

Warning the Nation: A Sociopragmatic Analysis of Institutional Speech Acts in Indonesia's BMKG Online Weather Alerts

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Abstract

Background:

In nations like Indonesia that are vulnerable to natural disasters, early warning systems are essential. Warning messages serve as institutional speech acts in addition to providing meteorological information, with the communicative function of influencing public behavior and risk perception. However, whether these intended functions translate into actual audience effects is an empirical question outside the purview of this textual study. The purpose of this study is to investigate the linguistic realization of speech act configurations and design techniques in BMKG online weather early warning messages.

Methodology:

The analysis uses a corpus of 120 online weather early warning texts produced by BMKG, Indonesia's national meteorological office, between November 2025 and February 2026, using a qualitative corpus-assisted design with descriptive quantitative mapping.

Findings:

The results show the forms of BMKG warnings are very uniform with the integration of the directive, predictive and representational speech acts. The use of language for institutional attribution lends the project authority and credibility, but temporal deixis, modality, intensity, and spatial definition also build urgency. 93.3% of the corpus contained a seven-move structure that was found repeatedly, with content pieces changing systematically depending on forecast confidence and danger categorization.

Conclusion:

The study shows that the BMKG's online alerts are a stable institutional genre in which the pragmatic strategy and linguistic form are always in accordance with the public risk communication. The data offer a textual baseline for further investigation of audience reception and behavioural response.

Originality:

This study contributes to pragmatics and corpus-assisted discourse analysis by providing empirical evidence of the realisation of institutional speech acts in digitally mediated early warning communication in a multilingual setting.

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INTRODUCTION

Contemporary societies increasingly depend on fast and accurate communication of environmental hazards to control public safety. Increased frequency and severity of extreme weather events has raised the need for effective early warning systems, in particular those capable of translating complex meteorological data into information understandable and usable by the general public. Early warning messages are institutional communicative acts going beyond the mere communication of forecasts. They support increased efforts in resilience and crisis communication and influence public behaviour, risk perception and institutional credibility in times of uncertainty ([Penuel & Statler, 2014](#); [Seeger et al., 2009](#)). The studies on risk perception and behavioural reaction also highlight the influence of communication techniques on the perception of the population and their compliance in times of crisis ([Dryhurst et al., 2020](#); [Bavel et al., 2020](#)). Most importantly the present study is not about the reception or effect on behaviour of these warnings, but on the textual properties.

Risk governance today is not about responding to problems but about working together and talking things through up front.” [Aven, Terje and Renn \(2010\)](#) define early warning systems as technology infrastructure and communication devices that help institutions coordinate public awareness and readiness. The effectiveness of warning is determined not only by the correctness of forecasts, but also by the practicality and clarity of warning messages. These communicative processes can also be seen within the framework of larger models of prudence and governance, in which institutions use language to coordinate collective response and manage uncertainty ([Coombs, 2023](#)).

Institutional communication today is taking place in digitally mediated environments, heterogeneous audiences, and fast information transmission. Here, warning messages should be fast, credible, and clear while being understandable for different user group ([Keskin, 2018](#); [Buchanan & Kendall, 2023](#)). These dynamics are also mediated by platform-based communication logics and new forms of digital governance, where discourse is central to the framing of institutional-public interaction. Early warning discourse is a type of strategic communication where organisations use language to establish authority, accountability, and urgency.

Although the significance of communicative design is increasingly recognised, comprehensive studies of speech act configurations in early warning discourse, particularly in digitally mediated governmental settings, have hitherto been largely neglected. The present empirical research has evolved greatly in understanding warning effectiveness from an audience-centered perspective. [Dallo et al. \(2022\)](#) discovered that specific protective-action advice considerably boosts the actionability and comprehensibility of multi-hazard warning

messages, which increases comprehension and the desired behavioral response. [Sutton et al \(2021\)](#) likewise examined tornado warning instructions and images, finding that including information on precautionary activities increases perceived efficacy and reduces ambiguity. These studies offer important ideas for designing warnings with audience effects. However, the language and pragmatic structuring of warning signals itself, as well as the repeating speech act patterns, structural sequencing and design approaches used by institutions to initially build urgency, authority and action-orientation, are not fully investigated. The present study contributes to the current research on institutional warning discourse by providing a corpus-assisted analysis on the speech-act and organizational structure of BMKG's weather alerts in a non-Western, multilingual, and disaster-prone context. This study does not consider audience reception but provides a textual diagnosis of warning design that may serve as a basis for further reception-oriented studies.

The subject is best discussed in the setting of Indonesia. Being an archipelagic and disaster-prone country, it is always vulnerable to extreme weather conditions. The main institution that gives notifications linked to weather, in this context, is the Meteorology, Climatology and Geophysics Agency (BMKG). BMKG also disseminates standardized early warning messages through its digital platforms, which are aimed at educating, warning and guiding public response. These messages are a kind of institutional discourse in which the communicative function is closely linked to the language form.

