

# Quantifying impacts of the COVID-19 pandemic through life expectancy losses

Jonas Schöley



@jschoeley



0000-0002-3340-8518

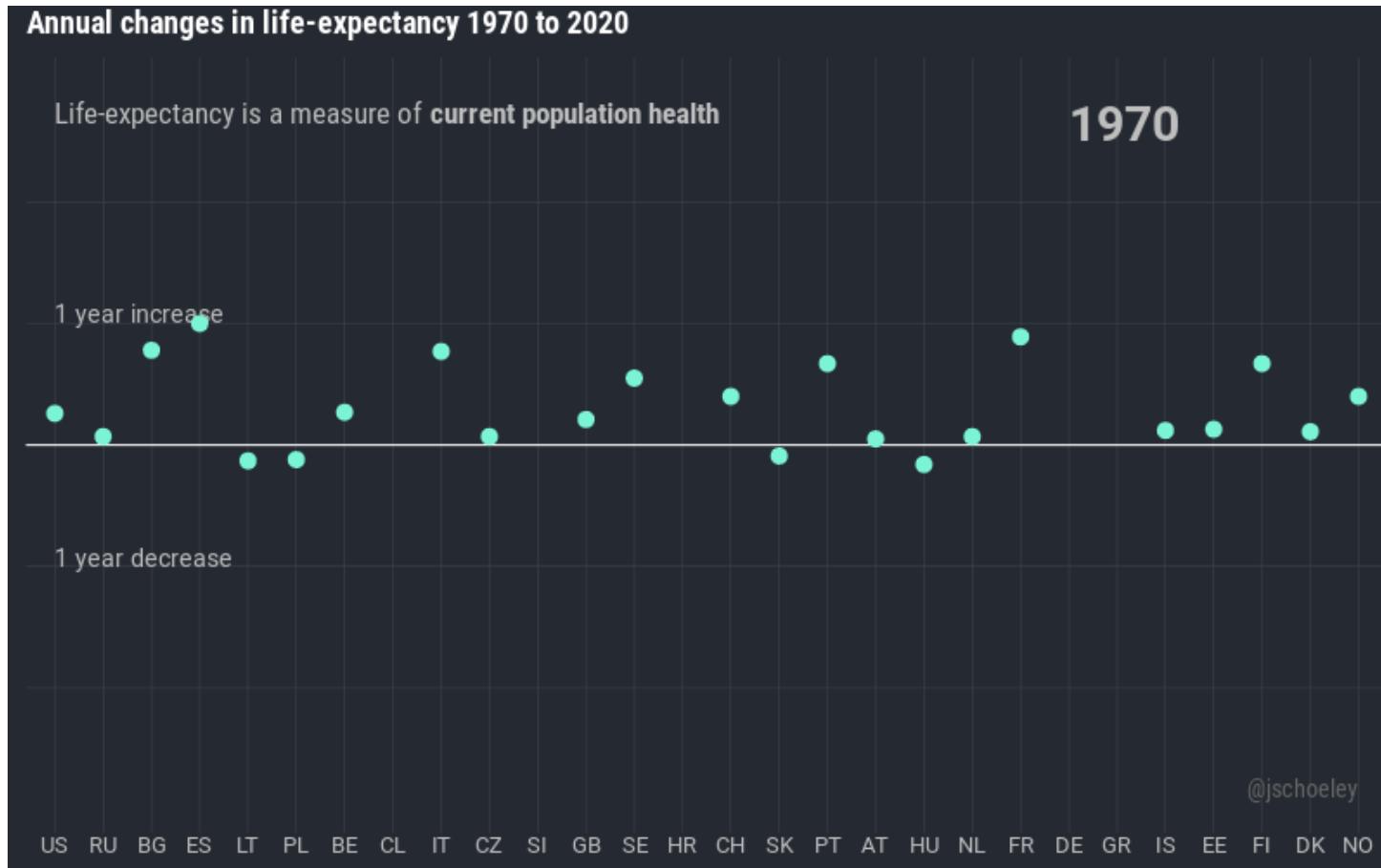


schoeley@demogr.mpg.de



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# Why life expectancy?



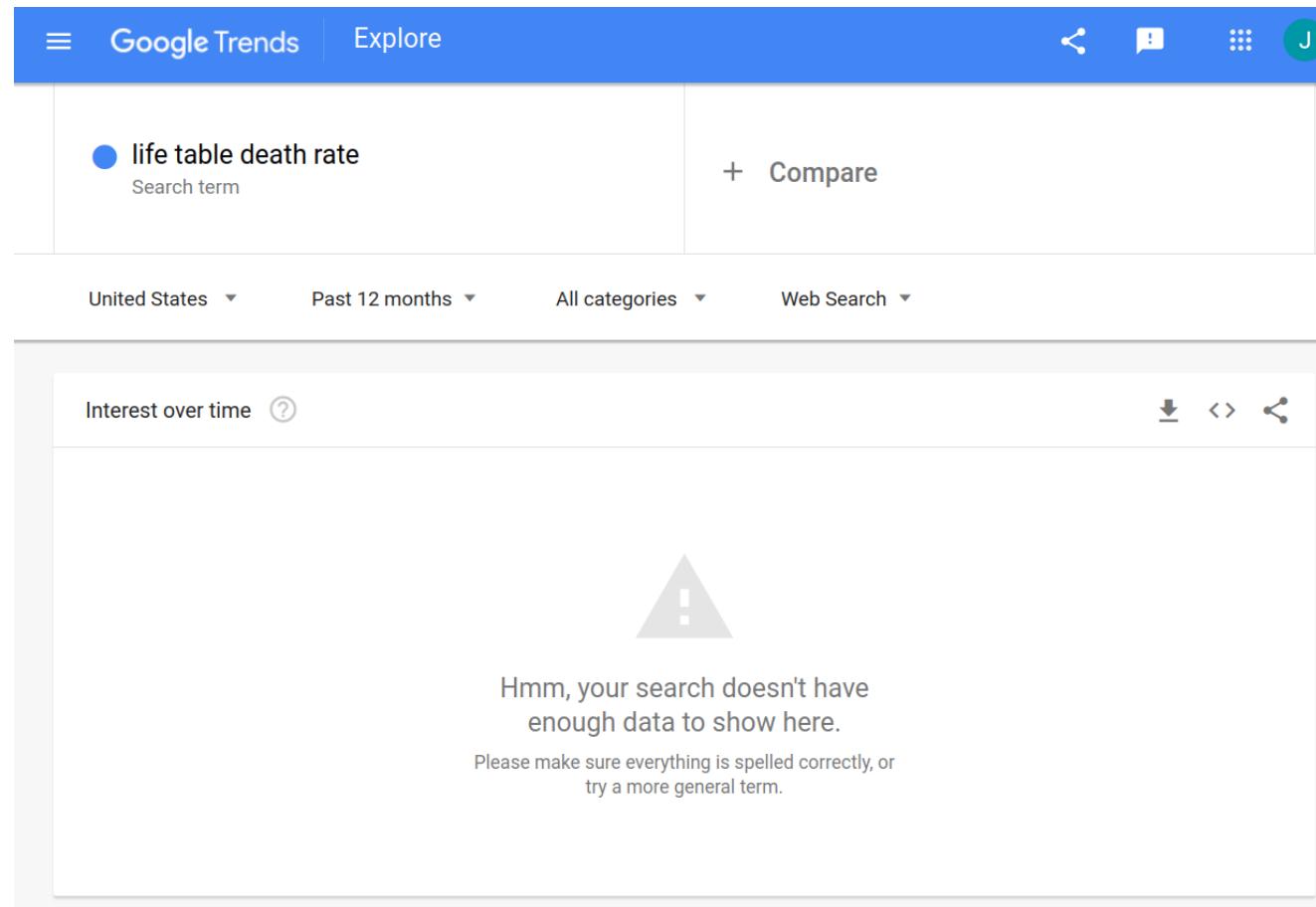
**Why  $e_0$**   
to quantify period shocks?

Why not  $1/e_0$ ?

