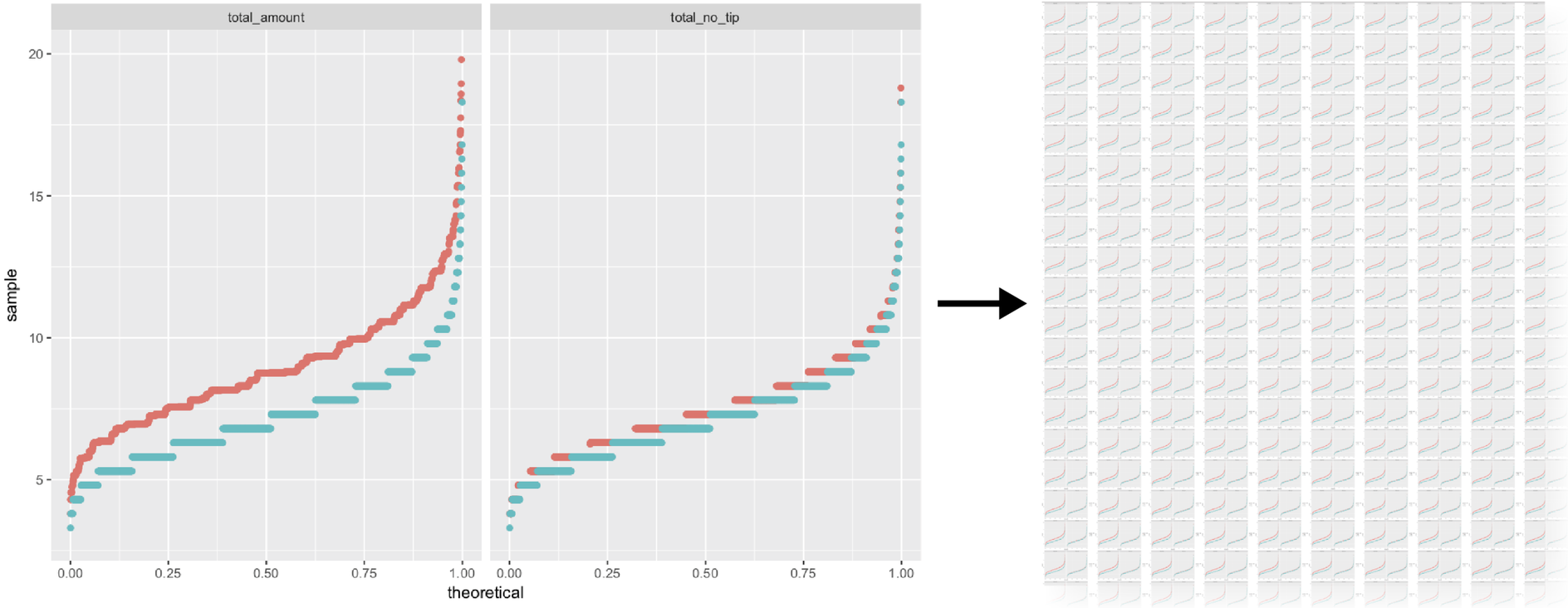
VISUALIZING BIG DATA WITH TRELLISCOPE

Faceting With TrelliscopeJS

Ryan Hafen
Author, TrelliscopeJS

Faceting with TrelliscopeJS

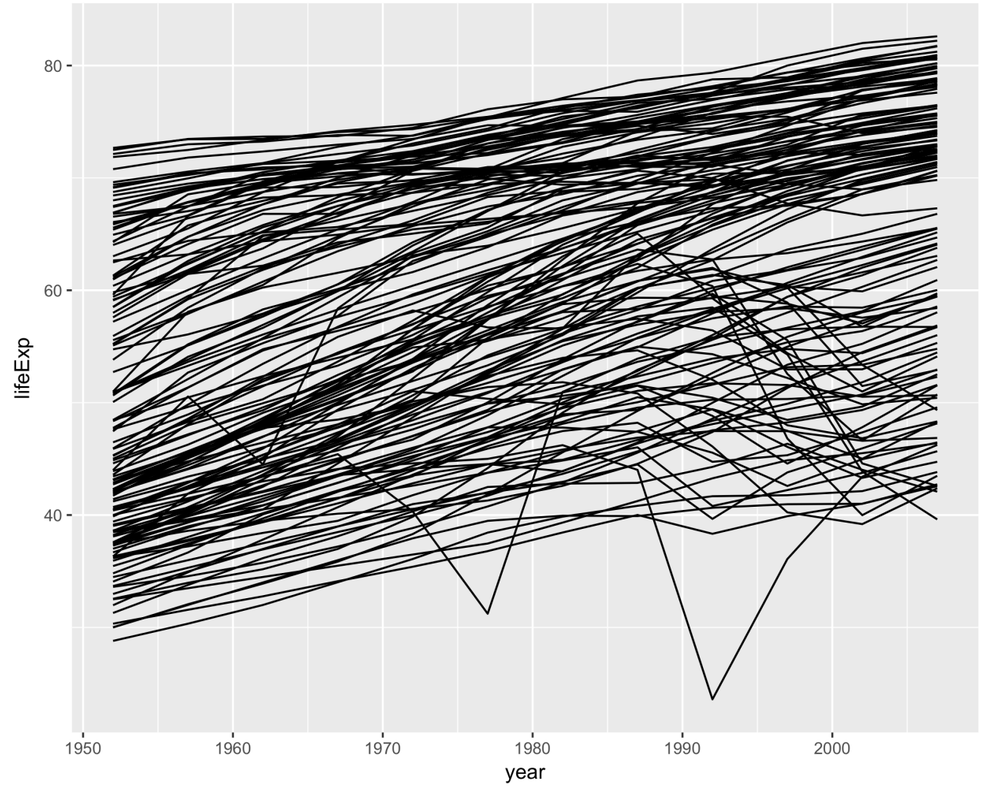


The Gapminder Data

```
> library(gapminder)
> head(gapminder)
# A tibble: 6 x 6
  country     continent  year lifeExp      pop gdpPercap
  <fct>       <fct>     <int>   <dbl>    <int>     <dbl>
1 Afghanistan Asia       1952    28.8  8425333       779
2 Afghanistan Asia       1957    30.3  9240934       821
3 Afghanistan Asia       1962    32.0 10267083       853
4 Afghanistan Asia       1967    34.0 11537966       836
5 Afghanistan Asia       1972    36.1 13079460       740
6 Afghanistan Asia       1977    38.4 14880372       786
```

