Combating the COVID-19 Pandemic: The Role of the SARS Imprint

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Abstract

We provide evidence of delayed attention and inaction in response to COVID-19 in countries that did not experience SARS in 2003. Using cross-country data, we find that individuals in countries that had SARS infections in 2003 search more intensively for COVID-19-related information on Google in late January 2020, the time of the first known outbreak in Wuhan, China. Early attention to the novel virus, as measured by Google searches, is associated with deeper stock market drops in countries with SARS experience. In contrast, people in countries without SARS experience started to pay more attention much later, in March. Moreover, governments in these countries responded significantly more slowly in implementing social distancing policies to combat domestic COVID-19 outbreaks than governments in countries with SARS experience. Moreover, such early responses of individuals and governments in countries with SARS experience are prevalent within continent, even in non-Asian countries. Furthermore, people in countries with SARS experience are more compliant with social distancing rules. These timely attention and proactive responses of individuals and governments are more pronounced in countries that reported deaths caused by SARS, which left deeper imprints. Our findings suggest that the imprint of similar viruses' experience is a fundamental mechanism underlying timely responses to COVID-19.

Keywords: COVID-19, Imprint, SARS Experience, Delayed Response

JEL Classification: D83, E70, G10, H12, I10

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1. Introduction

The coronavirus disease 2019 (COVID-19) is one of the deadliest global pandemics in human history, one that accounted for more than 1.8 million deaths worldwide in 2020 and is estimated to cause a 4.3% contraction in global GDP in 2020.[1] Despite its severity, people and governments across the globe respond differently in their containment measures and economic policies (e.g., Ding et al., 2020a, 2020b; Huang et al., 2020).

This paper studies how the imprint of an experience with similar viral outbreaks affects countries' responses to COVID-19. In particular, we explore the heterogeneous attention and responses to the first known outbreak of COVID-19 in Wuhan, China, between countries severely affected by Severe Acute Respiratory Syndrome (SARS) in 2003 and other countries, given the similarity between the viruses that cause SARS and COVID-19. We find that countries with experience of SARS infections pay attention to COVID-19 earlier and respond in a more timely and proactive manner.

First, we directly examine whether an imprint of SARS experience exists using Google search data. We study people's attention to the first known outbreak of COVID-19 in China from January 20 to January 31, 2020, which covers the initial government responses and the first extensive media coverage of COVID-19 in China and abroad. We find that searches for "SARS" and "coronavirus" in Google are eight times and two times higher, respectively, in the 28 countries with SARS cases in this two-week window than in other countries without SARS experience. People in countries without SARS experience pay attention to COVID-19 much later, when the disease begins to spread rapidly outside China in March. Furthermore, the number of Google searches for "SARS" is twelve times higher in the 10 countries with SARS deaths than in other countries without SARS deaths, suggesting that the imprint is stronger when the disease causes fatalities. In addition, earlier search attention to COVID-19 in countries with SARS imprints is prevalent within continent, even in non-Asian countries (e.g., countries in Europe and North America).

[1] See further details in the World Bank's report, Global Economic Prospects.

Second, we examine how different search attention to COVID-19 affects stock market performance across countries during the first COVID-19 outbreak in Wuhan. In particular, we find that Google search attention for SARS is negatively associated with the cumulative abnormal returns (*CAR*) of stock market indexes from January 20 to January 31. Furthermore, a one standard deviation increase in Google search attention explained by the SARS imprint leads to a 61.35 basis point drop in CAR. This finding further supports the imprint channel we propose, since the investors imprinted by SARS react more strongly than other investors to the first COVID-19 outbreak. These findings complement those of Da et al. (2011, 2015), which show that investors' search attention plays a substantial role in the stock market.

Next, we examine the role of SARS imprints in government responses to domestic COVID-19 outbreaks. We perform a duration analysis of various government containment measures on the interactions between COVID-19 case numbers and the indicator denoting SARS experience. We find that contemporaneous COVID-19 case numbers are positively associated with the timeliness of containment measures (i.e., school closures, workplace closures, cancellation of public events, restrictions on public gatherings, restrictions on domestic movements, and international travel controls), and this effect is significantly more pronounced for countries with SARS imprints. For example, a 100% increase in COVID-19 cases is associated with 69.7% and 22.6% increases in the rates of school closures in countries with and without SARS infections, respectively. Furthermore, following government social distancing rules, people in countries with SARS deaths are also more constrained in their daily movements, which is associated with lower COVID-19 infection rates in such countries.

Our findings contribute to the literature examining the impact of prior experience on subsequent economic and social activities. Ever since the seminal work by Stinchcombe (1965), the social and economic impacts of imprints have been studied widely (e.g., Marquis and Tilcsik, 2013). A number of studies have shown that early life experiences can leave imprints that influence individuals' careers (e.g., Elder, 1986, 1998; Gibbons and Waldman, 2006; Oyer, 2006, 2008; Law and Zuo, 2020), risk attitude (e.g., Chiang et al., 2011; Malmendier and Nagel, 2011, 2016; Guiso et al., 2015; Bernile et al., 2017), investments (e.g., Kaustia and Knüpfer, 2008; Knüpfer et al., 2017; Huang, 2019; Malmendier et al., 2020), and corporate management (e.g., Bayus and Agarwal, 2007; Billett and Qian, 2008; Malmendier et al., 2011; Kaplan et al., 2012; Benmelech and Frydman, 2015; Schoar and Zuo, 2017; He et al., 2018). In particular, inexperienced investors tend to neglect risk until they experience severe and adverse investment outcomes (e.g., Gennaioli et al., 2012; Chernenko et al., 2016). For the first time, this paper documents a crucial fundamental mechanism underlying the different responses to COVID-19 across the globe: the experience of similar viruses.[2] This has important policy implications for economic aid programs and containment measures worldwide, as early responses to COVID-19 can mean the difference between life and death.

2. Background

2.1. COVID-19 (caused by SARS-CoV-2)

According to the World Health Organization (WHO), severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes COVID-19. The first known outbreak of COVID-19 was in Wuhan, China. The earliest known COVID-19 case, detected by SARS tests, was recorded on December 15, 2019. The media and public in China started to pay attention to COVID-19 in late January. In particular, on January 20, Dr. Zhong Nanshan, a Chinese epidemiologist who had earned international fame for managing the 2003 SARS outbreak in China, addressed the nation on China Central Television (CCTV) and, for the first time, confirmed the human-to-human transmission of COVID-19. Since then, the Chinese government has initiated several strong containment measures. On January 23, the Chinese government started a complete lockdown of Wuhan after 444 cases had been confirmed. This lockdown, which affected approximately 57 million people, was the first major move to contain the outbreak. On January 25, the first day of the Chinese Lunar New Year, the Standing Committee of the Politburo, the highest authority of the Chinese Communist Party, held an emergency meeting regarding COVID-19. It was unprecedented for the Standing Committee of the Politburo to convene on the Chinese New Year, so this meeting sent a strong signal of the severity of the COVID-19 situation to the rest of the world. On January 30, WHO declared COVID-19 a global

[2] Several contemporaneous studies examine the economic consequences of COVID-19 outbreaks in China and beyond, as well as policy responses to the virus. For example, see Atkeson (2020); Baker et al. (2020); Barrot et al. (2020); Chen et al. (2020); Ding et al. (2020); Duan et al. (2020); Eichenbaum et al. (2020); Fahlenbrach et al. (2020); Feng et al. (2020); Gormsen and Koijen (2020); Hassan et al. (2020); Ramelli and Wagner (2020); Stock (2020).

public health emergency. To examine people's attention to the first known COVID-19 outbreak, we thus use the two-week window from January 20 to 31, which covers the first widespread media reports and government actions.[3]

2.2. SARS (caused by SARS-CoV-1)

There are many similarities between viruses SARS-CoV-1 and SARS-CoV-2, which cause SARS disease and COVID-19 disease, respectively. Specifically, SARS-CoV-2 is most closely related to SARS-CoV-1, according to an article by the National Institutes of Health titled "SARS-CoV-2 stability similar to original SARS virus." SARS-CoV-2 is recognized as a SARS family virus with similar symptoms and forms of transmission. Moreover, both first known outbreaks of SARS and COVID-19 were in mainland China. In summary, COVID-19 is similar to SARS in many respects but quite different from other known pathogens, such as MERS and the influenza virus.[4] Hence, in this paper, we use SARS infections to measure past adverse experience.

3. Data and Summary Statistics

We collect data on the 2003 SARS epidemic from the WHO website. The first SARS patient was identified in Guangdong province of China in November 2002, after which the disease spread to the other 28 countries. Ten out of these 28 countries across four continents reported SARS fatalities (see Table A1 in the Online Appendix). As of December 31, 2003, WHO had reported 8,096 SARS cases worldwide, with a fatality rate of 9.6%. We obtain data for the COVID-19 pandemic from WHO and Johns Hopkins University, whose databases cover daily COVID-19 confirmed cases and deaths for 165 countries/territories.

