

VACCINE DISCOURSE IN THE NARRATIVE OF SOCIAL MEDIA CULTURE IN INDONESIA

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Abstract

The pros and cons of vaccination in Indonesia are reflected through opinions in the online community as cultural artifacts, that each explains their arguments, ranging from issues of safety, effectiveness, religion, as well as conspiracy theories. The difference in perspective is expressed in different languages through social media culture which has increased in demand as a means of finding health information. This study aims to analyze the overall culture of online vaccine communities and understand the narratives of vaccine discourse in two Facebook groups, each representing anti-vaccine and pro-vaccine groups. Using a qualitative method with a virtual ethnography approach, this research uses the cyber media analysis method and refers to four different linguistic and psychological categories namely affective, social, medical and biological categories and ten different sub categories from Furini and Menegoni to gain insight into the language used for conversations regarding vaccination on social media. The results show that there are differences in the level of media space, media archive, media object, and experiential stories in the two communities, while results also show that the anti-vaccine Facebook group uses language that contains an element of anger, does not focus on certain health problems or certain diseases, and discussions that focuses on entities. While the language used by the pro-vaccine Facebook group contains more anxiety, is more focused on family cases, specific diseases or vaccines. Research findings are expected to assist health institutions in producing social media content with linguistic and psychological features that can distinguish information available in anti-vaccine and pro-vaccine groups.

Keywords: anti-vaccine; facebook; pro-vaccine; social media culture; virtual ethnography

INTRODUCTION

The debate over the use of vaccines has been an ongoing issue even before the emergence of the Covid-19 pandemic. However, the main concern of the debate is the increase of public doubt regarding vaccines that can threaten the coverage of basic immunizations such as hepatitis B, polio, measles, BCG and pentavalent vaccines for children which at the time before the pandemic only reached 57.9%, far from the target of 93 % (Suwantika, 2021). At a time when Indonesia is conducting the world's largest vaccination campaign against measles and rubella (MR), data shows that between 2017 and 2018, more than 68 million children aged 9 months to 15 years were targeted for MR immunization (Pronyk et al., 2019). The first phase in 2017 was declared a success, with more than 35 million children vaccinated on the island of Java, with vaccine coverage close to 100%, where measles cases have seen a sharp decline. However, in the following year, with a target of 32 million children in 28 provinces, the number of vaccine coverage or use decreased drastically in the second campaign phase, which was launched in August, 2018. The refusal of immunization which resulted in low immunization

coverage also occurred when the emergence of diphtheria outbreaks in various regions in Indonesia in 2017-2018.

This is due to several factors, one of which is related to widespread doubts about the halal status of vaccines. These doubts relate to vaccine licensing under Islamic law related to the potential use of pork in the manufacturing process (Pronyk et al., 2019). Similar to the case of the diphtheria epidemic in Indonesia several years ago which infected hundreds and killed 44 people, the reasons behind the rejection of the vaccine are mostly due to religious factors, which are supported by a number of alternative health practitioners and several Islamic circles in Indonesia who consider immunization un-Islamic and trying to ignore vaccination campaigns against diphtheria (Harvey, 2018).

Such doubts are a manifestation of the misinformation being spread by anti-vaccine groups that is very common on all social media platforms. Despite the fact that the number of anti-vaccine advocates in the real world is still a small minority, on social media the movement seems to hold a majority point of view (Diresta, 2018). The Internet democratizes the flow of information, and allows anyone with a particular point of view, both pro and anti-vaccine, to reach large numbers of people with relative ease. Besides its reach, social media provides freedom and flexibility for users who have their own identity construction, so that the language style or choice of words used in the messages they create becomes wider (Watie, 2013). One of the social media used to express their beliefs regarding the use of vaccines is Facebook, in the form of an online community which has formed its own culture. In simple terms, culture can be interpreted as values that exist between communities and cultural artifacts are a manifestation of these values, which are reflected in how the community and its members behave every day when interacting (Nasrullah, 2017).

In light of the vaccine debate rife across multiple platforms, anti-vaccine group narratives perform particularly well on social media, where algorithms reward personal anecdotes involving emotion and sensational content over content based on scientific facts (Diresta, 2018). When anti-vaccine groups take advantage of social media features for their agenda, the health misinformation they spread can contribute to increasing public doubt regarding vaccine use. However, when used responsibly by pro-vaccine groups, they can act as educators capable of educating the public and stimulating new research; health service education; direct the public to their websites and landing pages for up-to-date reliable health information; market innovative services such as health care social fund services; posts related to case information, photos, and results; and share reviews and testimonials of recovered patients (Sampurno, Kusumandyoko, & Islam, 2020). Unlike traditional media, content posted on social media does not go through editorial curation or scientific verification, and can consist of a complex mix of evidence and personal opinion. In addition, social media users often maintain anonymity, thus enabling individuals to express their views freely (Puri, Coomes, Haghbayan, & Gunaratne, 2020). Thus, social media not only offers millions of information in it, but demands the maturity of thinking of its users.

A study also shows that the anti-vaccine movement is well-funded and technically savvy. They follow the best practices of internet marketers, write blogs and promote content and share

material across all new platforms (Diresta, 2018). Specifically on Facebook, the results of the study also found that anti-vaccine activists use all of Facebook's features to grow and reach large audiences, and to build community. Members of these groups buy ads to promote their pages and groups; the anti-vaccine keyword appeared as a suggested option in Facebook's interest-based targeting tool, and anti-vaccine groups targeted new parents as well as pregnant women. They leverage Facebook Live for real-time communication with their audience. Meanwhile, Facebook pages and groups are used to coordinate, engage supporters in everything from advocating on Twitter to harassing pro-vaccine doctors (Diresta, 2018).

