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Examining the Framing of 'COVID-19 Vaccines': A Corpus-Based Investigation of Malaysian Newspapers

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Abstract

The widespread dissemination of misinformation or the 'infodemic' surrounding COVID-19 poses a significant challenge as the virus continues to spread globally, compounded by the reluctance of many individuals to accept 'COVID-19 vaccines'. While existing research has predominantly explored how the media framed the disease, its psychological impact, and the presence of disinformation in its messaging, limited attention has been given to the portrayal of 'COVID-19 vaccines' in the media and their reception among the general population. This study employs a corpus-based methodology to examine the framing of 'COVID-19 vaccines' within a specific English Malaysian newspaper corpus. The data for analysis was gathered through the compilation of news reports from The Star, one of the nation's primary English newspapers. The analysis showed that the vaccine was positively framed and correlated with keywords like 'special', 'effective', and 'important', as well as with keywords indicating its importance to one's health and the masses. However, two negatively connoted keywords were also used to describe the act of immunisation. This study's findings can encourage informed decision-making on COVID-19 vaccination by dispelling unwarranted fears. Positive news coverage can boost confidence and prevent panic while mitigating negative emotions and risk perceptions. These findings can help media practitioners better frame vaccine-related issues in their writings and understand how the public perceives them.

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1. INTRODUCTION

News has evolved to be an important source of information with the capacity to influence public opinion and behaviour. It is believed that news is a tool for reporting events to the community and its surroundings which are delivered through mass media (Luhfi et al., 2021). The importance of news in shaping public opinion and activity is significant that the type of news disseminated by the media determines the pattern of movement within a community group.

In the context of the recent COVID-19 pandemic, the media rushed to cover the latest epidemic which has halted the world. People's paranoia fuelled more media coverage of the occurrences. Each media organisation depended on a variety of sources to present the news (Ogbodo et al., 2020). Malaysia was no exception to this unprecedented global circumstance. As the outbreak continued to unfold, the Malaysian government decided to opt for the procurement of vaccines and the planning of immunisation for the public. Many media outlets report on the COVID-19 vaccination every day beginning in December 2020, during a period when diverse parties investigated, questioned, disputed, supported, and disagreed on the COVID-19 vaccines. Most nations, including Malaysia, endorsed the choices. However, there were others who opposed the idea of vaccination. Subsequently, the media has extensively covered the topic of vaccination as a means of addressing the outbreak.

It has been recognised that the framing of news plays a crucial role, not only in shaping public perception and discussions, but also in effectively communicating the management of disease outbreaks (Mutua & Ong'ong'a, 2020). It is worth noting that this process is impacted by several aspects such as human interaction by a reporter and media competitiveness, which might result in undesirable effects in some situations (Adekunle & Adnan, 2016). This news framing can be sometimes misleading and some of it may be false (Hua & Shaw, 2020). There are cases where media frequently abound with health-related misinformation, including misleading information regarding vaccination (Altay & Mercier, 2020). Gislason (2013) states that the utilisation of a specific news frame during a health crisis has substantial implications for public comprehension and responses to the outbreak. Therefore, it is crucial to consider how news is framed, as it can impact the public's acceptance of COVID-19 vaccines.

Based on the recent literature, researchers worldwide have shown significant interest in studying news framing, particularly in the context of COVID-19, in contrast to previous epidemics (Mutua & Ong'ong'a, 2020), for example, investigating how the media frames COVID-19 in newspapers or mass media outlets (Mutua & Ong'ong'a, 2020) and examining the framing of COVID-19 vaccination in Malaysian local newspapers (Siang & Balaraman, 2022). Despite extensive research on COVID-19, there is a notable lack of research regarding how vaccination is framed specifically in the Malaysian context. This represents a limited scope that warrants further expansion and investigation. Furthermore, most media studies on news framing employ content analysis, which is undoubtedly qualitative in nature. To fill this gap,

this study seeks to emphasise the use of both qualitative and quantitative (corpus) approaches in analysing the local news framing of the 'COVID-19 vaccines'. This paper aims to address these gaps by conducting an analysis of the usage of the keyword 'COVID-19 vaccines' in Malaysian online newspapers. Additionally, the study seeks to determine whether the framing of the 'COVID-19 vaccines' keyword in Malaysian newspapers is predominantly positive or negative. To achieve the aims of the present study, two research questions were crafted:

1. What are the 'COVID-19 vaccines' related keywords used in English Malaysian newspapers?
2. Are the 'COVID-19 vaccines' related keywords framed positively or negatively in the English Malaysian newspapers?

These research questions become the guide for the researchers to map a research design in order to meet the following objectives of this study:

1. To examine the 'COVID-19 vaccines' related keywords used in English Malaysian newspapers.
2. To learn whether the 'COVID-19 vaccines' related keywords are positively or negatively framed in Malaysian newspapers.

By achieving these objectives, the findings of this study provide a foundation for further investigation into the role of news report framing in shaping public opinion and for the development of best practices for responsible journalism.