To measure Google search attention, we use two keywords: "SARS" and "coronavirus." Google Trends provides search index measures ranging from zero (i.e., no search on the keyword) to 100 (i.e., peak popularity for the keyword), which represents search interests relative to the highest point for a given region and time. We obtain cross-sectional data for 165 countries from the "Interest by region" section to compare

[3] See Figure A1 in the Online Appendix for the important events and dates of COVID-19 developments worldwide, from the first known case in December 2019 to March 2020, when it became a global pandemic.
[4] See, for example, "'Sars-family' virus claims the second victim in China", *BBC*, January 16, 2020. Section 1.1 in the Online Appendix shows more detailed discussions for the similarities between SARS and COVID-19.

relative search intensities among regions. For countries with low search volumes, the search indexes are missing, and we replace them with zero. Panel A of Table 1 shows the summary statistics. From January 20 to 31, the average Google search index values for the keywords "SARS" and "coronavirus" are 2.848 and 9.930, respectively. Among *SARSCase*=0 countries, the average *GoogleSARS* and *GoogleCoronavirus* are 0.661 and 6.288, respectively. These numbers are much higher for *SARSCase*=1 countries (i.e., 13.554 and 27.750), especially for *SARSDeath*=1 countries (i.e., 25.6 and 33.2). This unconditional pattern suggests that people in countries with SARS imprints pay more attention to COVID-19-related information, especially people in countries with SARS deaths.

Table 1: Summary Statistics

Panel A: Attention and Stock Returns						
	Sub-Sample				Full Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
	SARSCase=		*SARSDeath*=			
Variables	0	1	0	1	Mean	S.D.
GoogleSARS	0.661	13.554	1.381	25.600	2.848	9.439
	(137)	(28)	(155)	(10)	(165)	
GoogleCoronavirus	6.288	27.750	8.429	33.200	9.930	16.857
	(137)	(28)	(155)	(10)	(165)	
CAR	-0.827	-1.828	-0.902	-2.922	-1.218	1.891
	(39)	(25)	(54)	(10)	(64)	
CumRet	-2.226	-4.041	-2.540	-5.068	-2.935	2.295
	(39)	(25)	(54)	(10)	(64)	

Panel B: Social Distancing						
Variables	N	Mean	S.D.	Median	P25	P75
School	32,860	0.462	0.499	0	0	1
WorkPlace	32,860	0.142	0.349	0	0	0
PublicEvent	32,860	0.543	0.498	1	0	1
Gathering	32,860	0.274	0.446	0	0	1
InternalMovement	32,860	0.360	0.480	0	0	1
Travel	32,860	0.380	0.485	0	0	1
COV19Cases	32,860	26,178.500	163,558.900	234.5	0	4,410.5

Notes. This table presents the summary statistics of sample data. Panel A is for Google search indexes across 165 countries and stock market returns across 64 countries. Mainland China is excluded. Columns (1) and (2) show *SARSCase*=0 and 1 countries, respectively. Columns (3) and (4) show *SARSDeath*=0 and 1 countries, respectively. Columns (5) and (6) show the full sample. The mean values of *GoogleSARS*, *GoogleCoronavirus*, *CAR*, and *CumRet* are reported with observation numbers in parentheses below. Panel B is for the country-date panel data on government social distancing policies and domestic COVID-19 development across 155 countries from January 1 to July 30, 2020. See the Appendix Table for detailed variable definitions.

Moreover, we obtain information for government social distancing policies from the Oxford COVID-19 Government Response Tracker (OxCGRT) for the following six categories: school closure, workplace closure, public events cancellation, gathering restrictions, restrictions on internal movement between cities/regions, and international travel controls (Hale et al., 2020). As shown in Panel B of Table 1, closing schools and canceling public events are the most frequently implemented government policies, while closing workplaces is the least frequently implemented policy. Of the 155 countries in our sample, 147 countries implemented school closures at all levels, and 99 countries implemented workplace closures for all non-essential industries.

4. Empirical Analyses and Results

4.1. The Imprint of the 2003 SARS Epidemic

We begin our analysis by estimating whether an imprint of the 2003 SARS experience exists during the initial COVID-19 outbreak in Wuhan. Specifically, we perform an OLS regression of Google search indexes for SARS during the two-week window from January 20 to January 31, 2020, on the country's SARS experience. This two-week window covers the entire first government response in China and broad media coverage of COVID-19, as described in Section 2.1.[5] Formally, the regression can be expressed as follows:

$$GoogleSARS_i = \alpha + \beta \times SARSCase_i + Controls_i + Fixed\ Effects + \varepsilon_i, \quad (1)$$

where $GoogleSARS_i$ indicates the Google search index for the keyword "SARS" in country *i* during the initial outbreak in Wuhan; $SARSCase_i$ is an indicator variable denoting that country *i* has recorded domestic SARS cases. Panel A of Table 2 shows the results. In column (1), the coefficient on *SARSCase* is 5.282 at the 5% significance level. Given that the average *GoogleSARS* among *SARSCase*=0 countries is 0.661, the search attention for SARS-related information is about eight times (5.282/0.661=7.991) higher in countries with SARS experience.

[5] Table A2 in the Online Appendix shows similar results for different time windows of the outbreak in Wuhan.

Furthermore, we use $SARSDeath_i$ as the main independent variable in the regression, an indicator variable denoting that country i has recorded domestic SARS deaths. In column (3), the coefficient on *SARSDeath* is 16.477 at the 1% significance level, suggesting that people in countries with SARS fatalities search about twelve times (16.477/1.381=11.931) more intensively than people in countries without SARS fatalities. These results suggest that the 2003 SARS experience left an imprint in the memories of people who started to search for SARS information at the very beginning of the COVID-19 outbreak in China, and the experience of SARS deaths left an even stronger imprint. In addition, people in countries without SARS deaths started to pay attention to SARS and COVID-19-related information much later, at the beginning of March, when COVID-19 spread widely outside of China (see Figure A2 in the Online Appendix).

In Panel B, we use "coronavirus" as the Google search keyword to estimate the attention to COVID-19-related information in late January, since WHO did not officially name the pandemic "COVID-19" until March 11, 2020. In column (1), the coefficient on *SARSCase* is 12.679 at the 1% significance level, suggesting that people in countries with SARS cases search for coronavirus-related information about two times (12.679/6.288=2.016) more intensively than people in countries without SARS experience.

Table 2: Imprints of SARS (Google Search Indexes)

	Full Sample				Excluding Asia	
Panel A: SARS searches						
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	*Google SARS*	*Google SARS*	*Google SARS*	*Google SARS*	*Google SARS*	*Google SARS*
SARSCase	5.282**	5.527**			5.167*	
	(2.33)	(2.29)			(1.75)	
SARSDeath			16.477***	16.595***		13.721*
			(3.37)	(3.34)		(1.86)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	NO	YES	NO	YES	YES	YES
Observations	165	165	165	165	124	124
Adjusted R^2	0.562	0.554	0.648	0.641	0.340	0.522

	Full Sample				Excluding Asia	
Panel B: Coronavirus searches						
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	*Google Coronavirus*	*Google Coronavirus*	*Google Coronavirus*	*Google Coronavirus*	*Google Coronavirus*	*Google Coronavirus*
SARSCase	12.679***	15.469***			18.516***	
	(2.72)	(3.69)			(4.29)	
SARSDeath			17.878**	20.824***		17.071***
			(2.17)	(2.84)		(3.06)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	NO	YES	NO	YES	YES	YES
Observations	165	165	165	165	124	124
Adjusted R^2	0.361	0.509	0.355	0.497	0.636	0.586

Notes. This table presents the results of cross-sectional OLS regressions of Google search indexes on SARS imprints during the initial COVID-19 outbreak in Wuhan. In Panel A (B), the dependent variable, *GoogleSARS* (*GoogleCoronavirus*), is the Google search index for keyword "SARS" ("coronavirus") from January 20 to 31, 2020. The main independent variable, *SARSCase* (*SARSDeath*), is an indicator denoting the country that had SARS cases (deaths). *Log*(*GDP*), *Log*(*Popu*), *Log*(*AvgCOV19*), *TradeIntensity*, *LifeExpectancy*, and *Log*(*GovDebt*) are controlled in all columns. Mainland China is excluded. See the Appendix Table for detailed variable definitions. Robust standard errors are used, and *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

In addition to the imprint hypothesis, several alternative mechanisms may explain the higher search attention for SARS. First, the countries that recorded SARS infections might be more vulnerable to COVID-19 as well, given the similarity between the two viruses, which were also both discovered in mainland China. To mitigate this concern, we exclude mainland China from our analyses to estimate other countries' responses before COVID-19 spread globally. Google is also restricted in mainland China.

