

# Vaccine narratives on social media in Malaysia

## Acknowledgements

This report was prepared by Harris Zainul, Farlina Said, Nazran Johari and Izzah Ibrahim. Herizal Hazri and Alizan Mahadi provided overall guidance for the report. Joann Saw, Wan-Peng Tan and Mohd Farouf Sahal provided editorial and design support. This report benefitted from extensive stakeholder engagement with numerous scholars, media practitioners and fact-checkers who work on and around the Covid-19 infodemic. Discussions and interviews with them contributed immensely to this report.

## Executive summary

Facebook and Twitter are the largest text-based social media platforms in Malaysia with 91.7% and 37.1% of Malaysian internet users having an account, making them powerful communication and miscommunication tools. As Malaysia entered its second year combatting the Covid-19 pandemic, vaccines offered hope that some semblance of normalcy could resume. The National Covid-19 Immunisation Programme (NCIP) kicked off at the end of February 2021 but it was clear from the start that vaccines faced a threat that grew in tandem with pandemic – an infodemic, which includes misleading claims about vaccines that could circulate easily on these platforms.

Our study looks at the top 2,000 posts that received the highest engagement on Facebook and Twitter in English and Malay between October 2020 and May 2021 to gauge the Covid-19 vaccine conversation in the country and how it contributed to vaccine hesitancy. We conducted a thorough content analysis of the posts and coded them on nine topics: vaccine development; vaccine supply and access; vaccine safety and efficacy; public health; politicisation; economics; conspiracy theory; liberty and freedom; and morality and religion.

The top three topics – “supply and access”, “safety and efficacy” and “public health” – made up 76% of the 2,000 posts, while the remaining topics made up between 2.8% and 7.3% of the dataset. Posts from Facebook received 7.4 times more engagement than Twitter, and posts in Malay received almost double the engagement than English posts. To identify how people reacted to the topics, we did a sentiment analysis which resulted in an almost equal split, with 35% of posts being positive, 33% neutral and the remaining 31% negative. To gauge people's attitudes towards the vaccines specifically, we coded the posts for whether they included some form of public service content recommending vaccination or any form of opposition. The dataset shows 45% of posts are generally pro-vaccine with a mere 3% against it.

While the last finding gives important context to the severity, or lack thereof, of the anti-vaccine threat in the country, recommendations against vaccination could be getting engagement elsewhere, such as private social media groups and communication channels. This means that despite the threat of anti-vaccine content being lesser than what we had expected at the outset of this study, it cannot be taken for granted.

Moving forward, the government and society need to work towards the twin goals of ensuring availability of authoritative information and ensuring that the information is accessible to everyone, everywhere. This is for the overarching objective to get every eligible person in Malaysia to register for vaccination. Some of the tools that can be utilised to that end include:

- facilitating two-way real-time question-and-answer communication to address questions and doubts about the vaccines;
- craft targeted messaging to the yet-to-register group;
- targeted in-person communication at localities with low vaccine registration rates;

- involving the National Pharmaceutical Regulatory Agency (NPRA) to promote vaccine safety;
- include languages spoken by foreign communities in the FAQ section on JKJAV's website;
- creating a toolkit of pro-vaccine information to debunk common misinformation;
- tracking developing news about the vaccines and vaccination process to pre-empt developments that could lead to hesitancy;
- roping in religious, business, and social leaders, other non-government stakeholders to amplify pro-vaccine messaging;
- co-opt businesses, such as supermarkets, minimarkets and convenience stores to help spread the message to those who might have missed public service announcements in traditional and digital media;
- simplify the message by breaking down scientific concepts, such as vaccine efficacy;
- identify communication strategies capable of nudging people to vaccinate; and
- educate the public on:
  - how social media platforms and communication applications work. For instance, why certain content is removed from social media and how the "forwarded many times" tag on WhatsApp is designed to slow down the spread of viral messages;
  - motivation behind certain false claims; and
  - how vaccines are efficacious against new variants of concern.

As more people get vaccinated, external development, such as the Delta variant's increased transmissibility and higher daily case numbers and death toll, could help push more people to register for vaccination. This could change the risk assessment of those with existing concerns over the safety and efficacy of vaccines – i.e. that it is more dangerous to be not vaccinated now than before.

However, we fully expect vaccine-related conversations to continue to change in tandem with wider developments on the vaccines and vaccine-related matters. As the country loosens the SOP for fully vaccinated individuals, we believe that the conversation will shift towards the topic of "liberty and freedom", specifically how vaccination can be a gateway to freedoms. This could also mean that conspiracy theories along the lines of vaccination being a covert strategy to create a compliant citizenry can be played up.

Regardless, the experience with the infodemic shows the consequences of eroding trust levels in authorities, experts and science, and how communications must be done in times of crisis.

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# 1. Introduction

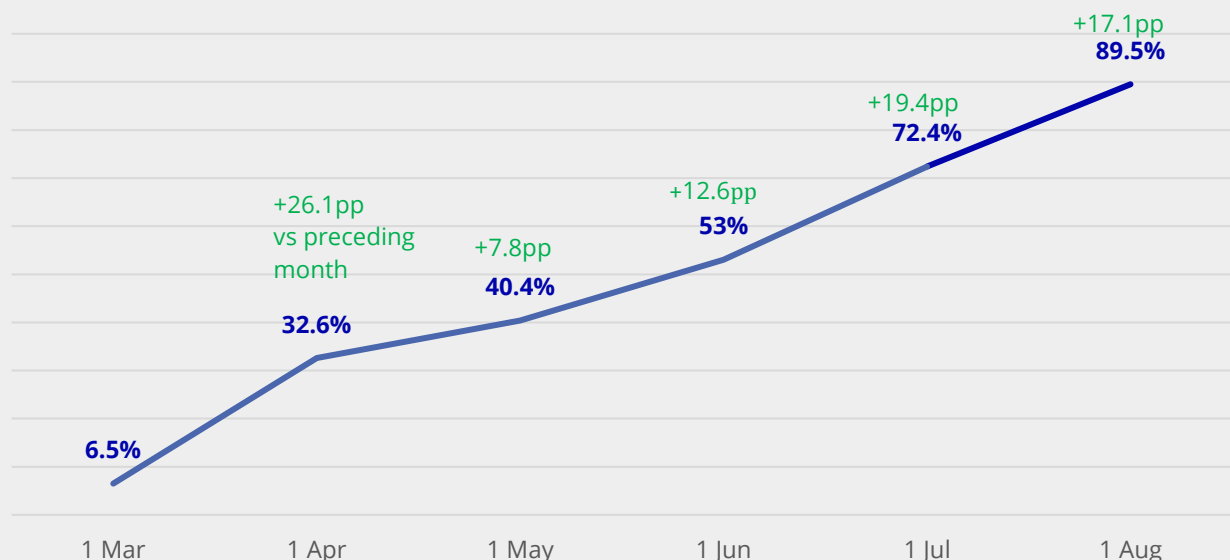
Since the development of Covid-19 vaccines, focus on the pandemic has shifted from its consequences to the development, availability, and safety of the vaccines. This, unfortunately, is taking place amid an infodemic, which the [WHO](#) describes as “an overabundance of information, both online and offline... [including] deliberate attempts to disseminate wrong information to undermine the public health response and advance alternative agendas of groups or individuals”. The WHO goes on to state that the infodemic includes mis- and disinformation which “can be harmful to people’s physical and mental health; increase stigmatisation; threaten precious health gains; and lead to poor observance of public health measures, thus reducing their effectiveness and endangering countries’ ability to stop the pandemic”.

In Malaysia, the National Covid-19 Immunisation Programme (NCIP) kicked off at the tail end of February 2021. It aims to vaccinate 80% of the population to establish herd immunity and prevent the continued spread of Covid-19. At the time of writing, Phase 1 of the NCIP, which prioritised front-liners, has been completed, and Phase 2 and 3, aimed at seniors above 60 and/or with existing comorbidities, and those above the age of 18, is ongoing.

In parallel to the mainstream NCIP was the AstraZeneca-Oxford University vaccination opt-in programme for volunteers on a first-come first-served basis. Its first offering on 2 May 2021 saw all [268,000 slots snapped up in about three hours](#). Following offerings met with [equal, if not faster, take-up rates](#).

## Vaccine registration rates in Malaysia as a percentage of eligible population

Source: Covid-19 Immunisation Task Force

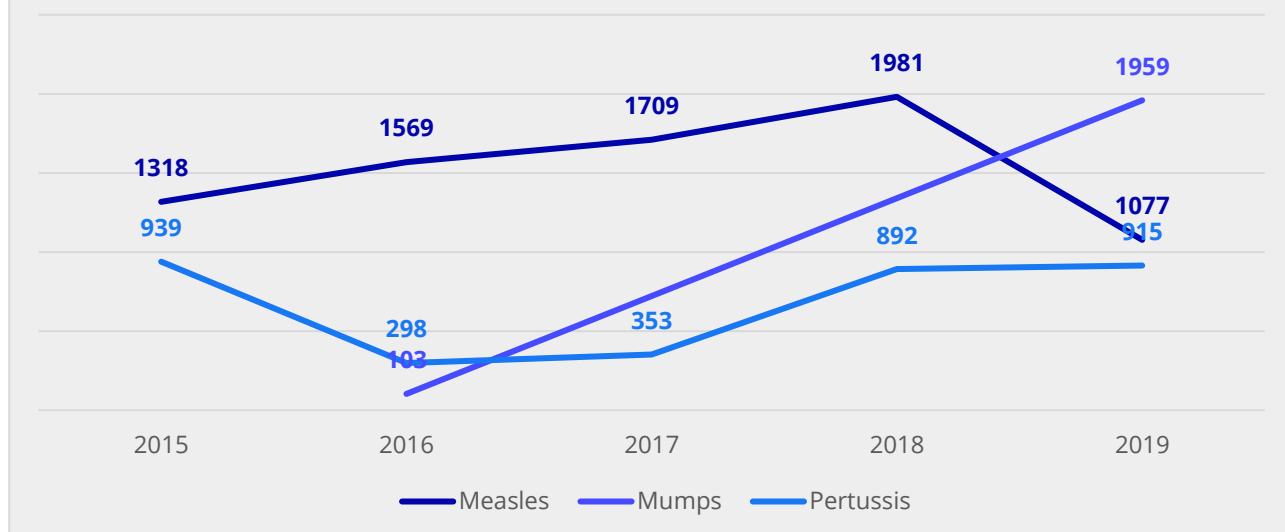




Meanwhile, national-level registration rates for the vaccines are encouraging, with take up increasing steadily since registration first opened. For the 27.6% remaining unregistered as of 1 July, this could be due to a multitude of factors. Aside from vaccine hesitancy and rejection, other factors include a lack of awareness, difficulty registering for the vaccination process, and some still adopting a “wait-and-see” approach before registering.

### Top 3 VPDs in Malaysia

Source: World Health Organisation



Of concern is how pockets of vaccine-preventable diseases (VPDs) remain in the country. Even once-eliminated VPDs, such as [polio](#), have made a comeback in recent years. There were also been more than 1,000 cases of measles annually between 2015 and 2019, while cases of pertussis and mumps have increased over that same period.

## 2. Research objectives

This research seeks to identify the most common topics of Covid-19-vaccine-related social media posts in Malaysia. Through this, we will be able to assess the state of vaccine information and posts spreading misleading Covid information in Malaysia. Further, we will identify how narratives dissuading against vaccines are framed, and under what topic, thus allowing stakeholders to adopt data-driven outreach, counter-messaging, and fact-checking efforts. For the public, we hope by highlighting these trends, they are better able to identify problematic posts.



## 3. Research methodology

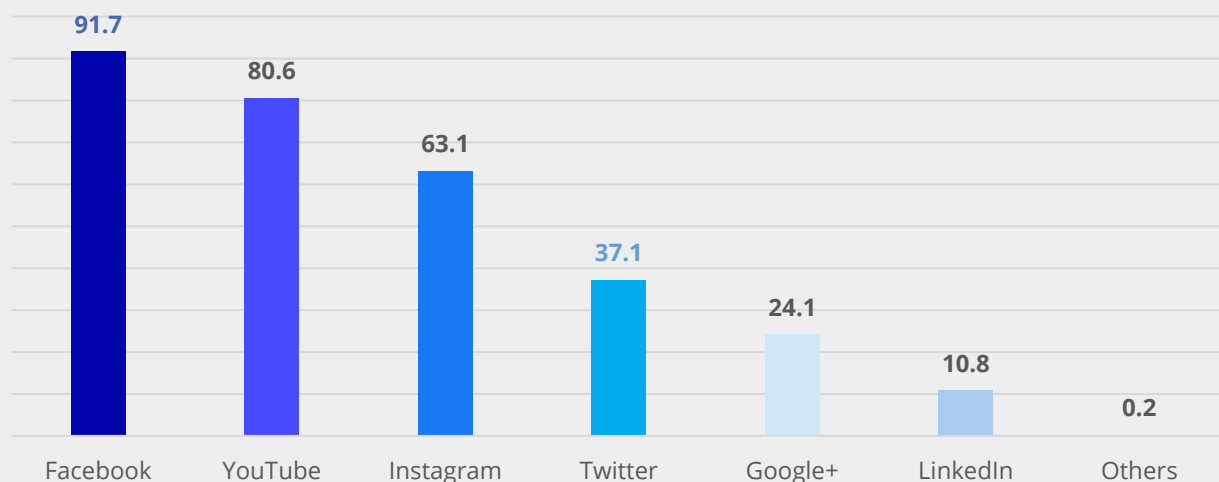
### 3.1. Content analysis

#### 3.1.1. Dataset

We engaged a data analytics company to scrape posts from Facebook and Twitter containing the keywords "vaccine" and "vaksin" from October 2020, a month before Pfizer's announcement on its vaccine efficacy rate and Malaysia's decision to purchase it, to May 2021. The first keyword, "vaccine", is used as a proxy for English posts while "vaksin" acts as proxy for Malay posts. The two platforms are the top two text-based social media platforms in Malaysia by user numbers.

#### Percentage of users of social media platforms

Source: MCMC Internet Users Survey 2020



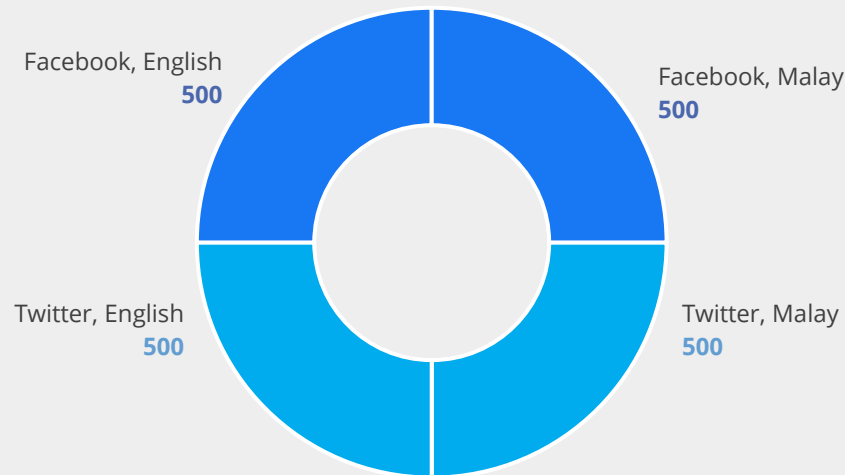
As our focus was on vaccine-related conversations in Malaysia, we only included posts that contained geolocation tags of somewhere within the country. This resulted in a total of 323,764 posts across both platforms.

We then narrowed this down to the top 500 posts with the most engagement on both platforms in both languages for the content analysis. Our final dataset contains 2,000 posts. We opted to analyse posts with the most engagement because these should reflect the content that resonate with Malaysians on social media. For engagement on Facebook, we calculated the reactions, comments, and shares, while for Twitter, engagement was the sum of comments, retweets, and likes.



**Full dataset overview**

n=2,000



Our full dataset contains 2,000 posts drawn from four datasets that contain 500 posts each: (1) Facebook Malay, (2) Facebook English, (3) Twitter Malay, and (4) Twitter English.

To ensure that we only code posts from ordinary social media pages and/or users, we removed posts from accounts belonging to the government, members of parliament and senators, and the mainstream media. Posts with links only were also excluded from the final dataset, along with those containing too little information for us to confidently code.

### 3.1.2. Coding list and sentiment analysis

We derived our initial list of codes from [Smith, Cubbon and Wardle of FirstDraft](#), which includes: (1) development, provision and access; (2) safety, efficacy and necessity; (3) political and economic motives; (4) conspiracy theory; (5) liberty and freedom; and (6) morality and religion. To ensure that FirstDraft's codes are applicable in the Malaysian context, we coded a random sample of the final dataset using its list of codes and making detailed notes of when and where a more appropriate code was needed. This informed our final list of codes (below).

