

## YOUTUBE MONITORING STUDY AS A COMPLEMENTARY INFORMATION STRATEGY IN ADDRESSING THE COVID-19 PANDEMIC

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**Abstract:** Effective community mitigation through voluntary behavior change has become indispensable and the best way to reduce mortality caused by COVID-19. The objective of the work was to conduct a follow-up study to track the most viewed Brazilian videos on YouTube about COVID-19 to determine how the coverage of preventive behaviors for effective community mitigation changed during the period included in the research. This is an exploratory, cross-sectional and quantitative study carried out on 06/30/2020, using the descriptor ‘coronavirus’. Initially, the 144 videos with the highest number of views on the website and published between 05/01/2020 and 06/30/2020 were pre-selected, considering that these two months represented the rapid growth of confirmed cases of COVID-19 in Brazil. Videos not recorded in Portuguese, duplicated or longer than 30 minutes were excluded. Two evaluators recorded the uniform resource locators (URL) of the videos, which were downloaded from the YouTube website to analyze data on their audience and duration. Finally, data analysis was carried out and the results were described. The study did not require approval from the Research Ethics Committee, as it involves public data. Among the pre-selected and most viewed videos on YouTube, 17 were excluded (6 in other languages, 5 in English and 1 in Chinese; 1 duplicate; 10 longer than 30 minutes). The top 100 most viewed videos were analyzed and revealed the following results:

A total of 29,278,053 views; 1,062,780 “liked”; 65,017 “I didn’t like it”; 125,841 comments; and duration of 10 hours, 15 minutes and 26 seconds. It is interesting to note that in phase 2 there was a decrease in the approach to prevention behaviors, as less than a third of the videos in phase 1 and less than a fifth in phase 2 addressed any of the main prevention behaviors listed by the Centers for Prevention

and Control. of US Diseases. Furthermore, there was also a decrease in information about the symptoms of COVID-19 in phase 2 in relation to phase 1. Given the continuity of the pandemic, the number of video views highlighted YouTube’s potential to be used as a mediator of interaction and communication about COVID-19. However, on the other hand, the analysis of the videos also revealed that the videos available on YouTube could contribute more significantly to educating and mobilizing the public to adopt community mitigation behaviors against COVID-19 in Brazil.

**Keywords:** COVID-19. Coronavirus. Pandemics. Social media.

## INTRODUCTION

Social media are useful tools that impact individual and collective behavior, which can affect the evolution of the COVID-19 disease. The effect of social media on its users can be influenced by different types of access to information (ALDMOUR et al., 2020; GOZZI et al., 2020).

Health campaigns on social media have been used as a health promotion tool capable of inducing positive behaviors, eliminating negative ones and reducing the high number of deaths from COVID-19 (AL-DMOUR et al., 2020).

*YouTube* is not only one of the most effective means of promoting awareness and interest in community mitigation of COVID-19 because of its broad population reach. Furthermore, many people may have low literacy levels, which makes it difficult or impossible to read and decipher behavioral recommendations available on websites (BASCH et al., 2020a).

Many people use *YouTube* as a source of research and the availability of informational videos has the potential to empower users and contribute to the training of students and health professionals (SALVADOR et al., 2017).

*YouTube* supports the process of

educating people and allows individuals to find contributory information, including that related to health (BASCH et al., 2015, 2016, 2017, 2020a, 2020b). The urgent need for mobilization and engagement due to COVID-19 accelerated the identification of *YouTube's* potential to disseminate information about community mitigation behaviors necessary to contain the pandemic.

The need to contain the spread of COVID-19 involves the propensity of individuals to adopt community mitigation behaviors. In this context, the community is influenced by the perception of individual risk and the quality of information from digital media regarding the developments of the pandemic (GOZZI *et al.*, 2020).

Acting with planning can be decisive in avoiding a high number of deaths resulting from COVID-19. Easily performed behaviors such as washing hands and maintaining social distancing can be encouraged to contain the pandemic, slowing the spread of the disease (AL-DMOUR et al., 2020), including after immunization with the emergence of vaccines.

Social distancing contributes to reducing the number, duration and proximity of interpersonal contacts and, consequently, mitigates the number of infected people, viral transmission and the effects of the pandemic (OH *et al.*, 2021).

