

Zika and microcephaly: from the scientific discovery by Fiocruz to the institution's Facebook

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Introduction

The theme zika/microcephaly was one of the most relevant subjects in the Brazilian national news in the summer of 2015/2016 and raised important issues to be considered by the fields of health communication and science communication, such as the validation of discourses by science, limitations of knowledge scientific, the rise of information of doubtful veracity and its consequences, among others (AGUIAR, ARAÚJO, 2016). As a public institution for research and health promotion, the Oswaldo Cruz Foundation (Fiocruz) played a prominent role in this scenario for its research and scientific results and, from a communication point of view, used its Facebook page for a more direct interaction with the population (despite his media advisory efforts and presence of the media-mediated institution).

For an understanding of the panorama of contemporary communication, it is imperative to consider the changes brought about by the new information and communication technologies. In the area of science communication, the research "Public Perception of Science and Technology in Brazil" shows that the Internet and social networks are already the second main means of access to S & T information for Brazilians. In this context, Facebook, the platform that will be the object of this study, presents itself as one of the most popular social networks in Brazil.

In this paper, we study the approach of the theme "zika / microcephaly" in the official website of Fiocruz in the social network Facebook: from page postings during a year, which included a complete period of the epidemic, from the first news of the disease, through its peak, to the beginning of its latency period the following winter.

About zika - Discovered in Uganda in 1947, the zika virus had its presence confirmed in Brazil in May 2015. The disease in question is known as zika fever or just zika, and the virus is of the same family of the virus that causes dengue and the virus that causes chikungunya. In common, in addition to some of the symptoms, they have the same way of transmission, the mosquito *Aedes aegypti*. Unknown by health professionals, the infection was characterized

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by its similarity to dengue and by causing red patches on the skin. Initially, zika did not cause concern to health authorities, as only 20% of infected people develop the symptoms.

In October 2015, however, with the increase in the number of birth announcements of babies with microcephaly, experts began to suspect the relationship with the virus infection - a scenario confirmed by scientific findings released the following month, in November. From this moment on, the zika virus has become a significant public health issue within and outside the country (in February 2016 the World Health Organization considered the advancement of microcephaly linked to the zika international emergency situation). The zika outbreak gained national and international media attention, as shown by surveys such as that of Aguiar and Araújo (2016), and had enormous repercussions on social networks, as demonstrated by studies such as Garcia (2017).

The months that followed the November announcement were characterized by great uncertainties. Faced with an epidemiological emergency, where the scientific making was incapable of answering all questions of public opinion, the rumors multiplied, spreading fear in the population and worrying the organizations of the health area.

Social networks and communication on science and health - To think about any aspect or theme within contemporary communication, one must consider the enormous impact of new media. According to the Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação, most Brazilian households (51%) have access to the internet and that the country has just over 100 million users, numbers that are growing every year (TIC Domicílios, 2015). The use of social networks, such as Facebook, was cited by 77% of respondents as one of the activities practiced on the network. According to the latest research on "Public Perceptions of Science and Technology in Brazil," the theme "Medicine and Health" is the one that most arouses interest among Brazilians and the internet is already the second main means of access to information on science and technology.

Taking this into account, we argue that the Internet can be a great ally in public engagement with science and health issues. For Nisbet and Scheufele (2009), new digital media have the potential to mobilize individuals and increase public participation in science. For Garbin, Guilam and Neto (2012), who spoke about the use of the Internet for health promotion, access to the diversity of information and tools enables the individual to be the agent of the knowledge acquisition process itself. Bortolozzi et al. (2015), in turn, emphasize that the health area is one of the most available and accessed on the Internet, while Wilcox (2012 apud ROCHA, 2016) believes in the power of digital networks to change the paradigm of distance between science and the public, something also observed by Antunes et al (2014).

However, studies about the internet and social networks need to consider the negatives and pitfalls of the medium. Garbin, Guilam, and Neto (2012) highlight the inequality of access to digital media as a reproduction factor of the existing forms of exclusion. They also question the quality of the information provided (sometimes incomplete, contradictory, incorrect or fraudulent), ask whether the Internet does not reinforce the intense medicalization of society and problematize the possible empowerment of the user, which could lead to extreme individualization of issues that should be related to public health policies.

