ERUDITIO Vol. 4, No. 1, Desember 2023, pp. 17-32
P-ISSN: 2580-7722 | E-ISSN: 2807-6222

Exploring the Communication, Information, and Education Strategies of the Indonesian FDA for COVID-19 Vaccine Development

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ARTICLE INFO

Article history
Received:
October 31, 2023

Revised:
March 21, 2024

Accepted:
March 28, 2024

DOI:
https://doi.org/10.54384/eruditio.v4i1.179

ABSTRACT / ABSTRAK

Pandemi COVID-19 menjadi permasalahan kompleks yang dihadapi oleh dunia. Ketiadaan antivirus spesifik atau vaksin pada periode awal wabah menyebabkan pendekatan kesehatan masyarakat menjadi strategi utama untuk mencegah penyebaran COVID-19. Minimnya transparansi pada awal wabah juga menyebabkan misinformasi di masyarakat. WHO menyebutnya sebagai infodemi, suatu kelimpahan informasi, baik benar maupun tidak, yang menyebabkan publik sulit menentukan referensi sebenarnya. Di Indonesia, misinformasi dalam bidang kesehatan bukan merupakan permasalahan baru dan berada di peringkat teratas bersama dengan sosial politik. Pemerintah menggunakan media sosial untuk menyediakan informasi kepada masyarakat. Media sosial itu sjuga juga memegang peranan penting dalam infodemi sebagai medium penyebaran informasi, baik benar maupun tidak. Badan Pengawas Obat dan Makanan (BPOM) memainkan peran penting dalam hal edukasi melalui media sosial. Studi ini bertujuan untuk memetakan elemen yang membentuk keterlibatan masyarakat pada penggunaan media sosial BPOM, khususnya dapat penyebaran informasi mengenai pengembangan vaksin COVID-19. Studi ini menggunakan metode regresi dengan keterlibatan masyarakat yang dikalkulasi dari jumlah *like* dan komentar sebagai varibel dependen. Tiga variabel independen yang membentuk keterlibatan masyarakat adalah kekayaan media, produksi konten, dan tope konten yang diambil dari sudut pandang pemerintah. Sentimen pada konten Instagram diukur dengan menganalisis komentar yang masuk menggunakan InSet Semantic Lexicon. Berdasarkan, regresi binomial negatif, kerangka pikir yang dikembangkan dalam penelitian ini signifikan untuk mengobservasi fenomena yang ada. Kekayaan media dan produksi konten secara signifikan mempengaruhi keterlibatan masyarakat. Konten asli dan konten informasi mendorong masyarakat memberikan keterlibatan yang lebih. Secara umum, sentiment publik pada konten BPOM baik pusat maupun daerah cenderung positif.

The COVID-19 pandemic has become a complicated problem faced by the world. The absence of specific antiviral drugs or vaccines at the beginning of the outbreak made the public health approach the primary strategy for preventing the spread of COVID-19. The lack of transparency at the start of the COVID-19 outbreak also led to public misinformation. WHO called it an infodemic, an excess of information, whether true or not, making it difficult for people to determine valid references. In Indonesia, misinformation on health matters is not a new difficulty and is in the top rank along with socio-political. The government utilizes social media to provide information to the citizens. Social media itself has a vital role in the infodemic as a medium for disseminating information, whether credible or not. The Indonesian FDA plays an essential role in conducting education through social media. This study aims to map the elements forming citizens' engagement in

Indonesian FDA social media use, especially in disseminating information about the COVID-19 vaccine. This study uses a regression method with citizens' engagement (calculated from the number of likes and comments) as the dependent variable. Three independent variables form citizen engagement elements: media richness, content production, and content type defined by the government. The sentiment toward government Instagram posts was measured by analyzing citizens' comments using the dataset from InSet Semantic Lexicon. Based on negative binomial regression results, data obtained that the framework developed in this research was statistically significant in observing the phenomenon. Media richness and content production significantly affect citizens' engagement. On the other hand, original and informative content encourages more citizen engagement. Generally, public sentiment on Indonesian FDA Instagram content, both head office and regional offices, tends to be more positive than negative.