2. LITERATURE REVIEW

2.1 Corpus Analysis in Studying News Framing

Corpus analysis is a method of studying large bodies of text, or 'corpora', in order to identify patterns and trends in language use. This approach is particularly useful in analysing news framing because it allows researchers to identify and measure the prevalence of specific words, phrases, and frames across a wide range of news sources and over time. Semetko and Valkenburg (2000) state that "framing research examines how language and other symbolic devices frame issues by emphasising certain aspects and downplaying others" (p. 11). By using corpus analysis, researchers can identify the prevalence of specific frames and language use across a range of news sources, allowing them to gain insights into how news media shapes public perceptions of issues. For example, Han et al. (2017) examined Chinese media coverage of climate change from 2005 to 2015 and identified six frames used in reporting, with the environmental and human impact frame being the most common. The use of certain frames was associated with specific information sources, and the study revealed that party-sponsored Chinese newspapers framed climate change from the perspective of global collective efforts.

Meanwhile, another example can be seen from a study conducted by van Gorp (2005) who used corpus analysis to examine news coverage of the European Union in Dutch and French newspapers. The study found that different frames were used to represent the EU in different countries, with French newspapers emphasising economic and political integration, while Dutch newspapers focused more on issues of sovereignty and national identity. Overall, these studies demonstrate how corpus analysis can be a valuable approach in analysing news framing, as it allows researchers

to identify and measure the prevalence of specific frames and language use across a range of news sources.

2.2. Media Framing Theory

Mass and news media framing can be defined as the ability of news organisations to impact public perception and behaviour by subtly changing how information is presented (Lecheler & de Vreese, 2019). In a greater sense, it is a notion relating to how the media influence or direct the public to interpret a news item by emphasising a new perspective based on its appraisal of and linking to earlier comparable instances (Siang & Balaraman, 2022). This situation substantially impacts how people understand and respond to the story. Kahlstrom and Norin (2012) noted that its purpose is to emphasise and choose how news items are presented within a predetermined and limited context.

It is essential to consider how societal issues are framed and presented by the media (Siang & Balaraman, 2022). Morissan et al. (2020), for instance, insisted that examining media framing is crucial since it influences public perception. Scheufele and Tewksbury (2007) agreed on this motion as they claimed that if media framing is done correctly, it can influence and modify people's and even society's values and beliefs. On the other hand, if the framings are not relevant, the audience may reject them (Yioutas & Segvic, 2003), resulting in media credibility being harmed.

Based on past literature, an adaptation of Fatima's (2020) descriptions and indicators of media framing is utilised as a guideline in the present study. Media framing generally can be divided into two frames, which are constructive/positive and negative. The constructive/positive frame can be further segmented into several more frames: solution-oriented frame (efforts made by the government in tackling the issue at hand), future-oriented frame (how a scenario will pan out while addressing the 'what-now?' concern), public-oriented/empowerment (engages in issues with the public on their common ground), inclusiveness/diversity (incorporating perspectives and stories from around the world), mathematical (statistics and situational contexts related to an issue), co-creation (language use that reflects empowerment and engagement), concern (for unaffected areas and people disproportionately affected by a crisis and its international spread), and solidarity (empathy for the parties involved and the use of language that makes the party being credited look powerful). Adding to this list, the use of positive words can be another indicator of positive framing in a text. Azevedo et al. (2013) mentioned that affective abstract concepts of 'good' and 'bad' are spatially epitomised as 'up' and 'down', respectively.

On the other hand, Fatima (2020) described negative frames in several ways: blame-attribution (phrases or words that reflect the assignment of blame to a specific party), conflict (struggle and arguments of the parties involved), consequences (bad outcomes that may cause anxiety rather than favourable outcomes), sensational language (sensational and exaggerated phrases and linguistic structures), uncertainty (about the unknown and anxiety of potential risks to an issue), the use of 'us' and 'them' (manipulates warmongering and conflicts to divide the world), and denial (refuse to grasp the severity of an issue by downplaying it and lowering the perception of responsibility of the parties involved).

2.3 Framing of News Reports Related to COVID-19 Vaccination

A news report is a form of journalism that presents information about recent events in a factual and objective manner. Genuine news reports may present opinions, even though many journalists believe that news should only present facts and not opinions (van Dijk, 1990). News reports can be found in a variety of media outlets such as newspapers, magazines, television, radio, and online news websites. They typically follow a standard format which includes a headline, lead paragraph, body, and conclusion and are written in a clear and concise style to convey information to the reader or viewer. The report would provide details about what happened, when it happened, who was involved, and any other relevant information, without including any personal opinions or biases.

Since the commencement of COVID-19 vaccine distribution in late 2020, studies conducted on the framing of news reports related to 'COVID-19 vaccination' and how it might have influenced vaccine take-up among individuals are still in their initial stage. For instance, a study conducted by Piltch-Loeb et al. (2021) attempted to examine the impact of various information channels on the acceptance of 'COVID-19 vaccines' in the United States during the initial phase of their rollout in the country. With regard to vaccine acceptance, they discovered that "traditional channels of information, especially national TV, national newspapers, and local newspapers increased the likelihood of vaccine acceptance" (Piltch-Loeb et al., 2021, p. 1).

2.4 The Previous Studies on News Report Framing

News report framing is an important aspect of media communication that can shape public opinion and attitudes towards various social, political, and health-related issues. Over the years, researchers have conducted numerous studies to examine the ways in which news reports are framed and how these frames can influence people's perceptions and behaviours.

