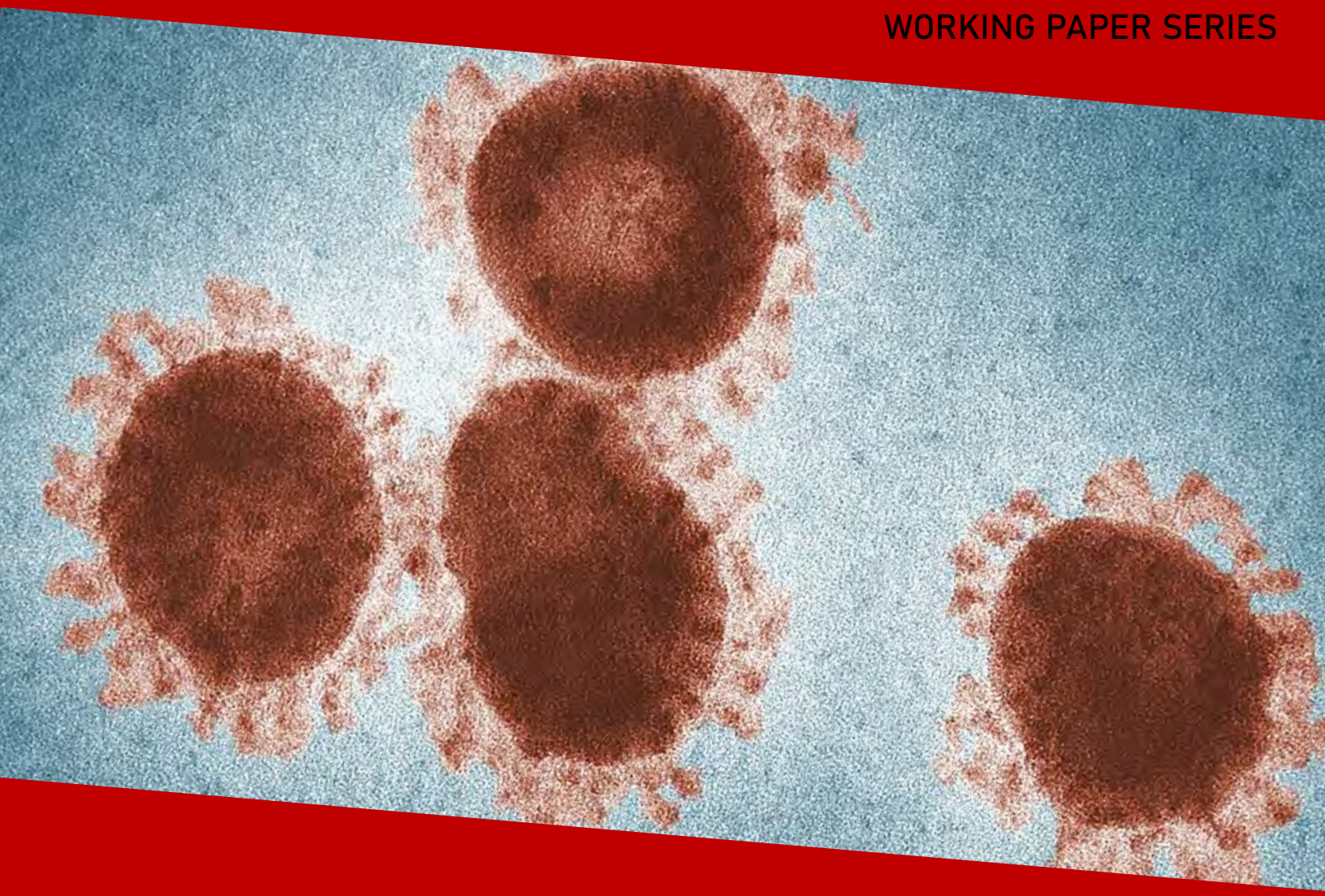
SAN DIEGO STATE UNIVERSITY

CENTER FOR HEALTH ECONOMICS AND POLICY STUDIES

WORKING PAPER SERIES



Later Onset, Fewer Deaths from COVID

OCTOBER 27, 2020

Ainoa Aparicio Fenoll
University of Turin, IZA, GLO, & CHILD

Shoshana Grossbard
San Diego State University, Family Inequality Network at University of Chicago, IZA, CESifo, & GLO