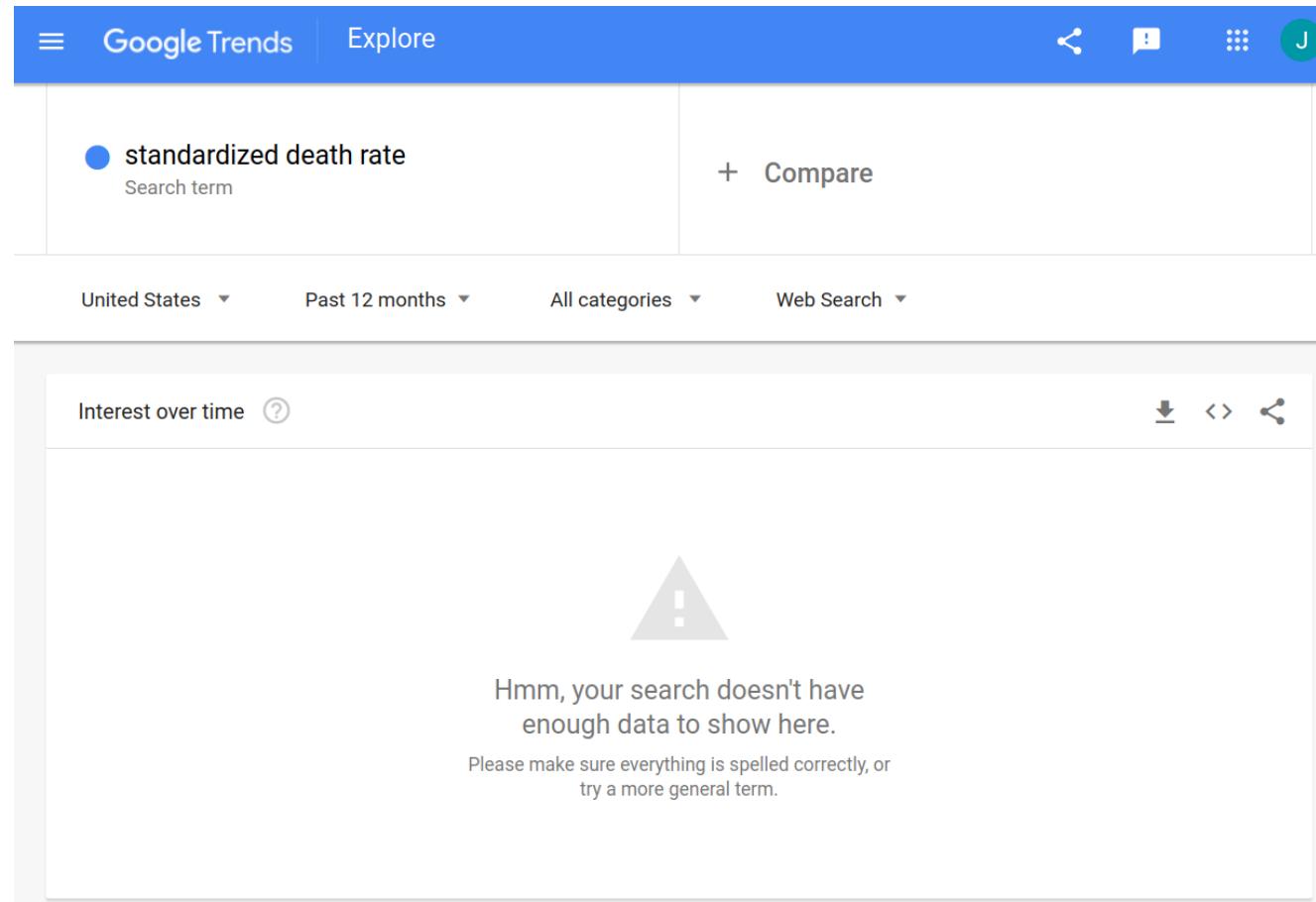
# Why? Attention!

1/e<sub>0</sub>

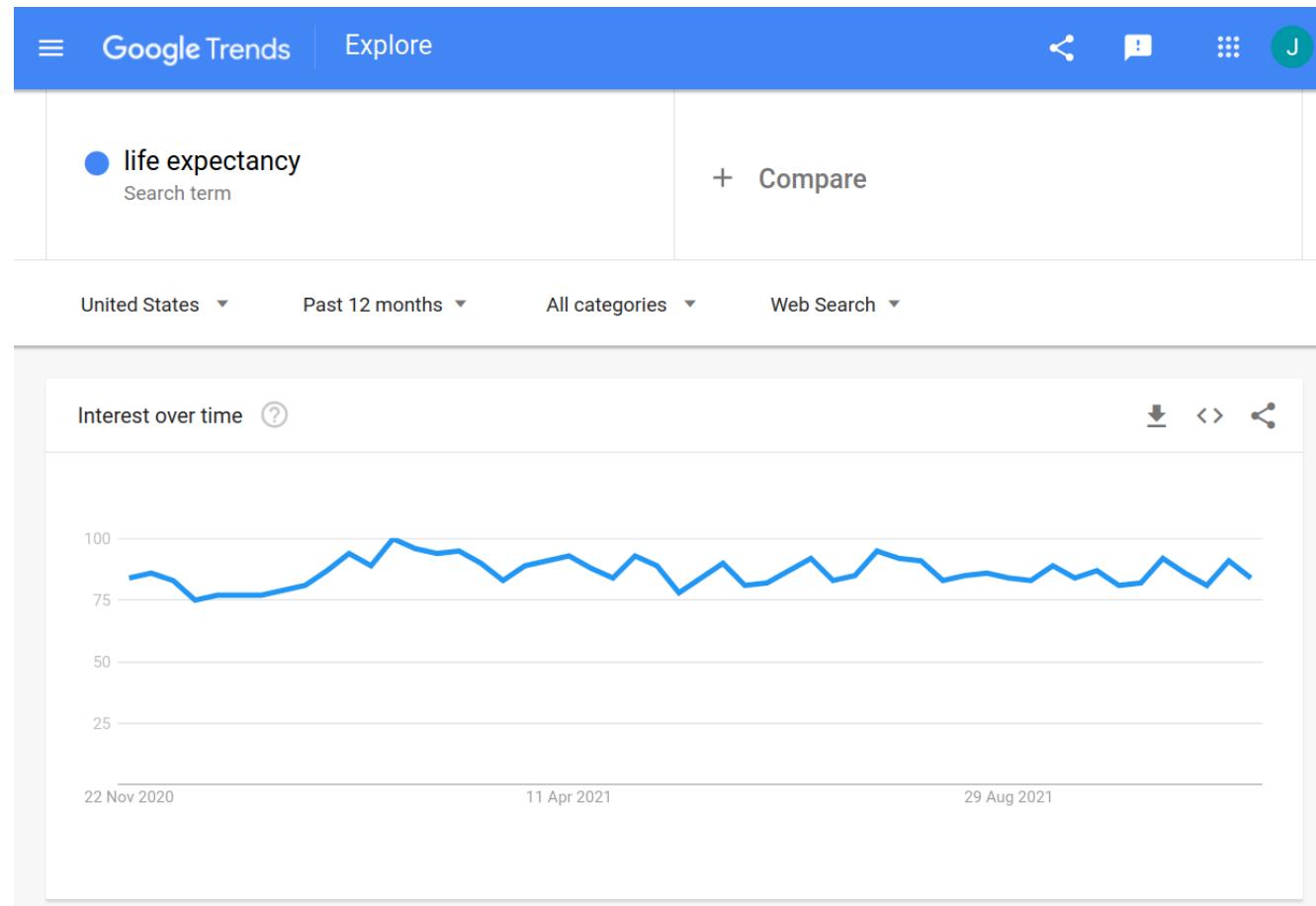
# Why? Attention!



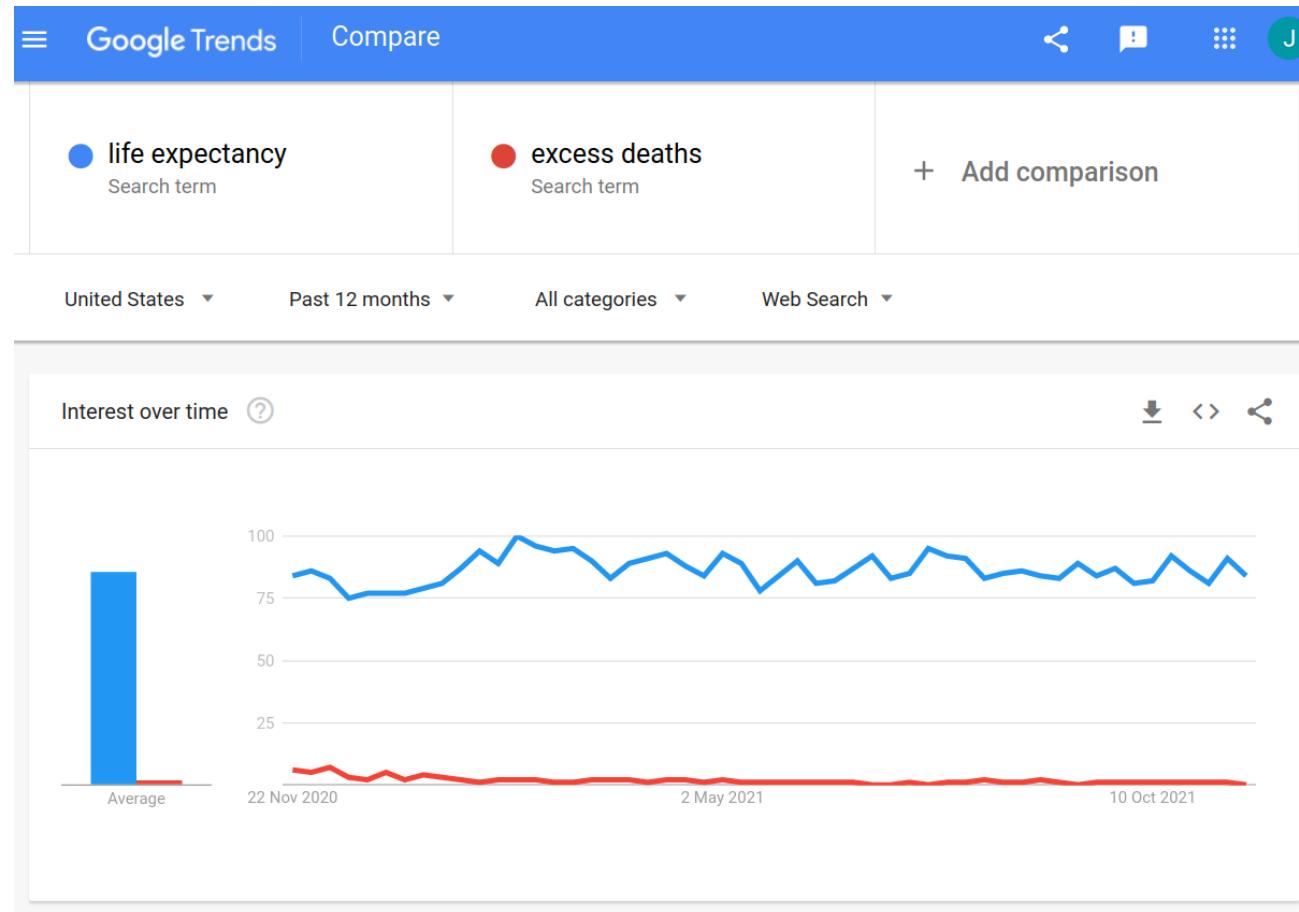
# Why? Attention!



