

The Evolution of the COVID-19 Pandemic Through the Lens of Google Searches

Main Text: Figures and Tables

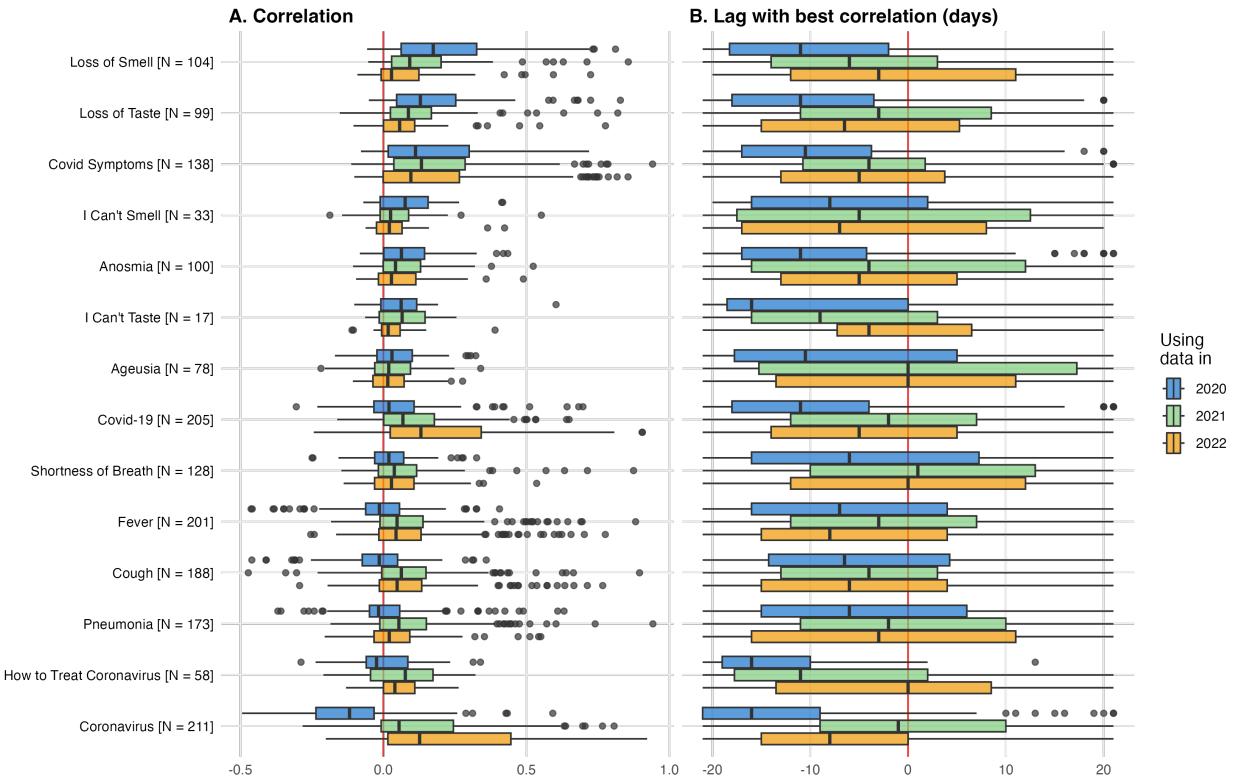


Figure 1: Search interest correlating with and anticipating COVID-19 cases. Panel A shows the correlation between search interest and reported COVID-19 cases. Panel B shows the lead/lag value of COVID-19 cases that produced the highest correlation with search interest. ‘N’ indicates the number of countries with available data. The boxplots include: center line, median; box limits, upper and lower quartiles; whiskers, 1.5x interquartile range; points beyond whiskers, outliers.