The transmission of useful information reduces fear, anxiety and helps the population adopt appropriate behaviors to face the current pandemic (AL-DMOUR *et al.*, 2020).

Furthermore, the hypothesis that the production of videos about COVID-19 can provide safe information to patients using *YouTube* will bring new perspectives on the use of this type of strategy for health education and academic training in Brazil.

It is observed that *YouTube* is a social media platform with billions of daily views and the possibility of supporting public health efforts (LI et al., 2020).

Finally, the scarce regulation on the type of content available on *YouTube* (GUPTA et al., 2016), the limitations and deficiencies in the information presented in many videos on *YouTube*, the lack of scientific research publications that have evaluated the topic in the scenario Brazilian, motivated the carrying out of this research.

The importance of carrying out research that evaluates the quality and informational veracity of videos posted on *YouTube* is highlighted, especially those related to health issues, which have great potential to contribute to improving the population's quality of life (SALVADOR et al., 2017).

In this sense, the integration of knowledge with the aim of overcoming the fragmentation of knowledge is relevant, highlighting the importance of interdisciplinary researchers in this process (FAZENDA, 2015).

In view of the above, this research is justified and it is hoped that the results can help in understanding the use of this type of social media that adopts the practice of watching and sharing informative and/or educational videos, which have great potential as complementary tool for prevention, control and treatment of illnesses and their complications.

The temporal analysis of two distinct moments of a pandemic through *YouTube* videos allows the identification and observation of changes in the content and criteria of the videos, such as: quality; source (origin); domain; intention; and the metrics of views, "liked" and "disliked" reactions, comments and video duration. Important factors that instigate the modification of public policies and contribute to the adequacy and dissemination of necessary behavioral recommendations in the context of the COVID-19 pandemic (BASCH et al., 2020a, 2020b).

In this scenario, the objective of this work was to conduct a follow-up study to track the most viewed Brazilian videos about COVID-19 on YouTube to determine how the coverage of preventive behaviors for effective community mitigation changed during the period included in the research.

## METHODS

The observational, cross-sectional, quantitative study referring to phase 2 was carried out on YouTube on 06/30/2020, with videos uploaded between 05/01/2020 to 06/30/2020 (Adapted from BASCH et al., 2020a), and followed methodology similar to that adopted in phase 1 (SANTOS et al., 2023) carried out on YouTube on 04/30/2020, with videos uploaded between 01/01/2020 to 04/30/2020 (Adapted from BASCH et al., 2020b; From SILVA et al., 2020). This follow-up study was carried out to determine in the analyzed videos how the coverage of preventive behaviors for effective community mitigation changed during the period included in the research.

The descriptor 'coronavirus' was used and the first 100 videos with the highest number of views were selected, recorded in Brazilian Portuguese, related to the topic, not duplicated and less than 30 minutes long, assuming that users generally do not tolerate watching long videos (ABEDIN et al., 2015).

The *Uniform Resource Locator* (URL) of each video was downloaded from the YouTube website to analyze data about the videos. These were analyzed independently, by RLS and MMT. Agreement between raters was determined by Cohen's Kappa Coefficient ( $K=0.799$ ).

The following parameters were recorded for all videos: upload date; viewing numbers; positive reactions "I liked" and negative reactions "I didn't like"; number of comments; and duration.

This study focused on the key preventive behaviors listed by the US Centers for Disease Control and Prevention, mortality and fear, symptoms, transmission and natural history, and other precautions of COVID-19 (Adapted from Basch et al., 2020b).

Data were analyzed using SPSS software (*Statistical Package for Social Sciences*, IBM Inc., USA) version 26. Descriptive statistics analyzes were performed. The association between categorical variables and the variable origin of the videos was verified using the Chi-Square test ( $X^2$ ). A significance level of 95% ( $p<0.05$ ) was adopted).

This research followed the ethical standards of the YouTube platform (<https://www.YouTube.com/yt/copyright/pt-BR/fair-use.html>) and the recommendations of Resolution 510/2016 of the Brazilian Health Council and of Federal Law number: 12,527/2011. As they are publicly accessible videos and the study does not involve contact of any kind with the characters in the videos or the owners of the YouTube channels, submission to the Research Ethics Committee was not necessary (SALVADOR et al., 2017).