	Topic	Description
1	Development of vaccines	How the vaccine was developed
2	Supply and access of vaccines	Supply and/or access to the vaccines, including the process to access them

3	Safety and efficacy of vaccines	Safety and efficacy, including vaccination side effects
4	Public health	Need and/or necessity to vaccinate for personal and/or public health reasons; including posts related to and that could impact on public health systems
5	Politicisation	Criticising public policies surrounding the vaccines and vaccination process
6	Economics	Economic motives of actors involved and/or related with the vaccines and their supply, development and/or dissemination
7	Conspiracy theory	Content containing, referring and/or dispelling well-established or novel conspiracy theory, including claims of non-proven Covid-19 cures
8	Liberty and freedom	How vaccines interact with civil liberties and personal freedom
9	Morality and religion	Posts containing moral and religious views and/or elements around vaccines, religious obligations, and their composition and the way they are tested

Besides the changes to the name of the topics and accompanying descriptions, we altered the description to be more value neutral where possible. This is to account for the analysis of sentiment and attitudes towards vaccines. In total, we coded each post for its: (1) topic, (2) sentiment (positive, neutral, negative); and (3) attitude towards vaccines (pro, neutral, against).

We coded only for the most dominant narrative in the post.

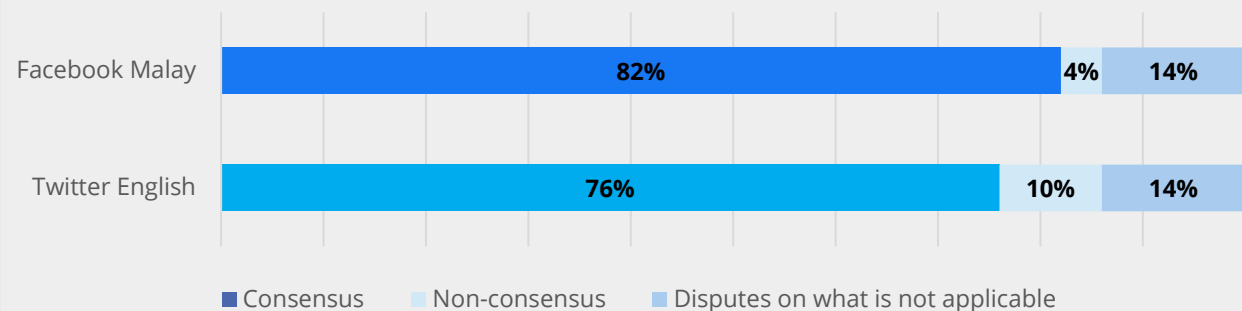
### 3.1.3. Intercoder reliability

Content analysis is inherently a subjective exercise, which makes intercoder reliability an important factor. To that end, before beginning with the content analysis of the full dataset, we independently coded a test dataset before comparisons were made to identify how frequently we achieved consensus on the code, sentiment, and attitude towards vaccines. The test dataset comprised 5% of the final dataset, with 50% coming from Facebook posts in Malay and the remaining 50% from Twitter posts in English.



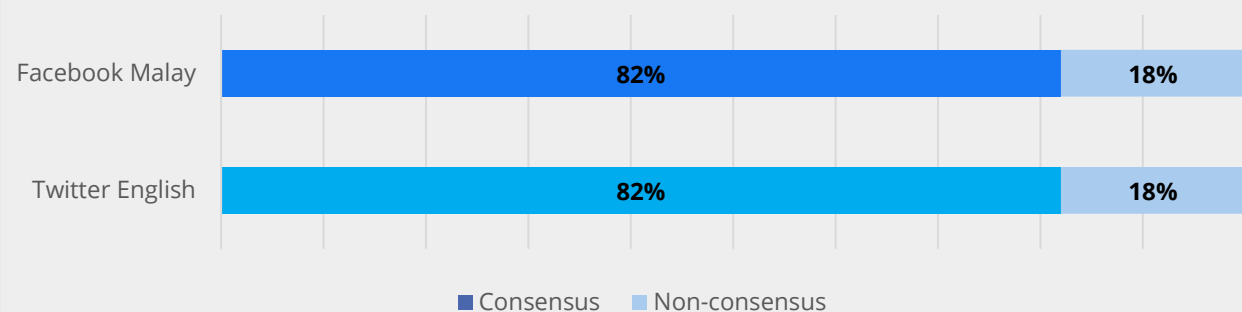
### Topic coding test results

Test dataset: 50 posts each



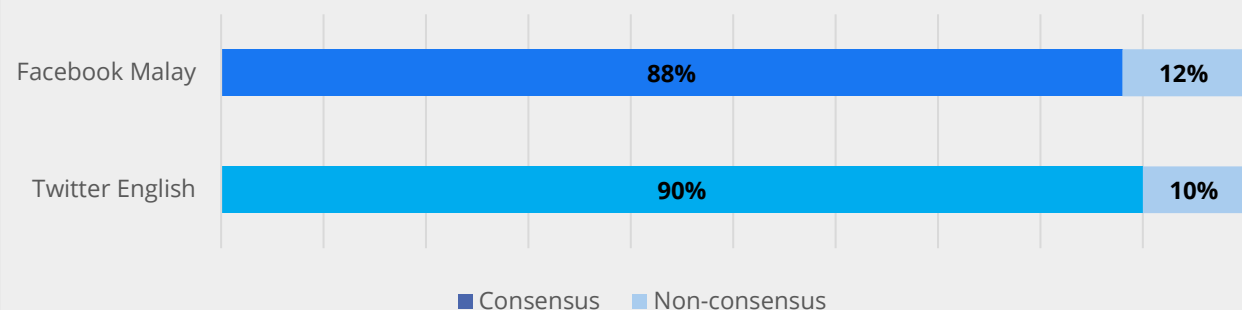
### Sentiment coding test results

Test dataset: 50 posts each



### Attitude towards vaccines test results

Test dataset: 50 posts each



A few things came to light from this exercise. The first was that we mainly disagreed on when a post is deemed not relevant and/or not applicable. The second was we failed to achieve consensus on posts that are generally either too short with little context or too lengthy and containing multiple potential topics.

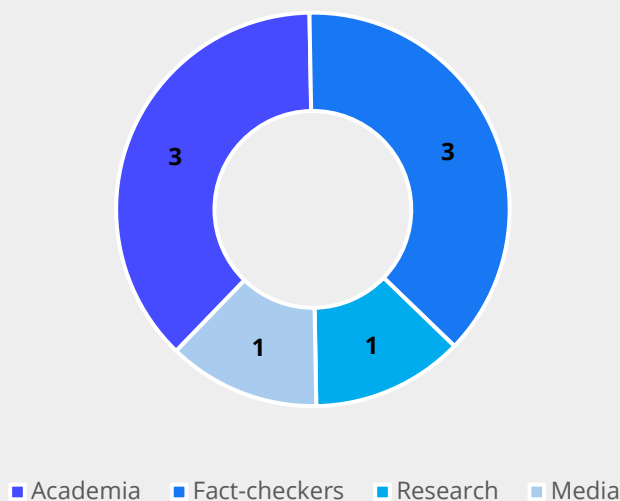


Moving forward, we introduced two measures to address the complications found in the test and to ensure a higher reliability rating. These were (1) having a dedicated code for when posts contain multiple topics and the coder cannot confidently decide on which is the most dominant topic; and (2) making sure that all posts coded as “not applicable” are double coded by a separate member.

### 3.2. Key informant interviews

To complement our research, we interviewed stakeholders working in and around the research area. They include those from government institutions, academia, media, fact-checkers, and other individuals. This allows us to have multi-sectoral points of view and a more comprehensive understanding of the information environment in Malaysia pertaining to vaccines. To be noted is that because of the various movement-control orders (MCOs) and work-from-home instructions, securing interviews during this period was more difficult than expected.

**Stakeholders interviewed by industry**



### 3.3. Limitations to our study

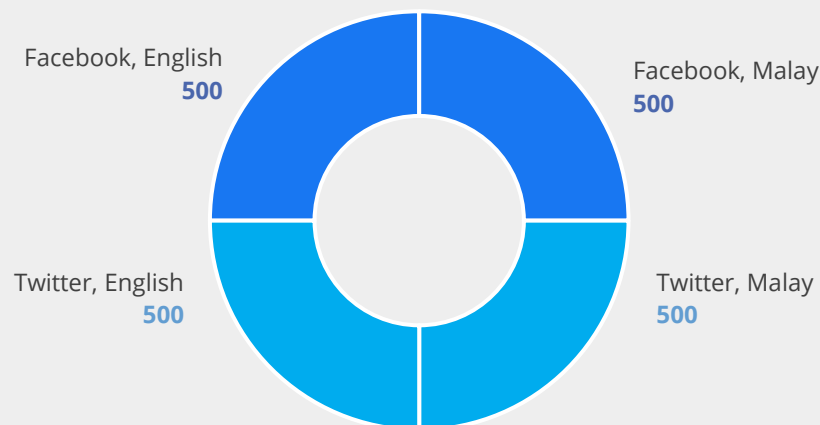
As with all studies of this nature, there are inherent limitations to the findings. The first is that the content analysis was only conducted on social media posts from Facebook and Twitter with a geolocation tag within Malaysia. Not all social media users opt in on this feature due to privacy and/or other considerations, meaning that some posts that would have otherwise been relevant were not captured in our dataset. Facebook and Twitter posts are also not representative of all conversations on vaccines in Malaysia, and that we were only able to scrape public posts on both platforms. This means we could not capture posts in private groups and pages, and those from and between private accounts. There is also the consideration that not all social media users spell “vaccine” and “vaksin” correctly, and there are indications that some users deliberately misspell them, i.e. “veksin”, “beksin”, etc. This may be an effort to avoid automated detection and flagging of posts, although we are not able to confirm this. Lastly, due to our own language limitations, we had to remove posts in a language other than English and Bahasa Malaysia, despite containing the keywords “vaccine” and/or “vaksin”.

## 4. Data findings

### 4.1. Data overview

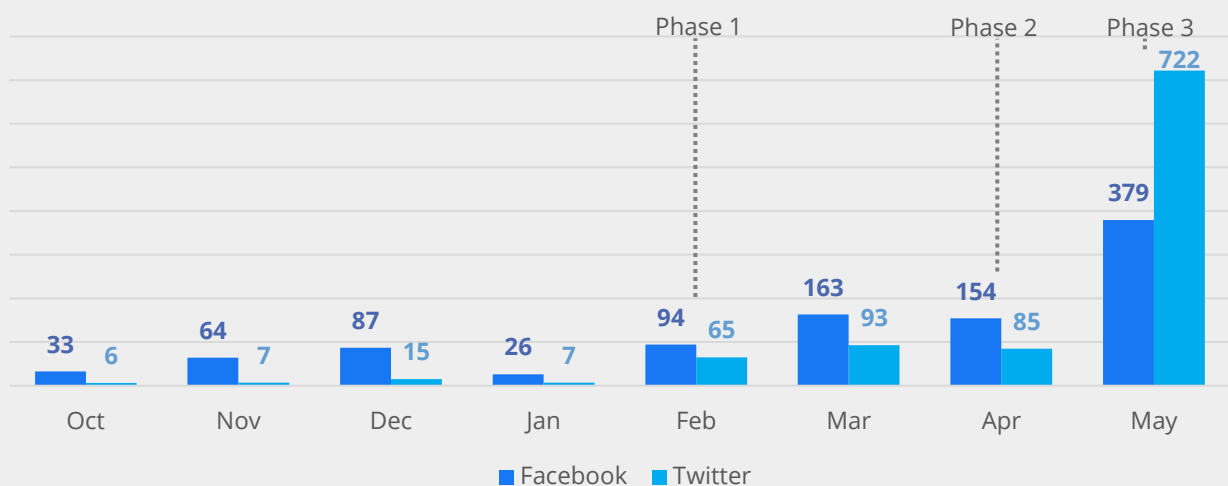
#### Full dataset overview

n=2,000



Our full dataset contains a total of 2,000 posts drawn from four datasets of 500 posts each: (1) Facebook English, (2) Facebook Malay, (3) Twitter English, and (4) Twitter Malay.

#### Number of posts by month



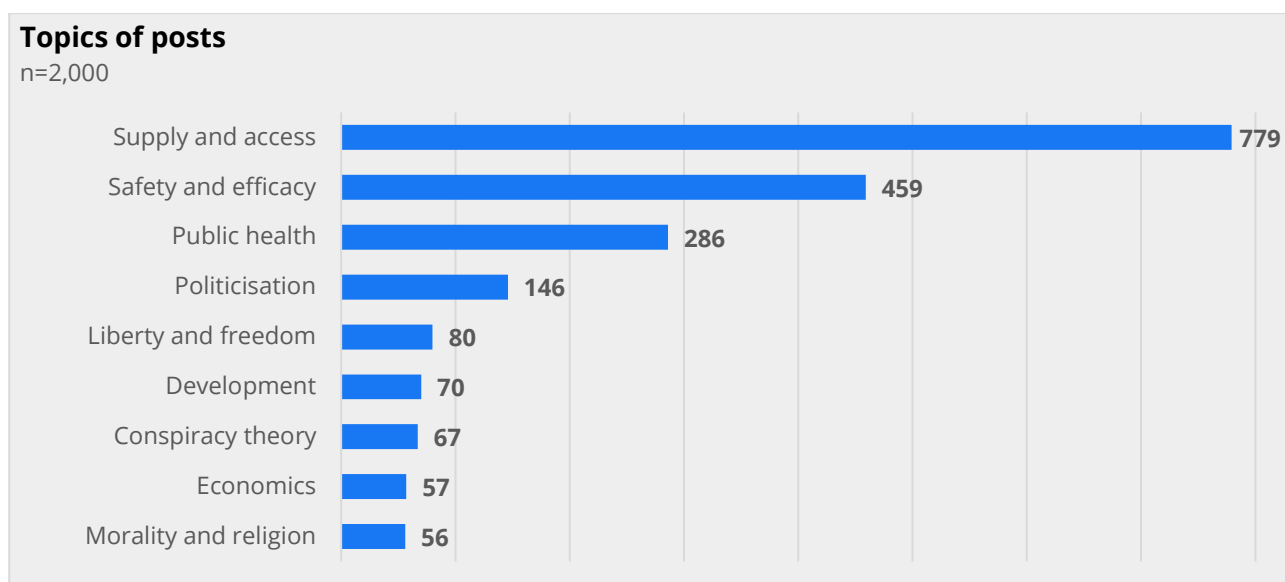
In terms of distribution, the pre-NCIP period of October 2020 to January 2021 contributed a mere 12% of the dataset (245 out of 2,000). Meanwhile, posts since the start of Phase 1 of the NCIP in



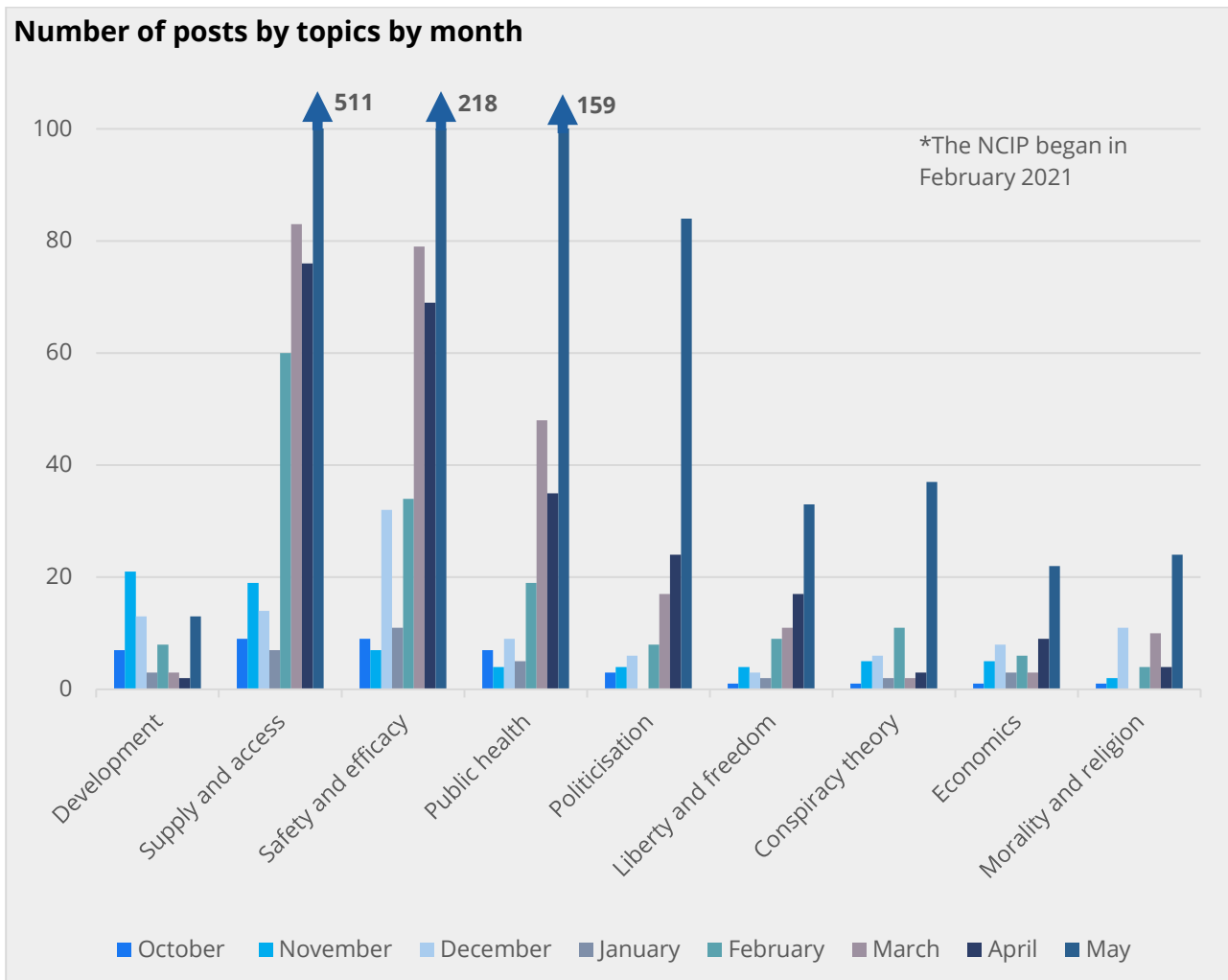
February 2021 made up 88% of the full dataset. Notably, 55% of all posts in the full dataset came from May 2021. An explanation for this is that since Phase 3 of the NCIP included adults older than 18, we believe that the increase in the number of people eligible for vaccination lent itself to an increase in engagement with vaccine-related posts on social media.

