Publication-ready ggplot2

Scientific workflows: Tools and Tips 🛠️

2026-05-21

What is this lecture series?

Scientific workflows: Tools and Tips 🛠️

🗓️ Every 3rd Thursday 🕓 4-5 p.m. 📍 Webex

- One topic from the world of scientific workflows
- Material provided online
- If you don't want to miss a lecture
  - Subscribe to the mailing list
- For credit points: Send me a short message (Email or Webex)

From default to publication-ready

- Making a first plot is easy, but making it publication-ready takes more work, choices and iterations

So many things you can tune:

- The plot itself: which geoms to pick
- Themes, colours, fonts
- How to highlight your results
- Creating multi-panel plots
- Exporting at a readable size

Different outputs (poster/talk/journal figure) require different tweaks

Today

We'll focus on:

1. **Custom themes** for a consistent look
2. **Colour** choice
3. **Multi-panel layouts**: how to combine plots
4. **Exporting** plots at the right size and resolution

> **Note**
>
> This is not an exhaustive list, there is so much more ggplot extension packages and tricks out there.

How it works

- There's a **GitHub repo** you download and open in your IDE (I'll use Positron)
- I demonstrate each topic: **follow along or just watch**
- Each module has a short **exercise** to play with the concept
- **Questions** anytime: in the chat or just unmute

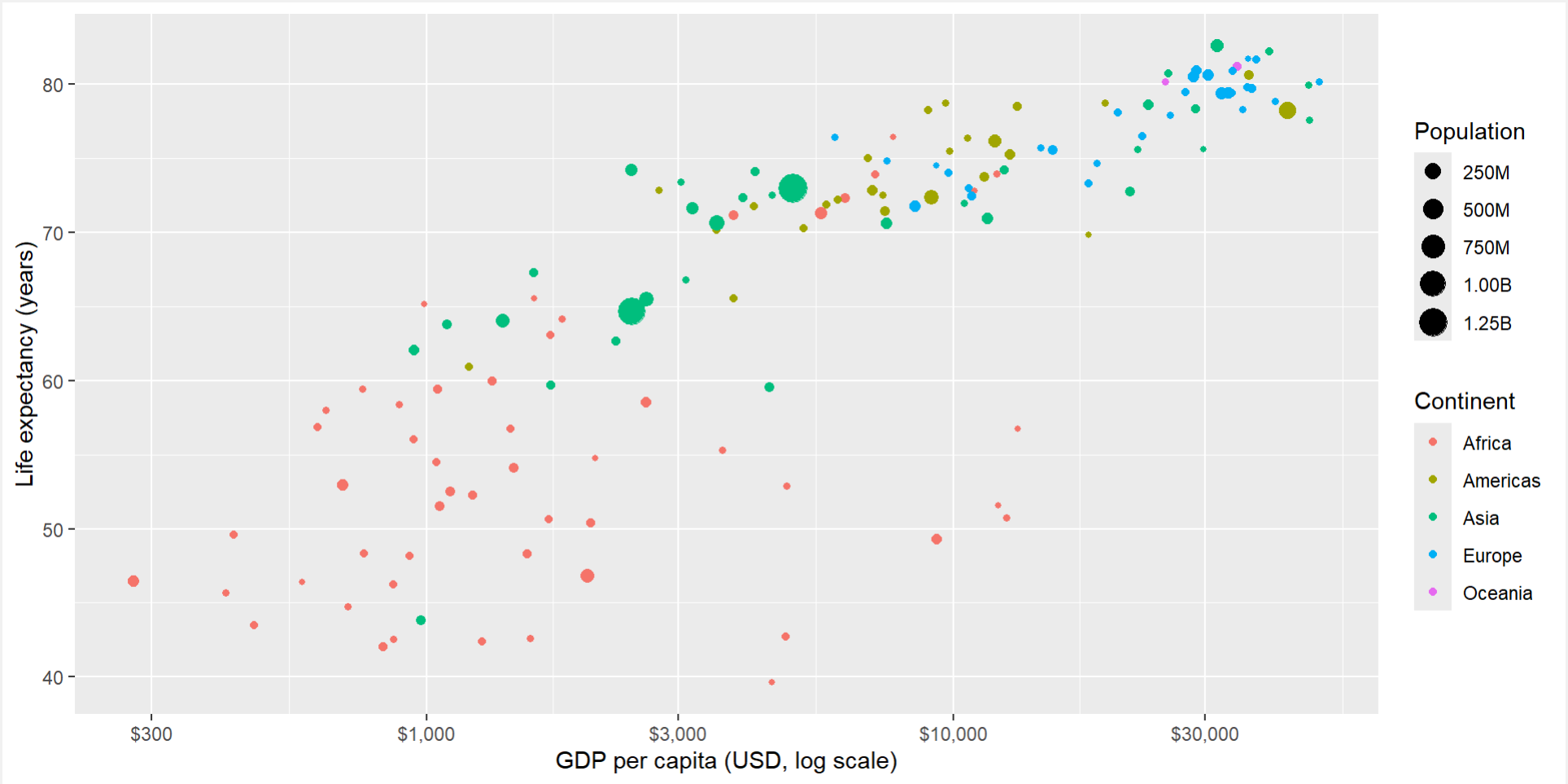
Get set up

1. Click the green **Code** button → **Download ZIP**
2. Unzip it somewhere you can find it
3. Double-click the `.Rproj` file → opens in RStudio
    - *(Positron/VS code users: open the folder)*
4. Run `install_packages.R` to install today's packages

