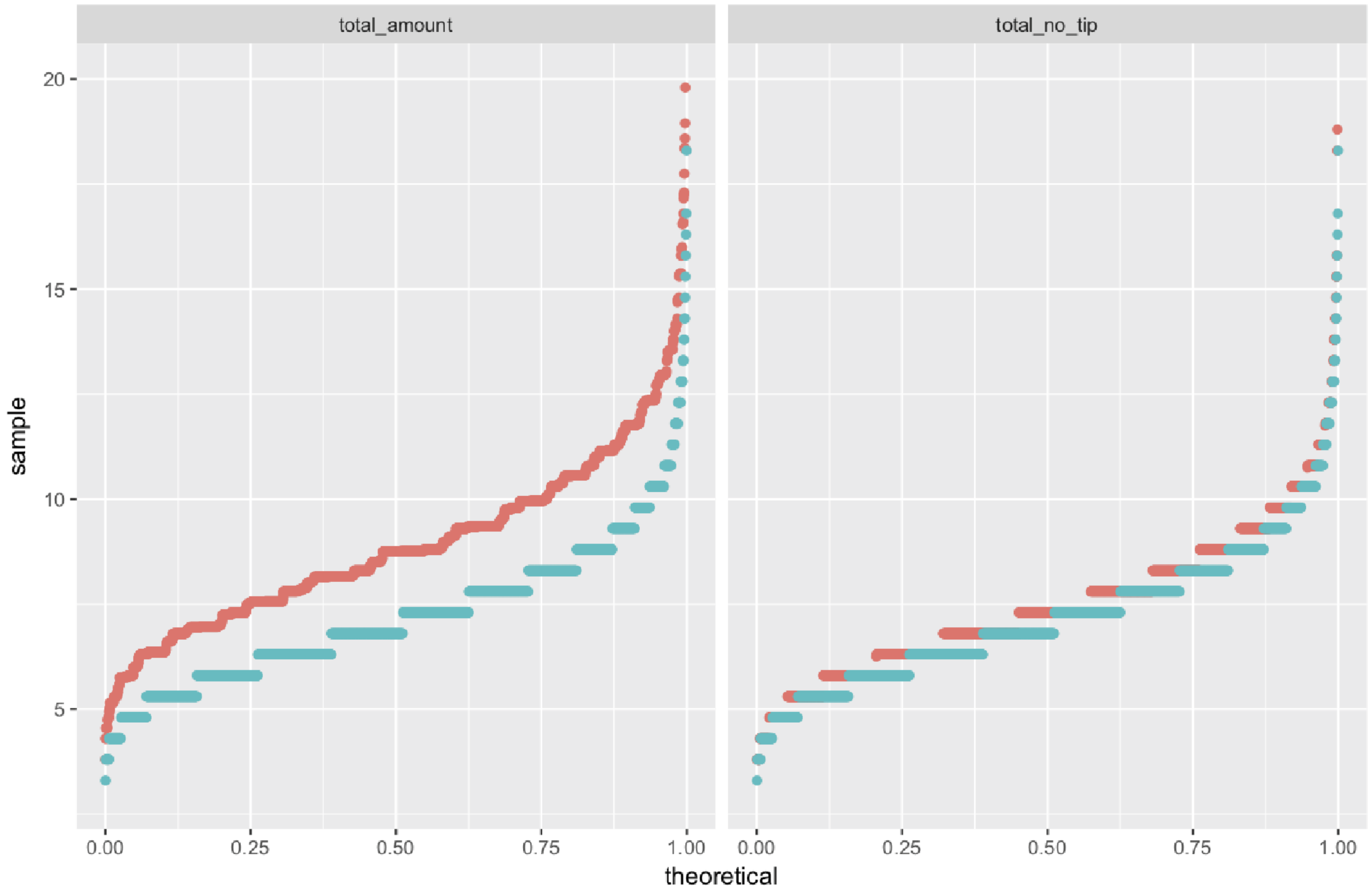
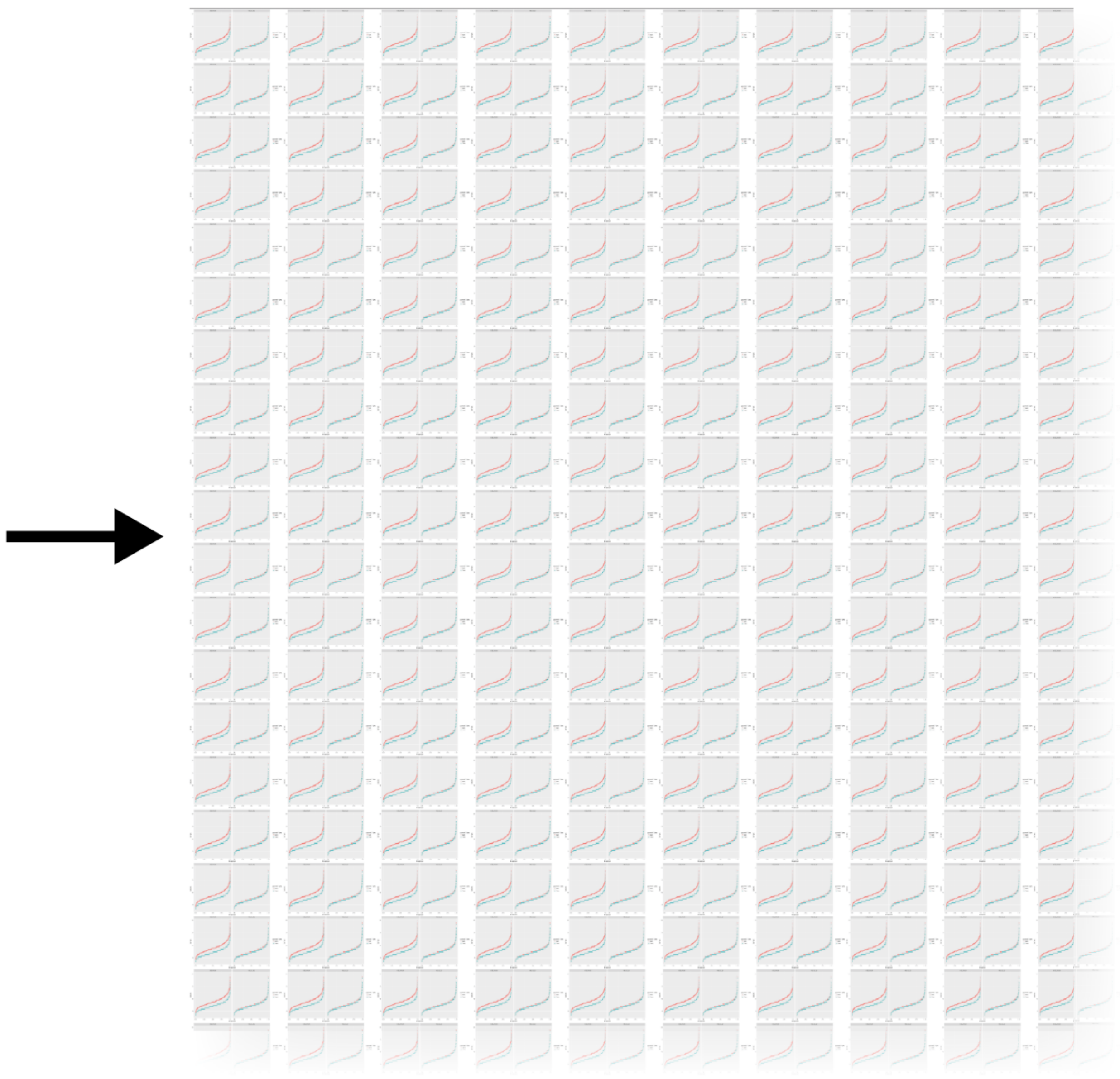
Faceting with TrelliscopeJS

VISUALIZING BIG DATA WITH TRELLISCOPE IN R

Ryan Hafen
Author, TrelliscopeJS

Faceting with TrelliscopeJS





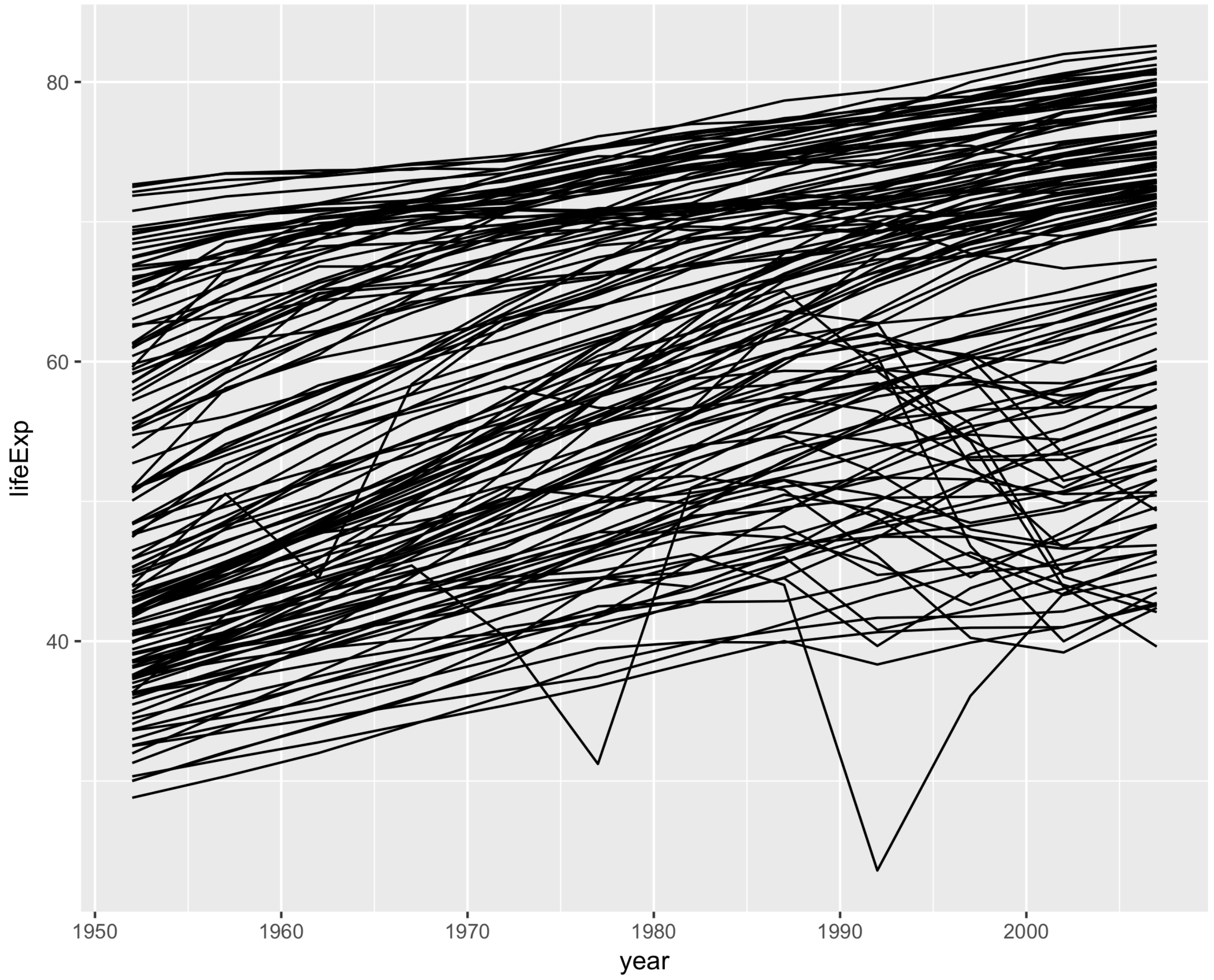
The Gapminder data

```
