Interactive mapping of Covid-19 disinformation in Ibero-America

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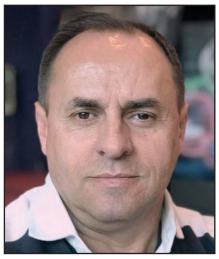

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Abstract

Fake news, created with different intentions and disseminated through various social networks and messaging platforms, has become a significant means of disinformation in the current landscape. In the face of certain events or controversial situations, the number of fake new items increases, a situation that can become worrying. One such event was the arrival of the Covid-19 pandemic. To combat this phenomenon, various fact-checking bodies appeared with the objective of demonstrating and disseminating whether a certain piece of information was correct. At the international level, these organizations have joined together in the *#CoronaVirusFacts/#DatosCoronaVirus Alliance*. The organization *Chequeado* from Argentina has collected information coming from Latin American (Latam) countries plus Spain and Portugal in a specific database, which allows for their analysis on an independent basis. The objective of this work is to analyze and make graphically visible the thematic distribution, media typology, and digital formats of the fake news that circulated regarding the coronavirus pandemic in Ibero-America by means of the social network analysis technique (SNA) and others, using the information from the aforementioned database. Its final visualization is shown by means of interactive mapping, which can be manipulated by the user to analyze the results through the application of different integrated filtering strategies.

Keywords

Fake news; Disinformation; Misinformation; Hoaxes; Fact-checking; Post-truth; Data visualization; Verification; Covid-19; Pandemics; Health information; Ibero-America.

1. Introduction

The global COVID-19 coronavirus pandemic since early 2020 has been accompanied by an unprecedented wave of planetary disinformation.

> "Misleading content –cures, 'medical' advice, conspiracy theories, etc.– disseminated on various media (socio-digital networks, SMS, private messaging, traditional media, etc.). What do we know today about this mass of disinformation? What does it tell us about the functioning of information processes in contemporary societies?" (**Monnier**, 2020).

Research publications show the importance of a second, unprecedented pandemic of fake news. Disinformation about COVID-19 has attracted a lot of attention.

> "Much of the initial research has focused on the types, origins, and spread (**Brennen** *et al.*, 2020), as well as possible effects of false information and conspiracies around the coronavirus and the pandemic (Freeman et al. 2020). Academic, industry, and journalistic accounts have examined the propagation of COVID-19 disinformation by state actors (**Swan**, 2020), the prevalence of COVID-19 conspiracy theories (**Freeman** *et al.*, 2020; **Uscinski** *et al.*, 2020), the spread of misinformation on social media on platforms such as *Facebook* and *Twitter* (**Hollowood**; **Mostrous**, 2020), as well as interventions to counteract misinformation on social media (**Pennycook** *et al.*, 2020)." (**Brennen** *et al.*, 2021).

1.1. Disinformation

The concept of disinformation, understood as the dissemination of false news as a technique of political/war attack, has been known since ancient times but became popular in the media from the 1980s onwards (**Rivas-Troitiño**, 1995; **Martínez-Musiño**, 2011). The *Royal Spanish Academy* (*RAE*) (2014) defines disinformation as

> "to give information intentionally manipulated to serve certain purposes, or to give insufficient information or omit it" (*RAE*, 2014).

Recently the EU has defined it as

> "false, inaccurate or misleading information intentionally designed, presented and promoted to cause public harm or for profit" (*High Level Group on Fake News and Online Disinformation*, 2018).

With the development of the web and the subsequent explosion of social networks, which have been joined by instant messaging platforms, the phenomenon has overflowed both in magnitude and impact on the knowledge and decisions of citizens worldwide (**Bond**, 2012). This impact has already been detected in several areas of social behavior, but with special incidence in politics and health. Its appearance in the context of politics brought to fame the term post-truth[1], collected by the *Royal Spanish Academy* (*RAE*) in 2017 as

> "Deliberate distortion of a reality, which manipulates beliefs and emotions in order to influence public opinion and in social attitudes" (*RAE*, 2014).

Misinformation, whether intentional or not, is an ally of post-truth and makes objective facts lose influence in defining public opinion, giving precedence to the emotional over the rational (**Subires-Mancera**, 2017). In addition, fake news spreads faster and has greater reach in social networks than real news (**Vosoughi**; **Roy**; **Aral**, 2018).

In the area of health, misinformation has been growing to such an extent that **Larson** (2018) published in the journal *Nature* an article entitled "*The biggest pandemic risk? viral misinformation*". In it he stresses that

> "the avalanche of contradictory information, misinformation, and manipulated information on social networks should be recognized as a global threat to public health."

It denounces the fact that the anti-vaccine movement, which has been fueled by the misinformation circulating on the Internet, is causing an alarming drop in the number of people vaccinated, especially children, and an increase in infant mortality due to this cause. The use of the Internet as a source of health information on the web has been of concern since the network became popular, driving the use of reliable sources and the development of certificates of quality of information, but the increase of hoaxes or fake news on social networks has turned disinformation into a problem to which solutions must be found to deal with it (**Chou**; **Oh**; **Klein**, 2018).

The *II Study on Health Hoaxes* (*Instituto #SaludsinBulos*; *Doctoralia*, 2019) reveals that almost two out of three healthcare professionals surveyed (66%) claim that health hoaxes increased (compared to 57% who believed so in 2018) and that misinformation is causing patients to mistrust the healthcare professional as a source of information. Healthcare practitioners have dubbed this effect "Dr. Google" (**Rosenbaum**, 2018; **Segrelles-Calvo**, 2016; **Stein**, 2011). The following *Health Hoax Studies* (*III* and *IV*) focused on COVID hoaxes specifically.

The increase in hoaxes or fake news and their effect has led various international organizations to begin to study the phenomenon and try to adopt measures to control it. One of the first was the EU, whose *European Council* promoted the creation of the *East StratCom Task Force* in 2015 (*European Council*, 2015) to "*counter current Russian disinformation campaigns*". They disseminate their work on the web at
https://euvsdisinfo.eu

where their flagship publication is *Disinformation Review.* Since then, it has been keeping it in mind to fight against it (*European Commission*, 2018a; 2018b; 2018c; 2022; *High Level Group on Fake News and Online Disinformation*, 2018).

For its part *Unesco*, through its *International Programme for the Development of Communication* (*IPC*), published a manual, *Journalism, "fake news" and disinformation - Handbook for journalism education and training* (**Ireton**; **Posetti**, 2018) to guide journalism professionals and other actors to fight disinformation. The number of organizations and media outlets that have been joining to tackle disinformation has been growing since then in all countries, especially those dedicated to verifying information.

Due to criticism:
https://www.nytimes.com/es/2019/11/01/espanol/opinion/red-social-facebook-sorkin.htm

also the companies behind these social networks have been forced to intervene, especially the social network *Facebook* that recognizes that part of the problem is that fake news is a business, because it attracts clicks and therefore advertising (**Jiménez-Cano**, 2017). The European Union got, in October 2018, the industry to agree for the first time in the world, a voluntary self- regulatory code of good practice to combat the spread of disinformation online (*European Commission*, 2018c). This code was revised and in June 2022 published as a strengthened *Code of practice on disinformation*, to which other stakeholders have adhered (*European Commission*, 2022).

However, it was only after the pressure caused by the COVID-19 pandemic and the subsequent US elections, which have made things worse in terms of disinformation, that companies began to take more far-reaching measures than those taken until then (*El Español*, 2020, **Raya**, 2020; *ABC*, 2020). In fact, a report published by *Avaaz* (2020), a global citizens' platform, pointed to *Facebook*'s algorithm as the problem, given that at despite the efforts made by the company to warn users, the results have been minimal, highlighting that the contents of the most popular websites that disseminate false information are seen four times more than those that show truthful information on the platform.

Another strategy to curb hoaxes has been to promote the information literacy of the targeted citizens. Information literacy, metaliteracy as it is currently conceptualized, or Media and Information Literacy, as it is called by *Unesco*, involves the acquisition of skills that, among other things, enable one to evaluate information critically, weighing its veracity. Promoted by librarians and teachers since the end of the 20th century, it is a long-term strategy, complementary to journalistic rigor and technological performance. The EU also promotes the competences of digital citizens since its emergence, having in the *DigComp Framework for digital competence* (**Ferrari**; **Punie**; **Brečko**, 2013) its current strategy to boost them. It is also appealing to those people with these competences to collaborate by reporting the hoaxes they find
https://theconversation.com/5-ways-to-help-stop-the-infodemic-the-increasing-misinformation-about-coronavirus-137561

Faced with the advance of disinformation, the journalistic media also began to worry, as their work was beginning to suffer in terms of public credibility. To avoid this, they have launched various platforms, called verification platforms, which try to dismantle this type of "news," and which have been emerging all over the world. Journalists have joined the push for media literacy and in 2015, the verification organizations formed an international network, the *IFCN* (*International Fact-Checking Network*), under the auspices of the *Pointer Institute*, an American organization founded in 1975 that is now one of the most influential journalism schools in the world.
https://www.poynter.org/mission-vision

1.2. COVID-19 and disinformation

Although the problem of misinformation has reached its zenith in the months of pandemic produced by the SARS-CoV-2 virus (COVID-19), it has not been absent in other pandemics[2] such as Zika virus (**Almeida**, 2016) or Ebola (**Oyeyemi**; **Gabarron**; **Wynn**, 2014; **Wang** *et al.*, 2019). And equally in other plagues recorded throughout history occurred when social networks did not exist[3] (Figure 1).

