NAVIGATE

Next generation of advanced integrated assessment modelling to support climate policy making

Inequality and COVID-19

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based on works with D. Furceri et al. and S. Dasgupta

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821124.

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What can we do related in NAVIGATE?

1. Use existing cross-country dataset combining various sources to evaluate the empirical evidence of inequality and poverty impacts of **pandemics in the past**
2. Use available **micro-data combined with past waves of household surveys** in selected countries to evaluate the impact on household income and consumption, perform nation-wide poverty assessment, and assess sociodemographic drivers of these impacts (gender, age, education, …)

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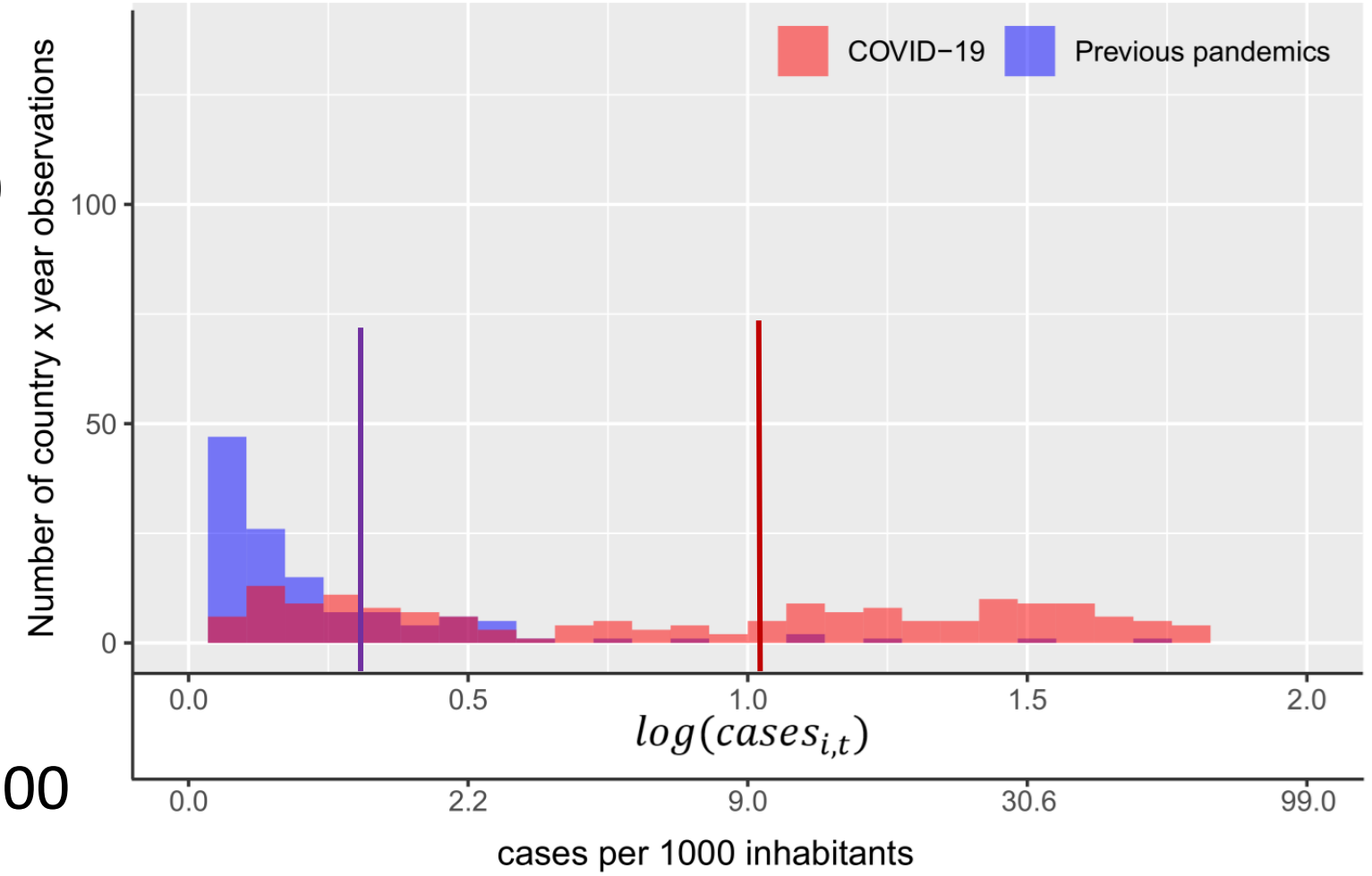
Past pandemics and COVID-19

- As of Dec 13:
  9.2 cases per 1000

- Past pandemics:
  1. SARS in 2003,
  2. H1N1 in 2009,
  3. MERS in 2012,
  4. Ebola in 2014,
  5. Zika in 2016
- Avg. 0.8 cases / 1000



