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Digital Voices in Early Days: Analysing Local Government Social Media Approaches to Risk Communication During the Initial Stages of the COVID-19 Pandemic in Indonesia

FARISHA SESTRI MUSDALIFAH*
ANNADA NASYAYA
ANANG DWI SANTOSO
Sriwijaya University, Indonesia

ABSTRACT

This study evaluates the communication strategies utilised by local governmental bodies in Indonesia concerning the risk communication associated with the COVID-19 pandemic. Furthermore, an analysis is conducted on the impact of these communication approaches in promoting public engagement. In this study, we collected a dataset consisting of 1,577 tweets that originated from five different local governments in Indonesia. This dataset was obtained using web crawling techniques and was intended to be used for content analysis purposes. The findings of this study demonstrate that local governments employ a diverse range of risk communication strategies. This encompasses the distribution of medical knowledge, protocols for maintaining health, frequent reports on the COVID-19 status in different areas, governmental measures, initiatives for public education, community engagement endeavours, information about accessible assistance, enforcement of regulations, provision of emotional assistance, and promotion of collaborative efforts. The findings of this research demonstrate that some forms of content, such as narratives or testimonies from individuals who have recovered from COVID-19 or medical experts, public awareness campaigns related to COVID-19, and interactive quizzes or activities, have a significant coefficient of determination. This discovery implies that the material above has generated substantial attention and involvement from the general public.

Keywords: *COVID-19, risk communication, social media, Indonesia, communication strategies.*

INTRODUCTION

During the onset of the COVID-19 pandemic, Indonesia underwent significant social, economic, and health-related changes (Caraka et al., 2020). The emergence of the first case of COVID-19 in March 2020 had a considerable impact. It spread to all aspects of people's lives, compelling the Government of the Republic of Indonesia to respond immediately by establishing policies implementing Large-Scale Social Restrictions (PSBB) to prevent the virus's spread. These restrictions also influence the Indonesian economy, where companies are experiencing a decline in product demand due to shifting household consumption patterns (McKibbin & Fernando, 2021). Various agencies, from the government to education, enforce social restrictions by conducting activities at home.

On the other hand, critical sectors, including tourism, manufacturing, and exports, have experienced unprecedented disruptions, increasing redundancies and unemployment (Rahma et al., 2021; Rajagukguk, 2021). Fluctuations in the prices of essential products and the threat of inflation are significant obstacles that can increase the likelihood of economic instability. During a crisis of this magnitude, the government, the private sector, and the community must work together to combat the pandemic.

*Corresponding author: farishasestrim@fisip.unsri.ac.id
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While health authorities are fulfilling their responsibilities to provide scientific information about the pandemic, the public obtains a plethora of unofficial information about the crisis (Bravo et al., 2023). Large amounts of information, also known as infodemics, disseminate rapidly through social media, much like a virus (Zarocostas, 2020). The public and healthcare professionals are confused about the diagnosis and treatment of COVID-19 due to the prevalence of false information. This is also due to the paucity of research results and dissemination of information about COVID-19 in the early days of the pandemic (Shereen et al., 2020). In this instance, risk communication is essential for disseminating accurate information and assessing community vulnerability to pandemic-related risks (Bravo et al., 2023). In addition, the initial phase of the pandemic was the beginning of the crisis, during which the level of uncertainty regarding the COVID-19 virus was at its peak.

Consequently, the need for effective risk communication can resolve various public concerns regarding the causes and dangers of crises (Smillie & Blissett, 2010). Risk communication bridges health experts, policymakers, and the general public during a pandemic to ensure all parties can understand and accept the information. The community can track the latest case developments and take the necessary precautions to mitigate risks.

In the context of government, effective risk communication contributes to developing or maintaining the credibility of disseminated information (Boholm, 2019). In this digital era, the rapidity with which information is disseminated through various media types strengthens risk communication. The information provided by the government allows communities to make sound decisions. In this instance, the local government has a strategic role in disseminating information during a disaster. Indonesia's decentralised government structure necessitates local governments' participation to ensure that all information reaches all levels of society (Putra & Matsuyuki, 2020). The locality owned by the local government enables it to have direct access to local communities and to comprehend the characteristics and requirements of the community following the local economic, social, and cultural context. By collaborating with local health agencies, local governments can ensure that the information provided is pertinent, appropriate, and meets the local community's requirements.

During the COVID-19 pandemic, central government policies were continued with implementations that were adapted and modified according to the local regions' capabilities and resources. Local governments ensure that vital information regarding the prevention and management of COVID-19 is conveyed plainly and effectively to the public through various media, from local mass media to social media (Padeiro et al., 2021).

This study seeks to evaluate how local governments in Indonesia communicate about COVID-19 in the early stages and the effectiveness of their communication strategies in promoting engagement. This study also aims to emphasise significant aspects of risk communication, such as signal amplification, vaccination information availability, and the balance between prevention and treatment communication. The significance of this research resides in understanding local government communication strategies in response to a pandemic, which can serve as a reference for future stakeholders in designing and implementing a crisis communication strategy. The research problem formulation contains the following: How is COVID-19 related to the risk communication strategy implemented by local governments in Indonesia? What are the strengths and weaknesses of this community engagement-promoting communication strategy?

LITERATURE REVIEW

Generally, disaster management and health emergencies for the community always involve communication elements to convey information, whether in the form of warnings, risk messages, evacuation instructions, symptoms, or medical treatment (Reynolds & Seeger, 2005). Ignorance of the effects of natural calamities will result in significant problems due to a deficiency of high-quality information for the community and government to make sound decisions (Reynolds & Seeger, 2005). Risk communication plays a role in improving the quality of decisions and actions taken for the future, particularly in crises, in order to reduce anxiety circulating in society, notably through social media (Nuraryo, 2021; Tsao et al., 2021). In addition, the initial phase of the Covid-19 pandemic was marked by uncertainty, resulting in the continued circulation of misleading information about the virus. Risk communication is part of risk management, which is still relevant to crisis communication. Crisis communication focuses on things that could go wrong, whereas risk communication focuses on things that could go wrong (Telg, 2022). Consequently, the crucial function of risk communication in the field of public health in the early stages of this pandemic is to ensure the dissemination of accurate information about the pandemic and prevent public panic.

Frequently, research on risk communication relates to social psychology, cognitive psychology, economics and their applications within organisations or communities (Glik, 2007). Risk communication seeks to comprehend and assist the public in processing risk information, frequently accompanied by anxiety in stressful situations (Glik, 2007). The capacity of a society's members to process information can be hindered by situations that induce stress. The efficacy of the risk communication strategy contributes to protecting public safety against the COVID-19 pandemic and increases public awareness, trust, and preparedness for coping with this disaster.

The public frequently relies on the government and agents of government agencies to guide decision-making during times of crisis (Wukich & Mergel, 2016). Community participation in social media as a source of information is beneficial for the government in understanding the requirements and desires of the public. It can be used to inform public policies. Government organisations are responsible for disseminating information to the public via extant media outlets. Along with technological advancements, government organisations should also adapt to the most recent methods of communicating with the public, one of which is using social media as a risk communication medium (Bruns et al., 2012; Takahashi et al., 2015). The use of social media by government organisations in crises as a complementary medium to increase public awareness of disasters has garnered traction. Channels such as Instagram, Facebook, and Twitter enable the dissemination of information swiftly and efficiently to multiple audiences (Aoun & Aoun Barakat, 2023). Especially when an emergency occurs, this is incredibly helpful.