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
```

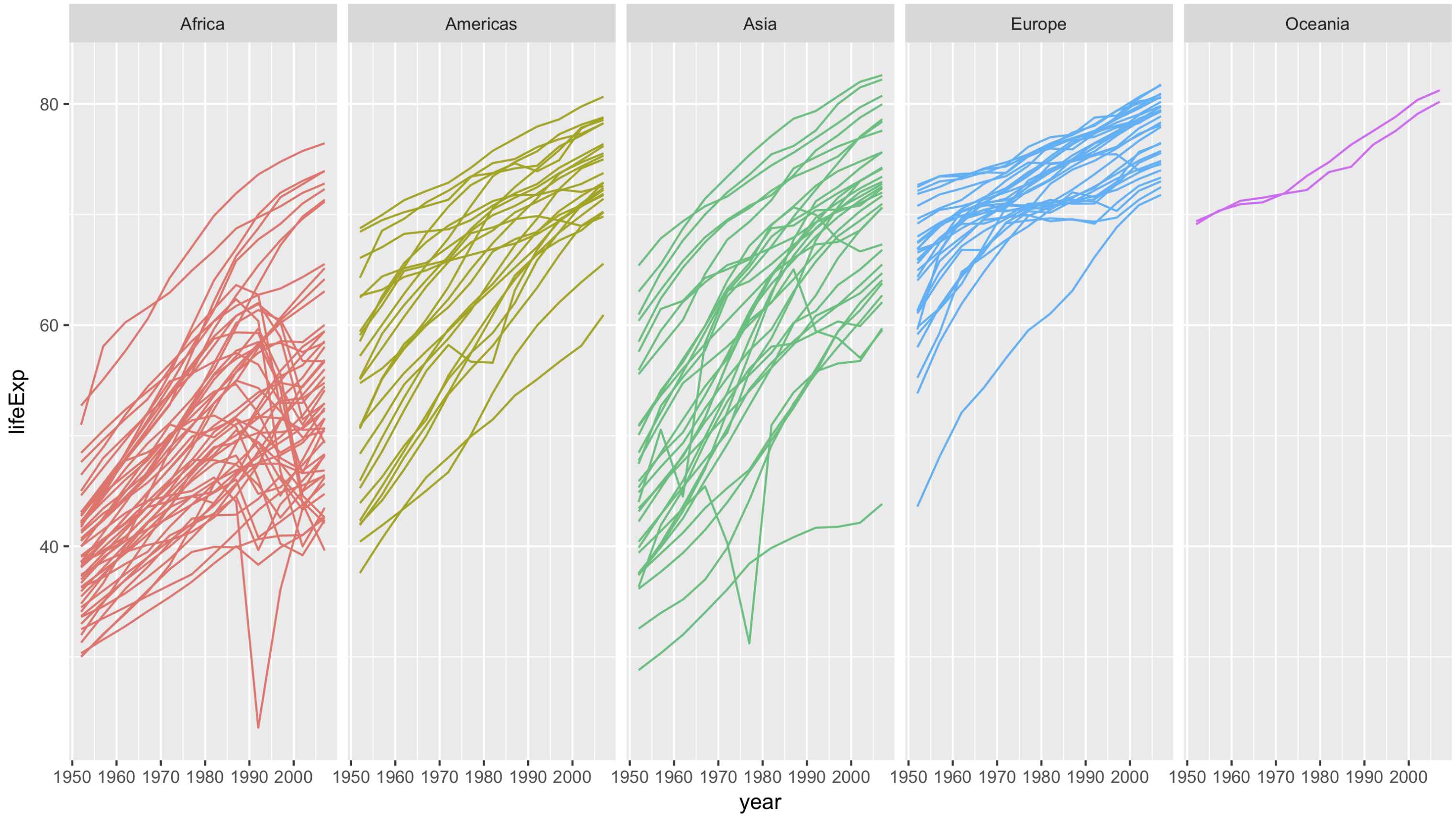
Life expectancy over time per country

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



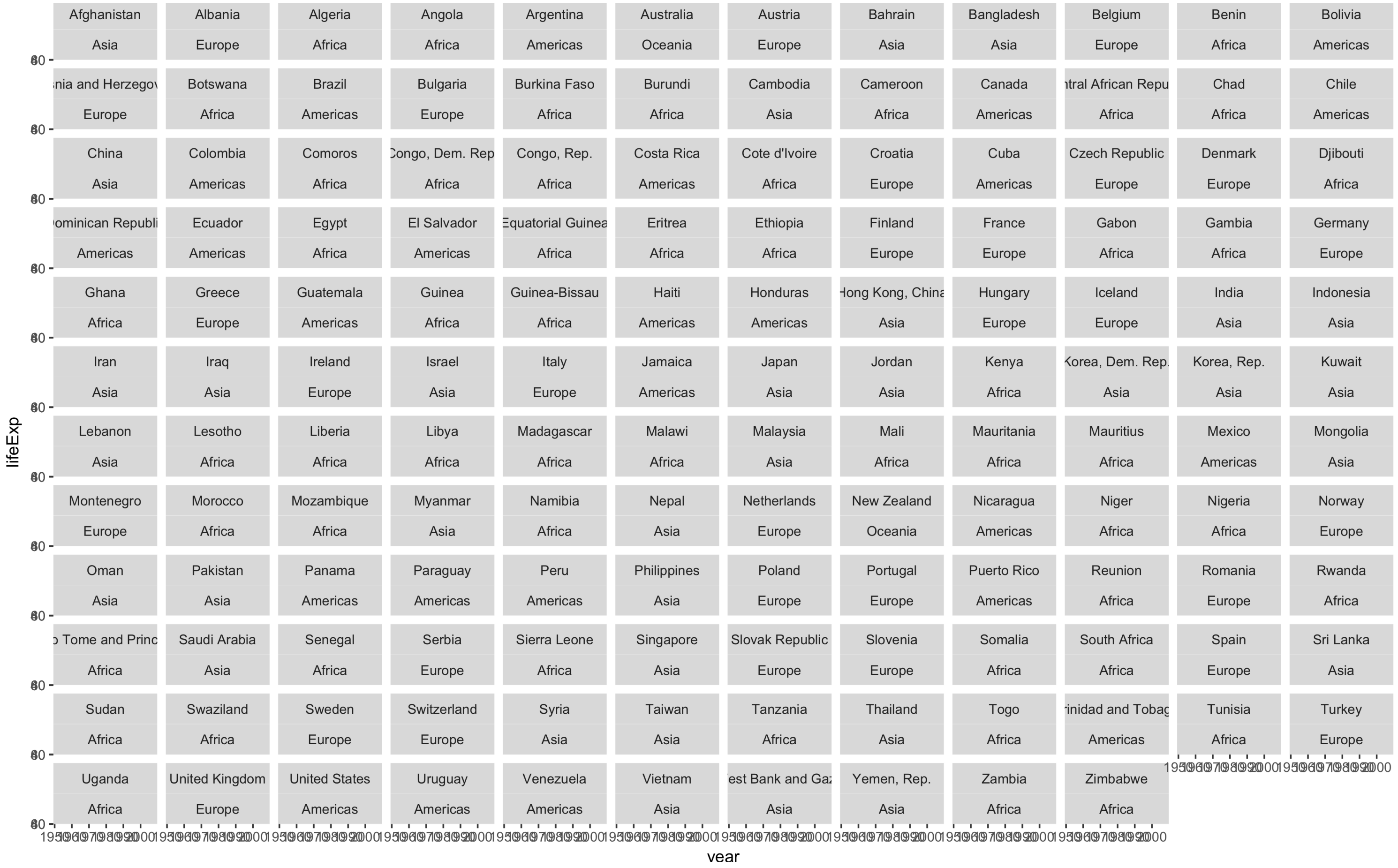
Faceting on continent

```
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` .