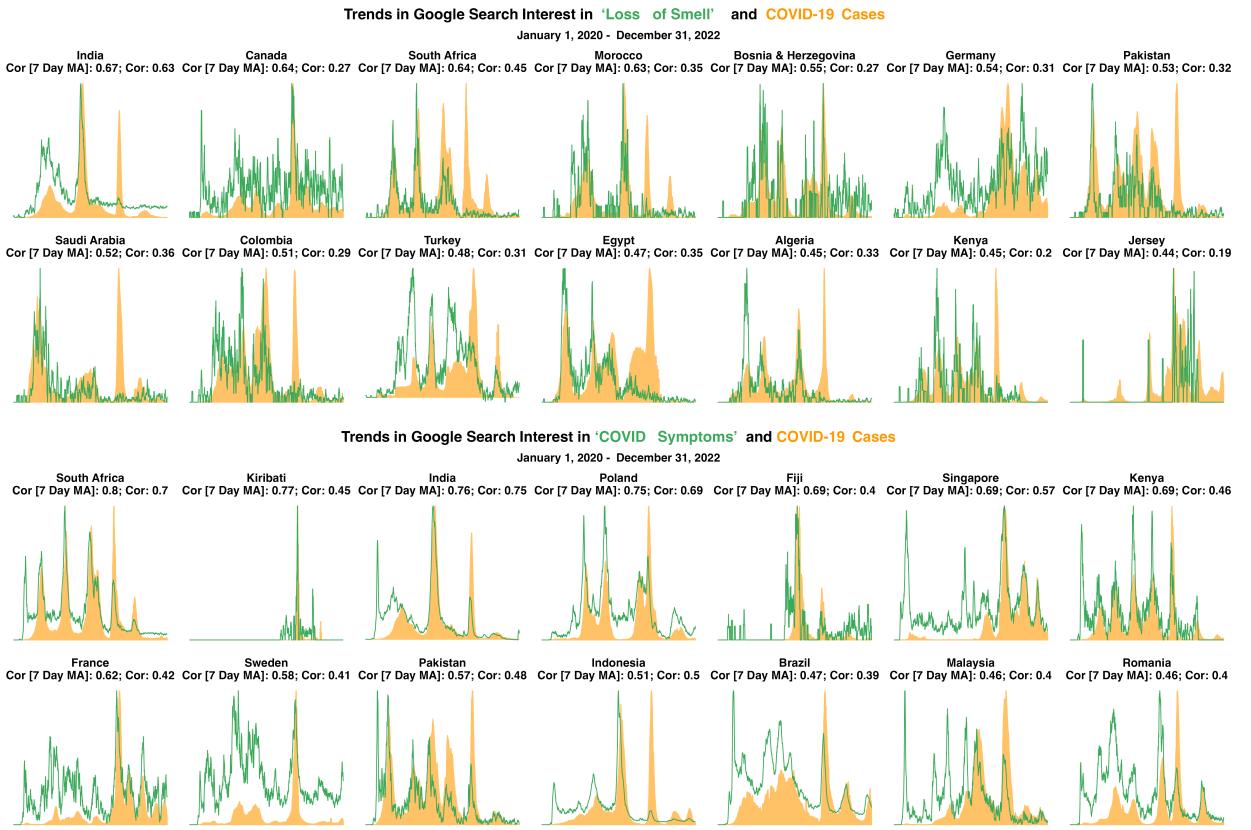


Figure 2: Trends between reported COVID-19 cases and search interest in (1) “Loss of Smell” (top) and (2) “COVID Symptoms” for countries with the top correlations between cases and search interest. To more clearly show trends, the seven-day averages of search interest and cases are shown.

Table 1: Explaining correlation between search interest in loss of smell and COVID-19 cases, using data from 2020 and 2021