## 4.2. Topics of posts

By coding for the topics present in the posts, we were able to identify the share of conversation surrounding vaccines on both Facebook and Twitter in Malaysia.



The top three topics in the posts we analysed were "supply and access" (39%), "safety and efficacy" (23%) and "public health" (14%), which made up 76% of the 2,000 posts. This highlights that these three topics made up the largest share of the conversation surrounding vaccines. Meanwhile, the remaining six topics, while present in social media conversations in the country, did not receive the most engagement. These topics are "development", "liberty and freedom", "conspiracy theory", "economic intention" and "morality and religion".



Looking at the distribution of posts for each topic over time, the share of the conversation in the pre-NCIP period was split more evenly among the topics. All topics registered fewer than 20 posts a month between October and January, except for “development” in November with 21 posts and “safety and efficacy” in December with 32 posts.

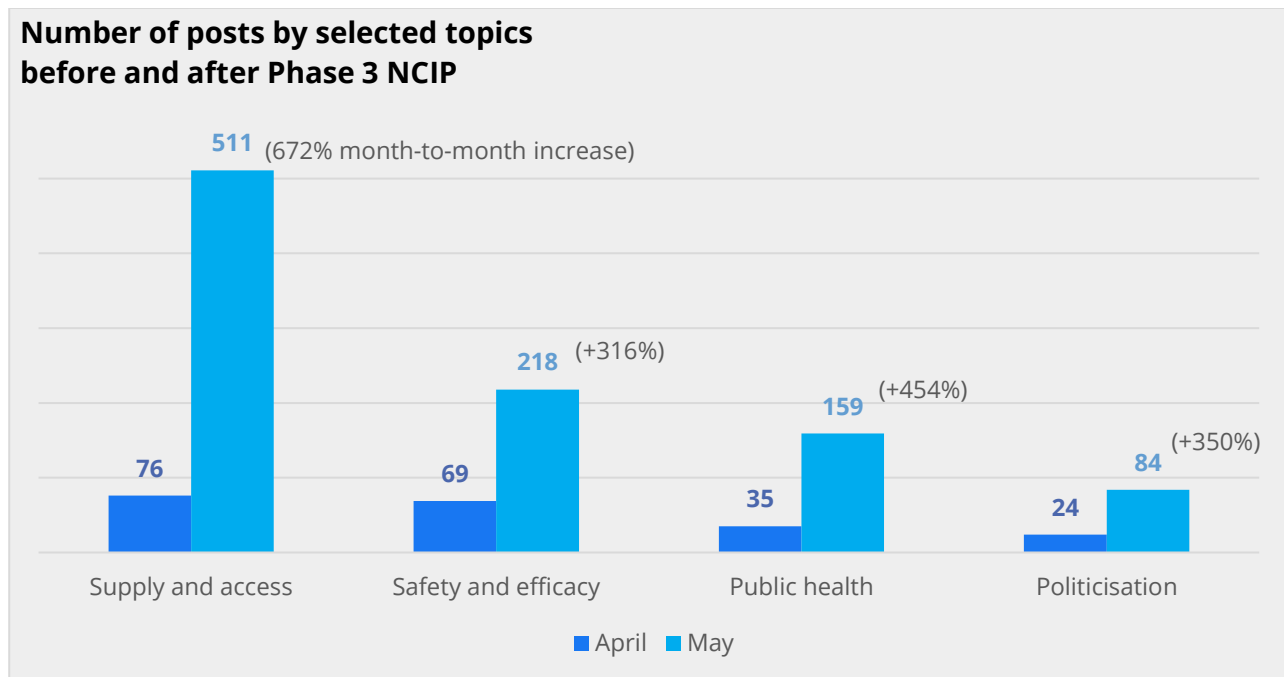
This also highlights that engagement with all vaccine-related posts, regardless of topic, only picked up following the start of the national vaccination programme. In fact, eight out of nine topics peaked in May, the last month we collected our data from. With May seeing the start of Phase 3 of the NCIP, this suggests that as more people became eligible to receive the vaccines, the more they were engaging with vaccine-related posts.

The exception to the trend is the “development” topic, which peaked in November with 21 posts before steadily declining to 13 in May. This suggests that vaccine development made up a larger share of the conversation in the earlier days with public attention moving elsewhere since. One explanation for the early peak is that the first three vaccines developed successfully (efficacy rates





published) were announced by [Moderna](#) on 16 November 2020, [AstraZeneca](#) on 23 November 2020, and [Pfizer](#) on 10 December 2020.



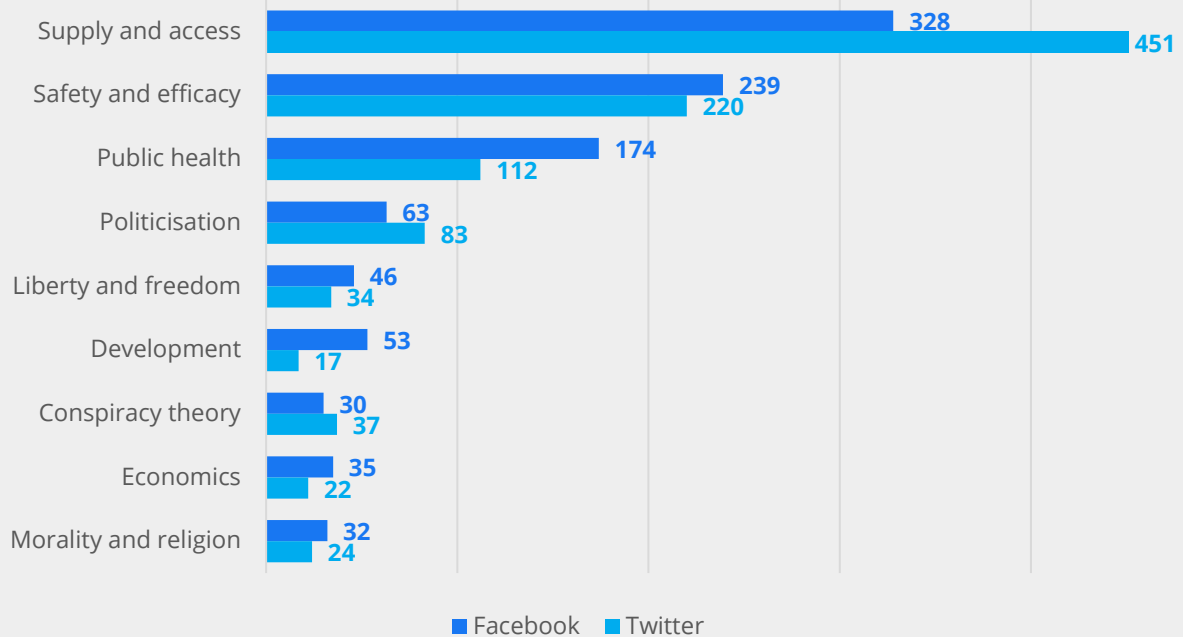
Meanwhile, in the pre- and post-phase 3 NCIP period of April and May 2021, the “supply and access”, “safety and efficacy”, “public health” and “politicisation” topics saw between a threefold and sixfold increase in the number of posts. One possible reason for the increase in “supply and access” and “safety and efficacy” posts could be that there had been two opt-in registrations for the AstraZeneca vaccine then – on 2 May and on 23 May. There were also negative perceptions surrounding the AstraZeneca vaccine over the risk of blood clots and how some countries had either halted its use or removed it from their vaccination programmes.

The “public health” topic increased by 454% when recipients recommended others to get vaccinated after receiving their first doses. The “politicisation” topic increased 350% on the back of the public questioning the government’s decision to set up the first-come, first-served opt-in registration for AstraZeneca vaccines.



### Topics of posts by platform

n=2,000

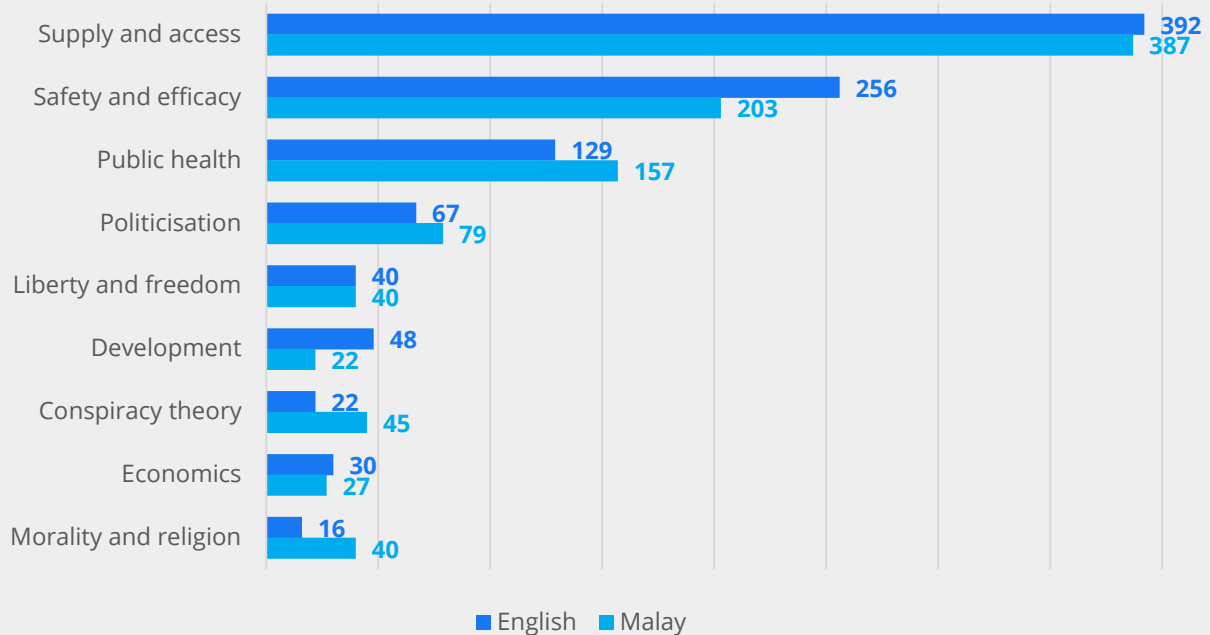


In a cross-platform comparison, there is not much differentiation in the topics of posts with the range of differences for eight of the nine topics being between 1.08 times and 1.55 times. The exception, however, is the "development" topic, which appeared in Facebook posts 3.1 times more than Twitter.



### Topics of posts by language

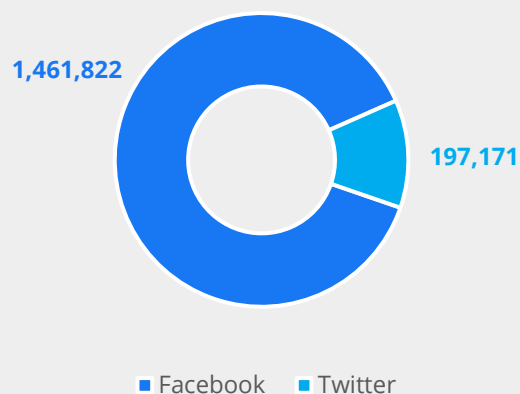
n=2,000



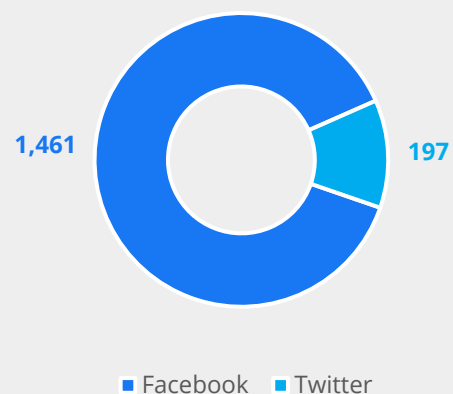
In the cross-language comparison of the topics of posts, a similar trend can be identified for most topics whereby the range of differences is between 1 and 1.26. This is except for "morality and religion" and "conspiracy theory" topics that were represented 2.5 and 2 times more in the Malay dataset than in English dataset. Meanwhile, the "development" topic appeared 2.1 times more in English dataset than in the Malay one.

### 4.3. Engagement of posts

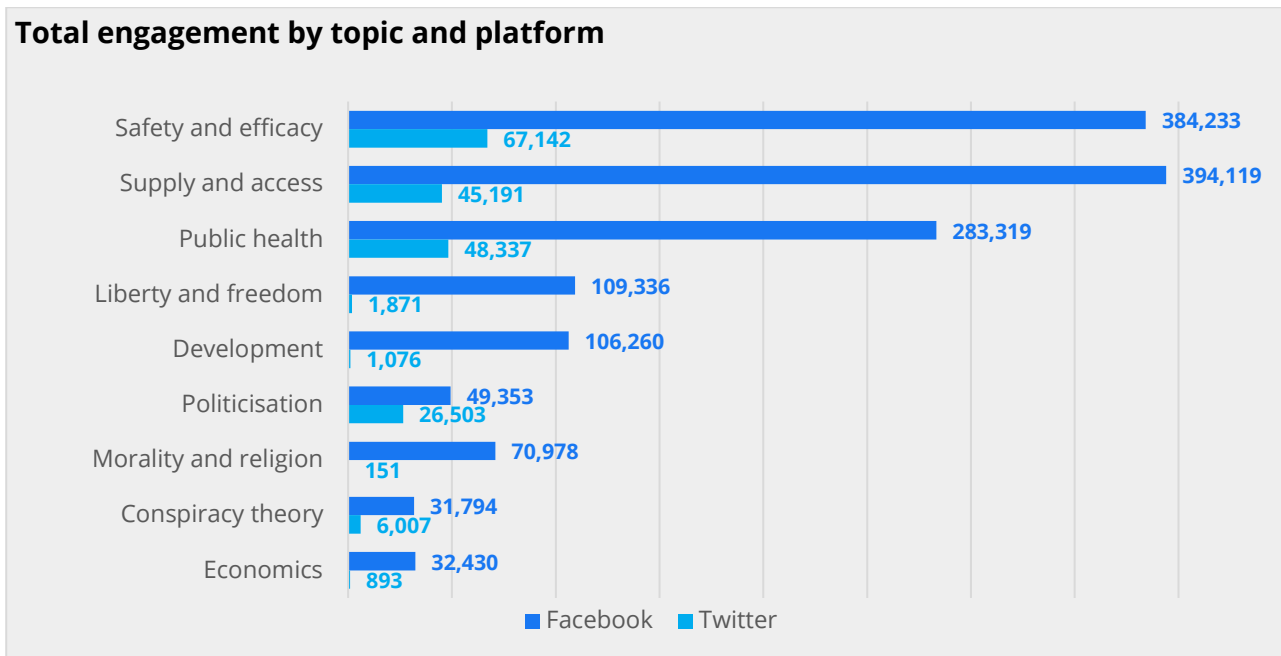
#### Total engagement of posts by platform



#### Average engagement of posts by platforms



The Facebook posts received a total of more than 1.4 million engagements while Twitter posts received slightly more than 197,000 engagements. Thus, the average engagement of Facebook posts in our dataset is 1,461 and Twitter posts at 197. To note is that these numbers are not directly comparable because of the inherent differences of these platforms.