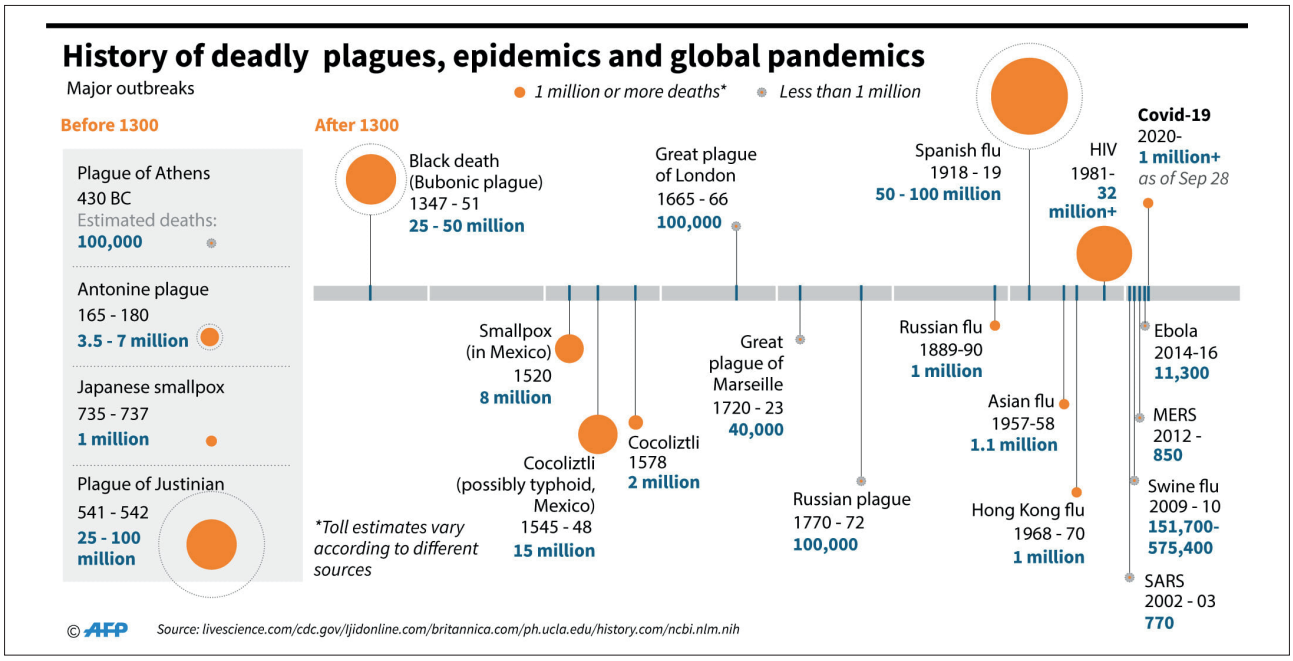

Figure 1. The great epidemics of history
https://shorturl.at/cuMQX

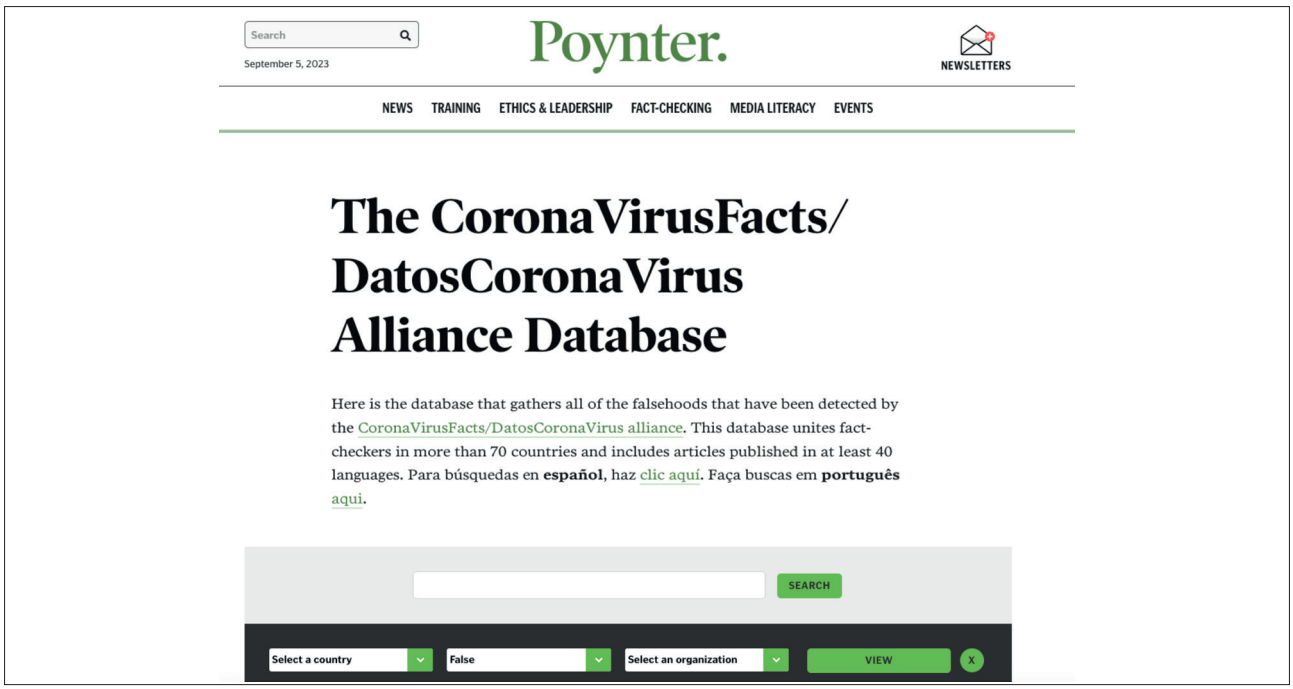

Figure 2. *Poynter* database web page on COVID-19.
https://www.poynter.org/ifcn-covid-19-misinformation/?covid_countries=0&covid_rating=51174&covid_fact_checkers=0

The COVID-19 misinformation, however, involves many new elements, which makes it complex:

> "the multiplication of media, channels and actors involved in the production and distribution of content (actors from the world of health, politics, the media, religious, ordinary citizens, etc.); the uncertainties and even contradictions that marked public communication almost everywhere in the world, particularly at the beginning of the epidemic, linked to the lack of data, the desire to reassure the public, the fear of triggering panic movements or of suffering the consequences of strong economic or political actions" (**Monnier**, 2020).

The *Poynter Institute's International Fact Checker Network* (*IFCN*) launched the *#CoronaVirusFacts Alliance* in January 2020, at a time when the spread of the coronavirus was limited to China but already causing rampant misinformation around the world. This alliance united more than 100 fact-checkers from around the world to publish, share and translate facts related to the COVID-19 pandemic. The *World Health Organization* classifies this as an infodemic.

