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The impact of twitter on people's attitudes towards face mask during covid-19 pandemic in Malaysia

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Abstract
The impact of social media on people's attitudes towards wearing face masks has been significant, particularly during the Covid-19 pandemic in Malaysia. In this study, over 21 months spanning from March 2020 to December 2021. The datasets includes 1863 tweets that were collected and analyzed to understand the evolving attitudes and opinions of Malaysians towards the use of face masks as a preventive measure against the spread of the virus. The emergence of the COVID-19 pandemic prompted widespread discussions on social media platforms like Twitter, which played a critical role in disseminating information about the benefits of face masks wearing making them crucial sources for understanding public sentiment and attitudes, leveraging sentiment analysis and content analysis techniques. We used Python machine learning to analyze relevant tweets. Findings from this study reveal the temporal evolution of attitudes, reflecting the initial skepticism, growing acceptance, and eventual normalization of face mask usage among Malaysians. The analysis underscores the role of influential events, government announcements, and public health campaigns in shaping public discourse and attitudes. Moreover, the study highlights the influence of social media in disseminating information, dispelling myths, and fostering collective responsibility toward public health measures. While the minority emotions were positive, the proportion of anti-mask tweets was highly negative. The impact of social media on people's attitudes towards wearing face masks in Malaysia has been negative.

Keywords: Face mask, social media, sentiment analysis, negative sentiment, covid-19 pandemic

Introduction

One of the nations impacted by the COVID-19 epidemic when it first appeared in late 2019 is Malaysia. The Malaysian government has put in place several measures in response to the epidemic to prevent the virus from spreading, including the requirement that face masks be worn in public. In Malaysia, face masks have been required since April 2020, when it first went into force [1]. In Malaysia, wearing a face mask was required, and failing to comply can result in fines or even incarceration. To ensure adherence to the law requiring face mask use, the government has also given away free face masks to the populace. The Malaysian government has recommended using face masks. Face masks have been suggested to prevent the virus from spreading by preventing respiratory droplets from infected people. In Malaysia, the public has generally recognized the wearing of face masks as an efficient COVID-19 prevention method. The government has been strongly supporting the use of face masks through public health campaigns and programs [2] Social media, on the other hand, has served as a platform for the dissemination of false information and mistrust regarding the use of face masks. Some people have questioned the necessity of wearing masks as a result of conspiracy theories and misleading information concerning the efficiency of face masks in preventing the spread of COVID-19 that has been distributed on social media platforms [3]. The use of face masks has been encouraged by social media.

To fill those gaps, we analyzed the Twitter datasets gathered in Malaysia from March 2020 to December 2021 and replied to the subsequent study questions (RQs). 1. (a) What are the overall public attitudes in the direction of mask-wearing in Malaysia? (b) How have public attitudes modified over the years because the pandemic progressed?

2. What are people's worries or justifications? In response to these questions, the rest of the paper is organized as follows: Section 2 discusses the literature review of the current study. Section 3 describes the data collection and methodology, which are provided in Section 4 results, and discussions are followed by the conclusion and future research and limitations in Section 5.

Literature review

Positive impact towards face mask-wearing as a social norm promoted through social media.

Malaysians use social media to spread information about the positive impacts of using face masks to prevent the spread of COVID-19. They have disseminated statistics and scientific proof that show how efficient face masks are at avoiding the spread of the virus. This knowledge has contributed to increasing positive perceptions [4]. The government uses social media to encourage the implementation of face masks as part of its public health programs. As part of its public health initiatives, the Malaysian government has promoted the usage of face masks on social media [5]. The government has distributed videos and visuals that encourage the wearing of face masks in public spaces. These messages have aided in increasing understanding of the significance.

Social media has also been utilized to share pictures and videos of regular people wearing masks, which has helped to further support the notion that putting on a mask is an

honorable and kind gesture. Social media has also encouraged people to publish their photos and videos of themselves wearing masks, which has helped to change negative perceptions about mask use. Social media users have posted pictures and videos of themselves wearing face masks, fostering the idea that wearing a face mask is a responsible behavior. This has made it increasingly common for individuals to wear masks in public places [6]. This has encouraged individuals to view wearing masks as a collective gesture and a sign of solidarity, and it helped to create a sense of community around the practice.

