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A Framework for Response Escalation and Emergency Response Asset Management

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Abstract

The Centers for Disease Control and Prevention (CDC) responds to public health emergencies at various levels within its organization. Overtime, CDC's response capabilities have matured across the organization due to years of emergency management investment and experience across the agency. In 2019, CDC began to implement the Graduated Response Framework to formalize an approach for managing public health emergencies that recognizes its response capabilities and meets the evolving needs of the country. This brief report summarizes CDC's Graduated Response Framework structure, and how response management escalates and de-escalates according to resource needs and complexity.

Keywords

emergency management; emergency preparedness; response framework

A Graduated Response Framework

Over the last several decades of National Incident Management System (NIMS) use across the country, resource management remains one of the most important aspects contributing

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to a successful emergency response. It is especially difficult to standardize large emergency response efforts across multiple organizations with different work cultures and experience with Incident Command System.^{1–3} Organizations often leverage the flexibility, adaptability, and scalability of NIMS to structure their Incident Management System (IMS) to best fit specific situation.^{4,5}

The US Centers for Disease Control and Prevention (CDC) is one of the US government's over 400 agencies; it is the nation's leading science-based, data-driven, service organization that protects the public's health. It organizes its public health work into programs within national centers, institutes, and offices (CIO) that focus on specific areas of public health.⁶ Following the development of NIMS in 2004, activation of the IMS at CDC included an emergency response level designation from 1 to 3.⁷ Level 1, CDC's highest level IMS activation, was reserved for complex emergencies of the largest scale requiring substantial agency-wide effort and surge staffing from across the agency's centers. Level 2 responses required significant program staff from the leading center and resource support from across the agency for IMS functional services. Finally, level 3 responses were IMS activations that were primarily managed by the lead center; these responses could be handled within the program with minimal augmentation and optional agency-level IMS functional services. Examples of level 1 to 3 responses include the 2016 Zika response, 2007 Hurricane Dean, and the 2013 H7N9 Avian Influenza response, respectively.

Over time, public health emergency responses grew in scale and complexity, pushing the limits of resources to address multiple, simultaneous disease outbreaks, natural disasters, and emergencies.^{8,9} CDC agency-level response capabilities matured due to years of emergency management investment and experience across the agency. In 2019, the Office of Readiness and Response and its Division of Emergency Operations developed the Graduated Response Framework (GRF) to formalize an approach for managing public health emergencies that recognizes this growth and meets the evolving needs of the country. The GRF approach is a 3-level structure for improved management of CDC's public health emergency responses at the right level within the agency through better coordination, organization, and use of agency resources.

GRF follows NIMS principles of scalability, standardization, and unity of effort⁹ and supports CDC's "Moving Forward" initiative to be a more flexible, response-capable agency while maintaining the core public health work critical to the health of the nation.¹¹ Framework development requires ongoing engagement between Office of Readiness and Response and experts from other centers at CDC. The GRF Steering Committee oversees the development, implementation, and maintenance of the GRF and supporting materials and resources. The committee examines specific issues and develops recommendations and resources for addressing them, including guidance for the practical implementation and operationalization of the framework. The Steering Committee formalized the framework by developing the Concept of Operations as the blueprint for managing GRF responses. In conjunction with CDC's All Hazards Plan, the GRF Concept of Operations offers guidelines and resources for multilevel response management, focusing on implementation and management of response processes and procedures across the response levels.⁷

Graduated Response Framework levels

The CDC GRF levels include a program-led response, center-led response, and agency-wide response. Many CDC responses begin as normal operations and routine surveillance identifying a need for increased efforts for a specific disease outbreak, natural disaster, or other emergency event. When a threat exceeds the capacity of normal operations, coordination is escalated to the most appropriate level of the GRF. A program-led response is managed within a single program with primary responsibility for the threat. The establishment of a program-led response is both an augmentation of activities compared to day-to-day functions and a reprioritization of activities necessary to address the public health threat at hand (Figure). These responses represent a public health threat with heightened public, policy, or interagency interest but do not necessarily require use of an IMS structure, as staff from the responsible program largely makeup the group of responders. Although most activities are managed directly by the responsible program, the CDC Emergency Operations Center (EOC) and its incident management experts are available to support. An example of this type of response would be a multistate foodborne outbreak. These outbreaks are expected to happen each year but can require programmatic shifts to end the outbreak.

A center-led response is used when resource demands exceed the capability and capacity of the responsible program. The response may include coordination across CDC CIOs or US Department of Health and Human Services Operating Divisions/Staff Divisions (Op Divs/Staff Divs) or other United States government interagency partners. At this level, staff resources from across the center may be redirected from their normal job duties to support response activities. The lead center may request assistance from other centers, including where expertise is necessary to manage response functions housed in other parts of the agency. Center-led responses often utilize a smaller-scale IMS structure, including multiple functional teams or task forces. These responses may utilize the EOC facilities or its emergency management specialists to advise on designing an effective IMS structure, creating an incident action plan, and completing a summary of conclusion report following the de-escalation of a response. Center-led responses are established at the direction of division or center leadership, with an incident manager typically identified (Figure). An example would be a large, multistate outbreak of a vaccine-preventable disease, beyond what is expected by a program.