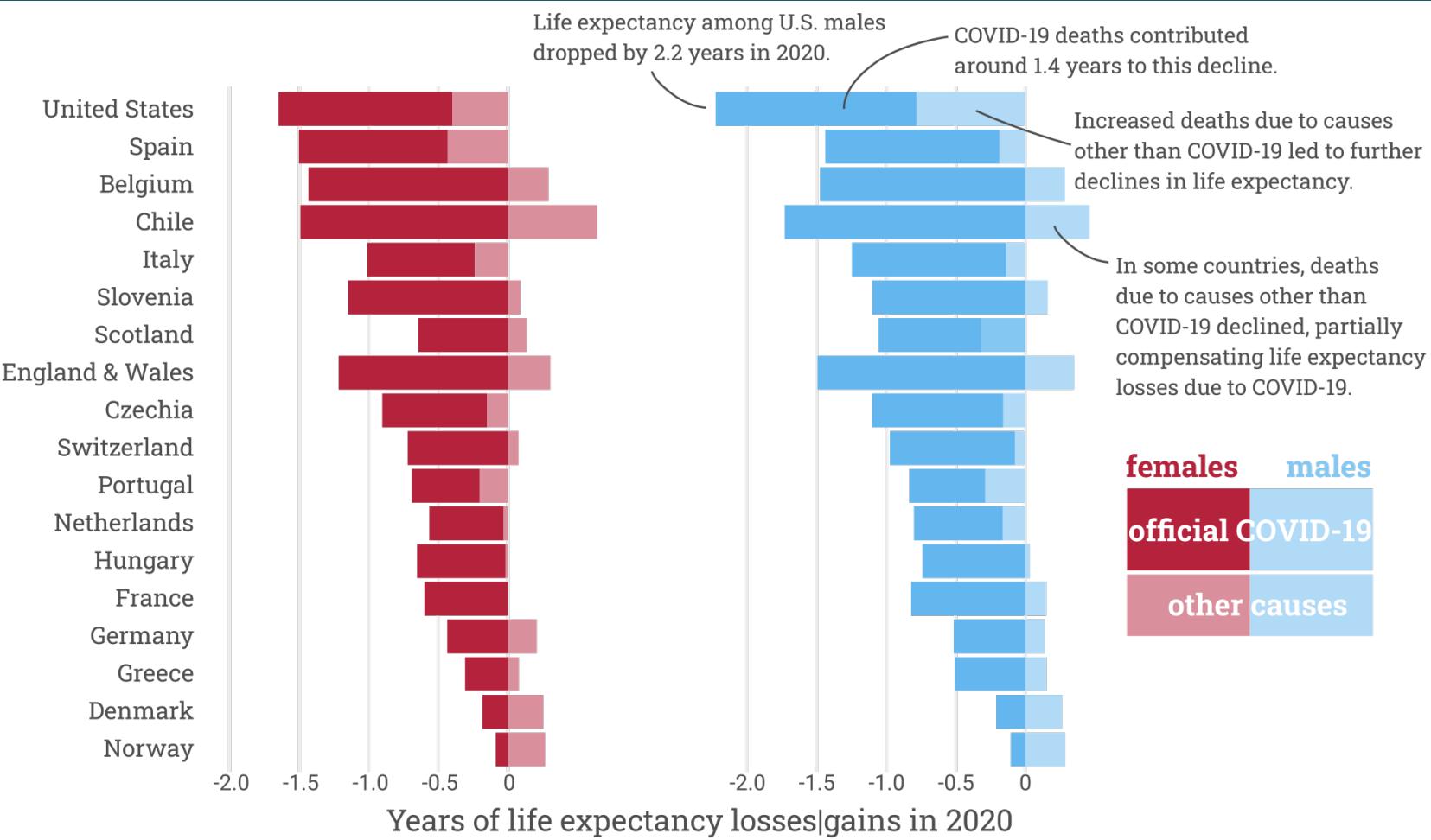
# Why? Attention!



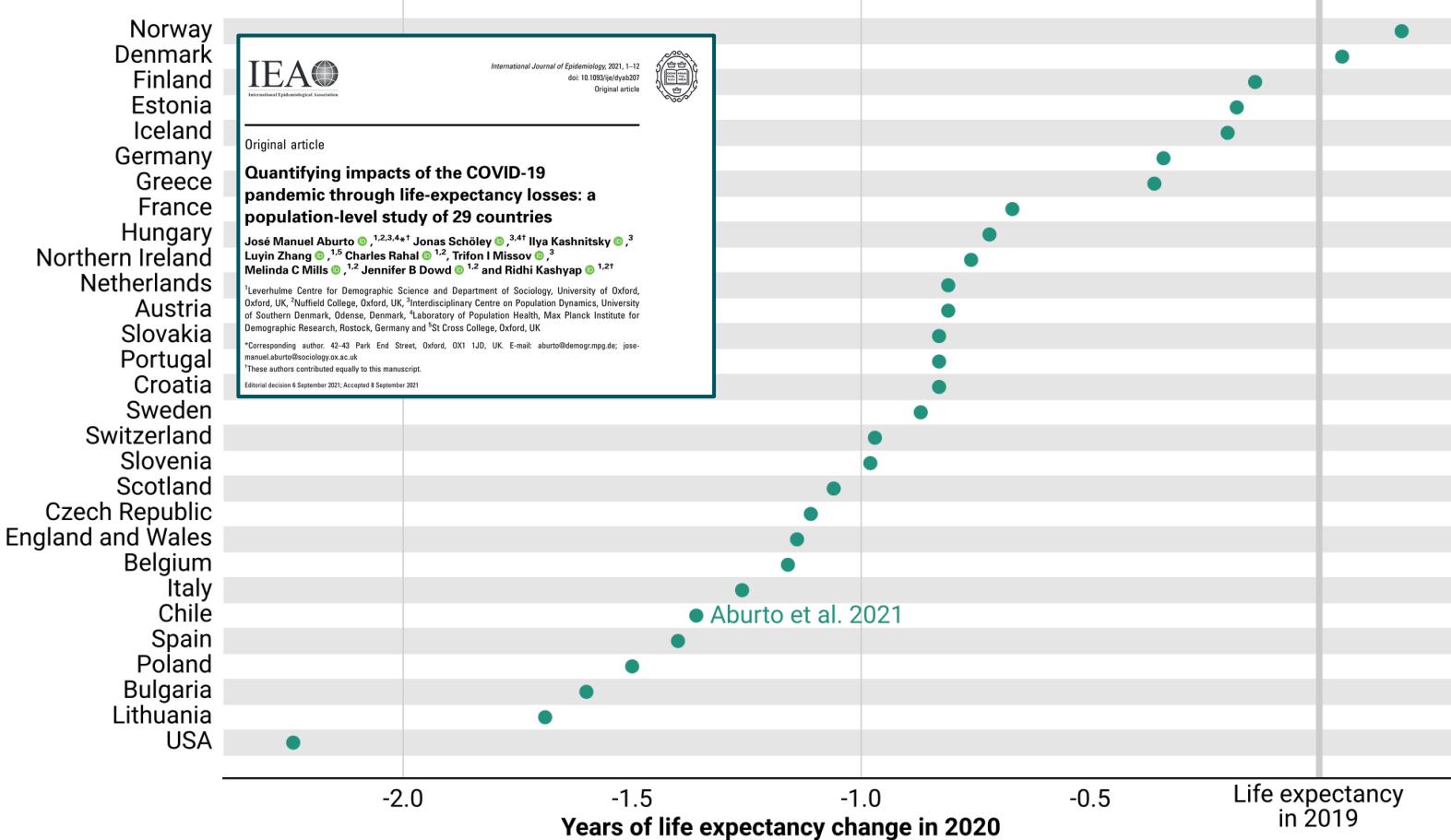
# Why? Attention!