One of the activists of the anti-vaccine campaign in Indonesia is Dewi Hestyawati, who calls herself a holistic Islamic health activist. Through social media such as Facebook and Twitter which are used as a platform to spread her beliefs, she said that diseases such as diphtheria and polio could be prevented and treated without the use of vaccines, but enough with diet and alternative therapy called "Bekam" which is a type of suction therapy considered to remove toxins from a person's body (Harvey, 2018). Meanwhile, social media is also well utilized by Joseph Mercola, the main anti-vaccine figure in the United States who uses his personal website (mercola.com) and various social media, to sell various health products that have not been proven to be effective and safe, for personal profit (Hakim, 2017). Regarding the rejection of vaccines for religious reasons, this also happened in 2017 in Yogyakarta, where there were several schools that refused vaccines in the MR (Measles Rubbela) immunization program. Using theological arguments, these schools believe that in the technical hadith, it is stated that Islam has taught the most superior immunization method based on the prophet's instructions derived from God's revelation so that the vaccine program carried out by the government is considered no longer needed (Muallifah, 2018).

Another cause of the emergence of rejection or doubt about vaccines is the existence of various cultural constructs, so that there is no constructive relationship between health providers and health users (Laturrahmi, 2018). In the context of the use of social media related to vaccine discourse, differences in cultural background play a major role in the perspective on the meaning made by users. To be able to minimize the gap between individuals who come from the biomedical tradition and individuals who depart from a non-biomedical perspective, an individual who functions as a cultural mediator is needed. But in reality, this role is often not optimal because it is not balanced with good health literacy (Laturrahmi, 2018). This gap then has implications for the lack of solutions that can overcome these issues. Meanwhile, based on research that aims to identify public perceptions of measles immunization in Sleman Indonesia, there are several factors that play a major role in influencing the decision of the people of Sleman to use the vaccine, namely the side effects of measles immunization, the influence of the behavior of health workers and religious leaders regarding non-measles immunization, and the lack of government role in enforcing regulations regarding the attractiveness of measles immunization (Wahyunarni, Ahmad, & Ratnawati, 2018). It can be concluded that based on an analysis of the literature since 1999-2017 regarding vaccine rejection or doubt, there is little evidence that explains the existence of a comprehensive strategy in overcoming these problems (McClure, Cataldi, & O'Leary, 2017).

Various literatures that examine the phenomenon of vaccines in Indonesia indicate that overall, there is a decline in vaccine users in Indonesia. However, this decline did not occur in all regions of Indonesia. Studies show that the acceptance rate of dengue vaccine among the population of Aceh, Indonesia is relatively high (around 75%). A favorable attitude towards the vaccine and towards vaccination practice was the most important independent predictor of higher dengue vaccine acceptance. Higher monthly income and socioeconomic status were also associated with better support for dengue vaccination, but the association did not appear to be strong. Being halal and providing full protection against dengue virus infection are the most important characteristics of the dengue vaccine that can encourage high acceptance of the vaccine among community members in Aceh, Indonesia (Harapan, Anwar, Setiawan, & Sasmono, 2016). Seeing this fact, public acceptance of vaccines is not only determined by income and high socioeconomic status, but the need for good health literacy, which is obtained from quality health information, one of which is through social media.

Until a few years ago, health issues were discussed more with traditional gatekeepers (i.e., healthcare professionals and organizations), but now with the development of technology, things have changed. Social media has become the ultimate source for information, even for health issues. Nowadays, people seek first information about possible symptoms or diseases on social media platforms and health decisions are based on social media content (Furini & Menegoni, 2018). Social media provides unprecedented real-time access to the attitudes, beliefs, and behaviors of people from various demographic groups. Social media is increasingly becoming a center of activity for anti-vaccination activists (Dredze, Broniatowski, Smith, & Hilyard, 2015). At least 80% of Internet users search for health information online, and 16% of them search online for information about vaccinations.

While it is unclear how many of these Internet users specifically seek out or incidentally obtain vaccination information from social media, the study results show that people regularly share vaccine information on social media platforms, and that the anti-vaccination movement uses social media as one of them, even as the main communication tool (Dredze et al., 2015). The social media such as Facebook and Twitter became a place to accommodate the narrative of the anti-vaccine movement. The results of a study that sought to understand the behavior of anti-vaccine members on Twitter found that those with long-term anti-vaccination attitudes manifested conspiracy thoughts, did not believe in the government, and were assertive and part of the in-group in the use of specific language. Meanwhile, new recruits seem inclined to form anti-vaccination attitudes through the same government distrust and general paranoia, but are more social and less certain than their long-term counterparts (Mitra, Counts, & Pennebaker, 2016).

With regards to health studies, there is great interest in research objects and subjects that include the phenomenon of vaccines. This study refers to several previous studies that are relevant to the analysis of vaccine discourse, both for and against vaccines, as well as narratives or communication patterns used in vaccine conversations in social media culture. In a study conducted by Orr et.al, their research mapped and described the role played by web-based social media and social media as a platform for public debate and discussion regarding

vaccination during the Polio crisis in Israel in 2013. Their study attempts to examine how social media can act as an important platform for debating, discussing and disseminating information about vaccines (Orr, Baram-Tsabari, & Landsman, 2016). Social media serves as an outlet for the public, a form for expressing doubts, concerns, and criticisms of political, medical, and social issues. Social media is an active and versatile debate and discussion facilitation platform in the context of vaccination discussions. The results show that comments on social media, as well as the socio-demographic profiles of commentators, suggest that social media is an active and versatile debate and platform that facilitates discussion in the context of vaccination (Orr et al., 2016).