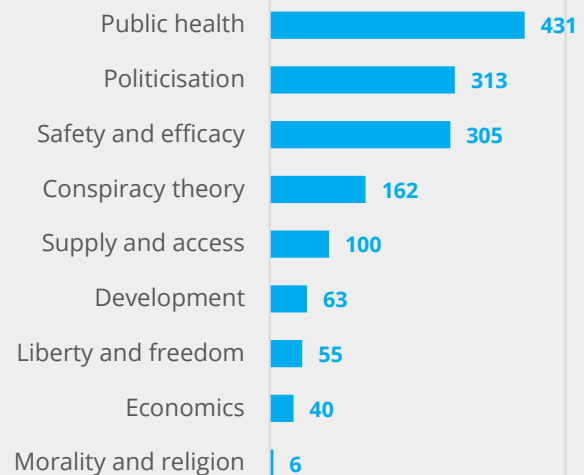
Our findings show that both platforms share the same top three topics with the most engagement but in different order. In descending order for Facebook, the topics with the most engagement are "safety and efficacy", "supply and access", and "public health intentions". For Twitter, these are "safety and efficacy", public health intentions", and "supply and access". This suggests that the vaccine-related topics that Malaysians engaged most with remain the same regardless of platform. Also noteworthy is that the top three topics contributed 72% of the total engagement received by posts on Facebook, and 81% of the total engagement received by posts on Twitter. To be noted, however, is that the top three topics that received the most engagement are also the top three topics by number of posts.



### Average engagement of Facebook posts by topic



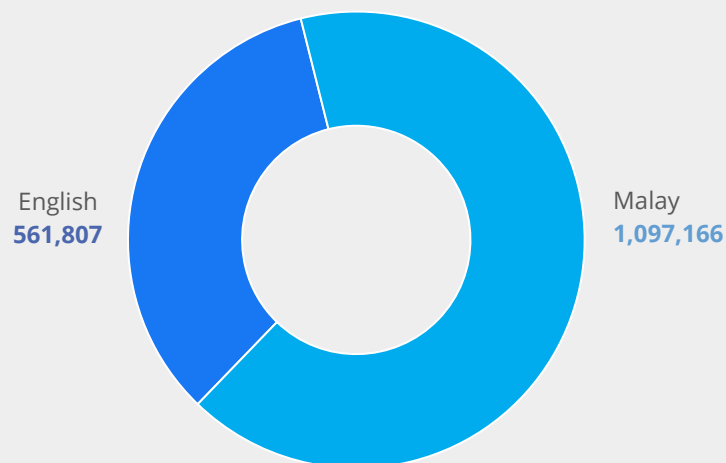
### Average engagement of Twitter posts by topic



While the total engagement for each topic remains relatively similar regardless of platform, the average engagement for each post paints a different picture. For Facebook, the top three topics with the highest average engagement in descending order are “liberty and freedom”, “morality and religion” and “development”. Notably, these three topics with the highest average engagement are different from the top three topics with the highest total engagement on Facebook. For Twitter, the top three topics with the highest average engagement are “public health”, politicisation”, and “safety and efficacy” – with only the latter also being present in the top three topics with the highest total engagement. This suggests that the higher total engagement received by posts with the topics of “safety and efficacy”, “supply and access” and “public health” is due to the high number of posts coded under those topics rather than each post receiving a lot of engagement.



### Total engagement by language

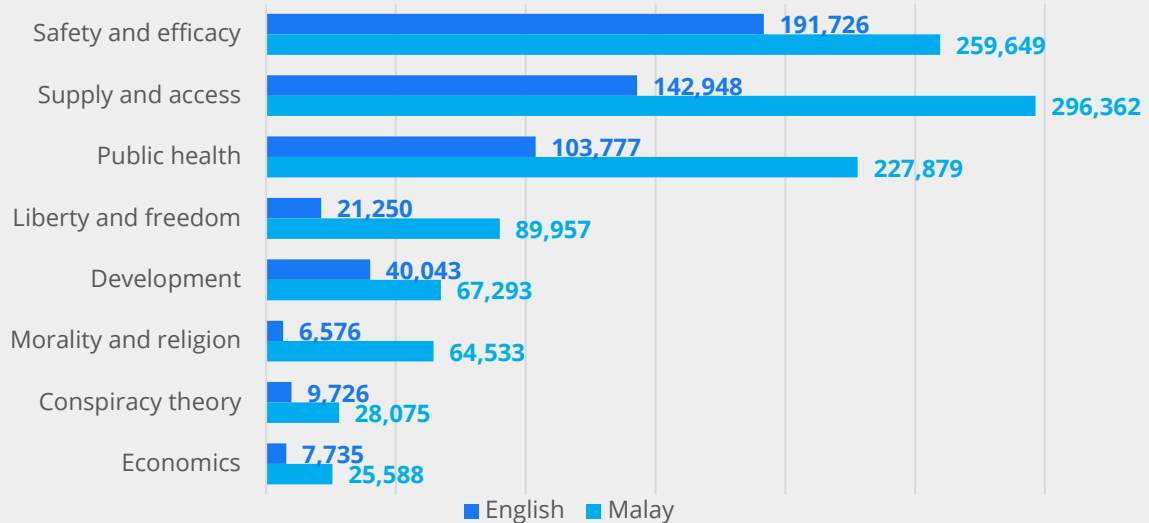


While there is an inherent difference in how people engage with posts on Facebook and Twitter, an analysis of the engagement received by language is still feasible because each language dataset contains posts from both Facebook and Twitter. This means that any difference in engagement due to the platform is reflected in both language datasets.

By language, the total engagement received by Malay posts is 1.95 times more than English. While this could be due to demographic factors, we should note that a big percentage of the population in Malaysia is bilingual. Contextually, the national syllabus for schoolchildren from Year One to Form 5 (ages 7 to 17) includes English as a mandatory subject. Regardless, from a policy and/or messaging perspective, this finding ought to be kept in mind.



### Total engagement by topic and language



Unsurprisingly, posts in Malay received more engagement across the board regardless of topics compared with English posts. That said, the top three topics with the highest engagement in both English and Malay datasets are similar, but in differing orders. For the English dataset, in descending order, the topics are “safety and efficacy”, “supply and access”, and “public health” while Malay dataset in descending order are “supply and access”, “safety and efficacy”, and “public health”, respectively. The top three topics in the English dataset contributed 78% of total engagement and 71% in the Malay dataset. It is also notable that posts coded for the topic of “morality and religion” received 9.8 times more engagement in Malay than English, “liberty and freedom” 4.2 times more, “economics” 3.3 times more, and “conspiracy theory” 2.8 times more.

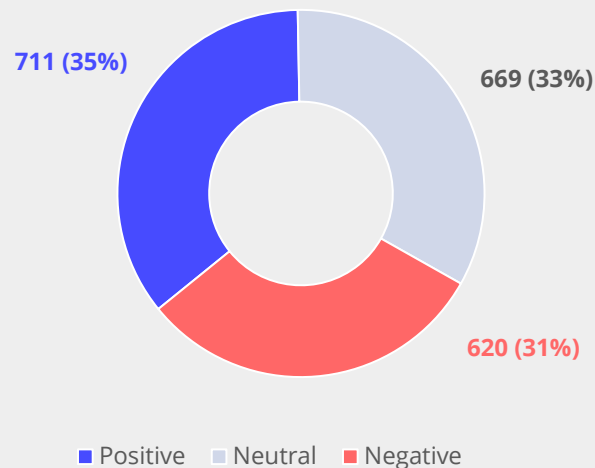


## 4.4. Sentiment of posts

The sentiment of the posts acts as a proxy for how the creator is feeling and/or reacting vis-a-vis the post being analysed. This adds another layer of analysis insofar that we are better able to determine how people are reacting to that particular vaccine-related topic.

### Sentiment of posts

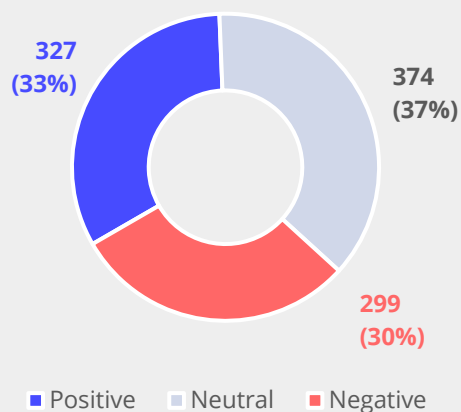
n=2000



The sentiments of the posts in our full dataset are almost equally split with 35% being positive, 33% neutral, and the remaining 31% negative.

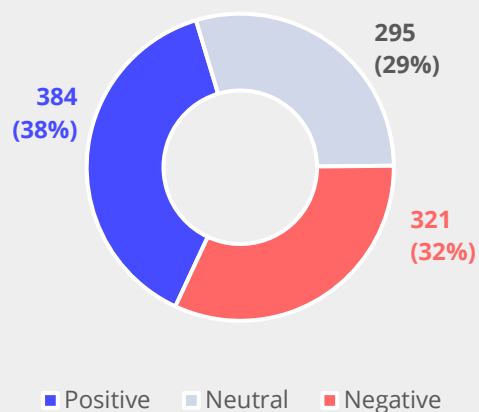
### Sentiment of English posts

n=1,000



### Sentiment of Malay posts

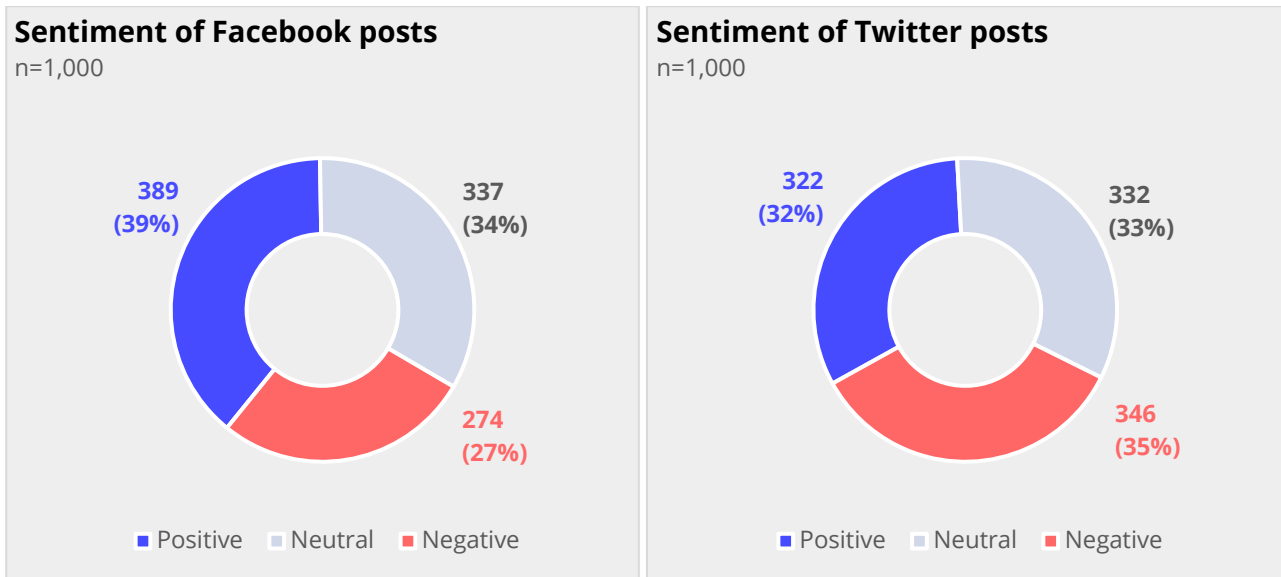
n=1,000



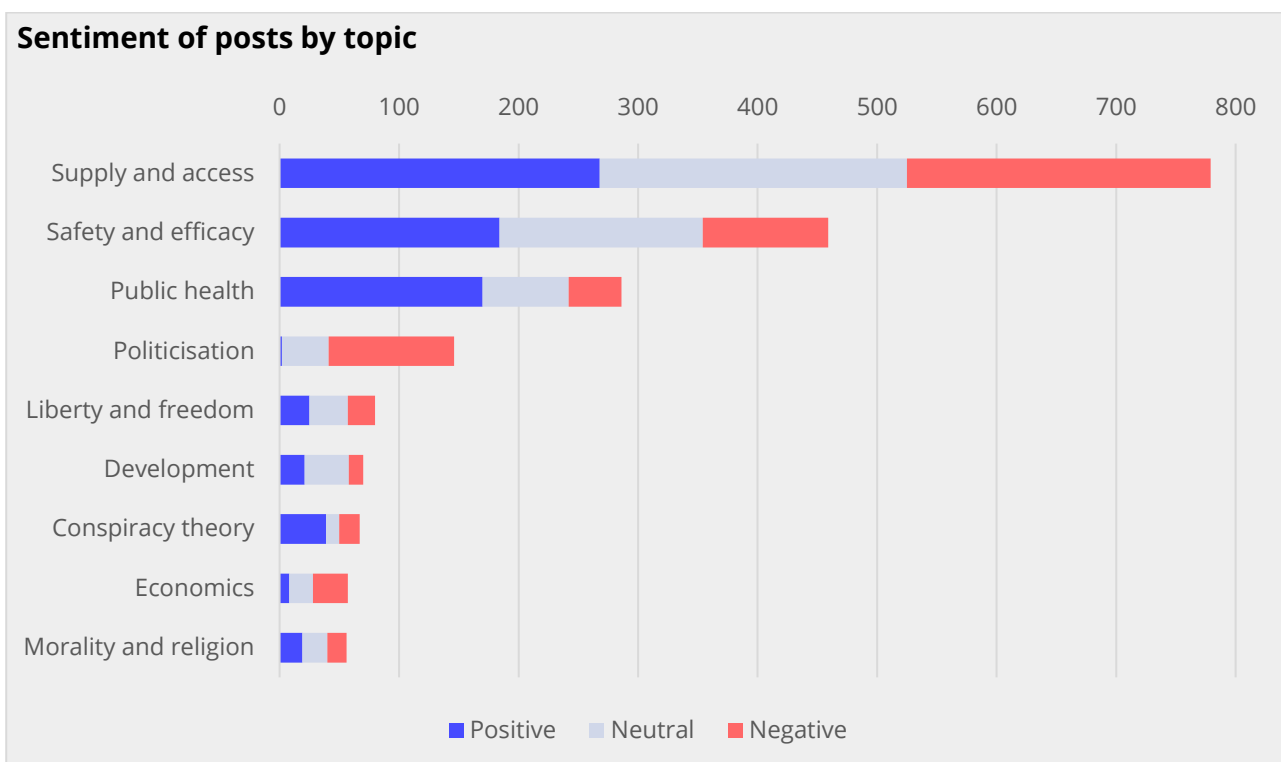
In a cross-language comparison, the sentiment present in the posts differentiates slightly. The English dataset skews in favour of "neutral" (37%) at the expense of "positive" (33%) and "negative" (30%) sentiments, while the Malay dataset skews towards both "positive" (38%) and "negative" (32%)



(32%) with the amount of "neutral" (29%) posts decreasing. The latter indicates that Malay posts lean towards either end of the spectrum rather than neutral as compared with the English posts.



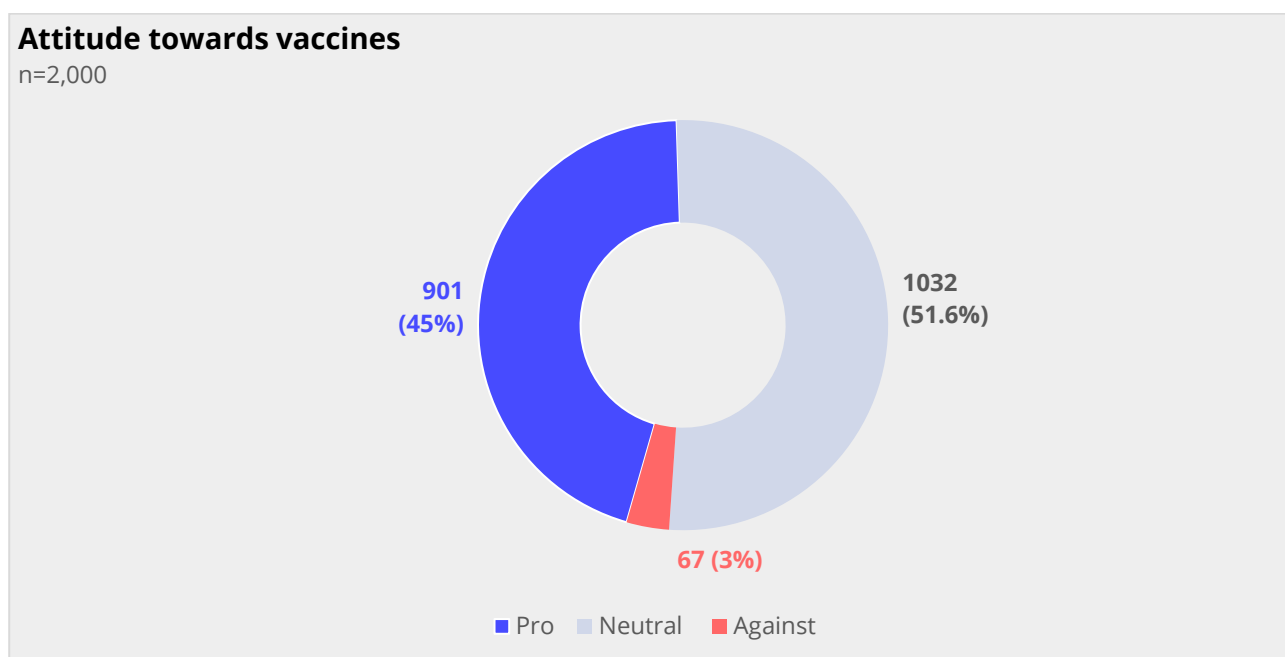
Cross-platform, Facebook contains more positive posts (39%) compared to Twitter (32%), while Twitter contains more negative posts (35%) than Facebook (27%). The neutral posts, meanwhile, are nearly identical at 34% and 33%.



