Understanding international agenda using media analytics: The case of disaster news coverage in Indonesia

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Abstract: Global Data on Event Location and Tone (GDELT) database on global events allowed the platform to be a source for big data analysis that potentially signifies our understanding on the extent of event reports. On 28 September 2018, an earthquake with a magnitude of M7.4 shook Palu and Donggala. Various countries broadcast the disaster, including economic partner countries such as the U.S., Australia, and Japan. This paper questions determinant of the inter-news coverage on the earthquake and tsunami in Palu and Donggala between foreign and domestic media. The paper found that the dynamic of news broadcasts on disaster varied between countries and that the coverage fluctuated in all countries. The paper presents newsworthiness of disaster events depends on contextual, political and spatial proximity between countries. This paper’s findings point to the remaining challenge to understand disaster impacts on the community, despite new data and methodology are employed.

Subjects: Internet Languages; Multimedia; International Relations; Government; Newswriting and Reporting; BroadcastNews; Internet; Publishing

Keywords: Media analytics; GDELT; disaster news; earthquake; Indonesia

1. Introduction

The importance of international news has increased with globalization and intensive communication among people worldwide. The need to understand current events in other parts of the world has rapidly grown as global businesses and international affairs intensify. In the realm of international communication and journalism, news transmitted from other countries tends to influence the audience’s perceptions and attitudes toward these countries (Wu, 1998). This would become more pronounced if foreign news, along with its agenda-setting programs, is the only source of...
information, which thus shapes the public’s opinions on a particular country. In the case of news on natural disasters, the time taken for coverage is shorter than other issues as the coverage tends to be rapidly updated and focus on the current impacts of the disasters on humans, built environments, and the economy (Houston et al., 2012). The media also plays a role in informing and determining recovery of priority, shaping the public’s perceptions on natural risks, and influencing individual strategies over mitigation of future vulnerabilities (Miles & Morse, 2007).

However, presently, there is a lack of studies on newsworthiness by examining inter-news coverage on disaster between international and domestic media. It is important to understand each country’s interests and reasons so the country can examine current international relationships and agendas. As such, this study aims to understand newsworthiness by looking at inter-news coverage on disaster between international and domestic media, this paper uses the inter-news coverage on the earthquake and tsunami in Palu and Donggala.

The Palu earthquake occurred on Sunday, 28 September 2018, at 6.02 PM GMT+8 with a magnitude of M7.4. The epicenter of the earthquake was at a depth of 10 km, 27 km northeast of Donggala. The earthquake shocks were felt in Donggala Regency, Palu City, Parigi Moutong Regency, Sigli Regency, Poso Regency, Tolitoli Regency, Mamuju Regency, and even Samarinda City, Balikpapan City, and Makassar City. The earthquake triggered a tsunami up to 5 meters high in Palu City and resulted in a large scale of casualties. There were victims who suffered minor injuries, and there were those who lost their lives. This earthquake also caused damages to infrastructures like buildings, from minor damages to collapses. The report by the Ministry of Public Works and Housing shows that more than 2,200 people lost their lives, more than 4,400 were injured, and 680 went missing [4]. The report also suggests a large scale of infrastructure destruction, with 68,000 houses, 2,736 schools, more than 22 health facilities, and religious spaces being destroyed.

This research aimed to contribute to the disaster newsworthiness and its impact on the community by looking at inter-news coverage on disaster between international and domestic media using innovative big data and methodology. As the GDELT database contains millions of worldwide news data, this study filters earthquake and tsunami in Palu and Donggala news data from countries with the highest amounts of aid funding and news data from Indonesia on the news on each of the foreign countries’ aid programs. We also employ geocodes were available for locations where news was published and locations where news was reported, which allowed for the visualization of the news flow.

The remainder of the paper is structured as follows. In sections two and three, the materials and methods used as well as an analysis of the dynamics and spatial flow of news coverage are discussed, respectively. The last section concludes the research with a presentation of the potential of big data use for obtaining new information on and insights into news media coverage between countries.