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1. Impacts of past pandemic events

- Impact of past pandemics various socioeconomic
- Using a continuous measure of cases

$$\Delta_k y_{i,t} \equiv y_{i,t+k} - y_{i,t-1} = \beta_c^k log_{10}\left(1 + \frac{1000 \cdot confirmed\_cases_{it}}{population_{it}}\right) + \theta^k X_{i,t} + \alpha_i^k + \gamma_t^k + \epsilon_{i,t}^k$$

- Computing Impulse response functions based on Panel Country dataset
- IV approach to correct for measurement errors of «cases» and health system characteristics

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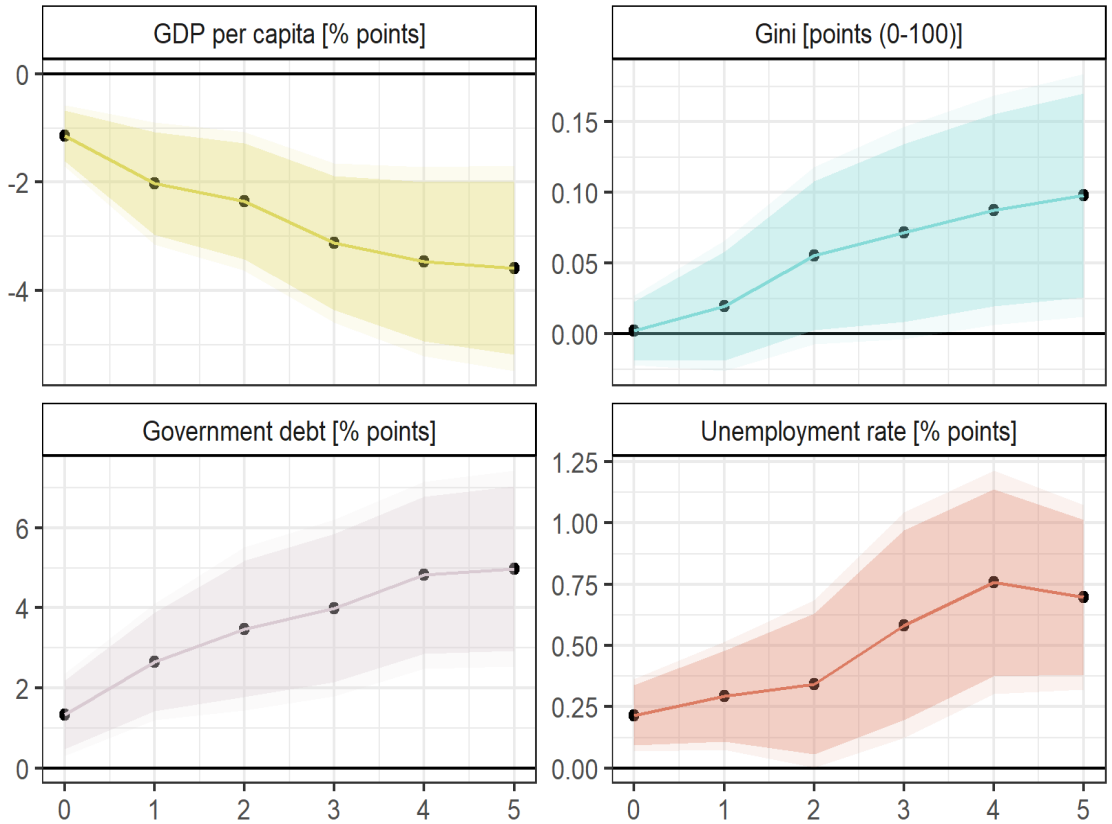
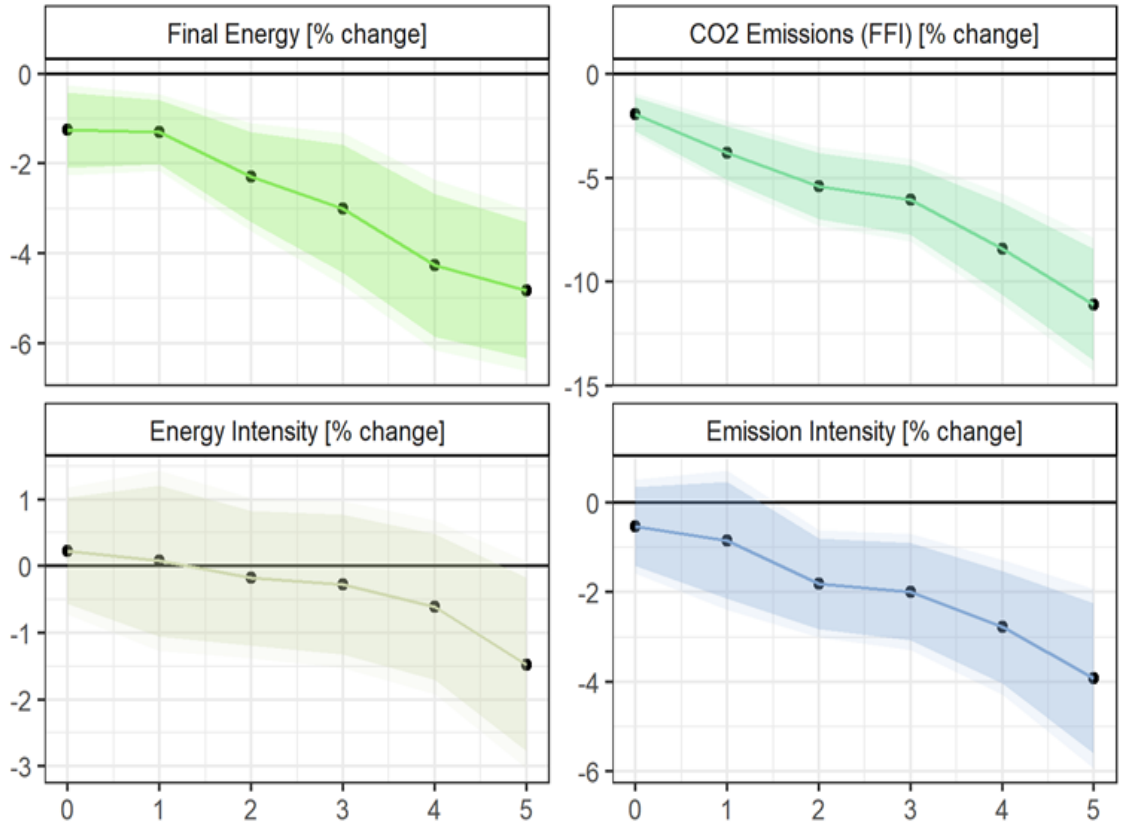
Economy

