# Fake news during the Covid-19 pandemic in Spain: a study through Google Trends

## Bulos durante la pandemia del Covid-19 en España: un estudio a través de Google Trends

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**ABSTRACT**

**Introduction**: On March 14, 2020, a state of alarm was declared in Spain to stop the spread of a new type of coronavirus. Facing the proliferation of fake news about the pandemic and the political and social situation, the Spanish government declared a plan to fight hoaxes that could harm the social climate. **Methodology**: This research performs a quantitative analysis of searches in Spain for the terms "bulo" [EN: Hoax] and "fake" on Google during a historical period, and compares them with the pandemic in Spain through a regression analysis. **Results**: A historical peak of searches for "bulo" was observed one month before the worst data on deaths in Spain were reached, and a positive correlation (r = 0.966) in the comparison between searches for the word "bulo" and the victims of Covid-19. **Discussion**: The analysis indicates that, statistically, the data from Google searches for the word "bulo" and daily deaths have a similar growth relationship during the pandemic's spread period in Spain. This does not happen with "fake". **Conclusions**: the interest in "bulo" and "fake" increases the day after the state of alarm implementation. Citizens were interested in looking for information related to hoaxes and fakes. Furthermore, citizens' interest in both terms precedes the government's statements about its intention to fight against false news.

**KEYWORDS:** bulo; fake; Covid-19; Google Trends; post-truth; State of alarm; coronavirus; audiovisual

**RESUMEN**

**Introducción**: El 14 de marzo de 2020 se declaró el estado de alarma en España para frenar la expansión de un nuevo tipo de coronavirus. Ante la proliferación de *fake news* sobre la pandemia y la situación política y social, el Gobierno español manifestó su intención de luchar contra los bulos que

pudieran perjudicar el clima social. **Metodología:** Esta investigación realiza un análisis cuantitativo sobre las búsquedas en España de los términos "bulo" y "*fake*" en Google durante un periodo histórico y los compara con el de la pandemia en España a través de un análisis de regresión. **Resultados:** Se aprecia un pico histórico de búsquedas de "bulo" un mes antes de que se alcanzaran los peores datos de fallecidos en España y una correlación positiva (R =0,966) entre la comparación de las búsquedas de la palabra "bulo" y las víctimas por Covid-19. **Discusión:** El análisis indica que los datos de las búsquedas en Google por la palabra "bulo" y las muertes diarias tienen una correlación estadística durante el periodo de expansión de la pandemia en España. **Conclusiones**: El análisis de regresión demuestra que durante el desarrollo de la pandemia existió una tendencia correlativa entre el interés de los ciudadanos españoles por las noticias falsas y el incremento de muertes por Covid-19.

**PALABRAS CLAVE:** bulo; *fake*; Covid-19; Google Trends; post-verdad; estado de alarma; Coronavirus; audiovisual.

**CONTENT**

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# 1. Introduction

In December 2019, the Chinese government reported the first cases of an unknown type of pneumonia in the city of Wuhan (China), a disease later called COVID-19 (Jin et al., 2020; Guan et al., 2020). The virus spread rapidly through Asia, Europe, Africa and the Americas, prompting the World Health Organization (WHO) to declare COVID-19 an epidemic. On March 11, the WHO assessed that it could be considered a pandemic given its high level of instability and easy spread across the world (WHO, 2020).

The first case in Spain was detected on January 31, 2020 (WHO, 2020). Months later, on March 3, due to the spread of the virus across Europe, the Spanish Government promoted the first social distancing measures for sports events that could attract fans from countries where outbreaks had already been declared (Jin et al., 2020; Costa-Sánchez and López-García, 2020). On March 9, the closure of educational centers in some autonomous communities was decreed, as well as the recommendation to people belonging to high-risk groups to stay at home (WHO, 2020). After broadening these measures for several days, the state of alarm was declared on March 14, allowing citizens to travel only in specific situations. On March 29, production was limited only to the so-called essential sectors, and, on April 9, some others were allowed to reopen, extending the state of alarm until May 10, but with possible further extensions (Guan et al., 2020).

## 1.1. Hoaxes during the COVID-19 pandemic

Since the state of alarm initiated, several platforms (Maldita, 2020; Newtral, 2020) promoted open spaces on the Internet to alert citizens to possible hoaxes and fake news regarding the new

coronavirus. These platforms' objective is to verify information circulating on the Internet, especially on social networks such as Facebook or Twitter, platforms such as Youtube and memes, and chain letters on WhatsApp. They also seek to provide citizens with the necessary tools to have accurate information available and to contrast them with daily events, especially during the COVID-19 pandemic in Spain (Maldita, 2020; Newtral, 2020). They are part of the International Fact Checking Network (IFCN) and/or the High-Level Group of Experts to counter fake news and disinformation designated by European Commission in 2018 (IFCN, 2020).