2. Literature framework

2.1. News Agenda, Framing and Contextual Factors
We borrow the news agenda and framing theory that emphasis mass media place on certain issues and topics that correlates strongly with the importance that is attributed to these issues and topics by the public and identifies the worthy of government’s and the public’s attention (Entman, 2007; Scheufele & Tewksbury, 2007; Tewksbury & Sheufe, 2009). In this sense, framing theory examines public’s response during, after and their understanding of a particular event. Furthermore, several factors that may determine news framing include social norms and values, organizational pressures and constraints, pressures of interest groups, journalistic routines, and ideological or political orientations (Shoemaker & Reese, 1996). Disaster news and its impact has widely been studied in recent literature. Using the news frame theory, disaster news tend to change according to different aspects of an event, also known as “frame changing” (Houston
These frames tend to change as different orientations toward public issues and events depending on how the issues are receive publicly. The model further suggests that events were received greatly at first and over time the attention eventually fades. As such, understanding how frames change over time is important to examine different aspects of disaster that attract attention and how it effects the public such as disaster management, mitigation, preparedness response, and recovery. Thus, news frames change and psychological impact of a disaster may differ depends on the time period since the occurrence. The Consumption of disaster newspaper and radio coverage may also lead to posttraumatic stress disorder (PTSD) caseness and posttraumatic stress (PTS; Pfefferbaum et al., 2014). However, as there remains to be limited studies on this impact and the growing number of media types following technology advancement, there is need of additional research to investigate multiple media formats especially newer formats such as online news and social media. In this sense, media has crucial role in disaster events to communicate, describing what occurred and updating the public on the post-event. Nevertheless, the paper argues that media’s role to provide insights on community preparedness, recovery, and resilience remains to be disappointing. Another contextual factor is the geographical aspect that seems to be the most attractive for news coverage (Shoemaker & Reese, 1996). The study by (Singer et al., 1991) shows that hazard type has no significant effect, but geographic location and the interaction between hazard and location are important for news readers. For instance, In the USA, distance and specific case of disaster may increase the news media coverage (Van Belle, 2000). While in the western media, disasters news is more likely to reported if it occurred in the First world, compared to occurrence in the third world (Gaddy & Tanjong, 1986). Thus, news coverage on disaster events and or international news flows more generally is determined by case selection methods and how the selection methods. While (Houston et al., 2012) further suggests that disaster news is temporally and geographically bound to local communities’ preparedness or resilience of the current disaster area, thus questions any benefit or implications for national scale. Finally, studies on disaster news also points on the link with social and political response to disasters (Van Belle, 2000). News media coverage plays a crucial role to shape policies, preparedness and prevention towards future disasters, disasters, the shaping of disaster policy, and even the efforts to prepare for and prevent future disasters. Specifically, news media also determine political communication between countries and governments. For instance, foreign governments and private agencies rely on news media on disaster site conditions that are far away from their country. As such, news coverage determine agenda setting for foreign countries and their respective public opinions demands for response and reconstruction programs (Gaddy & Tanjong, 1986).

3. Newsworthiness of natural disasters analysis

We framed the research using the theory of newsworthiness and the news media on natural disasters analysis. The theory of newsworthiness developed by (Galtung & Ruge, 1965) suggests that news is worth reporting based on the psychology of individual perceptions such as one that the significance of one factor could be offset by another factor. In further detail, (Kwak & An, 2014) argues that counted as these factors are frequency, intensity, unambiguity, meaningfulness, consonance, unexpectedness, and the continuity of an event. These factors determine media companies’ decisions to report particular news items through their channels, such as newspapers and TV news programs. However, in a more complex analysis, (Wu, 1998) argues that newsworthiness alone is not adequate to understand the determinants of international news flow. There are two important factors in how international news is channeled. The first factor is the gatekeepers’ perspectives, that include newsworthiness, socio-cultural structure, organizational constraints, and the agenda-setting that international news services have. The attention and interest of international news regarding a foreign country may be steered by the news media agenda and the deviance of the event. Second, according to the logistical factors, the clout of a country determines news media interests in coverage, including trade relationship, cultural background, and geographical proximity and regionalism. Presently, the emergence of technology 4.0 has allowed information technologies to be distributed and accessed worldwide. Following technology advancements, news coverage and its analytical methods have extended in the past.
decade. The abundance of data availability and new analytical methods allows one to analyze data in a much efficient and new way. This may be represented by datafication, referring to the use of digital technologies to release the knowledge associated with physical objects by decoupling them from the data associated with them.1 Explaining further, (Mayer—Schonberger & Cukier, 2017) argues that datafication shows that the indirect uses of texts and location data have nothing to do with the data themselves, for the purpose of which information was initially generated. New uses emerge, and new value could be created. When news texts become online copies, these news texts are then known as being “digitized.” Meanwhile, when texts are indexed and searchable, then these texts are said to go through datafication. To gain some clarity of this distinction, take the following as instances in the transportation sector. While defining the shortest route and tracking are examples of digitization, the revenues from loyalty programs, restaurant recommendations, and advertisements are examples of datafication. This shift is also found in the journalism sector, as in the information on broadcast, print, and web news that is available offline and online and is accessible to gather and analyze.

