

COVID-19 Data Analysis: Investigating the Importance of Testing Strategies and Vaccination Programs

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Aim of the project

- Identify important indicators for epidemic situations
- Find empiric evidence of mostly known facts
 - Importance of testing
 - Influence of vaccinations
- How do some countries manage epidemic so well?
 - Inspect and compare fatalities
 - testing strategies of different countries

Data

Our World in Data

- 192 countries
- 60+ variables
- National reporting authorities
- Collected by OWID members



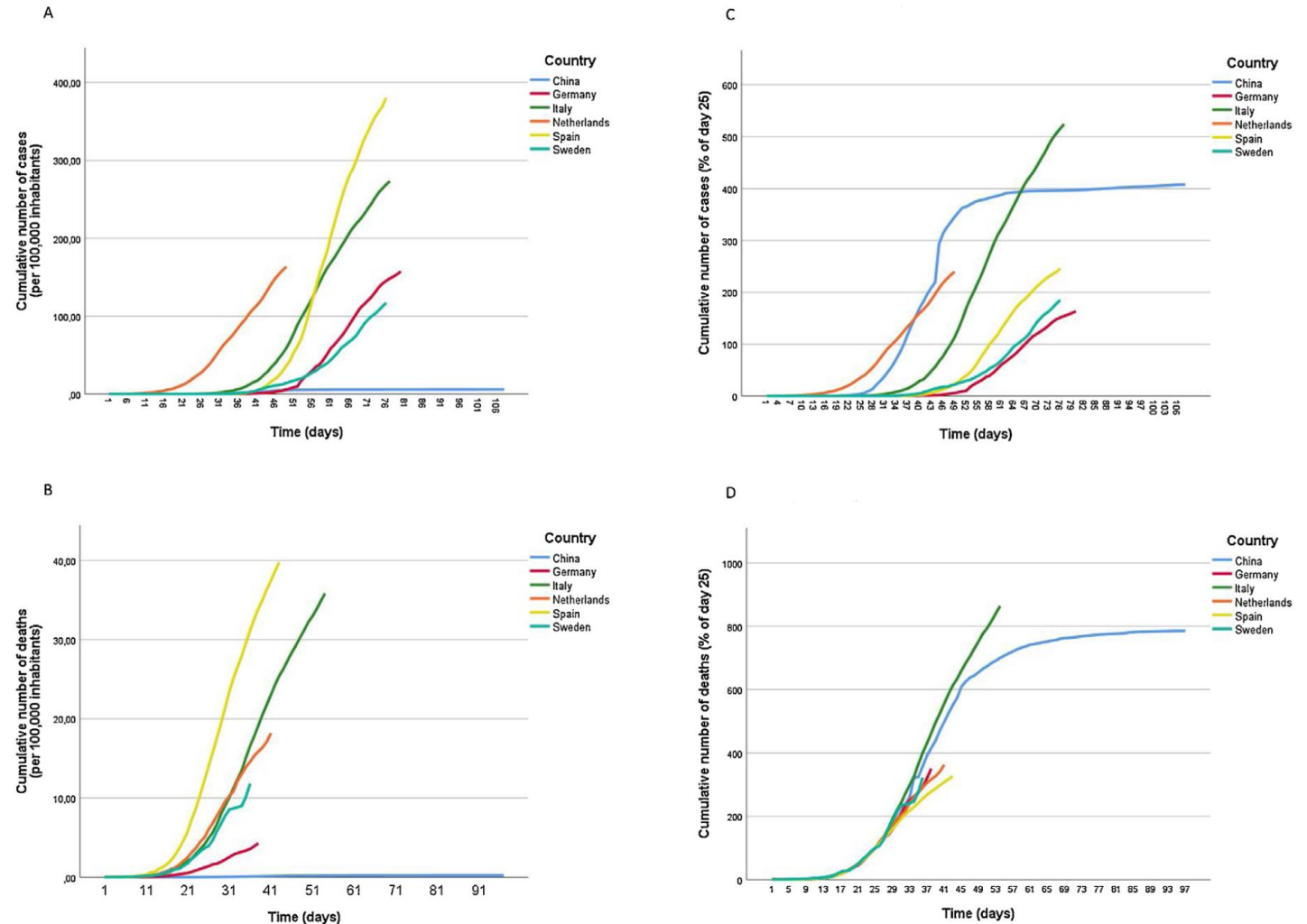
Comparing Countries

Difficulties

- Local outbreaks (cp. Italy)
- Different points in time
- Testing strategies
- Socioeconomic factors