Second, 13 of the 28 countries that suffered from SARS in 2003 are in Asia and are geographically close to mainland China. Those countries could be more seriously affected by COVID-19. We control for the average number of daily new COVID-19 cases in this window, which measures the severity of the domestic COVID-19 situation. Only 4 out of the 165 countries had more than 10 confirmed COVID-19 cases as of January 31, 2020. Furthermore, we control for life expectancy to proxy for the robustness of a country's healthcare systems, the size of the government debt to proxy for the government's fiscal capacity to combat COVID-19, GDP, and population.[6] We also control for countries' trade intensity with China to mitigate the concern that economic proximity to mainland China could explain the higher attention to

[6] We thank the editorial team for these useful suggestions.

COVID-19.

Third, in columns (2) and (4), to further mitigate the concern of geographic proximity to mainland China, we include continent fixed effects to use the variation within continent and find consistent results. Moreover, in columns (5) and (6), we exclude Asian countries and restrict our sample to the other continents, mainly countries in Europe, North America, and Africa. The coefficients on *SARSCase* and *SARSDeath* are both significantly positive. These findings serve as strong evidence that even in non-Asian countries such as Europe, people in countries affected by SARS in 2003 pay significantly greater attention to the COVID-19 outbreak in Wuhan even when there were zero (or close to zero) domestic cases.[7]

4.2. Attention, Stock Market Reaction, and SARS Imprints

This section further examines the relation between the increased search attention in Google and the stock market performance at the beginning of the pandemic. Specifically, we obtain stock market index data from Thomson Reuters Eikon for the biggest 65 markets, which comprise more than 99% of the total global stock market capitalization in 2018. We choose the MSCI World Price Index as the global market index.

Following the seminal work by Da et al. (2011, 2015), we regress *CAR* from January 20 to January 31, 2020 on Google search indexes for SARS. Table 3 reports the regression results. In column (1), the coefficient on *GoogleSARS* is -0.044 at the 5% significance level, suggesting that increased search attention is associated with decreases in the stock market. In column (2), we calculate the cumulative return and obtain similar results.

Next, we explore whether the SARS imprint explains the association between Google search attention and stock market returns. For these 64 countries, we repeat the regression in column (2) of Table 2 Panel A and calculate the predicted *GoogleSARS*. Then, we perform the regression of *CAR* on predicted *GoogleSARS*. In column (3) of Table 3, the coefficient on $\widehat{GoogleSARS}_{Case}$ is -0.065, suggesting that a one

[7] Following Ding et al. (2020a), we compare Google search attention before and after the date at which each country surpassed 100 COVID-19 cases. Table A3 in the Online Appendix shows that people in countries with SARS cases pay significantly more attention to COVID-19 following domestic outbreaks.

standard deviation increase in Google search attention explained by the SARS imprint leads to a 61.35 (9.439×0.065) basis point drop in CAR. In column (4), we use *SARSDeath* to predict *GoogleSARS* and find that the coefficient on $\widehat{GoogleSARS}_{Death}$ is -0.074, which is larger than that in column (3), suggesting a deeper imprint resulting from SARS deaths and a stronger stock market reaction. In columns (5) and (6), we again use cumulative return as dependent variable and obtain similar results.

Table 3: SARS Experience, Attention, and Return

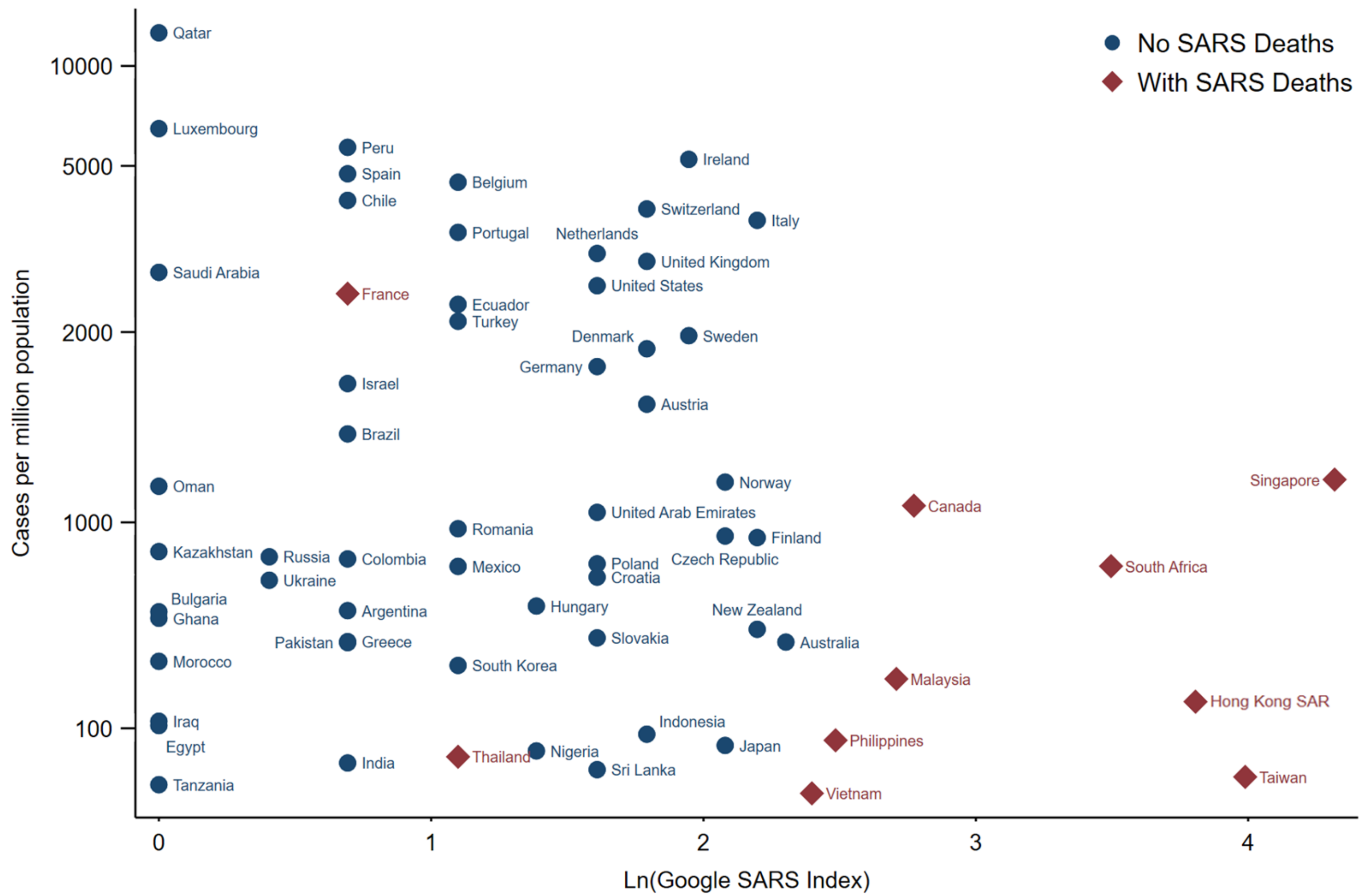
Variables	(1) *CAR*	(2) *CumRet*	(3) *CAR*	(4) *CAR*	(5) *CumRet*	(6) *CumRet*
$GoogleSARS$	-0.044**	-0.049*				
	(-2.63)	(-1.80)				
$\widehat{GoogleSARS}_{Case}$			-0.065*		-0.123**	
			(-1.75)		(-2.20)	
$\widehat{GoogleSARS}_{Death}$				-0.074***		-0.142***
				(-3.07)		(-3.60)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	YES	YES	YES	YES	YES	YES
Observations	64	64	64	64	64	64
Adjusted R^2	0.469	0.362	0.433	0.453	0.364	0.416

Notes. This table presents the results of cross-sectional OLS regressions of stock market returns during the initial COVID-19 outbreak in Wuhan on SARS imprints for 64 markets (mainland China is excluded). The dependent variable, *CAR* (*CumRet*), is the cumulative abnormal return (cumulative return) from January 20 to 31, 2020. $\widehat{GoogleSARS}_{Case}$ ($\widehat{GoogleSARS}_{Death}$) is the predicted Google search index using *SARSCase* (*SARSDeath*). *Log*(*GDP*), *Log*(*Popu*), *Log*(*AvgCOV19*), *TradeIntensity*, *LifeExpectancy*, and *Log*(*GovDebt*) are controlled in all columns. See the Appendix Table for detailed variable definitions. Robust standard errors are used, and *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

4.3. Government Actions to Combat COVID-19 Outbreaks

In this section, we aim to understand the impact of SARS imprints on government actions to combat domestic COVID-19 outbreaks. Figure 1 shows the scatter plot of Google search indexes for "SARS" from January 20 to January 31, 2020, versus the cumulative COVID-19 cases per million population on the 90th day since the first confirmed domestic case. The countries with SARS deaths are clustered in the bottom-right corner, suggesting that the SARS imprint is associated with higher search attention and lower COVID-19 infections.