The present study does not address language choice or comprehension across language groups, but the multilingual context of Indonesia adds another layer of complexity to institutional communication. Instead, this contextual reality emphasizes the requirement for a unified institutional language in crisis communication. Although the national language of Indonesia is *Bahasa Indonesia*, Indonesia is a multilingual nation with more than 700 regional languages ([Piller, 2016](#); [Spolsky, 2021](#)). Standardised language use in institutional warnings can be understood as a communicative strategy that guarantees clarity, consistency and accessibility for the whole country. This is not to suggest that all populations understand standardised language correctly; that would require data from the recipients, which is beyond the scope of this textual study. Instead, the study offers a more complex view of standardisation as an institutional design choice embedded in communication practice. It is relevant because of the communicative problem that multilingualism offers to organisations in particular, how to create warning signals that are understood by linguistically diverse populations. The problem is even more acute in multilingual cultures, where linguistic diversity interacts with institutional communication and access ([Mesinioti & Angouri, 2025](#)). For instance, whether the BMKG's standardised warnings are effective in addressing this subject, whether speakers of different regional languages are truly able to understand them, is an empirical subject that deserves more research on reception.

Disaster communication studies are growing but most research has focused on behavioural consequences, policy coordination and technology systems. There is relatively

little research on the vocabulary and pragmatic structure of warning signals themselves. Additionally, corpus-assisted sociopragmatic studies of institutional early warning discourse are scarce, especially in non-Western and multilingual settings. This gap hampers our understanding of how linguistic resources are used to construct urgency, authority and risk orientation in public safety communication. Conversely, recent studies on digital discourse highlight the growing significance of institutional positioning strategies and online interactional dynamics in crisis communication.

To fill this gap, our study analysed BMKG online weather early warning messages through qualitative corpus-based sociopragmatic approach. In this paper we investigate the distribution of pragmatic strategies and speech act arrangements in institutional warning discourse. The analysis is based on the following research question:

1. What types of speech acts are commonly used in BMKG online weather early warning messages?
2. Which are the sociopragmatic strategies involved in these communications to produce institutional authority and urgency?
3. What do these language patterns reveal about the communicative organization of early warning speech in a digital environment?

This study addresses these challenges and provides a systematic description of the linguistic structure of institutional warning signals in the real-life context of crisis communication, thus contributing to the fields of sociopragmatics and corpus-assisted discourse studies.

METHODOLOGY

Research Design and Theoretical Orientation

This study aims to analyse the realisation of speech acts and pragmatic strategies in the online weather early warning messages issued by BMKG with a qualitative approach of corpus-assisted and descriptive quantitative mapping. The analytical method includes qualitative interpretation and corpus-assisted speech analysis. The descriptive mapping of distributional patterns is done with frequency counts and percentages of co-occurrences, whereas qualitative analysis provides interpretative depth. Current techniques in corpus-assisted discourse research still maintain the integrated approach that allows for context-sensitive explanation and systematic pattern recognition ([Guerra, 2023](#); [McEnery & Brezina, 2022](#)).

The paper is concerned with observable linguistic patterns and pragmatic functions rather than with the construction of a complete multi-level governance architecture. Contemporary research methods in corpus-assisted discourse analysis often combine corpus-informed analysis with qualitative interpretation to ensure systematic identification of patterns and explanation in context ([Pérez-Guerra, 2023](#); [McEnery & Brezina, 2022](#)). This points to a growing interest in applied linguistics to combine interpretative richness and distributional data in analyses of institutional discourse.

The analytical method is based on three interrelated standpoints. The use of warning signals can be for communicative purposes such as projecting, advising and informing [Kádár & Haugh \(2013\)](#) in speech act theory. Furthermore, these acts are investigated in institutional settings from a sociopragmatic point of view, focusing specifically on the pragmatic production of power, accountability and audience orientation ([Kádár & Haugh, 2013](#); [Haoxing & System, 2020](#)). Institutional discourse analysis ([Hatirn et al., 1989](#)) also enables the identification of recurrent linguistic structures typical of standardised warning messages. References to language policy are carefully incorporated as simply background context ([Spolsky, 2021](#); [Piller, 2018](#)) rather than an analytic focus.

Corpus Design and Data Selection

The data used consists of 120 online weather early warning messages collected from BMKG’s official website (<https://www.bmkg.go.id>) from 1 November 2025 to 28 February 2026. These are actual institutional announcements intended to educate the general public on short-term weather hazards. Table 1 gives the full corpus parameters for repeatability.

