

# Covid Tracker

Today's date: 2020-10-08  
Database last date: 10/7/20

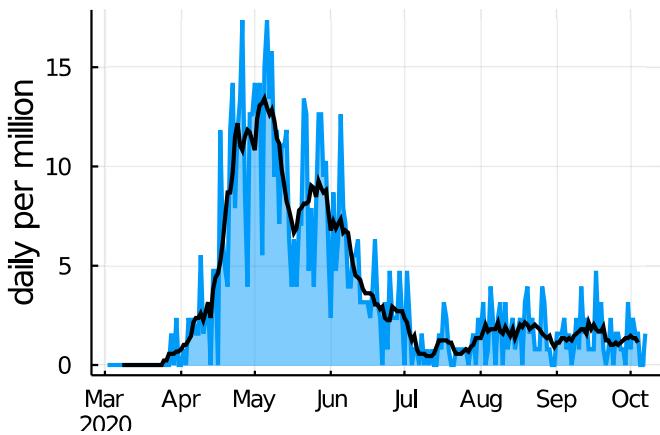
```
• begin
•   _BASE_DIR = joinpath(@__DIR__, "..")
•   push!(LOAD_PATH, joinpath(_BASE_DIR, ".."))
•   using CovidTracker
• end
```

```
• df = download_covid_data();
```

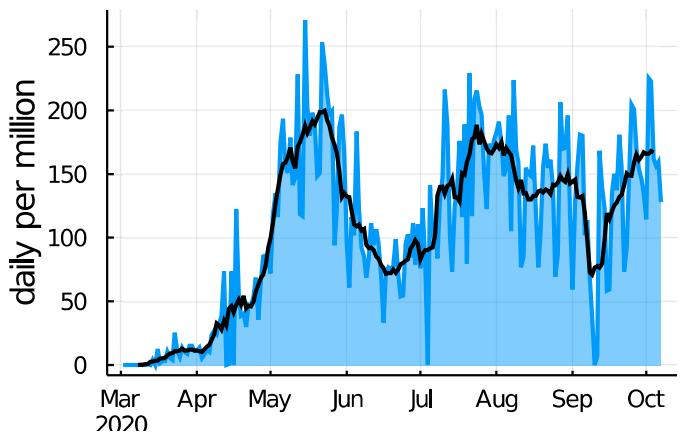
```
• _SIZE = (690, 250); # plotsize
```