By mid-June 2020, Maldita had collected over 590 hoaxes or fake news since the pandemic began in Spain. Some examples are the lack of evidence that sodium chlorite could cure COVID-19 in 24 hours, or that gargling with vinegar, warm water or salt prevents infection, or that the WHO had prohibited performing autopsies on corpses who were ill with COVID-19. Other apparent hoaxes Maldita (2020) has denounced were that the COVID-19 vaccine is produced with aborted fetuses, that masks incubate cancer, that an ultraviolet lamp kills the Coronavirus and that the WHO has warned of the Nipah virus outbreak; an even deadlier virus than the new Coronavirus. All these hoaxes or fake news, and many more, are archived in the COVID-19 database on the Maldita platform (2020) and only correspond to those that have been disseminated in the Spanish territory through social networks such as Facebook, Tik Tok, or WhatsApp, among others (Maldita, 2020).

However, these websites, in spite of being evaluated by the IFCN, do not implement any objective methodology that confirms whether their assessments are correct in all cases. Unlike software that detects reused images, most of Maldita and Newtral's hoaxes detection bases on the criteria of specialists who decide which sources are reliable and which are not (Maldita, 2020). Likewise, some authors (Pérez, 2020; Encabo, 2020) have linked both fake news detection portals with various political parties and criticize Newtral and Maldita as a new form of censorship, since no one controls those who monitor the dissemination of fake news (Encabo, 2020).

Amid this controversy, the Head of the Civil Guard cabinet, José Manuel Santiago, claimed in mid-April 2020, that they were working on the detection of hoaxes and fake news to minimize the climate opposing the Government's handling of the COVID-19 crisis (Moncloa, 2020). The reason, according to Santiago, was twofold: to prevent the social stress caused by these hoaxes and to minimize the climate against the Government's handling of the crisis (Moncloa, 2020). Reactions to this statement came right after, and different media accused the Government of restricting freedom of speech (Olmo, 2020).

In the face of several publications questioning the Civil Guard's liberty regarding the fake news issue (Cuesta and Guirado, 2020), the minister of Internal Affairs, Fernando Grande-Marlaska, explained that security forces were not countering dissemination of hoaxes and false news on the Internet to avoid criticism of the Executive, "Hoaxes are fake news and their purpose is to arouse great social panic with objective risk to social order" (Sainz-Pardo, 2020). According to the Spanish Government, political criticism was not included in the alleged list of hoaxes and fake news, which already are a portion of freedom of speech, and that only disinformation capable of generating social instability was being monitored and controlled (Olmo, 2020). For her part, the Minister of Defense, Margarita Robles, stated that the Government stands for freedom of speech and claimed its guarantee during the state of alarm, which does not imply any legal limitation of this right (Del Riego, 2020).

## 1.2. Fake and Post-Truth theories

The etymology of "*falso*" [EN: fake] comes from Latin *falsus* which means to deceive someone or oneself. "*Noticia*" [EN: news] comes from Latin *notitia* (something that is made known and/or an idea or concept) (DECEL, 2020). Fake news, from its Spanish linguistic morphology, would be to make any idea or concept known with the aim of deceiving someone or oneself. Hence, someone might share a piece of fake news unconsciously, deceiving themselves and others.

Fake news can be classified according to its types (Tandoc, Wei Lim and Ling, 2017): news satire, news parody, fabrication, manipulation, advertising, and propaganda. These types of disinformation have taken over the public discourse since late 2016 (Niño, Barquero and García, 2017; Jankowski, 2018; Carrera, 2018), when Russian intelligence agents tried to influence the United States presidential elections. Since then, fake news became a political concern and a type of propaganda used by some candidates, especially Donald Trump (Jankowski, 2018; Barrientos-Báez, Barquero and García, 2018). In Spain, these types of disinformation, in addition to being called fake news, are also labeled as hoaxes, meaning, false pieces of news that are disseminated with the objective of harming someone (Palomo and Sedano, 2018; Rodríguez-Ferrándiz, 2019).

Both terms have been linked to post-truth; a concept that, for some authors (Barquero-Cabero, Rodríguez-Terceño and Gonzálvez-Vallés, 2018), constitutes a hazard in contemporary societies, especially when it is related to health communication. The key to counter post-truth, according to the authors (Barquero-Cabero, Rodríguez-Terceño and Gonzálvez-Vallés, 2018), consists in providing healthcare institutions with new tools to improve communication between professionals and patients through ICTs. This way, the quality of individual attention given to each patient would be enhanced, giving them alternatives when faced with possible hoaxes or fakes from other Internet websites.

Post-truth has also been introduced in audiovisual content through deepfakes, which are very difficult to detect in some cases (Cerdán and Padilla, 2018). Any Internet user can download and operate these programs with personal computers. Their use, in addition to political satire, is aimed at the creation of pornographic videos in which female actors and celebrities' faces have been swapped onto the bodies of porn female actors (Cerdán and Padilla, 2018). Similarly, in the political field, several authors (Palomo and Sedano, 2018) have analyzed the information published about Donald Trump, according to post-truth theories reflecting whether the false news posted on Facebook sparked a debate whether Trump won the presidency thanks to fake news.

However, post-truth has also been criticized by other authors (Habgood-Coote, 2018) since it is very sensitive to the historical and social context of a geographical location and does not have great influence on public opinion. According to Habgood-Coote (2018), these new terms are unnecessary because their use bears powerful propaganda with anti-democratic connotations. Something that, for some authors (Coello and Mateos, 2004; Coello, 2008) signifies a deep crisis in journalism and in the media. Current journalism is affected by an overstimulated society, constantly open to new experiences (Palomo and Sedano, 2018). Citizens are interested in novelty and this changes how journalists treat news information, making it more appealing and in line with modern times.