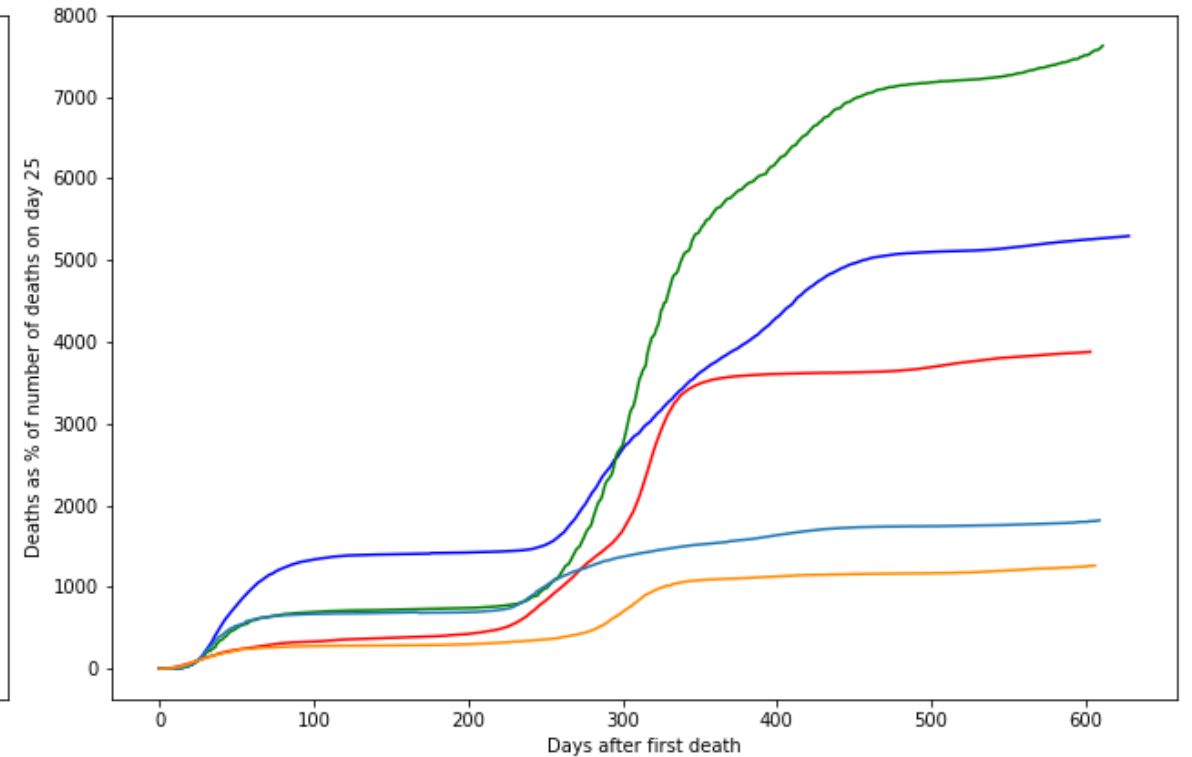
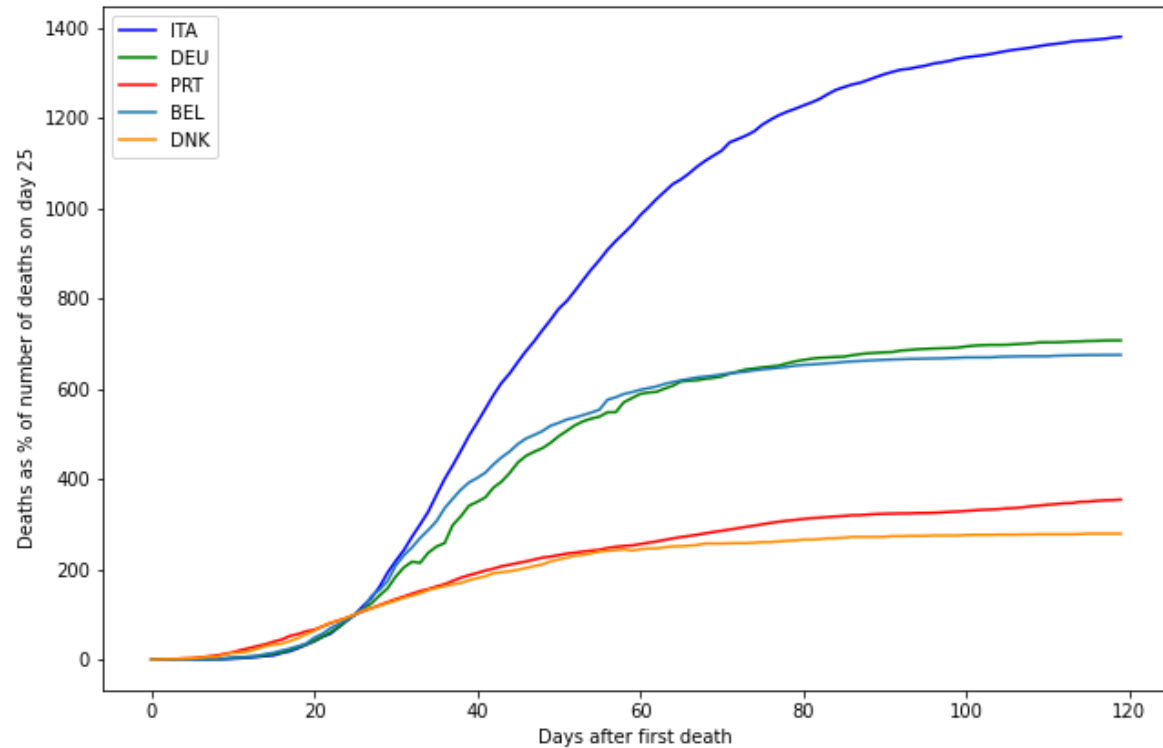
Middelburg & Rosendaal (2020)