Use of social media by health authorities to disseminate accurate information about the benefits of face mask-wearing

To raise public knowledge of the significance of wearing masks during the COVID-19 pandemic, health authorities must accurately distribute information about the advantages of face mask use [7]. Wearing a mask can assist in reducing the spread of respiratory droplets that may contain the virus, which is one of the important warnings health authorities have distributed. Health authorities have also disseminated information on the various kinds of masks that are readily available, how to use a mask properly, and how to properly dispose of masks. Health authorities now have an easy way to reach a wide audience and efficiently provide correct information thanks to social media [8]. Social media use has also increased interaction and engagement with the Social media use has increased interaction and involvement with the general public. Health authorities have addressed queries and worries posted by the public on social media, answering them truthfully and eliminating myths and misconceptions concerning the usage of face masks.

Use of social media by the government to promote face mask-wearing as part of their public health campaigns

During the COVID-19 outbreak, the Malaysian government used social media to encourage the usage of face masks as part of its public health efforts. The usage of face masks in public locations is being promoted by the government through the use of social media platforms like Facebook, Twitter, and Instagram [9]. Wearing a mask is a responsible and kind gesture that protects oneself and others against the spread of COVID-19. This is one of the main messages the government has communicated. The government has also offered instructions on how to wear a mask properly, what kinds of masks are most effective, and how to properly dispose of worn masks [10]. To engage the public, the government has employed a variety of strategies.

Negative impact of social media on face mask-wearing in Malaysia

The rapid spread of false information, the amplifying of non-compliance behavior, and the development of echo chambers that support opposing ideas have all been observed in Malaysia. Confusion and distrust among the general population have been caused by the dissemination of incorrect information about the efficacy and safety of face masks via social media platforms [11]. Additionally, viral content showing disregard for and defiance of face mask regulations has aided in normalizing such conduct and undermined the group effort to stop the spread of COVID-19. With people gravitating toward like-minded groups and being resistant to changing their opinions in the face of strong information, the presence of echo chambers has further polarized public opinion [12].

Proliferation of false information about face masks

During the COVID-19 pandemic, the spread of misleading information about face masks on social media has become a worrying phenomenon, throwing doubt on public health initiatives. Social media platforms have evolved into both a vital source of information and a haven for false information as the globe struggles to deal with the extraordinary challenges brought on by the virus [13]. Confusion and distrust have been spread among the public as a result of false statements that have been made concerning the effectiveness, safety, and necessity of wearing face masks. The quick and unfiltered dissemination of information on digital platforms, the attractiveness of conspiracies that feed on uncertainty, and the decline in confidence in well-respected scientific competence are some of the elements that are fueling this flood of disinformation [14].

The ease with which misleading information may spread through social media platforms is one of this problem's most startling features. Misinformation can spread quickly thanks to sharing, re-tweeting, and riposting, frequently outperforming attempts by fact-checkers and health authorities to refute it. This has been made worse by the lack of information at the beginning of the pandemic when many people were looking for answers a midst fast-changing regulations. Due to a lack of clear and consistent communication as well as social media algorithms' natural tendency to give priority to sensational content, misinformation was able to flourish in this setting [15]. In the struggle against COVID-19, the spread of misleading information regarding face masks on social media poses a serious obstacle. Conspiracy theories profit from uncertainty, misinformation spreads quickly thanks to the viral nature of digital platforms, and the amount of contradictory information undermines faith in scientific knowledge [16]. It will take a coordinated effort from public health organizations, social media platforms, professionals, and the general public to address this issue. By utilizing social media's benefits while avoiding the negative aspects, it is feasible to halt the spread of false information and guarantee that true information regarding face masks takes precedence, eventually enhancing the well-being of people and communities in these hard times.

Spread of conspiracy theories

The propagation of conspiracy theories during the COVID-19 pandemic has highlighted the less positive aspects of social media's power, showing how these channels may generate disinformation that undermines attempts to promote public health [17]. A particular confluence of doubt, anxiety, and the desire for secret knowledge has given rise to and spread throughout online discussions, fueling conspiracy theories about the virus and its causes. These hypotheses include everything from the claim that the virus was purposefully created as a bio weapon to the idea that it is a ruse to manipulate the population. Conspiracy theories are appealing because they can offer straightforward explanations for complicated and disturbing occurrences [18]. People seek understanding and a sense of control over their situations in a world that is coping with the sudden and perplexing emergence of a global pandemic. Conspiracy theories provide a captivating narrative in which

unidentified, frequently evil-seeming powers control events. This story is compelling because it claims to expose the purported reality hidden in official justifications, giving followers a sense of agency in a situation where they might otherwise feel helpless. Social media technologies, where users can find like-minded communities that affirm and amplify their opinions, serve to increase the allure [19].

