Big Data Analysis of Policies on Disaster Communication: Mapping the issues of communication and public responses in the government social media

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Abstract. Government communication contributed to the success of public policy implementation. Government social media is an instrument that can be utilized to measure public’s sentiment and support towards certain policies. This paper aims to present how the government's policies on disaster are represented on the social media owned by the Badan Nasional Penanggulangan Bencana (BNPB) or Indonesian National Board for Disaster Management. This study analyzed both information and public comment posted in those social media between March and May 2020 to explore the state and citizen relations during the Covid-19 Pandemic in Indonesia. Using NVivo as a tool for text analysis methods, this study examines the theme pattern in government communication and public sentiment towards them. The study identifies content categories government's communication, i.e. information, persuasion, and coercion. Concerning the public sentiment, this study finds high responses to behavioral contents, with negative (resistant) sentiments towards them. This study concludes that the government needs to treat the public as a collaborative partner, therefore the public policies on disaster need to be narrated comprehensively rather than partially intended to control public behavior.

Keywords: government communication, policies on disaster, Covid-19, big data, social media

1. Introduction
Covid-19 pandemic affects all aspects of world human life, including Indonesia. Not only health sector but also financial, industrial, labor, trade, education, transportation sectors, and etc. They suddenly need policies governing diverse needs to solve covid-19-induced problems. This Covid-19 pandemic management requires all stakeholders’ participation, including citizens, government, and varying organizations and individuals in policy making and implementation processes.

Indonesian government, through Presidential Decree Number 12 of 2020, effective since April 13, 2020, communicates to public that Corona-19 virus pandemic is a national disaster. This Presidential Decree states that the management of corona-induced national disaster is conducted by Covid-19 Management Acceleration Task Force. This presidential decree and the Stipulation of Covid-19 managing policy in region should consider the regulation. There have been 5,723 deaths in Indonesia per August 9, 2020, at 12.00 p.m. [1].

Data on government’s response and public’s reaction to dealing with Covid-19 is very large in volume, scattered around, unstructured anywhere, and developing dynamically. This condition reflects some of big data’s characteristics. This study will analyze some scattered data of the communication of Covid-19 management policy and public response in Indonesian National Board for Disaster Management (BNPB)’s official Facebook, with New Nvivo data processing tool help. Thus, this study belongs to data analysis category for public policy during disaster.
2. Method

Data were taken from posts in National Board for Disaster Management’s official Facebook, as non-ministry governmental institution functioning to help Republic of Indonesia’s President to handle disaster as mentioned in Law Number 24 of 2007 about Disaster Management. During Covid-19 pandemic, BNPB serves as Covid-19 management task force (Satgas) handling Covid-19 pandemic through public behavior change approach. Data from BNPB’s Facebook account on https://www.facebook.com/hashtag/BersatuLawanCovid-19 (1.859.181 followers), were collected by using inclusion criteria: hashtag #BersamaMelawanCovid-19, and discussing information related to Covid-19 development, Covid-19 protocol, and government policy in dealing with social-economic effect of Covid-19. The information was post in the period of April 1, 2020 to July 31, 2020, with 55 information postings obtained, and 5 most relevant and latest public responses were taken from each of posting.

Descriptive quantitative approach was used in this research, with content analysis being technique of analyzing data. All postings uploaded by BNPB were copied into New NVivo QSR International software. The reason behind the use of NVivo was that the software has capability to perform Natural Language Processing (NLP) tasks. NLP is a form of artificial intelligence that helps machines “read” text by simulating the human ability to understand language. NLP techniques incorporate a variety of methods to enable a machine to understand what’s being said or written in human communication—not just words individually—in a comprehensive way. This includes linguistics, semantics, statistics and machine learning to extract the meaning and decipher ambiguities in language.

Using Nvivo, the data were made node and categorized by their contents. The categories used were: (i) information delivery (informational function) of Covid-19 effect; (ii) persuading (rhetoric function), appealing or sharing value to influence the collective movement, (iii) enforcing the rule to change behavior (coercive function), delivering the regulation containing Covid-19-related protocol to be performed by the public. From Narrative and Messaging Perspective, the result of analysis will increase the evidence of the tendency of “message” type communicated by BNPB.