Palm et al. (2021) studied how COVID-19 vaccination messages influenced vaccine acceptance among Americans. Effective messages significantly influenced intentions to vaccinate, beliefs about others' vaccination, and the importance of collective action. To increase success, messages should emphasise safety, positive social norms, and the independence of vaccine development from politics.

Prior to the COVID-19 pandemic, studies investigated how news reports on vaccination in mass media affected vaccine hesitancy. Yu et al. (2016) found that public confidence in the Hepatitis B vaccine in China was undermined by media reports highlighting its side effects and the reported cases of infant deaths following its administration. Similarly, Tran et al. (2018) reported a high rate of vaccine hesitancy and refusal in an urban setting in Northern Vietnam after people learned about the adverse effects of vaccination through the media.

Studies related to how news reports on vaccines, particularly the COVID-19 vaccines, have influenced people's perception of vaccination in Malaysia is still limited. Ghazali et al. (2020) conducted a study on vaccination coverage in Malay newspapers, but it was conducted before the COVID-19 pandemic, and they found that vaccination efforts in Malaysia did not receive sufficient attention from newspapers.

There is a scarcity of research regarding the impact of Malaysian news reports on COVID-19 vaccination on individuals' beliefs and intentions to receive the vaccine.

It is crucial to address this issue since newspapers and mass media play a crucial role in influencing public perceptions and attitudes during health epidemics like Ebola, SARS, MERS, and COVID-19. The information delivered through mass media has the power to influence public opinions and behaviours (Catalan-Matamoros & Elías, 2020; Mutua & Ong'ong'a, 2020).

Vaccination message framing can impact readers' vaccination attitudes; a positive frame can lead to a positive attitude (Altay & Mercier, 2020). It is crucial to crafting vaccine messages carefully, considering factors that influence message acceptance (Palm et al., 2021).

3. METHODS

The present study aims to analyse how the Malaysian press framed the 'COVID-19 vaccines' in the headlines and news articles. Hence, the study adopts a corpus-based approach, involving corpus analysis on wordlist, keyword lists, and collocate analysis to identify news frames in the studied corpus.

3.1 Data Collection: Building 'COVID-19 vaccines' Related News Reports in Malaysian English Newspapers (CovVac-MEN) Corpus

Data for the study was gathered by compiling news reports from The Star, one of the prominent English newspapers in Malaysia, spanning from July 23, 2021, to August 8, 2021. This timeframe coincided with the second phase of COVID-19 vaccination in Malaysia. In phase two, the COVID-19 vaccines were administered for the first time to the public (prioritising senior citizens, disabled, and high-risk individuals) after it was administered to all 'frontline' workers (e.g., health workers and police force) (Jawatankuasa Khas Jaminan Akses Bekalan Vaksin COVID-19 [JKJAV], 2021, as cited in Suah et al., 2021). Thus, the analysis made of the selected corpus might shed some light on how the media portrays the 'COVID-19 vaccines' to the public which then influences the public acceptance of the vaccine. The Star newspaper publisher was chosen in this study because of its wide circulation within Malaysia. It was launched on June 23, 1995, and its online platform, The Star Online, is Malaysia's first news website and is recognised as one of the best in Asia by the World Association of Newspapers and News Publishers (WAN-IFRA) (The Star, 2022). Since the present study focused on the framing of the 'COVID-19 vaccines' in news articles, the type of articles selected for the purpose of the current study was only the news reports/story featured on the front page and Nation news category where the terms associated with the pandemic were selected. The news reports/stories were identified after making a search based on these keywords: 'COVID-19', 'coronavirus', and 'vaccine'. If any of the keywords were mentioned in the headline or news content, the news reports/story were included in the analysis. In addition, the relevant news reports/story were collected using search items featured under a subtopic called 'The COVID-19 Watch' on the news press' official website, https://www.thestar.com.my/. The search capitulated 538 news reports/stories. The distribution of the selected news articles based on dates within the selected time frame is presented in Figure 1.

From Figure 1, the distribution of news reports highlighting the news coverage about the COVID-19 vaccines was generally high every day as the COVID-19

vaccination in Malaysia was still in the second phase. These news articles were extracted, saved in Word documents, and cleaned before they were analysed in #LancsBox 5.0 online software. The CovVac-MEN corpus has 12420-word types that consist of 178675-word tokens and 9.870 lemmas. Although the size of the specialised corpus used in this study was relatively small, it provided valuable preliminary insights into the framing of 'COVID-19 vaccines' in the selected media. Significant keywords and their collocates were identified by comparing the wordlist of the specialised corpus to a reference corpus. The chosen reference corpus was the British National Corpus (BNC) Baby 2014, extracted from the larger BNC 2014 data pool.

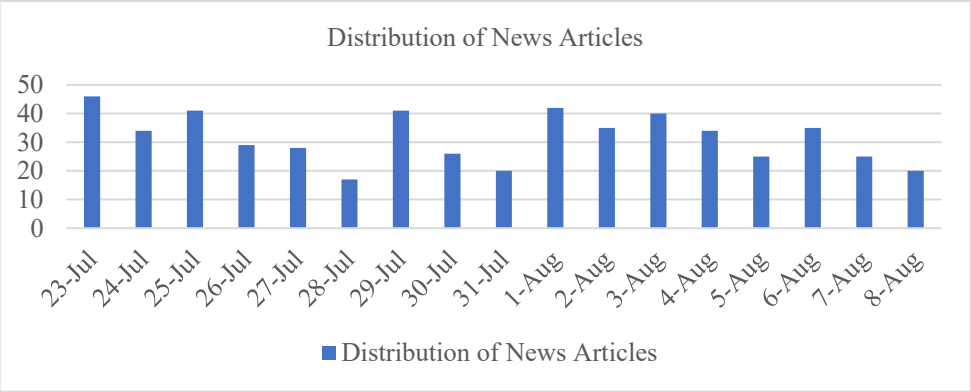

Figure 1. Distribution of the selected news articles.