There are many ways in which social media contributes to the spread of conspiracy theories. Conspiracy theories are more likely to emerge on users' feeds as a result of algorithms that unintentionally highlight sensitive and polarizing information to increase engagement [20]. The problem is made worse by echo chambers because people are more likely to find and spread material that supports their preexisting ideas. Because algorithms amplify content based on popularity rather than accuracy, conspiracy theories start to spread. Additionally, the democratization of information on social media obfuscates the distinction between confirmed sources and unverified assertions, making it difficult for consumers to separate trustworthy information from unfounded rumors [21].

Conspiracy theories have a negative influence on public health initiatives that cannot be understated. The urgency of following recommendations like mask use and immunization might be undermined by narratives that cast doubt on the severity of the illness or the justifications for public health interventions [22]. These ideas frequently prey on people's anxieties and fears, leading them to choose untested, potentially harmful alternatives over proven public health measures. For instance, the promotion of unproven "cures" or false information regarding the safety of vaccines can have severe repercussions, resulting in decreased vaccine uptake and a protracted pandemic. A diversified strategy is needed to combat conspiracy theories' proliferation. To engage with the public on social media platforms and provide evidence-based information in a way that is understandable and accessible, public health authorities and trustworthy experts must first do so. Demystifying the issue and putting an end to the attraction of conspiracy ideas can be accomplished by publicly discussing the ambiguities and complexity underlying the pandemic.

To stop the spread of these beliefs, collaboration with social media platforms to identify and mark erroneous or misleading content is essential [23]. Education about media literacy is another essential tactic. People who have developed their critical thinking abilities are better able to distinguish between trustworthy sources and stuff that is full of conspiracies [24]. Users can be equipped to make wise choices regarding the information they consume and share by learning how to assess the credibility of sources, cross-reference data, and query sensational claims. Furthermore, having courteous and sympathetic talks with people who hold conspiracies can encourage them to open up and perhaps even change their ideas [25].

Data and methodology

The data collection of this study covered 21 months between March 2020 to December 2021. The data came from citizens' comments on Twitter accounts and were coded in Python programming and we collected 1863 tweets. There are several essential steps in the approach, We gather tweets about face masks by incorporating pertinent keywords mask-wearing behavior, masks, face mask, face mask-wearing, face cover, cloth cover, and mouth cover. Next, Python scripts are used to send API (application programming interface) requests, which retrieve real-time or historical tweets that match the specified criteria. Hashtags like #face mask and #COVID19mask, user profiles, the name of the nation, and the period can all be used to target relevant topics. These queries can range from broad terms like "face masks" to more specific terms connected to arguments or actions involving the wearing of masks. Python computer software was used for the data after it had been gathered. By considering times Preprocessing of tweets included duplicate removal, lower casing, and contraction expansion. This calls for actions like deleting duplicates, managing re-tweets, and removing pointless content. Non alphabetic characters, @usernames, #hashtags, URLs, the queried hashtag, and the name of the specific country were removed. The Python package NLTK was used for tokenization, part-of-speech tagging, and stop-word removal. We identified and removed non-English tweets.