Repo: https://github.com/selinaZitrone/advanced-ggplot-workshop

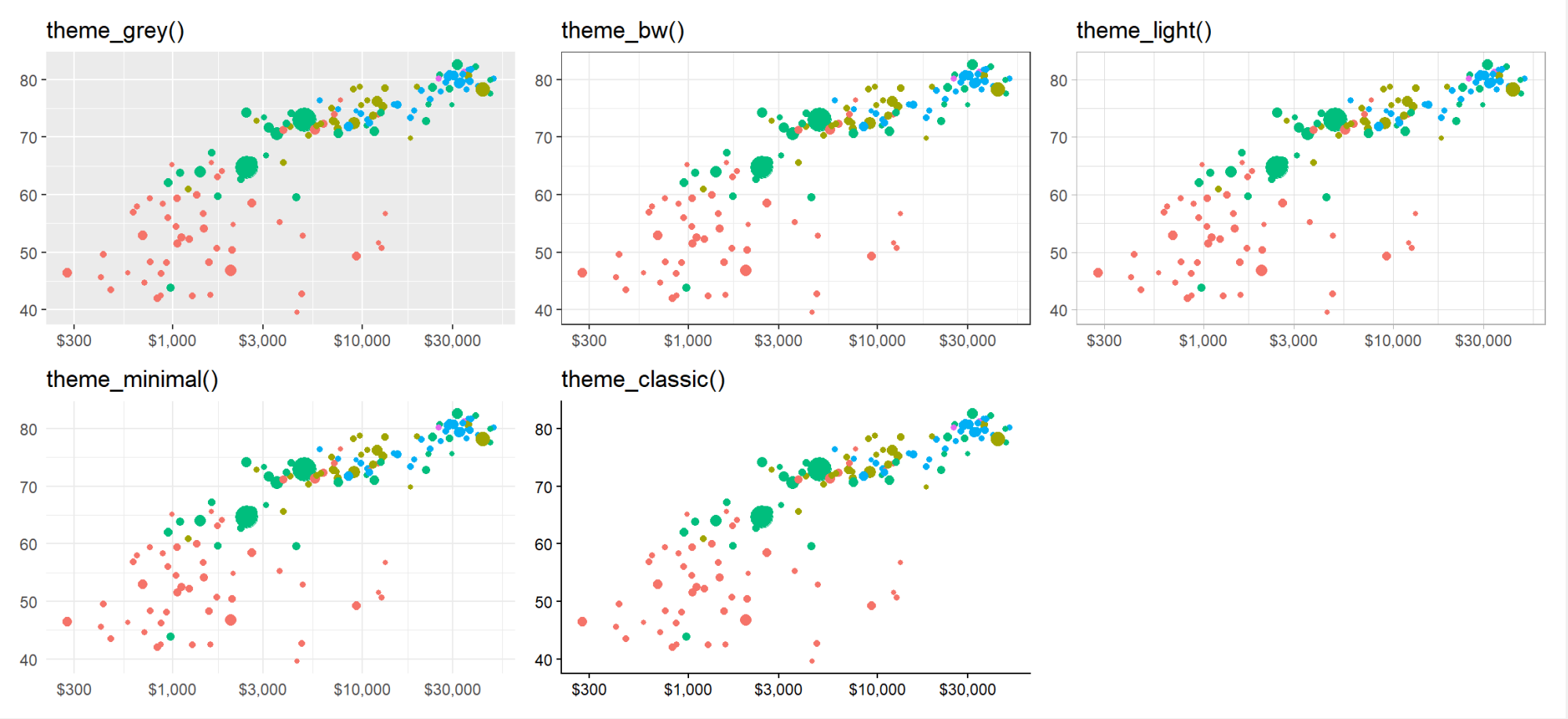
1. Custom themes

The default isn't publication-ready



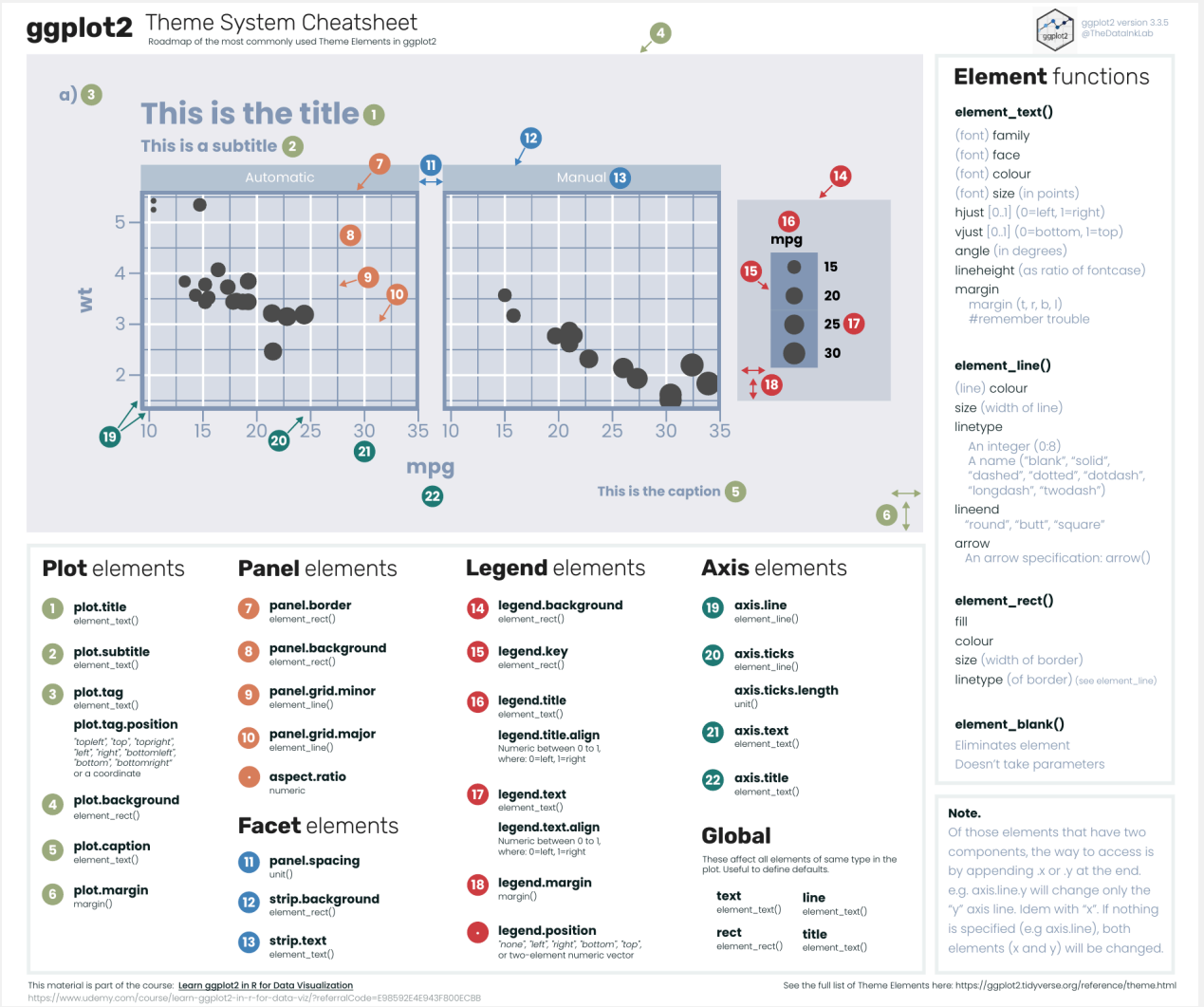
Built-in themes: a quick win

Add a `theme_*()` layer and the whole look changes.



