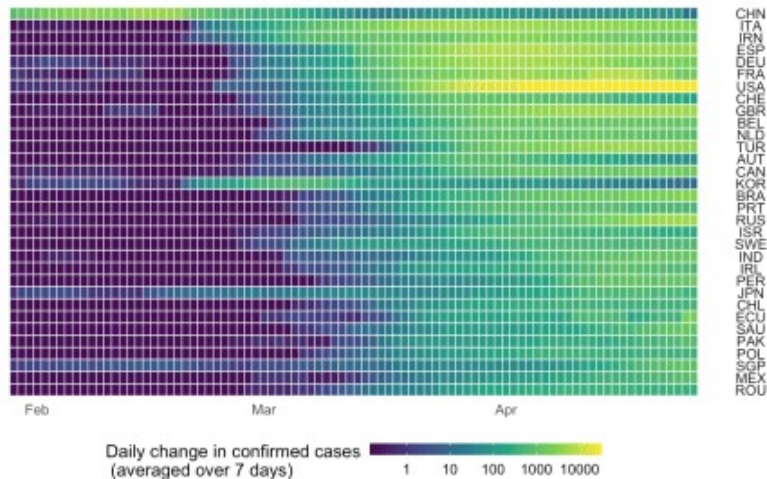


```
...merged <- download_merged_data(cached = TRUE, silent = TRUE)
```

```
plot_covid19_stripes(
  merged,
  type = "confirmed",
  min_cases = 10000,
  sort_countries = "start"
)
```

Covid19 Stripes: Confirmed cases (new cases per day)



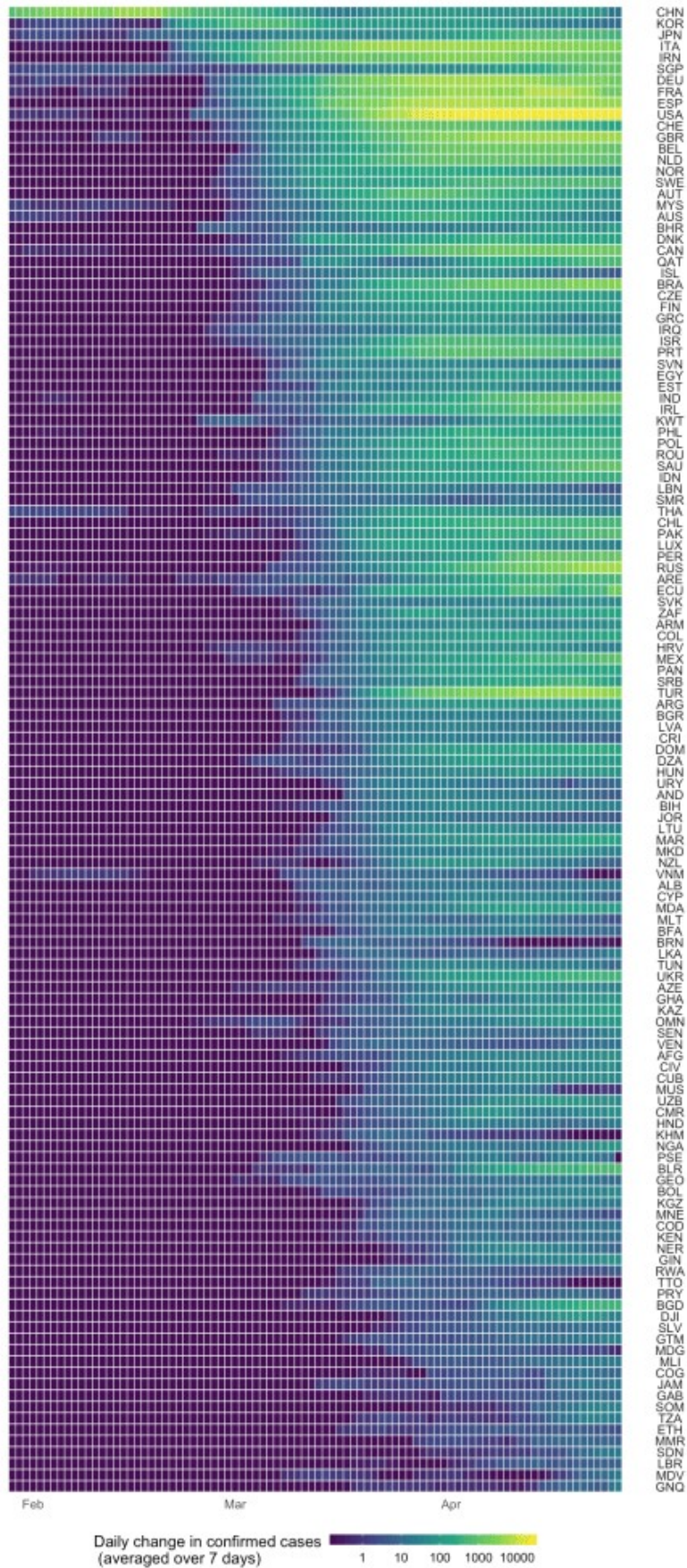
Case data: Johns Hopkins University Center for Systems Science and Engineering (JHU CSSE). Data obtained on April 26, 2020. The sample is limited to countries with more than 10000 confirmed cases. Code: <https://github.com/joachim-gassner/tidycovid19>.