- Temporal alignment
- Deaths rather than cases
- Deaths as % of deaths on day 25 (panel D)



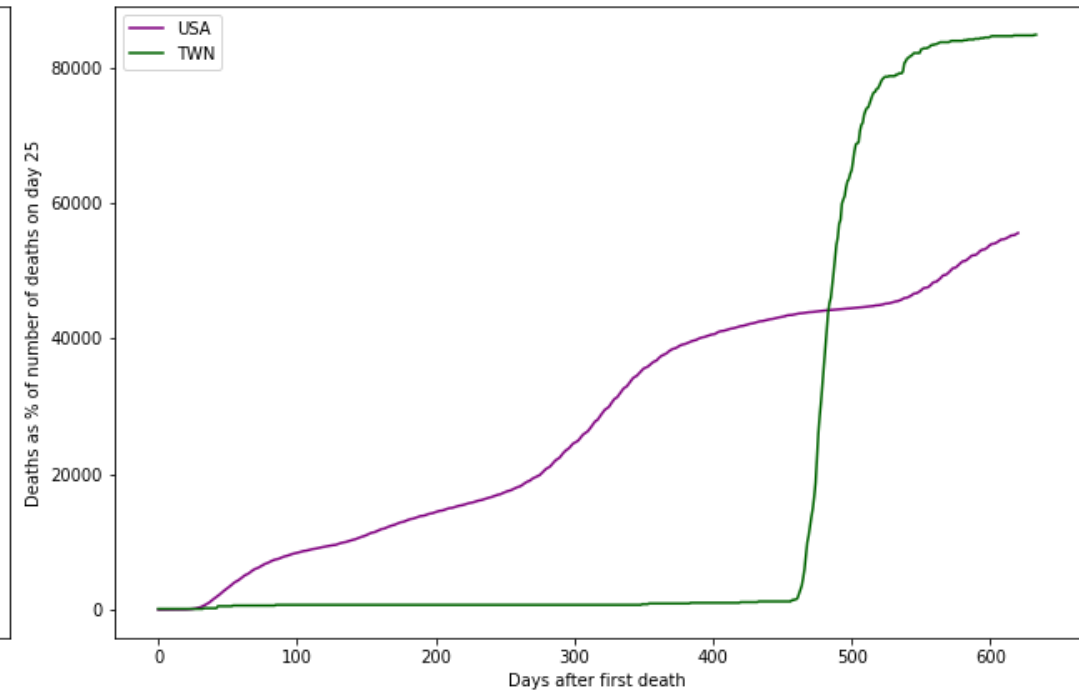
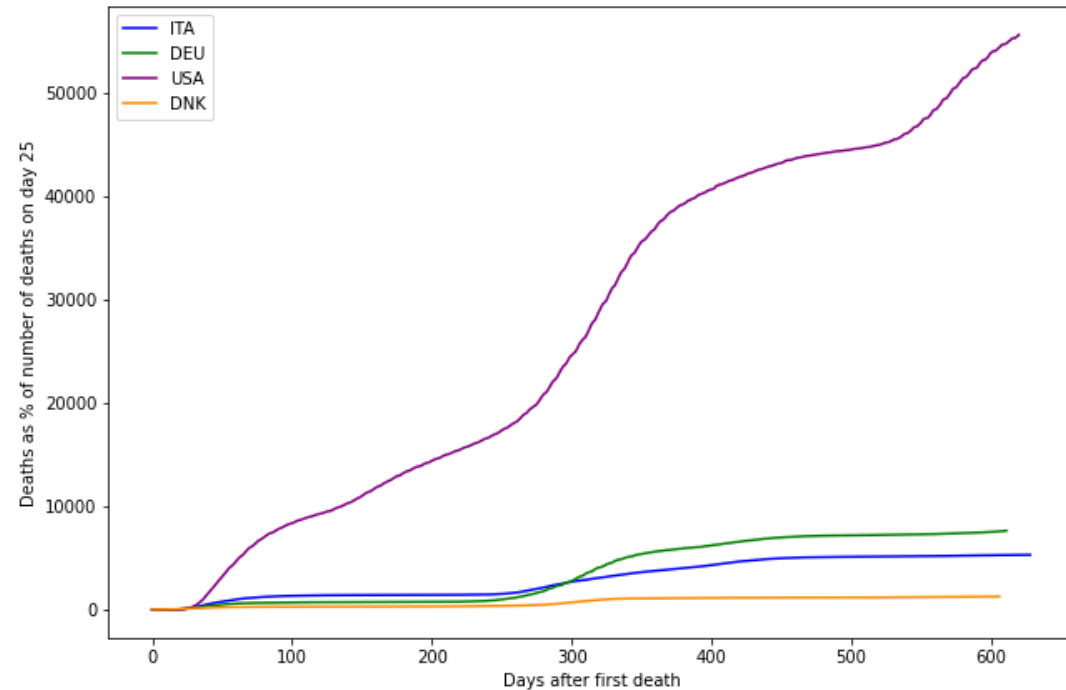
Source: Middelburg & Rosendaal (2020)