Environment





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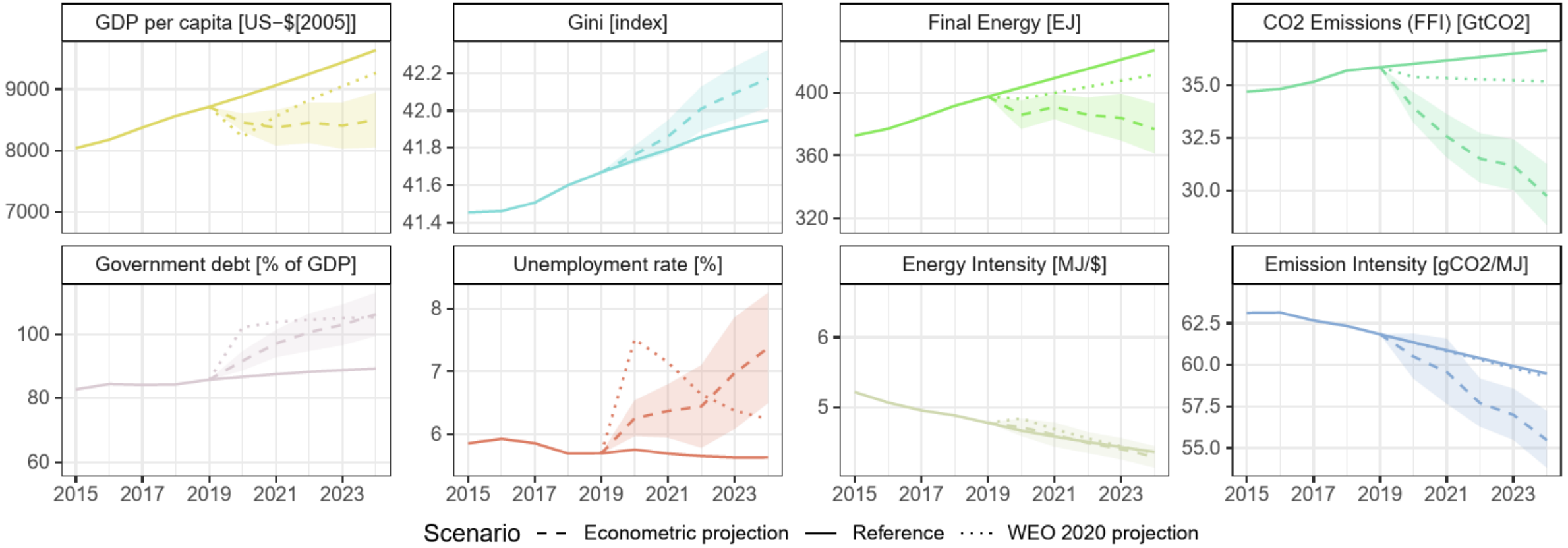
Projection for COVID-19