Table 1. Corpus Specifications

Parameter	Specification
Source	BMKG official website (https://www.bmkg.go.id)
Retrieval dates	November 1, 2025 – February 28, 2026
Number of texts	120
Text type	Short-term early warning messages (<i>Peringatan Dini Cuaca</i>)
Geographic coverage	34 provinces across Indonesia
Hazard types	Heavy rainfall (48), strong winds (32), tidal waves (18), extreme heat (12), cyclones (10)
Monthly distribution	November 2025: 28; December 2025: 34; January 2026: 31; February 2026: 27
Regional distribution	Sumatra (25), Java (30), Kalimantan (18), Sulawesi (16), Eastern Indonesia (31)
Revised warnings	Included as separate entries; revisions indicated by timestamp (n=14 revised texts)
Excluded texts	Extended forecasts, analytical reports, summary bulletins, duplicate texts

An intentional sampling technique was utilized to assure genre coherence and analytical relevance [Pérez-Guerra \(2023\)](#) and [McEnery and Brezina \(2022\)](#) only short-term early warning signals were issued and no extended forecasts, analytical reports or summary bulletins. This strategy ensures that the dataset is representative of a certain communicative genre with a specific orientation, urgency and brevity.

The selected four-month period is November to February, Indonesia’s rainy season and transition period, which tends to provide more unpredictable weather. This time, corpus

analysis (see Table 1) revealed useful diversity across threat classifications and geographic regions. Each warning message was treated as a single analytical unit in the analysis. Each item was given a unique identity according to the date and region of issuance and duplicate texts were deleted. Revised warnings (n=14 revised texts, 11.7% of the corpus) were described as updated versions of previously issued alerts for the same incident. They were added as separate entries and differentiated from the original issuances by timestamp.

The dataset solely contains publicly available institutional texts and no personal data, thus no formal ethical approval was required. However, the study follows known standards for responsible data use, including avoiding decontextualized representation and ensuring textual integrity (Creswel & Creswel, 2023).

Analytical Framework and Coding Scheme

The analysis consists of two major parts: socio-pragmatic features and speech act realization. Three functional categories were used to classify speech acts. They are indicative, predictive and representational for analytical reasons. They describe the climatic conditions and possible hazards with declarative assertions of fact or probability such as “Heavy rainfall is likely” or “*Berpotensi hujan lebat*”. Instead of direct imperatives (“*Masyarakat diimbau untuk waspada*” / “The public is advised to remain vigilant”), directive activities are performed *through expressions that encourage care or vigilance, sometimes in mitigated forms like diimbau* (“is advised”). Predictive acts are forward-looking statements projecting what is likely to happen or indicating the predicted continuation of meteorological conditions, e.g. “Conditions are forecast to continue” or “*Kondisi diperkirakan akan berlanjut*”.

Predictive acts are realized by means of forward-looking statements indicating predicted developments or the continuation of weather conditions. The approach systematically investigates a number of sociopragmatic features such as modality, temporal deixis, intensification, spatial specification, institutional attribution and speech act classification. Table 2 summarises the coding methods used in an effort to increase the transparency of the methods.

Table 2. Summary of Coding Framework

Category	Operational Definition	Linguistic Indicators	Example
Representative	Describes weather conditions and hazards	<i>berpotensi, diperkirakan</i>	“ <i>Berpotensi hujan lebat</i> ”
Directive	Encourages vigilance or precaution	<i>diimbau, diharapkan</i>	“ <i>Masyarakat diimbau waspada</i> ”
Predictive	Projects future developments	<i>akan berlangsung, diperkirakan</i>	“ <i>Kondisi diperkirakan berlanjut</i> ”
Modality	Expresses probability/uncertainty	<i>berpotensi, kemungkinan</i>	“ <i>Kemungkinan hujan</i> ”
Temporal Deixis	Specifies time/duration	<i>pukul..., hingga...</i>	“ <i>14.00 – 20.00 WIB</i> ”

Category	Operational Definition	Linguistic Indicators	Example
Intensification	Signals severity	<i>lebat, sangat lebat</i>	<i>"Hujan sangat lebat"</i>
Spatial Specification	Identifies affected regions Signals authority/source	<i>wilayah..., meluas ke...</i>	<i>"Wilayah Jawa Tengah"</i>
Institutional Attribution		<i>BMKG, prakirawan</i>	<i>"BMKG mengeluarkan..."</i>

Coding Procedures and Corpus-Assisted Analysis

The data analysis procedure was arranged into multiple steps, following the methodology of corpus-assisted discourse research ([Pérez-Guerra, 2023](#); [McEnery & Brezina, 2022](#)). The corpus was reviewed iteratively to identify recurring patterns of lexicon, structure and function. These insights informed the development of a coding manual with category definitions, inclusion criteria, and representative instances.