Let's practice!

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Interacting with the TrelliscopeJS displays

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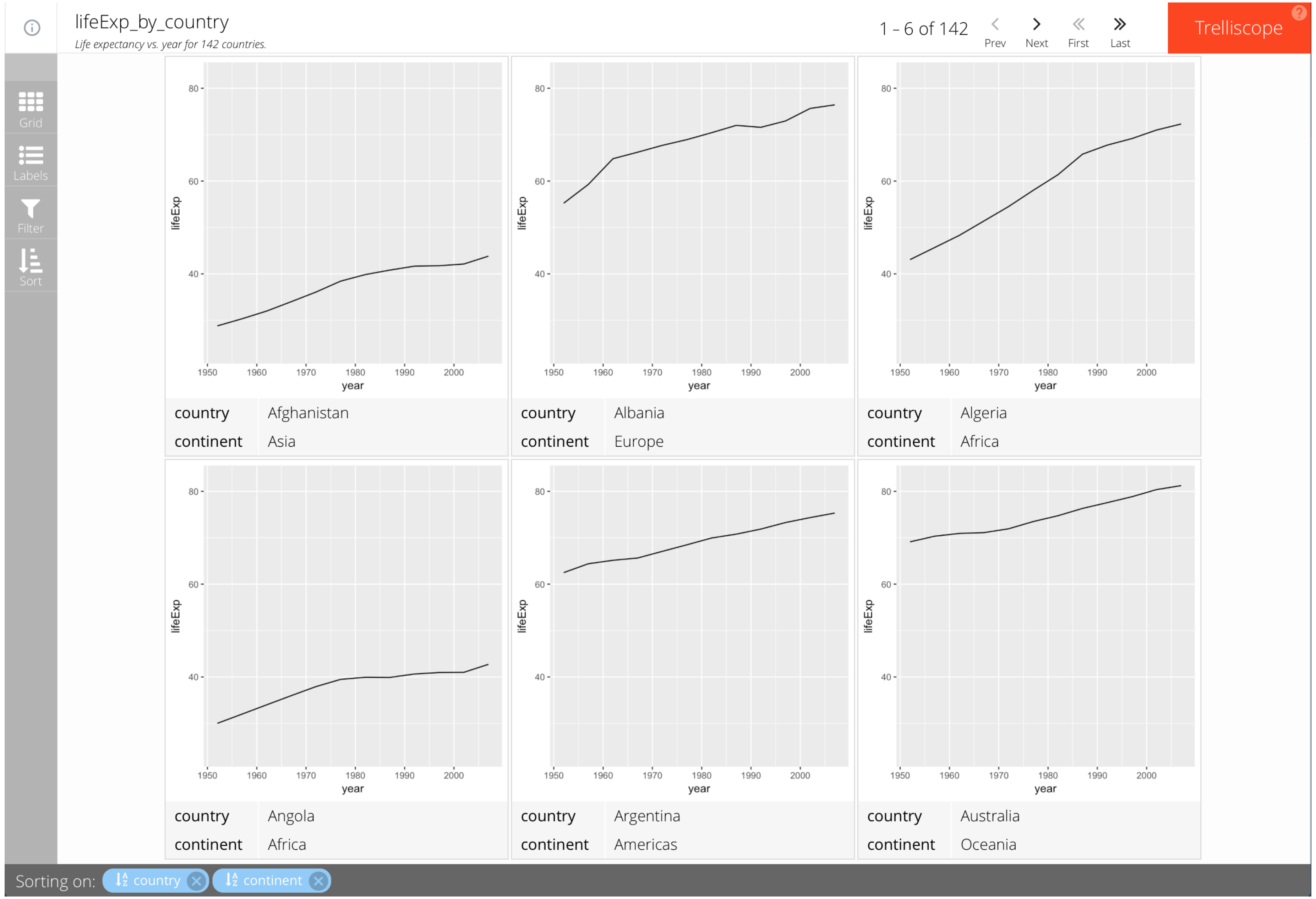
datacamp

Scalable faceting



lifeExp_by_country

Life expectancy vs. year for 142 countries.

