International Journal of Civil Service Reform and Practice
Vol. 14, No 1, 2026 | e-ISSN 2409-5532
Published by the Astana Civil Service Hub

INCREASING THE RELIABILITY AND AVAILABILITY OF OFFICIAL INFORMATION DURING EMERGENCIES

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Received:
February 28, 2026

Revised:
March 7, 2026
March 16, 2026

Accepted:
March 21, 2026

DOI:
10.56289/ijcsrp.226

ABSTRACT

This article examines the issues of increasing the reliability and accessibility of official information during emergencies in the Republic of Kazakhstan. Emergencies of natural, technological, and epidemiological nature and the pre-, during, and post-crisis phases of information support are analysed. Special attention is paid to the role of government agencies, mass media, social networks, and digital technologies (mobile applications, early warning systems). The main factors affecting the credibility of information — source transparency, the fight against fake news, and public digital literacy — are analysed. Specific recommendations are provided to increase public trust and ensure information security.

Keywords: *emergencies, official information, trust, accessibility, Kazakhstan, mass media, social networks, misinformation.*

INTRODUCTION

Providing the public with timely, reliable, and comprehensible information during emergencies constitutes a fundamental prerequisite for safeguarding human life and maintaining public order. The effectiveness of crisis response largely depends on the speed, accuracy, and consistency of official communications. The 2024 Almaty earthquake serves as a compelling illustration of this principle: deficiencies in the delivery of seismic alert messages, some of which failed to reach residents' mobile devices, contributed to heightened public anxiety and confusion. This episode underscored the systemic importance of resilient and technologically reliable alert mechanisms. More broadly, a series of natural disasters and technological incidents in Kazakhstan in recent years, including floods, industrial accidents, and the COVID-19 pandemic, have exposed structural weaknesses in the national system of emergency information dissemination.

In recent years, Kazakhstan has experienced recurrent spring floods and industrial incidents across multiple regions, prompting local authorities to declare states of emergency. For instance, in 2025, a local-level technological emergency was declared in Alatau, Almaty Oblast, following a major fire at a large landfill site (Raisvikh, 2025). Such cases illustrate both the diversity of risk sources and the necessity of coordinated crisis communication mechanisms.

FINDINGS AND DISCUSSION

In this regard, Kazakhstan's 112 emergency service is progressively adopting a similar integrated model, consolidating information from multiple emergency agencies to ensure unified and authoritative public messaging. Traditional and digital mass media, such as television, radio, and online platforms play a complementary role by disseminating verified information and providing continuous updates as the situation evolves.

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Overall, the development of an effective emergency communication system requires not only technological infrastructure but also institutional coordination, regulatory clarity, and sustained public trust. The recent experiences of Kazakhstan demonstrate that strengthening these components is essential for enhancing national resilience and ensuring the protection of citizens in times of crisis.

In the post-crisis phase, communication strategies shift from urgent alerting to stabilisation, recovery, and accountability. Information dissemination at this stage is intended to keep the population informed about the normalisation of the situation, ongoing recovery operations, compensation mechanisms, and preventive measures designed to mitigate the risk of recurrence. Transparent reporting on the number of casualties, the scale of material damage, and the progress of reconstruction efforts serves not only an informational function but also a trust-building one. By providing verified and regularly updated data, public authorities reduce uncertainty, counteract speculation, and enable citizens to form an accurate understanding of the evolving circumstances.

Among the core principles of emergency communication, information reliability represents the most sensitive and consequential dimension. The credibility of crisis communication is shaped by several interrelated factors: the source of information, its official status, the verifiability of its content, and the prevalence of misinformation within the information environment. In practice, public trust is typically concentrated in institutional sources. In Kazakhstan, official communications are primarily associated with the Ministry of Emergency Situations of the Republic of Kazakhstan, the Ministry of Internal Affairs of the Republic of Kazakhstan, and local executive bodies (akimats), all of which are perceived as authoritative and legally accountable actors. The institutional legitimacy of these bodies plays a central role in shaping public perception of message authenticity.

At the same time, the deliberate dissemination of false information constitutes a significant challenge during emergencies (Hinata et al., 2024). Crisis situations are characterised by heightened psychological vulnerability, increased demand for information, and rapid circulation of unverified content through digital platforms. Under such conditions, misinformation and disinformation can spread exponentially, distort risk perception, and provoke panic or socially destabilising behaviour. Recognising these risks, Kazakhstan's legislation considers legal liability for the intentional dissemination of false information, particularly in the context of a declared state of emergency. This regulatory approach reflects an effort to safeguard informational integrity while maintaining public order.