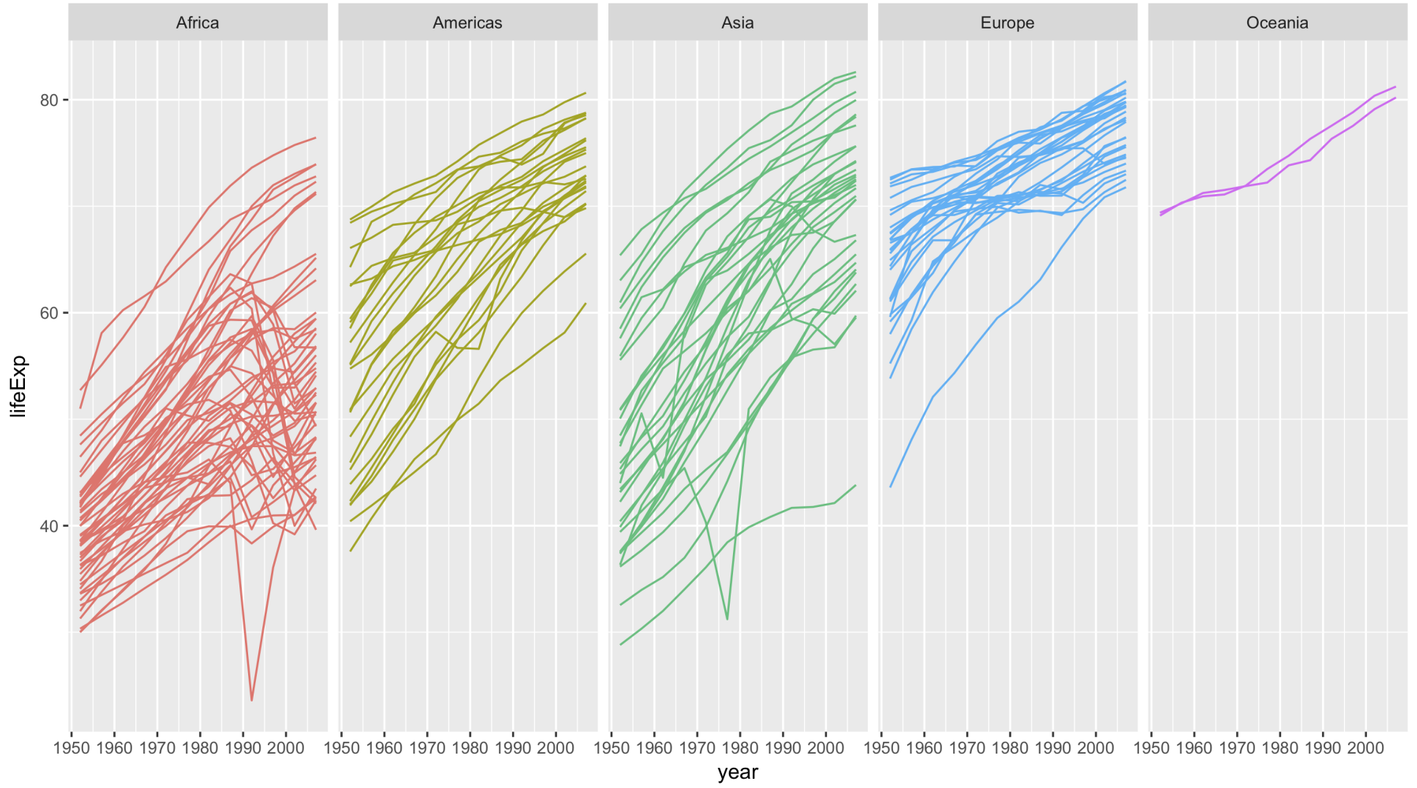
Life Expectancy Over Time Per Country

```
ggplot(gapminder, aes(year, lifeExp, group = country)) +
  geom_line()
```



Faceting on Continent

```
ggplot(gapminder, aes(year, lifeExp, group = country, color = continent)) +
  geom_line() +
  facet_wrap(~ continent, nrow = 1) +
  guides(color = FALSE)
```



Faceting on Country

```
ggplot(gapminder, aes(year, lifeExp)) +
  geom_line() +
  facet_wrap(~ country + continent)
```

Faceting with TrelliscopeJS

It's as easy as swapping out `facet_wrap()` for `facet_trelliscope()`.

As with `facet_wrap()`, control rows and columns with `nrow` and `ncol`.

Additional options:

- Specifying the grid layout with `nrow` and `ncol`, similar to `facet_wrap()`.
- Giving the display a name (`name`) and description (`desc`).
- Specifying where the display should be placed with `path`.

