How COVID-19 public interest in the United States fluctuated: A Google Trends Analysis

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Abstract

Background: In the absence of vaccines and established treatments, nonpharmaceutical interventions (NPIs) are fundamental tools to control coronavirus disease 2019 (COVID-19) transmission. NPIs require public interest in order to be successful. In the United States, there is a lack of published research on the factors that influenced public interest in COVID-19. Using Google Trends, we examined the US level of public interest in COVID-19 and how it correlated to testing and other countries.

Objective: To determine how public interest in COVID-19 in the US changed over time and the key factors driving this change, such as testing. US COVID-19 public interest was compared to countries that have been more successful in their containment and mitigation strategies.

Methods: In this retrospective study, Google Trends was used to analyze the volume of internet searches within the US relating to COVID-19, focusing on dates between December 31, 2019 to March 24, 2020. Volume of internet searches related to COVID-19 was compared to other countries.

Results: Within the US throughout January and February 2020, there was limited search interest in COVID-19. Interest declined for the first 21 days of February. A similar decline was seen in geographical regions that were later found to be experiencing undetected community transmission in February. Between March 9 and March 12, there was a rapid rise in search interest. This rise in search interest was positively correlated with the rise of positive tests for SARS-CoV-2 (6.3, 95% CI ?2.9 to 9.7; P <.001). Within the US, it took 52 days for search interest to rise substantially from first positive case; in countries with more successful outbreak control it took less than 15 days.

Conclusions: Containment and mitigation strategies require public interest in order for them to be successful. The initial US level of COVID-19 public interest was limited, and even fell during a time when containment and mitigation strategies were being put in place. A lack of US public interest in COVID-19 existed when containment and mitigation policies were in place. Based on our analysis, it is clear policy makers need to develop novel methods of communicating COVID-19 public health initiatives.

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Abstract:

Background

In the absence of vaccines and established treatments, nonpharmaceutical interventions (NPIs) are fundamental tools to control coronavirus disease 2019 (COVID-19) transmission. NPIs require public interest in order to be successful. In the United States, there is a lack of published research on the factors that influenced public interest in COVID-19. Using Google Trends, we examined the US level of public interest in COVID-19 and how it correlated to testing and other countries.

Objective

To determine how public interest in COVID-19 in the US changed over time and the key factors driving this change, such as testing. US COVID-19 public interest was compared to countries that have been more successful in their containment and mitigation strategies.

Methods

In this retrospective study, Google Trends was used to analyze the volume of internet searches within the US relating to COVID-19, focusing on dates between December 31, 2019 to March 24, 2020. Volume of internet searches related to COVID-19 was compared to other countries.

Findings

Within the US throughout January and February 2020, there was limited search interest in COVID-19. Interest declined for the first 21 days of February. A similar decline was seen in geographical regions that were later found to be experiencing undetected community transmission in February. Between March 9 and March 12, there was a rapid rise in search interest. This rise in search interest was positively correlated with the rise of positive tests for SARS-CoV-2 (6.3, 95% CI −2.9 to 9.7; $P<.001$). Within the US, it took 52 days for search interest to rise substantially from first positive case; in countries with more successful outbreak control it took less than 15 days.

Interpretation

Containment and mitigation strategies require public interest in order for them to be successful. The initial US level of COVID-19 public interest was limited, and even fell during a time when containment and mitigation strategies were being put in place. A lack of US public interest in COVID-19 existed when containment and mitigation policies were in place. Based on our analysis, it is clear policy makers need to develop novel methods of communicating COVID-19 public health initiatives.

Funding

No funding was received for the creation of this project.

Introduction

Over the past 20 years, two pathologic human coronaviruses (HCoVs) have emerged that cause significant morbidity and mortality: severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV). In December 2019, another pathologic HCoV, SARS-CoV-2, emerged in Wuhan, China, causing the coronavirus disease 2019 (COVID-

19).[1,2,3] The severe acute respiratory syndrome (SARS) epidemic in 2003 reported 8 098 cases and 774 deaths. Cases were concentrated in five countries and regions: China, Taiwan, Hong Kong, Singapore, and Canada. SARS was brought under control in 8 months through syndromic surveillance, prompt isolation of patients, strict quarantine, and community-level quarantine. In contrast, COVID-19 has resulted in more than 2 800 deaths, 82 000 confirmed cases, and more than 46 countries affected in just 3 months.[4] COVID-19 is associated with significant morbidity and mortality, with a case fatality rate (CFR) reported as high as 7.2%.[5]

Unfortunately, the epidemiological trajectory of SARS-CoV has been a poor predictor of the SARS-CoV-2 worldwide impact. While many similarities exist between SARS and COVID-19, clear differences in transmissibility and severity pyramids alter their epidemiologic trajectories. As many as 81% of patients with confirmed COVID-19 have been reported to have mild disease.[6] This contributes to greater community transmission, making traditional public health measures in halting human-to-human transmission more challenging.[5]

In the absence of vaccines and established treatments, nonpharmaceutical interventions (NPIs) are the fundamental tools to control human-to-human transmission: isolation, quarantine, social distancing, and community containment tools.[7] An early and sustained response with NPIs has been shown to reduce transmission of a new contagious pathogen.[8] NPIs have achieved improved control of COVID-19 in the Republic of Korea, Hong Kong, and Singapore.[9,10]

Containment strategies for COVID-19 began in the United States (US) in January 2020, with travel restrictions, removal of persons with COVID-19 from the community and into medical facilities, and instructions on mandatory quarantine for those traveling from endemic areas. Once community transmission became evident, the US shifted from containment to a mitigation strategy in early