## State Plots

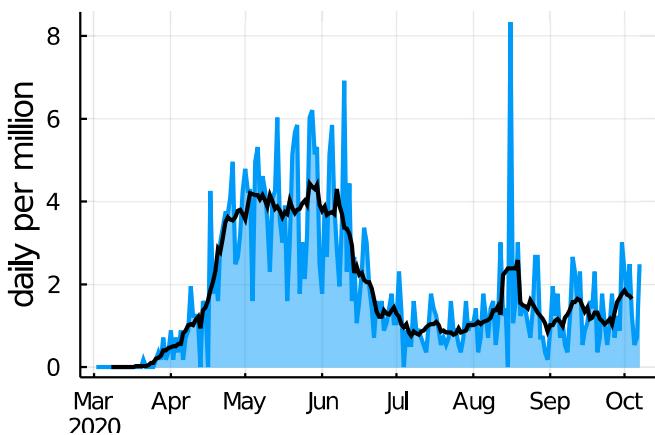
Hennepin, Minnesota, deaths



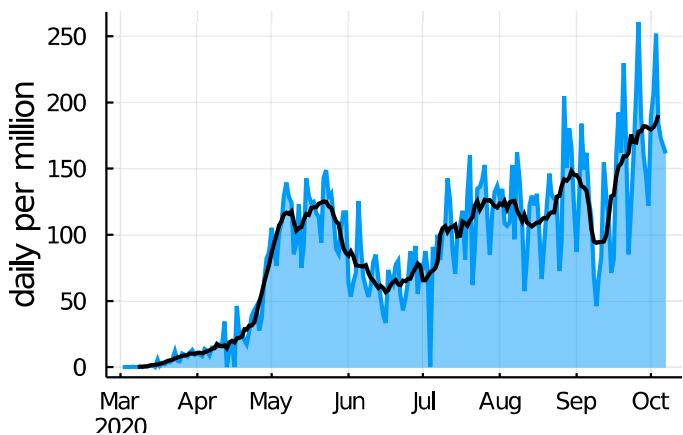
Hennepin, Minnesota, confirmed



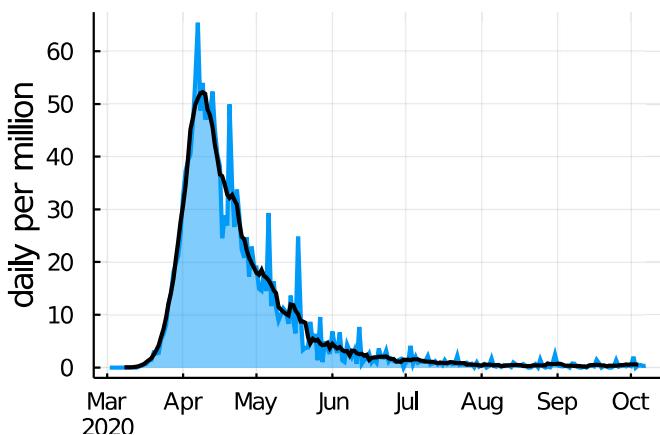
Minnesota, deaths



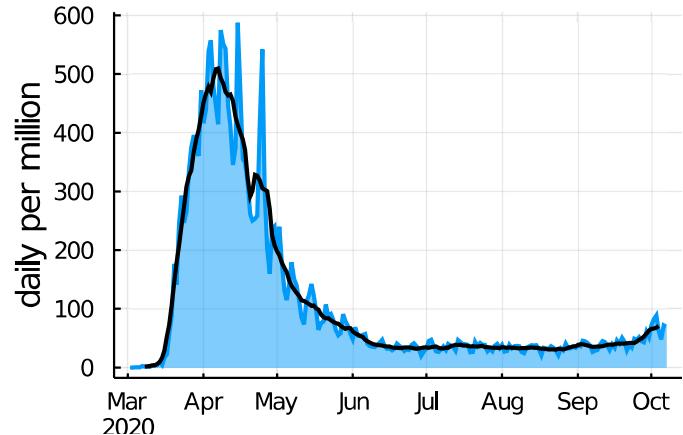
Minnesota, confirmed cases



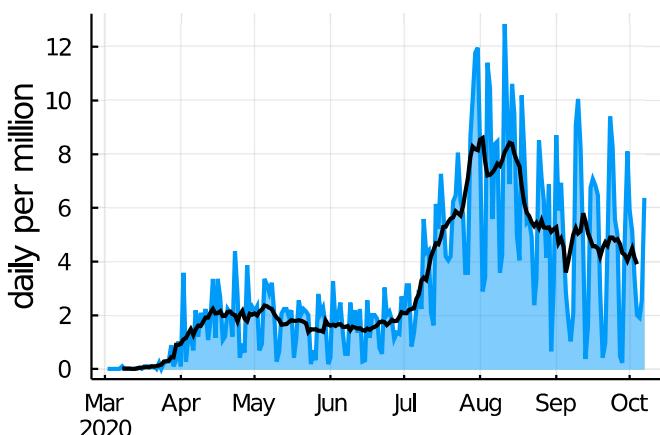
New York, deaths



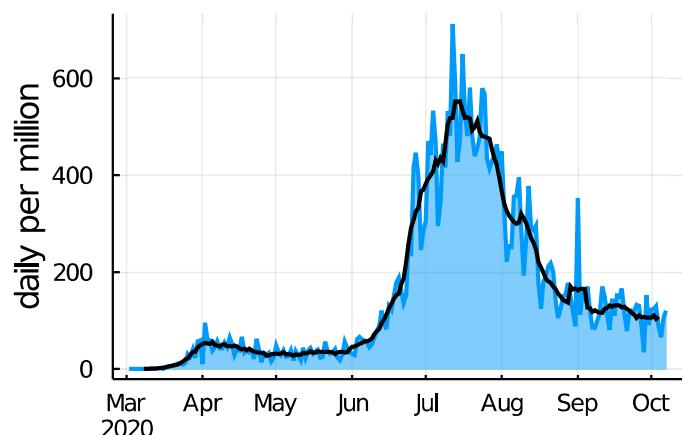
New York, confirmed cases



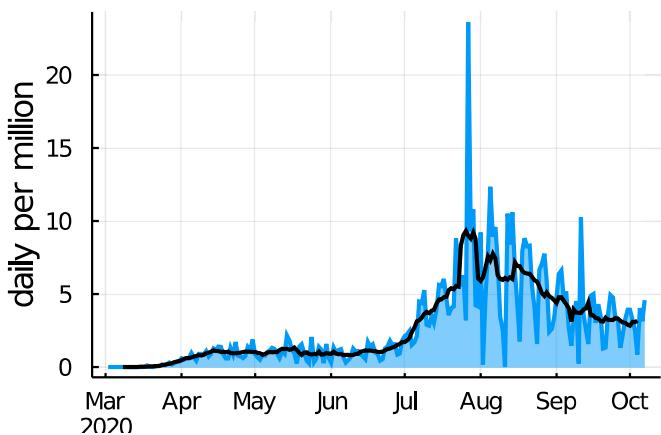
Florida, deaths



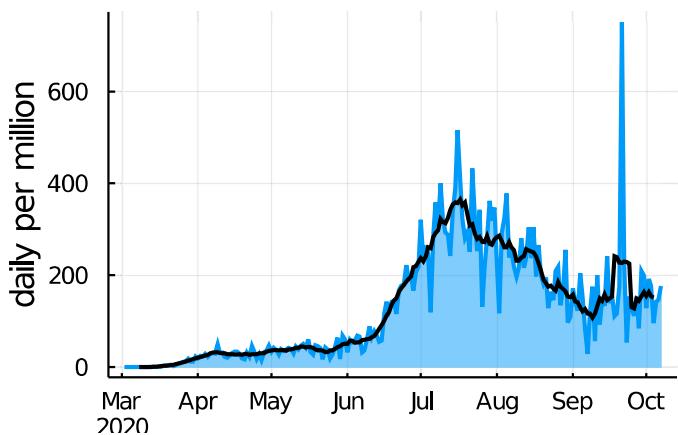
Florida, confirmed cases



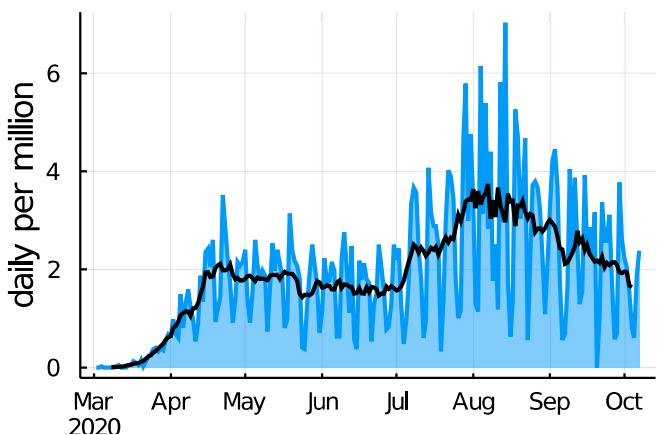
Texas, deaths



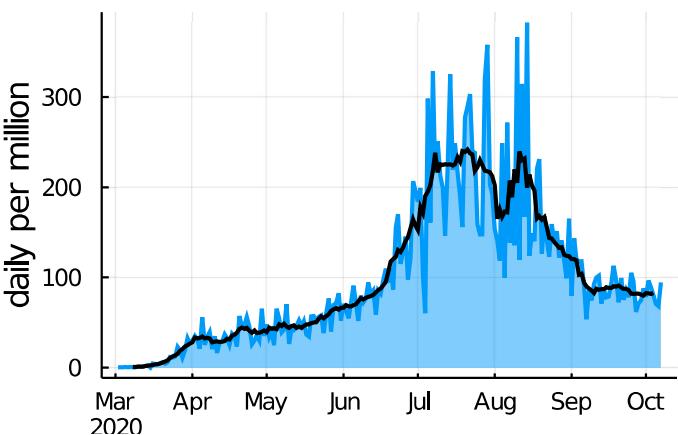
Texas, confirmed cases



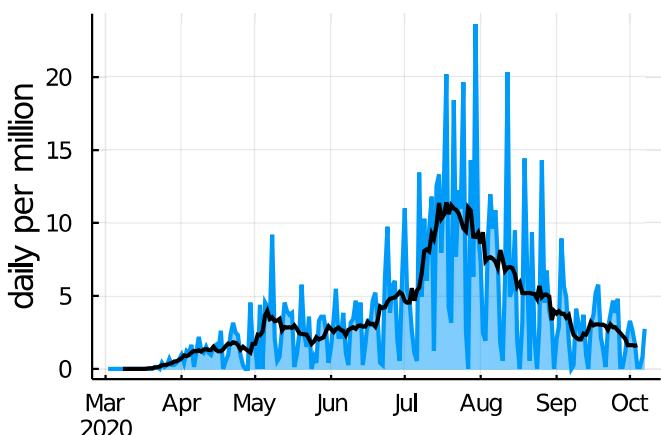
California, deaths



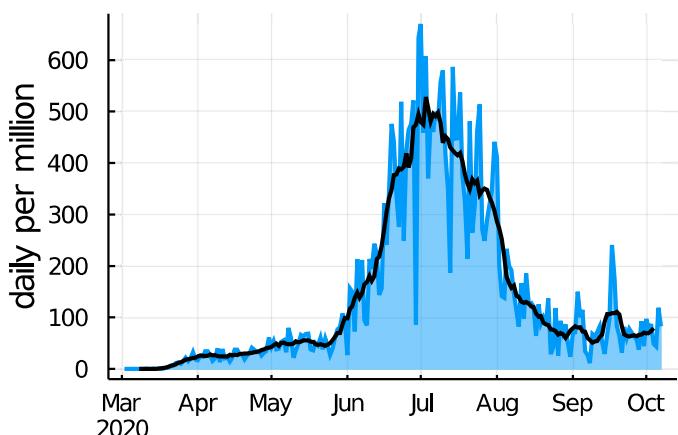
California, confirmed cases