Nevertheless, proliferation of fake news has become one of the main characteristics of contemporary democracies, particularly due to the use of emotions (Bakir and McStay, 2018; Rodríguez-Fernández, 2019); emotions suitable to what a fraction of society wants to hear, even if it is not true

(Farkas and Schou, 2018). Therefore, it is quite easy to discredit, attack, and delegitimize political opponents with no evidence. It does not matter whether the lie is later discovered because the damage has already been done (Bakir and McStay, 2018). However, other authors have conducted cognitive studies on emotions in these types of news (Cuesta-Cambra, Martínez-Martínez, Niño-González, 2019). Through eye tracking techniques they investigated the effects of information and emotion on people's attention responses to pro-vaccine and anti-vaccine news, concluding that no differences were found in the emotion provoked between anti-vaccine and pro-vaccine websites, and that anti-vaccination persuasion occurred via cognitive, not emotional methods (Cuesta-Cambra, Martínez-Martínez, Niño-González, 2019). The WHO has developed the COVID-19 Infodemics observatory (a portmanteau word between *information* and *pandemics*) to monitor and report on the enormous amount of news related to the pandemic. Search-engines and media companies such as Facebook, Google, Pinterest, Tencent, Twitter, TikTok or Youtube are collaborating to counter rumors dissemination, including disinformation claiming that the virus cannot survive in warmer climates, taking a high dose of Chloroquine medication may protect you, or that large amounts of ginger and garlic intake may prevent the virus (UN, 2020).

One of their indicators is the Infodemic Risk Index, which ranges between minimum zero and maximum one. According to their data, Spain ranges between 0.02 and 0.12 and holds the eighth place among the countries with the lowest index (mean value of 0.08). By way of contrast, the countries with the highest index are Peru (0.98), Venezuela (0.78) and Iran (0.64), while Singapore (0.003), Hong Kong (0.011) and France (0.014) hold the lowest positions. However, reliability of information sources in Spain is 76.57%, with 42.1% chances of possible presence of bots (accounts or generators of false and computerized information to perform their tasks automatically), compared to 57.9% of people generating information, dropping to the 45th position in this ranking (Infodemics, 2020). Therefore, it exhibits overall percentages of 71.4 % of reliable and 28.6% of unreliable news in Spain.

To date, several studies have analyzed fake news during the COVID-19 pandemic (Ahmad, Murad, 2020; Ahmed et al., 2020; O'Connor and Murphy, 2020; Meneses, Silva and Colaço, 2020). Nevertheless, no investigation performs a quantitative analysis of Spanish citizens' search queries for the terms "*bulo*" and "fake" on Google and compares them with the new coronavirus pandemic official data.

## 2. Objectives

This work's main objective is to find out the evolution of Spanish people's interest in search queries for "*bulo*" and "fake" made to Google since 2004. The secondary objective is to investigate if there is a correlation between search requests for "*bulo*" and "fake" on Google and COVID-19 daily deaths in Spain during the spread of the pandemic (from February to June, 2020).

## 3. Methods

This research performs a quantitative analysis of the "*bulo*" and "fake" search queries entered into Google's search engine through the data provided by Google Trends. Recent investigations (Bokelmann; Lessmann, 2018; Kamiński; Loniewski; Marlicz, 2019; Quintanilha et al., 2019; Villa

and Cerdán, 2020) use similar study methods to examine trending citizen's interests in different regions of the world. Likewise, various investigations (Strzelecki, 2020; Ortiz-Martínez et al, 2020; Yuan et al, 2020; Li et al, 2020; Springer et al, 2020; Ayyoubzadeh et al, 2020) have collate Google Trends data in relation to searches regarding COVID-19 to compare them with the evolution of the pandemic, concluding that these data can constitute a prediction tool for future events.

Google Trends data is an impartial and categorized sample of searches made on the Google platform, allowing to measure and display interest in one or several particular topics anywhere in the world. This analysis method has several filtering options. Real-time data is a random sample of searches covering the last seven days. A non-real time random sample collects Google data that goes as far back as 2004 and up to the past 36 hours, allowing comparison between various topics of interest (Google, 2020).

All these data are integrated in a graph displaying the frequency of search terms in one or several locations in the world. The horizontal coordinate axis represents time (since 2004) and the vertical axis the frequency of searches scaled between 0 and 100. Google Trends normalizes its data, so each data point is divided by the total searches of the geography and time range it represents to compare relative popularity. Otherwise, places with the most search volume would always be ranked highest. The resulting numbers are then scaled on a range of 0 to 100 based on a topic's proportion to all searches on all topics. Therefore, different regions that show the same search interest for a term do not always have the same total search volumes. For example, a country with few inhabitants where 80% of search queries correspond to a specific word will reflect a higher score than a country with a large population where only 40% of the searches correspond to that word (Google, 2020).

This research performs two analyses based on Google Trends data. The first analysis (historical-descriptive) studies the evolution of the terms "*bulo*" and "fake" on Google searches from 2004[1] until June 2020. The second, conducts a regression analysis of the same terms and compares them with the data of the Ministry of Health in Spain (Edata, 2020)[2] regarding the number of daily deaths due to COVID-19 during the pandemic spread period (from February to June 2020).