Applying Middelburg & Rosendaal's method

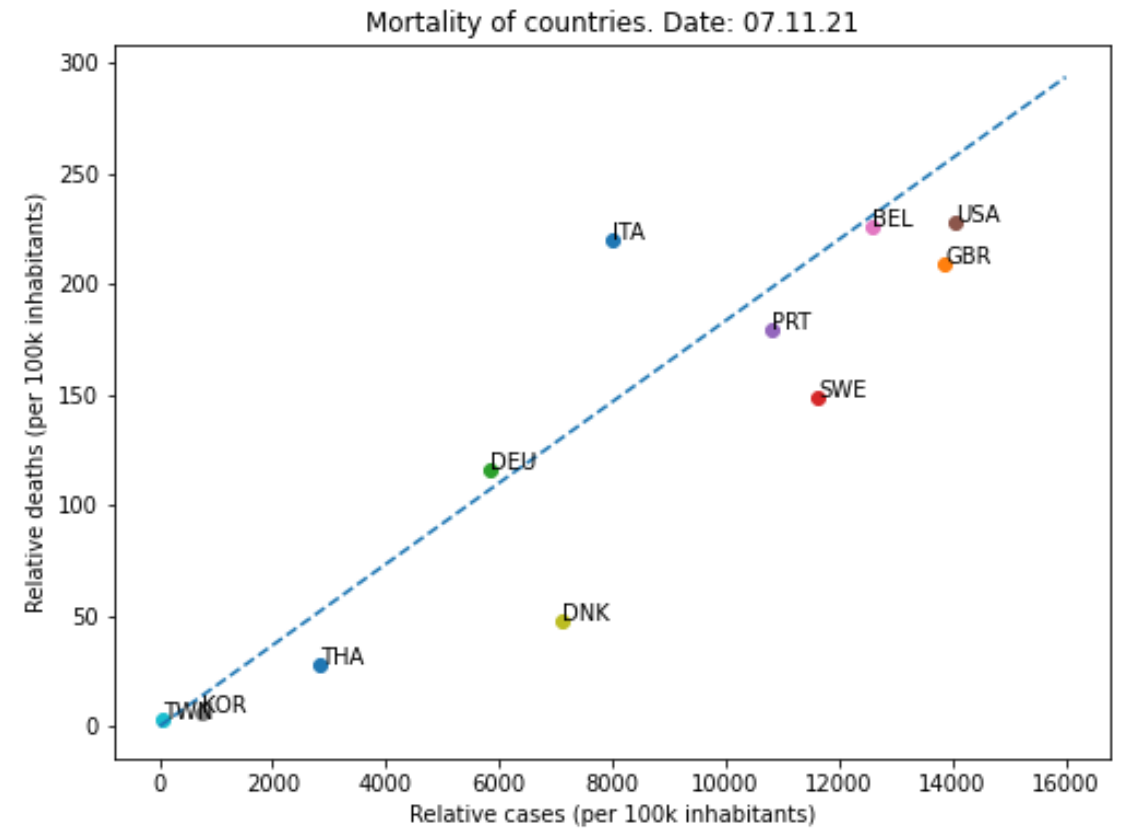
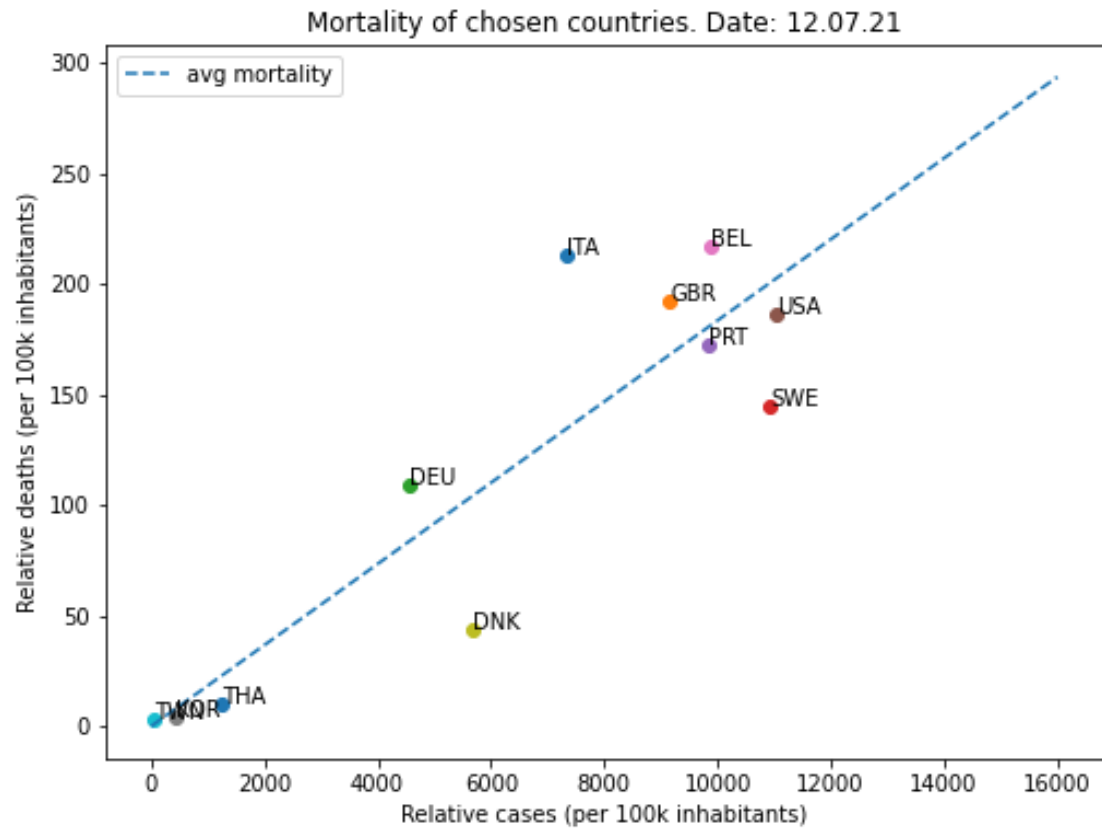