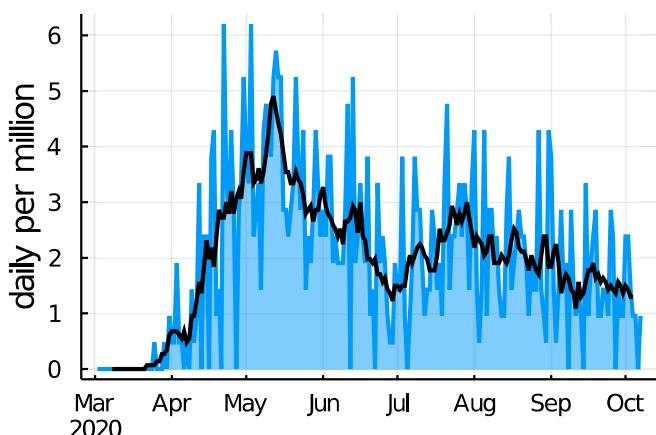
Arizona, deaths



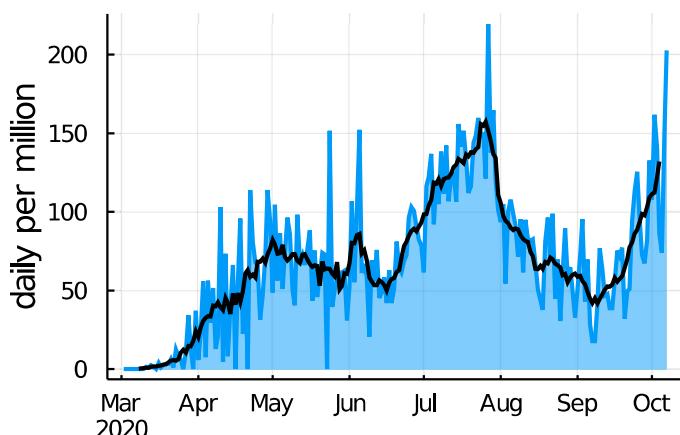
Arizona, confirmed cases



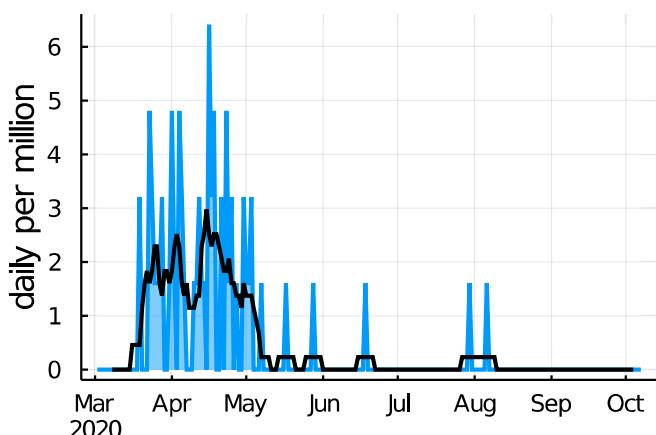
### New Mexico, deaths



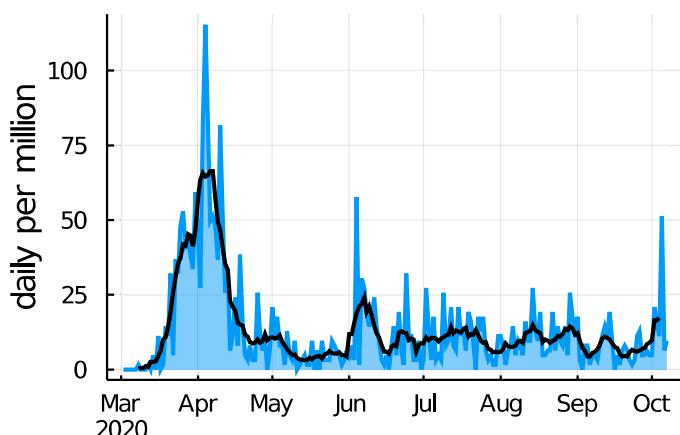
### New Mexico, confirmed cases



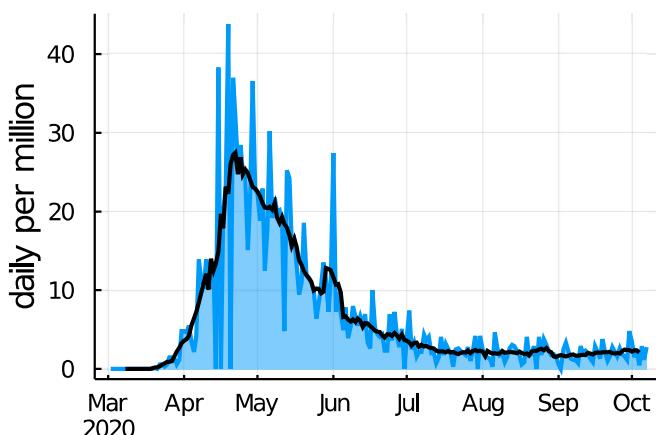
### Vermont, deaths



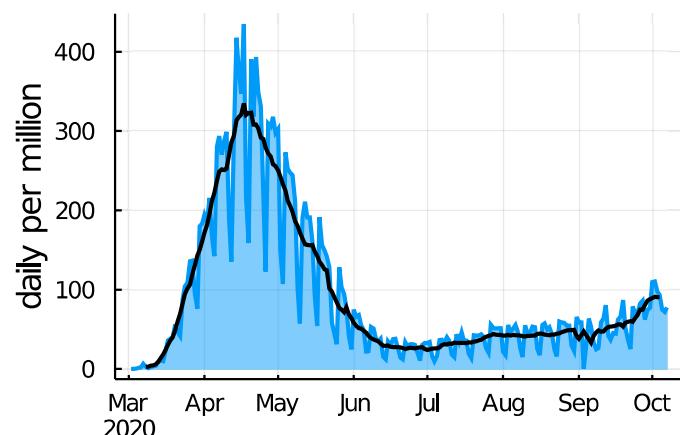
### Vermont, confirmed cases



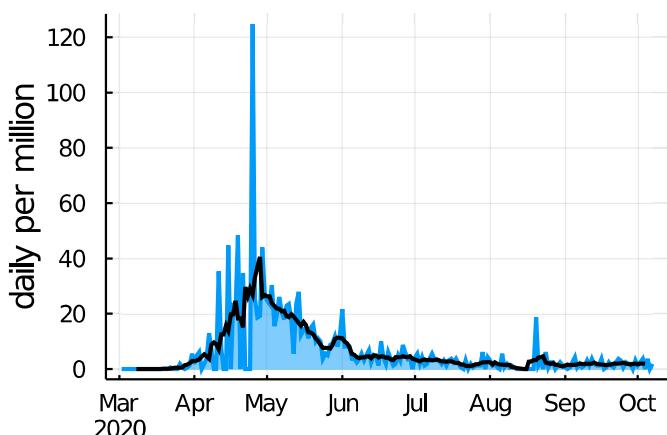
### Massachusetts, deaths



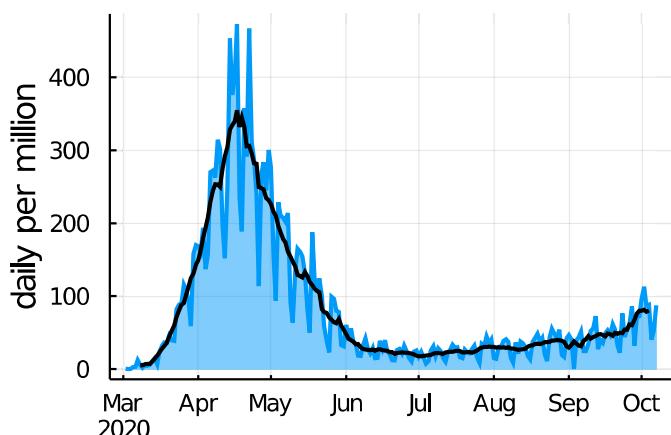
### Massachusetts, confirmed cases



Middlesex, Massachusetts, deaths



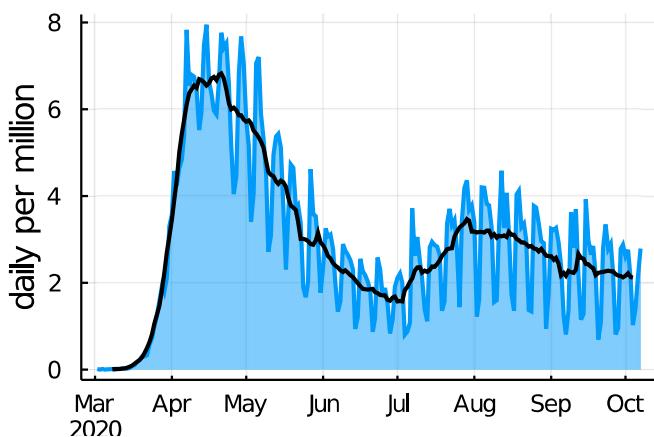
Middlesex, Massachusetts, confirmed cases



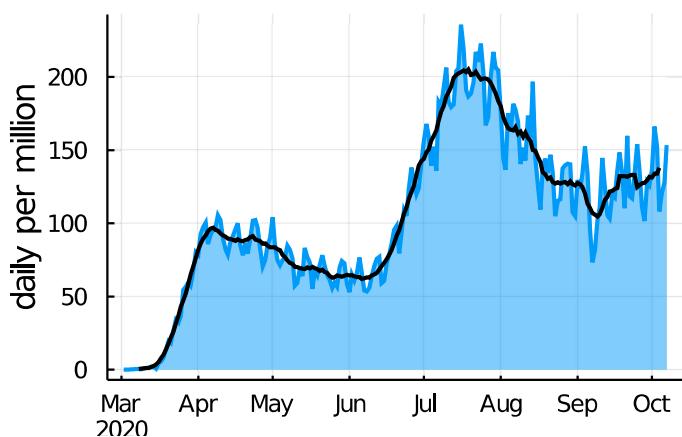
## Country plots

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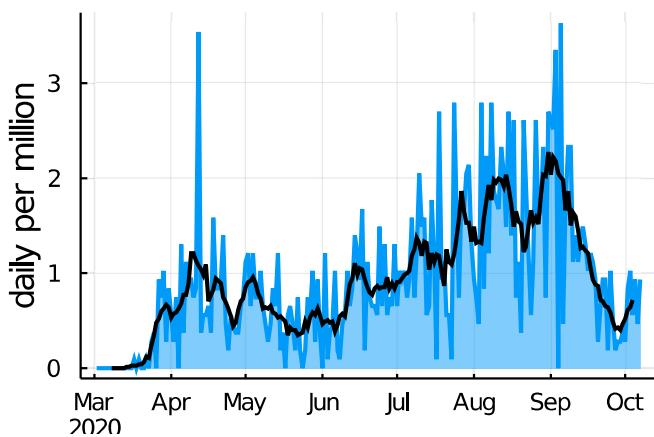
US, deaths