Figure 1: COVID-19 Development, Google Search, and SARS Imprints



Notes. This figure shows the scatter plot of COVID-19 development and Google search attention across 64 countries/territories (mainland China is excluded). The vertical axis displays the cumulative number of COVID-19 cases per million population on the 90th day since the first confirmed domestic case. The horizontal axis displays the natural logarithm of one plus the Google search index for the keyword "SARS" from January 20 to 31, 2020. Diamonds (circles) denote countries/territories with (without) SARS deaths.

One of the major criticisms of government containment measures is the slow response to COVID-19. We employ the Cox proportional hazard model to study the association between the likelihood of implementing various containment measures (e.g., lockdowns) and the SARS imprint. Formally, the regression can be expressed as follows:

$$h_i(t) = h_0(t)\, exp\big(\beta_1 \times Log(COV19Cases)_{i,t} + \beta_2 \times Log(COV19Cases)_{i,t} \times SARSCase_i + \beta_3 \times SARSCase_i + Controls_i + Continent\ FE\big), \quad (2)$$

where $h_i(t)$ is the expected hazard at date *t* for country *i*; $h_0(t)$ is the baseline hazard and represents the hazard when all of the predictors are equal to zero; $Log(COV19Cases)_{i,t}$ is the natural logarithm of one plus the cumulative number of confirmed COVID-19 cases in country *i* on date *t*; $Controls_i$ includes life expectancy, government debt, GDP, population, and trade intensity with China. We also control for continent fixed effects. Each country enters the hazard regression on the date of its first confirmed domestic COVID-19 case and exits after the respective policy takes effect. We cluster the standard errors by date to allow the correlation of errors across countries.

The sample contains 155 countries worldwide for which we have data on government actions. We estimate the hazard probabilities for six different containment measures in Table 4. Panel A uses *SARSCase* to proxy for the SARS imprint, and Panel B uses *SARSDeath*. In columns (1) to (6) of Panel A, the coefficients on *Log*(*COV19Cases*) are all positive, suggesting that the likelihood of enforcing these containment measures is higher when there are more contemporaneous COVID-19 cases. Moreover, in columns (1) to (6), the coefficients on *Log*(*COV19Cases*)×*SARSCase* are all significantly positive, suggesting that the positive associations between COVID-19 case number and the likelihood of containment measures are higher in countries with SARS imprints: governments with SARS experience respond more quickly to domestic outbreaks than governments without SARS experience.

For example, for school closure in column (1), a 100% increase in the COVID-19 case number yields a hazard ratio equal to 1.226 (Exp(0.294×Ln(2))=1.226) in countries without SARS experience, indicating that the rate of school closure increases by 22.6%. For countries with SARS cases, a 100% increase in the

COVID-19 case number leads to a 69.7% increase in the rate of school closure (Exp((0.294+0.469)×Ln(2))-1).

In Panel B, we use *SARSDeath* to proxy for the SARS imprint and find similar but stronger results. These findings are consistent with Table 2, which shows that the imprint of SARS experience, especially SARS deaths, plays an important role in how a country later copes with similar crises. Again, we restrict the sample to non-Asian countries and find consistent results for all six containment measures (see Table A4 in the Online Appendix).

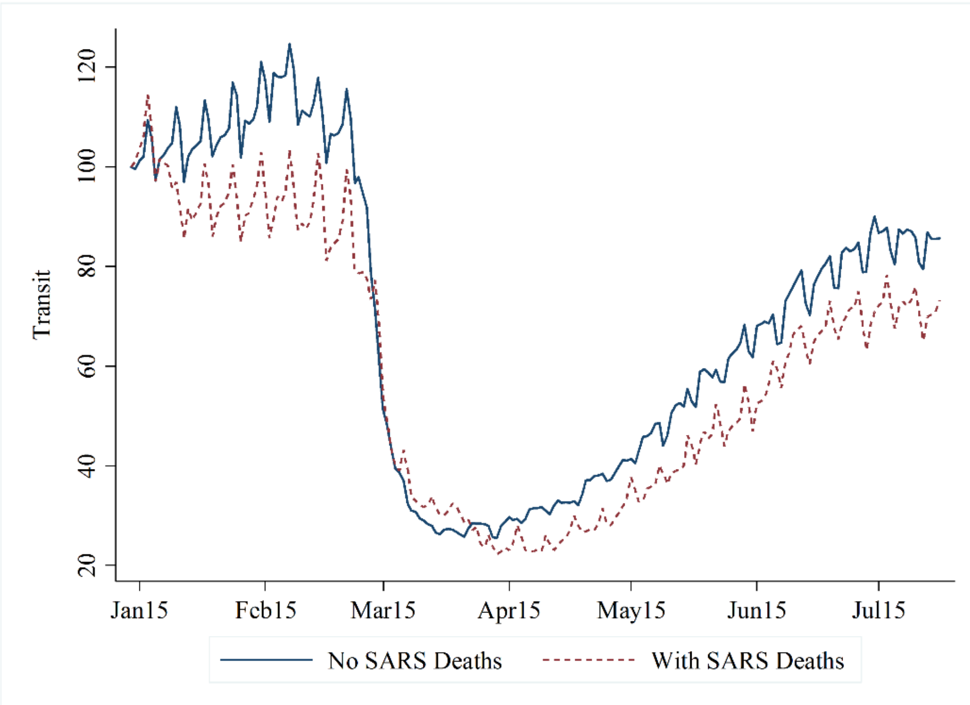
Table 4: Policy Responses to Combat COVID-19

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	*School*	*WorkPlace*	*Public Event*	*Gathering*	*Internal Movement*	*Travel*
Panel A: SARS Case						
Log(*COV19Cases*)	0.294***	0.202***	0.393***	0.040	0.225***	0.122
	(4.15)	(3.02)	(3.42)	(0.70)	(3.61)	(1.49)
Log(*COV19Cases*)×*SARSCase*	0.469***	0.405***	0.341***	0.437***	0.261***	0.197***
	(5.60)	(5.89)	(3.45)	(5.48)	(3.15)	(3.25)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	YES	YES	YES	YES	YES	YES
Observations	3,060	11,036	3,033	10,121	6,420	7,551
Chi-Squared	127.9	147.2	119.5	118.6	63.62	66.96
Panel B: SARS Death						
Log(*COV19Cases*)	0.373***	0.273***	0.459***	0.101**	0.283***	0.167**
	(5.00)	(4.40)	(4.23)	(2.12)	(4.93)	(2.22)
Log(*COV19Cases*)×*SARSDeath*	0.608**	1.138***	0.773***	0.485***	0.748***	0.637***
	(2.38)	(5.25)	(3.36)	(3.24)	(3.58)	(4.89)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	YES	YES	YES	YES	YES	YES
Observations	3,060	11,036	3,033	10,121	6,420	7,551
Chi-Squared	122.8	173.8	96.41	70.57	87.80	64.92

Notes. This table presents the results of Cox proportional hazard regressions for policy responses to COVID-19 at the country-date level. Each country enters the hazard regression (origin date) when the country reports its first COVID-19 case. The failure date is the date when the respective policy takes effect. *Log*(*COV19Cases*) is the natural logarithm of one plus the number of concurrent cumulative confirmed cases. *SARSCase* (*SARSDeath*) is an indicator denoting the country had SARS cases (deaths). *SARSCase* (*SARSDeath*), *Log*(*GDP*), *Log*(*Popu*), *TradeIntensity*, *LifeExpectancy*, and *Log*(*GovDebt*) are controlled in all columns. Mainland China is excluded. See the Appendix Table for detailed variable definitions. Standard errors are clustered at the calendar date level, and *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 2 shows that people's daily transit movements are substantially lower in countries with SARS deaths (i.e., the dashed line) than in other countries without SARS deaths (i.e., the solid line) during both the beginning of the pandemic (January to early March) and the reopening stages (May to July). Many countries started to implement social distancing rules in March and relaxed those rules gradually beginning in May. In summary, both governments and individuals with SARS imprints start social distancing earlier and are more cautious in the reopening stage.[8] This could explain the lower infection rates in such countries, as suggested in Figure 1.

Figure 2: SARS Experience and Residential Mobility



Notes. This figure shows the average transit movement trend for two groups of countries from January 13 to July 30, 2020, based on Apple mobility data. The vertical axis represents the daily number of requests made to Apple Maps for directions by transportation type "Transit," which is normalized to 100 on January 13, 2020 for each country. The dashed (solid) line represents the countries with (without) SARS deaths. Figure A3 in the Online Appendix shows the pattern for transportation types "Walking" and "Driving."

5. Conclusion

The current COVID-19 pandemic is a once-in-a-century global crisis. A universally accepted tenet of public health is that healthcare systems should respond to pandemics as early and as intensively as possible. Although many countries have been working hard to combat this disease, COVID-19 has nevertheless spread dramatically in many parts of the world, and its impacts are detrimental to human life and well-

[8] Table A5 in the Online Appendix shows similar results obtained via multivariate analysis.

being. While we document the impact of SARS experience on individual and governmental responses to COVID-19, understanding the long-term consequences of this pandemic experience is left for future research.