The interactivity of social media facilitates communication between the government and the public. This benefit enables the discussion and input of the public on social media to be considered by the government, thereby fostering an inclusive and democratic atmosphere (McGuire et al., 2020). This democratisation has the potential to enhance policy formulation from various angles. Xiao et al. (2015) have noted that there is still a digital divide in society, so social media is believed not to reach all segments of society. In addition, disseminating false information poses a significant threat to society in crises such as the Covid-19 pandemic. The simplicity with which information (and misinformation) can be disseminated (via social

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media) erodes the credibility of the government's public communications. It is the government's responsibility to monitor and rectify false information.

METHODOLOGY

This study employed a quantitative approach with descriptive and associative content analysis methods to describe the facts and characteristics of a particular population or object in a systematic, accurate, and factual manner. To analyse quantitative content, the following steps were taken: formulating the goals of conceptualisation analysis, conceptualisation and operationalisation, coding sheets, population and samples, training or coder training and testing the validity of reliability, coding process, final reliability calculations, data input, and analysis (Krippendorff, 2019).

We analysed social media content owned by local governments in Indonesia, which, at the start of COVID-19, implemented the Large-Scale Social Restrictions (PSBB) policy for the first time. This study utilised Twitter as a social media platform because Twitter is a popular microblogging platform (Kim et al., 2013; Kim et al., 2018). Most local administrations have also utilised Twitter to communicate with the general public (Panagiotopoulos et al., 2014; Sáez Martín et al., 2015). This study's population consists of 1,577 Tweets that belong to five local governments on Twitter (Table 1).

The data acquisition process involved a two-step search of social media platforms utilised by local governments. Firstly, we visited the local government's official website before searching for local government Twitter accounts directly in the Twitter search field. Afterwards, we gathered data using Python from 1 January to 1 June 2020 under the assumption that COVID-19 and the PSBB implementation in each region differed. This study collects tweets, remarks, likes, replies, and retweets as data.

Table 1: Research population

Region	Username	Number of analysed tweet
City of Depok	@pemkotdepok	468
Tangerang Regency	@PemKabTangerang	57
DKI Jakarta	@DKIJakarta	347
City of Bandung	@HumasBdg	244
West Java	@humasjabar	461
Total		1.577

The coding procedure was based on the categories of information shared on the local government's Twitter account. This study's tweet categories were adapted from Chen et al. (2020) and Tsao et al. (2021). The two studies present a classification of content that the government frequently shares in responding to the COVID-19 pandemic. This classification includes medical information, health protocols, case updates, and collaboration with other parties, reflecting the government's comprehensive approach to providing the public with information and education during a pandemic.

In research employing face validity, testing for validity ensures that the coding employed is appropriate for measuring the concept. Validation was conducted by examining previous research to determine the scientific community's approval, and then by evaluating the measuring instruments used by experts.

A valid measuring instrument must also be highly reliable. Content analysis must be conducted objectively, meaning there should be no differences in interpretation between coders. Every coder who evaluates this will reach the same conclusion. This concept is referred to as reliability, which is the extent to which the same results are obtained when the same measuring instrument is used multiple times (Krippendorff, 2019).

In addition to the percentage of agreement, the Holsti formula is a commonly employed measure of inter-coder reliability (Neuendorf, 2022). This reliability reflects the proportion of similarities between raters when evaluating a piece of content (Krippendorff, 2019). Reliability ranged from 0 to 1, where 0 indicated that none of the coders concurred and one indicated that all the coders agreed. The greater the number, the greater the rate of dependability. According to the Holsti formula, the minimum acceptable reliability rate is 0.7, or 70%. This means that if the calculation results indicate a reliability greater than 0.70, this measuring instrument is genuinely reliable. However, if it is below 0.7, the measuring instrument (the coding sheet) is deemed unreliable (Krippendorff, 2019).

This study's reliability testing was conducted by measuring reproducibility, also known as inter-coder reliability. Reproducibility seeks to determine the extent to which the measuring instrument can produce identical results for coder one and other coders, regardless of the circumstances. This is done to reduce the author's subjectivity. All tweets assessed by each coder are then reevaluated to ensure that both coders have been assigned the same approval rating.

This data analysis used simple linear regression to compare the quantity of information (as the independent variable) with each interaction metric, namely replies, retweets, and favourites. It is determined by the coefficient of determination R2 how much variation in the dependent variable is explained by the independent variable. The P-value evaluates the null hypothesis regarding a relationship between the two variables, with a value below 0.05 indicating a significant relationship. The *, **, and *** symbols clarify the significance level at p 0.1, p 0.05, and p 0.01 in the table context. After conducting the analysis, the interpretation of R2 and P-value summarises which topics have the most significant influence on interaction and the effect of information quantity on interaction metrics.

RESULTS AND DISCUSSION

Medical Information

Figures 1, 2, and 3 depict the classification of tweets along the medical information axis. Figure 1 demonstrates that with the exception of Tangerang, all participating local administrations tended to communicate this information with varying intensities. The lack of tweets from Tangerang suggests a failure in the communication strategy or the selection of alternative platforms as the primary media. The Government of DKI Jakarta, for instance, invites the public to implement #socialdistance on public transport and provides health advice via a tweet: "Friends, thank you for implementing #socialdistance aka #JagaJarakAman on public transport. Take care of your health and personal hygiene at all times, and travel only when necessary!"

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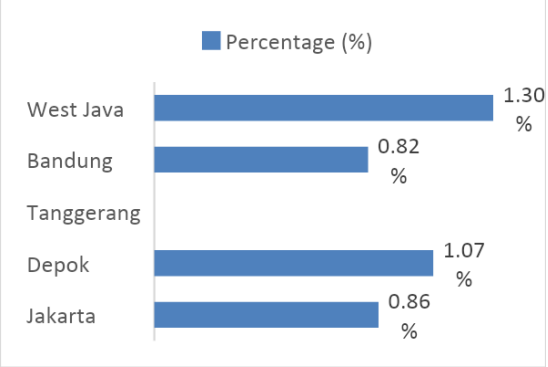

Figure 1: Symptoms and how to recognize COVID-19

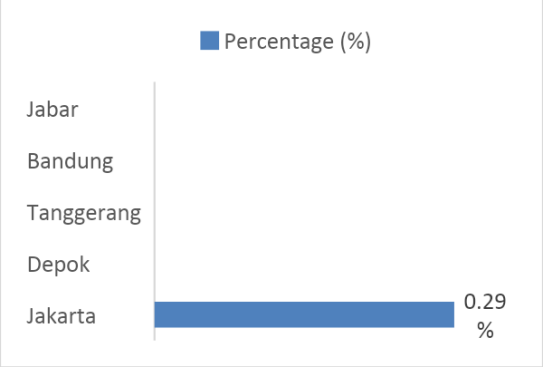

Figure 2: Information related to vaccination

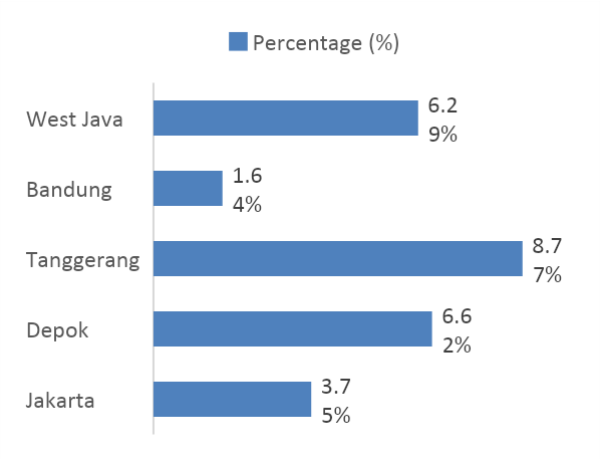

Figure 3: How to handle and treat those who are infected

Figure 2 demonstrates that vaccination information is also only available in Jakarta. The DKI Jakarta Government, via @dinkesJKT, announced that "According to @dinkesJKT, based on the latest developments in the case, severe pneumonia caused by the coronavirus that spread from Wuhan City, China, can be transmitted between humans in a limited capacity, and there is no vaccine available." The absence of vaccination-related information in other local governments raises significant concerns regarding the degree to which this information was deemed essential at the onset of the COVID-19 pandemic.