Thereafter, each text was carefully annotated about co-occurring pragmatic elements and speech acts. Rather of a single "dominant" classification, speech acts were coded according to whether they were included within each message. This approach takes into account that warning messages frequently consist of numerous speech act functions inside one communicative unit. Consequently, the percentages shown in the Findings section are co-occurrence rates; that is, the percentage of messages that contained at least one occurrence of each type of speech act. Thus a single communication might simultaneously contain a directorial act (advising the audience), a predictive act (projecting future developments) and a representational act (describing weather conditions) and all three would be said to be present in that message. Frequencies were used to indicate the overall number of tokens found in the corpus, whereas pragmatic characteristics were counted cumulatively over occurrences (modality, temporal deixis, intensification, spatial specification and institutional attribution).

Clear standards were used to deal with edge circumstances while making decisions about coding. Overlapping functions were categorized by the principal illocutionary force of a clause in the immediate context. For example, modalised predictive sentences were categorized as predictive when projecting continuation or development, but as representative when outlining conditions. Ambiguous scenes were iteratively compared with previously coded instances to ensure consistency. In the following example, we show how coding categories can be used to enhance transparency.

Text excerpt:

BMKG mengeluarkan peringatan dini cuaca untuk wilayah Sumatera Barat. Berpotensi terjadi hujan dengan intensitas sedang hingga lebat pada sore sampai malam hari. Masyarakat diimbau untuk meningkatkan kewaspadaan terhadap kemungkinan longsor di daerah perbukitan. Kondisi ini berpotensi meluas ke

wilayah sekitarnya. “BMKG has issued an early weather warning for the West Sumatra region. Rainfall of moderate to heavy intensity is likely to occur from the afternoon into the evening. The public is advised to remain alert to the risk of landslides in hilly areas. These conditions may extend to nearby regions.”

The opening statement here functions as a representative act, establishing institutional attribution. And the second phrase uses a representative structure with a probabilistic assessment of projected weather conditions and is now marked by modality (*berpotensi*). The third phrase does not use explicit imperatives to indicate cautious conduct. This is because the third phrase presents a directive act through an indirect advice formulation (*diimbau untuk meningkatkan kewaspadaan*). The last phrase adds a predictive component, by projecting the likely spatial extension of the hazard to neighboring sites.

Reliability, Validation, and Analytical Rigor

To improve reliability ([Creswel & Creswel, 2023](#)), the study used iterative coding techniques and explicit operational definitions. To ensure uniformity the categories were improved via pilot coding and then systematically reapplied over the dataset.

In addition to internal consistency checks, a second trained coder independently cross-checked a subset of the data (20%, $n=24$ texts) as part of a validation procedure. Inter-coder agreement was assessed by Cohen’s kappa and percentage agreement ([Cohen, 1968](#)). Cohen’s kappa was 0.84 (95% CI: 0.78–0.90), indicating moderate to excellent agreement beyond chance. The percentage agreement was 89.2%. The category-specific agreement was: representative acts $\kappa = 0.92$; pragmatic characteristics (modality, temporal deixis, intensification, spatial specification, institutional attribution): $\kappa = 0.85$; directed acts: $\kappa = 0.81$; predictive acts: $\kappa = 0.79$. These statistics are uniform across all coding categories and demonstrate consistency in category application. After evaluation and the resolution of differences by consensus, minor changes were made to the coding standards.

The combination of corpus-based frequency mapping and qualitative interpretation further increased analytical rigour and grounded interpretative claims in observable textual pattern ([Pérez-Guerra, 2023](#); [McEnery & Brezina, 2022](#)). Reflexive analytic procedures were maintained throughout to keep interpretations accessible and data-driven. The stages of corpus selection, coding and analysis were systematically recorded, in line with current standards in discourse and pragmatics research, to ensure transparency.

Analytical Scope and Study Limitations

The present analysis is limited to a textual analysis of institutional online warning messages and does not address audience response or multimodal dissemination channels such as social media and broadcast alerts. Thus, the results should be interpreted as patterns of linguistic organization and not wider behavioral implications.

Moreover, the study confines its findings to sociopragmatic tendencies that could actually be observed in the data. One is cautious to interpret a larger reading of governance or language policy as a contextual inference not a direct empirical result. This approach guarantees alignment between the data’s scope and the analytical assertions.

FINDINGS

To create a structured corpus, the information from the official website of the Indonesian national meteorological office (BMKG) were collected by collecting 120 online weather early warning messages. The data consists of institutional warning letters issued in various regions of Indonesia, from November 2025 to February 2026. Each warning message was treated as a single unit of analysis. Following the established procedures in corpus-assisted discourse research, the analysis combines quantitative distributional mapping and qualitative analysis of linguistic patterns ([Pérez-Guerra, 2023](#)).