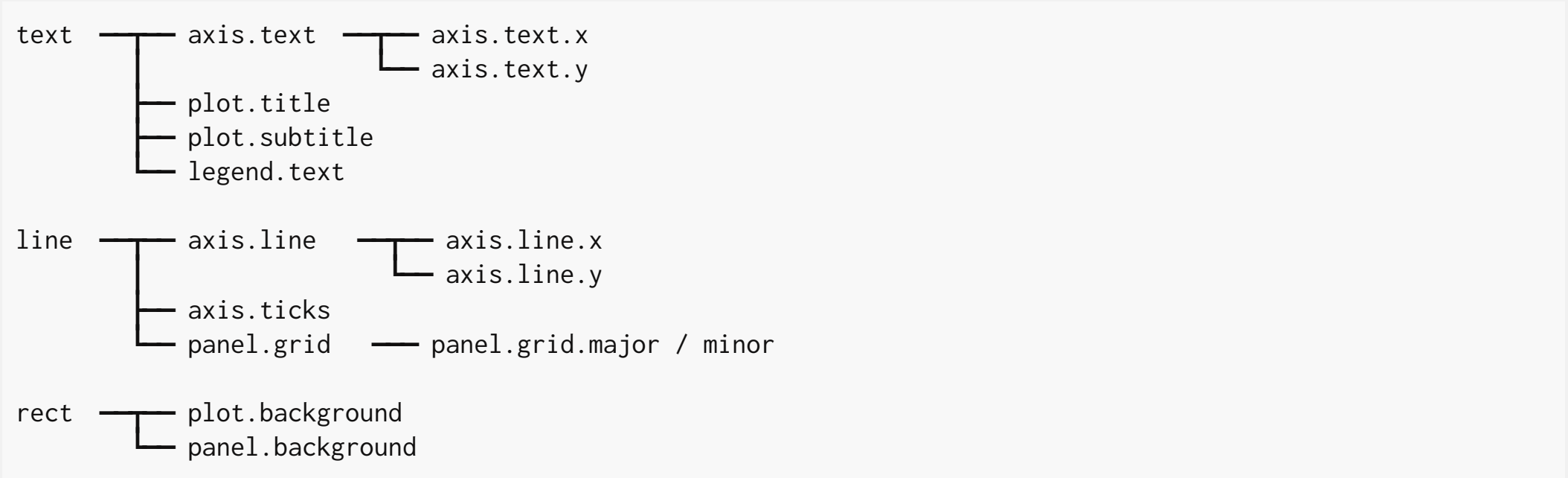
Further customization with `theme()`

A theme controls everything that isn't data: Fonts, sizes, colours, grid lines, spacing, legends, …



ggplot2 theme-system cheatsheet (by Clara Granell)

Inheritance of `theme` elements



- Set a **parent** and it affects all its **children**
- E.g. Change `text` once and every piece of text updates

How to change a theme

```
p_bubble +
  theme_light(base_size = 18) +
  theme(
    legend.text = element_text(size = rel(0.85)),
    panel.grid.minor = element_blank()
  )
```

Live demo

Open `demo/01_themes.R`

Your turn

> ✏️ Exercise (~7 min):
>
> Open `exercises/01_themes_exercise.R`

2. Colour with intent

Pick intuitive colours

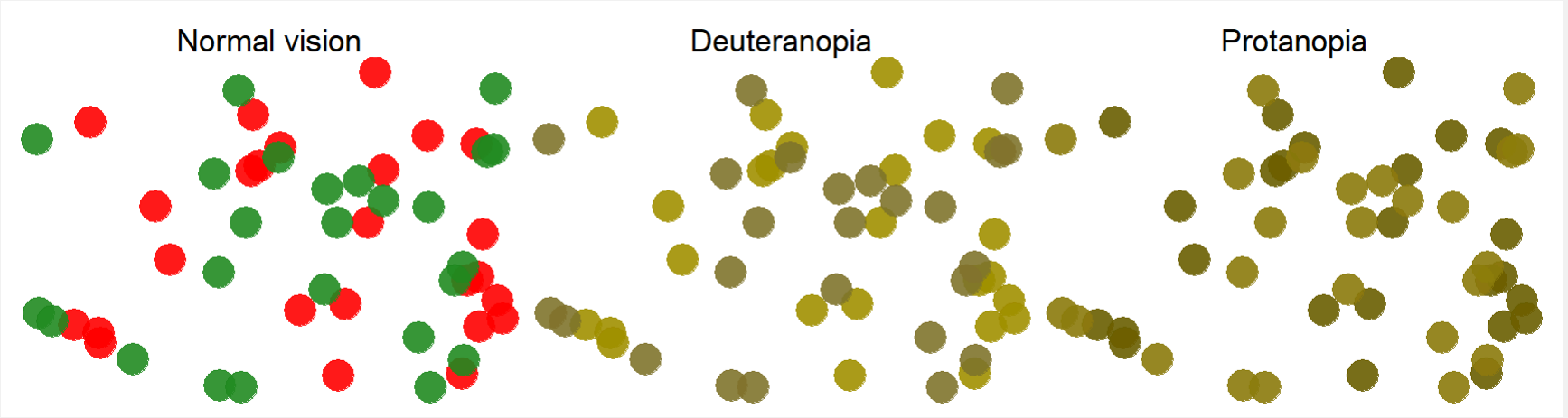
Use colours your reader already associates with the thing.