March.[11,12] Public interest is critical to the effectiveness of containment and mitigation strategies alike; indeed, the first confirmed patient with COVID-19 in the US did not have severe symptoms initially, yet sought evaluation on January 19 after seeing a health alert from the US Centers for Disease Control and Prevention (CDC).[13]

While there have been studies on public interest within China and Taiwan in the early days of their respective outbreaks, there is a lack of published research of US public interest in COVID-19 during early containment and mitigation strategies.[14, 15]

When discussing public interest, communication platforms are at the forefront. Since the 1990s, digital media has become the dominant means of communication worldwide.[16] More than 90% of the US population actively uses the internet in their daily lives. Google is the most popular internet search engine in the world. It is also the most popular within the US with a search engine market share of 88.2%.[17] Google Trends, a real-time sample of Google search data, has been publicly available since 2006. Several health-related studies have utilized Google Trends to measure the interest in infectious diseases and disease awareness for the general public.[18,19,20,21] Google Trends has played a major role in the emerging field of Infodemiology, the study of electronically transmitted medical information for the purposes of public health.[22] While there is no absolute method to measure COVID-19 public interest, Google search data has been leveraged in prior research studies as a correlate.[23,24,25]

Countries that have prior experience with SARS (and have largely contained COVID-19) instituted robust public health campaigns. These campaigns are targeted to increase public interest in containment and mitigation policies. Increased public interest is thought to be correlated with increased attention and willingness to take part in strategies to reduce person-to-person transmission.[9,10,26]

Using Google Trends search queries as a proxy, we examined the US level of interest in COVID-19 during the critical time when containment and mitigation strategies were first being employed. We analyzed how the number of positive SARS-CoV-2 cases affected Google search interest in the US.

Lastly, we compared COVID-19 public interest in the US and Italy to that of countries and regions that have focused on public education as a key strategy, delivering guidance through traditional print, broadcast media, social media, and other novel methods: Singapore, Hong Kong, and the Republic of Korea.[26,27].

Methods

Study Tools

This was a retrospective study of the public online search interest in COVID-19 in the early months of 2020, within the US in the setting of changing case numbers, major news headlines, and implementation of NPIs. Subsections of the US and other countries and regions were further examined. A variety of tools were utilized to gain this understanding.

Google Trends, is a publicly available website (https://trends.google.com/trends/) that allows users to gain an understanding of what the general population is searching for on Google's search engine. Google searches are stored, anonymized, processed, and repeat searches are removed.[16] When a user accesses Google Trends, they are able to extract a value for the search volume of keywords and phrases across specific geographical areas The output from the tool is converted from the absolute search volume and is reported as a relative volume named, "search interest", which is assigned a numerical value. Search interest is calculated and the value ranges between 0 to 100. We refer to this value as "relative search volume" (RSV)".[20,28] An elevated RSV is indicative of a higher proportion of users searching a topic within a set location and time period.

The COVID Tracking Project is a website (https://covidtracking.com/) that aggregates all available COVID-19 testing information in the US for each day. Its information is collected from each State's Department of Health and Human Services. The COVID Tracking Project has been cited by many major news organizations.[29,30] It originally began reporting data on March 4, 2020. Our results were collected by referencing the "US daily 4pm ET" datasheet and using the copy function for the following sections: Date, Positive. This information was saved as confirmed cases of COVID-19 (Appendix, Table 1).

Other tools were also used to achieve context in the form of timeline and major cultural events that surrounded the rise of COVID-19 within the US. In order to provide societal context, news stories were extracted from The New York Times article, "A Timeline of the Coronavirus Pandemic"(Appendix, Table 2).[31] To understand what drew the attention of the US population in early March, Google Daily Trends was utilized. This tool displays the 20 most searched topics daily in the US, with the ability to review up the last 28 days of data.

Selection Criteria

The starting date December 31st, 2019 was chosen due to the major news headline from Wuhan about an unknown pneumonia.[31] The end date March 24, 2020 was chosen as it was the most recent accessible date when this project was started.

Study Design

The main topic explored was the search interest in COVID-19. The most commonly searched keyword was chosen to represent this topic. To identify the most searched keyword, on March 30, 2020 we accessed and queried google trends for “coronavirus,” “COVID-19,” “COVID,” “SARS,” and “SARS-COV-2.” Filters set a timeline from December 31, 2019 to March 24, 2020 and an additional filter limited the search to the US. No filter was set for category or search type. The results were graphed over time (Appendix, Figure1). The most searched term, “coronavirus”, was selected for further analysis below.

Sub-Groups Design

A secondary analysis of the relationship between coronavirus RSV over time in areas with significant outbreaks was examined. Throughout early 2020, New York City(NYC), NY and Seattle-Tacoma, WA were experiencing high levels of disease burden within the US. [32,33,34,35] On March 31, 2020 we accessed and queried google trends for “coronavirus”. Filters set the above timeline and the location filter was set to NYC, NY. No other filters were set and the results were downloaded. The same process was repeated with the location filter for Seattle-Tacoma, WA. For another comparison, countries and regions with similar first case dates were chosen for comparison including: Italy, Singapore, Republic of Korea, and Hong Kong. Using the same steps as above with the location filter set respectively, the keyword was searched in the local language (Appendix, Table 3), and the results were downloaded. In the Daily Search Trends section, we extracted information on the most popular searches from March 3rd to March 14th.