	<i>Dependent variable:</i>							
	Correlation							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total COVID-19 Cases, log	0.02*** (0.01)						0.03*** (0.01)	0.03*** (0.01)
Per Pop. Using Internet		0.0000 (0.001)						0.0002 (0.002)
Mobile Cell Sub. per 100			0.0000 (0.0005)					0.0002 (0.001)
GDP Per Cap, Log				-0.004 (0.01)			-0.04 (0.03)	-0.04 (0.04)
Low Income					-0.01 (0.06)		0.03 (0.13)	0.03 (0.13)
Lower Middle Income					0.05 (0.04)		0.04 (0.09)	0.04 (0.09)
Upper Middle Income					0.005 (0.04)		0.01 (0.06)	0.01 (0.06)
Europe and Central Asia						-0.03 (0.05)	-0.01 (0.05)	-0.01 (0.06)
Latin America and Caribbean						-0.06 (0.06)	-0.03 (0.06)	-0.03 (0.06)
Middle East and North Africa						0.02 (0.06)	0.04 (0.06)	0.04 (0.06)
North America						0.33*** (0.11)	0.34*** (0.11)	0.35*** (0.12)
South Asia						0.20** (0.10)	0.14 (0.10)	0.15 (0.10)
Sub-Saharan Africa						-0.07 (0.06)	-0.06 (0.06)	-0.06 (0.07)
Constant	-0.18* (0.10)	0.13*** (0.05)	0.13** (0.06)	0.17 (0.11)	0.12*** (0.03)	0.15*** (0.05)	0.05 (0.34)	0.05 (0.36)
Observations	112	106	110	107	109	112	107	105
Adjusted R ²	0.08	-0.01	-0.01	-0.01	-0.01	0.14	0.22	0.20

*p<0.1; **p<0.05; ***p<0.01

Table 2: Explaining the lead/lag value that produced the highest correlation between search interest in loss of smell and COVID-19 cases, using data from 2020 and 2021

	<i>Dependent variable:</i>							
	Best Lag							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total COVID-19 Cases, log	0.07 (0.52)						-0.33 (0.69)	-0.44 (0.71)
Per Pop. Using Internet		0.03 (0.05)						0.06 (0.13)
Mobile Cell Sub. per 100			0.06* (0.03)					0.05 (0.05)
GDP Per Cap, Log				0.56 (0.90)			0.19 (2.51)	-1.13 (2.96)
Low Income					-4.99 (4.15)		-14.11 (9.49)	-12.75 (9.74)
Lower Middle Income					-1.36 (2.87)		-5.06 (6.57)	-4.74 (6.65)
Upper Middle Income					-1.44 (2.80)		-0.63 (4.33)	-1.48 (4.45)
Europe and Central Asia						0.11 (3.91)	-0.97 (4.08)	-0.74 (4.20)
Latin America and Caribbean						-8.58** (4.07)	-9.92** (4.31)	-9.46** (4.38)
Middle East and North Africa						-1.78 (4.27)	-0.56 (4.37)	-1.35 (4.63)
North America						3.00 (8.38)	1.26 (8.57)	3.43 (8.87)
South Asia						1.83 (7.12)	3.50 (7.28)	4.40 (7.54)
Sub-Saharan Africa						3.50 (4.13)	8.26* (4.84)	8.57* (5.08)
Constant	-7.71 (7.15)	-8.21** (3.22)	-13.41*** (3.99)	11.57 (8.01)	-5.41*** (1.98)	-5.50 (3.42)	-0.32 (25.51)	3.58 (26.78)
Observations	112	106	110	107	109	112	107	105
Adjusted R ²	-0.01	-0.01	0.02	-0.01	-0.01	0.09	0.12	0.12