One of the focuses of efforts to spread science and health on the Internet without a doubt should be Facebook, the most popular social network in the world today. Created in 2004, Facebook reached the mark of one billion active users daily in 2016. In Brazil, a survey of Facebook itself pointed out that 99 million Brazilians access the platform at least once a month and that 8 out of 10 connected Brazilians are in this network. For Recuero (2012), social networks, such as Facebook, need to be thought of as their characteristics as a means of

disseminating information, in addition to the contents that are spread and produce four intrinsic effects. The first is the formation of cascades of content sharing, which affect the circulation of information exponentially; the second is the decentralization of the production of this information (and the consequent creation of filtering structures, which in Facebook correspond to its system of algorithms). The third place, the interconnection between the various audiences of a social network, with the confusion between the emitting and receiving poles of the communication process. And, finally, the replication of information and content from another medium, with the dissemination of links that direct the public to external sites.

Method

In this paper, as already mentioned, the Fiocruz Facebook page will be analyzed. Linked to the Ministry of Health, Fiocruz is present in several Brazilian states. In 2006 it was voted the best public health institution in the world by the World Federation of Public Health Associations and, according to the ranking of the University of Leiden in the Netherlands, Fiocruz is the best research institute in Brazil regarding scientific production quality. In the study on "Public Perceptions of Science and Technology in Brazil" cited above Fiocruz is the most mentioned by the interviewees. In June 2018, the Fiocruz Facebook page has reached about 120 thousand followers.

When an institution creates a fan page, it can share the most varied types of content with other users of the social network. In this research, it was decided to evaluate the publications of the Fiocruz Facebook page on the topic zika / microcephaly. Initially, through the program Netvizz, data were collected for the last 999 posts (maximum number that the software allowed to obtain), counted retroactively from the day of download (07/28/2016). Information was collected such as date, message, type, number of engagement, comments, likes, shares, among others. Data from posts dated February 24, 2015, until July 28, 2016, were obtained.

Subsequently, these publications were screened, selecting only those that mentioned the term "zika" and/or "microcephaly" in their text. The published posts of the first mention of the term zika, observed on 05/14/2015, until May 2016, completing one year, were stipulated as a corpus of research. We understand that this period covers a cycle that begins with the discovery of the zika virus in Brazil, passes through the period of low initial visibility, the explosion in the following summer, with the discovery of association with microcephaly and ends at the beginning of a new period of latency, with the end of the hottest period of the year. The final corpus obtained consists of 132 posts.

The content analysis carried out in this paper is based on the models advocated by Bardin (1977). This methodology allows mapping each unit according to the aspects considered relevant to the research. The construction of the protocol used was based on two studies consulted during the literature review. In Ramalho et al. (2012), this method was designed to be applied to the science and technology news published by the Iberoamerican countries. In Rocha (2016), the developed model was used for the analysis of Facebook postings of science museums.

The first dimension of this protocol is exclusively to identify each unit of analysis from the date of its publication on Facebook and a brief description of its message. The second, "Framing", is composed of eight categories of thematic classification, and the same post could fit into more than one of the categories. The third, "Format", identifies which features are used by the page editing to serve the posts (text, image, link, video, hashtag or other). Finally, in

"Engagement", we sought to observe the volume of interactions that the audience maintained with the posts, through their engagement (sum of likes, comments, and shares). Although each of these possibilities of participation presents different meanings from the interaction between the public and the page, this work will not delve into this differentiation or even create a hierarchical method between them. Besides, there is no pretension to delve into audience behavior or page reach statistics. This study also analyzed, in a qualitative way, the comments with greater engagement published in the period. However, we will focus on the quantitative results, observed through the methodology described above.

Results and discussion

The results were organized to form a panorama divided into four dimensions (frequency, framing, format, and engagement), and will be presented as follows:

Frequency - In this topic, we analyze the frequency of posts on zika / microcephaly on Fiocruz's Facebook page, relating them to the total universe of publications made in it. During the period considered in this study Fiocruz made 720 posts, but with a certain variation of frequency according to each month and each day of the week analyzed. In the months with more activity (May / 2015, October / 2015 and November / 2015), 84, 77 and 74 posts were published, respectively. Meanwhile, the month of August / 2015 registered the lowest index of publications, only 17. It is worth mentioning that between July and August of 2015 there was a strike in Fiocruz and the page of Facebook got to be 18 consecutive days without activity.

Among all the activity of the page in the period stipulated for the research, there are 132 posts that approach the subject zika and/or microcephaly. This means that about a fifth of the publications made by Fiocruz on its Facebook page, between May / 2015 and May / 2016, talked about it. However, this proportion also varied widely: while there were no mentions in July / 2015, August / 2015 and September / 2015, for example in November / 2015, December / 2015, January 2016 and February / 2016 zika posts accounted for 21 %, 41%, 45% and 60% of total posts, respectively.