Outcome Measures

The primary outcome measure was evaluating the relationship between search interest for COVID-19, (Figure 1) major news events, and positive cases of SARS-COV-2. Secondary outcome measures included the following: an analysis of the search interest within areas of the US experiencing high disease burden, an analysis of search interest in specific foreign countries, and an examination of the major search topics in the US in early March.

Study Analysis

The RSVs for “coronavirus” were tabled alongside the cases of COVID-19 (Appendix, Table 1). The RSV for “coronavirus” was graphed alongside major COVID-19 news headlines and cases of COVID-19 to examine the relationship between RSV and major events as cases of COVID-19 were increasing (Figure 1). To further analyze the relationship between cases of COVID-19 and RSV “coronavirus”, cases of COVID-19 data were linearized using logarithmic transformation with base of 2. Log_2(cases of COVID-19) were then graphed against the RSV for “coronavirus”. A linear relationship was assumed, and a model was fit. Within Microsoft Excel’s data analysis toolkit, the relationship was analyzed via linear regression. To describe the linear regression, descriptive statistics including Pearson coefficient, means, standard error, and 95% confidence intervals were calculated.

Sub-Groups Analysis:

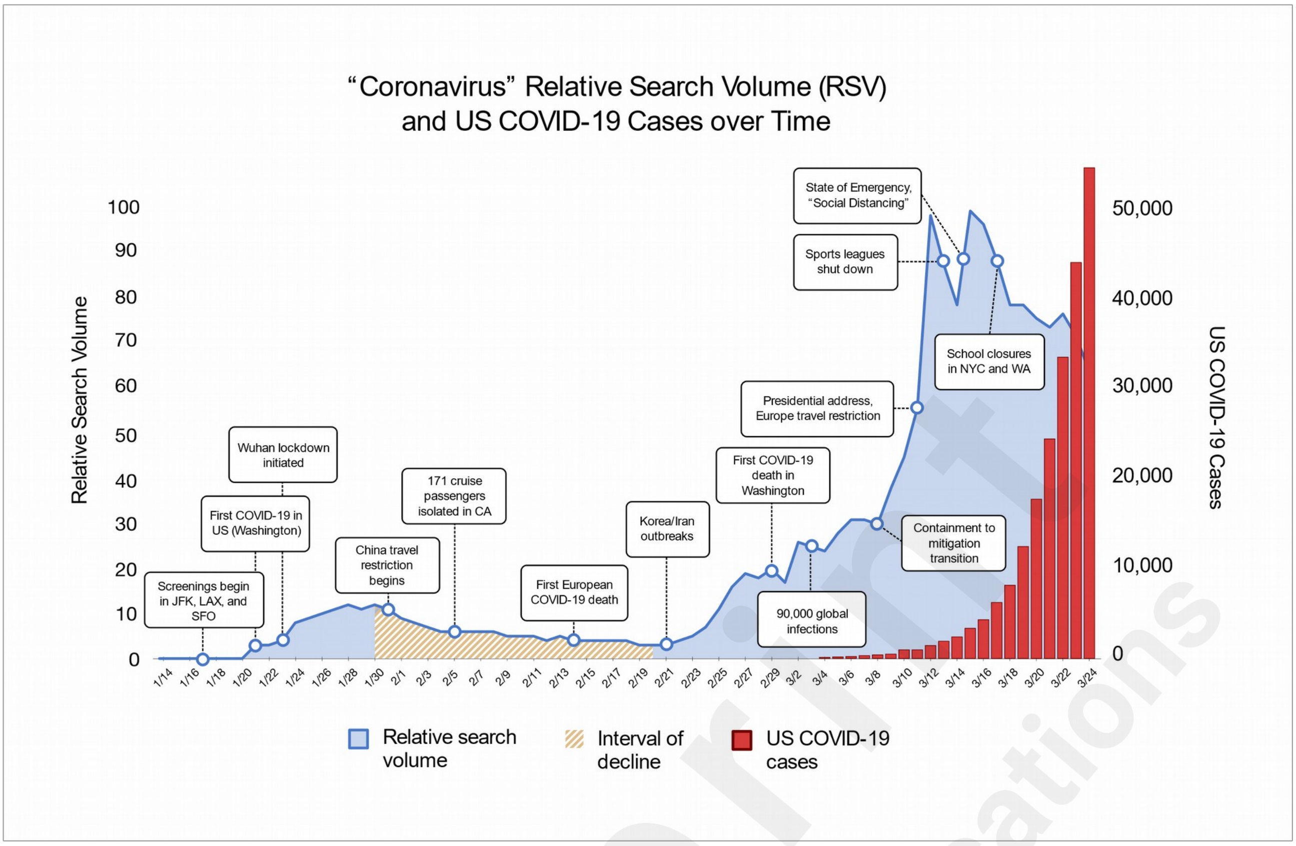
The results of RSV “coronavirus” over time were graphed for NYC and Seattle-Tacoma (Figure 3) as well as for foreign countries (Figure 4). The first date that the RSV > 90 was recorded alongside the first reported cases and the time between those two dates (Appendix, Table 4). Results of the time between first case and RSV >90 in each location were then graphed (Figure 5). Top searches for every day leading up to and following March 11 were recorded into a table (Appendix, Table 5). Top 5 searches on March 11 were also recorded (Appendix, Table 6).