## RESULTS

The follow-up study was carried out on YouTube on 06/30/2020 and pre-selected the 144 videos with the highest number of views on the website and published between 05/01/2020 and 06/30/2020. 17 videos were excluded (6 in other languages: 5 in English and 1 in Chinese; 1 duplicate; 10 longer than 30 minutes). The first 100 most viewed videos were analyzed and revealed the following results: 29,278,053 views; 1,062,780 positive "like" reactions; 65,017 negative "I didn't like" reactions; 125,841 comments; and total duration of 10 hours, 15 minutes and 26 seconds.

Next, data from the videos were evaluated (Table 2) and compared with the results of the phase 1 research (Table 1).

In both phases, the majority of the 100 videos were submitted by news agencies; in phase 2, there were 70 videos (Table 2); and in phase 1, 55 videos (Table 1).

Regarding COVID-19 prevention behaviors, almost all of them were less frequent in the videos from phase 2 (Table 2) than in those from phase 1 (Table 1) of the study: hand hygiene (n=11 in phase 2 vs. n= 24 in phase 1); staying home when sick (n=1 vs. n=2); cover cough/sneeze with tissue, throw away tissue (n=1 vs. n=2); wear a face mask to protect others if you are sick (n=2 vs. n=3). The behavior of cleaning and disinfecting highly touched objects and surfaces was more frequent in phase 2 than in phase 1 (n=2 vs. n=1, respectively).

The behaviors of avoiding close contact with those who are sick and wearing a face mask for protection if caring for the sick were not mentioned in any phase of the study.

It is intriguing that phase 2 of the study comprises two months that represented a rapid increase in confirmed cases of COVID-19 in Brazil (BRASIL, 2020) in relation to the period of the phase 1 study, however, there was a decrease in the approach to prevention behaviors, which can be seen by the hand hygiene item, which is present in 11 videos in phase 2 and in 24 videos in phase 1.

Although the videos were widely viewed, less than a fifth of the videos in phase 2 and less than a third in phase 1 addressed any of the behaviors necessary to mitigate COVID-19 in Brazil.

Regarding mortality or fear, in phase 2, 63 videos mention death and 7 suggest anxiety or fear; while in phase 1, 71 videos mention death and 9 suggest anxiety or fear.

The COVID-19 can cause different symptoms, varying from person to person, so

the most common symptoms of the disease were investigated in the videos. In this sense, there was less attention to the following symptoms of the pandemic in phase 2 of the study compared to phase 1: cough (n=9 and 18 for phase 2 vs. 1, respectively), shortness of breath (n=7 vs. 15) and fever (n=8 vs. 20). Comparing data from phases 1 and 2, a significant decrease in information about COVID-19 symptoms in phase 2 can be seen, which must be the opposite, that is, there must be a focus on transmitting information about COVID-19 symptoms -19 to mitigate contamination.

Regarding transmission and natural history, comparing phase 2 of the study in relation to phase 1, modes of transmission (n= 16 vs. 17), incubation period (n= 6 vs. 6) and treatment (n= 45 vs. 29).

It is interesting to note that in phase 1, broadcast and natural history were present in less than a third of the videos; and there is an increase in interest in the treatment item, with 45 videos in phase 2 and only 29 videos in phase 1.

Other precautions for the transmission of COVID-19, which may be necessary, were evaluated and, once again, it is clear that the focus of phase 2 videos on precautionary aspects in relation to COVID-19 is reduced when compared to phase 1: quarantine (n=18 vs. 31); staying indoors (n=17 vs. 24); restrict transportation (n= 4 vs. 8).

Regarding the intention of the video, although 97 videos from phase 2 were informative in nature, there was a decrease in the approach to prevention behaviors and information about COVID-19 symptoms in relation to phase 1. The videos from phase 2 were classified in: informative (n=97); personal statement (n=0); advertisement (n=0); others (n=3). And the videos from phase 1 in: informative (n=76), personal statement (n=12), advertisement (n=2), others (n=10).