3.1. Newsworthiness of natural disasters analysis
One of the sources of big data is the GDELT database, a platform that hosts millions of news stories worldwide since the 1980s. From a comparison of GDELT against other similar sources it is known that GDELT is a powerful database. For instance, the paper by (Kwak & An, 2016) analyzed that the news items obtained from GDELT and Event Registry (ER) were similar although the two datasets were quite different in terms of scale and news sources. GDELT collected 2.26 times to 6.43 times more documents than ER per day. The GDELT database also publishes documents in more varied languages per day on average, 64.1 vs 14 languages, respectively. There are many studies in various disciplines that used GDELT data, including those on public responses to government policy (Bodas-Sagi & Labeaga, 2016), tone changes over time in election (Burkard et al., 2017), and disaster analysis, as one on Hurricane spatial movement in the U.S (Owuor et al., 2020). The study by (Aitenang et al., 2018) shows that news on a particular country in another country is important to shape perspectives and appropriate policies toward the former country’s foreign perspectives. Furthermore, the study by (Kwak & An, 2014) suggests that the unexpectedness of an event that continues for days reinforces the newsworthiness of the event over time. The study by (Tewksbury & Sheufele, 2009) shows that the database is dominated by news in English (more than 2 million articles), followed by news in the Spanish (646,000) and Arabic (320,000) language. The paper further shows that the Daily Mail (United Kingdom/UK) and Reuters (United States of America/USA) are the largest sources of articles. News flow and coverage on natural disasters are expected not only to communicate the events and their physical and socio-economic impacts, but also to warn and contribute to individual and community preparedness, recovery, and resilience (Houston et al., 2012). It is further suggested by the paper that, on average, news coverage on disasters takes shorter time than other issues as it tends to focus on the current impacts of the disasters on humans, built environments, and the economy as important topics. On the other hand, the study highlights that there is little coverage of what caused the disasters, or what influence responses to the disasters and what the disasters mean to the people and communities experiencing them. Thus, this may weaken the disaster narrative, which will hinder people from learning from the news coverage any preparedness for themselves and from understanding the national or societal implications for those who experience the disasters. There are several issues arose in the media and disaster reports. The first issue is the demand for high speed and accurate information update. The study by (Binderkrantz, 2020) shows that traditional news channels such as newspapers are regarded to be slow in keeping the public updated on disaster news because as soon as it is disseminated, the information will have become outdated. Furthermore, as media is strongly tied with interest groups, their framed messages would consequently highlight some features of reality and downplay some others. In this sense, news frame could be seen as a weapon to generate support for a specific action or policy. Second, the news coverage of natural disasters could define and limit discourses related to these events. As natural disasters cause destructions and inhibit daily services, media coverage allows news of the need for recovery of capital and social and built environments. For instance, a previous study argues on how media coverage priorities of the
recovery of various forms of capital—natural, human, social, and built—shape the public’s perceptions on natural risks and how these influence individual strategies over mitigation of future vulnerabilities (Miles & Morse, 2007). In a disaster study, (Arva et al., 2013) suggests that one has to carefully analyze the GDELT database. The study by (Kwak & An, 2014) highlights that as U.S. news media are the most tracked and available from the GDELT database, the number of news items on a certain disaster might be influenced by them. One way to avoid bias is to use other global news media that report on the disaster. Another study predicted the value of news within the next few hours. The study by (Nouriabaksh et al., 2017) argues that journalism computation using GDELT data has improved how journalism operates. The study used NLP and machine learning techniques that allowed the model to learn and predict disaster news that would have high values, obtained from a feed of local authorities and news media. For instance, it compared the disaster feed against Reuter News and found that out of 18 disasters over the analysis period, there were 8 events the disaster feed was ahead of the news office in reporting.