Limitations of the method

- Drastic scale difference makes comparison difficult
- Comparison of subsequent waves?

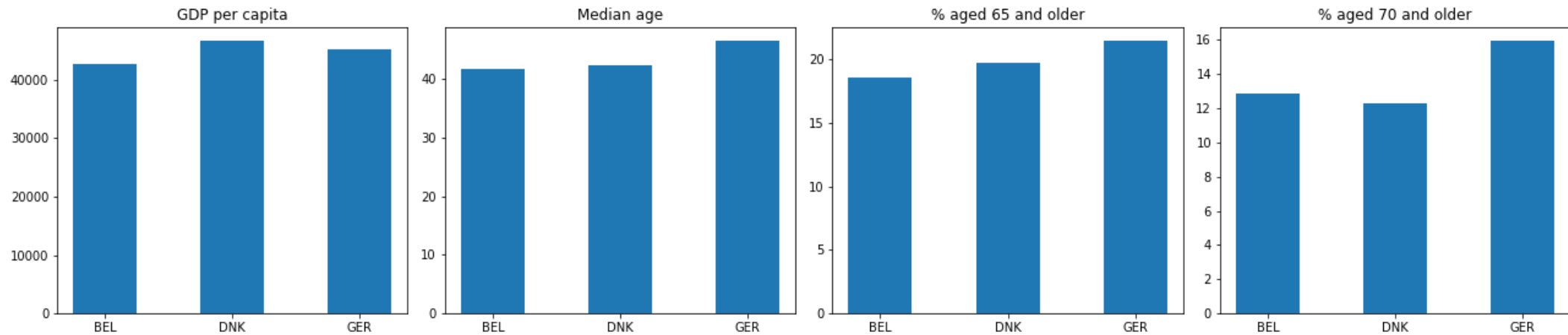


Mortality as a first indicator



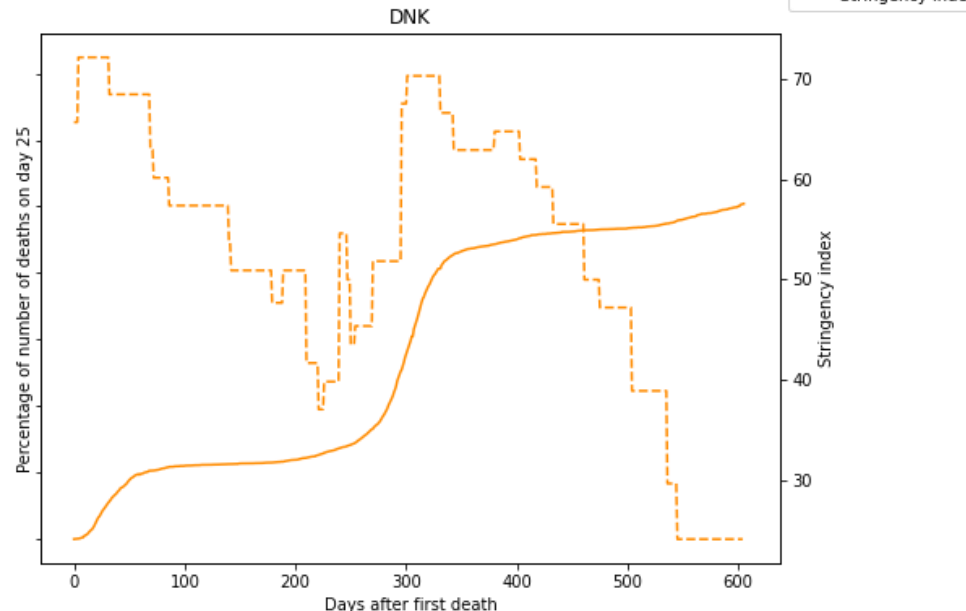