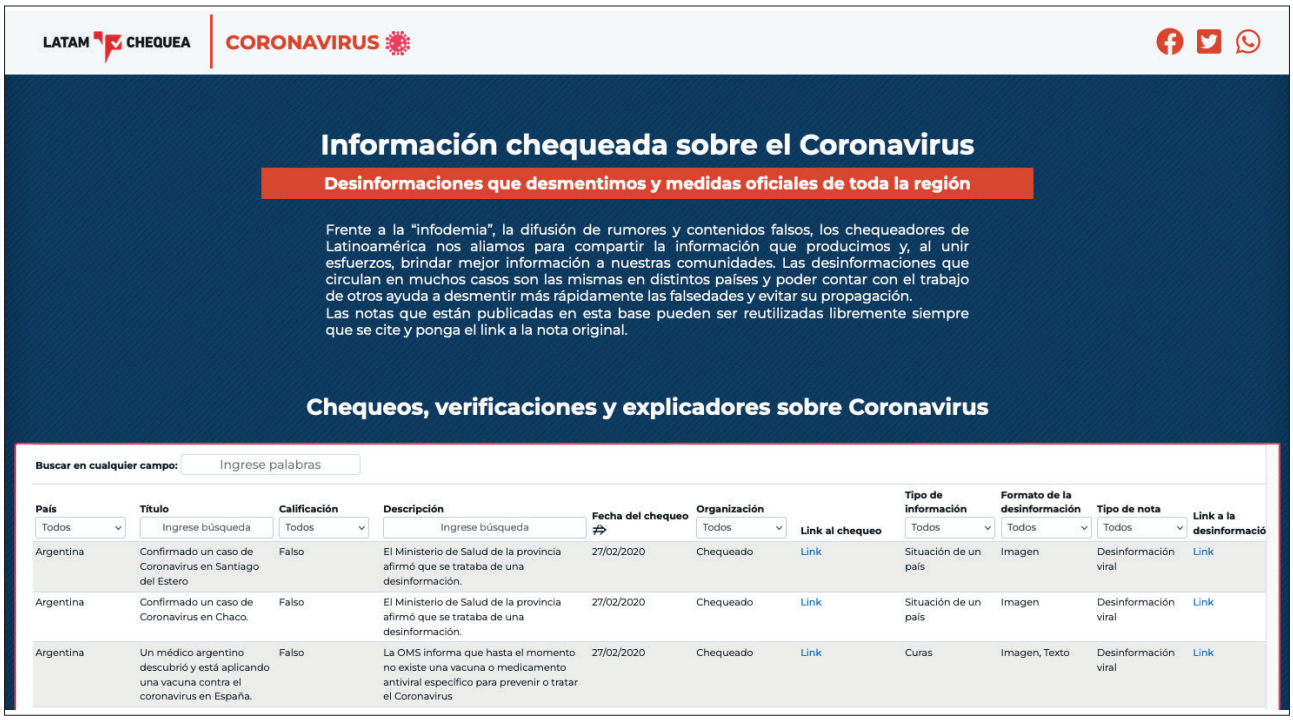

Figure 3. *Latam Chequea* web page on COVID-19.
https://chequeado.com/latamcoronavirus

The *#CoronaVirusFacts* database
https://www.poynter.org/coronavirusfactsalliance

collects all hoaxes discovered by the *Alliance* and will be updated daily with new publications until early 2023. It can be sorted, filtered and searched by content. The database brings together fact-checkers from more than 70 countries and includes articles published in at least 40 languages (Figure 2).

In April of that same year, also under the auspices of the *#CoronaVirusFacts Alliance*, a specific database began to be published with verified information on coronavirus from the different verifying agencies of Latin American (Latam) countries, plus those of Spain and Portugal, a subset of the previous one. *Latam Chequea Coronavirus* integrated 35 organizations from 15 countries[4], to disseminate in Spanish and Portuguese the misinformation circulating about COVID-19, Figure 3. The project was coordinated by the organization *Chequeado*[5] (Argentina) and supported by *Google News Initiative*. Unlike the previous one, this database is free to download, available at:
https://chequeado.com/latamcoronavirus

The verification objectives of the organizations adhered to the *Latam Check Coronavirus* project can be summarized as follows:

1. To know the number of posts related to COVID-19 fake news, their volume with and frequency.
2. To analyze the most frequent interactions with false content published on COVID- 19 and its relationship with the type of publication.
3. Determine the level of interaction of COVID-19 related content on a per verifier basis.

1.3. Visualization of fake news about COVID-19

Using visual elements such as graphs and maps, data visualisation provides an accessible way to identify and understand trends, outliers and patterns in data. It is used to provide simple summaries of large data sets. In visualisation, statistics is joined by other disciplines that help to highlight information to make it easier to understand.

> "The raw material to develop an effective visualization is data, figures and the search for information. And, thanks to information design, it is possible to take these variables and transform them into graphic pieces that will help the general public to perceive the relationships they have more easily" (**Bayas-Ramírez**, 2020).

Thus, data visualisation on COVID-19 allows us to use another way of communicating information and methods that serve other disciplines (design, communication, data journalism, databases, etc.) to analyse and make data accessible.

Examples of visualisations of fake news data related to the SARS-CoV-2 pandemic include those using data collected by the *#CoronaVirusFacts Alliance* mentioned above. This alliance has created a database of more than 17,000 fake news verifications, which it presents in several types of interactive visualisations on its website. One of them (Figure 4) shows on a map the number of verifications per country since January 2020, a map updated at the end of each month. The distribution of the data logically reflects the contributors to the *Alliance*, as there is no direct data where there are no verifiers.

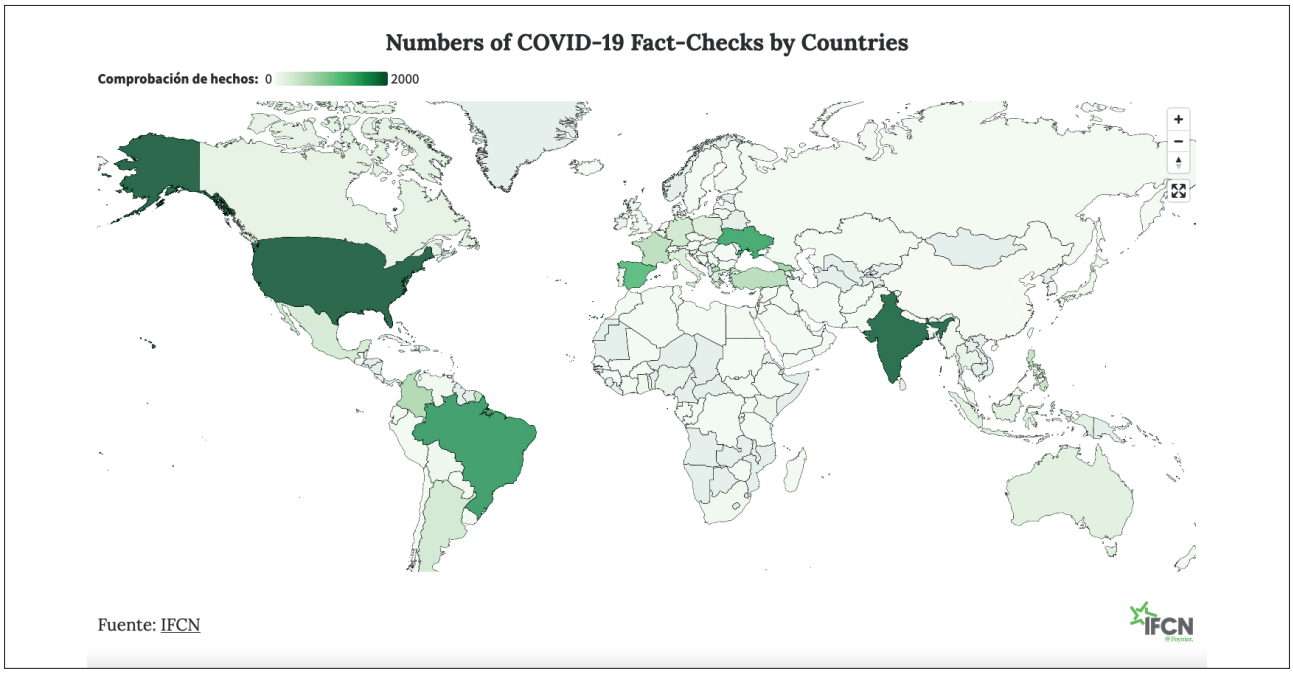

Figure 4. Fake news checks by country since January 2020.
https://flo.uri.sh/visualisation/8541954/embed?auto=1

