The Controversy in Media Health Coverage: The Stayaway Covid Application and Information Sources

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Abstract

Presented as an essential tool to stop the covid-19 pandemic, the Stayaway Covid app has remained at the scene of the national media landscape since it was mentioned for the first time, having generated around 1,400 news in 2020. This remarkable volume of news coverage reflects the potential relevance of this technology during a pandemic and the controversy among the public and the media. To contribute to the understanding of the news coverage of the application, we analysed the sources of a sample of 182 press, radio and television news pieces associated with Stayaway Covid, distinguishing those that focus on privacy and obligatoriness controversies from those that do not. In this case of public health controversy, the results show that experts did not take the lead, with politicians having a more prominent role in fueling the controversy, especially concerning the intention to make the application mandatory.

Keywords

pandemic, media, sources of information, controversy, health journalism

A Controvérsia na Cobertura Mediática de Saúde: A Aplicação Stayaway Covid e as Fontes de Informação

Resumo

Apresentada como um importante instrumento no combate à progressão da pandemia de covid-19, desde que foi mencionada pela primeira vez nos *media*, a aplicação Stayaway Covid manteve-se em cena no panorama mediático nacional, tendo originado cerca de 1.400 notícias em 2020. Este assinalável volume de notícias justifica-se não só pela potencial relevância desta tecnologia em contexto de pandemia, mas também pelas polémicas que se levantaram na opinião pública e nos *media*. De forma a contribuir para a compreensão da cobertura noticiosa da aplicação, foram analisadas as fontes de uma amostra de 182 notícias de imprensa, rádio e televisão com referência à Stayaway Covid, distinguindo as que focam as controvérsias da privacidade e da obrigatoriedade das que não o fazem. Os resultados evidenciam que, neste caso de controvérsia em saúde pública, os especialistas não assumiram o protagonismo, tendo os políticos tido um papel mais preponderante a alimentar a polémica, sobretudo no que diz respeito à intenção de tornar a aplicação obrigatória.

1. Introduction

The year 2020 will go down in history for having changed the world, citizens' lives, and the media agenda. The covid-19 pandemic that hit the planet was global, democratic, and overwhelming. In January 2020, the World Health Organization (WHO) declared the covid-19 outbreak a public health emergency of international concern (World Health Organization, 2020). This announcement in March and the balance of the months that followed would prove to be dramatic. As of January 31 2021, over 102.000.000 people have been confirmed to be infected with covid-19 worldwide, and nearly 2.200.000 people have died (https://covid19.who.int/).

In Portugal, several universities and research centres have worked to support health authorities in combating the pandemic since the beginning of the coronavirus' proliferation. In this context, in April 2020, the Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), the Public Health Institute of the University of Porto (ISPUP) and the spin-off companies Keyruptive and Ubirider joined forces to develop Stayaway Covid. This mobile app could be used as a digital solution to track the spread of the virus in the country.

The increase in the number of people infected during the first wave of the pandemic, combined with the need to control the disease in the post-lockdown phase, led to the development of mobile solutions for digitally tracking the disease in various parts of the world. Apparently, successful application launches, as was the case in Singapore and South Korea, encouraged more than 40 countries to develop and adopt this type of solution (Munzert et al., 2021). According to data from the European Commission (Comissão Europeia, n.d.), of the 27 countries in the European Union, 19 have developed covid-19 digital tracking applications.

Naturally, the public debate raised by these initiatives caught the media's attention. Similarly to what happened in other countries, the Portuguese app was also faced with controversy. In fact, from the outset, the announcement of different dates for public release, the heated discussions regarding user privacy and data security, or the government's controversial intention of making the app mandatory, as well as other critical variables — such as the low number of users, the reduced generation of codes or their residual inclusion by users —, ultimately seemed to have compromised the app's effectiveness.

This study addresses the media — printed press, television, and radio — coverage of Stayaway Covid in 2020. The goal is to understand whether controversy influences the journalists' use of information sources, namely regarding the number and status of people heard in the news process. In particular, this study adopts a comparative perspective between the different media studied and between the presence, or not, of controversies related to data privacy and the mandatory use of the app.

2. The Sources in the News Process

The relationship between information sources and journalists is crucial for understanding the sources' role in the news process. In more functional and utilitarian analysis, Manuel Pinto (2000) states that sources are always interested and communicate with a view to different objectives, ranging from seeking visibility and media attention to setting the public agenda or neutralising the interests of competitors or opponents. In turn, journalists resort to sources, for example, to obtain information, confirm or deny claims from other sources, dispel rumours, and develop stories.

This approach seems relatively straightforward; however, the author warns that it may be too simplistic if we consider that sources and journalists are "uniform, homogeneous, invariable realities" (Pinto, 2000, p. 281). The truth is that the interaction between sources and journalists is much more complex. Pinto recalls studies by Ericson in 1989 to emphasise that "different sources have different requirements, both in terms of exposure and knowledge" (Pinto, 2000, p. 281). These varying requirements from sources can influence the journalist's work when producing the news. Examples of these variables include the "off the record" and "embargo", as well as pseudo-events and the increasingly frequent use of live broadcasting on radio and television (Pinto, 2000).

