

Typology of Tweets and User Engagement Generated by US Companies Involved in the Development of COVID-19 Vaccines

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Abstract

COVID-19 has evoked an unprecedented public health crisis throughout the world. This study conducted a quantitative content analysis of ($N=295$). Twitter posts generated by four US companies engaged in discovering a vaccine for COVID-19 to understand how their Twitter feed balanced corporate branding, product branding (vaccine, medicines, etc.), and disseminated reliable scientific information relating to COVID-19, in the social media space. Results suggested that these companies were actively embedding technical information in their corporate and product branding in the context of COVID-19. It was also observed that tweets providing technical and scientific information about the progress made towards the development of COVID-19 vaccine garnered high levels of user engagement from target audience. Findings indicate growing importance of technical communication in corporate settings during public health crisis.

Keywords: COVID-19 vaccine, pharmaceutical companies, branding, social media, content analysis

Introduction

The coronavirus disease (COVID-19) has unleashed a pandemic that has evoked serious public health concerns across the globe. To ameliorate part of the issue, experts are adopting the use of social media as a tool to disseminate public health information regarding this affliction based on the latest updates about COVID-19 vaccine trials. The epidemic began as a new virus, SARS-CoV-2, spread from Wuhan, China, since December, 2019, and spread to 114 countries within three months, forcing the World Health Organization (WHO) to declare a global pandemic since March, 2020. With no clinical therapeutic solution cure in sight, most administrative bodies have enforced stringent social distancing and quarantine measures as preventive strategies. At the same time, national governments, large pharmaceutical companies, and bio-technology start-ups, alone or in collaboration, started redirecting considerable proportion of their resources to develop new and/or repurpose drug compounds to provide a medical solution to this affliction.

Few studies that investigated organizational social media communication strategy during global health crises almost exclusively focused on the risk communication efforts undertaken by government or non-profit health organization. To the best of our knowledge, no study has investigated how for-profit science-based companies (for example: biotechnology/ pharmaceutical) engaged their consumers and stakeholders during such a global emergency. To address that paucity, this study developed a coarse-grained typology of tweets generated by the four US bio-tech/pharmaceutical companies during the COVID-19 pandemic. By categorizing the corpus of tweets a broader understanding on how the companies used Twitter during this unprecedented pandemic can be gained. Identification of tweet categories and the responses elicited by them will shed light on how these organizations disseminated reliable scientific/ technical information and complemented the health communication efforts undertaken by relevant government entities and non-profit organizations during the pandemic.

Methods

A quantitative content analysis of the Twitter content generated by the four foregoing U.S.-based companies was performed. The sample consisted of all tweets posted from the focal companies' Twitter handle from March 01, 2020 through May 31, 2020. We chose March 01 because arguable the first experimental broad spectrum antiviral drug (NHC, EIDD-1931) was reported to deliver promising results against multiple coronaviruses, including SARS-CoV-2 on March 05, 2020 (Sheahan et al., 2020) preceding WHO's declaration of global pandemic status for COVID-19.

All tweets were downloaded and saved using Twitter's Developer's account. Only text and links were retained. Emojis, or pictures embedded in the tweets were discarded. All direct replies were discarded too. Tweets originating during the last week of May were used for coding practice and were discarded from the final sample, yielding the effective study period to be March 01 through May 24, 2020.

U.S. Based Pharmaceutical Companies Engaged in Covid-19 Vaccine Discovery



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Findings

- About 23% of the tweets conveyed scientific information about the COVID-19 vaccines that these companies were developing. Although, features of corporate branding were observed in tweets that were primarily geared to disseminate COVID-19 related information (approximately 19%), a considerable percentage of tweets (15.6%) simply conveyed scientific information about various aspect of this disease, without resorting to any form of corporate or product branding.
- From marginal perspective, it appears that the companies struck a balance between corporate branding (32%) and product branding (37%). About 55% of the tweets shared some form of scientific/technical information and, in the context of COVID-19, an overwhelming 74% of tweets disseminated COVID-19 related information. Additionally, overall 43% of the tweets contained scientific or technical information on COVID-19 related topics.
- Highest user engagement was observed in the product-branding category that conveyed COVID-19 related information. In other words, tweets containing information about COVID-19 vaccine tended to elicit maximum user responses. Users mostly retweeted COVID-19 vaccine related tweets that did not contain any scientific/technical information; however, tweets containing scientific information related to COVID-19 vaccines earned more favorites.
- Significant difference in retweeting behavior was also observed between the class of tweets providing non-technical information about COVID-19 vaccines (Product-branding, non-technical, COVID-19 related class in Table 1) and the class of tweets that engaged in (a) corporate branding without providing any technical or COVID-19 related information ($p=0.001$), (b) technical product related information without conveying any COVID-19 related information ($p=0.004$), and (c) general scientific information not related to COVID-19 ($p=0.001$).
- Turning to H1a and H1b, the descriptive statistics associated with the average number of followers associated with each corporate Twitter handle, number of tweets (relevant to this study) generated by each Twitter handle, average number of favorites and average number of retweets garnered by each Twitter account during the study period

Company Specific Analysis of Twitter Activities and User Engagement				
Company	Mean no. of Followers (in '000)	No. of relevant tweets during study period	Mean (s.d.) Favorites count	Mean (s.d.) Retweet count
Invivo	10.6	40	131.55 (121.25)	70.75 (80.21)
Novavax	4.582	67	24.27 (19.70)	51.51 (257.21)
Moderna	22.5	40	230.2 (575.61)	154.55 (437.82)
J&J	197.5	148	54.65 (158.67)	42.62 (102.22)

Research Questions

RQ1: What are the predominant categories of tweets messages that US-based for-profit bio-tech/pharmaceutical companies generated during COVID-19 pandemic?

RQ2a: Which category of tweets generated by US-based for-profit bio-tech/pharmaceutical companies during COVID-19 pandemic elicited most retweets?

RQ2b: Which category of tweets generated by US-based for-profit bio-tech/pharmaceutical companies during COVID-19 pandemic elicited most favorites?

H1a: Number of followers associated with each Twitter handle is positively related with the number of retweets

H1b: Number of followers associated with each Twitter handle is positively related with the number of favorites.

Examples of Tweets by the Companies

Corporate-branding, non-technical, unrelated to COVID-19	"We just announced first quarter 2020 financial results &business updates. Read more: https://t.co/5XkPGhpUw https://t.co/mDaWS28M6h 5/7/2020" (Moderna, 5/7/2020 at 11:04am)
Corporate-branding, non-technical, COVID-19 related	"J&J is proud to honor the frontline health workers courageously leading our communities through the #COVID19 crisis. Watch to meet some of these fearless frontline heroes, and learn how you can join J&J." (J&J, 4/26/2020, 4:00 pm)
Product-branding, non-technical, COVID-19 related	"Inovio Pharmaceuticals [®] race to create a vaccine began when the genetic sequence of COVID-19 was posted online by Chinese scientists just weeks after the outbreak was identified. https://t.co/JfgmAuJ00 https://t.co/kawgGghz2s " (Inovio, 3/22/2020, 11:37pm)
General, non-technical, unrelated to COVID-19	"CDC estimates that between Oct. 1 and March 14, at least 38 million people were sick with fl <u>u</u> . https://t.co/pWoauiL141 " (Novavax, 3/24/2020, 1:37 pm)