Meanwhile, public response is represented in sentiments available in facebook in group: 😊 = like, 😍 = Super/love , 😘 = care , 😊 = laugh, 😱 = wow/surprised, 😞 = sad, 😤 = angry. In addition to emoticons representing emotional public response, this response also sees the posting type reshared most frequently by public to know type of information motivating the public to share. From Crisis Response and Management perspective, the behavior of resharing information communicated by government is defined as expanding supporting network to address disaster issue. Data analysis will explain the types of communication tendency during disaster and majority public’s reaction. The result of analysis is presented in the frequency tabulation matrix of phenomenon occurrence. This finding will be used to confirm the representation of narrative and messaging approach and crisis response and management perspective [2] in policy communication during disaster conducted by BNPB Indonesia.

From public response, the presentation of result was designed to explain the issues getting positive, neutral, and negative responses. The conclusion of content analysis on communication and public response was organized into the conclusion of Mapping the Issues of Disaster Communication in Indonesia from Covid-19 case.

3. Basic Theory

How is the state-society relation integrated into new media era policy communication in Covid-19 pandemic disaster condition? This article will address the question from policy perspective. This article will view the meaning of governmental communication and society’s response to government’s social media from two perspectives: (i) narratives and messaging, and (ii) crisis response and management.

Narrative and Messaging perspective focuses on “content message” and communicator or messenger aiming to influence government’s or public’s decision making. Message communicated by government can influence society’s perception and response to reduce the risk during Covid-19 crisis. Therefore, the substance of content communicated should contain risk and how to reduce the risk.
Government generally acts based on three points concerning narrative and message during crisis. The three points are: (i) providing adequate information timely to the public, (ii) providing accurate and non-contradictive information to the public; (iii) entrapped in responding to controversial information related to disaster information [2].

Meanwhile, Crisis Response and Management perspective reflects and explains society’s action in responding to the situation. This response to situation is affected by the value believed in, urgency reason, and uncertainty related to situation and action. Management approach and crisis response stated that crisis condition brings out leadership challenge related to decision making, valid public information distribution, accountability, collaboration, and coordination involving many individuals and mass organizations. Crisis management and response requires the coherence of (1) adaptive public policy, (2) mutually supporting individual, group, and network interaction, and (3) contextual political, social, and local, national, and global economic conditions [3,4].

In summary, as recommended by Weible et al [2], public policy communication should connect public response to policy information during pandemic to grow understanding on public policy making and collective policy action. Policy communication is studied from social media message in official facebook account of Indonesian National Board for Disaster Management, thereafter called BNPB, with keywords: #BersamaMelawanCovid19 (fighting against Covid-19 together).

A. Public Policy Communication Perspective in New Media Era

Public policy is the one developed by governmental boards and officials to do their duty. An important component of public policy is policy communication focusing on message and messenger aiming to influence government or public decision making [4].

Previous studies on policy communication found policy communication via both new and conventional media playing strategic role in changing society’s attitude. The communication processes intended are: (i) providing the public information on policy; (ii) persuading public through policy narratives campaign; (iii) portraying public response indicating society’s attitude and behavior change [5,6,7].

Policy communication in new media era is easier. New media is a communicating media referring to the content accessible anytime and anywhere on digital ware enabling the interaction between information sender and receiver, and creative participation of many parties [8]. About 64% of 272.1 populations are internet users in Indonesia per January 2020 with social media penetration of 59%. The five top social media platforms used are YouTube, WhatsApp, Facebook, Instagram [9]. Moreover, Republic of Indonesia’s Presidential Regulation Number 95 of 2018 about Electronic-Based Government (SPBE) underlies each governmental institution to utilize new media to communicate institutional policy based on information technology, including new media.

In addition to the policy communication easiness in new media era, some challenges of public response risk are also found attenuating the message of public policy. Public response through social media is not always positive or ideal to follow-up, but should be defined as network development in message making and delivery. It is important because policy communication is a means of delivering message to influence public perception and trust. The lower public trust in government leads to the lower citizen support and in turn harms the successful policy implementation [10].