Journalists' integration into different institutional frameworks raises issues such as the socio-political environment (Hivon et al., 2010), the type of connection to the employer (e.g., precariousness), the editorial/political orientation of the news agency, or the level of workload at each moment (e.g., lack of time to consult more sources). Furthermore, journalists have different ages, genders and degrees of training, different statuses in the profession, and work in different institutional frameworks (Pinto, 2000). These variables can influence journalistic practices, how journalists relate to their sources, and what they expect to get from each news piece they write. Despite being currently characterised as confrontational, more often than not, "the source-journalist relationship is symbiotic" (Traquina, 2010, p. 256). If it is true that the source needs the journalist, it is no less true that the latter also needs their sources.

Several studies have sought to characterise the sources by establishing taxonomies. Such is the case of Manuel Pinto (2000), who separates sources according to specific criteria, such as their nature, origin, duration, attitude towards the journalist or action strategy, or Manuel Chaparro (Lopes, 2016), who classifies sources in a similar fashion, defining them as organised, informal, allied, reference, or bibliographic sources. Felisbela Lopes (2016) has also defined six variables that offer a complete view of information sources: number, composition, identification, geography, gender, and status.

The analysis of sources in the journalistic process often takes into consideration the sources cited in the news. A study by Felisbela Lopes et al. (2013) analysed news articles on health published in three Portuguese newspapers (*Expresso*, *Público* and *Jornal de Notícias*) for about 3 years concluded the sources cited are few, but almost always identified. News that did not indicate sources were rare, with the daily newspapers citing an average of one or two sources and the weekly four or more sources in most of the news reported. "This increase in the number of people who speak will certainly be an

asset when assessing the quality of the information provided by a given source", and the citation of only one source "does not contribute to the multiplicity of points of view that should (almost) always be promoted" (Lopes et al., 2013, p. 66).

Regarding the status of sources in health media coverage, studies such as that by Olga Magalhães et al. (2020) confirm the prevalence of specialised sources, such as doctors and scientists, in journalism. "Their high degree of specialisation makes them more likely to influence the media agenda than a member of the general public" (Magalhães et al., 2020, p. 122). That is because health information often requires an expert to explain its predominantly technical nature, as, generally speaking, few journalists specialise in this area (Magalhães et al., 2020).

The above mentioned study published in 2013 on media coverage of health in the Portuguese press revealed that, among the specialised sources, the more frequently used are institutional sources that hold positions in the health field (Lopes et al., 2013). In addition to specialised sources, the media also value official sources (politicians, administrators, and health directors) in health news coverage. After institutional specialists, the Portuguese media privileged official sources (Lopes et al., 2013).

> This great visibility of official sources and specialised institutional sources has an underlying organisation pervious to the demands of the journalists' work. Acting proactively about the media or revealing a remarkable capacity to respond to the requests they receive, these sophisticated sources of information constitute a kind of brotherhood perpetuated by the news texts. (Lopes et al., 2013, p. 70)

3. Controversy in Health Journalism

In a study on the coverage of influenza A in the Portuguese media, Felisbela Lopes et al. (2010) recall that since 1900 "we have already witnessed three confirmed flu pandemics, with the Spanish Flu being the most devastating" (p. 140). In their study, the authors also mention that many scientists believed a global flu pandemic was likely to occur in the next few years. The "prophecy" would come to be, and, 10 years later, the world was devastated by an infectious disease caused by SARS-CoV-2, which would spread rapidly worldwide.

In the context of a public health crisis, such as the one experienced in 2020, journalists must convey clear messages and warnings to populations about the prevention, symptoms, and treatment of the disease (Lopes et al., 2010). We witnessed the preparation of public messages to warn populations against threats to their health (Reynolds & Seeger, 2005). In crisis and emergency scenarios, with a high threat to public health, it is essential to combine risk communication strategies with crisis communication. Communication failures are critical, as they can prevent the population from being adequately protected. On the contrary, effective communication maximises the public's ability to act

more efficiently and favours containment, reduces resistance, and enhances the chances of recovery (Lopes et al., 2010).

One of the most effective ways of massively communicating with the population is precisely through the media. Therefore, media use is part of the literature recommendations in the communication of pandemics (Vaughan & Tinker, 2009). Through the media, health authorities can send important and urgent messages to populations. Such is the case with the press conferences of the Directorate-General for Health in Portugal since 2020.

Interestingly enough, while the media can positively influence public health-related attitudes and behaviours (Nagler et al., 2015), conversely, the messages they convey when covering controversial themes can also increase its adverse effects. Although this area of research remains underexplored, there appears to be some evidence that exposure to conflicts and controversies in the media is associated with creating public confusion, diminishing trust in health recommendations, and reducing the adoption of prevention behaviours (Nagler et al., 2015). Viewed as the presence of disagreement between the players heard in the news, controversy affects the public perception of specific issues and seems to be directly related to the nature of the actors involved (Tschötschel et al., 2020).