You can quickly glance that at least some countries are experiencing declining case rates. This is very good news but we know this already from similar displays. How can `plot_covid19_stripes()` help to discover new information in the data? Scroll down the admittedly longer visual below that lists more countries and take mental note of all countries that seem to have comparably strong growth rates relative to their neighbors (the country stripes are sorted by the timing of the outbreak).

```
merged <- download_merged_data(cached = TRUE, silent = TRUE)
```

```
plot_covid19_stripes(
  merged,
  type = "confirmed",
  min_cases = 100,
  sort_countries = "start"
)
```

Covid19 Stripes: Confirmed cases (new cases per day)

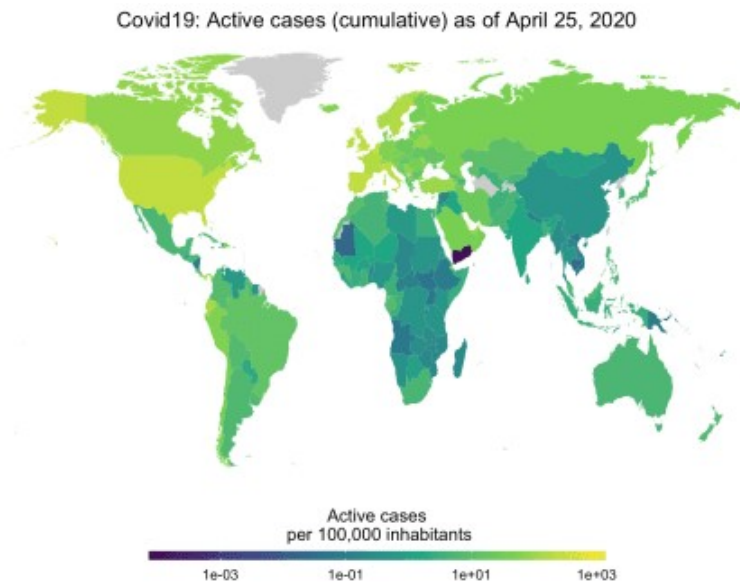


Case data: Johns Hopkins University Center for Systems Science and Engineering (JHU CSSE). Data obtained on April 26, 2020. The sample is limited to countries with more than 100 confirmed cases. Code: <https://github.com/joachim-gasserv/tidy-covid19>.

If your eyes work similarly to mine, you might have registered the U.S., Great Britain, Canada, Brazil, Israel, Portugal, India, Ireland, Peru, Russia, Turkey, Ukraine, Belarus, and Bangladesh. What do have at least some of these countries have in common? Although I tempted to speculate, I will leave this question to the political scientists.

