



## "Effect of income inequality on COVID-19 pandemic: Evidence from European countries"

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### ABSTRACT

Evidence from research on infectious diseases suggests that income inequality is related to higher rates of infection and death in disadvantaged population groups. Our objective is to examine whether there was an association between income inequality and the numbers of cases and deaths during the first wave of the COVID-19 pandemic in European countries. We determined the duration of the first wave by first smoothing the number of daily cases, and then using a LOESS regression to fit the smoothed trend. Next, we estimated quasi-Poisson regressions. Results from the bivariate models suggest there was a moderate positive association between the Gini index values and the cumulated number of infections and deaths during the first wave, although the statistical significance of this association disappeared when controls were included. Results from multivariate models suggest that higher numbers of infections and deaths from COVID-19 were associated with countries having more essential workers, larger elderly populations and lower health care capacities.

### CITE THIS VERSION

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# Effect of income inequality on COVID-19 pandemic: Evidence from European countries

David A. Sánchez-Páez

## Background

- More inequitable countries have worse health outcomes.
- From LDC, the higher the income inequality, the greater the impact of COVID.

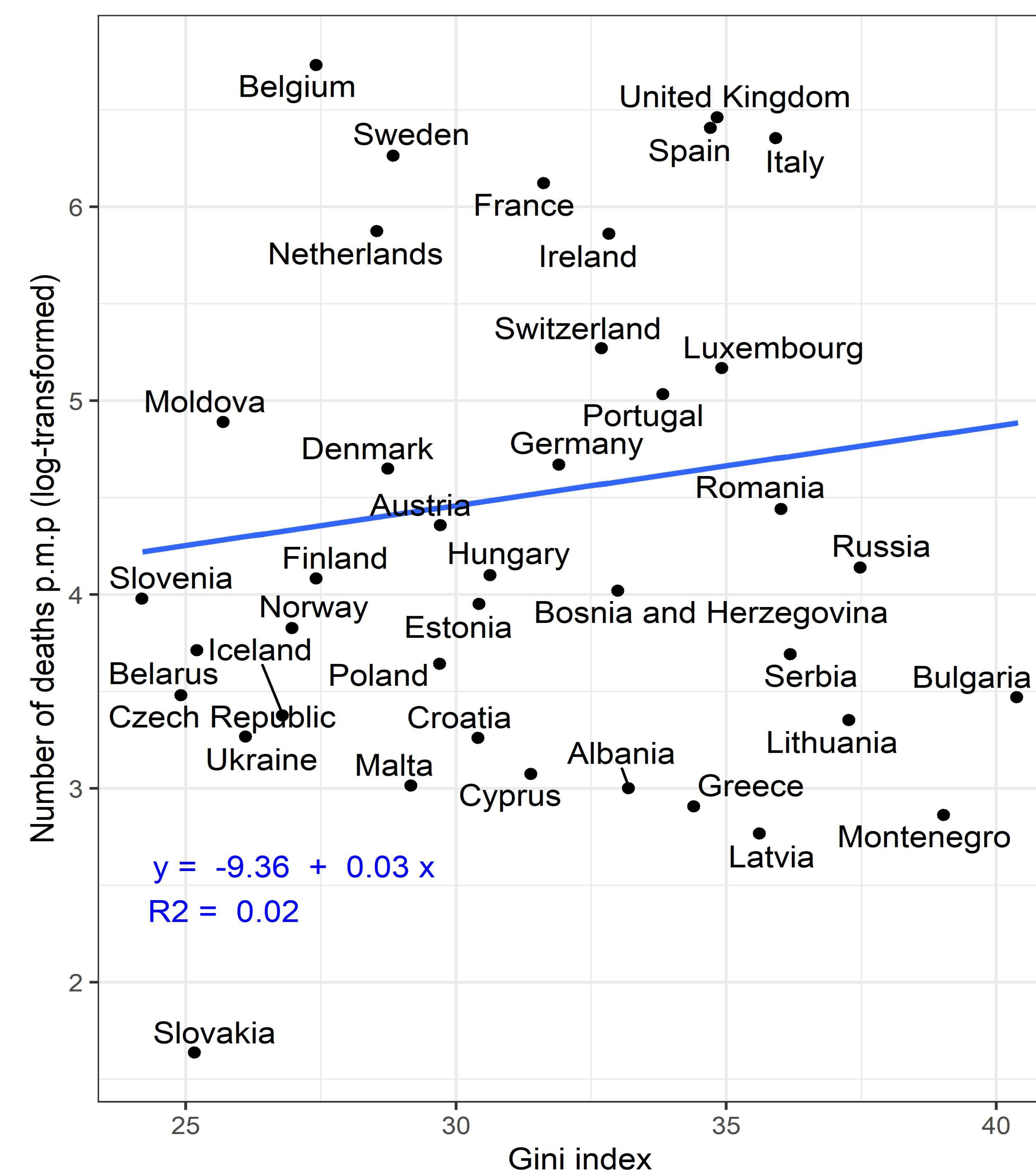
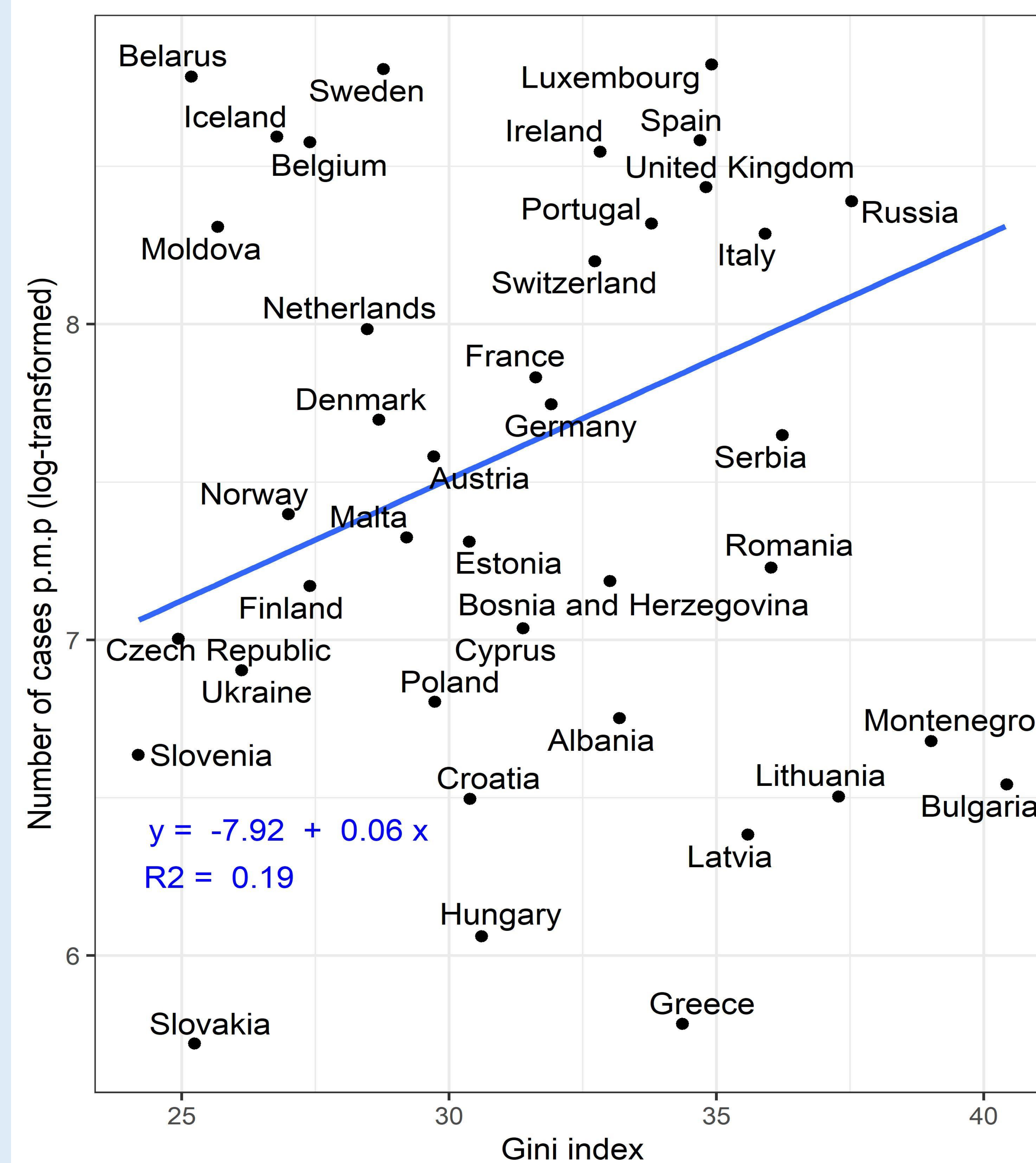
## Research question

Has income inequality among European countries exacerbated COVID's impact?

