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CONTENT ANALYSIS OF THE SPANISH PRESS ABOUT THE USE OF THE RESOURCE OF INFOGRAPHICS TO REPORT INFORMATION REGARDING THE GLOBAL HEALTH CRISIS ORIGINATED BY COVID-19

Análisis de contenido de la prensa diaria española sobre el uso de la infografía para informar de la crisis sanitaria de la COVID-19

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Abstract

This paper examines a series of infographics designed to share information regarding the global health crisis originated by COVID-19 in 2020 that were published in the press during the first months of the pandemic. This research aims to explore how infographics are used, as well as the most recurrent elements and techniques used in information related to COVID-19. Information produced by the media to cover different topics on the pandemic presents a challenge for journalism due to what has been categorized as complex information. Drawing on the hypothesis that infographics may be the most suitable journalistic genre to render complex information, we developed a research based on content analysis so as to determine the usage that four Spanish newspapers (*El País*, *El Mundo*, *La Vanguardia* and *ABC*) make of infographics elements. During this period, we observe a significant increase in the number of infographics found in the press to report the pandemic. In addition, data used at a time of social alarm must be obtained from governmental information sources. Regarding the most recurrent techniques, we detect simple, locational graphics and color codes that ensure a quick understanding of information for all citizens. The design of information covering the pandemic is consolidated in all the headers to promote coherence and continuity in graphic styles, as well as effective data management, which also provides readers with prior knowledge of the design and technique. As a general conclusion, we consider that infographics are an essential genre in pandemic information due to the quantitative and locative nature of the information that shapes its graphic expression.

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Keywords: COVID-19; Healthcare Information; Crisis Information; Infographics; Data visualization; Data journalism; Maps; Graphics; Information sources; Information display.

Resumen

Este trabajo analiza las infografías publicadas en prensa durante los primeros meses de la pandemia para informar de la crisis sanitaria mundial que en 2020 provoca la covid-19 con el objetivo de conocer el uso que se hace de este género periodístico así como las técnicas y elementos que tienen mayor presencia y que caracterizan la información relativa al coronavirus. Partimos de la hipótesis de que el género periodístico más adecuado para transmitir esta información compleja a una sociedad heterogénea es la infografía. Se ha realizado una investigación mediante la técnica de análisis de contenido para conocer el uso que la prensa española, concretamente *El País*, *El Mundo*, *La Vanguardia* y *ABC*, hace de los elementos infográficos en esta pandemia. Durante este periodo se evidencia el significativo incremento del número de infográficos en prensa utilizados para informar de la covid-19 y que los datos utilizados en un momento de alarma social requieren las fuentes de información gubernamentales. Con respecto a las técnicas más recurrentes son gráficas simples, ubicativas y códigos de color que garantizan una rápida comprensión para el conjunto de la población. Se consolida el diseño de la información de la pandemia en todas las cabeceras para fomentar la coherencia y continuidad en los estilos gráficos así como una eficaz gestión de los datos, que además permite el conocimiento previo del diseño y la técnica a los lectores.

Palabras clave: Covid-19; Información sanitaria; Información de crisis; Infografía; Visualización de datos; Periodismo de datos; Mapas; Gráficos; Fuentes de información; Visualización de información.

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1. INTRODUCTION

In the current coronavirus crisis, and its enormous global consequences, informing society becomes a major necessity. The media are responsible for transmitting to the population both the development of the pandemic and all forms of action to be taken in the face of the emergency health situation.

In the information society in which the covid-19 health crisis has unfolded, the large amounts of data generated to monitor and control the pandemic have become the

protagonists of the information that the media convey to the population as a whole. The data on locations, the monitoring of the number of infections and deaths, as well as the macro data reporting on the socioeconomic impact generated by the pandemic, have eclipsed the rest of the thematic agenda. Data journalism is the specialization in charge of collecting, analyzing and interpreting data, using data visualization techniques. For its dissemination and publication in the written media, infographics are the most suitable graphic element for transmitting this information, making it quickly and visually understandable to the entire population. This is what has led us to analyze the use that the media make of infographics, already considered by almost all experts as a journalistic genre, to inform during this health crisis.

1.1. Working hypothesis

We start from the main hypothesis that the journalistic genre of infographics is the most appropriate to convey the complex information produced by the global coronavirus crisis.

Secondly, the deepening of the information society with data science has taken center stage and, by extension, data journalism. During the coronavirus crisis, a systematic universal collection of health, economic, political and social data was carried out, data which, in addition to being the subject of analysis and research in their fields, are of global interest.

Finally, the media are responsible for disseminating these data to the whole of society, which is eager for information due to the health alert. Infographics have become the ideal informative element to represent these data due to their rapid comprehension in the dissemination of information to the population as a whole.

1.2. Research objectives

The general objective of this research is to carry out an analysis of the use that newspapers make of infographics to report complex realities about the covid-19 pandemic. For this purpose, we have studied the data, the infographic techniques and the characteristics of their publication, to see their influence on the formal development of each of the newspapers in the study and the importance acquired by infographics in the Spanish press during this period of health crisis.

As secondary objectives we establish:

- To know to what extent the pandemic resorts to the use of infographics as well as their extension and application as a journalistic genre that denotes their quality.
- To delimit the techniques and infographic elements that have the greatest presence and their relationship with the nature of the data that characterize the information related to the coronavirus.
- With respect to infographic techniques, the aim is to know the current status in the press to see how the pandemic information has affected its use.

- To determine if there is a growing interest and recognition of infographics as an informative technique in this health crisis in the media.

2. STATE OF THE ISSUE AND THEORETICAL FRAMEWORK

We define infographics as the journalistic genre that combines text with other languages such as typography, iconography, color or the composition of elements to transmit information in a way that is in keeping with the nature of the data that comprise it, with the aim of effective, rapid and visual dissemination. We assume that infographics is a journalistic genre because it has the specific techniques established for the elaboration of information, although different languages are used for its diffusion in the media, since, as journalistic information, it will ensure "veracity, accuracy, expository clarity and speed of execution" (Alonso, 1998, p. 1). The languages involved make it possible for the information to appear clearly before the reader's eyes, without forgetting that "graphic construction is a discipline that must take into account, in addition to - technique and intuition, the means and rules of graphic semiology" (Cortizo Álvarez, 2007, p. 279).