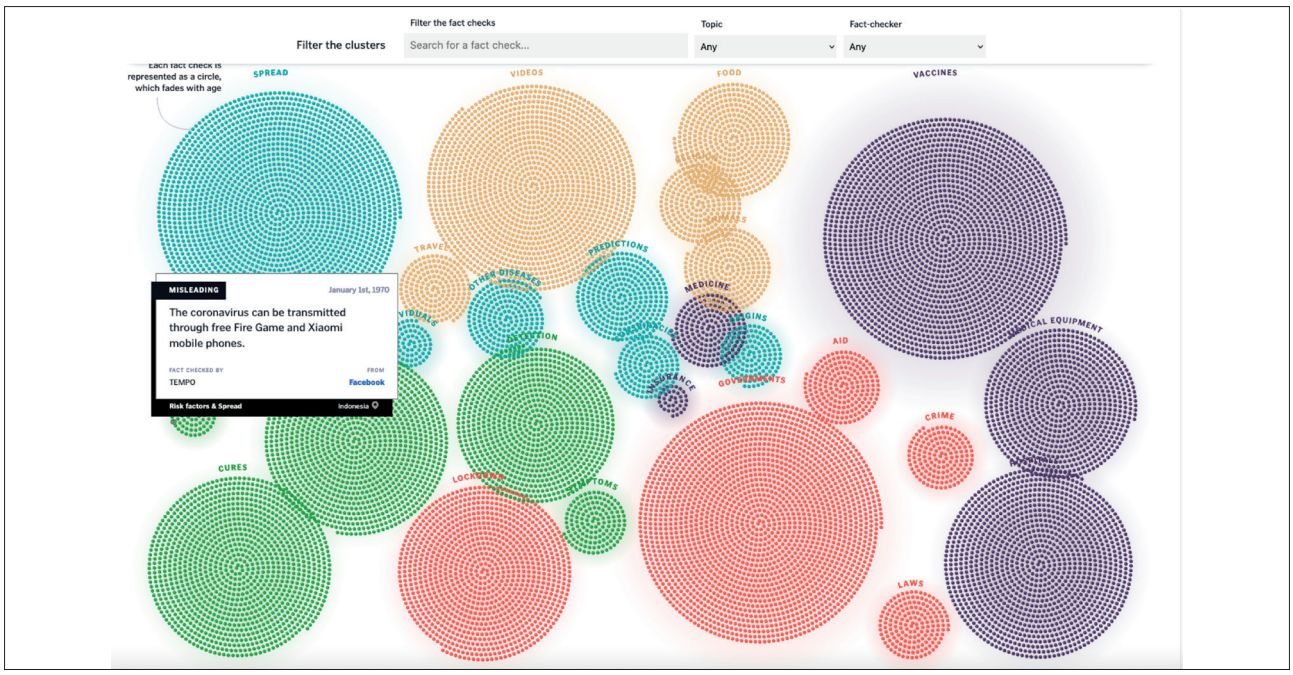

Figure 5. Categories of hoaxes.
https://www.poynter.org/coronavirusfactsalliance

Two other visualizations show the categories with which the alliance classifies the verifications made in its database. One of them shows their evolution over time, showing how they are changing and how some topics are appearing. Figure 5 shows them by size according to the number detected, allowing to read a small synthesis of each of the verifications. It also incorporates the possibility of filtering.

Another example to note is that five European verifiers[6] made from a report they published on the spread of the infodemic in parallel with the spread of the COVID-19 pandemic across Europe and the imposition of large-scale public health measures, using the 645 COVID-19 related verifications they made during the months of March and April 2020. The results are displayed in visual form on the website:
https://covidinfodemiceurope.com/?lang=en

As in the previous case, the different types stand out (in this case with an iconographic chart with the most common ones, Figure 6) and how they vary over time:

They also use the geographical distribution of some hoax subtypes (Figure 7) and timelines to show how specific hoaxes spread across different countries (Figure 8). To enlarge information also uses interactive visualizations (interactive version of the graphic in Figure 7 at:
https://view.genial.ly/5ef071b6478cb20d63238325

It is also worth mentioning the work published by **Bayas-Ramírez** (2020), which performs different visualizations with data from the *Ecuador Chequea* verifier.

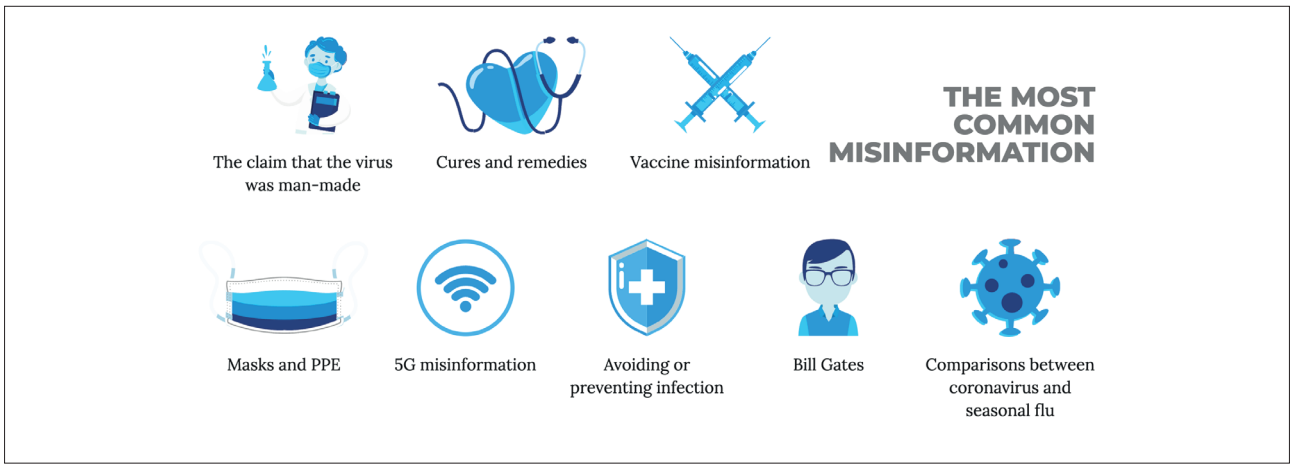

Figure 6. The most common hoaxes.
https://covidinfodemiceurope.com/?lang=en

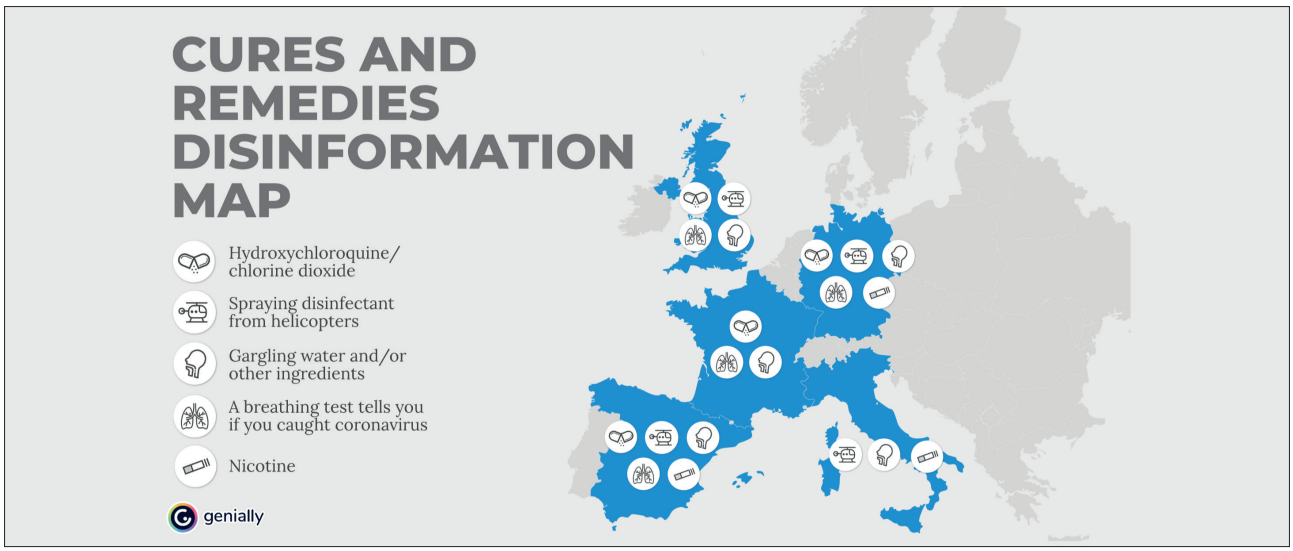

Figure 7. Map of misinformation about cures and remedies.
https://covidinfodemiceurope.com/?lang=en

2. Target

The objective of this work is to analyze and make graphically visible the thematic and geographic distribution, the typology of media and digital formats of the fake news that circulated about the coronavirus pandemic in Iberoamerica, using statistical techniques and social network analysis (SNA).

3. Methodology and data source

Social network analysis (SNA) (**Avila-Toscano**, 2018) has been used as a methodology for part of the data visualization. SNA uses networks and graph theory (**Andrienko** *et al.*, 2020; **Otte**; **Rousseau**, 2002).

The software used to create these visualizations has been *Gephi* (**Bastian**; **Heymann**; **Jacomy**, 2009): *https://gephi.org*

Gephi is a program for visualizing, exploring, and understanding all types of graphs and networks (**Cherven**, 2015). It is free, open source and has ARS as the basis of its operation. The spatialization algorithms used have been *Atlas Force 2* and *Atlas 2-3D*. It has been combined with a viewer that allows exporting to the web the graphs made with *Gephi*, called *gexf.js* (**Velt**, 2011) and which is available on *Github*:
https://github.com/raphv/gexf-js

This viewer enables interactivity for multiple users and supports the inclusion of several plots.