1 - 6 of 142

country Afghanistan
continent Asia

country Albania
continent Europe

country Algeria
continent Africa

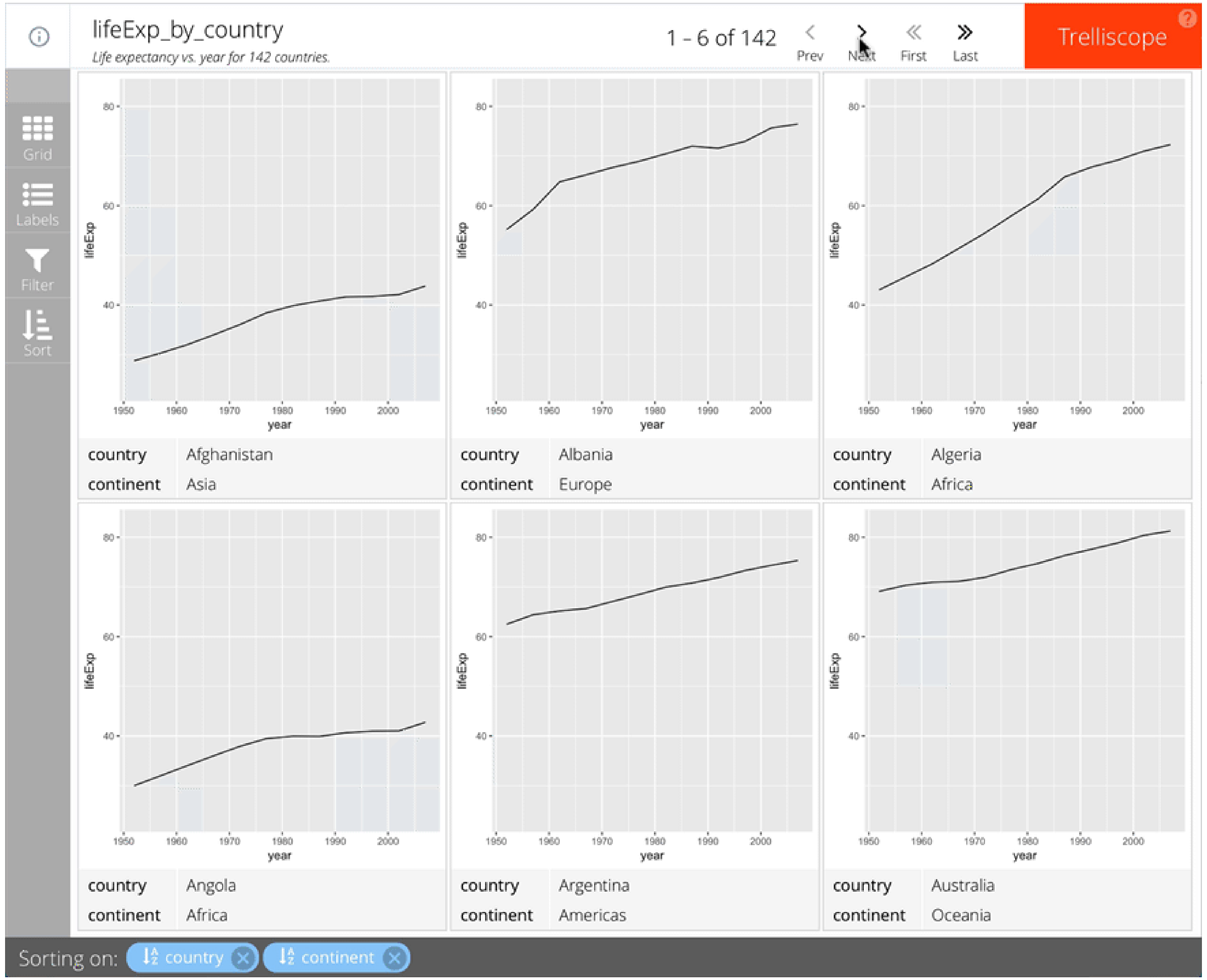
country Angola
continent Africa

country Argentina
continent Americas

country Australia
continent Oceania

Sorting on: country continent

Paging



lifeExp_by_country

Life expectancy vs. year for 142 countries.

1 - 6 of 142

country	Afghanistan
continent	Asia

country	Albania
continent	Europe

country	Algeria
continent	Africa

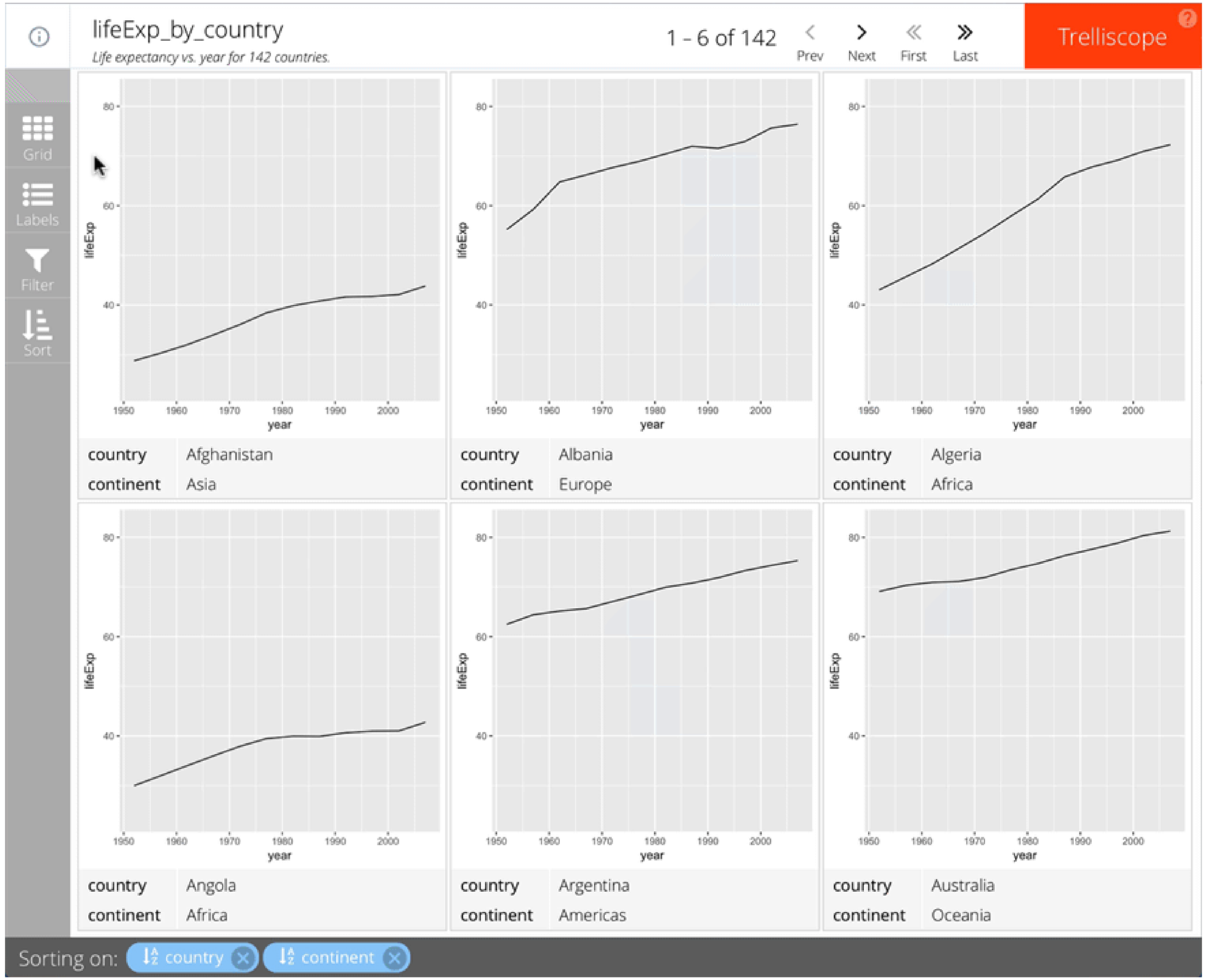
country	Angola
continent	Africa

country	Argentina
continent	Americas

country	Australia
continent	Oceania

Sorting on: country ⊗ continent ⊗

Grid layout



lifeExp_by_country

Life expectancy vs. year for 142 countries.