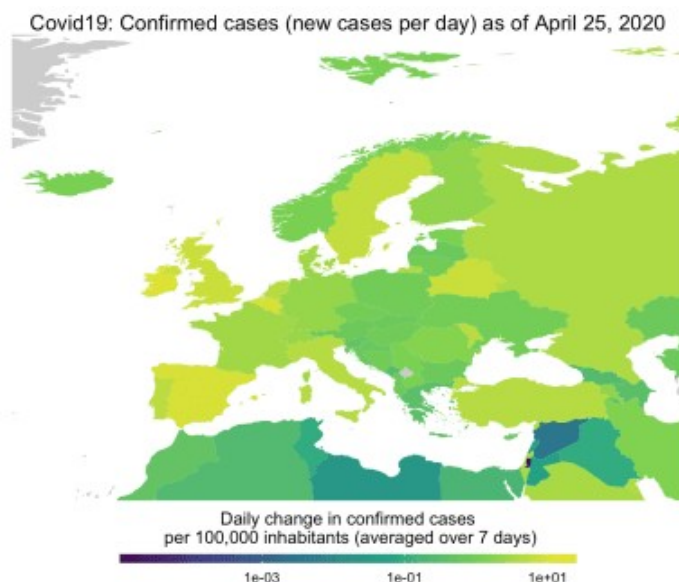
I love maps but I normally argue that maps are overrated as data displays. Most of us have a reasonably good idea where countries are located so why waste ink on showing us something that we already know? But then again, when phenomena spread world-wide it makes sense to track this spread over time with maps. The new function `map_covid19()` provides this functionality. Using the various measures provided by the data collected with the package, you can map things in levels, in changes, in absolute levels as well as deflated by population. For, example, here you see a current map for the current number of active cases, relative to the population.

```
map_covid19(merged, type = "active", per_capita = TRUE, cumulative = TRUE)
```



You can also focus on a certain region when you like. Here we take a look at new confirmed cases across Europe.

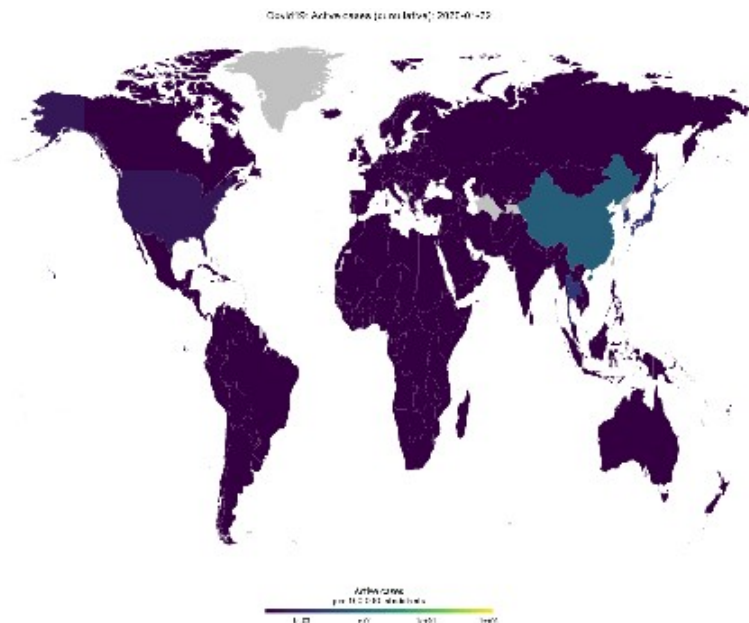
```
map_covid19(merged, type = "confirmed", per_capita = TRUE,
            region = "Europe")
```



Finally, you use the function to create animated choropleth maps to show the spread of Covid-19 over time. The GIF below shows active cases per capita over time.

```
map_covid19(merged, type = "active", cumulative = TRUE, per_capita = T,
            dates = unique(merged$date))
```

```
## A vector of dates found. Will create animation. This will take a while...
```