Policy communication plays three basic functions to grow public support and obedience: (i) information dissemination (informational function); (ii) persuading (rhetoric function); and (iii) restricting/governing (coercive function) [11].

Those overlapping three functions aim to build public support to the successful policy implementation. Rhetoric function in policy communication includes: (i) constitutive (building public understanding and response to policy message); (ii) materiality (reconfiguring novelty condition of policy issue); (iii) publicity (raising public justification); (iv) media (connecting policy actions separated by space and time), and (v) culture (binding policy development to norm and practice) [12,13,14, 15, 16].
One of important aspects in communication is reduced uncertainty. In the context of disaster situation, policy communication is expected to make public and government understand the risk and know something in facing uncertainty and crisis, either individually or collectively. In disaster management, accurate information is needed by public or private sectors caring about disaster management. Therefore, policy communication in Covid-19 pandemic era is very important to get public support in collaboration with government to mitigate the risk of disaster effect and to meet the public needs during disaster.

Public communication during crisis and disaster is required to explain emergency issue simply and understandably to everyone. Inappropriate policy communication during crisis potentially decreases public trust and government credibility. Decreased public trust in government credibility during crisis increases the effect of disaster risk within society, due to incompliance with disaster protocol specified by government. Additionally, the communication of crisis running not smoothly encourages people to search for information from other sources vulnerable to disinformation. Communication network should function to maintain public trust in information communicated by government [17,18]. Information content communicated by media contradicting government information will result in public confusion generating contradictive reaction to government policy. In other words, more effective government communication is required. Effective communication during crisis is defined as all messages presented and distributed to public transparently, credibly, and understandably. Main target of policy communication during crisis or disaster is to build proactive and secure public behavior in crisis condition [19].

B. Public response to policy communication

In new media era, social media becomes a reference or information source to the public. Similarly, during Covid-19 pandemic, social media helps accelerate information dissemination from government or from scholars’ seminar result. In addition to positive effect, social media can also have negative effect such as info-demic on Covid-19, disseminating information, rumor, misinformation, and disinformation. Information received by public can affect public decision and attitude [11,20,21]. Stimulus-response theory explains that individual’s perception on information stimulus will result in certain reaction or response. The more the stimulus, the more is the reaction. Any stimuli can be connected to anything. Considering this theory, misinformation about Covid-19 as stimulus can result in like-dislike and pro-con responses. On the other hand, stimulus-response theory also explains response leans to stimulus believed in, corresponding to norm, value, and belief. Previous studies found that social media disseminated info-demic leading to public confusion during Covid-19 pandemic [22,23,24].

Pedrosa, Sánchez-Núñez, Peláe [25] found that even the same news or information communicated through media can generate varying emotions. Public response to policy information communicated by government can be either favorable or unfavorable, so-called positive and negative sentiments. Public sentiment reflects readers’ emotional response to message communicated. Sentiment is generally divided into 4 groups: fear, sorrow, repugnance, and anger. In public communication context in Covid-19 era, previous studies found public response is affected by information consumed and its group affiliation background. It is because people prefer hearing information from the group compatible to their norm, value, and belief. Public fear of crisis period is a factor making it entrapped with misinformation on Covid-19.

From government side, public response signals the extent of public trust in government. Government should improve information content presentation model, as an attempt of improving public trust. Alon Barkat’s [25] study found the types of government communications to which public responds either positively or negatively. The substance of information acceptable to public’s critical thinking tends to get positive response. In addition, the use of symbols such as figure and image generating expectation also tends to get positive response. Figure support echoing the message similar to that communicated by government is identified to confirm public’s positive response to government’s policy communication.
A previous study on Covid-19 crisis in Spain found that communication style generating citizen’s trust will be more effective if politician and health expert voice same, transparent, empathic, and positive information. Otherwise, communication style generates public distrust when (i) health alertness information ignores economic aspect, (ii) information content is incoherent or contradictory; (iii) information generates doubt viewed from scientific reasoning aspect; (iv) policy decision making is arbitrary and incoherent, and (v) there is political conflict [24].