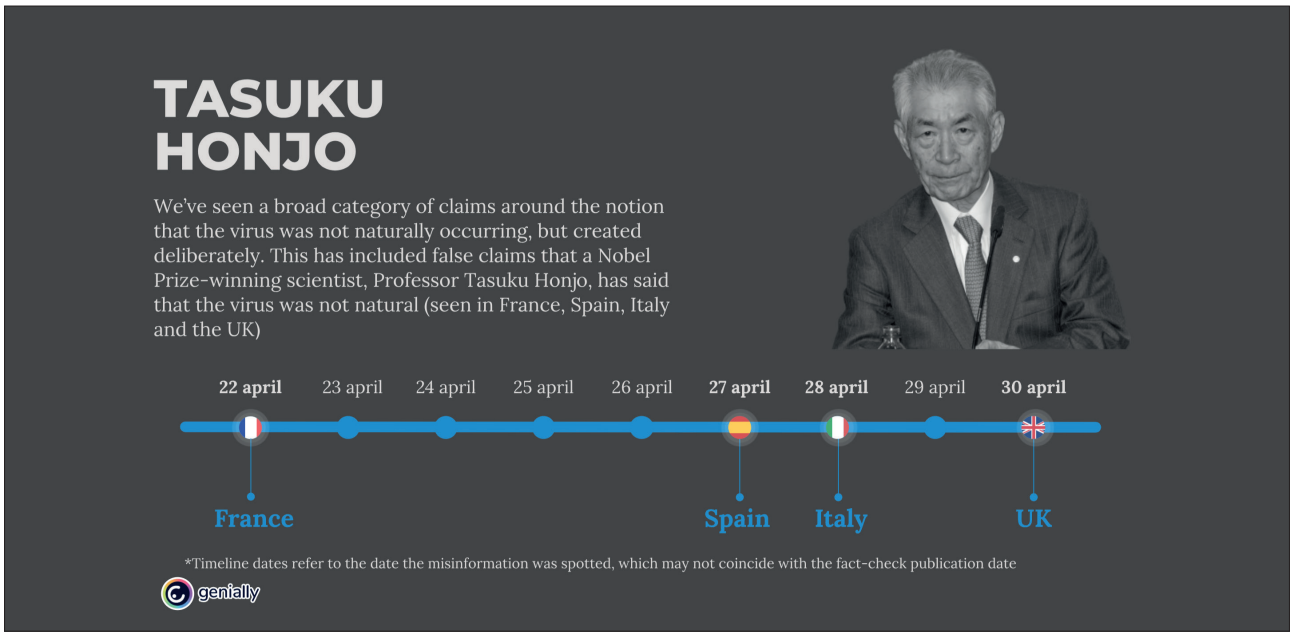

Figure 8. False claims referring to alleged statements by Nobel Prize winner Tasuku Honjo.
https://covidinfodemiceurope.com/?lang=en

SCImago Graphica (**Hassan-Montero**; **De-Moya-Anegón**; **Guerrero-Bote**, 2022) , and *Excel* (dynamic graphics) have also been used for other statistical analyses.
https://www.graphica.app

The data used comes from the collection conducted by the Spanish, Portuguese, and Latin American verification agencies (*Latam Chequea Coronavirus* network) belonging to the *International #CoronaVirusFacts/ Network Alliance* (*IFCN*) of the *Poynter Institute* mentioned above.

Unlike the general data, this table can be downloaded in .csv format (comma separated values) for free use, with acknowledgement of authorship. It is the one that has been used in this work as the basis for data analysis, graphs, and visualizations (Figure 3).

Although it is called a database, it is a single table with structured data: the rows contain the different records, and the columns contain the different data (a database interrelates two or more tables). As it is in .csv format, it can be processed by different spreadsheet programs (*Excel* from the *Office* suite, *LibreOffice Calc* from the *LibreOffice* suite...) as well as visualization programs, as all of them take the data in this format for further processing.

The data collected from each contrasted information (registry) are described in Table 1.

Table 1. Data collected in the table of verified news data

Country	Corresponds to the country where the information is detected and where it is checked by a verifying organization.
Title	A short descriptive sentence of the information.
Rating	A word (or words) indicating the degree of truthfulness of the information.
Description	Text summarizing the information content.
Date of check	Date on which the information is analyzed by the verifying entity.
Organization	Verifying entity.
Link to the checkup	Link to the result of the information analysis.
Type of information	Describes the subject matter of the information using one or more descriptors from a controlled vocabulary.
Misinformation format	Whether it has been disseminated as text, image, video, audio or other, or any combination thereof.
Type of note	Describes the type of information generated by the verifying entity.
Link to disinformation	Link to the information being analyzed.
Date of detection misinformation	Date on which the information to be analyzed is detected.
Origin	The medium in which the information has been detected to be disseminated, whether traditional media or social networks, and which ones are being used, is collected.
Person	Collect the person or media source of the information, if known.
Updates	Date(s) on which the verifier's analysis of the information has been updated.
Circulated in other countries	The countries where the analyzed information has also been detected are listed below.

Since 2022, the table has stabilised at a number of records slightly above 5000, obtained since January 2020. In addition to the standardisation of words (with and without accents, typographical errors, etc.), the table required some modifications to the data, which are detailed below.

Scoring: Qualification does not follow a controlled vocabulary shared by the verifiers. This leads to overlapping in some terms with similar or overlapping meanings. Thus, they have been assimilated to a single concept, the one closest to the term chosen to represent it (Table 2).

Table 2. Qualifying descriptors of the result of the study of the veracity of the information

False	Bulo, Fake, False, Unsustainable, Manipulated, Liar, Lie
True	True, True but..., Not fake....
Questionable	hasty, questionable, misrepresented, debatable, doubtful,misleading, exaggerated, out of context, inaccurate, half true, partially untrue, taken out of context
Satire	Satire
Not verifiable	Undecidable, No certainty, No evidence, Not verifiable, No data

There is also the option 'Multiple verification', which indicates that different statements in the information had to be verified. Based on the information provided by the verifier in the dataset, a consensus has been reached to assign it to

one of the grouped classification categories in the table above. Similarly, the blank cells have been filled in with the most approximate assessment based on the description provided by the verifier.

Type of information: This field collects the subject matter that the (alleged) news item is about. They also use a small controlled vocabulary that, in this case, does not present ambiguities: Authorities, Virus characteristics, Contagions, Coronavirus, Cures, Measures, Origin of the virus, Others, Prediction, Prevention, Spread, Tests, Symptoms, Situation of a country, Conspiracy theories, Antigen testing, Vaccines, COVID-19 variants.

Disinformation format: Whether text, image, video, audio, or any combination of these is used. No problems, except for some typographical errors.

Origin of the information: This refers to the digital medium through which it was detected that it was beginning to be disseminated. Although they use a vocabulary that is not excessively broad, it is not controlled either. It suffers from several problems: it incorporates specific concepts of some general ones that it also includes, for example: social networks (generic) and *Facebook*, *Instagram*, etc. (specific). This is due to the impossibility in some cases of pinpointing the exact origin. They also use different words to refer to a single concept (Website, Web page, Government website).

After cleaning up these problems the resulting vocabulary includes the following terms: Statement, Email, *Facebook*, *Instagram*, Media, Other, Social Networks, SMS, *Telegram*, Television, *TikTok*, *Twitter*, Web, *WhatsApp*, *YouTube*, *Zoom*.

The term Statement disappeared with the elimination of a note type category explained below.

Type of note: This field also follows a controlled vocabulary with only five categories: Media Check, Public Figure Check, Viral Disinformation, Explainer and Other, with more than one term being possible to assign (not frequent). The "Explainer" category refers to

> "more general articles that are not likely to be verified or disproven (e.g., explanatory articles about the science behind the virus or about the different confinement rules in each country)":
> *https://covidinfodemiceurope.com*

Since our focus is on misinformation, whether intentional or misinterpreted, these explanatory articles have been dismissed as an additional informational product of the verifying entity and not properly a verification of information. This leaves the total number of records analyzed at 3693.

4. Results

The web address where the interactive visualizations made with *Gephi* and *Gexf.js* can be consulted is:
http://metroteach.com/covid/index.html

We will now analyze the results obtained for each of the aspects studied.