Abreu Sojo gathers all the arguments put forward by different authors to consider infographics a journalistic genre and establishes that infographics "have a clearly defined structure; they have a purpose; they have formal marks that are repeated in different works; and they make sense by themselves" (2002, p. 85). Each and every one of these reasons is sufficient in itself to consider it a journalistic genre, and so it is treated in this paper.

This acceptance of infographics as a journalistic genre does not remain in the theoretical field but reaches infographists such as Alberto Cairo or Jaume Serra and even the media, such as the newspaper *El Mundo*, which in its style guide states that the development of infographic elements, both at a technical and informative level, has been such that infographics have come to the forefront to become "a separate informative genre, differentiated from written news and illustration, since it is a compendium of traditionally separate techniques -photography, illustration and illustration-, has been such that infographics have come to the forefront to become "a separate informative genre, differentiated from written news and illustration, since it is a compendium of traditionally separate techniques -photo, computer graphics, written data- that inextricably unite to form a differentiated journalistic whole" (Diario *El Mundo*, s.f., p. 13).

Regarding the contributions of infographics, Alberto Cairo (2012) refers to the help they can provide in explaining data, especially numerical data, and what we find most interesting is that in many cases resorting to infographics is the only way for data to be understood, since otherwise they would be invisible to readers. Above all, infographics must be governed by the informative principle and for this, professionals must know their technique and languages and opt for graphic formulas that work for the widest possible audience without falling into artistic demonstrations above the informative criterion.

We consider the term data visualization to be analogous to infographics and will also be used in this paper because we understand that it refers to the same technical processes. While it is true that infographics has certain connotations in its dissemination and is more typical of the journalism environment, and that data visualization is more associated with the scientific analysis of data and especially with digital extensions of infographics such as the dynamic nature and interactivity, both share the essential principles. The relevant issue is to always keep in mind that "one thing is general infographics and another is informative press infographics, which is a product of infjournalism in any of the channels, supports and manufacturing processes" (Valero Sancho, 2000, p. 124).

Informative data are the essence of infographics and therefore the information we are going to obtain depends on their quality. From there, the infographer builds the data visualization based on principles and techniques. Visualization as a tool seeks, first of all, to understand the data obtained and, then, the most effective representation for its dissemination in the media.

If anything has characterized the sources of information during the pandemic, it is the conflicts arising from poor data collection. Different systems, criteria and policies have provided data that did not agree as a whole, both nationally and internationally. The denunciation of this situation among administrations, political groups and citizens highlighted the need for a systematic collection methodology, agreed among all locations and based on the same principles at the national level. The discredit and reliability of the data finds a point of certain consensus when studying the deaths that occurred in 2019 during that period and those of 2020 that evidences the gap in the figures. The terrible difference between the two figures are considered almost direct deaths by covid-19 (Llanera, 2020).

Another characteristic of the pandemic data is that it encompasses all social, economic and geopolitical spheres, and journalists have been confronted with complex information. The pandemic information links through the virus an infinity of themes, characteristics, factors and variables in complex data resulting from the union of all that encompasses, globally, all cultures, economies, politics and societies, making it a complicated information situation.

The purpose of infographic techniques when faced with information composed of different elements, which in turn may constitute a unit or whole among themselves, is to be able to represent it without that tangled or difficult character to transmit it effectively. In other words, we would be creating a complex system, based on very simple principles, which would allow us to understand the information quickly and without having specific qualifications for it. And in that sense infographics "transmit information with the aim of clarifying the complex that can hardly be presented by other means, such as statistical proportions and trends, complex processes or maps" (Cairo, 2012). The way to communicate complex information for the media is to put oneself in the place of the reader of the medium, something that is very difficult when overinformation characterizes complexity. The journalist must have the ability to abstract from everything

secondary to so many factors in the information processes. Then we become aware that "as information becomes more complex, design becomes more important not only as a container of the news, but as informative content by itself" (Subiela Hernández, 2017, p. 1022).

The development of Big Data or big data understood as the "set of technologies, algorithms and systems used to collect data on a scale and variety not reached until now and the extraction of valuable information through advanced analytical systems supported by parallel computing" (Aced, Heras and Sáiz, 2017, p. 3) modifies the scope of information. Big Data is characterized at the beginning by the so-called 3 Vs: volume, variety and velocity (Camargo-Vega *et al.*, 2015), to which others are being added "to define Big Data more precisely, for example, Veracity (the quality of the data captured is key), Variability (the meaning of the data changes frequently and inconsistencies can occur that have to be managed) and Value (the revenue or benefits of Big Data)" (Aced, Heras and Sáiz, 2017, p. 3).

These massive data require a new journalistic specialization, data journalism. The processing and dissemination of these data require "the use of technological tools and resources available on the network, coding languages and algorithm programming, massive data processing techniques (big data) and advanced knowledge of computational science (computer science), at the same time more accessible and more affordable" (Flores Vivar and Lopez Lopez, 2020, p.81). Data visualization is a fundamental part of Big Data analysis and, as a means of representation for data dissemination, it is considered the product par excellence of data journalism (Ferrerías Rodríguez, 2016).

In the last thirty years, infographics have proliferated thanks to the digitalization of processes. The truth is that from the point of view of journalistic functions they are not so new. Since ancient times there have been complex graphic forms to represent information, but we have to wait until 1638 to find the "Prodigious volcano", the first infographic published in the press (Tascón, 2011). Maps are the first infographics included in the daily press according to Gonzalo Peltzer and he explains how the map "expresses some or all the components of an information according to a geographical order" (1991, p. 140) although the most elementary maps respond only to the function of location.

Graphs and diagrams are not a novelty in the essence of the infographic technique either, established by William Playfair in *The Commercial and Political Atlas* in 1786, where he lays the foundations of the most used graphs in the press and in his words "serves to simplify the complex, allows the brain a greater retention and is a visual aid to busy men. Finally, graphs enable us to see apparently non-existent relationships between variables, which are often hidden among the multitude of facts and figures, otherwise difficult to compare" (Playfair, n.d.) where we see that the approach is absolutely current.

What is new is the use we make of infographics every time we are confronted with a non-daily informative situation, which means asking ourselves what is the appropriate application in the situation at hand. At the moment, digitization accelerates and expands the processes of data visualization, with the ability to associate information sources from Big Data to graphics. There is a wide range of programs available that generate automated and online maps and really complex graphs, both technically and informatively, in a matter of minutes. This is new, and it is all that has been used to deal with the complex information about the pandemic.