VISUALIZING BIG DATA WITH TRELLISCOPE

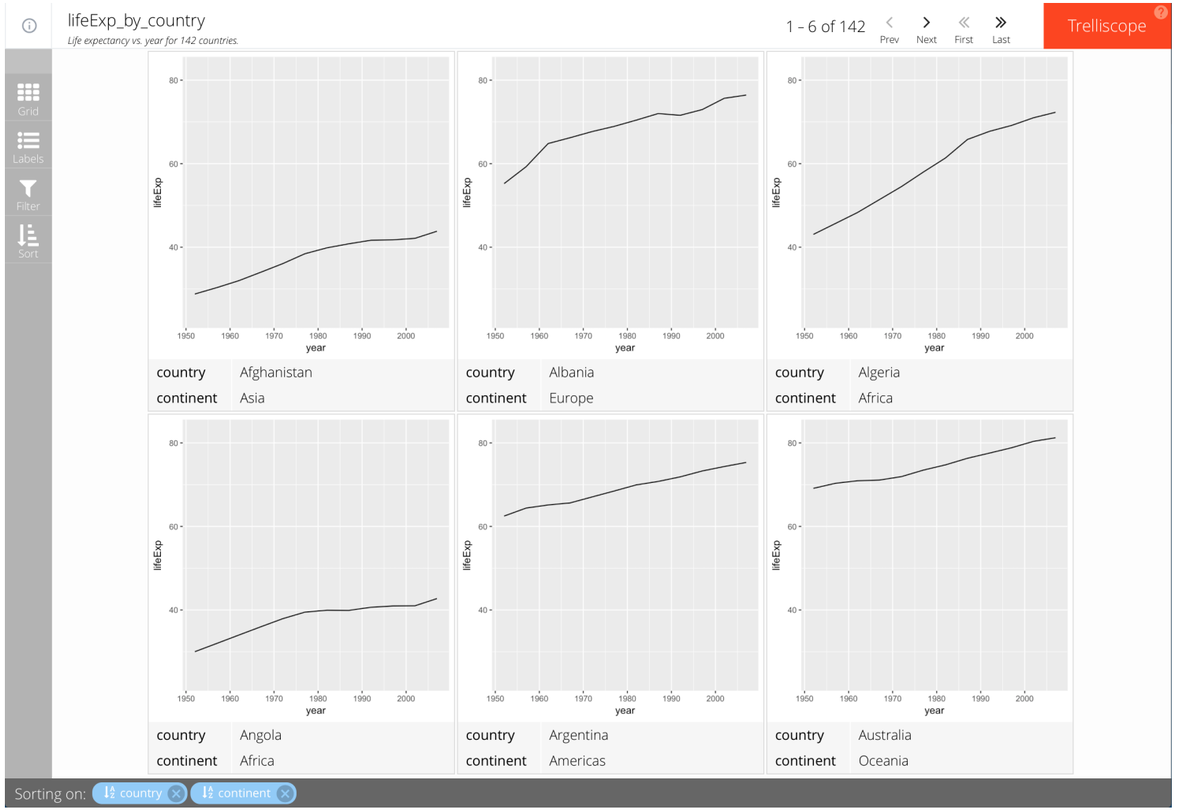
Let's practice!