Tangerang is the leader in information regarding the management and treatment of the infected (Figure 3), while other regions have a more balanced approach between prevention and treatment. Meanwhile, Depok is focusing on increasing the test capacity of PCR Swab test.

Health Protocol

Our research revealed that local governments' communication strategies and topic selections reflect the unique social and cultural characteristics of each municipality and the informational requirements of the community. As the economic and political capital of Indonesia, Jakarta places a high priority on education regarding the implementation of health protocols (Figure 4). DKI Jakarta tweets that individuals without symptoms should wear masks when leaving their homes. However, Depok, Tangerang, and Bandung, have lower rates. Our research also revealed that West Java has a higher priority than other regions for the dissemination of information regarding the use of masks. The regional government of Depok

urges its citizens, "Let's make PSBB a success by adhering to the existing protocols. If forced to participate in activities outside the residence, maintain a safe distance and always wear a mask." In West Java, however, the approach is more of an appeal for support: "Dear West Java people, let's assist health workers fight Corona! "After work fine"

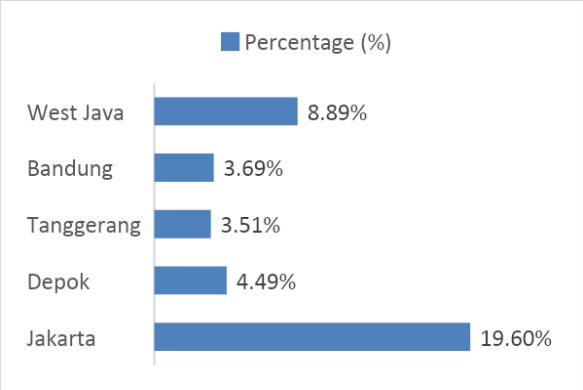

Figure 4: Explanation and education about wearing masks, washing hands

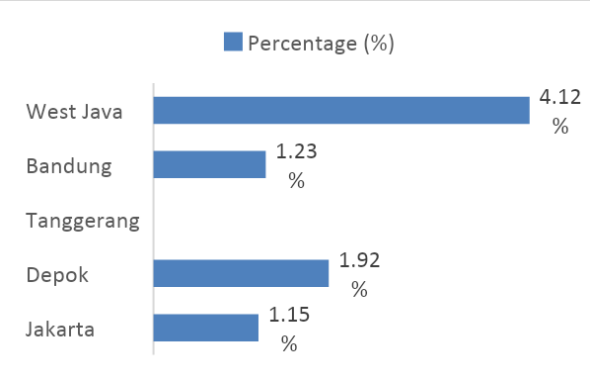

Figure 5: The correct way to use a mask and hand sanitizer

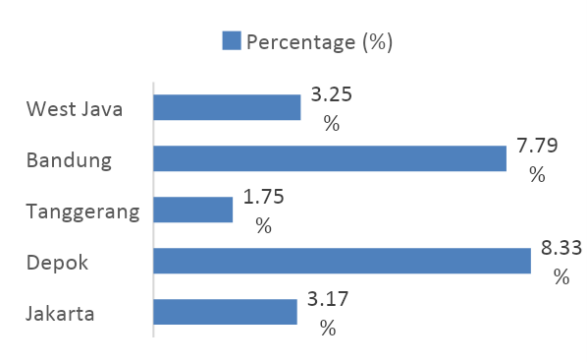

Figure 6: Providing information about public areas that need to be avoided

Figure 5 demonstrates that, with the exception of Depok and West Java, mask and hand sanitizer usage instructions are not emphasised in the majority of localities. This may indicate that the local government deems this information to be of lesser importance or that the community is already aware of it. Tangerang, for instance, provides infographics demonstrating how to use masks appropriately. As an alternative, West Java promotes the use of cloth masks, "*Sampurasun warga Jabaaarr*." Don't neglect to wear a cloth mask every time you go outside." Finally, local administrations provide information on public areas to avoid, as shown in Figure 6. Depok and Bandung have higher populations than other regions, reflecting the unique response dynamics of these areas to the COVID-19 epidemic. From March 23 to April 5, 2020, the DKI Jakarta government has imposed restrictions on the transport sector. For instance, one of their tweets stated, "In an effort to safeguard citizens while suppressing the spread of Covid-19, restrictions will be imposed on Jakarta's transport sector from March 23 to April 5, 2020. #JakartaTangkalCorona #Dirumahaja"

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Case Reports

The number of cases provides insight into the importance and urgency of the information provided to the public. Local governments provided information regarding the number of new cases, recoveries, and fatalities as the highest priority in the risk communication strategy at the onset of the COVID-19 pandemic (Figure 7). It is crucial for the public to be informed about COVID-19 cases. The Jakarta government actively disseminates this information, but its intensity is lower than that of Depok. Due to the fact that Depok's high intensity correlates with a significant increase in cases, it has chosen a communication strategy that emphasises openness and continues to promote public awareness. Meanwhile, Bandung has a lower proportion, implying a different communication strategy. For instance, the Depok Regional Government provided an update via the following tweet: "Friends of Depok Residents, here is the most recent information regarding the development of Covid-19 in Depok City: Sunday, April 26, 2020 #Covid19Depok"

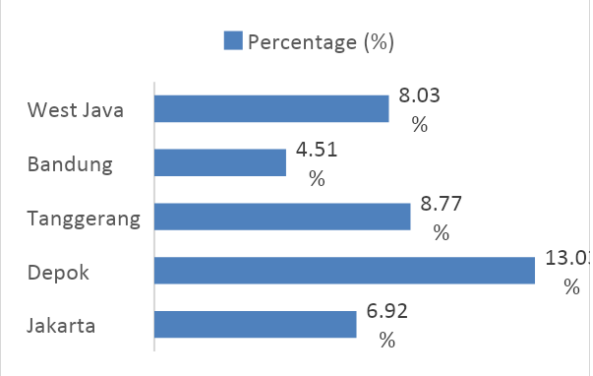

Figure 7: Number of new cases, recoveries, and deaths

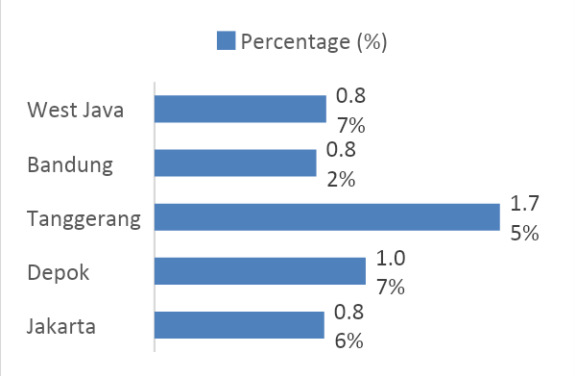

Figure 8: Distribution of cases by district or region

This study discovered that information regarding the distribution of cases by sub district or other region was scarce in each local government (Figure 8). This demonstrates that the local government in this study is still focusing on a general description of cases as opposed to specific information on areas where COVID-19 cases are currently prevalent. This may be a result of efforts to prevent hysteria or stigmatisation of certain regions, which can reduce their economic potential. Tangerang is a region with a higher proportion that may place greater emphasis on regional data when determining closure policies or other area restrictions. Several regions have provided maps of the distribution of cases to provide a more detailed description of the distribution of cases. Jakarta's tweet provides an example: "Map of the distribution of #COVID19-positive cases in DKI Jakarta." #JakartaResponseCorona "

Governmental Policies

As shown in Figure 9, the sharing of information regarding social restrictions and other associated policies is a relatively high priority for all local governments in this study. Bandung is the highest-ranking local government in this regard, indicating that it has a proactive communication strategy to disseminate various government policies. Large-scale social restrictions (PSBB) are one of the methods used to interrupt the transmission chain. For instance, a tweet from the DKI Jakarta Government stated, "Large-scale social restrictions (PSBB) were implemented officially today. Jakarta, which is typically teeming, is currently desolate. Thank you in advance "#dirumahaja! #JakartaResponseCorona."