To end on a high note: The data on Government measures provided by ACAPS allow us to single out those countries that are starting to lift restrictions. Let's look at some countries.

```
library(gghighlight)
library(lubridate)

##
## Attaching package: 'lubridate'

## The following object is masked from 'package:base':
##
##      date

acaps <- download_acaps_npi_data(cached = TRUE, silent = TRUE)

merged %>%
  select(iso3c, date) %>%
  left_join(
    acaps %>%
      filter(log_type != "Phase-out measure") %>%
      mutate(date = as.Date(date_implemented)) %>%
      group_by(iso3c, date) %>%
      summarise(n_phase_in = n()),
    by = c("iso3c", "date")
  ) %>%
  left_join(
    acaps %>%
      filter(log_type == "Phase-out measure") %>%
      mutate(date = as.Date(date_implemented)) %>%
      group_by(iso3c, date) %>%
      summarise(n_phase_out = n()),
    by = c("iso3c", "date")
  ) %>%
  group_by(iso3c) %>%
  mutate_at(vars(n_phase_in, n_phase_out), ~cumsum(iffelse(is.na(.), 0, .))) %>%
  mutate(share_out = n_phase_out/n_phase_in) %>%
  select(iso3c, date, n_phase_in, n_phase_out, share_out) %>%
  filter(!is.na(share_out)) -> phase_out

merged %>%
```

```

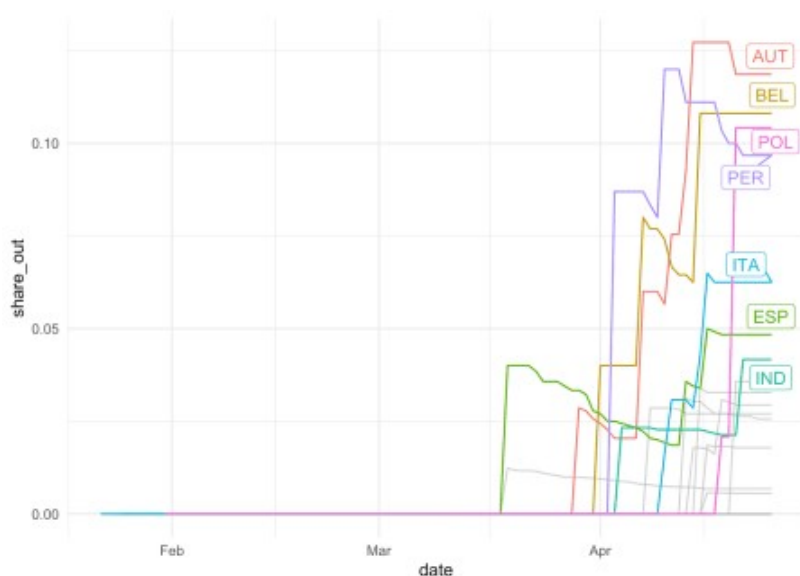
left_join(phase_out, by = c("iso3c", "date")) %>%
group_by(iso3c) %>%
filter(max(confirmed) > 10000) %>%
mutate(max_share = max(share_out, na.rm = TRUE)) %>%
ungroup() -> merged_phase_out

ggplot(
  merged_phase_out %>% filter(!is.na(share_out)),
  aes(x = date, y = share_out, color = iso3c)
) +
  geom_line() +
  gghighlight(max_share > 0.04) +
  guides(color = FALSE) +
  theme_minimal()

## Warning: Tried to calculate with group_by(), but the calculation failed.
## Falling back to ungrouped filter operation...

## label_key: iso3c

```



So, for at least some countries, the a reasonably share of measures have been lifted, with Austria leading the field. Which areas do these lifted restrictions affect?

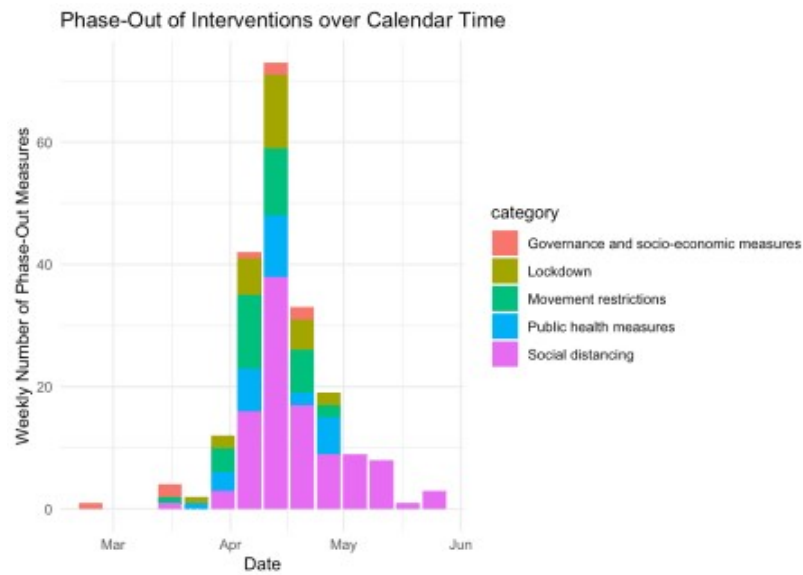
```

acaps %>%
  filter(log_type == "Phase-out measure") %>%
  mutate(week = floor_date(date_implemented, "weeks", week_start = 1)) %>%
  group_by(week, category) %>%
  summarize(nli = n()) %>%
  select(week, category, nli) -> df

ggplot(df, aes(x = week, y = nli, fill = category)) +
  geom_col(position = "stack", stat = "sum") + theme_minimal() +
  labs(title = "Phase-Out of Interventions over Calendar Time",
       x = "Date",
       y = "Weekly Number of Phase-Out Measures")

## Warning: Ignoring unknown parameters: stat