3.2 Data Analysis

The data was analysed by using the #Lancsbox 5.0 which offers a wordlist, keyword list, and collocate features for text analysis. No reference corpus was used because the comparative analysis was not involved. By analysing the keywords 'vaccine' and 'COVID-19' in the keyword list and their collocates, significant associations with other words in the corpus and how the keywords were framed in the corpus were revealed. This also revealed whether the keywords were negatively or positively associated with the said discourse. From the keyword list, salient lexical items could be identified as the list showed not only the overly used words in a corpus but also statistical significance tests by using the log-likelihood test (LL) to determine which words were significant in a corpus and are worth further investigation. McEnery and Hardie (2011) suggested that key items with an LL value of over 7.0 are deemed significant; thus, the researchers used this LL measure to determine the significant key items. Once the significant key items were sorted, the final corpus analysis of collocate was executed. Lists of collocates were generated to learn what words highly co-occurred with the 'COVID-19 vaccines' in the newly built specialised corpus. The Mutual Information (MI) statistical test was utilised to calculate the collocational strength because it is one of the most frequent statistical formulae employed by researchers in corpus research (Cheng, 2012; Hunston, 2002). In the present study, the researchers set the MI score of 3.0 or above to consider a collocate as significant (Hunston, 2002). Therefore, using the MI Score value, the 'COVID-19' collocates could be identified, which then revealed the lexical framing of the 'COVID-19 vaccines' in the selected Malaysian English newspapers. The researchers investigated lexical framing by referring to the descriptions and indicators of frames as proposed by Fatima (2020).

4. RESULTS AND DISCUSSION

4.1 Keyword List

Table 1 presents the keyword list from the CovVac-MEN corpus, after a comparison was made to the selected reference corpus, BNC2014Baby. The top ten words with the highest Log-Likelihood (LL) value, referring to the 'COVID-19 vaccines' within the corpus, were identified from this keyword list.

Table 1. List of keywords referring to the 'COVID-19 vaccines'.

No.	Keywords	Log-L. Value
1	Vaccine	3809.46
2	Vaccination	3354.47
3	Vaccinated	2181.55
4	Vaccines	1404.86
5	Immunisation	864.24
6	Vaccinations	770.76
7	Jabs	391.08
8	Shots	186.18

The analysis in Table 1 reveals that the term 'vaccine' stands out as the most significant keyword (LL=3809.46) within the corpus when referring to 'COVID-19 vaccines'. Conversely, the term 'shots' is identified as the least salient keyword (LL=186.18) in the keyword list used to denote 'COVID-19 vaccines' in the corpus. In order to gain the big picture of the 'COVID-19 vaccines' notion, there is a need to focus on a small number of keywords that are both relevant and statistically significant to the representation of the 'COVID-19 vaccines': 'vaccine', 'vaccination(s)', 'vaccinated', and 'immunisation'. Once the salient keywords were determined, the keywords were further analysed in collocation analysis to investigate the lexical framing of the 'COVID-19 vaccines' in the CovVac-MEN corpus.

4.2 Identified Frames of the 'COVID-19 Vaccines'

Brezina (2016) defined collocation as words that systematically co-occur in a corpus "to create a range of cross-associations that can be visualised as networks of nodes and collocates" (p. 90). Collocation analysis sheds light on significant associations between words used within a corpus by providing statistical evidence of their co-occurrence (Williams, 2001). In the study, the significant association between words can help the researchers to identify how the 'COVID-19 vaccines' was framed in the CovVac-MEN corpus. The collocation analysis revealed several frames that signified various semantic preferences and discourse prosodies as shown in Table 2.

Table 2. Categories of the collocates.

Frame	Categories	Collocates
Positive	Acceptance	receive, want, given, received, gave, getting, get, fully, completed, outreach, nationwide, registered
	Types of People	people, students, employees, Malaysians, adults, workers, individuals, migrants, citizens, seniors, family, recipients
	Collective Group	population, members, states, country, district, herd, committee, countries

Table 2 continued…

	Accessibility	mobile, walk-in, open, public, digital, certificate, *MySejahtera*
	Well-being	antibodies, immunity, immunisation, health
	Intensity	boost, increase, more, least, high
	Positive Adjectives	important, effective, special
	Economy	tourism, industry
Negative	Political Entity	minister, government, administer, states, country, Khairy, Adham
	Figurative Speech	jab, jabs, shot, shots

As illustrated in Table 2, eight categories related to positive semantic preferences for the notion of the 'COVID-19 vaccines' and two categories related to negative semantic preference were identified from the examined corpus. The frames are based on the adapted descriptions and indicators proposed by Fatima (2020).