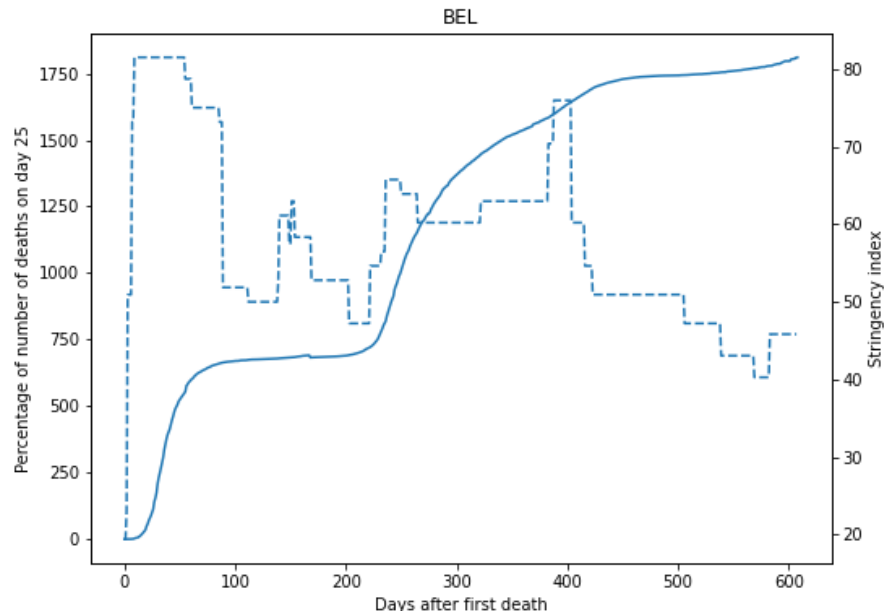
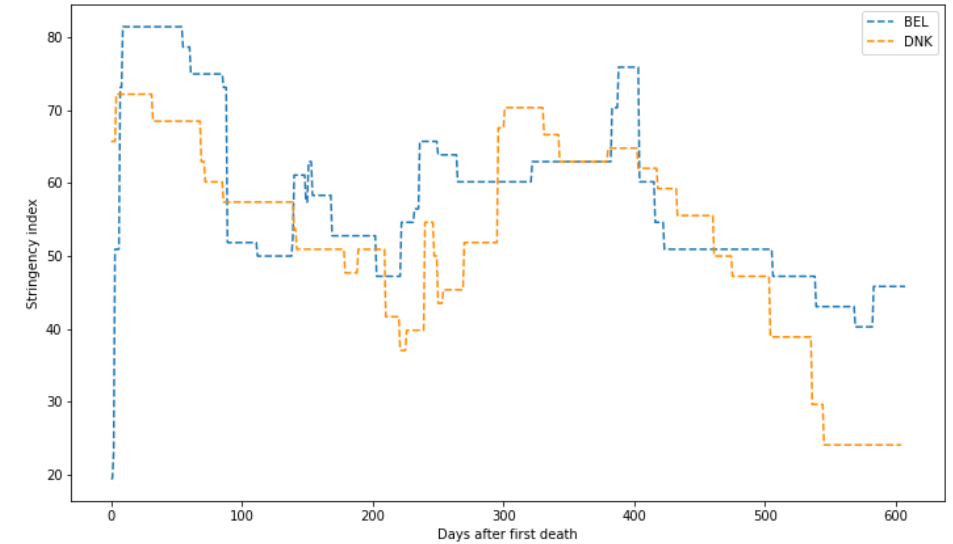
Belgium and Denmark

- Socioeconomic factors influence course of the pandemic (Mena et al. 2021)
- Population
 - Denmark: 5.8 M
 - Belgium: 11.5 M