Appendix Table: Variable Definitions

Variable Names	Variable Definitions
SARSCase	An indicator variable that equals one if the country had SARS cases, and zero otherwise.
SARSDeath	An indicator variable that equals one if the country had SARS deaths, and zero otherwise.
GoogleSARS	Google search index for keyword "SARS" from January 20 to January 31, 2020. For countries with low search volumes, the search indexes are missing, and we replace them with zero.
GoogleCoronavirus	Google search index for keyword "coronavirus" from January 20 to January 31, 2020. For countries with low search volumes, the search indexes are missing, and we replace them with zero.
Log(*GDP*)	Natural logarithm of the country's GDP (in USD). (World Bank Database.)
Log(*Popu*)	Natural logarithm of the country's total population. (World Bank Database.)
Log(*AvgCOV19*)	Natural logarithm of one plus the average daily new COVID-19 cases from January 20 to January 31, 2020.
CAR	Cumulative abnormal return, computed as the sum of abnormal daily returns (in percentage points) from January 20 to January 31, 2020, where the abnormal return is calculated based on the market model: $Abnormal\ Return_{i,t} = Ret_{i,t} - \hat{\alpha}_i - \hat{\beta}_{1i,t-1} Ret_{M,t-1} - \hat{\beta}_{2i} Ret_{M,t} - \hat{\beta}_{3i} Ret_{M,t+1}$, where $\hat{\alpha}_i$, $\hat{\beta}_{1i}$, $\hat{\beta}_{2i}$, and $\hat{\beta}_{3i}$ are estimated in the pre-event window period from July 1 to December 31, 2019, $Ret_{i,t}$ is the index return in country/territory *i* on date *t*, and $Ret_{M,t}$ is the return of the global market index (i.e., the MSCI World Price Index).
CumRet	Cumulative return computed as the sum of daily returns (in percentage points) of the stock index from January 20 to January 31, 2020. (Thomson Reuters Eikon Database.)
TradeIntensity	The ratio between the country's trade amount with China and its total trade amount calculated using 2018 data, where trade amount equals the sum of imports and exports. (United Nations ComTrade Database.)
LifeExpectancy	The average number of years an individual in the country is expected to live. (United Nations Population Division Database.)
Log(*GovDebt*)	Natural logarithm of one plus the country's government debt amount (in USD). (IMF Database.)
School	An indicator variable that equals one when the school closure policy is enforced at all levels in the country, and zero before the policy takes effect.
Workplace	An indicator variable that equals one when the work-from-home policy is enforced for all but essential workplaces in the country, and zero before the policy takes effect.
PublicEvent	An indicator variable that equals one when the country requires public events to be canceled, and zero before the policy takes effect.
Gathering	An indicator variable that equals one when the country bans gatherings of ten people or more, and zero before the policy takes effect.
InternalMovement	An indicator variable that equals one when the country restricts domestic transit between cities/regions, and zero before the policy takes effect.
Travel	An indicator variable that equals one when the country closes its border (i.e., an international travel ban), and zero before the policy takes effect.
Log(*COV19Cases*)	Natural logarithm of one plus the country's cumulative number of COVID-19 cases at date *t*.

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Online Appendix for

Combating the COVID-19 Pandemic: The Role of the SARS Imprint

Contents

Additional Background of COVID-19

1.1 Government Responses to COVID-19

The coronavirus disease 2019 (COVID-19) is the sixth and the most recent global deadly pandemic.[9] By December 31, 2020, more than 83 million confirmed COVID-19 cases have been reported in over 200 countries, areas, or territories, with more than 1.8 million recorded deaths related to COVID-19.[10] Bill Gates, the co-chairman and co-founder of the Bill & Melinda Gates Foundation that heavily invested in global healthcare systems, said that the COVID-19 is starting to behave like the "once-in-a-century pathogen we've been worried about."

The United States, the hot zone of COVID-19, has been criticized heavily for its slow responses to contain the virus. For example, the Center for Disease Control (CDC) test kits were found to have manufacturing defects, and the Food and Drug Administration (FDA) did not allow the use of any test kits from institutions other than CDC until February 29.[11] As of December 2020, nearly 20 million COVID-19 cases with more than 345 thousand deaths have been reported in the U.S., according to Coronavirus Resource Center at Johns Hopkins University. In an article from *Science*, IHME COVID-19 Forecasting Team predicted that around 511,000 lives could be lost to COVID-19 in the U.S. alone by the end of February in 2021. See, "Modeling COVID-19 scenarios for the United States", *Science*, October 23, 2020.

As a part of the urgent plans to respond to COVID-19, leaders of G20 major economies held a virtual talk on March 31, 2020, claiming to inject US$ 5 trillion fiscal stimulus. Kristalina Georgieva, Managing Director of IMF, stated that nearly 80 countries are requesting IMF to help battle coronavirus, and IMF is ready to deploy US$1 trillion lending capacity. See, "Understanding the economic shock of coronavirus",

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[9] The past five notable pandemics in modern human history are the Plague of Justinian in the 6th century, Black Death in the 14th century, Smallpox from the 15th to the 17th century, Cholera in the early 19th century, and the 1918 influenza pandemic.

[10] Our COVID-19 data in the analyses are obtained from WHO and Johns Hopkins University (JHU).

[11] Kelly Wroblewski, director of infectious disease at the Association of Public Health Laboratories, stated that the critical problem with CDC's test kits is the negative control. The declaration of public health emergencies, unintentionally, limited the diagnostic capacity. See detailed description in a news article from *Science*: https://www.sciencemag.org/news/2020/02/united-states-badly-bungled-coronavirus-testing-things-may-soon-improve#.

Harvard Business Review, March 27, 2020; "Coronavirus: A visual guide to the economic impact", *BBC*, June 30, 2020.

1.2 COVID-19 and Other Epidemics

The novel coronavirus is recognized as the SARS family virus. Chan et al. (2020), published online on January 24, 2020, studied the familial cluster of pneumonia associated with the novel coronavirus and conducted a phylogenetic analysis showing it is closest to the SARS-related coronavirus found in Chinese horseshoe bats. Moreover, Van Doremalen et al. (2020) found that the stability of SARS-CoV-2 in aerosols and on various surfaces is similar to that of SARS-CoV-1.

Positive coronavirus was first detected using the SARS tests in the Central Hospital of Wuhan. One doctor, Li Wenliang, shared a message to fellow doctors on December 30, 2019, warning about a possible outbreak of an illness which resembled severe acute respiratory syndrome in Wuhan ("Li Wenliang", *The Lancet*, February 18, 2020). Subsequently, there were 27 COVID-19 cases recorded as of December 31, 2019. On January 9, 2020, a 61-year-old man, who had an underlying heart condition, became the first known person to die of COVID-19. The virus spread rapidly across cities in China, and by March 15, 2020, there were 80,860 officially confirmed cases, as shown in Figure A4.[12] The first confirmed case outside of China, according to the WHO, was reported in Thailand on January 13, followed by a few confirmed cases in other countries. Figure A4 shows that the total number of confirmed cases outside mainland China was under 150 until January 31.

In addition to SARS, several other epidemics happened in the past 20 years, such as the Middle East respiratory syndrome (MERS) caused by MERS-CoV and the swine influenza caused by H1N1. However, they are quite different from COVID-19. In particular, the MERS outbreak started in Saudi Arabia in 2012 and resulted in 2,494 laboratory-confirmed cases with a total of 858 deaths (34% fatality rate) at the end of November 2019.[13] The fatality rates and the speeds of transmission are very different between COVID-19 and MERS. Moreover, WHO particularly pointed out the key differences between influenza and COVID-