4.2.1 Positive frames based on categories of collocates

The first positive frame contained such collocates as 'receive' (MI: 5.52), 'want' (MI: 5.3), 'given' (MI: 4.91; 6.29; 7.14), 'received' (MI: 4.75; 5.72; 3.34; 5.39), 'gave' (MI: 7.65), 'getting' (MI: 5.83), 'get' (MI: 6.64; 6.49), 'fully' (MI: 8.23), 'completed' (MI: 4.76), 'outreach' (MI: 6.63), 'nationwide' (MI: 4.44), and 'registered' (MI: 5.47) suggested the 'COVID-19 vaccines' acceptance among the public since most of the collocates were statistically and significantly associated with the keyword 'vaccine'. The listed collocates are mainly action verbs indicating the statistics or number of people 'receives'/'received', 'want', 'gets', 'getting', 'given', or 'completed' the 'vaccine'. For example, '2,113,511 people or 34.3% of the Klang Valley's adult population have received their second dose'. When statistics or figures are used in newspapers it is considered to be a constructive or positive element in media framing (Hermans & Gyldensted, 2019). This finding suggested a positive semantic preference for the 'COVID-19 vaccines' because these verbs were used to indicate the public demand or desire to take the vaccine voluntarily. The collocates 'fully' and 'completed' indicate the notion of complete vaccinations, involving the administration of both required doses, regardless of the specific vaccine received. Furthermore, the collocates 'outreach' and 'nationwide' suggested a broad acceptance of COVID-19 vaccination among the general population. These findings are in line with the results obtained from the study conducted by Syed Alwi et al. (2021) who found a substantial level of vaccine acceptance among Malaysians, with an overall acceptance rate of 83.3%. This positive framing is believed to enhance the impact of public acceptance, consequently aiding in mitigating the burden of COVID-19.

The second frame contains collocates which refer to types of people: 'students' (MI: 6.93), 'employees' (MI: 6.49), 'migrants' (6.02), 'Malaysians' (MI: 5.81), 'family' (MI: 5.79), 'adult' (5.73), 'workers' (MI: 5.70), 'recipients' (MI: 5.69), 'individuals' (MI: 5.50), 'citizens' (MI: 5.05), and 'people' (MI: 4.98). All these words are the collocates of 'vaccinated' except for 'migrants' and 'citizens', which are the collocates for 'vaccination' and 'recipients' which is the collocate for 'vaccine'. The inclusion of diverse target groups of people in newspapers is deemed to be constructive in nature (Fatima, 2020), as it incorporates perspectives and stories from diverse groups of people while constructing views that counter the newspaper's polarisation (Hermans & Gyldensted, 2019). In addition, the finding indicates that a specific target

group of individuals was prioritised for vaccination. Clearly, students and employees/workers were framed as the target group for vaccination based on the high MI scores. MCO execution was found to have a critical effect on students' negative emotional symptoms, happiness, and work-life balance (Yunus et al., 2021). Meanwhile, due to the cash flow issues faced by many SMEs, they had to allocate funds towards fixed expenses, despite minimal or no sales, hence leading to financial instability and a potential crisis of bankruptcy (Hasin et al., 2021). Apart from that, the data showed that migrants had a slightly higher MI value than Malaysians which may indicate the importance of the vaccine to the immigrants ~~as~~ compared to Malaysians. This observation could be attributed to the rising number of positive COVID-19 cases detected among migrant workers (Wahab, 2020).

The third frame includes the collocates linked to a collective group: 'population' (MI: 6.06), 'members' (MI: 5.39), 'state' (MI: 3.13; 3.38; 4.20), 'states' (MI: 3.99; 4.33), 'country' (MI: 4.57), 'district' (MI: 5.79), 'herd' (MI: 5.07), 'committee' (MI: 5.11), and 'countries' (MI: 4.73). These collocates suggested the notion that the 'COVID-19 vaccines' was linked to being accepted or received in large groups, framing a positive idea of wide approval or acknowledgement by the masses. In addition, the collocates of these collective groups highlighted the action or effort made by the masses (Pattison et al., 2022), in this case, 'COVID-19' immunisation. This notion further strengthened the first frame which carried the idea of positive acceptance of the 'COVID-19 vaccines' among the public. Some of these words were used to describe a high statistic or a huge number of people who had been fully vaccinated. As extracted from the text, these excerpts highlight the use of some of these words in presenting mathematical figures:

Excerpt 1: "...from the CITF, 96.7% of the adult population in the Klang Valley have received at least a dose of vaccine..."

Excerpt 2: "…for Sabah, the target to reach 80% herd immunity in Sabah can be realised before…"

Excerpt 3: "…Teaching Profession (NUTP) is urging its 220 000 members to get vaccinated to help keep the…"

The excerpts show that the words 'population', 'herd', and 'members' were used to indicate a high percentage or number of people who were vaccinated and a high percentage of herd immunity that was expected to be reached. The use of the figure highlights a positive framing through the use of mathematical elements in newspapers (Hermans & Gyldensted, 2019). Matthes and Kohring (2008) found that news reports that used large numbers to describe the benefits of a policy tended to be more positively framed than reports that used small numbers. Through the incorporation of mathematical elements into news stories, journalists can help to frame complex issues in a positive light and highlight successful solutions to societal problems (Hermans & Gyldensted, 2019). This evidence reflects the importance of high acceptance of the COVID-19 vaccines to curb the pandemic (Syed Alwi et al., 2021).