The data allow us to conclude that the topic zika / microcephaly was highlighted in Fiocruz's Facebook page after November 2015, after the indications that the disease was associated with an increase in the number of cases of microcephaly, followed by the officialization of this thesis by health agencies. Then, with the arrival of summer and the explosion of the number of cases, the theme continued on high. Since the institution was directly involved in the research and technological development related to the epidemic, as we had hoped the Fiocruz page followed the coverage of the press and the displacement of public attention, which intensified with the news of the association of the two diseases, scientific results and with the debate itself on the outlook that the epidemic of a little-known disease like zika has elicited. In April and May 2016, however, attention to the subject is less relevant, although it is not possible to confirm a downward trend without the analysis of the following months.

Framing - This topic deals with the framing of the posts. In 21 of the 132 publications, posts were classified in more than one category. The "News / Results / Discoveries" frame was the one with the highest number of occurrences, 25% of the posts. The frame "Political and/or Institutional Issues" came next, with 24%, with the frame "Scientific Events" being the third place with 15% presence. The others are Actions / Service, 12%; Microcephaly Reporting

Bulletins, 10%; Orientations, 10%; Clarification of hoax, 9%; and Posts mentioning news stories or scientific papers about Fiocruz, 8%).

The types of frames obtained and the number of occurrences of each one of them could indicate the priorities of approach and treatment of the question by Fiocruz in Facebook. In a context of an epidemic caused by a little-known virus, Fiocruz stood out as the entity responsible for the leading scientific discoveries, the development of innovations and the proposal of public policies to combat the epidemic. In its Facebook page, the scientific approaches were prioritized, with the dissemination of research results, academic events and technological innovations; and political-institutional, with the publication of contents of the Ministry of Health and the Federal Government.

It is worth mentioning the space dedicated to clarifying rumors and disseminating basic information on zika / microcephaly, which indicates Fiocruz's proposal to dialogue with a broad public, in addition to its network of academic and scientific links. Specifically on rumors, it should be noted that the uncertainties and doubts aroused on the topic, together with the facilities for dissemination of information made possible by social networks, have created a propitious environment for the multiplication of content without scientific foundation, as also identified by Aguiar and Araújo (2016) and Garcia (2017). As problematized by Garbin, Guilam and Neto (2012), this reality corroborates the idea that some of the information presented on the internet presents questionable quality and comes from sources with little or no credibility. In seeking to counter the rumors in circulation, Fiocruz is actively involved in the production of the narrative about the zika / microcephaly epidemic.

Format - Of the 132 posts, 120 presented some image, either uploaded (80 cases) or automatically uploaded by a link (40 posts). The type of image most used is photography, such as mosquitoes, events, authorities, laboratories, among others. Also, there are 22 occurrences of electronic flyers, usually with information about events and actions. It was also observed, in particular cases, the use of infographics, comics, and tables.

A strong institutional bias is present in 32 of the published images. Pictures of Fiocruz's units, Fiocruz's presidency and its directors, political authorities, and other examples often appear. In 22 cases, the images propagate signs of science and medicine, such as laboratories, scientists, doctors, etc. There are also ten mosquito images, alluding directly to the vector of the disease. These data indicate that the page is used as a mean to strengthen the image of the institution and also uses the credibility of Fiocruz and trust associated with scientific symbols to try to reduce the uncertainty of the moment of crisis. As pointed out by Antunes et al. (2016) about the imaging representation of the epidemic in Instagram, images related to pregnancy are also recurrent in Facebook of Fiocruz: 17 registers bring pregnant and/or newborn, in detail of the belly, breastfeeding or babies' heads, strengthening the relationship between zika and microcephaly.

All posts have some text, and the use of links is also quite common, appearing in 114 posts. Of these, 99 go to the website of the Fiocruz News Agency - often for texts published in other communication channels of the Fiocruz units and reproduced in the agency. The use of videos that run directly on the Facebook page (not links to videos on other platforms) is small (there are only ten occurrences) and five live broadcasts were made during the period, usually at press conferences. The use of hashtags occurred in 109 posts, and 216 hashtags were used in total (with repetitions), with the highlight for #zika, with 76 appearances, followed by #microcephaly (30), #chikungunya (22), #dengue (20), #Aedes (10) and #AedesAegypti (10). Other hashtags refer to units, institutes, and publications of Fiocruz, such as #FiocruzPernambuco and #InformeENSP. No other features, such as animated gifs or status

change, were used in posts about zika / microcephaly. In short, the Fiocruz page opted for more traditional formats, with little variation and experimentation in this dimension of Facebook.