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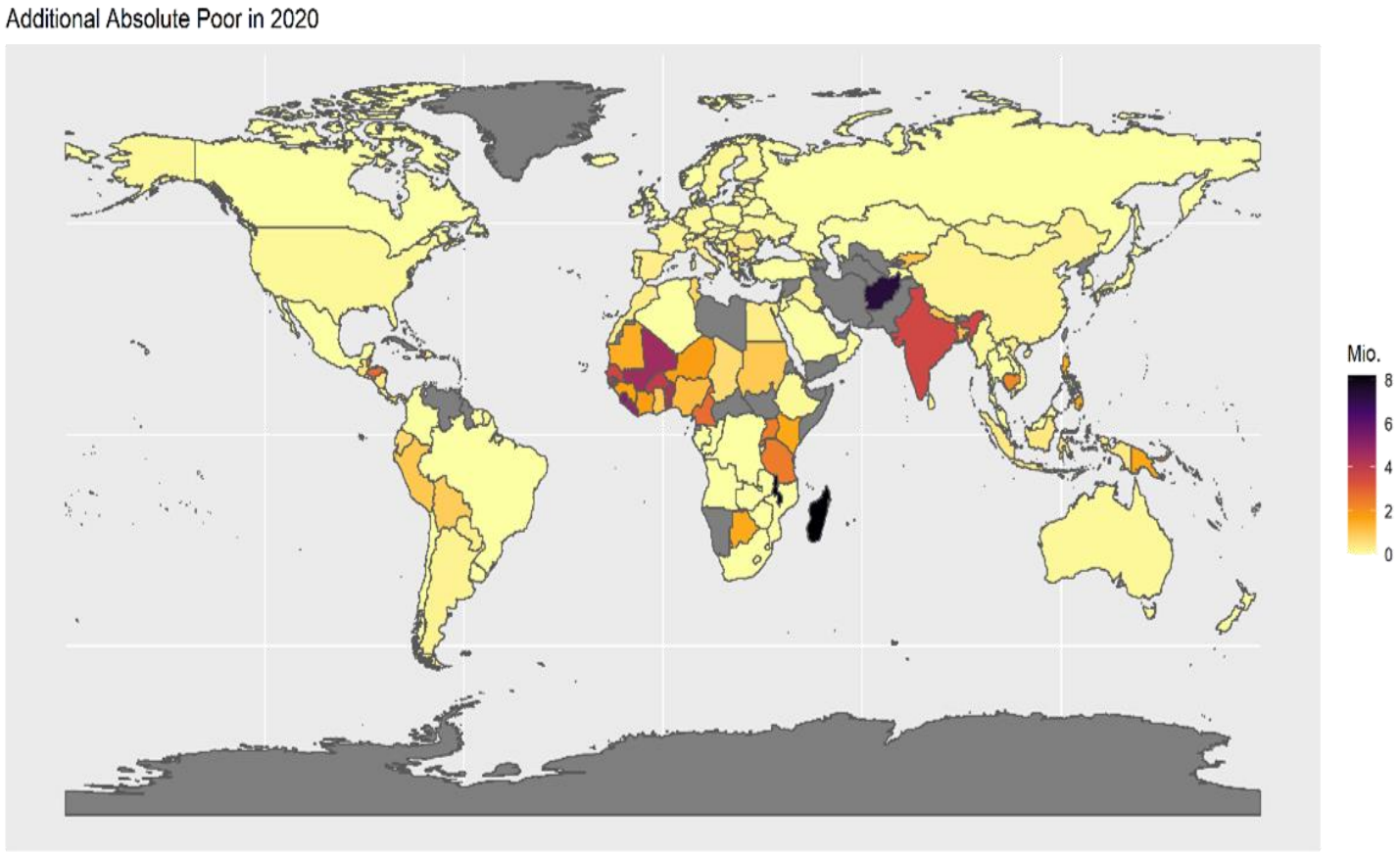
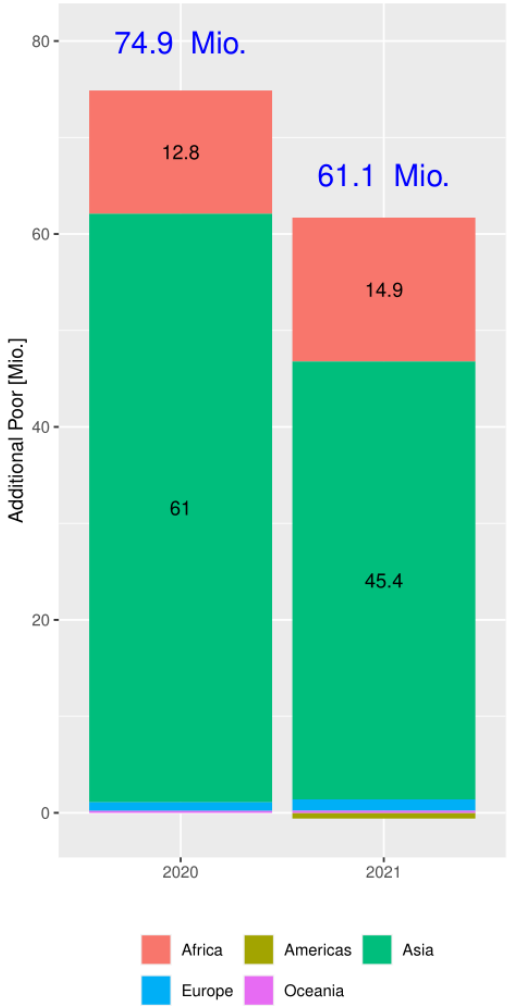
Impact on Poverty