```

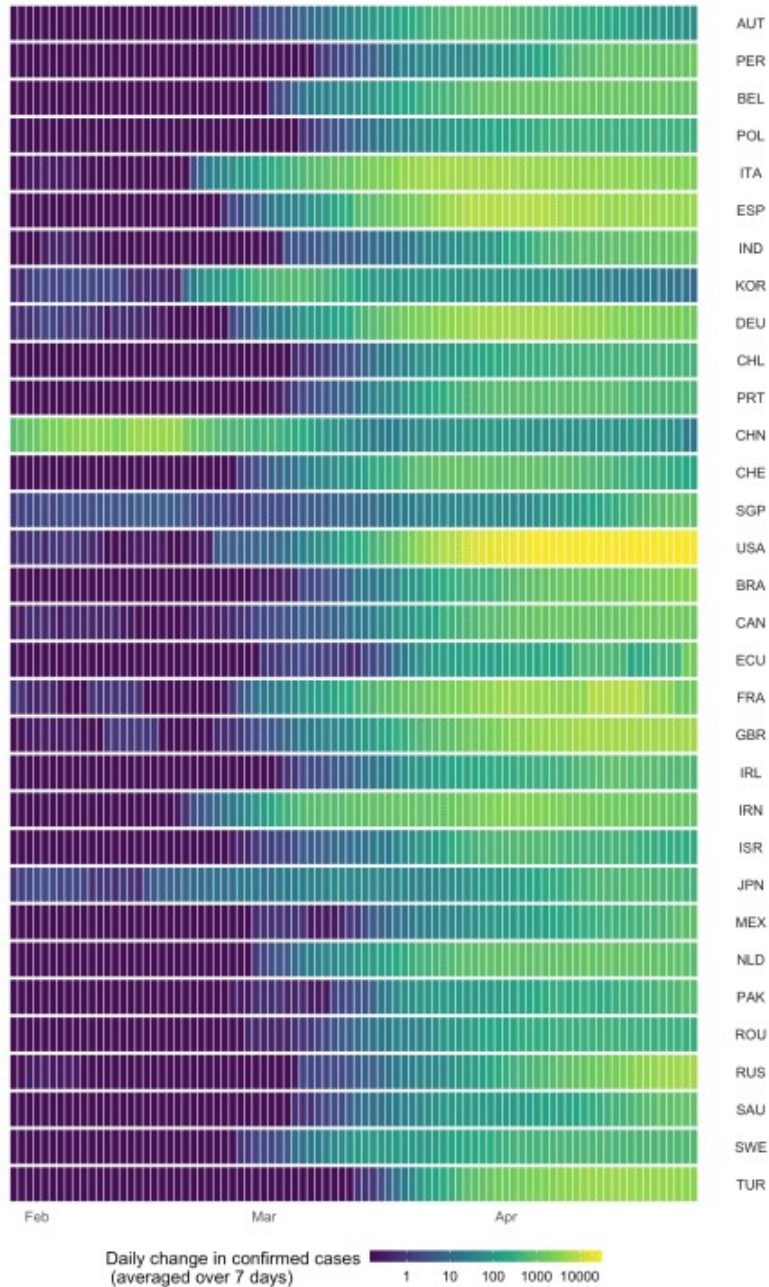


Last question: How does the spread pattern look when we sort by the share of lifted measures?

```
merged_phase_out %>%
  select(iso3c, max_share) %>%
  distinct() %>%
  arrange(-max_share) -> sortdf
```

```
merged_phase_out$iso3c <- factor(merged_phase_out$iso3c, level = sortdf$iso3c)
plot_covid19_stripes(merged_phase_out, type = "confirmed")
```

Covid19 Stripes: Confirmed cases (new cases per day)



Hmmm. While for most of the countries that have lifted many restrictions it seems as if indeed they have seen slowing spreads recently, there are some countries that lift restrictions albeit still growing or constant new case numbers.