This article will identify the type of communication conducted by National Board for Disaster Management (BNPB) in its Facebook account with keywords #BersamaMelawanCovid19 and type of public response to the posting.

4. Findings and Discussion
Discussion focuses on answering the question “how is the state-society relation integrated into policy communication in new media era in Covid-19 pandemic disaster condition?” from two perspectives: (i) Narratives and Messaging, and (ii) Crisis Response and Management.

From narratives and messaging perspective, hashtag #BersamaMelawanCovid19 can be read as government’s wish to get public support to unite dealing with various effects of Covid-19. Since the first posting hashtag #BersamaMelawanCovid19, from May 23 2020 to August 1 2020, 55 postings were found. Considering narratives and messaging perspective, the author classified message types into following categories: (i) informative, delivering data or explanation; (ii) persuasive (inviting or persuading to act or to change attitude or action), and (iii) coercive, governing/restricting. The study found that majority governmental communication is informative (65.91%), persuasive (25%) and coercive (9.09%) in nature. Informative category contains: (i) Data of Covid-19 Control Development; (ii) Covid Source and Risk; (iii) social policy of covid effect; (iv) information on economic policy of covid effect. Persuasive category contains: (i) persuasion of Covid-19 Protocol Complying Behavior Change, (ii) persuasion of social-economic revival post-pandemic. Meanwhile, coercive aspect contains sanction against Covid-19 protocol violation.

Issue contents communicated by government are as follows: (i) Information on Covid-19 Control Development Data, (ii) Information on Covid-19 Transmission Source and Risk, (iii) Social Policy of Covid-19 effect; (iv) information on economic policy of covid effect. Persuasive category contains: (i) persuasion of Covid-19 Protocol Complying Behavior Change, (ii) persuasion of social-economic recovery post-pandemic; (vii) sanction against Covid-19 protocol violation.

Keywords stated most frequently in BNPB information posting are presented in Figure 1.

The most prominent issues are (i) government’s message to cope with Covid-19 effect in unity (in Indonesian bersatulawancovid19; Penanganan, masyarakat, pemerintah, melakukan, pandemi, berita), (ii) health issue (kesehatan); (iii) children issue (anak); (iv) performing protocol (melakukan protokol). Hashtags read are, among others) (i) safe and productive (#amanproduktif), (ii) social distancing (#jagajarak), (iii) wearing mask (#pakaimasker). These three hashtags represent the
government’s attempt of persuading the COVID-19 protocol implementation while echoing public productivity, from social and economic aspect. It can be seen from the words hotel (hotel), tourism (pariwisata), and travelling. The content of disaster management policy coordination and synergy can be read from the words local government (daerah), and name of province (Jakarta, DKI), County (Kabupaten). The content of policy communication objective to change public behavior can be read from the words change (perubahan), Adaptation (adaptasi), behaviour (kebiasaan). From word count, the names of spokespersons arise: ‘reisa’ and “doni”. From Narrative and Messaging perspective, the role of communicator is important to confirm content message. Doni Monardo is Indonesian Army lieutenant general currently serving as Head of Indonesian National Board for Disaster Management (BNPB). Meanwhile, dr. Reisa Broto Asmoro is a public figure, model, and former Miss International. The figures of both communicators imply government’s expectation to boost public trust. In the case of #BersatuLawanCovid19 posting, public response is represented in figure 2. Public comment reaction belongs to informative (60.40%), persuasive (29.98%), and coercive (9.7%) communications. By its proportion, the comment on persuasive aspect has largest proportion.

Meanwhile, the proportion of share for BNPB’s posting is 69% for informative, 24.9% persuasive, and 5.5% coercive categories. This data indicates that BNPB still focuses on expansion and confirming information related to case development, risk control, and social-economic recovery preparation during pandemic, up to the end of July 2020. Majority communications are received with good sentiments, as characterized with “Like” and “love/super” proportion. From posting #BersatulawanCovid19, emoticons arising are “like- ” (95.5%), “super/love- ” (2.09%), “sad- ” (0.86%), “laugh- ” (0.77%), “care- ” (0.46%), “wow- ” (0.20%),”angry- ” (0.09%).