In a recent study, Attila Szabo (2020) tested the effect of controversial messages about health issues in the judgments of 91 young participants. The researcher's results have shown that controversial information impacted their judgment and that this change persisted for at least a week.

One example of a media case that illustrates how controversial media information can impact individual judgment was the controversy over the age at which women should start screening for breast cancer through mammography. In 2009, a study published by the United States Preventive Services Task Force recommended biannual screening for women aged 50 to 74, emphasising that for women aged 40 to 49, the benefit of biannual screening was reduced. The controversy was caused by the fact that the American Cancer Society recommended having a mammogram annually from the age of 40, with studies conducted in Canada and Sweden showing that screening women between 40 and 49 years old had reduced mortality by 30% (Gaspar, 2016).

These contradictory recommendations naturally attracted the media's attention, but is it possible to know to what extent the media coverage of the controversy affected the perceptions and behaviours of women in deciding when to have a mammogram? Nagler et al. (2019) analysed the content of 364 television news focusing on recommendations from the United States Preventive Services Task Force and the American Cancer Society between 2009 and 2016. The results revealed the continuing prevalence of controversial information about the most appropriate age to start breast cancer screenings. The authors concluded that cumulative exposure to these messages could influence women's decision-making about screening, as well as their confidence in cancer prevention recommendations (Nagler et al., 2019).

In a study of the common features of public health-related controversies, Patil (2011) compares the eruption of controversies to a phoenix. After they suddenly emerge,

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"they are fiercely debated and die abruptly, either because they are simply eclipsed by a new, larger controversy or because the passage of time makes them irrelevant, and so they are buried but never resolved" (Patil, 2011, p. 97).

Adding to what has been mentioned about the controversy, mass communication through the media is not exempt from the risks of inaccuracies or misunderstandings. If low-quality journalism about politics or business can affect reputations, in medicine, inaccurate reporting or news can generate false hopes and unjustified fears (Shuchman & Wilkes, 1997). Contradictions can also occur, resulting from the complexity of the themes and the crossing of sources with contrary statements (Lopes et al., 2010). Moreover, using a single source of information can bias the message, as only a single point of view is presented.

In fact, as Hivon et al. (2010) point out, "journalists are often accused of providing only a partial view, neglecting the views of vulnerable interested parties" (p. 34). For journalism to be accurate, plural, and ethical, it would be expected that the various parties should be heard and established as sources, specifically in cases of controversy where there are diverging opinions and positions. "When you only hear one person or write using a single document as a source, there is only room for one vision" (Lopes et al., 2013, p. 66). Moreover, from a deontological point of view, if the journalists have the right to "access sources of information freely" (Estatuto do Jornalista. Lei n.º 1/99, 1999, Chapter II, Article 6), they also have an obligation to "seek to diversify their sources of information and to listen to parties concerned in the cases addressed" (Estatuto do Jornalista. Lei n.º 1/99, 1999, Chapter II, Article 14, Point 1, para. e).

However, while it is recommended that the journalist includes other source categories to promote a more democratic debate, is that enough? Hivon et al. (2010) believe that it is not and raise different questions, as there are also variables to be considered when it comes to the public that consumes health news. Do readers (the corpus of the study focused only on printed press) judge scientific controversies in the same way? Do they similarly assess the credibility of sources? Do they attach the same weight to the voices the press presented and to the validity of their claims?

What seems unquestionable is that the media represent an essential source of information for the lay public on science and technology issues. Turning the focus to the mobile app that is the object of this study, it is important to remember, as stressed by Hivon et al. (2010), that health technologies "affect our lives in many ways, as in addition to paying for their implementation, we support their social costs" (p. 34). Therefore, "citizens need to be properly informed in order to be able to participate in the social and political debate about these technologies and to be able to think critically about the decisions that affect their lives" (Hivon et al., 2010, p. 34).

4. Media Coverage of the Stayaway Covid App

Stayaway Covid was publicly announced for the first time in April 2020. Considering the pandemic scenario that dominated the world, the media agenda was dedicated

almost exclusively to covid-19. As such, the development of the app immediately drew the media's attention.

Between April 27 and September 1, the day of the announcement, the clipping platform subscribed by INESC TEC and ISPUP had already registered more than 500 news — including printed press (46), online (458), radio (9), and television (11) — mentioning the Portuguese app used for tracking covid-19.

Even before the app became available, the debate on whether or not it preserved data privacy was widely covered in the media, as both experts and opinion makers spoke out against or in favour. The controversial phase of mandatory use came later when the government considered the possibility of forcing the public to install the app, which caused an uproar, both in public opinion and in the media. Given the controversy, the government retracted its decision, and the use of the application remained voluntary.