	Present (N=100)	Number of views (n=140.027.282)	Origin and loading of videos				p
			Healthcare professional (n=5)	Academic university (n=1)	News agencies (n=55)	Others (n=39)	
			n (%)	n (%)	n (%)	n (%)	
<b>Preventive behaviors</b>							
Hand hygiene	24 (24)	76.443.705 (54,6)	1 (20)	0 (0)	6 (10,9)	17 (43,6)	0,003
Avoid close contact with those who are sick	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Stay at home when you are Sick	2 (2)	3.562.108 (2,5)	1 (20)	0 (0)	0 (0)	1 (2,6)	0,024
Cover your cough/sneeze with tissue; throw away the fabric	2 (2)	4.038.040 (2,9)	0 (0)	0 (0)	1 (1,8)	1 (2,6)	0,978
Wear a face mask for protection if you are taking care of the sick	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Wear a face mask to protect other people if you are sick	3 (3)	3.893.101 (2,8)	1 (20)	0 (0)	1 (1,8)	1 (2,6)	0,152
Clean and disinfect objects and highly touched surfaces	1 (1)	68.917 (0,1)	0 (0)	0 (0)	1 (1,8)	0 (0)	0,843
<b>Mortality or fear</b>							
Mentions death	71 (71)	59.363.274 (42,4)	3 (60)	0 (0)	44 (80)	24 (61,5)	0,086
Suggests anxiety or fear	9 (9)	17.331.179 (12,4)	0 (0)	0 (0)	3 (5,5)	6 (15,4)	0,337
<b>Symptoms</b>							
Cough	18 (18)	28.779.565 (20,6)	1 (20)	0 (0)	5 (9,1)	12 (30,8)	0,058
Shortness of breathe	15 (15)	56.637.816 (40,4)	1 (20)	0 (0)	5 (9,1)	9 (23,7)	0,262
Fever	20 (20)	29.713.347 (21,2)	3 (60)	0 (0)	5 (9,1)	12 (30,8)	0,007
<b>Transmission and natural history of illness</b>							
Transmission mode	17 (17)	29.502.293 (21,1)	2 (40)	0 (0)	7 (12,7)	8 (20,5)	0,372
Incubation period	6 (6)	9.064.343 (6,5)	2 (40)	0 (0)	1 (1,8)	3 (7,7)	0,007
Treatment	29 (29)	36.077.355 (25,8)	1 (20)	0 (0)	15 (27,3)	13 (33,3)	0,791
<b>Other precautions</b>							
Quarantine	31 (31)	36.623.602 (26,2)	1 (20)	0 (0)	14 (25,5)	16 (41,0)	0,340
Stay indoors	24 (24)	59.618.744 (42,6)	2 (40)	0 (0)	11 (20)	11 (28,2)	0,598
Restrict transportation	8 (8)	4.907.228 (3,5)	0 (0)	0 (0)	7 (12,7)	1 (2,6)	0,289

Table 1. Description of the content covered in 100 YouTube videos viewed about the COVID-19 disease on 04/30/2020.

Source: Prepared by the authors (2022).

In: SANTOS, R. L. *et al.* YouTube and its role as a complementary information strategy to combat the Covid-19 pandemic. **Themes in Public Health: Covid-19**, v. 3, p. 1-9, 2023.