*p<0.1; **p<0.05; ***p<0.01

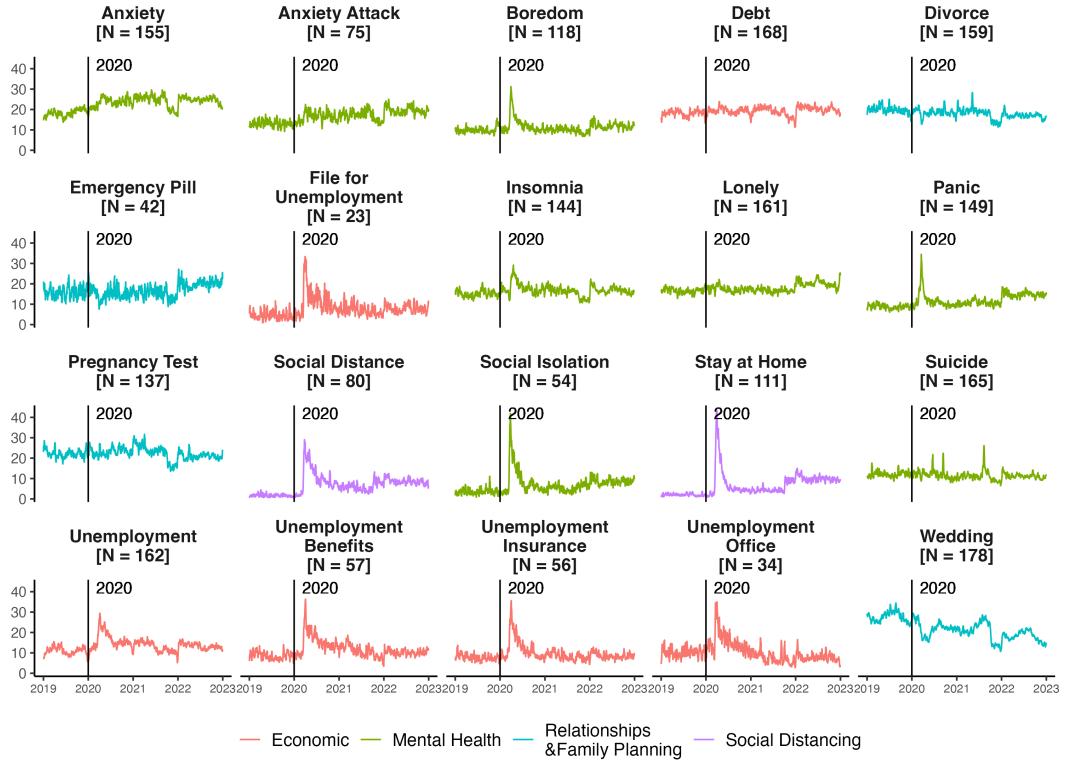


Figure 3: Trends in search interest in social, economic, and mental health keywords from 2019 to 2022. To show trends more clearly, the seven-day moving average of search interest is shown. ‘N’ indicates the number of countries with available data.