5. Analysis Methods and Data

This paper aims to investigate how controversy influences or not journalists resort to information sources in health news. Using the case of the Stayaway Covid app and considering different media, this study analyses how the nature of the controversy, namely the matters of privacy and mandatory use, influences the number and status of sources heard in the news process. Given the framework outlined in the literature review, the following hypotheses were raised:

H1: The controversy's nature and the different media (television, radio, and printed press) is associated with different journalistic practices regarding the sources heard in the news about Stayaway Covid.

H2: Given the specialised nature of the app and the public health context, expert sources have assumed a leading role in the news coverage.

The indicators were collected using the news platform Cision, subscribed by INESC TEC, and also by ISPUP, which monitors press, television, radio, and online news mentioning these organisations.

This study uses two methods: quantitative analysis and data content analysis to collect evidence that can confirm or not our working hypotheses. The time frame considered was the year 2020. In that sense, the first step was to extract from the platform all the news published in 2020 regarding "Stayaway Covid" or "aplicação" (the Portuguese word for an app) from a total of 1,397 news items.

It was possible to extract the news sorted by media automatically. Given the high number of news (over 1,000) detected in online media, only radio, television, and printed press news were analysed.

In all phases of the analysis, the three media were viewed separately. A first screening eliminated live news from the television and radio sample and opinion articles and editorials from the news sample in print media. The result was a corpus of 182 news stories (100 in print, 47 in television and 35 in radio), which were the object of this research.

A second screening was also conducted for each of the three media, using the content analysis method to separate the *controversial* from the *non-controversial* news.

Non-controversial news were all those that did not refer to any controversy (privacy, mandatory use, ineffectiveness, funding, or others). In other words, they always referred to the app in a neutral tone.

In the case of controversial news, reference to privacy or mandatory use was considered a selection criterion. In the selection relating to privacy, other search keywords were considered, such as "dados pessoais", "proteção de dados" e "segurança" (Portuguese words for "personal data", "data protection", and "security"). For the selection regarding mandatory use of the app, the search included expressions such as "mandatório" e "uso mandatório" (Portuguese words for "mandatory" and "mandatory use").

In a third screening, the controversial news set was split into three subsets according to the type of controversy (*privacy, mandatory use*, or *both*). The frequency of the news in each subset was counted.

In both groups (controversial and non-controversial), the sources of information were analysed regarding the following variables: presence/absence of reference to sources, number and status of cited sources. The analysis focused on each news set in the controversial subgroup (privacy, mandatory use, and both).

This classification was based on the taxonomic model developed by Lopes (2016), adapted for this case study, as will be explained next. Analysing the number of sources is crucial in this study and constitutes a determining factor in confirming our working hypotheses. While the absence of sources can make a journalistic text less credible, the existence and frequency of sources "allow us to perceive whether the journalist respects the principle of the contradictory and seeks to hear several versions/explanations of the subject in question or if, on the contrary, the journalist presents a simplistic account of the events, that is, the facts are only partially reported" (Lopes, 2016, p. 184). The presentation of more than one source of information can be particularly relevant whenever the news addresses controversial issues.

The status of the sources is also an important variable to understand which of the controversial news took greater prominence — whether those that focus on privacy, with more sources originating from civil society or those focusing on the matter of mandatory use, where most sources were members of the government or national politicians.

Following the taxonomic model Lopes (2016) proposed, four groups of sources were considered: official, professional, non-professional and citizens.

The official sources group includes "politicians with institutional positions" and "presidents/directors of institutions". In the model taxonomy, "this group considers sources holding public office (elected or appointed) who, when dialoguing with journalists, are associated with a public institution/organisation/company" (Lopes, 2016, p. 186). However, this study also includes private institutions, such as INESC TEC, which, despite being private, has public universities as associates and is itself, in this news process, an official source of information on the app. Thus, this study separates "presidents/directors of public institutions" and presidents/directors of private institutions". In the official sources group, this study also takes into consideration the geographical criterion to differentiate "national politicians with institutional positions" and "European politicians with institutional positions".

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In the group of professional sources, that is, "sources that speak because they exercise a certain profession that is their main job, for which they are paid" (Lopes, 2016, p. 186), this study differentiates experts and commentators. As the sample used also includes international experts, experts were classified according to geography. That led to obtaining three variables in this group: national experts, international experts, and commentators.

In the group of non-professional sources, this study considers "the sources that carry out a certain activity, in parallel with their profession" (Lopes, 2016, p. 186), primarily within civil society associations.

Finally, in the group of citizens are the "sources unrelated to any position, professional category or group, speaking on their behalf" (Lopes, 2016, p. 186). We could consider two unknown and notable subgroups; however, we only registered "unknown" in our sample.