## 4. Results

Figure 1 shows Google search volumes from January 2004 to June 2020. The highest peak in the graph corresponds to the term "*bulo*" in April 2020. Other moments with high interest volumes are March 2020 (72), May 2020 (52), and January 2020 (35). Regarding searches for the word "fake", data show the following interest peaks: July 2016 (69), April 2020 (56), March 2020 (56), and August 2014 (47). Total search volumes are lower for "bulo" compared to "fake".

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[1] First year when Google Trends published data about searches entered into Google's search engine.

[2] Daily data until May 25 and from this date no, accumulated covering 7 days due to a change in the methodology of the Ministry of Health, Social Service and Equality.
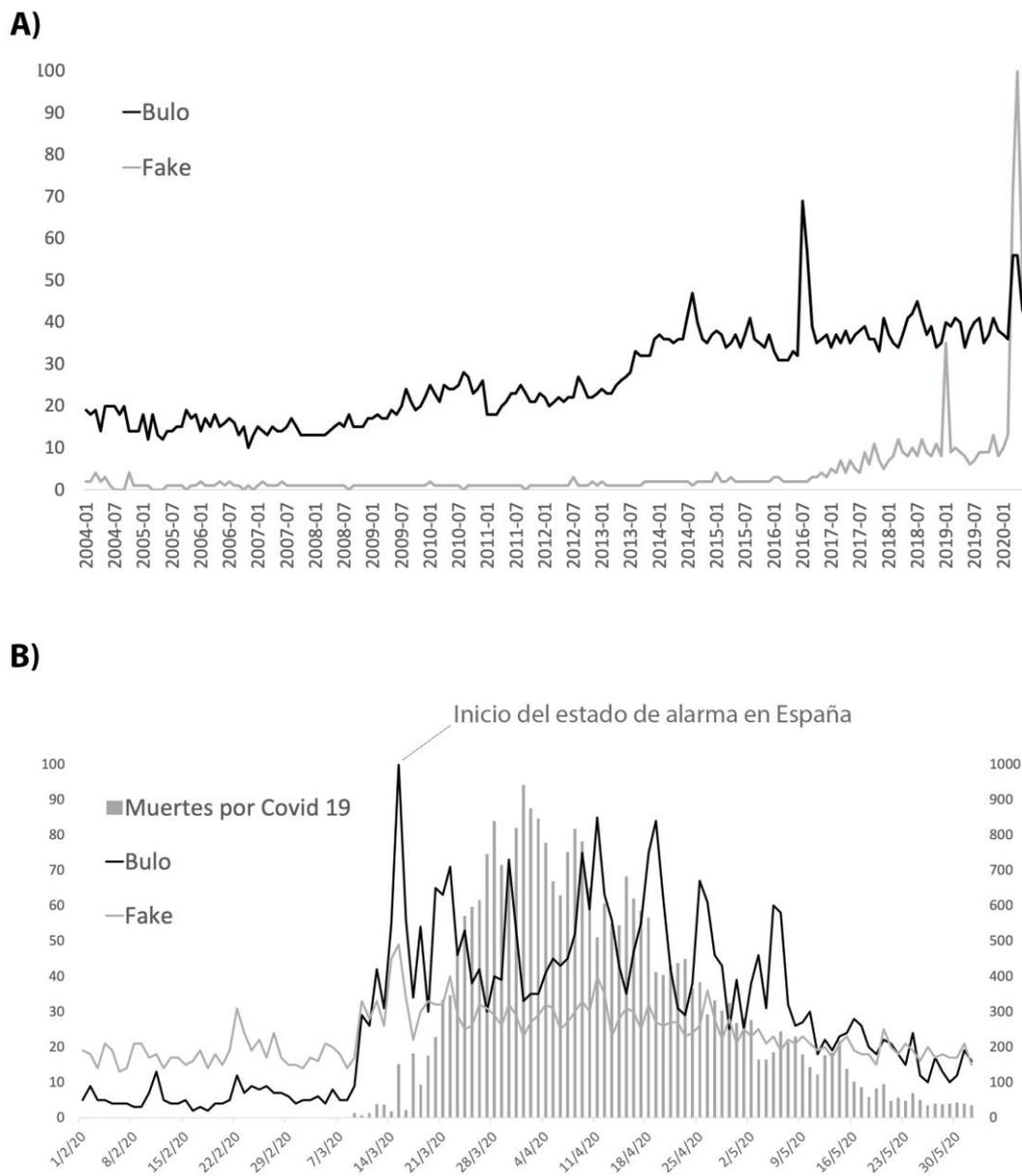
**Figure 1**: A) Historical period: Searches for the terms "*bulo*" and "fake" on Google (January 2004 to June 2020); B) Pandemic period: Searches for the terms "*bulo*" and "fake" on Google during the COVID-19 pandemic in Spain (from February to June 2020), and the number of COVID-19 deaths in Spain.
**Source:** Authors' own creation based on Google Trends data.

The results of the analysis during the pandemic in Spain (Figure 2, A) show the search volumes for "*bulo*" and "fake", and the number of daily COVID-19 deaths during the spread of the pandemic in Spain, from February 1 to June 1, 2020. The highest search spikes for the term "*bulo*" in descending order in figure 1 (A) are: March 15 (100), April 11 (85), April 19 (84), March 22 (71), April 25 (67), and March 20 (65); and for "fake": March 15 (49), March 22 (40), April 11 (40), April 26 (36), and April 12 (35).