If we move away from our object of study to look at the design of journalistic information as a whole, in which infographics is a specific field, we can see how infographics generate synergies with all the information on the page and vice versa, although each has its own visual language. Analyzing the use of infographic techniques requires this overall view with all the hierarchies in the pages, sections and publication (Salvat, 2003). Although style manuals sometimes separate what corresponds to the layout and design of their pages from what refers to infographics, both areas are defined in terms of the other. In fact, some of the layout functions require iconographic elements such as pictograms or graphics, which do not reach the level of infographics as a journalistic genre, but which assist and are fundamental to organize, hierarchize and present information, the three functions that define journalistic design. The trend of their use is increasing due to the need to structure pages and sections according to the new digital media that encourage the breakdown of information into smaller units, allowing agility in reading, content selection and facilitating the different reading levels.

Infographics in the media are usually associated with the most relevant news and usually appear the days following the development of major events. "Every time a war conflict or other exceptional event jumps into the news: graphics grow in size and prominence" (Hernández Lorca, 2010, p.83) for different reasons, whether practical or informative.

During a crisis or deep change with important consequences, information becomes the protagonist of social life and then press infographics are used to inform about events of great urgency such as wars, attacks, accidents or catastrophes (Valero Sancho, 2008). Major catastrophes and global crises generate information of universal interest. The year 1991 is the year of reference for Spanish infographics. The First Gulf War meant an enormous coverage effort for the Spanish newspapers of the time, not only for the international section, but also for the infographics sections (Serra, 1998). The newspapers *El Sol*, *El Mundo*, *La Vanguardia*, *El Periódico*, *ABC* and *El País*, among others, reported daily through infographics the great combats of the previous day (Serra, 1998). Infographics played a fundamental role, especially due to the lack of access to photographs (Hernández-Lorca, 2010). Something similar happened with the coverage of the Falklands War (1982), the Iran-Iraq War or the Balkan War (1991-2001). The use of infographics in this type of events allows "the vision of multiple places and diverse facets as well as successive times to show them throughout the days, going from more to less" (Valero Sancho, 2008, p.637).

The global coronavirus epidemic is a new reality that everyone has had to face. In this crisis "we can appreciate both the surprise factor and the destabilization, stress and reduction of time that conditions decision making, the emotion of the affected publics, the media pressure, the challenge for the image of the authorities and the danger for the position of power of the rulers" (Crespo and Garrido, 2020, p.13). The media have been conditioned because the alarm and concern about the spread of the virus has surpassed national barriers even before internal measures were taken in the countries.

Covid-19 is the name WHO has given to "the infectious disease caused by the coronavirus" discovered in Wuhan, China. This virus receives the scientific name SARS-CoV-2 coronavirus, and causes its first fatality on January 9, 2020, in China. It soon spreads to Thailand and Japan. On January 21, the United States confirmed the first infection in the country, the first on the American continent. One day later, the city of Wuhan closes its airports and train stations and China confirms 547 infected and 17 deaths in the country (UNHCR, 2020). On January 24, the first cases in Europe are detected in France. On January 30, WHO presents a situation report stating that there are a total of 7,818 confirmed cases worldwide and declares an international public health emergency. On March 11, the situation is considered a pandemic, understood as the "global spread of a new disease" (WHO, 2020).

The first confirmed case of covid-19 in Spain occurred on January 31, 2020, a German tourist resident on the island of La Gomera (UNHCR, 2020), a relevant date in our chronology to initiate the study. On March 4, the first fatality was confirmed in Spain and the first social distancing measures began to be considered (*Marca*, 2020), although mass events continued to be held, which became the main sources of the virus. When, on March 11, the WHO declared a worldwide pandemic, Spain recorded figures of 2,218 people infected and 54 deaths (*Marca*, 2020). The following day the Government decided to close all educational centers in Spain, and a day later decreed a state of alarm. At that time, the number of cases reached 5,200 and the number of deaths exceeded 133.

On March 24, Spain is positioned ahead of China in number of infections and four days later, the Government decides to suspend all non-essential activities. On April 1st the number of infected people in Spain exceeds 100,000 and the number of deaths exceeds 9,000 (UNHCR, 2020), so on April 3rd a new extension of the state of alarm is established and quarantine zones are started to be prepared for asymptomatic infected people.

From April 10 onwards, the number of daily deaths gradually decreased and on April 22, after agreeing to another extension, the Government announced a gradual de-escalation of the restriction measures. On April 28, the measures for the end of the confinement were announced and the following day the plan, established in 4 phases of de-escalation, was presented. The number of deaths recorded so far is 23,882, 210,773 cases of contagion and 102,548 cases of infected persons recovered (*RTVE*, 2020). This is a brief chronology of the health emergency in which our research is framed.

3. METHODOLOGY

The methodology chosen for this research is content analysis, the object of study being the infographics on the global coronavirus crisis published in Spanish general-information newspapers. Content analysis is defined by Juan José Igartua as "any systematic procedure devised to examine the content of archived information" (2006, p.181). This research technique aims to "obtain a summary of the characteristics of a set of messages" (Igartua, 2006, p.184). This research procedure has been selected because of its "suitability as a technique whose use makes it possible to empirically evaluate the characteristics of the informative message and from this to obtain objective and significant data about it" (López del Ramo and Humanes, 2016, p.90). Krippendorff states that one of the characteristics of content analysis is its reliability, because "if other researchers, at different times and perhaps in different circumstances, apply the same technique to the same data, their results should be the same as those originally obtained" (1990, p.29).

The *corpus* or sample of the research are the infographics that the national general information newspapers *El País*, *El Mundo*, *La Vanguardia* and *ABC* publish, in their printed version, on the global coronavirus crisis. According to the results of the First Wave 2020 of the General Media Study (EGM), these newspapers are the ones with the highest number of readers. *El País* is the general daily newspaper with the highest number of readers per day, with 1,044,000 readers, followed by *El Mundo* with 657,000 readers, *La Vanguardia* with 532,000 readers and fourth place *ABC* with 444,000 readers per day.

The analysis period chosen for this investigation covers from January 31, when the first case of coronavirus was detected in Spain, until April 29, 2020, the date on which the Government announces the beginning of the de-escalation to end the quarantine in which the Spaniards have been under since March 14, 2020.

The defined sample resulted in a total of 360 daily publications, 90 for each of the four newspapers selected for the research. The analysis of the newspapers was carried out in its entirety, taking into account all the sections and pages of each one of them. The number of study units obtained, that is, all the infographics published by *El País*, *El Mundo*, *La Vanguardia* and *ABC*, was 1,123 in this period. All infographics were counted, regardless of their subject matter, except for weather maps, which were excluded from the calculation.

