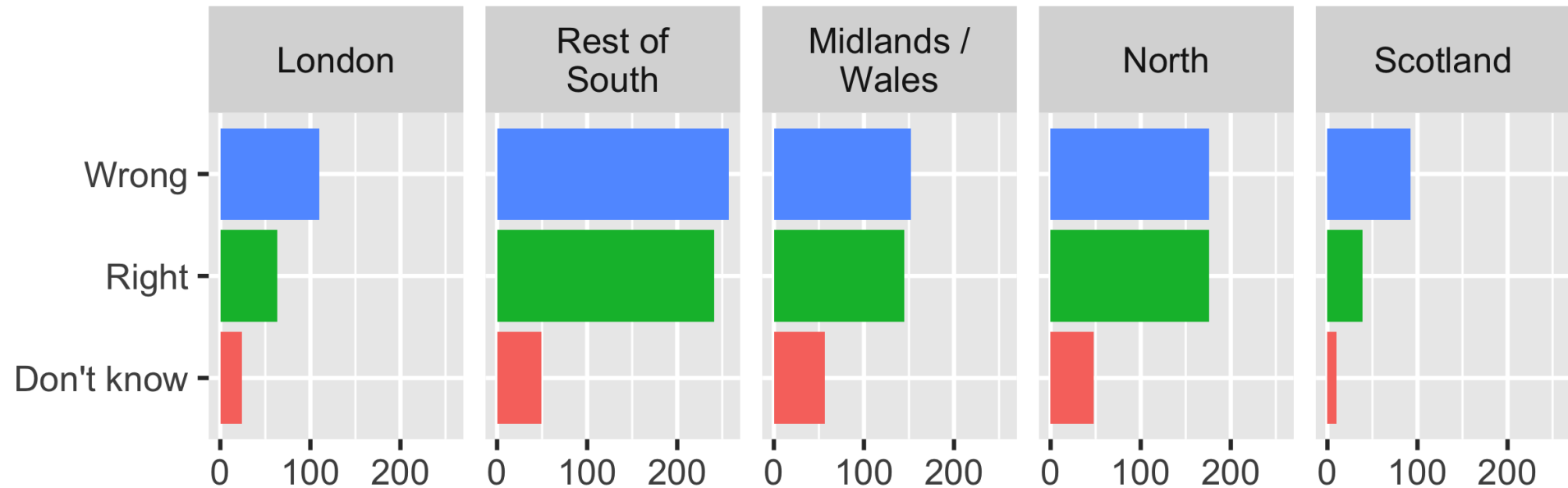### YouGov Survey Results, 2-3 September 2019

Source: bit.ly/2lCJZVg

Fix up facet labels

Was Britain right/wrong to vote to leave EU?
YouGov Survey Results, 2-3 September 2019

Source: bit.ly/2lCJZVg

Select meaningful colors

Rainbow colors not always the right choice

Was Britain right/wrong to vote to leave EU?
YouGov Survey Results, 2-3 September 2019