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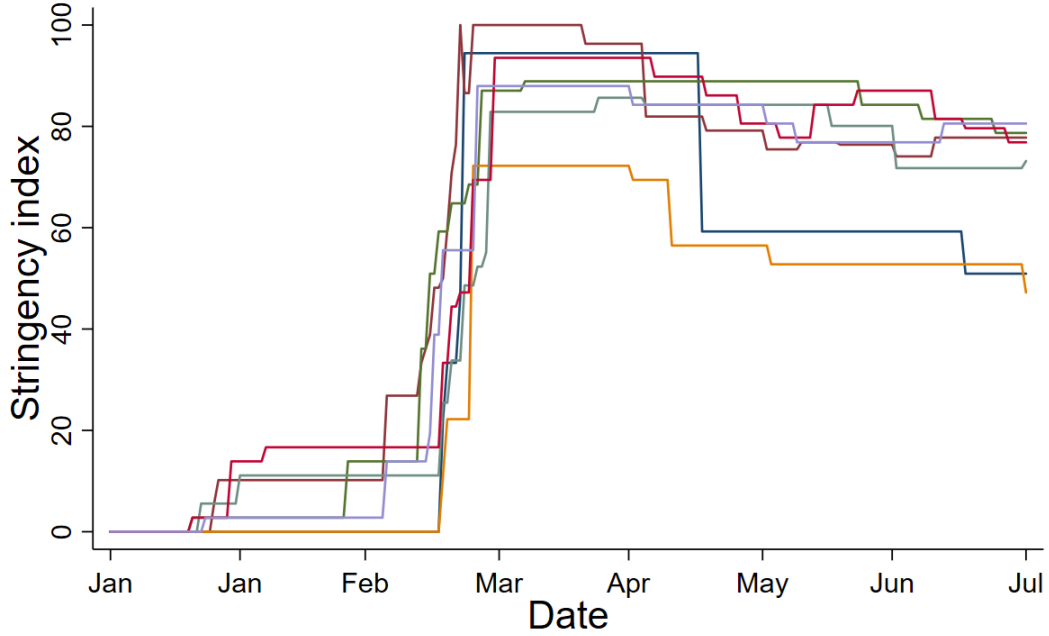
2. Micro-data evidence on COVID-19 impacts

- Seven African countries have since April performed “COVID module” telephone interviews related to their DHS/LSMS panel studies: Ethiopia, Djibuti, Kenia, Mali, Nigeria, Uganda, and South Africa, India