Table 1 summarises what we have just described, and provides examples of sources found in the news that compose the corpus of this study.

|	STATUS OF THE SOURCE	EXAMPLE
Official	National politicians with institutional positions	António Costa, prime minister
	European politicians with institutional positions	Sophie in 't Veld, a Dutch member of the European Parliament
	Presidents/directors of public institutions	Luís Goes Pinheiro, chairman of Serviços Partilhados do Ministério da Saúde (Shared Services of the Portuguese Ministry of Health)
	Presidents/directors of private institutions	José Manuel Mendonça, chairman of the board of Systems and Computer Engineering, Technology and Science
Profissional	National experts	Luís Filipe Antunes, Centro de Competências em Cibersegurança e Privacidade, Universidade do Porto (Center of Competence in Cyber Security and Privacy)
	International experts	Isobel Braithwaite, University College of London
	Commentators	Paulo Portas, political commentator
Non-professional	Organised in civil society associations	Ricardo Lafuente, Defesa dos Direitos Digitais (Digital Rights Defence)
Citizens	Unknown	André Filipe, citizen

Table 1 *Classification of sources according to status*

6. RESULTS

The goal of analysing 182 news items (100 print, 47 television and 35 radio) considered part of this study was to differentiate controversial from non-controversial news.

Eighty-three controversial news items and 96 non-controversial news were then considered, as three press reports were removed from this last group because they addressed different controversies not contemplated in this study.

The results show that there is almost a balance between controversial and non-controversial news (Figure 1). Of the media analysed, it appears that radio is the only one with more *controversial* news (Figure 2), although the difference is not significant.
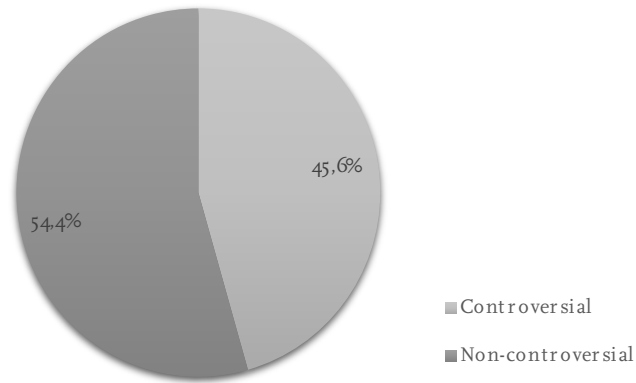
Figure 1 *Classification of controversial news on the matters of privacy and mandatory use*
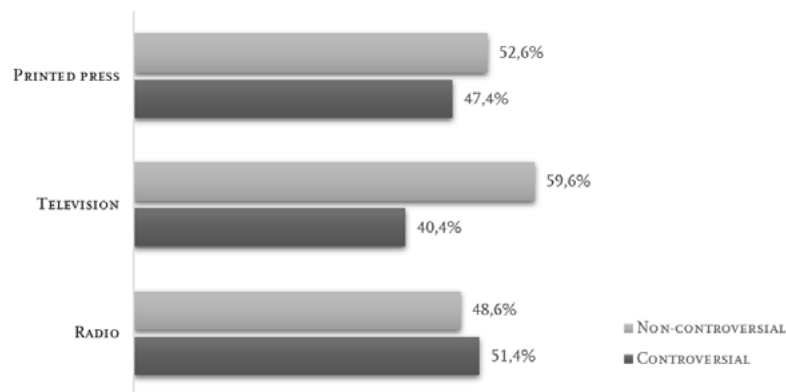
Figure 2 *Percentage of controversial and non-controversial news in radio, television, and printed press*

The practice of citing sources in the news (Figure 3) was always followed in the case of controversial news. Non-controversial news mostly cite one source, and in 16.2% of the news, no source is cited at all. More than half (61.4%) refer to two or more sources in the news where controversy is present. A significant percentage (27.7%) of news refers to four or more sources.
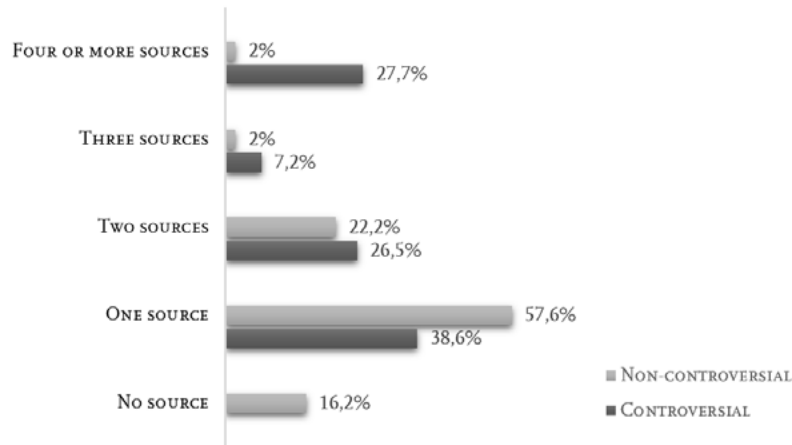
Figure 3 *Percentage of controversial and non-controversial news according to the number of sources cited*

The number of controversial and non-controversial news sources was also analysed separately for radio, television, and printed press to understand if they differed significantly.