The next frame includes the collocates that suggested the idea of accessibility to the COVID-19 vaccination: 'mobile' (MI: 7.50), 'walk-in' (MI: 6.07), 'walk-ins' (MI: 4.92), 'open' (MI: 5.09), 'public' (MI: 4.97), 'digital' (MI: 7.60), 'certificate' (MI: 8.05), '*MySejahtera*' (MI: 5.36). The 133 collocates of 'vaccination', 'certificate' and 'digital' were found to be statistically significant. The collocate 'certificate' frames the

COVID-19 'vaccination' as authentic, verified, authorised, and something that carries credentials. This could promote people's confidence in the act of immunisation. Meanwhile, 'digital' (which relates to vaccination certificates) and '*MySejahtera*' (i.e., an application developed by the government of Malaysia in managing the COVID-19 outbreaks) linked 'vaccination' to the positive semantic preference for online, paperless, sophisticated, convenient, and advanced. Besides, the collocates 'mobile' and 'walk-in' linked the positive frame of ease and convenience to the COVID-19 vaccination. Meanwhile, the collocates 'open' and 'public' implied the idea of no secrecy, not hidden, nationalised, official, and democratic to the COVID-19 vaccination. The Organisation for Economic Co-operation and Development (OECD) recognises five foremost policy dimensions that drive people's trust in government institutions: responsiveness, reliability, integrity, openness, and fairness (OECD, 2020). The collocate 'open' allows the public to reflect on openness and fairness, allowing the public to be aware and comprehend what the authority is doing, specifically about COVID-19 vaccination. All these collocates have suggested positive framing of the act of immunisation because the highlight of the government's efforts pertaining to an issue, in this case, the COVID-19 pandemic, indicates solution-oriented framing (Fatima, 2020; Hermans & Gyldensted, 2019). Therefore, this positive frame may positively influence public acceptance and confidence in the vaccine.

Apart from that, the fifth frame was based on the collocates associated with health or well-being: 'antibodies' (MI: 5.52), 'immunisation' (MI: 3.32), and 'health' (MI: 3.29). The findings further revealed significant associations between the keyword 'vaccinated' and the collocates 'achieve'/'achieved'/'achieving', 'herd', and 'immunity'. These associations of keywords clearly signify positive framing of the 'COVID-19 vaccines' in achieving herd immunity in Malaysia. Figure 2 displays the collocation graph of the keyword 'vaccinated' generated by the #LancsBox 5.0 software based on the MI measurement.

The collocation graph in Figure 2 describes the notion that when individuals listed in the first frame had been fully 'vaccinated', it helped society achieve herd immunity. These collocations strengthened the third category that associated the act of vaccination with the significance of one's well-being and health. It also indicates a future-oriented frame as it highlighted how the situation with regard to COVID-19 will unfold in the future (Hermans & Gyldensted, 2019). The positive frame would assist in boosting people's tendency to take the vaccine not just for the sake of their health, but also for the community. This notion is supported by Loomba et al. (2021) who found that many respondents in the United Kingdom (UK) and the United States (US) would want to be vaccinated if it means protecting their families, friends, or people in the at-risk groups rather than if the vaccine worked solely for themselves. Thus, with this positive frame, it is hoped that public acceptance of the vaccine can be increased.

Besides the health or well-being frame, the analysis also revealed another positive frame encompassing verbs, adjectives, and nouns indicating frequency or intensity. The collocates under this frame are 'boost' (MI: 6.53), 'increase' (MI: 4.87), 'more' (MI: 4.45), 'high' (MI: 4.13), and 'further' (MI: 4.86), 'booster' (9.05), and 'very' (MI: 4.79). These collocates constructed semantic preference of strength or power to the keyword 'vaccination'. This might indicate that the act of immunisation had a certain force to change, improve, uplift, or push to a higher, broader, or bigger quantity or size. Azevedo et al. (2013) stated that affective abstract concepts of 'good'

and 'bad' are spatially epitomised as 'up' and 'down', respectively. For instance, Meier and Robison (2004) used a reaction time paradigm to determine that positive words were categorised more quickly as positive when presented at the top compared to the bottom of a monitor, whilst the opposite was true for negative words. Therefore, the collocates of 'boost', 'increase', 'high', 'more', 'further', and 'very' framed the idea of vaccination positively among the readers.