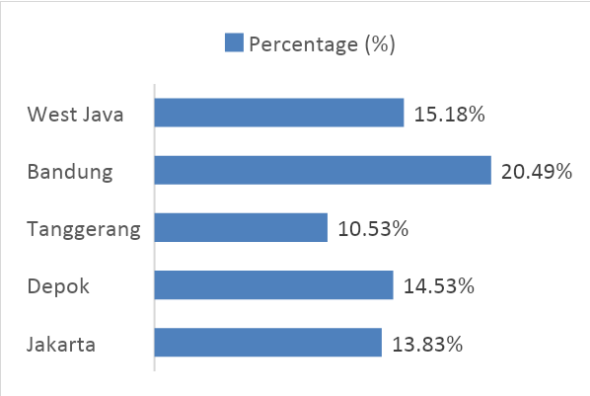

Figure 9: Announcement of social restrictions or other policies

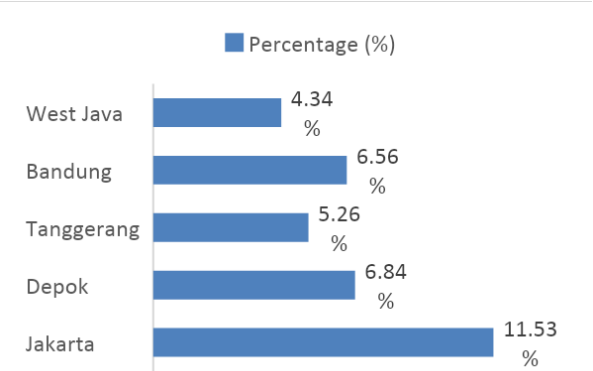

Figure 10: Information about vaccination or treatment centers

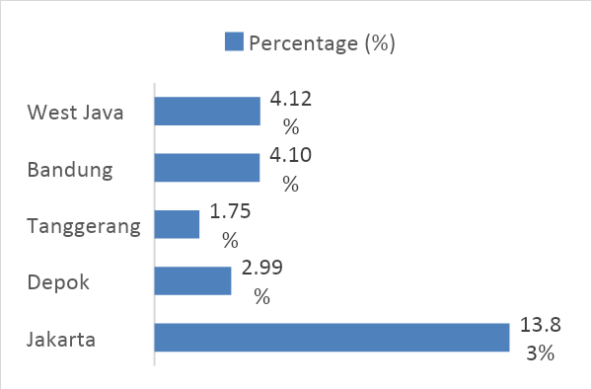

Figure 11: Assistance program for affected communities

Figure 10 demonstrates that Jakarta has the most information on vaccination and treatment centres, followed by Depok and Tangerang. This could be related to government capacity, access to resources, and perceptions of risk in each local government included in this study. The imperative need for information and the availability of adequate resources to respond to crises is being led by Jakarta in its pursuit of data pertaining to aid for affected communities. This study also found that Depok, Tangerang, and West Java delivered aid programmes with less intensity, which could be attributed to their limited resources (Figure 11). The Jakarta government, for instance, is implementing a social assistance programme by educating the public via social media such as Twitter and inviting the public to pose questions about PSBB social assistance. For instance: "So you don't become perplexed! Here are sixteen frequently asked inquiries regarding the PSBB COVID-19 programme for social assistance in the nation's capital. #JakartaTangkatCorona #PSBBJakarta #Hadapibersama #YukPakaiMasker #dirumahaja #bansos"

Community Education

Risk communication through the dissemination of information to educate the public is a crucial instrument for raising public awareness and guiding society through uncertain situations. This study found that one of the primary goals of local governments is to undertake COVID-19 awareness campaigns. Bandung and West Java lead this indicator in terms of campaign intensity, while Tangerang opts for a more conservative approach (Figure 12). As an example, the government of Depok conducts social service as a form of public awareness

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campaign regarding the significance of preventing the transmission of the virus. "Social Service in the context of Preventing the Spread of Covid-19 in the Depok City region." Activities between 14 and 23 April 2020. image: "pic.twitter.com/AmMN8QX26"

Nevertheless, as shown in Figure 13, Tangerang excels in COVID-19 Myths vs. Facts campaigning with a higher percentage than other local governments. This information is essential for overcoming specific challenges posed by circulating misinformation or falsehoods. In light of the perils of disinformation, this strategy is appropriate for ensuring a correct understanding of COVID-19 and its treatment. Example of a tweet: "Five methods for preventing the dissemination of hoaxes during a pandemic: Identify fake news... #JalaHoaks #JakartaTangkatCorona #HadapiBersama image: "pic.twitter.com/WsqT36Y71r"