Blogpost on colours by Lisa Charlotte Muth (Datawrapper)

Two things that matter

For scientific figures:

1. **Intuitive** colours that match what your reader expects
2. **Colourblind-safe** colours

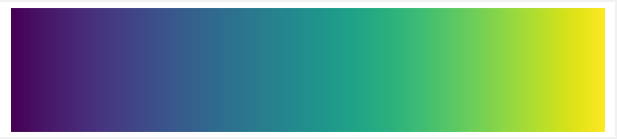


Three kinds of palettes

Qualitative

Distinct categories

Sequential



Ordered, low to high

Diverging

Above / below a midpoint

Okabe-Ito (base R)

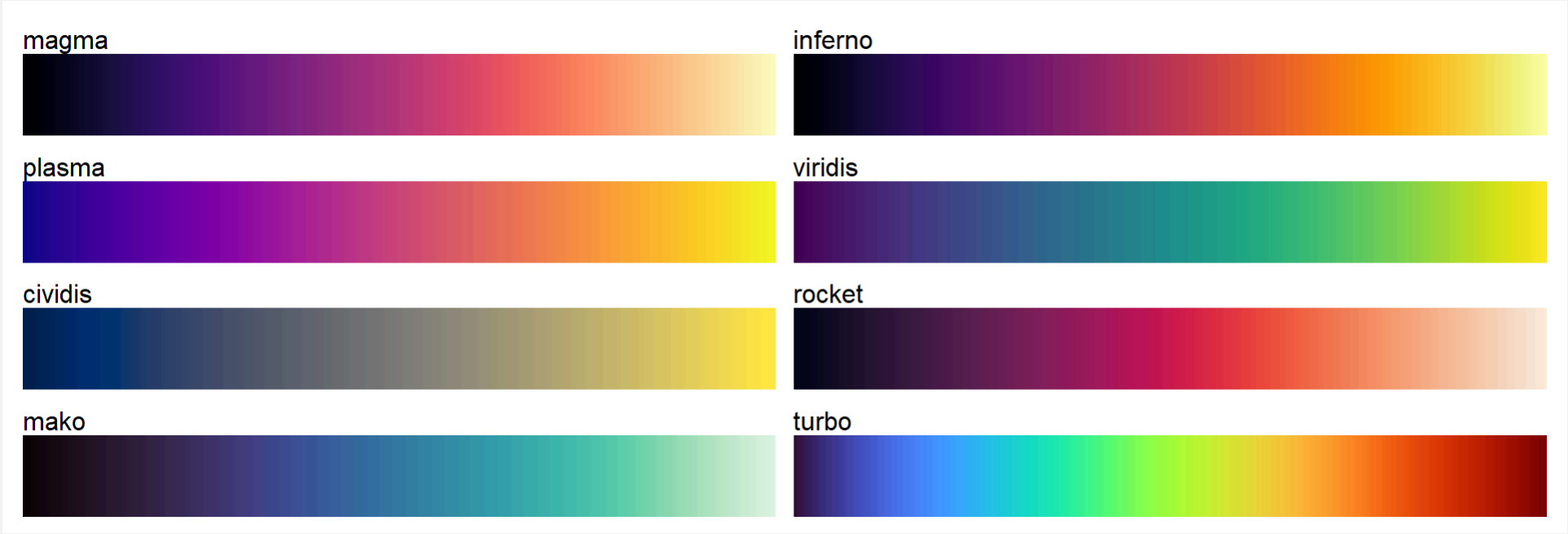
A colourblind-safe qualitative palette, built into base R.

- 8 distinct hues plus black and grey, separable under all common CVD types
- access with `palette.colors(palette = "Okabe-Ito")`

See here for details

viridis (built into ggplot2)

Perceptually uniform, colourblind- and greyscale-safe. Best for ordered or continuous data.

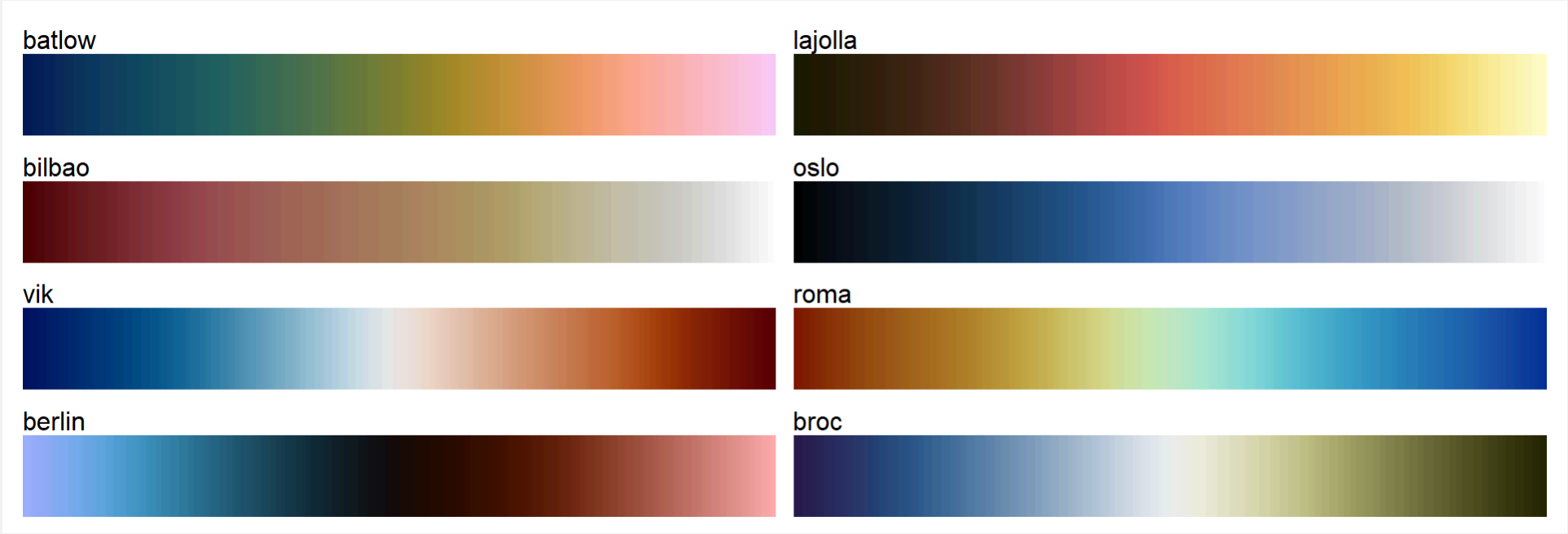


- access with `scale_colour_viridis_d()` / `_c()`

See here for details

scico R package

Perceptually uniform and colourblind-safe. Made for **scientific data** and designed to be fair, readable, and citable