Data from the Spanish Ministry of Health regarding deceased persons due to the new coronavirus (Figure 1) during said period show an increase in COVID-19 deaths as of March 13, with the highest peak on April 1, 2020, with 941 deaths (100). The next highest peaks in the graph (Figure 2, A) occurred on April 2 with 875 (87), March 28 with 839 (83), April 3 with 846 (84), and April 8 with 818 (81).

To analyze and compare the searches for "*bulo*" and "fake" with the official data on COVID-19 deaths, we are going to conduct a regression analysis based on the mean values of the monthly data from each group. Figure 2 (A) shows a regression plot graphing the data on searches for "*bulos*" on Google compared to daily deaths due to Coronavirus in Spain. In Figure 1 (B) this same analysis is conducted, but this time the monthly mean values of searches for "fake" are compared with the number of deaths due to Coronavirus. These results show a positive correlation (R = 0.9966) in the case of "*bulo*" and deaths. However, the correlation of the variable "fake" with the same data from the Minister of Health is statistically less significant (R = 0.8546).
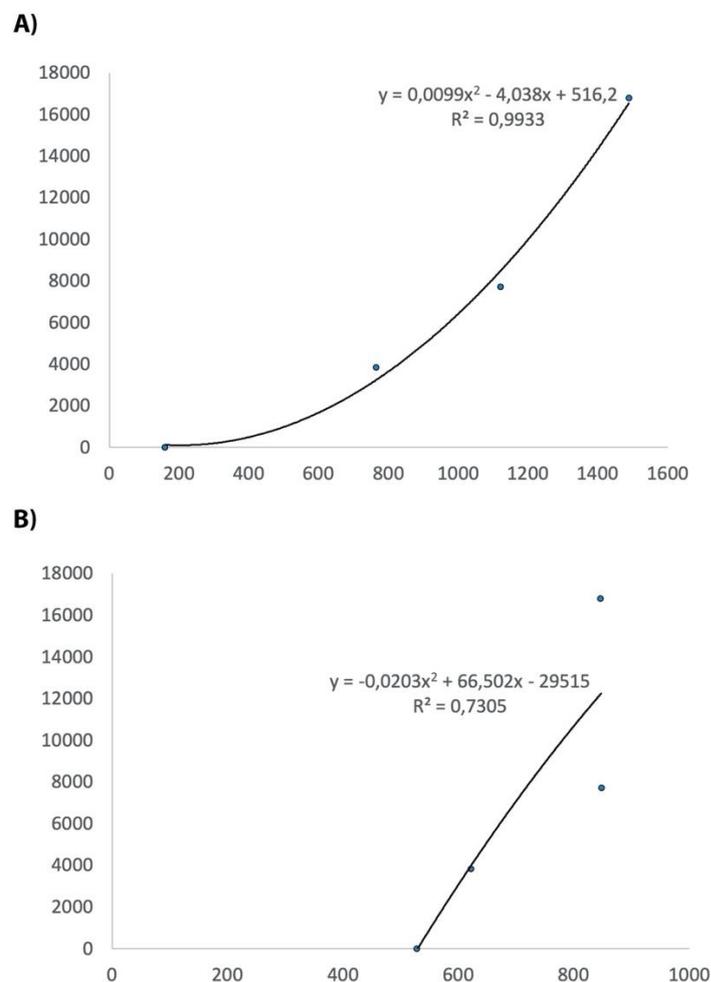
**A)**



$$y = 0,0099x^2 - 4,038x + 516,2$$
$$R^2 = 0,9933$$

**B)**



$$y = -0,0203x^2 + 66,502x - 29515$$
$$R^2 = 0,7305$$

**Figure 2**: Regression plot of searches for the word "*bulo*" on Google and COVID-19 victims in Spain (A). Regression plot of searches for the word "fake" on Google and COVID-19 victims in Spain (B).
**Source:** Authors' own creation based on Google Trends data.

## 5. Discussion

The findings in this research reveal that interest in "*bulo*" reached, in Spain, its highest historical peak on Google Trends in April 2020 (Figure 1, B); a date on which the country was in the midst of the state of alarm due to the spread of COVID-19. The interest in searches for "fake", although it was not the most prominent in the graph (56), was the second highest peak, outstripped only by the one of July 2016 (69).

These data demonstrate the unprecedented interest Spanish citizens had in Google searches for the terms "*bulos*" and "fake", linked to false news and post-truth by different authors (Palomo and Sedano, 2018; Padilla and Cerdán, 2018). Results in the graph also show that interest in this type of content on Google precedes the increase in CODIV-19 deaths in Spain. While the highest peak of searches for "*bulo*" and "fake" coincides on March 15 (Figure 1, A), the highest point of deaths due to the pandemic in Spain is found in this graph on April 1, 2020 (941 deaths in one day, according to official numbers).

On another note, the mean values of total search volumes indicate a similar index in "*bulo*" and "fake" in the graph of Figure 1 (A). However, this changes in figure 1 (B), since "fake" is outstripped by "*bulo*" in the searches of the 2004-2020 period.