In another study, entitled 'Development of an Interactive Social Media Tool for Parents With Concerns About Vaccines', Shoup et al. (2015) seeks to describe a process for designing, building, and evaluating theory-based social media intervention tools to help reduce parental concerns about vaccination. The survey results suggest that social media can represent an effective intervention tool to help parents make informed decisions about vaccination for their children. Focus groups and interviews revealed four main themes for tool development: Parents wanted information describing the benefits and risks of vaccination, transparency of information sources, moderation of the tool by an expert, and ethnic and racial diversity in people's visual appearance. Usability testing showed that parents were satisfied with the usability of the tool but had difficulty performing some information retrieval. Based on focus groups, interviews, and usability evaluations, the research team made additional revisions to the tool's content, design, functionality, and overall look and feel (Shoup et al., 2015).

Meanwhile, the research conducted by Kang et al. (2017) explained the importance of examining current vaccine sentiment on social media by building and analyzing a semantic vaccine information network from a Twitter user website that is widely used in the United States, as well as to aid public health communication with vaccines. Kang et al. build a semantic vaccine information network from internet articles shared by Twitter users in the United States. The study was conducted by analyzing the resulting network topology, comparing semantic differences, and identifying the most prominent concepts in the network that express positive, negative, and neutral vaccine sentiments. The results show that the semantic network of positive vaccine sentiment shows greater cohesiveness in discourse compared to the larger network, which is less connected to negative vaccine sentiment (Kang et al., 2017).

Furthermore, according to Kalimeri et al. (2019), insights from social media data can inform interventions that consider the cognitive, moral, psychological, and political values of people who are vaccinated against vaccination, building general trust with reference to their values. In their research entitled 'Human Values and Attitudes towards Vaccination in Social Media', Kalimera et al. study the world views of people who "like" for or against a vaccine-themed Facebook page. Specifically, the study assessed differences in political viewpoints, moral values, personality traits, and the public interest, finding that those who were skeptical about vaccinations appeared to trust the government less, agree less, while they placed more emphasis on values of anti-authoritarian. Exploring the differences in moral narratives as expressed in the linguistic descriptions of Facebook pages, the study saw that pages that defend vaccines

prioritize family values while pages of vaccine indecision focus on the value of freedom (Kalimeri et al., 2019).

While other studies seek to see the need for successful strategies to address parental vaccine doubts, a significant public health concern. The purpose of the research conducted by Daley et al. (2018) was to assess whether internet-based platforms with vaccine information and interactive social media components improve parental attitudes regarding vaccines. The results showed that the internet-based intervention improved parental attitudes about vaccines, among parents who were hesitant about vaccines at baseline. Perceived self-efficacy around vaccination decision-making increased, as did positive attitudes about the benefits of vaccination, whereas concerns about vaccination risks decreased (Daley, Narwaney, Shoup, Wagner, & Glanz, 2018).

Based on the explanation above, which sees a correlation between the increasing number of discussion forums on vaccine debates on social media platforms as a cultural artifact and the increasing public doubts about the use of vaccines in Indonesia, this study attempts to analyze the overall culture of online vaccine communities, as well as vaccine discourse in the narrative of social media culture. The aim is to understand how individuals interact with vaccine information, the type of language used, and the descriptions used in conversation. The words people use on social media platforms can provide important insights into their thoughts and emotions (Furini & Menegoni, 2018). The research is also expected to provide an understanding of the language expressions used by people to talk about vaccinations allowing for the creation of new public health capabilities that are able to distinguish between accurate and misleading information. As governments and public health agencies work to formulate a coherent and proactive approach to disease prevention, it is imperative that they re-evaluate their stance on educating the public through social media content.

Proactive efforts demonstrated by increasing vaccine development, production and distribution are appropriate, but not sufficient. However, the means to increase and strengthen public confidence in such measures are essential if the government is to succeed (Gu et al., 2018). If the government intends to end the cycle of dangerous epidemics caused by public distrust of vaccines, then health institutions need to replace false information that informs that distrust with complete and correct information by understanding the characteristics of the language used by the people, and then producing social media content with linguistic and psychological features that can distinguish information available in the anti-vaccine and pro-vaccine groups.

METHOD

This study uses a qualitative method with a virtual ethnographic approach, which explains that virtual ethnography is a methodology used to investigate the internet and explore entities or users when using the internet (Nasrullah, 2017). The researchers argue that virtual ethnographic approach is a suitable method to be used in this study because the focus of research is on several virtual communities on social media, specifically Facebook which is a discussion forum about vaccines. By using this approach, researchers are able to explain the phenomena in depth because researchers are part of the subject being studied by following the activities of group

members in the virtual world, as well as being part of the group's followers. To be able to identify culture and cultural artifacts in the virtual world, especially in revealing how cyber culture is produced, the meanings that emerge, relationships and patterns, to how it functions through the internet medium, this research uses the cyber media analysis method which is a combination and at the same time guides the process of analyzing virtual ethnography. In principle, in analyzing culture on the internet, this method requires a unit of analysis, both at the micro and macro levels. Media space and media archives are in micro units or text, while media objects and experiential stories are in macro units or contexts (Nasrullah, 2017). Meanwhile, the data collection technique was carried out by exploring field sites, namely observing the activities of group members from virtual communities on Facebook social media.