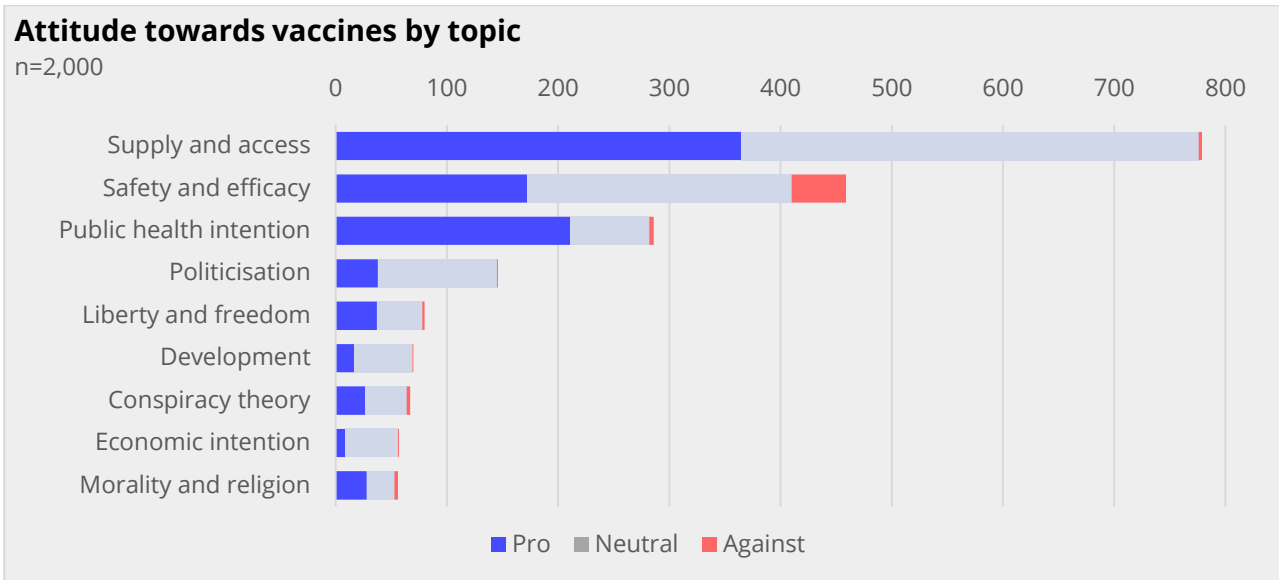


At the micro level, topics with a majority of positive sentiment (>50%) were “public health” and “conspiracy theories”. Topics like “supply and access”, “safety and efficacy”, and “morality and religion” contain posts that were at least 33% positive in sentiment. Meanwhile, only “politicisation” and “economics” saw a majority of posts (>50%) being negative. This suggests that apart from “politicisation” and “economics” and “supply and access”, which received an almost equal amount of positive and negative posts – 34% and 33% respectively – in general, sentiment on vaccine-related topics remains relatively positive.

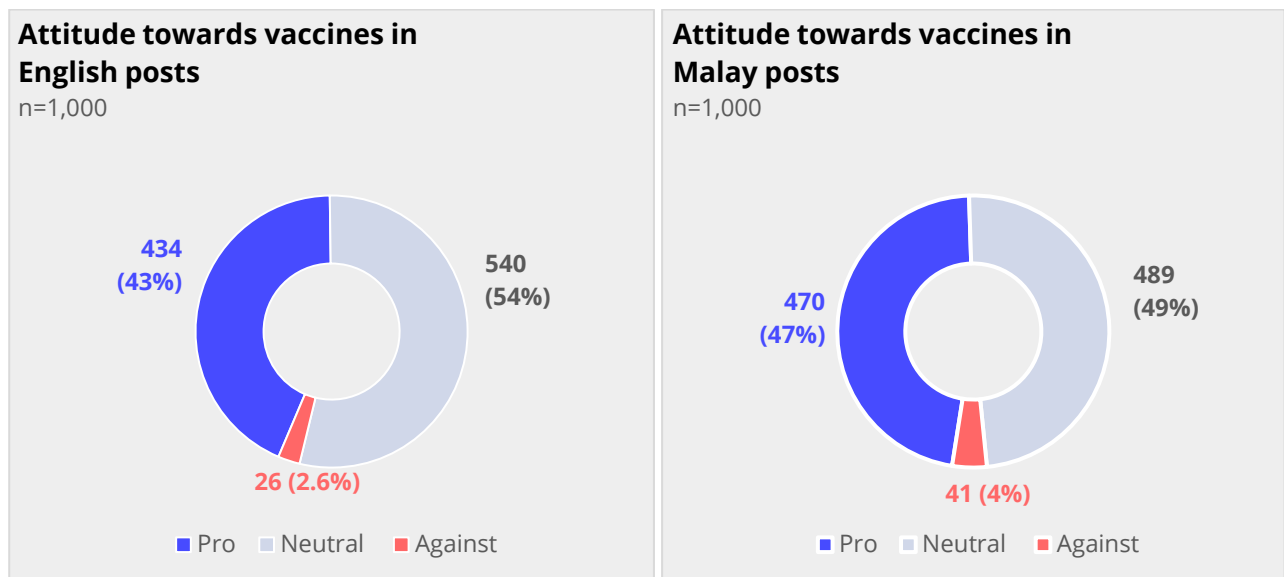
## 4.5. Attitude towards vaccines



Regarding the attitude towards vaccines in the analysed posts, 45% were generally pro-vaccine and included some form of explicit public service content recommending friends/followers to get vaccinated. Another 52% contained neither an explicit recommendation to get vaccinated nor any opposition. This leaves a mere 3% of posts in the dataset indicating that they were against the Covid-19 vaccines and/or were recommending against it. Keeping in mind that posts recommending against vaccination could be getting engagement on closed social media groups and/or communication channels or have been removed by the social media platforms – this finding gives important context to the severity of the anti-vaccine threat in the country.



Meanwhile, for all topics of posts, a majority is either “pro” or “neutral” towards the vaccines. With the exception of the “safety and efficacy topic”, others contained between 1 and 3 posts against vaccination. This highlights how narratives against vaccinations, in our dataset at least, are generally centred on the topic of “safety and efficacy”. For context, 12% of all posts coded with the topic “safety and efficacy” recommended against vaccinations, and this makes up 73% of all posts coded as “against” in our dataset.

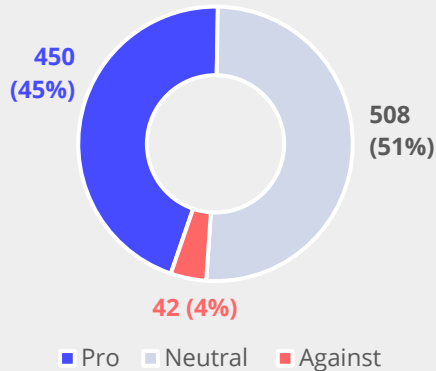


Separated by language, there are more Malay posts recommending and/or encouraging vaccinations (47%) than posts in English (43.4%). On the opposite end of the spectrum, there are 1.6 times more posts against vaccines and/or discouraging vaccinations in Malay than English. As a total percentage of posts in that language, posts coded “against” remain relatively small at 4.1% (Malay) and 2.6% (English).



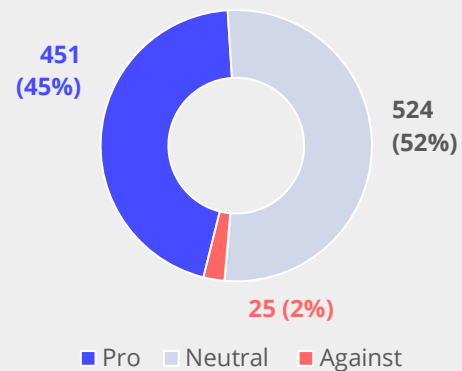
### Attitude towards vaccines on Facebook

n=1,000



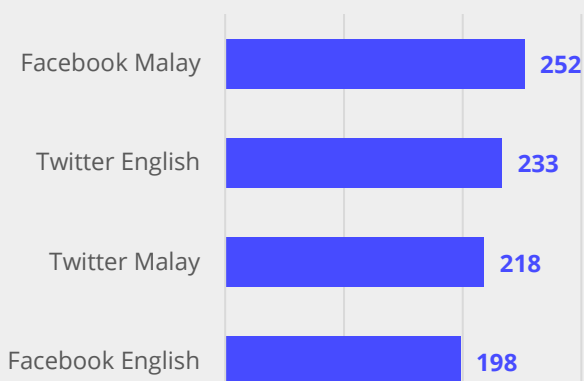
### Attitude towards vaccines on Twitter

n=1,000

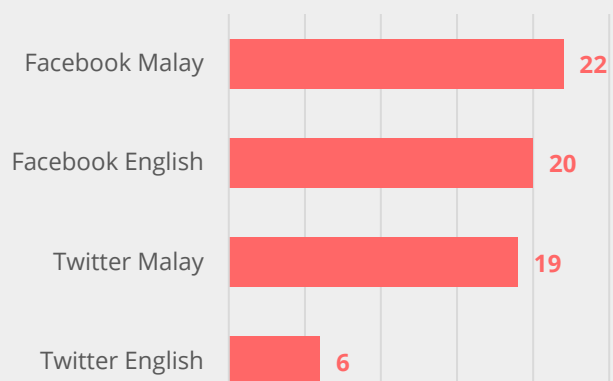


By platform, the number of posts recommending and/or encouraging vaccines is nearly identical, but there are more posts not recommending and/or discouraging vaccines on Facebook (4.2%) than Twitter (2.5%).

### Posts recommending vaccines by platform and language



### Posts against vaccines by platform and language



At a more granular level, we see that the Facebook Malay and Twitter English datasets contain more pro-vaccination posts than Twitter Malay and Facebook English. Meanwhile, the Facebook Malay, Twitter Malay, and Facebook English datasets contain 91% of posts against vaccines, with the remainder from Twitter English.

## 5. Content analysis by topic

### 5.1. Development



On both platforms in both languages, posts on the “development” topic largely consist of links to articles and reports on the development of vaccines, while a smaller number consists of opinions on the topic. Overall, both Malay and English platforms are similar in their content on this topic with the attitude towards the vaccines being largely positive.

Opinion posts are generally supportive of the vaccines being developed, regardless of which vaccine. For these opinion posts, two broad narratives are identified. The first focuses on vaccine effectiveness and the second on what stage of development the vaccine is at. An example of positive attitudes regarding the development of the vaccine, the top post in English Twitter dataset is from Professor Adeeba Kamarulzaman, dean of the Faculty of Medicine at Universiti Malaya that mentions both intellectual property (IP) waivers for vaccines and the effectiveness of the Pfizer vaccine. The second most engaged post in the “development” topic focuses on Sinopharm obtaining approval from the World Health Organisation.

Posts sharing articles or reports are mainly on the development of vaccines, including those from Russia and China, as well as vaccines produced by Western countries, such as AstraZeneca and Pfizer. Shared articles tend to be “good” news regarding vaccines. For example, one of the most engaged posts in the Facebook English dataset was an article from the SAYS official account regarding China having four out of 10 Covid-19 vaccine candidates worldwide that have successfully entered Phase 3 of clinical trials. Meanwhile, one of the top posts in the Facebook Malay dataset is an article shared by the website Rotikaya on Malaysia being one of the first recipients of the vaccines.

Other noteworthy items under the “development” topic include posts from the director-general of health, Tan Sri Dr Noor Hisham Abdullah, receiving the top six most engagement in the Facebook English dataset. His posts generally centre on the latest development of vaccines and highlight each vaccine candidate’s efficacy rates. Notably, one post shared reports over concerns of the vaccines increasing the risk of contracting HIV. In the Facebook Malay dataset, the top four posts by engagement originated from the account Public Health Malaysia. Three of the four posts explain how the vaccines were able to be developed in record time and why that should not be a cause for concern. The other post from Public Health Malaysia addresses the concerns surrounding the development of mRNA vaccines.

As both English Twitter and Malay Twitter have a relatively small number of posts on this topic, there is no one account that contributes significantly to this topic.

Regarding posts with an overall negative sentiment, the displeasure is directed towards other matters surrounding the development of vaccines, not the vaccines per se. For example, there was a narrative critical of the Malaysian government for being too slow with vaccine approvals and questioning the need for the National Pharmaceutical Regulatory Agency (NPRA) to conduct its own testing and approval of the vaccines when other countries had already approved them. There were also posts asking why Malaysia does not possess the capacity to develop its own vaccines. This follows news reports that Vietnam intends to develop its own.

## 5.2. Supply and access

Across the datasets, the “supply and access” topic contains personal and private discussions on the progress of the NCIP and its subsequent results. There are two main narratives in this topic. The first includes posts scrutinising and discussing the lack of vaccine supplies for the population and the processes going towards supplying them (whether fairly or unfairly so). These included discussions about the sources of the vaccines acquired and organisational and logistical arrangements. The second narrative discusses the overall accessibility of the vaccine, particularly concerning the ability to register for the vaccine, eligibility and logistical accessibility for vaccination appointments.

When comparing the distribution of these posts over time, the narratives initially focused on the developments in the supply category, aligning with the announcement of shipments of vaccines and progression of the NCIP's vaccination stages. With the announcement of the AstraZeneca opt-in programme in May, the narratives on accessibility became more frequent.

These developments on supply and access have also contributed to the mixed sentiment distribution over time. It was one of the few topics in the full dataset with a similar proportion of posts coded positive and negative sentiment. Relatedly, posts coded as containing a positive sentiment centred on vaccine recipients who praised the quickness of the overall process. However, as the NCIP progressed into its later stages, there were growing negative sentiments about the perceived ineffectiveness in implementing the national vaccination programme.

Both Facebook and Twitter posts contained similar narratives. A noteworthy difference was the source of the content as that affected the emphasis of particular narratives and the distribution of sentiments. For example, for Facebook, the posts in our dataset contained a higher number of official pages, including political actors and members of the public service, such as posts from Dr Noor Hisham and the police. These sources shared news and updates concerning vaccine supplies, with the aim of encouraging their audience to register for the vaccination programme. Further examples include updates on logistical arrangements and anecdotes of personnel receiving their vaccines. Meanwhile, posts concerning the access to vaccines were generally along the lines of alternative policy recommendations and criticism over the NCIP's implementation.

In contrast, posts from the Twitter dataset contain a broader distribution of individuals and groups engaging with the topic of “supply and access”. There is greater engagement in a personal capacity, where they provide their opinions or commentaries to the topic of “supply and access”. There are notably more posts engaging with the access element in the Twitter dataset, criticising the registration process, particularly the MySejahtera system and the lack of coordination with the Covid Assessment Centres (CAC). There are also more posts criticising the eligibility of certain individuals or groups granted early access to the vaccines. The criticism was directed at who qualifies as a front-liner and preferential treatment for “VVIPs” such as celebrities, political elite and their families.

Unlike the differences across social media platforms, the language datasets do not differ significantly in terms of content and the narratives. There were complaints concerning the lack of proactiveness from the government on communication and improving on the issues within the NCIP and its rollout. This is noted in the complaints on the choice of locations for the vaccine administration centres (VAC). There were also discussions surrounding the underutilisation of other resources in the healthcare industry, such as private hospitals, pharmacies and community clinics, to administer the vaccines. The differences were predominantly observed by the greater breadth of sources in English. They include politicians, celebrities, individuals and even foreign embassies communicating their contributions and efforts in providing vaccines. There were also community groups and individuals actively sharing information regarding the registration process and other means to aid accessibility to vaccine recipients.