Keywords: COVID-19, Indonesian FDA, Instagram, social media
Kata Kunci: BPOM, COVID-19, Instagram, media sosial

1. Introduction

Since the end of December 2019, in Wuhan, China, an outbreak has occurred caused by a type of betacoronavirus. The outbreak spread rapidly from one city to the rest of the country in just 30 days (Wu & McGoogan, 2020). The causative agent of the outbreak was subsequently identified as SARS-CoV-2 and designated as COVID-19 (Sohrabi et al., 2020). In March 2020, COVID-19 spread over the world and changed the complicated issue that the world was dealing with. In mid-February 2020, the director-general of WHO, pointed out that the epidemic or outbreak was also an infodemic. Similar to the virus itself, most information is disseminated instantaneously and makes it challenging for individuals to distinguish between credible and sufficient sources. Infodemics are impossible to completely eradicate, and in the social media age, controlling them presents significant challenges. (Tangcharoensathien et al., 2020). Infodemic is used to characterize rumors, stigmas, and conspiracy theories during public health emergencies. In the 2002-2003 SARS outbreak, fear developed and created a stigma in Asians resulting in delayed medical efforts contributing to expanding the epidemic through community transmission (Cinelli et al., 2020; Islam et al., 2020; Sohrabi et al., 2020).

Zhang et al. (2021), in their study in China, mentioned that the sources of COVID-19 infodemic are chat platforms such as WeChat (40.1%), video sharing platforms such as Tiktok (23.4%), and news sharing platforms such as Sina News (22.1%). The study results are in line with the simulation of the dissemination of information on social media using epidemic models conducted by Cinelli et al. (2020). The reproduction of information leading to infodemic has a similar value compared to the virus spread model. Digital 2021 data mentions that the world's total population reached 7.83 billion people, and 4.2 billion (53.6%) are active social media users. That figure increased by 4.6% compared to the previous year. The global score shows that the average time of day used to use social media reaches 2 hours 25 minutes. The most popular platforms are Facebook, YouTube, WhatsApp, Instagram, WeChat, TikTok, to QQ (Kemp, 2021).

Social media plays a significant role in influencing the public during the COVID-19 pandemic because the citizens themselves tend to prioritize information from social media

(Ahmad & Murad, 2020). Bridgman et al. (2020) identified a strong link between social media exposure and misperceptions about COVID-19, and social media is also associated with public non-compliance due to the expanding misperceptions about COVID-19. Concurrently, the public health approach as a strategy to overcome the pandemic requires community compliance (Wu & McGoogan, 2020).

Hoaxes in Indonesia in general and specifically on health hoaxes is not a new problem. The Indonesian Telematics Society (MASTEL) study in 2017 said that out of 1,146 respondents, 44.3% received hoax messages every day. MASTEL's data also declares that hoaxes about health, food, and beverages become the most frequently received types of hoaxes after socio-political and SARA (Ethnic, Religious, Racial, and Inter-group). Data of the Indonesian Journalists Association (PWI) in 2017 even mentions 27 percent of the 1,000 hoaxes are health news and are the most significant number. The Indonesian Anti-Hoaxes Society (MAFINDO) data in 2018 is similar to MASTEL of health, drug, and food-related hoaxes in Indonesia, the third highest after political and religious hoaxes.

Per Presidential Regulation No. 80 of 2017, the Indonesian Food and Drug Administration (BPOM) carries out government duties in drug and food supervision. One of the strategic activities in drug and food control is education related to safety, quality, and medical benefits. Social media BPOM as a government agency with specific tasks and functions in drug and food becomes very important to support education and public communication conducted by other government elements. BPOM social media accounts managed by the Public Communication Department supported by social media accounts from all Technical Implementation Units (UPT), an extension office of BPOM (Dharma, 2023), as a vertical government agency, in the region.

La et al. (2020) points to social media use as one of Vietnam's elements in disseminating information to handle COVID-19. With the existing conditions, social media can be the spearhead of BPOM in conducting Communication, Information, and Education of food and drug in general. Concerning COVID-19 specifically, Communication, Information, and Education are also conducted to support the development of the COVID-19 vaccine. Communication, Information, and Education itself is a terminology that is relatively attached to the Indonesian government's health efforts and used by other agencies, such as the Ministry of Health and the National Narcotics Agency.