To carry out the content analysis, a codebook was developed with 18 abstract variables and their respective values. Understanding variables as "attributes, qualities, observable characteristics" (Ñaupas Paitán *et al.*, 2014, p.186) and abstract variables as those that are not directly observable or quantifiable, and need a precise definition to make their measurement possible. As a unit of study, each of the infographics published in the selected newspapers during January 31 and April 29, 2020 has been defined. All the infographics published have been taken into account to finally establish as the unit of

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analysis those dealing with the subject of the coronavirus pandemic. For this reason, a total of 360 issues have been analyzed.

Table 1. *Abstract variables established for the content analysis.*

	VARIABLES	VALUES
1	Newspaper	1. <i>El País</i> 2. <i>El Mundo</i> 3. <i>La Vanguardia</i> 4. <i>ABC</i>
2	Date	January 31, 2020 to April 29, 2020
3	Coronavirus thematic	1. Yes 2. No
4	Section	1. Home page 2. International 3. Opinion 4. Spain 5. Society 6. Economy 7. Science 8. Technology 9. Culture 10. Sports 11. Local 12. Health 13. Cover Story 14. Special coronavirus 15. Trends 16. Policy 17. Back cover
5	Page on which you are located	1. Home page 2. Page Par 3. Odd Page 4. Double page
6	Position of the infographic on the page (vertical axis)	1. Superior 2. Center 3. Inferior 4. Entire page
7	Position of the infographic on the page (horizontal axis)	1. Right margin 2. Left margin 3. Centered 4. Entire page

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8	Infographic size (in modules where advertising space is purchased)	1. Less than 11 modules 2. Between 11 and 25 modules 3. Between 26 and 40 modules 4. Between 41 and 55 modules 5. 56 modules or more
9	Subject of the infographic	1. Number of infections and/or deaths 2. Preventive measures 3. Covid-19 Symptomatology 4. Health policies 5. Economic policies 6. Economic impact 7. De-escalation 8. Survey
10	Typology of infographics	1. Comparison 2. Documentary 3. Scenic 4. Ubicative 5. Megainfografía Valero, 2008 Valero, 2001
11	Basic textual components of infographics	1. Holder 2. Explanation 3. Body 4. Source 5. Credit Otero <i>et al.</i>, 2012
12	Iconic components of infographics	1. Graphic 2. Map 3. Table 4. Diagram Leturia, 1998
13	Use of color	1. Yes 2. No
14	Intentionality in the use of color	1. Denotative 2. Connotative 3. Schematic
15	Functionality of color in infographic elements	1. Informative 2. Composition 3. Connotative 4. Symbolic Montes and Garcia, 2015
16	Origin of the information (source)	1. Public organization 2. Private company 3. Media 4. Own 5. Expert

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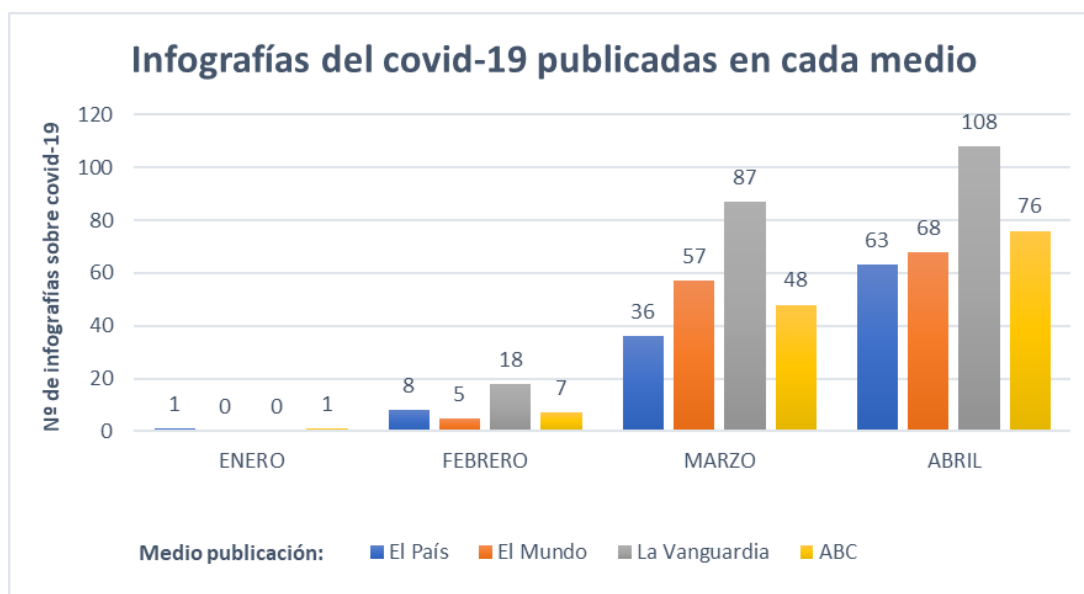
17	Prepared by	1. Own 2. Expert 3. Media 4. Private company 5. Public organization
18	Relationship with the text	1. Independent informative infographics 2. Complementary infographics

Source: Own elaboration.

4. DISCUSSION

The use of infographics increases progressively as the health crisis deepens and it is evident that the pandemic is responsible for this increase in infographics when we analyze the themes. Of the total of 1,123 units counted in the study, the newspaper *La Vanguardia* is the one that publishes the most infographics on any subject with 33.9%, while the newspaper *El País* reaches 18.5%, 20.5% for *El Mundo*, and 26.9% for *ABC*.