CHEPS

CENTER FOR HEALTH ECONOMICS AND POLICY STUDIES

San Diego State University

COMMENT NO. 2020-001

Later onset, fewer deaths from COVID*

Ainoa Aparicio Fenoll (University of Turin, IZA, GLO, and CHILD, ainoa.apariciofenoll@unito.it)
and
Shoshana Grossbard (San Diego State University, Family Inequality Network at University of Chicago, IZA, CESifo, and GLO, sgrossba@sdsu.edu)

ABSTRACT

We test whether European countries or US states who experienced their first death from COVID-19 at a later date have fewer deaths from COVID 60 and 100 days after the start of the pandemic in their borders. Our sample consists of 29 European countries associated with the European Union and 50 U.S. states and we control for a number of demographic, economic and health-policy related factors that are likely to influence mortality. We find that late starting countries or states registered fewer deaths from COVID-19. Countries/states' differential reliance on partial or complete lockdown policies helps explain an area's advantage of being a late starter.

Keywords: SARS-CoV-2, mortality, Western countries, medical technology, lockdowns.

Landoni et al. (2020) compared death rates at 50 days after COVID-19's onset in 14 Western countries and found that the later a country first experienced at least 0.1 death per million inhabitants, the lower the death rate 50 days after onset. We add to their study as follows: we examine the association between cumulative deaths at 60 and 100 days after onset of COVID-19 in a particular area based on a larger sample: 29 European countries and 50 U.S. states,[1] and use regression analysis to control for a number of factors likely to influence mortality.

We define onset in a particular area as the day that area experienced its first death from COVID-19 (it ranged from February 15 (France) to April 13 (Wyoming)).[2] 'Days since onset in FR' is defined as the number of days that elapsed from the time of the first death in France until the first death in the area. Multivariate regression models of the logarithm of cumulative deaths give us the percentage growth/decline in deaths resulting from a unit change in a variable. The models in columns 1 to 2, Table 1, control for population size, proportion of young adults living with their parents, percent of the population over 65, percent urban, Gross Domestic or State Product per capita, rent levels, tests per capita, number of hospital beds, a control for whether the area is in the US versus the EU, whether a government is left-leaning, and an interaction between left-leaning and US. Accordingly, cumulative deaths 60 days past onset declined by 7.4 percent for every extra day a country was saved from the pandemic (col.1) and by 10 percent when cumulative deaths are measured 100 days past onset (col. 2). Since we control for population size our results can be interpreted as associations between timing of onset and cumulative deaths per capita. These results support Landoni et al's (2020) finding and apply to US states and European countries.

Landoni et al (2020) mention that later starters may have learned from other countries' experience with preventative strategies such as lockdowns. To test for that possibility, we run regressions that also include whether the country or state had a full or partial lockdowns and number of days from onset to implementation of lockdowns. Results, reported in Columns 3 and 4, indicate smaller coefficients of days from onset. For example, an extra day since onset reduces cumulative fatalities at 100 days of epidemic only by 7.9% (column 4), not by 10% (column 2). Learning about the effectiveness of lockdowns could thus have helped later starters. Alternative explanations include improved pathophysiologic understanding, better testing technology, and more widespread adoption of personal protections. It is hoped that future work will examine this question with more detailed data of the type used by Laliotis and Minos (2020) or Amuedo-Dorantes et al (2020).

[1] 26 EU members, UK, Switzerland and Serbia.
[2] More about our data sources and methodology can be found in Aparicio and Grossbard (2020).

References

Amuedo-Dorantes C., Kaushal N., Muchow A.N. (2020). Is the Cure Worse than the Disease? County-Level Evidence from the COVID-19 Pandemic in the United States IZA Discussion Paper No. 13695, September.

Aparicio-Fenoll A, Grossbard S (2020). Intergenerational Residence Patterns and COVID-19 Fatalities in the EU and the US, IZA Discussion Paper No. 13452, July.

Laliotis I, Minos D (2020). Spreading the Disease: The Role of Culture. COVID Economics CEPR, 40, 180-210.

