

Twitter users' sentiments toward mask wearing

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Background: As of September 2021, more than 221 million COVID-19 cases had been confirmed globally. Not only have people's lifestyles and work patterns changed significantly, but also individuals' ideas, opinions and attitudes.

Social media platforms have become increasingly essential information sources through the pandemic. On 20 March, 2020, the United Kingdom government officially ordered that all its bars, restaurants and cafes must be closed immediately, and that they would not be open for business for at least 14 days. This and subsequent closures became known as "lockdown": no public social activities or other activities in-person such as shopping or schooling, which decreased opportunities for face-to-face communication. Due to the lockdowns for coronavirus disease (COVID-19), social media (Ronnie Das and Wasim Ahmed, 2020) has played an influential role in making social media even more important for exchanging peer-to-peer information in real time. For example, The Scottish Government's official Twitter account @scotgov updates its followers daily about the pandemic by using hashtags such as '#coronavirus' and '#StaySafe'. Apart from traditional media such as newspapers and television broadcasts, social media broadens possible directions of communication: communications happen not only from official information providers to the public, but also to and from members of the public with the governments, and with one another. People have been able to obtain frequent up-dates about the pandemic from governments and mainstream news organizations from their official social media accounts to follow the social distance policy and get the latest pandemic news as soon as possible.

The World Health Organization advises people to wear a face mask in public to protect themselves from COVID-19. It provides materials and cites supporting studies demonstrating that a medical face mask is an effective way to protect people from COVID-19. Some researchers (Kashyap, A., Singh, K., Sabat,2020) think that face masks, as a form of personal protective equipment (PPE), are an effective, economical barrier against the virus.

People have varying attitudes toward wearing face masks, a controversy which has led to extensive public debate during the pandemic. Wearing a face mask has been a normal occurrence in East Asia for many years, but not in Western countries such as the United Kingdom and the USA (Prasad, R. 2020,BBC News), where usage of face masks has historically been rare (Aravindakshan, A., Boehnke, J, 2020).

Objective(s): We approached the current study with the following questions: (1) what is people's attitude when they are talking about wearing facecovering policy on social media? (2) Have the attitudes about face masks changed throughout the pandemic?

Method: The first step was data collection with the Twitter API and tweepy to retrieve the text from the collected tweets. Next, we prepared the data for analysis by pre-processing and cleaning the tweets. In the third step, we visualized the cleaned and tokenized data in a word cloud. Finally, the specific topics were determined with sentiment analysis.

We extracted the data using the Twitter API from two subsequent time periods. Group 1 spanned 21-10-2020 to 04-11-2020 (49,362 tweets), and Group 2 came from 16-12-2021 to 30-12-2021 (27,718 tweets). Each group lasts 2 weeks, according to the policy from Twitter API, only the data within 7 days can be collected, so there are 4 times to collect the corresponding data. The final dataset, consisting of all 77,080 tweets, was posted by more than 10,000 unique users who tweeted or retweeted posts with mask-related hashtags. The tweets are in English only. For each tweet, we retrieved the source and user information, including content, location, username, retweets, favorites, and the tweet's timestamp. For extracting these, we created a hashtag list (#facemask, #facecovering, #mask, #facemasks, #maskwearing, #Face-Covering) and then used an associated search list (facemask, facecovering, mask, facemasks, maskwearing, FaceCovering), which means 12 documents with those keywords separately will be collected at each collecting time.

Results: We found that Twitter users' attitudes evolved from negative and neutral to more positive when tweeting about wearing face masks. The public appears to have gradually accepted that masks have become a standard part of daily life. Although some researchers [9] have found that community use of masks is unlikely to be an effective control policy for seasonal respiratory diseases, people who insist on wearing masks significantly reduce the risk of clinical infections. Some recent research (Cowling, B. J., Chan, K. H., Fang, 2009) suggests that wearing a face mask can prevent household transmission of influenza virus. Since the SARS-CoV-2 virus remains viable and infectious in aerosols for hours, and for days on surfaces (Van Doremalen, N., Bushmaker, T., 2020), case testing and isolation may require a different strategy than that required to control SARS-CoV-1 (Zou, L., Ruan, F., Huang, M., Liang, L.). Our findings suggest that the necessity of a long-term and community-wide facemask policy has become more acceptable by the public for self-protection under the circumstances and as the pandemic continues.

Our sentiment analysis has shown that when people tweet about face masks, they post about a variety of topics. The findings suggest positive changes in thinking about face masks over a long amount of time. Tweets certainly can impact how policy makers, such as health boards and public safety departments, could communicate with citizens, as well as how to reach more citizens in shaping public policy on other health and social care issues that concern people. Some topics show the increasingly trending of public acceptance in terms of wearing facemask, illuminating that the rising of citizen recognition towards protective effect from facecovering.

Future Work: In the future, we would like to expand the size of the dataset and not only focus on Twitter but other social media platforms such as Instagram. Second, although we eliminated duplicate tweets to achieve accurate sentiment analysis, we cannot avoid Twitter

bots repeatedly retweeting the same tweets. This triggers massive repetition; the same tweets appear frequently under a certain hashtag or topic, resulting in making an inference on the topic popularity calculation, which requires importing related machine learning methods to classify.

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