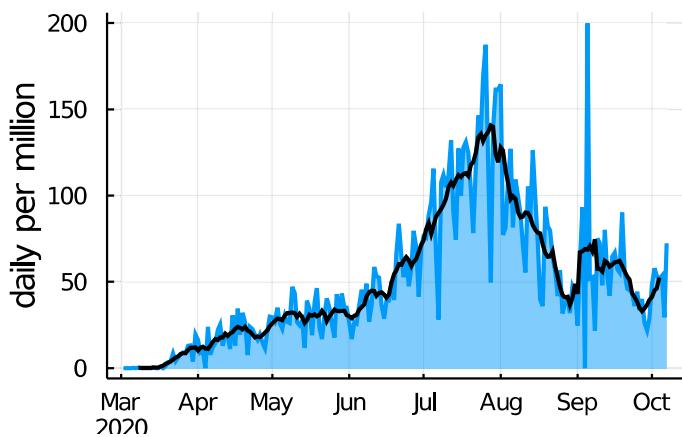
US, confirmed cases



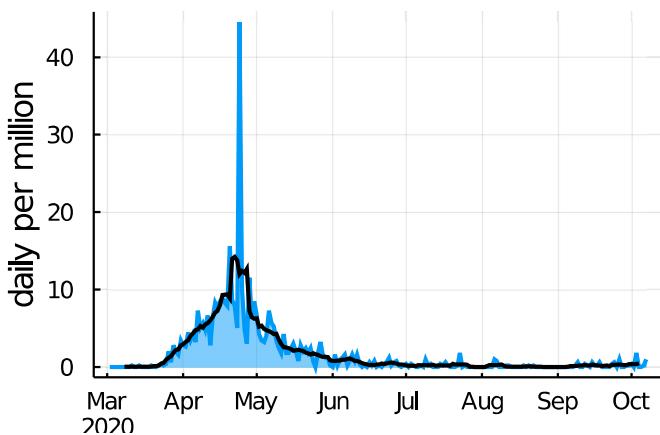
Dominican Republic, deaths



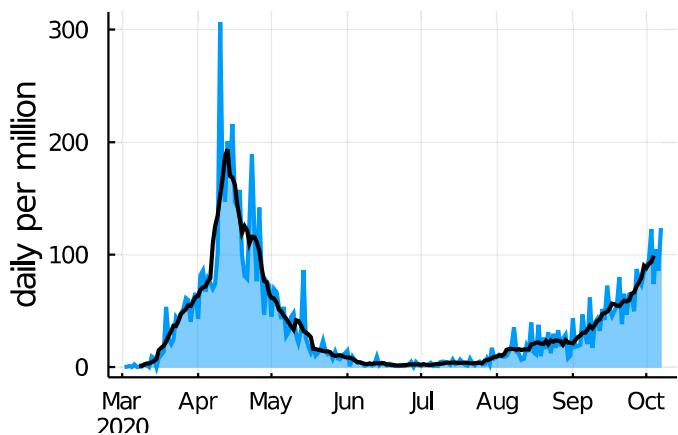
Dominican Republic, confirmed



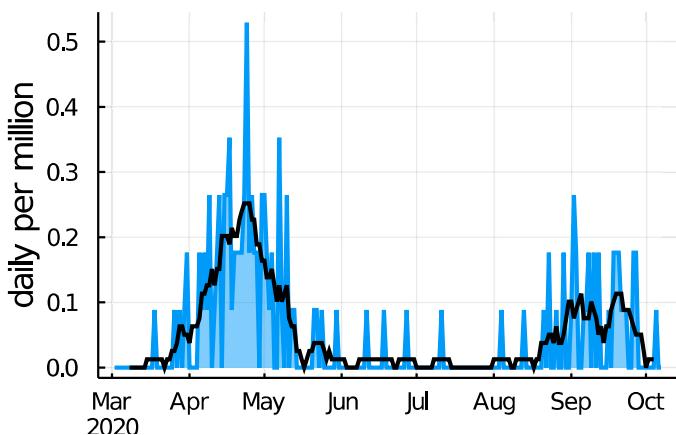
### Ireland, deaths



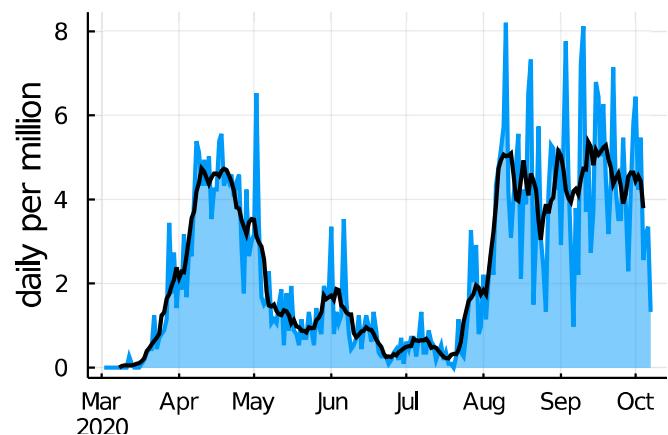
### Ireland, confirmed cases



### Cuba, deaths

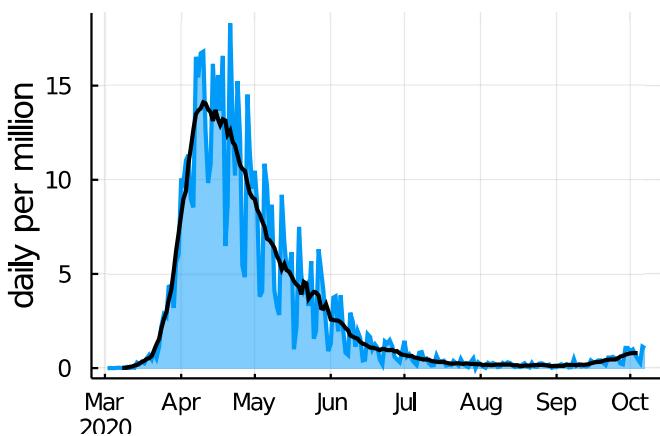


### Cuba, confirmed cases

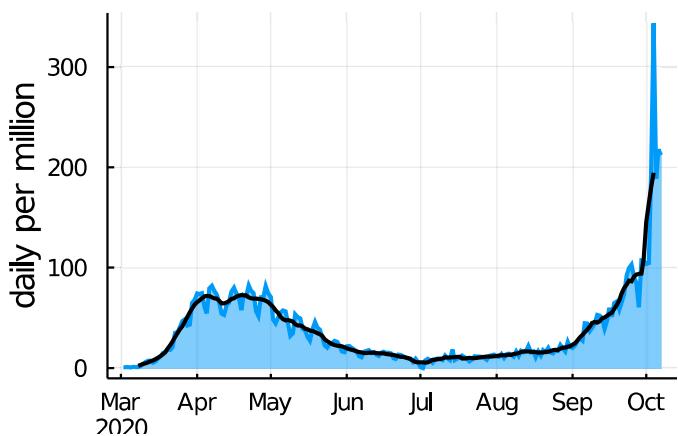


## Europe

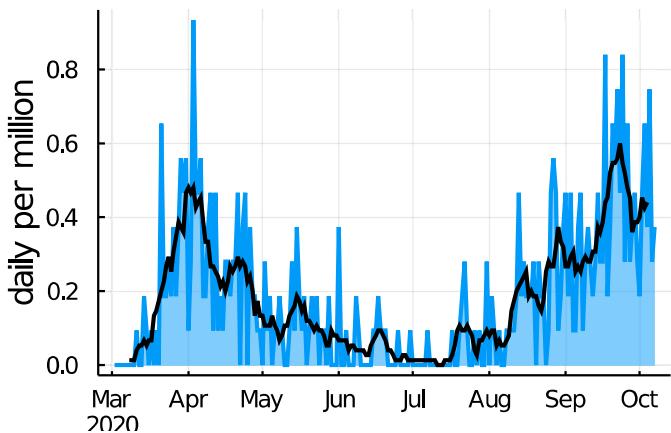
### United Kingdom, deaths



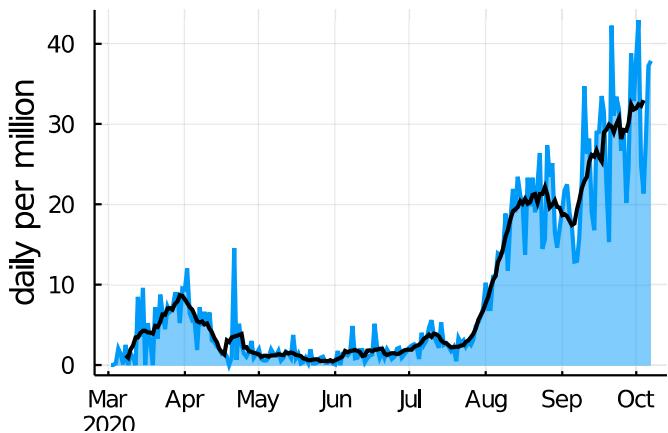
### United Kingdom, confirmed cas



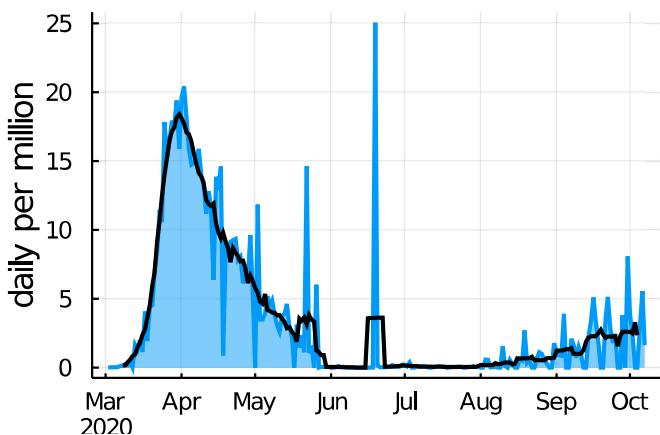
### Greece, deaths



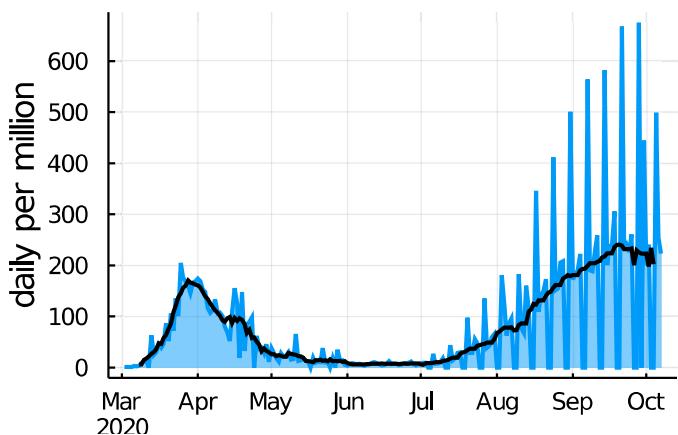
### Greece, confirmed cases



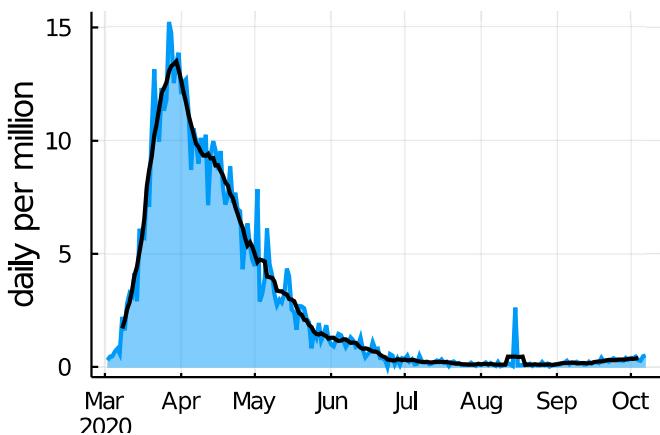
### Spain, deaths



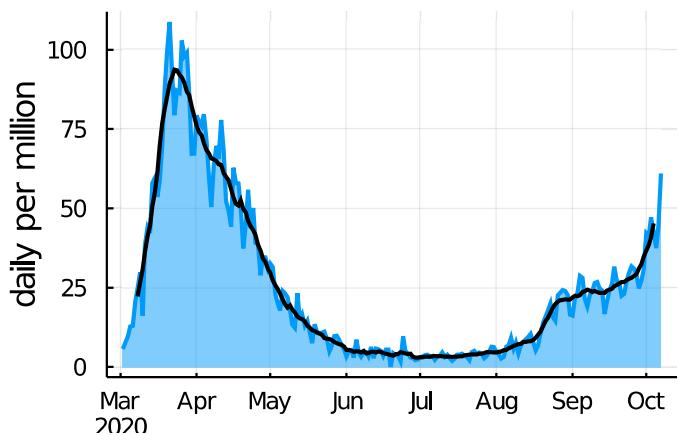
### Spain, confirmed cases



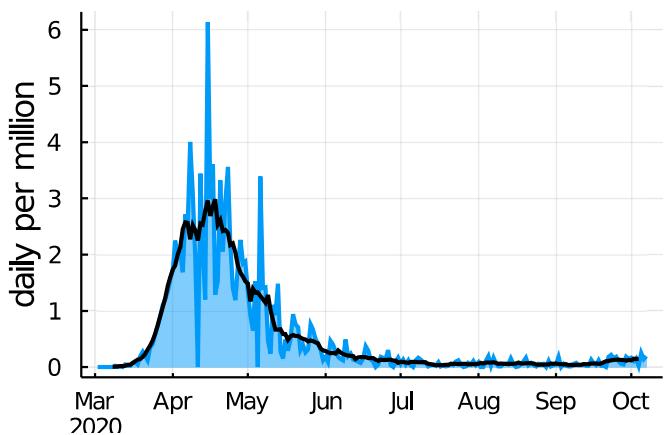
### Italy, deaths



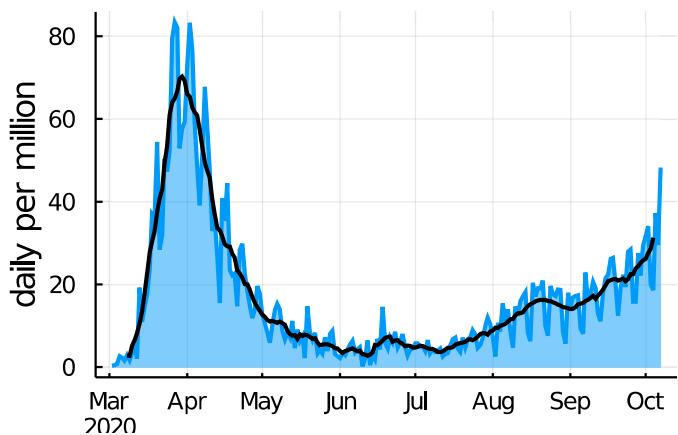
### Italy, confirmed cases



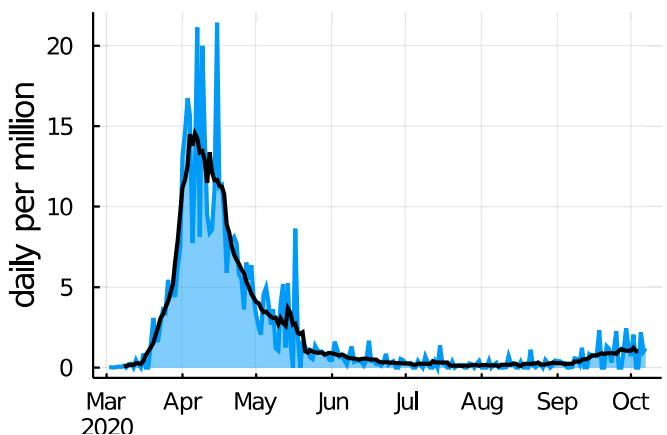
### Germany, deaths



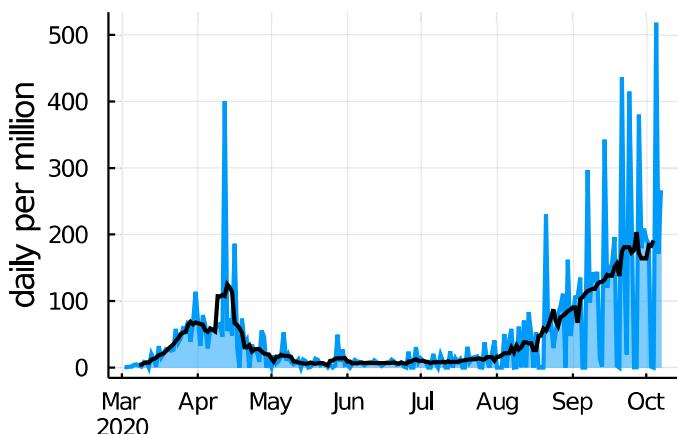
### Germany, confirmed cases



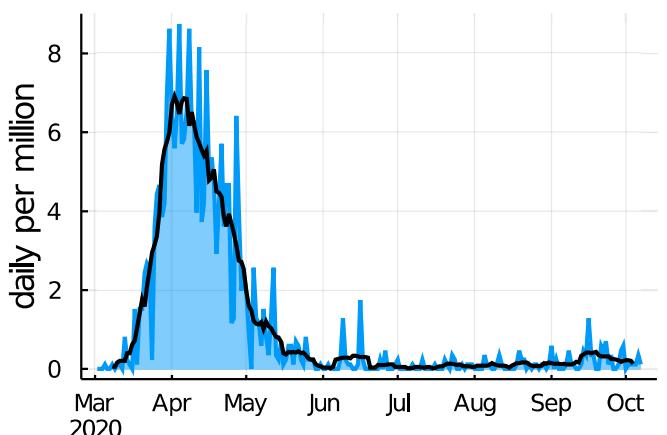
### France, deaths



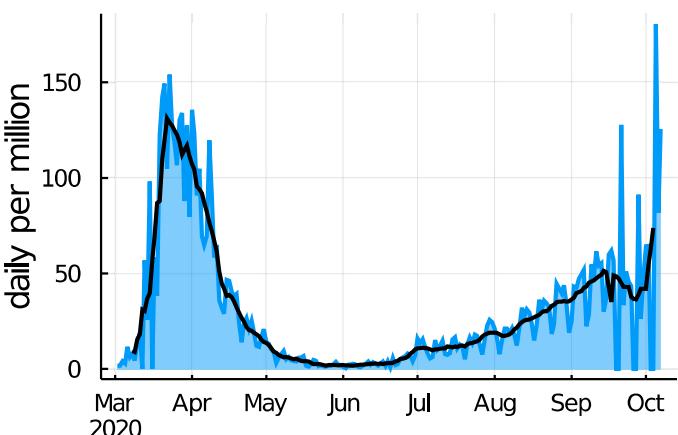
### France, confirmed cases



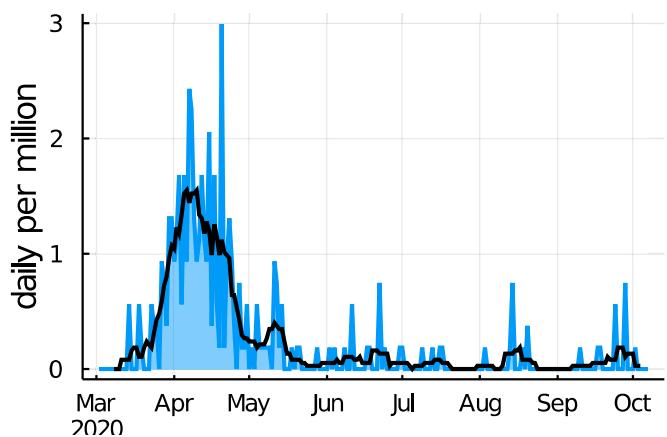
### Switzerland, deaths



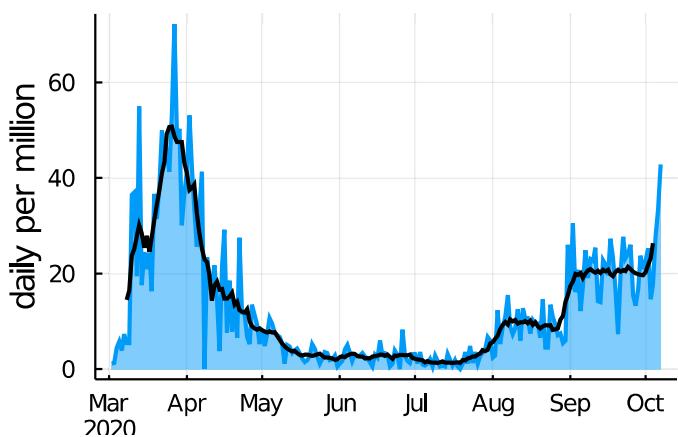
### Switzerland, confirmed cases



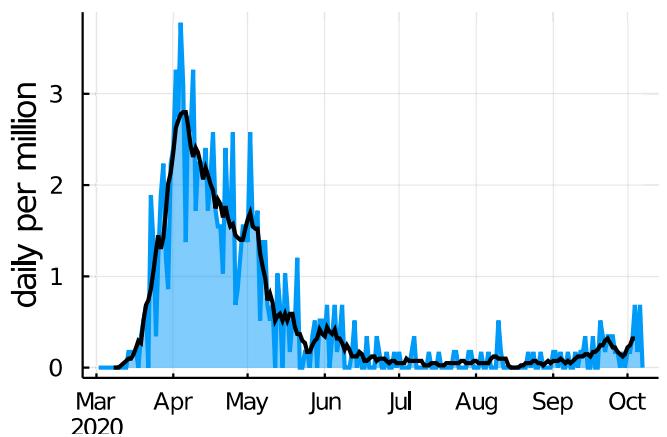
### Norway, deaths



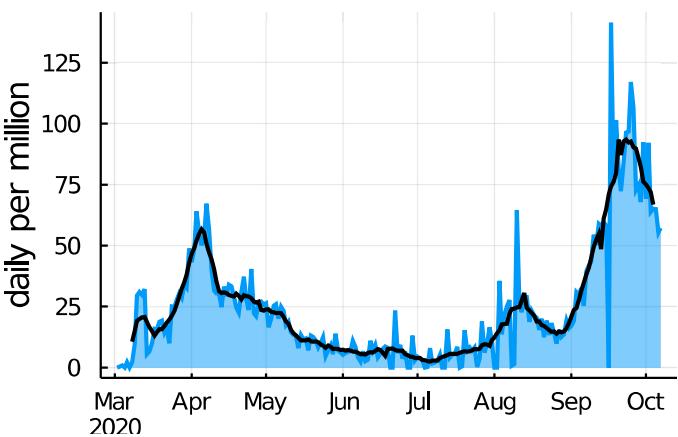
### Norway, confirmed cases



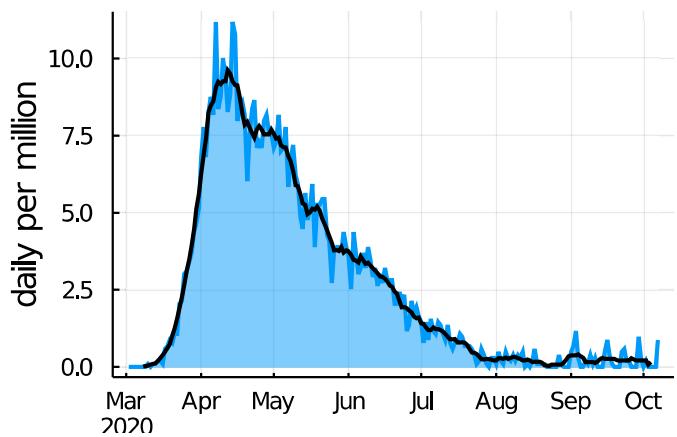