In connection with the research objective, namely to be able to understand the narrative of vaccine discourse on social media, with a focus on the discussion on the linguistic and psychological aspects of the language used in social media culture, the researchers analyzed several Facebook groups with the theme of vaccine use in Indonesia. Based on the data obtained, there are five Facebook groups that have this theme. Three of them showed a contra attitude towards vaccines, and only two groups were pro against the use of vaccines. Specifically, this study focuses on two Facebook groups representing the anti-vaccine movement and the pro-vaccine movement, respectively. The group representing anti-vaccines called their group the "Anti-vaccination and Immunization Movement". Meanwhile, the group representing the pro-vaccine group named their group "GESAMUN - Movement Awareness of Immunization". The two groups were selected based on the number of members or the most members compared to other groups. In this study, researchers analyzed 183 posts from November 2018 to November 2019 (59 posts in the anti-vaccine group and 124 posts in the pro-vaccine group).

Table 1: Categories of Linguistic and Psychological Messages

Category	Sub-Category	Category Example
Affective	Positive	Happy, Glad, Fun, Tired
	Negative	Depressed, Shame
	Anger	Angry, Shame, War
	Anxiety	Restless, Problem, Bad
Biological	Body	Bone, Kidney, Heart
	Health	Health, Illness, Disease
Medical	Disease	Papillomarivirus, Diabetes
	Vaccine preventable diseases	Measles, Meningitis
Social	Family	Father, Sister, Brother, Son
	Entity	Pharmacy, Government

Source: Furini & Menegoni (2018)

To analyze the narrative in the two Facebook groups, the researchers used the categorization proposed by (Furini & Menegoni, 2018). The table above defines the existence of four distinct linguistic and psychological categories (affective, social, medical, and biological) and ten distinct subcategories (e.g., positive, negative, anger, anxiety, family, entity, disease, vaccine-preventable disease, body and health). For each subcategory, (Furini & Menegoni, 2018) defines a word list and a list of possible occurrences of each word. For example, the word

"worried" was introduced in the subcategory of anxiety. Subcategory analysis makes it possible to gain insight into the language used for conversations about vaccinations on social media.

RESULT AND DISCUSSION

By using the cyber media analysis method, researchers can analyze the culture of the anti-vaccine and pro-vaccine communities on social media, both at the micro level which includes media space and media archives and at the macro level which includes media objects and experiential stories (Nasrullah, 2017). In the media space, this level can reveal the existing structure of the medium on the internet, as well as the location or place where culture occurs and communities interact. Based on observations at the media space level, pro-vaccine and anti-vaccine Facebook accounts serve to facilitate communities that are pro and anti-vaccine who wish to seek and share information related to vaccines. Regarding the procedure for being part of the two communities, anyone can join the community as long as they have a Facebook account. For both communities, anyone who joins can post content in the form of text, videos, or photos. However, features such as posting content do not apply to individuals who have not joined both communities, which are limited to only accessing existing content.

In relation to the graphic aspect of the appearance of the two communities, audio-visual content dominates the community page both on the main page and content published by its members. In the anti-vaccine community, the main page is filled with photos of happy babies with the caption "things that make me happy", followed by the words "my mom researched vaccines and said no". This indicates a strong effort to win public sympathy toward their beliefs by using photos of babies who are helpless and relatable with their family members. A similar agenda is also visible on the content posted by members which consists of a number of religious related videos stating the haram status of vaccines. While in the pro vaccine community, the majority of content is filled with photos, such as the main page filled with photos with the text "spread awareness stop resistance", as well as photos from members showing the use of vaccines on the vaccination program table that has been taken, and posts from members in the form of e-posters promoting various online and offline events to increase vaccine usage, which indicates an effort to strengthen their beliefs on vaccine safety, by using various encouraging photos from individuals who are experts in their fields.

At the media archive level, the form of text produced by entities can be seen in the form of media articles, notes, photos, pictures, and videos. The texts contained in these various forms of media not only represent the opinions of users on social media, but also show the ideology, social background, political views, cultural uniqueness, and represent the identity of the members. In the anti-vaccine community, published texts tend to convey all sorts of misinformation and fake news, ranging from the dangerous side effects of vaccines, doubts about the efficacy of vaccines, conspiracy theories to narratives of global elites that rule the world. However, in the pro vaccine community, the values contained in the text produced by the entity reflect the identity of its members who prioritize family health as well as curiosity and a high level of concern for their family members, but also the discipline to always use

certain vaccines at the appropriate time, based on the schedule stated in the child's vaccination program.

At the media object level, researchers can see how activities and interactions between users or between users, both in micro units and macro units, derive from the text in the cyber media and the context around the text. In the anti-vaccine community, members of the anti-vaccine group are considered diligent in providing engagement, such as liking, commenting and sharing, on anti-vaccine-themed content uploaded by other group members. In addition, they often use emotional words and even ignite emotions when delivering content. The high activity of the anti-vaccine group will certainly increase production and accelerate the circulation of misinformation on social media. In the pro-vaccine community, many members have various vaccine information based on science that is gathered from credible sources. The interaction that occurs between members is very calm, conducive, and minimal conflict. Based on high curiosity and concern for their family members, the majority of interactions began with a question sentence related to vaccines, which then received positive feedback in the comment column and a high level of encouragement.