country	Afghanistan
continent	Asia

country	Albania
continent	Europe

country	Algeria
continent	Africa

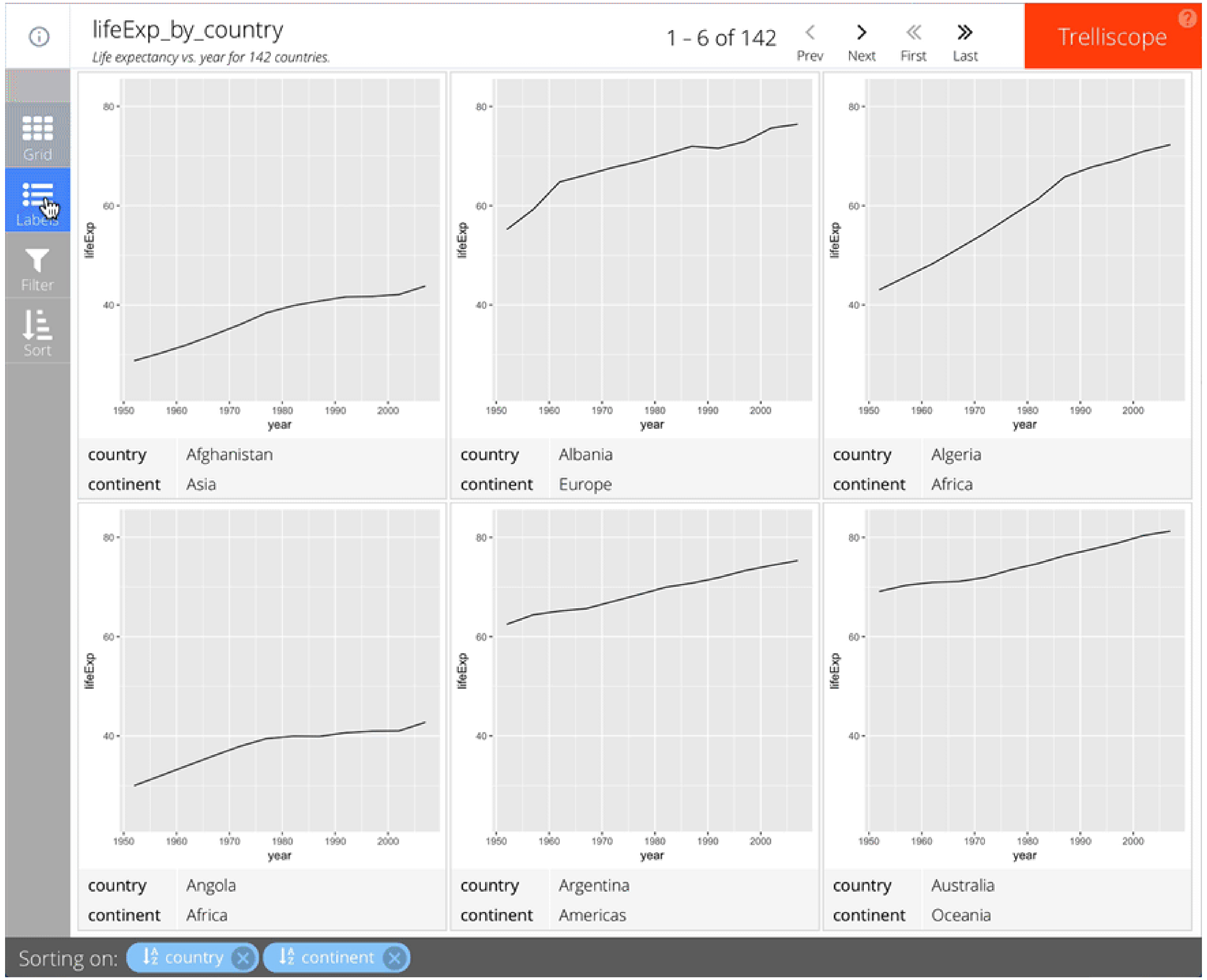
country	Angola
continent	Africa

country	Argentina
continent	Americas

country	Australia
continent	Oceania

Sorting on: country continent

Labels


lifeExp_by_country

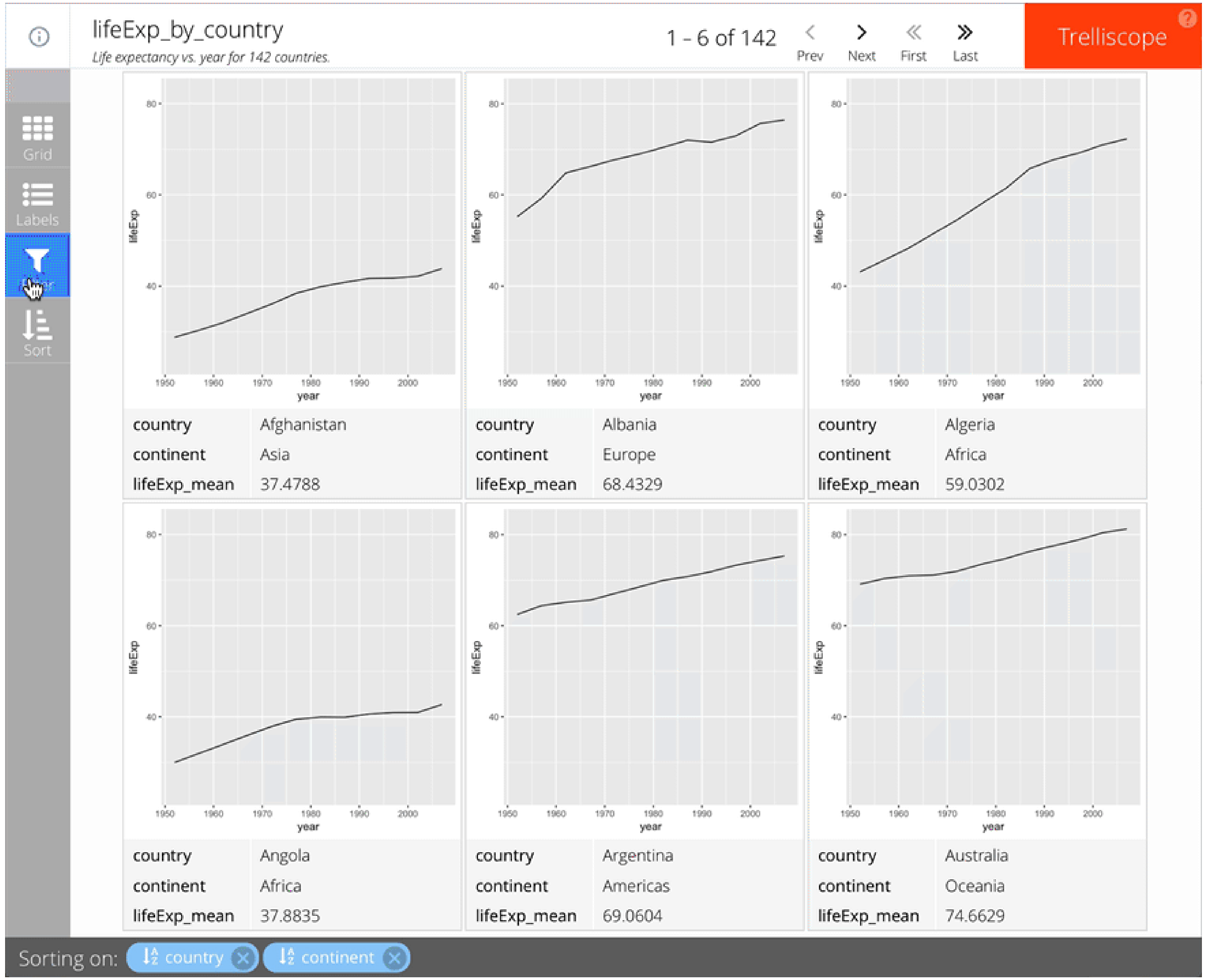
Life expectancy vs. year for 142 countries.

1 - 6 of 142

country	Afghanistan	country	Albania	country	Algeria
continent	Asia	continent	Europe	continent	Africa
country	Angola	country	Argentina	country	Australia
continent	Africa	continent	Americas	continent	Oceania

Sorting on: country continent

Filtering



lifeExp_by_country

Life expectancy vs. year for 142 countries.

