Transmission of SARS-CoV-2 and mortality of COVID-19

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May 23, 2022

COVID-19 is a respiratory diseases caused by the virus SARS-CoV-2. SARS-CoV-2 originated in Wuhan, China in late 2019 and subsequently caused a worldwide pandemic leading to the death of tens of millions of people. Vaccines for SARS-CoV-2 first became available in late 2020. SARS-CoV-2 vaccines are strongly protective against severe illness and death. As a result, since early 2021 there has been a decoupling between the number of SARS-CoV-2 cases and mortality due to COVID-19.

The UGA COVID-19 working group has created a tracker allowing the user to visualize trends in data sourced from various providers. These data, updated daily, may be viewed online, and downloaded using the following code:

```
library(here) # for building file paths relative to project root directory ("here")

source('R/get_covid_data.R')

# Download, save and load data into R
# The dataset is a very large file.
# For efficiency, the code below will download fresh data only once per day.

# data filename for today (tagged with today's date)
filename <- paste0("covid_data_",format(Sys.Date(), format="%Y%m%d"))
fullpath <- here::here(paste0("data/",filename,'.rds'))

# load existing data, or download and save fresh data
if (file.exists(fullpath)) {
  # load data from saved file
  covid_data <- readRDS(file = fullpath)
} else {
  # download fresh data
  covid_data <- get_covid_data()
  # save newly downloaded data locally, in the "data/" folder
  saveRDS(covid_data, fullpath)
}
```

Your task is to create a visualization to investigate and quantify the decoupling of SARS-CoV-2 cases and mortality in the US. What pattern of decoupling do you observe? Did this decoupling happen in different ways in different parts of the country? Does the national average reflect state-level trends?