In the experiential stories level, the researcher attempts to uncover the reality behind the uploaded or created text and sees how the motive and effect aspects are. In principle, at this level, researchers can connect the reality that occurs in the virtual world or online with the reality that exists in the real world. Regarding the motive for using Facebook to construct messages, it should be noted that the researcher did not conduct direct interviews with its members, but based on observations made for 3 months, the researcher saw that the majority of members in both the anti-vaccine and pro-vaccine communities consisted of mothers with different age variants. So, it can be argued that the motive of using Facebook is that mothers prefer and are comfortable using the media. This is also in line with studies showing that mothers are very active on social media, especially Facebook. They do not only upload photos and write captions, but these mothers are also diligent in giving and replying to comments directed at them. The results of the study generally show that 81 % of Facebook users are mothers with different age variants.

This is due to the strong commitment that mothers have on social media, especially Facebook. In addition to expanding their network, mothers feel that their Facebook friends support their beliefs. In connection with the situation and moment that became the background of the entity constructing the text, it should be mentioned that this research was conducted several months before the Covid-19 pandemic, to be precise from October to December 2019. However, intense discussions about vaccines had been going on even before the pandemic, specifically regarding the increasing doubts regarding basic immunizations, which only reached 57.9%, far from the target set by the government, which was 93%. Doubts about vaccines occurred simultaneously when Indonesia was conducting the world's largest vaccination campaign against measles and rubella, which in practice, the number of vaccine coverage or use decreased drastically from year to year. In addition, vaccine hesitancy also occurred during the emergence of diphtheria outbreaks in various regions in Indonesia. So, it can be argued that the texts constructed by members of the two communities are a reflection of the situation that is

happening around them and even for some members is what they are facing personally in the real world, which creates a sense of frustration that triggers a desire to share and express their beliefs on social media.

Narrative on Affective Category

Category	Sub-Category	Category Example	Number of Events	
			Anti-Vaccine	Pro-Vaccine
Affective	Positive	Happy, Glad, Fun, Tired	3	17
	Negative	Depressed, Shame	7	6
	Anger	Angry, Shame, War	31	3
	Anxiety	Restless, Problem, Bad	2	52
Source: Research Results				

In terms of analyzing vaccine discourse in the narrative of social media culture, the first step taken by the researcher in this study was to enter the cultural arena, which is interpreted as a deliberate involvement in the virtual community where the culture occurs (Nasrullah, 2017). So, for a period of 3 months from the beginning of October to the end of December 2019, the researchers became followers as well as part of the discussion participants of the two groups. This is done so that in making observations, not only as a third person or outsider, but also being the first person involved in the formation of cyber-social reality. Based on the results of observations and participation by researchers in both groups, there were more posts in the pro-vaccine group, which was 124 posts, compared to the anti-vaccine group which only had 59 posts. This indicates that the pro-vaccine group is a source of information about vaccines and health in general, especially for parents, as well as an intervention medium for parents who have doubts about the use of vaccines.

A study shows that social media can represent an effective intervention tool to help parents make decisions about vaccination for their children, because parents want information that describes the benefits and risks of vaccination, transparency of information sources, moderation of the tool by an expert, and diversity, ethnicity and race in people's visual appearance (Shoup et al., 2015). In fact, another study also showed that internet-based interventions would improve parental attitudes about vaccines, among parents who were hesitant about vaccines at the outset. Perceived self-efficacy around vaccination decision-making increased, as did positive attitudes about the benefits of vaccination, whereas concerns about vaccination risks decreased (Daley et al., 2018).

Based on a relevant study, it can be concluded that the majority of Indonesian people when deciding to use vaccines are motivated by personal feelings and beliefs rather than scientific evidence. This is also supported by social media platforms that make narratives from anti-vaccine groups perform very well due to the platform's algorithms that value personal anecdotes involving emotions and sensational content rather than content based on scientific facts (Diresta, 2018). Therefore, it is important to understand the point of view of individuals who talk about vaccinations in Facebook groups. In addition, social media provides freedom

and flexibility for users who have their own identity construction, so that the language style or choice of words used in the messages they create becomes wider (Watie, 2013).

The data shows that there are 78 of 124 (63%) posts from the pro-vaccine group as well, and there are 43 out of 59 (73%) posts from the anti-vaccine group that contain affective narratives. This reflects the various emotions expressed by the two groups when discussing vaccines. A total of 52 posts in the pro-vaccine group contained anxiety narratives, while 31 posts in the anti-vaccine group contained angry narratives.

The data showed that individuals discussing vaccination in the pro-vaccine group were more anxious than people discussing vaccination in the anti-vaccine group. The following is an example of a post containing a narrative of anxiety: “Thank you for accepting me into this group. After a month since vaccinating my children, I really hope that my decision to vaccinate my second and third son will have a good impact on them because i want them to be free from any diseases. I am worried that if they are not vaccinated, they will end up like my first son, who has often been sick recently, maybe because at that time he was not vaccinated”.

Meanwhile, anger in the anti-vaccine group was higher than in the pro-vaccine group. An example of an outrage post is: “This is my son Aaron, not vaccinated except that time he was vaccinated twice when he was newborn. It really angers me every time I remember. I regret it because I didn’t really want that for my son. He had several fevers after he was injected with the first newborn vaccine. Thank God he is always healthy even without the vaccine and additional immunizations after that... Even though I took a trip to the country with a different weather. He is 2 years old this month... Thank God, he has never had a cold or flu”. Anxiety and anger are common narratives found especially on social media because the platform is an active and versatile debate and a platform that facilitates discussion in the context of vaccination as well as a medium that serves as an outlet for the public, a form of expressing doubts, concerns, and criticism of political, medical, and social issues (Orr et al., 2016).