1 - 6 of 142

country	Afghanistan
continent	Asia
lifeExp_mean	37.4788

country	Albania
continent	Europe
lifeExp_mean	68.4329

country	Algeria
continent	Africa
lifeExp_mean	59.0302

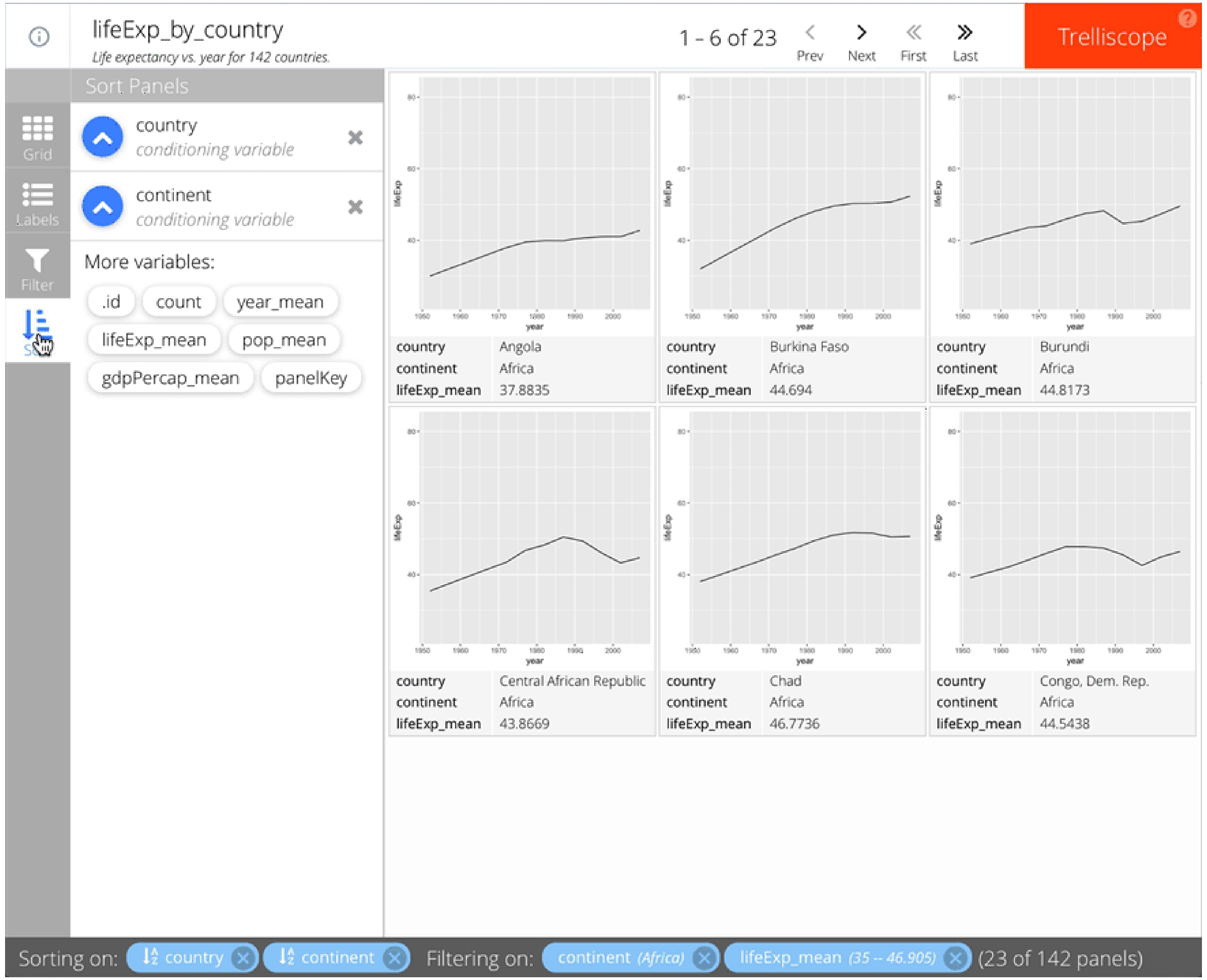
country	Angola
continent	Africa
lifeExp_mean	37.8835

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

Sort Panels

- 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)

Let's practice!

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Additional TrelliscopeJS features

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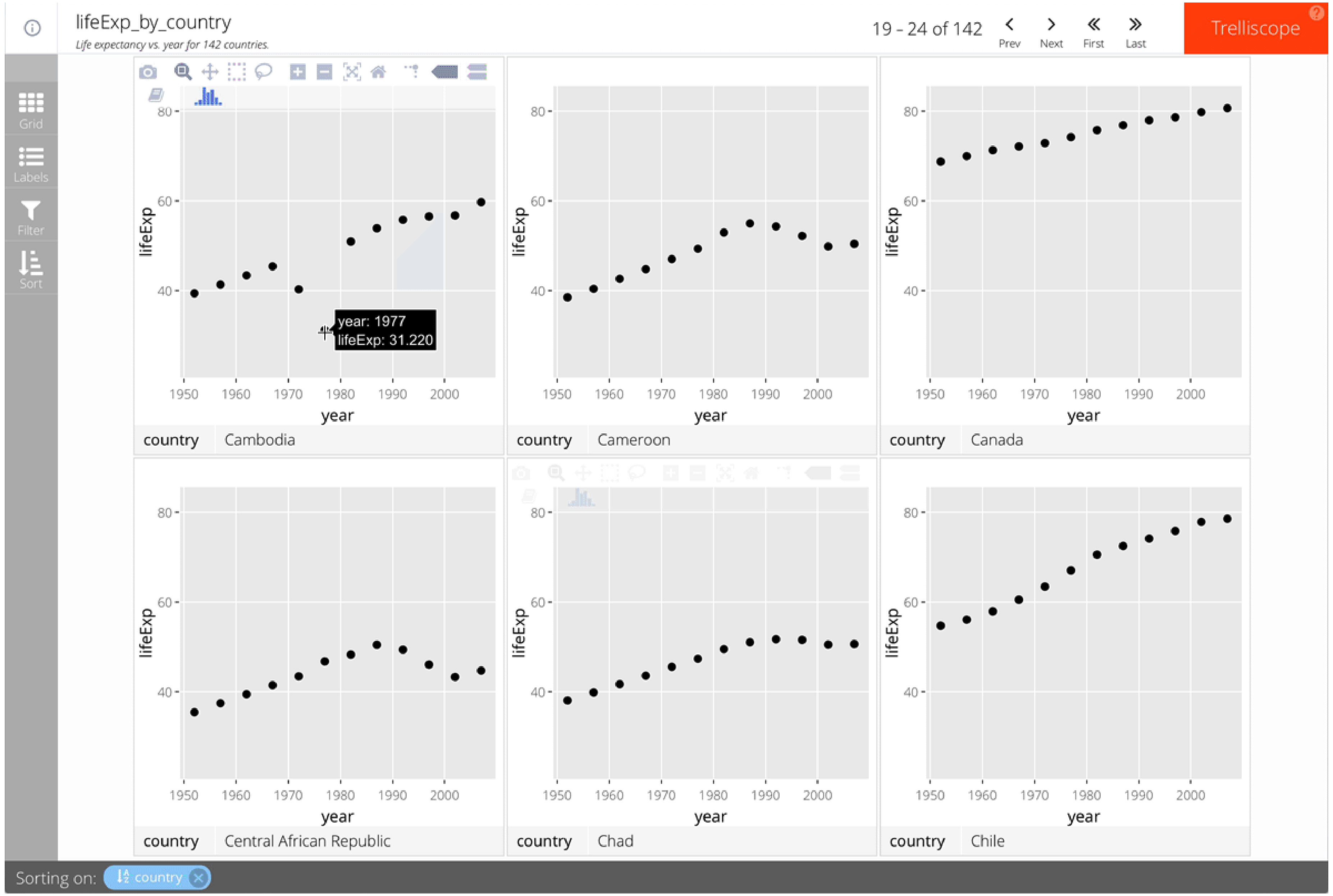
ggplot panel interactivity using Plotly

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

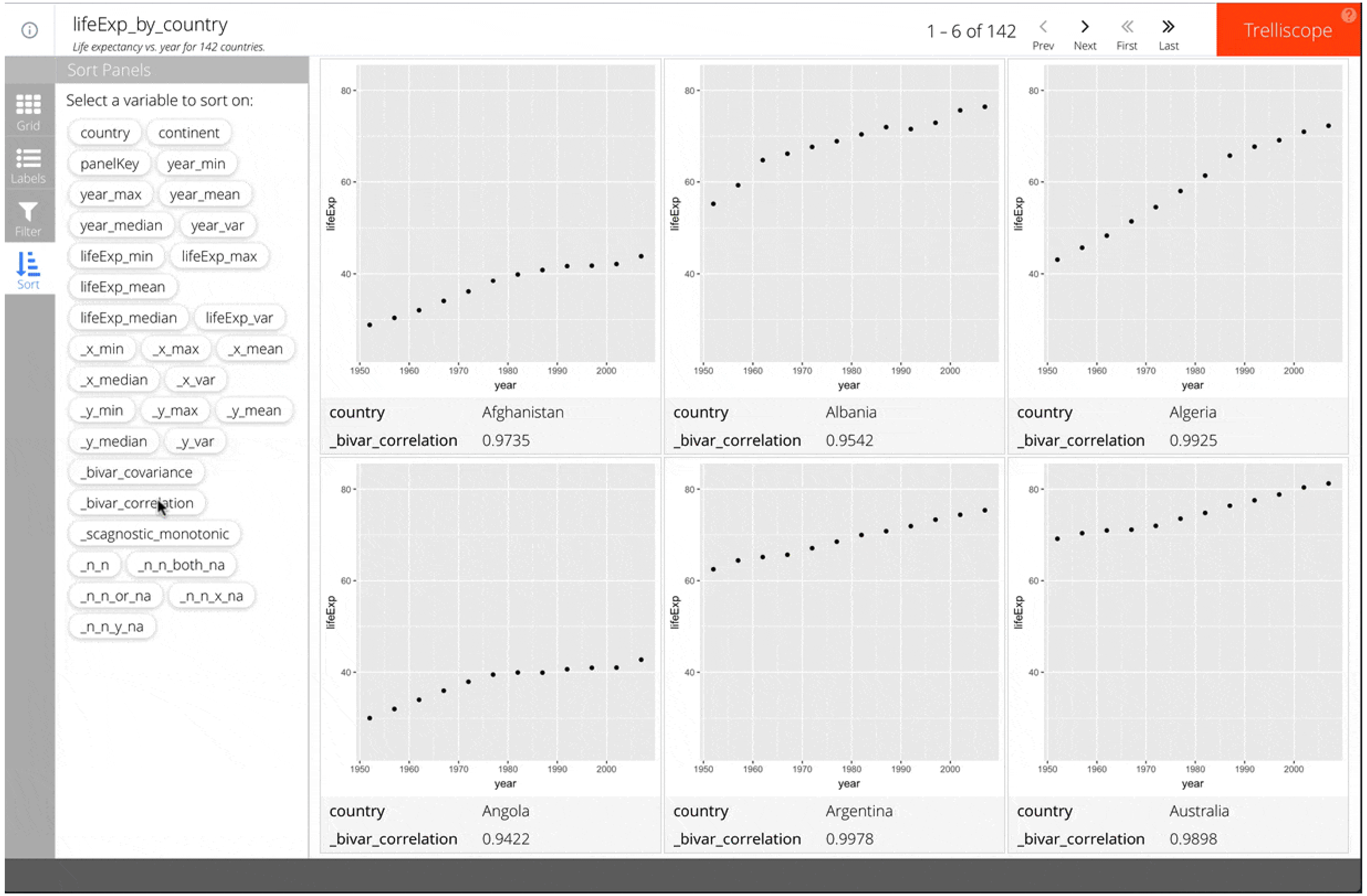