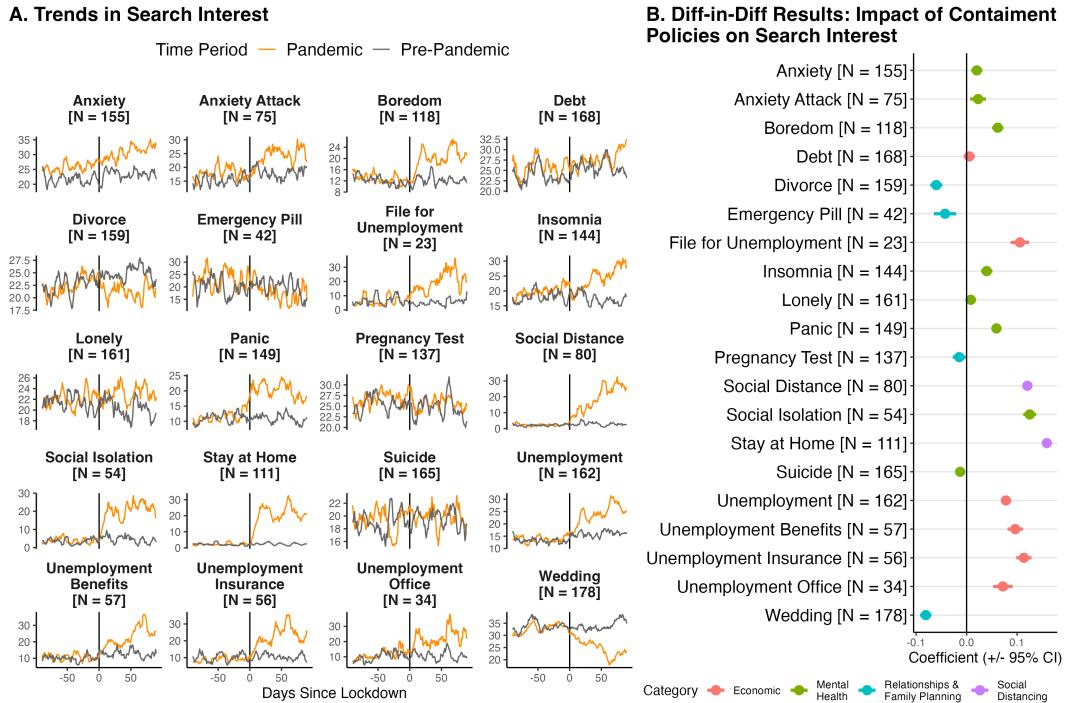
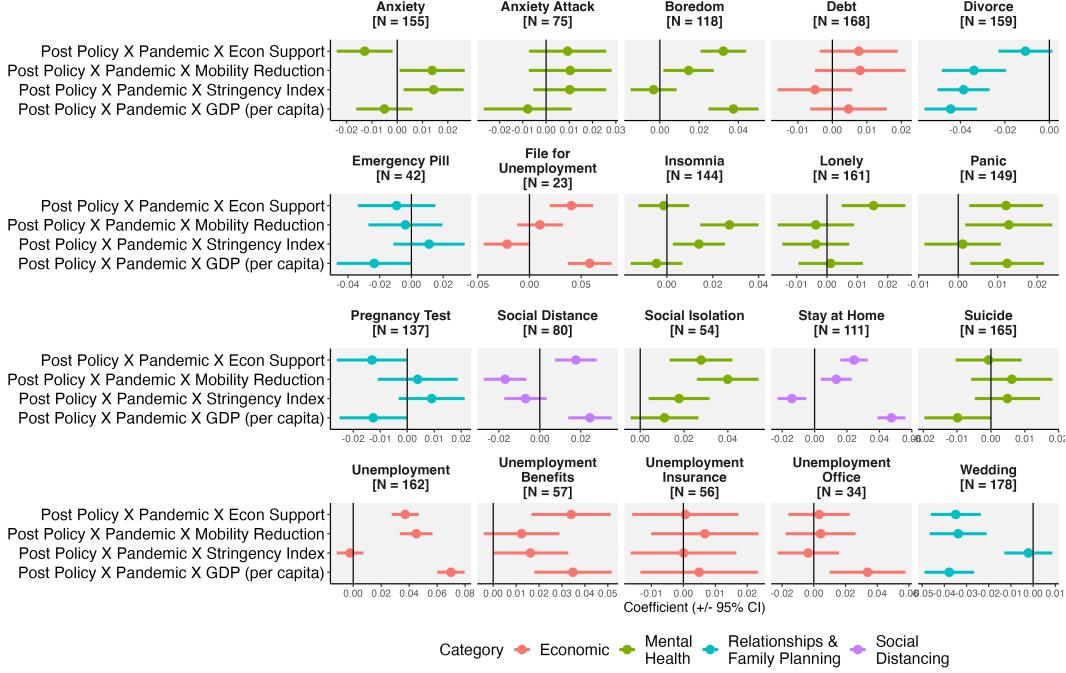


Figure 4: Association of COVID-19 policies and search interest: results pooling all countries. Point estimates and 95% confidence intervals are shown. To show trends more clearly, the seven-day moving average of search interest is shown in panel A. ‘N’ indicates the number of countries with available data.

A. Diff-in-Diff Results: Heterogeneity of Impacts of Containment Policies on Search Interest by Levels of Economic Support, Containment Policy Restrictions, and per capita GDP