4. Data and methods
Data were obtained from the GDELT database that is available online. The database, also known as Conflict and Mediation Event Observations (CAMEO) database, is updated every 15 minutes and provides a rich source for news on events, conflicts, and social events worldwide gathered from a wide range of international sources. Presently, the database tracks news media in over 1,000 languages globally. The large-scale database covers news in over 100 languages mostly on physical events such as protests, strikes, disasters, and others, with more than 200,000 event data on Indonesia in the last 20 years (Aritenang et al., 2018).

This research limited the period of analysis to three weeks since the occurrence of the earthquake on 28 September 2018, until 30 October 2018. This period was chosen following the results of a preliminary analysis showing that the amount of news on the disaster dropped significantly after four weeks. Furthermore, we selected news media from Australia, the U.S., Japan, and Europe as these countries provided the highest amounts of aid funding for the disaster recovery project for data availability from the GDELT database. We also included the European Union as a news actor as it could be considered as a single political identity that might provide aids and donations in events of disasters. It should be noted, however, that the limited amount of news in this research was due to the small coverage of Indonesian news media and the relatively unknown state of Palu and Donggala globally.

In this section we discuss the methods used to conduct analysis. First, we examined the dynamic of news occurrences in each country and region during the period. It should be noted that this research only considered English-language news published in the selected countries. As a result, the quantity of news was not as high as that in the Indonesian native language.

Second, we also identified news in Indonesia that mentioned the above countries’ aid policies for the disaster, both in Jakarta and in Palu and Donggala. The occurrences of news in Jakarta might indicate that the central government had acknowledged the importance of the aids given by the above countries.

To conduct these queries, the news in Indonesia and the above countries was filtered using specific event codes which are presented in the following table (Table 1) using the Google Cloud BigQuery tool. Our next query was to select all news items between 29 September 2018, and 30 October 2018, as we assumed that within one month the news topic would shift from the disaster event to funding aids and humanitarian activities. Our BigQuery syntax example is presented in the following graph (Figure 1). Actor1countrycode refers to the country where the news was published, and Actor2countrycode refers to the country reported in the news published by Actor 1. As the results also included other events that occurred at the same time, the results were then cleaned manually specifically for the Palu and Donggola earthquake disaster news. The cleaning query obtained 492 news url’s including those on the disaster event, emergency response,
### Table 1. Event codes, description, and news frequencies

| No | CAMEO Event Codes | CAMEO Event Description | News Frequencies |
|----|-------------------|-------------------------|-----------------|
| 1  | 010               | Make statement, not specified below | 113             |
| 2  | 023               | Appeal for aid, not specified below | 23              |
| 3  | 033               | Express intent to provide material aid, not specified below | 45              |
| 4  | 042               | Make a visit | 107             |
| 5  | 060               | Engage in material cooperation, not specified below | 58              |
| 6  | 070               | Provide aid, not specified below | 104             |
| 7  | 071               | Provide economic aid | 32              |
| 8  | 084               | Return, release, not specified below | 9               |
| 9  | 086               | Allow international involvement not specified below | none            |

### Figure 1. A sample line graph using colors which contrast well both on screen and on a black-and-white hardcopy.

**Figure 1.** A sample line graph using colors which contrast well both on screen and on a black-and-white hardcopy.

**SELECT * FROM `gdelt-bq.full.events`**
-- then we add a filter to only look at events in or after 1990
WHERE SQLDATE >= 20180929 and SQLDATE <= 20181030
-- and another filter to look at only the specific camera
--codes you provided (I think EventCode is the correct column here,
AND EventCode IN ('023', '033', '07', '088', '042', '060', '070', '084', '010', '071')
AND Actor1CountryCode = 'USA'
AND Actor2CountryCode = 'IDN'

humanitarian operations, and aid plans. Third, we mapped geographically both the news coverage in the countries and the news coverage in Indonesia about the countries to visualize and analyze the flow of news.

### 5. Results
This section displays the analysis of news sentiment, news coverage dynamics and visualizes the spatial flow.

First, the news sentiment suggests the intensity and length of period of the news varied between countries (Table 2 and Table 3). With more than 340 news articles, on average, the likely impact (Goldstein scale value) and news tone on the disaster were low, 3.1 and −2.42, respectively, suggesting cooperativeness—non-conflict events and sadness. This represents that the perceived impact of the event of earthquake disaster in Palu and Donggala was negative, being relatively higher in Europe and the United States and moderate in Japan.