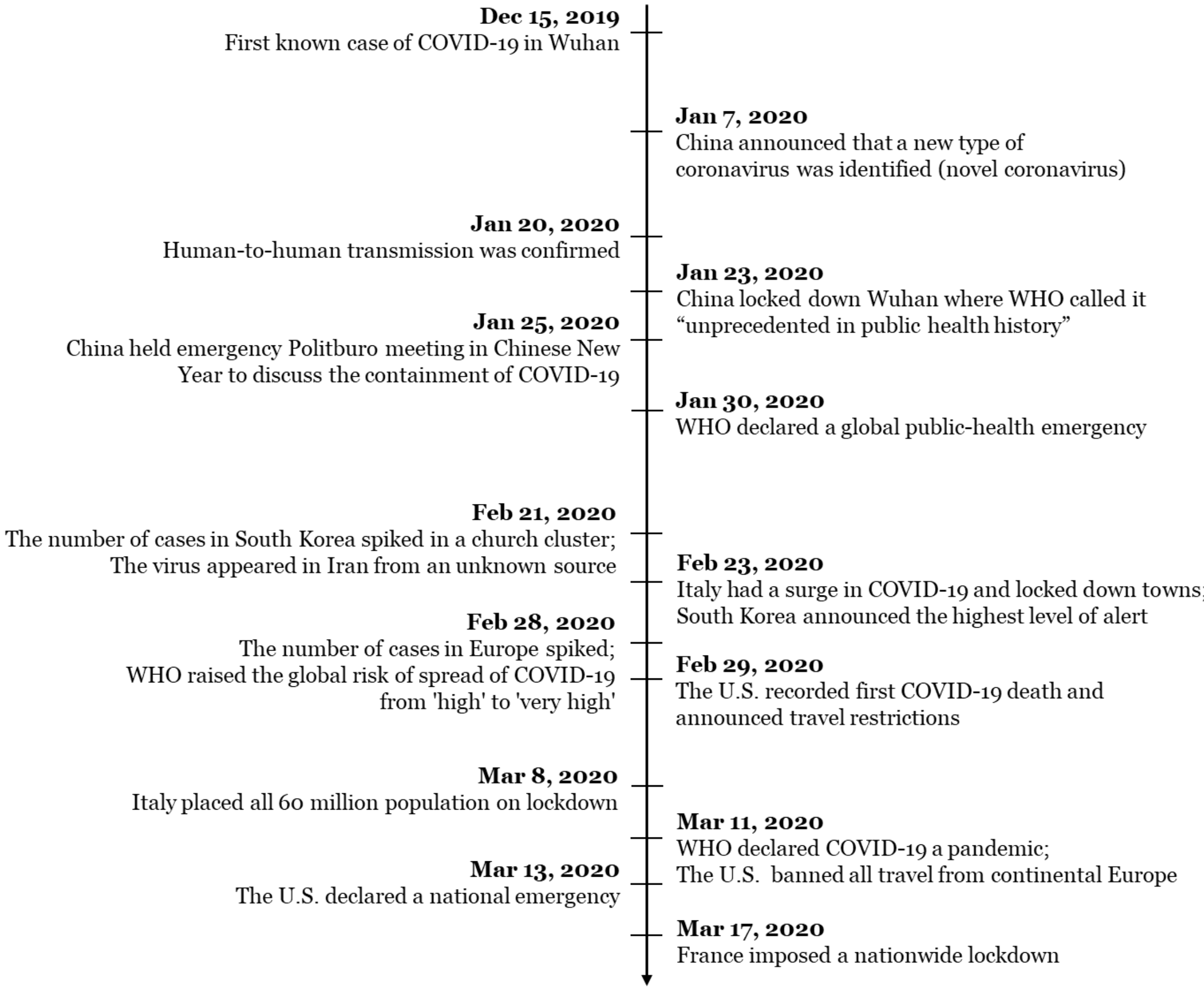
[12] See Huang et al. (2020) on the development of coronavirus in Wuhan, China.
[13] https://www.who.int/emergencies/mers-cov/en/.

19. For example, influenza has a much shorter incubation period and spreads faster than COVID-19. More importantly, the fatality of influenza is below 0.1% (e.g., 0.02% for H1N1, according to the CDC), while the crude fatality rate of COVID-19 is between 3% to 4%, according to WHO.[14]

The relationship between SARS and COVID-19 is not just about virus similarity. The experience gained from SARS also helps doctors to combat the COVID-19. David Naylor, a leading Canadian expert on pandemic control, said that Canada's response to COVID-19 benefited vastly from the country's experience with the 2003 SARS epidemic that killed 44 Canadians (Webster, 2020). In contrast, the U.S. has recorded SARS cases but no deaths and has approximately four times as many COVID-19 cases per million population and more than twice as many COVID-19 deaths per million population as Canada by December 2020.

[14] https://www.who.int/news-room/q-a-detail/q-a-similarities-and-differences-covid-19-and-influenza.

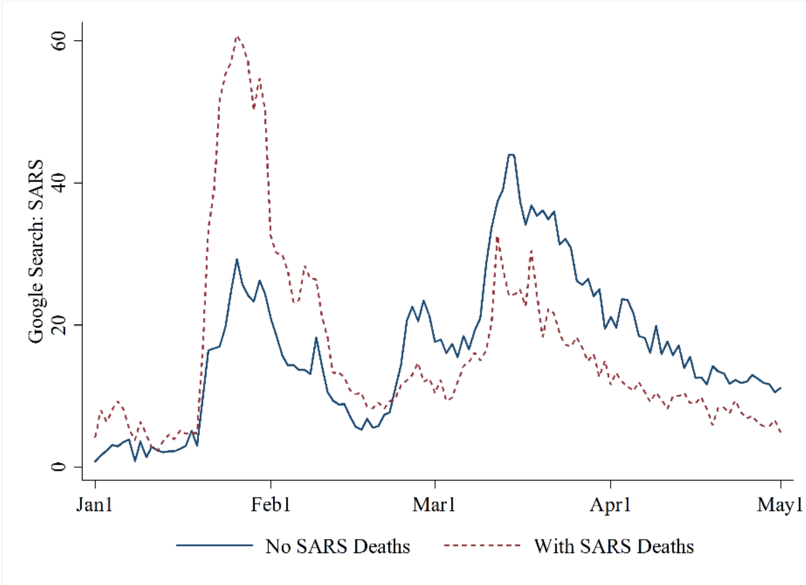
Figure A1: Timeline of COVID-19 Outbreak



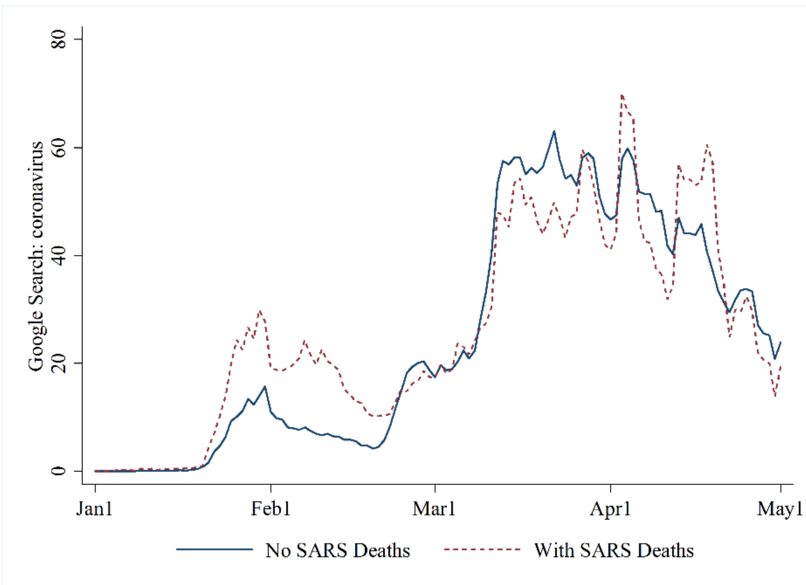
Notes. This figure shows the milestones for COVID-19 development worldwide from the first known case in December 2019 to March 2020, when it became the global pandemic. We summarize these events with the dates accordingly along the timeline.