- Comparing
  - Pre- and
  - Post-lockdown



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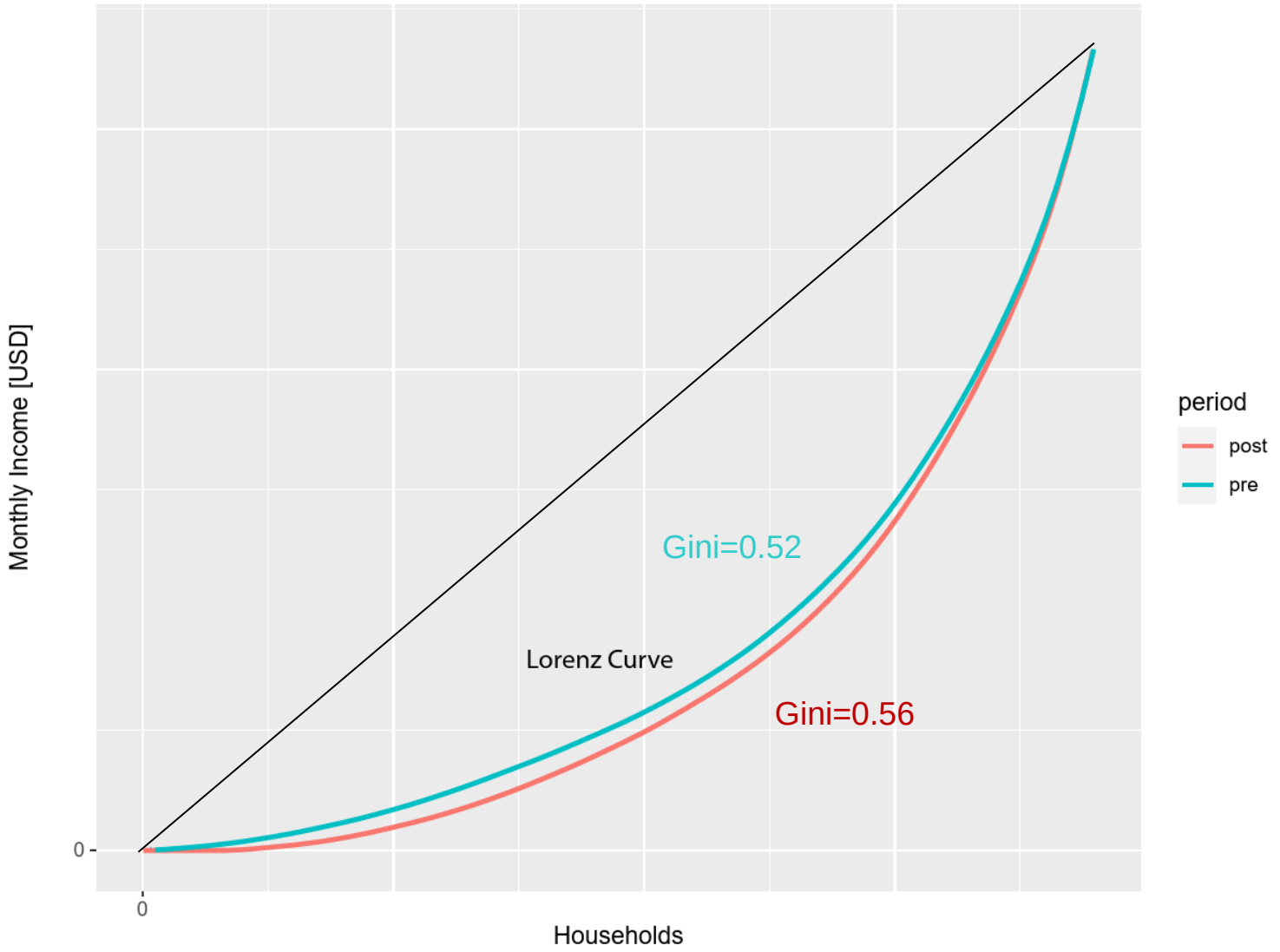
Example: South Africa

For comparison:
The Gini index in ZAF increased by 0.01 between 2000 and 2015



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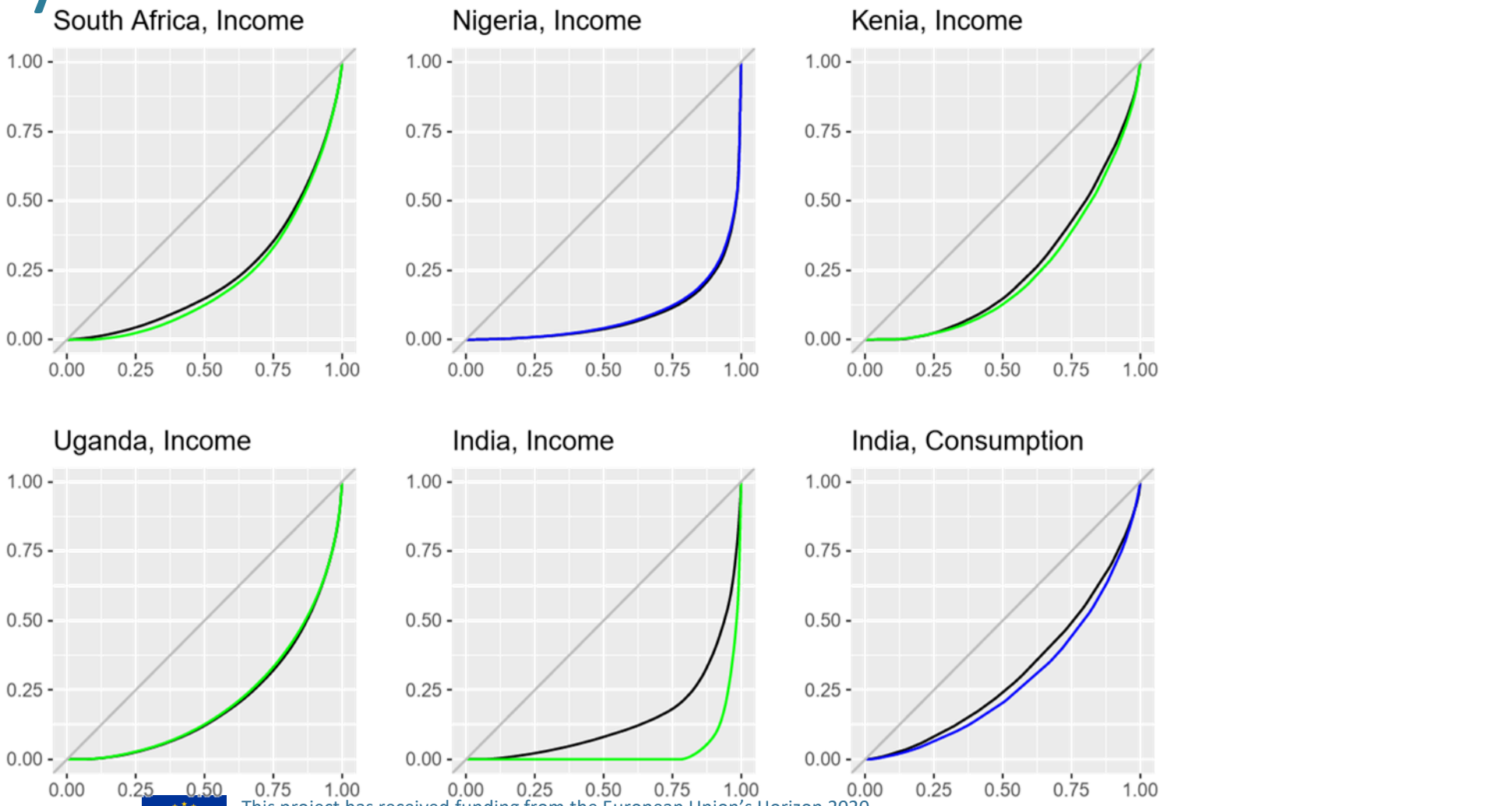
Inequality across countries