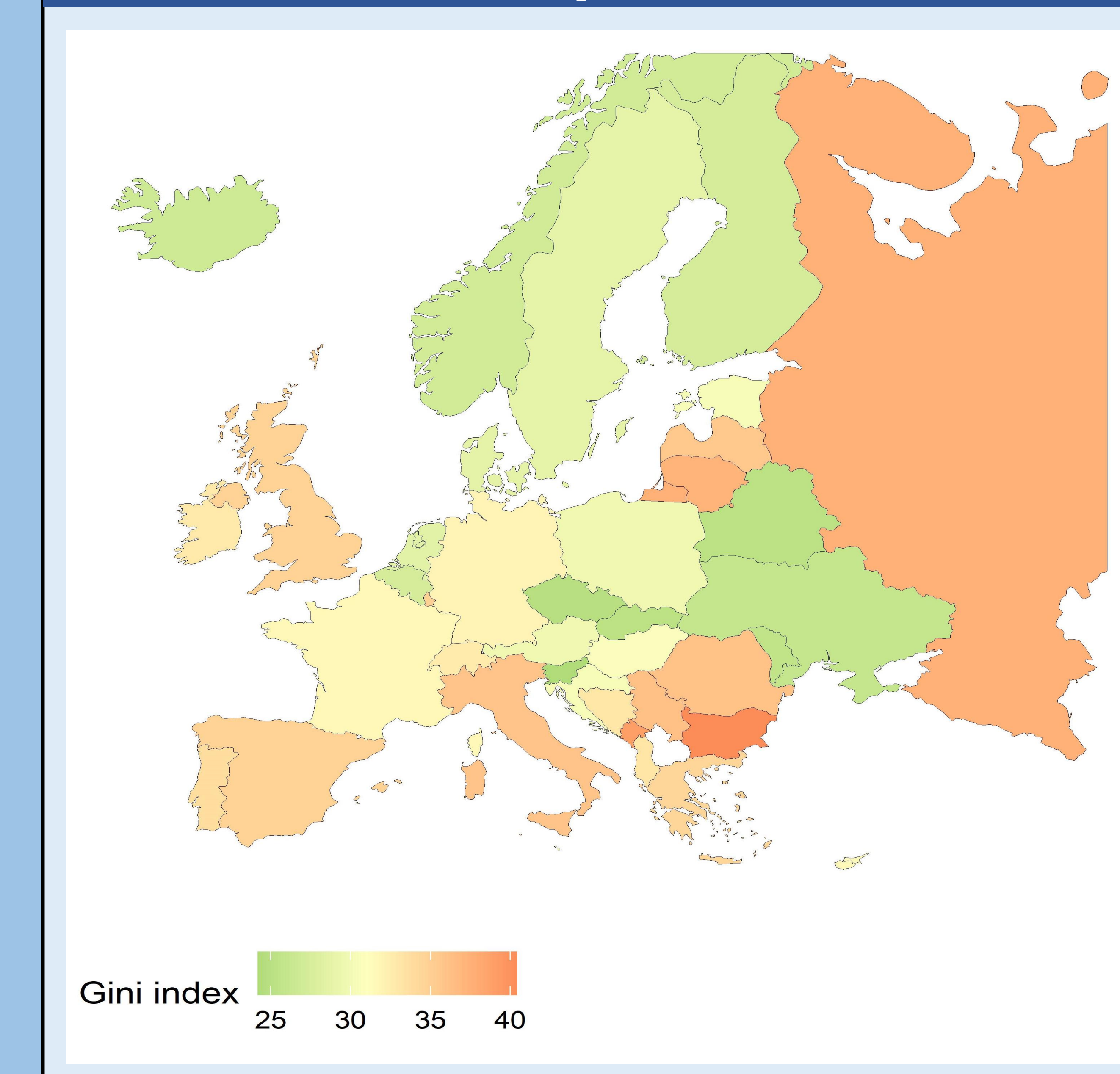
## Data and methods

- 39 countries.
- COVID data from Our World in Data. Other variables from United Nations, UNESCO, WHO, and World Bank. Cut-off date is 30/06/20.
- Poisson regressions including log of population as offset.