The reliability of information is also closely linked to the transparency and responsiveness of state institutions. Delays in official reporting, partial disclosure, or perceived concealment of facts may erode public confidence and create an informational vacuum that is quickly filled by rumours. In certain cases, emergency situations have been accompanied by temporary internet shutdowns or restrictions on communication platforms. While such measures may be justified on security grounds, they can simultaneously impede the circulation of verified information and inadvertently stimulate the proliferation of unsubstantiated narratives. Thus, maintaining a balance between security considerations and informational openness remains a complex governance challenge.

Closely related to reliability is the principle of accessibility, which implies that emergency information must reach all segments of the population without discrimination. Accessibility is determined by several structural factors: the level of development of telecommunications infrastructure, linguistic inclusivity, the usability of digital platforms and applications, and the

capacity of persons with disabilities or other special needs to receive and comprehend information.

A critical structural constraint concerns access to internet and mobile communication networks. Although more than 93% of Kazakhstan's population regularly uses the internet, connectivity gaps persist in remote and sparsely populated rural areas. Despite strategic plans to achieve universal internet coverage by 2027, current 4G network coverage extends to approximately 88–90% of residents. Consequently, communication strategies that rely exclusively on internet-based channels risk excluding certain territorial communities during emergencies. This reality underscores the necessity of a multi-channel approach — including SMS alerts, cell broadcast systems, traditional media, and offline notification mechanisms — to ensure comprehensive and equitable dissemination of critical information.

Language barriers constitute a significant dimension of information accessibility in emergency communication. As a multilingual state, Kazakhstan disseminates official information in both the state language (Kazakh) and Russian, reflecting the country's sociolinguistic composition. In many instances, emergency announcements are issued simultaneously in two languages, and certain digital platforms also provide English-language versions to accommodate foreign residents and international audiences. For example, the *Darmen* mobile application — developed as a rapid public alert tool — is available in Kazakh, Russian, and English, thereby reducing linguistic exclusion and ensuring that identical information is accessible to diverse ethnolinguistic groups.

Nevertheless, practical challenges remain. In some regions, residents may encounter emergency notifications in only one language, which can result in partial comprehension or misinterpretation of critical instructions. Such inconsistencies undermine the principle of equal access to information and may disproportionately affect linguistically homogeneous rural communities. From a governance perspective, ensuring systematic bilingual (and, where appropriate, trilingual) dissemination is not merely a matter of inclusivity but of operational effectiveness, as misunderstanding of protective instructions during a crisis can have direct safety implications.

The usability and technical reliability of dedicated mobile applications and official web platforms also exert a direct influence on the accessibility of emergency information. If digital interfaces are overly complex, poorly optimised, or technically unstable, users may be unable to obtain essential updates in a timely manner. Technological compatibility presents an additional constraint: owners of smartphones operating on outdated versions of Android or iOS may fail to receive certain categories of push notifications or emergency alerts. Consequently, accessibility must be understood not only in terms of message transmission but also in terms of message reception and user experience.

Effective emergency messages should therefore adhere to established principles of clarity, brevity, and specificity. Content must be structured in a manner that enables rapid comprehension under stress conditions, ideally supplemented by visual aids such as maps, diagrams, or geolocation markers where appropriate. International practice demonstrates the value of standardised message formats. For instance, in the United States, the Federal Emergency Management Agency oversees integrated alert systems in which notifications immediately display the type of hazard, recommended actions, the issuing authority, and a timestamp. Such structured presentation facilitates rapid situational assessment. In Kazakhstan, there is an emerging practice of incorporating concise, action-oriented

instructions within SMS notifications, provided in up to three languages, when necessary, which reflects movement toward comparable standards of clarity.

During emergencies, the effectiveness of communication depends on the coordinated functioning of the broader information ecosystem, encompassing state authorities, mass media, and digital social networks. Government agencies act as the primary generators and authoritative sources of verified information, and their responsiveness is therefore decisive. In Kazakhstan, the central coordinating body in this domain is the Ministry of Emergency Situations of the Republic of Kazakhstan and its territorial subdivisions. In addition, the Ministry of Internal Affairs of the Republic of Kazakhstan and local executive bodies (akimats), which are directly involved in response operations and public protection, bear concurrent responsibility for information dissemination.