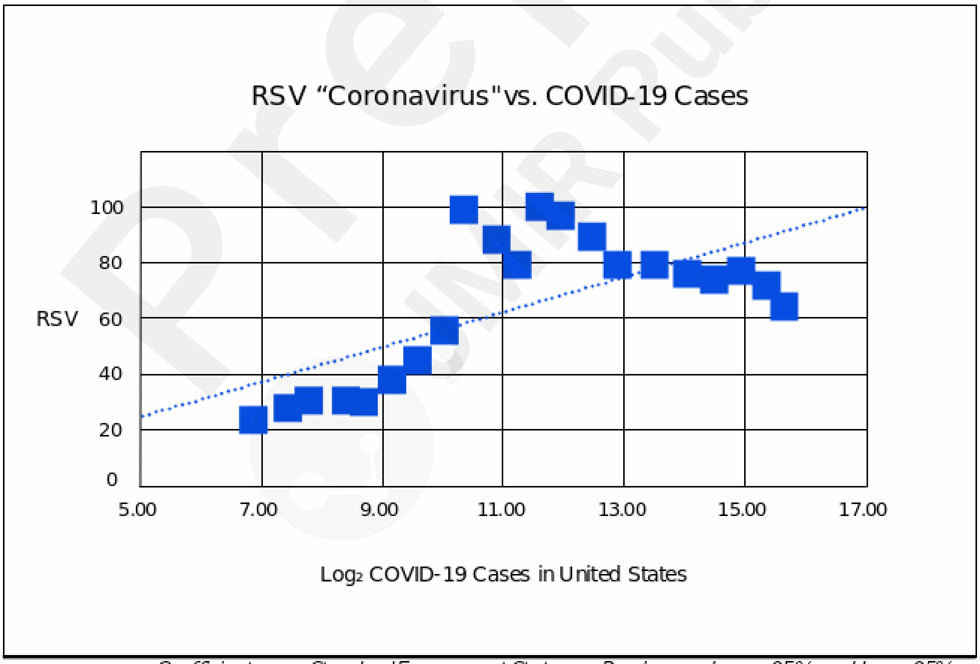
Results

Primary Results

RSV for coronavirus remained below 12 throughout all of January and most of February. It began to rise at the end of February and between March 9th and March 12th, figure 1 demonstrates an increase in the RSV for "coronavirus" within the US to an RSV of 99. Figure 2 validates the relationship between Log_2(cases of COVID-19) and "coronavirus" RSV. There is a positive, significant correlation between the two with an equation F(RSV(Coronavirus)) = 6.32(Log_2(cases of COVID-19)) - 6.97 and an $R^2 = 0.445$. The X variable has a p-value of $9.64*10^{-4}$, and a 95% confidence interval of 2.93-9.71.

Figure 1





	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-6.974	18.846	-0.370	0.715	-46.418	32.471
X Variable 1	6.321	1.621	3.899	0.001	2.928	9.714

Figure 2

Sub-Group Results

Figure 3 shows that in both NYC and Seattle, there was a small rise in interest that occurred in January followed by a fall in interest throughout February before reaching an RSV of 100 in mid-March. Figure 4 shows the RSV trend for “coronavirus” over time in other countries. Italy showed lower interest throughout January and February than Singapore, Republic of Korea, or Hong Kong. Figure 5 shows the time between first confirmed case and high levels of public interest, reflected as RSV > 90. Appendix tables 5 and 6 show March 11th was the day when the most popular daily search topics in the US reflected COVID-19 related queries.

Figure 3

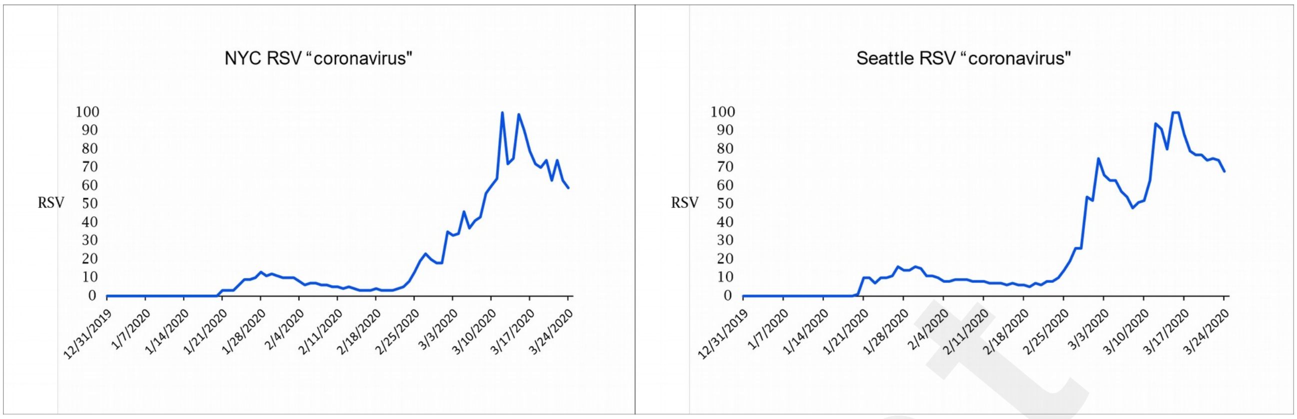

NYC RSV "coronavirus"
RSV
100
90
80
70
60
50
40
30
20
10
0
12/31/2019
1/7/2020
1/14/2020
1/21/2020
1/28/2020
2/4/2020
2/11/2020
2/18/2020
2/25/2020
3/3/2020
3/10/2020
3/17/2020
3/24/2020
Seattle RSV "coronavirus"
RSV
100
90
80
70
60
50
40
30
20
10
0
12/31/2019
1/7/2020
1/14/2020
1/21/2020
1/28/2020
2/4/2020
2/11/2020
2/18/2020
2/25/2020
3/3/2020
3/10/2020
3/17/2020
3/24/2020