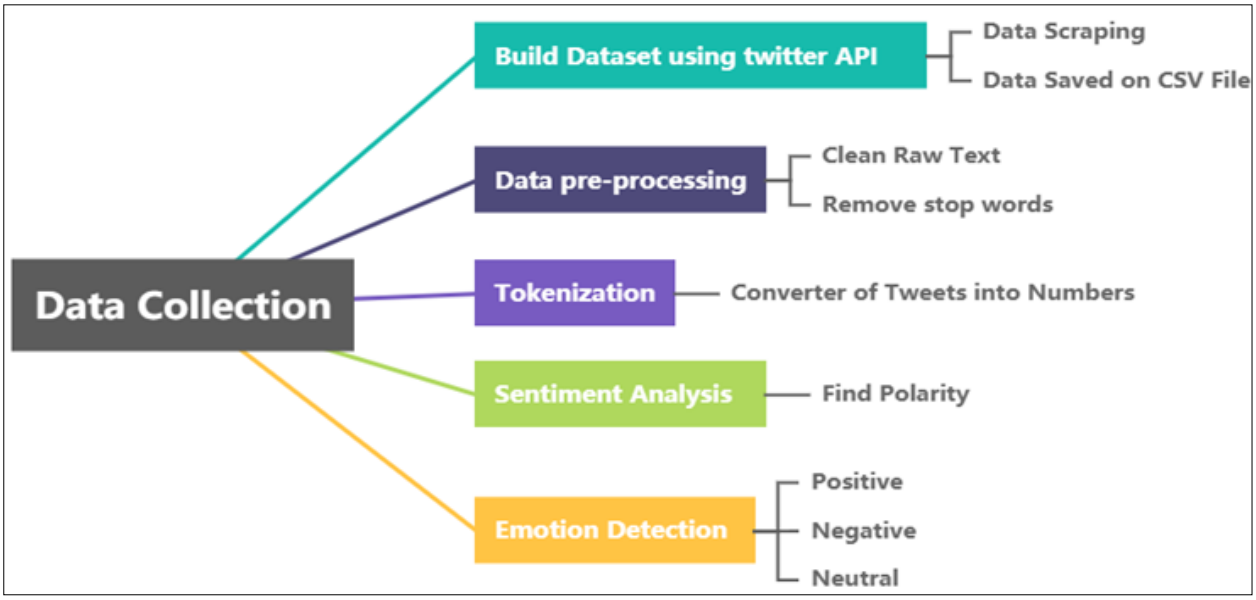

Fig 1: Research design

Results

We first present the sentiment analysis result during the study period of 21 months. A total of 1863 tweets met our inclusion criteria suggested negative tweets more than positive tweets and 59% of the relevant tweets didn't express their opinion.

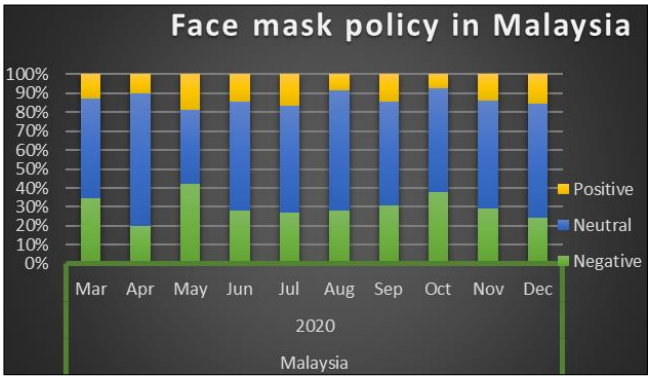

Fig 2: Progressive result of face mask policy in 2020

The presented chart in Figure 2 offers a comprehensive view of face mask perception in 2020. The green color denotes the negative perception, the blue shows the neutral perception, and the red represents the positive perception. A line graph depicts the sales trend, with each point on the line corresponding to the total revenue generated in a particular month. In 2020, the most time citizens with positive attitudes were in March, May, July, September, November, and December. The depicted chart provides an insightful representation of a year-long trend spanning the twelve months. The chart showcases distinctive patterns and fluctuations across the year. Notably, March, May, and October display an upward attitude, indicating the most with a high negative perception of the year, and May is the only month with few attitudes in 2020.

This decline could be due to potential reasons, suggesting an area for further investigation and improvement. Overall, the chart's visual depiction of the year-long data underlines the importance of identifying trends and seasonality, enabling informed decision-making and strategic planning for the upcoming year.

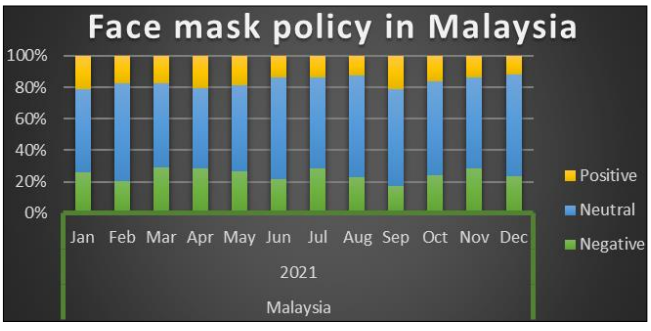

Fig 3: Progressive result of face mask policy in 2021

The chart in Figure 3 presents a comprehensive view of the data under consideration. On a positive note, it's evident that there has not been a noticeable increase over the year, which is a testament to the lack of trust. However, transitioning to a more neutral standpoint, while it seems to be slowing down in the most recent. As Figure 2 shows, initially, the proportion of negative tweets was higher than positive tweets.