Figure A2: Trend of Google Search Index

Panel A: SARS Searches



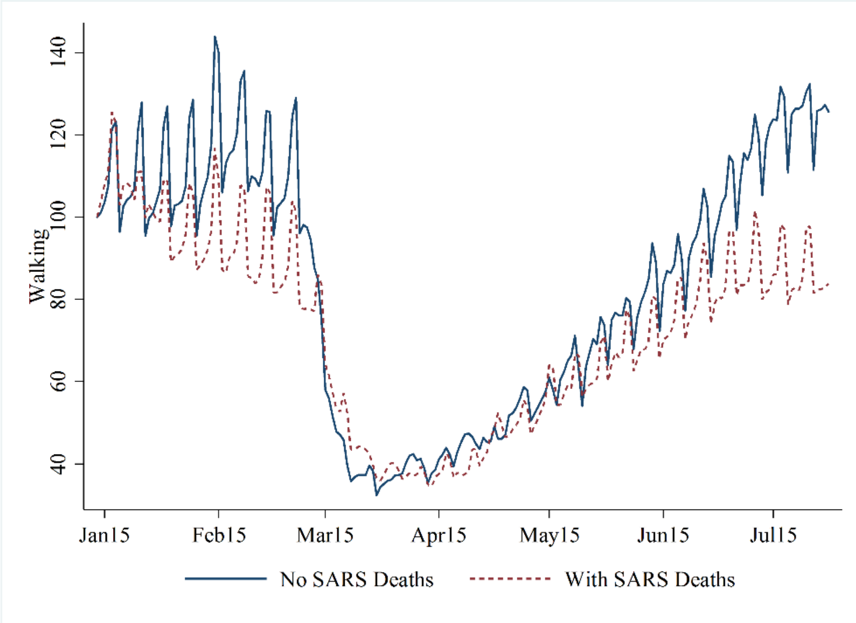
Panel B: Coronavirus Searches



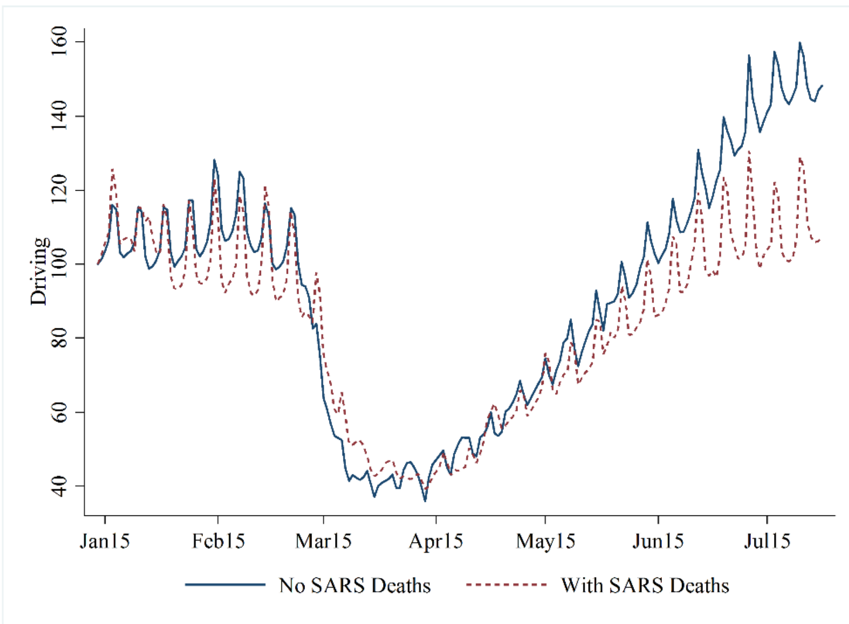
Notes. This figure shows the average Google search index for two groups of countries from January 1 to May 1, 2020. In Panel A, the vertical axis represents the Google search index for the keyword "SARS." In Panel B, the vertical axis represents the Google search index for the keyword "coronavirus." Google search index for each country and each keyword is downloaded separately from https://trends.google.com. Google normalized the search results to make it comparable across countries. The daily Google search index for each country during a certain period equals the total number of searches in this day divided by the peak number of searches of this country over this period. The Google search index ranges from zero (i.e., no search on the keyword) to 100 (i.e., the peak number of searches for the keyword), representing relative search interests compared to the highest point in the period. More details on the data can be found at https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052. In both panels, the dashed line represents the average Google search index in the 10 countries with SARS deaths. The solid line represents the average Google search index in the 155 countries without SARS deaths. Mainland China is excluded.

Figure A3: SARS Experience and Residential Mobility (Robustness)

Panel A: Mobility trend for Walking

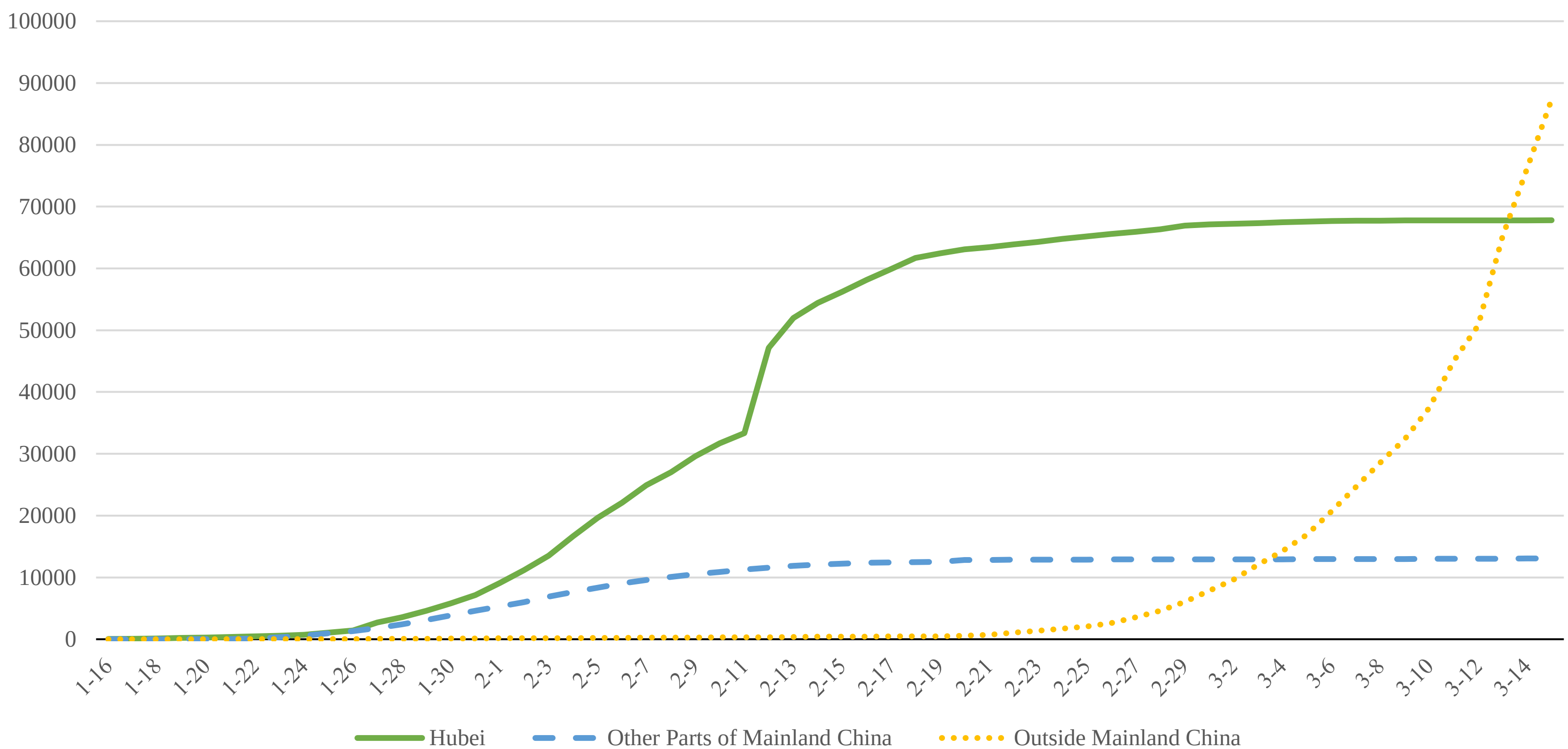


Panel B: Mobility trend for Driving



Notes. This figure shows the average movement trend for two groups of countries from January 13 to July 30, 2020, based on Apple mobility data. In Panel A, the vertical axis represents the daily number of requests made to Apple Maps for directions by transportation type "Walking," which is normalized to 100 on January 13, 2020, for each country. In Panel B, the vertical axis represents the daily number of requests made to Apple Maps for directions by transportation type "Driving," which is normalized to 100 on January 13, 2020, for each country. Data for May 11 and May 12 are not available from Apple, and hence we use linear interpolation to fill up the two-day values. Mainland China is not covered in the data. More details on the data can be found at https://www.apple.com/covid19/mobility. The dashed (solid) line represents the countries with (without) SARS deaths.

Figure A4: COVID-19 Case Numbers Over Time



Notes. This figure shows the cumulative number of COVID-19 cases across the globe from January 16 to March 15, 2020. The green solid line represents the cumulative number of COVID-19 cases in the Hubei province of China. The blue dashed line represents the cumulative number of COVID-19 cases in other parts of mainland China. The yellow dotted line represents the cumulative number of COVID-19 cases outside mainland China. Starting from February 12, 2020, Hubei province started to include clinically diagnosed cases into total confirmed cases, which caused a sharp increase in the cumulative number of COVID-19 cases. While in other places, only lab-confirmed cases are included in the WHO data.

Table A1: Reported SARS Cases Around the World

Country/Territory	Female	Male	Total	Number of deaths	Case fatality ratio (%)
Australia	4	2	6	0	0
Canada	151	100	251	43	17
France	1	6	7	1	14
Germany	4	5	9	0	0
Hong Kong SAR	977	778	1,755	299	17
India	0	3	3	0	0
Indonesia	0	2	2	0	0
Italy	1	3	4	0	0
Kuwait	1	0	1	0	0
Macao SAR	0	1	1	0	0
Mainland China	2,674	2,607	5,327	349	7
Malaysia	1	4	5	2	40
Mongolia	8	1	9	0	0
New Zealand	1	0	1	0	0
Philippines	8	6	14	2	14
Ireland	0	1	1	0	0
South Korea	0	3	3	0	0
Romania	0	1	1	0	0
Russia	0	1	1	0	0
Singapore	161	77	238	33	14
South Africa	0	1	1	1	100
Spain	0	1	1	0	0
Sweden	3	2	5	0	0
Switzerland	0	1	1	0	0
Taiwan	218	128	346	37	11
Thailand	5	4	9	2	22
United Kingdom	2	2	4	0	0
United States	13	14	27	0	0
Vietnam	39	24	63	5	8
Total			8,096	774	9.6

Notes. This table presents the information about SARS spread. The list contains all countries/territories with SARS cases. We report the total number of SARS cases (female vs. male), the number of deaths, and the fatality ratio (in percentage point). Data are obtained from the last update of the WHO summary of the cumulative SARS report, which is available at https://www.who.int/csr/sars/country/table2004_04_21/en/.