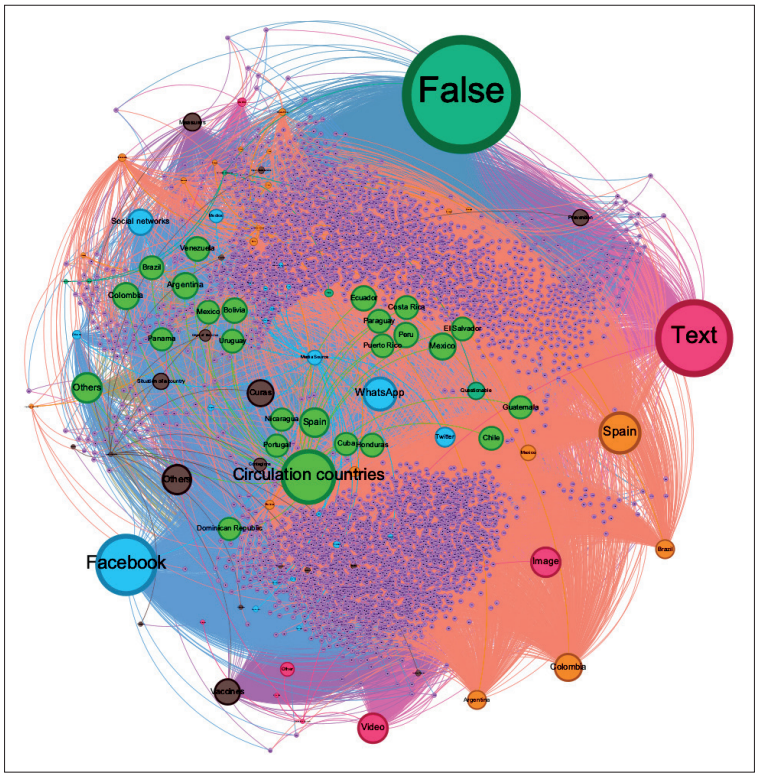

Figure 9. Total data set of verified news items.
Source: *http://metroteach.com/covid/index*

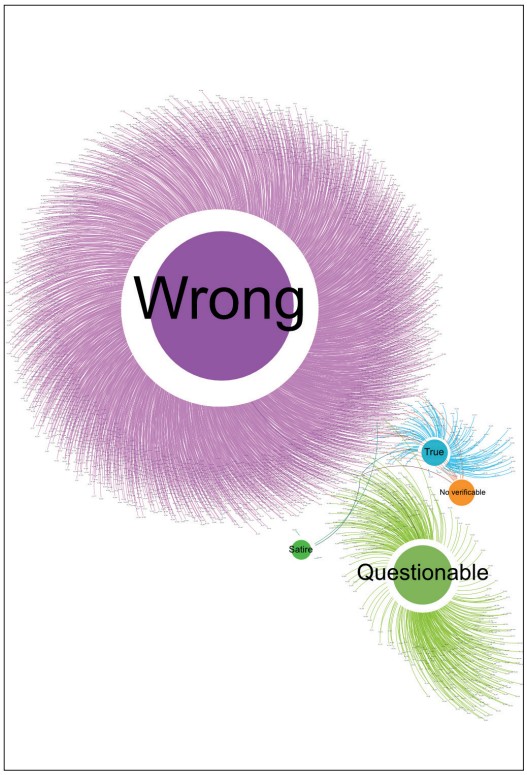

Figure 10. Final rating of the news after verification by the agencies (number of nodes: 3699, number of links: 3698).

Figure 9 shows the total set of verified news items by category with all the analyzed data and their respective nodes. It includes a total of 4690 nodes and 10040 links since the data for some criteria analyzed include more than one value. It represents the full set of unfiltered relationships.

4.1. Classification of verified news items

Figure 10 shows the result of the rating data category, which records the result of the analysis of the verification performed. As can be seen, the number of information determined as false is extremely high. The result is not surprising given that it has an initial bias: the agencies investigate and try to dismantle precisely those pieces of information that are not true. They also investigate those that citizens send them for verification, which they encourage. In both cases they are driven by suspicion of falsity. Hardly anyone is interested in verifying information if they believe it to be true.

Since the expected result of the verification is that it is false information, the focus of the analysis is on the rest, especially on those qualified as Questionable and True. It is noteworthy that in both sets, especially in true, one of the most prominent groups focuses about a country, in addition to cures and vaccines which are also important in the false ones.

The distribution of the rating of verified news by country also highlights that in some countries the percentage of questionable and true is high compared to others. Those countries with a small number of verified news items, such as the Dominican Republic, Cuba, Nicaragua, Paraguay, should be discarded.

4.2. Origin of verified news

Figure 13 shows the results of the source data category, which shows the channels through which the information was disseminated. *Facebook* is clearly the most used medium, followed by *WhatsApp*. It was already commented in

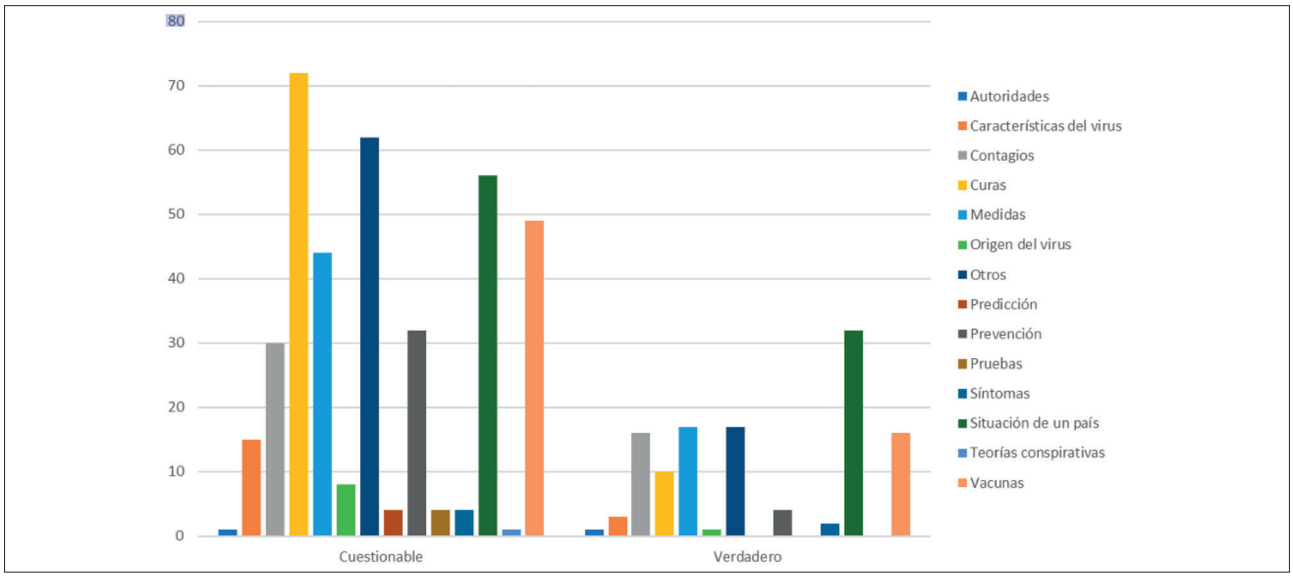

Figure 11. Thematic distribution of verified news items rated as questionable and true.

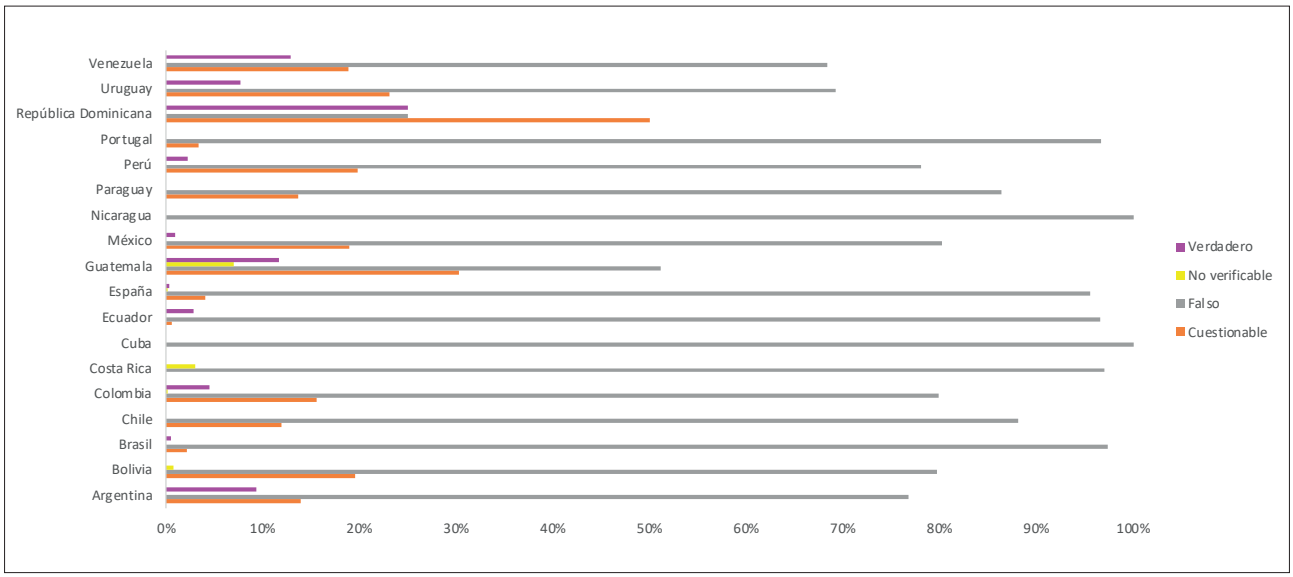

Figure 12. Percentage of the different ratings after verification of the information in relation to those conducted in each of the participating countries.