The results show that the media generally share the same trend (Table 2). The printed press produced the highest number of controversial news, citing two or more sources (69.6%), followed by radio (55.6%), and finally television (47.4%). In the case of non-controversial news, television takes the lead in the news that do not mention any source (21.4%), followed by the printed press (14.8%) and radio (11.8%). Radio cites only one source more often (70.6%), whereas two or more sources are cited mostly by television (35.7%), followed by the printed press (24.1%) and radio (17 .6%).

	NEWS	RADIO	TELEVISION	PRESS
	No sources	0.0%	0.0%	0.0%
Controversial	One source	44.4%	52.6%	30.4%
	Two or more sources	55.6%	47.4%	69.6%
	No sources	11.8%	21.4%	14.8%
Non-controversial	One source	70.6%	42.9%	61.1%
	Two or more sources	17.6%	35.7%	24.1%

Table 2 *Percentage of controversial and non-controversial news according to number of sources cited*

As to the nature of the controversy, mandatory use was primarily addressed on radio and television news, whereas printed press focused mainly on privacy (Figure 4).
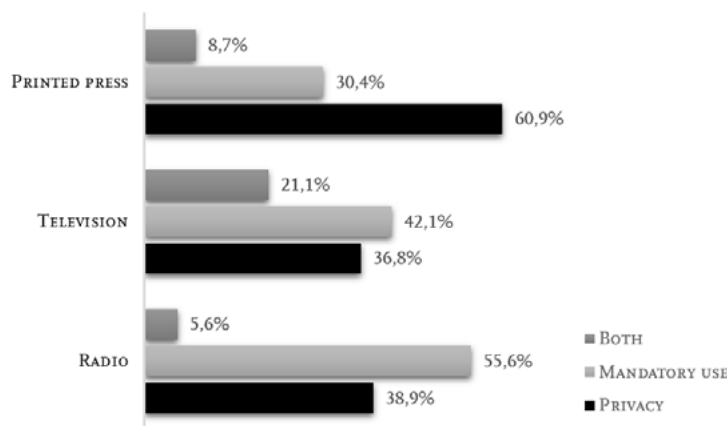
Figure 4 *Percentage of news on matters of privacy, mandatory use, or both*

The nature of the controversy seems to influence the use of information sources (Figure 5). Thus, close to half (45.2%) of the news published on privacy use only one source, while those focusing on mandatory use with two or more sources reach 78.2% (against 54.7% on the matter of privacy).
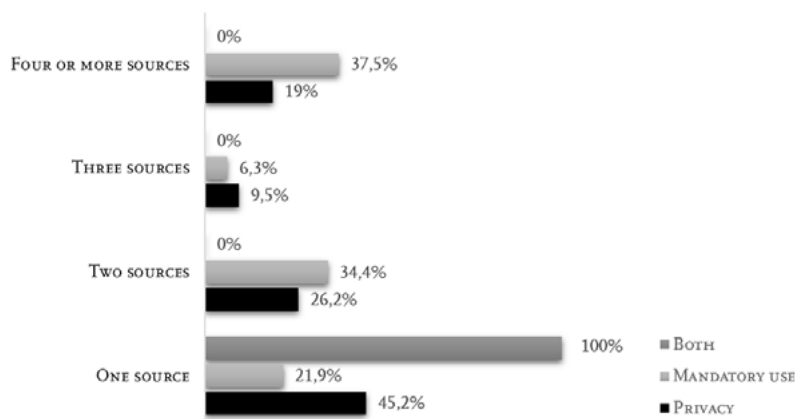

Figure 5 *Percentage of news on matters of privacy, mandatory use, or both, according to number of sources*

The analysis conducted reveals that all three media use more sources in the news focusing on mandatory use, with radio recording the highest percentage (80%) in two or more sources, followed by the printed press (78.5%) and television (75%). When it comes to privacy, the use of two or more sources drops considerably, particularly on the radio (28.6%) and television (42.9%). In printed press, the difference is not that noticeable (64.3%).

The data obtained (Table 3) show that the non-controversial news coverage of the app is based on three types of sources: managers of private institutions (namely from INESC TEC), followed by politicians and heads of public institutions. These three types

constitute over 90% of the sources heard. The news items about the app's development mainly focused on its developers and were then commented on by politicians. Not once, for example, was the voice of citizens heard.