But if we look at the infographics whose specific theme is the pandemic and that, therefore, have constituted the units of analysis, a total of 583, the infographics published by *La Vanguardia* amount to 51.9% of the total of those published, being again the newspaper that published more infographics related to covid-19 distributed as follows temporarily in this way:



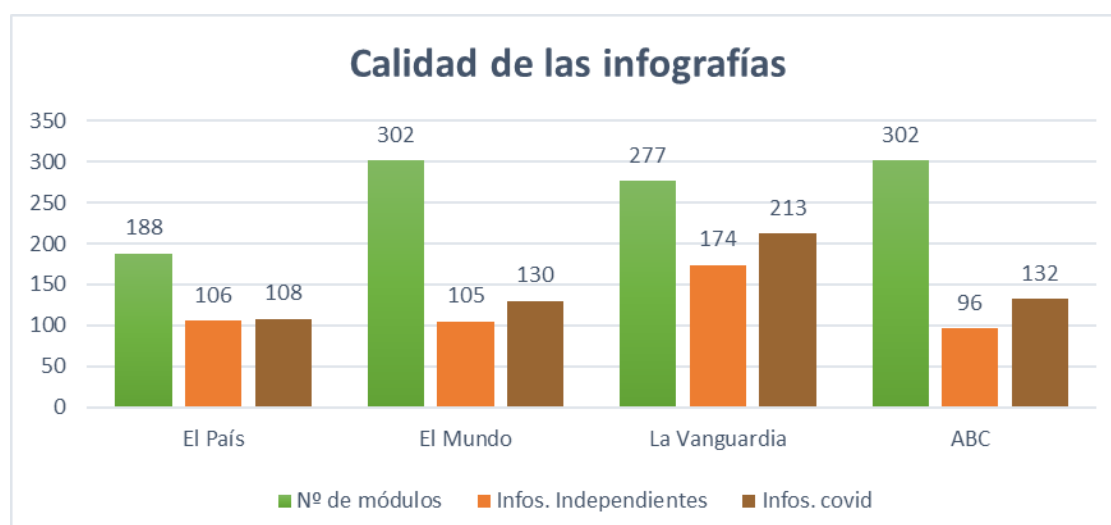
Coronavirus infographics published by month in each newspaper.

Source: Own elaboration.

Therefore, the trend in the publication of specific infographics is increasing as the health crisis worsens and a greater use of infographics is consolidated, with 315

infographics being published in April, which represents 54% of the total number of specific infographics.

To determine the informative use of infographics, we focused on the variables of the physical space they occupy on the page, counted in modules, and the construction of complete and independent infographics typical of the journalistic genre, since both determine the quality of the infographics referring to the pandemic.



Infographics of the coronavirus published, the space they occupy in modules and those that function as independent journalistic genre.

Source: Own elaboration.

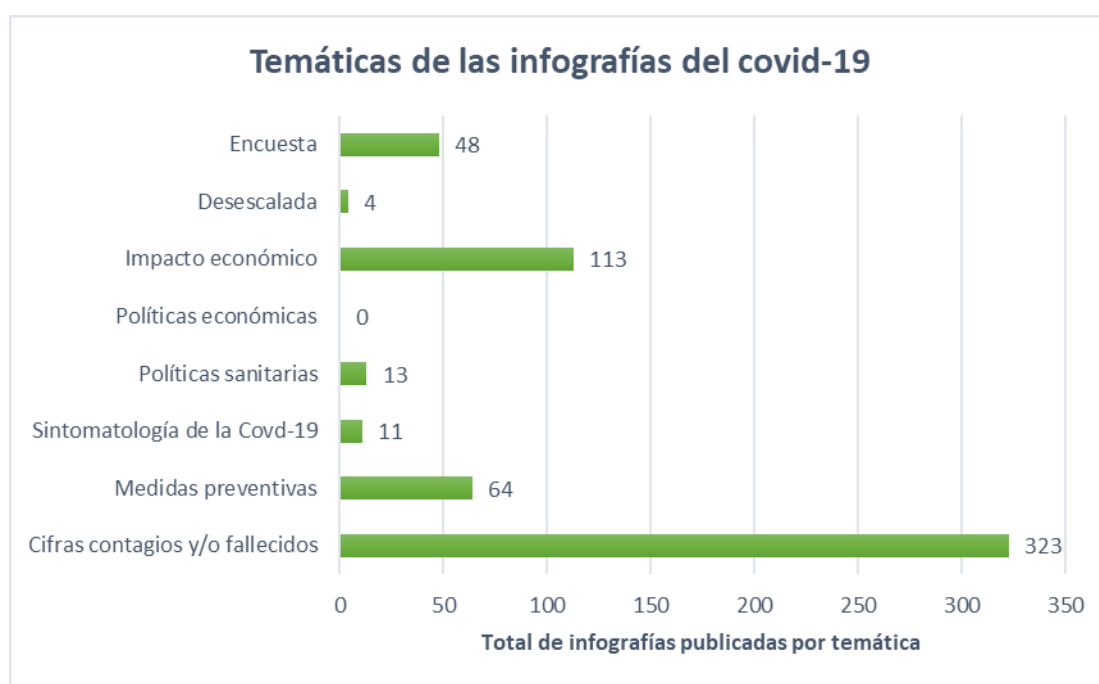
The surprising thing about the graph is that it is not a question of the number of infographics, which is also a question of the amount of infographics, but of the dedication of time and resources to dedicate space and informative eagerness to them on the part of the newspapers. This is evident in the publications of *El País*, which with a smaller number of infographics published, opts for complete infographics that function as an independent journalistic genre in 98.1%, while *La Vanguardia*, with a high number of infographics, in fact resolves in very little space most of the time and devotes less space than *El Mundo* and *ABC*, which have almost half the number of infographics, and devote twice as much space to those published, showing a higher quality.

The enormous social consequences, mainly health-related, of the epidemic determine that most of the infographics, 42.3%, are published in the Society section. On the other hand, contrary to our forecasts, only 8.7% of covid-19 infographics are concentrated in the International section, despite the universal nature of the pandemic, both in terms of the extent and repercussions of each source of infection in other countries. It is interesting to note the presence of infographics in the Politics and Opinion sections, where they are not common, but the openness to this journalistic genre, from which debate, analysis and opinion are based, is very pertinent. This small euphoria in the empire of infographics is overshadowed by the small presence of pandemic infographics on the front page of newspapers, since it represents only 0.8% of the total number of

infographics, with *El País* having three on the front page and the rest of the headers only one.

The aim was to determine the degree of production of the infographics sections and whether they have sufficient resources to publish their own visualizations or whether other agents participate. From the values observed, established in variable 17, it is evident that the vast majority are produced by the infographics departments of each of the newspapers analyzed, except for some collaboration with experts and only one produced by an external private company.

Regarding the specific topics covered by the infographics on the coronavirus, we show the results that correspond to the total number of newspapers due to the consensus among the headers. The number of infections and/or deaths prevails, with an average among all newspapers of 55.4%, being these data collected and published every day by all newspapers understood as evidence of the advance or retreat of the virus.



Pandemic themes of the infographics published in all the headers of the study.