the introduction the problem that this social network has regarding the dissemination of fake news, a problem related to the profitability of the same. It also invites a reflection: *Facebook* is a social network used mostly by older people than the rest and *WhatsApp*. Regardless of other factors that may influence virality, the possibility of fitting with previous beliefs or prejudices in older people favors their dispersion without being questioned.

4.3. Geographic distribution by country of verified news items

Figure 14 shows the result of the geographic distribution of the verified news. It includes data from the Country and Circulated in other countries fields. It should be borne in mind that not all countries in the area have a verifying entity, but it gives us an idea of the impact of this problem. Although up to 62 countries are listed where some information was circulated, the great interconnection between the countries on both sides of the Atlantic, due to their common language

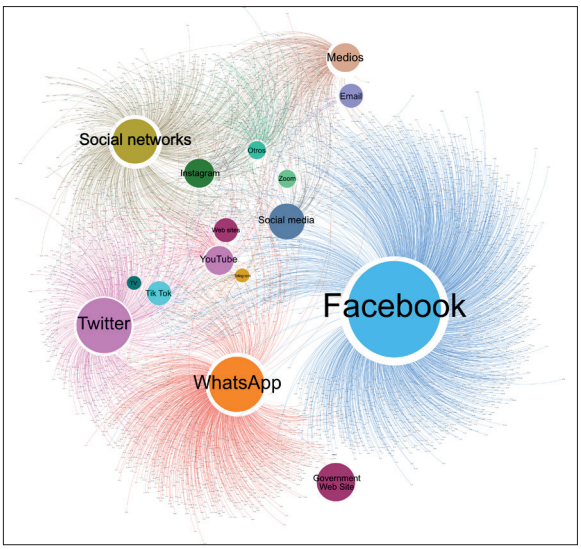

Figure 13. Initial distribution channels of the verified information (number of nodes: 4243, number of links: 4224)

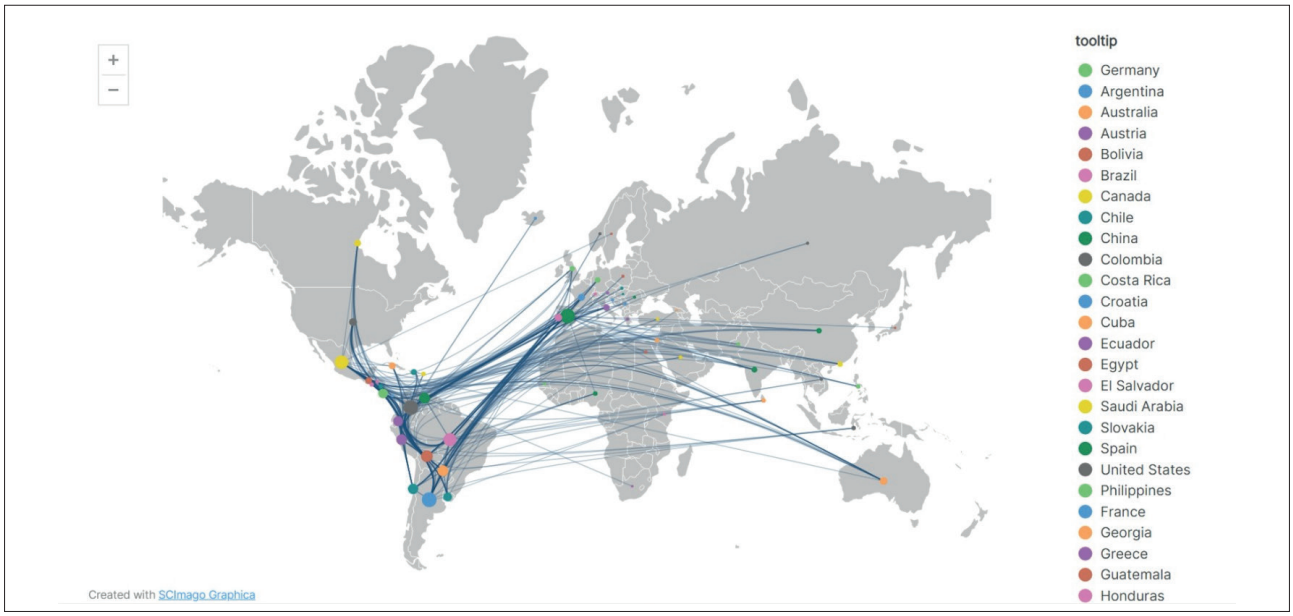

Figure 14. Geographical distribution of verified news items (number of nodes: 62, number of links: 1643).

and culture, is evident. And, of course, between Latin American countries. The rest of the countries involved reflect the main destinations of emigration for work or studies.

Since we do not have data from all countries, nor other data that could provide more information, it is not possible to know whether, for example, the degree of digitalization of citizens has a positive or negative impact on their dispersion.

4.4. Type of information in verified news items

Figure 14 shows the subject matter of the news items checked. As it is a disease, health aspects were the subject of most of them, but the measures taken by governments and the situation of the country, which have political consequences, also stand out. The number of them devoted to vaccines is relevant, in line with what was denounced by the experts. A remarkably high amount to counteract, precisely, one of the relevant scientific milestones derived from the joint struggle of science against this global pandemic obtaining several safe vaccines in a brief period.

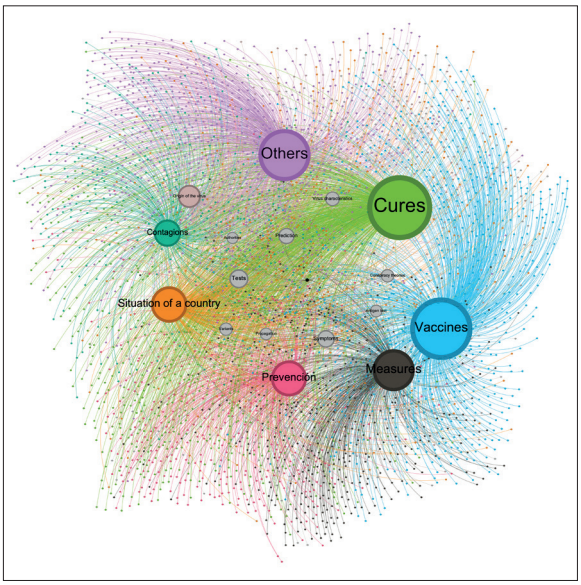

Figure 15. Distribution of the subject matter of the verified news (number of nodes: 3890, number of links: 3889).