STATUS OF THE SOURCE		CONTROVERSIAL			NON-CONTRO-VERSIAL
		PRIVACY	MANDATORY USE	BOTH	
Official	National politicians with institutional positions	24.2%	32.7%	44.4%	30.7%
	European politicians with institutional positions	2.1%	4.7%	0.0%	1.0%
	Presidents/directors of public institutions	14.7%	5.6%	0.0%	10.6%
	Presidents/directors of private institutions	31.5%	25.2%	22.2%	52.9%
Professional	National experts	13.7%	16.8%	22.2%	2.9%
	International experts	5.3%	1.9%	5.6%	0.0%
	Commentators	2.1%	3.8%	0.0%	1.9%
Non-professional	Organised in civil society associations	5.3%	0.9%	5.6%	0.0%
Citizens	Unknown	1.1%	8.4%	0.0%	0.0%

Table 3 *Percentage of controversial news on the matters of privacy, mandatory use, or both, and percentage of non-controversial news, according to the status of the sources*

This picture completely changes when the controversy aspect arises, especially when it comes to the sources heard. Data analysis also allows us to understand that different sources of information vary depending on the nature of the controversy. Among official sources, politicians with institutional, national, and European positions were called on to give an opinion or were cited more often in controversial news on mandatory use than in the news focusing on privacy.

Although the difference is not significant in terms of national politicians, in the case of European politicians with institutional positions, the results show that they were used as sources twice more often in the news focusing on mandatory use. On the contrary, presidents/directors of public and private institutions were cited more often than official political sources in the news related to privacy instead of news on mandatory use. The leaders of public institutions provided statements about the app's privacy more than twice as often (14.7%) compared to mandatory use (5.6%). The difference in the case of leaders of private institutions is not that significant (31.5% on the matter of privacy, and 25.2% on the matter of mandatory use).

In the group of professional sources, we observed that national experts intervened more actively as sources in the news that focused on mandatory use (16.8%). However, the difference was not significant compared to news pieces focusing on privacy (13.7%). It was the opposite with international experts, with 5.3% of citations in the news related to privacy and only 1.9% in those focusing on mandatory use. The commentators' participation was somewhat balanced, as they were asked to give their opinion in 2.1% of the news on privacy and 3.8% in the news on mandatory use.

The non-professional sources organised in civil society associations were more active in the news that focused on the app's privacy: 5.3% compared to 0.9% of news focusing on mandatory use. On the contrary, unknown citizens were more often invited to give their opinion in the news that highlighted the mandatory use of the app (8.4%), compared to those that mentioned the privacy aspect (1.1%).

The use of sources also depends on the nature of the media. National politicians intervened more often in the news that focused on privacy (44.4% for television and 25% for radio) than in those addressing the aspect of mandatory use (27.8% for television and 18.8% for radio). The opposite happened in the printed press, with newspapers citing politicians more often on the issue of mandatory use (42.1%) than on privacy (21.8%). National experts played a more active role in the cases of news that focused on mandatory use. On the contrary, they played no active role in radio and television news regarding the privacy controversy.

7. Discussion

In a year dominated by the covid-19 pandemic, there was a "disruption in the world media system, which in many countries, namely in Portugal, created the conditions for a journalism marked by civic and citizen responsibility" (Cabrera et al., 2020, p. 187). In crisis for decades, traditional media managed to gain new momentum compared to the direct competition of social networks and free online content (Cabrera et al., 2020). Traditional media became the most accessible and reliable means of information for ordinary citizens. The analysis of information sources, more specifically the mediatisation of the Stayaway Covid app, is particularly relevant because official sources present this technology as an essential tool for the containment of the pandemic and because it is questioned by specialists and civil society associations that become opinion leaders for the ordinary citizen, who will form an opinion and make the decision to install the app (or not).

The results obtained from the analysis of our corpus confirm the first hypothesis: the nature of the controversy and the different media (television, radio, and printed press) is associated with different journalistic practices regarding the sources heard in the news *about* Stayaway Covid. Firstly, it is confirmed by the data presented that media controversy is significantly associated with using a higher number of sources. The news that addressed more neutral aspects of the app were the only ones in which no source was cited or featured one source only. Whenever privacy or mandatory use was the subject of the news, journalists cited sources, and, in 60% of cases, they heard two or more sources. The data obtained suggest that the practice of citing sources is more associated with the principle of the contradictory, in which parties with relevant interests are heard than with the practice of going deeper into matters and exploring different perspectives. To a certain extent, the data show a paradox: when the media follow the general principle (Lopes et al., 2013) of clarifying public opinion (listening to various sources regarding the matters in the news), this generates more significant controversy, which affects the public's perception of the problems, generating more confusion (Nagler et al., 2015).

The media also presented different coverages. Television tended to have a more neutral coverage, devoting less time to controversy over the app. Moreover, television presented the most news without mentioning any source of information. Radio was the medium that devoted more time to controversy than neutral news regarding the mandatory use of the app, followed by television. Printed press, in turn, focused more on the issue of privacy, listening on average to more sources, and followed a more sustained approach to Stayaway Covid in terms of time devoted to the matter. Thus, because it was more political, intense, and limited in time (less than a week), the issue of mandatory use ended up drawing more attention than all other matters, both in radio and television, which are characterised by their immediacy. For that reason, more time and space were devoted to this aspect. News that focused on privacy were featured twice more often in printed media than those focusing on mandatory use. With a broader exposure over time (about six months), the news related to privacy, more technical, found more space for context and debate in the printed media. The role of politicians as sources of information, associated with greater media coverage and the impact of controversy (Nisbet et al., 2003; Tschötschel et al., 2020), seems to be more prevalent in radio and television, as they focus more on the present, marked by the political agenda.