B. Maps of Variables

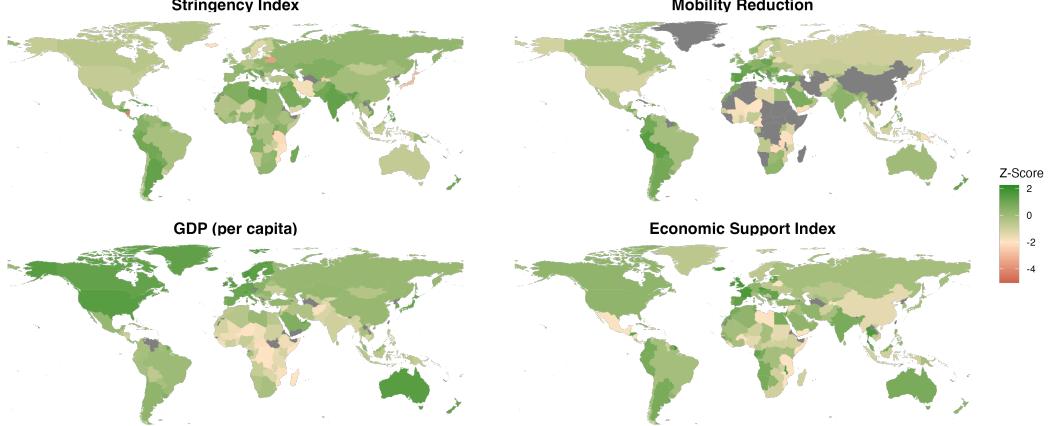


Figure 5: Association of COVID-19 policies with search interest: difference-in-differences results that explore heterogeneity of results across containment policy restrictiveness, economic support, and GDP per capita. Each coefficient comes from a separate regression. The stringency index comes from the University of Oxford COVID-19 Government Response tracker, a composite measure of the restrictiveness of policy measures. Mobility reduction comes from Google COVID-19 Community Mobility Reports, which measure the percent change in mobility relative to pre-pandemic levels. Per capita GDP comes from the World Bank's World Development Indicators; we use log per capita GDP. The Economic Support index from the Oxford COVID-19 Government Response tracker, which measures the extent of economic support across metrics such as income support and debt relief. We standardize all variables into z-scores—having a mean of zero and standard deviation of one. 'N' indicates the number of countries with available data. Maps produced using R, version 4.2.2 (<https://www.r-project.org/>); data for country boundaries come from Natural Earth (<https://www.naturalearthdata.com/>).

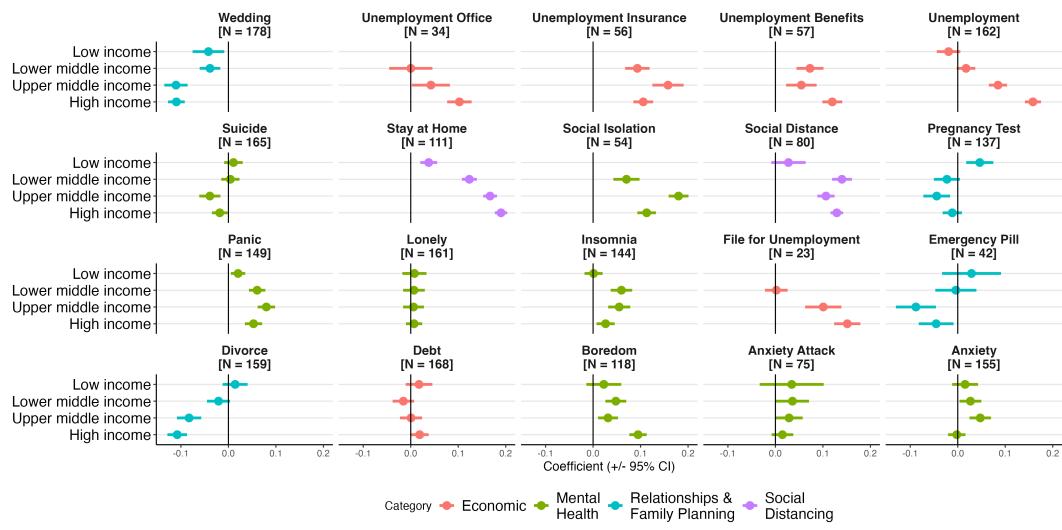


Figure 6: Association of COVID-19 policies and search interest: difference-in-difference results pooling countries by income level. Point estimates and 95% confidence intervals are shown. 'N' indicates the number of countries with available data.