Indonesia is one of the countries with the largest social media users in the world. With a population of 274.9 million people, active social media users in Indonesia as of February 2021 is 170 million people. Compared to 2020 data, there is a rise in the number by 6.3%, or about 10 million users (Kemp, 2021). The average time used by Indonesians to access social media per day reaches 3 hours 14 minutes. Compared to the 2020 data on social media used by more than 50% of users, Instagram became the social media with enormous growth from 79% in 2020 to 86.6% in 2021. YouTube and WhatsApp remain ranked first and second.

The added value of Government 2.0 or the use of government social media is in the potential for greater public engagement and interaction due to interaction patterns within the social media platform itself. Upon information submitted by the government, the public can immediately respond well by giving likes, sharing on their timeline, and comment—interaction from the public on this social media platform quantified as citizen engagement. So the purpose of this study is to analyze citizens' engagement in the utilization of

government social media, especially for the Communication, Information, and Education of the COVID-19 vaccine.

2. Method

Research on the use of social media by the government has been widely conducted. One of the earliest researches was from Abdelsalam et al. (2013) in Egypt, who delved into social media's links to the Arab Spring. Bonsón et al. (2014) and several studies conducted by the same researchers analyzed citizens' engagement from various social media such as Facebook, Twitter, and YouTube. Specifically, in the circumstances of COVID-19, the government's use of social media, especially at the beginning of pandemic, has been researched by La et al. (2020) and Chen et al. (2020). This research departs from the framework developed by Chen et al. (2020) by making certain modifications.

In this study, data was collected in 2021 from social media activity on the headquarters official account (@bpom_ri) and 73 regional BPOM offices' accounts. While several regional offices utilized Facebook, Twitter, and TikTok alongside Instagram, updates on Twitter and TikTok were not maintained consistently across all regions. All regional offices also had Facebook accounts, but some used personal profiles instead of designated Pages. Due to the inherent differences in how users interact with personal profiles and Pages, engagement metrics from both variations were excluded from the analysis. The data collection period spanned from August 6th, 2020, coinciding with the commencement of clinical trials for the Sinovac COVID-19 vaccine, to February 18th, 2021, the date of issuance for the Emergency Use Authorization (EUA) for the COVID-19 vaccine produced by Biofarma, Indonesia's state-owned vaccine manufacturer.

The framework developed by Chen et al. (2020) uses media richness, dialogic loop, content type, and emotional valence as independent variables. In this research, dialogic loop is replaced by content production that refer to Larsson (2018) and Hull et al.(2019). Besides, emotional valence variables will analyze separately on the sentiment formed. More precisely, the differences in Weibo and Instagram characteristics also switch the indicators on each variable. In media richness, the indicators used in this study are photos, infographics, and videos. Infographic components do not exist in the framework that developed by Chen et al. (2020), but Jarreau et al. (2019) and Chemela (2019) are defined infographic separately from the photo, given the differences in elements and knowledge that may be loaded. Two main categories are used in this research are news events and information. Furthermore, considering the distinct characteristics of Weibo and Instagram, the indicators used for each variable will be adjusted accordingly. Thus, the framework of this research is as follows:

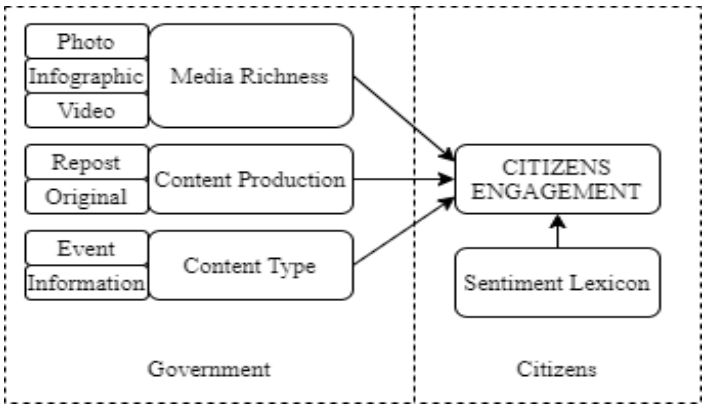

Figure 1 Research framework.