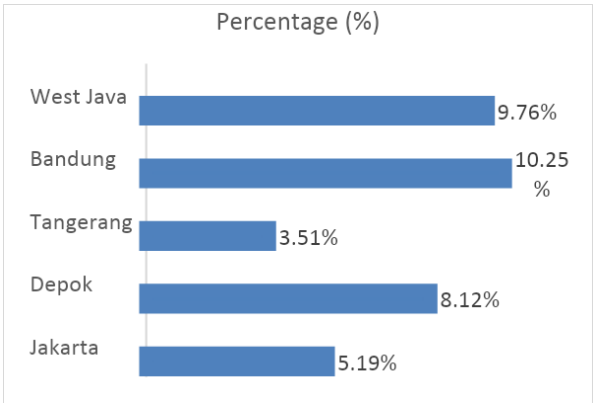

Figure 12: Public awareness campaign about COVID-19

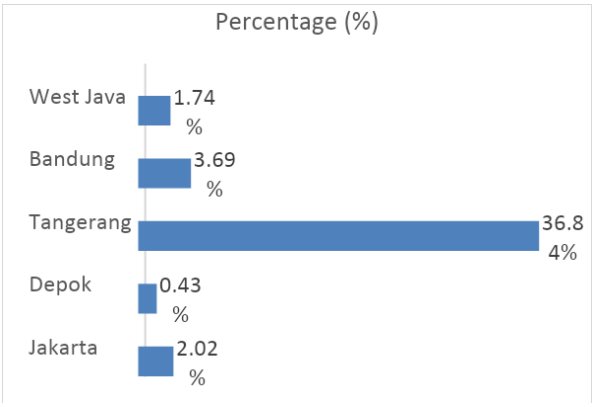

Figure 13: Myths vs Facts about COVID-19

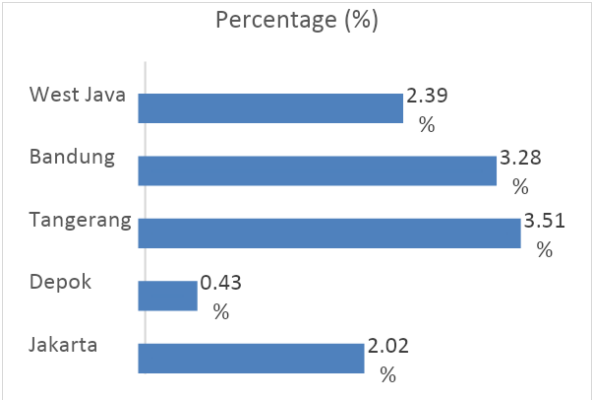

Figure 14: Stories/testimonials from recovered patients or medical personnel

In this study, it was also discovered that community education was conducted differently, namely by inviting patients who had recovered from COVID-19 or medical personnel to share their experiences (Figure 14). Even though the amount is not as large as other information, this testimony deserves to be valued, particularly in order to create public trust and narratives to build collective efforts to combat the virus's danger. In order to increase public awareness, Bandung disseminated medical personnel's experiences with COVID-19. For instance: "Doctor Deborah, the most exhausting Covid-19" @pkmpaskal https://www.faktaindonesianews.com/fakta-peristiwa/23556/dokter-deborah--covid-19-yang-paling-melelahkan-.html

The Engagement

Community participation is an essential component of the risk communication strategy. For this reason, information dissemination should employ more informative strategies. Despite the fact that social media facilitates two-way and even multi-way communication, this feature is underutilised. In Figure 15, our research reveals that quizzes and other interactive activities have not entirely become a local government strategy in Indonesia. Depok, Bandung, and West Java have made endeavours in this regard, albeit in minute quantities. The limited use of this interactive communication strategy demonstrates that space for public education is not being fully utilised.

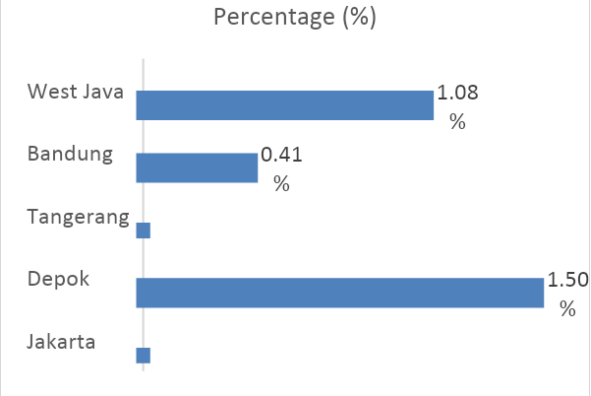

Figure 15: Quiz or other interactive activity aimed at educating the public about COVID-19.

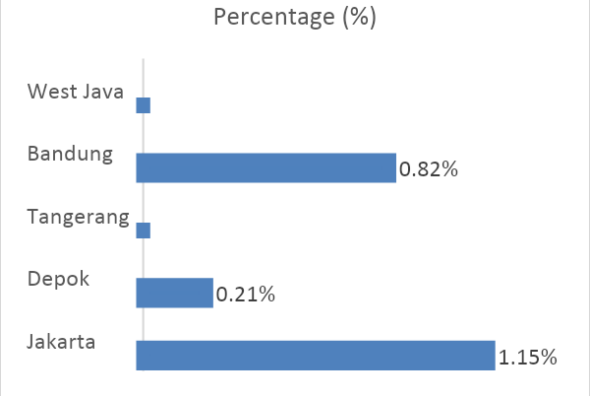

Figure 16: Question and answer sessions with doctors or health officials

In Jakarta, Depok, and Bandung, a similar number of debriefings with physicians or health officials have been conducted, as depicted in Figure 16. This demonstrates the local government's commitment to presenting health officials/doctors for direct dialogue with the community in the COVID pandemic situation. In other words, despite the fact that social media offer tremendous potential for two-way or more communication, this potential is not being optimally utilised by communication strategies that can encourage community engagement. In fact, accommodating the community's need for communication and interaction can contribute to increased trust and awareness. In Depok, the Call Centre for the Task Force for the Acceleration of Handling Covid-19 is collaborating with the Depok City Indonesian Doctors Association (IDI) at 112 line 1 and 119 in the hopes that residents will remain #stayathome.

Support Information

In this study, it was determined that information regarding assistance is disseminated through two channels: information regarding the distribution of food or financial assistance and methods in which the community can encourage a more collaborative management of the COVID-19 pandemic. Both are intended to emphasise the importance of communication in addressing the complex challenges posed by COVID-19. Figure 17 depicts the first indicator, which suggests that Depok, Bandung, and West Java are significantly more active than Jakarta and Tangerang. As indicated in the tweet: "10,000 Food Packages, Special Presidential Assistance for Bandung City Residents #BandungFightCovid19", Bandung has received 10,000 food packages as special assistance from the President.

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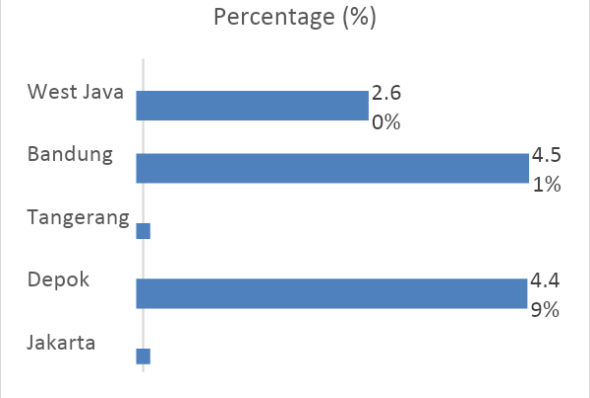

Figure 17: Information on the distribution of food or financial assistance

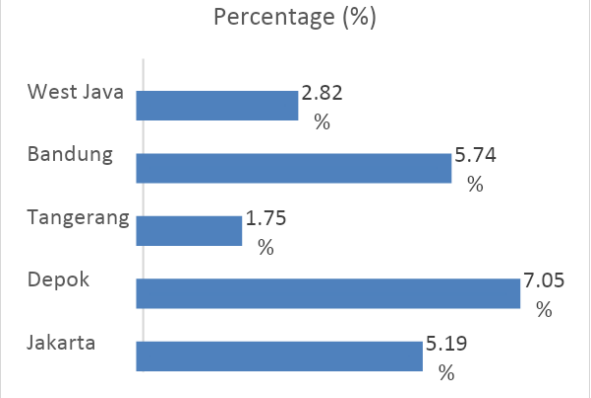

Figure 18: Ways the community can contribute

Our research also revealed that there are initiatives that emphasise community contributions. Figure 18 demonstrates that all local administrations have implemented this practice to varying degrees. Jakarta, Depok, and Bandung are in the lead, indicating that there are efforts to encourage the active participation of the community in providing material, moral, and other forms of support in response to the pandemic. However, the low numbers in Tangerang and West Java indicate that the communication strategy must be enhanced to maximise the potential for community contributions. As seen in the tweet: "Today, Wednesday (21/04), the Tangerang Regency Government received several donations for handling Covid-19 from private companies and BPJS Employment." Handai Tolan #Dirumahsaja image: https://twitter.com/LTTWob6lgG".