Figure 4

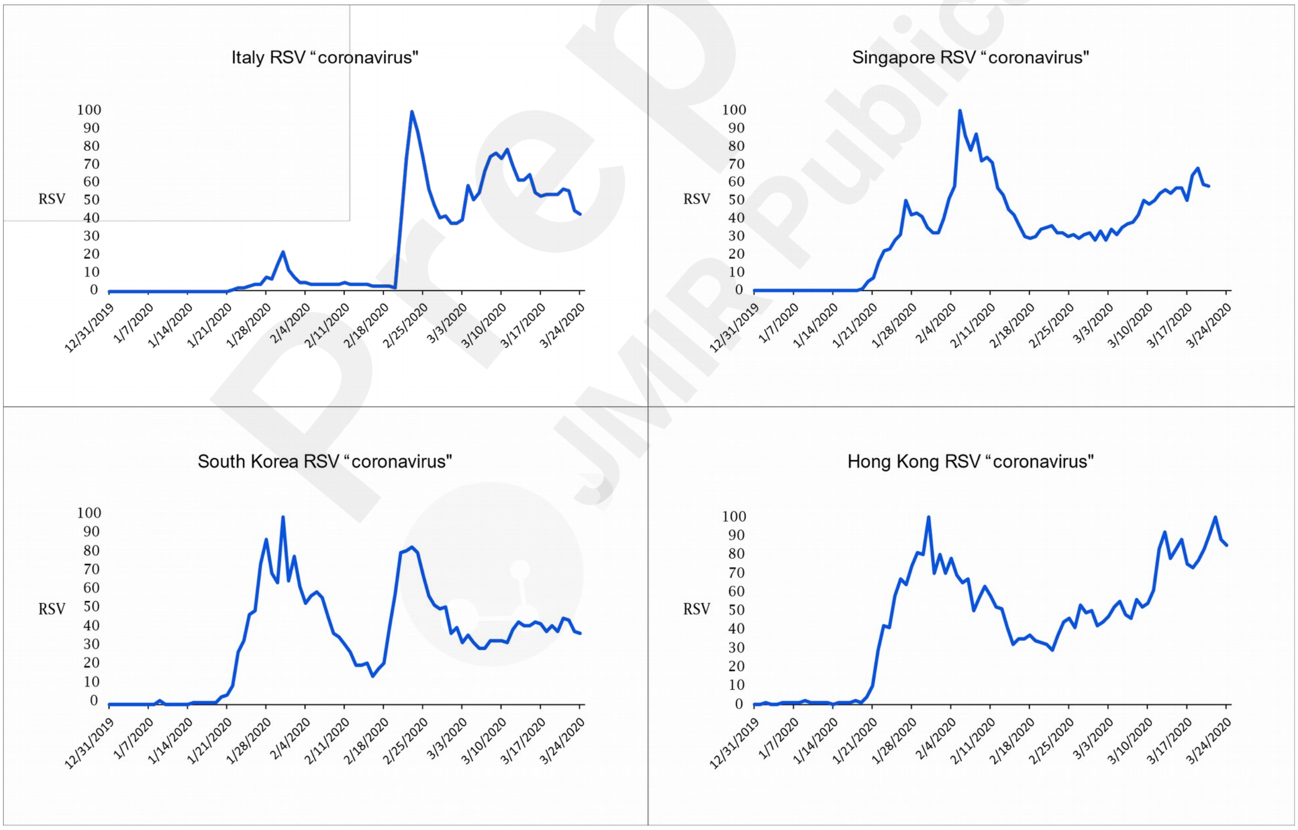
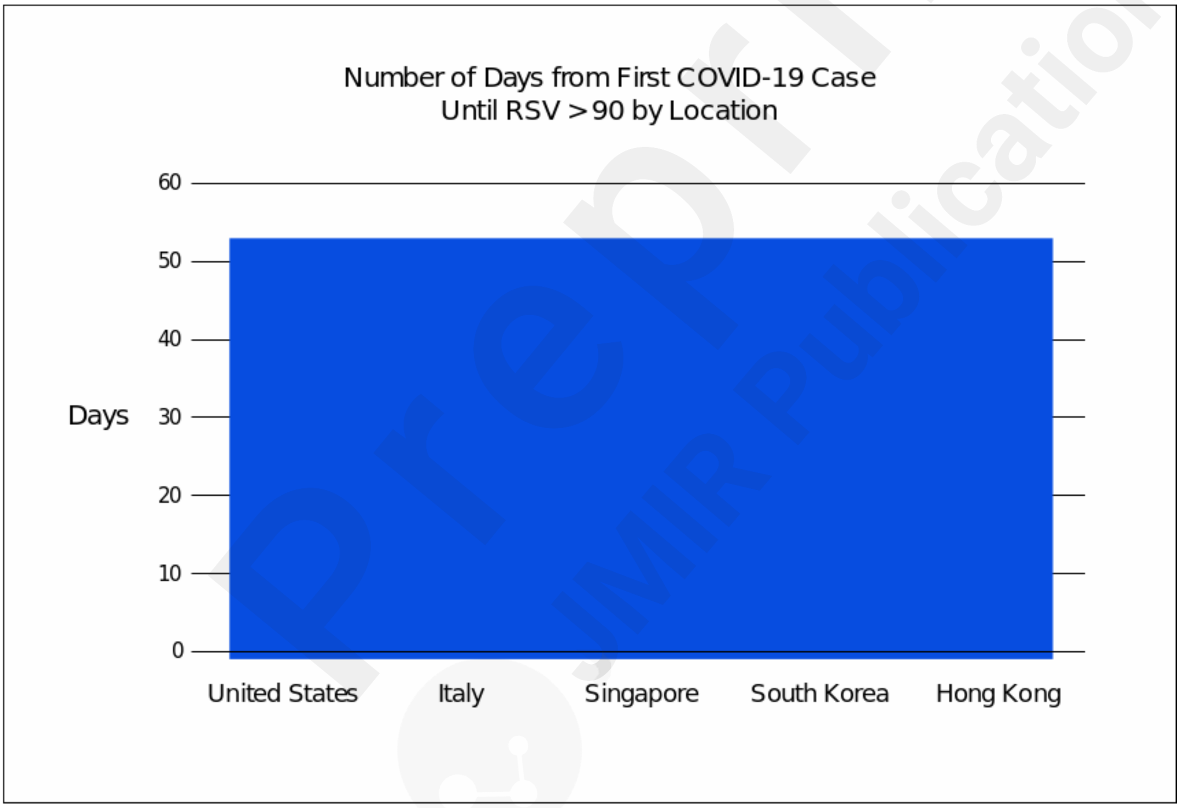