### 5.3. Safety and efficacy



“Safety and efficacy” cover 12 narratives that can be characterised by posts discussing the safety and efficacy of the vaccines themselves or those aimed at building or undermining confidence in the vaccines. Specifically, they concern the administration of vaccines on public figures; possibility of deaths, side effects or illnesses from the vaccines; efficacy and its definition-related discussions; efforts of the NPRA; personal experiences with vaccinations; life after herd immunity is achieved, monetary compensations for vaccine-related side effects; safety in the administration of vaccines; safety of vaccine development; safety of the vaccine for special groups and hesitation in getting the vaccines.

Narratives for the topic can be divided into periods before the NCIP began and after the first phase was implemented. Prior to the availability of the vaccines to the front-liners, conversations on the vaccines focused on the potential recipients of the first doses of vaccines, with a preference for politicians to test the safety and efficacy of vaccines. Other narratives in this period discussed progress on the development of vaccines and tests by the NPRA. With the first phase of the programme, narratives were then impacted by personal experience, concerns for vaccinations of special groups of people and shared content on vaccine-related deaths. The narratives were

shaped by events such as the vaccination of key public figures, the death of the national archer and a nurse, infections of 40 Health Ministry workers after their vaccination and incorporation of AstraZeneca into Malaysia's vaccination drive albeit via a voluntary sign-up process. The events would receive a flurry of responses such as the vaccination of the prime minister and Kinabatangan MP Bung Moktar Radin receiving high engagements as well as the infection of the 40 ministry workers.

Frequency of negativity in sentiment was highest in March around the death of the nurse, though this was directed at the media outlet for linking the death to the vaccine. A similar trend surrounded the passing of the national athlete where despite the negative posts, the anti-vaccine statements were low. Negative posts were also high surrounding the incorporation of AstraZeneca into the vaccination programme, particularly as publicity on blood clot risks preceded its arrival in Malaysia in April and the approval by Malaysia's JKJAV. Posts also referred to the ban of AstraZeneca in other countries, which raised concerns over its safety. Positive sentiments were highest with the demonstration of safety with the vaccinations of public figures such as the prime minister, Bung Moktar, Tun Dr Mahathir Mohamad and minister in charge of the vaccination programme, Khairy Jamaluddin. Positive sentiments also surrounded posts explaining the safety of the vaccine for special groups and those sharing positive experiences, such as low side effects from the vaccines.

Across all platforms, the most prominent narratives are the administration of vaccines on public figures, conversations on vaccine-related deaths or illnesses, discussions on the limitations of vaccine efficacy, safety for special groups, especially breastfeeding mothers and pregnant women, explanations on the safety of the vaccines, and personal experiences detailing positive stories or documenting side effects. Most of the posts on Facebook came from community pages while content from Twitter drew from personal accounts. As such, the community pages may represent interest groups such as Persatuan Pengguna Islam Malaysia (PPIM) and Public Health Malaysia, which featured narratives seeking clarification or explaining the tests, development or concerns. Facebook has a higher number of posts seeking compensation from the government for any side effect of the vaccine compared with Twitter. Posts by Public Health Malaysia and Dr Noor Hisham in the Facebook dataset bolstered contents on efficacy, where conversations would discuss the limitation of efficacy, whether this is the possibility of getting infected after vaccinating, the effectiveness of existing vaccines against new variants or efficacy of different vaccines.

Meanwhile, Twitter has more reactions to shared information. Twitter posts featured higher records of personal experiences, more conversations on AstraZeneca and higher anecdotal mentions of vaccine hesitancy. The personal experiences would detail the side effects of the vaccines, across different vaccine-types received. A handful of Twitter posts also linked safety of vaccines to approvals by institutions such as WHO and EU, specifically on AstraZeneca's vaccine. The posts refer to WHO's approval of the AstraZeneca vaccine and possibility of a retraction of the approval following the rise in blood clot cases. In addition, the headlines on EU suing AstraZeneca were frequently shared with the assumption that the legal battle is due to blood clots and side effects when in actuality the legal issue was over the delayed delivery of vaccines. The inability of



government to control the pandemic also reflected mistrust in the capability to administer the vaccines.

Linguistically, the English data set feature more rhetoric on the administration of vaccines on politicians, specifically when they were first in line. Additionally, content on post-vaccination life differs across the Malay and English dataset. The Malay dataset features more posts on the futility of a return to normalcy when the country achieves herd immunity, particularly as the MCO was still in force and cases remained high while other countries were able to return to a semblance of normalcy. Posts on life after achieving herd immunity in the English dataset lean towards neutral and positive sentiments where it is projected that the vaccines would open new areas of medicine and the realities of the standard operating procedure (SOP), such as masks being a mainstay of Malaysian life. Posts on compensation if anything were to go awry differ across language. Posts calling for compensation by government were mostly by PPIM on the Facebook Malay dataset while the English dataset also featured private actors, such as insurance companies. The posts from insurance companies mainly appear in the Twitter English dataset.

The posts on the administration of vaccines on public figures were effective in bringing attention to the safety and efficacy of vaccines. In some cases, public figures being vaccinated built confidence in the vaccines. For instance, Dr Mahathir's vaccination convinced the older population to register for vaccination. The figures drawing headlines differ across platform and language. A majority of the Facebook posts in Malay on the administration of vaccines on public figures were dominated by Bung Moktar's announcement that he is the first vaccine recipient, while Twitter posts in English shared Muar MP Syed Saddiq Syed Abdul Rahman's reception of AstraZeneca. Khairy's Sinovac vaccination and sudden ability to "speak" Mandarin were shared on Facebook datasets and Twitter Malay. Meanwhile, Prime Minister Muhyiddin Yassin's vaccination was mentioned across all datasets except Twitter English. The influence of political leaders to increase confidence in the vaccine is significant, since the goal is to have the same vaccines for the public as politicians. However, this also raises the concern that politicians were getting "better" vaccines than the general population, with impacts on safety and efficacy assessments by the public.

Further narratives on efficacy and vaccinations aim to articulate the definition of efficacy, where vaccination is misconstrued as a cure. Thus, even until May, the dataset displayed content articulating the purpose of a vaccination is to reduce severity of symptoms and there is a possibility of reinfections, without clear content in the dataset explaining or describing the definition of efficacy.

Mainly found in the English dataset, the definition of efficacy is discussed to be lower severity of symptoms if one is infected with Covid-19, lower risk of getting infected by Covid-19 and building up immunity against infections. However, the information is not shared effectively and may also miss the link to the government's decision to relax the MCO but with strict SOP in place. Trust in vaccinations dropped further when the 40 Health Ministry workers were infected with covid-19 despite being vaccinated. In addition, the Sabah cluster that emerged after a woman received her two doses as well as news of infections post-vaccine completion from other countries reduced trust and expectations of efficacy.

Concerns over vaccine-related deaths or illnesses are expressed across all platforms, particularly if they impacted confidence in the safety and efficacy of the vaccine. Death of the archer, the nurse, a Perak policeman and a teacher associated with vaccines raised concerns over the safety of the vaccines. In addition, news about deaths during tests and experiences of other countries – specifically Indonesia – also eroded confidence in vaccines. Safety of the vaccines for groups, particularly those with health conditions, such as allergies and pregnancy was also discussed. The latter on pregnant mothers touched on the types of vaccines acceptable to special groups. As information was contradictory, this reduces trust in the safety of vaccines for special groups – namely those older, with chronic illness, the pregnant and those deemed unfit for vaccination.

Concerns over the AstraZeneca vaccine, particularly the risk of blood clots, cut across all datasets and were concentrated between April and May when voluntary registrations opened. The AstraZeneca vaccine featured in several posts, especially those on vaccine-related deaths or illnesses, its efficacy and safety, as well as reactions of institutions, such as the EU or WHO. Individuals also shared their experience of receiving the AstraZeneca vaccine and the side effects – or lack thereof.

The role of ratifying bodies, transparency in test facilities, vaccinations on public figures, safe administration of vaccines as well as documentation of the personal experience shape the environment of trust around the vaccines. The coverage on Dr Mahathir's jab and the oldest recipient of the vaccine in Sarawak boosts trust in the vaccine. AstraZeneca's acceptance by WHO and updates on the NPRA process also helped to build trust in the vaccine, in addition to those sharing personal experience. The personal experience, which documents side effects, stories of convincing the older generation to get the jab and anecdotes of a family being infected saved by the vaccinated, reflects the experience of the general population being vaccinated. However, the personal experience also captures negative experiences such as lower dosage of vaccines administered to some users. This creates doubt in the safety of the process, which increases vaccine hesitancy.

It can be surmised that individuals weigh vaccine risks against present unhealthy lifestyles, concern over unknown side effects, possibility of side effects and uncertainty over the vaccine development. The risk perception is influenced by messages from the community amplifying concerns over vaccine-related deaths or illnesses or possibility of getting infected after vaccinating. These messages are circulated within communities and are shared by family members or neighbours. While the dataset becomes more positive in sentiment as more people are vaccinated, concerns over infections post-vaccination and vaccine-related deaths might prohibit growth.

## 5.4. Public health



The “public health” topic saw the third most posts in our dataset. Attitudes towards the vaccines on this topic are largely positive. On both platforms, the most common type of narrative is the sharing of vaccination experiences, namely that they have received their vaccination. This is sometimes accompanied with a picture at the vaccination centre and a pro-vaccine sentence encouraging others to get vaccinated. Ways of encouragement include stressing the severity of the Covid-19 virus, that none of us is truly safe until all of us are vaccinated, and that we should be vaccinated if we really care about our loved ones.

In the Facebook dataset, a number of well-known public figures had also encouraged the public to vaccinate, including Nicole Wong (politician), Dyana Sofya Mohd Daud (politician), and Ning Baizura (artiste). This is relatively absent on Twitter, with only a couple of posts from comedian Dr Jason Leong getting high engagements.

One noticeable aspect of the Facebook English dataset is the presence of posts from accounts belonging to companies from a diverse range of industries, including healthcare, food and beverage, and insurance. These are usually public service announcement posts encouraging the public to get vaccinated and sometimes accompanied by a promotion of their products and/or goods. A number of these posts also offer discounts or vouchers to the vaccinated, while posts from the insurance companies generally contain details of their coverage. The Facebook English dataset also contains opinion polls asking, among others, whether vaccines should be given to “anti-vaxxers”, and whether the pandemic will end with the advent and introduction of the vaccines.

In the Facebook Malay dataset, the account “Public Health Malaysia” contributes a large amount of pro-vaccine posts. The content ranges from encouraging younger people to help their parents register for the vaccine to explaining why vaccines are crucial to beating the pandemic. Besides that, the accounts Friends of PDRM (Royal Malaysian Police) and Upin and Ipin also appear numerous times in the Facebook Malay dataset, strongly urging Malaysians to get vaccinated.

Meanwhile, posts with a negative sentiment are generally over matters such as failure to show up for vaccination appointments; poor vaccine registration numbers; and demanding political parties to do more to raise and spread awareness about the importance of vaccines.

## 5.5. Politicisation



Posts coded for “politicisation” gained increasing engagement following the declaration of the emergency in January 2021 and the subsequent suspension of Parliament. Generally, posts under this topic scrutinised policies implemented to contain the pandemic, which developed over time to include demands for accountability from decision-makers.

These discussions were divided into two main narratives. The most prominent “politicisation” narrative was the perceived disparities in the implementation of SOP and vaccine distribution, with the allegations being that these that the political elite had “first dibs” at the vaccines. The second expressed doubt over the intentions of measures introduced to manage the pandemic – whether they are truly in the public interest or for political gain.

There were also state-level developments reflected in the posts, including allegations that the Pahang royal family had acquired a few thousand vaccines and their involvement in granting prioritised vaccinations to those working at the Genting Highlands Resort. Elsewhere, there were also allegations that vaccine supplies were used for political support in Sarawak and Sabah and accusations of the government's withholding supplies to Penang. These developments contributed to the predominantly negative sentiment posts in the “politicisation” dataset. This, however, did not affect the general attitude towards the vaccine, which remained neutral to positive overall.

The general narratives and sentiments were similar across the Facebook and Twitter datasets. In the Facebook dataset, there were more posts from public figures engaging with Covid-19-related policies, while posts from ordinary accounts generally shared discontent. Examples of the former include official sources explaining policies, providing further clarification, and to disprove misconceptions. On the other hand, there were former members of the executive who criticised the policies and the poor outcomes.

In contrast, the Twitter dataset contains more posts from individuals questioning and criticising privileged individuals and groups. In addition to the political elite, there were criticism aimed at the Pahang royal family in regards to allegations of them acquiring unregulated vaccine doses and allowing preferential vaccine appointment dates to certain entities such as the Genting Group. There were posts questioning and criticising the aptitude and motives of politicians and cabinet members on their promises to the public. Most notably, these were directed towards to the Science, Technology and Innovation (MOSTI) Minister Khairy, who is also the coordinating minister for the NCIP. Other criticism included the deflected accountability for the rising number of Covid-19 cases daily; lack of clear leadership and proactivity towards addressing vaccine hesitancy, particularly in rural areas; and prioritising political gain over public interest.

Meanwhile, there were only minor narrative differences in the English and Malay datasets. There was, however, different emphasis on elements of the narratives identified. For example, narratives in the Malay language dataset emphasised more on the Covid-19 policies. There was more direct engagement on the policies as a whole, be it endorsement or criticism, by political parties, political elite and public. Included in these narratives were demands of transparency and accountability for the ministers involved, with suggestions of a pay cut to aid the country's recovery.

The English dataset found greater engagement with the narrative of the political elite utilising the pandemic and the subsequent emergency powers for personal gain. The event that stimulated greater engagement with this narrative was the offer to supply vaccines to the state of Penang. The incident sparked calls from the public demanding for the decentralisation of vaccine procurement, following perceptions of politicisation of vaccine supplies. An interesting observation in the English dataset was the discussion of foreign involvement in domestic affairs, noted in the role and motives of Abu Dhabi and its role in the 1MDB case.

## 5.6. Liberty and freedom



The "liberty and freedom" topic contains nine main narratives. In no order of frequency, these are the possibilities of international travel; possibility of domestic travel; necessity of vaccine passports to access facilities and freedom of movement; consent surrounding vaccinations; freedoms impacted by the pandemic and herd immunity; possibility of restricting freedom of those who refuse to be vaccinated; government's role to control vaccine hesitancy; posts on the MCO and state of emergency; as well as responses to celebrities and public figures breaching the SOP.

As the pandemic has brought about unprecedented control of personal movement and other limitations of civil liberties, posts under this topic frame the vaccination process as limited liberties versus what can be gained with the achievement of herd immunity. Posts can be aspirational and discuss ideas to achieve herd immunity either by limiting or granting greater freedoms. Most would carry the logic that vaccination would be the gateway to future freedoms, particularly those related to travel.

The most prominent trend on this topic is the shift in tone and sentiment over time. Where at the start of the second phase of the vaccine programme is positive, particularly with the prospects of domestic travel, sentiments gradually shifted to negativity as case numbers fail to fall over time. The narratives display discontent over the lack of improvement in conditions, with vaccinations and increasing movement restrictions not improving the quality of life of Malaysians. The negativity is manifested in posts proposing the restriction of freedoms to those who reject vaccinations, those picky about vaccines and anger directed at celebrities, namely Neelofa and Tiz Zaqyah, and other individuals caught breaching the SOP. These included calls to restrict freedoms for the purpose of

controlling the pandemic such as crackdowns on troll accounts or misinformation campaigns, and restricting access to facilities such as EPF, or access to private property like coffee shops.

While conversations across the platforms are concentrated on the narratives mentioned, Facebook posts have a greater degree of discussion on vaccination consent, particularly to pick a vaccine. The argument is based on the perception that there are differences in the vaccines, particularly those given to the general population and those given to public figures. The type of conversation on freedoms differs across platforms. Where Facebook posts talk about possible social gatherings and expressions of democratic rights such as elections with herd immunity, Twitter, with shorter posts and reactive comments, feature discussions on restrictions and limitations of freedoms.

Travel garnered the most posts across all the platforms with aspiration for domestic travel expressed more often in Malay posts than English posts. These are frequently accompanied by posts of having completed two doses and those aspiring to meet family members. In regard to international travel, many wishing to fulfil the haj expressed vaccine preference for those accepted by Saudi Arabia. Vaccine passports are discussed further in the English posts where they are seen as granting freedom of movement and the impact on groups not vaccinated (for acceptable reasons).

Vaccine passports are seen as granting greater freedoms of movement outside or within the country and as a requirement to access facilities like coffee shops or mosques. There are expectations even after completing the two doses of vaccinations or after receiving vaccinations that certain freedoms would be allowed. There is a sense of urgency for those trapped in countries such as Singapore and the UAE, unable to return even after vaccination. Travel is the largest motivator under this topic, where the promise of travel internally or abroad is a driving force to vaccinate.

