MINDWELL SCIENCE PRESS SDN. BHD.

Journal of Systemic Risk
Volume 1, Issue 1

RESEARCH ARTICLE

Evaluating the Effectiveness of Government Emergency Response: A Characteristic-Based Framework, Tested against Major Accident Investigation Reports since 2010

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Published: 28 June 2026

Abstract

Emergency response is a critical element of government emergency management. A successful response typically exhibits four characteristic features: timeliness, accuracy, regularity and systematicity. These four features can serve as the basis for constructing a theoretical framework for evaluating the effectiveness of government emergency response. The investigation reports on major accident and disaster response published by the Ministry of Emergency Management since 2010 also show that when all four features are satisfied simultaneously, the government response is efficient. Inefficient responses, by contrast, exhibit marked deficiencies in one or more of these four features. According to this characteristic-based evaluation framework, there are four important current pathways for enhancing government emergency response capacity: improving intelligence gathering and decision-making capacity; scientifically assessing the causes of events and respecting the laws governing their development; optimising the regulatory system and strengthening control over its implementation; and reinforcing systemic thinking and a sense of the overall picture.

Keywords: government emergency management; emergency response; characteristic-based evaluation framework; emergency handling

1 Introduction

Emergency response is a key variable determining a government's emergency management capacity. An effective response has long been an important objective in perfecting the government emergency management system and improving government emergency management capacity. Regrettably, however, although governments at every level from central to local have made extensive preparations in advance and formulated relatively complete and standardised emergency plans, when an emergency or disaster actually strikes, some governments and departments are still at a loss and cannot mount an adequate and effective response. Where does the problem lie? The academic literature contains many studies on this question, with two representative strands.

One strand holds that the necessary prior planning and preparation are preconditions for emergency response: they help reduce the pressure and difficulty of responding and mitigate the harm or impact of an emergency or disaster, but planning and preparation cannot substitute for the response itself, nor can they fundamentally prevent an emergency or disaster from occurring.[1] The reason governments panic and respond inappropriately is that planning and preparation do not touch the internal links of the response activity itself.[2]

The other strand holds that responding too late or too early, over-reacting or under-reacting, all fall within the category of response failure (failure or ineffectiveness), and that the causes lie in intelligence failure, a lack of imagination and deficient leadership.[3] Achieving "proportionality" between response measures and the event itself is the objective of improving response effectiveness; classifying, grading and phasing possible emergencies, and on that basis adopting different measures and instruments, is the main pathway to achieving proportionality.

It will be seen that the first strand enriches and extends the connotation and denotation of emergency response and advances the perfection of the government emergency management system. The second provides an apt vocabulary for understanding response effectiveness and a systematic analytical framework for identifying different types of response. Their evident shortcoming, however, is that they either do not touch the response activity itself, or their analysis is too theoretical and idealised to distinguish clearly among the various practical problems that may arise in emergency response,

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and they offer no effective solutions to those problems.

In light of this, and reflecting on the relevant research, this article takes the investigation reports on major accident and disaster response published by the Ministry of Emergency Management since 2010 as its blueprint and the response outcomes recorded in them as its object of analysis, and addresses the following questions. First, how is one to determine whether a government emergency response in the real world is effective? Second, is the new evaluation framework sufficiently persuasive for determining the effectiveness of government emergency response, and are there examples in practice? Third, how can the effectiveness of government emergency response be further enhanced?

2 A Characteristic-Based Framework for Evaluating the Effectiveness of Government Emergency Response

Characteristic-based evaluation theory holds that any excellent and effective behaviour possesses certain stable characteristics; if a behaviour possesses these characteristics, or exhibits them markedly, it will achieve relatively ideal results, whereas if those characteristics are not evident or are absent, the behaviour will struggle to produce good results. For the effectiveness of government emergency response, these characteristics can reside only in those distinctive symbols and markers within the response process that genuinely demonstrate the response to be effective.

First, timeliness is the primary marker of whether a government emergency response is effective. Timeliness reflects whether the response catches the moment. It matters because it is directly related to the severity of the emergency, the difficulty of responding and the degree of harm inflicted. Responding too early wastes resources; responding too late not only greatly increases the difficulty of response and causes irreversible harm but may even fundamentally alter the nature of the event, causing the harm to grow geometrically.

Second, accuracy is an important precondition for judging a government emergency response effective. The essence of accuracy is to apply measures precisely according to the causes and severity of the emergency, in a manner neither vague nor disruptive. Otherwise, even a slight deviation may cause the response to falter or fail. This is what is meant by the sayings "an error of a hair's breadth leads to an error of a thousand li" and "one careless move loses the whole game".