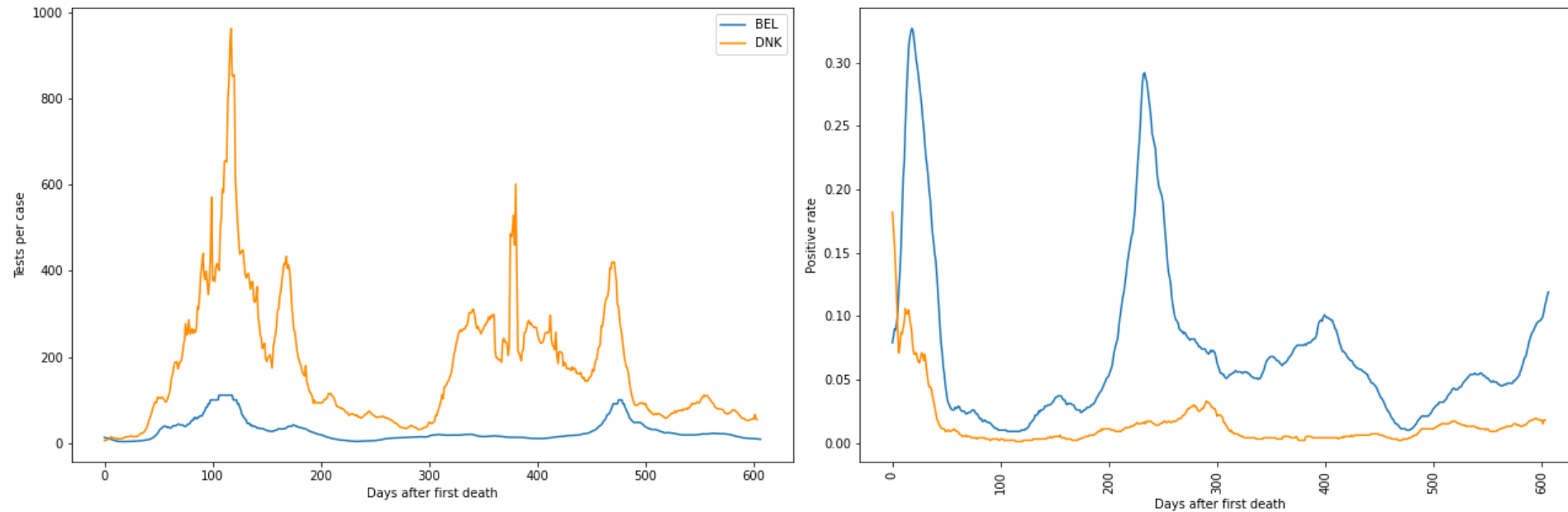
Lockdowns – the stricter the better?

- Oxford Stringency Index as policy measurement
- 0 = no restrictions; 100 = maximum restrictions