The positive mark of the Goldstein index might be interpreted as a positive impact of the news event, for instance, the President’s visit to the disaster location. The table below shows that the low Goldstein scale values ranged between −4 and −4.4, and the average tone levels ranged from
-5.83 to -8.93. The lowest Goldstein scale value found in the U.S. (-10), with an average tone value of -4.7, was of a news item entitled “watch: terrifying first-hand vision shows destructive power Indonesian tsunami sweeps through streets,” published in the New Zealand (www.tvnz.co.nz) and re-broadcast by Reuters in the U.S.

Second, to illustrate the dynamics of news coverage, the following graph below shows the number of news items on the Palu and Donggala disaster in four foreign countries: Australia, Europe, Japan, and the U.S. (Figure 2). Overall, the earthquake news only lasted for 2 weeks after the event. The graph below reveals that the disaster news was broadcast on the day the disaster occurred by news media in the USA and Japan, whereas news media in Australia and Japan broadcast the disaster 2 days after the disaster occurred. Meanwhile, the disaster news received only a little attention in Europe and Japan, with only 5–7 news items per day during the peak days in the first two weeks since the disaster. However, we also acknowledged that the limited number of news items on this disaster in Japan was because news media in Japan tended to broadcast the news in the Japanese language. On the other hand, in the U.S., the disaster news was persistently broadcast at more than 10 news broadcasts per day for more than two weeks before it slumped for a week and peaked again during the third week. In Australia, the news peaked only during

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**Table 2. Average tone**

|        | Mean | Median | Max | Min | N  |
|--------|------|--------|-----|-----|----|
| United States | -2.82 | -3.65  | 5.10| -8.93| 207|
| Japan   | -0.50 | -0.53  | 5.63| -5.98| 37 |
| Australia| -1.94 | -1.52  | 6.71| -6.17| 75 |
| Europe  | -2.54 | -3.98  | 2.48| -5.83| 23 |
| Overall | -2.35 | -3.01  | 6.71| -8.93| 342|

**Table 3. Goldstein scale index**

|        | Mean | Median | Max | Min | N  |
|--------|------|--------|-----|-----|----|
| United States | 3.91 | 3.4    | 8   | -10 | 207|
| Japan   | 3.57 | 2.8    | 8   | -4  | 37 |
| Australia| 1.77 | 1      | 7.4 | -4.4| 75 |
| Europe  | 3.50 | 3.4    | 7   | -4  | 23 |
| Overall | 3.37 | 3      | 8   | -10 | 342|

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![Figure 2. Number of Palu and Donggala disaster news items by country.](image-url)
the second week with news topics such as earthquake, number of victims, discussions on Australia’s donation plan (i.e., humanitarian assistance and disaster recovery assistance).

On the other hand, we also analyze reports by Indonesia-based news media on the number of activities of the four foreign countries related to the Palu and Donggala disaster (Figure 3). The graph uses 340 data of news coverage during the period of the study. The graph shows that news on aid and humanitarian assistance was found only from the U.S. and Australia during the early days. The news coverage of each country related to the disaster peaked at the end of the first week with 5–29 news items per day. The news coverage further declined and fluctuated for the following two weeks, especially in the U.S. and Australia. The news coverage faded three weeks after the disaster.

Third, we visualize news coverage on the disaster by both local and international news media. Both of the maps below were constructed from the news flow from each geocoded location. The news locations were further filtered to only unique locations. Therefore, if there were some news items from one location, we only selected one of them to visualize the news flow. The first map was constructed using 254 news flows to show news on the Palu and Donggala disaster from domestic news media (Figure 4). This figure shows that the disaster news reports were from various locations in Indonesia, especially from the Java and Sulawesi Islands. The news coverage generally reported activities related to the disaster event and management, with close links between districts on the graph. Although Balikpapan and Makassar were key logistic hubs, there
was no disaster-related news coverage on these two cities. One possible explanation is the limitation of news data availability regarding this information. The second map has 238 news flows, describing news from abroad regarding the disaster in Palu and Donggala (Figure 5). The figure shows that the news on the disaster was reported by numerous cities within each of the selected countries. In other words, the news on the disaster, including the news on humanitarian activities, of these selected countries was reported in various cities. For instance, news in the U.S. came from Georgia, Washington DC, New York, and Ohio. Meanwhile, in Australia the news was covered from Western Australia, Queensland, and Canberra.