Source: bit.ly/2lCJZVg

Manually choose colors when needed
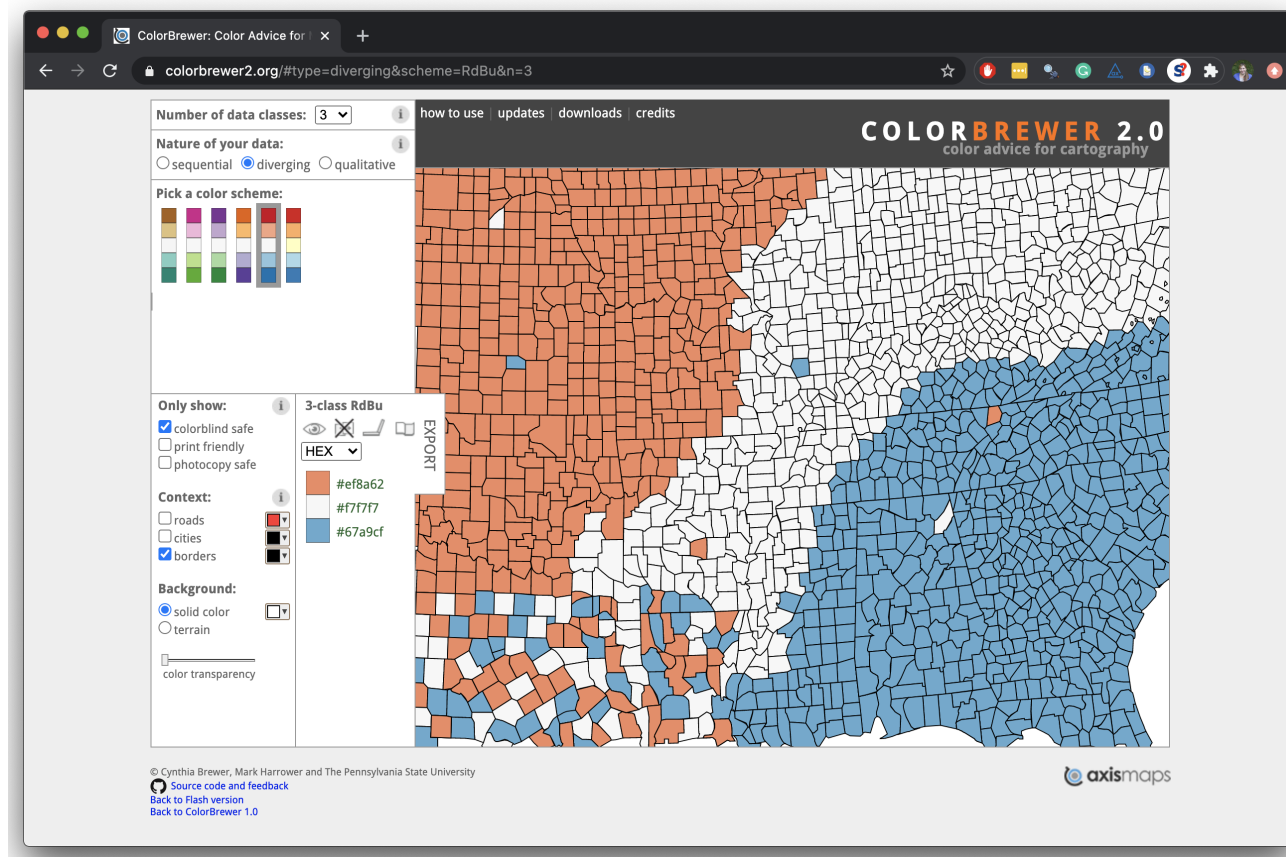
Was Britain right/wrong to vote to leave EU?
YouGov Survey Results, 2-3 September 2019