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Determinants of COVID-19 income loss (Probit)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Nigeria	South Africa	India	Kenya	Uganda	Djibouti	Mali
HH head gender (female)	0.042**	-0.180*	0.445**	0.50	0.065	0.286***	0.039***
	(0.013)	(0.078)	(0.037)	(0.209)	(0.359)	(0.000)	(0.008)
HH head age	-0.028***	-0.083***	0.023***	0.199***	0.028***	0.0002	0.008***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.790)	(0.000)
HH head age-squared	0.0003***	0.0009***	0.00003***	0.002**	-0.0003**	-0.0001***	-0.0001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HH head years of schooling	-0.004**	-0.044***	0.066***	-0.060**	-0.018*		
	(0.015)	(0.002)	(0.000)	(0.038)	(0.062)		
Log of income	-0.005	-0.159***	-0.352***	-0.221**	-0317***		
	(0.323)	(0.000)	(0.007)	(0.044)	(0.000)		
Poor					0.098***	0.101***	
					(0.000)	(0.000)	
Observations	3,432	4,125	1,316	1,787	3,921	1,372	1,372

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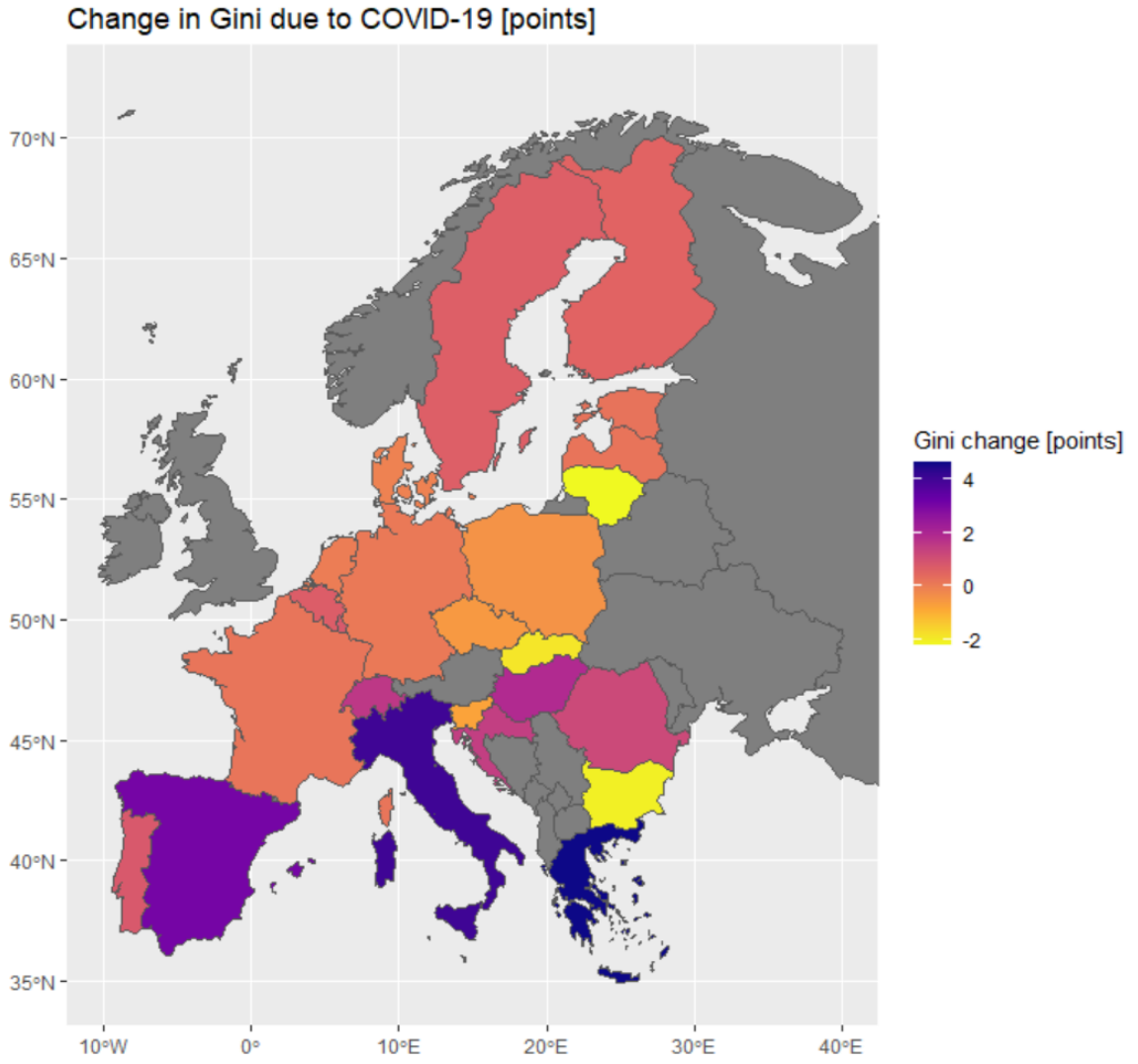
SHARE dataset (Europe)