	Origin and loading of videos					
	Present (N=100)	Number of views (n=29.278.053)	Healthcare professional (n=15)	News agencies (n=70)	Others (n=15)	p
	n (%)	n (%)	n (%)	n (%)	n (%)	
<b>Preventive behaviors</b>						
Hand hygiene	11 (11)	1.895.064 (6,5)	2 (13,3)	5 (7,1)	4 (26,7)	0,086
Avoid close contact with those who are sick	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Stay at home when you are sick	1 (1)	164.763 (0,5)	0 (0)	1 (1,4)	0 (0)	0,805
Cover your cough/sneeze with tissue; throw away the fabric	1 (1)	164.763 (0,5)	0 (0)	1 (1,4)	0 (0)	0,805
Wear a face mask for protection if you are taking care of the sick	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Wear a face mask to protect other people if you are sick	2 (2)	272.037 (0,9)	0 (0)	1 (1,4)	1 (6,7)	0,352
Clean and disinfect objects and highly touched surfaces	2 (2)	210.791 (0,7)	0 (0)	2 (2,9)	0 (0)	0,646
<b>Mortality or fear</b>						
Mentions death	63 (63)	19.638.413 (67,7)	3 (20)	51 (72,9)	9 (60)	0,001
Suggests anxiety or fear	7 (7)	2.739.615 (9,3)	0 (0)	5 (7,1)	2 (13,3)	0,358
<b>Symptoms</b>						
Cough	9 (9)	3.737.586 (12,7)	3 (20)	4 (5,7)	2 (13,3)	0,175
Shortness of breathe	7 (7)	3.017.017 (10,3)	4 (26,7)	2 (2,9)	1 (6,7)	0,005
Fever	8 (8)	3.500.656 (11,9)	5 (33,3)	2 (2,9)	1 (6,7)	<0,001
<b>Transmission and natural history of illness</b>						
Transmission mode	16 (16)	2.723.107 (9,3)	3 (20)	12 (17,1)	1 (6,7)	0,544
Incubation period	6 (6)	2.864.572 (9,8)	4 (26,7)	2 (2,9)	0 (0)	0,001
Treatment	45 (45)	14.239.921 (48,6)	4 (26,7)	33 (47,1)	8 (53,3)	0,274
<b>Other precautions</b>						
Quarantine	18 (18)	5.704.313 (19,5)	0 (0)	13 (18,6)	5 (33,3)	0,058
Stay indoors	17 (17)	5.109.534 (17,4)	0 (0)	11 (15,7)	6 (40)	0,012
Restrict transportation	4 (4)	1.873.145 (6,4)	0 (0)	4 (5,7)	0 (0)	0,409

Table 2. Description of the content covered in 100 YouTube videos viewed about the COVID-19 disease on 06/30/2020.

Source: Prepared by the authors (2022).

## DISCUSSION

Research with *internet* data allows an in-depth approach, aiming to identify patterns in the phenomenon under study and contextualize it (FRAGOSO; RECUERO; AMARAL, 2011

YouTube, therefore, can be useful in directing the development of actions or public policies for access to information on the topic, providing knowledge to its users and promoting health promotion actions in the context of the pandemic still ongoing in Brazil.

In countries with large territorial dimensions like this, it is known that YouTube is extremely useful for reaching people from different locations and promoting engagement.

The present study identified, through the significant number of video views, the great potential of *YouTube* in playing an important role in interaction and communication about COVID-19 in Brazil.

Our study of phases 1 and 2, similar to the study by Basch et al. (2020a), allows us to observe that given the need for social distancing, *YouTube* has an incredible reach, with the potential to communicate and mobilize the public about community mitigation and to reduce mortality due to the COVID-19 viral pandemic.

However, in our study the decrease in the approach to COVID-19 prevention behaviors in phase 2 compared to phase 1 requires attention, as less than a third of the videos in phase 1 and less than a fifth in phase 2 addressed any of the key prevention behaviors listed by the US Centers for Disease Control and Prevention. Furthermore, there was also a decrease in information about COVID-19 symptoms in phase 2 compared to phase 1.

The COVID-19 disease must be viewed from an intercultural perspective. One must be aware of the elements involved, which are not restricted to biological ones. Therefore, historical, political, social, economic and religious elements acquire importance (RAMOS, 2012; RAYMUNDO, 2013).

Comparatively, analyzing the work of Basch et al. (2020a, 2020b) in 2020, there was a small increase in prevention behaviors recommended by the US Centers for Disease

Control and Prevention (CDC) in the March videos (BASCH et al., 2020a) in relation to the January sample videos (BASCH et al., 2020b). In the January sample (BASCH et al., 2020b), less than a third of the videos and in the March sample (BASCH et al., 2020a), less than half, covered any of the prevention behaviors recommended by the Centers for Control and US Disease Prevention (CDC).

The minimum amount of information presented makes us rethink the need to make information available in the context of the COVID-19 pandemic and consider that videos available on *YouTube* could contribute more significantly to educating and mobilizing the public to adopt community mitigation behaviors of COVID-19 in Brazil. Furthermore, the research brings results that help reflect on the importance of using *YouTube* videos in health crises and health in general.

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