# Why? Decomposition!



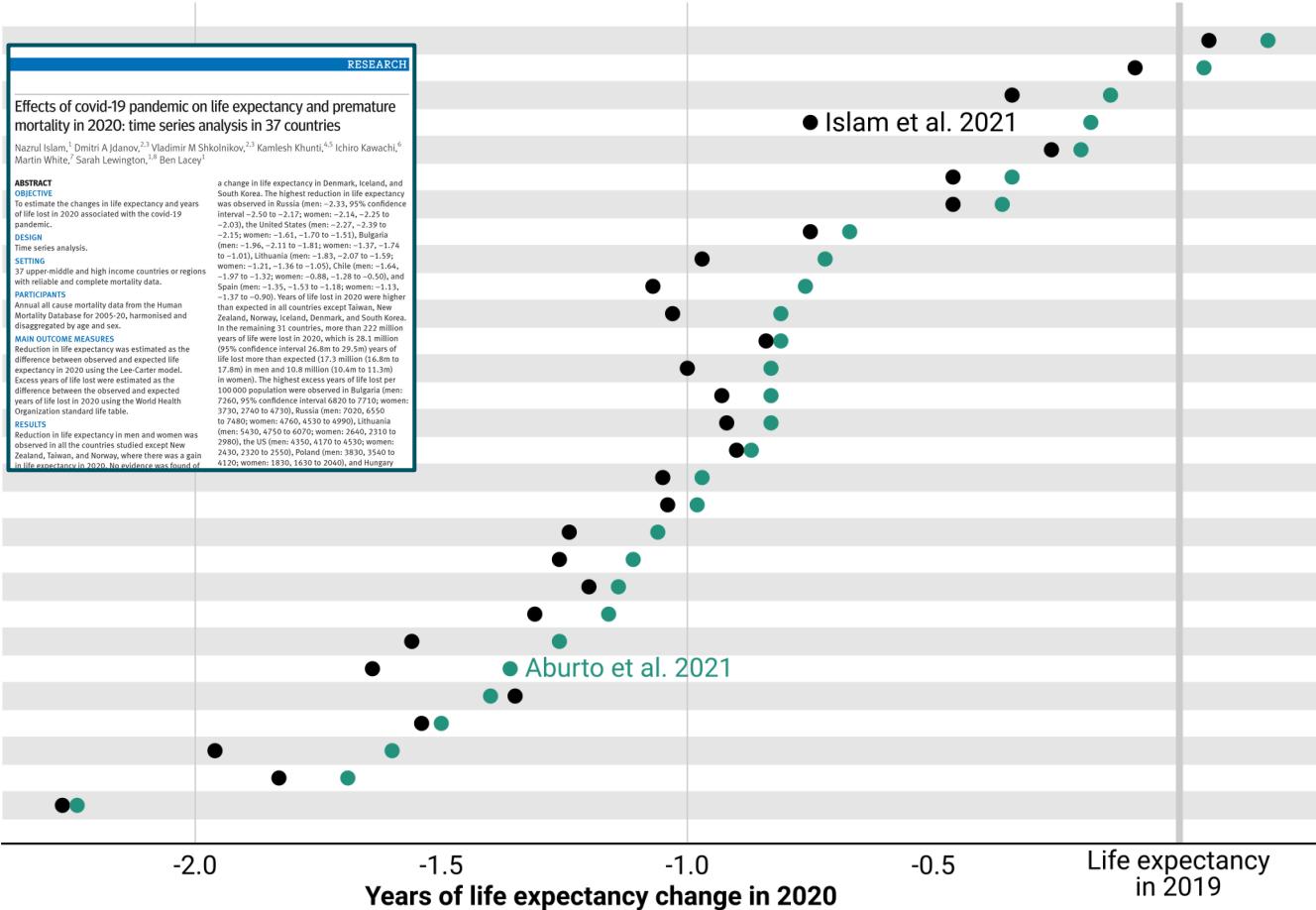
# Why? Robustness!



Aburto & Schöley et al. 2021.  
Quantifying impacts of the COVID-19 pandemic through life-expectancy losses: a population-level study of 29 countries.  
[10.1093/ije/dyab207](https://doi.org/10.1093/ije/dyab207)

# Why? Robustness!

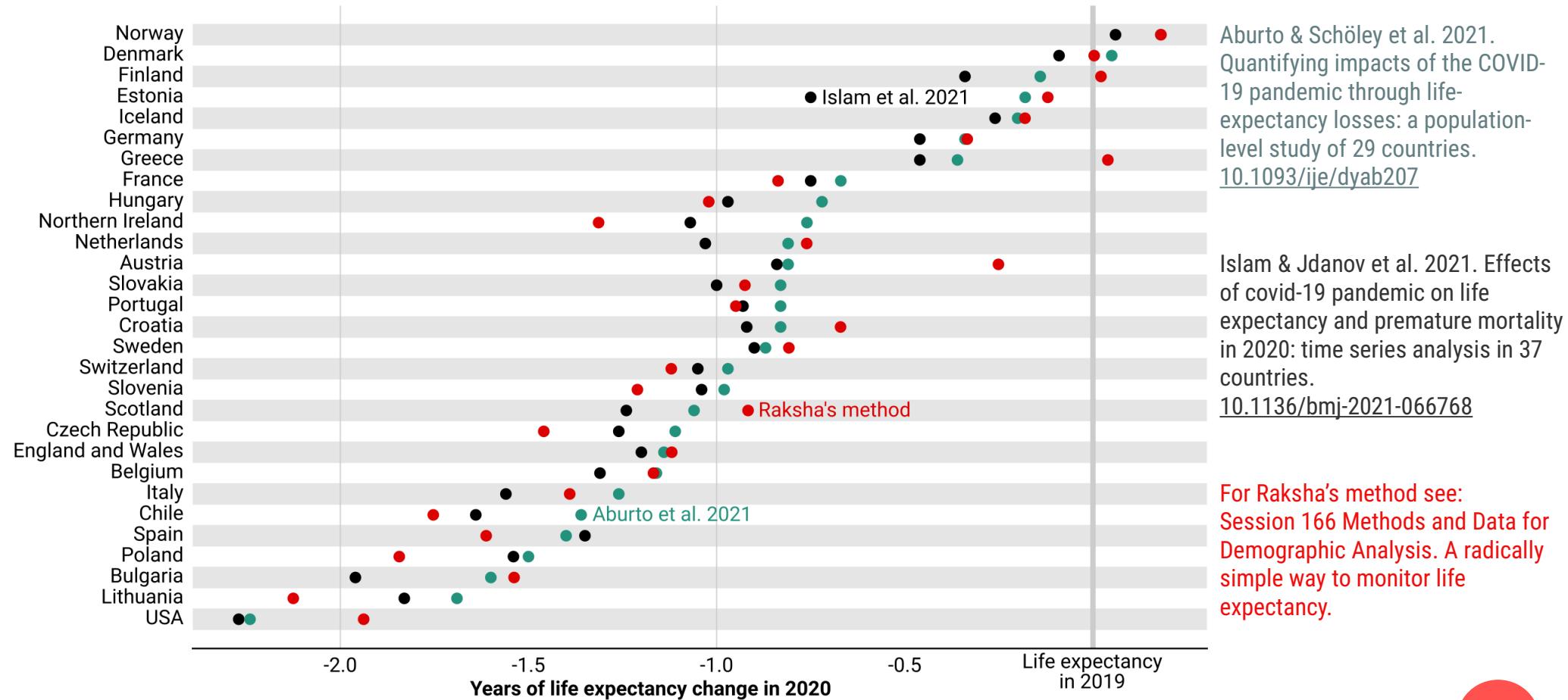
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Finland  
Estonia  
Iceland  
Germany  
Greece  
France  
Hungary  
Northern Ireland  
Netherlands  
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Portugal  
Croatia  
Sweden  
Switzerland  
Slovenia  
Scotland  
Czech Republic  
England and Wales  
Belgium  
Italy  
Chile  
Spain  
Poland  
Bulgaria  
Lithuania  
USA



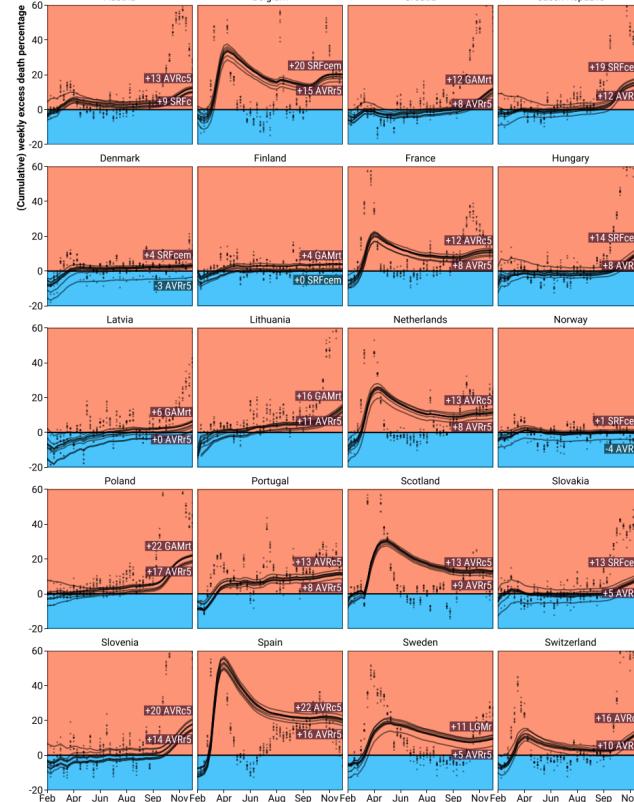
Aburto & Schöley et al. 2021. Quantifying impacts of the COVID-19 pandemic through life-expectancy losses: a population-level study of 29 countries. [10.1093/ije/dyab207](https://doi.org/10.1093/ije/dyab207)