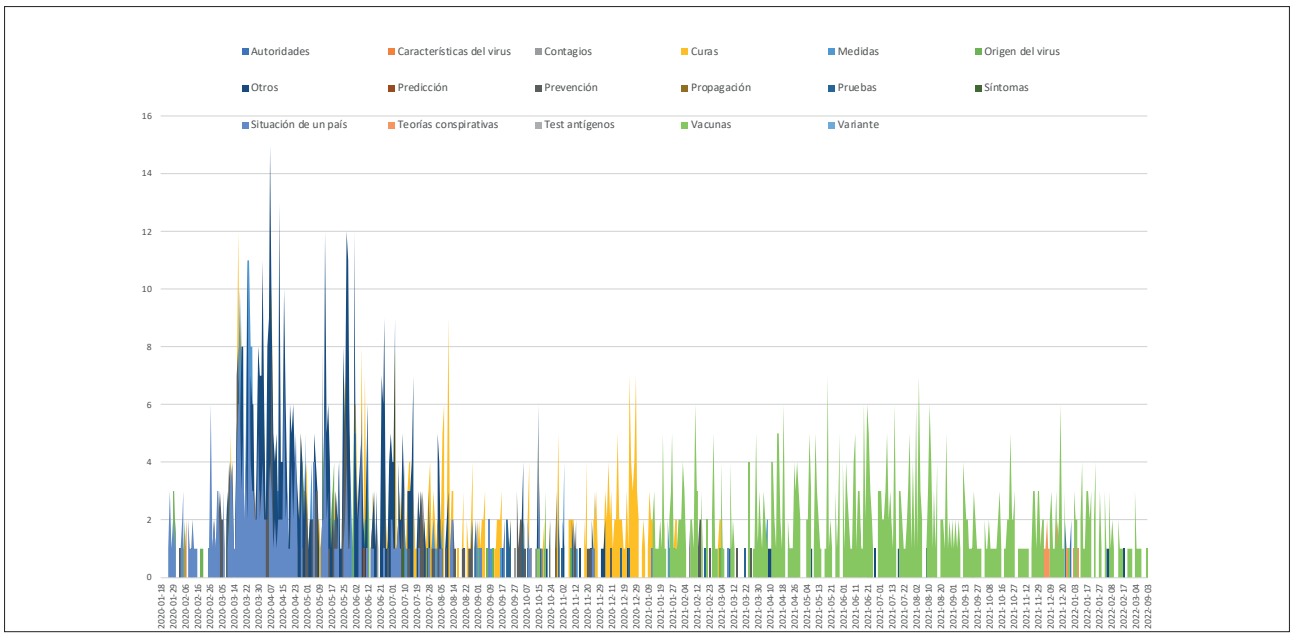

Figure 16. Evolution of verified news subject matter over time.

An interesting aspect is the evolution over time of the thematic content of the verified news. It adapts to the interest of the public, which reinforces the idea that part of the interest in the generation of fake news has an economic basis and manipulation of public opinion. Figure 16 shows the change in the colors (different subjects) in the three years in which the data is extended.

4.5. Format in which verified news is distributed

Figure 17 shows the distribution of formats in which verified information is transmitted. Text is the star, followed by video and image. This is because in many cases images and videos are accompanied by explanatory text to reinforce the idea.

5. Conclusions

The amount of false information that circulated on social networks in relation to the COVID-19 pandemic has been studied in numerous publications during and after the pandemic. This type of information has occurred at other similar moments in history, but today technology has facilitated it and allowed us to study the phenomenon. Fear of the unknown is a good breeding ground.

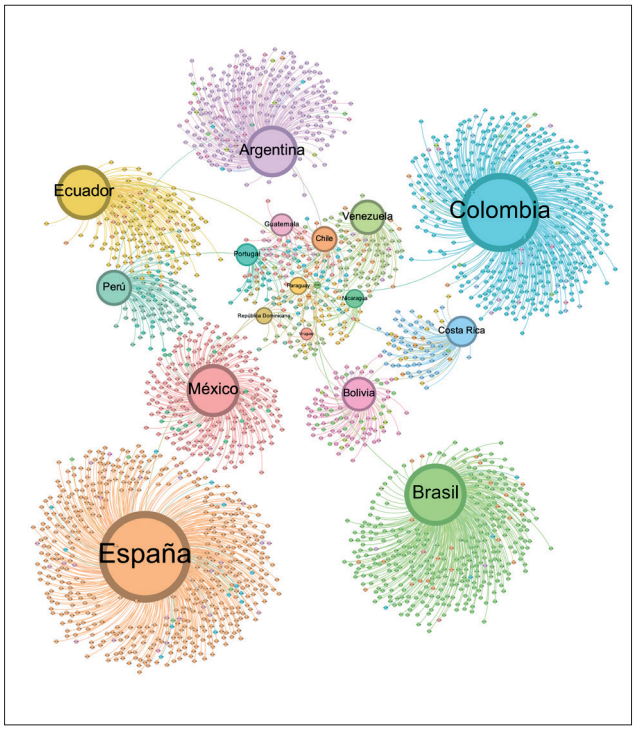

Figure 17. Distribution of news by countries.

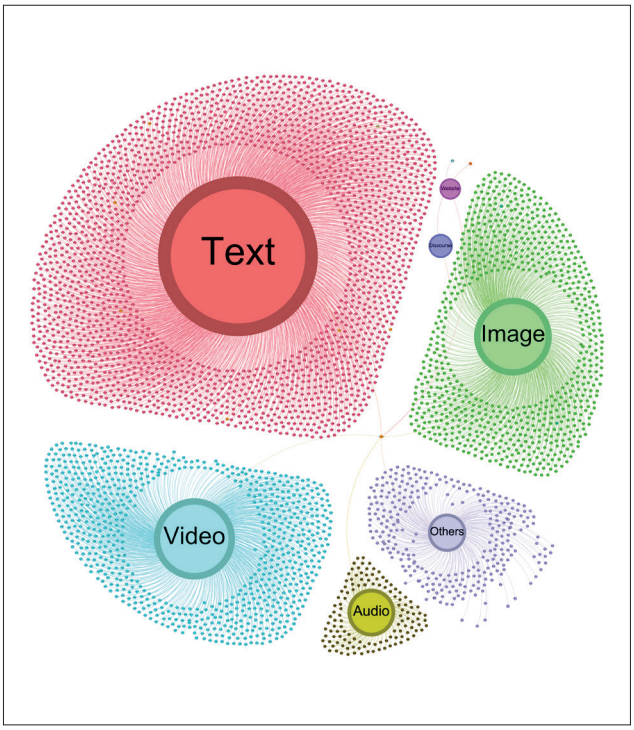

Figure 18. Evolution of verified news subject matter over time.

Although the data is initially skewed and most of the information verified is classified as false, a certain distrust is observed in news related to local situations. The results obtained help to understand the dynamics of fake news in a culturally related area through language, history and current relations, reflecting this connection in terms of geographical dispersion. The origin of this information suggests that the social network is the most common and that text is the format of choice, alone or in combination with images and videos.

The evolution over time of the theme they cover is in line with the change in interest that is also taking place, a strategy that is logically aimed at achieving their dissemination.

In order to achieve better results, it is advisable for organisations to work with uniform criteria from the moment they start collecting information, especially if they do so from different data entry points. The creation of controlled vocabularies for mandatory use improves overall consistency. The use of the 'other' category should also be minimised. In our case, this category represents too large a number in the information type data.

6. Notes

1. It was word of the year in 2016 for the *Oxford Dictionary.*
https://languages.oup.com/word-of-the-year/2016

2. See:
https://elordenmundial.com/mapas-y-graficos/grandes-epidemias-de-la-historia
https://www.library-archives.cumc.columbia.edu/blog/2020-03/pandemics-history-short-bibliography
https://bcmj.org/blog/history-pandemics

3. See, for example,
https://www.elespanol.com/cultura/historia/20200327/todas-fake-historia-pandemias-peste-negra-coronavirus/477452796_0.html
https://theconversation.com/bleach-bonfires-and-bad-breath-the-long-history-of-dodgy-plague-remedies-137658

4. *AFP Factual*, *Salud con Lupa*; *Aos Fatos*, *Estadao Verifica* and *Lupa*, from Brazil; *Bolivia Verifica*; *Mala Espina Check*, from Chile; *La Silla Vacía* and *ColombiaCheck*, from Colombia; *#NoComaCuento* (*La Nación*) and *La Voz de Guanacaste*, from Costa Rica; *Periodismo de Barrio* and *El Toque*, from Cuba; *Ecuador Chequea* and *GK*, from Ecuador; *EFE Verifica*, *Maldita.es* and *Newtral*, from Spain; *Agencia Ocote*, from Guatemala; *Animal Político*, *Spondeo Media* and *Verificado*, from Mexico; *Despacho 505* and *La Lupa*, from Nicaragua; *El Surtidor*, from Paraguay; *Convoca*, *OjoPúblico* and *Verificador* (*La República*), from Peru; *Observador* and *Polígrafo*, from Portugal; *PoletikaRD*, from Dominican Republic; *UyCheck*, from Uruguay; and *Cotejo.info*, *Efecto Cocuyo* and *EsPaja*, from Venezuela.

5. *Chequeado* is a verification project of *Fundación La Voz Pública* de Argentina:

> "We are a non-partisan, non-profit digital media dedicated to the verification of public discourse, the fight against disinformation, the promotion of access to information and the opening of data" (2022).
> *https://chequeado.com/conocenos*

6. *Agence France-Presse* (*AFP*) in France, *Correctiv* in Germany, *Pagella Politica/Facta* in Italy, *Maldita.es* in Spain, and *Full Fact* in the United Kingdom.

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