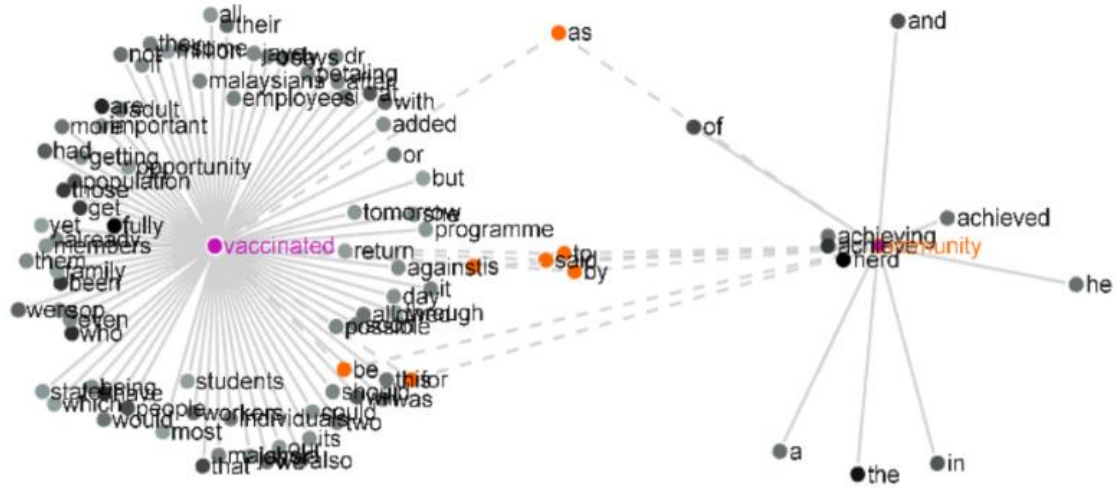

Figure 2. GraphColl for 'vaccinated'.

Another positive semantic preference that was identified is positive adjectives which indicated the 'COVID-19 vaccines' as essential and crucial. From the 126 generated collocates, it was identified that the keyword 'vaccine' was statistically and significantly associated with several words indicating positive notion: 'important' (MI: 5.70), 'effective' (MI: 5.35), 'special' (MI: 4.90), and 'registered' (MI: 4.71). These adjectives carry a positive connotation to the COVID-19 vaccines by describing it as functioning, unique, legalised, or authorised. Palm et al. (2021) found that effective messaging about COVID-19 vaccination can significantly influence the public's decision to get vaccinated, particularly when there is a strong emphasis on safety and efficacy. Kaplan and Milstein (2021) reported that even a public announcement on vaccine effectiveness at 95% influenced small increases in the acceptance of vaccines among a sample of the United States population. There were also significant increases in the probability of taking a vaccine. This is because the probability of vaccine efficacy had the largest effect among the three factors in vaccine acceptance decisions (Kaplan & Milstein, 2021). Therefore, framing the vaccine positively, particularly as being effective could influence the public's decision to get vaccinated.

The last category that indicated positive semantic preference identified from the corpus was economy. The collocates under this category were 'tourism' (MI: 4.11) and 'industry' (MI: 6.31). Even though there were only two collocates identified under this category, it highlighted the importance of the COVID-19 vaccination to the country's economic state. The examples taken from the corpus:

Excerpt 4: 'the move was made to revive the state's tourism sector which had long been affected by the COVID-19 pandemic'

Excerpt 5: '…a boost to domestic tourism and we expect the hotel industry to stay afloat with this incentive.'

The excerpts illustrate that the collocates 'tourism' and 'industry' indicate the presence of future-oriented frame, i.e., a positive frame, that discusses how a scenario will pan out in the future (Hermans & Gyldensted, 2019). Like other affected countries, the COVID-19 outbreaks and the MCO implementation have tremendously impacted Malaysia, incapacitating numerous economic segments in the country (Wahab, 2020). This is evident from, among others, booking cancellations made by customers for flight tickets and hotel reservations. Consequently, the number of tourists declined due to lockdowns in several countries including Malaysia as well as inhibiting tourist arrivals from other countries (Shaari et al., 2021). Thus, by framing the COVID-19 vaccination as critical to the nation's economy, it may positively persuade the public's acceptance of the vaccine.

4.2.2 Negative frames based on categories of collocates

Despite the positive framing of the 'COVID-19 vaccines' in the CovVac-MEN corpus, two categories indicated negative framing of the notion in the newly built specialised corpus. The first category that might indicate a negative semantic preference for vaccination was the political entity. The collocates involved were 'minister' (MI: 6.7), 'government' (MI: 3.56), 'administer' (MI: 8.0), 'administered' (MI: 6.35), 'state' (MI: 3.13; 3.38; 4.20), 'states' (MI: 3.99; 4.33), 'country' (MI: 4.57), 'countries' (MI: 4.73), 'Khairy' (MI: 3.88; 8.16), and 'Adham' (MI: 6.07). Even though this association suggested the COVID-19 vaccination as one of the government's efforts in combating the pandemic, an overall positive tone towards the government could change to a negative tone if the government is not the main source of the news item (Adiprasetio & Larasati, 2020). Hence, it might backfire since the act of immunisation was reflected to be influenced by and related to political agenda. This is because vaccination choice can be influenced by the belief in conspiracy theories (Germani & Biller-Andorno, 2021) and lack of trust in authorities (Kumar et al., 2016), which subsequently might influence the success of the anti-vaccination movements. By associating vaccination with the political entity, it might misinform the public, specifically the anti-vaxxers, regarding the true objective of immunisation. Hence, the media need to be careful in disseminating information with regard to the COVID-19 vaccines and identify potential communication strategies that might avoid negative framing of immunisation.