Islam & Jdanov et al. 2021. Effects of covid-19 pandemic on life expectancy and premature mortality in 2020: time series analysis in 37 countries. [10.1136/bmj-2021-066768](https://doi.org/10.1136/bmj-2021-066768)

## Why? Robustness!



# Why? Robustness!



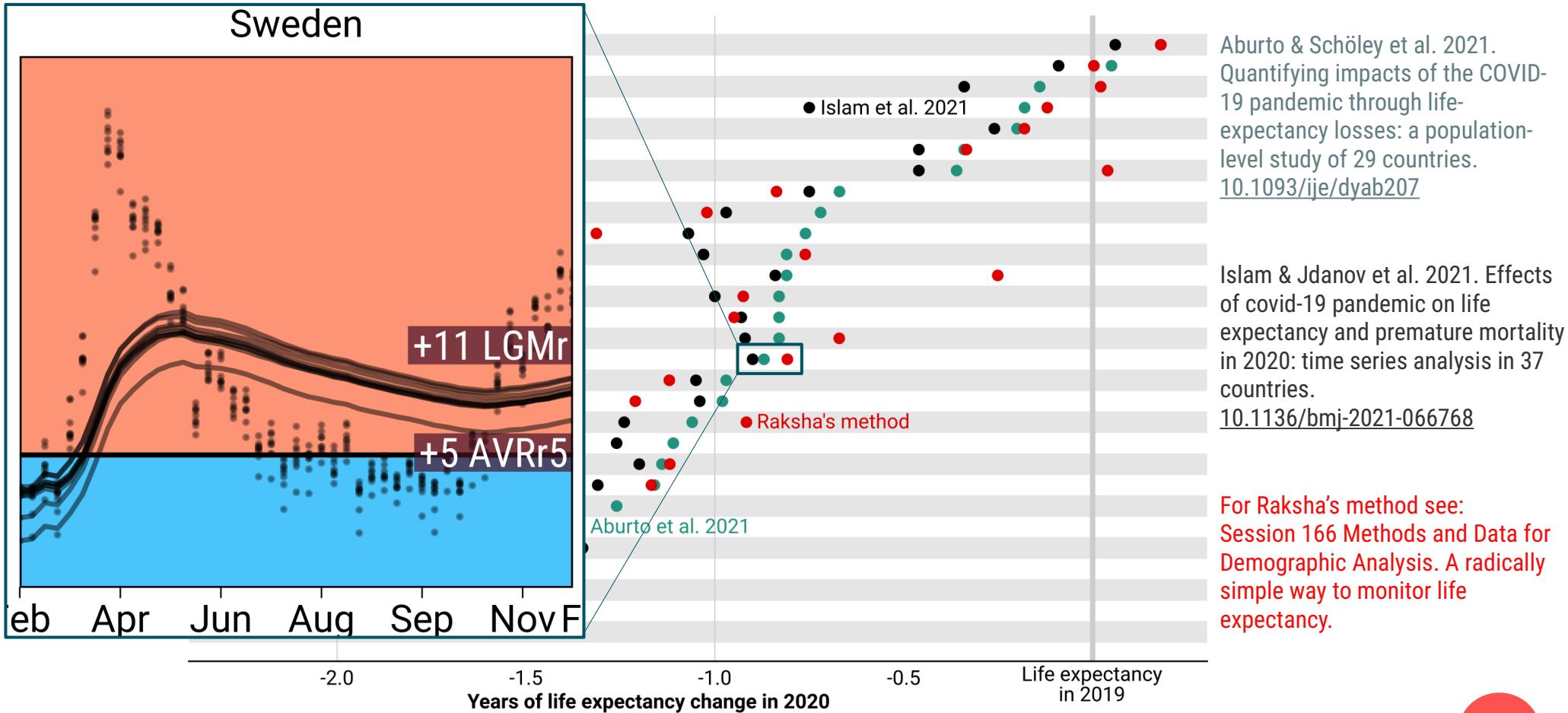
**Table 1:** Models for weekly expected deaths.

Model	Description	References
<b>Weekly averages</b> (AVGc5) 5 year average death counts (AVGr5) 5 year average death rates	Average over the weekly deaths counts or rates in the preceding 5 years implemented as quasi-Poisson GLM with week-of-year coefficients	[20], [29], [5]
<b>Serfling Model</b> (SRFc) without exposures (SRFcem) Euromomo style, i.e. no exposures, fitted only on weeks without flu-activity (SRFr) with exposures	Quasi-Poisson regression on death counts with log-linear long term trend, AIC selected Fourier-term seasonality, and public-holiday coefficients	[3], [31], [32], [9], [12]
<b>Generalized Additive Model</b> (GAMr) without temperature anomaly predictor (GAMrt) with temperature anomaly predictor as smoothly varying coefficient over week of year	Quasi-Poisson regression on death counts with log-linear long term trend, penalized cyclical spline seasonality, and public-holiday coefficients	[1], [26]
<b>Latent Gaussian Model</b> (LGMr) without temperature anomaly predictor (LRMrt) with temperature anomaly predictor as varying coefficient over week of year implemented as cyclic random walk	Bayesian Poisson regression on death counts with autoregressive trend, non-parametric time-varying seasonality, and public-holiday coefficients	[14]

Schöley. 2021. Robustness and bias of European excess death estimates in 2020 under varying model Specifications.  
[10.1101/2021.06.04.21258353](https://doi.org/10.1101/2021.06.04.21258353)