Simply add `auto_cog = TRUE` to `facet_trelliscope()`.

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



lifeExp_by_country

Life expectancy vs. year for 142 countries.

1 - 6 of 142

Sort Panels

Select a variable to sort on:

country	Afghanistan
_bivar_correlation	0.9735

country	Albania
_bivar_correlation	0.9542

country	Algeria
_bivar_correlation	0.9925

country	Angola
_bivar_correlation	0.9422

country	Argentina
_bivar_correlation	0.9978

country	Australia
_bivar_correlation	0.9898

Axis limits

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

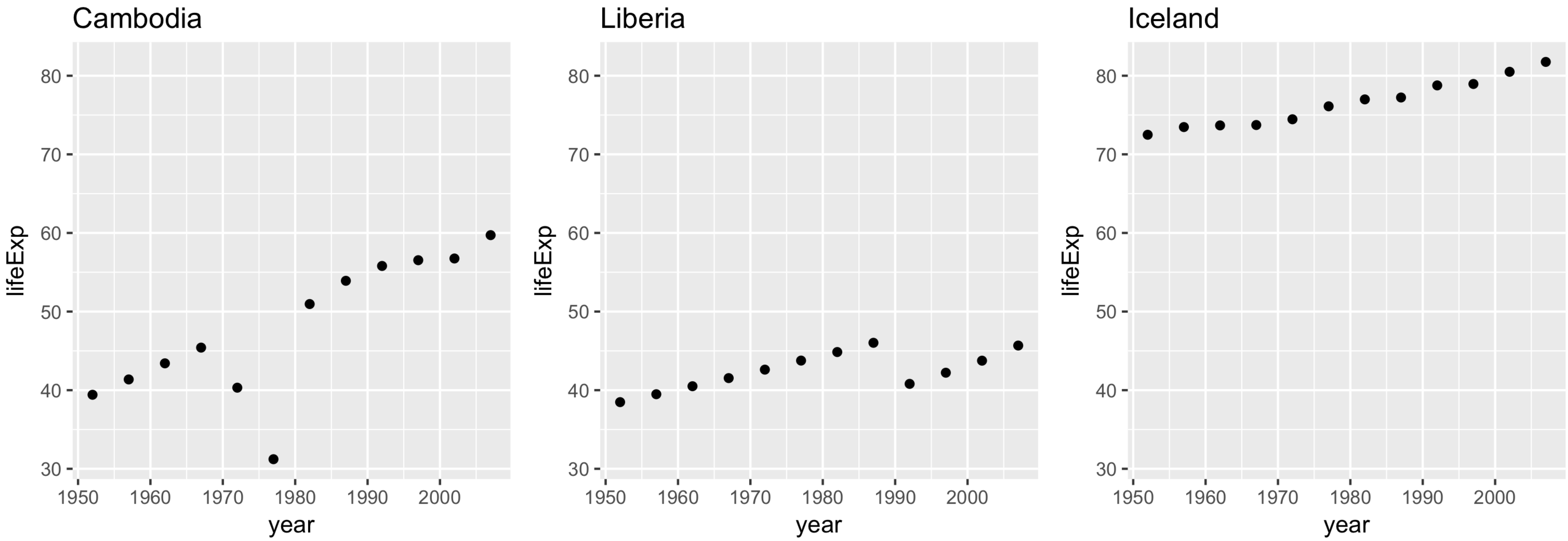
Three options:

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

scales = "same"

Each panel's limits are the same.