This study uses Chen et al. (2020) framework that hypothesizes posts with a high level of media richness are less likely to attract citizens' engagement. The hypothesis is different from Yang et al. (2021), who said that higher media richness would generate no higher engagement rate. In the context of differences in social media characteristics, the study agrees with Yang that the correlation is positive. Thus, the three hypotheses developed to refer to positive correlations, as follows:

H1: media richness positively influences citizens engagement.

H2: content production positively influences citizens engagement.

H3: content type positively affects citizens' engagement.

Table 1. BPOM Instagram Accounts

Level	Instagram Account (@)		
Head Office	@bpom_ri		
Regional Office	bbpom.palembang	bbpom.ponti	bbpom_makassar
	bbpom_manado	bbpom_padang	bbpom_samarinda_
	bbpom_serang	bbpom_surabaya	bbpom_yogyakarta
	bbpombanjarmasin	bbpomjayapura	bbpomlampung
	bbpommataram	bbpompalangkaraya	bpomaceh
	bpombandung	bpomdenpasar	bpomjakarta
	bpommedan	bpompekanbaru	bpomsemarang
	balaipomambon	bpom.pangkalpinang	bpom.batam
	bpom_bengkulu	bpom_di_kendari	bpom_mamuju
	bpom_manokwari	bpom_palu	bpom_sofifi
	bpomgorontalo	bpomjambi_	bpomkupang
	bpom_banggai	lokapom_dharmasraya	bpominhil
	bpomsungaipenuh	bpomtanahbumbu	kantorbpomdumai
	lokapombogor	lokapom.acehtengah	lokapom.belitung
	lokapom.jember	lokapom.tanjungpinang	lokapom_mimika
	lokapom.sorong	lokapom.tangerang	lokapom.kediri
	lokapom.tasik	lokapom_banyumas	lokapom_baubau
	bpomhsu	lokapom.lubuklinggau	lokapom_morotai
	lokapom_sangihe	lokapom_surakarta	lokapombalikpapan
	lokapombima	lokapom.acehselatan	lokapombuleleng
	lokapomende	lokapomkotawaringinbarat	lokapommerauke
	lokapompalopo	lokapommanggaraibarat	lokapomsanggau
	lokapomtanimbar	lokapomrejanglebong	lokapomtarakan
	lokapomtoba	lokapomtanjungbalai	lokapomtuba
	pom.payakumbuh		

Data of Instagram posts from 74 accounts that mentioned above are collected and then classified according to their relevance to the COVID-19 vaccine topics. Each Instagram post is then codified as explained in Table 2.

Table 2. Codification of Variables

Variable	Type	Code
Media richness	photo	0
	Infographics	1
	video	2
Content production	repost	0
	Self-produced	1
Content type	News event	0
	Information	1

There are various approaches to calculating citizens' engagement. However, for Instagram, there are characteristic differences because information about share aggregates is not available. Thus, citizens' engagement is calculated based on the number of likes and comments. This study uses calculations from Azmi and Budi (2018) that distinguish potent between likes and comments with likes given a weight of 1 while comments 2. Therefore, the calculation of citizen engagement, in this case, is as follows:

$$Citizen\ Engagement = (Likes\ \times 1) + (Comments \times 2)$$

In line with research by Chen et al. (2020) and the number of other studies on citizens' engagement, as well as the type of data that becomes variables, the analysis applied is negative binomial regression. This regression uses dependent variables in the form of count and relevant if the independent variable is categorical data. Negative binomial regression is an expansion of Poisson regression and is used in over dispersion conditions. The tools used for analysis are SPSS 26.

Comments from citizens in the Instagram posts exported using tools from exportcomments.com. Comments from citizens are then processed using the stages developed by Naseem et al. (2020), and because the incoming comments are in the Indonesian language, the dataset used as a reference to assess the sentiment of each comment is the InSet Lexicon developed by Koto & Rahmaningtyas (2017).