- access with `scale_colour_scico_d()` / `_c()`

scico R package, the colour maps by Fabio Crameri

Live demo

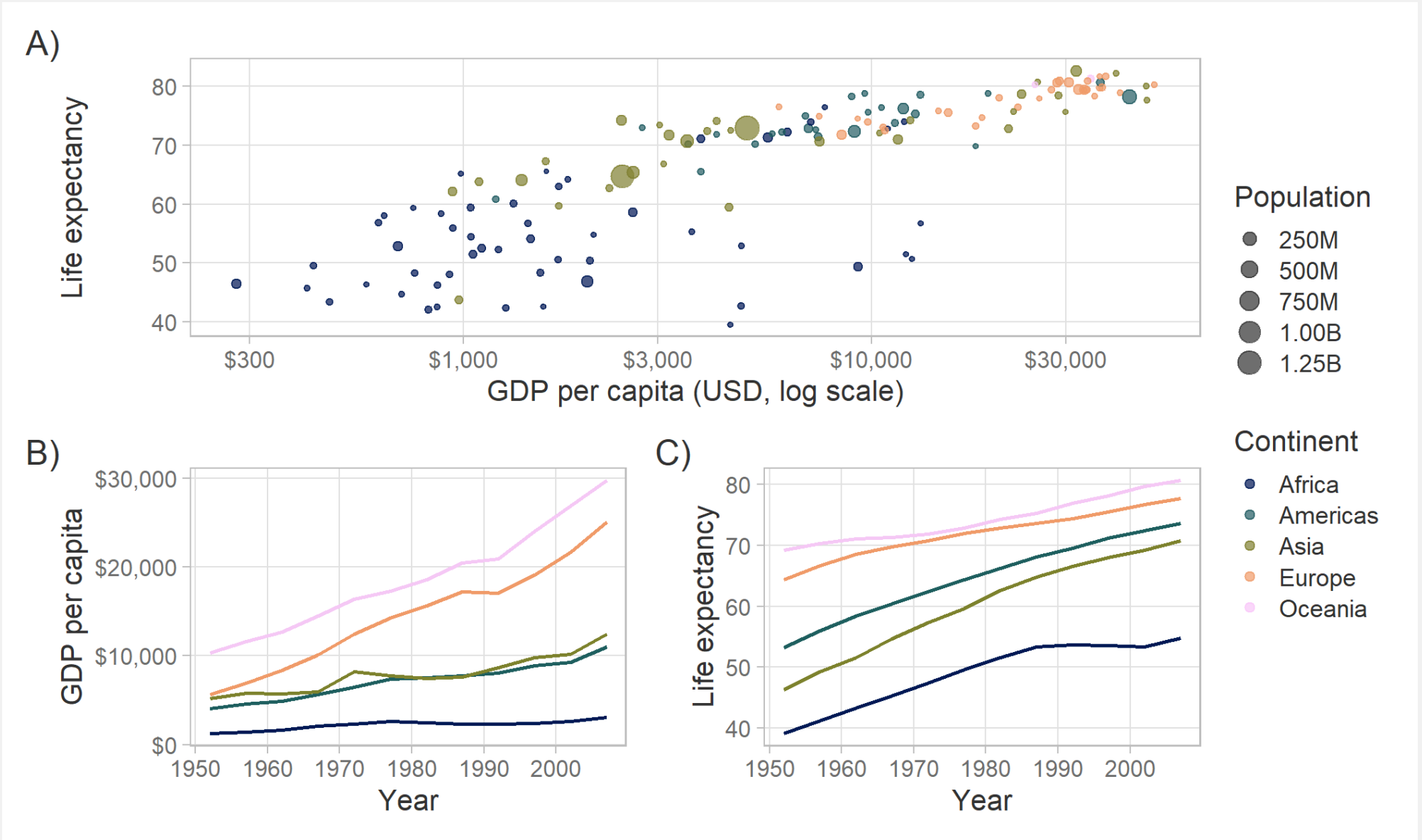
Open `demo/02_color.R`.

Your turn

> ✏️ Exercise (~5 min):
>
> Open `exercises/02_color_exercise.R`

3. Multi-panel layouts

Common multi-panel layouts



The patchwork package

- Compose plots
- Collect shared legends and axes
- Tag panels
- Apply additional plot layers to every panel
- Place plots inside plots as insets

The patchwork documentation is excellent

Live demo

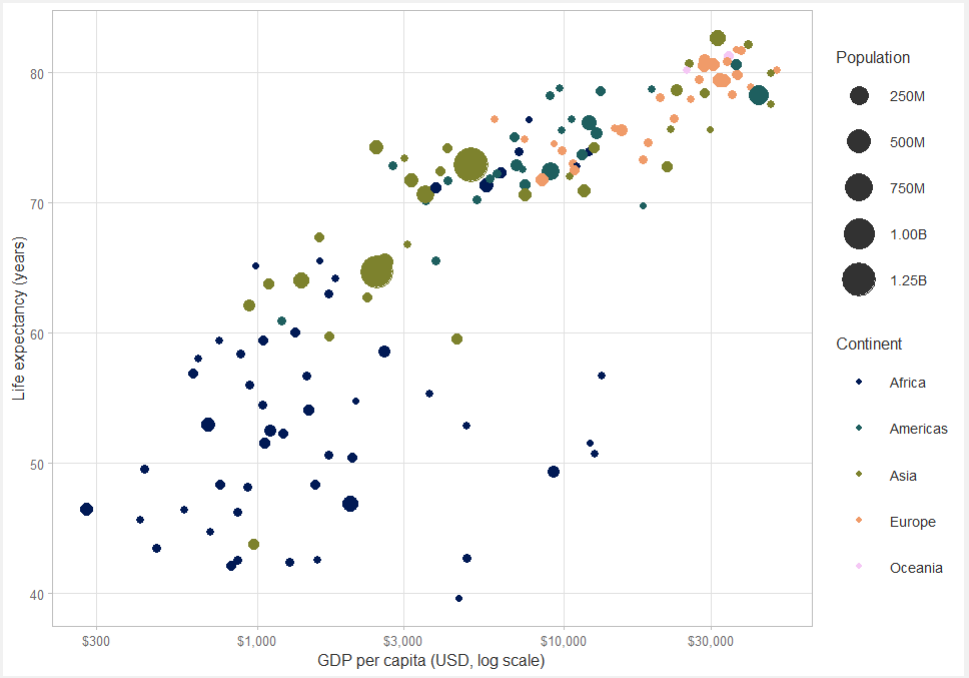
Open `demo/03_patchwork.R`.