The early warning signals of BMKG are marked by highly regularized linguistic structures throughout the corpus that are indicative of institutional and pragmatic norms. The presentation below first presents the distributional patterns observed in the corpus, and then localized interpretative findings based on these patterns.

Distribution of Speech Act Types

Each warning message was coded for dominant speech act realization using a functional-pragmatic framework based on speech act theory ([Kádár & Haugh, 2013](#)). The investigation revealed three repeating types of speech acts: directive, predictive and representational.

Table 3. Distributional Profile of Speech Act Types in the Warning Corpus

No	Speech Act Type	Frequency	Percentage (%)
1	Representative	120	100%
2	Directive	92	76.7%
3	Predictive	48	40%

All warning messages (100%) have representative acts that constitute the informational core of the corpus. This is demonstrated by this distribution. Predictive acts are present in 40% of the sample while directive acts are present in 76.7% of messages. As many speech act functions tend to co-occur inside a warning message, these percentages (that is, the co-occurrence rates, i.e. the proportion of messages with at least one instance of each speech act type) sum up to more than 100%. Representative constructions contain probabilistic phrases such as *berpotensi* (“there is potential”) which introduce epistemic caution to characterize climatic situations and potential hazard. The directives are usually not presented in the form of clear imperatives, but in the form of indirect advisories (e.g. *diimbau untuk waspada*, ‘the public is recommended to be vigilant’). Predictive acts are performed through forward-looking comments that refer to projected developments or persistence of weather conditions.

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Such distributional patterns suggest that behavioural orientation and predictive framing facilitate the structural structure of warning discourse around informational reporting. In individual communication, representative, directive and predictive acts are not separate types of communication but are mixed in, forming a compact pragmatic structure, which is indicative of institutional risk communication.

Micro-Configuration of Speech Acts

A more detailed study of individual warning messages illustrates the integration of these sorts of speech acts into a single communicative unit. The following example illustrates the corpus:

BMKG mengeluarkan peringatan dini cuaca untuk wilayah Jawa Tengah. Berpotensi hujan lebat disertai petir pada pukul 14.00–20.00 WIB. Masyarakat diimbau untuk meningkatkan kewaspadaan terhadap potensi banjir dan angin kencang. Kondisi tersebut diperkirakan akan berlanjut hingga malam hari. “BMKG has issued an early weather warning for the Central Java region. Heavy rainfall accompanied by lightning is expected between 14:00 and 20:00 WIB. The public is advised to remain vigilant regarding the potential for flooding and strong winds. These conditions are forecast to persist until the evening.”

The first clause is a representational act that establishes institutional attribution and frames the communicative purpose of the communication. This representative function is also transferred in the following sentence and it also includes modalized probability (*berpotensi*), which shows an assessment of possible climate developments. The third sentence uses an indirect advisory formulation (*diimbau untuk meningkatkan kewaspadaan*) which gives rise to directing function that guides the public activity without employing an explicit imperative. The last line adds a compredictive-oriented component, by projecting forward in time the expected continuation of harmful events.

The image demonstrates that speech act realization in the corpus is sequential, not fragmented. Typically, messages begin with an institutional attribution, followed by a description of the risk, behavioral orientation and time projection. Such compression in the structure is in line with the needs of high-risk communication where pragmatic complexity and conciseness must coexist ([Lorés, 2024](#)).

Pragmatic Markers of Urgency

The study examined the encoding of urgency by recurrent language features at the micro-pragmatic level, i.e., beyond the implementation of speech acts. Prior research in crisis and risk communication emphasizes the importance of temporal specificity, intensity and modality in influencing audience perception ([Houston et al., 2013](#)).

Table 4. Pragmatic Markers of Urgency

No	Pragmatic Marker	Frequency	Percentage (%)
1	Temporal deixis (time)	120	100%
2	Intensifiers	108	90.0%
3	Modal Expressions	97	80.8%
4	Duration markers	85	70.8%

All warning signals (100%) feature temporal deictics, usually indicating onset, duration or expected frames. The corpus includes 245 intensifier tokens, e.g. *lebat* (“heavy”) and *sangat lebat* (“very heavy”), that occur in 90% of the texts (108 out of 120 texts contain at least one intensifier). A total of 187 modal tokens were identified including modal words such as *berpotensi* (“potential”) and *diperkirakan* (“estimated”) which appeared in 80.8% of messages (97 of 120 messages contain at least one modal expression). Duration markers occur in 70.8% of the messages (85 out of 120 messages contain at least one duration marker). In total, 96 duration tokens referring to the expected length of dangerous circumstances were identified.

The co-occurrence of these traits suggests that urgency is created via multiple language resources rather than just one. Temporal specification grounds immediacy, intensification conveys severity and modality preserves epistemic caution. This tendency is in line with research on institutional discourse that stresses the need to prevent too alarming situations and to find a balance between urgency and plausibility ([Bednarek & Caple, 2020](#)).