Landoni G , Losi D, Fresilli S, Lazzari S, Nardelli P, Puglisi R & Zangrillo A (2020). Is time our ultimate ally in defying the pandemic? *Pathogens and Global Health*, DOI: 10.1080/20477724.2020.1785199

Table 1. Log of Cumulative Covid-19 Deaths as a function of days that elapsed between onset of COVID in France and in a particular country or state

VARIABLES	(1) deaths60	(2) deaths100	(3) deaths60	(4) deaths100
Days since onset in FR	**-0.0739*** **	**-0.100*** **	**-0.0690**	**-0.0789***
	(0.0265)	(0.0262)	(0.0430)	(0.0451)
Demo-economic				
Population	0.0455***	0.0479***	0.0521***	0.0555***
	(0.00977)	(0.0100)	(0.0118)	(0.0122)
Coresidence	0.0320**	0.0237*	0.0331**	0.0237
	(0.0136)	(0.0134)	(0.0146)	(0.0154)
% over 65	3.188	0.915	7.105	5.443
	(9.168)	(8.873)	(10.12)	(10.05)
% Urban	0.0288**	0.0295**	0.0327**	0.0327**
	(0.0132)	(0.0127)	(0.0138)	(0.0138)
GDP pc	4.58e-06	-9.81e-06	1.02e-05	-1.52e-06
	(1.30e-05)	(1.29e-05)	(1.51e-05)	(1.58e-05)
Rental Prices	0.000280	0.000521*	0.000326	0.000516
	(0.000304)	(0.000293)	(0.000299)	(0.000339)
Health Policies				
Days No social events			0.00124	0.000376
			(0.0124)	(0.0128)
Days No schools			-0.0176**	-0.0117
			(0.00781)	(0.00797)
Days No shops			0.0243	0.0132
			(0.0402)	(0.0438)
Days Partial lockdown			-0.0304	-0.0173
			(0.0245)	(0.0251)
Days Full lockdown			0.0203	0.0315
			(0.0331)	(0.0341)
No social events				
No schools			0.731	1.180
			(0.866)	(0.907)
No shops			0.265	-0.171
			(0.910)	(0.964)
Partial lockdown			-0.370	-0.261
			(0.452)	(0.469)
Full lockdown			-0.220	-0.153
			(0.571)	(0.591)
Tests pc	-0.416	4.952	-1.904	4.467
	(8.044)	(4.973)	(9.666)	(5.735)

Beds pc	-0.130	-0.0680	-0.0402	-0.0229
	(0.167)	(0.164)	(0.184)	(0.200)
Political variables				
US	0.631	0.932*	0.900	0.906
	(0.491)	(0.522)	(0.660)	(0.764)
Left-leaning gov.	0.221	0.0599	0.0135	-0.182
	(0.652)	(0.674)	(0.746)	(0.761)
Left-leaning gov.*US	-0.0985	-0.0727	0.107	0.213
	(0.696)	(0.702)	(0.838)	(0.833)
France		-2.161***		-1.717
		(0.809)		(1.253)
Constant	3.630	5.114*	1.048	1.993
	(3.160)	(3.031)	(3.621)	(3.533)
Observations	79	79	79	79
R-squared	0.645	0.672	0.677	0.691

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Days since onset in France is the number of days that passed from the first Covid death in France to the first Covid death in the country/state; Population is the number of country/state inhabitants expressed in millions; Coresidence is the share of 19-34 years olds living with their parents; % over 65 is the proportion of individuals over 65; % Urban is the share of the population who lives in urban areas; GDP pc is Gross Domestic Product per capita; Rental Prices are the average rental prices in the capital of the country/state; Days No social events is the number of deaths that passed from the first Covid death to the day in which social events were forbidden; Days No schools is the number of days to school closure; Days No shops is the number of days to the closure of non-essential shops; Days Partial lockdown is the number of days until some parts of the population locked down; Days Full lockdown is days until all the population locked down; No social events is an indicator for whether social events were allowed at the time of measurement of the dependent variable; No schools indicates whether schools were open; No shops is a dummy equal to one if non-essential shops were open; Partial lockdown indicates whether some parts of the population were locked down; Full lockdown is an indicator for all the population being locked down; Tests pc is the number of Covid tests per capita; Beds pc is the number of hospital beds per capita, US is a dummy equal to one if the observation is a US state; left-leaning government is an indicator that equals one if the majority of the government belongs to a left-leaning party (the Democratic party for US states); France is a dummy equal to one for France (it needed to be added due to partial information on tests).