Presented at session 118.  
 Estimating and Modelling Mortality

# Why? Robustness!

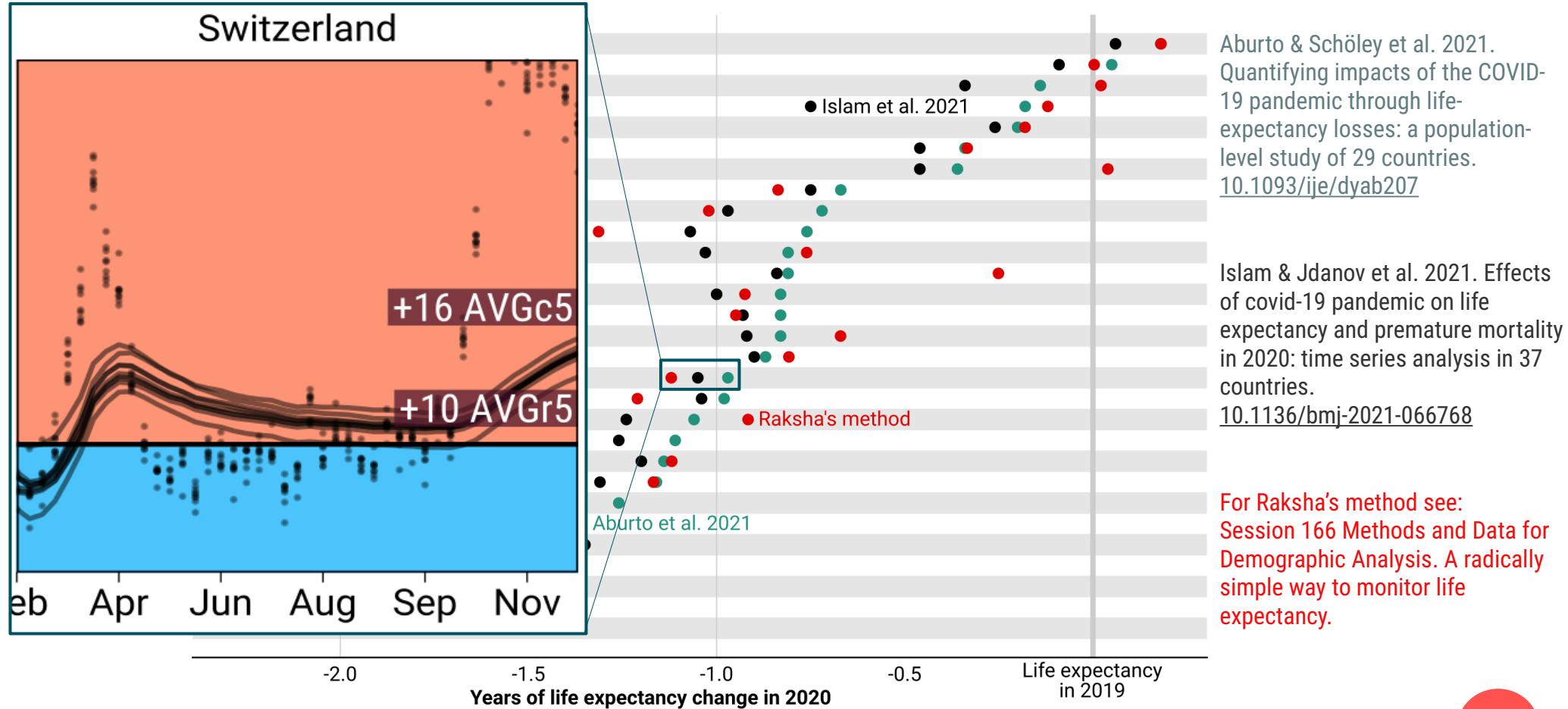


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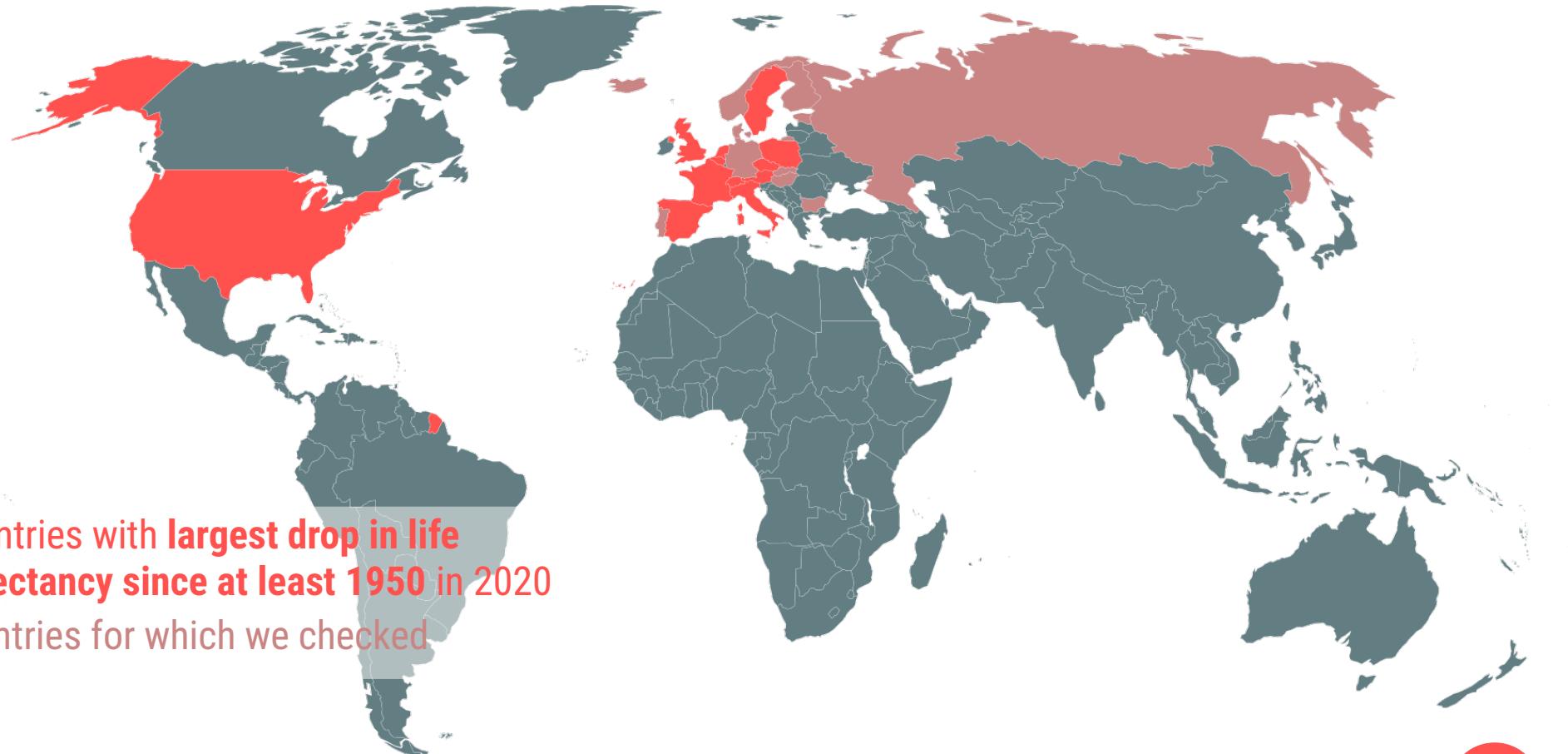
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For Raksha's method see:  
Session 166 Methods and Data for Demographic Analysis. A radically simple way to monitor life expectancy.