## 5.7. Conspiracy theory



On both Facebook and Twitter, the attitudes towards vaccines are generally positive, with posts mainly focusing on dispelling or disregarding them. While most posts generally focus on dispelling concerns over Covid-19 vaccines, they oftentimes take an angry or a sarcastic tone as their focus is to criticise or dispel the theories. For example, many posts are critical of the older generation for believing in the conspiracy theories. Another source of frustration is the ease of conspiracy theories spreading. There are also posts in Malay that air their frustration over the fact that Malays seem more susceptible to these conspiracies than other ethnic groups.

One reason the topic shows up more in the Malay dataset is that popular conspiracy theories espoused in Malaysia are more likely to gain the attention and resonate within the Malay (and Muslim) community. For example, one of the more popular conspiracy theories is the belief that the



vaccines are linked to a Jewish and/or Zionist plot for world dominance. This includes the conspiracy that buying the vaccines is to enrich Jews and/or Zionists, with one theory accusing the chairman and CEO of a pharmaceutical company as being a member of the Jewish National Fund.

Another popular conspiracy theory in our dataset is the allegation of the vaccines containing microchips. For posts in Malay, this theory is sometimes linked to the religious view that the vaccines are the creation of the “Dajjal” or anti-Christ. The conspiracy claims that the microchips will always enable tracking of one’s location, and even control over one’s mind. To be noted, however, is that as with other posts containing conspiracies, these are generally met with criticism or sarcasm.

Another conspiracy theory includes the allegation that the vaccines are swapped during the drawing from the vial process and the injection. This is attributed to videos showing a different coloured needle used to draw the vaccine from its vial and a needle of different colour used to inject the person. The posts that contain this conspiracy, however, also try to dispel it by stressing that this is normal procedure for vaccines.

Another highly engaged post links to a video of a Malaysian cautioning over the vaccines as there were rumours that a national archer died after being vaccinated.

## 5.8. Economics



Posts on the topic of “economics” contained narratives surrounding the use of national funds to combat the pandemic and the prospects of economic recovery. These discussions can be divided into three main narratives. The first covers the utilisation of national funds towards combating the pandemic, especially considering the approval of the 2021 Budget and the use of the National Trust Fund (Kumpulan Wang Amanah Negara, or KWAN). The second centres on the role of government-linked companies’ (GLCs) and private companies’ alleged profiteering from both the vaccination efforts and overall national economic recovery. The third consists of the miscellaneous economic effects brought by the pandemic, including financial incentives used to encourage vaccine registration and lower GDP growth.

While the discussions surrounding the implementation of economic recovery plans have been ongoing since the passing of the budget in late November 2020, recent events increased attention towards the topic. These included the situation of the purported two million vaccine doses donated to Penang and the growing dissatisfaction over the vaccine rollout and worsening domestic situation, which led discussions to move towards the viability of states acquiring their own supplies. Over time, the sentiment changed from neutral to negative.

When comparing the platforms, they were mostly similar in the range of narratives and content. However, what differed were the sources of these content. The Facebook dataset contained greater engagement from political actors concerning the 2021 Budget. Proponents expressed their opinions and endorsement, whereas detractors questioned its usage and ability of the government to use the money to aid pandemic recovery programmes. These official pages did not engage much with the narrative of private companies, except for announcements concerning the appointment of the GLC Pharmaniaga to bottle the SinoVac vaccine.

The Twitter dataset saw more individual posts regarding the 2021 Budget. Unlike the Facebook dataset, there were also other narratives, such as the pandemic's broader financial impacts on stock prices of relevant medical industries and the importance of providing assistance to severely affected regions like the Klang Valley – the biggest contributor to national GDP. Twitter also saw more engagements on the role of private companies, both local and foreign, and their potential financial gains. A notable example were discussions surrounding pharmaceutical companies such as AstraZeneca and their presumed commitment to ensure no additional profits from its deal in Malaysia.

When comparing the datasets by language, posts in the Malay dataset were more evenly distributed across the three narratives. However, there was more focus on the connections between political intent and economic policies behind the recovery efforts. In comparison, the English dataset were more economically inclined, reflecting the current state of the GDP and stock market. There was similar scrutiny regarding the budget and its decision-making. There was also engagement with private companies, such as insurance companies that promote their product as means to spur greater vaccination registrations. Additionally, given the method of engagement, there was a higher frequency of individuals urging their state representatives to obtain vaccines through a state capacity as opposed to relying on the federal government.

## 5.9. Morality and religion



Posts coded for the topic of “morality and religion” contain five main narratives. These focus on the development and ingredients of the vaccines; endorsements by individuals, religious bodies and/or authorities; vaccination and religious practice(s); anti-vaccine narratives; as well as prayers in current MCO conditions.

Until the announcement of vaccinations being a requirement for haj, a majority of the posts focused on the development and ingredients of the vaccines, particularly their halal status. These posts are negative in sentiment and were further instigated by Kelantan Deputy Menteri Besar Datuk Mohd Amar Nik Abdullah's concern regarding the halal status of vaccines from China. Regardless, posts were gradually interspersed with positive endorsements of the vaccines following announcements made by Islamic bodies such as Fatwa Ulama Dunia, Saudi Arabia, Pegawai Perubatan Kelantan,



Majlis Mesyuarat Jawatankuasa Muzakarah Majlis Kebangsaan, Malaysian ulama and religious leaders, such as Ustaz Azhar Idrus and Yusuf Al-Qardawi. As the second phase of the NCIP began, positive sentiments continued to proliferate, particularly with the possibility of being allowed to perform the haj. However, content describing encounters with anti-vaccination individuals gradually increased in the third phase of the NCIP.

There is a linguistic bias in the dataset with there being more posts, across a greater variety of narratives among the Malay posts compared with English posts. Conversations in the English dataset touch on the halal and haram status of vaccines and the ability of vaccines to be the gateway to completing religious practices such as haj. Meanwhile, discourses in Malay discuss the ingredients of the vaccines, endorsements from individuals, religious bodies and authorities, possibility of vaccinations complementing religious practices, and content on prayers. There is also conversation on government ethics in managing the NCIP, as there were reports of manipulations to booking slots in the Malay dataset. The posts display the underlying desire to ensure that receiving the vaccine would be in line with religious practices, such as whether it is halal or haram, and the aspiration to develop vaccines whose efficacy is dependent on alcohol abstinence.

In the Facebook English posts, narratives are greatly biased towards the mention of religious practices and development where the former would be responses to information that the vaccine would be needed for the haj and the latter on the halal or haram status of the vaccines. The interactions feature news shared by the authorities questioning the halal and haram status of vaccines, such as the Pahang mufti's statement on the vaccine being important to ensure peace of mind on 1 December 2020, and in response, posts cast doubts on religious practices and sincerity in requiring the vaccines to be halal.

Meanwhile, posts in the Twitter Malay dataset indicated the need for assurance that the vaccine is halal and referred to Indonesia's President Jokowi and Turkey's President Erdogan's decision to send their ulama to visit the development facilities. However, discourse on the halal-haram status is not one dimensional. In fact, the Malay dataset contained posts exploring other aspects of Islamic debates, such as would the lack of a halal endorsement be superseded by the religious obligation such as *maqasid syariah* and health needs.

In this topic, trust in vaccines lies in the endorsements from both domestic and international religious authorities, bodies, and leaders. For example, news about PAS president Hadi being vaccinated, along with the vaccination of religious leaders, such as Syeikh Abdurrahman, reassured the populace that the vaccines are safe and halal. In addition, trust is placed in religious bodies to conduct the necessary tests and research to determine the permissibility of the vaccines, as secular government bodies, such as the NPRA, are not seen as keeping Islamic practices in mind.

While not displaying anti-vaccine attitudes themselves, there were a few posts expressing frustrations about individuals who rejected vaccines and anti-vaccine practices around them. The anti-vaccine individuals are frequently those in positions of power, such as a secondary school teacher, the local mosque's imam or family members. The linkage between infections after

vaccinations, such as the 40 nurses, reduces impressions of the efficacy of the vaccines, thus driving individuals to adopt solutions enforced by religious beliefs, such as drinking water blessed by salawat. This shows that coverage impacting on the safety and efficacy of the vaccines could drive individuals to adopt alternative, religious-based solutions.



## 6. Selected narratives against vaccinations

This section highlights selected narratives against vaccinations in our dataset and from our stakeholder interviews. By matching these with an explanation of why and how it is either false or misleading, we hope to help build social media users' resilience towards these problematic narratives.

	Narratives against vaccines	Explanation
1	All major "Western" pharmaceutical companies, such as AstraZeneca, Pfizer, and Moderna, have not only Jewish CEOs but specifically CEOs who are part of or contribute to the Jewish National Fund. This is seen by Muslims as a serious concern as the JNF has contributed significantly to Israeli settlements throughout Palestine over the decades.	There is no evidence that any of the CEOs of "Western" pharmaceutical companies, or the pharmaceutical companies they run, contribute any money to the JNF.
2	Covid-19 vaccines are part of the Dajjal/anti-Christ agenda.	No evidence for this.
3	One person in Brazil died after volunteering for the AstraZeneca vaccine trials.	It was clarified that the person who died, while being part of the vaccine trial, had received a placebo. This means the death could be attributed to other factors unrelated to the vaccine.
4	The vaccines contain microchip(s), which after injection into the body, tracks the person's location and controls the mind.	No evidence of microchips in any Covid-19 vaccine.
5	A Malaysian national archer died shortly after receiving the Pfizer vaccine. Unfounded rumours spread that the vaccine was the cause of death.	Although a national archer did die after a Pfizer jab, the Health Ministry said the post-mortem shows a blocked coronary artery was the cause of death. There was no link between the death and vaccine.
6	Covid-19 is similar to the common flu and relatively low numbers of people	It is a mistake to equate Covid-19 with the common flu as its reproductive number (the



	<p>have died or developed major complications from it. Besides that, only the elderly and those with comorbidities are at risk, thus it is not necessary for everyone to get vaccinated.</p>	<p>number of secondary infections generated from one infected individual) is estimated to be between <a href="#">2 and 2.5 for Covid</a>, higher than for the flu. These numbers give a clear indication that Covid-19 must be taken more seriously than just the common flu.</p> <p>Further, although Covid does indeed have a bigger impact on seniors, its impact on the young cannot be ignored or minimised. It is not just that young people do lose their lives due to Covid, but there is also the growing concern over "<a href="#">long Covid</a>" and its long-lasting impact on coronavirus patients.</p>
7	<p>Covid-19 vaccines are not "real vaccines" as they do not cure the person from nor prevent the transmission of the novel coronavirus.</p>	<p>The vaccines are intended to <a href="#">help our bodies develop immunity</a> to the virus that causes Covid-19. This means that while the possibility of getting infected with Covid-19 still exists, vaccinations overwhelmingly help to prevent severe illness, hospitalisations, and death. The vaccines <a href="#">can also keep a person from spreading the virus</a> that causes Covid-19.</p>
8	<p>Covid-19 vaccines can lead to other diseases and dangerous side effects. Some personal experiences include a stroke.</p>	<p>Side effects are part of the immune response to the vaccine, although not all receiving the vaccine will experience them. Common side effects include pain at the injection area, redness, swelling and itchiness. <a href="#">More serious side effects are extremely rare</a>, including vaccine-induced blood clotting and myocarditis/pericarditis.</p> <p>By and large, the medical consensus is that the benefits of vaccination for all age groups, including the young, outweigh potential risks.</p>
9	<p>Vaccinations are ineffective as even with the NCIP rolling out nationwide, the number of cases in the country is steadily rising.</p>	<p>Context is important. The NCIP is being rolled out amid wider testing conducted at targeted localities, as well as the <a href="#">arrival of newer variants that can transmit faster</a>. Besides that, it must also be remembered that the</p>

		<p>vaccination programme is ongoing, and not everyone has had their doses yet. Taken together, this explains why case numbers continue to rise despite the NCIP rollout.</p> <p>To be noted is that <a href="#">Labuan had seen a significant decrease</a> in case numbers as early as mid-July when first dose vaccinations hit 87% and 52% being fully vaccinated.</p>
10	<p>The vaccines were developed too quickly, with the percentage of mortalities too high to build confidence. For instance, Pfizer-BioNTech trials saw the deaths of 23 individuals aged 80 and above in Norway.</p>	<p>The vaccines were able to be developed in record time because of an alignment of public health priorities, funding being made available, and bureaucracy sped up. Its development also draws on years of previous research on related viruses such as SARS and MERS. Besides that, multiple trials were also allowed to run in parallel, saving time. At no point, however, were standard safety processes ignored or skipped over. The WHO reviews and validates the vaccines with rigorous testing in addition to the tests conducted by Malaysia's Drug Control Authority and the NPRA, confirming its safety.</p> <p>Death is not impossible after vaccinations. However, the chances of dying due to complications from the administration of vaccines are rare. The US, for instance, reports 0.0018% deaths in cases of the vaccinated, where reports of the deaths are mandatory even if it is unclear if the vaccine is the cause. Available information has <a href="#">not established a causal link of the deaths to Covid-19 vaccines</a>.</p>
11	<p>There is concern about the vaccines' ingredients.</p>	<p>Information on the constituents of the vaccines is published in the <a href="#">Clinical Guidelines on Covid-19</a> vaccination in Malaysia.</p>
12	<p>The AstraZeneca vaccine has risks of blood clots and Denmark, Norway, Estonia, Latvia, Lithuania and Luxembourg have postponed its use in</p>	<p>The potential risks and potential benefits (where benefits are stated to be preventable ICU admissions) differ across age groups. For 20-29-year-olds, the potential risk of blood</p>

	their vaccine programmes.	clots is 1.9 per 100,000 people while potential benefits are 3.16 per 100,000 people. For 30-39-year-olds, the potential risk is 1.8 per 100,000 to 13.79 per 100,000 people. The potential risks per 100,000 people do not reach beyond 2.1 (for the 40-49-year-old group) to a potential benefit of 31.28.
13	Deaths from Covid vaccinations prove that the vaccine causes harm and is against the act of God.	<p>While deaths from complications linked to vaccines have occurred (refer to above statistics for more information), herd immunity would decrease the chances of a larger catastrophe fuelled by a strained public healthcare system.</p> <p>It may be possible that diseases and plagues are given as a form of punishment (Sunan Ibn-Majah, Hadith no 4019 and Surat Al-Run, Ayah 41). However, believers should remember in <a href="#">Sahih Al-Bukhari, Hadith no. 3474</a>, when Aisha posed a question to Prophet Muhammad if the plague is divine punishment from Allah, the Prophet responded, "It is a punishment sent by Allah by whom He wants to punish. And Allah made it a source of mercy for the believers. If one in the time of an epidemic plague stays in his country patiently hoping for Allah's reward and believing that nothing will befall him except what Allah has written for him, then he will get the reward of a martyr." How this can be interpreted is that the plague or any pandemic is either a punishment or mercy, where the responsibility of the believer is to believe and trust in Allah.</p> <p>In this view, it should also be mentioned that according to Sahih Al-Bukhari, Hadith no. 5678 "There is no disease that Allah has created, except that he also has created its treatment" and supported by foundations laid by Tawakkal or stated in Surah Ali Imran, verse 159, "Once you make a decision, put</p>

		<p>your trust in Allah. Surely Allah loves those who trust in Him" which denotes that in a situation of a pandemic, society can be tested and as it would be God's will to instigate the disease, there would be solutions which would be on the believers to decide on their paths. In Surat Al-Isra, Ayat 70, it is mentioned that Allah says "We have honoured every son of Adam" which places the protection of life as essential and honoured by Allah, placing the protection of life as a religious responsibility.</p>
14	The vaccines cause side effects and there is no mechanism to report on the side effects, particularly if these are problematic.	<p>MySejahtera version 1.0.30 and later allows users to report side effects. Individuals experiencing side effects are also able to seek medical assistance at hospitals, <a href="#">if they need to be observed there</a>.</p>
15	The vaccine will cause mutations in people.	<p>The vaccines do not change nor interact with DNA. The vaccines deliver instructions to cells to build protection against the virus. The material does not enter the <a href="#">nucleus of the cell where the DNA is kept</a>.</p>
16	The vaccines used in Malaysia are not as effective as those used in other countries as they are able to return to daily life with no restrictions.	<p>Vaccines here are approved by the National Pharmaceutical Regulatory Agency (NPRA). Effectiveness of the vaccines is tied to achieving herd immunity, which for Malaysia would be to vaccinate 80% of the population.</p> <p>As the SOP is made in consideration of present R-naughts trends, new variants and number of clusters would impact on its considerations.</p>
17	The vaccines contain pork-based ingredients.	<p>The <a href="#">AstraZeneca and Pfizer</a> vaccines do not use pork-derived ingredients. <a href="#">Sinovac</a>, which is processed and bottled by Pharmaniaga, received a halal certification from Majlis Ulama Indonesia. <a href="#">Deputy Science, Technology and Innovation Minister Ahmad Amzad Hashim</a> has clarified that vaccines chosen by Malaysia are those that do not contain animal</p>

		cells, inclusive of pork.
18	Vaccines are not suitable for pregnant women.	Vaccines are suitable to be administered to pregnant women, who as a matter of fact <a href="#">should be prioritised</a> as pregnant women are susceptible to severe Covid-19 infections, especially in the second and third trimesters. All pregnant mothers should be offered the benefits of vaccination between 14-33 weeks of pregnancy. Meanwhile, high-risk mothers should ideally be vaccinated pre-pregnancy. While <a href="#">mRNA-based vaccines remain the preferred option</a> , vector-based vaccines, such as AstraZeneca, are not contraindicated in pregnancy.
19	China's alleged role in creating the COVID virus means that vaccines produced by Chinese manufacturers are ineffective.	<p>This narrative is part of a greater debate <a href="#">concerning the origins of the virus</a>. At present, there is no conclusive evidence that China had created the virus, or that it had escaped from a lab. This is despite, WHO Director-General Tedros Adhanom Ghebreyesus, <a href="#">not wanting to rule out the possibility</a>.</p> <p>In regard to the effectiveness (and safety) of vaccines manufactured by Chinese companies, the WHO has listed the <a href="#">Sinopharm vaccine</a> and the <a href="#">SinoVac vaccine</a> for emergency use. Further, the NPRA has also approved the usage of those two vaccines and the one made by <a href="#">CanSino</a>. The WHO listings and NPRA approvals show that these vaccines are both safe and effective.</p>
20	There were no vaccine stocks as the government had not acquired them as originally stated. Thus, the delay of the NCIP vaccine rollout was time used to accumulate enough supply.	The narrative arose from the noted delays in the proposed vaccination rollout schedule. Despite launching the programme on February 24, <a href="#">(the current proportion of the population is 13.54% fully vaccinated, whereas 29.24% have had their first dose)</a> , which is behind its <a href="#">intended schedule of Phase 2 and 3 of the vaccination programme</a> .