From the earliest minutes of an emergency, official authorities are expected to address the population promptly, provide accurate and verified data, and communicate precautionary or evacuation measures as required. To fulfil these obligations, multiple communication channels are mobilised simultaneously, including press services, hotlines and call centres, official websites, SMS alert systems, and verified social media accounts. Such a multi-channel and institutionally coordinated approach enhances both the reach and credibility of official communications, thereby contributing to public trust and societal resilience in crisis situations.

Mass media remain among the most established and institutionally trusted channels for the large-scale dissemination of official information. Television and radio broadcasters possess the technical capacity to interrupt scheduled programming in order to transmit urgent announcements, thereby ensuring immediate outreach to broad segments of the population. Print and online news outlets perform an additional interpretative function: beyond relaying official statements, they contextualise data, provide expert commentary, and facilitate public understanding of complex developments. In this sense, traditional media serve not only as transmission mechanisms but also as mediators between state institutions and society.

Moreover, social media platforms have emerged as the fastest and most pervasive instruments of information exchange in contemporary societies. During emergencies, eyewitnesses frequently upload photographs, videos, and real-time observations from affected areas, generating a continuous stream of user-generated content. This phenomenon has a dual character. On the one hand, it can supply preliminary situational information that may precede official reporting and assist authorities in identifying emerging risks. On the other hand, the decentralised and unverified nature of such content significantly increases the likelihood of misinformation and exaggeration. In crisis contexts, where anxiety levels are elevated and demand for updates is acute, unverified reports can rapidly gain traction and shape public perception.

Accordingly, systematic monitoring of digital platforms has become an integral component of contemporary crisis communication policy. Government agencies are expected not only to disseminate verified information proactively but also to track circulating narratives and respond swiftly to inaccuracies (Baimbetova et al., 2024). For example, if social networks propagate inflated figures regarding casualties or damage, the competent authority must promptly issue a corrective statement, provide substantiated data and clarifying the factual situation. Such timely rebuttals are essential for preserving informational integrity and maintaining public trust.

Advances in digital technology have significantly expanded both the speed and scale of official information dissemination. In Kazakhstan, dedicated information systems and mobile applications play an increasingly prominent role in emergency communication. Among these tools is the *Darmen* mobile application, developed to facilitate rapid public notification. Through push notifications, residents receive immediate alerts concerning emergencies in their region, along with concise instructions and safety recommendations. Initially launched in Almaty, the application is now being progressively deployed nationwide, reflecting broader efforts to institutionalise digital alert mechanisms within the national civil protection framework.

Taken together, the interaction between traditional media, social networks, and state-operated digital platforms illustrates the evolution toward a hybrid communication model. In this model, the effectiveness of emergency response depends not only on the technological capacity to transmit messages but also on institutional coordination, rapid verification procedures, and the strategic management of the information environment as a whole.

In parallel with the development of digital alert technologies, Kazakhstan is undertaking the modernisation of its unified emergency dispatch service, 112. The reform agenda envisions transforming 112 into an integrated, multi-channel communication hub capable not only of receiving emergency calls but also of disseminating urgent notifications to the public. In this model, the 112 service functions as both a response and an information platform, consolidating data from various operational services and ensuring its prompt transmission through diverse communication channels.

A central technological component of this modernisation is the Cell Broadcast–based alert system, which leverages advanced mobile network capabilities to transmit emergency messages simultaneously to all compatible devices within a defined geographic area. Unlike conventional SMS delivery, Cell Broadcast does not depend on individual phone numbers and is therefore particularly effective in densely populated or rapidly evolving crisis zones. Messages transmitted through this system already contain standardised elements, including the type of emergency, the issuing authority, and a timestamp, thereby enhancing clarity and traceability. Nevertheless, residual technical constraints persist. Older mobile devices, smartphones operating on outdated software versions, or phones not properly registered on the network may fail to receive such notifications. Addressing these limitations requires coordinated engagement with mobile network operators and device manufacturers to ensure backward compatibility and broader system integration (Sagundykova, 2021).

To enhance both the reliability and accessibility of official emergency information, a comprehensive and systemic approach is required. The following strategic directions may be identified.

First, the institutionalisation of transparency and timeliness as guiding principles of crisis communication is essential. Public authorities should prioritise the rapid disclosure of verified information rather than delay publication due to reputational concerns. This presupposes the prior development of detailed communication protocols and clearly delineated responsibilities among agencies, ensuring that each institutional actor understands its informational mandate during a state of emergency.