Third, regularity is an important marker of whether a government emergency response is orderly, coordinated and efficient. Regularity determines what is permitted and what is not, what is correct and what is not, in the course of a government emergency response. Without unified and clear rules, it is very difficult to achieve a rapid and orderly response process or efficient interaction and coordination among departments, and the response process will be full of uncertainty.

Fourth, systematicity is the fundamental support for judging whether a government emergency response can give balanced consideration to all aspects while highlighting the key points. Government emergency response is a systems project: it requires publicity and guidance beforehand, organisation and mobilisation during the event, and reassurance and adjustment afterwards. An absence of publicity leaves some members of the public uncomprehending and uncooperative, or even abusive, creating a poor working atmosphere. Where some team members are chronically listless and impatient, inertia may breed within the response team. And if social mobilisation is insufficient and personnel are in short supply, the response will be stretched thin and fall into a resource predicament.

In short, according to characteristic-based evaluation theory, if the key characteristics above are simultaneously present, we may conclude on a basic level that a government emergency response is effective. A response lacking these key characteristics, even if it lacks only one, should be regarded as ineffective or inefficient. As Meyer puts it, the essence of government emergency response is "the ability to mobilise the cognitive and material resources available in the decision-making process to respond to threats in a manner that is proportionate and time-sensitive, in accordance with the severity, likelihood and nature of transboundary threats".[4]

3 Testing the Framework against Major Accident and Disaster Responses since 2010

3.1 Judging Effectiveness from the Performance of Timeliness

Extensive response practice shows that the earlier a government obtains information and the more promptly it decides on a response, the shorter the duration of the accident or disaster and the more successful the response. On 12 July 2021, the main building of the Siji Kaiyuan Hotel in Wujiang District, Suzhou, Jiangsu Province, collapsed, trapping nearly 30 people. At 15:33:03 the 110 emergency line received a call. Two minutes later the fire and rescue detachment arrived at the scene. Three minutes after that, the Jiangsu Provincial Fire and Rescue Corps, on receiving the report, activated the emergency response plan for major and especially major disasters and telephoned 11 heavy and light earthquake rescue teams totalling 694 personnel from Nanjing, Zhenjiang, Changzhou, Wuxi and Nantong and the logistics support detachment to assist at the scene. Ten minutes later the health commissions of Suzhou and Wujiang District successively

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dispatched 15 ambulances and organised on-site treatment. After nearly 40 hours of all-out rescue, the search-and-rescue task was essentially complete. The entire response process was rapid, professional and efficient, and no rescuer or medical worker was killed or injured. The response to other major accidents and disasters in various localities over the past decade likewise basically confirms this direct correlation between timeliness and response outcome.

3.2 Judging Effectiveness from the Performance of Accuracy

The concentrated expression of accuracy in government emergency response is the precise application of measures; its basic requirements are to identify the problem accurately, highlight the priorities of the work and apply targeted measures. Extensive response practice over the past decade shows that the more precise the response measures, the more targeted the emergency handling and the higher the response outcome. On 20 December 2015, a landslide occurred at a spoil ground in Guangming New District, Shenzhen, directly affecting an area of more than 380,000 square metres and destroying or burying 33 buildings. After the accident the Shenzhen municipal government immediately established an on-site rescue command post, mobilised airships to carry out on-site mapping and, combining high-technology means including optical radar, ground-penetrating radar and the high-density electrical method, divided the site into 35 grids and identified 7 priority search-and-rescue points, organising personnel to carry out a grid-by-grid blanket search around the clock. It also established a medical support group and an aftercare group, applying "one-to-one" treatment by specialists and medical staff to the injured and a "one family, one group; one group, one policy" approach to the families of the dead and missing. Afterwards the State Council investigation team concluded that the Shenzhen municipal government had responded promptly, adopted appropriate plans, taken forceful measures and conducted orderly aftercare.[5] Precise application is in essence scientific application: scientifically assessing the causes of the accident and its development trend and taking forceful measures to keep the losses from the accident to a minimum. In recent years, as training, drills and supervision in emergency response have deepened, the precision of government response measures has steadily increased, greatly improving response effectiveness and reducing the shock to economic and social operation. Take the handling of road traffic accidents: at present, when a road traffic accident occurs, localities can basically follow the basic requirements of emergency response by organising traffic police, fire and rescue and emergency medical services to reach the scene within a short time, and can apply handling measures precisely and complete the task quickly, without greatly affecting road traffic.