VISUALIZING BIG DATA WITH TRELLISCOPE

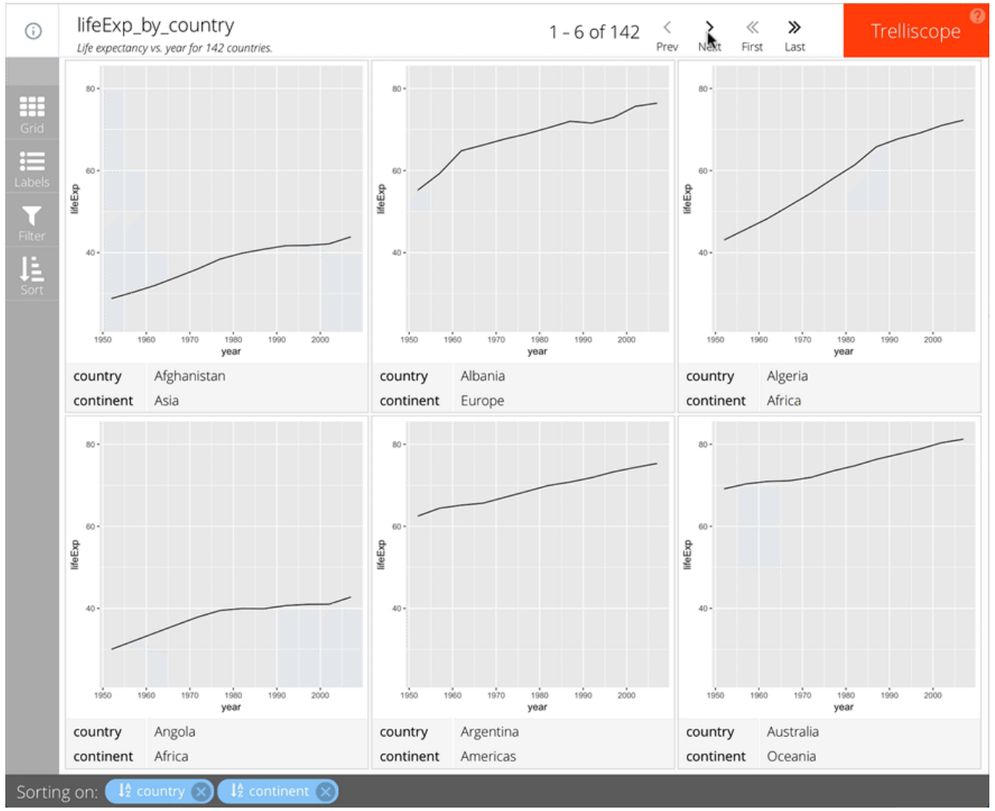
Interacting With TrelliscopeJS Displays

Ryan Hafen
Author, TrelliscopeJS

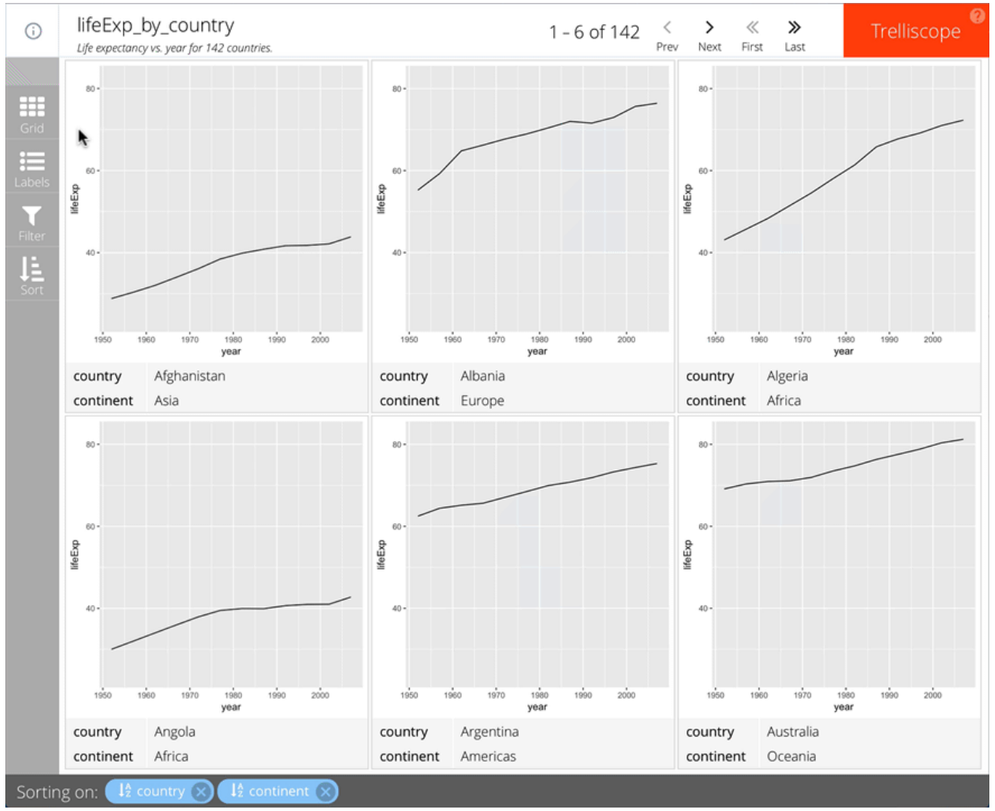
Scalable Faceting



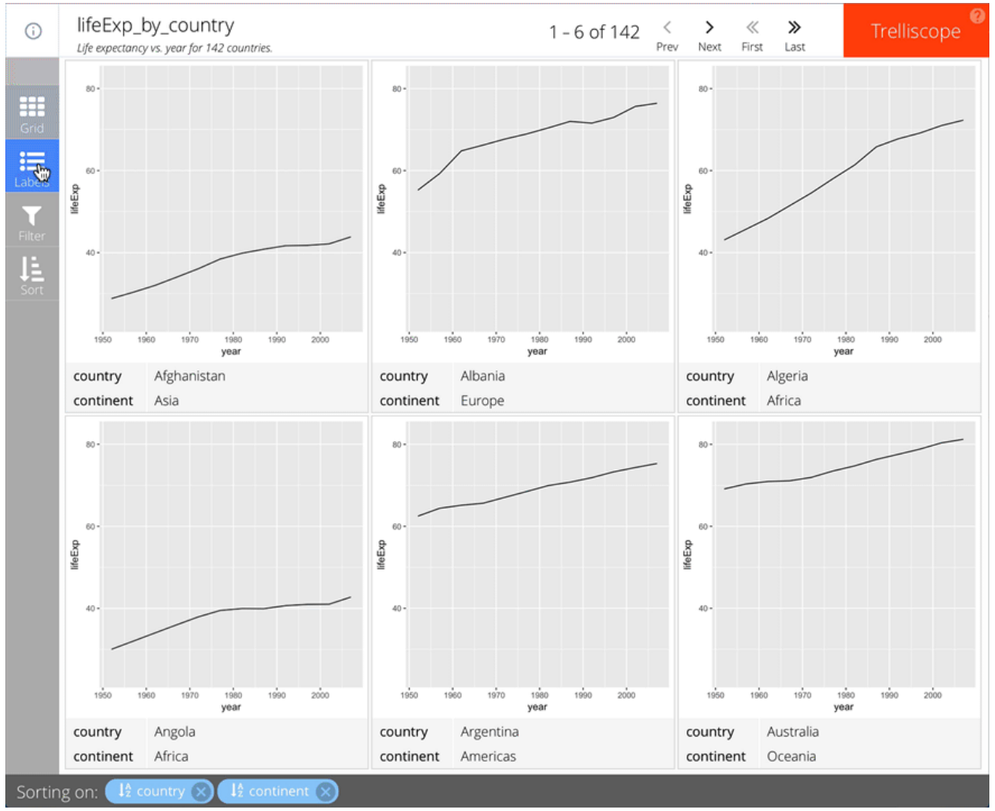
Paging


lifeExp_by_country
Life expectancy vs. year for 142 countries.
1 - 6 of 142
Prev
Next
First
Last
Trelliscope
Grid
Labels
Filter
Sort
lifeExp
year
country Afghanistan
continent Asia
country Albania
continent Europe
country Algeria
continent Africa
country Angola
continent Africa
country Argentina
continent Americas
country Australia
continent Oceania
Sorting on: country continent

Grid Layout


lifeExp_by_country
Life expectancy vs. year for 142 countries.
1 - 6 of 142
Prev
Next
First
Last
Trelliscope
Grid
Labels
Filter
Sort
lifeExp
year
country Afghanistan
continent Asia
country Albania
continent Europe
country Algeria
continent Africa
country Angola
continent Africa
country Argentina
continent Americas
country Australia
continent Oceania
Sorting on: country continent

