Emotions in Health Tweets: Analysis of American Government Official Accounts
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Abstract—The Government Departments of Health have the task of informing and educating citizens about public health issues. For this, they use channels like Twitter, key in the search for health information and the propagation of content. The tweets, important in the vitality of the content, may contain emotions that influence the contagion and exchange of knowledge. The goal of this study is to perform an analysis of the emotional projection of health information shared on Twitter by official American accounts: the disease control account @CDCgov, National Institutes of Health, NIH, the government agency HHSgov, and the professional organization PublicHealth. For this, we used Tone Analyzer, an International Business Machines Corporation (IBM) tool specialized in emotion detection in text, corresponding to the categorical model of emotion representation. For 15 days, all tweets from these accounts were analyzed with the emotional analysis tool in text. The results showed that their tweets contain an important emotional load, a determining factor in the success of their communications. This exposes that official accounts also use subjective language and contain emotions. The predominance of emotion joy over sadness and the strong presence of emotions in their tweets stimulate the virality of content, a key in the work of informing that government health departments have.

Keywords—Emotions in tweets emotion detection in text, health information on Twitter, American health official accounts, emotions on Twitter, tweets, emotions and content.

I. INTRODUCTION

One of the services provided by government health departments is to inform and to educate the population about public health issues and health risks [1]. For this, they must meet minimum standards, especially if the information is released through mass media channels such as social networks. Twitter, Facebook and YouTube, are online platforms with great prominence in the search for health information [2], and news or data shown in these networks, can reach millions of users in a matter of minutes. An example was the use of Twitter by the World Health Organization during the influenza A (H1N1) pandemic [3]. As in other communication platforms, tweets can use objective or subjective language, implicitly involving the possible emotionality of the content.

Emotions are contagious and a key factor for the exchange of knowledge [4]. On Twitter, therefore, as with other types of accounts, when official health agencies launch a tweet, they not only share information but also emotions. In previous studies, the importance of emotions to trigger the exchange and viral content has been exposed, especially if positive emotions such as happiness are transmitted [5].

The objective of this study is to analyze the possible emotionality in the tweets of four official health accounts in USA during the period from April 15 to April 30, 2018. Thanks to this analysis we will be able to discover the emotional burden and the treatment of health tweets launched by the disease control account @CDCgov, National Institutes of Health @NIH, the government agency @HHSgov and the professional organization @PublicHealth. To do this, we use emotion detection in text, a technique that requires natural language processing and automatic learning techniques [6] through the IBM Tone Analyzer tool.

II. OBJECT AND METHOD

The object of analysis of this study, carried out from April 15 to 30, 2018, are the tweets of the official accounts @NIH (47 tweets), @HHSgov (84 tweets), @PublicHealth (76 tweets) and @CDCgov (98 tweets). Their tweets have been analyzed, not including retweets. In addition to the overview, we analyzed in depth, the tweets that during that period of time contained the words "health", "vaccine", "cancer", "disease/s", "drug/s" and the topics "E.coli lettuce romaine" and "eggs recalled". These conversation topics generated controversy during the period of time analyzed.

For the study, we used the Tone Analyzer of IBM Watson tool. This tool is an example of analysis corresponding to the categorical model of emotion representation. The categorical model defends that there are basic categories or emotions such as anger, disgust, fear, joy, sadness and surprise [7], and those emotions are represented by words or categories. Tone Analyzer analyzes the affective load of tweets, the words that each phrase contains, providing score from 0 to 1, being None <.5, likely present .5 - .75 and Strong> .75, and classifies them into one of the five basic emotions: anger, disgust, fear, joy and sadness.

III. EVALUATION AND RESULTS

The accounts analyzed are: 1) @CDCgov with 1.07 M followers. Centers for Disease Control & Prevention. 2) @NIH with 862 thousand followers. Official Twitter account of the National Institutes of Health. 3) @PublicHealth with 489 thousand followers. Official account of the American Public Health Association. 4) @HHSgov with 737 thousand followers. News and information from the U.S. Department of Health & Human Services (HHS).

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Fig. 1 @CDCgov tweets analyzed (April 15-30)

Fig. 2 @NIH tweets analyzed (April 15-30)
In the analyzed tweets of @CDCgov, 54.08% showed no emotion and 45.92% was classified in some of the basic emotions. For @NIH, 51.06% were non-emotional and 48.94% emotional. In the tweets of @PublicHealth, 50% were non-emotional and 50% presented emotions. And for the account @HHSGov, 61.90% were emotional tweets and 38.10% did not present any emotions. In the analysis of the four official accounts, the presence of emotion Joy is higher than of Sadness. Anger is not shown in any of the cases and Fear, does not exceed 7% of the tweets.

The disease control account @CDCgov, with more than 1.07M followers, is the one with the highest percentage of non-emotional tweets. The account of the government agency @HHSGov, (News and information from the U.S. Department of Health & Human Services), with more than 737 thousand followers, is the one with the largest number of tweets classified as joy.

At a general level, the data showed that emotionality is marked in the tweets of the official health accounts analyzed, reaching in the case of @HHSGov 60% of emotionality...
The emotional load that the tweet contains implicit in their words. The choice of some words preparing a message is emotional information that serves their followers as a guide to real situations in hospitals [9].

Tweets are natural contextual responses that target the general public beyond culture [10]. Therefore, it is important the work that official departments do with this tool, the information they disseminate, how they disseminate it and with what emotional load.

Through their accounts, they launch content that comes from an official source, is credited in advance with a degree of considerable truthfulness. Their followers will be in direct contact with the information whether positive or not, and with the emotional load that the tweet contains implicit in their words. The choice of some words preparing a message is essential to connect the user and also to show different types of emotions. The choice of an adjective with a greater or lesser degree of valence, excitation or dominance [11] can turn the emotional balance.

Health tweets, as it happens with other contents, can be positive or negative, transmit bad or good news and information in general. As the results showed with the word "cancer", bad news is associated with negative emotions such as sadness, understanding bad news as information that negatively affects the user. Normally, the bad news related to health was established in the doctor-patient relationship [12], however, now they are also part of the digital sphere.

Previous studies have shown that viral content increases if the news is positive and the content transmits positive emotions such as happiness, even affirming that emotional intensity affects the probability of sharing regardless of the positivity or negativity of the generated emotion [5]. Through this study, we have seen how the emotion Joy, predominates over Sadness in the twitter accounts analyzed. This fact would help the virality of the contents. In addition, the presence of emotions in tweets is very important, a factor that helps these official health agencies to fulfill their role of reaching the user, informing and educating.

V. CONCLUSION

As with ads that use emotional content, which get more connection with their audience, emotional content also influences the assimilation of information and its dissemination in social networks. Health departments with official accounts on platforms such as Twitter also generate emotional information that serves their followers as a guide to issues of great importance, for example with public health.

Emotions are present in personal, professional tweets and also in those published by government agencies whose main mission is to inform and educate.

REFERENCES