# Why? Robustness!

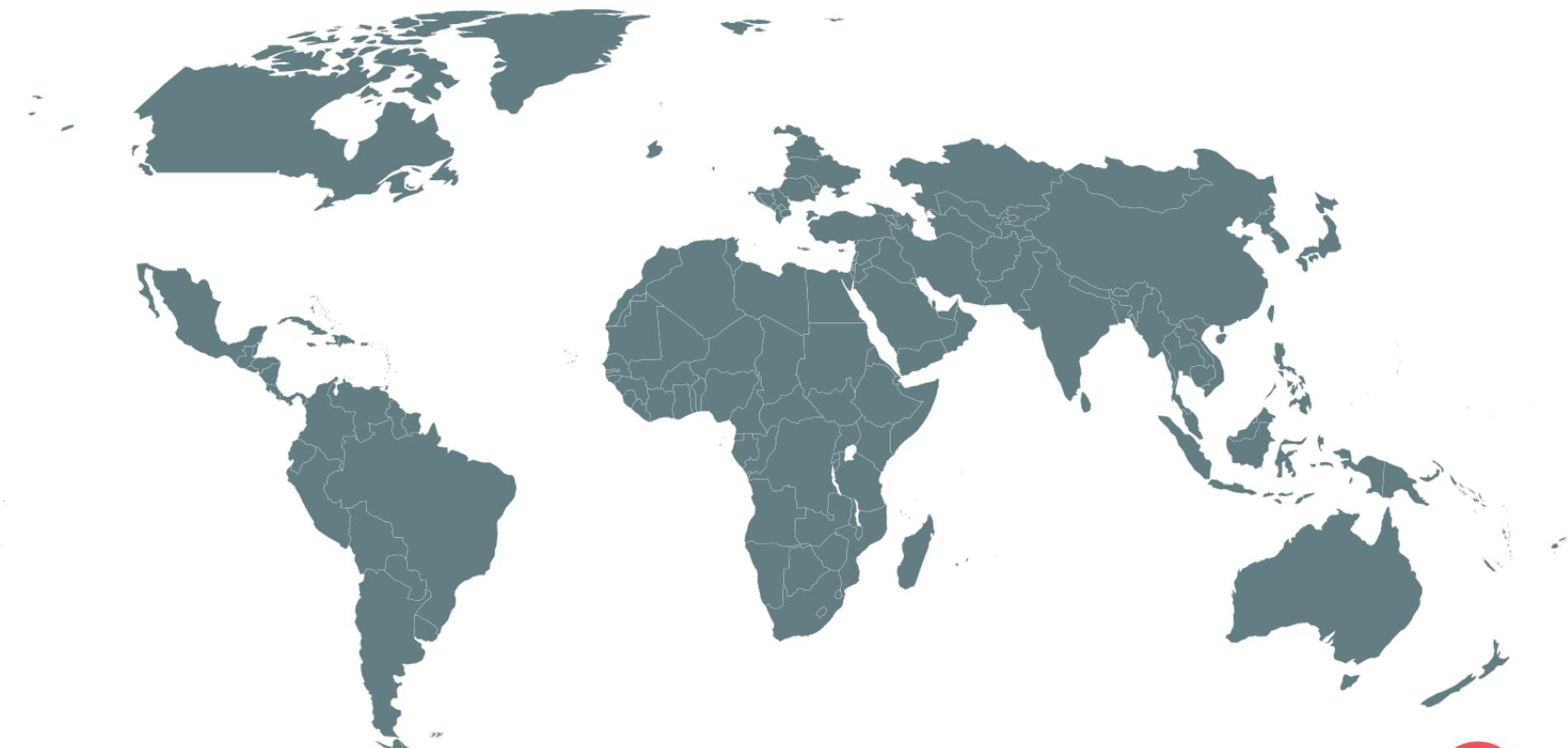


# Why? Historical perspective!

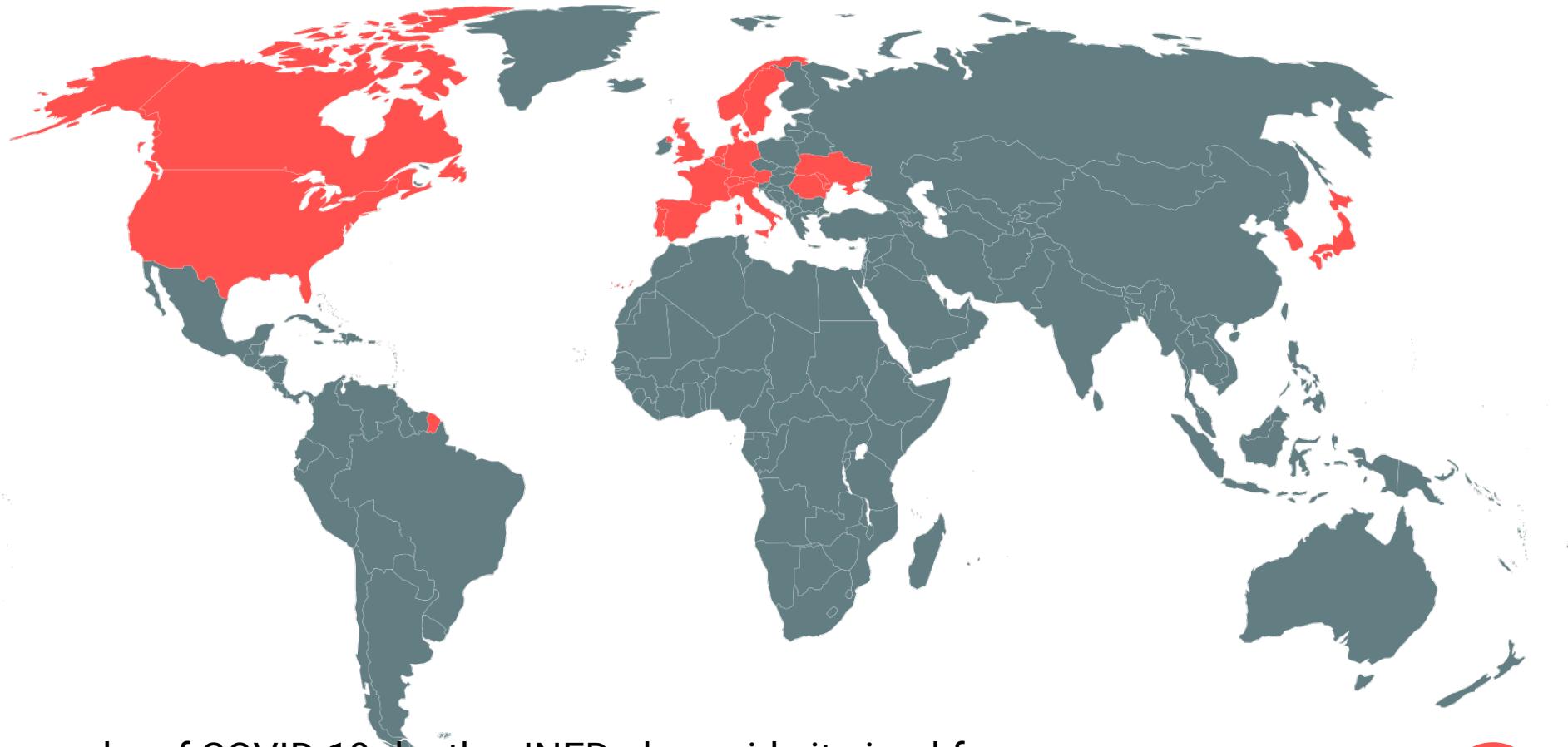


**What's next?**

# Coverage or quality?

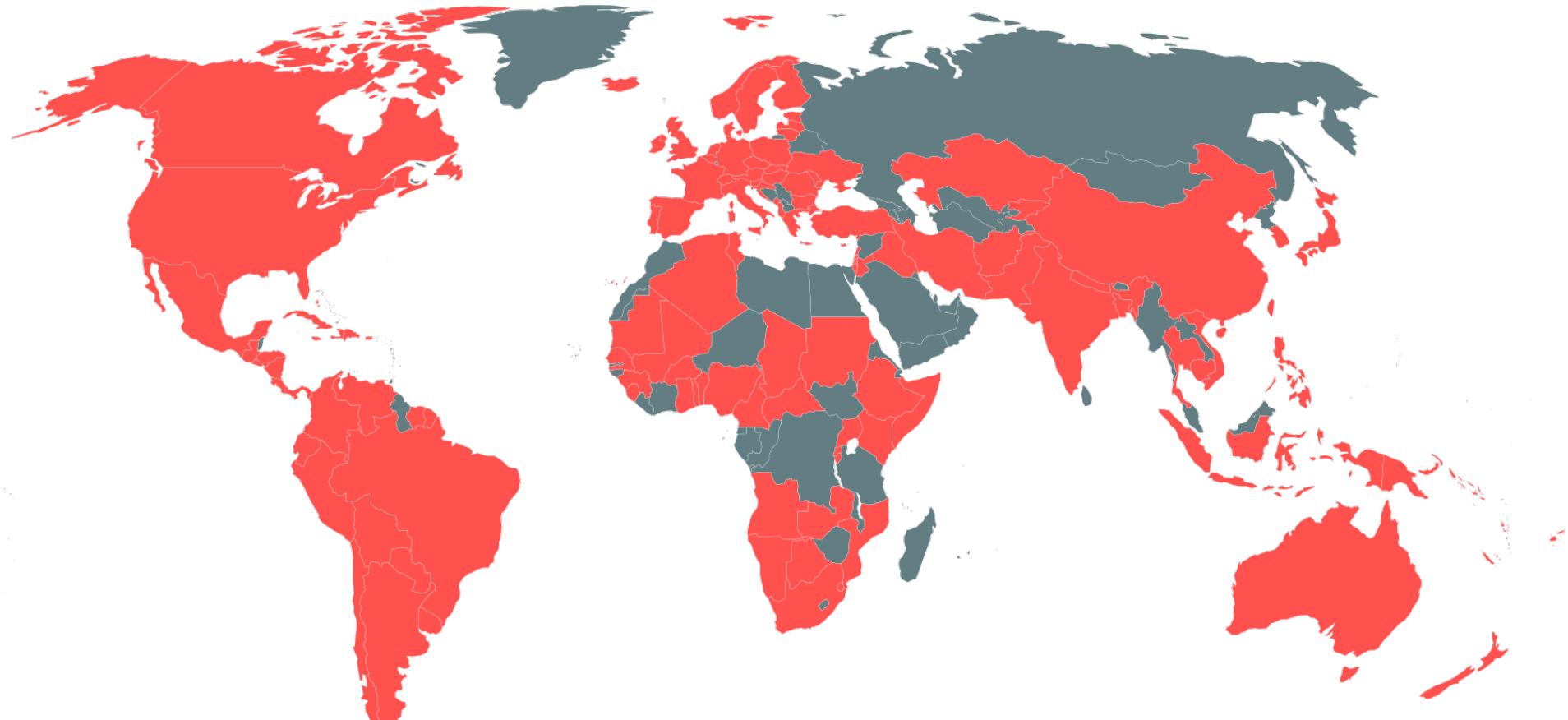


# Coverage or quality?



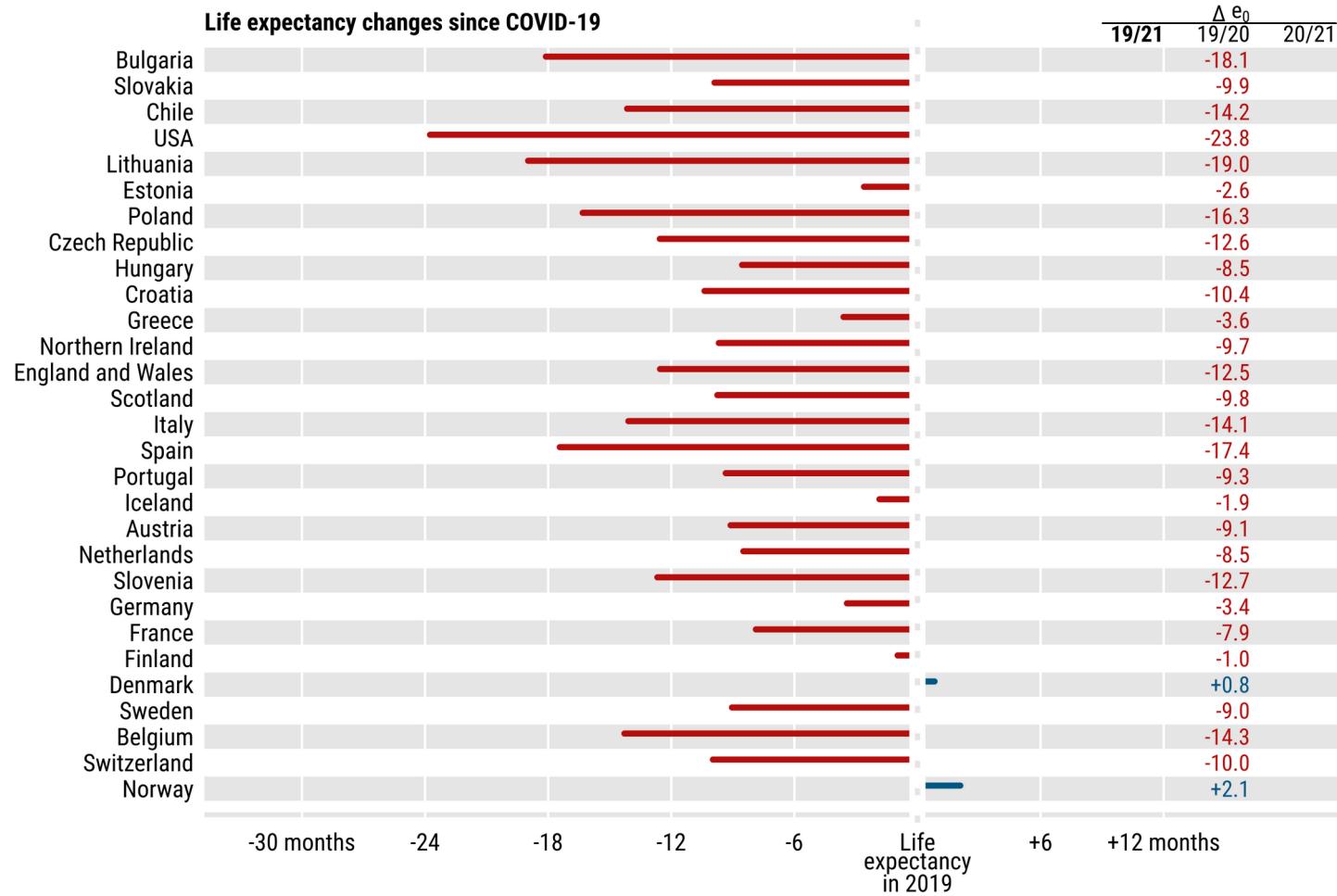
The demography of COVID-19 deaths. INED. dc-covid.site.ined.fr