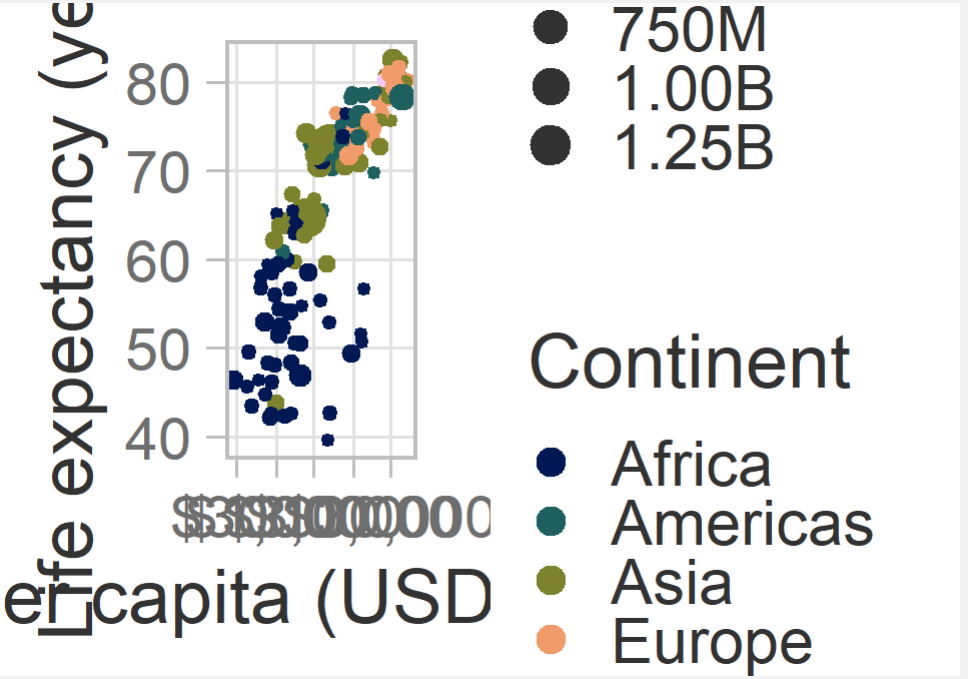
Your turn

> ✏️ Exercise (~8 min):
>
> Open `exercises/03_patchwork_exercise.R`

4. Exporting figures

Same plot, different canvas





Rule of thumb

Starting points for Canvas and font sizes:

Outlet	Canvas width	`base_size`
Paper, single column	~89 mm	8–10
Paper, double column	~120–180 mm	10–12
Slide, half	~150 mm	14–16
Slide, full	~250 mm	18–22
Poster	depends on layout	18–24

Live demo

Open `demo/04_export.R`.

Your turn

> ✏️ Exercise (~7 min):
>
> Open `exercises/04_export_exercise.R`

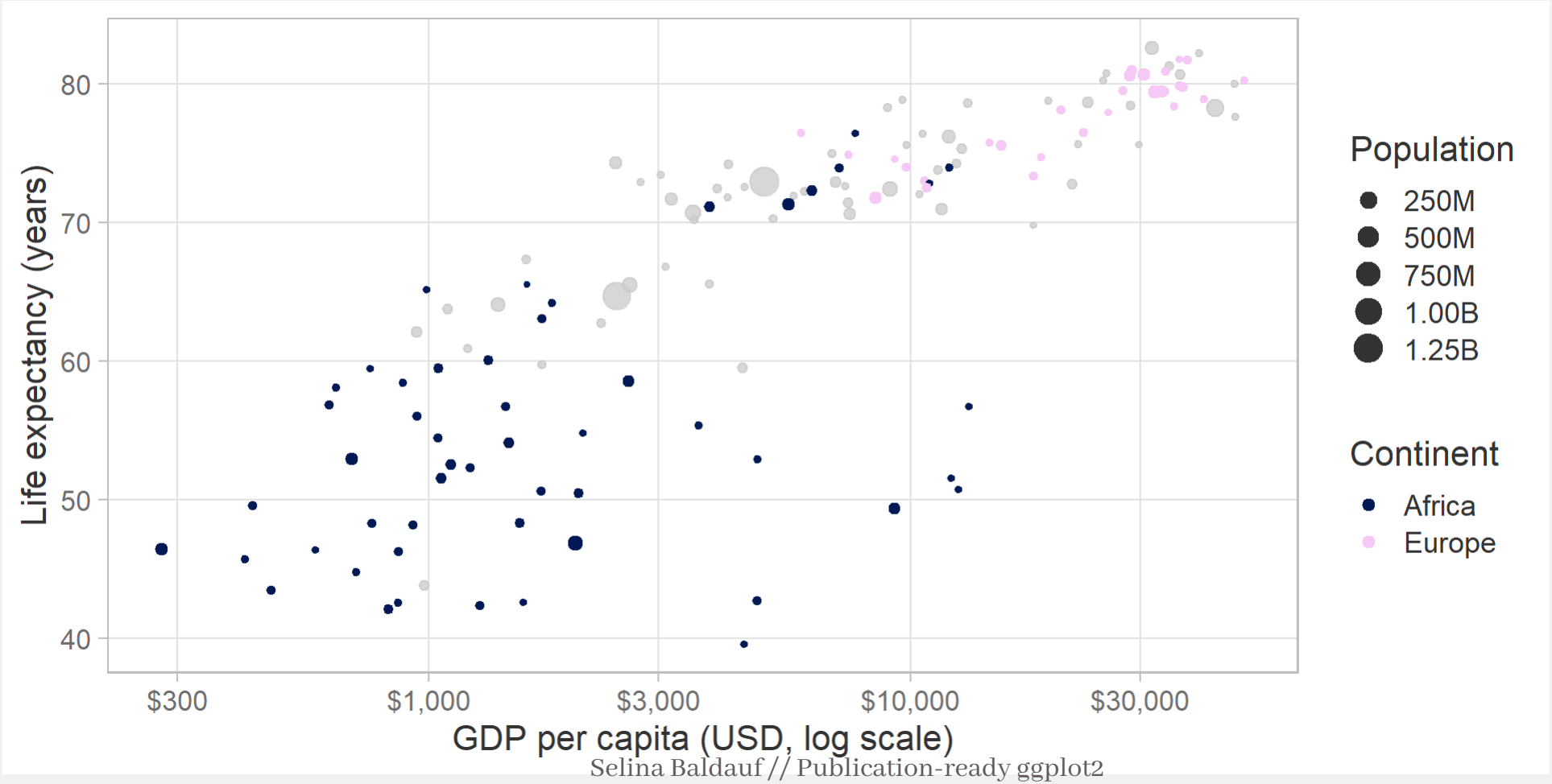
Other handy packages

The official ggplot extension gallery lists ~120 community extension packages to browse

gghighlight

`gghighlight` to fade data and highlight specific elements.