Narrative on Biological Category

Category	Sub-Category	Category Example	Number of Events	
			Anti-Vaccine	Pro-Vaccine
Biological	Body	Bone, Kidney, Heart	23	11
	Health	Health, Illness, Disease	2	37

Source: Research Results

The table above shows the number of narratives that talk about the human body or health in general. This category seeks to identify whether the Indonesian people are more concerned with human health in general or more concerned with specific parts of the human body. The data showed that there were 25 of 59 (42%) posts from the anti-vaccine group, and 48 out of 124 (39%) posts from the pro-vaccine group that indicated a biological narrative. This category is important for identification because discussions containing biological narratives have a high risk of misinformation due to inadequate health literacy, which can then lead to increased doubts about the use of vaccines. This misinformation cannot escape scrutiny and is ignored by the government and health institutions because even though the number of anti-vaccine

supporters in the real world is still a small minority, on social media the movement seems to hold a majority point of view (Diresta, 2018)

Meanwhile, the results showed that members of the anti-vaccine group talked more about the human body compared to the pro-vaccine group who paid more attention to human health in general. Here's a post that talks about the human body: "Building immunity is a natural process. With this natural process, our body uses multiple defenses. The first layer of our body's defense is the skin. The skin will prevent the entry of harmful substances. With vaccines, this law of nature is totally violated.

Because, vaccination is giving injections containing various ingredients which, under normal conditions, our skin will refuse to enter it into the body". While the following is an example of a post from a pro-vaccine group that focuses on general health: "As far as I know, vaccination or immunization is actually good for our health, because it aims to make a person's immune system able to recognize and quickly fight bacteria or viruses that cause infection". The existence of misinformation in biological narratives spread by anti-vaccine groups has implications for the emergence of rejection or doubt about vaccines, which is a concrete example of the existence of various cultural constructs, especially between the relationship and communication patterns of the medical side and the community, so that there is no constructive relationship between health providers and health users (Laturakhmi, 2018).

Narrative on Medical Category

Category	Sub-Category	Category Example	Number of Events	
			Anti-Vaccine	Pro-Vaccine
Medical	Disease	Papillomarivirus, Diabetes	17	9
	Vaccine preventable diseases	Measles, Meningitis	4	49

Source: Research Results

To understand whether an individual is talking about a particular disease or not, it is important to measure analytical thinking about vaccination. Observations showed that there were 21 out of 59 (36%) posts from the anti-vaccine group, and 58 out of 124 (47%) posts from the pro-vaccine group that contained medical narratives. The category indicates that when people talk about vaccine-preventable diseases, we can assume that they are well-informed about vaccinations and are likely to make analytic contributions to the vaccine debate. On the other hand, if an individual associates a vaccine-preventable disease with poor vaccine effectiveness, then that individual has inadequate health knowledge. This can contribute to the spread of inaccurate vaccine information, and has the potential to influence the decisions of many parents, as people regularly share vaccine information on social media platforms, and that the anti-vaccination movement uses social media as one of these, even as a primary means of communication (Dredze et al., 2015).

The table above shows that the pro-vaccine group talked more about the disease than the anti-vaccine group. Meanwhile, the pro-vaccine group talked more about vaccine-preventable diseases than the anti-vaccine group. The following is an example of a post containing a sub-category of disease narrative: "Intramucosal vaccination has been taught in Islam since 1400

years ago. This is a sunnah whose process is through eating dates which are also rich in vitamin K and glucose that newborns need ". Meanwhile, here is an example of a post containing a narrative of vaccine-preventable diseases: "One of the most important types of vaccines in my opinion is the MMR vaccine. It's important for those with measles, because it's very contagious." At the time the anti-vaccine member's post was posted, the researcher observed that no other individual had tried to substantiate the statement. This indicates that differences in cultural backgrounds play a major role in the user's perspective on meaning. To be able to minimize the gap between individuals who come from the biomedical tradition and individuals who depart from a non-biomedical perspective, an individual who functions as a cultural mediator is needed. But in reality, this role is often not optimal because it is not balanced with good health literacy (Laturrahmi, 2018).

Narrative on Social Category

Category	Sub-Category	Category Example	Number of Events	
			Anti-Vaccine	Pro-Vaccine
Social	Family Entity	Father, Sister, Brother, Son Pharmacy, Government	6	44
			29	9

Source: Research Results

In order to understand how the two groups discussed the issue of vaccination, it is important to understand whether members were directly involved in the vaccination process or if they were talking about vaccination in general. When referring to individuals who are directly involved in the vaccination process, the conversation usually centers around family members such as me, my brother, father, etc. Meanwhile, when referring to vaccines in general, the conversation is about general entities such as pharmaceuticals, industry, and government.

The data above shows that there are 35 out of 59 (59%) posts from anti-vaccine groups, and 53 out of 124 (43%) posts from pro-vaccine groups that contain narratives of social categories. This indicates that on average the pro-vaccine group talked more about family members than the anti-vaccine group. The following is an example of a narrative that talks about family: "Because dozens of students including my family members were hospitalized because of diphtheria, Thank God for Ayya I immediately gave the diphtheria vaccine at the community health clinic. God willing, the immune system will be stronger than before". Meanwhile, the anti-vaccine group spoke twice as much as the pro-vaccine group about the entity. These figures suggest that conversations in anti-vaccine groups are less personal and more focused on common entities.