Italy RSV "coronavirus"
Singapore RSV "coronavirus"
South Korea RSV "coronavirus"
Hong Kong RSV "coronavirus"
RSV
0
10
20
30
40
50
60
70
80
90
100
12/31/2019
1/7/2020
1/14/2020
1/21/2020
1/28/2020
2/4/2020
2/11/2020
2/18/2020
2/25/2020
3/3/2020
3/10/2020
3/17/2020
3/24/2020

Figure 5


Number of Days from First COVID-19 Case
Until RSV > 90 by Location
Days
60
50
40
30
20
10
0
United States
Italy
Singapore
South Korea
Hong Kong

Discussion

Using Google Trends data, our results indicate the initial US level of COVID-19 public interest was limited, and even fell during a time when containment and mitigation strategies were being put in place. On January 17, the CDC implemented public health airport entry screenings in San Francisco (SFO), New York (JFK), and Los Angeles (LAX), with announcements of other international airports to follow.[36] The CDC activated its Emergency Operations Center on January 20.[37] Despite these measures, until January 21, the RSV for "coronavirus" remained at 0, indicating the US public had a low interest in COVID-19.

On January 21, the CDC reported the first case of COVID-19 in the state of Washington.[38] By the end of January, the WHO had declared COVID-19 a "public health emergency of international concern" and the US had implemented aggressive travel restrictions from countries with significant spread.[39] These announcements resulted in the first modest upward movement of public interest. In February, there was actually a relative decline in public interest from February 1 to February 21. This is surprising considering the events that occurred during that time. The Diamond Princess cruise ship, with 428 US citizens, was found to have hundreds of cases. European deaths were being reported from COVID-19, and multiple countries started to report outbreaks.[40,41]

Even more surprising, this February decline in public interest was seen in the Seattle and NYC geographical areas, despite both areas experiencing undetected community transmission during this time.[32,33,34,35] A similar February downward trend of COVID-19 public interest was experienced in Italy, a country that experienced a high epidemiologic trajectory of COVID-19.[25] We suspect this downward trend in public interest in February contributed to the community transmission that occurred in NYC, Seattle, and Italy in February. Why there was a downward trend of COVID-19 public interest should concern policy makers as this was a critical time for containment measures requiring the public's attention.

A dramatic increase of COVID-19 public interest occurred from March 9-12. Several events could explain this. We discovered the top searched keywords on March 11 related to "Tom Hanks" and "NBA", each yielding more than ten million searches each. That day, actor Tom Hanks had tested positive for SARS-CoV-2.[42] Additionally, the National Basketball Association suspended all games when one of its players tested positive.[39] The third-highest search term for the day was related to "coronavirus symptoms," yielding more than five million searches. That evening, the President of the US announced travel restrictions from Europe in his first primetime television address of the pandemic.[44] The President's name was the top search term the following day, with over five million searches on March 12. It is interesting that societal events were associated with sharp increases in COVID-19 public interest. Based on our compiled search term histories, these events and the accompanying media coverage could have contributed to the culmination of COVID-19 public interest.

A strong correlation exists between positive SARS-CoV-2 cases and increasing RSV values. We interpret that COVID-19 public interest increased as more cases were discovered. This correlation shows the importance of diagnostic testing. The delays in diagnostic testing that occurred in the US were a contributor to delaying public interest.[45,46] However, this does not fully explain the substantial lack of public interest. Before the US developed a high level of public interest (RSV > 90), more than 50 days had passed from the first US case of COVID-19 and there had been thousands of positive cases with multiple deaths.[29,30]

One of the most interesting and concerning findings was the lack of early public interest in the US and Italy when compared to countries that have been able to contain COVID-19 more effectively. From the first case of COVID-19 in the US and Italy, it took 52 and 24 days, respectively, for public interest to reach high levels. In Singapore, Republic of Korea, and Hong Kong, public interest reached high levels within 15 days of the first positive COVID-19 case.