Naseem et al. (2020) analyzes numerous sequences in conducting sentiment analysis and recommended sequences are (1) removal of Unicode, URLs, user-mentions and hashtag symbols, (2) replacing emoticons and emojis, (3) replacing slang and abbreviations, (4) correction of spelling mistakes, (5) expanding contractions, (6) replacing elongated words, (7) removing punctuations, (8) lower-casing of words, (9) word segmentation, (10) removing numbers, (11) removing stop words, and (12) lemmatization. Especially for stage number 2, namely the treatment of emoticons and emojis, this study was not replaced but instead conducted a separate sentiment analysis using a dataset developed by Seleck (2019) before recombining at the end of the calculation. Stop words uses datasets developed by Haryalesmana (2016). The analysis process using combined techniques in spreadsheets and python. To obtain more factual circumstances and a more comprehensive discussion, the

results of regression and count of citizens comments sentiment intensified with interviews with BPOM social media administrators.

3. Results and Discussion

Per the data retrieval period from August 6, 2020, to February 18, 2021, and the COVID-19 vaccine as the scope of data, 2,178 posts were obtained from 74 BPOM Instagram accounts, both head office, and regional office. The 2,178 posts received 75,710 likes and 530 comments. The average post per account is 29.4. The main account, @bpom_ri, has 75 posts and includes the highest number compared to other accounts. The number 75 is only lower than posts that upload by @bbpom_manado and @bpom_manokwari.

Of all the available posts, the post with the highest engagement is an infographic titled 'Penerbitan Emergency Use Authorization Pertama Untuk Vaksin COVID-19' (Figure 2) created on January 11, 2021. The information post gained 2,616 engagements. The post was also reposted by 60 BPOM office accounts in the region and, in total, resulted in 674 engagements. The post with the next most citizen engagement is the live video of the publication of the first EUA COVID-19 vaccine, which was also made on January 11, 2021. There were 1,951 engagements, and the number of comments doubled compared to the infographic post that was explained before. Thus, it can be known that the issuance of the EUA COVID-19 vaccine becomes a massive public discourse so that the posts created by BPOM related to the topic get higher engagement than older posts. Accounts in BPOM, including @bpom_ri, reposted content from @lawancovid19_id 239 times. Several UPT accounts also repost content from @kemenkes_ri (47), @kemenristekbrin (30), and @kemenkominfo (24). Summary of engagement and content production explained in Table 3.

Table 3. Summary of Engagement and Content

Description	Account	Number
Most Engagements	@bpom_ri	43,959
Regional office account with high engagement	@bpomgorontalo	3,170
	@bbpom_surabaya	1,664
	@bpom_manokwari	1,347
	@bpompekanbaru	1,241
	@bbpom.palembang	1,096
Regional office account upload most original posts related to the COVID-19 vaccine	@lokapom.lubuklinggau	26 Posts
	@bbpom_serang	13 Posts
	@lokapombuleleng	10 Posts

Regarding media-richness to form the citizens' engagement, infographic posts dominated 1,267 posts (58.2%). Video posts were the least, with only 181 posts (8.3%). From the content production element, repost content is very dominant, with a proportion of 87.2% or 1,899 posts.

Figure 2. Indonesian FDA instagram post with the highest engagement

From content production perspective, the repost feature is not an official feature of Instagram. The repost feature is different from sharing on Facebook or retweet on Twitter. On Facebook or Twitter, when a piece of posts is removed, it automatically stops spreading. As for Instagram, reposting is the same as a new post. So, if a piece of post is deleted or stored in the archive by the account that initially posted it, then the spread can continue to occur considering a photo, infographic, or video has become a different post on another account.

Of the 2,178 posts analyzed, the dominating content type was information, with 1,423 (65.3%). In comparison, only 34.7% of posts preach an activity such as press conferences, inspections of facilities, and the implementation of vaccinations.

Statistical analysis of this study used negative binomial regression. The Pearson Chi-Square number in the Goodness of Fit parameter is 8,006. With the prerequisite $\alpha > 0.05$, then the model used corresponds to the available data. Sig. value on omnibus test obtained is 0.000 or with prerequisite $\alpha < 0.05$ then statistically significant analysis results.

Table 4. Test of Model Effects

Parameter	Wald Chi-Square	Hypothesis Test	
		df	Sig.
Intercept	8772.963	1	0.000
Media Richness	7.127	2	0.028
Content Production	1110.584	1	0.000
Content Type	2.382	1	0.123

Results from the Test of Model Effects obtained that Sig. for media richness is 0.028 and for content production is 0.000, while Sig. for content-type is 0.123. With the prerequisite α < 0.05, media richness and content production have a significant relationship with citizens' engagement, while content type does not have a significant relationship with citizens' engagement formation.