The following is an example of a conversation containing an entity narrative: "Even though it is not a trend in Indonesia, try reading what vaccines contain. This is not just a halal and haram issue. This is a "reading emergency" problem, trusting the government too quickly or people who happen to have the title 'doctor'. Try asking them.. What's in the vaccine? If we're in a restaurant, we can ask what's inside our food. Why can't we ask the same thing to a doctor?" Differences in moral narratives as expressed in the linguistic descriptions of the two groups' pages indicate that individuals posting on pages defending vaccines prioritize family values

while vaccine indecision pages focus on the value of freedom (Kalimeri et al., 2019). Based on the researcher's observations, specifically for narratives that focus on entities, it can be concluded that there are some of the 29 posts that are not open-minded to the feedback received in the comments column. While posts from other individuals are more open to the criticism they receive. This can be explained by previous research which saw a difference between the attitudes of long-term anti-vaccine members and new members. Members who have long-term anti-vaccination attitudes manifest conspiratorial thinking, distrust of government, and are assertive and part of the in-group in the use of specific language. Whereas new recruits seem inclined to form anti-vaccination attitudes through the same government distrust and general paranoia, but are more social and less certain than their long-term counterparts (Mitra et al., 2016).

CONCLUSION

Observation results showed that at the media space level, pro-vaccine and anti-vaccine Facebook accounts serve to facilitate communities that are pro and anti-vaccine who wish to seek and share information related to vaccines. Any individual can join the community as long as they have a Facebook account. In relation to the graphic aspect of the appearance of the two communities, audio-visual content dominates the community page both on the main page and content published by its members. At the media archive level, published texts in the anti-vaccine community tend to convey all sorts of misinformation and fake news, ranging from the dangerous side effects of vaccines, doubts about the efficacy of vaccines, conspiracy theories to narratives of global elites that rule the world.

However, in the pro vaccine community, the values contained in the text produced by the entity reflect the identity of its members who prioritize family health as well as curiosity and a high level of concern for their family members. At the media object level, members of the anti-vaccine group are considered diligent in providing engagement, such as liking, commenting and sharing, on anti-vaccine-themed content uploaded by other group members. In addition, they often use emotional words and even ignite emotions when delivering content. In the pro-vaccine community, many members have various vaccine information based on science that is gathered from credible sources. The interaction that occurs between members is very calm, conducive, and minimal conflict. In the experiential stories level, the motive of using Facebook is that mothers prefer and are comfortable using the media. In addition to expanding their network, mothers feel that their Facebook friends support their beliefs. Meanwhile, texts constructed by members of the two communities are a reflection of the situation that is happening around them, which creates a sense of frustration that triggers a desire to share and express their beliefs on social media.

In terms of analyzing vaccine discourse, the results showed that when compared to the pro-vaccine group, members in the anti-vaccine group talked less about family, but more about entity. They talk less about specific diseases and diseases associated with vaccines, but they talk more about the human body and less about health in general. In addition, conversations in the anti-vaccine group showed less anxiety and anger than those in the pro-vaccine group.

These results indicate that members of anti-vaccine groups typically believe that vaccines will damage parts of the human body, and that vaccination is the result of a conspiracy between entities such as the pharmaceutical industry and the government. The conversational characteristics in the anti-vaccine group appeared to be more effective because they provided a more general explanation. This can be seen in conversations that do not focus on certain health problems or on certain diseases. In contrast, conversations in the pro-vaccine group revealed more anxiety and were based on family cases, specific illnesses, or vaccines.

The findings in this study are expected to help public health institutions to minimize the adverse effects of negative media news trends regarding vaccines. Health institutions can use these findings to generate social media content with linguistic and psychological features that can differentiate information available in the anti-vaccine and pro-vaccine groups, thereby transforming false information with accurate information and strengthening public confidence in the use of vaccines.

LIMITATION AND STUDY FORWARD

Several limitations of this study should be mentioned. The flaws and shortcomings of this study is the result of data collecting based solely on observations of the activities of group members, without conducting personal interviews with community members, both pro and anti-vaccine. In addition, the results of this study may not be completely generalizable due to a small sample size consisting of only two communities on one social media platform, each representing anti-vaccine and pro-vaccine groups. Meanwhile, this research is directly related to a main research which seeks to analyze health risk communication on vaccine refusal in Bandung, Indonesia. Therefore, the purpose is to not only identify and analyze the linguistic and psychological features of vaccination conversations on social media, but further studies such as using a case study approach are required to gain comprehensive data related to the perception of the anti-vaccine community, particularly risk perception of members regarding risk communication policies implemented by the Indonesian government and other stakeholders.