In Figure 2 (A) the regression analysis is very close to 1 (R = 0.9966), which means that the data on Google searches for "*bulo*" and daily deaths have a positive correlation during the pandemic spread period in Spain; something that does not happen with search queries for "fake" (R = 0.8546).

Furthermore, this research addresses the issue of hoaxes and fake news, as well as other recent investigations have (Salaverría et al., 2020; Costa-Sánchez and López-García, 2020), from other perspectives and/or methodologies. Both works address the relevance of hoaxes and fake news during the development of the COVID-19 pandemic.

## 6. Conclusions

These events make us reflect upon several issues. First, that Spaniards' interest in "*bulo*" and "fake " increased the day after the implementation of an exceptional scenario, such as the state of alarm, on March 14. Secondly, faced with the imminent advent of an increase in the number of victims due to the spread of a pandemic, Spanish citizens were interested in searching for information related to hoaxes and fakes on Google to stay well informed in the face of a new and exceptional event, as the COVID-19 spread in Spain has been. And third, citizens' interest in "*bulo*" and "fake" precedes the Government's statements about its intention to fight against false news; hence the words of the Civil Guard general José Manuel Santiago in mid-April 2020 do not justify that first peak in the graph, unlike the one observed in the middle of the same month.

Regarding the regression analysis, we conclude that during the development of the pandemic there was a positive correlation between Spanish citizens' interest in false news and the increase in COVID-19 deaths. Something that makes us reflect on the relevance of fake news and hoaxes amid socially dramatic scenarios, such as a health crisis. We think this study can open a line of research to

verify if similar correlations occur in future events; considering especially the risk of possible new waves of infection. To this end, it would be necessary to collect again the data on search queries for "*bulos*" or "fakes" on Google Trends during a possible second or third wave of COVID-19 in a given region and to compare these data with the number of deaths or infections during that same period. After that, it be would be advisable to conduct a regression analysis to evaluate possible correlations between the data.

Similarly to other recent studies (Salaverría et al., 2020; Costa-Sánchez and López-García, 2020), we believe that research on hoaxes and fake news constitutes a tool capable of encouraging citizens to have a more reflective attitude towards the information circulating in the media and on social networks, especially during a health crisis period.

Nevertheless, this investigation has several limitations. Despite the fact that Google is the most used search engine by Spanish citizens (Google, 2020), there are other websites such as Yahoo, Bing or Yadex that were not included in this study.

## 7. Bibliography

Ahmad, A.R. & Murad, H. R. (2020). The Impact of Social Media on Panic During the COVID-19 Pandemic in Iraqi Kurdistan: Online Questionnaire Study. *J Med Internet Res*, *22*(5): e19556. http://doi.org/10.2196/19556

Ahmed, W., Vidal-Alaball, J., Downing, J. & López Seguí, F. (2020). COVID-19 and the 5G Conspiracy Theory: Social Network Analysis of Twitter Data. *J Med Internet Res*, *22*(5): e19458. http://doi.org/10.2196/19458

Arias Maldonado, M. (2019). Understanding Fake News: Technology, Affects, and the Politics of the Untruth. *Historia y Comunicación Social*, *24*(2), 533-546. https://doi.org/10.5209/hics.66298

Arraz, R. (16 de abril de 2020). *Newtral, Maldita... ¿Quién controla a los controladores?* Voxpopuli. t.ly/I2ha

Ayyoubzadeh, S.M., Ayyoubzadeh, S.M., Zahedi, H., Ahmadi, M. R. & Niakan Kalhori, S. (2020). Predicting COVID-19 Incidence Through Analysis of Google Trends Data in Iran: Data Mining and Deep Learning Pilot Study. *JMIR Public Health Surveill*, *6*(2): e18828. http://doi.org/10.2196/18828

Barquero Cabero, M., Rodríguez Terceño, J. & Gonzálvez Vallés, J. E. (2018). Tecnologías de la Comunicación y posverdad: implicaciones para la gestión de la Comunicación Hospitalaria. *Revista de Comunicación y Salud*, *8*(1), 85-97. http://doi.org/10.35669/revistadecomunicacionysalud.2018.8(1).85-9

Bakir, V. & Mcstay, A. (2018). Fake News and The Economy of Emotions. Problems, causes, solutions. *Digital Journalism*, *6*(2), 54-175. https://doi.org/10.1080/21670811.2017.1345645

Barrientos-Báez, A., Barquero Cabrero, M. y García García, E. (2018). Posverdad y comunicación 2.0: el reto periodístico de una era sin periodistas. *Revista de Ciencias de la Comunicación e Información*, *23*(1), 43-52. http://doi.org/10.35742/rcci.2018.23(1).43-52

Bokelmann, B. & Lessmann, S. (2018). Spurious patterns in Google Trends data - An analysis of the effects on tourism demand forecasting in Germany. *Tourism management*, *75*(1), 1-12. https://doi.org/10.1016/j.tourman.2019.04.015

Carrera, P. (2018). The stratagems of post-truth [Estratagemas de la posverdad] *Revista Latina de Comunicacion Social*, *73*, 1469-1481. https://doi.org/10.4185/RLCS-2018-1317