The agency-wide response is the highest GRF level reserved for large-scale responses centralized within CDC's EOC. The large, complex responses may include the need for resource collaboration between more than 2 centers, extensive US Department of Health and Human Services and United States government interagency coordination, the development of supplemental funding requests by the administration, or the management of supplemental funding appropriated by Congress. It requires significant support of the CDC IMS, involving staff from across the agency and full engagement of crosscutting functions (such as staffing, contract support, and communications), often needing extended staffing hours up to 24 hours a day. At the agency-wide level of response, the CDC Director appoints the IM, and directs the establishment, escalation, de-escalation, and deactivation of a response (Figure). An example of an agency-wide response would be a global threat or pandemic.

Response escalation

In addition to the above considerations for standing up CDC emergency responses, its escalation to a higher GRF level occurs when program- or center-led response level capabilities are exceeded. Common issues that may constitute the lead program or center's capabilities being exceeded include:

- Complexity: operational situation elements that demand cross-organization coordination, expertise, or procedural flexibility (eg, Stafford Act and Public Health Emergency)
- Urgency: extremely short-notice requirement identification or need to expedite established processes
- Volume: extraordinary amount and/or frequency of demands
- Visibility: significant external and national partner coordination around incident exceeds the norm
- Resource requirement: complex and urgent budgetary and personnel resource requirement and interagency coordination
- Impacted populations: need to address populations with unique vulnerabilities and/or high risk for adverse health outcomes

Response de-escalation

De-escalation, either to a lower GRF response level or transitioning response activities back to normal program operations, is considered when response demands are reduced. As response resource and coordination contracts, a decision is made to de-escalate the response based on:

- Completion of response objectives: at the beginning of a response, program, CIO, or IMS leadership establishes priorities and objectives that must be met to achieve the desired response end state. Deescalation may be appropriate when these objectives are on track to be completed or require fewer resources and coordination to continue making progress toward completion.
- Decreased resource demands: as response efforts continue, resource demands, including deployments, data gathering, and communication requirements, may decrease or be assumed by the lead CIO's capacity built during an incident. In addition, agency resources may be limited, and higher-priority responses may require resources reassigned from existing responses.
- Visibility: level of external or national partner coordination around incident decreases.

Conclusion

Before CDC was able to fully implement the GRF, it found itself responding to the global COVID-19 pandemic. Having the GRF in place allowed CDC to successfully respond to an additional 16 program-led, 5 center-led, and 1 additional agency-wide response during that

time. Not having the GRF in place would have put additional strain on CDC's emergency response resources over this 3-year period. Lessons learned from the COVID-19 response brought to light things CDC could improve across the agency. Acknowledging its need to improve both response and nonresponse operations led CDC to implement a new initiative for strategic change, CDC Moving Forward.¹¹ One major focus of this initiative is to develop a workforce prepared for future emergencies. CDC has since integrated cadres of staff and initiated training for preparedness and response activities within the GRF.

CDC is currently evaluating the capacity of centers to run center-led responses, building tools, and working on implementation. After over 4 years of active use of this system, we have found the need to adjust GRF further to better support emergency responses within CDC. In the future, GRF will be critically evaluated and improved upon using leadership input and user feedback.

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Implications for Policy & Practice

- CDC developed the GRF to ensure its emergency management framework recognized the way programs regularly respond to emergencies, while applying a consistent approach across the agency to the escalation and management of responses with more complex resource and coordination requirements.
- Through the GRF, CDC established a shared set of processes and procedures that serve as a baseline for emergency response activities across all centers within the agency, which allows for responses to be managed at the right level and to move seamlessly into an agency-wide posture when resource and coordination demands require.
- By establishing a baseline expectation for response capability and capacity, particularly among programs across the agency that frequently respond to emergency events, CDC is also working to ensure its centers and their component programs can address public health threats in their respective lanes, while also continuing to support the day-to-day functions the public and agency partners depend on CDC to deliver.
- Going forward, CDC is exploring ways to disseminate best practices and lessons learned from implementing the GRF in a way that can assist state, tribal, local, and territorial partners in adopting a GRF within their own areas of responsibility.

Response Level	Description
Agency-wide <i>Established at the direction of CDC Director upon recommendation of Preliminary Assessment Team; response centralized in the CDC EOC</i>	– Reserved for large-scale responses exceeding capacity of responsible CIOs – Requires significant augmentation of the CDC agency-wide IMS – Typically involves staff from across the agency, with full engagement of cross-cutting functions and DEO
Center-led <i>Established at the direction of Center Director; response managed within Center with some EOC coordination/support</i>	– Resource demands exceed responding program's existing capacity – Uses an IMS structure within a single or across a lead and supporting Center – Center staff may be redirected from normal operations to support response activities – Involves limited DEO support, primarily in the form of consultation and technical assistance for incident management and General Staff functions
Program-led <i>Change in posture at the direction of Division Director</i>	– Responses to routine or limited public health incidents, generally managed within a single program with primary responsibility for the threat at hand – Marked by a change in posture from day-to-day activities, pivoting away from other programmatic work to focus on responding to an incident – Does not necessarily require use of an IMS structure or involve EOC centralization and support

FIGURE.

CDC's Graduated Response Framework Three Levels of Activation

Abbreviations: CDC, centers for disease control; CIO, centers, institutes, and offices;

DEO, division of emergency operations; EOC, emergency operations center; IMS, incident management system;