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References

- ❖ Daley, M. F., Narwaney, K. J., Shoup, J. A., Wagner, N. M., & Glanz, J. M. (2018). Addressing Parents' Vaccine Concerns: A Randomized Trial of a Social Media Intervention. *American Journal of Preventive Medicine*, 55(1), 44–54. <https://doi.org/10.1016/j.amepre.2018.04.010>
- ❖ Diresta, R. (2018). Of Virality and Viruses : The Anti- Vaccine Movement and Social Media. In *Technology for Global Security (Vol. T4GS)*. Retrieved from <http://www.tech4gs.org/renee-diresta.html>
- ❖ Dredze, M., Broniatowski, D. A., Smith, M. C., & Hilyard, K. M. (2015). Understanding Vaccine Refusal. *American Journal of Preventive Medicine*, 1–3. <https://doi.org/10.1016/j.amepre.2015.10.002>
- ❖ Furini, M., & Menegoni, G. (2018). Public health and social media: language analysis of vaccine conversations. *Proceedings - 3rd International Workshop on Social Sensing, SocialSens 2018*, 50–55. <https://doi.org/10.1109/SocialSens.2018.00022>
- ❖ Gu, Z., Badger, P., Su, J., Zhang, E., Li, X., & Zhang, L. (2018). A vaccine crisis in the era of social media. *National Science Review*, 5(1), 8–10. <https://doi.org/10.1093/nsr/nwx098>
- ❖ Hakim, S. (2017). Mengapa Kita Harus “Berperang” Melawan Antivaks? Retrieved November 17, 2019, from kesehatanmuslim.com website: <https://kesehatanmuslim.com/mengapa-kita-harus-berperang-melawan-antivaks/>
- ❖ Harapan, H., Anwar, S., Setiawan, A. M., & Sasmono, R. T. (2016). Dengue vaccine acceptance and associated factors in Indonesia: A community-based cross-sectional survey in Aceh. *Vaccine*, 34(32), 3670–3675. <https://doi.org/10.1016/j.vaccine.2016.05.026>
- ❖ Harvey, A. (2018). Kelompok Anti-Vaksin Indonesia Skeptis Vaksin Bisa Cegah Wabah Difteri. Retrieved November 1, 2019, from tempo.co website: <https://www.tempo.co/abc/859/kelompok-anti-vaksin-indonesia-skeptis-vaksin-bisa-cegah-wabah-difteri>
- ❖ Kalimeri, K., Bonanomi, A., Beiro, M. G., Rosina, A., Urbinati, A., & Cattuto, C. (2019). Human values and attitudes towards vaccination in social media. *The Web Conference 2019 - Companion of the World Wide Web Conference, WWW 2019*, 248–254. <https://doi.org/10.1145/3308560.3316489>
- ❖ Kang, G. J., Ewing-Nelson, S. R., Mackey, L., Schlitt, J. T., Marathe, A., Abbas, K. M., & Swarup, S. (2017). Semantic network analysis of vaccine sentiment in online social media. *Vaccine*, 35(29), 3621–3638. <https://doi.org/10.1016/j.vaccine.2017.05.052>
- ❖ Laturrahmi, Y. (2018). Menelaah Fungsi Cultural Mediator Dalam Promosi Vaksin di Pedesaan. *INTERAKTIF Jurnal Ilmu-Ilmu Sosial*, 10(2).
- ❖ McClure, C. C., Cataldi, J. R., & O’Leary, S. T. (2017). Vaccine Hesitancy: Where We Are and Where We Are Going. *Clinical Therapeutics*, 39(8), 1550–1562. <https://doi.org/10.1016/j.clinthera.2017.07.003>
- ❖ Mitra, T., Counts, S., & Pennebaker, J. W. (2016). Understanding anti-vaccination attitudes in social media. *Proceedings of the 10th International Conference on Web and Social Media, ICWSM 2016, (Icwsml)*, 269–278.
- ❖ Muallifah, A. Y. (2018). Mengurai Hadis Tahnik dan Gerakan Anti Vaksin. *Jurnal Living Hadis*, 2(2), 253. <https://doi.org/10.14421/livinghadis.2017.1334>
- ❖ Nasrullah, R. (2017). *Etnologi Virtual: Riset Komunikasi, Budaya, dan Socioteknologi di Internet (Pertama; N. Nurbaya, Ed.)*. Bandung: Simbiosis Rekatama Media.
- ❖ Orr, D., Baram-Tsabari, A., & Landsman, K. (2016). Social media as a platform for health-related public debates and discussions: The Polio vaccine on Facebook. *Israel Journal of Health Policy Research*, 5(1), 1–11. <https://doi.org/10.1186/s13584-016-0093-4>

- ❖ Pronyk, P., Sugihantono, A., Sitohang, V., Moran, T., Kadandale, S., Muller, S., ... Kezaala, R. (2019). Vaccine hesitancy in Indonesia. *The Lancet Planetary Health*, 3(3), e114–e115. [https://doi.org/10.1016/S2542-5196\(18\)30287-0](https://doi.org/10.1016/S2542-5196(18)30287-0)
- ❖ Puri, N., Coomes, E. A., Haghbayan, H., & Gunaratne, K. (2020). Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases. *Human Vaccines and Immunotherapeutics*, 00(00), 2586–2593. <https://doi.org/10.1080/21645515.2020.1780846>
- ❖ Sampurno, M. B. T., Kusumandyoko, T. C., & Islam, M. A. (2020). Budaya Media Sosial, Edukasi Masyarakat, dan Pandemi COVID-19. *SALAM: Jurnal Sosial Dan Budaya Syar-I*, 7(5). <https://doi.org/10.15408/sjsbs.v7i5.15210>
- ❖ Shoup, J. A., Wagner, N. M., Kraus, C. R., Narwaney, K. J., Goddard, K. S., & Glanz, J. M. (2015). Development of an Interactive Social Media Tool for Parents With Concerns About Vaccines. *Health Education and Behavior*, 42(3), 302–312. <https://doi.org/10.1177/1090198114557129>
- ❖ Suwantika, A. (2021). Riset: Pandemi Covid-19 Ancam Cakupan Imunisasi Dasar Nasional. Retrieved July 30, 2021, from *kompas.com* website: <https://www.kompas.com/sains/read/2021/04/02/190500223/riset--pandemi-covid-19-ancam-cakupan-imunisasi-dasar-nasional?page=all>
- ❖ Wahyunarni, Y. I., Ahmad, R. A., & Ratnawati, A. T. (2018). Community's perception of measles immunization in Sleman. *Berita Kedokteran Masyarakat*, 32(8), 281. <https://doi.org/10.22146/bkm.6896>
- ❖ Watie, E. D. S. (2013). Gaya Bahasa Perempuan Indonesia Dalam Media Baru. *THE MESSENGER*, V(1), 1–10.