Cerdán Martínez, Víctor & Padilla Castillo, Graciela (2019). Historia del "*fake*" audiovisual: "*deepfake*" y la mujer en un imaginario falsificado y perverso. *Historia y Comunicación Social*, *24*(2) pp. 505-520. https://doi.org/10.5209/hics.66293

Costa-Sánchez, C. y López-García, X. (2020). Comunicación y crisis del coronavirus en España. Primeras lecciones. *El profesional de la información, 29*(3), 290-304. https://doi.org/10.3145/epi.2020.may.04

Cuesta-Cambra, U., Martínez-Martínez, L. & Niño-González, J. I. (2019). An analysis of pro-vaccine and anti-vaccine information on social networks and the internet: Visual and emotional patterns. *El profesional de la información*, 28(2), e280217. https://doi.org/10.3145/epi.2019.mar.17

Cuesta, C. & Guirado, J (21 de abril de 2020). Este es el mail que la Guardia Civil recibió para controlar los "bulos" que crean "desafección al Gobierno". *Okdiario*. t.ly/k9OV

DECEL (2020). DECEL: Diccionario etimológico. t.ly/WDfB

Del Riego, C. (27 de abril de 2020). España detecta 200 acciones de desinformación bajo la alarma. *La Vanguardia*. t.ly/aODG

Edata (2020). Evolución fallecidos por coronavirus España. Edata.es. t.ly/cTue

Encabo, I (25 de abril de 2020). La falta de una definición de fake-news permite a los Gobiernos acercarse a la censura. *El Independiente*. t.ly/AWRr

Google (2020). *Google Trends.* t.ly/mzPs

Guan, W., Ni, Z., Hu, Y., Linag, W., Ou, C., He, J., Liu, L., Shan, H., *et al*. (2020). Clinical characteristics of coronavirus disease 2019 in China. *The New England Journal of Medicine*, *382*, 1708-1720. https://doi.org/10.1056/NEJMoa2002032

Habgood-Coote, J. (2018). Stop talking about fake news! *Inquiry. An Interdisciplinary Journal of Philosophy*, 62(9), 1033-1065. https://doi.org/10.1080/0020174X.2018.1508363

IFCN (2020). *The International Fact-Checking Network*. t.ly/sEwi

Infodemics (2020). Covid19 Infodemics Observatory. https://bit.ly/2ZqLx58

Jankowski, N. W. (2018). Researching Fake News: A Selective Examination of Empirical Studies. *Javnost - The Public. Journal of the European Institute for Communication and Culture*, *25*(1-2). 248-255. https://doi.org/10.1080/13183222.2018.1418964

Jin, Z., Du, X., Yang, H., *et al.* (2020). Structure of M^pro from COVID-19 virus and discovery of its inhibitors. *Nature*, *582*, 289–293. https://doi.org/10.1038/s41586-020-2223-y

Kamiński, M., Łoniewski, I., & Marlicz, W. (2019). Global internet data on the interest in antibiotics and probiotics generated by Google Trends. *Antibiotics*, *8*(3), 147-155. https://doi.org/10.3390/antibiotics8030147

Larrouquere, L., Gabin, M., Poingt, E., Mouffak, A., Hlavaty, A., Lepelley, M. *et al.* (2020). Genesis of an emergency public drug information website by the French Society of Pharmacology and Therapeutics during the COVID-19 pandemic. *Fundamental & Clinical Pharmacology.* https://doi.org/10.1111/fcp.12564

Cuilian, L., Li Jia, C., Xueyu, C., Mingzhi, Z., Chi Pui, P., & Haoyu, C. (2020). Retrospective analysis of the possibility of predicting the COVID-19 outbreak from Internet searches and social media data, China, 2020. *Euro Surveill*, *25*(10). https://doi.org/10.2807/1560-7917.ES.2020.25.10.2000199

O'Connor, C., & Murphy, M. (2020). Going viral: doctors must tackle fake news in the covid-19 pandemic. *BMJ* 2020;369:m1587. https://doi.org/10.1136/bmj.m1587

La Moncloa (2020). *Lamoncloa.es.* t.ly/Nw1L

Maldita (15 de junio de 2020). El coronavirus y sus bulos: 591 mentiras, alertas falsas y desinformaciones sobre COVID-19. *Maldita.es*. t.ly/1lJa

Mazaira-Castro, A., Rúas-Araújo, J. & Puentes-Rivera, I. F (2019). Fact-checking in the televised debates of the Spanish general elections of 2015 and 2016 [Fact-Checking en los debates electorales televisados de las elecciones generales de 2015 y 2016]. *Revista Latina de Comunicacion Social*, *74*, 748-766. https://doi.org/10.4185/RLCS-2019-1355

Meneses, C., Silva, R., & Colaço, M. (2020). Intelligent Fake News Detection: A Systematic Mapping. *Journal of Applied Security Research*, *1*(22). https://doi.org/10.1080/19361610.2020.1761224

Muñiz-Velázquez, J. A., Chaplin, J. E. & Lozano Delmar, J. (2019). The fake first round about the earth. The case of the supposed chinese circumnavigation of 1421 from the post-truth paradigm [La falsa primera vuelta al mundo. El caso de la supuesta circunnavegación china de 1421 desde el paradigma de la posverdad]. *Revista Latina de Comunicación Social*, *74*, 950-968. https://doi.org/10.4185/RLCS-2019-1366