- Wave 8 CATI released *today*

SHARE
Survey of Health, Ageing and Retirement in Europe
50+ in Europe

- *52310 observations*
- *On average 3% income loss*
- *On average 1.0 point Gini increase*



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Conclusions

- **(1)** Even in the past, pandemics had persistent effects on socioeconomic, but also environmental variables
- However, only minor effect on energy/emission intensities!
- Design of stimulus policies thus keys targeted at desired (green?) development path
- **(2)** Besides macroeconomic costs: strong evidence of substantial increases in poverty and inequality, potentially persistent
- Addressing the humanitarian crisis at least as important, also for policy acceptance and from a welfare perspective

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SHARE dataset (Europe)

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iso3	gini_before	gini_after	average_loss	nobs	gini_impact
BEL	27.77	28.45	-3.65	2361	0.69
BGR	39.38	37.33	-11.49	524	-2.06
CHE	30.49	32.07	-3.03	827	1.57
CYP	47.21	59.72	14.62	327	12.51
CZE	27.63	27.07	0.25	1353	-0.56
DEU	33.75	33.84	-4.84	1504	0.09
DNK	34.48	34.40	-2.40	1135	-0.08
ESP	27.92	30.98	-8.32	688	3.06
EST	35.17	35.40	-4.53	2785	0.22
FIN	31.95	32.47	-3.77	783	0.53
FRA	30.63	30.81	-2.17	1197	0.18
GRC	27.53	32.13	-1.49	1832	4.60
HRV	37.30	38.73	0.48	1103	1.43
HUN	32.38	34.26	-5.52	406	1.89
ISR	38.10	39.56	-6.99	489	1.46
ITA	32.80	36.81	-8.92	1680	4.01
LTU	34.87	32.66	-8.43	824	-2.21
LUX	28.05	28.85	-2.08	295	0.80
LVA	46.14	46.34	-2.27	538	0.20
MLT	27.66	26.75	-3.17	414	-0.92
NLD	23.88	23.90	-2.57	428	0.02
POL	32.62	32.18	-3.36	1325	-0.43
PRT	34.93	35.73	-4.12	522	0.80
ROU	38.90	40.07	-4.61	919	1.18
SVK	29.21	27.33	-8.28	531	-1.88
SVN	33.88	33.11	3.30	1638	-0.77
SWE	33.42	34.07	-1.05	856	0.65

Table 1: Inequality impact of COVID-19 [SHARE dataset]

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Inequality across countries

country	measure	Avg. [%]	Gini Feb.	Gini Apr.	SWIID	GDP chg.
Nigeria	income	-24.517	0.744	0.743	0.441	-4.278
South Africa	income	-8.482	0.520	0.555	0.599	-8.000
Kenya	income	-8.273	0.474	0.494	0.461	1.048
Uganda	income	3.646	0.599	0.574	0.441	-0.288
India	income	-72.989	0.702	0.923	0.473	-10.289
India	consumption	-3.060	0.353	0.425	0.473	-10.289

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