Regulatory Enforcement

This study reveals that rule enforcement is one of the primary focuses of local governance in Jakarta. In addition, our study revealed that each local government has its own method for disseminating information regarding sanctions or penalties and patrol or raid activities. Figure 19 shows in greater detail that Bandung, West Java, and Jakarta tried to communicate information regarding sanctions or penalties. In contrast, Tangerang and Bandung chose not to disclose this information. Concerning sanctions or fines, Jakarta encourages its citizens to report crowds through the application or 13 other complaint channels.

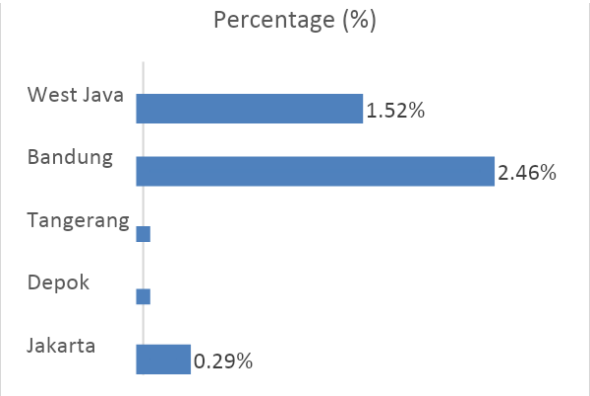

Figure 19: Information about sanctions or fines for violating health protocols.

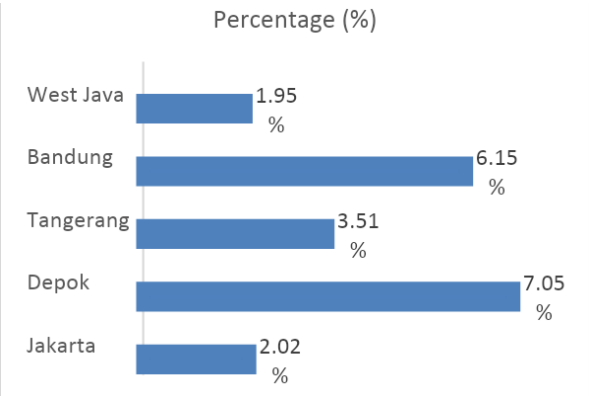

Figure 20: Updates on patrol or raid activities

In this study, local governments were discovered to have shared information regarding patrol or raid activity updates (Figure 20). This information is actively disseminated by Depok to increase public awareness of the significance of implementing health protocols. Other regions, including Bandung, Jakarta, Tangerang, and West Java, are performing the same activity with varying intensities. Tangerang monitored the PSBB implementation at multiple locations, for example: "Tangerang Regent Ahmed Zaki Iskandar... #TangerangLawanCovid19 #PSBB #DiRumahSaja pic.twitter.com/AKhj7oO7n4"

Emotional Assistance

In the COVID-19 situation, it is essential to provide emotional support because this situation involves both physical and mental health issues. Therefore, it is crucial for local governments to communicate positive or motivational messages and information about counselling services and mental support. Figure 21 demonstrates that local administrations are aware of the need to communicate motivating messages to the community. In this study, West Java has paid a disproportionately high amount of attention. This is designed to preserve the ethos and morality of society. In the category of optimistic messages, for instance, the Government of Jakarta encourages the public to send messages of encouragement to those battling this virus. For instance: "Let's encourage those who are struggling; record and send your message to jakartaexperienceboard@gmail.com with the subject line Message - [Name] - [Profession] #HadapiBersama #dirumahaja #JakartaTangkatCorona # PSBBJakarta." From Instagram's jxboard: pic.twitter.com/NPlqE1JfHm."

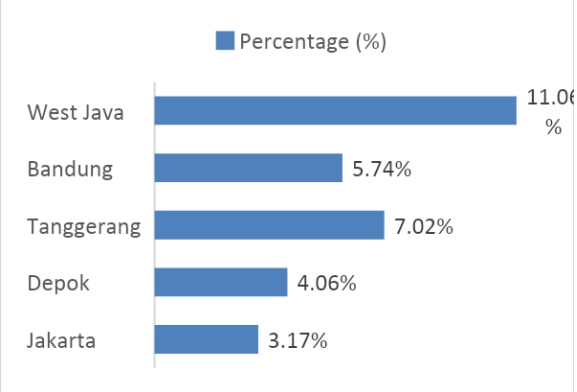

Figure 21: Positive or motivational messages

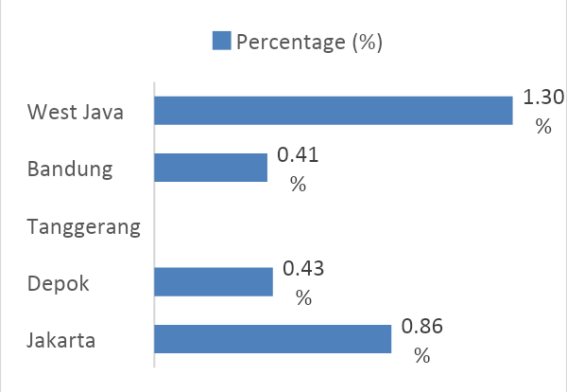

Figure 22: Information about mental counseling or support services

All local administrations except Tangerang have provided information on counselling or mental health support services (Figure 22). However, the information provided by this investigation is still very limited. In the midst of the COVID-19 pandemic, this may be attributable to a dearth of awareness or ownership of resources for providing mental support services. In contrast, the integration of emotional support through positive messages and counselling services plays a crucial role in promoting a more holistic approach to public health maintenance in light of the widespread and profound psychological effects of the pandemic. Through the 'Sahabat Jiwa' application, Jakarta's government has provided counselling services with psychologists. As evidence, a tweet states, "Counselling services with psychologists are accessible via the soul friend application, which can be accessed at

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https://sahabatjiwa-dinkes.jakarta.go.id/. #JakartaTangkatCorona #hadapibersama #PSBBJakarta #dirumahaja."

Collaboration in order to fight the COVID-19 pandemic holistically, a variety of non-governmental organisations and members of civil society must be involved. Given the complexity of the issues at hand and the need to collect resources and expertise from multiple stakeholders, this collaboration is crucial. This study reveals (Figure 23) that Bandung and West Java pay more attention to this aspect and share information regarding cooperation with organisations and communities than other local governments. The Jakarta government announced that 80 collaborators were involved in COVID-19 management in the city. As evidence, a tweet stated: "As of April 16, 2020, there were eighty participants. Thank you to the supporters who have supported and assisted COVID-19 in Jakarta. #PSBBJakarta #YukPakaiMasker #JakartaTangkatCorona #dirumahaja".