3.3 Judging Effectiveness from the Performance of Regularity

Regularity in government emergency response is concentrated in the degree of compliance with the relevant laws and regulations and with emergency response plans. As early as August 2007 the National People's Congress promulgated the Emergency Response Law of the People's Republic of China, which laid down clear provisions on the prevention of and preparation for emergencies, monitoring and early warning, emergency response and handling, and post-event recovery and reconstruction, and also required the establishment of a system of emergency plans. The emergency response plan is an important component of that system and generally comprises eleven elements: four levels of response procedure (general, larger, major and especially major); information sharing and processing; communications command and coordination; emergency handling; protection of emergency personnel; protection of the public; mobilisation and participation of social forces; accident investigation and analysis; detection and consequence assessment; news reporting; and termination of the response. The plan defines in advance the responsibilities of each department and the response procedures, so that emergency rescue can be guided to proceed quickly, efficiently and in an orderly way within a short time, keeping casualties, property losses and environmental damage to a minimum. Over the past decade, in the face of emergencies, localities have all been able to activate the emergency response plan at the first opportunity and to use the plan to guide the response, showing a relatively strong regularity. Compliance with the plan gives the response a basis in rules and a procedure to follow, and raises its professional and standardised level. Of course, whether departments can each fulfil their responsibilities and cooperate efficiently in a response is also one of the important criteria for determining the effectiveness of government emergency response from the standpoint of regularity. Under the requirements of a general emergency response, once an emergency occurs the emergency command body should immediately enter a wartime posture and the heads of all member units should converge quickly on the command centre, while public security, transport, health, emergency management, sub-district offices and other departments divide the work of comprehensive coordination, treatment of the injured, traffic control, security, on-site rescue, accident investigation, guidance of public opinion, aftercare and resettlement, and logistics. This is a mechanism of divided responsibility, parallel handling and orderly response. But when an emergency actually occurs, whether government departments can quickly enter that state is uncertain.

3.4 Judging Effectiveness from the Performance of Systematicity

Systematicity in government emergency response is concentrated in its collective, relational, logical and hierarchical character. The essence of emergency response is the abnormal state and its characteristic is uncertainty, so systematicity

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manifests at many levels. First, the systematicity of emergency response is manifested in the adequacy of emergency publicity. On the one hand, emergency publicity serves to guide the public to an accurate understanding of the severity of an emergency and the necessity of precaution, strengthening the awareness of avoiding danger and surviving; on the other, it serves to raise the public's conscientiousness in cooperating with the government's emergency arrangements. It may be said that the more adequate the emergency publicity, the higher the public's cooperation and the smaller the harm and loss caused by the emergency. In the 2008 Wenchuan earthquake, apart from Sangzao Middle School no other school had routinely carried out earthquake publicity and drills, but Sangzao Middle School persisted, and in the end created the miracle of no casualties in the earthquake. In May 2021 a mountain marathon in Baiyin, Gansu Province, encountered extreme weather and 21 participants died; it was subsequently learned that the organisers had not adequately assessed the local weather conditions, had not conducted relevant training and drills for management and service personnel, and had not formulated an emergency plan.[6] Second, the systematicity of emergency response is manifested in the breadth and depth of social mobilisation. The shift of emergency response from a "command" model to a "governance" model is an inevitable trend.[7] Under the governance model the government's role can only be that of leader, not that of sole provider. Whether the government can broadly mobilise the public to respond actively and participate efficiently is an extremely critical link in whether a response succeeds. Only by fully awakening and activating social forces and properly and orderly organising, guiding and coordinating them can an efficient response be achieved.

4 Implications of the Framework for Improving the Effectiveness of Government Emergency Response

First, the problem of timeliness should be solved by improving intelligence gathering and decision-making capacity. Experience in responding to major accidents and disasters shows that the key to timeliness lies in the promptness with which the government obtains intelligence and the promptness of its decisions. The most direct cause of slow or erroneous government decisions is a failure to obtain in good time accurate information that an emergency is about to occur or is occurring. If intelligence fails, errors in government decisions are almost unavoidable. Of course, another situation commonly arises in practice: the intelligence service has already issued sufficient warning signals and the government has already obtained sufficient information, yet it still hesitates, fearing both the wolf in front and the tiger behind, and dares not decide. This raises the question of decision-making capacity. In practice most such government leaders are seriously deficient in decision-making capacity: they either lack the capacity for sense-making and do not know where the crisis lies or what the bottom line is, or they lack the relevant knowledge and work experience, do not know what should and should not be done, and certainly do not know how to conduct effective risk communication and command coordination. Deficient intelligence gathering and decision-making capacity in government is a common lesson of emergency response, and the fundamental way out is to strengthen training for leading cadres at all levels in risk awareness and in handling emergencies. On the one hand, leading cadres should be helped to firmly embed the principle of putting the people and life first and to strengthen their risk awareness and bottom-line thinking; on the other, they should be organised to study intelligence-gathering techniques and the experience and lessons of predecessors, using practical, scenario-based instruction to solve the problem of being "afraid to act, unable to act and ineffective in acting" in the face of an emergency, and thereby genuinely raising the capacity and standard of emergency response.