Media richness posts that affect citizens' engagement are photos, videos, and infographics. As for the content production element, the original post encourages citizens' engagement compared with repost content. As for content type, information content encourages citizens' engagement instead of news events.

Table 5. Parameter Estimates

Parameter	B	Std.Error	Hypothesis Test	
			df	Sig.
Intercept	5.243	0.0964	1	0.000
Media Richness				
Photo	0.099	0.1846	1	0.591
Infographic	-0.222	0.0865	1	0.010
Video	0			
Content Production				
Repost	-2.188	0.0656	1	0.000
Original	0			
Content Type				
Events	-0.299	0.1939	1	0.123
Information	0			

Based on The Sig. value on the photo element, it can be concluded that H1 is partially supported. On the other hand, H2 was supported, and H3 was not supported.

Table 6. Sentiment Calculation Process

Comments	Emoticons	After Data Cleansing	Sentiment	
darurat apanya? Yang pesan?		‘darurat’, ‘apanya’, ‘pesan’	-7	Negative
Terlalu di paksakan bu.. udh order impor banyak sia2 kalo ga kepake keburu expayerd rugi hahahaa.. saya tau uji klinis mu bisa mencapai tahun 2022 kan ? Makanya di paksakan cepat walau nanti banyak populasi sakit karenaefek samping 😆😆	😆😆	'import', 'sia', 'sia', 'keburu', 'rugi', 'uji', 'capai', 'cepat', 'sakit', 'efek', 'samping'	-22	Negative
Yuk bismillah mulai vaksinasi, insha Allah vaksin juga bagian ikhtiar kita kepada Allah. Udah lolos uji klinis. Mui sudah menyatakan halal. Pemerintah udah janji buat gratis, sekarang tinggal kita yang ikutin prosedur vaksinasi kedepannya, semua ingin yang terbaik gak mungkin Negara mau nyelakain		'yuk', 'bismillah', 'allah', 'ikhtiar', 'allah', 'lolos', 'uji', 'gratis', 'tinggal', 'prosedur', 'terbaik', 'mencelakai', 'allah', 'pandemi', 'aamiin'	14	Positive

rakyatnya sendiri lewat vaksin ini. Insha Allah pandemi segera berakhir, aamiin.			
Bismillah.. Insya Allah saya siap di vaksin	'bismillah' 'allah'	9	Positive

This study obtained 530 comments from citizens gathered on 92 posts with 59 items on @bpom_ri accounts and 33 other posts belonging to 18 BPOM office accounts in the region. Based on InSet Lexicon sentiment analysis and combination with emoticon sentiment analysis to 530 citizen comments, 241 (45.5%) have positive sentiment and 133 (25.1%) negative discourse, while the rest is neutral. When compiled based on posts, then of the 92 posts commented, 55 (59.8%) had a positive sentiment, and 19 posts got negative sentiment or equivalent to 20.7%, while 19.6% neutral.

This study analyzes 74 Instagram accounts, and repost content is very dominant. A post, especially from the principal account, is likely to convert into different content on the regional office account. For example, 61 regional office accounts repost the highest citizen engagement post in @bpom_ri. Other posts in infographics regarding the invitation to support vaccination on January 15, 2021, were also reposted by 52 regional office accounts.

Repost of Instagram is different from Facebook with its 'share' feature and Twitter with its 'retweet' feature. On Facebook and Twitter, if the original post is removed or changed, it will impact other accounts that share or retweets. The repost content turns into an entirely separate post. Thus, one image in the form of the first EUA publishing infographic for the COVID-19 vaccine in Indonesia replicating 61 times, or 62 accounts in the BPOM environment, post the identical image with similar captions, and it will correlate with the Instagram algorithm.

As an official BPOM account, @bpom_ri has more followers than accounts relating to regional offices. It is possible that a citizen has seen a post on the @bpom_ri account and found it on another account that is a regional office account. If a citizen has given engagement either with likes or comments on the @bpom_ri account, there is a tendency that the citizen will not do the same on the same content.