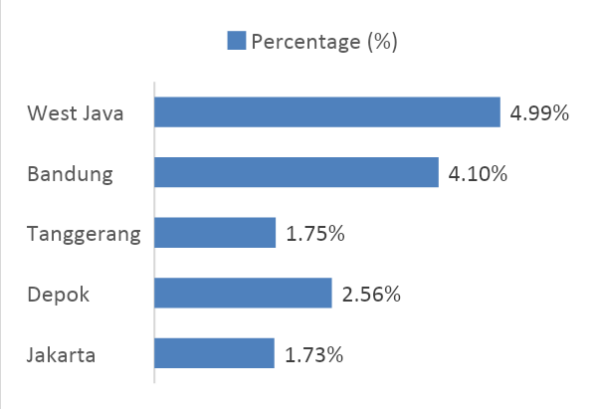

Figure 23: Collaboration with organizations, communities

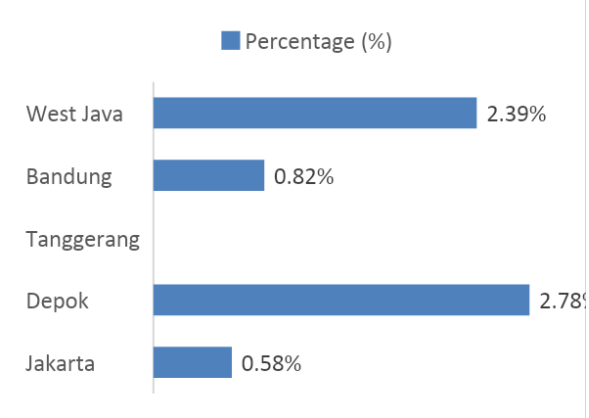

Figure 24: Announcements about collaborative initiatives or programs

Then, our analysis discovered a communication gap between potential collaborations initiated and the public's awareness of these initiatives. This is depicted in Figure 24 as a relatively low number, which may indicate that despite collaborative efforts, the community has not been informed about these initiatives. This study emphasises the importance of focusing not only on the formation of collaborations, but also on the communication of these efforts. Communication regarding collaboration can bolster efforts to reduce the impact of the COVID-19 pandemic and invite more individuals and groups to do so. In an endeavour to prevent COVID-19, one of the health centres produced self-protection equipment for newborns, according to the Jakarta government. As evidence, a tweet states, "Not only do health workers wear personal protective equipment, but newborns also wear PPE in the form of a face shield or face shield to prevent COVID-19." Actually, the Malaka Sari Village Health Centre produces it themselves. #JakartaTangkatCorona #PSBBJakarta pic.twitter.com/OzA1Ue7zKZ".

The Relationship Between Specific Information and Community Engagement

This study calculates the relationship between the average frequency of replies, retweets, and favourites and the average frequency of replies, retweets, and favourites to determine community engagement. All three are utilised to gain a more complete understanding of how society reacts to this information. Analysing replies provides an overview of questions of

concern or community questions; analysing retweets indicates the significance of a particular topic for the community to discuss; and analysing favourites reveals which content resonates most strongly from a moral standpoint.

Table 2 provides an overview of the community's responses to various topics presented by local governments via Twitter. Certain topics, such as medical information, preventative measures, symptoms, treatment for the infected, and health protocol education, receive a substantial amount of community involvement. This demonstrates the urgency and necessity for the community to comprehend and acclimatise to new public health information. Information on pandemic response infrastructure, such as vaccination centres, and information on social restrictions appear to have significant involvement, reflecting the public's wish to be aware of and comply with the implemented policies.

No.	Indicators	R^2		
		reply	retweets	favorites
1	Symptoms and how to identify COVID-19	.45**	.55**	.028
2	Information related to vaccination: schedule, benefits, side effects	.012	.012	.012
3	How to handle and treat those who are infected	.68***	.0012	.031
4	Explanation and education about wearing masks, washing hands	.11	0.21*	.025
5	The correct way to use a mask and hand sanitizer	.29	.17*	.069
6	Information about public areas to avoid	.59**	.0012	.012
7	Number of new cases, recoveries, deaths	.21*	.22*	.042
8	Distribution of cases by district or region	.03	.00073	.67
9	Announcement of social restrictions or other policies	.49**	.016	.038
10	Information about vaccination or treatment centres	.58**	.025	.015
11	Assistance program for affected communities	.74***	.025	.023
12	Public awareness campaign about COVID-19	.75***	.27	.074
13	Myths vs Facts about COVID-19	.058	.0057	.023
14	Stories/testimonials from recovered patients or medical personnel	.84***	.0055	.0082
15	Quiz or other interactive activity aimed at educating the public about COVID-19	.58**	.55**	0.9***
16	Question and answer sessions with doctors or health officials	.066	.032	.16*
17	Information on the distribution of food or financial assistance	.39*	.16*	.54**
18	Ways the community can contribute	.18*	.0057	.012
19	Information about sanctions or fines	.18*	.78***	.31
20	Update patrol activities or raids	.058	.0019	.012
21	Positive or motivational messages	.52**	.019	.0025
22	Information about mental counselling or support services	.16*	.034	.043
23	Collaboration with organisations, communities	.33*	.23*	.0084
24	Announcements about collaborative initiatives or programs	.64***	.25*	.017

Note: *, **, and *** represent significance levels of $p < 0.1$, $p < 0.05$, and $p < 0.01$ respectively.

Emotional and narrative topics, such as anecdotes or testimonials from cured patients, as well as public awareness campaigns, received a high level of financial engagement. This demonstrates that people require not only facts and information, but also narratives and content that can evoke their emotions, as they share comparable personal experiences. In fact, responses to topics such as myths versus facts, how individuals can contribute, and information regarding sanctions or penalties are more diverse. This demonstrates that the community is more sceptical of this information due to its controversial nature or the sensitivity of the issues it seeks to clarify.

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DISCUSSION

This study evaluates how Indonesian local governments communicate risks and responses to COVID-19, assessing efficacy, engagement, and communication strategy gaps. Emphasising key aspects like signal amplification, vaccination information, and the balance between prevention and treatment communication, this research aims to provide insight for more effective risk communication.

This study finds that local governments appear to disseminate information regarding COVID-19 symptoms and identification. In the concept of risk communication, signal amplification or signal amplification is a crucial component, and if it is not implemented, the community may not have a strong perception of risk (Dow & Tuler, 2022; Smith & McCloskey, 1998). This study also found that local governments rarely shared information about vaccinations, which resulted in a rise in public anxiety regarding the significance of vaccinations. This study also found that communication patterns between prevention and treatment are typically imbalanced. This demonstrates that local governments must communicate risks in a balanced manner in order for individuals to make sound decisions (Wiedemann & Dorl, 2020; Zikargae, 2020).

Local governments communicate health protocols differently, reflecting their assessment of community information needs. This difference may stem from perceived vulnerabilities tied to population density and social interaction intensity (Abrams & Greenhawt, 2020; Brewer et al., 2020; Lu, 2020). This study identifies regional governments as a credible source for effective communication. Some local administrations use infographics to visually convey health protocols, a method proven effective in previous studies (Bolívar et al., 2014; Haro-de-Rosario et al., 2018; Santoso et al., 2020).

In risk communication, overcoming ambiguity and unpreparedness is another obstacle (DePaula et al., 2022; Tosyali & Tosyali, 2022). The absence of local governments in several categories of information, such as how to properly use masks and hand sanitizers, demonstrates the existence of an information gap that ultimately hinders the effectiveness of preventative measures. Prior research has demonstrated that adherence to health protocols is influenced not only by risk awareness, but also by social norms and perceptions of these measures' efficacy (Indrayathi et al., 2022; Mat Dawi et al., 2021). Therefore, the messages conveyed must further this objective.

During the initial stages of the COVID-19 pandemic, information on cases, recoveries, and fatalities had dual effects. While it heightened public awareness and promoted adherence to health protocols, it also increased anxiety (Chen et al., 2020; Burch & Jacobs, 2021; Said-Hung et al., 2021). In this study, Depok prioritises transparency for public trust and preventative support, while Bandung communicates COVID-19 cases with less caution. Balancing risk communication to avoid causing distress or excessive uncertainty is a primary challenge (Joslyn et al., 2021). In the context of a pandemic, an overabundance of information and frequent updates may cause anxiety and uncertainty (Bishop, 2018; Medina, 2022). The study reveals limited local data sharing on case distribution by sub-district to prevent stigmatisation, acknowledging potential negative social and economic impacts.