### Denmark, deaths



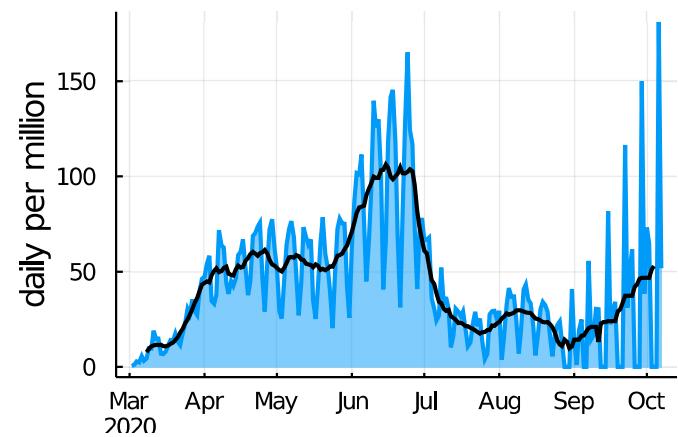
### Denmark, confirmed cases



### Sweden, deaths

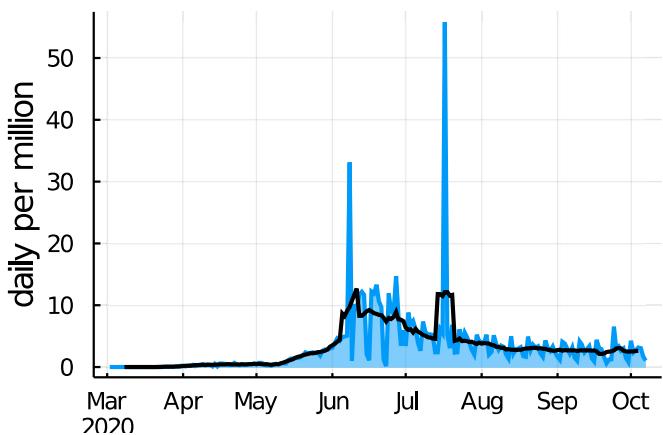


### Sweden, confirmed cases

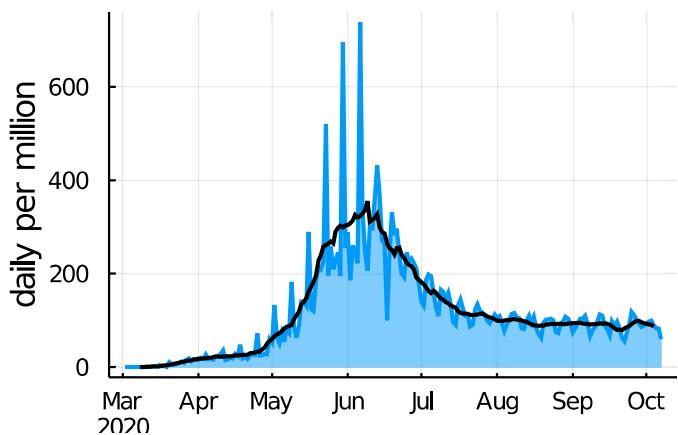


Latin America

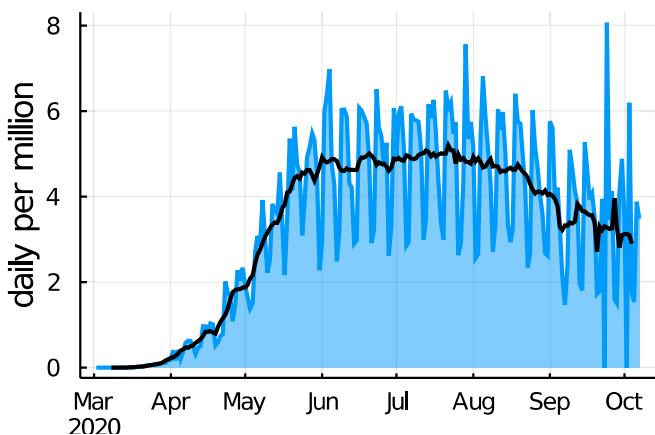
**Chile, deaths**



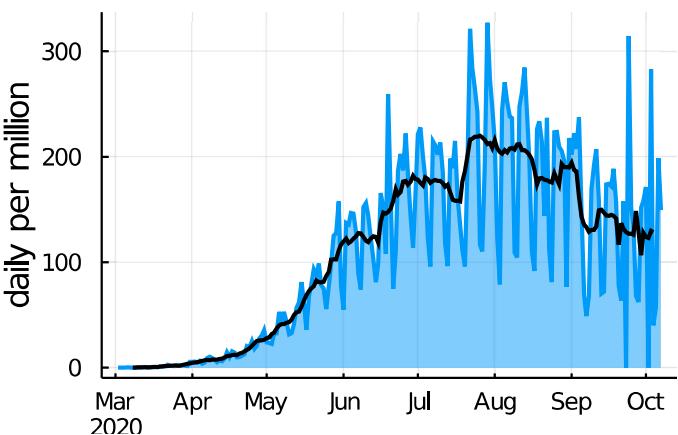
**Chile, confirmed cases**



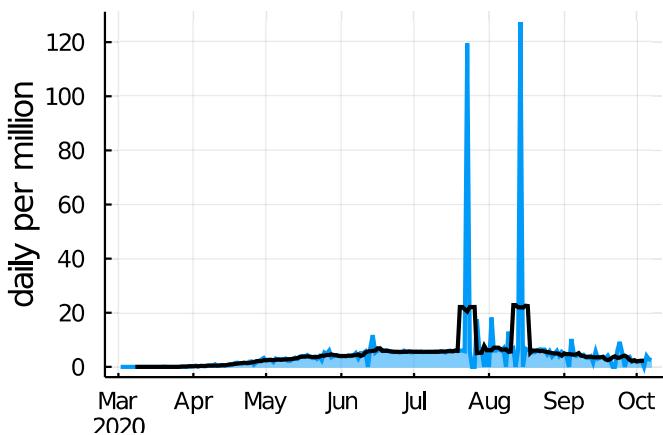
**Brazil, deaths**



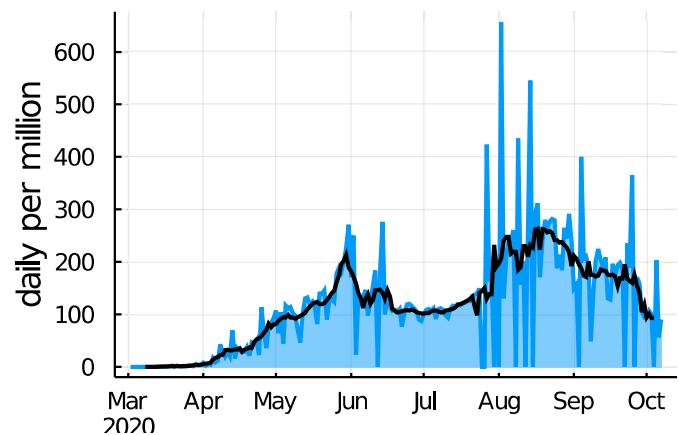
**Brazil, confirmed cases**



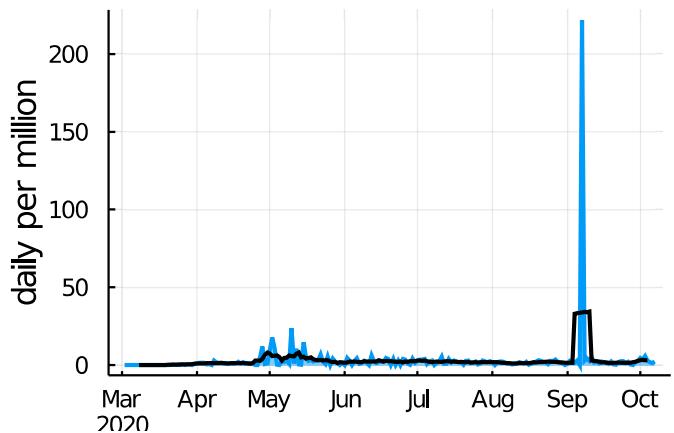
**Peru, deaths**



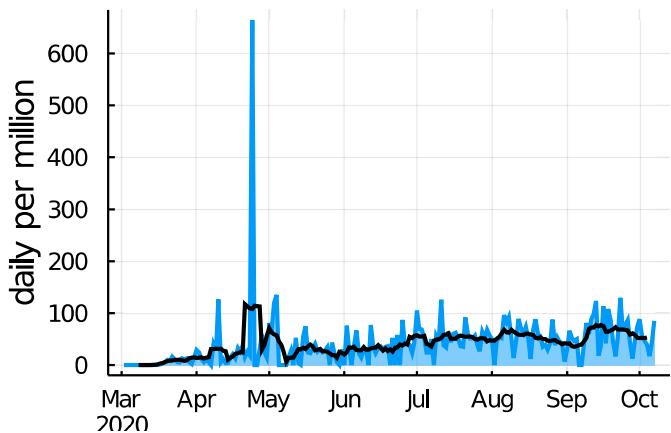
**Peru, confirmed cases**



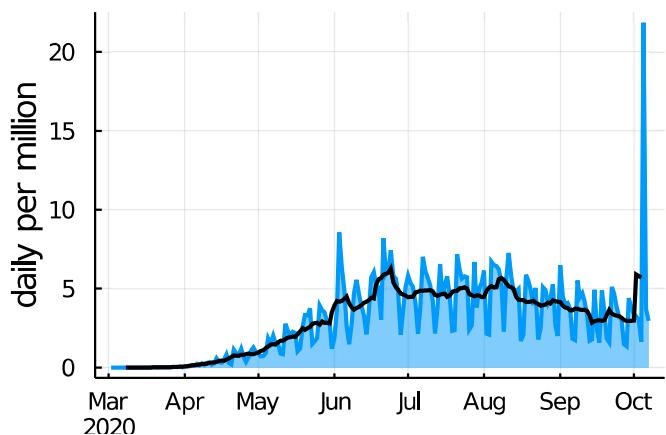
### Ecuador, deaths



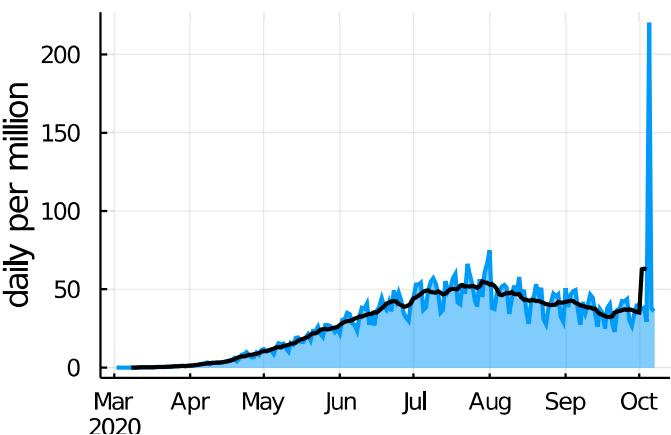
### Ecuador, confirmed cases



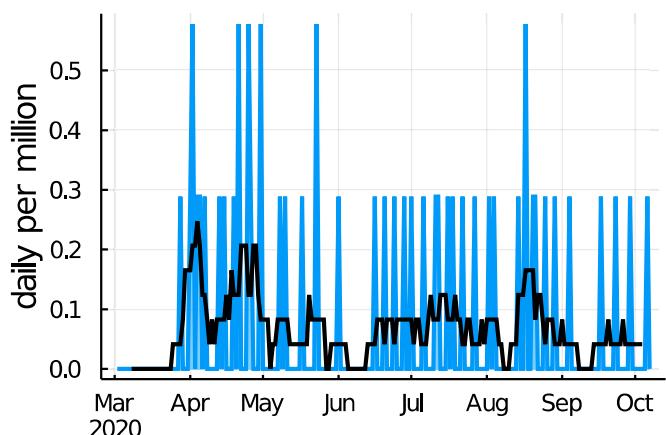
### Mexico, deaths



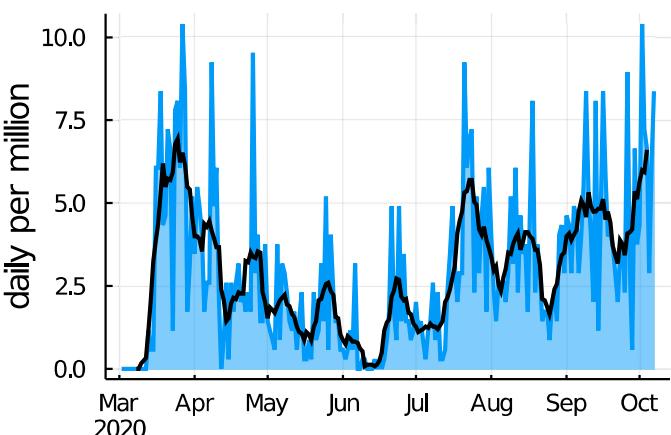
### Mexico, confirmed cases



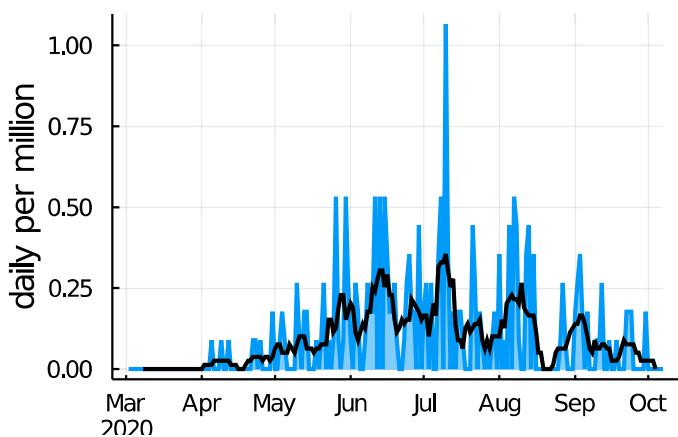
### Uruguay, deaths



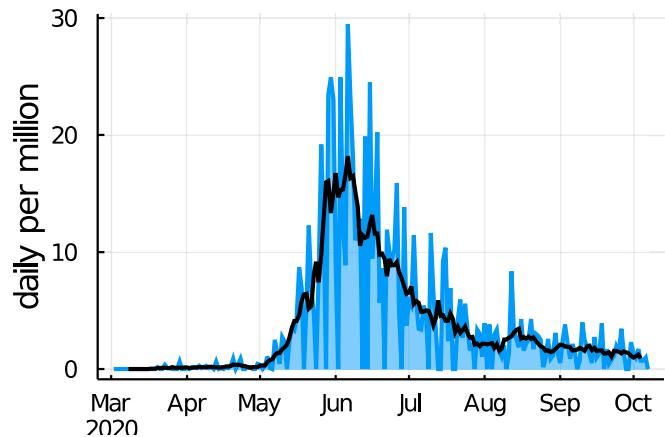
### Uruguay, confirmed cases



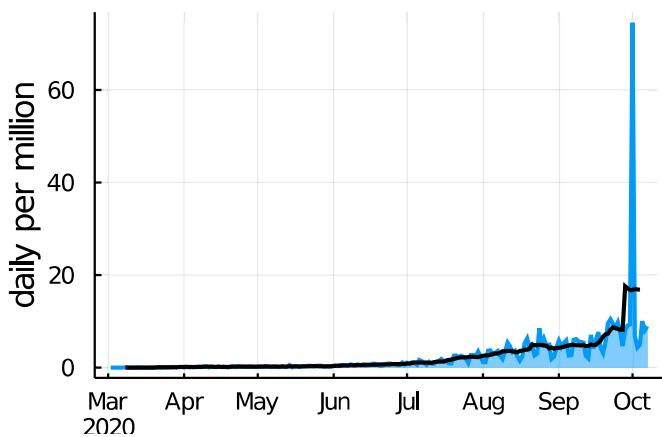
### Haiti, deaths



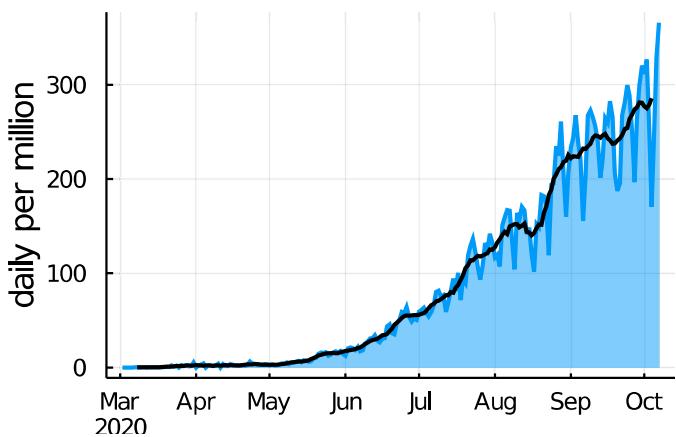
### Haiti, confirmed cases



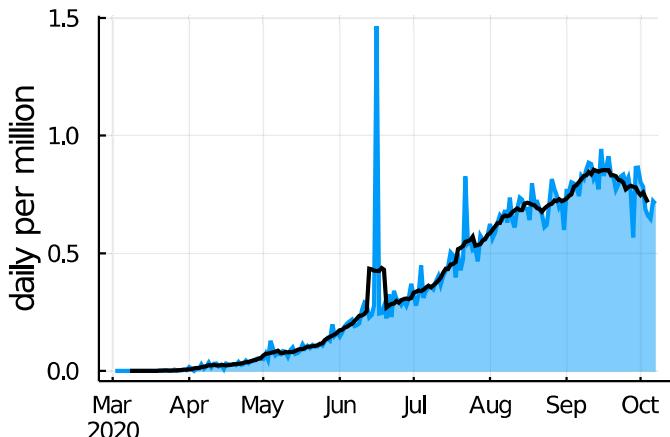
### Argentina, deaths



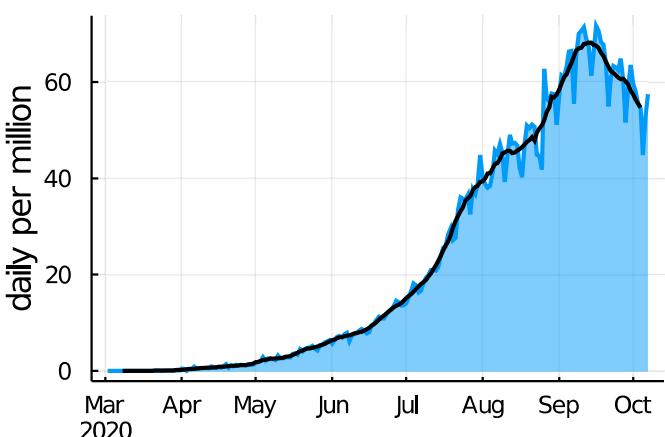
### Argentina, confirmed cases



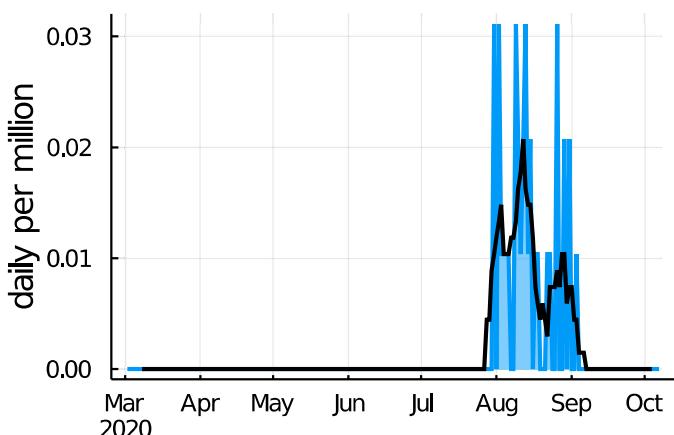
### India, deaths



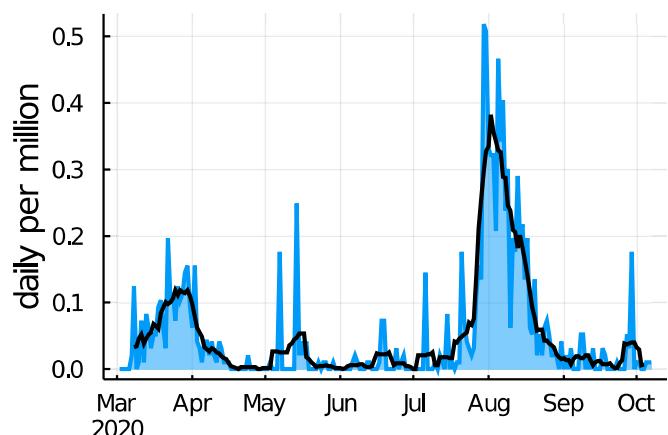
### India, confirmed cases



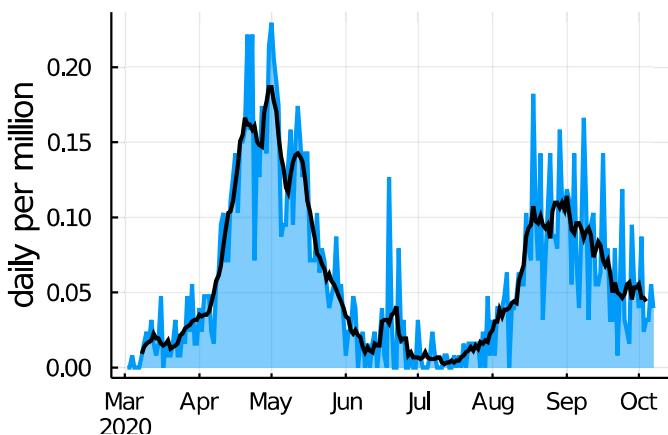
Vietnam, deaths



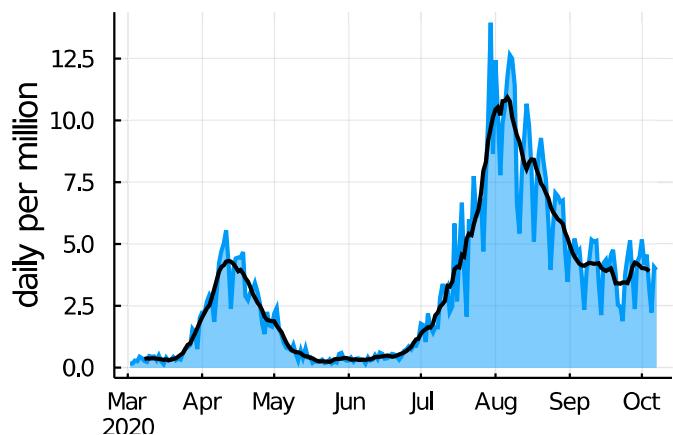
Vietnam, confirmed cases



Japan, deaths



Japan, confirmed cases



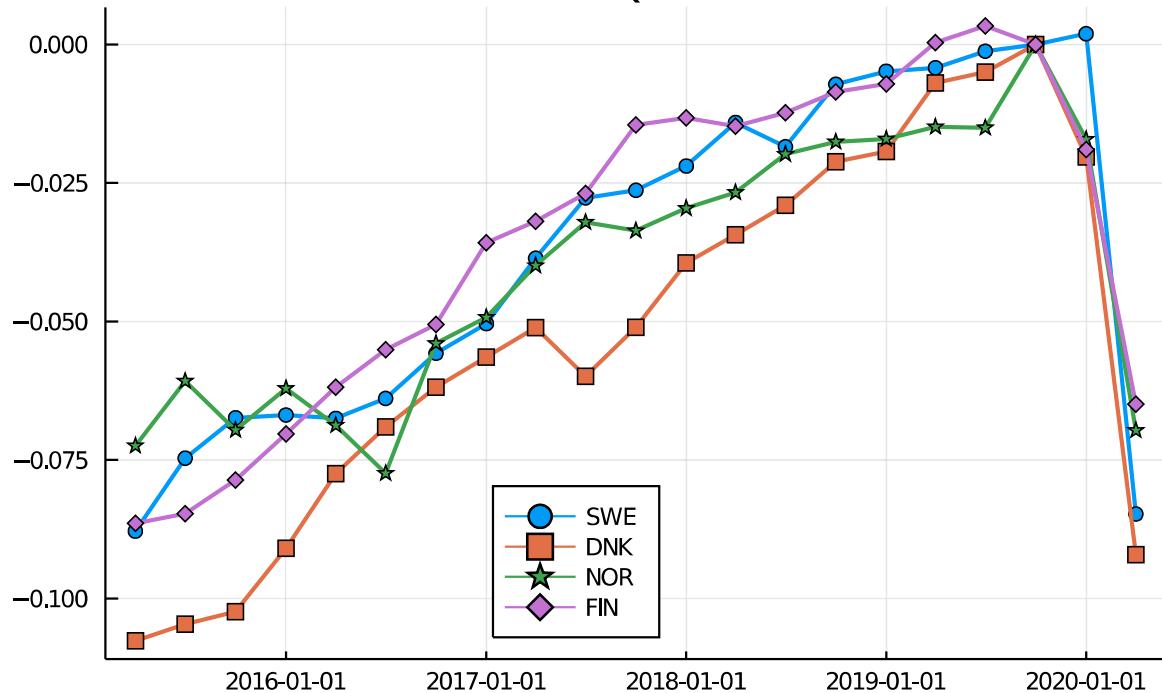