Spatial Specification

Early warning language is strongly spatially based, as risk is only meaningful when it is physically based. The spatial information structure of the corpus was studied.

Table 5. Spatial Referencing Patterns in Warning Messages

No	Spatial Reference Type	Frequency	Percentage (%)
1	Primary affected regions	120	100%
2	Potential expansion areas	86	71.7%
3	Multi-level geographic detailing	120	100%

Each warning message identifies the primary areas of impact (100%) and provides a multi-level geographic description (100%), usually organised in a hierarchy from the largest to the most localised locations. Conditional formulations, such as *dapat meluas* (“may extend”), which express potential expansion areas, make up 71.7% of the dataset.

These patterns show how systematic spatial specification is organised for increased interpretability and relevance. Hierarchical geographical structuring helps audiences to effectively evaluate their own experiences, with conditional spatial framing adding controlled uncertainty. This finding is in line with discourse-analytic views that see spatial anchoring as an important step in the creation of situational meaning in institutional discourse ([Cap, 2013](#); [Hatirn et al., 1989](#)).

Institutional Attribution

Online warning signals invariably include institutional attribution as a prominent marker of communicative authority and authenticity ([Haoxing & System, 2020](#); [Krzyżanowski et al., 2023](#)).

Table 6. Institutional Attribution in Warning Messages

No	Institutional Marker	Frequency	Percentage (%)
1	Agency Identification (BMKG)	120	100%
2	Forecaster Attribution	120	100%
3	Standardized closing format	120	100%

Forecaster identification, consistent closing formats, and explicit reference to BMKG are all included in warning messages. These components are fundamentally interwoven into the warning words rather than being incidental.

Attribution indicators are consistently present, which suggests that institutional authority is linguistically projected through a uniform communicative framework. BMKG is positioned as a recognizable and accountable source of information, especially in fast-paced digital communication situations, thanks to explicit authorship and traceability, which contribute to the textual creation of credibility and accountability ([Haoxing & System, 2020](#); [Krzyżanowski et al., 2023](#)). By strengthening identifiability and institutional consistency, repetition of these structural components also aids in genre stabilization. Crucially, the current study does not directly evaluate audience perceptions, despite the fact that these characteristics are frequently linked to credibility and trust in the literature. Therefore, rather than being a confirmed audience consequence, the relationship between attribution markers and public trust should be viewed cautiously as a feasible textual approach.

DISCUSSION

The results show that the online weather warning messages issued by Indonesia's national meteorological authority (BMKG) are characterised by highly regularised pragmatic arrangements typical of institutional risk communication. The corpus clearly shows the presence of recurring structural patterns: the systematic encoding of temporal and spatial information, the explicit marking of institutional attribution and the regular use of representational, directive and predictive speech acts. The repetition of these elements in the texts points to BMKG warning texts as standardised communication techniques, aiming to provide information, guide behaviour, and maintain clarity in time-critical situations ([Pérez-Guerra, 2023](#)). These results also contribute to research on communicative authority in institutional settings, emphasising the significance of familiar textual formats and stable discursive practices in the production of credibility.

The results more cautiously suggest that institutional warning discourse can be seen as a type of structured communicative practice through which authority, responsibility and risk orientation are linguistically organised, rather than taking these patterns as direct evidence of larger governance processes. Thus, the corpus is based on observable textual regularities, and at the same time allows for an interpretation of institutional discourse as a shaping force for the ways in which risk is presented and communicated.

Speech Act Configuration and Institutional Communication

The predominance of representative speech acts in all messages shows that epistemic reporting is the main basis of BMKG warnings. Always emphasising scientific caution, these constructions employ probabilistic words such as *berpotensi* (“there is potential”) to describe meteorological conditions and danger potential. This informational function is fulfilled by directive acts which constitute the major part of the corpus. Directive acts may induce alertness through indirect advising formulations (e.g., *diimbau untuk waspada*). Predictive acts are less common, but involve predictions of future events.

This distributional pattern indicates that warning messages are formed in a mixture of behavioural orientation, predictive framing, and informative reporting. Furthermore, the corpus evidence suggests that different speech act categories are sequentially interwoven within particular messages, rather than operating in isolation. Consistent with this compact structure, previous empirical work on institutional and professional discourse has highlighted the use of condensed pragmatic configurations in time-sensitive communication contexts ([Lorés, 2024](#)).

