Research Poster

OMG! It's FMD! Monitoring Twitter Conversations About Foot-and-Mouth Disease

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Introduction

Australia has strict biosecurity protocols in place to protect its agricultural industry and environment (Australian Government: Department of Agriculture, Fisheries and Forestry [DAFF], 2021). When foot-and-mouth disease (FMD) was detected in the nearby country of Indonesia in early May, 2022, the Australian government and agricultural industry was placed on high alert for the possible incursion of this contagious viral disease (DAFF, 2022). FMD affects ungulates, or cloven-hoofed animals, such as cattle, sheep, and pigs (Jamal & Belsham, 2013). Although non-threatening to humans, the presence of FMD in Australia could cause catastrophic losses to livestock numbers and an estimated AUD$80-billion-dollar cost to the economy (Australian Bureau of Agricultural and Resource Economics and Sciences, 2022). Indonesia's proximity to Australia makes it a popular destination for tourists and this outbreak of FMD occurred during peak travel time due to the overlap with school holidays (Whiteman, 2022). Although Australia's bar for biosecurity is high, inspection rates increased, decontamination mats were introduced to major airports, and messages about the risks of an FMD outbreak were airing nationwide once the threat was confirmed (Carter & Sullivan, 2022). Twitter provides a platform for discussion and scientific communications about agricultural issues such as FMD; however, it is important to understand how these issues are being discussed, who the discussion leaders are, and how effective current communications efforts are at disseminating information. This study's purpose was to explore Twitter content about this issue to identify message sentiment and key influencers.

Conceptual Framework

The two-step flow of communication (Katz & Lazarsfeld, 1955) can be applied to Twitter-based conversations. In the model, opinion leaders provide an intermediary step between content creators and the public (Choi, 2014). Online public forums are often used to determine what the public says about topics in the media, such as disease outbreaks (Choi, 2014; Ruth et al., 2020). These opinion leaders often digest mass media, then share news with their own personal influence (Roshwalb et al., 1956). Twitter content allows conversations and engagement among these stakeholder groups that can be analyzed to determine communication effectiveness, metrics, and sentiment (Specht & Buck, 2019). Two-step flow can help show how opinion leaders are affecting the conversation around FMD.

Methods

This study is a descriptive, quantitative content analysis conducted using Meltwater, a social media monitoring program. Although the FMD situation in Indonesia is ongoing (DAFF, 2022), we selected the data collection dates of May 1-August 31, 2022, to include the first recorded case of FMD in Indonesia until the University of Melbourne's Centre of Excellence for Biosecurity Risk Analysis increased the risk of an incursion from 9% to 11% in August (Dodd, 2022), the first increase in five years. The Meltwater search parameters were to identify Twitter posts in English that contained at least one of the following keywords: "foot-and-mouth disease," "foot and mouth disease," or "#FMD." The search also excluded any results with "hand, foot and mouth disease" or "hand foot and mouth disease" to eliminate content regarding human disease. These parameters identified 29,455 tweets to include in subsequent analyses. The posts were analyzed via Meltwater widgets. The subjective and emotive nature of Twitter posts allows them to be categorized as positive, negative, or neutral (Liu, 2012). Top Twitter posters were identified, as well as tweets with the greatest reach or how many Twitter users could have seen the post due to the hashtag (Team, 2022). The research objectives were: 1) to determine the percent of positive, negative, and neutral

sentiment of Twitter posts regarding this topic and 2) to identify the top Twitter accounts posting content about this topic.

Findings

Meltwater uses natural language processing (NLP) to classify the sentiment of each tweet as positive, negative, or neutral by assessing opinion and tone. NLP is a branch of artificial intelligence in which computers have the ability to understand text or spoken words and assign them meaning similar to how humans would (IBM, n.d.). Of the 29,455 posts analyzed via the search parameters, 10% of posts were positive, 54% of posts were negative, and 36% of posts were neutral. Based on the search results with the greatest reach or number of potential viewers, the top 10 Twitter accounts were all media outlets (Table 1).

Table 1.

Top 10 Twitter Accounts, Number of Tweets and Sum of Potential Reach

Twitter Account	Number of Tweets	Sum of Potential Reach
CNN	1	58.8 million
Reuters	3	25.4 million
Fox News	1	22.2 million
ABC News (U.S.)	1	17.6 million
Associated Press	2	15.9 million
CNN International	1	13.9 million
Guardian	3	10.6 million
Bloomberg	9	8.6 million
Hindustan Times	3	8.6 million
Al Jazeera English	2	8.0 million

Note. The Sum of Potential Reach figures are rounded to nearest hundred thousand.

Conclusions, Implications & Recommendations

The use of Meltwater for data collection and analysis is a limitation; however, the data demonstrated how the potential of an FMD outbreak in Australia led to news coverage around the world. The posts were predominantly neutral or negative in sentiment, which is to be expected with this type of topic. The top 10 Twitter accounts based on reach and number of potential viewers were all media outlets indicating attention was given to reporting the potential of an FMD incursion. As most of the top posters are news broadcasters, consistent and accurate communications across platforms was vital, even across international borders. Within the two-step flow model, information from the mass media is shared through opinion leaders to their followers, even on social media (Choi, 2014). The involvement of media outlets with large reach demonstrated the messages about FMD were being shared to a wide audience, which demonstrates communication effectiveness.

FMD is a significant risk to biosecurity and demonstrates the need for effective risk and crisis communications efforts. Although Australia already has plans in place for an outbreak, there is a gap in public knowledge that should be addressed. Creating crisis communications strategies and tactics that leverage social media platforms, such as Twitter, will help increase awareness around FMD and create a sense of ownership to help stop an incursion. Additional research should continue to explore how opinion leaders communicated about this issue through traditional media outlets, personal social media accounts, and organizational efforts.

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