Moreover, our study indicates that the local governments in this study prioritise information exchange about social restriction policies differently. Multiple local governments have demonstrated a solid commitment to communicating this policy, demonstrating a proactive communication strategy that can increase public trust and ensure policy compliance. Information regarding vaccine centres and assistance programmes reflects the

significance of a rapid and comprehensive response to a pandemic emergency. Regarding assistance, the local government reflected in this study that it is essential to provide access to the resources required to surmount risks (Asmorowati et al., 2021; Tuti et al., 2022).

Our study reveals varying information levels in COVID-19 awareness campaigns, emphasising a proactive communication strategy for an intuitive understanding of health hazards. The local government's commitment to presenting facts over falsehoods is crucial for effective crisis prevention and response (Ali, 2022; Cuan-Baltazar et al., 2020). Additionally, some local governments involve cured patients or medical staff in testimonials to enhance empathy and public awareness of risk.

Emphasising community participation in risk communication is vital for promoting comprehension and desired behaviours. In this vein, dissemination of informative information and dialogue with the community are crucial approaches. Despite social media's unique capacity to facilitate two-way or even multi-way communication (Purbokusumo et al., 2021; Sobaci, 2015). Despite social media's potential for interactive communication, this study finds underutilisation by Indonesian local administrations. Optimising activities like assessments and interactive engagements could enhance community engagement and COVID-19 comprehension. Active community participation, as per risk communication theory, improves comprehension and acceptability of risk mitigation actions (Tosyali & Tosyali, 2022; Young et al., 2016). While some local governments host Q&A sessions and establish call centres, fostering dialogue between the public and health authorities is crucial for building trust and dispelling misconceptions (Odejide & Egbokhare, 2023). A more inclusive and interactive communication strategy can significantly enhance public understanding, reduce uncertainty, and foster trust in pandemic management.

One of the most essential aspects of risk communication is how individuals can access assistance and contribute to its mitigation (Asmorowati et al., 2021; Øydgard & Pedersen, 2022). This study uncovered disparities in the dissemination of relevant information. Some local governments appear to be more proactive than others in providing information about the distribution of food and financial assistance. This demonstrates the government's dedication to ensure people's welfare during difficult circumstances. In addition, our research reveals that nearly every regional government has initiatives aimed at inviting the community in order to garner support from diverse sectors of society (Viskupič & Wiltse, 2022). These efforts constitute community participation in the context of risk communication in order to optimise the actions taken and strengthen community support. Cooperation with organisations outside of local government, such as the private sector, uncovered in this study demonstrates the significance of partnerships with multiple stakeholders in crisis management.

Our research revealed that each local government has a unique communication strategy. In this study, some regional governments prioritised patrol and raid operations, whereas others encouraged the public to report gatherings. This may reflect social dynamics and the ability of leaders to communicate pertinent information in a plain and concise manner (Nwakasi et al., 2022; Yen & Liu, 2021). Several local governments in this study decided not to communicate sanctions-related information as part of a more passive risk communication strategy. Previous research has emphasised that in crisis situations, it is necessary to employ a communication strategy that places less emphasis on sanctions, which are deemed more effective and increase public compliance (Chon & Kim, 2022; Guan et al., 2021).

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According to our research, the local government has disseminated positive messages that demonstrate a proactive strategy for reaching out to the community and bolstering the sense of community. This demonstrates a commitment to demonstrating empathy and empowering the public (Castro-Martinez et al., 2021). Nonetheless, this study reveals that emotional support is not a priority for some local administrations. While physical health receives the majority of attention, mental health is being neglected. In fact, a crucial aspect of risk communication is ensuring that the public has access to the necessary resources to manage risks, including counselling and mental support services.

The local government in this study has collaborated with non-governmental organisations and the community, according to our research. This demonstrates the heightened awareness of the need for multi-stakeholder engagement in pandemic response. Nonetheless, the dissemination of information regarding the initiation of collaboration has not been completed. In fact, this communication is essential for encouraging more people and organisations to collaborate (Jeong & Kim, 2021; Leask et al., 2021). Moreover, for collaboration messages to be even more effective, they must be integrated into a larger narrative about the value of collaboration and how society can contribute (Ceresia & Misuraca, 2020).

CONCLUSION

This study evaluates the efficacy of local government communication strategies during the Covid-19 pandemic, emphasising the importance of conveying risks and responses effectively. Based on findings, local governments employ multiple risk communication strategies, such as providing medical information, health protocols, updates on the Covid-19 case in each region, government policies, public education, community engagement, information on assistance, enforcement of rules, emotional support, and collaboration. However, an imbalance in focusing on prevention over treatment has been noted, with differences in communication methods leading to variable community responses. Using infographics and proactive policy communication aims to build public trust and understanding, while interactive community engagement strengthens adherence to health protocols.

At the onset of the Covid-19 pandemic, statistics on cases, cures, and fatalities had various consequences. When disseminating information, the government does not want to cause excessive uncertainty among the public. Several local governments are committed to communicating policies using proactive communication strategies designed to increase public trust. This study demonstrates that there is a proactive communication strategy to facilitate people's intuitive comprehension of health threats. The community's participation can increase understanding and adherence to health protocols through interactive dialogue and initiatives such as exams. As disseminating information regarding community assistance and participation in pandemic management is a crucial element of risk communication, this is an attempt to strengthen community support.

Several local governments in this study decided not to communicate sanctions-related information as part of a more passive risk communication strategy. In this crisis situation, it is crucial that the local government sends out positive messages to the community and bolsters the spirit of the group. The fact that local governments have collaborated with non-governmental organisations and the community demonstrates a heightened awareness of the need to involve multiple stakeholders in addressing the effects of a pandemic.

This paper contributes to the academic comprehension of how local governments use social media approaches for risk communication and crisis response. This paper assists practitioners and stakeholders in developing more effective risk communication strategies for coping with crisis situations such as the Covid-19 pandemic. This study's findings on the use of social media and approach can be used as a guide for compiling accurate, explicit, and acceptable messages to the public.

Acknowledging its limitations, the study suggests avenues for future research, including a broader data collection timeframe and the inclusion of various social media platforms to capture the evolving nature of governmental communication strategies. The rapid changes in pandemic scenarios necessitate agile adjustments to communication strategies, an area ripe for further academic exploration. The current research, focused on Indonesian regional governments' Twitter use, could be expanded to consider other factors influencing risk communication in a pandemic context.

BIODATA

Farisha Sestri Musdalifah, is a lecturer of Communication Science at Sriwijaya University, South Sumatra, Indonesia. She obtained her Master's degree in Communication Science from the University of Indonesia and her Bachelor's degree in Sociology from the University of Indonesia. She currently dedicates her experience and knowledge in the Department of Communication, Faculty of Social and Political Sciences, Sriwijaya University. Her research interests encompass media and cultural studies, journalism, media literacy, gender, and political communication. Email: farishasestrim@fisip.unsri.ac.id

Annada Nasyaya, is a lecturer of Public Administration, Faculty of Social and Political Sciences, Sriwijaya University. She graduated from Magister of Public Administration the Faculty of Social and Political Sriwijaya University in 2013. Since 2019, she has worked as a lecturer and researcher at the Department of Public Administration, Faculty of Social and Political Sciences, Sriwijaya University. Her research focuses on Development Administration, Strategic Management, and gender. Email: annadanasyaya@fisip.unsri.ac.id

Anang Dwi Santoso, is a lecturer of Public Administration, Faculty of Social and Political Sciences, Sriwijaya University. He received Bachelor of Public Administration from Universitas Brawijaya and holds Master of Public Administration from Universitas Gadjah Mada. His research interests are mainly about disaster management, disability studies and e-government. Email: anangdwi@fisip.unsri.ac.id

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