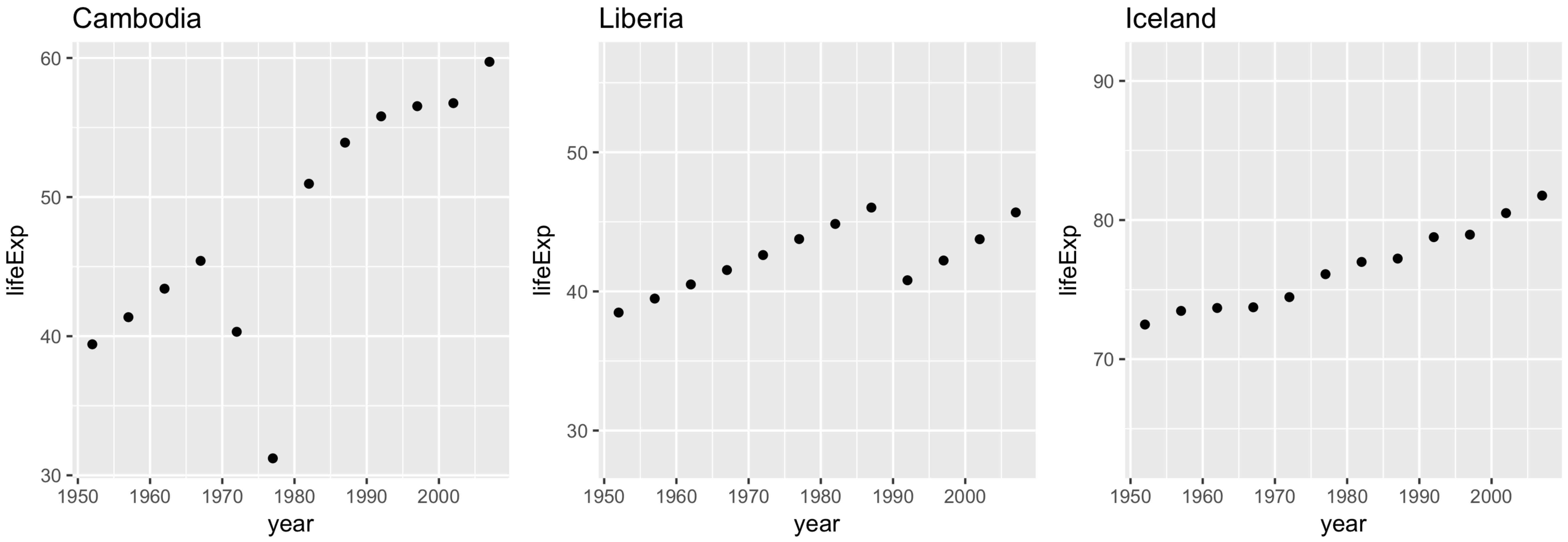
Enables "apples to apples" comparisons across panels.



scales = "sliced"

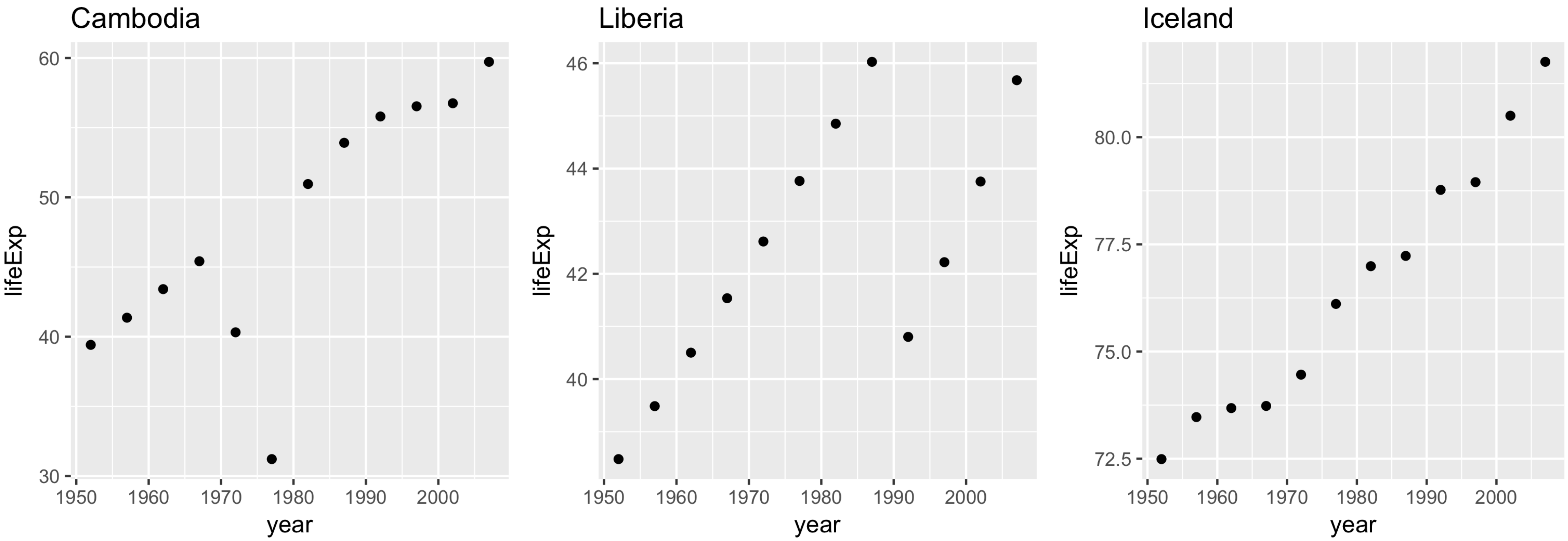
Each panel's limits span the same range but don't necessarily start in the same place.

Useful for making comparisons of differences of scale.



scales = "free"

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



Let's practice!

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Adding your own cognostics

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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.

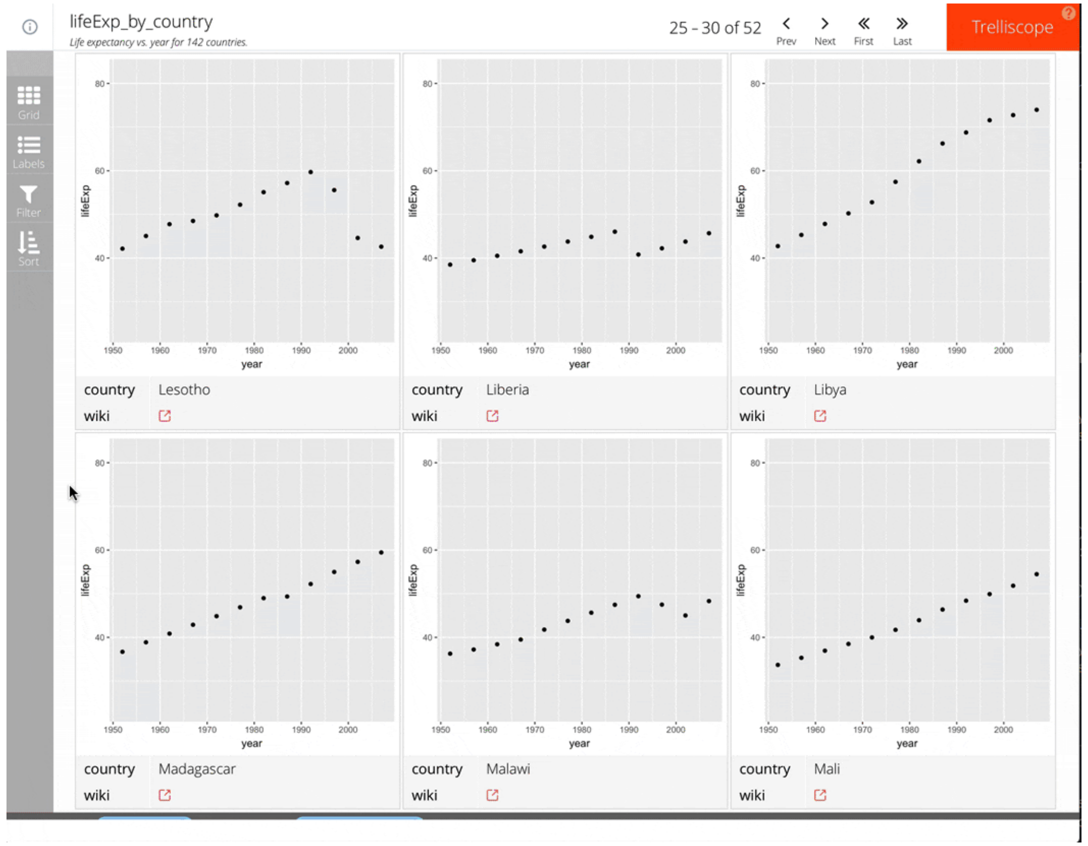
Latest life expectancy as a cognostic

```r
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
# ... with 1,698 more rows
```

Hyperlinks as cognostics

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



lifeExp_by_country

Life expectancy vs. year for 142 countries.

25 - 30 of 52

country Lesotho
wiki

country Liberia
wiki

country Libya
wiki

country Madagascar
wiki

country Malawi
wiki

country Mali
wiki

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)
```

Let's practice!

VISUALIZING BIG DATA WITH TRELLISCOPE IN R