Reposts are also not only done by accounts belonging to regional offices. The @bpom_ri also reposts posts from another account, especially @lawancovid19_id. Thus, there are two interaction areas for citizens: in the @lawancovid19_id account itself and the @bpom_ri account as another official government account that reloads the same post. Community engagement is certainly divided on each content.

Meanwhile terms of the COVID-19 vaccine, in addition to the official account @bpom_ri, the most active account to create and upload original posts is @lokapom.lubuklinggau, with the majority being event news. At each distribution facility inspection activity, the Loka POM account manager in Lubuk Linggau made a post in the form of photo events accompanied by captions in the form of information on the events. On the other hand, accounts like @bbpom_serang tend to create their infographic content. The difficulty level is certainly different. The event photo from Loka POM Lubuk Linggau amounted to 26; indeed, the level of production difficulty is different from the infographic content created by @bbpom_serang. Of the 13 original content @bbpom_serang, 9 are

infographics, while of the 26 original content @lokapom.lubuklinggau, only 4 of them are infographics. In creating infographic content, there are different difficulty levels than just uploading photos and captioning them. There are elements of searching for sources of information, and there are considerations in converting information into a more visual form, Etc. Infographic posts not automatically increase engagement. In Loka POM Lubuk Linggau, out of 22 original posts in photos or videos, the average engagement is 23. In contrast, the average engagement on infographic content is only 13. While in BBPOM Serang, the average engagement on the original post in the form of photos is 15, while for infographics, the average rises non-significant to 16 engagements.

The necessity of the existence of regional office accounts itself needs to be clarified by BPOM. The regional office account itself is entirely meant for the local approach given the geographical context in Indonesia. Some accounts add local language in captions to emphasize locality details. On the other hand, several regional offices themselves are moderately active in making posts on other issues that become the task of BPOM, such as food safety or online cosmetic selling. The topic of the COVID-19 vaccine itself is generally being discussed extensively in Indonesia so that the administrators of most regional office accounts are proactive in creating or reposting content related to the COVID-19 vaccine.

The results of statistical analysis show that the content type does not significantly form citizens' engagement. This result is actually in line with Chen et al. (2020) that content type only partially influences citizens' engagement. On the other hand, the research also shows a massive impact on the content of information. That is in line with the findings in this study.

Our findings highlight the importance of content production in fostering citizen engagement. Notably, the dominance of reposted content creates a vast pool of data sources for analysis. However, the analysis reveals concerns regarding the effectiveness of reposts, as citizen engagement appears to be significantly higher for original content. This trend is evident when examining activity on the main account (@bpom_ri), where original content consistently generates higher average citizen engagement compared to reposted content.

Significance is also shown by media richness, in line with the researcher's understanding of concept by Yang et al. (2021) instead of Chen et al. (2020). Instagram itself is content that puts forward visuals so that media richness elements play a more critical role than Weibo or Twitter, for example. However, when viewed in the estimates parameter against a slightly different result because with the video as point 0, the photo turns out to be 0.099 more encouraging citizen engagement, while the infographic is precisely -0.222. However, the value of Sig. for photos is 0.591 or insignificant. Simultaneously, the infographic gained 0.01 or quite clearly its significance in shaping citizens' engagement.

It should be understood that infographic content is more reposted by regional office accounts, whereas some regional accounts have low citizen engagement. The repost factor ultimately pushes the infographic position at the minus position. Based on this research, a more optimal classification of richness media is required, for example, referring to Jarreau et al. (2019) that posts such as video graphics, live video, and collage photos are also considered the influence on citizen engagement.

Our analysis revealed a negative impact ($\beta = -2.188$) associated with reposted content, suggesting minimal positive influence from disseminating the same photo across multiple accounts. Citizen engagement appeared to favor original content, as exemplified by discussions surrounding Loka POM in Lubuk Linggau and BBPOM in Serang. Notably, for regional offices, content showcasing local activities, such as screenings of vaccine

distribution facilities, garnered higher engagement likely due to a perceived sense of proximity for local citizens. Additionally, posting frequency emerged as a significant factor influencing citizen engagement. Reposting a high volume of photos within a short timeframe (more than three posts simultaneously) can negatively impact Instagram's algorithm, causing information overload and preventing citizens from seeing all the reposted content. Consequently, this practice hinders the intended information dissemination and public understanding efforts.