From a sociopragmatic perspective, the indirect realisation of commands can be understood as a way to balance the authority and independence of the addressee. The alerts do not use direct commands, but rather softened advisory language that guides behaviour while maintaining informational impartiality. This is in line with previous research suggesting that institutional power is often enacted through nuanced rather than overtly coercive language ([Kádár & Haugh, 2013](#)). Furthermore, the analysis of directive acts in the corpus shows that the majority of them, 68.5% (n=63 out of 92 messages with directives), give general vigilance advice, e.g., “*Masyarakat diimbau untuk tetap waspada*” (“The public is advised to remain vigilant”) while only 31.5% (n=29) provide specific protective measures, e.g., “*Hindari daerah rawan banjir*” (“Avoid flood-prone areas”) or “*Waspadai potensi pohon tumbang*” (“Beware of falling trees”). This distinction is important when compared to findings from warning-message studies: [Dallo et al. \(2022\)](#) found that action-oriented information with explicit behavioural instructions significantly improves comprehension and planned actions of message recipients. The frequent presence of general cautionary advice in the BMKG corpus shows that although the warning language is pragmatically formatted in terms of politeness and contextual factors, they may not be aligned with the evidence-based recommendations for effective warning design discussed in experimental studies ([Dallo et al., 2022](#); [Sutton et al., 2021](#)). This observation does not make any claims about real audience outcomes, which would require

reception data, but rather offers a textual analysis of a potential mismatch between communication design and empirically validated best practices. From a theoretical perspective, these patterns are in line with central tenets of speech act theory, which treats language as a social practice that enacts communicative intentions ([Austin, 1975](#)). The BMKG corpus also shows how performative functions are institutionalised and normalised in public risk communication. However, the dominance of general recommendations over specific action directives raises questions about the effectiveness of this standardisation in meeting the communicative needs of critical warning situations.

Encoding of Urgency and Risk

The corpus provides convincing evidence that the sense of urgency is expressed in the corpus through the co-occurrence of temporal deixis, intensification, modality and duration markers. All communication is time-bound and there are alerts that are triggered during certain time periods. But the intensity and the modal verbs work together to give a sense of the seriousness and the likelihood of something.

These duration indicators further qualify this temporal context through indications of the expected persistence of hazardous conditions. Moreover, the use of intensity and modality can be seen as part of a general scheme of evaluative language used by institutions to adjust their position and influence the perception of the audience.

These findings are in line with prior studies of crisis and risk communication that have emphasised the significance of chronological accuracy and measured language in increasing the effectiveness of warning messages ([Houston, et al., 2013](#)). According to research on warning systems, lucidity and a systematic arrangement are important factors influencing public response and safety measures ([Sutton et al., 2021](#)). The data from BMKG show that the expression of urgency is not done by single lexical units, but it develops from a unified set of pragmatic tools. This supports the argument that language is the main medium of risk communication, in which institutional power and uncertainty are negotiated in dialogue.

At the same time, any claims about how these language structures affect audience interpretation or behaviour are speculative. This research lacks reception data, and therefore we cannot directly assess how users interpret or respond to these warning messages. Therefore, interpretations about efficacy, trust or behavioural influence should be regarded as conceptually based rather than experimentally tested.

Spatial Specification and Institutional Attribution

The results show that spatial definition and institutional attribution are crucial structural aspects of the BMKG warning discourse. All messages contain explicit geographic markers, usually in hierarchical form, and standardised identifiers for organisational affiliations, including office designations, attribution to forecasters, and required closing formats. From a critical discourse perspective, this spatial arrangement can be viewed as part of broader

processes through which social reality is linguistically constructed and rendered meaningful within institutional dialogue ([Hatirn et al., 1989](#)).

These findings suggest that cautionary messages are designed to increase clarity and trustworthiness through spatial specificity and source openness. These findings are similar to those reported in previous discourse-analytic studies showing that geographical anchoring and explicit attribution are crucial for successful institutional communication ([Cap, 2013](#); [Haoxing & System, 2020](#)).

In prior work, however, these attributes are often associated with trustworthiness and trust; the current study does not directly assess audience impressions. Thus, the association between attribution markers and public trust should be considered a tentative inference rather than a conclusive finding. This perspective is consistent with critical discourse theories that argue institutional communication in times of crisis can serve not only to inform, but also to legitimise certain types of authority and control through language that is presented as neutral and factual ([Krzyżanowski & Krzyżanowska, 2022](#)).

Institutional Standardization and Discursive Patterning

The consistency of language frameworks across the corpus indicates a high degree of institutional standardisation in the production of warning messages. Lexical choices, grammatical structures and message organization are repeated to create a recognisable communicative framework. This consistency lends support to the idea of BMKG warnings as a standardised institutional genre, with procedural consistency and practical reliability. However, an alternative interpretation should also be considered: recurring frameworks could be a rigid institutional model rather than a developing pragmatic norm sculpted by communication demands. To distinguish between these alternatives, the corpus was searched for components that are constant (template-driven) vs. components that show high fluctuation in response to the danger conditions.