6. Discussion and conclusion

In this paper we have showed the use of news articles collected through the GDELT news database. This study has revealed that big data analysis provides new information on and insights into how news media in a particular country broadcast certain news topic in another country. Using the news coverage on the earthquake disaster in Palu and Donggala from late September to October 2018, this paper analyzed the dynamic and spatial flow of news coverage in the countries with the highest amounts of aid, namely Australia, Europe, Japan, and the U.S. However, the Indonesian government has been criticized over the governance of international aid operations. Generally, the foreign organizations allowed to operate in Palu were nationally registered in Indonesia, had been operating in the country during “peace time,” and had been assisting the government in previous disasters (Trias & Cook, 2019). This explains for those who argued that the organizations did not have the necessary expertise and had failed to register with the Ministry of Foreign Affairs or their respective embassies (Betteridge et al., 2018).

The government selected humanitarian international assistance was prepared to accept based on humanitarian needs such as medical and environmental management for mosquito-borne diseases (malaria; Meijer et al., 2019). Other foreign aids were focused to be operated in the following aspects: shelter; livelihoods and basic needs such as water, sanitation, and hygiene (WASH); protection, gender, and inclusion (PGI); migration and displacement; disaster risk reduction; and national society (NS; IFRC, 2019). There were also country-specific aid providers such as the local non-governmental organization (NGO) Aksi Cepat Tanggap (ACT) in collaboration with the Asia Pacific Alliance for Disaster Management (A-PAD) to construct a settlement complex, directly led by A-PAD Korea and funded by the Korea International Cooperation Agency (KOICA) and the Community Chest of Korea (CCK; Daswati et al., 2019).
Meanwhile, the EU provided $1.74 million in immediate aid (ACAPS, 2018) and the U.S. did $11.7 million in aid for emergency livelihood, child protection, shelter, and WASH needs as well as technical assistance for the Indonesian government (USAID, 2018). This was also confirmed by a recent study on collaborative response that suggests several findings. The first finding concerns commitment to goals. In carrying out their commitments, several humanitarian agencies still lacked coordination between stakeholders, for example, between local and central government and international humanitarian agencies as a result of slow response from the local government. Second, the rising issue on the accuracy of data on victims and the locations of their shelters led problems with logistics allocation. The third finding was about a lack of coordination between humanitarian agencies (Daswati, Samad & Wekke, 2020).

This paper drew the following conclusions. First, the dynamic of news broadcast on disasters varied between countries. For instance, the earliest news coverage on the topic started early on the same day in the U.S. and Japan, while it only started in Australia and Europe about two days later. Furthermore, the research also shows specific cities where the news coverage originated, such as Georgia, Washington DC, New York, and Ohio in the U.S. and Western Australia, Queensland, and Canberra in Australia. This finding revealed that local news media in foreign countries also reported the disaster that occurred in Palu and Donggala. Second, coverage of Indonesian-based news on foreign countries’ activities during the early days was only found for the U.S. and Australia, which peaked in the first week with 5–29 news items per day. Contrarily, there were less than 7 news items daily in Japan and Europe, suggesting low media attention to the activities of both actors related to the disaster despite their relatively significant amounts of aid funding to Indonesia.

Finally, this paper contributed to the literature in two respects. First, the paper showed that a foreign country’s international relationship and its news media agenda determine the attention and interest of newsworthiness. Newsworthiness is also determined by geographical proximity and regionalism. This highlights “frame changing” that news frames tend to change following different interests and how the public receive the aspects of the event, and the importance of contextual where geographical distance and political linkages determine news coverage (Houston et al., 2012; Van Belle, 2000).

Second, the use of big data on newsworthiness remains to be challenging. The GDELT data did not allow analysis to understand what the disasters meant for the people and communities experiencing the disasters nor plans for humanitarian assistance from the selected countries. This extents findings and concern raised by (Houston et al., 2012) that news coverage plays a limited role for the society to understand individual and community preparedness, recovery, and resilience. Although we realized that this might be due to the limited time period of analysis, the findings highlighted the growing consensus for future research to examine the normative function of media in the context of disasters and how society could benefit from such function.

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Notes
1. https://www.promptcloud.com/blog/datafication-era-of-big-data
2. https://www.republika.co.id/berita/en/national-politics/18/10/02/pfxs8d414-18-countries-offer-aid-in-aftermath-of-palu-quake

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