It is interesting to observe parallels between these results and the numbers found in similar works, such as Rocha (2016), who studied the Facebook pages of the Botanical Garden (JB), the Museum of Astronomy (Mast), the Museum of Science and Life (MCV) and the Planetarium, all of Rio de Janeiro state. While the presence of texts occurs in 100% of the Fiocruz posts considered in this research, the results obtained by Rocha (2016) vary between 92% and 100%. As for the use of images, 90% of the posts on the Fiocruz page present this feature, while this percentage varies between 65% and 100% in fan pages evaluated by Rocha (2016). Regarding the use of links, the index found in this research (86%) considerably surpasses the highest percentage recorded by Rocha, which was 33%. The same occurs with the occurrence of hashtags, which in Facebook of Fiocruz appears in 82% of the posts, while in the pages analyzed by Rocha (2016) the percentage varies between 15% and 23%. The videos are broadcast in 7% of the analyzed posts in this survey and only 2% in the page with the highest occurrence recorded by Rocha (2016).

Engagement - The engagement number corresponds to the result of the sum of "likes", "comments" and "shares"; and lets measure audience participation on Facebook fan page posts. In the period under study, the total engagement rate was 347. If isolated only to zika / microcephaly publications, this number rises to 987, evidencing the interest aroused by the theme. However, there was a great variation in the engagement even among posts on zika / microcephaly: of the 132 analyzed, 110 had less than average engagement (987), while the publication with more interactions, published in December / 2015 and classified in category "Rumors / Clarifications", arrived alone with more than 33 thousand of engagement. The month that reached the highest average of engagement was December / 2015, with 2315 - in part, to the repercussion of this single post.

Posts classified as "Clarification of hoax" were the ones with the highest average engagement (4332). In this category, only 4 of the 12 publications had engagement performance lower than the mean posts on zika / microcephaly (987). On the other hand, even in the "Orientations", and "News / Results / Discoveries" categories, most posts were below average (9 of 13 and 26 of 34, respectively). This could indicate that of the three categories with the highest average of interactions, only in "Clarification of hoax" the number could reflect the interest for the category as a whole and not precisely the interest for only specific posts. In the other two, the average is changed by a minority of posts that have performed better.

Final considerations

From the analysis of the frames of the posts, it was possible to conceive which image of "science" was conveyed in the context of zika / microcephaly by Fiocruz on Facebook. Traditional signs of science were used to confer credibility and validation of the contents disseminated by the page, clearly presenting a positive bias and appreciation of scientific work and the institution itself. This was in contrast to the scenario marked by feelings of uncertainty, instability, and risk observed in the epidemic by other researchers (AGUIAR and ARAÚJO, 2016, ANTUNES et al., 2016, NUNES and PIMENTA, 2016, GARCIA, 2017).

The plurality of approaches of the posts also seems to indicate that Fiocruz sought to dialogue with a broader public than only the researchers, students, and professionals inserted in its network of links of action. If the engagement categories were analyzed according to the engagement, "Clarifications of a hoax", "Orientations" and "News / Results / Discoveries" received more attention from the public. In this case, the potential of Facebook as an essential tool of science communication is verified, rather than of communication between peers.

Publications addressing rumors deserve special consideration. In discussing and directly combating these narratives on its page, Fiocruz disputed the production of meanings about the epidemic with other sources, of dubious credibility, but which gained visibility among part of the population. These publications received the highest number of engagements, demonstrating the public's interest in more official sources of information on the issues raised by the rumors.

About the format of the posts, the data of this research indicates the option to use more traditional features in the posts. The Fiocruz page varied and experienced little concerning the various formats made possible by Facebook. The use of static images, texts and links were predominant in detriment of videos (with few occurrences) and gifs (with no presence). The latter are formats that, according to Rocha (2016), generate higher traffic and engagement in the network. These data can demonstrate both an institutional positioning that is more averse to the use of these resources (in the case of gifs and other less traditional possibilities of communication) and/or, also, lack of capacity to exploit the potential of networks, in this case, the preparation of specific materials for Facebook.

Limitations of this study should be highlighted. The chosen methodology allowed to conceive a panorama from the posts that addressed zika and/or microcephaly. Thus, it was left out of this research, for example, the understanding of others science-health related themes and also about the goals determined by the management team of the Fiocruz page, which could give more clarification on the management strategy of the social network by the institution. We think that this relevant case study, focused on the use of the leading current social network by the most significant public health institution in Brazil, can bring essential findings for science communications, but we reiterate that due to the few studies in the area, the universe of reality on science, health, and social networks is still mostly unknown.

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