# Coverage or quality?

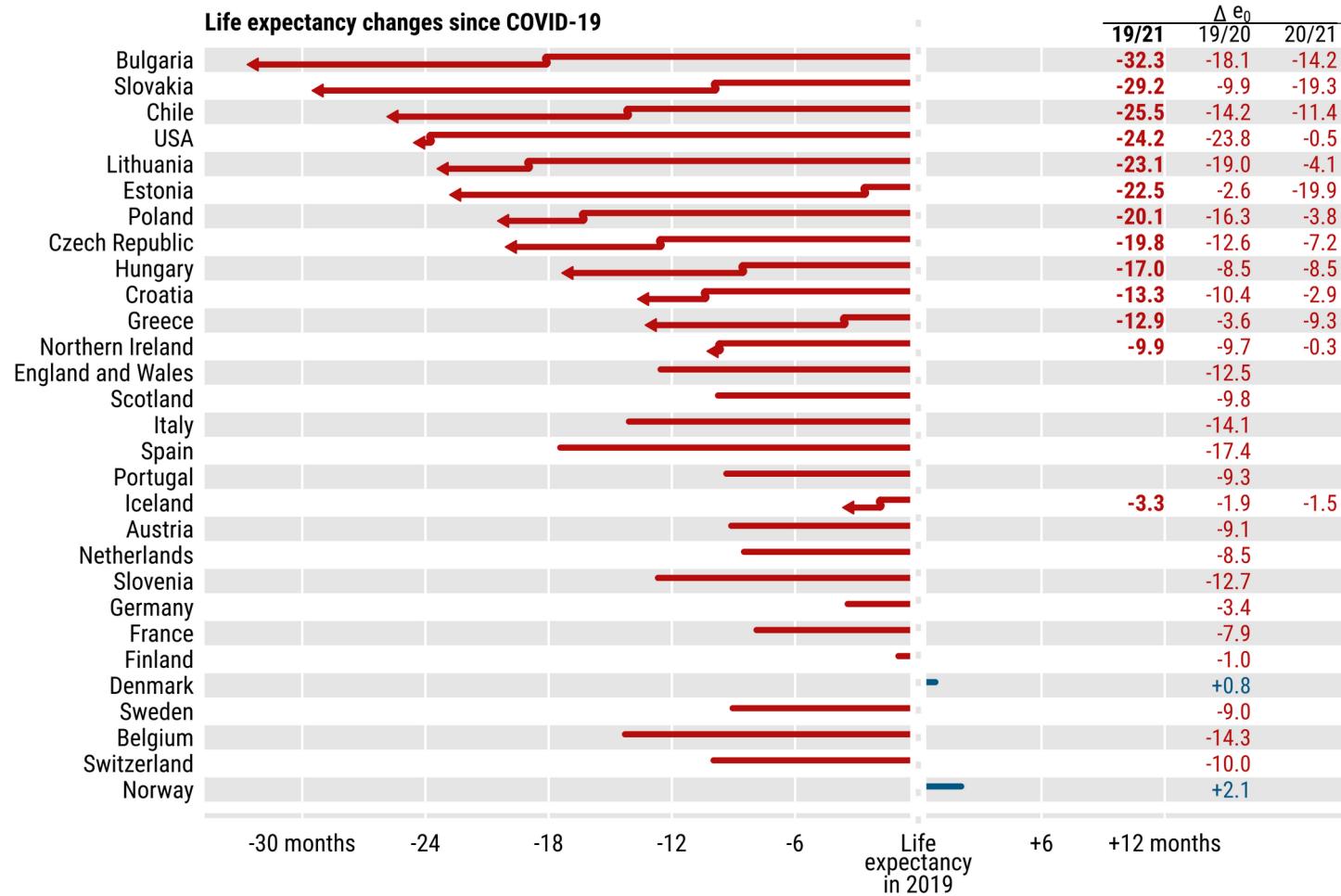


COVerAGE-DB: A database of COVID-19 cases and deaths by age. MPIDR.

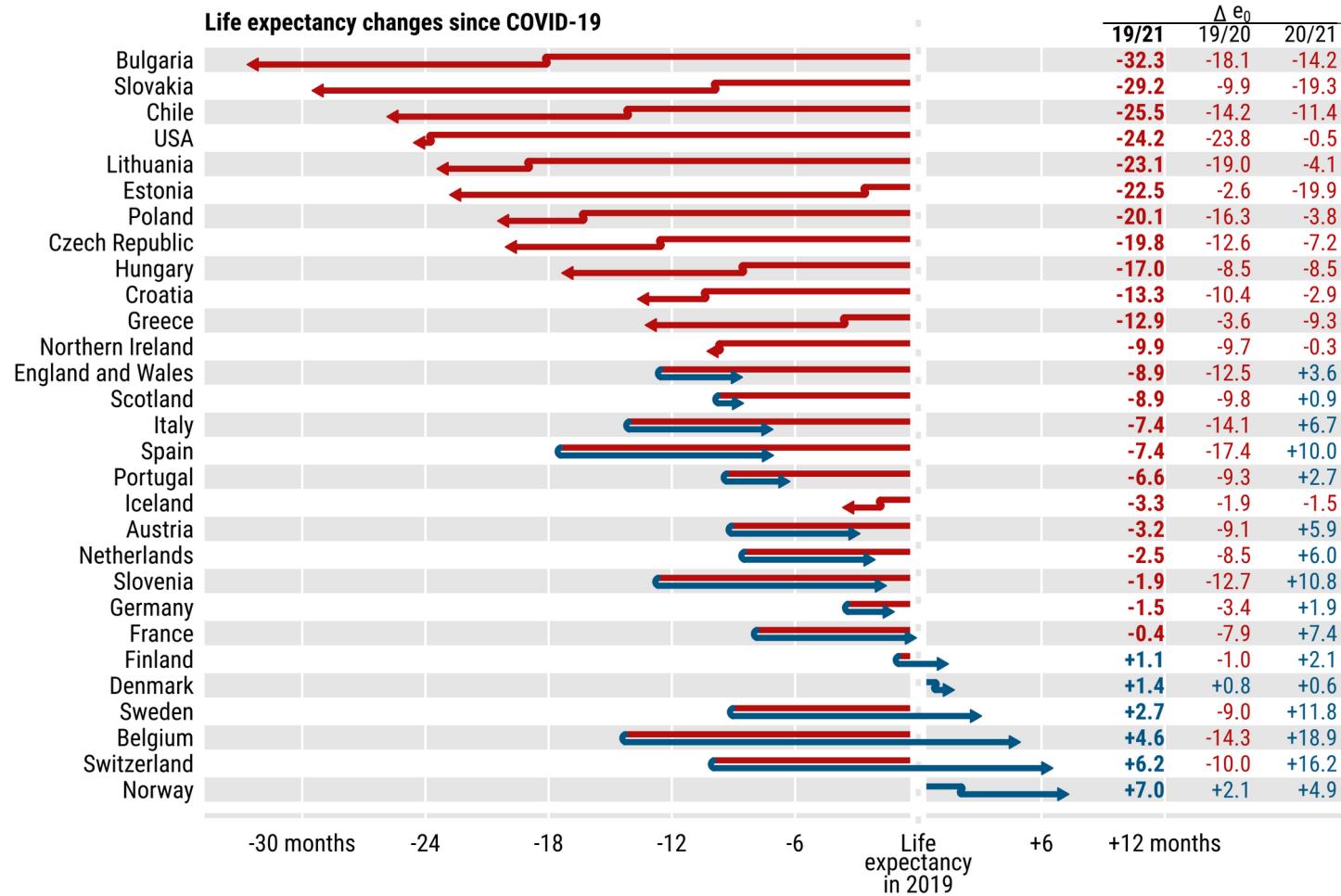
# Bounce backs or continued losses?



# Bounce backs or continued losses?



# Bounce backs or continued losses?



# Reproducible analysis

[github.com/jschoeley](https://github.com/jschoeley)

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