The central headquarters account (@bpom_ri) itself engages in reposting content from the official COVID-19 account (@lawancovid19_id). This reposting adheres to a standardized content management process involving submission and supervisor approval. However, regional offices exhibit significant variations in their content management practices, leading to a lack of uniformity in their reposting policies. This inconsistency has demonstrably impacted the overall study results. Nonetheless, reposting offers an attractive option for regional managers, as it provides readily available content, eliminating the need for independent data collection, graphic design, and information verification procedures associated with original content creation.

Lexicon-based sentiment analysis plays a crucial role in interpreting citizen engagement on social media platforms. Social media provides a valuable space for citizens to actively participate in the implementation of government policies, often by interacting with official government social media accounts. However, sentiment analysis in Bahasa Indonesia can be hindered by the limited availability of labeled datasets in Indonesian compared to English. Consequently, data processing often involves translation from Bahasa Indonesia to English, which can lead to potential loss or alteration of contextual meaning. To address this challenge, the InSet Lexicon emerges as a fundamental tool. This Indonesian sentiment lexicon comprises two datasets: a positive lexicon with a sentiment score ranging from 1 to 5, and a negative lexicon with a score ranging from -5 to -1.

Our analysis revealed a high degree of concordance between the calculated sentiment and the intended meaning conveyed within the comments. Table 4 qualitatively demonstrates this similarity through four illustrative examples. Notably, a significant portion of citizen engagement occurs through comments and replies on the central headquarters account (@bpom_ri). This high level of activity suggests a public desire to be heard by the authorities. This trend is also observed on other government social media accounts, particularly those associated with prominent institutions such as the Ministry of Health (@kemenkes_ri) and the President of Indonesia (@jokowi).

Nearly 60% of incoming comments have a positive sentiment to support COVID-19 vaccinations. Several comments with negative sentiments lead to generating discussions with respective replies between citizens. BPOM itself is present on several questions by conducting specific responses in the form of reply comments. However, in most comments that come in and even include question marks, BPOM does not respond.

The response process, especially in the @bpom_ri account, is carried out by the public complaints handling division in a different bureau than the content administrator in the public relations division. Both divisions have initially been in the same bureau, but the latest reorganization process placed the pair on two different bureaus. Public complaints entered through comments or Direct Messages will be followed up according to the public complaint

handling procedures applicable in BPOM. That is also why the response to comments, in general, is related to complaints and does not respond to opinions that are different from government policy.

The positive sentiment itself is a good resource for the government, especially BPOM, to encourage the socialization of the COVID-19 vaccine. Individual citizens who voluntarily reply to contrary comments are an asset for the government to optimize communication, information, and education through social media, especially Instagram.

4. Conclusion

Using the framework developed by Chen et al. (2020), media richness and content production significantly influence citizen engagement and content type configuration. Our analysis of media richness revealed a sequential preference for photos, followed by videos and infographics. Interestingly, photos, as an independent variable, exhibited statistical insignificance. This finding underscores the need for a more optimal and statistically robust content categorization within this dimension. Such a categorization should particularly focus on capturing the variations in richness across different media formats. Furthermore, the study demonstrates that original content is a more effective driver of citizen engagement compared to reposted content. While citizen sentiment leaned slightly towards content categorized as "information" over "news events," this trend was not statistically significant. Paradoxically, some news event posts with local context still generated higher engagement than informational posts.

Encouragingly, sentiment analysis of comments directed towards the @bpom_ri account and the 73 regional office accounts revealed a predominantly positive tone. This positive sentiment presents a valuable asset that BPOM can leverage for future communication, information dissemination, and educational efforts regarding the COVID-19 vaccine.

This study extends beyond refining the media richness categorization and offers actionable recommendations for BPOM. First, the development of a comprehensive social media utilization policy is crucial. This policy should specifically address regional office accounts and prioritize strategies to cultivate greater citizen engagement on the COVID-19 vaccine and other BPOM initiatives. Secondly, the policy should advocate for minimizing reposts and prioritize the creation of original content.

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