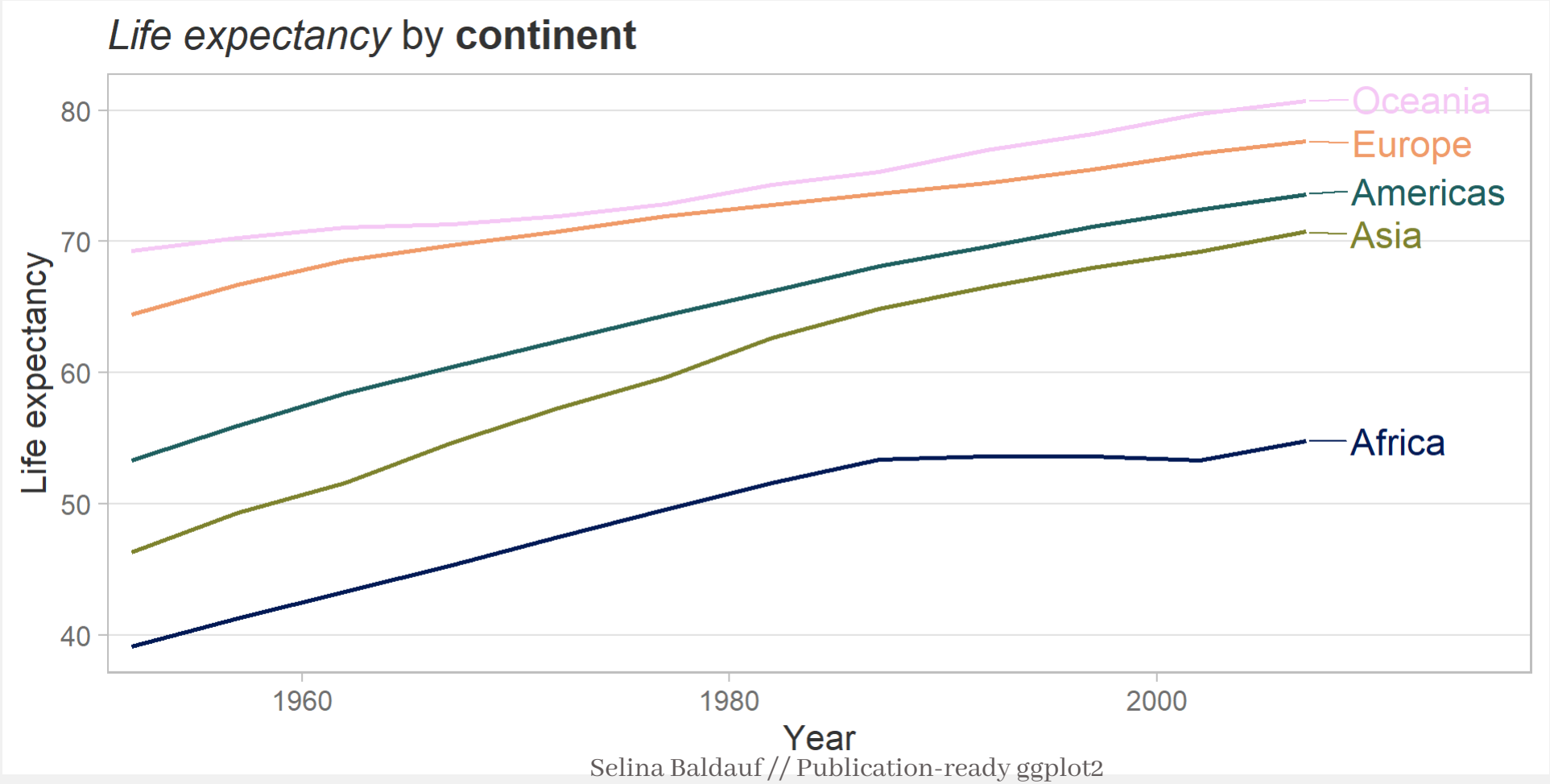
▶ Code



ggrepel + ggtext

ggrepel and ggtext for labels and markdown text

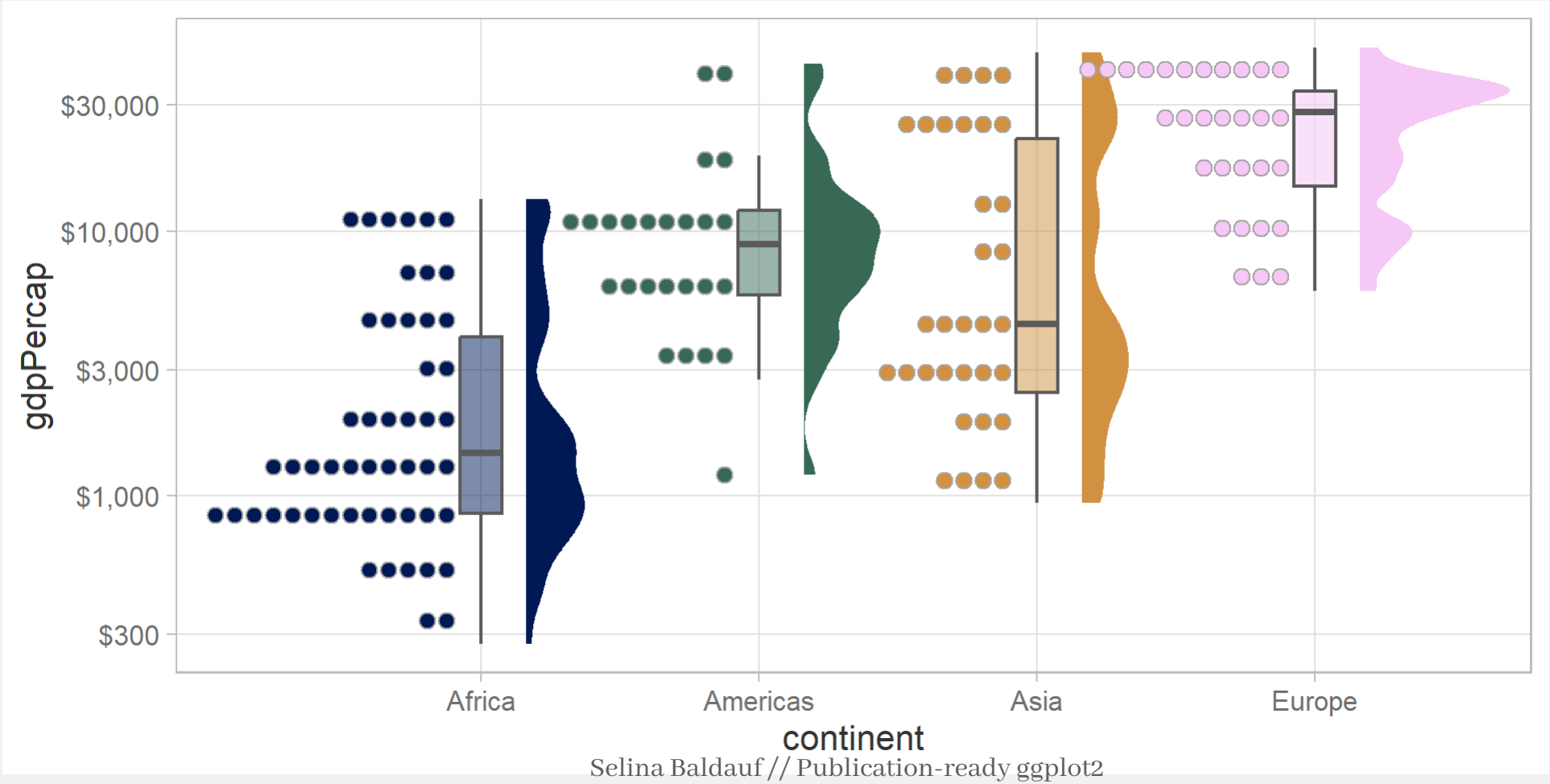
- Code



ggdist raincloud plots

ggdist to show distributions and uncertainty -> Barplot alternatives

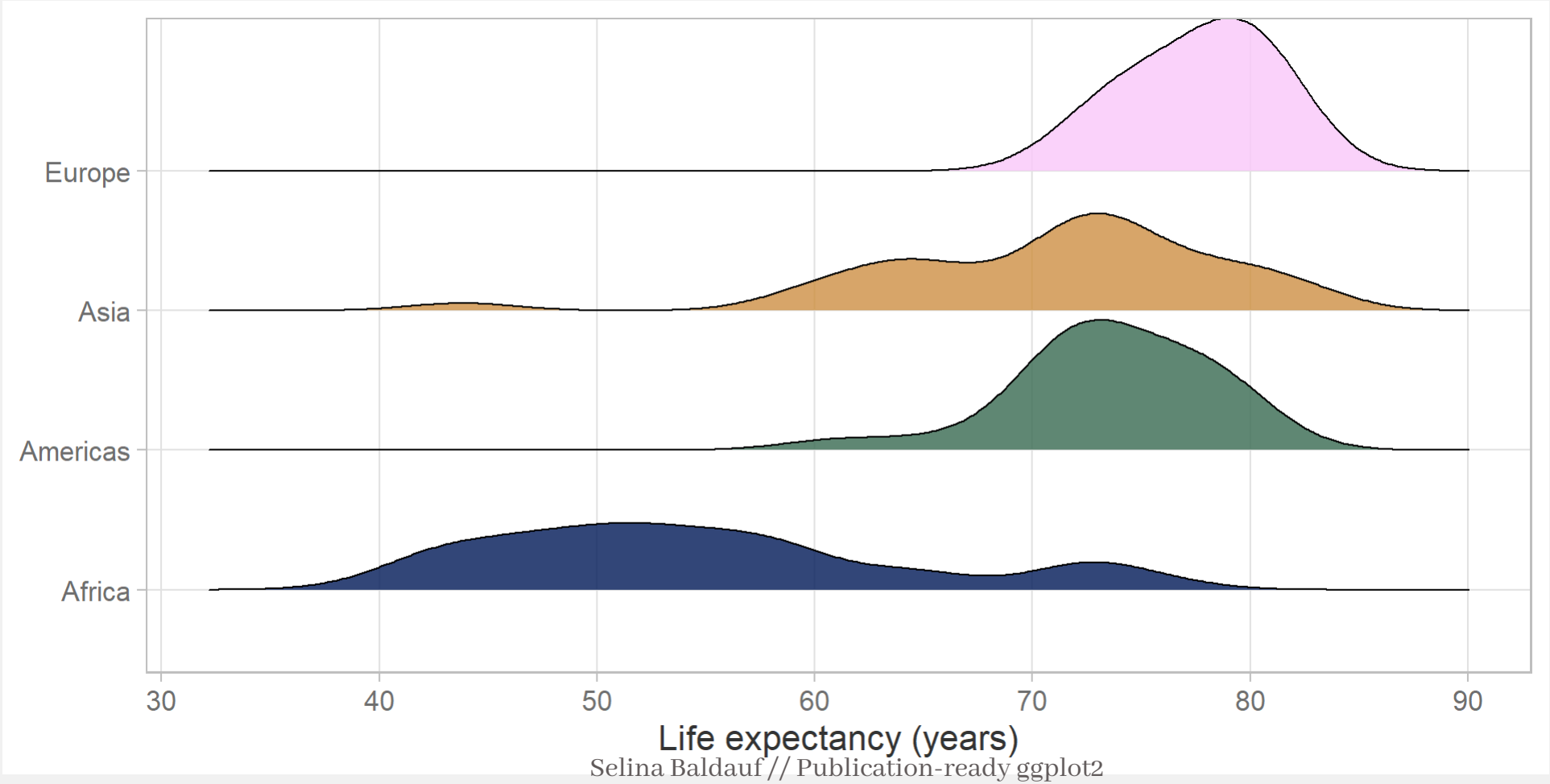
▶ Code



ggridges

ggridges for ridgeline distribution plots

▶ Code



Takeaways

What you can take back to your own plots:

1. **Custom themes**: write one `theme_*()` function, source it, `theme_set()` it everywhere it's needed
2. **Colour with intent**: pick intuitive, colourblind-safe palettes (Okabe-Ito, viridis, scico), and check with `cvdPlot()`
3. **Multi-panel layouts**: compose plots with `patchwork`, collect shared legends, add tag panels, …
4. **Export**: pick the canvas size, preview with `ggview::canvas()`, tweak `base_size` and geoms, and save with `ragg::ragg_png` or `cairo_pdf`.

Next lecture/workshop

Topic tba

🗓️ 18.06.2026 🕓 4-5 p.m. 📍 Webex

🔔 Subscribe to the mailing list

📧 For topic suggestions and/or feedback send me an email

The end :)

Questions?