## A Comparison between Nordic Countries

```
• begin
•   using FredData
•   using Plots
•   using DataFrames
• end
```

```
• # make sure you have your API key access set up
• # https://github.com/micahjsmith/FredData.jl
• f = Fred();
```

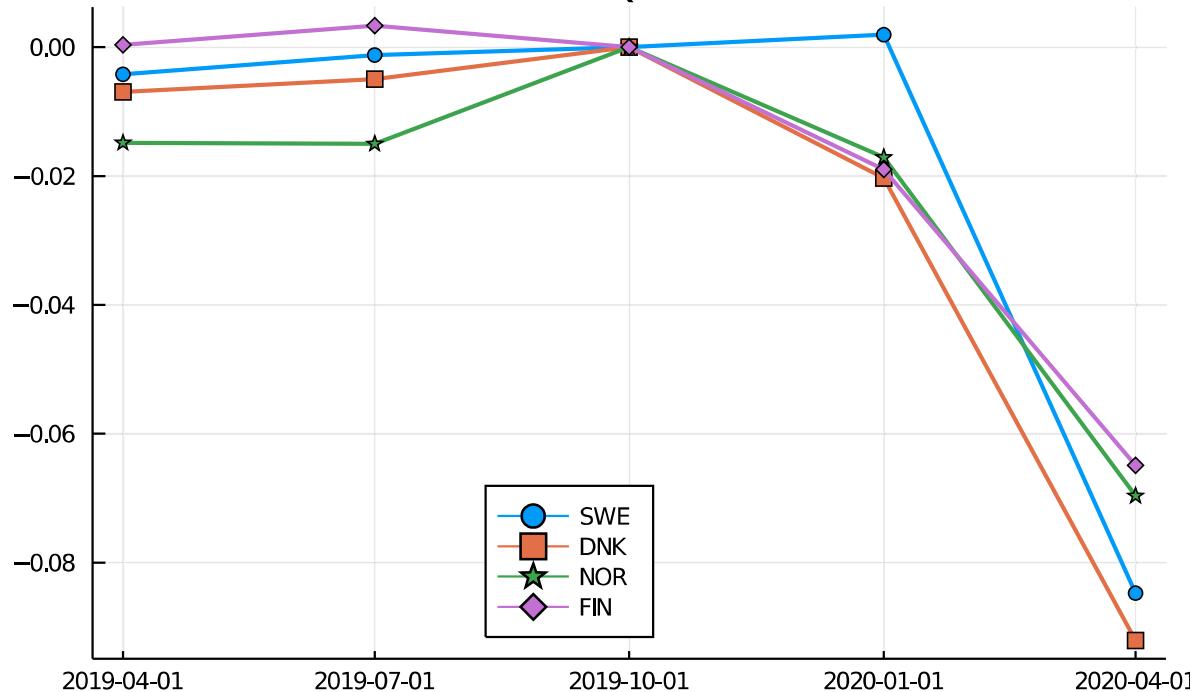
```
• begin
•   # Quarterly real GDP at 2010 constant prices
•   sweden_gdp = get_data(f, "CLVMNACSCAB1GQSE")
•   denmark_gdp = get_data(f, "CLVMNACSCAB1GQDK")
•   norway_gdp = get_data(f, "CLVMNACSCAB1GQNO")
•   finland_gdp = get_data(f, "CLVMNACSCAB1GQFI")
• end;
```

## Log Quarterly Real GDP, SA 2019Q4 = 0



- `normalized_gdp_plots(range=20)`

## Log Quarterly Real GDP, SA 2019Q4 = 0



- `normalized_gdp_plots(range=4)`

By not locking down, Sweden saved around 2% of GDP with respect to its neighbors in 2020 Q1.

- *# NOTE: norway quarterly GDP data may be off by a month*

# Cost of life calculation

Sweden avoided the GDP drop of its neighbors in 2020Q1.

What if Sweden had the death rate of Norway, but GDP will have fallen as much as in Norway in the 2020Q2.? What's the GDP gain per unit of life lost?

```
• begin
•   death_rate_NOR = total_deaths("Norway") / get_pop("NO")
•   death_rate_SWE = total_deaths("Sweden") / get_pop("SE")
• end;

• begin
•   # annual GDP for Sweden in current USD
•   annual_GDP_SWE_USD = get_data(f, "MKTGDPSEA646NWDB").data["value"][][]
• 
•   # quarterly value
•   quarterly_GDP_SWE_USD = annual_GDP_SWE_USD / 4
• 
•   # counter_factual_deaths if Sweden had Norway mortality rate
•   counter_factual_deaths_saved_SWE = get_pop("SE") *
•     (death_rate_SWE - death_rate_NOR)
• 
•   idx_NOR = findfirst(