Source: bit.ly/2lCJZVg

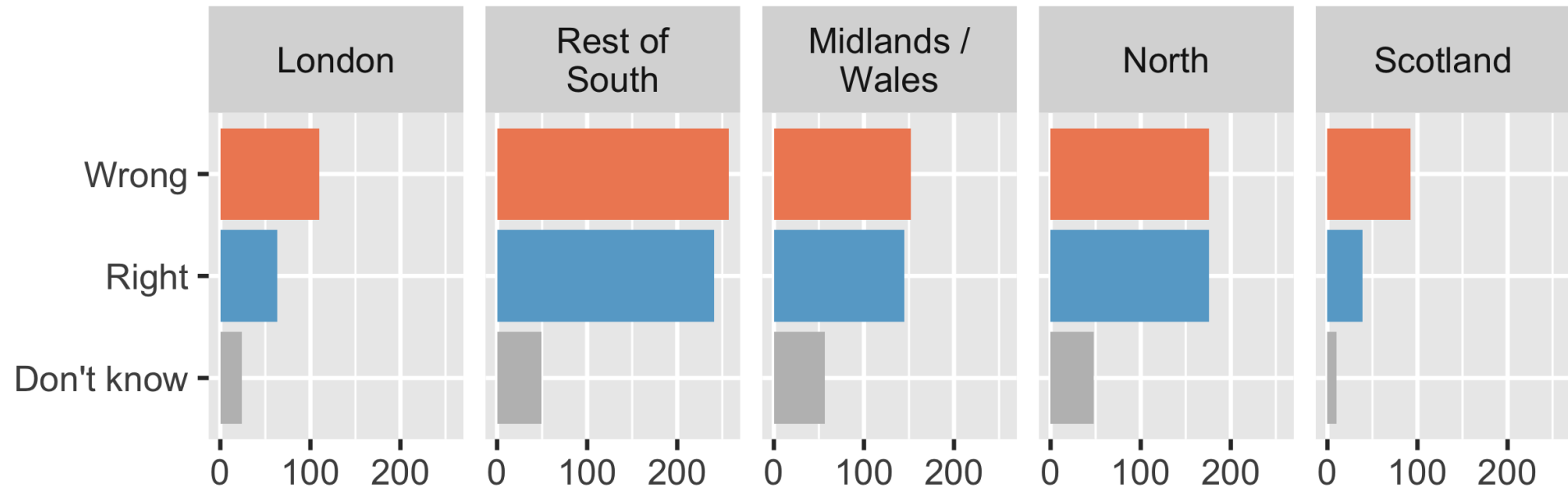# Choosing better colors

colorbrewer2.org

Use better colors

Was Britain right/wrong to vote to leave EU?
YouGov Survey Results, 2-3 September 2019

Source: bit.ly/2lCJZVg

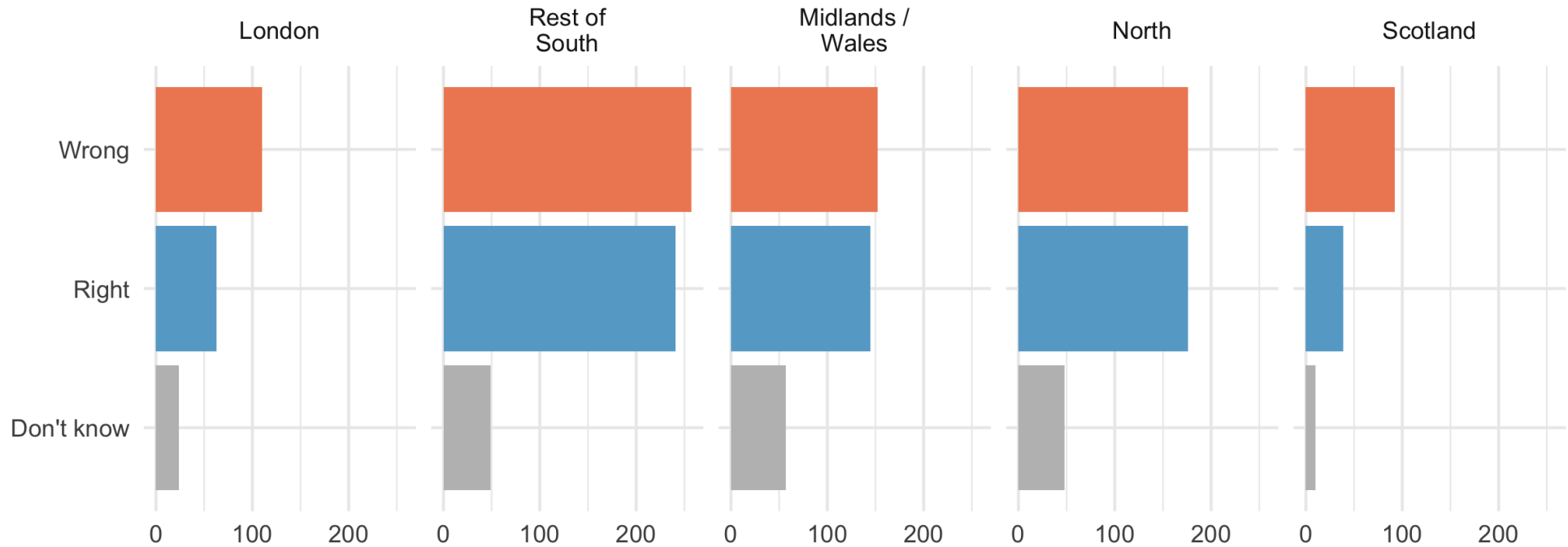# Select theme

Was Britain right/wrong to vote to leave EU?
YouGov Survey Results, 2-3 September 2019

Source: bit.ly/2lCJZVg

Your turn!

- RStudio Cloud > `AE 07 – Brexit + Telling stories with dataviz` > `brexit.Rmd`.
- Change the visualisation in three different ways to tell slightly different stories with it each time.