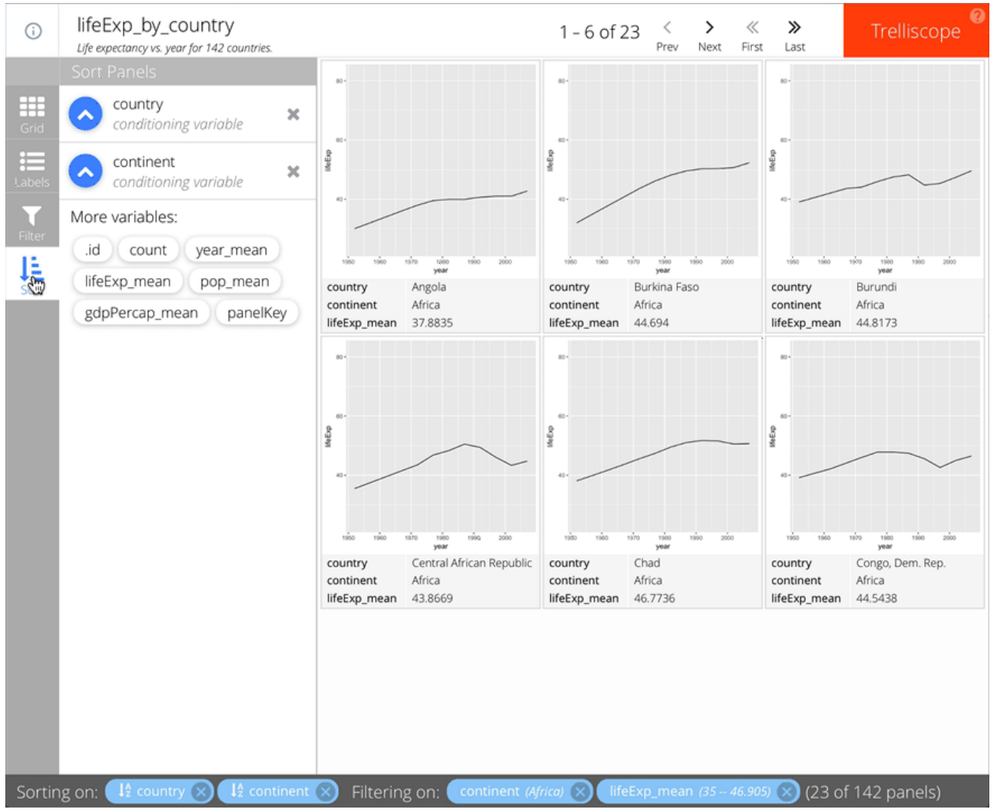
Labels


lifeExp_by_country
Life expectancy vs. year for 142 countries.
1 - 6 of 142
Prev
Next
First
Last
Trelliscope
Grid
Labels
Filter
Sort
lifeExp
year
country Afghanistan
continent Asia
country Albania
continent Europe
country Algeria
continent Africa
country Angola
continent Africa
country Argentina
continent Americas
country Australia
continent Oceania
Sorting on: country continent

Filtering


lifeExp_by_country
Life expectancy vs. year for 142 countries.
1 - 6 of 142
Prev
Next
First
Last
Trelliscope
Grid
Labels
Filter
Sort
lifeExp
year
country Afghanistan
continent Asia
lifeExp_mean 37.4788
country Albania
continent Europe
lifeExp_mean 68.4329
country Algeria
continent Africa
lifeExp_mean 59.0302
country Angola
continent Africa
lifeExp_mean 37.8835
country Argentina
continent Americas
lifeExp_mean 69.0604
country Australia
continent Oceania
lifeExp_mean 74.6629
Sorting on:
country
continent

Sorting


lifeExp_by_country
Life expectancy vs. year for 142 countries.
1 - 6 of 23
Prev
Next
First
Last
Trelliscope
Sort Panels
Grid
Labels
Filter
Sort
country
conditioning variable
continent
conditioning variable
More variables:
.id
count
year_mean
lifeExp_mean
pop_mean
gdpPercap_mean
panelKey
country Angola
continent Africa
lifeExp_mean 37.8835
country Burkina Faso
continent Africa
lifeExp_mean 44.694
country Burundi
continent Africa
lifeExp_mean 44.8173
country Central African Republic
continent Africa
lifeExp_mean 43.8669
country Chad
continent Africa
lifeExp_mean 46.7736
country Congo, Dem. Rep.
continent Africa
lifeExp_mean 44.5438
Sorting on:
country
continent
Filtering on:
continent (Africa)
lifeExp_mean (35 -- 46.905)
(23 of 142 panels)

VISUALIZING BIG DATA WITH TRELLISCOPE

Let's practice!

VISUALIZING BIG DATA WITH TRELLISCOPE

Additional TrelliscopeJS Features

Ryan Hafen
Author, TrelliscopeJS

ggplot Panel Interactivity using Plotly

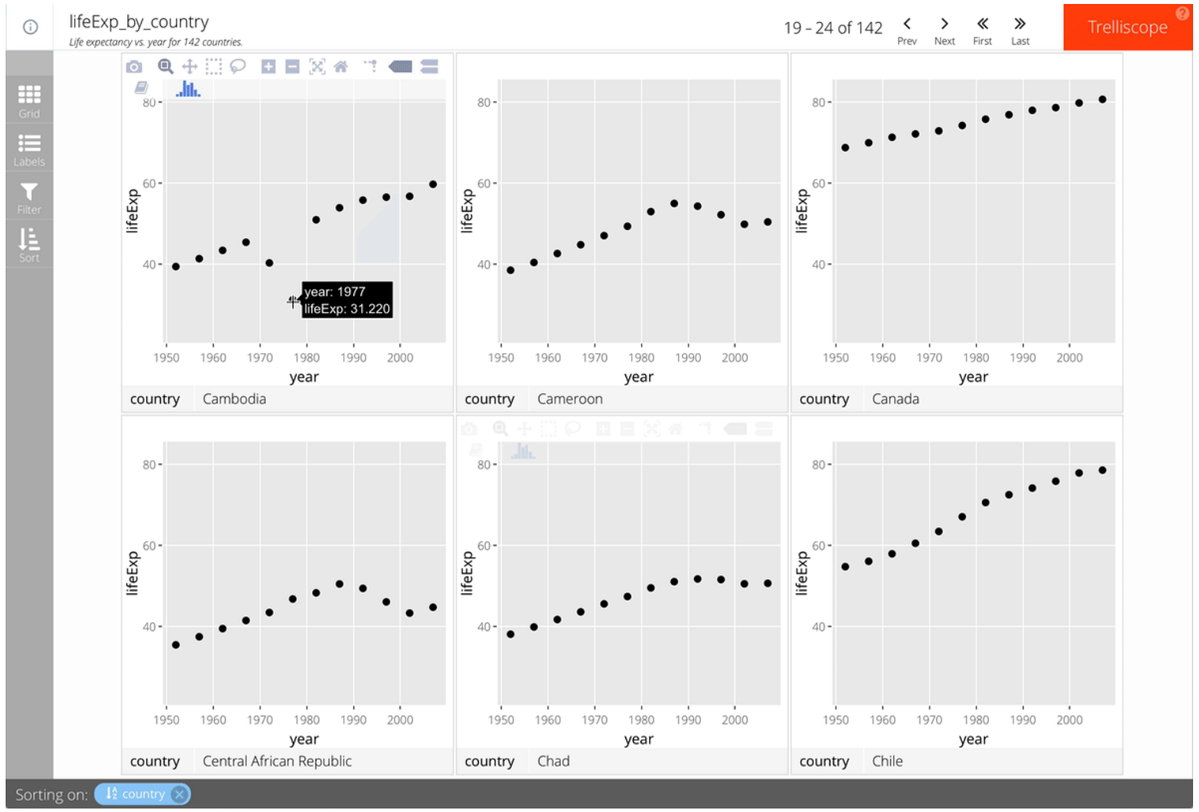
Simply add `as_plotly = TRUE` to `facet_trelliscope()`.