		<p>There were official explanations for the delay, much of which were attributed to the difficulties in obtaining the stocks from overseas providers. A notable example was Khairy stating that <a href="#">vaccine acquisition has been unfairly monopolised by the West</a>, such as the United States, the United Kingdom and the European Union.</p> <p>While this does not discount the valid criticism towards the NCIP and the government's management of the pandemic, there is no evidence to suggest an unwillingness to obtain these vaccines. There was also additional coverage from media sources and civil society groups, and <a href="#">the WHO</a> on the <a href="#">confirmation</a> and <a href="#">arrival</a> of supplies to dispute these claims.</p>
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## 7. Proposals

There are many policy options to consider in addressing the infodemic inclusive of legislation, regulation, fact-checking, pre-bunking, media literacy campaigns, and of course, public communications. This section of the paper focuses on the latter, namely, communication strategies to make information available to inform the public's decision to get vaccinated.

Having said that, it is worth reiterating that legislations and regulations are not the silver bullets to address the infodemic as they are made out to be. As highlighted in "[A framework towards addressing vaccine-related false information in Malaysia](#)" published by ISIS Malaysia in May 2021, laws that are vague in its objective and broad in its applicability could lead to new risks. This is due to the inherent nature of regulating matters of speech. For example, a law with a vague objective could lead to a chilling effect on legitimate dissent, while one that is broadly applicable could see those whose only "crime" is not knowing any better running afoul of it.

Besides that, and as argued [previously](#), the concept of deterrence that underlies and justifies most of these legislations is also not as effective as one might think. Deterrence here refers to the idea of imposing some form of punitive punishment – usually a fine or jail term – to caution would-be creators of false information. Upon closer scrutiny, this idea is undermined as it presumes that all contributors to the infodemic are doing so intentionally. Legislating as a means towards addressing

this problem would then mean that those who genuinely do not know any better, or in other words the innocently mistaken, could be liable for prosecution.

The concept of deterrence falters further when considering how certainty of apprehension, rather than severity of punishment upon apprehension is a more important factor in creating deterrence. Taking this together with the internet's high levels of anonymity and false identities, it is easy to see why and how the most dedicated creators of disinformation will not be deterred.

Moreover, we must also appreciate how the infodemic is still prolonging in Malaysia despite the presence of at least three different laws to investigate and prosecute creators of false information – the Emergency (Essential Powers) (No. 2) Ordinance 2021, the Communications and Multimedia Act 1998, and Section 505(b) of the Penal Code.

Moving forward – at the outset, we need to be cognisant that there are two components vital for promoting good information on vaccines and the vaccination process: (1) availability of information, and (2) accessibility of that information. The former refers to ensuring authoritative materials regarding vaccines and vaccinations are available for public access, while the latter refers to minimising barriers to obtain the information, inclusive of messaging initiatives.

While the government should bear the larger share of responsibility in convincing people to vaccinate, we must appreciate that a whole-of-society approach is needed to ensure the NCIP's success. Owing to the high number of people who need to receive the right message from the right messenger, another important consideration relates to the issue of government distrust.

Among others, contributory factors to the levels of distrust include a strong perception of double standards of enforcement when it comes to the MCO SOP, the health minister's "warm water" gaffe in March 2020, and the increasing Covid-19 case numbers daily. Besides that, there are allegations of someone somewhere obtaining kickbacks from the vaccine purchases, not helped by the confidentiality agreements signed with manufacturers.

Rightly or wrongly, and fairly or unfairly, these, among other examples, have eroded trust in the government. Further damaging trust levels is the perceived lack of accountability, primarily stemming from the emergency declaration and consequent lack of meaningful parliamentary sessions to debate the decisions. Taken together, these could have knock-on effects on the NCIP. This could manifest itself in the view that the vaccines used in the country are of subpar quality and failed to adhere to safety protocols.

## 7.1. For the government

**Two-way communication channels for those with lingering questions and doubts about the vaccines.** After more than six months since vaccine registrations were first opened to the public, we should operate on the assumption that those who have yet to register are unlikely to register. The exception is those who want the vaccine but lack the means and/or knowledge to access it. Regardless, the government must mobilise resources to reach out and establish communication with the vaccine hesitant. This is to facilitate two-way real-time communication and question and answer. Owing to the urgency of the NCIP, we must be more proactive in creating conversations and to receive and address lingering questions and doubts.

**Targeted messaging at the yet-to-register group.** With the NCIP underway, the authorities must cross-check their respective databases to identify individuals or demographic groups which have yet to register for the vaccine. They should receive text messages and be included in targeted social media campaigns promoting the vaccines. These messages should be “customised” to the intended recipients’ values.

**Targeted in-person communication at localities with low registration rates.** Identify localities where vaccine registration rates are lagging, and matching them with analytics drawn from MySejahtera and HIDE to identify where people frequent in that locality. Once this is determined, then information and registration booths should be set up at these localities. At this juncture, we need to be doubling down on in-person communication at the level closest to the ground. Since the NCIP kicked off, most people with access to traditional and digital media would already have seen something on the vaccination programme. Those left out need to receive the information as soon as possible.

**The NPRA needs to engage with the public directly on what it is doing to ensure vaccine safety.** While the NPRA enjoys a high degree of trust among the people, it is somewhat detached from the day-to-day conversations on the safety of the vaccines. Most, if not all communications coming from the NPRA thus far have focused on the technical aspects of vaccine safety and presented in an official format. To close the gap between the regulators and the people, and to promote the safety messaging, the NPRA can present a face (or faces) behind its work to make it more relatable. This will help assuage concerns over the safety of the vaccines, and dispelling the allegations that those approving the vaccines are in cahoots with Big Pharma.

**The frequently asked questions (FAQs) section on JKJAV’s website should also include foreign languages widely used in Malaysia, such as Indonesian, Bengali and Nepali.** Currently the FAQ is available in English, Malay, Chinese and Tamil. The current language options are laudable, yet more can be done to ensure that certain large demographics living in Malaysia can consume the information in their preferred language.

**Creating a toolkit with pro-vaccine information to debunk misinformation.** At this juncture, it must be recognised that the government cannot be shouldering the entire responsibility of promoting

the vaccines. However, the government should be leveraging on its resources and invest in a toolkit (or get experts to create the toolkit) containing basic information on the vaccines and debunks of common misinformation. The idea here is for the public to be able to peruse this toolkit when spreading the message about vaccines and to debunk misinformation when they encounter it. This will be akin to arming the people with good information, lending itself to the scalability of current messaging efforts.

**Tracking developing news about the vaccines and vaccination process.** This is to ensure that the government does not get blindsided by any vaccine-related development that could lead to an increase in hesitancy. One way to do this is to maintain constant media and social media monitoring to identify topics related to vaccines. Narratives change as a response to developments, therefore, necessitating proactive and responsive measures from the government. This will allow for the preparation of appropriate counter-messaging, prebunking, and fact-checking initiatives.

## 7.2. For the whole-of-society

**Diversify the sources of pro-vaccine messaging to include groups with higher trust and credibility levels.** This means that pro-vaccine messaging should also be coming from non-government stakeholders and actors who possess good standing, credibility and authority in their respective society. This includes, among others, religious, business, and social leaders, heads of residents' associations, and charitable organisations. Another source is general practitioners (GPs) who generally have pre-existing relationships with the community. By leveraging on existing relationships, familiarity, and trust, we can better ensure that the pro-vaccine messages do not fall on deaf ears.

**Get civil society organisations involved with migrant communities to spread awareness on the need to vaccinate.** This, however, must come with the explicit and unequivocal guarantee that they will be free from harassment when attending their vaccination appointments. No amount of good information and conviction will make up for the fear of persecution.

**Businesses can also play a crucial role in the spreading of pro-vaccine information.** One way is to leverage on supermarkets, minimarkets and convenience stores across the country to display pro-vaccine posters containing basic information, with leaflets detailing further information. This would help get the message out to those who might have missed public service announcements in traditional and digital media.

## 7.3. General messaging strategies

**Breaking down scientific concepts, such as vaccine efficacy.** As it stands, people are comparing vaccine efficacy as if comparing groceries at the supermarket. This is potentially problematic because oftentimes they only compare the primary efficacy rate when there are other factors, such as secondary efficacy, to consider.

**Nudging people to get vaccinated.** A growing body of social scientists have been experimenting on the effectiveness of different pro-vaccination messages to encourage people to get vaccinated. Among others, the [work of Dr Katherine Milkman](#), professor of operations, information and decisions at the Wharton School and her colleagues stand out. Of the 20 messaging strategies they tested, ranging from jokes to direct appeals, texting people to say a flu shot had been reserved especially for them had been found to boost vaccination rates. This is ostensibly due to how the messaging strategy creates a “sense of ownership” over the vaccine dose(s). Notably, this finding has been [implemented](#) by researchers at the University of California, Los Angeles (UCLA) and on the island of Jersey in the English Channel.

**Addressing the imbalance between false but simply understood messaging and authoritative science-based messaging.** In fairness, good effort has been made towards simplifying the science behind the vaccines and why we must vaccinate. In comparison, however, certain false information and narratives are even simpler to understand with the added dimension of emotional appeals. At this juncture more must be done towards complementing the *ethos* present in science-based messaging with *pathos* to appeal to both needs of the reader.

**Highlighting the difference between medical consensus and opinion of individuals in the medical profession.** This is aimed at addressing rogue individuals from the medical profession making unsubstantiated claims contrary to the medical consensus. Further, people need to be made more aware that not all medical professionals are similarly experienced and possess equal expertise to be commenting on vaccines and the vaccination process.

**Highlighting the motivation behind certain false claims.** There are groups and individuals promoting alternative treatments that have yet to be proven to be effective against Covid-19 in a clinical trial. The problem worsens when these groups and individuals make baseless allegations against the safety, efficacy and necessity of the vaccines by preying on people's fears. By highlighting their financial motive when people buy their unproven products, then the full picture can be made clearer to the public that they are not doing it out of the goodness of their hearts.

**Highlighting how vaccines are efficacious against the new variants of concern (VOC).** This is in response to those putting off getting their vaccinations due to the false impression that the current vaccines do not provide adequate protection against the VOC.

**Highlighting how social media platforms and communication applications work.** Currently some people are of the view that when social media companies remove content from their respective platforms, it is a form of censorship and a conspiracy to cover up the truth. To address this, more must be done to highlight why the decision was made to remove the post and how it broke community guidelines and/or rules.

**Highlighting the purpose of the ‘forwarded many times’ tag on WhatsApp.** Introduced in [April 2020](#), it is meant to slow down the spread of viral messages. While we do not know the amount of

misinformation spread this way, it is nonetheless a good step to ensure users pause and evaluate the information before forwarding it on. Notably, some stakeholders we interviewed highlighted how some people who took the opposite view and were under the impression that the “forwarded many times” tag meant that the message is important and true since many others are sharing it.

## 8. Conclusion and future research

The research we conducted paints a more positive picture of the information environment surrounding vaccines and the vaccination process than initially expected. The fact that only 3% of the 2,000 posts across Facebook and Twitter in both English and Malay contains an indication against the vaccines and/or recommends against it is encouraging. However, two outstanding concerns remain: (1) 12% of all posts coded as being “against” vaccines is under the “safety and efficacy” topic. This means more must be done to assure the people that the vaccines are safe and efficacious, and (2) the dataset we analysed only includes public accounts, groups and pages, meaning that conversations held in private are not captured. This could be a potential area for further research moving forward.

Further, the posts span from October 2020 to May 2021, meaning that they are a snapshot of that period. As we are aware, narratives surrounding vaccines and the vaccination process are not static and change as a response to wider developments on the topic. This calls for an early warning system to identify and highlight developing narratives with the aim of countering through messages, prebunking and fact-checking.

Moving forward, with more people getting vaccinated as time goes by along with external developments such as the Delta variant's increased transmissibility, and higher daily case numbers and death tolls could help push more people to register for vaccination. This could potentially change the risk assessment of those with existing concerns over the safety and efficacy of the vaccines - i.e. that it is more dangerous to be without vaccination now than before.

However, we fully expect vaccine-related conversations to continue to change in tandem with wider developments on the vaccines and vaccine-related matters. As the country loosens MCO SOP for fully vaccinated individuals, we believe that the conversation will shift towards the topic of “liberty and freedom”, specifically how vaccination can be a gateway to future freedoms. This could also mean that conspiracy theories along the lines of vaccination being a covert strategy to create a compliant citizenry can be played up.

Regardless, this experience with the infodemic must serve as a wake-up call for the wider the consequences of eroding trust levels in authorities, experts and science, and how communications must be done in times of crisis.

For now, no effort must be spared in reaching out, engaging, and convincing those who have yet to register for the vaccines to do so immediately. Not only does the success of the NCIP hinge on this, but also any subsequent recovery of lives and livelihoods. We hope that our work helps in getting us there.



## 9. Appendix

### Coding sheet

#### 1. Post sentiment

What is the general sentiment of the post being analysed? Choose one:

- Positive
- Neutral
- Negative

#### 2. Attitude towards vaccines

What is the attitude towards vaccines shown in the post being analysed? Choose one:

- Pro
- Neutral
- Against

#### 3. Topic of the post

What is the topic present in the post being analysed? Choose the most prominent one:

	Topic	Description
1	Development of vaccines	How the vaccine was developed
2	Supply and access of vaccines	Supply and/or access to the vaccines, including the process to access them
3	Safety and efficacy of vaccines	Safety and efficacy, including vaccination side effects
4	Public health	Need and/or necessity to vaccinate for personal and/or public health reasons; including posts related to and that could impact on public health systems
5	Politicisation	Criticising public policies surrounding the vaccines and vaccination process
6	Economics	Economic motives of actors involved and/or related with the vaccines and their supply, development and/or dissemination



7	Conspiracy theory	Content containing, referring and/or dispelling well-established or novel conspiracy theory, including claims of non-proven Covid-19 cures
8	Liberty and freedom	How vaccines interact with civil liberties and personal freedom
9	Morality and religion	Posts containing moral and religious views and/or elements around vaccines, religious obligations, and their composition and the way they are tested

## **List of stakeholders interviewed**

*\*Alphabetical order*

	Name	Designation	Organisation
1	Darshini Kandasamy	Editor	Trident Media
2	Gayathry Venkiteswaran	Assistant Professor, School of Media, Languages and Cultures, Faculty of Arts and Social Sciences	University of Nottingham Malaysia
3	Gregory Ho	Research associate	Khazanah Research Institute
4	Khalil Majeed	Co-founder and managing editor	Faqcheck Lab
5	Dr Mahyuddin Daud	Assistant Professor, Department of Civil Law, Ahmad Ibrahim Kuliyyah of Laws	International Islamic University Malaysia
6	Norman Goh	Fact checker	AFP
7	Dr Sabariah Salleh	Senior lecturer, School of Media & Communication Studies, Faculty of Social Sciences & Humanities	Universiti Kebangsaan Malaysia
8	<i>Name withheld</i>	<i>Fact checker</i>	<i>Media company</i>



## **Vaccine narratives on social media in Malaysia**