An important aspect of containment is isolation and quarantine. These both require significant public education and interest for compliance. One of the main goals of modern quarantine is to reduce transmission by increasing the social distance between persons. This requires the general public to understand the actions to take when they are exposed to a disease or develop symptoms, such as effective separation and duration of quarantine.[47] Policy makers should consider partnering with existing popular digital platforms(Facebook, Twitter, Google and others) to not only monitor interest, but to engage the general public when messaging is rapidly changing.

Limitations

There are several limitations associated with this analysis. First, the exclusive use of Google Trends as a data set does not comprise all internet search traffic. Google constitutes 72% of search engine activity.[15] The remainder of internet search activity is conducted on other search engine platforms and is not represented in our analysis. Second, the presumptive association between RSV and public interest has limitations. While RSV offers an innovative method to approximate public interest and has been utilized in prior research, its accuracy in measuring public interest has not been validated.[23,24,25]

Given the anonymity of the data which Google Trends makes available to the public, it is difficult to determine which segments of the population may be underrepresented or excluded from the analysis.[48]

Third, the search criteria used in this analysis are not standardized and may not encompass all search phrases used by the public including countries that have different platforms and different communication channels.. Finally, with three months of search information included, conclusions drawn from this data set must be considered in the context of a longer and continually evolving pandemic event, especially within the context of different SARS-COV2 timelines. .

Conclusion

Public interest in COVID-19 was limited until March 12, 2020, when a rapid succession of events brought the disease into full public view. Surprisingly, public interest declined into most of February, even in geographic areas that were experiencing undetected community transmission and during a time when containment strategies were in place. While an inability to perform aggressive testing likely contributed to a low level of interest, other countries with improved control of COVID-19 had an accelerated level of public interest after their first positive case.

SARS-CoV-2 is now the third novel pathologic HCoV to emerge in a relative short course of time. At this time there is no proven vaccine or pharmacologic treatment available, making adoption of public health initiatives critical to curtail spread. Based on our analysis, it is clear policy makers need to develop novel methods of communicating with the public for not only SARS-CoV-2, but for emerging infectious diseases. As popular digital tools continue to become ubiquitous, we propose policymakers utilize them to not only understand public interest, but to tailor targeted messaging towards the public.

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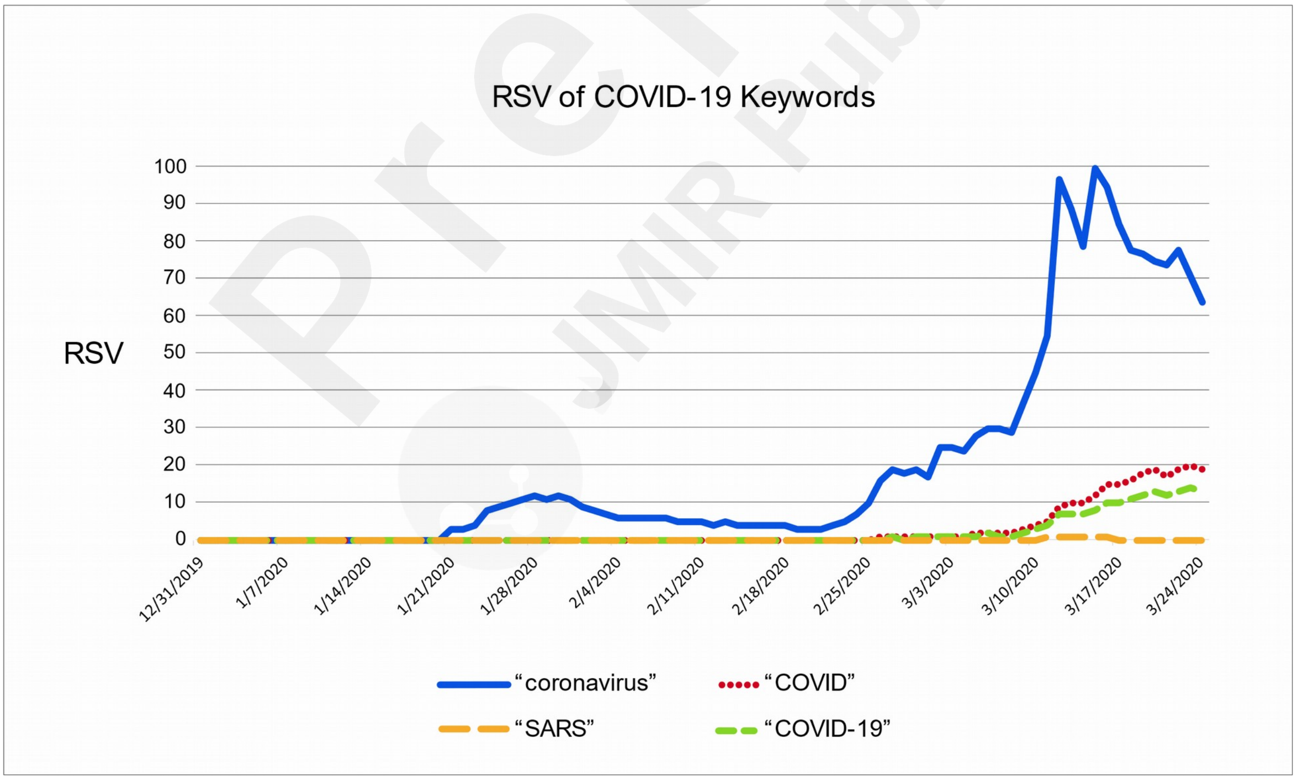
Iltifat Husain MD is a cofounder of Impathiq Inc and iMedicalApps.com

Scott Gilmore MD is a cofounder of Impathiq Inc

All other authors do not have conflicts of interest to declare.