Taking as a starting point the work of Magalhães et al. (2020) regarding the role of experts when covering issues related to health and research, the second hypothesis suggested that, given the specialised nature of the app and the public health context, expert sources played a predominant role in the news coverage. The data collected does not support this hypothesis, as national politicians played a more relevant role in the news coverage, mainly when the news focused on privacy and mandatory use controversies. While in non-controversial news, politicians lagged behind the heads of private institutions, in controversial news, they were some of the most relevant sources. Specialised sources also lagged behind the presidents and directors of public institutions regarding controversial news, despite their essential role in the coverage. These data are also not in line with other studies in health, such as that by Lopes et al. (2013), who pointed out that specialised sources were consulted most often.

In the case of the Stayaway Covid app, its more political aspect seems to have prevailed instead of its public health component. While it is true that INESC TEC is an official source because it is the institution responsible for the app's development, it may also have been seen by the media as a specialised institutional source. The respective spokespersons, chosen for their academic training and research experience, were also viewed as specialists since they were directly involved in the app's development. This aspect must have been critical in the non-controversial phase. Nevertheless, it is significant that politicians have had such a strong presence, especially in the coverage of controversies linked to mandatory use.

National experts — divided mainly between health professionals, technology experts and constitutionalists — played a more active role in the news that focused on mandatory use (16.8%), compared to those that focused on privacy (13.7%); however, the difference was not that significant. The opposite happened with international experts.

Presidents/directors of public and private institutions were cited more often as sources in the news related to privacy than those focused on mandatory use. While in the case of the leaders of public institutions, that difference was relevant because they provided statements about the app's privacy more than twice as often compared to mandatory use, this margin was thinner in the case of the leaders of private institutions. The justification for this may lie in the fact that INESC TEC's spokespersons, who are also viewed as official sources from private institutions, have been frequently called to make statements on both controversies.

Again, and in line with previous studies (Magalhães et al., 2020), the data from this study show that when covering subjects, journalists still do not privilege individual citizens or citizens organised in associations. Their role in the news process is marginal, as media professionals do not frequently consider their perspectives. When the coverage did not focus on any controversy, the perspectives of citizens were utterly absent. Moreover, as expected, civil society associations, such as D3 and Deco, played a much more active role in the news that focused on the app's privacy compared to the matter of mandatory use. The opposite happened with the unknown citizens.

Generically speaking, and comparing both controversies, it is possible to state that the coverage of the mandatory use, which took place mostly on radio and television, was very limited in time and heard primarily from the voice of national and, to a lesser extent, European politicians. National experts were consulted more often than specialised sources from other countries. Here, fewer civil society organisations and more individual citizens played an active role. The privacy issues were addressed more often in newspapers, for a remarkable period, from the perspectives of presidents of private (namely INESC TEC) and public institutions. International experts were consulted more often in this case as well. Civil society organisations also played a relevant role in the news process regarding privacy. Therefore, being different in their origin, the controversies also received a different journalistic treatment. The controversy of mandatory use, originated by government intent, appealed more to politicians than the matter of privacy. In turn, the privacy controversy, raised mainly by democratic concerns, gave more voice to organised civil society.

8. Conclusions

This analysis of the Stayaway Covid app news coverage shows that the controversy dominated a large part of the public discussion in the media, from the beginning of its development until the end of the year. It was the first time that Portugal implemented a mobile app at the national level to benefit public health. Although not everyone may understand how it works, public opinion, politicians, institutional leaders, and experts took positions in favour and against using the Stayaway Covid app. Was media communication plural? It can be said that yes, as there was, in most cases, an effort to present different perspectives. Whether it was sufficiently enlightening is beyond the scope of this study; however, the presentation of different perspectives through different sources

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is primarily associated with controversy. As suggested by the literature in this domain, that can compromise the public perception of the subjects.

This study also confirms that the different means of communication qualify the public space differently regarding health communication. Radio and television are more dependent on the political agenda and have addressed the controversies related to mandatory use when politicians raised the issue. On the other hand, the printed press offers a space for reflection that extends over time and is more dedicated to the general context of the app. It is important to mention that other controversies related to the app could not be analysed as part of this study. Furthermore, online news, which constituted the majority of pieces published on the app, was not considered and, therefore, we do not know if they could influence the results obtained.

Nevertheless, this work significantly contributes to understanding the news coverage of controversies in health and technology according to the sources of information heard in the process. Besides the previously mentioned analysis on the behaviour of different media and the reflection on how different sources can accentuate the controversy, this study highlights the nature of players involved as a relevant factor in explaining the controversy's dimension. In fact, and contrary to what happens in other health issues where the controversy is not relevant, in this study, political players appear as one of the key elements that fuel the controversy.

Translation: Rita Pacheco

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