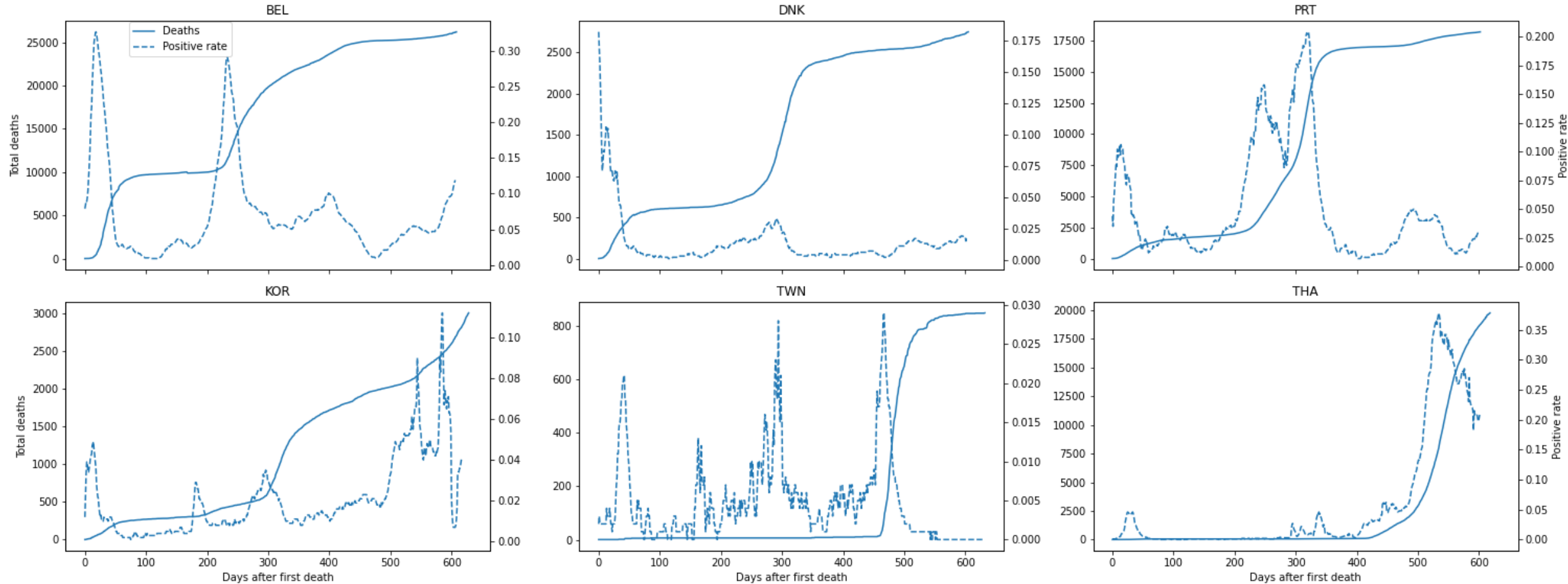


Testing strategies

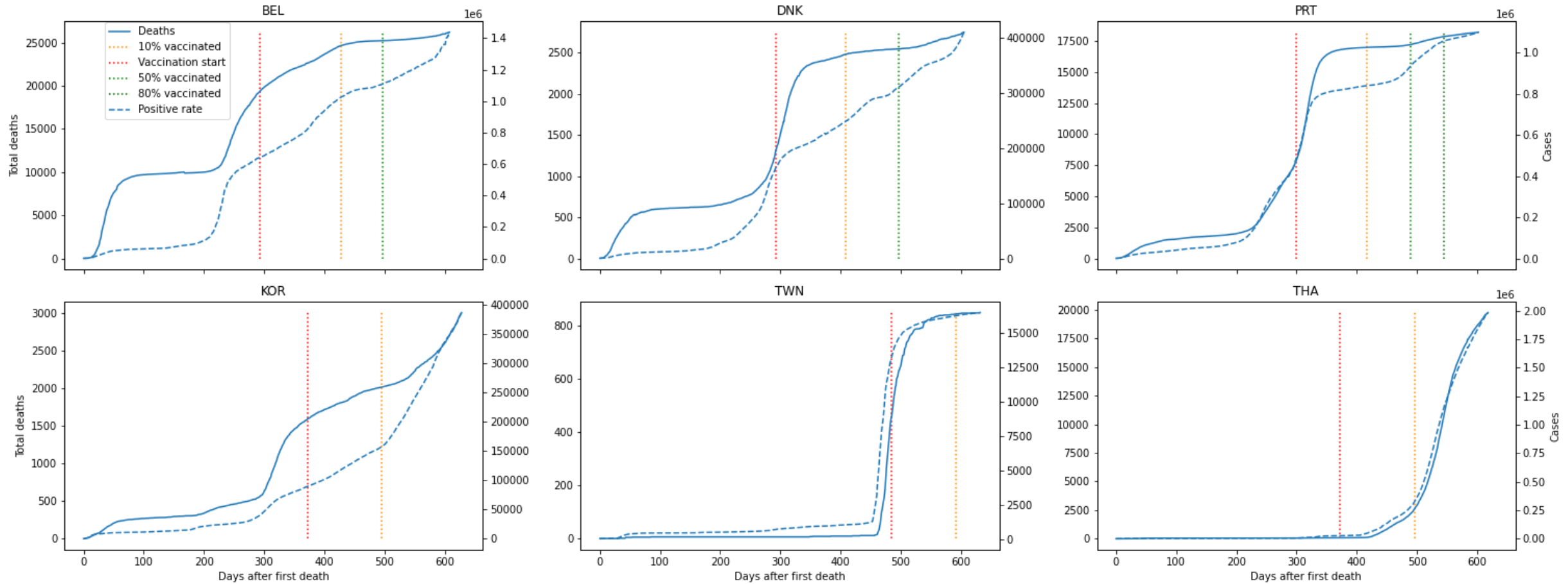
- WHO (2020): positive rate below 5% indicator that epidemic is under control



Positive rate as indicator



Effect of Vaccinations



Conclusion

- Countries differ drastically in management of pandemic
- Important factors
 - Incidence, Lockdowns, testing strategies, vaccinations
- Positive rate as additional indicator of epidemic situation
 - Identification of "under-testing"
 - More testing reduces need for strict lockdown
- Limitations
 - Seasonal effects, virus variants

References

R. A. Middelburg and F. R. Rosendaal, “Covid-19: How to make between-country comparisons,” *International Journal of Infectious Diseases*, volume 96, pages 477–481, 2020.

G. E. Mena, P. P. Martinez, A. S. Mahmud, P. A. Marquet, C. O. Buckee, and M. Santillana, “Socioeconomic status determines covid-19 incidence and related mortality in santiago, chile,” *Science*, volume 372, number 6545, 2021.

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W. H. Organization et al., “Public health criteria to adjust public health and social measures in the context of covid-19: Annex to considerations in adjusting public health and social measures in the context of covid-19, 12 may 2020,” *World Health Organization, Tech. Rep.*, 2020.