Second, the problem of accuracy should be solved by scientifically assessing the causes of events and respecting the laws governing their development. The key to accuracy lies in judging the causes of an emergency accurately, which is the precondition for adopting the corresponding measures in a targeted way and for matching the means of solving the problem to the cause that produced it. To solve the problem of accuracy, the corresponding response measures should first be taken according to the severity of the emergency, so that the intensity of the response matches the degree of harm. The severity of an emergency differs in the stages before it occurs, while it is occurring and as it gradually abates, and the intensity of the corresponding measures should differ accordingly. If the intensity is too low, the spread of the event cannot of course be stopped and there is under-response; if it is too high, costs become excessive and unnecessary sacrifices are made. The way out is first to make a scientific assessment of the current state of the emergency. Only by being clear about what the problem is and where the crux lies can one know what should be done. Second, scientific methods and data should be used to grasp accurately the laws governing the development of the emergency. At the same time the principle of seeking truth from facts should be upheld, and the needs and voices of the public should be matched precisely, in a manner neither rigidly doctrinaire nor bound by form. Only by grounding the work in solving the key problems and aiming at the target precisely can real and hard measures for emergency response be produced.

Third, the problem of regularity should be solved by optimising the regulatory system and strengthening control over its implementation. The regulatory system for emergency response comprises institutional rules such as emergency plans, operating standards and work programmes; organisational rules such as the organisational system and the leading

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bodies; and implementation rules such as operating guidelines and work manuals. Institutional rules provide the institutional guarantee, organisational rules provide leadership and human resources, and implementation rules enable the response to be genuinely carried out. China once used the 2003 SARS prevention and control as a window to establish a relatively complete institutional system for emergency response, but many institutional rules suffer from copying, fragmentation and wishful thinking.[7] Some government departments even treat institutional rules merely as political symbols, treating the drafting of rules as the whole or the end of the response process, and lacking routine management such as drills, resource preparation and timely updating. As for organisational rules, the central authorities have explicitly required the establishment of organisational rules for emergency response that are "under unified command, combining specialised and regular forces, responsive and linked from top to bottom", but some localities understand them inaccurately, implement them half-heartedly or even alter and distort them, so that overlapping institutions, duplicated functions and coincident work persist, and the problem remains that everyone is responsible for the same matter but no one takes responsibility for it properly. Some institutional rules deal with the acting subject, mode of operation and operating procedure in a vague manner, which also causes some implementation rules to become hollow. To solve the problem of regularity, besides gradually optimising the regulatory system through conceptual renewal, process re-engineering and technological innovation, what is more important is to strengthen control over implementation. The usual means of strengthening control are judicial, administrative and social. The judicial means, by perfecting legal institutions and raising the standard of law enforcement, uses the seriousness of the law to guarantee the deterrent effect of implementation. The administrative means, by exercising administrative orders and organisational discipline, holds accountable those who violate them, guaranteeing the compulsory force of implementation. The social means relies on people's conscience and public opinion, and through evaluation, support and praise raises the conscientiousness with which people comply.

Fourth, the problem of systematicity should be solved by reinforcing systemic thinking and a sense of the overall picture. Systemic thinking emphasises a precise grasp of the whole, so that there is an overall view and a direction. A sense of the overall picture emphasises handling the relationship between advancing the whole and making breakthroughs at key points, and consciously locating oneself within the whole: "he who grasps the great also grasps the small." To solve the problem of systematicity, one may begin with a systematic evaluation of how the response runs, identifying gaps from a coordinated and efficient response in such respects as the establishment of command bodies, the definition of departmental responsibilities, the allocation of professionals and resources, and the operating mechanism. The systematic evaluation can be combined with systematic institution building: by making specific responsibilities, response mechanisms and action measures of the departments and units concerned concrete and detailed, these institutions can be made useful and effective at critical moments. In addition, solving the problem of systematicity requires broadly strengthening risk awareness and self- and mutual-rescue capacity throughout society. Publicity and education departments should give full play to all kinds of media and can draw on the experience of countries such as Japan and Germany by incorporating disaster prevention and safety education into basic education, and by organising richly varied practical drill activities to stimulate public interest and strengthen the educational effect.

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