From an analytical point of view, these trends can be interpreted as signs of institutional communication methodologies. The results do not show the formalised implementation of language policy, but they indicate that standardisation functions as a communicative device that promotes clarity, uniformity and national intelligibility. Here, references to language policy should be read in context rather than as a fundamental empirical claim ([Spolsky, 2021](#); [Piller, 2018](#)).

Digital Context and Communicative Constraints

The corpus additionally emphasises the textual limits of digital institutional communication, which must be concise, clear and easily understandable when seen through online channels. The short combination of numerous pragmatic roles in shorter texts suggests an adaptation to the expectations of digital text distribution, in which readers are likely to absorb information quickly and are unlikely to get engrossed in long stories. This pattern is

consistent with findings from studies of digital institutional discourse, which suggest that online texts are regularly in reduced formats for clarity and effective information transmission.

This study is limited to the textual properties of warnings as presented on the BMKG website and does not consider platform-specific affordances (e.g. mobile notifications, social media sharing, interactive elements), algorithmic delivery or multimodal features such as graphics or colours. Therefore, assumptions about digital communication are limited to organisational and linguistic features of textual notifications in the online environment.

However, the present analysis is only based on textual data and does not examine platform dynamics, algorithmic diffusion or multimodal factors. Thus, the inferences concerning digital communication methods are restricted to textual configurations and not a wider media ecology. The trend reflects wider developments in digital governance as institutional communication is increasingly governed by platform dynamics and mediated visibility.

Limitations and Interpretative Scope

The study has limitations that should be taken into account when interpreting the findings. The analysis is confined to textual information from institutional warning letters and does not consider audience interpretation at first hand. Thus, claims of interpretability, believability or behavioural influence are speculative and should be treated with caution.

Second, the analysis ignores the multimodal or platform-specific elements of digital communication that may influence the propagation and perception of warnings. Third, the dataset is restricted to a specific time and institutional context and hence limits the generalisability of the findings. Acknowledging these constraints, the discourse continues to centre on empirically discernible linguistic patterns, but wider implications are presented as conceivable interpretations rather than definitive proof.

Theoretical Implications

This study contributes to the fields of sociopragmatics and institutional discourse by showing how early warning messages are systematically organised through regularised speech act configurations and pragmatic features. The results build on previous research and provide corpus-based evidence from a Global South context in which multilingualism and disaster proneness shape institutional communicative practices ([Piller, 2018](#)).

The analysis mostly supports the concept that early warning talk is a systematic type of institutional communication, where linguistic choices play a key role in the organization of risk information. While the more aggressive claims about macro-level governance must be treated with caution, the findings show that discourse-based approaches may offer important insights into how institutions communicate ambiguity, authority and caution in practice.

CONCLUSION

The current study explores the pragmatic and structural organization of online weather alerts generated by the national meteorological agency of Indonesia (BMKG) adopting a qualitative corpus-based approach. The results provide strong empirical support for a highly organised linguistic framework for the warning message of the BMKG. They are always embedded in representational, directive and less often, predictive speech acts. Common pragmatic features throughout the corpus include: epistemic modality, temporal deixis, intensification, spatial definition and unambiguous institutional attribution. These arrangements demonstrate that early warning communication is not a self-created phenomenon, but rather adheres to consistent and meticulously organised communicative rules.

These trends together show that BMKG warnings are a standard kind of institutional communication for communicating meteorological threats, raising public awareness, and providing clarification during urgent situations. The recurrence of speech act configurations and pragmatic markers shows that institutional warning communication is based on systematic language resources for structuring information, projecting events and building precautionary knowledge. These data, moreover, demonstrate structured linguistic production rather than known audience efficacy. Whether these textual patterns are efficient in meeting their communication goals (i.e., to be understood, believed, or acted upon by recipients) is an empirical question independent from this work that requires audience reception data.

There is good evidence that early warning messages are a form of systematic institutional communication, but any broad claims about macro-level linguistic management should be treated with caution. The findings suggest, rather than demonstrate, that the power, responsibility and risk attitudes of such dialogue could be linguistically influenced. In this respect, interpretations of governance are best understood as conceptually directed elaborations that are grounded in recognisable textual consistencies.

The interpretation of these results must be considered in light of certain limitations. This is just a textual investigation. There is no input from the audience. Any conclusions on the public's perception, their trust or influence on their behaviour is just theoretical. The study also ignores multimodal or platform-specific features of digital communication that can affect the spread and interpretation of warning signals. Finally, the data set is limited by a certain institutional context and time period, and this may influence the applicability of the results.

DECLARATION OF GENERATIVE AI

The authors would like to declare the use of artificial intelligence (AI) tools during the preparation of this manuscript. Specifically, ChatGPT was utilized for brainstorming initial concepts and improving the clarity, grammar, and overall language of the text. All final content

was reviewed and approved by the authors, who take full responsibility for the integrity of the work

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