For example:

```
gap_life <- select(gapminder, year, lifeExp, country, continent)

ggplot(gap_life, aes(year, lifeExp)) +
  geom_point() +
  facet_trelliscope(~ country + continent,
    name = "lifeExp_by_country",
    desc = "Life expectancy vs. year for 142 countries.",
    nrow = 2, ncol = 3,
    as_plotly = TRUE)
```

ggplot Panel Interactivity using Plotly



Context-Based Automatic Cognostics

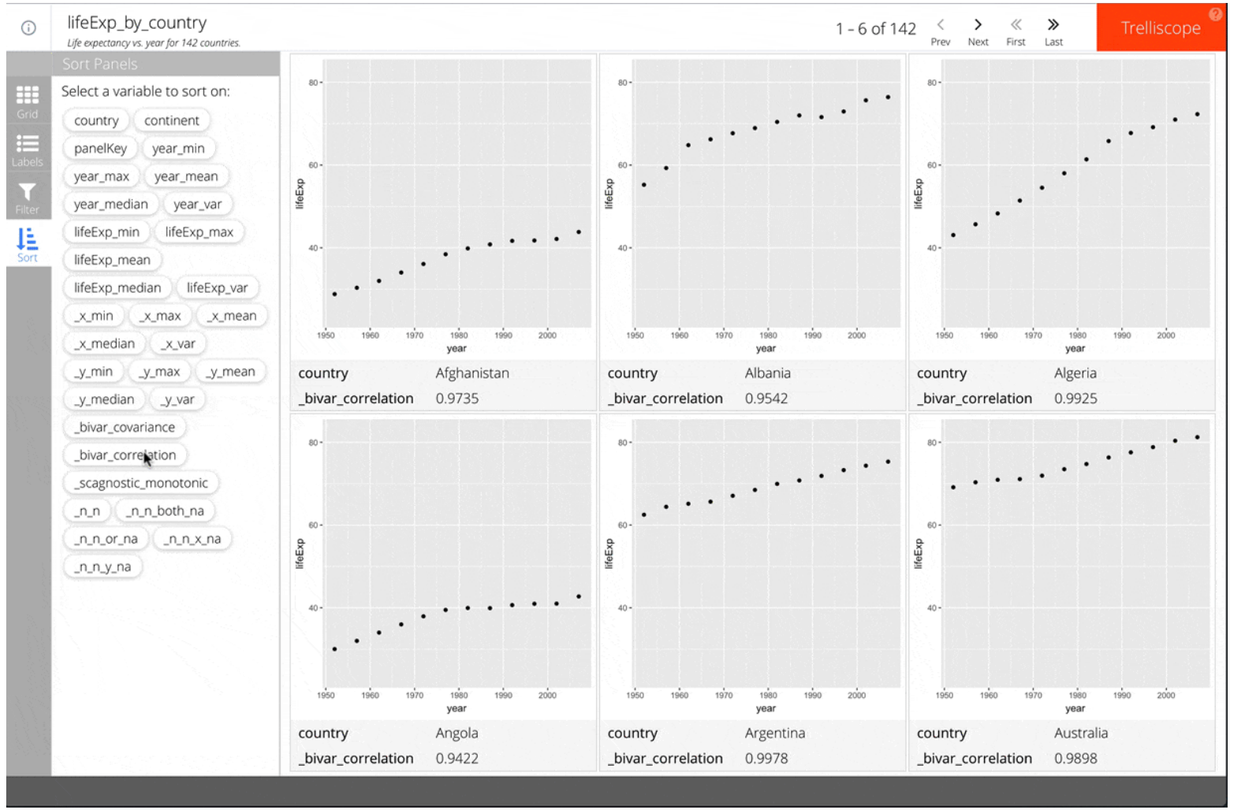
Simply add `auto_cog = TRUE` to `facet_trelliscope()`.

For example:

```
ggplot(gap_life, aes(year, lifeExp)) +
  geom_point() +
  facet_trelliscope(~ country + continent,
    name = "lifeExp_by_country",
    desc = "Life expectancy vs. year for 142 countries.",
    nrow = 2, ncol = 3,
    auto_cog = TRUE)
```

See the help for `autocogs::autocog` for more information about available automatic cognostics.

Context-Based Automatic Cognostics



Axis Limits

Axis limit ranges can be controlled with the `scales` argument.

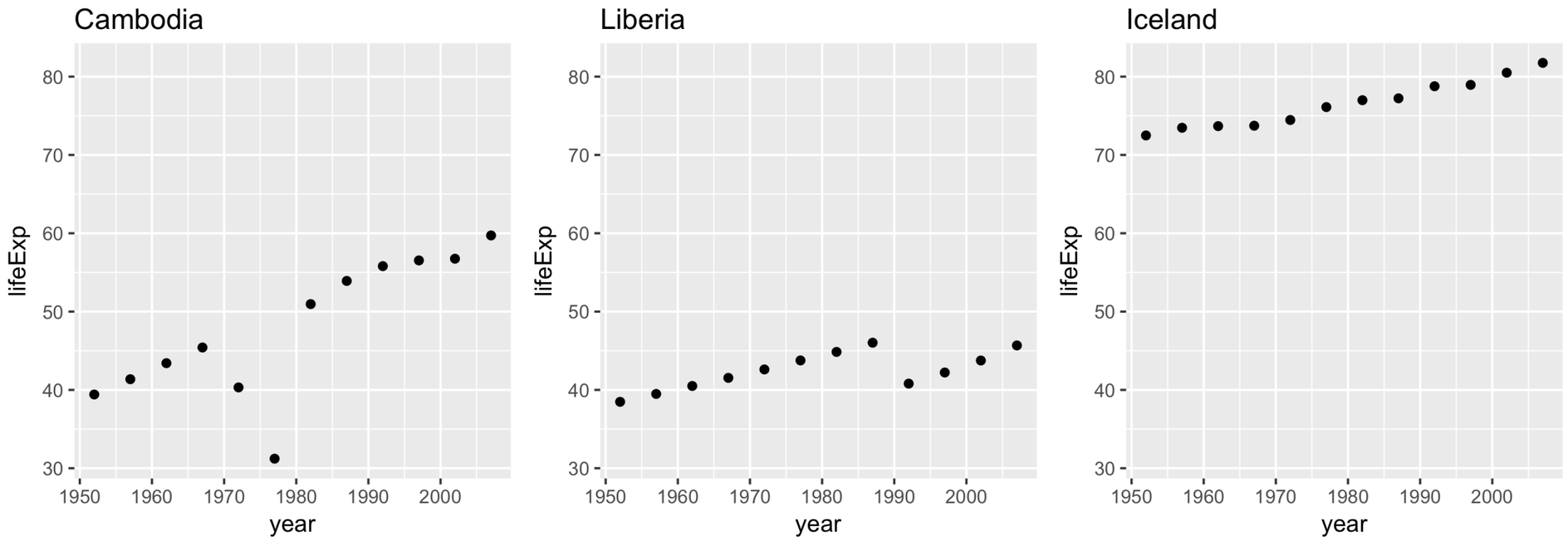
Three options:

- `"same"` (default)
- `"sliced"`
- `"free"`

scales = "same"

Each panel's limits are the same.

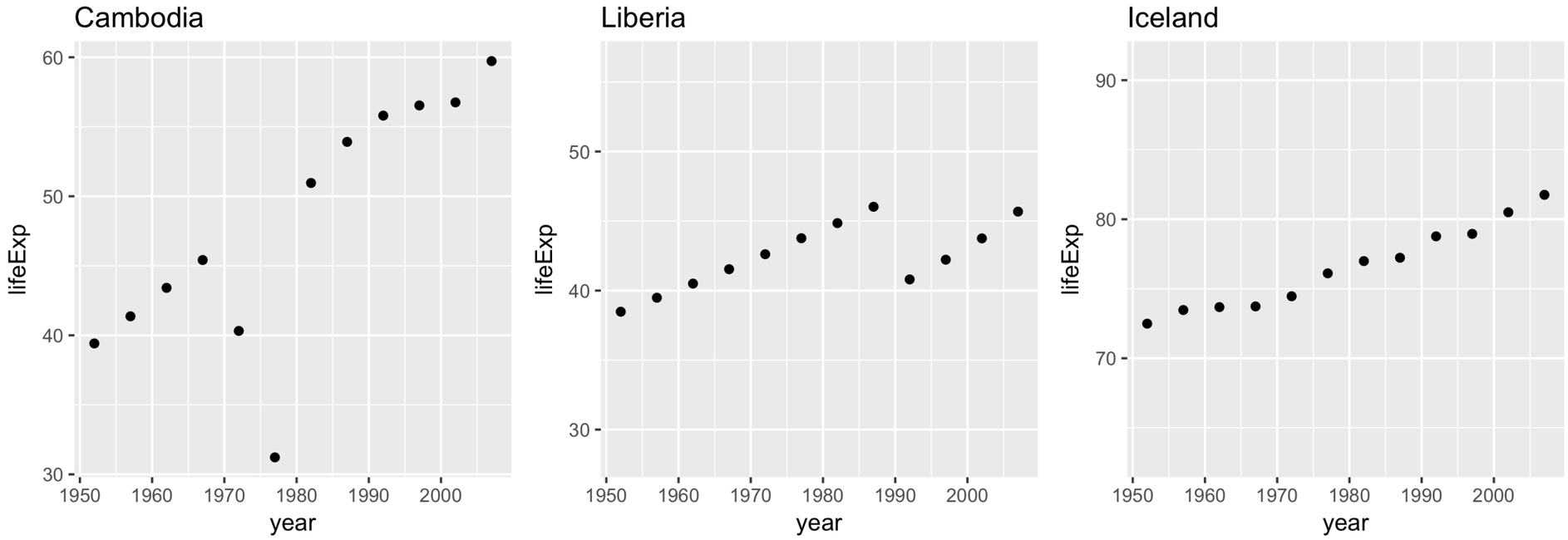
Enables "apples to apples" comparisons across panels.



scales = "sliced"

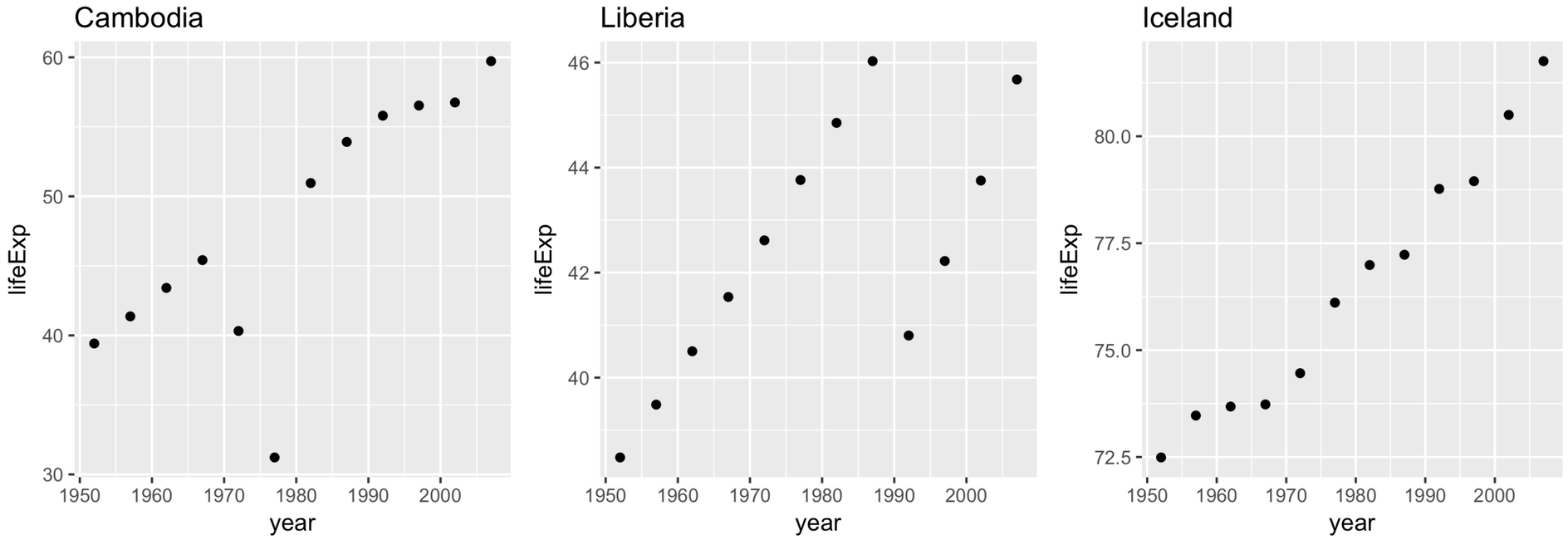
Each panel's limits span the same range but don't necessarily start in the same place.