Table A2: Imprints of SARS (Longer Windows)

	(1)	(2)	(3)	(4)	(5)	(6)
Time Window	[Jan 07, Jan 31]	[Jan 07, Jan 31]	[Jan 20, Feb 20]	[Jan 20, Feb 20]	[Jan 07, Feb 20]	[Jan 07, Feb 20]
Variables	*GoogleSARS*	*GoogleSARS*	*GoogleSARS*	*GoogleSARS*	*GoogleSARS*	*GoogleSARS*
Panel A: SARS Case						
SARSCase	9.187**	9.605**	9.134**	9.504**	10.376**	10.800**
	(2.15)	(2.12)	(2.36)	(2.32)	(2.31)	(2.28)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	NO	YES	NO	YES	NO	YES
Observations	165	165	165	165	165	165
Adjusted R^2	0.499	0.490	0.412	0.401	0.393	0.382
Panel B: SARS Death						
SARSDeath	27.963***	28.276***	26.003***	26.282***	29.069***	29.396***
	(2.66)	(2.65)	(2.87)	(2.86)	(2.80)	(2.80)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	NO	YES	NO	YES	NO	YES
Observations	165	165	165	165	165	165
Adjusted R^2	0.616	0.610	0.573	0.565	0.568	0.560

Notes. This table presents the results of the cross-sectional OLS regressions of Google search indexes on SARS experience in three different time windows, covering the initial COVID-19 outbreak in Wuhan. The time window in columns (1) and (2) is from January 7 to January 31, 2020. The time window in columns (3) and (4) is from January 20 to February 20, 2020. The time window in columns (5) and (6) is from January 7 to February 20, 2020. China announced that a new type of coronavirus (i.e., novel coronavirus) was identified on January 7. The human-to-human transmission of COVID-19 was confirmed on January 20. February 20 is right before the COVID-19 outbreak in South Korea, Iran, and Europe (i.e., non-SARS countries). The dependent variable, *GoogleSARS*, is the Google search index for keyword "SARS" during the respective time windows. In Panel A (B), the independent variable, *SARSCase* (*SARSDeath*), is an indicator denoting that the country had SARS cases (deaths). *Log*(*GDP*), *Log*(*Popu*), *Log*(*AvgCOV19*), *TradeIntensity*, *LifeExpectancy*, and *Log*(*GovDebt*) are controlled in all columns. *Log*(*AvgCOV19*) is the natural logarithm of one plus the average daily new COV-ID 19 cases during the respective time windows. Mainland China is excluded. See the Appendix Table for detailed variable definitions. Robust standard errors are used, and *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A3: Google Search, COVID-19 Development, and SARS Imprints

Variables	(1) [-5, 5] *Google Coronavirus*	(2) [-10, 10] *Google Coronavirus*	(3) [-15, 15] *Google Coronavirus*
Post	2.686**	4.351***	5.799***
	(1.99)	(2.91)	(3.82)
Post×SARSCase	9.810***	17.118***	23.451***
	(2.90)	(5.32)	(6.82)
Country FE	YES	YES	YES
Observations	1,757	3,352	4,944
Adjusted R^2	0.702	0.584	0.485

Notes. This table presents the results of the panel OLS regressions of Google search indexes on COVID-19 development and SARS experience. We construct a balanced panel of 165 countries from January 1 to July 31, 2020. Following Ding et al. (2020), in columns (1), (2), and (3), we restrict the regression sample to observations during 5, 10, and 15 days before and after the discovery of 100 confirmed COVID-19 cases in each country. The dependent variable, *GoogleCoronavirus,* is the daily Google search index for the keyword "coronavirus" for each country. *Post* is an indicator denoting the dates after the discovery of 100 COVID-19 cases. *SARSCase* is an indicator denoting that the country had SARS cases. Mainland China is excluded. Standard errors are clustered at the country level, and *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A4: Policy Responses to Combat COVID-19 (Exclude Asia)

Variables	(1) *School*	(2) *WorkPlace*	(3) *Public Event*	(4) *Gathering*	(5) *Internal Movement*	(6) *Travel*
Panel A: SARS Case						
Log(*COV19Cases*)	0.728***	0.251***	0.428***	0.086	0.332***	0.220**
	(6.80)	(2.64)	(2.93)	(1.26)	(3.45)	(2.04)
Log(*COV19Cases*)×*SARSCase*	0.457***	0.488***	0.451***	0.436***	0.244**	0.182**
	(2.98)	(3.93)	(3.29)	(4.50)	(2.03)	(2.23)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	YES	YES	YES	YES	YES	YES
Observations	2,304	7,977	1,951	7,627	4,157	5,047
Chi-Squared	170	135.5	77.23	103.4	50.96	107.2
Panel B: SARS Death						
Log(*COV19Cases*)	0.882***	0.347***	0.534***	0.187***	0.402***	0.279***
	(7.45)	(4.14)	(4.20)	(3.49)	(4.41)	(2.94)
Log(*COV19Cases*)×*SARSDeath*	2.553***	1.298***	8.156***	0.339**	1.053***	1.091**
	(4.09)	(3.00)	(3.95)	(2.00)	(3.21)	(2.48)
Controls	YES	YES	YES	YES	YES	YES
Continent FE	YES	YES	YES	YES	YES	YES
Observations	2,304	7,977	1,951	7,627	4,157	5,047
Chi-Squared	127.6	181.9	116.7	49.39	73.24	44.71

Notes. This table presents the results of Cox proportional hazard regressions for policy responses to COVID-19 at the country-date level. Asian countries are excluded in all columns. Each country enters the hazard regression (origin date) when the country reports its first COVID-19 case. The failure date is the date when the respective policy takes effect. *Log*(*COV19Cases*) is the natural logarithm of one plus the number of concurrent cumulative confirmed cases. *SARSCase* (*SARSDeath*) is an indicator denoting that the country had SARS cases (deaths). *SARSCase* (*SARSDeath*), *Log*(*GDP*), *Log*(*Popu*), *TradeIntensity*, *LifeExpectancy*, and *Log*(*GovDebt*) are controlled in all columns. See the Appendix Table for detailed variable definitions. Standard errors are clustered at the calendar date level, and *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A5: SARS Experience and Mobility

Variables	(1) *Stay-at-Home*	(2) *Stay-at-Home*	(3) *Transit*	(4) *Transit*	(5) *Go to Workplace*	(6) *Go to Workplace*
PolicyStringency	1.025***	1.031***	-2.896***	-2.916***	-2.227***	-2.268***
	(29.69)	(32.26)	(-40.35)	(-44.26)	(-31.53)	(-34.28)
PolicyStringency×SARSCase	0.156*		-0.341**		-0.420***	
	(1.78)		(-2.26)		(-2.74)	
PolicyStringency×SARSDeath		0.368**		-0.685***		-0.551*
		(2.11)		(-2.64)		(-1.92)
Country FE	YES	YES	YES	YES	YES	YES
Weekday FE	YES	YES	YES	YES	YES	YES
Observations	20,540	20,540	20,621	20,621	20,621	20,621
Adjusted R^2	0.740	0.742	0.787	0.788	0.667	0.666

Notes. This table presents the results of panel OLS regressions of residential mobility on SARS experience at the country-date level. Mobility data are obtained from Google COVID-19 Community Mobility Reports (https://www.google.com/covid19/mobility/). The sample period goes from February 15 to July 27, 2020. For mobility measure in each category, it is computed as the percentage change compared to a baseline. The baseline value is the median value, for the corresponding day of the week, during the 5-week window from January 3 to February 6, 2020. *Stay-at-Home* is the daily percentage change in the duration of time spent at residence compared to the baseline value for that day of the week. *Transit* is the daily percentage change of the number of visits to transit stations compared to the baseline value for that day of the week. *Go to Workplace* is the daily percentage change of the number of visits to places of work compared to the baseline value for that day of the week. See more details on the Google mobility data at: https://www.google.com/covid19/mobility/data_documentation.html?hl=en. *PolicyStringency* is the sum of stringency indexes for all containment measures (i.e., school closure, workplace closure, public event cancelation, restrictions on gatherings, public transport closure, stay at home orders, restrictions on internal movement, and international travel controls) in each country on each day, where the stringency index for each containment measure is obtained directly from the Oxford COVID-19 Government Response Tracker (OxCGRT, https://github.com/OxCGRT/covid-policy-tracker). *SARSCase* (*SARSDeath*) is an indicator denoting that the country had SARS cases (deaths). Country fixed effects and weekday fixed effects are included in all columns. Weekday fixed effects denote the fixed effects for each day of the week. All dependent variables are in percentage points (i.e., multiplied by 100). Standard errors are clustered at the country level, and *t*-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

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