

COVID-19 Misinformation and Polarization on Twitter: #StayHome, #Plandemic, and Health Communication

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ABSTRACT

This study investigated polarization on Twitter related to the COVID-19 pandemic by examining tweets containing #Plandemic (suggests the pandemic is a hoax) or #StayHome (encourages compliance with health recommendations). Over 35,000 tweets from over 25,000 users were collected in April 2020 and examined using sentiment and social network analyses. Compared to #StayHome tweets, #Plandemic tweets came from a more tightly connected network, were higher in negative emotional content, and could be sub-divided into specific categories of misinformation and conspiracy theories. To evaluate the stability of users' COVID-related perspectives, the prevalence of pro- and anti-mask sentiment was measured in same users' tweets approximately four months later. Results revealed substantial stability over time, with 40% of #Plandemic users tweeting anti-mask hashtags compared to just 2% of #StayHome users. Findings demonstrate COVID-related polarization on Twitter and have implications for public health interventions to quell the propagation of misinformation.

KEYWORDS

COVID-19, Health Communication, Misinformation, Pandemic, Public Health, Social Network Analysis, Social Networks, Twitter

INTRODUCTION

Social media has become increasingly popular over the past two decades, with current statistics indicating that 2.65 billion people worldwide use at least one social media platform (Clement, 2019a). One popular platform is the microblogging site Twitter, which allows users to disseminate short messages to other users. Twitter has approximately 330 million active users, including 1 in 5 adults in the United States (Clement, 2019b; Hughes & Wojcik, 2019). According to a 2019 survey, 71% of Twitter users get news from the site and 42% use the site to discuss politics (Hughes & Wojcik, 2019). Twitter has also become a popular site for sharing and discussing science and science policy (Anderson & Huntington, 2017; Su et al., 2017). In the context of the COVID-19 pandemic, a number of major health organizations, such as the Center for Disease Control and Prevention and the

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World Health Organization, have launched social media campaigns to communicate with the general public about the nature of the novel coronavirus, current numbers of cases and deaths, public health recommendations, and other pertinent information (Merchant & Lurie, 2020). Due to the rapidly developing nature of the pandemic and widespread recommendations to reduce in-person social contacts, social media sites such as Twitter have also become an attractive means of sourcing and sharing pandemic-related information among the general public (Limaye et al., 2020).

Recent research has raised concern about polarization on Twitter, a phenomenon that occurs when users primarily interact with others who share their views within insular communities (Conover et al., 2011). Polarization produces social networks of users who share similar views and who are more likely to interact with one another than with other users. These networks are distinct from formal online groups in that they form organically through users' online behaviors (e.g., engagement with others' posts) and lack a defined structure or organization. Polarization can contribute to a number of negative outcomes, including the proliferation of false information and resistance to outside influence. A swell of misinformation (i.e., false information) related to COVID-19, including conspiracy theories, has already been documented on Twitter (Kouzy et al., 2020), raising concerns that this may be dissuading people from following the recommendations of health experts (Limaye et al., 2020). At the same time, there is a dearth of research on social networks that share COVID-related misinformation on Twitter. The overarching aim of the current study was to examine the characteristics of these networks using social network and sentiment analyses.

BACKGROUND

Polarization and misinformation have previously been studied in the context of chronic diseases, such as cancer, as well as infectious disease outbreaks, such as Ebola and Zika virus (Wang et al., 2019). As Pershad et al. (2018) point out, Twitter can be a powerful tool for scientists, clinicians, and science communicators to disseminate health information, but it can also provide a platform for non-credible, untrustworthy sources. In other words, anyone can claim to be an expert on Twitter, which can lead to the formation of small communities that endorse scientifically unsupported beliefs. Past infectious disease outbreaks have provided opportunities for studying the way that disease-related misinformation spreads on social media, particularly Twitter. For example, in an analysis of tweets related to the 2014 Ebola outbreak, Jin et al. (2014) identified a number of false rumours (e.g., that the iPhone 6 was causing infections, that terrorists were intentionally spreading the virus) that spread in similar manners to true news. This polarization and spread of misinformation may contribute to negative downstream health consequences for individuals and societies. For example, belief in medical conspiracy theories have been associated with poorer health behaviors, such as not using sunscreen, avoiding vaccination, and using alternative medicine in place of traditional medical care (Oliver & Wood, 2014). Similarly, models based on influenza, monkeypox, and norovirus outbreaks suggest that misinformation can have a large impact on public health, largely through individuals' health behaviors that can either increase or decrease their likelihood of contracting or spreading the disease (Brainard & Hunter, 2020).

In the context of COVID-19, belief in conspiracies (e.g., that the virus is a biological weapon) and misinformation (e.g., that the virus is no more severe than seasonal influenza) has already been linked with a reduced likelihood of wearing a face mask (Romer & Jamieson, 2020), reduced willingness to receive a COVID-19 vaccine (Romer & Jamieson, 2020; Teovanović et al., 2021), and poorer overall compliance with public health guidelines (e.g., physical distancing; Earnshaw et al., 2020; Lee et al., 2020; Teovanović et al., 2021). Similarly, Clark et al. (2020) found that people with low levels of trust in government, a feature of many conspiracy theories, were less likely to wear masks, practice physical distancing, and engage in frequent handwashing. Belief in COVID-19 conspiracy theories is also associated with a greater likelihood of using pseudoscientific practices, such as consulting an astrologer or inhaling saline solution, to attempt to prevent COVID-19 infection (Teovanović et al.,

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