Useful for making comparisons of differences of scale.



scales = "free"

Each panel's limits are based on the bounds of its own data.



VISUALIZING BIG DATA WITH TRELLISCOPE

Let's practice!

VISUALIZING BIG DATA WITH TRELLISCOPE

Adding Your Own Cognostics

Ryan Hafen
Author, TrelliscopeJS

New Variables as Cognostics

All variables in the data passed in to `ggplot()` are inspected for use as cognostics.

- If the variable is numeric and varies within each panel group, a set of summary statistics is computed for each panel.
- If the variable is constant within each panel group, a single cognostic with that value is computed for each panel.

Latest Life Expectancy as a Cognostic

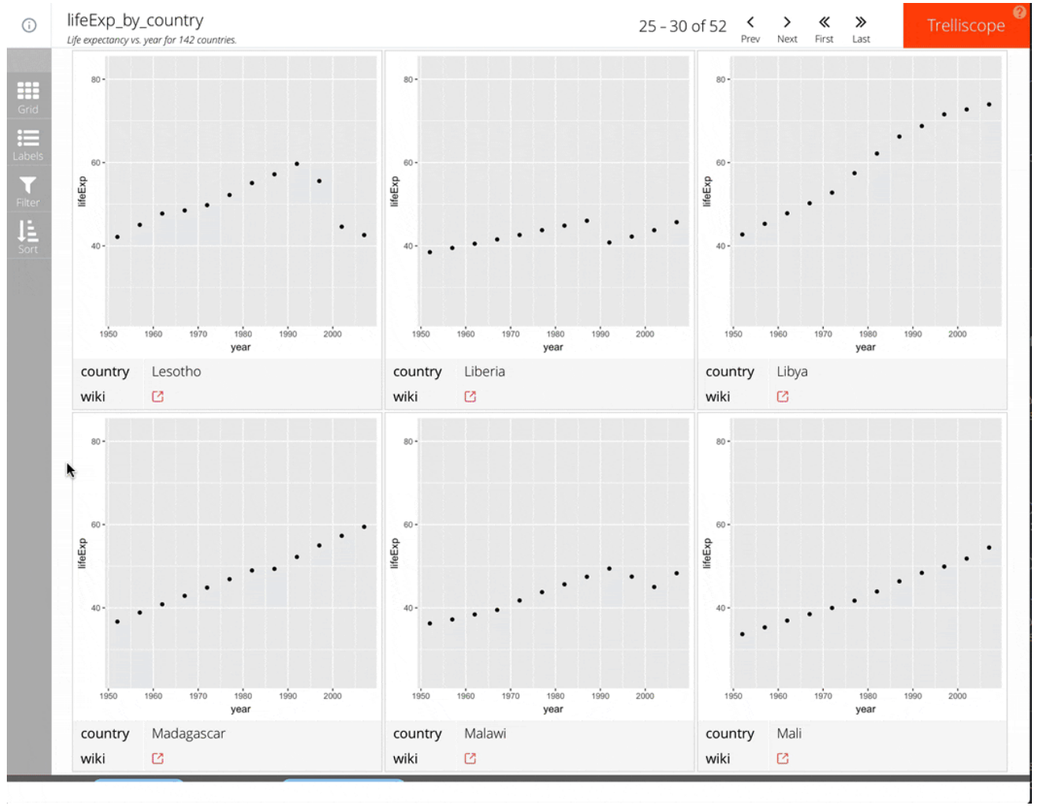
```
gap <- gapminder %>%
  group_by(country) %>%
  mutate(latestLifeExp = tail(lifeExp, 1))
```

```
gap
```

```
# A tibble: 1,704 x 7
# Groups:   country [142]
   country     continent  year lifeExp      pop gdpPercap latestLifeExp
   <fct>       <fct>     <int>   <dbl>    <int>     <dbl>          <dbl>
 1 Afghanistan Asia       1952    28.8  8425333       779           43.8
 2 Afghanistan Asia       1957    30.3  9240934       821           43.8
 3 Afghanistan Asia       1962    32.0 10267083       853           43.8
 4 Afghanistan Asia       1967    34.0 11537966       836           43.8
 5 Afghanistan Asia       1972    36.1 13079460       740           43.8
 6 Afghanistan Asia       1977    38.4 14880372       786           43.8
 7 Afghanistan Asia       1982    39.9 12881816       978           43.8
 8 Afghanistan Asia       1987    40.8 13867957       852           43.8
 9 Afghanistan Asia       1992    41.7 16317921       649           43.8
10 Afghanistan Asia       1997    41.8 22227415       635           43.8
# ... with 1,694 more rows
```

Hyperlinks as Cognostics

```
gap <- gapminder %>%
  group_by(country, continent) %>%
  mutate(wiki = paste0("https://en.wikipedia.org/wiki/", country))
```



Customizing Custom Cognostics

A function `cog()` can be wrapped around a variable to fine-tune how a cognostic is handled in Trelliscope.

With `cog()`, some of the most useful things you can specify include:

- `desc`: a meaningful description for the cognostic
- `default_label`: a boolean specifying whether the cognostic should be shown as a label by default or not

```
gap$wiki <- cog_href(gap$wiki,
                     desc = "Link to wikipedia",
                     default_label = TRUE)
```

VISUALIZING BIG DATA WITH TRELLISCOPE

Let's practice!