Newtral (2020). *Newtral.es*. t.ly/hYVP

Niño Gonzalez, J. A.; Barquero Cabrero, M.; García García, E. (2017). Opinión pública e infoxicación en las redes: los fundamentos de la post-verdad [Public opinion and infoxication in the networks: fundamentals of post-truth] *Vivat Academia, revista de Comunicación*, 139, 83-94. http://doi.org/10.15178/va.2017.139.83-94

Olmo, J. M. (20 de abril de 2020). El debate de los bulos le estalla a Sánchez: un órgano de Moncloa vigila las 'fake news'. *El Confindencial*. t.ly/tare

OMS (2020b). COVID-19: cronología de la actuación de la OMS. Organización Mundial de la Salud. https://www.who.int/es/news-room/detail/27-04-2020-who-timeline---covid-19

Ortiz-Martínez, Y., Garcia-Robled, J. E., Vásquez-Castañeda, D. L., Bonilla-Aldana, D. K. & Rodriguez-Morales, A. J. (2020). Can Google Trends predict COVID-19 incidence and help preparedness? The situation in Colombia. *Travel Medicine and Infectious Disease*, *36*. https://doi.org/10.1016/j.tmaid.2020.101703

Rodríguez-Fernández, L. (2019). Desinformación y comunicación organizacional: estudio sobre el impacto de las fake news. *Revista Latina de Comunicación Social*, 73. 1714-1728. http://doi.org/10.4185/RLCS-2019-1406

Rodríguez-Ferrándiz, R. (2019). Posverdad y fake news en comunicación política: breve genealogía. *El profesional de la información, 28*(3). 280-314. https://doi.org/10.3145/epi.2019.may.14

Pablos Coello, J. M. d. & Mateos Marín, C. (2004). Estrategias informativas para acceder a un periodismo de calidad, en prensa y TV. Patologías y tabla de 'medicación' para recuperar la calidad en la prensa. *Ámbitos. Revista Internacional de Comunicación*, *11-1*2, 341-365. http://dx.doi.org/10.12795/Ambitos.2004.i11-12.19

Pablos Coello, J. M. d. (2008). El frenesí comunicativo como desinformación. *Comunicar: Revista científica iberoamericana de comunicación y educación*, *31*, 173-179. https://doi.org/10.3916/c31-2008-01-022

Palomo, B & Sedano, J. (2018). WhatsApp as a verification tool for fake news. The case of B de Bulo [WhatsApp como herramienta de verificación de fake news. El caso de B de Bulo] *Revista Latina de Comunicacion Social*, *73*, 1384-1397. https://doi.org/10.4185/RLCS-2018-1312

Pérez, M. A. (20 de abril de 2020). El Gobierno concedió a la 'verificadora de bulos' Maldita.es una subvención de 6.000 euros antes de las elecciones. *Libertad digital*. t.ly/GDm0

Quintanilha, L., Souza, L., Sanches, D., Senos-Demarco, R. & Ferreira-Fukutani, K. (2019). The impact of cancer campaigns in Brazil: a Google Trends analysis. *Ecancer medical science*, *13*(963), 1-9. https://doi.org/10.3332/ecancer.2019.963

Tandoc Jr., E., Wei Lim, Z. & Ling, R. (2017). Defining *Fake News*. A typology of scholarly definitions. *Digital Journalism*, *6*(2), 137-153. https://doi.org/10.1080/21670811.2017.1360143

Salaverría, R., Buslón, N., López-Pan, F., León, B., López-Goñi, I. y Erviti, M.-C. (2020). Desinformación en tiempos de pandemia: tipología de los bulos sobre la Covid-19. *El profesional de la información, 29*(3). 290-315. https://doi.org/10.3145/epi.2020.may.15

Springer, S., Menzel, L.M. & Zieger, M (2020). Google Trends reveals: Focus of interest in the population is on treatment options rather than theories about COVID-19 animal origin. *Brain, Behavior, and Immunity. 87*, 134-135. https://doi.org/10.1016/j.bbi.2020.05.005

Strzelecki, A. (2020). The Second Worldwide Wave of Interest in Coronavirus since the COVID-19 Outbreaks in South Korea, Italy and Iran: A Google Trends Study, *Brain, Behavior, and Immunity*, *87*. https://doi.org/10.1016/j.bbi.2020.04.042

UN Departmen of Global Communications (2020). *UN tackles 'infodemic' of misinformation and cybercrime in COVID-19 crisis.* United Nations. https://bit.ly/389wmRw

Villa-Gracia, D. & Cerdán, V. (2020). Evolución de la popularidad de Donald Trump y otros mandatarios internacionales en *Google Trends* (2016-2019). *El profesional de la información*, *29*(1). https://doi.org/10.3145/epi.2020.ene.12

WHO (2020). *Novel coronavirus emerges in China*. World Health Organization. https://bit.ly/2BwSr0k

Yuan, X., Xu, J., Hussain, S., Wang, H., Gao, N. & Zhang, L. (2020). Trends and Prediction in Daily New Cases and Deaths of COVID-19 in the United States: An Internet Search-Interest Based Model. *Exploratory Research and Hypothesis in Medicine*, *5*(2), 41-46. https://doi.org/10.14218/ERHM.2020.00023

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