•     x -> x >= Dates.Date(2020,01,01),
•     norway_gdp.data["date"])
• )
•   idx_SWE = findfirst(
•     x -> x >= Dates.Date(2020,01,01),
•     sweden_gdp.data["date"])
• )
• 
•   # counter factual GDP loss if Sweden GDP would have fallen in 2020 Q2 by the same
•   # amount as Norway
•   counter_factual_gdp_loss_SWE_USD = quarterly_GDP_SWE_USD *
•     (1 - normalize(norway_gdp)[idx_NOR] / normalize(sweden_gdp)[idx_SWE])
• end;

value_of_life = 466818.0247820191
• value_of_life = counter_factual_gdp_loss_SWE_USD / counter_factual_deaths_saved_SWE
```

The counter factual value of life is **USD 466,818.**

## Auxiliary functions

- `using Suppressor`

`normalize` (generic function with 1 method)

```
• function normalize(series; date=Dates.Date(2019,10, 1))
•     idx = findfirst(x -> x >= date, series.data["date"])
•     series.data["value"] / series.data["value"][idx]
• end
```

#### normalized\_gdp\_plots (generic function with 1 method)

```
• function normalized_gdp_plots(; range=20, legendpos=:bottom)
•     fig = plot(
•         sweden_gdp.data["date"][end-range:end],
•         log.(normalize(sweden_gdp)[end-range:end]),
•         label="SWE", lw=2, marker=:auto,
•         legend=legendpos,
•         title="Log Quarterly Real GDP, SA\n2019Q4 = 0")
•     plot!(fig,
•         denmark_gdp.data["date"][end-range:end],
•         log.(normalize(denmark_gdp)[end-range:end]),
•         label="DNK", lw=2, marker=:auto)
•     plot!(fig,
•         norway_gdp.data["date"][end-range:end],
•         log.(normalize(norway_gdp)[end-range:end]),
•         label="NOR", lw=2, marker=:auto)
•     plot!(fig,
•         finland_gdp.data["date"][end-range:end],