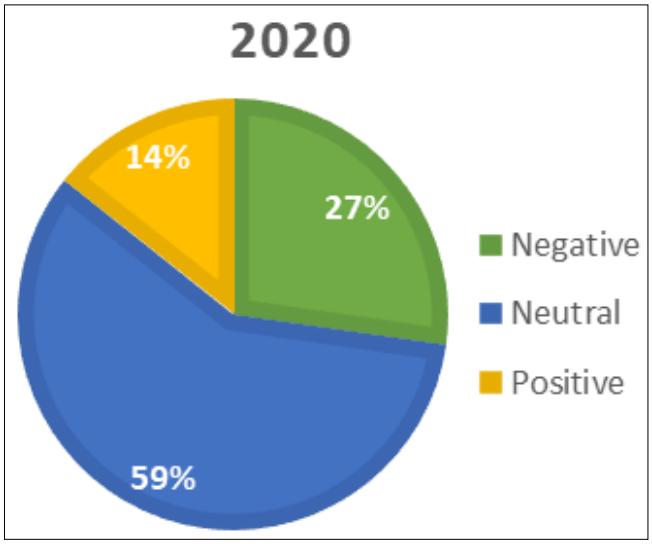

Fig 4: Global face mask policy in 2020

Figure 4 revealed 3 major categories of concerns or justifications with a positive perception of (14%), a negative perception of (27%), and neutral tweets (of 59%).

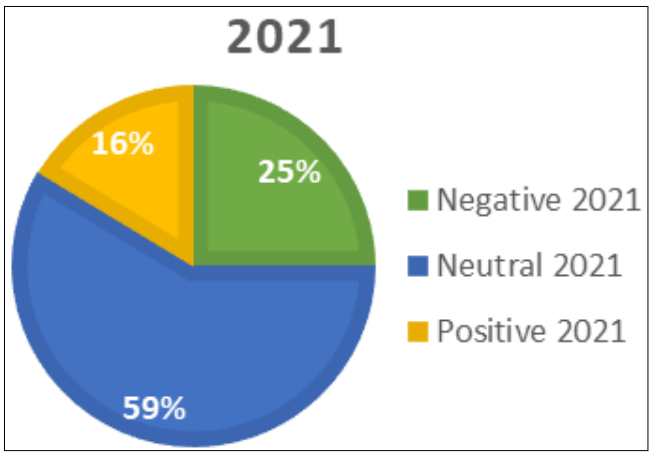

Fig 5: Global face mask policy result 2021

Figure 5 illustrates the distribution of attitude of face mask sentiment analysis for the year 2021. Each slice of the pie represents a category attitude. Notably, negative tweets (25%) indicate its significance in the overall year, (59%) neutral tweets and positive tweets (16%).

Discussion

Several variables may affect a person's adherence to medical advice during a pandemic like COVID-19. We deduce from the data that social media and governance have a big impact on Malaysian citizens' attitudes regarding taking preventive action [26]. The majority of respondents mentioned they were more interested in finding out about COVID-19 through social media than through mass media. In this study, we examined public comments on Twitter to analyze how people felt about using face masks to stop the corona virus from spreading. To understand the opinions expressed in the 1863 tweets that were compiled between March 2020 and December 2021, [27]. We used Python to analyze them. The findings show that many studies only used pre-built sentiment analyzers by comparing the sentiment of an expression to the attitude expressed, even though the fact that there is substantial of many literature analyzing social

media data to understand public opinions toward contentious health concerns. According to a multiple regression analysis, people's views toward exhibiting protective behavior were well predicted by social media and e-government. This emphasizes how important it is to maintain the public's access to trustworthy information via digital platforms [28]. Our findings were supported by those who came to the view that the government had a substantial impact on the public's perception of face masks during the COVID-19 outbreak in Malaysia. The government's distribution of emergency information during an infectious event affects people's decision to engage in preventive measures.

First, if people were aware of the real state of the situation and how the government is handling it, they would be more likely to abide by public health recommendations. The results of this study offer various new perspectives on how to improve public health communication techniques to spread the word about the advantages of wearing facial masks and other protective gear as well as fighting misinformation. People would be more likely to follow public health advice if they were informed of the reality of the situation and how the government is treating it [29].