Appendix (Supplement)



Appendix Figure 1

Date	"Coronavirus" RSV	COVID Cases	Date	"Coronavirus" RSV	COVID Cases	Date	"Coronavirus" RSV	COVID Cases
12/31/19	0		**1/29/20**	11		**2/27/20**	19	
1/1/20	0		**1/30/20**	12		**2/28/20**	18	
1/2/20	0		**1/31/20**	11		**2/29/20**	20	
1/3/20	0		**2/1/20**	9		**3/1/20**	17	
1/4/20	0		**2/2/20**	8		**3/2/20**	26	
1/5/20	0		**2/3/20**	7		**3/3/20**	25	
1/6/20	0		**2/4/20**	6		**3/4/20**	24	118
1/7/20	0		**2/5/20**	6		**3/5/20**	28	176
1/8/20	0		**2/6/20**	6		**3/6/20**	31	223
1/9/20	0		**2/7/20**	6		**3/7/20**	31	341
1/10/20	0		**2/8/20**	6		**3/8/20**	30	417
1/11/20	0		**2/9/20**	5		**3/9/20**	38	584
1/12/20	0		**2/10/20**	5		**3/10/20**	45	778
1/13/20	0		**2/11/20**	5		**3/11/20**	56	1053
1/14/20	0		**2/12/20**	4		**3/12/20**	99	1315
1/15/20	0		**2/13/20**	5		**3/13/20**	88	1922
1/16/20	0		**2/14/20**	4		**3/14/20**	79	2450
1/17/20	0		**2/15/20**	4		**3/15/20**	100	3173
1/18/20	0		**2/16/20**	4		**3/16/20**	97	4019
1/19/20	0		**2/17/20**	4		**3/17/20**	89	5723
1/20/20	0		**2/18/20**	4		**3/18/20**	79	7730
1/21/20	3		**2/19/20**	3		**3/19/20**	79	11719
1/22/20	3		**2/20/20**	3		**3/20/20**	76	17033
1/23/20	4		**2/21/20**	3		**3/21/20**	74	23197
1/24/20	8		**2/22/20**	4		**3/22/20**	77	31879
1/25/20	9		**2/23/20**	5		**3/23/20**	72	42152
1/26/20	10		**2/24/20**	7		**3/24/20**	64	51954
1/27/20	11		**2/25/20**	11				
1/28/20	12		**2/26/20**	16				

Appendix Table 1

News Headlines	
Date	Event
31-Dec	Wuhan “unknown pneumonia”
11-Jan	First death from the virus
23-Jan	Wuhan, a city of 11 million is placed on total lockdown
30-Jan	WHO declares global health emergency
31-Jan	China travel ban
5-Feb	171 cruise passengers placed in isolation in California
11-Feb	Named COVID 19
14-Feb	First death in Europe
21-Feb	Outbreaks in South Korea and Iran
23-Feb	Italy locks down 10 towns
24-Feb	White House petitioned congress for 1.25 billion
29-Feb	First US COVID death in Washington; international travel warning
3-Mar	90,000 infections are noted in the world
8-Mar	California transition to mitigation
11-Mar	NBA shutdown and Europe travel ban
12-Mar	MLB and NHL shutdown
13-Mar	State of emergency
15-Mar	CDC "social distancing"
17-Mar	Seattle and NYC school closure
22-Mar	NYC stay at home in NYC

Appendix Table 2

Localized Search Terms for Foreign locations		
Location	Translation for Coronavirus	Exact Search Term Used for this Location
Mandarin and Cantonese	□□ □□	"coronavirus + □□ □□"
Korean	□□□ □□□□	"coronavirus + □□□ □□□□"
Italian	coronavirus	"coronavirus"

Appendix Table 3

First Case and RSV >90 by Location			
Location	First Case Date	RSV >90 Date for "coronavirus"	Public Search Response Time (days)
United States	1/20/2020	3/12/2020	52
Italy	1/30/2020	2/23/2020	24
Singapore	1/23/2020	2/7/2020	15
South Korea	1/20/2020	1/28/2020	8
Hong Kong	1/22/2020	1/30/2020	8

Appendix Table 4

Most Popular Google Searches from March 3 to March 14th		
Date	Trending Search	Estimated Number of Searches
March 3, 2020	Super Tuesday results	10000000
March 4, 2020	Katy Perry	2000000
March 5, 2020	Post Malone	1000000
March 6, 2020	Daylight's savings	2000000
March 7, 2020	UFC 248	2000000
March 8, 2020	International Women's Day	1000000
March 9, 2020	2020 Election primary results	2000000
March 10, 2020	Harvard	500000
March 11, 2020	Tom Hanks	10000000
March 12, 2020	NBA	5000000
March 13, 2020	Coronavirus symptoms	500000
March 14, 2020	Pandemic	10000000

Appendix Table 5

Most Popular Google Searches on March 11		
Date	Trending Search	Estimated Number of Searches
11-Mar	Tom Hanks	10000000
11-Mar	NBA	10000000
11-Mar	Coronavirus Symptoms	5000000
11-Mar	Pandemic	2000000
11-Mar	Disneyland	2000000
11-Mar	March Madness	2000000

Appendix Table 6

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Supplementary Files

Figures

Figures