![Fig.2. Substance of Policy Communication and Public Response](image)

Public response content is presented in figure 3. Public response refers to unity and dichotomy of actors, government (pemerintah) and public (masyarakat, kami, saya, kita, rakyat). The topic discussed is related to health issue (covid, corona, kesehatan, penyakit, keluarga, anak). Feeling communicated by publics includes: (i) anxiety (takut, alah, Tuhan, geram); (ii) hope (semoga, segera, berakhir, semangat); (iii) support (mari, pakai, masker, rumah, bantu); (iv) resistance (tidak, biasa, jangan).
The discourse revealed from the con-comment is that information delivered by government related to Covid-19 is: (i) lie or manipulation; (ii) only frightening the people; (iii) there is vaccine, drug, and hospital service business interest, (iv) spokesperson and task force are the ones benefiting from the salary generated by the role played. It can be seen from the comment: “Corona will be stated as ending when the state’s money is used up”. The discourse of anger is also manifested into pornographic utterance.

This study also found comments from putatively buzzer accounts, characterized with identical comment using different accounts, and repetition in some postings. It can be found in both pro- and con-government responses. The example of putatively buzzer comment from pro-government group is: Government has taken maximal endeavor to break the virus chain and even been infuriated with this pandemic… It is up to us as the community, let’s help our government. Done blame at each other! We can start with ourselves, wash hand with soap and don’t forget to wear mask when we get out of home. Pray much! Hopefully this pandemic will end immediately… particularly thank to paramedics, your sacrifice is very great, as you are in the frontline, keep spirit, stay positive, stay healthy, and social distancing. May Allah always protect you, amen” repeated in 15 different accounts.

Meanwhile, from the con-government group, there are similar comment repetitions in different accounts. For example: Thinking/orphan (president) insight”,…. may God give painful death to those tormenting millions people through covid-19 pandemic event]”. Negative comment is also stated in pornographic sentence or image/sexuality diction. Another reaction is to parody BNPB’s spokesperson (doctor Reisa and lieutenant general Doni Monardo) in caricature. The example of comment indicating readers’ saturation is: “my family, I, and my ancestor in invisible world are very thankful for this unimportant information”.

Public comment during disaster revives racial (Chinese), and religious (Islam and non-Islam) sentiments. Even, this group distrusting the government makes narration as if government oppresses people and benefits from the Covid-19 disaster management policy. They narrates that the government deserves God’s punishment. The con-group also generates discourse of dispute between pro-government political support group and its political opponent in Presidential Election period (Cebong vs Kampret). This study cannot analyze the government’s response to the contradictory public response, due to one-way communication in BNPB’s facebook.

5. Conclusions
This study concludes as follows. Firstly, state-society relation in Covid-19 disaster policy communication in Indonesia reflected on semi-opened posting #BersatuLawanCovid19. It means government only posts information/persuasion/coercive policy, but does not give response to public comment on the posting.

Secondly, in the communication of Covid-19 disaster policy, government and society stake public trust elements. It means that government designs communication pattern and content to win the public trust in order to accept and comply with government’s appeal. On the other hand, the con-government group of society narrates their distrust. The narrative dispute between the two groups potentially confirms or attenuates public trust in government in general. In such situation, government’s
communication is required to give more robust evident foundation and policy consistency, thereby winning the public trust. Thirdly, public communication policy during disaster vulnerably results in horizontal and vertical conflicts, because of panic and condition pressure. Narrative constructed by con-government group through comment written on BNBP’s facebook posting is connected to issues of religion, poverty, data manipulation, and elite capture over state budget.

From those three conclusions, the mapping of communication and public response issues in social media during Covid-19 disaster in Indonesia needing follow up include: (i) communication content issue, giving smaller persuasive and coercive potion, thereby impacting on the delayed change of public behavior in taking action according to government’s policy; (2) communication technique and information content need variation, to prevent the people from saturation, (3) data validity and policy communication synchronization are urgent to win the public trust. The weakness of study is related to its data source containing one issue only #BersatuLawanCovid19 for 3 month-duration. Further study should increase data coverage and government institution entity coverage as the material of study.

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