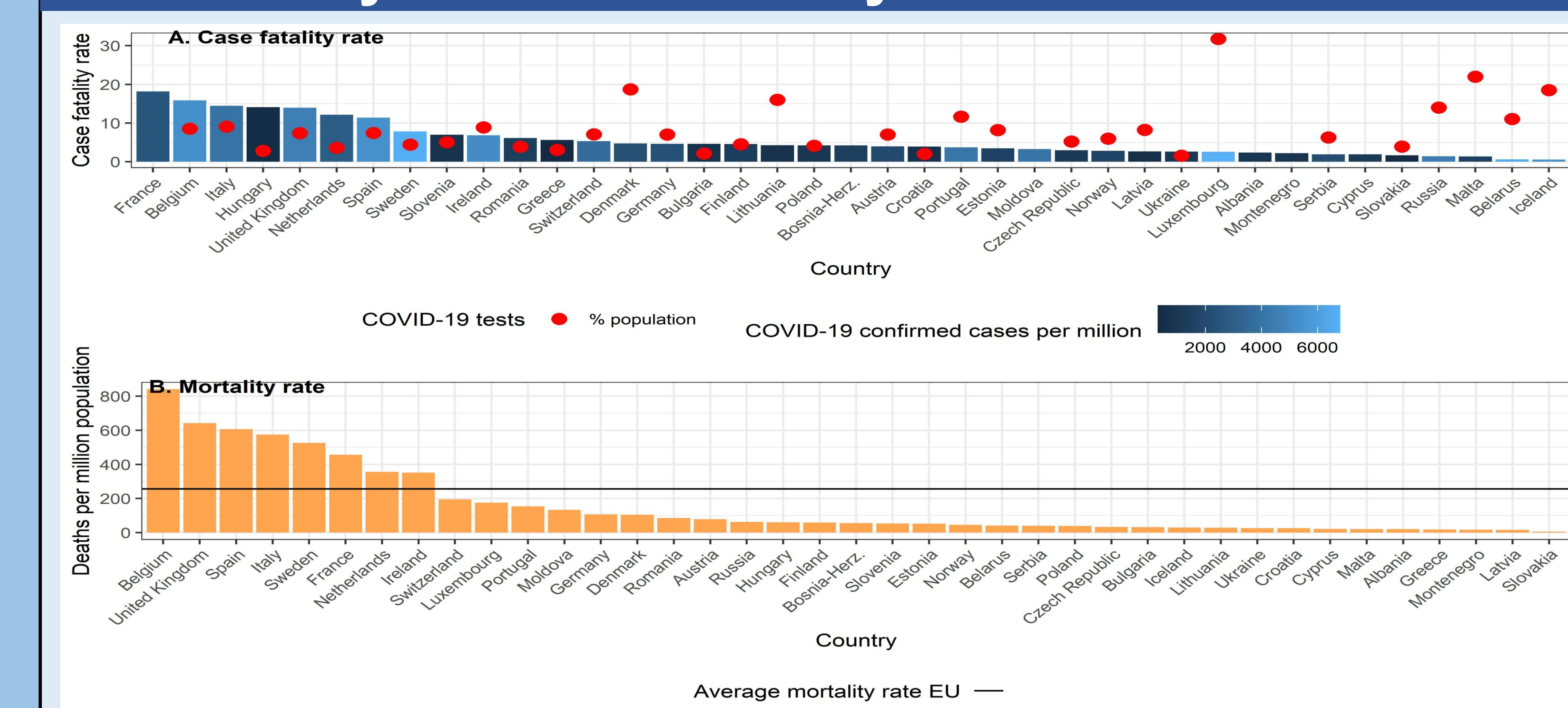
## Association between COVID-19 cases and deaths, and Gini index



## Gini index in European countries



## Case fatality rate and mortality rate



## Relative risk of Gini index on cases and deaths

Variable	Cases		Deaths	
	[1]	CI 95%	[2]	CI 95%
Gini	1.07	1.07 - 1.07	1.05	1.05 - 1.05
GDP pc			1.00	1.00 - 1.00
Education			0.98	0.98 - 0.99
65+			0.88	0.87 - 0.88
Urbanization			1.03	1.03 - 1.03
Physicians			1.25	1.24 - 1.25
Beds			1.00	1.00 - 1.00
Model accuracy				
R-squared	0.19		0.65	0.02

## Conclusions

- COVID-19 has spread faster and the effects have been more adverse in countries with unequal income distribution.
- During the first wave, the probability of becoming infected and dying from COVID-19 increased with Gini index.
- It is not the level (GDP) but the distribution of income that matters.
- Education is inversely correlated.
- Older people have higher odds of death.
- In high populated areas, COVID spread faster and the chances of dying are higher.