Second, structured cooperation with mass media should be strengthened. The professional preparedness of journalists covering crisis events significantly influences the accuracy and tone of public reporting. Specialised training programs for journalists and regional media

representatives—such as those initiated by the Ministry of Information—can enhance standards of responsible reporting and mitigate sensationalism during high-stress situations.

Third, systematic monitoring of social media platforms and proactive digital engagement must become a permanent function of public authorities. Dedicated communication teams or designated officials should track trending narratives, respond promptly to misinformation, and maintain continuous activity on verified accounts across major platforms. Around-the-clock responsiveness contributes to narrative control, reduces the spread of rumors, and reinforces institutional credibility.

Fourth, linguistic inclusivity and accessibility barriers must be consistently addressed. Official communications should be disseminated simultaneously in Kazakh and Russian, with English-language versions provided when necessary. Particular attention must be paid to the semantic equivalence and accuracy of translations to avoid inconsistencies in meaning. Equal linguistic access constitutes not only a cultural obligation but also a practical safety requirement.

Fifth, technological infrastructure requires further enhancement. Nationwide deployment of the Cell Broadcast system, in partnership with mobile operators, should be complemented by the continued use of SMS alerts as an alternative channel, particularly for users with older devices or in areas limited to 2G or 3G connectivity. Redundancy in communication channels is a critical principle of resilient emergency systems; reliance on a single technological solution may create avoidable vulnerabilities.

Sixth, public awareness and digital literacy must be strengthened. Citizens should be informed about the functioning and importance of emergency communication mechanisms, including SMS notifications from the 112 service and the use of dedicated applications such as *Darmen*. Educational campaigns and preparedness programs can improve individual responsiveness and reduce confusion during real crises.

Seventh, refinement of the legal framework is necessary to ensure regulatory clarity. Legislation governing states of emergency and media activity should explicitly define principles of information policy under extraordinary conditions. This may include provisions safeguarding transparency, narrowly circumscribing the grounds and duration of internet restrictions, and reinforcing liability for the intentional dissemination of false or distorted information. Clear legal parameters contribute to predictability and institutional accountability.

The implementation of these measures in an integrated and coordinated manner is expected to significantly enhance the quality, reliability, and accessibility of official information during emergencies. However, isolated reforms are unlikely to yield sustainable results. Only through the alignment of legislative norms, technological capacity, institutional professionalism, and effective public engagement can Kazakhstan establish a robust and exemplary model of emergency communication that reinforces public trust and societal resilience.

CONCLUSION

Given Kazakhstan's geographic, climatic, and industrial characteristics—which collectively generate recurrent risks of natural and technological emergencies—the reliability and accessibility of official information will remain a matter of enduring strategic importance. This study has examined information dissemination practices across the pre-crisis, crisis, and post-crisis phases, analysing how institutional, technological, legal, and sociolinguistic factors

shape the effectiveness of emergency communication. The central finding is that accurate, timely, and universally accessible information constitutes a foundational condition for effective crisis management and societal resilience.

Public trust in official communications does not arise automatically; it must be systematically cultivated through consistent transparency, institutional accountability, and technological competence. Government agencies must adhere rigorously to principles of openness, respond promptly to misinformation, and strategically employ modern communication technologies to ensure broad and equitable outreach. In this regard, Kazakhstan has initiated several important reforms. The phased introduction of the Mass Alert system and the expansion of mobile-based notification mechanisms represent significant steps toward strengthening rapid alert capacity. Efforts are also underway to formalise standardised algorithms for information dissemination during emergencies, thereby clarifying interagency responsibilities and procedural coordination. Concurrently, legislative provisions addressing the intentional distortion or fabrication of information are being reinforced to protect the integrity of the public information environment. Nevertheless, these measures remain in a developmental phase, and further institutional consolidation is required.

The recommendations formulated in this study — ensuring the rapid and accurate delivery of information; strengthening partnerships with mass media; institutionalising multi-channel communication; eliminating linguistic and technological barriers; modernising infrastructure; and enhancing public digital literacy — are mutually reinforcing and should be implemented as components of a comprehensive strategy rather than as isolated initiatives. Only through such an integrated approach can the quality, inclusiveness, and credibility of official emergency communications be substantially improved.

Enhanced informational reliability and accessibility will contribute not only to more effective mitigation of emergency consequences but also to broader governance objectives, including citizen safety, institutional legitimacy, and social stability. Ultimately, the management of information during crises transcends the technical sphere of communication policy. It constitutes a core element of national security architecture and a critical determinant of social cohesion in times of uncertainty.

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