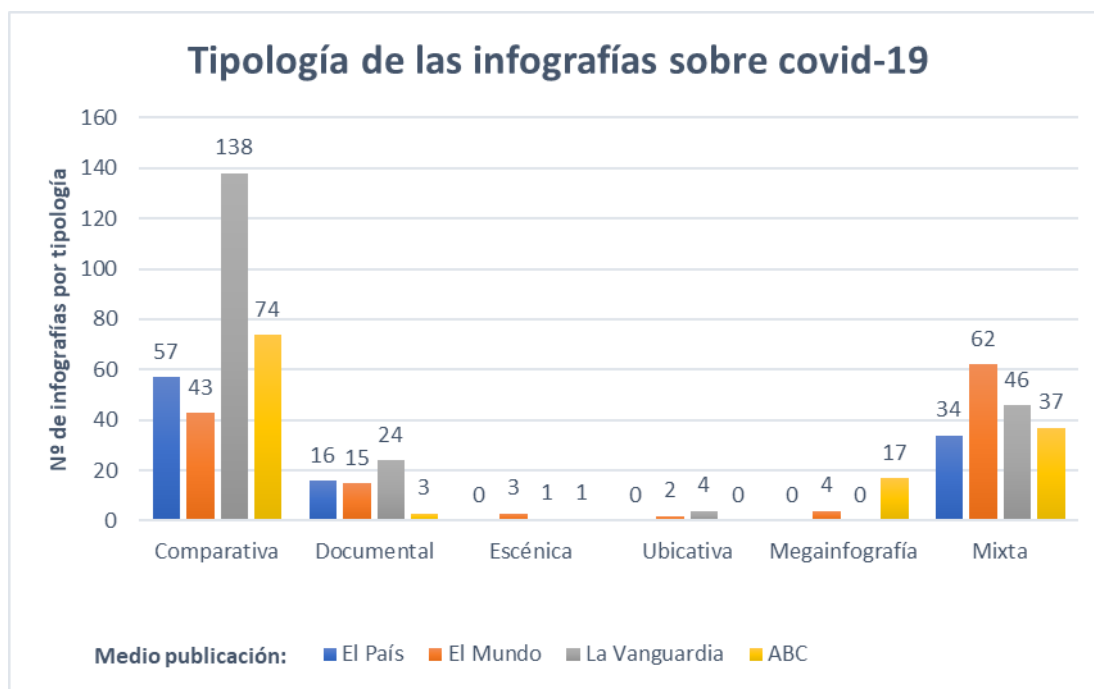
Source: Own elaboration.

We consider that knowing the sources of information used to represent the data is significant in the study, since they determine the reliability of the data and the weight and trust placed in public agencies. The result is that 40.1% of the infographics published by the selected newspapers make exclusive use of data from public bodies for their elaboration, being therefore the most used source. The extent of the problem and the capacity for data collection justify the data, and yet it seems to us to be a low percentage for the responsibilities of national and international official bodies in the

development of the pandemic. The second most frequently used source was that of private companies with 23.4%, but in many cases it was not used as the only source but rather as a complement to public sources. Data from other media have also been consulted to prepare the infographics with an average of 4.2% among all the newspapers and those using their own information barely reached 6.3%, which shows the low capacity of the publications to obtain them, but given the nature of the crisis, it is understandable.

In order to know the infographic techniques used to cover the pandemic topic, we approached the iconic components of infographics from the cataloguing established by Leturia (1998), which differentiates between graphs, maps, tables and diagrams. Thus, 53.3% of the units of analysis were composed exclusively of graphics, 12.1% were infographics combining graphics and maps, and 8.4% were composed only of maps. It is worth noting the number of infographics in both *El Mundo* (4.1%) and *ABC* (5.6%), which are composed of graphs, maps and tables. These results show the concordance of their representation with the information data: firstly, they are comparative quantities (remember that the number of infections/deaths is the most recurrent) and are almost always expressed in column or fever graphs and the importance of the spatial reference of the data throughout the pandemic due to the importance of the location of the information that is specified in the maps. It is evident that this type of graphs are the most used together with maps, not only independently, but in mixed infographics that combine both techniques.

Establishing categories according to the usefulness of infographics in the informative process is fundamental for the study and we base ourselves on those established by Valero Sancho (2008) who differentiates four types of infographics, to which we decided to incorporate megainfographics as another modality to specify within informative infographics and that "are those that cover all the existing information about an event, action or thing, in one or more pages" (Valero Sancho: 2001, p. 83).



Number of infographics published by media according to their function.
Source: Own elaboration.

Regarding the typology of the infographics analyzed, 53.5% presented a comparative typology, 9.9% a documentary typology, 0.8% a scenic typology and 1% an ubicative typology. In addition, 30.7% of the elements that reported through a mixed typology, comparative and ubicative, were analyzed, these two functions being the paradigm of covid-19 information. A total of 23 mega-graphics were found, all of them related to the subject of this research, showing the informative interest. The *ABC* newspaper published the most, a total of 17, followed by *El Mundo* and *El País*. The newspaper *La Vanguardia* was the only one that did not use megainfographies to report.

To address the intentionality in the use of color in infographics, we resort to the traditional categories that differentiate between Denotative, when it is linked to the world of the representation of reality and color thus becomes a realistic or natural attribute of objects or figures; Connotative, if it represents the world of sensations, since connotation is the action of factors that are not descriptive, but psychological, symbolic or aesthetic; or Schematic, if it refers to the codes of functionality, arbitrariness and spontaneity. In this case it is always used as a flat color. Color is the language that is present in each and every one of the infographics in the study, and the predominant intentionality in its use is connotative in 90.7% of the infographics, followed by denotative with 9%, while schematic intentionality is only represented in two of the total units of analysis.

Regarding the function played by color we can speak of Informative category when the color of the images enables a better knowledge of the reality or object of reference or favors the understanding of the message, of Composition when the color affects the

design with some of the six compositional variables, with respect to the one that tries to make the color evoke emotions would be Connotative and in the case of a harmony between the theme and the colors of the page. Finally, in the symbolic function is understood when in the composition appears some chromatic combination that is associated with any symbol: flag, coat of arms, logo, etcetera" (Montes Vozmediano and García Jiménez, 2015, p.123-124). In the study, the informative function dominates with 53.5% of the infographics analyzed followed by the compositional functionality in 41.6%, the connotative in 2.4% of the cases and the symbolic in only 0.3%. In 2% of the infographics analyzed, the informative and compositional functionality of color was combined. This leads us to consider the use of color as effective with data and information design.