Besides political entity, figurative speech was another frame identified in the CovVac-MEN corpus. The collocates under this frame are 'jab' (MI: 4.50), 'jabs' (MI: 5.24), 'shot' (MI: 3.56), and 'shots' (MI: 4.24). The use of 'jab'/'jabs' and 'shot'/'shots' in referring to vaccine injections might seem harmless as they were commonly found in various discourses. Nevertheless, 'jab' and 'shot' are not only defined as a dose of medicine or drug injection but their definitions are also linked to negative semantic preference, implying violent metaphor. Merriam-Webster Online Dictionary (n.d.) defines 'jab' as: (i) to pierce with or as if with a sharp object (stab), (ii) to poke quickly or abruptly (thrust), (iii) to strike with a short straight blow (a term used in boxing), and (iv) to pointedly tease or mock (someone). While 'shot' is defined as (i) an act of shooting, (ii) a directed propelling of a missile, which contains negative connotation to the act of vaccination. This is because 'jab' is described as an action

that is performed suddenly and violently—stab and thrust. Furthermore, it is also a term normally used to refer to an assault movement in boxing that is linked to a violent metaphor. In the meantime, 'shot' can also be used to refer to a directed discharge of a firearm like a gun, implying a war metaphor. Figure 3 further illustrates how these collocates associate with the COVID-19 vaccines.

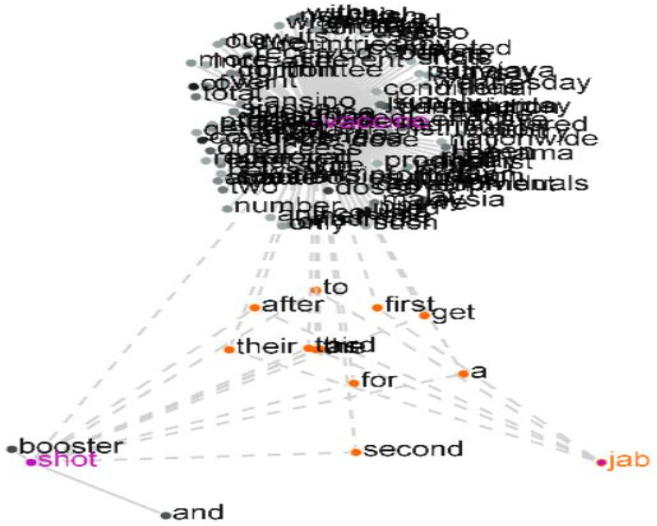

Figure 3. GraphColl for 'vaccine' with 'jab' and 'shot'.

Semino (2021) stressed that violent metaphors, though they have been extensively utilised in communications about the COVID-19 pandemic, have also been widely criticised since they inappropriately personify the virus as a malicious foe, triggering extreme anxiety, possibly legitimising authoritarian governmental measures, and entailing that those who die did not fight hard enough. She suggested that such metaphors should be avoided especially in public communication. She believed that other appropriate and versatile metaphors in communications related to the pandemic with an aim to reduce it should be considered. This is because such metaphors might trigger the feeling of anxiety in taking the COVID-19 vaccines. Klemm et al. (2016) state that any use of sensational, exaggerated words and language structure should be avoided particularly in newspaper writing as it frames an issue negatively. Therefore, it is highly significant for any communications related to vaccines, specifically the COVID-19 vaccines, to be thoroughly and meticulously written, based on what linguists have learned regarding the factors that influence message acceptance (Palm et al., 2021).

5. CONCLUSION

To recapitulate, the study aims to answer these research questions: (1) What are the 'COVID-19 vaccines' related keywords used in English Malaysian newspapers? and (2) Are the 'COVID-19 vaccines' related keywords framed positively or negatively in the English Malaysian newspapers? Based on the results, it can be deduced that the 'COVID-19 vaccines' related keywords were statistically and significantly mainly correlated with verb, noun, adjective, and adverb collocates that indicated both positive and negative framing of the notion 'COVID-19 vaccines'. The

analysis revealed that generally the 'COVID-19 vaccines' was positively framed in different ways in the newspaper. The identified categories of the positive frames are acceptance (e.g., 'receive', 'want', 'completed'), groups of people (e.g., 'students', 'employees', 'migrants'), collective groups (e.g., 'population', 'members', 'committee'), accessibility (e.g., 'mobile', 'walk-in', 'digital'), well-being (e.g., 'antibodies', 'immunity', 'health'), intensity (e.g., 'boost', 'increase', 'least'), positive adjectives (e.g., 'important', 'effective', 'special'), and economy (e.g., 'tourism', 'industry'). Nevertheless, there were two categories of negative frames which were used to describe the act of COVID-19 immunisation. They were political entities (e.g., 'minister', 'government', 'Khairy'), and figurative speech (e.g., 'jab', 'shot').

The present study is among the first attempts to delve into the news frames, specifically by the Malaysian newspapers in reporting COVID-19 vaccines related-news. Therefore, the findings from this study can become one of the main references for future researchers who are keen on media studies related to the COVID-19 vaccines in the Malaysian context. In terms of methodological perspective, since most of the research on media frame is mainly conducted qualitatively via content analysis, the present study exemplifies how the news frame can be identified systematically via a corpus-based approach. This study's findings can encourage informed decision-making on COVID-19 vaccination by dispelling unwarranted fears. Positive news coverage can boost confidence and prevent panic while mitigating negative emotions and risk perceptions. These findings can also enhance the vaccination campaign in Malaysia.

Limitations of the study include the use of a small corpus from one newspaper, the focus on only one type of news article, and the limited discussion of keywords and collocates in context. Future research should compare how different newspapers have framed the COVID-19 vaccines and explore the role of mass media in the vaccination drive through feature articles and opinion pieces. Additionally, analysing the news frame of COVID-19 vaccines-related news reports in Malay newspapers might produce different research findings.

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