•         log.(normalize(finland_gdp)[end-range:end]),
•         label="FIN", lw=2, marker=:auto)
•     return fig
• end
```

#### total\_deaths (generic function with 1 method)

```
• function total_deaths(country)
•     DATE_STR = r"^\d{1,2}\/\d{1,2}\/\d{2}$"
•     return filter(x-> x["Country/Region"] === country, df[:global_deaths]) |>
•             x -> x[!, DATE_STR] |>
•             x -> mapcols(sum ∘ skipmissing, x) |>
•             x -> x[end][1]
• end
```

#### commas (generic function with 1 method)

```
• # https://stackoverflow.com/questions/52213829/in-julia-insert-commas-into-integers-for-printing-like-python-3-6
•
• function commas(num::Integer)
•     str = string(num)
•     return replace(str, r"(?<=[0-9])(?=(?:[0-9]{3})+)?![0-9])" => ",")
• end
```

#### with\_terminal (generic function with 1 method)

```
• function with_terminal(f)
•     local spam_out, spam_err
•     @color_output false begin
•         spam_out = @capture_out begin
•             spam_err = @capture_err begin
•                 f()
•             end
•         end
•     end
•     spam_out, spam_err
• end
```

```
•     HTML("""
•     •         <style>
•     •             div.vintage_terminal {
•     •                 }
•     •             div.vintage_terminal pre {
•     •                 color: #ddd;
•     •                 background-color: #333;
•     •                 border: 5px solid pink;
•     •                 font-size: .75rem;
•     •             }
•     •
•     •         </style>
•     •     <div class="vintage_terminal">
•     •         <pre>$({Markdown.html esc(spam_out)})</pre>
•     •     </div>
•     • """
•   end
```