Finally, we would like to highlight a result common to the publication, the data and the iconic elements, and that is that a specific information design has been generated and consolidated during the coronavirus crisis. There are three factors that have determined this: firstly, the duration of the pandemic in time that informatively denotes consolidation of a topic, secondly, the informative "success" due to the social demand that wishes to directly consult this topic in a recognizable way and thirdly, the need to create a previous structure that allows updating the information in an efficient way. As a result, solid designs in all the headers that reinforce the identity of the theme and the medium.

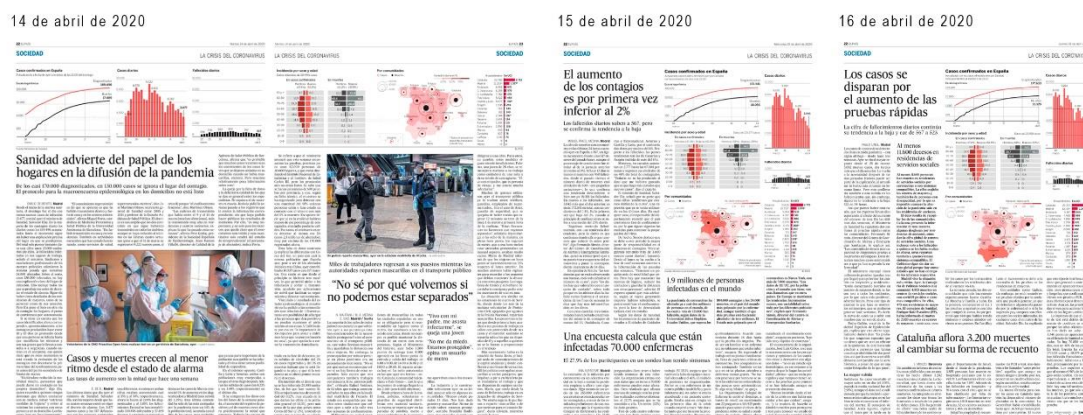
The characteristics of the designs of the pandemic information are that the subject matter is differentiated from the rest of the sections and is combined to create a set by grouping the contents. The coherence of the designs is stricter and specific to the subject in all graphic orders, which results in the ease of updating the graphs according to the continuity that characterized the data and that compose the information day after day, in many cases, in a cumulative way.

In the four headers, the design of their infographic elements is consolidated as of a certain date. The information is updated and, sometimes, its position on the page is modified, but not its design. But it goes beyond the infographics, and the visualization of the information is consolidated within the page frame forming a coherent whole. Therefore, each type of information always corresponds to the same representation, thus achieving concordance at page and media level in all its editions.

For this synergy, we use headbands, short typographic elements that frame a series of information under a thematic criterion in order to contextualize and unify, with symbols and icons related to the theme to facilitate and increase its effectiveness on a regular basis. But they are also present as spatial, thematic and temporal location elements in the information breakdowns and any text on the page. They exercise another function, not informative, when they assist the layout for a better distribution of texts, with graphic reliefs and more effective distributions where in some cases the paths of the text are carried out with these pictograms. In short, these minor infographics are important in the design of information for the organization and contextualization of information.

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In the case of *El País*, this occurs as of April 14 and is characterized by the fact that it is a special within the Society section. It is identified by a headband located from the spine with the text *La crisis del coronavirus*, by the design and the red color range that is maintained in all the maps of proportional points and graphics, by the location at the top of the page of the infographics and the repetition of the 5 and 3 column models of the distribution of the infographics, thus obtaining a horizontal and a vertical page model that alternate according to the informative needs, with the vertical dominating the center or the interior of the pages.



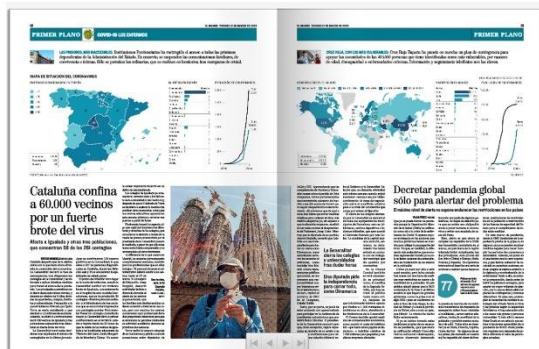
El País pages that set the design standard since April 14.
Source: Diario El País.

In *El Mundo* it is set earlier, as of March 13. The special pages open with a headband that covers both facing pages. The width of the bar, the blue color with white, the typography of the section called *Primer plano* bajo folio and the icon of the coronavirus give us an idea of the relevance of the special for its forcefulness and the eagerness to integrate all the information under that headband.

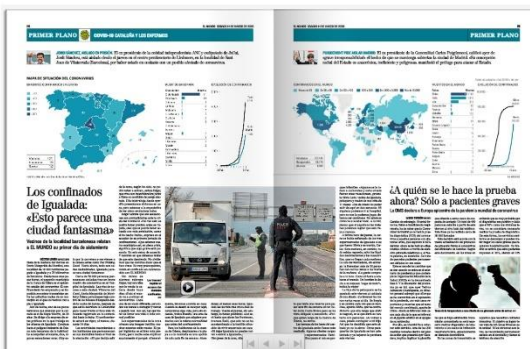
The basic design of the special concentrates the weight of the infographics at the top of the pages and a pediment is formed at the top that almost every day contains first a map of Spain on the even page and to the right, on the odd page, a world map that are usually accompanied by small bar graphs, lines, areas. That is to say, that in the information the proximity factor prevails and in second place the projection in the world. This distribution leaves a horizontal page that is enhanced by a profile or entrance to the full width of the page. Very solid design, excessively hieratic at the beginning, with the development begins to incorporate seven graphics that start from the bottom of the page and its development runs through the text with spectacularity, while in as many occasions they resort to an extra vertical graphic with a width of two or three columns and the entire height of the page except once. In all the models, the same range of blues and patterns is maintained for all the infographics, which is evidence of the strict model followed for this special.

Content analysis of the Spanish press about the use of the resource of infographics to report information regarding the global health crisis originated by COVID-19

13 de marzo de 2020



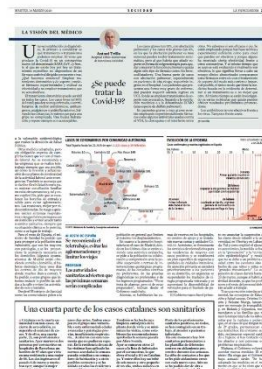
12 de marzo de 2020



Pages of El Mundo consolidating the design since March 13.
Source: El Mundo newspaper.