Second, the analysis of our data revealed three distinct periods of comments on Twitter about masks that closely matched recent events, such as altered public health authority recommendations, state-level mask regulations, and other recent occurrences. This could have an impact on establishing and using a real-time dashboard based on social media to evaluate and track public opinions toward important health-related issues, enabling more effective and targeted health communication activities [30].

Third, we also discovered common factors, such as perceived difficulty that contribute to anti-mask attitudes. Although there was media coverage of some problems with public health authorities, it doesn't appear that this information had gained any sort of popularity on social media. Regarding this, healthcare providers may consider coming up with more creative and engaging strategies to enlighten the public and prevent misinformation on social media sites. Although it has long been recognized that social media may be exploited as a platform to spread false health information and cause anxiety, this study showed that during the COVID-19 outbreak, social media was not successful in motivating the public to take preventative measures. According to a [31] study, Malaysians used Facebook to express their solidarity and strength amid the crisis, according to a study. This shows that social media assisted Malaysians in coping effectively with the unusual situation. Our findings support their finding that there is a significant correlation between social media use and the willingness to engage in preventive activity. Social media has not been acknowledged as an excellent tool for positive impact. Additionally, some users resisted wearing masks because they believed that they were not required for healthy people and were ineffective at preventing the virus's spread [32]. Reliable sources that supported these perspectives suggested that past, conflicting advice may have a lasting impact and that the population may not be aware of or may not accept new recommendations from the government. In contrast to [33] research, this necessitates open communication between decision-makers and public health experts regarding scientific ambiguity, the justification for certain recommendations, and the possibility of revising recommendations when new evidence becomes available.

Conclusion

The pandemic must be effectively controlled as the COVID-19 epidemic spreads. People must adhere to recommended preventive practices, like wearing face masks to sustain public health. Limiting COVID-19 transmission will be attainable if the general population takes strong action in support of preventive measures [34]. The study's findings will be useful for future planning if there is another wave of an outbreak. People's attitudes toward playing defense are influenced by social media and government. The government should focus on creating digital services to help with disease mitigation while also ensuring good risk communication and information flow to the public during a pandemic [35]. The wearing of public masks has generated significant debate in Malaysia despite being recognized as an essential personal protection approach to stop the COVID-19 epidemic. This study used a small Twitter datasets and a combination of qualitative text analysis and machine learning techniques to classify the public's perception of wearing masks and how this perception changed over time. The results show that while some tweets favored mask use, many tweets opposed it [36]. Up until this point in the pandemic, the ratio has stayed virtually stable. Masks were often reviled because of the difficult physical effects, lack of effectiveness, and the fact that they were unnecessary or inappropriate for certain people or circumstances. Based on these findings, we urge public health groups to hone their communication strategies to better inform the public about the benefits of wearing masks and combat rumors. Some examples of such strategies include increasing data and reasoning transparency, being willing to admit any mistakes that may have been made in the early stages of the pandemic as a result of incomplete data, and instructing the public on how to properly interpret ambiguous or conflicting scientific study results.

Future research

Future research should create better machine learning classifiers to enable opinion mining from social media data, particularly tweets, which are usually quick and informal. This would make it possible to continuously and automatically collect and monitor public opinion. Future work should also include more diverse social media platforms that represent various user groups and interaction techniques, rather than relying just on their publicly accessible social media posts and use qualitative approaches like interviews and focus groups to get a deeper understanding of why certain demographic groups have strong attitudes against wearing masks.

Limitations

This study has some limitations and future possibilities. First, due to the study's small sample size, it is challenging to reach generalizations about Malaysian citizens. A larger sample size should be used in the study to better understand the situation. Second, the individuals may have given socially acceptable answers, which could skew the self-reported responses. In the future, research may acquire data by observation rather than by asking subjects to respond. Third, a previous study discovered that responses to preventive measures vary between countries based on

people's perceptions of their governments. To extend the application of the current findings, it is advised that a comparative study be done among other countries. Despite these limitations, the findings aid in our understanding of the public's attitudes toward taking a defensive stance in the face of the COVID-19 outbreak in Malaysia.

Conflict of interest statements

The authors have no competing interests to declare.

Data availability statement

The study team and Twitter used the Twitter API to retrieve the data that was used in this paper. The data can be made available upon request with the relevant data usage agreements in place between Twitter and the research team.

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