In the case of *La Vanguardia*, it is standardized on March 10, and begins with the graphic continuity of the information on the pandemic with a sober headband of "Emergencia sanitaria" that alternates its position and the color pattern that characterizes it. Being the medium with the highest number of infographics during the whole period under study, it is true that it has no comparison with the magnificent pages of *ABC* or the newspaper *El Mundo*. Although they start occupying 4 or 5 columns of the newspaper the first ten days of March with the composition of several graphs, map of proportional symbols of Spain and line graph, the infographic interest in this special is immediately reduced. Two small area charts in one column, and in some cases one, is the norm that prevails in this publication very soon. Tedious and redundant for a month, with the exception of several three-column graphs, it ends up consolidating the previously one-column graph to two columns. It is surprising the scarce infographic treatment in a medium with a high level of typographic management.

10 de marzo de 2020



13 de marzo de 2020



14 de marzo de 2020



15 de marzo de 2020



Pages of La Vanguardia that set the design standard since March 10.
Source: La Vanguardia newspaper.

Content analysis of the Spanish press about the use of the resource of infographics to report information regarding the global health crisis originated by COVID-19

In the *ABC* newspaper on March 27, the decision was made to consolidate the design in the society section. It also opens with a top banner that begins with the text Crisis of the coronavirus and specifies the subject. It is characterized by the range of warm colors with a predominance of orange and red, being the only case in which the color jumps to the body of the information with red frames, typographies of headlines also in red until March 18 jumps to the title in 5 columns in high box: Qué ofrece el gobierno (What the government offers).

The *ABC* incorporates an iconographic element that represents the virus also in these tones and is used to give dynamism to the composition, it becomes a center of visual interest that plays with the weights of the page looking for balance (the weight of the graphics is concentrated in the upper part), generates textual paths that give fluidity and alternates with the complete figure or sections of it on the base of the page. Circular shapes have a strong presence, either in pie charts as proportional sphericals, or as colored circular resources that house information to highlight. The balance of shapes is very interesting when there is so much fever and bar graph and is perfectly offset by the incorporation of these circular elements. A perfect information design work in all orders.

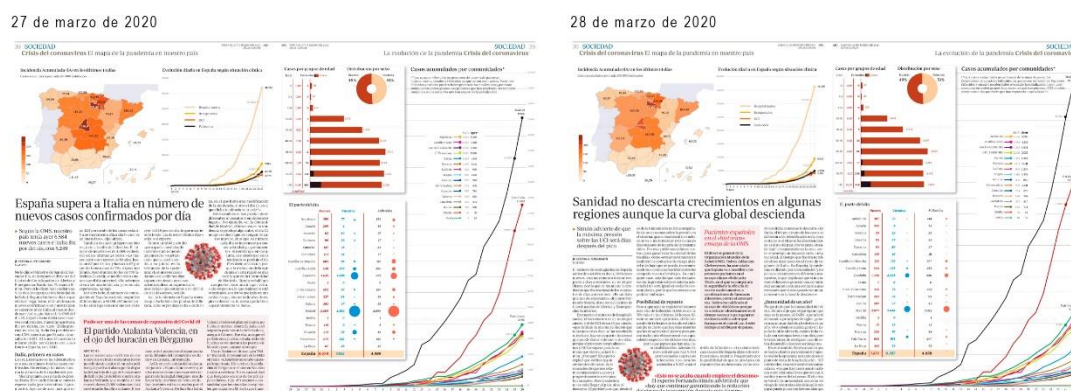


Figure 3. First pages of *ABC* where the specific design is applied as of March 27.
Source: ABC Newspaper.

5. CONCLUSIONS

This research serves to learn about the use of the informative genre of infographics during the first months of the pandemic produced by covid-19, as well as to find working patterns in the application of infographics in exceptional or crisis situations.

We started from the hypothesis that the most appropriate journalistic genre to convey the complex information on the coronavirus was infographics, and this is confirmed by observing the increase in independent infographics published on the subject, which are concentrated in the months of March and April when the data accumulate around the variables that define the pandemic, the crisis worsens and are disseminated for more

effective information to a population that demands reliable, accurate and rigorous information in an environment of social alarm.

These infographics are characterized by the nature of the data that justify them. Journalists are faced with a large amount and complexity of data so they must be represented graphically to be understood more quickly and visually. These data are also characterized by being continuous in time and sequential in the representations, and work with the same variables in the constant updating of the data. The predominant theme of the infographics on the coronavirus is the evolution of the numbers of infections and deaths, relevant in that the data informs the population of the progress or regression of the pandemic and its infographic representations of the data are mainly comparative graphs and ubicative maps with these variables.

The forms of representation of this essential information will be fundamentally through simple graphics, dominating columns, lines and areas, and the maps represent the information with different codes such as dots, color or proportional symbols to fulfill the informative and ubicative functions of infographics. During the established period of analysis, mega infographics have always been related to the thematic of covid-19, although we expected that a larger group would be published.

In the infographics on the coronavirus crisis, the factor of the proximity of the topics prevails, although it is a global pandemic, they have been concentrated around the Society section because it affects the whole of society and have been prepared mostly by the departments of the headers themselves. In addition, the most frequently consulted source of data was public bodies. There is a majority tendency to present infographics as independent informative elements, which encourages the idea that these elements have become a new journalistic genre.

The peculiarity of the crisis situation, extended in time, recurring thematic data that accumulate, information that affects health, economy and all fields, evidences the need to create a specific infographic style and layout for reporting coronavirus issues in order to integrate contents, update them quickly, keep them accumulated in time, represent thematic concordance as well as create an informative identity.

The four headers of the study made a specific and general design to the subject of the coronavirus, at an early date of the pandemic and extending well beyond the end of the information. The tendency is evident in all the newspapers to group the covid-19 information based on the design, in the constancy and coherence in all its applications: it follows the first principle of information design, which is none other than that the same information should have the same representation. This, which is applied to title levels, chromatic ranges, graphics, maps, infographic resources and others, here is a leap of degree, since it is taken to all the elements of the subject matter, but also transcends time and the continuity in the use of these principles reaches the entire infographic treatment of the study of the pandemic.

In crisis situations, much of the information learned during this process will be used to cover future needs that may arise. The results obtained in the research are useful to the extent that any complex informative situation with similar characteristics can repeat this informative model due to the informative effectiveness demonstrated.

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